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Ms Tamara Bosnjak
Assistant Development Manager

Date: 3 January 2026
Our Ref: 30234941
Subject: Updates to DA Flood Risk and Impact Report

This Flood Risk and Impact cover letter has been prepared by Arcadis on behalf of T&P Chimes Development Pty Ltd (the Applicant) to accompany a State Significant Development Application (SSDA) for a shop top housing development at 45-53 Macleay Street, Potts Point (the site).

The proposal seeks approval for the construction and operation of a 15-storey shop-top housing development comprising:

- 44 apartments, including:
  - 23 affordable apartments on podium level 1 and 2 which will be managed by a community housing provider (CHP) for 15 years
  - 21 market apartments over 12 levels
- Ground floor retail
- Four levels of basement for parking, services and storage
- Vehicular and loading access from McDonald Street
- Landscaping and communal open space.

This letter has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 16th May 2025 issued for the SSDA (SSD-83867719). Specifically, this letter has been prepared to respond to the SEARS requirement issued below.

Table 1 - SEARs Compliance

Item	Description of Requirement	Appendix A Section Reference
Flood Risk	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	Sections 7 (Flood extent, velocity) 7.2.1 (Climate Change), 7 (Risk on site, site access and egress)

Item	Description of Requirement	Appendix A Section Reference
Flood Risk	Where the concept 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.	Section 7
Flood Risk	Detail any flood risk management measures that are to be incorporated as part of the concept 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

We have reviewed KHA's recent detailed SSDA drawings (*251024_FrozenPlanSet_RevG*), and our review confirms the proposed finished floor levels are above the flood planning levels as summarized in the table below, noting Point ID locations are defined in Appendix A and flood levels for internal locations are taken at the boundary adjacent to the location.

Point ID	Location	Adjacent 1% AEP / PMF Flood Level (m)	Flood Planning Level Requirement	FPL (m AHD)	Current (m AHD)	Compliant
1	Main Entrance South	28.2 / 28.2	Greater of 1% AEP flood level + 0.5m or the PMF	28.7	28.73	Yes
2	Main Entrance East	28.25 / 28.25	Greater of 1% AEP flood level + 0.5m or the PMF	28.864	29.1	Yes
3	Retail Entrance East	27.8 / 27.8	1% AEP	27.670	27.90	Yes
5	Basement (Driveway Crest West)	26.6 / 26.6	Greater of 1% AEP flood level + 0.5m or the PMF	27.1	27.31	Yes
6	Basement (Driveway Crest East)	26.8 / 26.8	Greater of 1% AEP flood level + 0.5m or the PMF	27.3	27.31	Yes
7	Basement Stairs	26.8 / 26.8	Greater of 1% AEP flood level + 0.5m or the PMF	27.3	27.31	Yes
8	Transformer / Substation	27.2 / 27.2	1% AEP	27.2	27.3	Yes

Furthermore, Arcadis have undertaken a comparison of the previous architectural scheme for which the FIRA was based against the latest architectural scheme to assess if the existing flooding assessment and associated outcomes remain applicable or warrant reassessment. As the flood extents are located wholly within the public domain i.e. outside of the private property, there are no flood-related changes from the previous scheme. The only change within the public domain is the removal of the vehicular driveway in the

southeast corner which improves the assessment outcome as the 14mm increase identified in the previous flood impact risk assessment report will no longer occur.

It is our professional opinion that the overall impact of this change is negligible and would not alter the results detailed in the current report nor impact compliance with the above SEARs. No mitigation measures are deemed to be required as the hazard levels for all scenarios remain Low, and the short duration of flooding adjacent to the site does not warrant a horizontal emergency evacuation response, but rather employ a shelter in place or vertical evacuation as quick draining flood waters pose no risk of stranding occupants long term within the site.

Our recommendation is to retain the exiting proposed strategy detailed in the Flood Impact and Risk Assessment Revision 5 dated 13 March, 2025, provided in Appendix B.

Yours sincerely,



Nemesio Biason Jr | BE (Civil), MIEAust, CPEng NER, BPTas, DBP Act Practitioner
Associate Technical Director
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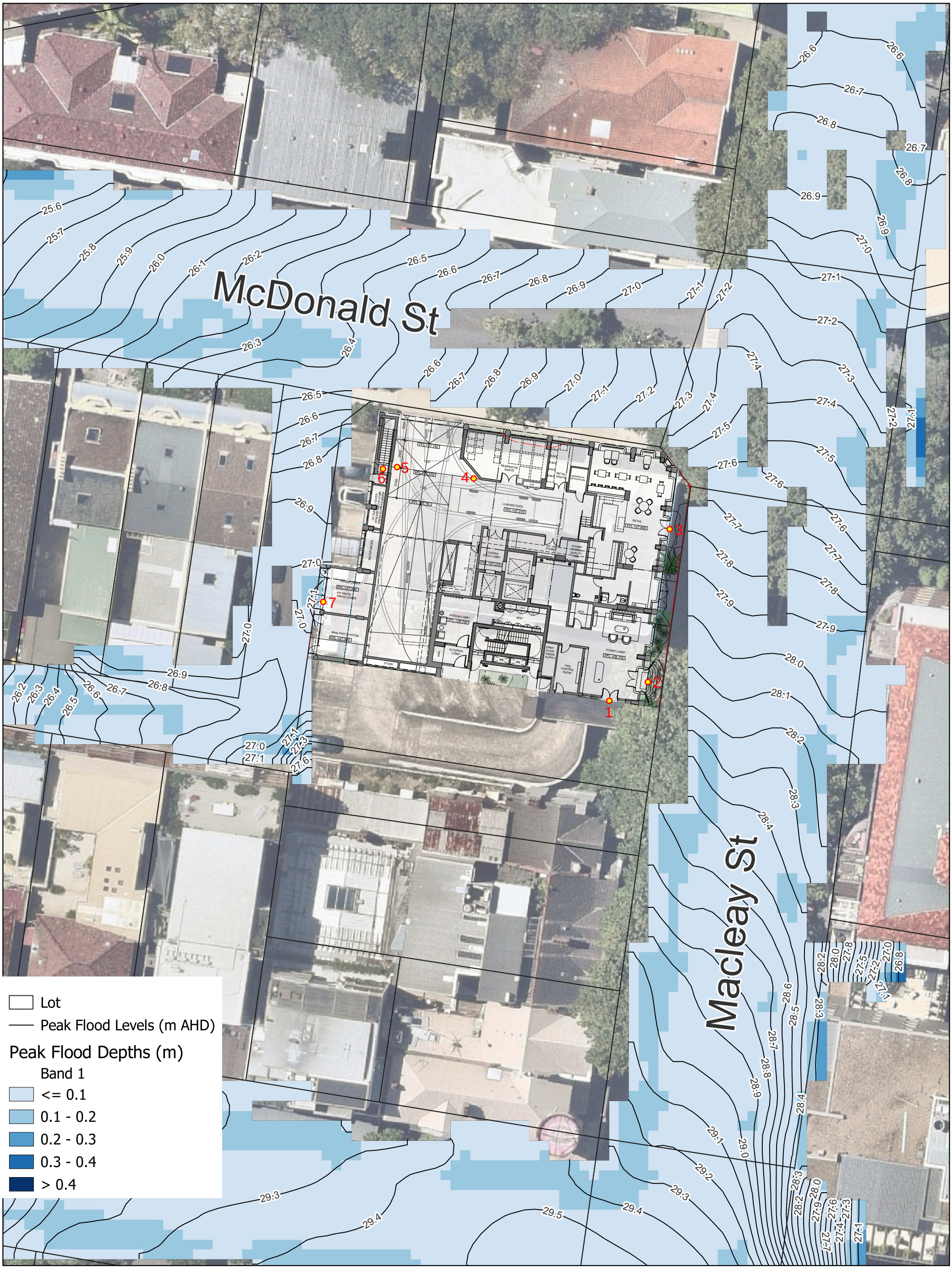
Appendix A

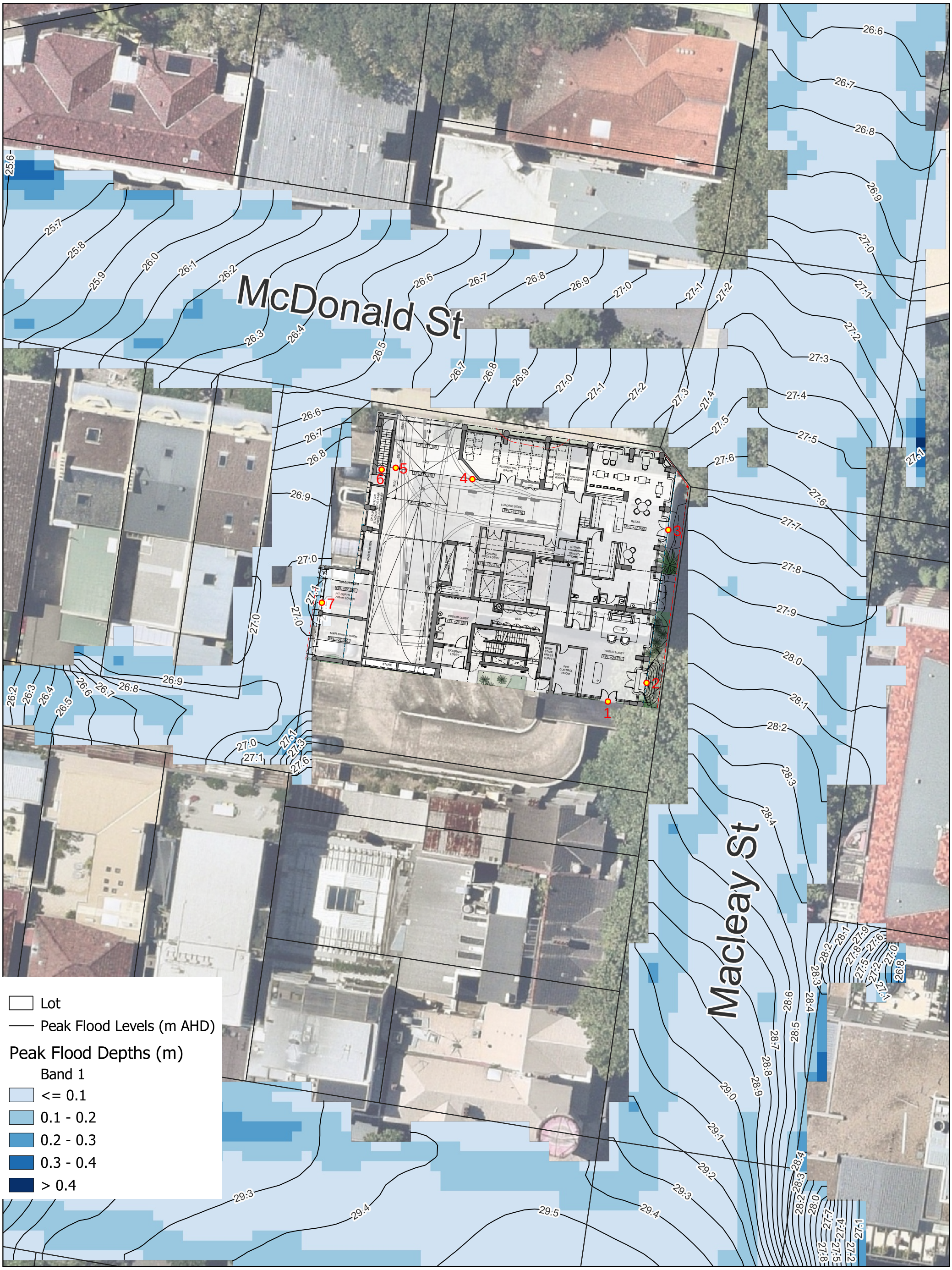
Compliance Check Reference Map



3/12/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP Peak Flood Depths and Levels_Post-Development Case


McDonald St
Macleay St
Lot
Peak Flood Levels (m AHD)
Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4
1
2
3
4
5
6
7
0
10
20 m
A3 Scale: 1:350
3/12/2025 MGA 56
45-53 Macleay Street, Potts Point
PMF Peak Flood Depths and Levels_Post-Development Case

Appendix B

Flood Impact and Risk Assessment

Revision 5 – 13 March 2025

45-53 Macleay Street, Potts Point, NSW

Flood Impact and Risk Assessment (FIRA) Report

13 March 2025

TIME & PLACE
POTTS POINT MID-RISE DEVELOPMENT

Flood Impact and Risk Assessment (FIRA) Report

Author	Sepideh Jafari	
Checker	Nemesio Biason Jr	
Approver	Nemesio Biason Jr	
Report No	30234941-ED-01	
Date	13/03/2025	
Revision Text	5	

This report has been prepared for Time & Place in accordance with the terms and conditions of appointment for Potts Point Mid-Rise Development. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

REVISIONS

Revision	Date	Description	Prepared by	Approved by
1	21/02/2025	DRAFT Issue	SJ	NB
2	10/03/2025	DRAFT Issue – Test of Adequacy	SJ	NB
3	11/03/2025	DRAFT Issue – Test of Adequacy	SJ	NB
4	11/03/2025	DRAFT Issue – Test of Adequacy	SJ	NB
5	13/03/2025	Final Issue for Lodgement	SJ	NB

Executive Summary

This Flood Impact and Risk Assessment (FIRA) Report has been prepared by Arcadis on behalf of Time and Place Ltd to support a Concept State Significant Development Application (SSDA) for a mixed-use development at 45-53 Macleay Street, Potts Point. The site is located within the Woolloomooloo catchment area, which falls under the of the City of Sydney(CoS) Local Government Area (LGA).

The Woolloomooloo TUDlow Flood Model received form CoS Council was used for this study without any major modifications. The model is based on ARR 1987, and TUFLOW version 2011 was adopted to maintain consistency with the existing flood study. The model underwent limited calibration and verification and was used as is with the exemption of utilising the site detailed ground survey over the LidAir aerial survey used in the base model.

For the 1% AEP event, peak flood levels around the building range from 26.605 m AHD to 28.505 m AHD. Peak flood velocities are below 1.5 m/s, and flood depths remain under 0.2 m. As a result, the flood hazard is classified as low. Flood inundation occurs within minutes of rainfall onset. For events smaller than the PMF, inundation lasts approximately one hour, while for the PMF event, it lasts about 30 minutes.

Under post-development conditions, the 1% AEP peak flood levels have generally decreased slightly due to the new pedestrian path, which is lower than the existing one. However, a localized increase in flood levels occurs near the southeastern corner of the building due to minor ground level adjustments. The increase in flood levels is less than 100 mm, remains localized around the road gutter area, and does not impact surrounding buildings.

The proposed finish surface levels at the openings shown in the SJB Architects drawing 6253-A DA-1003 Rev 2 dated 12.02.2025 comply with COS' minimum Flood Planning Levels (FPLs) requirements.

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1 Introduction

This FIRA report has been prepared by Arcadis on behalf of Time and Place Ltd (the Applicant) to accompany a Concept State Significant Development Application (SSDA) for a mixed-use development at 45-53 Macleay Street, Potts Point (the site).

The site is located within the City of Sydney Local Government Area (LGA). It has an area of approximately 1,289sqm and is legally described as SP 934. The site currently accommodates a 12-storey residential flat building comprising 80 studio apartments, and associated car parking (refer Figure 1).

The site is in Potts Point, which is well serviced by public amenities such as a supermarket, cafes, destination retail shops and a library. Further afield is the Sydney CBD and the Royal Botanic Gardens to the west, and Elizabeth Bay and Rushcutters Bay to the east.

The site is within convenient walking distance (750m) of Kings Cross Train Station which provides rail connections to Bondi Junction and South Sydney. It also benefits from access to local bus services along Macleay Street which run every 10 minutes on average throughout the day and connect the site with Potts Point, Central Station and Barangaroo.



Figure 1 Aerial Photograph of Site

The project seeks concept approval pursuant to section 4.22 of the EP&A Act for a 13-storey mixeduse shop-top housing development comprising three levels of basement car parking, ground floor retail and residential above.

The project will include 15% affordable housing for a 15-year period to utilise the height and floor space bonuses in the Housing SEPP. The proposal will comply with the maximum height and FSR controls for the site when utilising the bonuses provisioned for under the Housing SEPP for affordable housing provision, and the Sydney LEP 2012 for design excellence

Table 1 Project Details

Descreptor	Project details
Proposed Use	Shop Top Housing / Commercial Premises
Project Description	Construction of 13 storey mixed-use development comprising 3 levels of basement, ground floor retail and residential above.
Gross Floor Area	Maximum 5,529.8 sqm
Building Height	Maximum 50.05m (inclusive of 30% affordable housing bonus and 10% design excellence bonus)
Floor Space Ratio	Maximum 4.29:1 (inclusive of 30% affordable housing bonus and 10% design excellence bonus)
Vehicle access	Vehicle access to be provided off McDonald Street.

This study provides key findings on flood extents, depths, velocities, and hazard classifications for design storm events tp ro 1% AEP, and Probable Maximum Flood (PMF).

1.1 Catchment Description

The proposal is located within the Woolloomooloo catchment area, which falls under the City of Sydney Local Government Area (LGA). The site is situated in the densely developed suburb of Potts Point, an area characterized by a mix of residential and commercial land uses.

The Woolloomooloo catchment covers an area of approximately 160 hectares all of it draining to SWC's major trunk drainage systems (known as SWC 30) taking flows from the upper regions of the catchment to Sydney Harbour at Woolloomooloo Bay.

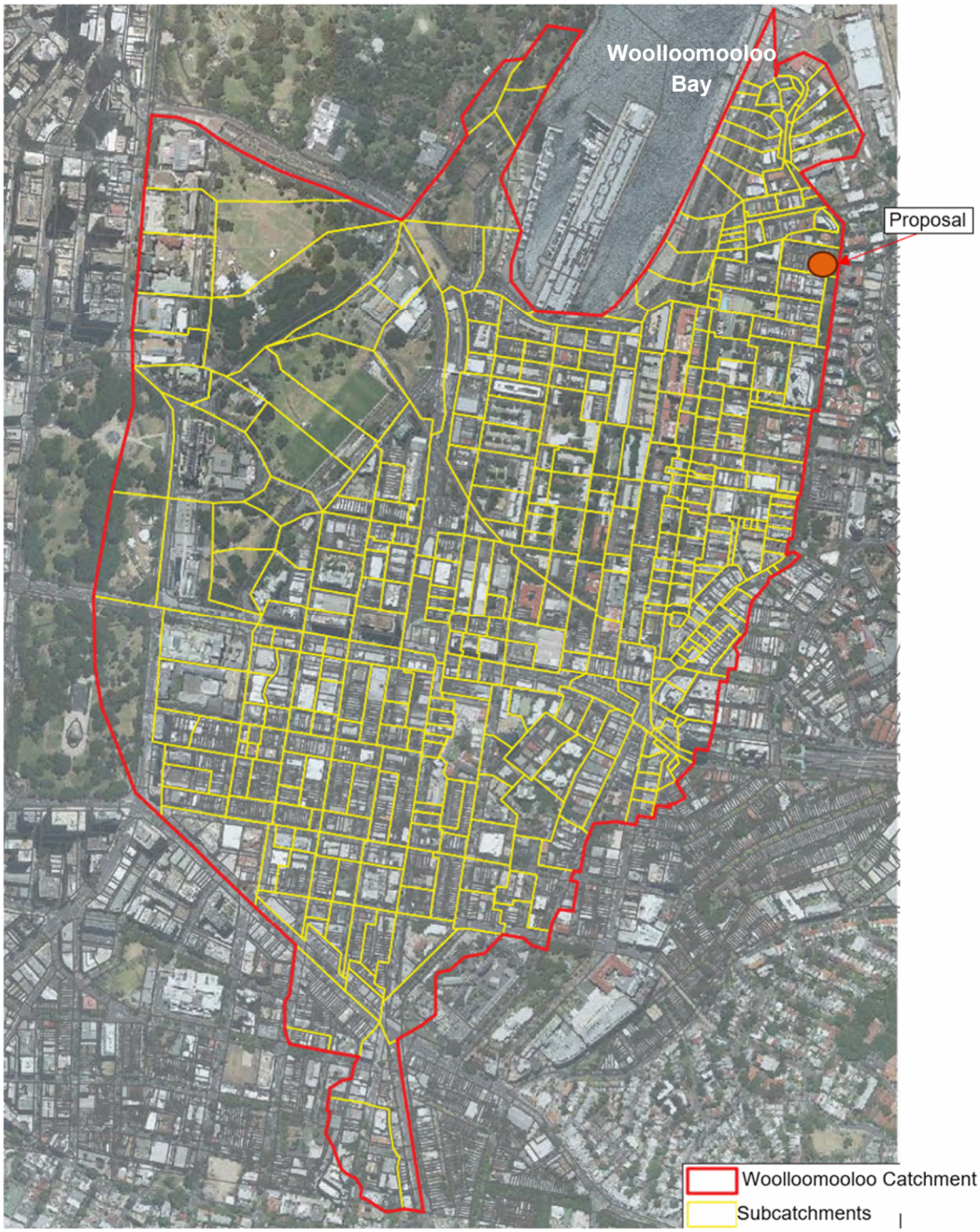


Figure 2 Catchment Delineation

2 Previous Studies

The previous studies relevant to the current project are presented in **Error! Reference source not found.**Table 2 below.

Table 2 Previous Studies

Study	Description	Incorporated in the current study
Woolloomooloo Flood Study, by WMA Water, July 2013	The flood study for the Woolloomooloo catchment which has defined the existing flood conditions and developed a suitable model, which has been used for the Floodplain Risk Management Study and Plan.	The Wolloomooloo flood model has been used as the base model for the current study
Potts Point Mid-Rise Development Floodplain Management Report, by Van der meer, 2011	This report assesses the flood risk to the proposed development at 45-53 Macleay St, Potts Point, NSW for compliance with the City of Sydney Interim Floodplain Management Policy. The flood analysis shows that flooding is confined to ponding in the street kerb and gutter.	NA

3 Available Data

Table 3**Error! Reference source not found.** lists the available data that has been used in the current study.

Table 3 Summary of Available Data

Data	Description
Aerial Imagery	Recent high-resolution aerial photographs (20/1/2025) have been extracted from NearMap
Topographic Data Including Site Survey	Colliers has conducted a topographic survey of the site (19/09/2023). This survey was incorporated into the TUFLOW model.
Design Surfaces	The design surface was provided on 13/02/2025 and incorporated into the TUFLOW model for the proposed scenario
Woolloomooloo TUFLOW Model	Woolloomooloo TUFLOW model was provided by the City of Sydney Council and was used as the base model for the current assessment. No adjustments were made to the provided model except for the inclusion of survey data and the design surface.

4 SEARS

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 7th of Feb 2025 issued for the SSDA (SSD-79316759). Specifically, this report has been prepared to respond to the SEARS requirement issued below.

Table 4 SEARs

Item	Description of Requirement	Section Reference (this report)
Flood Risk	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	Sections 7 (Flood extent, velocity) 7.2.1 (Climate Change), 7 (Risk on site, site access and egress)
	Where the concept 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.	Section 7
	Detail any flood risk management measures that are to be incorporated as part of the concept 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

5 Methodology

The current methodology includes the following key steps:

1- Review of Previous Flood Study

A review of the Woolloomooloo Flood Study prepared by WMA Water (July 2013) was undertaken to understand the parameters used in the associated flood model.

2- Incorporation of Survey Data into the Woolloomooloo TUFLOW Model provided by CoS council to Arcadis.

Survey data for the site was incorporated into the TUFLOW model.The updated model was then executed to generate flood results for a range of design storm events, including 20% Annual Exceedance Probability (AEP), up to 1% AEP (100-year ARI), and Probable Maximum Flood (PMF). The outputs included flood extent, depth, level, velocity, and hazard classification across the study area.

3- Incorporation of the Design Surface into the Model

The design surface for the proposed development was integrated into the TUFLOW model. The model was then rerun to assess the post-development flood conditions under the same range of flood events.

4- Comparison of Existing and Proposed Case Results

Flood results between the existing and proposed scenarios was compared. The differences in flood levels were used to generate flood afflux mapping, identifying any potential impacts of the development on surrounding properties and overland flow paths..

5.1 Hydraulic Modelling

The Woolloomooloo TUFLOW model was supplied by the City of Sydney Council. The hydrological assessment for the model has been conducted using DRAINS; however, the DRAINS model has not been provided.

5.1.1 Catchment delineation

From the flood study (2013), it is understood that the sub-catchment areas have been delineated based on ALS survey and making the assumptions that:

- properties generally drain to streets or inlet pits; and
- flow in streets is along gutters and uni-directional.

The DRAINS hydrologic runoff-routing model has been used to determine hydraulic model inflows for the local sub-catchments within the study area.

From the flood study 2013 it is understood that the Horton Infiltration loss model has been used within DRAINS software. It has assumed that he soil in the catchment has a slow infiltration rate potential and the antecedent moisture condition has been considered to be rather wet.

It is important to note that the DRAINS model was not provided for this study, and the modelling has been conducted using the boundary conditions included in the supplied TUFLOW model.

5.1.2 Grid Size

A computational grid cell size of 2 m by 2 m has been used in the TUFLOW model.

5.1.3 Modelling of Buildings

Permanent buildings and other significant structures likely to obstruct flow have been modeled as impermeable obstructions to flood flow (i.e., they were excluded from the model grid).

5.1.4 Model Roughness

Typical values in the literature have been used for the roughness values as follows in Table 5:

Table 5 Roughness values

Surface Type	Manning's n
Very short grass or sparse vegetation	0.035
General overland areas, gardens, roadside verges, low density residential lots (default)	0.045
Medium density vegetation	0.060
Heavy vegetation	0.100
Roads, paved surfaces	0.025
Concrete pipes	0.013
Clay pipes	0.025
Brick	0.014
PVC	0.011

5.1.5 Boundary Condition

The TUFLOW model incorporates both internal and external inflow boundary conditions. The downstream tailwater condition has been modeled as a fixed water level, representing the expected water surface elevation along Wolloomooloo Bay.

While the downstream sections of the model are affected by high water levels in Woolloomooloo Bay, the project site is located further upstream and has been determined to be unaffected by these influences.

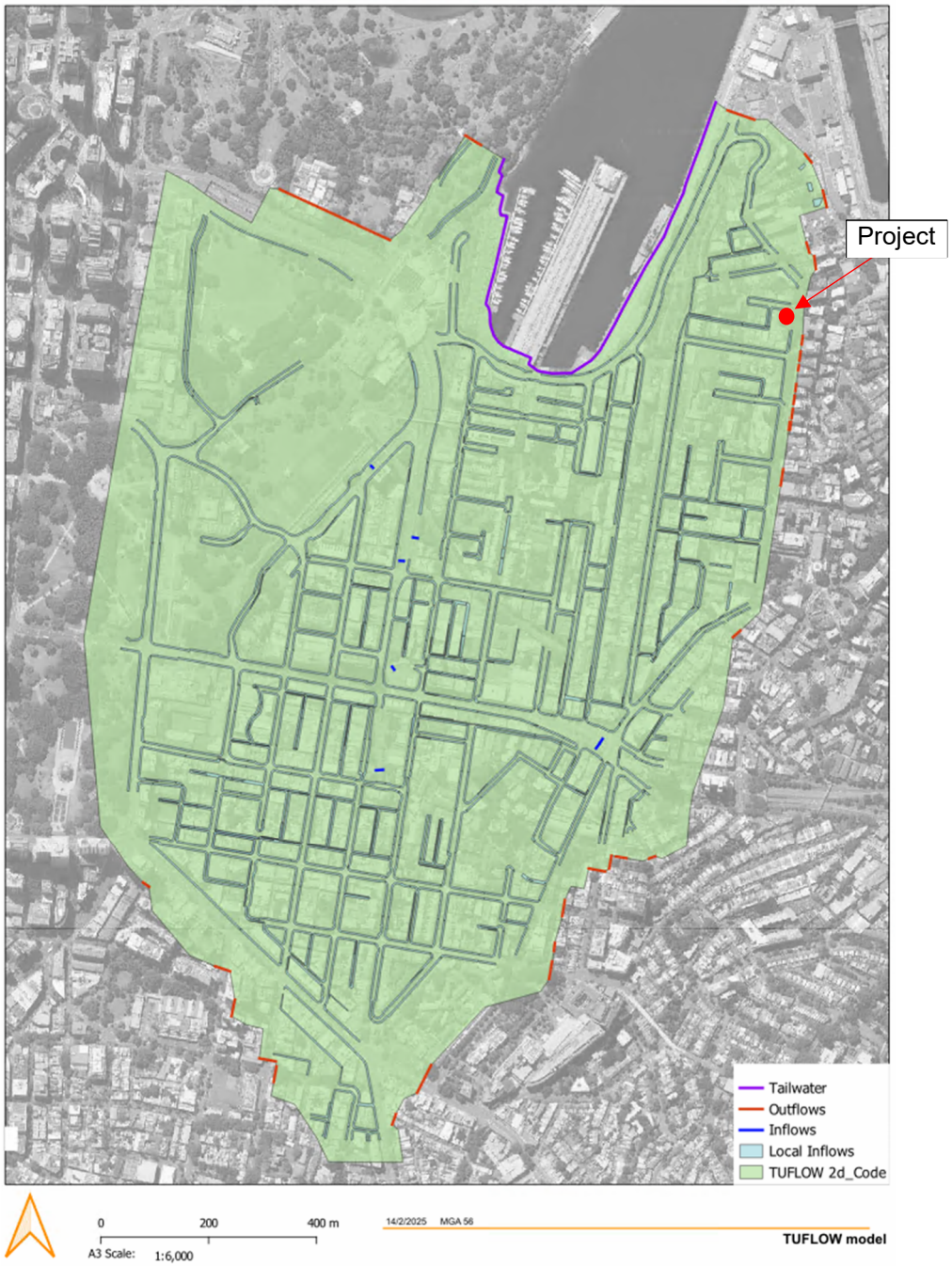


Figure 3 TUFLOW Model

5.1.6 Critical Events

The model is based on ARR 1987. According to the 2013 Flood Study, the critical storm duration for different parts of the catchment has been determined by simulating the 100-year ARI event across a range of storm durations, from 15 minutes to 12 hours. An envelope of model results has been created, identifying the storm duration that produced the maximum flood depth at each grid point within the study area. Based on this analysis, a 60-minute storm duration has been selected as the critical duration for events up to the 100-year ARI.

For the Probable Maximum Flood (PMF) event, the critical duration has been found to be 15 minutes for the upper areas of the catchment, while a 30-minute duration has been found to be critical for areas downstream of Cathedral Street.

It was estimated that for the current project location, the 15-minute duration is the critical event.

Table 6 Critical Events

Event	Critical Duration
Up to 1%AEP event	60 min
PMF	15 min

6 Assumptions and Limitations

- The Woolloomooloo Flood Model has been utilized for this flood study without any major modifications. The model has underwent limited calibration and verification, and therefore, it has been adopted as is.
- The model is based on ARR 1987, and updating it to ARR 2019 is beyond the scope of this study. ARR 1987 typically produces more conservative flood estimates compared to ARR 2019. Updating to the latest guidelines would likely result in different flood outcomes, necessitating recalibration and verification to ensure consistency and accuracy.
- Same TUFLOW version used in the flood study was used to keep the consistency and preventing any errors in the model.
- Given the use of an old TUFLOW version (2011) and the potential for minor glitches in the results, a neutral impact is defined as any change in peak flood levels within ±20 mm.

7 Modelling Results

7.1 Existing Condition

7.1.1 Peak Flood Depths and Levels

Figure 4 presents the 1% AEP peak flood depths and levels. Maps for other flood events are included in the Appendix for reference.

Extracted flood levels around the building are detailed in Table 7. Refer to Figure 4 for Point ID location.

For the 1% AEP flood event, peak flood levels range from 26.605 m AHD at Point 7 to 28.505 m AHD at Point 1. As shown in the table 7, flood levels for events more frequent than the PMF exhibit only minor differences. Peak flood depths are generally below 0.1 m along the roads and under 0.2 m along the gutters.

Table 7 Existing Peak Flood Levels

Point ID	20% AEP	10% AEP	1% AEP	1% AEP + Climate Change	PMF
1	28.503	28.504	28.505	28.507	28.516
2	28.348	28.349	28.350	28.352	28.361
3	27.768	27.768	27.769	27.769	27.776
4	27.223	27.223	27.225	27.252	27.257
5	26.875	26.875	26.877	26.878	26.886
6	26.781	26.781	26.782	26.783	26.789
7	26.602	26.605	26.605	26.608	26.620
8	26.885	26.886	26.889	26.892	26.913
9	27.713	27.713	27.714	27.715	27.720

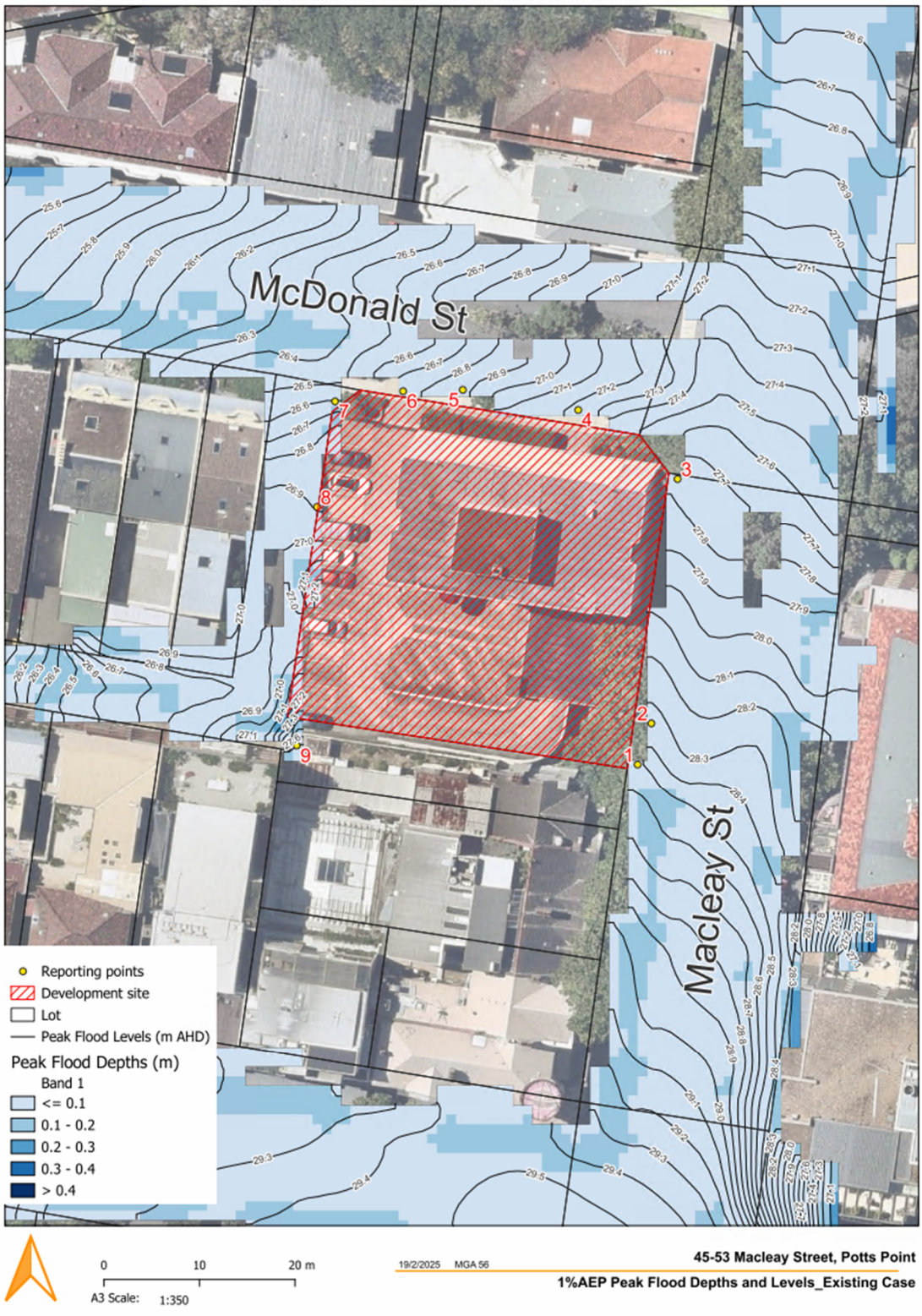


Figure 4 Existing Condition – 1% AEP Peak Flood Depths and Levels

7.1.2 Peak Flood Velocities

The 1% AEP peak flood velocities around the building are illustrated in Figure 5. The analysis indicates that peak velocities are generally below 0.2 m/s, with higher velocities observed along the gutters, reaching to 1.5 m/s.

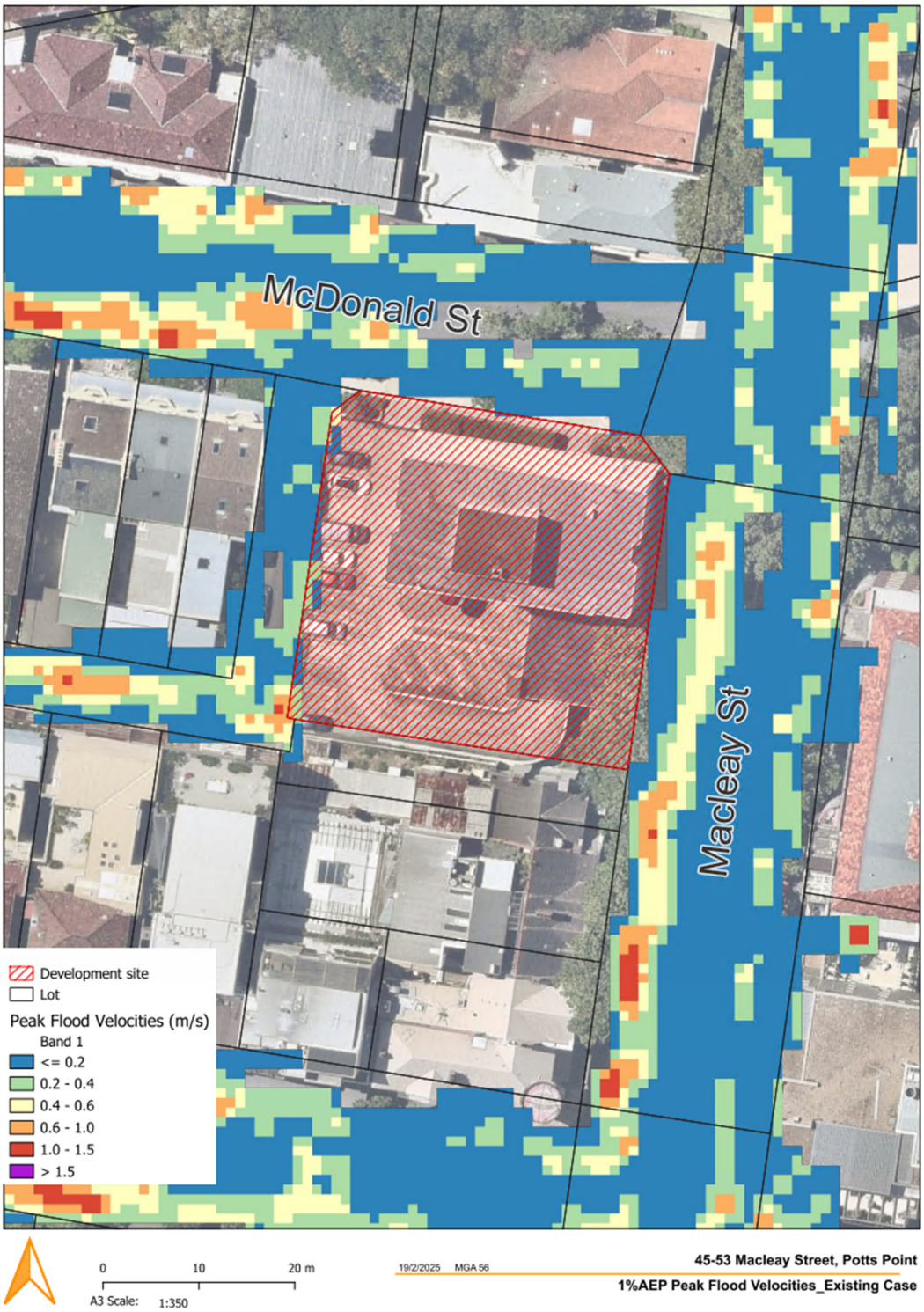


Figure 5 Existing Condition - Flood Velocities

7.1.3 Peak Flood Hazard Categories

The 1% AEP peak flood hazard categories are presented in Figure 7. Since peak flood depths are below 0.2 m and peak flood velocities do not exceed 1.5 m/s, the peak flood hazard around the building is classified as Low Hazard (based on Figure 6).

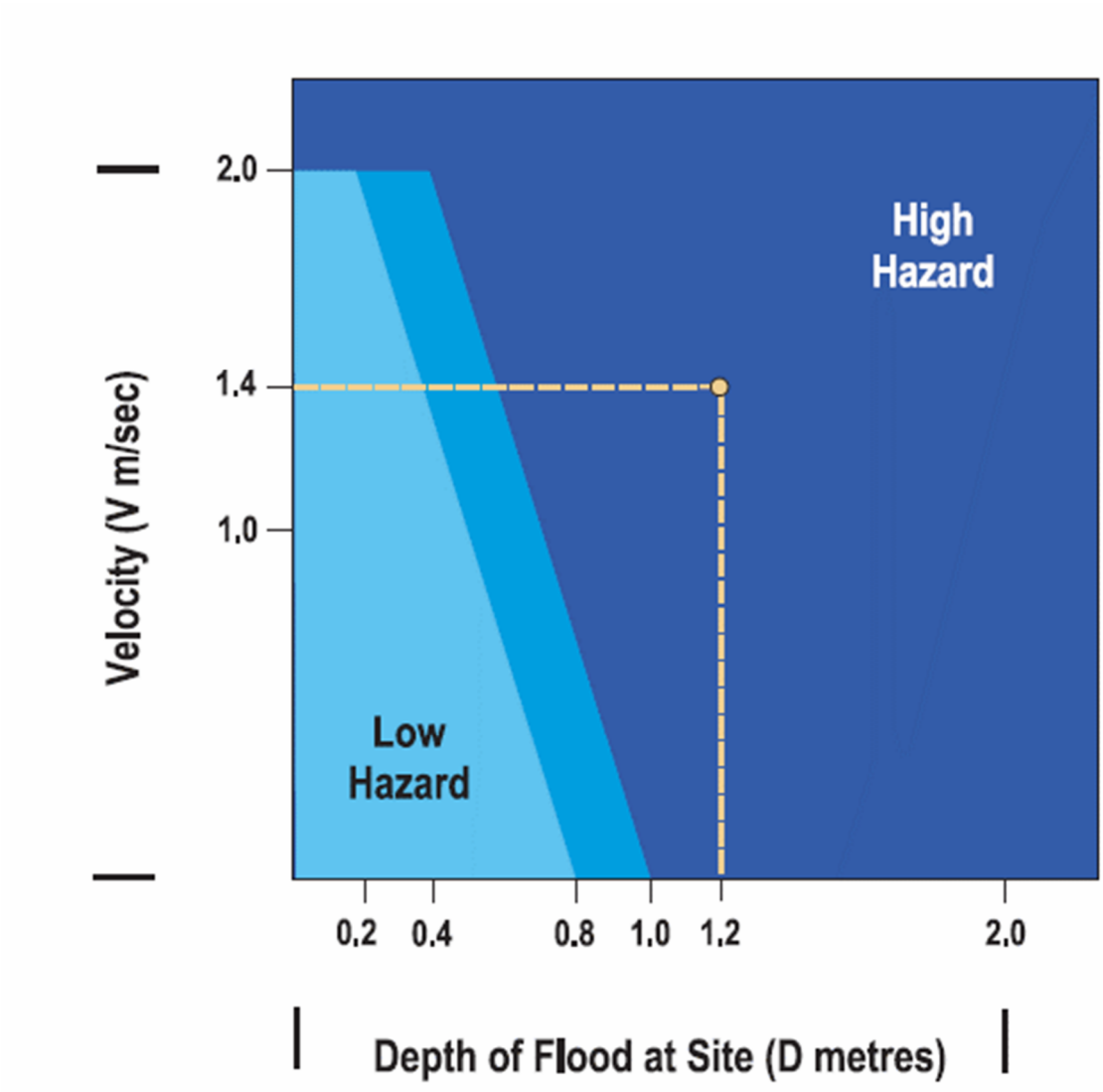


Figure 6 Flood Hazard Category based on the Australian NSW Floodplain Management Manual)

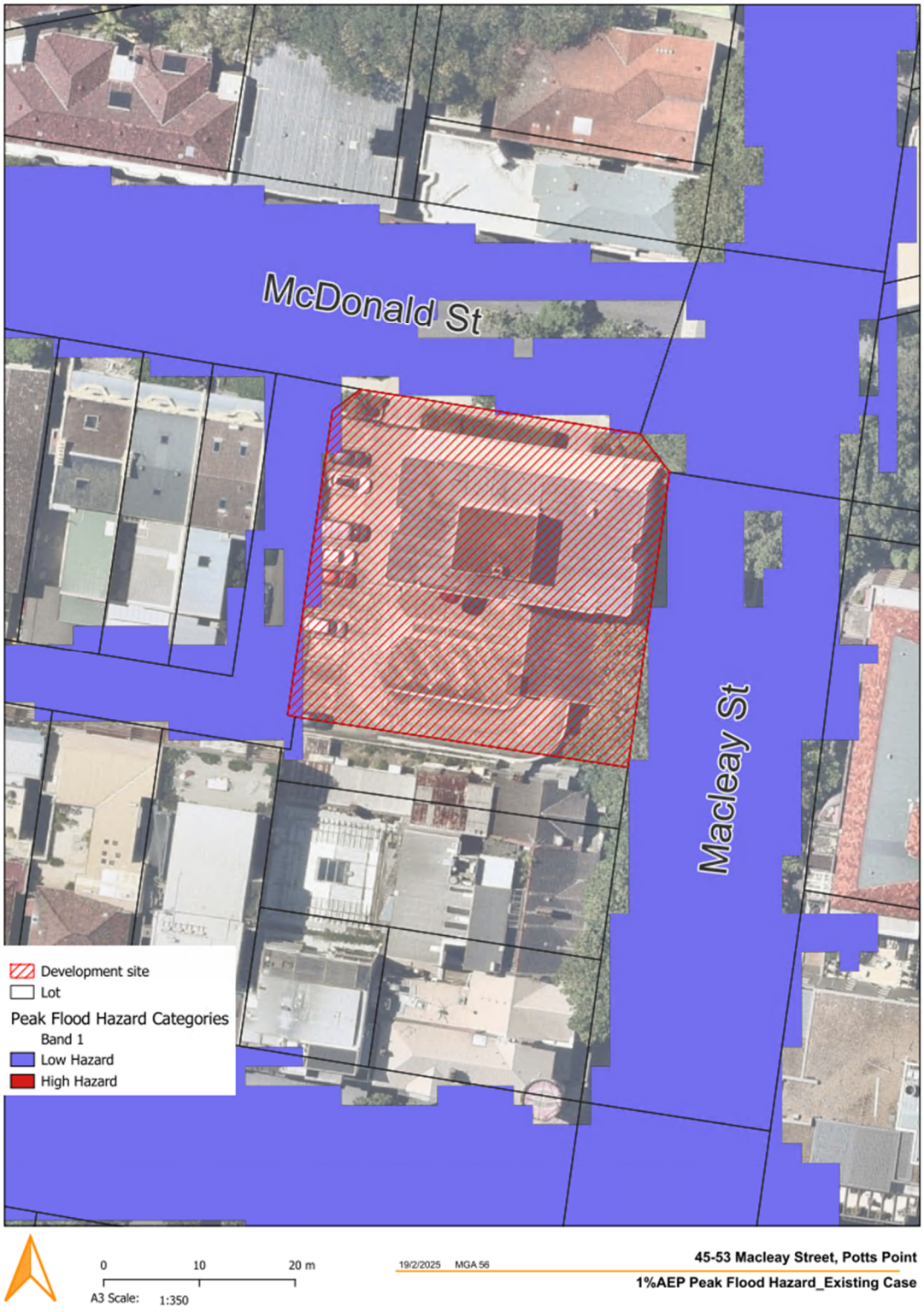


Figure 7 Existing Condition - Flood Hazard Categories

7.1.4 Time to onset and Duration of Inundation

To determine the time to onset and duration of inundation, flow hydrographs have been extracted from three locations (labeled N1 to N3) shown in the Figure 8. The 1% AEP flow hydrographs are presented in Figure 9, and PMF hydrographs are shown in Figure 10.

As shown, for the 1% AEP event, flood inundation occurs within a few minutes (less than 12 minutes) and lasts for approximately an hour. During PMF event, flood inundation occurs within few minutes (leass than 6 minutes) and last for approximately 30minutes.

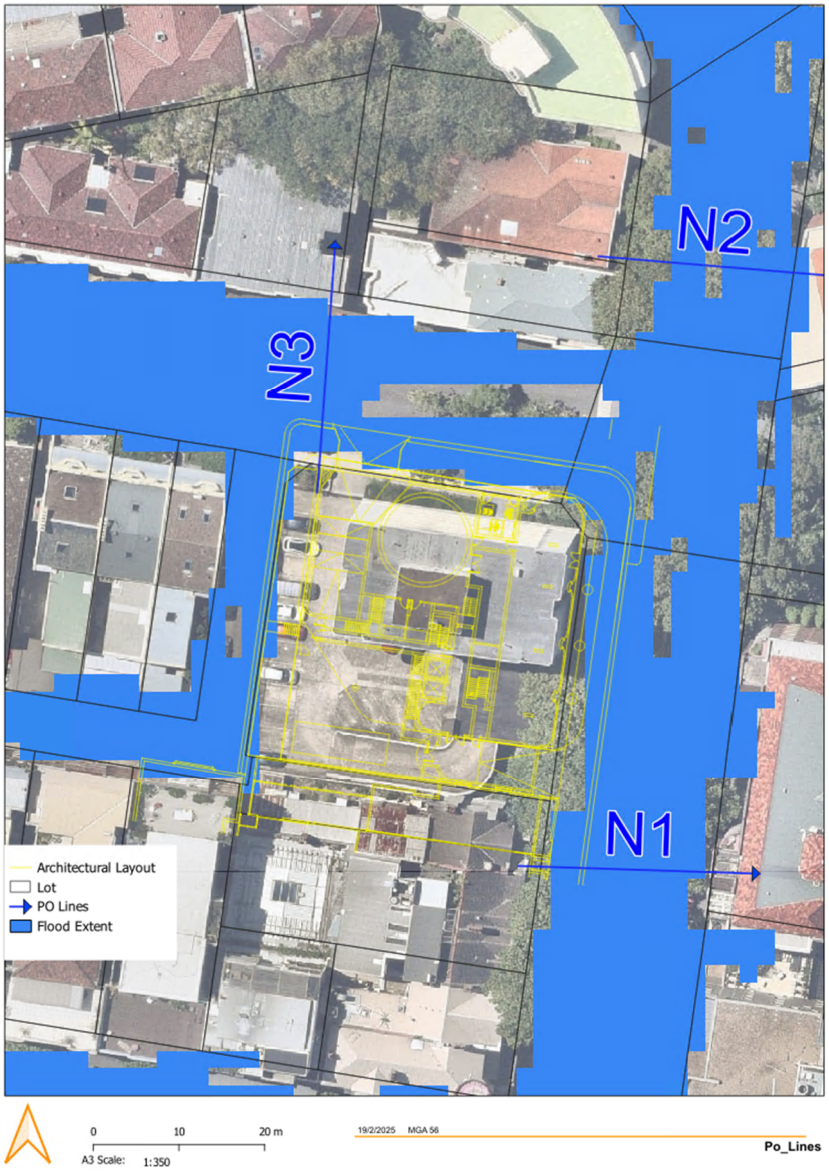


Figure 8 Location of the reporting PO Lines

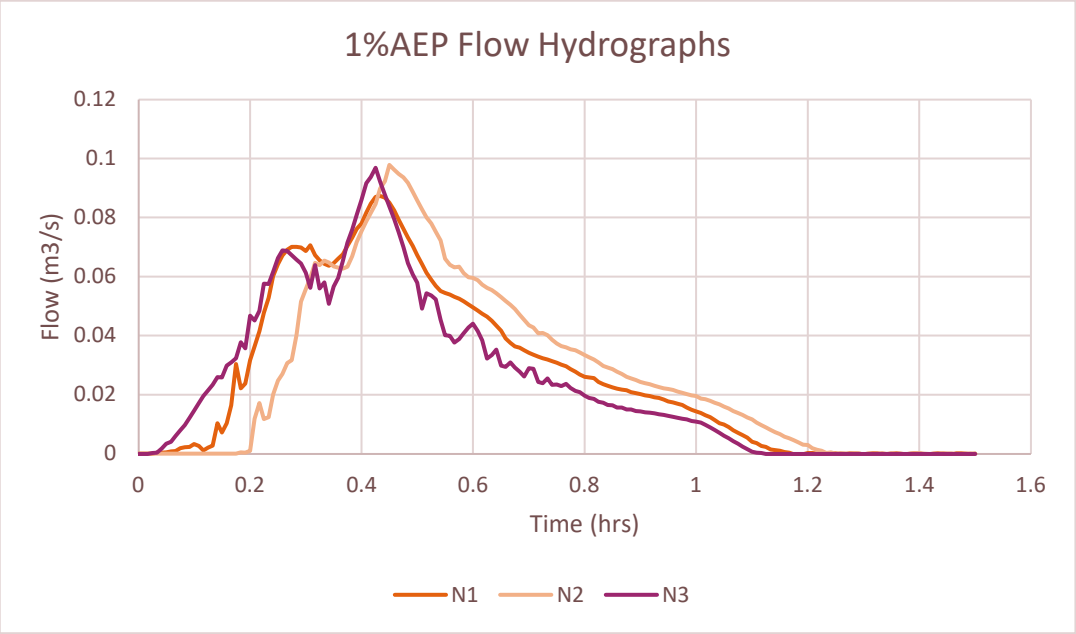


Figure 9 1%AEP Flow Hydrographs

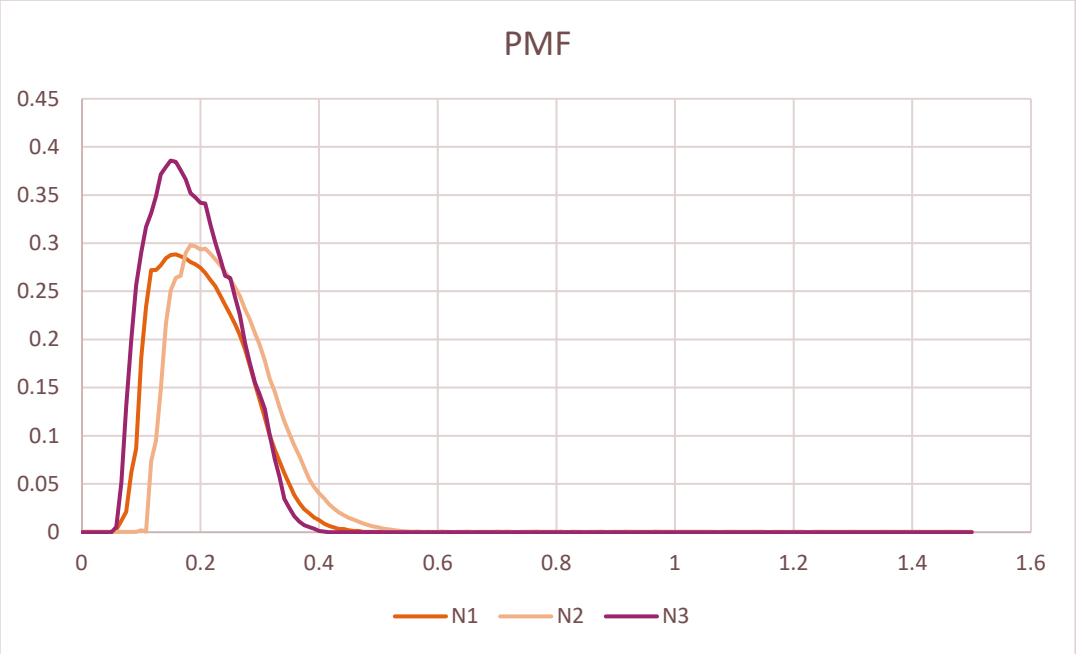


Figure 10 PMF Flow Hydrographs

7.2 Post-Development Impact Assessment

The proposed development is a mixed-use building to be constructed on a site that currently contains an existing building. The only aspect of the development that may influence flood behavior around the building is any changes to the footpath path and kerb&gutter, which have been modeled in TUFLOW to assess potential flood impacts. The post-development peak flood velocity, and hazard maps are included in the Appendix. As these results are generally similar to existing conditions, they have not been repeated here, and only the peak flood depth and levels and impact has been discussed.

7.2.1 Peak Flood Depths and Levels

Figure 11 presents the 1% AEP peak flood depths and levels for the post-development condition with and without Climate change. Post-development with claimte change due tosea-level rise and increase in rainfall intensity have been investigated. The results as shown in Table show negligible increase in 1%AEP flood levl due to climate change.

Maps for other flood events are included in the Appendix for reference.

Extracted flood levels around the building are detailed in Table 8. For the 1% AEP event, peak flood levels range from 26.588 m AHD at Point 7 to 28.485 m AHD at Point 1. Peak flood depths are generally below 0.1 m along the roads and under 0.2 m along the gutters.

Table 8 Design Peak Flood Levels

Point ID	20% AEP	10% AEP	1% AEP	1% AEP + Climate Change	PMF
1	28.482	28.484	28.485	28.486	28.503
2	28.366	28.366	28.364	28.365	28.378
3	27.659	27.660	27.670	27.674	27.690
4	27.150	27.151	27.152	27.153	27.158
5	26.791	26.791	26.794	26.795	26.803
6	26.584	26.585	26.588	26.591	26.607
7	26.613	26.614	26.617	26.619	26.627
8	26.891	26.891	26.896	26.899	26.921
9	27.713	27.713	27.714	27.2	27.720

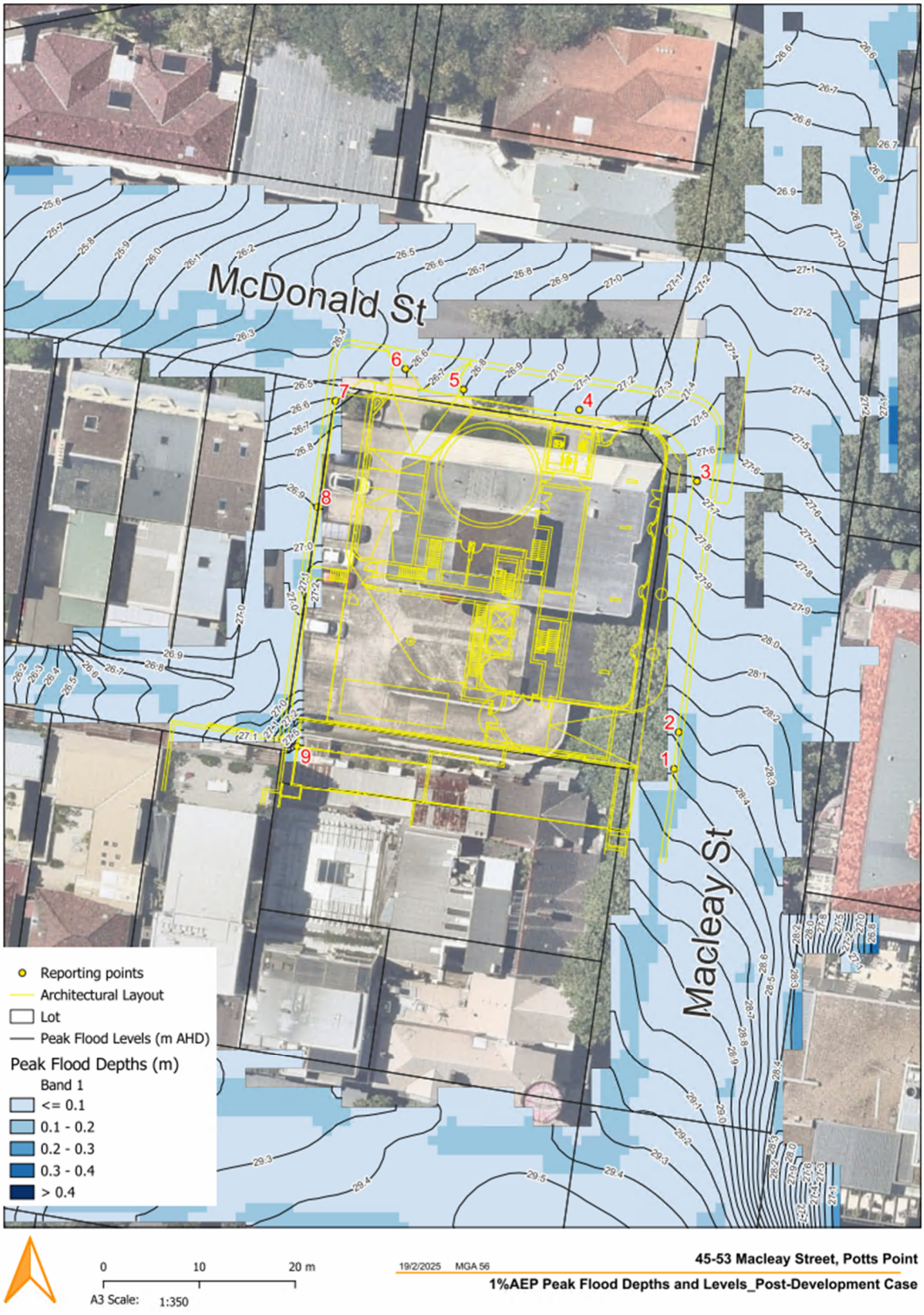


Figure 11 1% AEP Peak Flood Depths and Levels (Post-Development Condition)

7.2.2 Changes in Peak flood Levels

The 1% AEP peak flood impacts (Afflux) are shown in Figure 12 (for other events, refer to the Appendix). Given the use of an older TUFLOW version and the potential for minor glitches in the results, a neutral impact is defined as any change in peak flood levels within ±20 mm, Which generally falls within the industry's acceptable range and that food hazard classification remains low hazard, and confined within the public road reserved only. Given the stage of the development is at Concept State Significant Development Application (SSDA) phase we consider this acceptable. Should a lesser adverse impact is required, a refined flood modelling can be undertaken during the detailed design development phase.

The 1% AEP peak flood levels have decreased due to the new pedestrian path, which is generally lower than the existing one. However, there is a localized increase near the southeastern corner of the building, resulting from a slight rise in ground levels due to the proposed pedestrian path. This increase in flood levels is less than 100 mm, remains localized, and does not impact surrounding buildings.

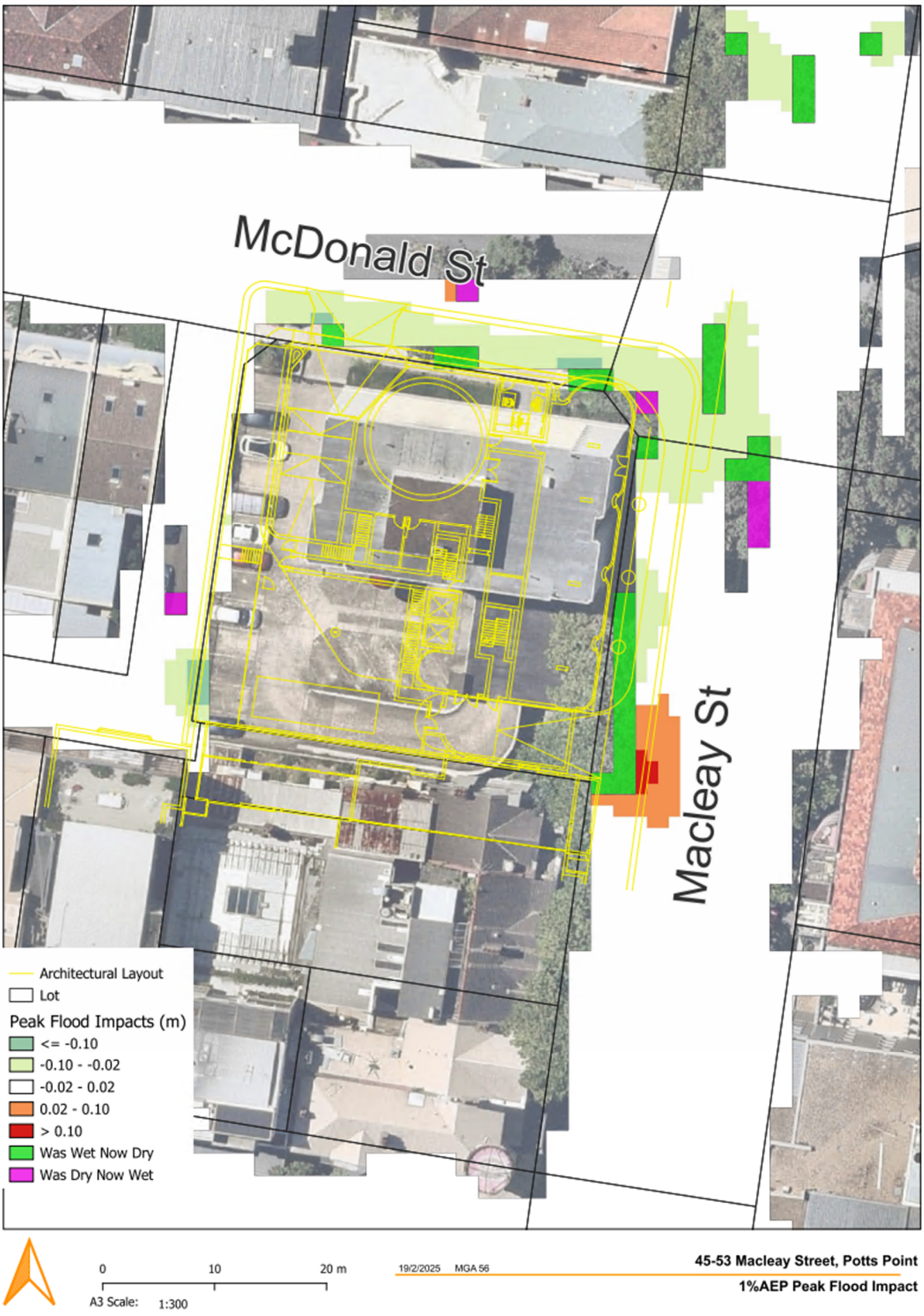


Figure 12 1% AEP Peak Flood Impact

8 Conclusions and Recommendations

The Woolloomooloo TUFLOW model has been utilized for the flooding assessment of the proposed development. No major modifications were made to the model, as it is assumed to be calibrated and validated based on the accompanying 2013 Woolloomooloo Flood Study.

Flood mapping for both existing and proposed conditions has been generated and is presented in the Appendix. For the 1% AEP event, peak flood levels around the building range from 26.605 m AHD to 28.505 m AHD. Peak flood velocities are below 1.5 m/s, and flood depths remain under 0.2 m. As a result, the flood hazard is classified as low. Flood inundation occurs within minutes of rainfall onset. For events more frequent than the PMF, inundation lasts approximately one hour, while for the PMF event, it lasts about 30 minutes. Based on this, the risk on-site is considered minimal

Under post-development conditions, the 1% AEP peak flood levels have generally decreased due to the new pedestrian path, which is lower than the existing one. However, a localized increase in flood levels occurs near the southeastern corner of the building due to minor ground level adjustments. The increase in flood levels is less than 100 mm, remains localized, and does not impact surrounding buildings.

The CoS Interim Floodplain Management policy requires proposed development to have floor levels, entry points, openings set at or above the relevant flood planning levels (FPLs). Table 9.0 below summarises the FPLs requirement. Table 10.0 below shows the compliance status of different areas of the development with the FPLs based on the levels shown in SJB Architects drawing 6253-A DA-1003 Rev 2 dated 12.02.2025.

Table 9 FPLs requirement

TYPE	**MINIMUM FLOOD PLANNING LEVELS**
Main Entrance/Basement	1%AEP flood level + 0.5m or PMF (whichever is the higher)
Substation	1% AEP flood level
Basement Driveway Crest	1%AEP flood level + 0.5m or PMF (whichever is the higher)
Any openings*	1%AEP flood level + 0.5m or PMF (whichever is the higher)
Table 9.0 : Minimum Flood Planning Levels requirement	

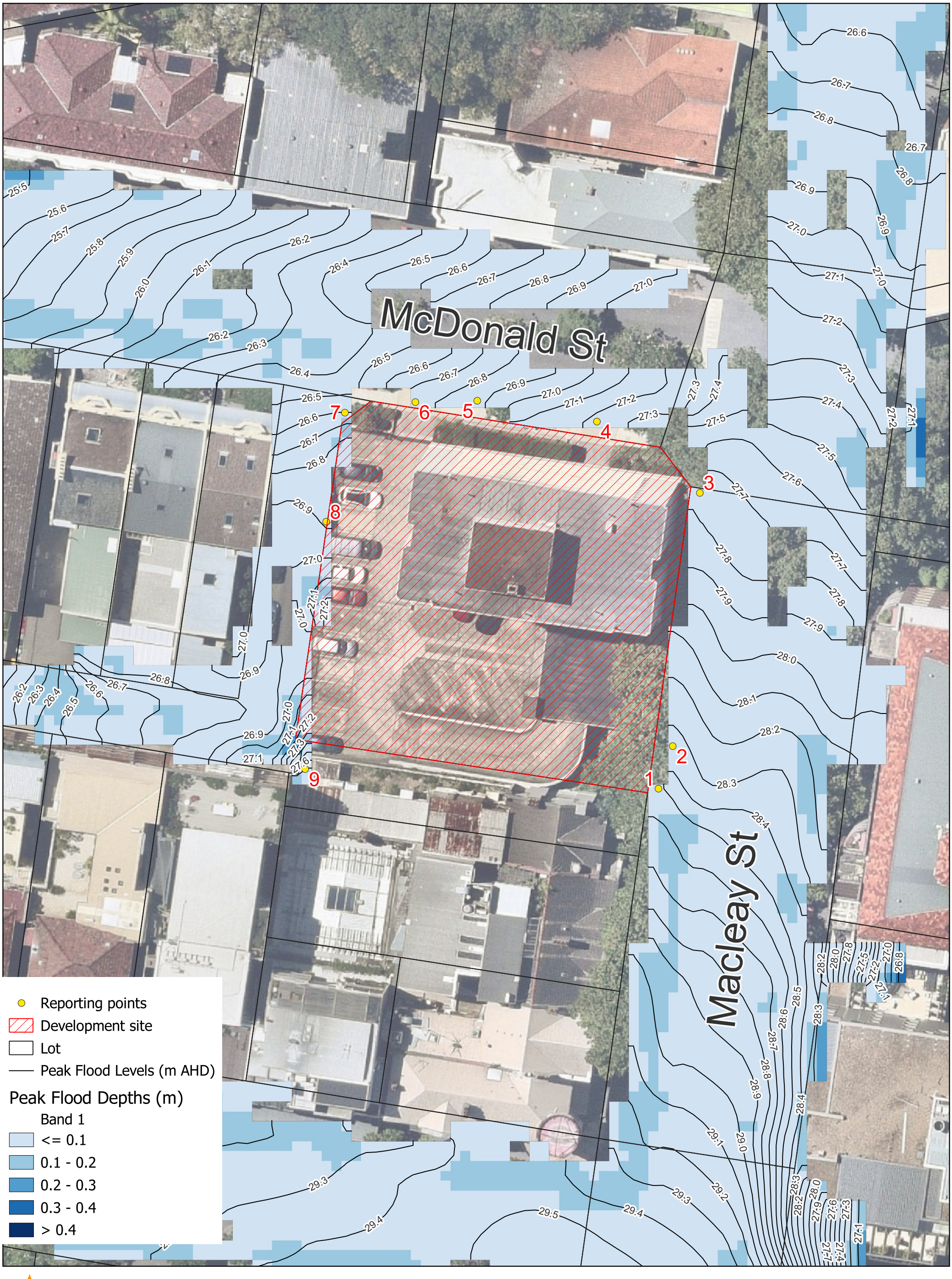
*Any openings (shaft, grills, ventilation, etc) that will allow floodwater to flow onto the basement level.

Table 10 Compliance Status

Point ID	Location	1% AEP Flood Level (m)	PMF Flood Level (m)	Flood Planning Level Requirement	FPL (m AHD)	Current	Compliant?
1	Main entrance LHS / Basement	28.485	28.503	1% AEP flood level + 0.5 m or the PMF (whichever is the higher)	28.985	29.1	Yes
2	Main entrance RHS / Basement	28.364	28.378	1% AEP flood level + 0.5 m or the PMF (whichever is the higher)	28.864	29.1	yes
3	Retail / Basement	27.670	27.690	1% AEP for retail 1% AEP flood level + 0.5 m or the PMF (whichever is the higher) for basement	27.670 [Retail] 28.170 [opening to basement]	27.90 for retail 29.1 for Lift Level in lobby	yes
4	Substation	27.152	27.158	1% AEP flood level	27.152	27.40	yes
5	Basement (Driveway Crest LHS) / Loading Dock	26.794	26.803	1% AEP flood level + 0.5 m or the PMF (whichever is the higher) 1% AEP flood level	27.294 26.794	27.65 for basement driveway crest 27.4 for loading dock	yes
6	Basement (Driveway Crest RHS)	26.588	26.607	1% AEP flood level + 0.5 m or the PMF (whichever is the higher)	27.088	27.65 for basement driveway crest	yes

9 Appendix

9.1 Existing Condition Flood Maps


McDonald St
Macleay St
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8
9
Reporting points
Development site
Lot
Peak Flood Levels (m AHD)
Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
20%AEP Peak Flood Depths and Levels_Existing Case

McDonald St

Macleay St

Development site

Lot

Peak Flood Velocities (m/s)

Band 1

<= 0.2

0.2 - 0.4

0.4 - 0.6

0.6 - 1.0

1.0 - 1.5

> 1.5

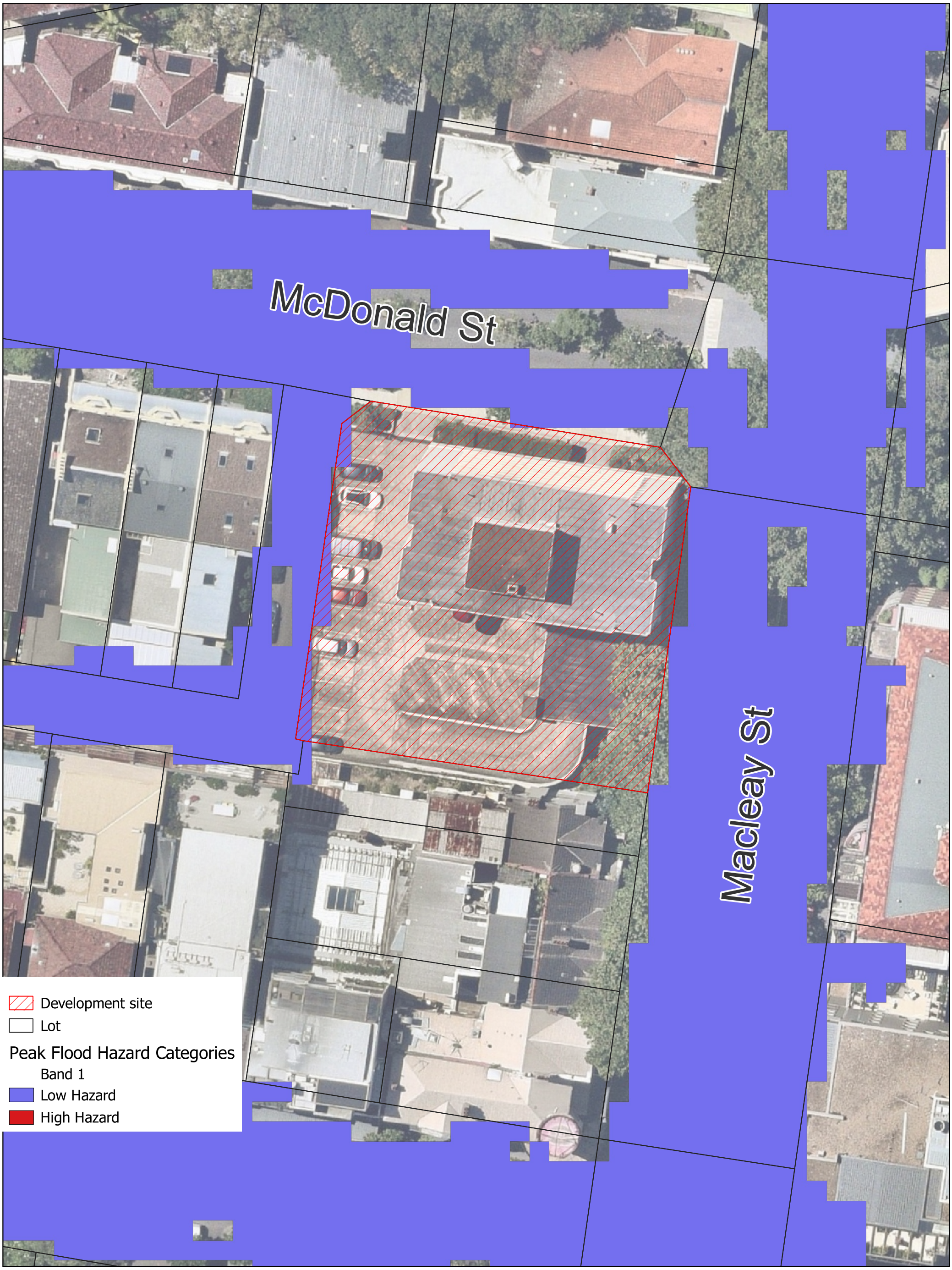
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

20%AEP Peak Flood Velocities_Existing Case


McDonald St
Macleay St
Development site
Lot
Peak Flood Hazard Categories
Band 1
Low Hazard
High Hazard
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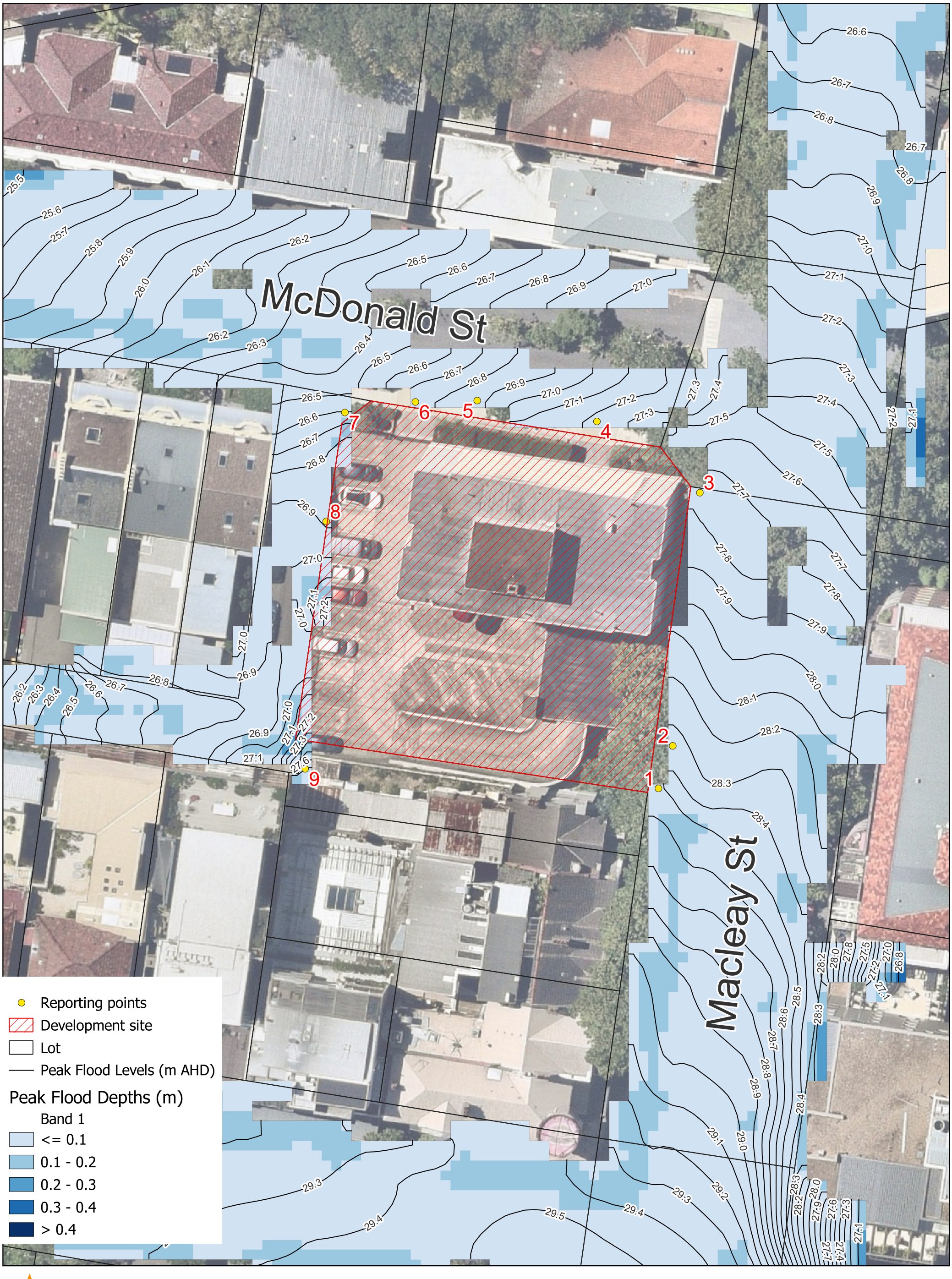
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
20%AEP Peak Flood Hazard_Existing Case


McDonald St
Macleay St
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Reporting points
Development site
Lot
Peak Flood Levels (m AHD)
Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
10%AEP Peak Flood Depths and Levels_Existing Case

McDonald St

Macleay St

Development site

Lot

Peak Flood Velocities (m/s)

Band 1

<= 0.2

0.2 - 0.4

0.4 - 0.6

0.6 - 1.0

1.0 - 1.5

> 1.5

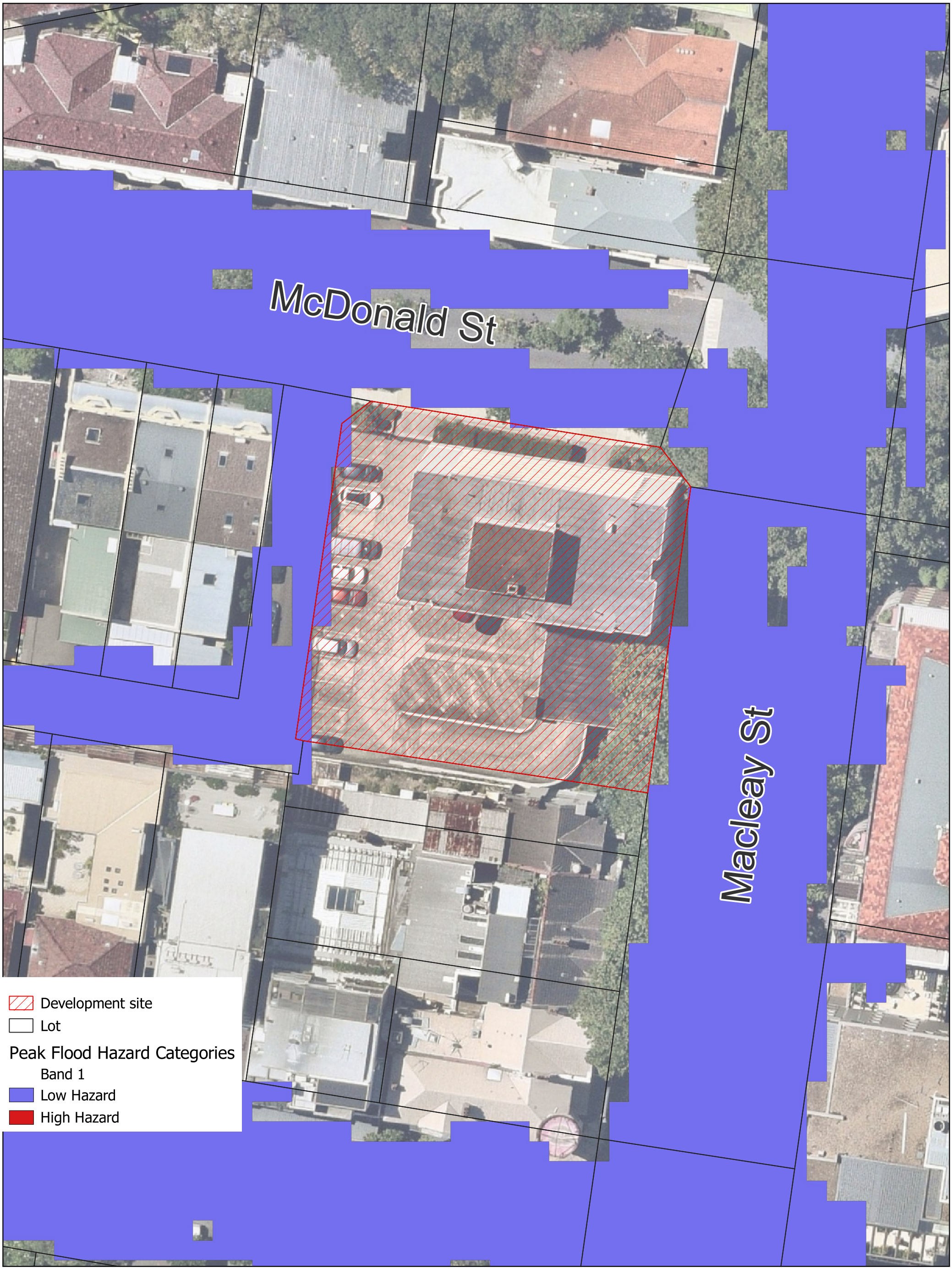
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

10%AEP Peak Flood Velocities_Existing Case


McDonald St
Macleay St
Development site
Lot
Peak Flood Hazard Categories
Band 1
Low Hazard
High Hazard
0
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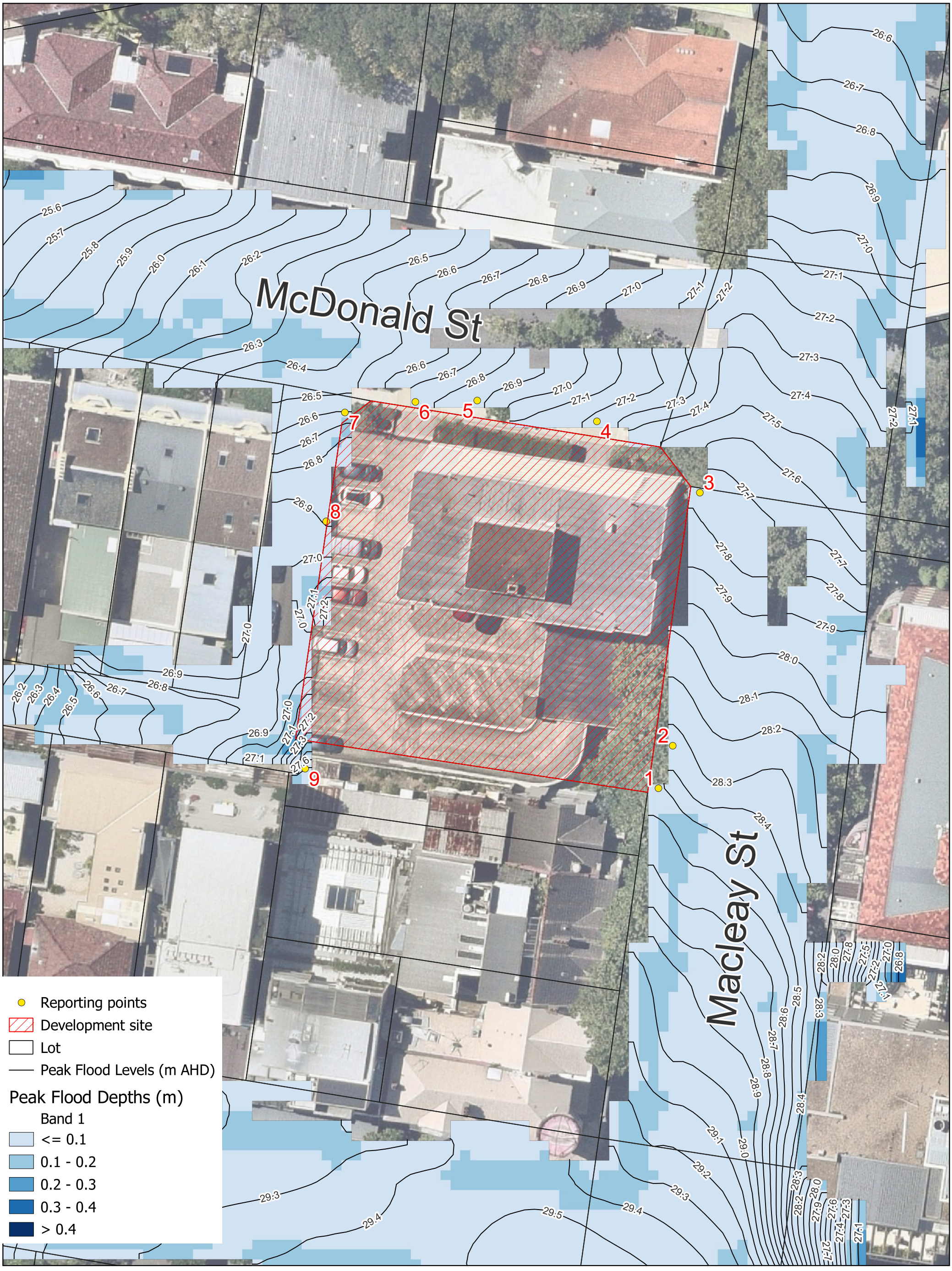
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
10%AEP Peak Flood Hazard_Existing Case



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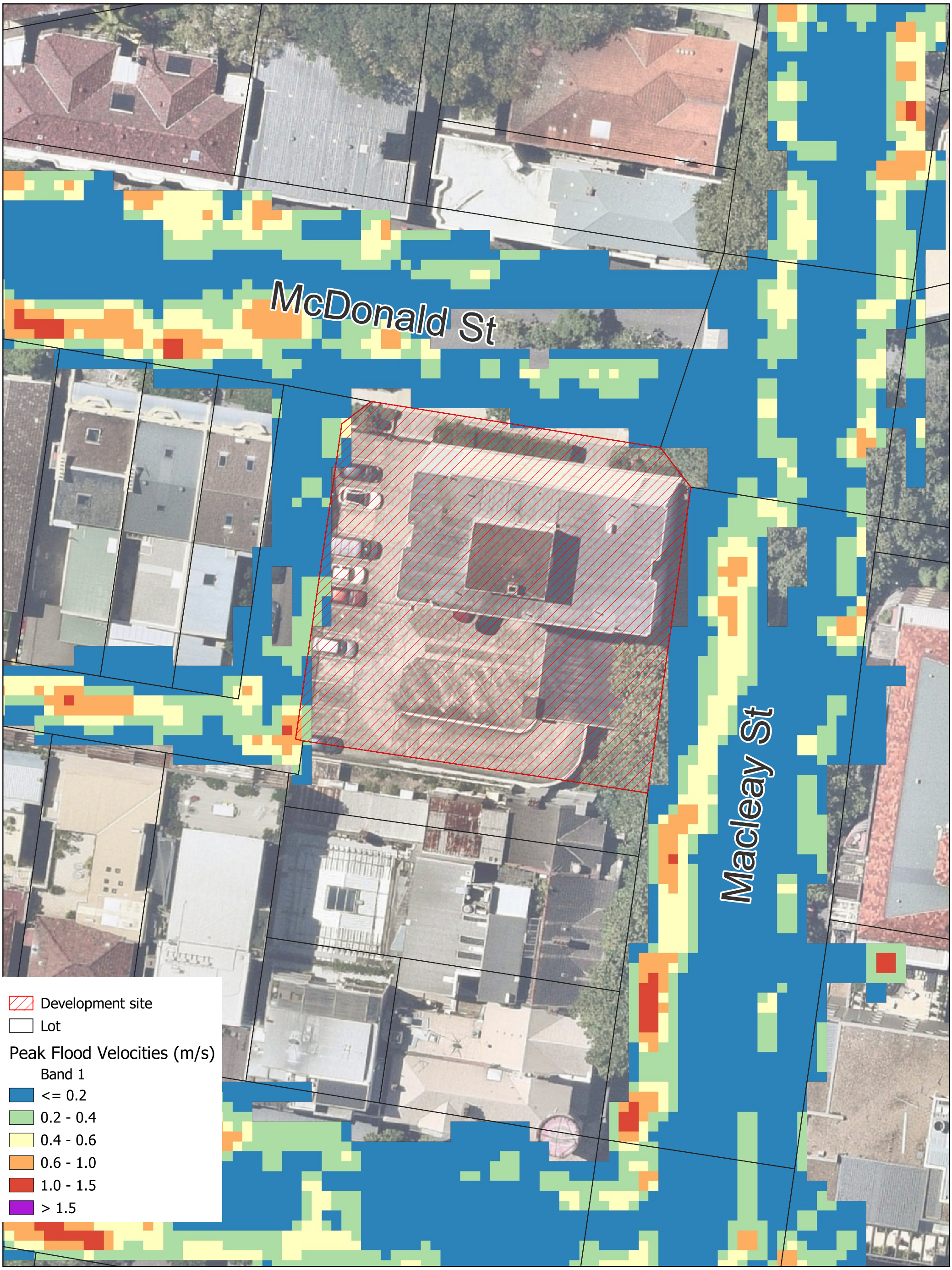
19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP Peak Flood Depths and Levels_Existing Case



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A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP Peak Flood Velocities_Existing Case


McDonald St
Macleay St
Development site
Lot
Peak Flood Hazard Categories
Band 1
Low Hazard
High Hazard
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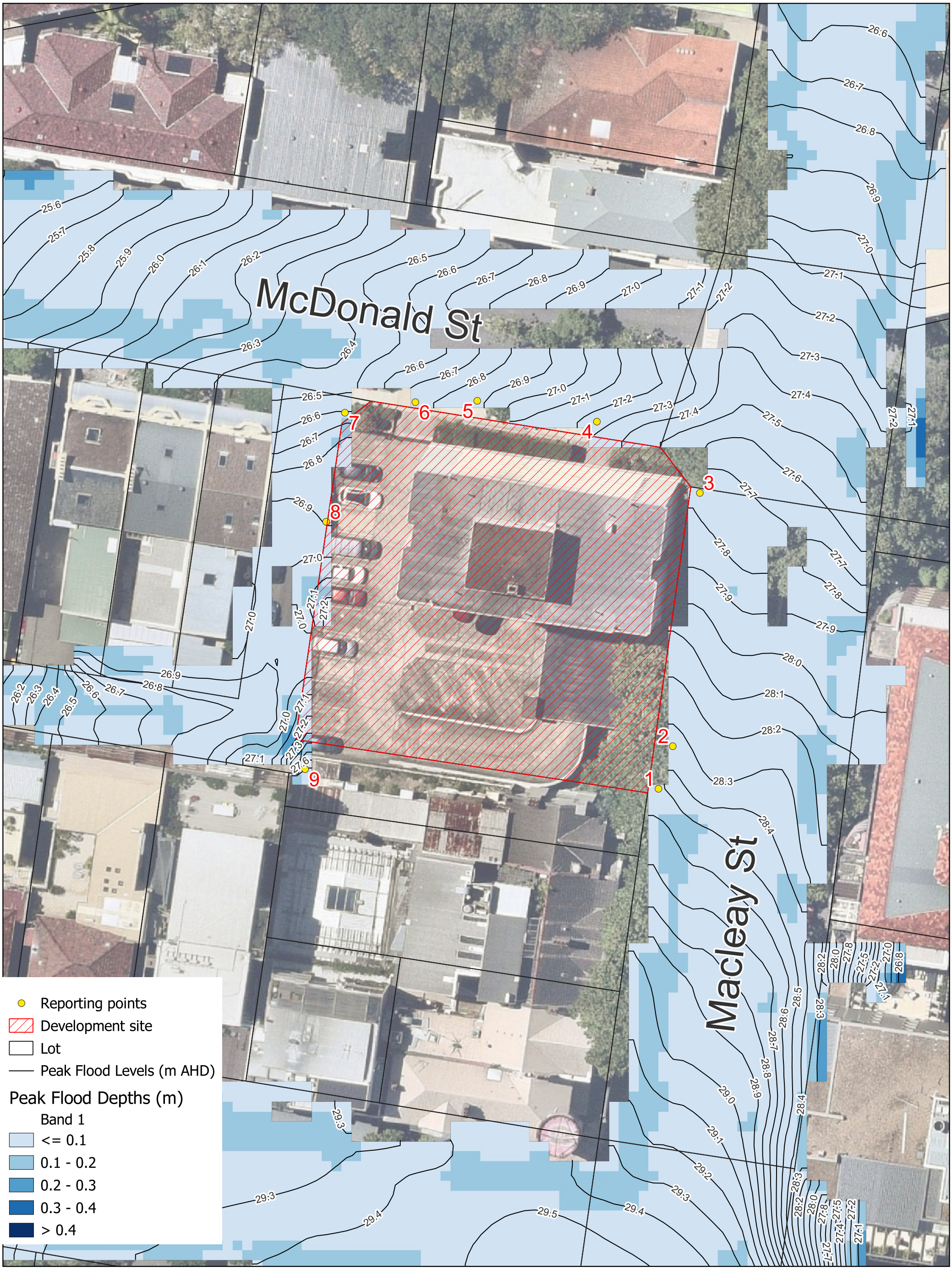
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
1%AEP Peak Flood Hazard_Existing Case



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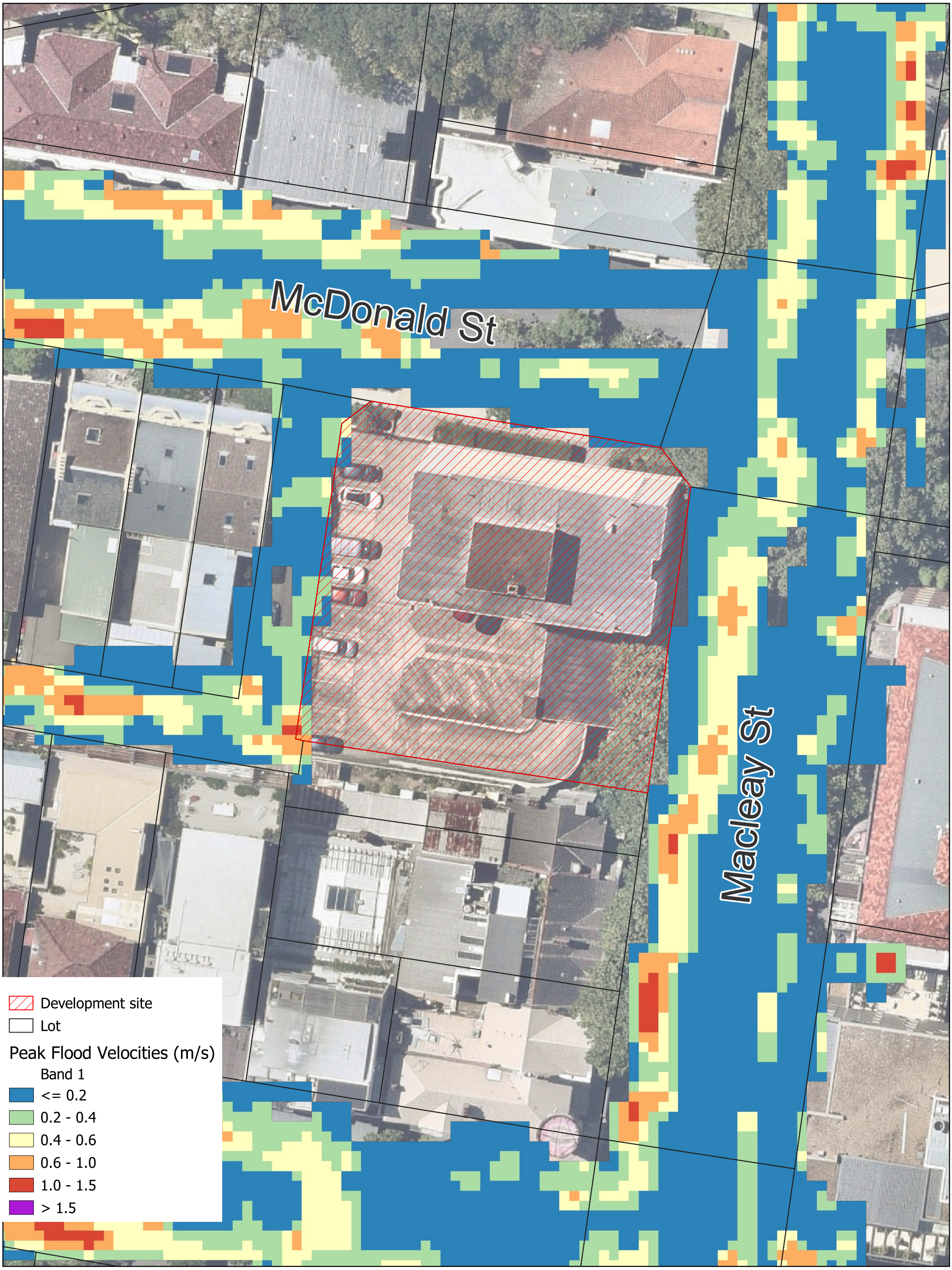
19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

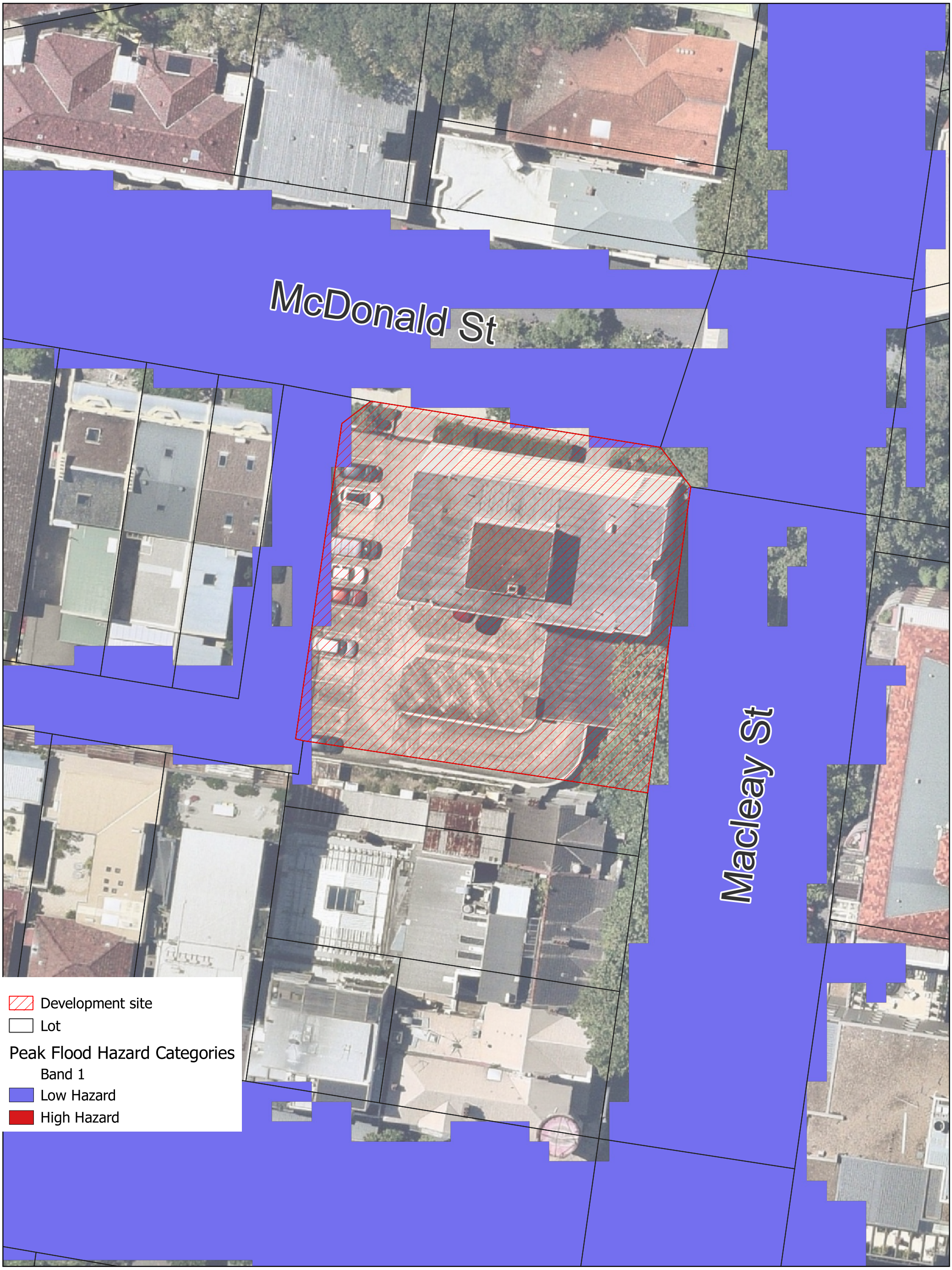
1%AEP_CC Peak Flood Depths and Levels_Existing Case



19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP_CC Peak Flood Velocities_Existing Case


McDonald St
Macleay St
Development site
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Peak Flood Hazard Categories
Band 1
Low Hazard
High Hazard
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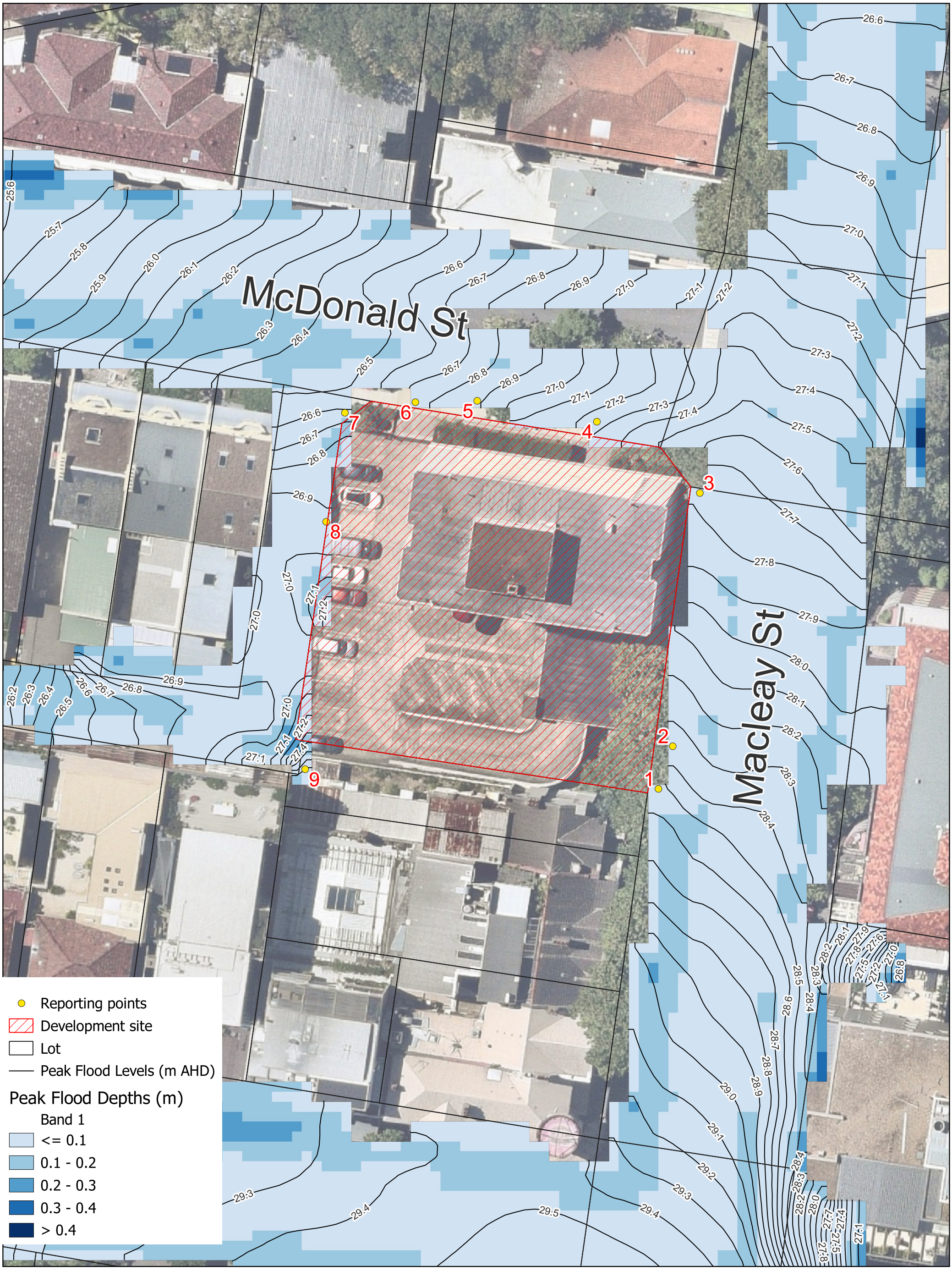
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
1%AEP_CC Peak Flood Hazard_Existing Case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Development site
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Peak Flood Levels (m AHD)
Peak Flood Depths (m)
Band 1
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0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4
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20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
PMF Peak Flood Depths and Levels_Existing Case

McDonald St

Macleay St

Development site

Lot

Peak Flood Velocities (m/s)

Band 1

<= 0.2

0.2 - 0.4

0.4 - 0.6

0.6 - 1.0

1.0 - 1.5

> 1.5

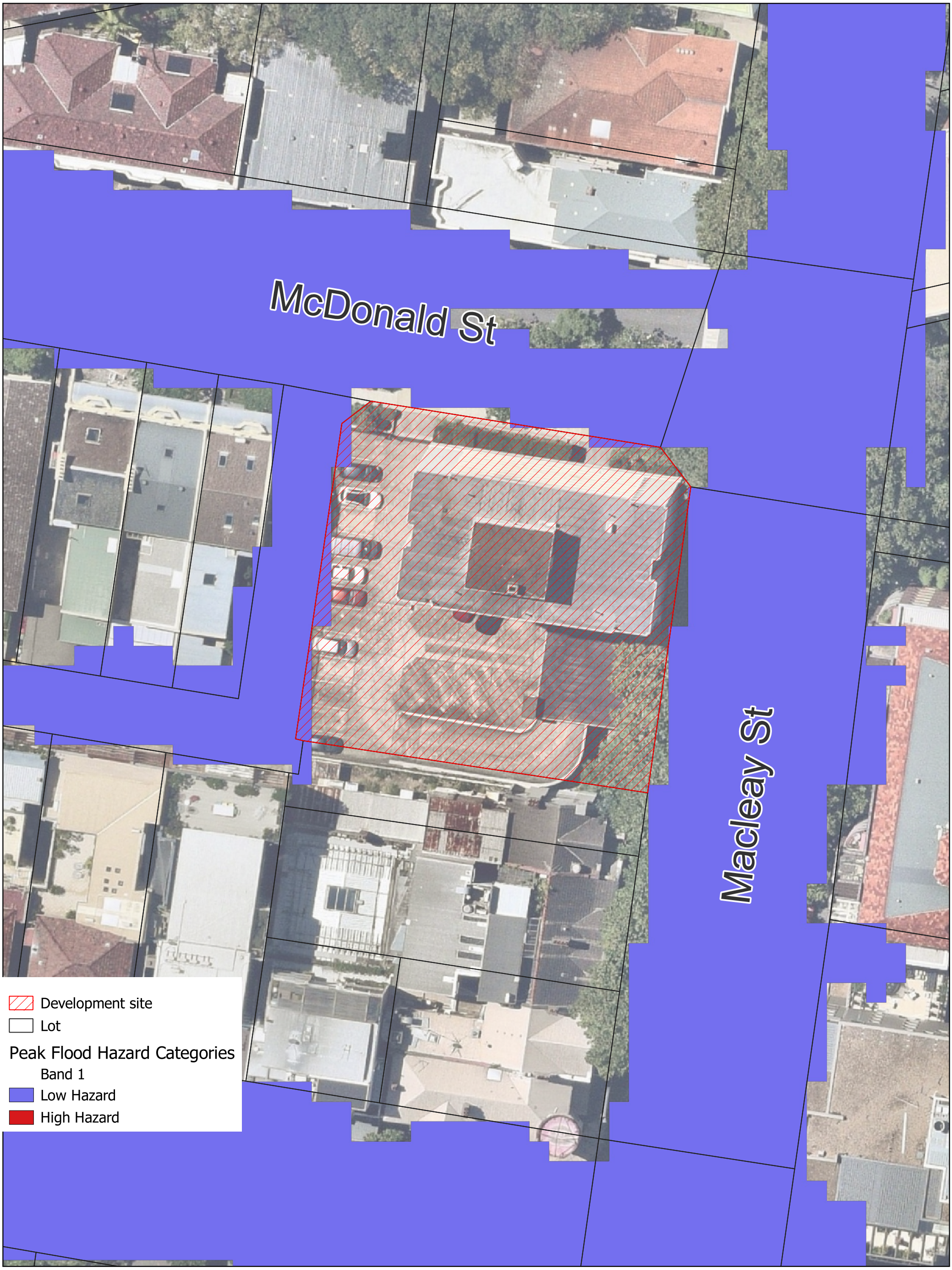
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

PMF Peak Flood Velocities_Existing Case



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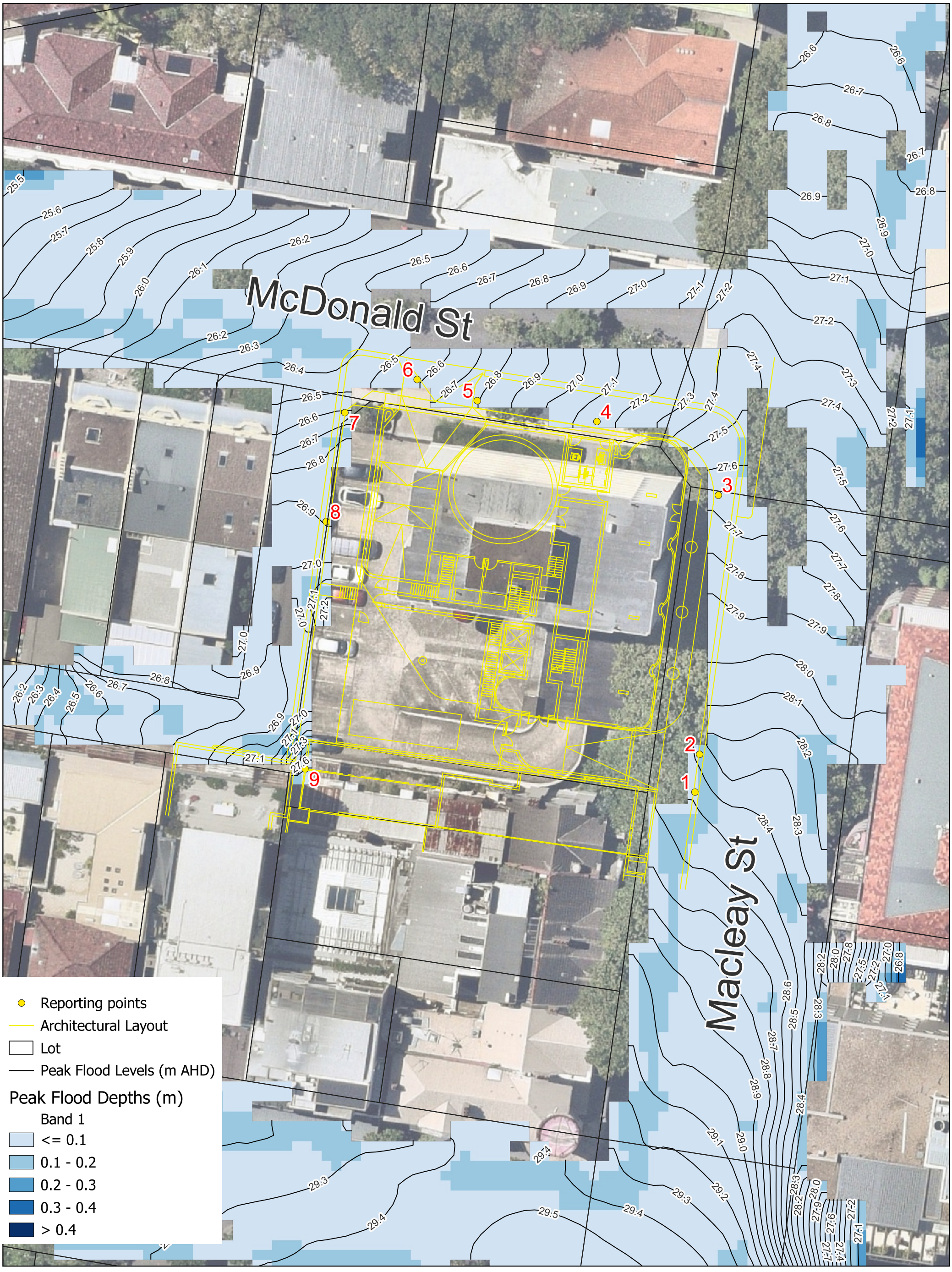
A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

PMF Peak Flood Hazard_Existing Case

9.2 Post-Development Condition Flood Maps


McDonald St
Macleay St
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Reporting points
Architectural Layout
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Peak Flood Levels (m AHD)
Peak Flood Depths (m)
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<= 0.1
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0.3 - 0.4
> 0.4
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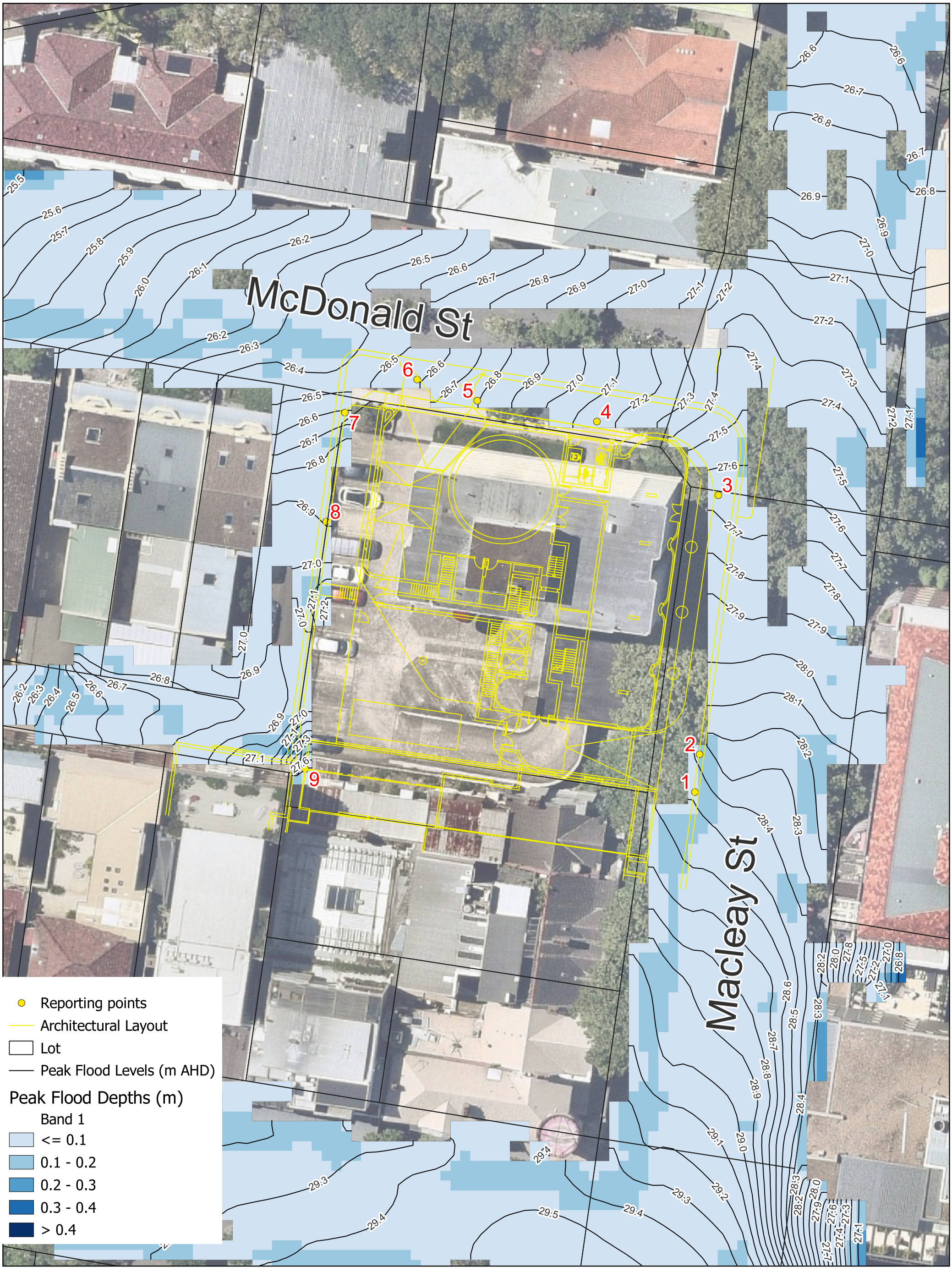
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
20%AEP Peak Flood Depths and Levels_Post-Development Case



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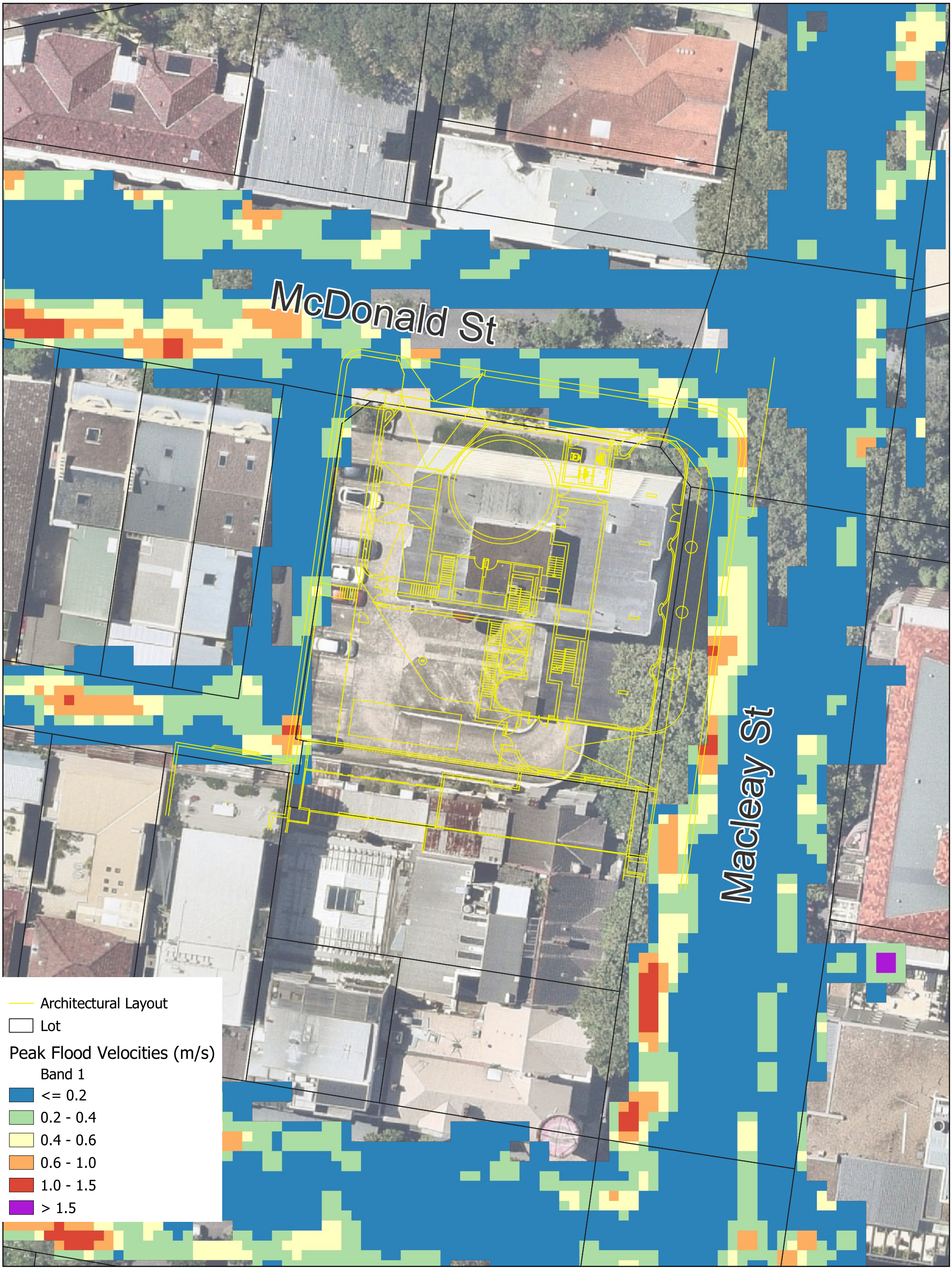
45-53 Macleay Street, Potts Point

20%AEP Peak Flood Depths and Levels_Post-Development Case



0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

20%AEP Peak Flood Velocities_Post-Development Case

McDonald St

Macleay St

Architectural Layout

Lot

Peak Flood Hazard Categories

Band 1

Low Hazard

High Hazard

0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

20%AEP Peak Flood Hazard_Post-Development Case

McDonald St

Macleay St

Reporting points
Architectural Layout
Lot
Peak Flood Levels (m AHD)

Peak Flood Depths (m)
Band 1
<= 0.1
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0.2 - 0.3
0.3 - 0.4
> 0.4

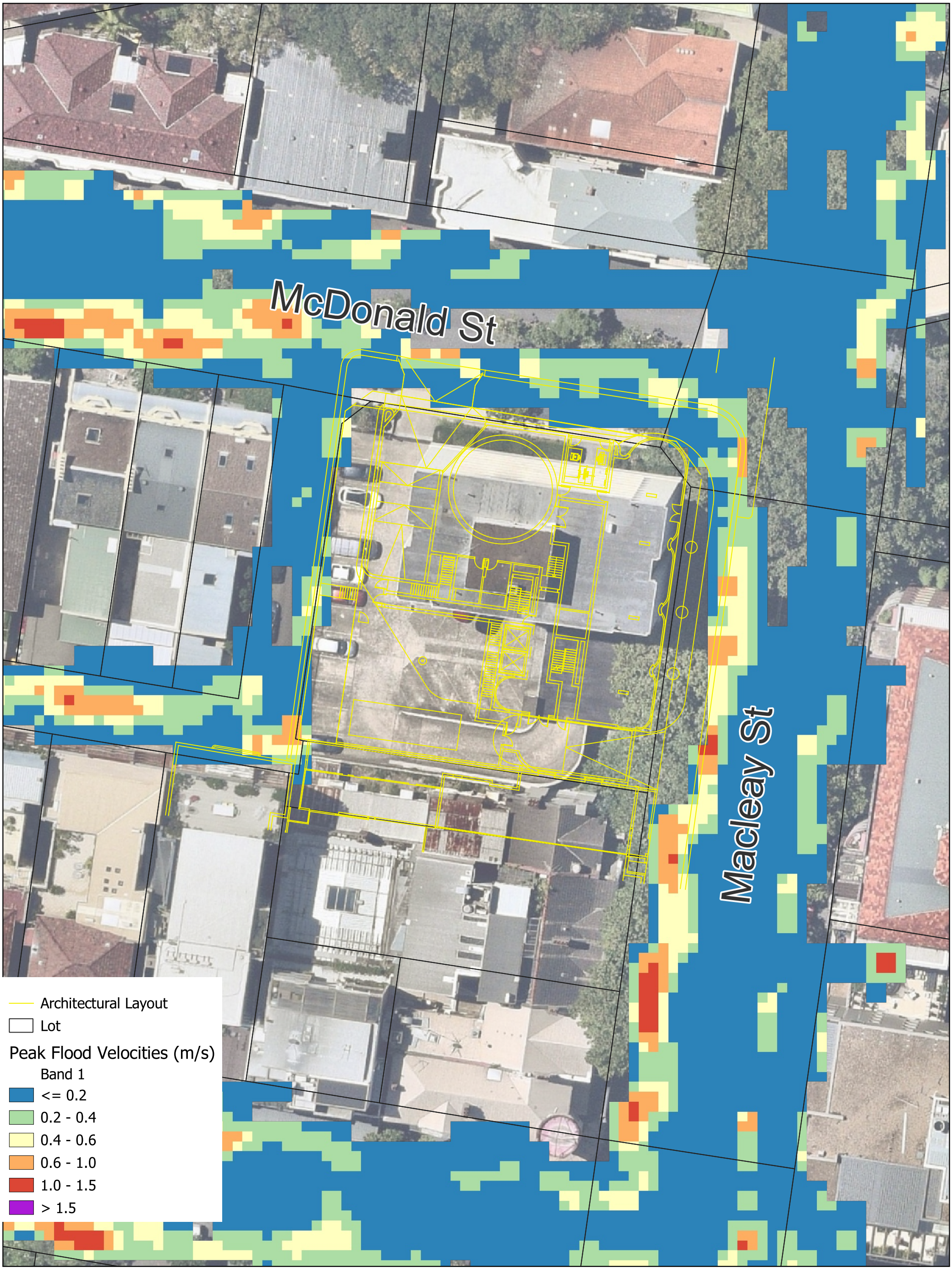
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

10%AEP Peak Flood Depths and Levels_Post-Development Case



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A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

10%AEP Peak Flood Velocities_Post-Development Case



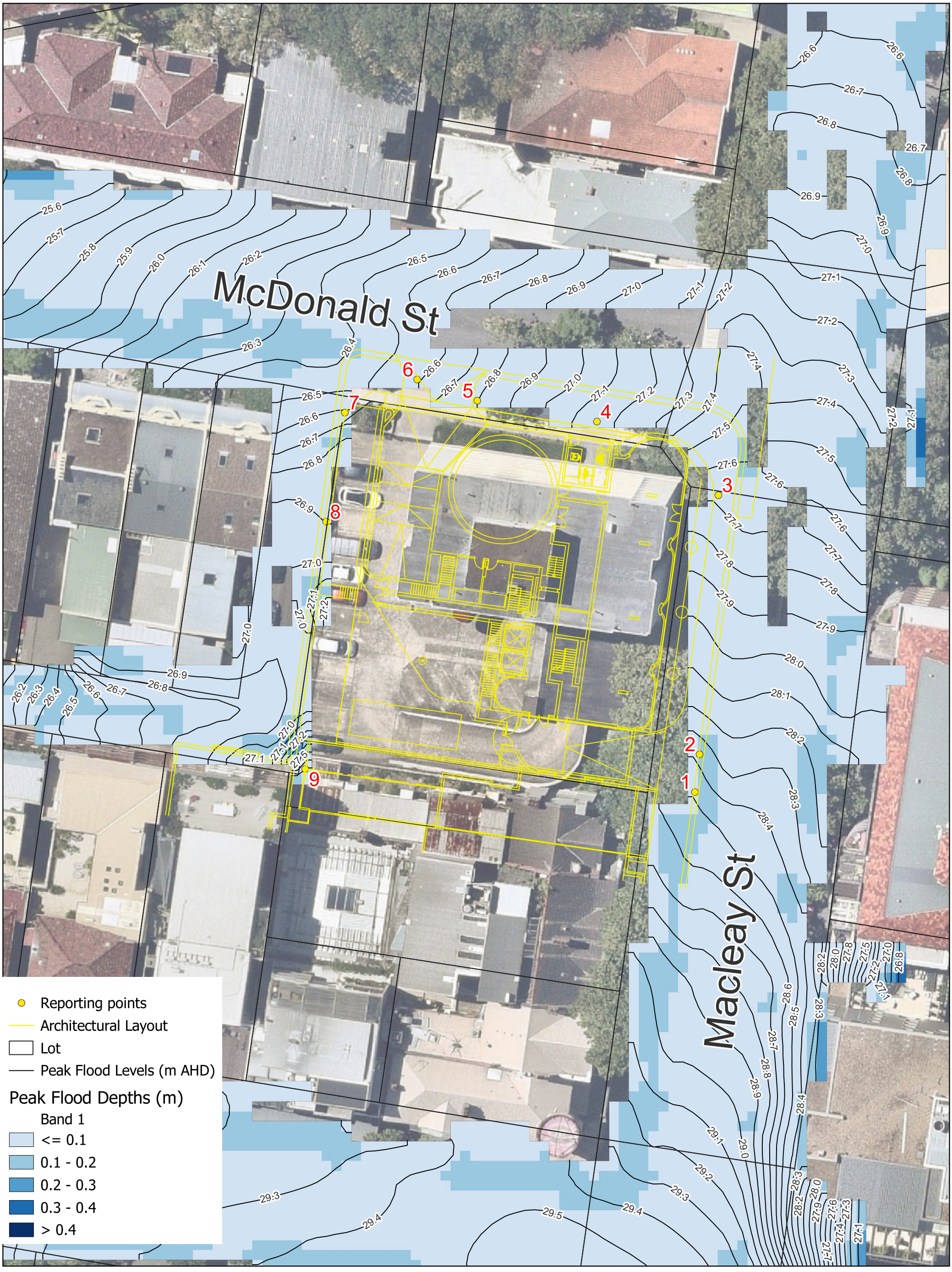
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

10%AEP Peak Flood Hazard_Post-Development Case


McDonald St
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Reporting points
Architectural Layout
Lot
Peak Flood Levels (m AHD)
Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
1%AEP Peak Flood Depths and Levels_Post-Development Case

McDonald St

Macleay St

Architectural Layout

Lot

Peak Flood Velocities (m/s)

Band 1

<= 0.2

0.2 - 0.4

0.4 - 0.6

0.6 - 1.0

1.0 - 1.5

> 1.5

0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP Peak Flood Velocities_Post-Development Case



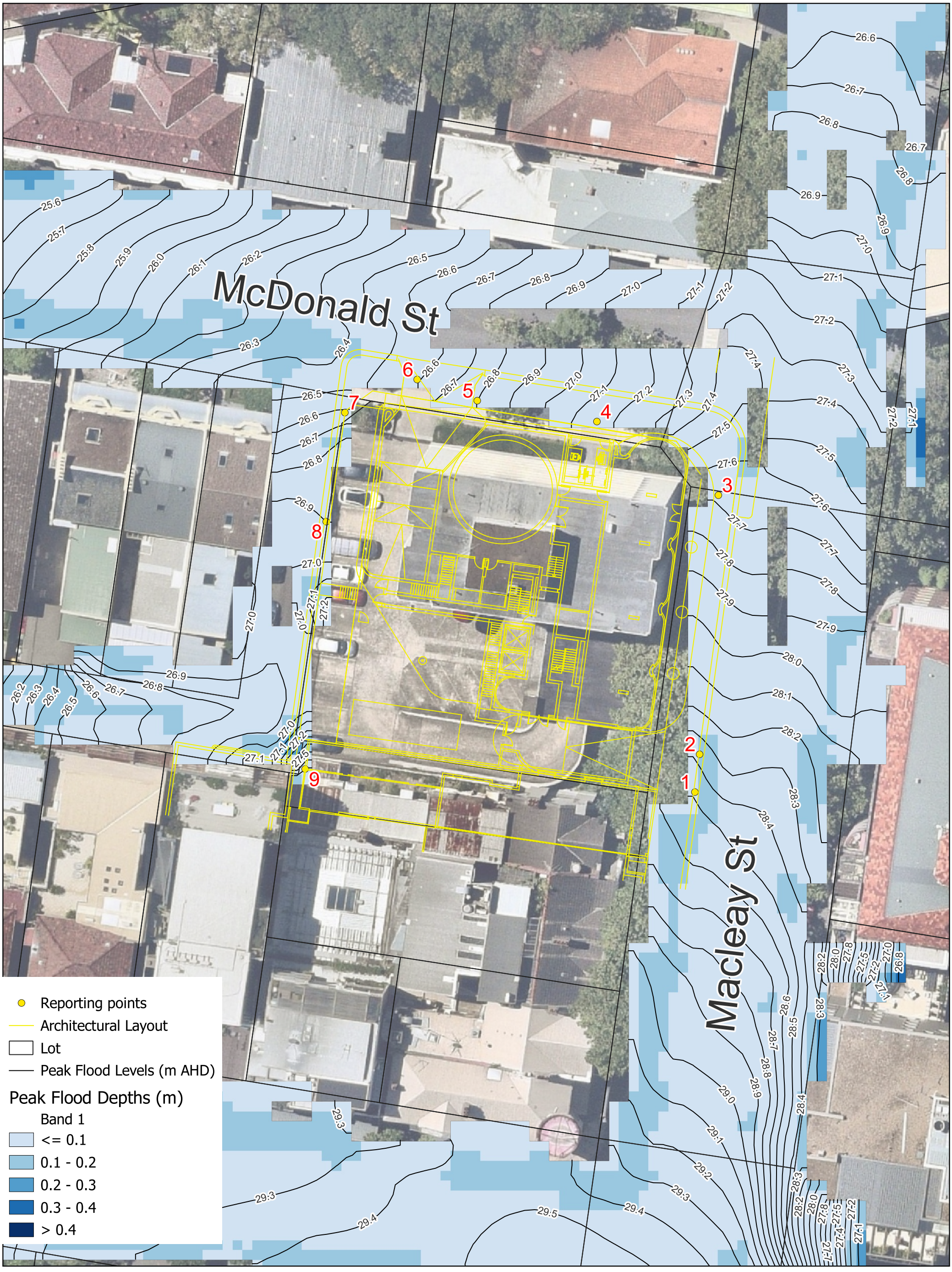
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

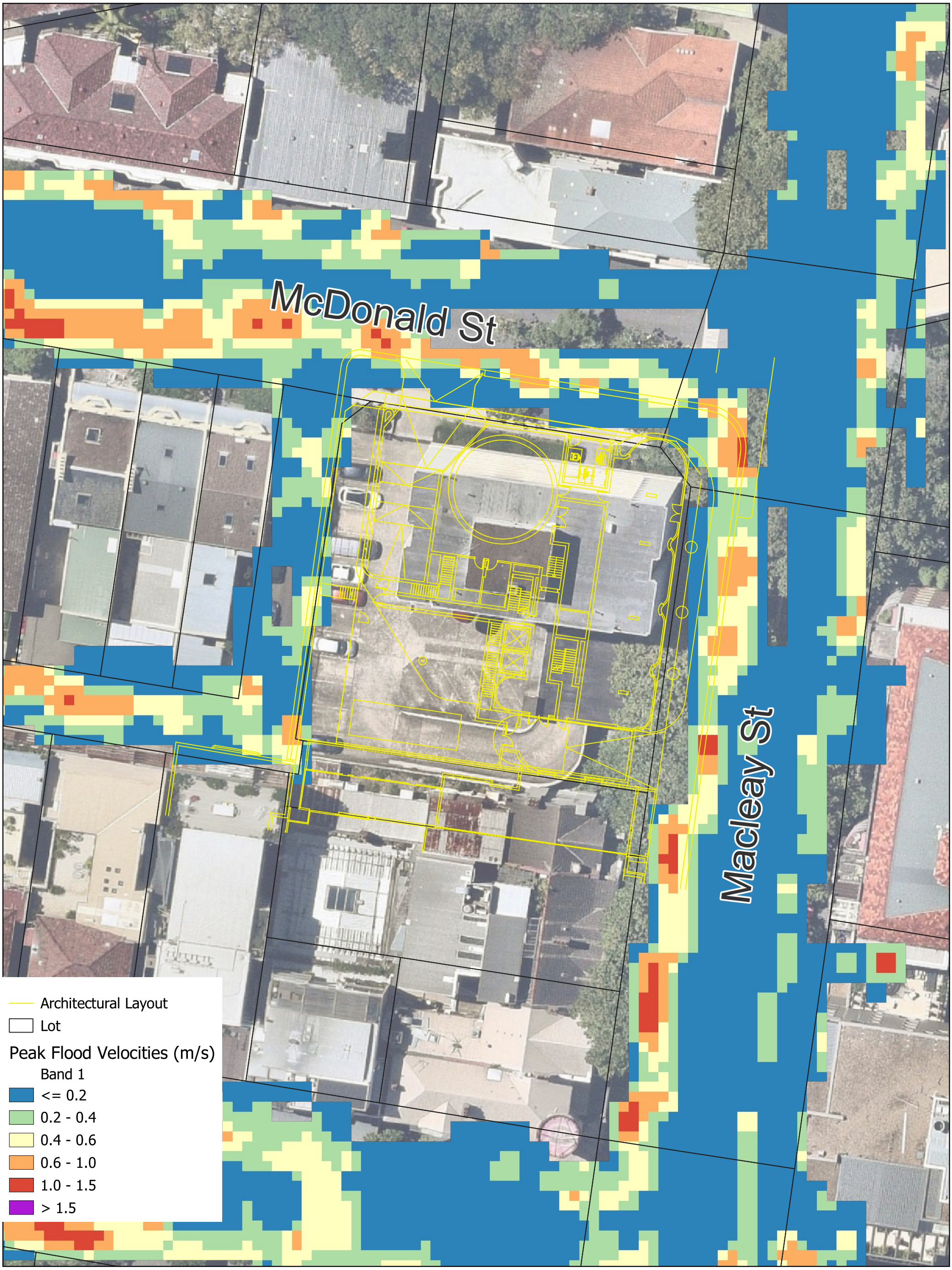
1%AEP Peak Flood Hazard_Post-Development Case



19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP_CC Peak Flood Depths and Levels_Post-Development Case



19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP_CC Peak Flood Velocities_Post-Development Case



0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP_CC Peak Flood Hazard_Post-Development Case

McDonald St

Macleay St

Reporting points
Architectural Layout
Lot
Peak Flood Levels (m AHD)

Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4

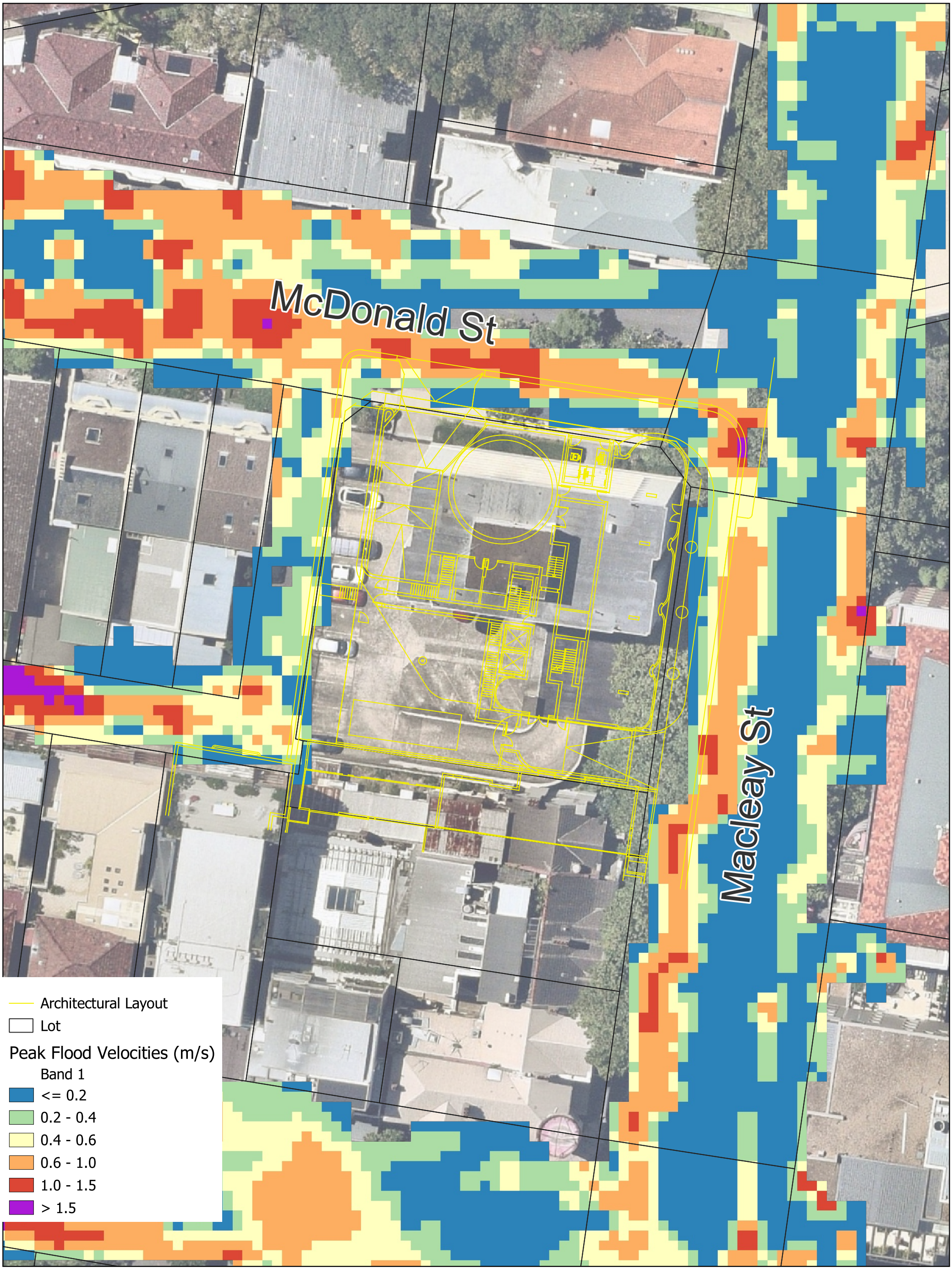
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

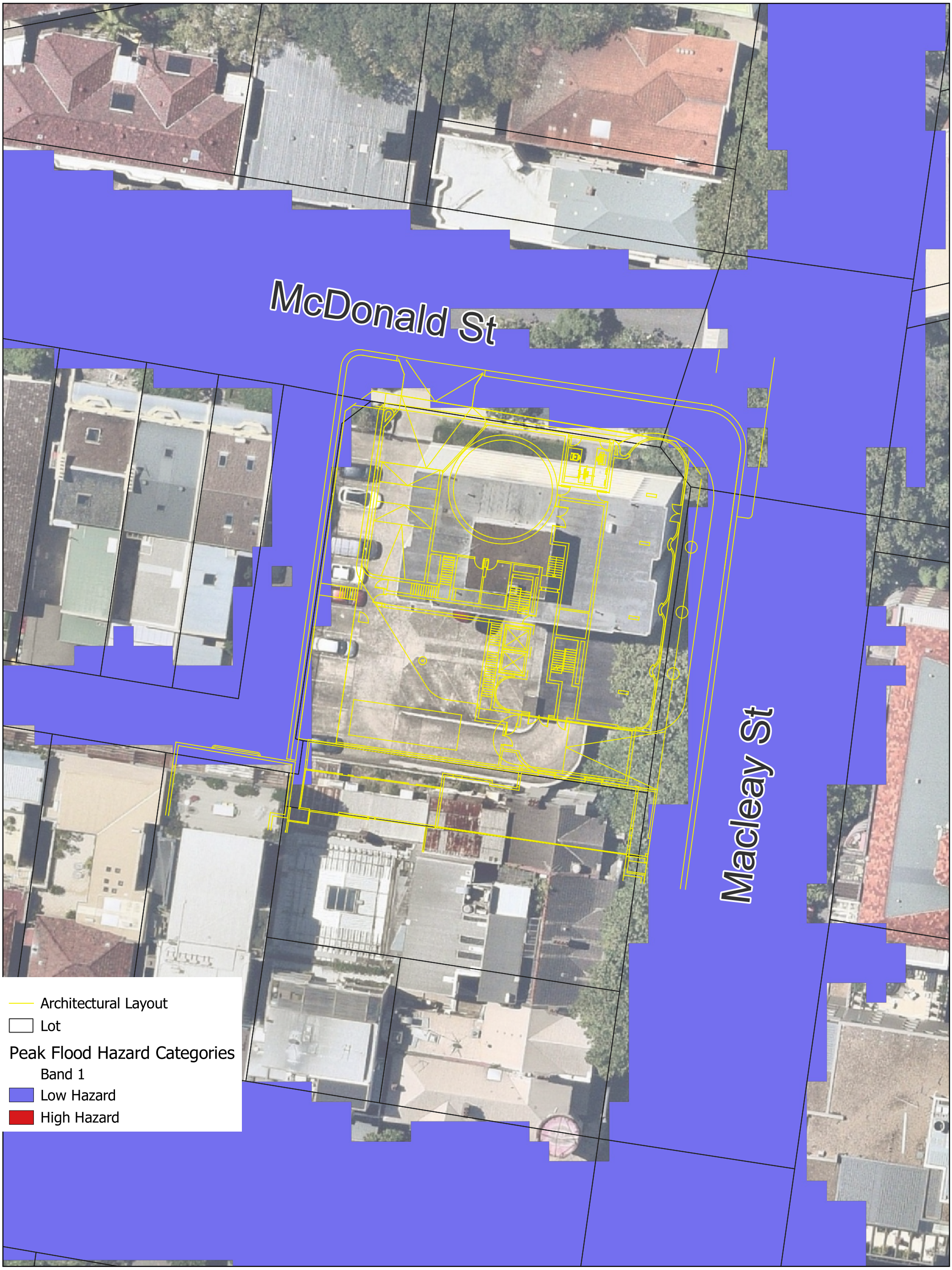
PMF Peak Flood Depths and Levels_Post-Development Case



19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

PMF Peak Flood Velocities_Post-Development Case



0 10 20 m

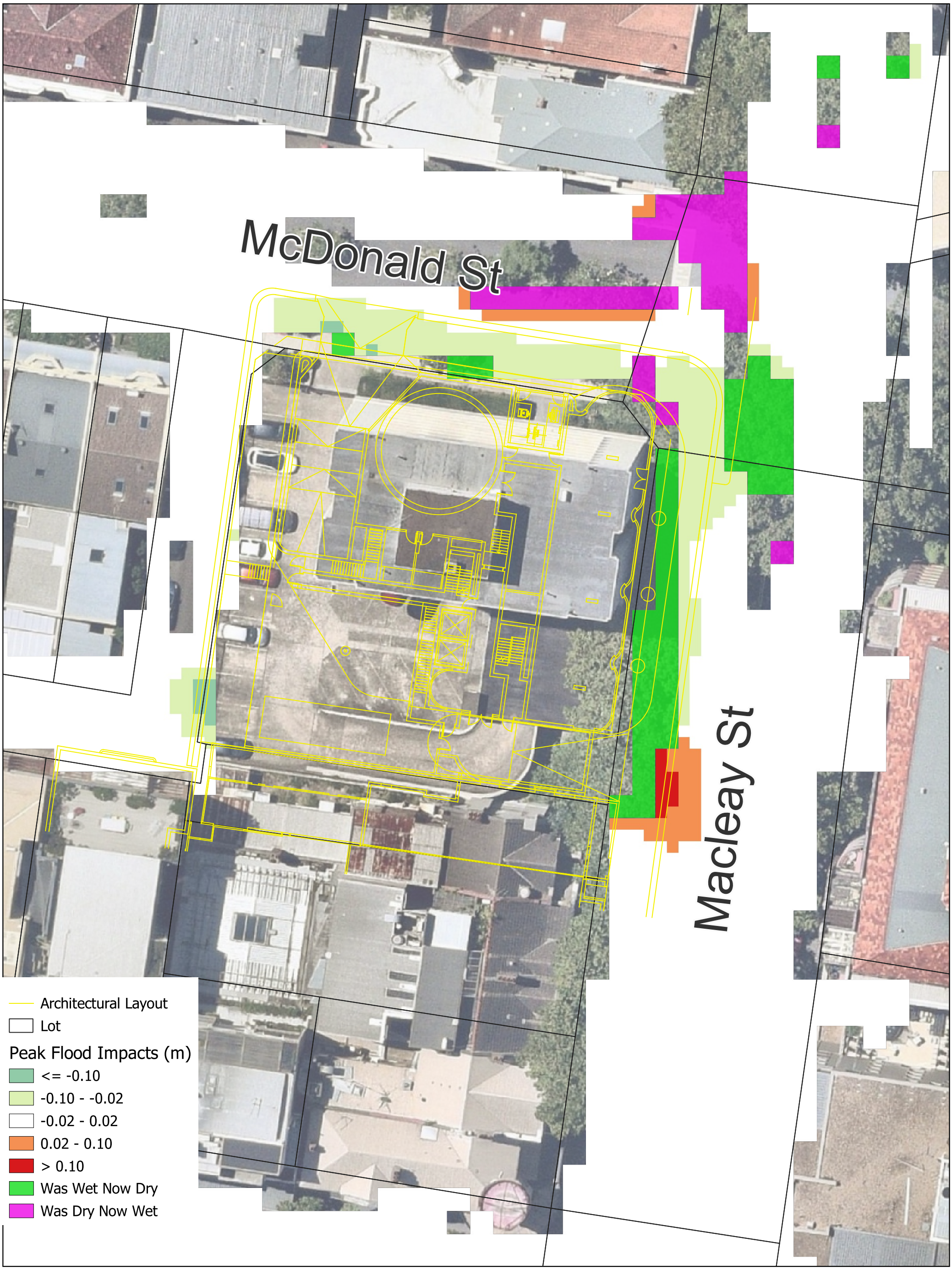
A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

PMF Peak Flood Hazard_Post-Development Case

9.3 Flood Impact (Afflux) Maps



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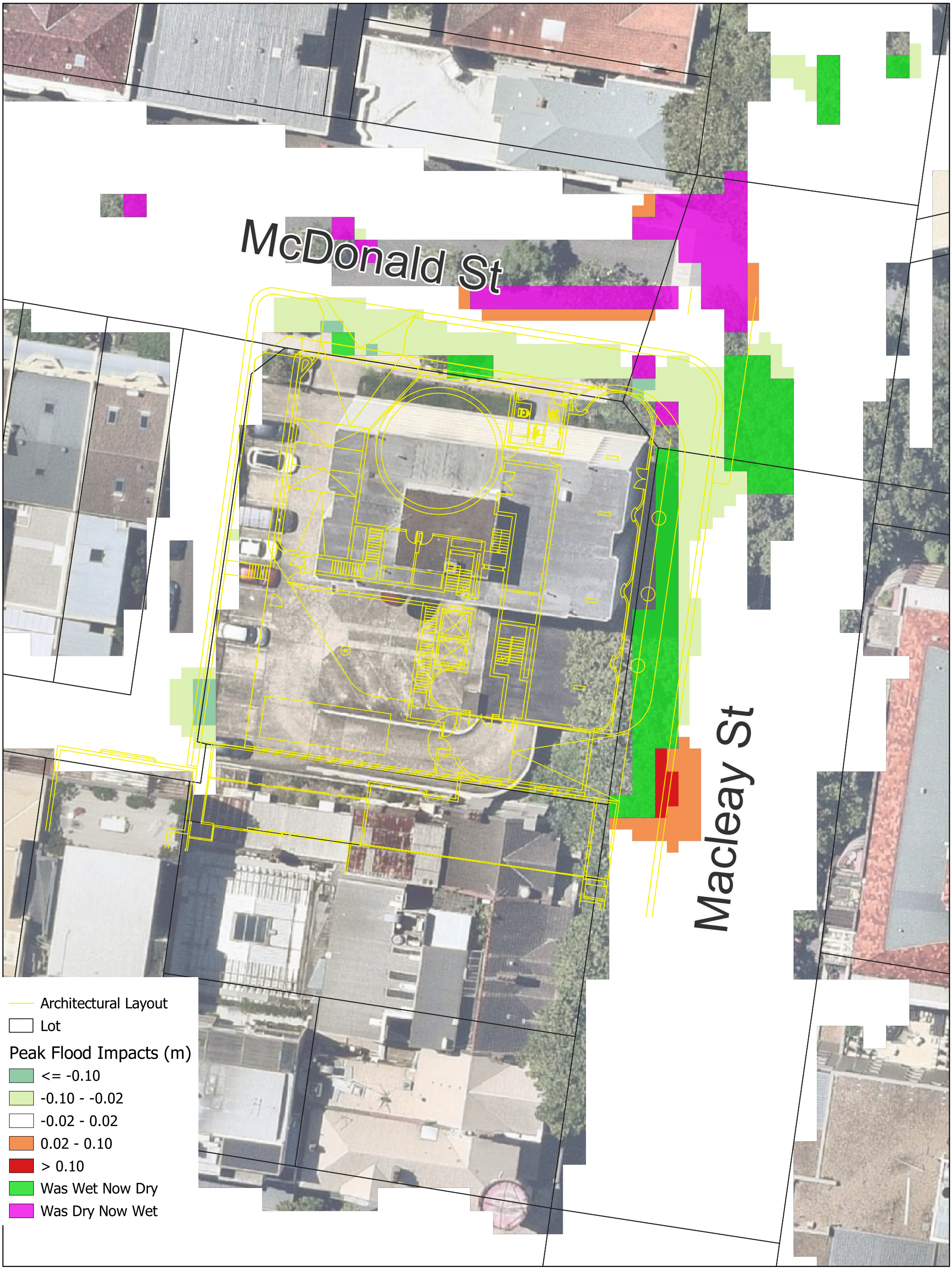
A3 Scale: 1:300

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

20%AEP Peak Flood Impact



0 10 20 m

A3 Scale: 1:300

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

10%AEP Peak Flood Impact

McDonald St

Macleay St

Architectural Layout

Lot

Peak Flood Impacts (m)

<= -0.10

-0.10 - -0.02

-0.02 - 0.02

0.02 - 0.10

> 0.10

Was Wet Now Dry

Was Dry Now Wet

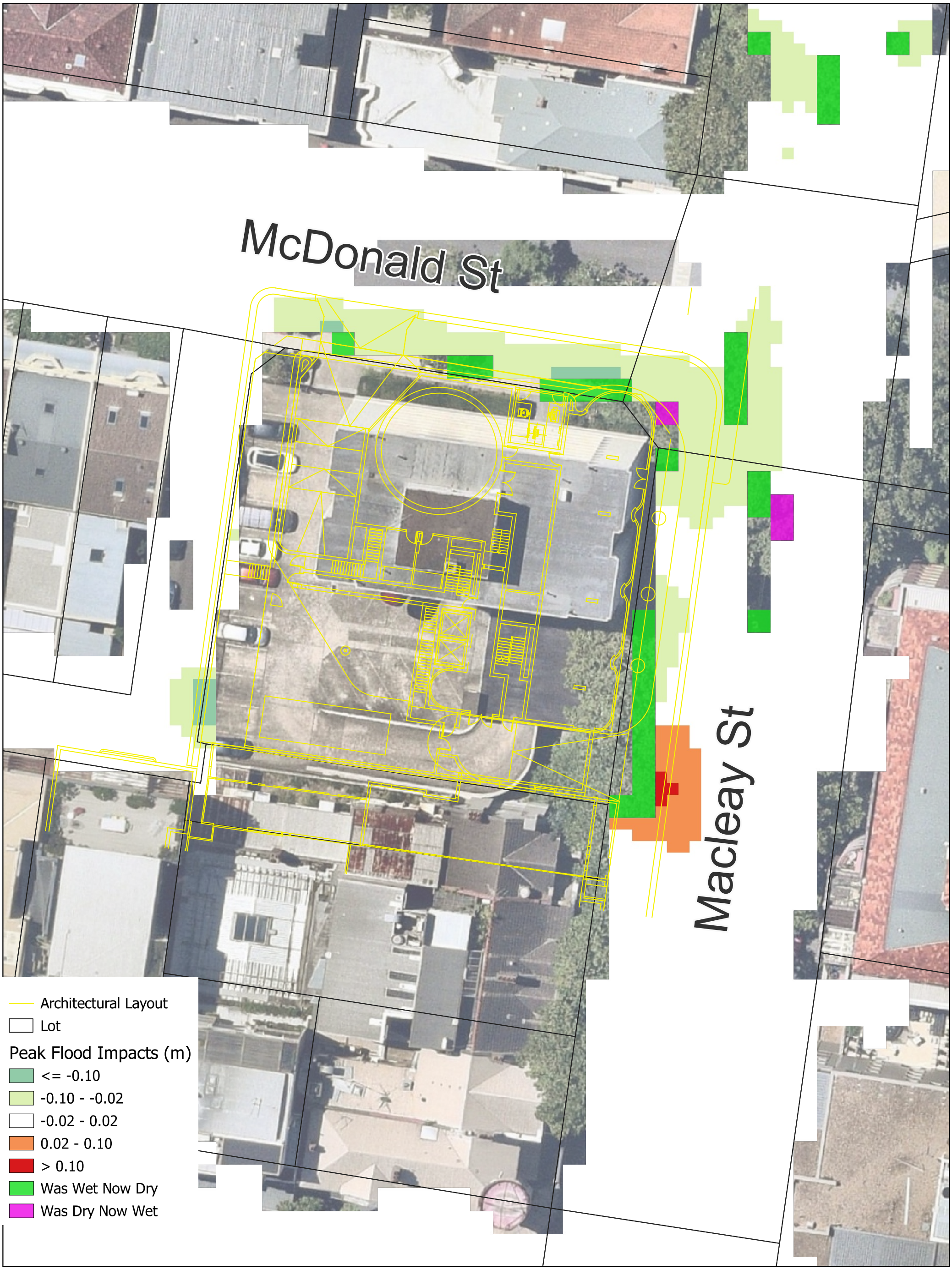
0 10 20 m

A3 Scale: 1:300

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP Peak Flood Impact



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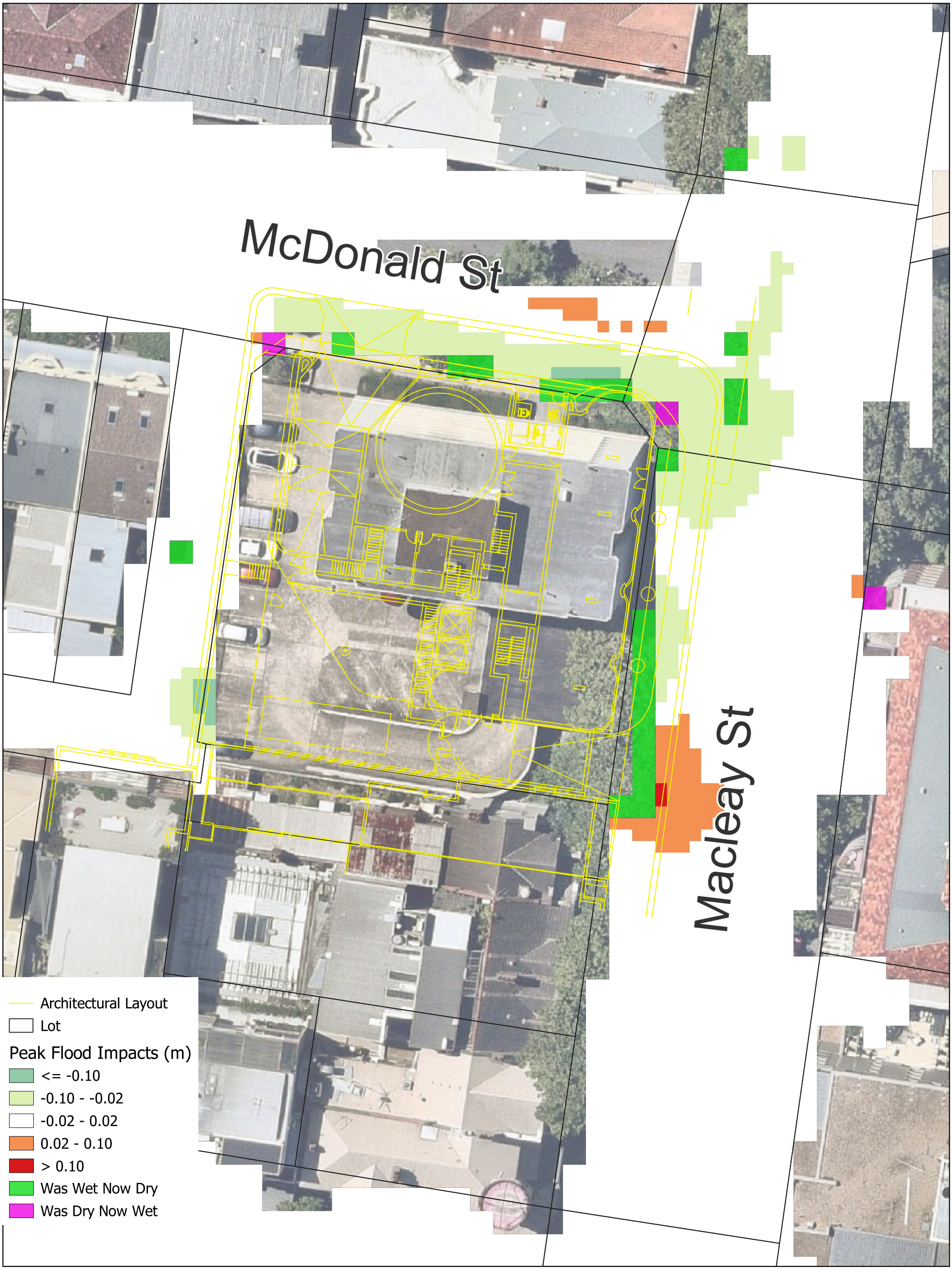
19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP_CC Peak Flood Impact



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19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

PMF Peak Flood Impact

45-53 Macleay Street, Potts Point, NSW

Flood Impact and Risk Assessment (FIRA) Report

13 March 2025

TIME & PLACE
POTTS POINT MID-RISE DEVELOPMENT

Flood Impact and Risk Assessment (FIRA) Report

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Report No	30234941-ED-01	
Date	13/03/2025	
Revision Text	5	

This report has been prepared for Time & Place in accordance with the terms and conditions of appointment for Potts Point Mid-Rise Development. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

REVISIONS

Revision	Date	Description	Prepared by	Approved by
1	21/02/2025	DRAFT Issue	SJ	NB
2	10/03/2025	DRAFT Issue – Test of Adequacy	SJ	NB
3	11/03/2025	DRAFT Issue – Test of Adequacy	SJ	NB
4	11/03/2025	DRAFT Issue – Test of Adequacy	SJ	NB
5	13/03/2025	Final Issue for Lodgement	SJ	NB

Executive Summary

This Flood Impact and Risk Assessment (FIRA) Report has been prepared by Arcadis on behalf of Time and Place Ltd to support a Concept State Significant Development Application (SSDA) for a mixed-use development at 45-53 Macleay Street, Potts Point. The site is located within the Woolloomooloo catchment area, which falls under the of the City of Sydney(CoS) Local Government Area (LGA).

The Woolloomooloo TUDlow Flood Model received form CoS Council was used for this study without any major modifications. The model is based on ARR 1987, and TUFLOW version 2011 was adopted to maintain consistency with the existing flood study. The model underwent limited calibration and verification and was used as is with the exemption of utilising the site detailed ground survey over the LidAir aerial survey used in the base model.

For the 1% AEP event, peak flood levels around the building range from 26.605 m AHD to 28.505 m AHD. Peak flood velocities are below 1.5 m/s, and flood depths remain under 0.2 m. As a result, the flood hazard is classified as low. Flood inundation occurs within minutes of rainfall onset. For events smaller than the PMF, inundation lasts approximately one hour, while for the PMF event, it lasts about 30 minutes.

Under post-development conditions, the 1% AEP peak flood levels have generally decreased slightly due to the new pedestrian path, which is lower than the existing one. However, a localized increase in flood levels occurs near the southeastern corner of the building due to minor ground level adjustments. The increase in flood levels is less than 100 mm, remains localized around the road gutter area, and does not impact surrounding buildings.

The proposed finish surface levels at the openings shown in the SJB Architects drawing 6253-A DA-1003 Rev 2 dated 12.02.2025 comply with COS' minimum Flood Planning Levels (FPLs) requirements.

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1 Introduction

This FIRA report has been prepared by Arcadis on behalf of Time and Place Ltd (the Applicant) to accompany a Concept State Significant Development Application (SSDA) for a mixed-use development at 45-53 Macleay Street, Potts Point (the site).

The site is located within the City of Sydney Local Government Area (LGA). It has an area of approximately 1,289sqm and is legally described as SP 934. The site currently accommodates a 12-storey residential flat building comprising 80 studio apartments, and associated car parking (refer Figure 1).

The site is in Potts Point, which is well serviced by public amenities such as a supermarket, cafes, destination retail shops and a library. Further afield is the Sydney CBD and the Royal Botanic Gardens to the west, and Elizabeth Bay and Rushcutters Bay to the east.

The site is within convenient walking distance (750m) of Kings Cross Train Station which provides rail connections to Bondi Junction and South Sydney. It also benefits from access to local bus services along Macleay Street which run every 10 minutes on average throughout the day and connect the site with Potts Point, Central Station and Barangaroo.



Figure 1 Aerial Photograph of Site

The project seeks concept approval pursuant to section 4.22 of the EP&A Act for a 13-storey mixeduse shop-top housing development comprising three levels of basement car parking, ground floor retail and residential above.

The project will include 15% affordable housing for a 15-year period to utilise the height and floor space bonuses in the Housing SEPP. The proposal will comply with the maximum height and FSR controls for the site when utilising the bonuses provisioned for under the Housing SEPP for affordable housing provision, and the Sydney LEP 2012 for design excellence

Table 1 Project Details

Descreptor	Project details
Proposed Use	Shop Top Housing / Commercial Premises
Project Description	Construction of 13 storey mixed-use development comprising 3 levels of basement, ground floor retail and residential above.
Gross Floor Area	Maximum 5,529.8 sqm
Building Height	Maximum 50.05m (inclusive of 30% affordable housing bonus and 10% design excellence bonus)
Floor Space Ratio	Maximum 4.29:1 (inclusive of 30% affordable housing bonus and 10% design excellence bonus)
Vehicle access	Vehicle access to be provided off McDonald Street.

This study provides key findings on flood extents, depths, velocities, and hazard classifications for design storm events tp ro 1% AEP, and Probable Maximum Flood (PMF).

1.1 Catchment Description

The proposal is located within the Woolloomooloo catchment area, which falls under the City of Sydney Local Government Area (LGA). The site is situated in the densely developed suburb of Potts Point, an area characterized by a mix of residential and commercial land uses.

The Woolloomooloo catchment covers an area of approximately 160 hectares all of it draining to SWC's major trunk drainage systems (known as SWC 30) taking flows from the upper regions of the catchment to Sydney Harbour at Woolloomooloo Bay.

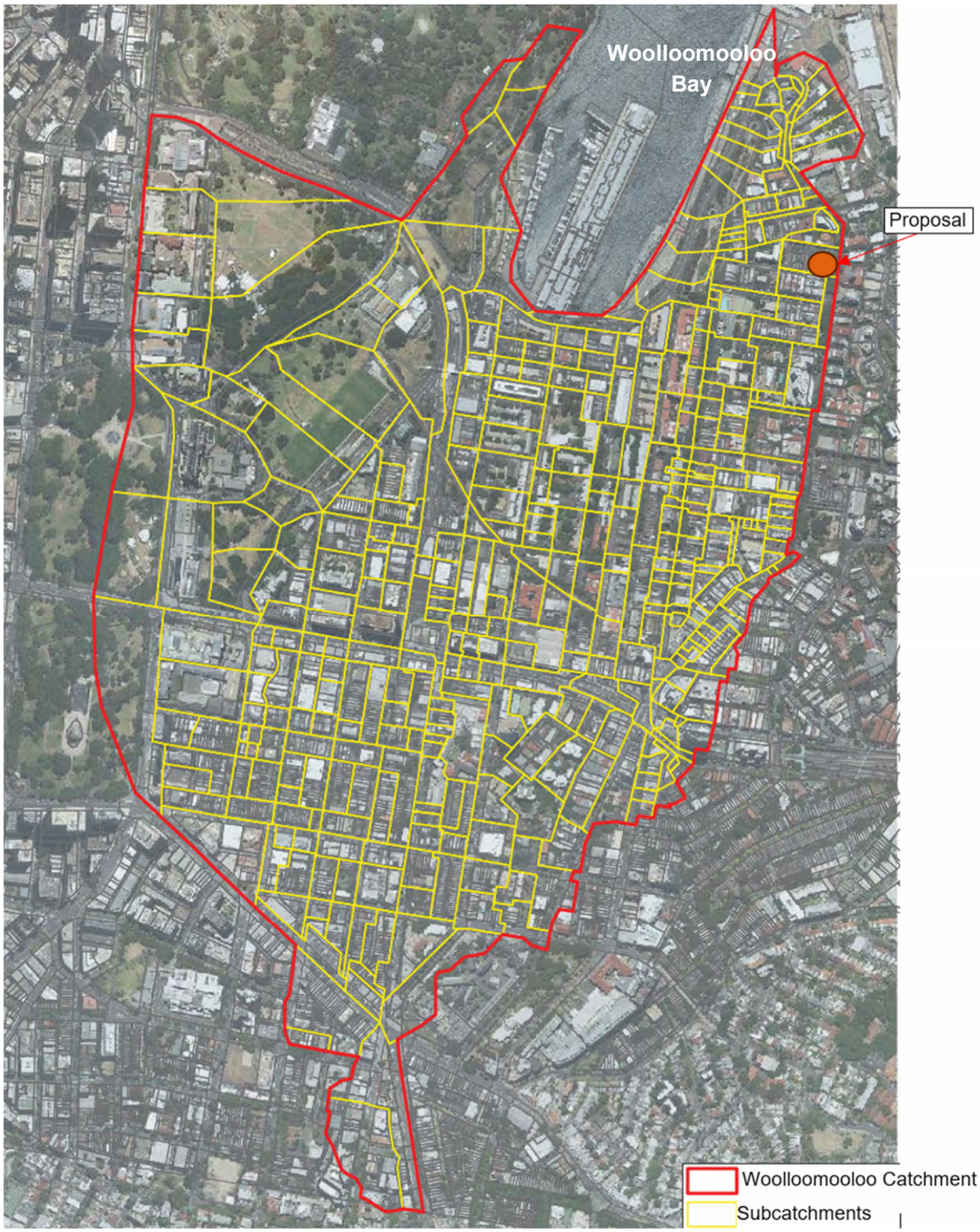


Figure 2 Catchment Delineation

2 Previous Studies

The previous studies relevant to the current project are presented in **Error! Reference source not found.**Table 2 below.

Table 2 Previous Studies

Study	Description	Incorporated in the current study
Woolloomooloo Flood Study, by WMA Water, July 2013	The flood study for the Woolloomooloo catchment which has defined the existing flood conditions and developed a suitable model, which has been used for the Floodplain Risk Management Study and Plan.	The Wolloomooloo flood model has been used as the base model for the current study
Potts Point Mid-Rise Development Floodplain Management Report, by Van der meer, 2011	This report assesses the flood risk to the proposed development at 45-53 Macleay St, Potts Point, NSW for compliance with the City of Sydney Interim Floodplain Management Policy. The flood analysis shows that flooding is confined to ponding in the street kerb and gutter.	NA

3 Available Data

Table 3**Error! Reference source not found.** lists the available data that has been used in the current study.

Table 3 Summary of Available Data

Data	Description
Aerial Imagery	Recent high-resolution aerial photographs (20/1/2025) have been extracted from NearMap
Topographic Data Including Site Survey	Colliers has conducted a topographic survey of the site (19/09/2023). This survey was incorporated into the TUFLOW model.
Design Surfaces	The design surface was provided on 13/02/2025 and incorporated into the TUFLOW model for the proposed scenario
Woolloomooloo TUFLOW Model	Woolloomooloo TUFLOW model was provided by the City of Sydney Council and was used as the base model for the current assessment. No adjustments were made to the provided model except for the inclusion of survey data and the design surface.

4 SEARS

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 7th of Feb 2025 issued for the SSDA (SSD-79316759). Specifically, this report has been prepared to respond to the SEARS requirement issued below.

Table 4 SEARs

Item	Description of Requirement	Section Reference (this report)
Flood Risk	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	Sections 7 (Flood extent, velocity) 7.2.1 (Climate Change), 7 (Risk on site, site access and egress)
	Where the concept 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.	Section 7
	Detail any flood risk management measures that are to be incorporated as part of the concept 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

5 Methodology

The current methodology includes the following key steps:

1- Review of Previous Flood Study

A review of the Woolloomooloo Flood Study prepared by WMA Water (July 2013) was undertaken to understand the parameters used in the associated flood model.

2- Incorporation of Survey Data into the Woolloomooloo TUFLOW Model provided by CoS council to Arcadis.

Survey data for the site was incorporated into the TUFLOW model.The updated model was then executed to generate flood results for a range of design storm events, including 20% Annual Exceedance Probability (AEP), up to 1% AEP (100-year ARI), and Probable Maximum Flood (PMF). The outputs included flood extent, depth, level, velocity, and hazard classification across the study area.

3- Incorporation of the Design Surface into the Model

The design surface for the proposed development was integrated into the TUFLOW model. The model was then rerun to assess the post-development flood conditions under the same range of flood events.

4- Comparison of Existing and Proposed Case Results

Flood results between the existing and proposed scenarios was compared. The differences in flood levels were used to generate flood afflux mapping, identifying any potential impacts of the development on surrounding properties and overland flow paths..

5.1 Hydraulic Modelling

The Woolloomooloo TUFLOW model was supplied by the City of Sydney Council. The hydrological assessment for the model has been conducted using DRAINS; however, the DRAINS model has not been provided.

5.1.1 Catchment delineation

From the flood study (2013), it is understood that the sub-catchment areas have been delineated based on ALS survey and making the assumptions that:

- properties generally drain to streets or inlet pits; and
- flow in streets is along gutters and uni-directional.

The DRAINS hydrologic runoff-routing model has been used to determine hydraulic model inflows for the local sub-catchments within the study area.

From the flood study 2013 it is understood that the Horton Infiltration loss model has been used within DRAINS software. It has assumed that he soil in the catchment has a slow infiltration rate potential and the antecedent moisture condition has been considered to be rather wet.

It is important to note that the DRAINS model was not provided for this study, and the modelling has been conducted using the boundary conditions included in the supplied TUFLOW model.

5.1.2 Grid Size

A computational grid cell size of 2 m by 2 m has been used in the TUFLOW model.

5.1.3 Modelling of Buildings

Permanent buildings and other significant structures likely to obstruct flow have been modeled as impermeable obstructions to flood flow (i.e., they were excluded from the model grid).

5.1.4 Model Roughness

Typical values in the literature have been used for the roughness values as follows in Table 5:

Table 5 Roughness values

Surface Type	Manning's n
Very short grass or sparse vegetation	0.035
General overland areas, gardens, roadside verges, low density residential lots (default)	0.045
Medium density vegetation	0.060
Heavy vegetation	0.100
Roads, paved surfaces	0.025
Concrete pipes	0.013
Clay pipes	0.025
Brick	0.014
PVC	0.011

5.1.5 Boundary Condition

The TUFLOW model incorporates both internal and external inflow boundary conditions. The downstream tailwater condition has been modeled as a fixed water level, representing the expected water surface elevation along Wolloomooloo Bay.

While the downstream sections of the model are affected by high water levels in Woolloomooloo Bay, the project site is located further upstream and has been determined to be unaffected by these influences.

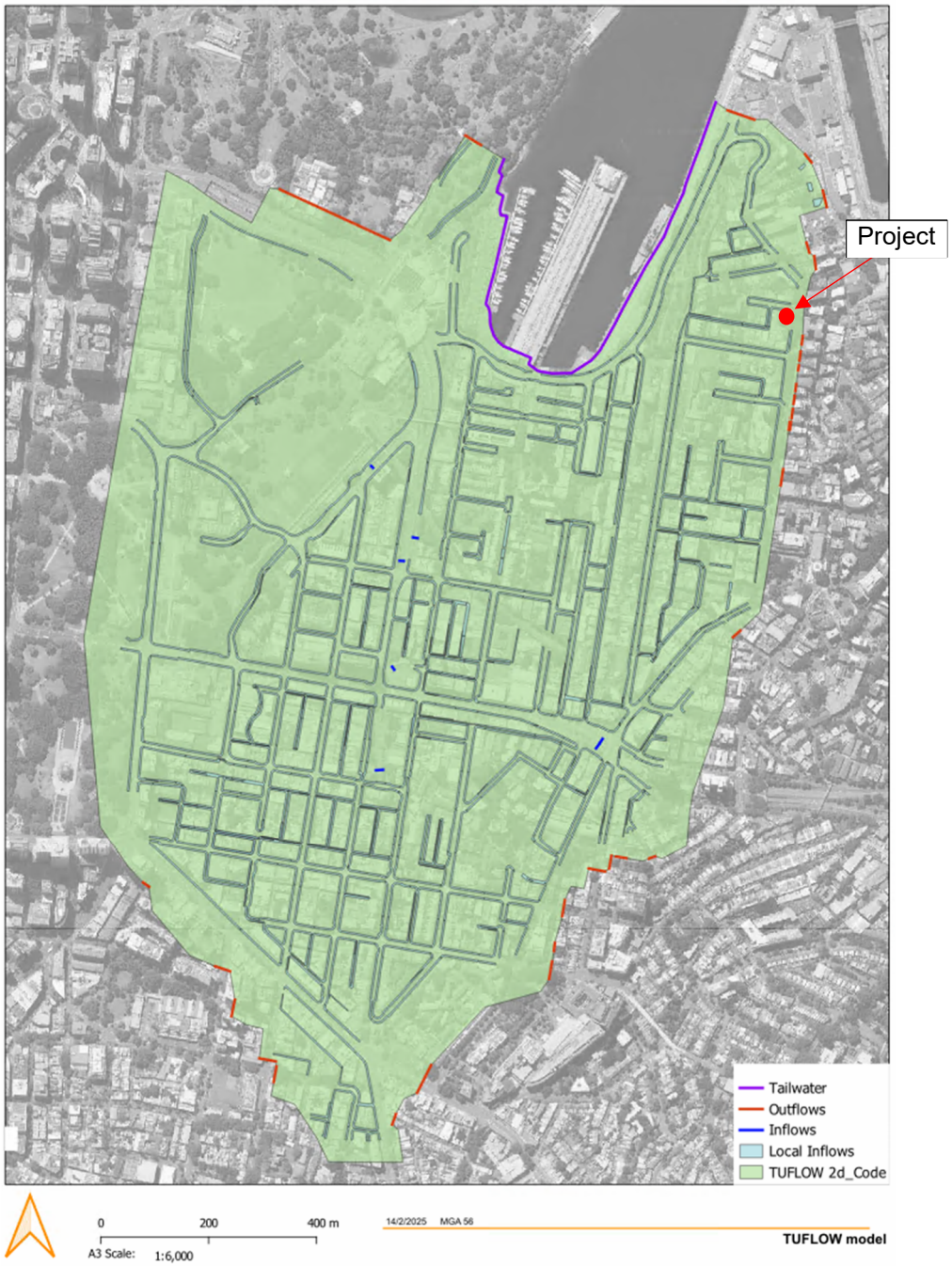


Figure 3 TUFLOW Model

5.1.6 Critical Events

The model is based on ARR 1987. According to the 2013 Flood Study, the critical storm duration for different parts of the catchment has been determined by simulating the 100-year ARI event across a range of storm durations, from 15 minutes to 12 hours. An envelope of model results has been created, identifying the storm duration that produced the maximum flood depth at each grid point within the study area. Based on this analysis, a 60-minute storm duration has been selected as the critical duration for events up to the 100-year ARI.

For the Probable Maximum Flood (PMF) event, the critical duration has been found to be 15 minutes for the upper areas of the catchment, while a 30-minute duration has been found to be critical for areas downstream of Cathedral Street.

It was estimated that for the current project location, the 15-minute duration is the critical event.

Table 6 Critical Events

Event	Critical Duration
Up to 1%AEP event	60 min
PMF	15 min

6 Assumptions and Limitations

- The Woolloomooloo Flood Model has been utilized for this flood study without any major modifications. The model has underwent limited calibration and verification, and therefore, it has been adopted as is.
- The model is based on ARR 1987, and updating it to ARR 2019 is beyond the scope of this study. ARR 1987 typically produces more conservative flood estimates compared to ARR 2019. Updating to the latest guidelines would likely result in different flood outcomes, necessitating recalibration and verification to ensure consistency and accuracy.
- Same TUFLOW version used in the flood study was used to keep the consistency and preventing any errors in the model.
- Given the use of an old TUFLOW version (2011) and the potential for minor glitches in the results, a neutral impact is defined as any change in peak flood levels within ±20 mm.

7 Modelling Results

7.1 Existing Condition

7.1.1 Peak Flood Depths and Levels

Figure 4 presents the 1% AEP peak flood depths and levels. Maps for other flood events are included in the Appendix for reference.

Extracted flood levels around the building are detailed in Table 7. Refer to Figure 4 for Point ID location.

For the 1% AEP flood event, peak flood levels range from 26.605 m AHD at Point 7 to 28.505 m AHD at Point 1. As shown in the table 7, flood levels for events more frequent than the PMF exhibit only minor differences. Peak flood depths are generally below 0.1 m along the roads and under 0.2 m along the gutters.

Table 7 Existing Peak Flood Levels

Point ID	20% AEP	10% AEP	1% AEP	1% AEP + Climate Change	PMF
1	28.503	28.504	28.505	28.507	28.516
2	28.348	28.349	28.350	28.352	28.361
3	27.768	27.768	27.769	27.769	27.776
4	27.223	27.223	27.225	27.252	27.257
5	26.875	26.875	26.877	26.878	26.886
6	26.781	26.781	26.782	26.783	26.789
7	26.602	26.605	26.605	26.608	26.620
8	26.885	26.886	26.889	26.892	26.913
9	27.713	27.713	27.714	27.715	27.720

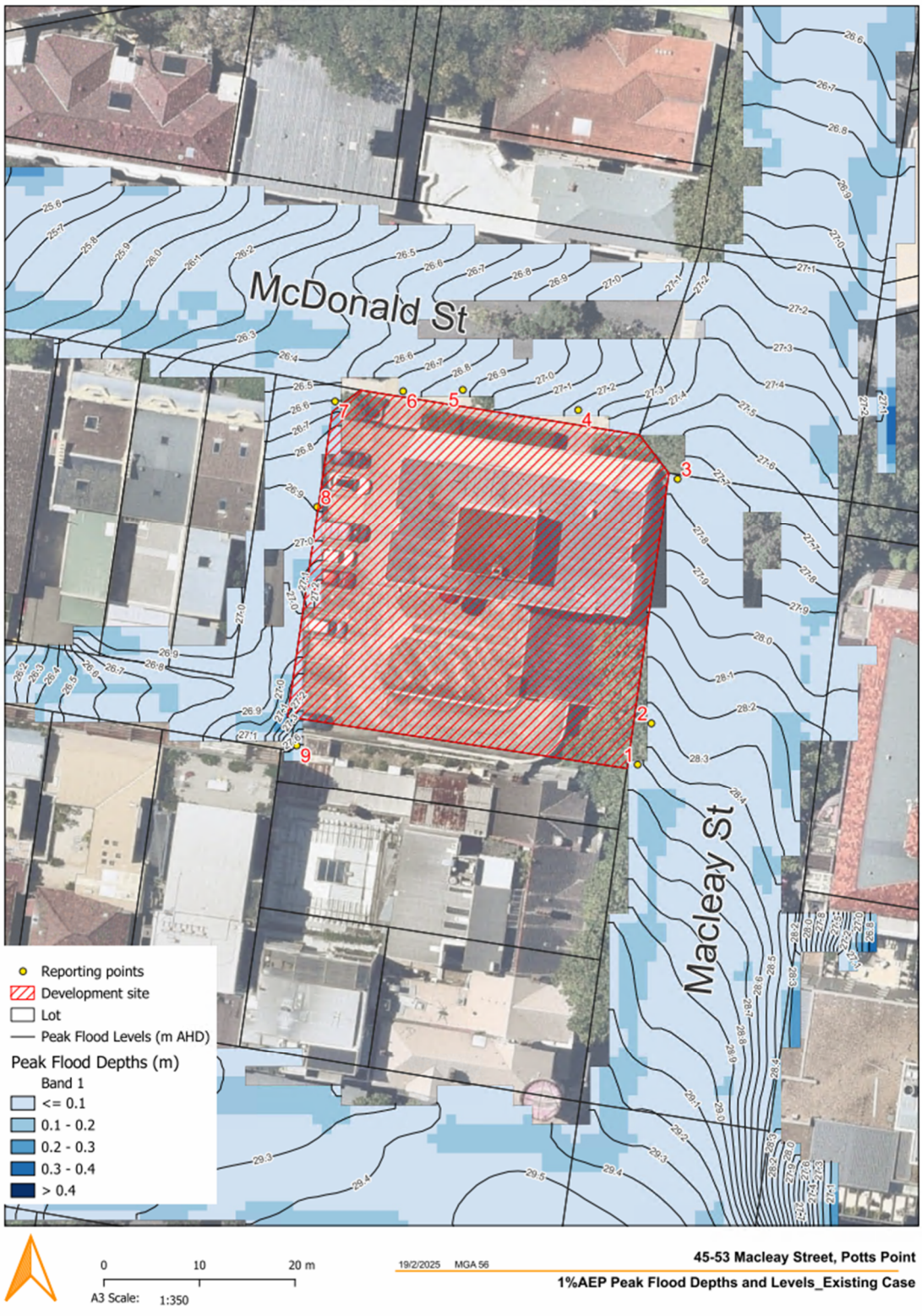


Figure 4 Existing Condition – 1% AEP Peak Flood Depths and Levels

7.1.2 Peak Flood Velocities

The 1% AEP peak flood velocities around the building are illustrated in Figure 5. The analysis indicates that peak velocities are generally below 0.2 m/s, with higher velocities observed along the gutters, reaching to 1.5 m/s.

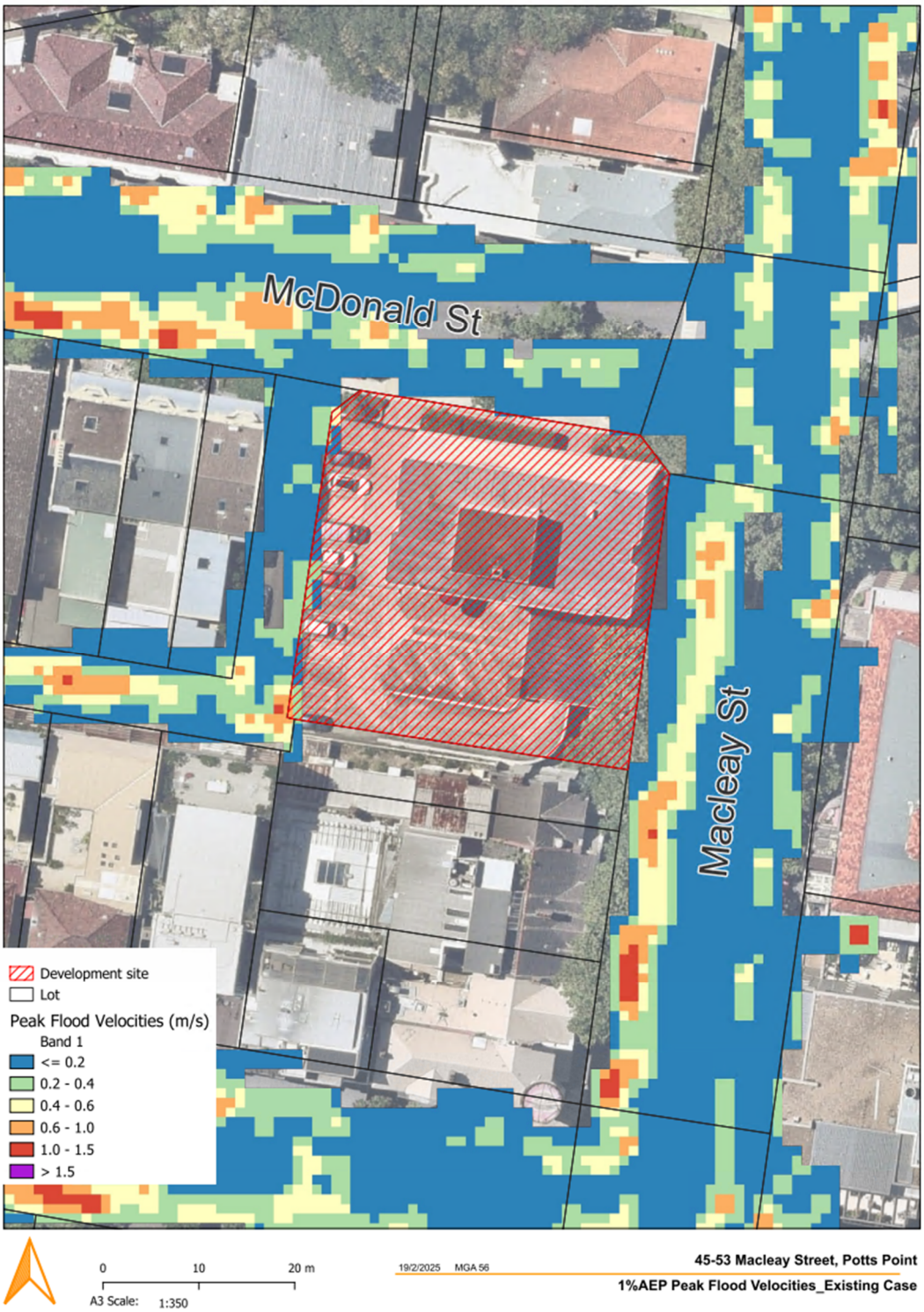


Figure 5 Existing Condition - Flood Velocities

7.1.3 Peak Flood Hazard Categories

The 1% AEP peak flood hazard categories are presented in Figure 7. Since peak flood depths are below 0.2 m and peak flood velocities do not exceed 1.5 m/s, the peak flood hazard around the building is classified as Low Hazard (based on Figure 6).

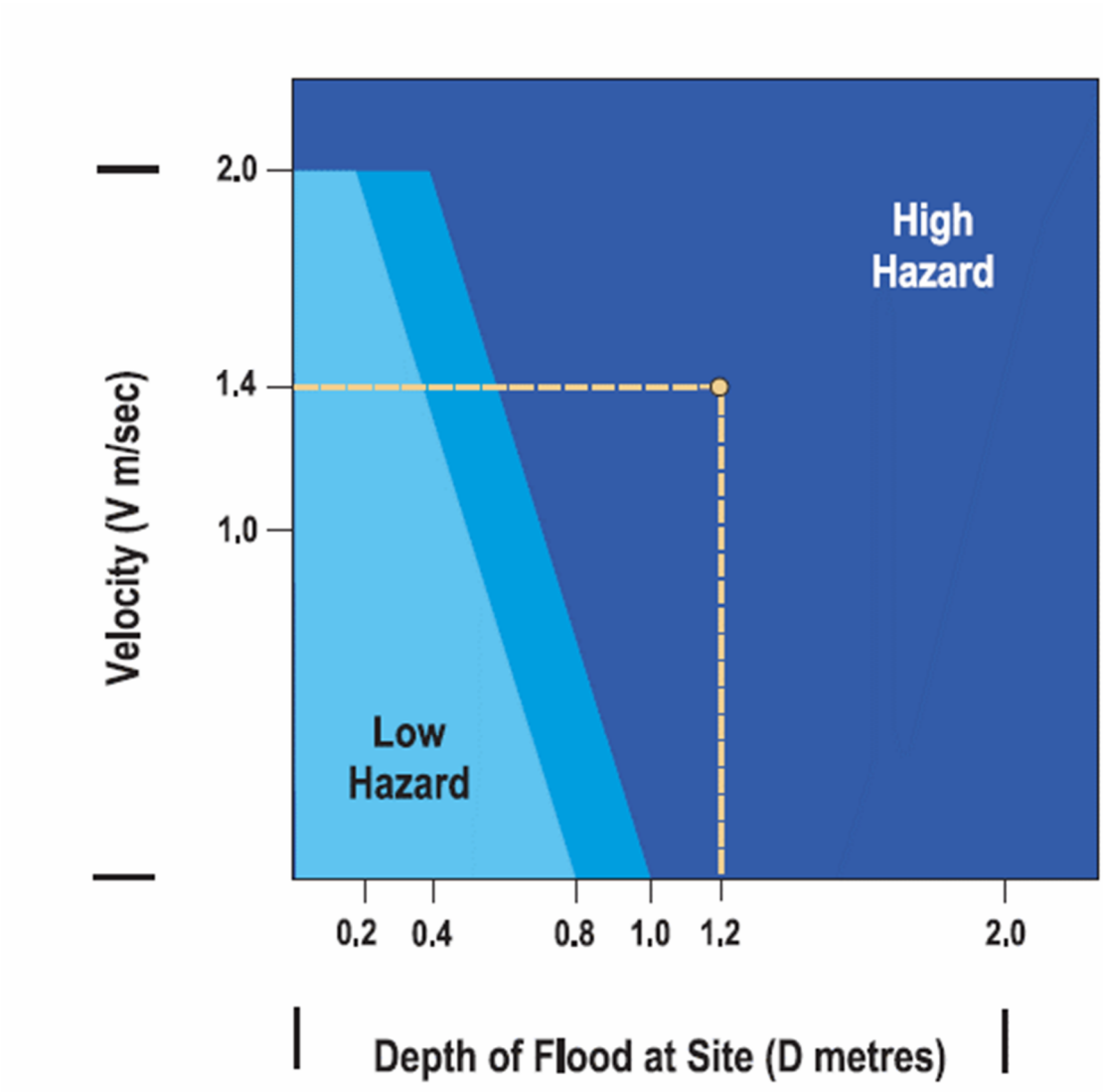


Figure 6 Flood Hazard Category based on the Australian NSW Floodplain Management Manual)

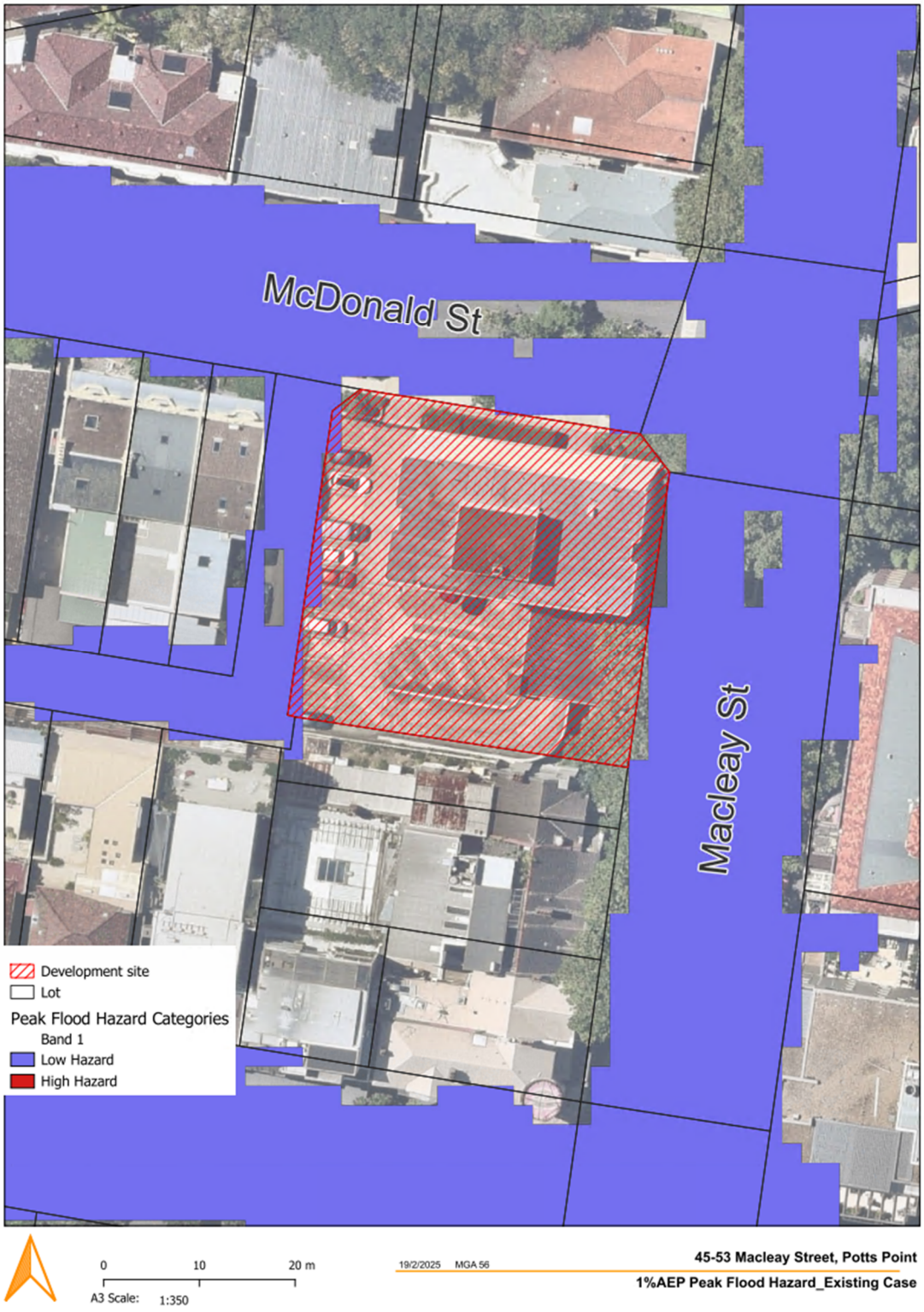


Figure 7 Existing Condition - Flood Hazard Categories

7.1.4 Time to onset and Duration of Inundation

To determine the time to onset and duration of inundation, flow hydrographs have been extracted from three locations (labeled N1 to N3) shown in the Figure 8. The 1% AEP flow hydrographs are presented in Figure 9, and PMF hydrographs are shown in Figure 10.

As shown, for the 1% AEP event, flood inundation occurs within a few minutes (less than 12 minutes) and lasts for approximately an hour. During PMF event, flood inundation occurs within few minutes (leass than 6 minutes) and last for approximately 30minutes.

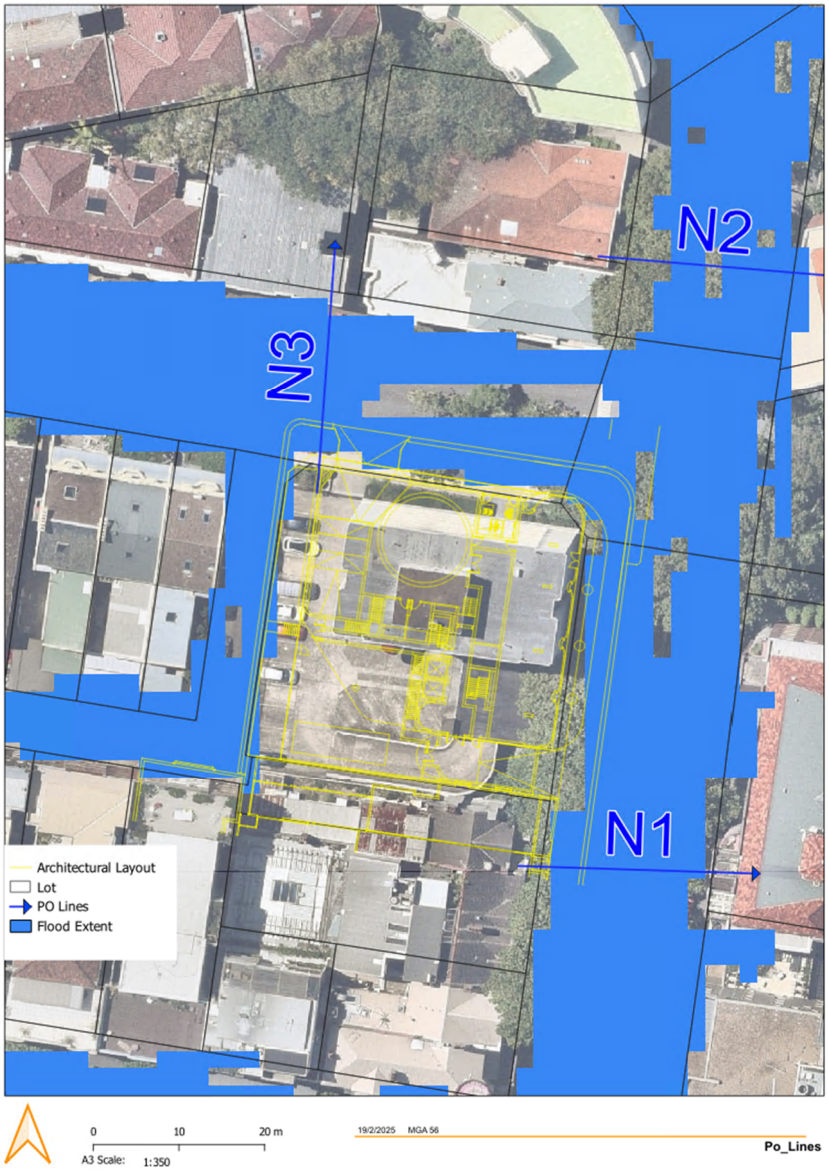


Figure 8 Location of the reporting PO Lines

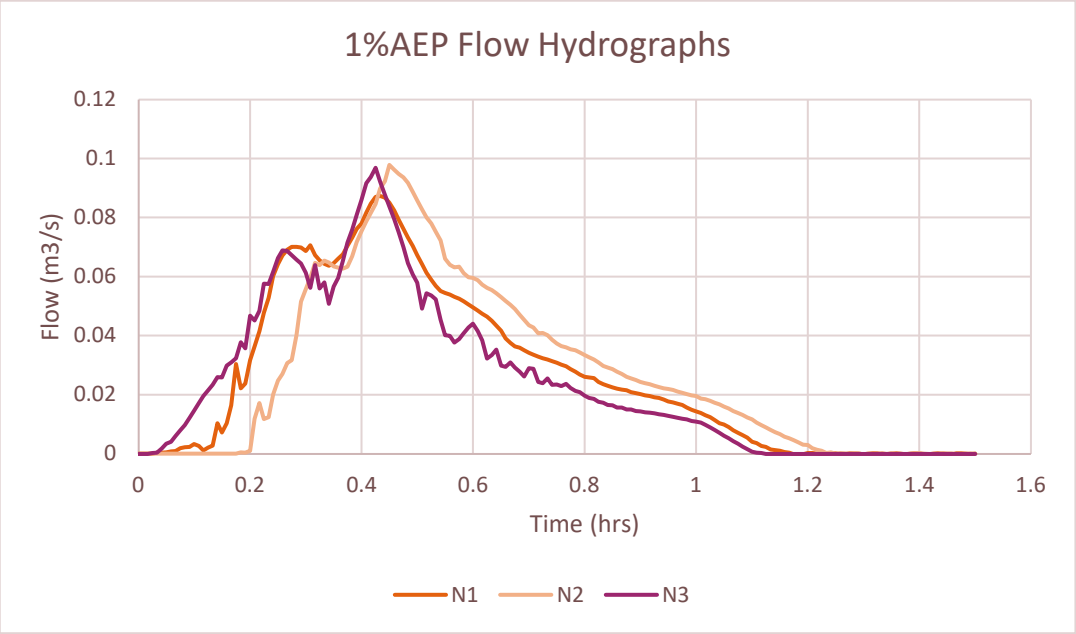


Figure 9 1%AEP Flow Hydrographs

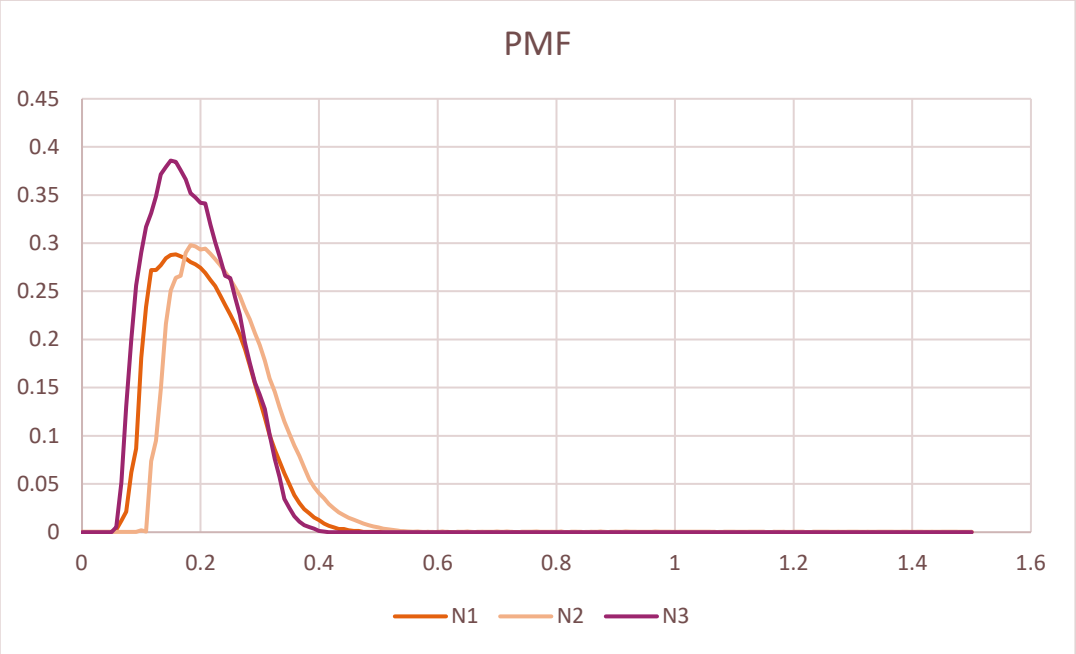


Figure 10 PMF Flow Hydrographs

7.2 Post-Development Impact Assessment

The proposed development is a mixed-use building to be constructed on a site that currently contains an existing building. The only aspect of the development that may influence flood behavior around the building is any changes to the footpath path and kerb&gutter, which have been modeled in TUFLOW to assess potential flood impacts. The post-development peak flood velocity, and hazard maps are included in the Appendix. As these results are generally similar to existing conditions, they have not been repeated here, and only the peak flood depth and levels and impact has been discussed.

7.2.1 Peak Flood Depths and Levels

Figure 11 presents the 1% AEP peak flood depths and levels for the post-development condition with and without Climate change. Post-development with claimte change due tosea-level rise and increase in rainfall intensity have been investigated. The results as shown in Table show negligible increase in 1%AEP flood levl due to climate change.

Maps for other flood events are included in the Appendix for reference.

Extracted flood levels around the building are detailed in Table 8. For the 1% AEP event, peak flood levels range from 26.588 m AHD at Point 7 to 28.485 m AHD at Point 1. Peak flood depths are generally below 0.1 m along the roads and under 0.2 m along the gutters.

Table 8 Design Peak Flood Levels

Point ID	20% AEP	10% AEP	1% AEP	1% AEP + Climate Change	PMF
1	28.482	28.484	28.485	28.486	28.503
2	28.366	28.366	28.364	28.365	28.378
3	27.659	27.660	27.670	27.674	27.690
4	27.150	27.151	27.152	27.153	27.158
5	26.791	26.791	26.794	26.795	26.803
6	26.584	26.585	26.588	26.591	26.607
7	26.613	26.614	26.617	26.619	26.627
8	26.891	26.891	26.896	26.899	26.921
9	27.713	27.713	27.714	27.2	27.720

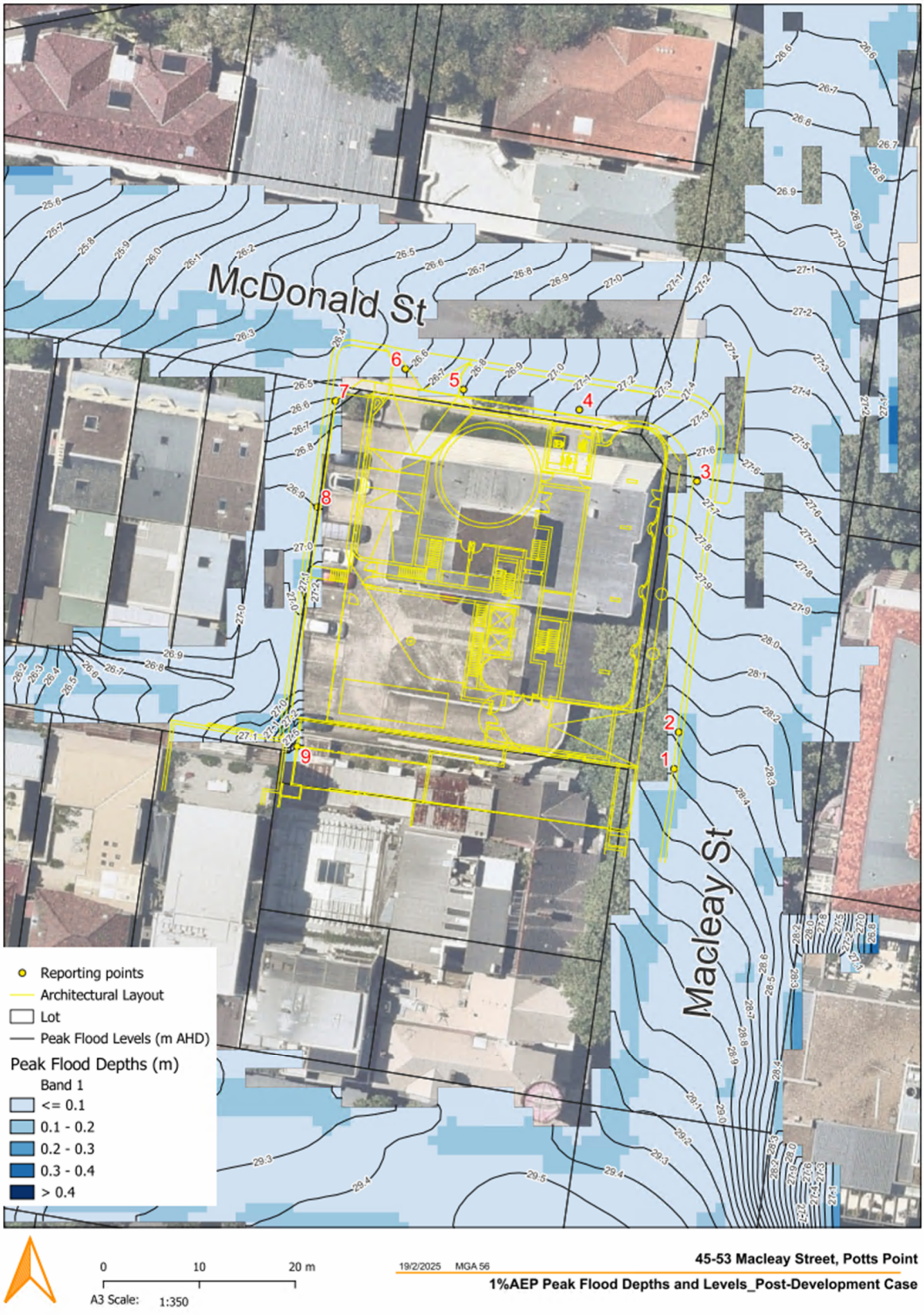


Figure 11 1% AEP Peak Flood Depths and Levels (Post-Development Condition)

7.2.2 Changes in Peak flood Levels

The 1% AEP peak flood impacts (Afflux) are shown in Figure 12 (for other events, refer to the Appendix). Given the use of an older TUFLOW version and the potential for minor glitches in the results, a neutral impact is defined as any change in peak flood levels within ±20 mm, Which generally falls within the industry's acceptable range and that food hazard classification remains low hazard, and confined within the public road reserved only. Given the stage of the development is at Concept State Significant Development Application (SSDA) phase we consider this acceptable. Should a lesser adverse impact is required, a refined flood modelling can be undertaken during the detailed design development phase.

The 1% AEP peak flood levels have decreased due to the new pedestrian path, which is generally lower than the existing one. However, there is a localized increase near the southeastern corner of the building, resulting from a slight rise in ground levels due to the proposed pedestrian path. This increase in flood levels is less than 100 mm, remains localized, and does not impact surrounding buildings.

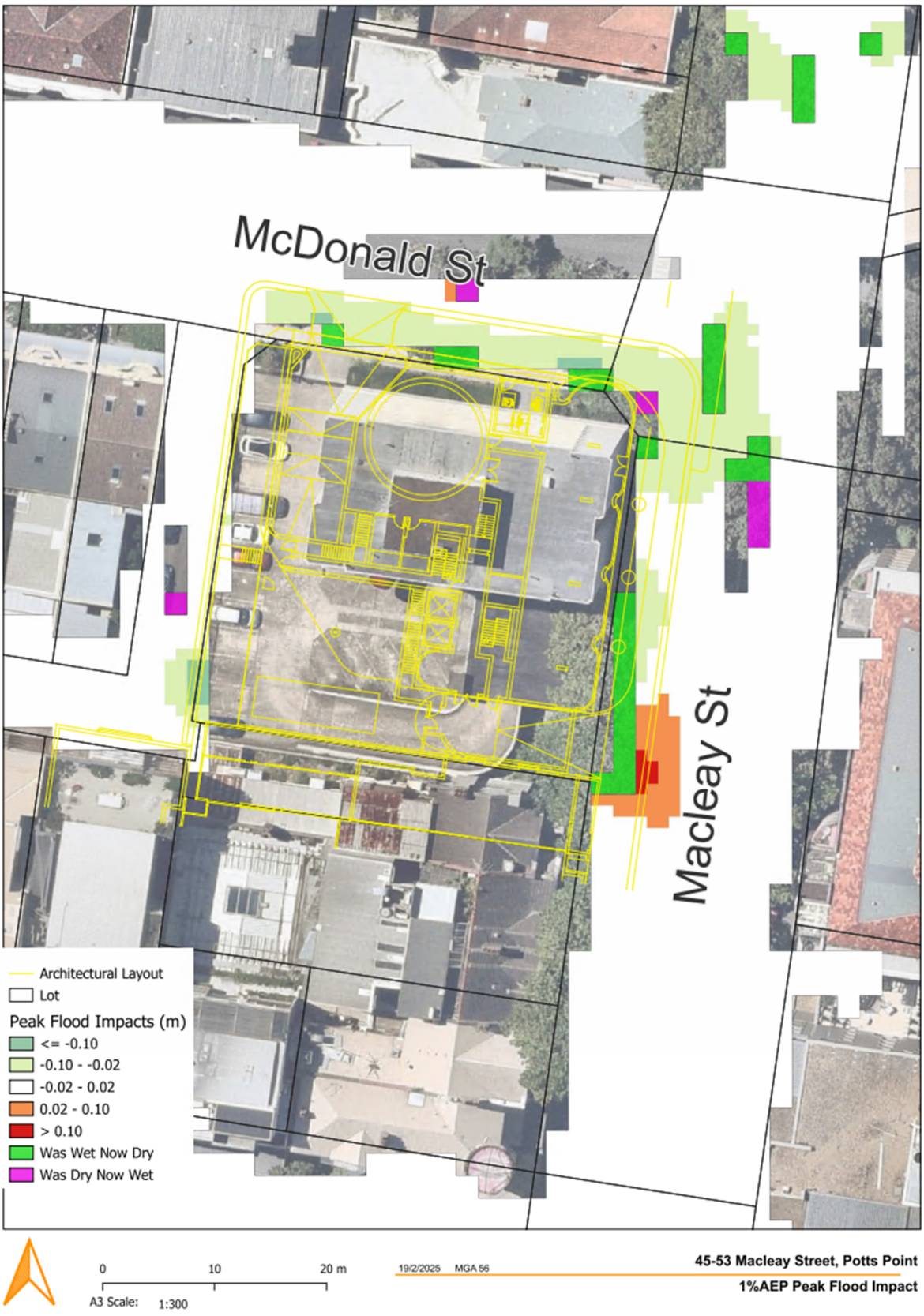


Figure 12 1% AEP Peak Flood Impact

8 Conclusions and Recommendations

The Woolloomooloo TUFLOW model has been utilized for the flooding assessment of the proposed development. No major modifications were made to the model, as it is assumed to be calibrated and validated based on the accompanying 2013 Woolloomooloo Flood Study.

Flood mapping for both existing and proposed conditions has been generated and is presented in the Appendix. For the 1% AEP event, peak flood levels around the building range from 26.605 m AHD to 28.505 m AHD. Peak flood velocities are below 1.5 m/s, and flood depths remain under 0.2 m. As a result, the flood hazard is classified as low. Flood inundation occurs within minutes of rainfall onset. For events more frequent than the PMF, inundation lasts approximately one hour, while for the PMF event, it lasts about 30 minutes. Based on this, the risk on-site is considered minimal

Under post-development conditions, the 1% AEP peak flood levels have generally decreased due to the new pedestrian path, which is lower than the existing one. However, a localized increase in flood levels occurs near the southeastern corner of the building due to minor ground level adjustments. The increase in flood levels is less than 100 mm, remains localized, and does not impact surrounding buildings.

The CoS Interim Floodplain Management policy requires proposed development to have floor levels, entry points, openings set at or above the relevant flood planning levels (FPLs). Table 9.0 below summarises the FPLs requirement. Table 10.0 below shows the compliance status of different areas of the development with the FPLs based on the levels shown in SJB Architects drawing 6253-A DA-1003 Rev 2 dated 12.02.2025.

Table 9 FPLs requirement

TYPE	**MINIMUM FLOOD PLANNING LEVELS**
Main Entrance/Basement	1%AEP flood level + 0.5m or PMF (whichever is the higher)
Substation	1% AEP flood level
Basement Driveway Crest	1%AEP flood level + 0.5m or PMF (whichever is the higher)
Any openings*	1%AEP flood level + 0.5m or PMF (whichever is the higher)
Table 9.0 : Minimum Flood Planning Levels requirement	

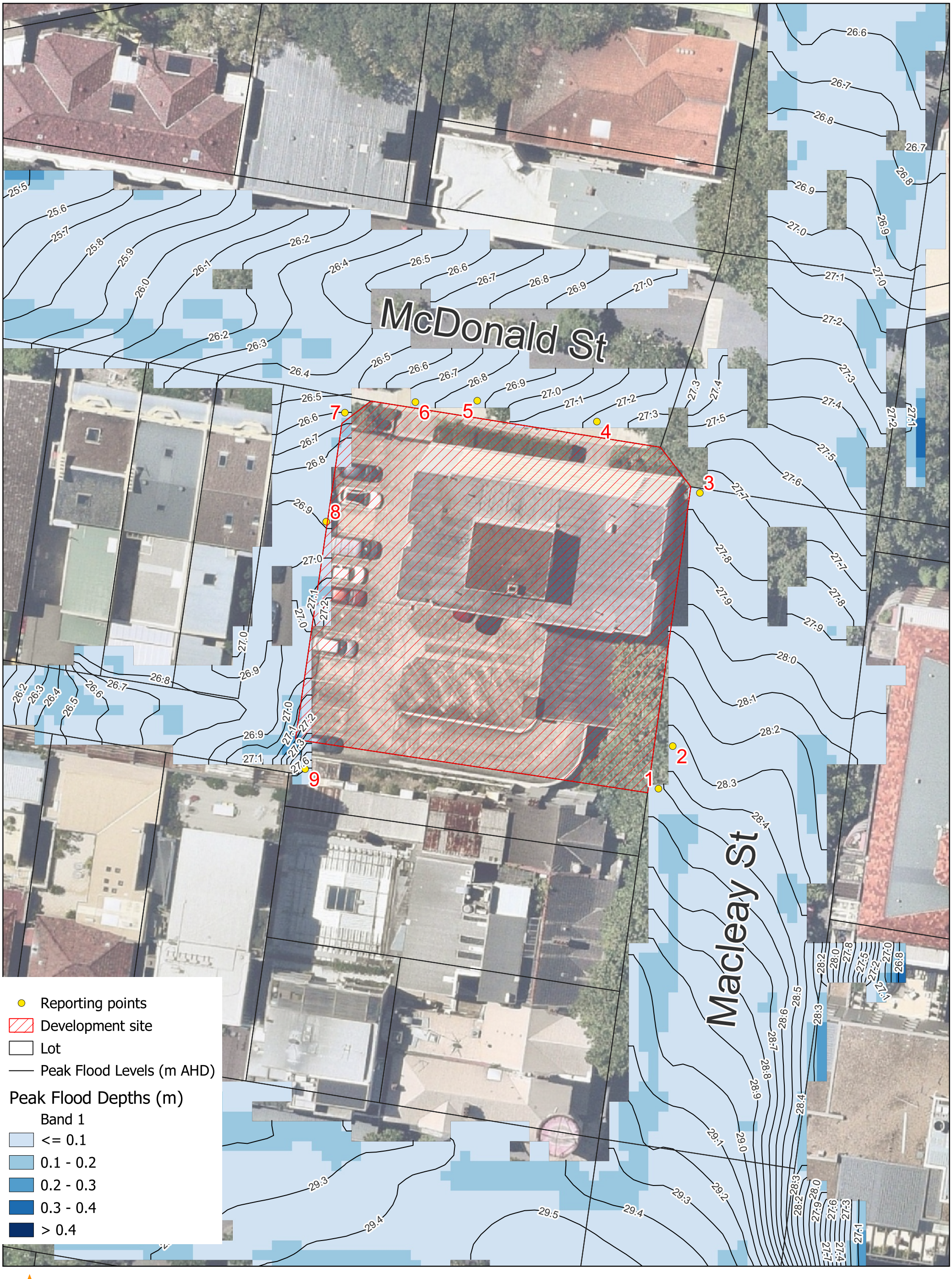
*Any openings (shaft, grills, ventilation, etc) that will allow floodwater to flow onto the basement level.

Table 10 Compliance Status

Point ID	Location	1% AEP Flood Level (m)	PMF Flood Level (m)	Flood Planning Level Requirement	FPL (m AHD)	Current	Compliant?
1	Main entrance LHS / Basement	28.485	28.503	1% AEP flood level + 0.5 m or the PMF (whichever is the higher)	28.985	29.1	Yes
2	Main entrance RHS / Basement	28.364	28.378	1% AEP flood level + 0.5 m or the PMF (whichever is the higher)	28.864	29.1	yes
3	Retail / Basement	27.670	27.690	1% AEP for retail 1% AEP flood level + 0.5 m or the PMF (whichever is the higher) for basement	27.670 [Retail] 28.170 [opening to basement]	27.90 for retail 29.1 for Lift Level in lobby	yes
4	Substation	27.152	27.158	1% AEP flood level	27.152	27.40	yes
5	Basement (Driveway Crest LHS) / Loading Dock	26.794	26.803	1% AEP flood level + 0.5 m or the PMF (whichever is the higher) 1% AEP flood level	27.294 26.794	27.65 for basement driveway crest 27.4 for loading dock	yes
6	Basement (Driveway Crest RHS)	26.588	26.607	1% AEP flood level + 0.5 m or the PMF (whichever is the higher)	27.088	27.65 for basement driveway crest	yes

9 Appendix

9.1 Existing Condition Flood Maps


McDonald St
Macleay St
1
2
3
4
5
6
7
8
9
Reporting points
Development site
Lot
Peak Flood Levels (m AHD)
Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
20%AEP Peak Flood Depths and Levels_Existing Case

McDonald St

Macleay St

Development site

Lot

Peak Flood Velocities (m/s)

Band 1

<= 0.2

0.2 - 0.4

0.4 - 0.6

0.6 - 1.0

1.0 - 1.5

> 1.5

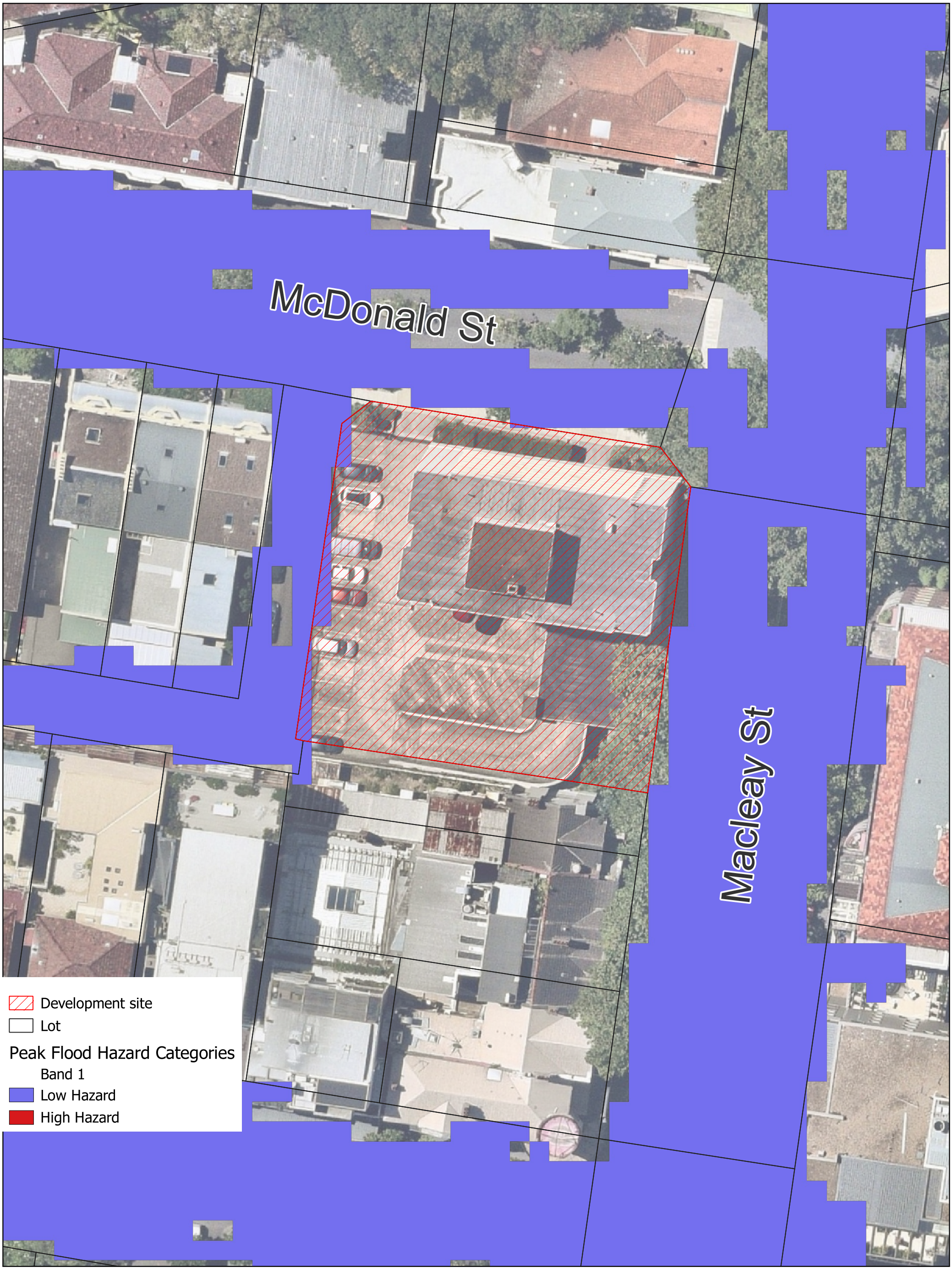
0 10 20 m

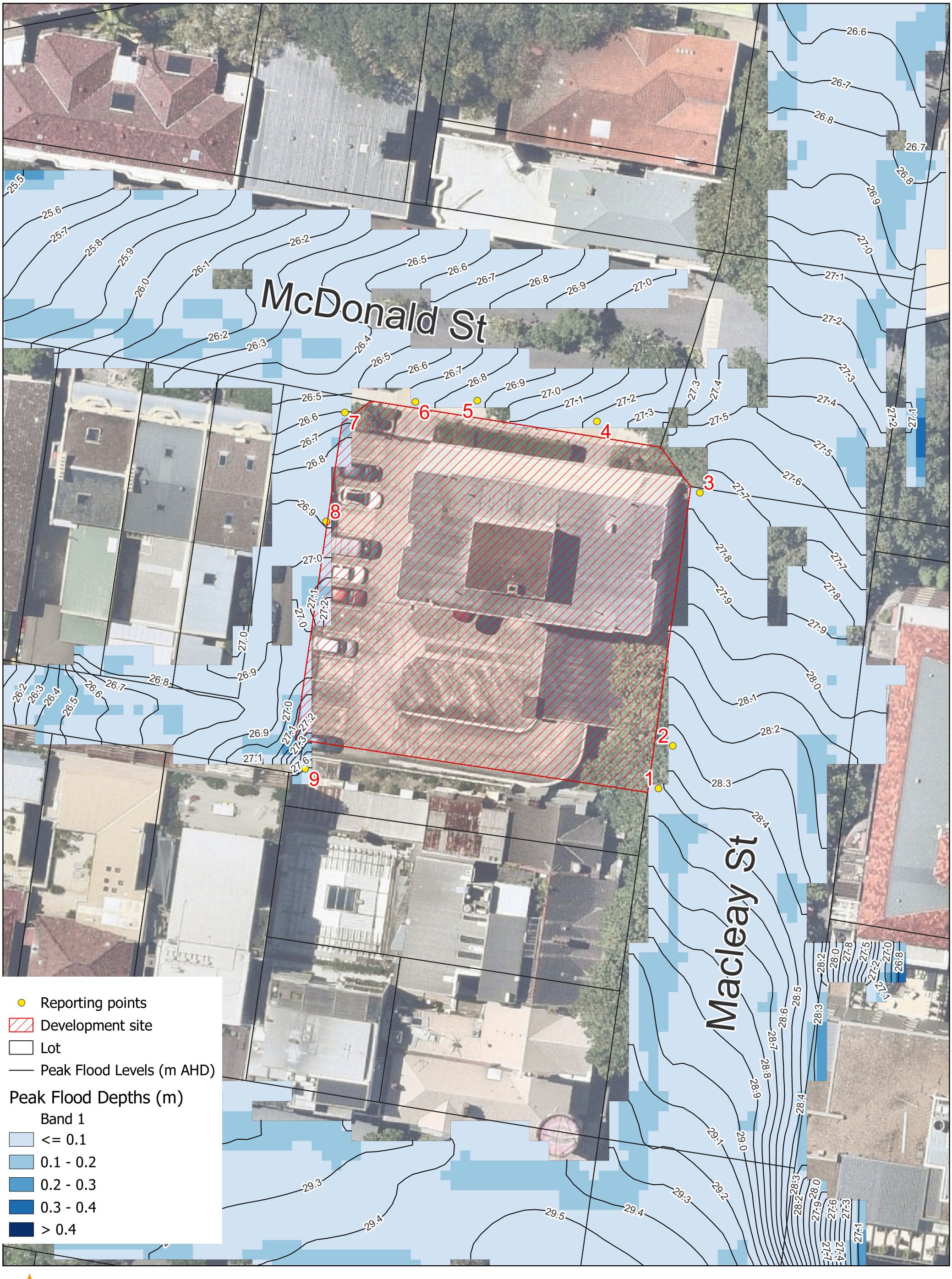
A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

20%AEP Peak Flood Velocities_Existing Case


McDonald St
Macleay St
Development site
Lot
Peak Flood Hazard Categories
Band 1
Low Hazard
High Hazard
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
20%AEP Peak Flood Hazard_Existing Case


McDonald St
Macleay St
1
2
3
4
5
6
7
8
9
Reporting points
Development site
Lot
Peak Flood Levels (m AHD)
Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
10%AEP Peak Flood Depths and Levels_Existing Case

McDonald St

Macleay St

Development site

Lot

Peak Flood Velocities (m/s)

Band 1

<= 0.2

0.2 - 0.4

0.4 - 0.6

0.6 - 1.0

1.0 - 1.5

> 1.5

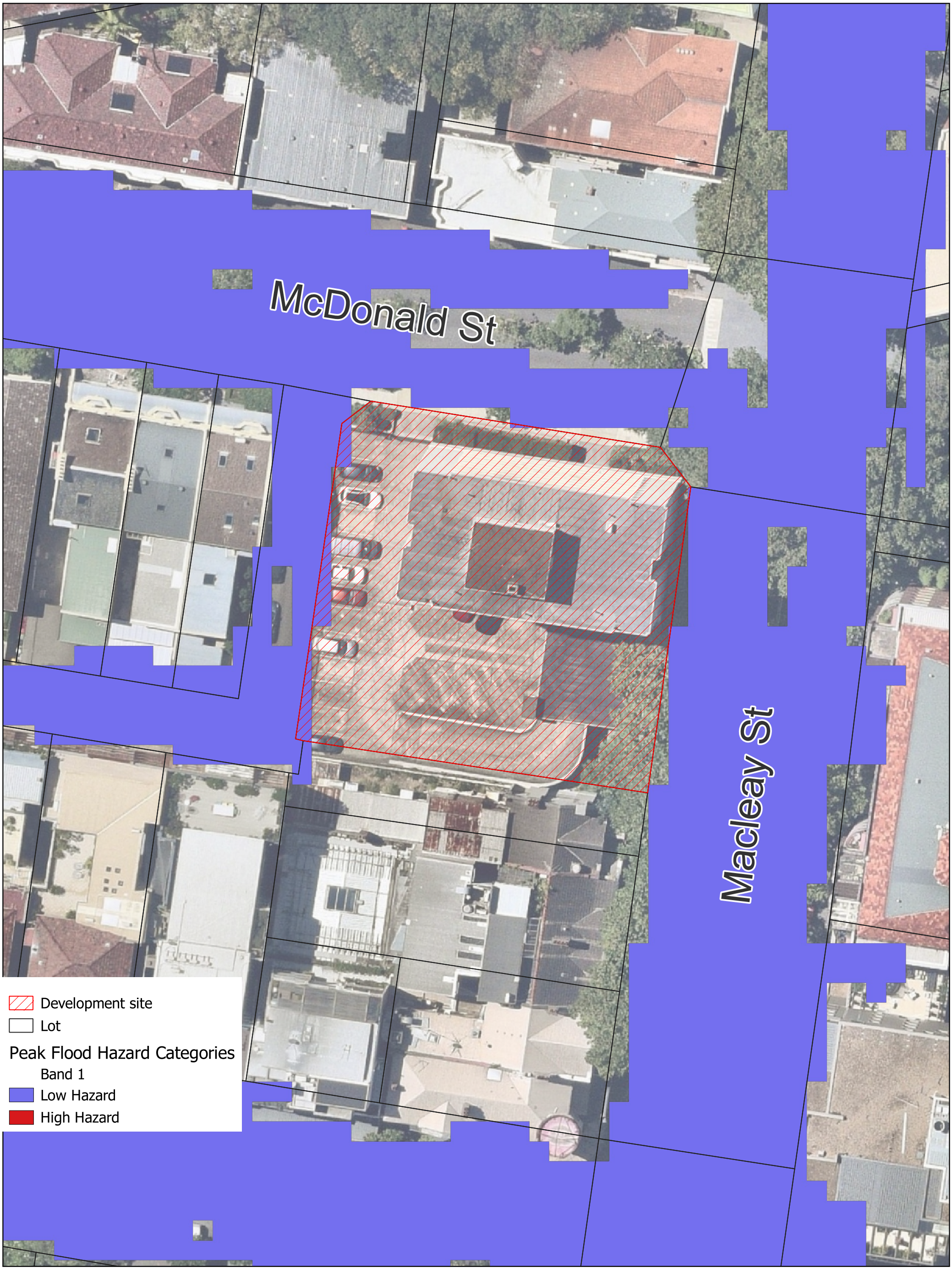
0 10 20 m

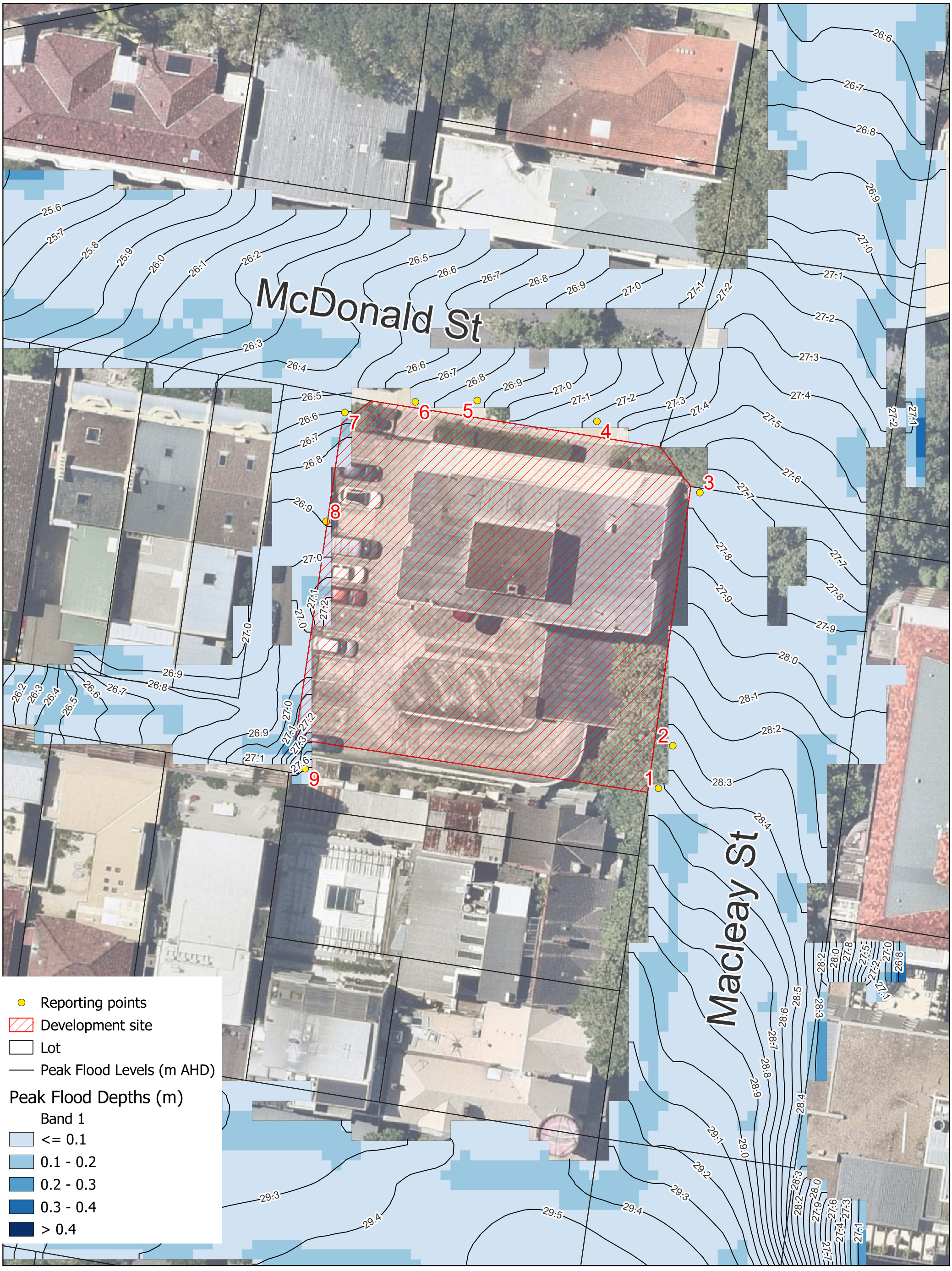
A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

10%AEP Peak Flood Velocities_Existing Case


McDonald St
Macleay St
Development site
Lot
Peak Flood Hazard Categories
Band 1
Low Hazard
High Hazard
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
10%AEP Peak Flood Hazard_Existing Case



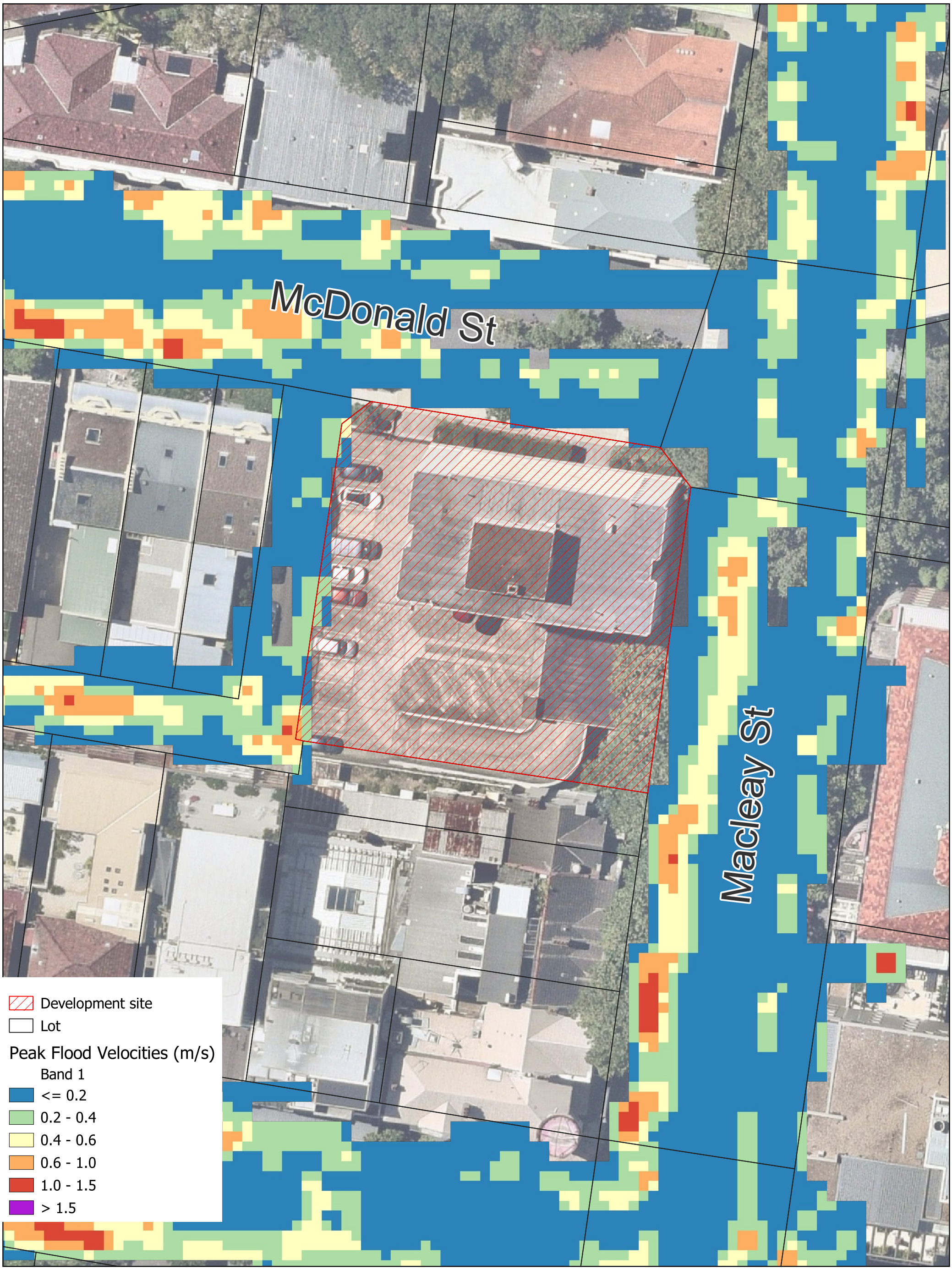
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP Peak Flood Depths and Levels_Existing Case



0 10 20 m

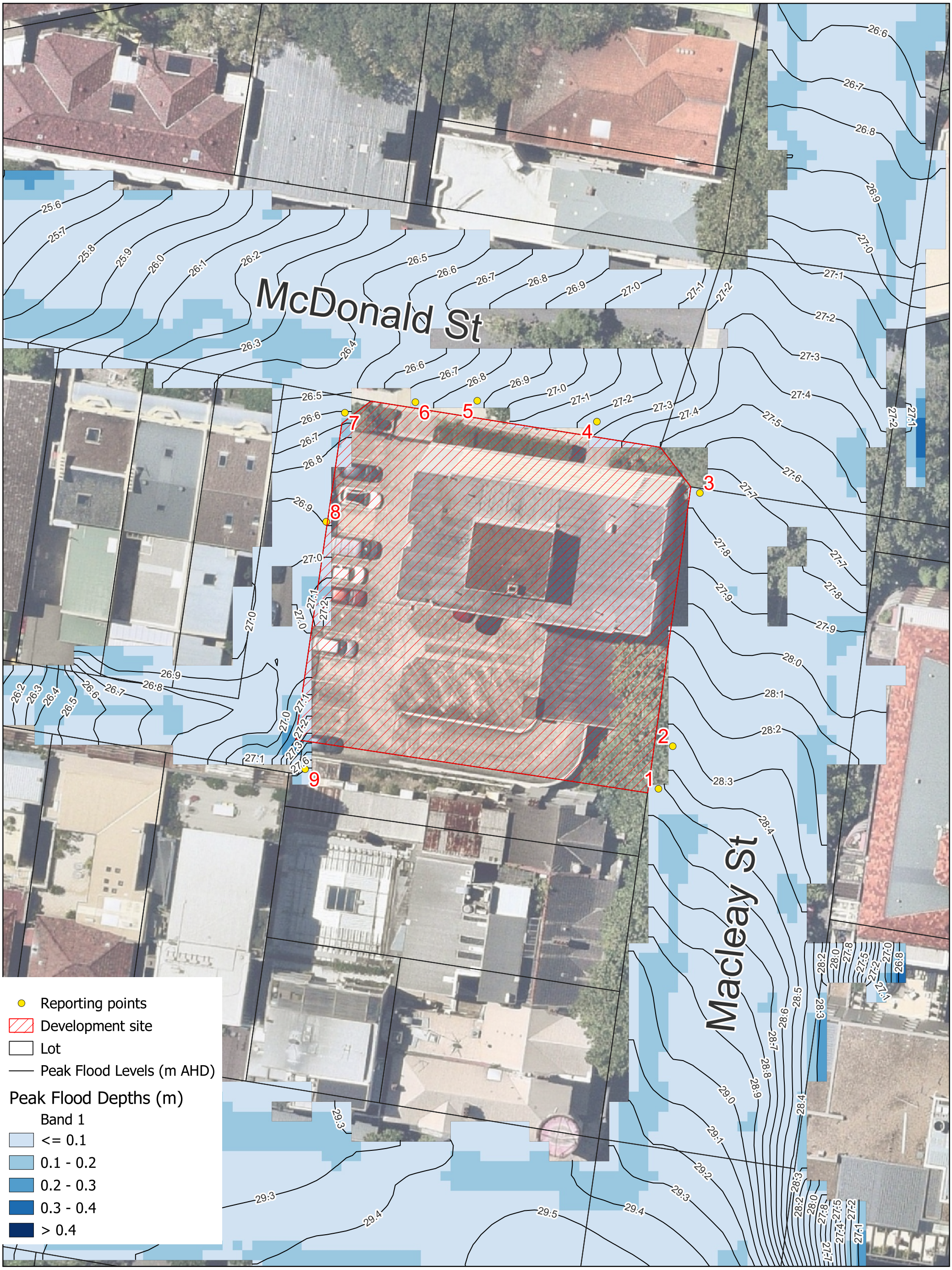
A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP Peak Flood Velocities_Existing Case


McDonald St
Macleay St
Development site
Lot
Peak Flood Hazard Categories
Band 1
Low Hazard
High Hazard
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
1%AEP Peak Flood Hazard_Existing Case



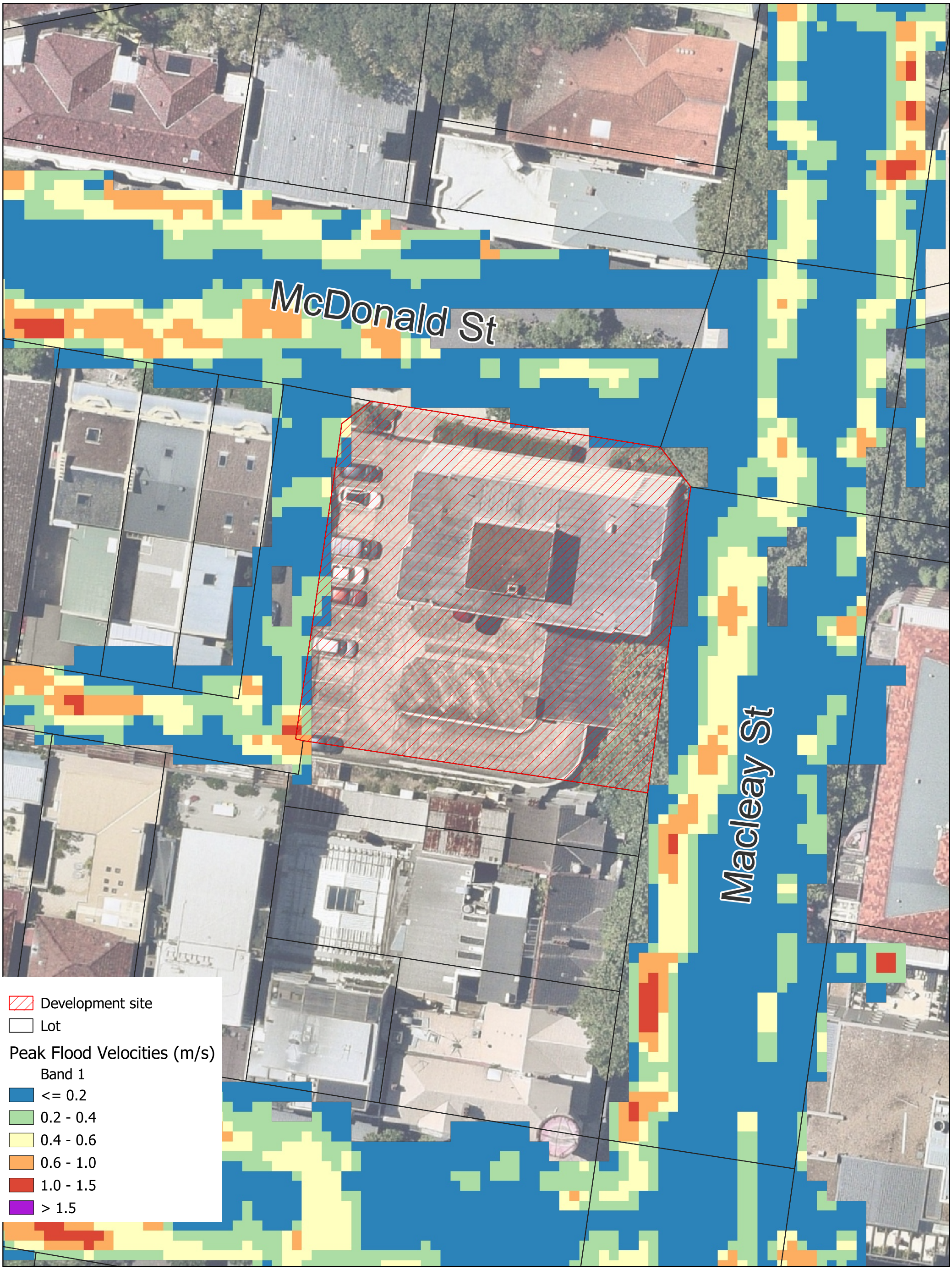
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

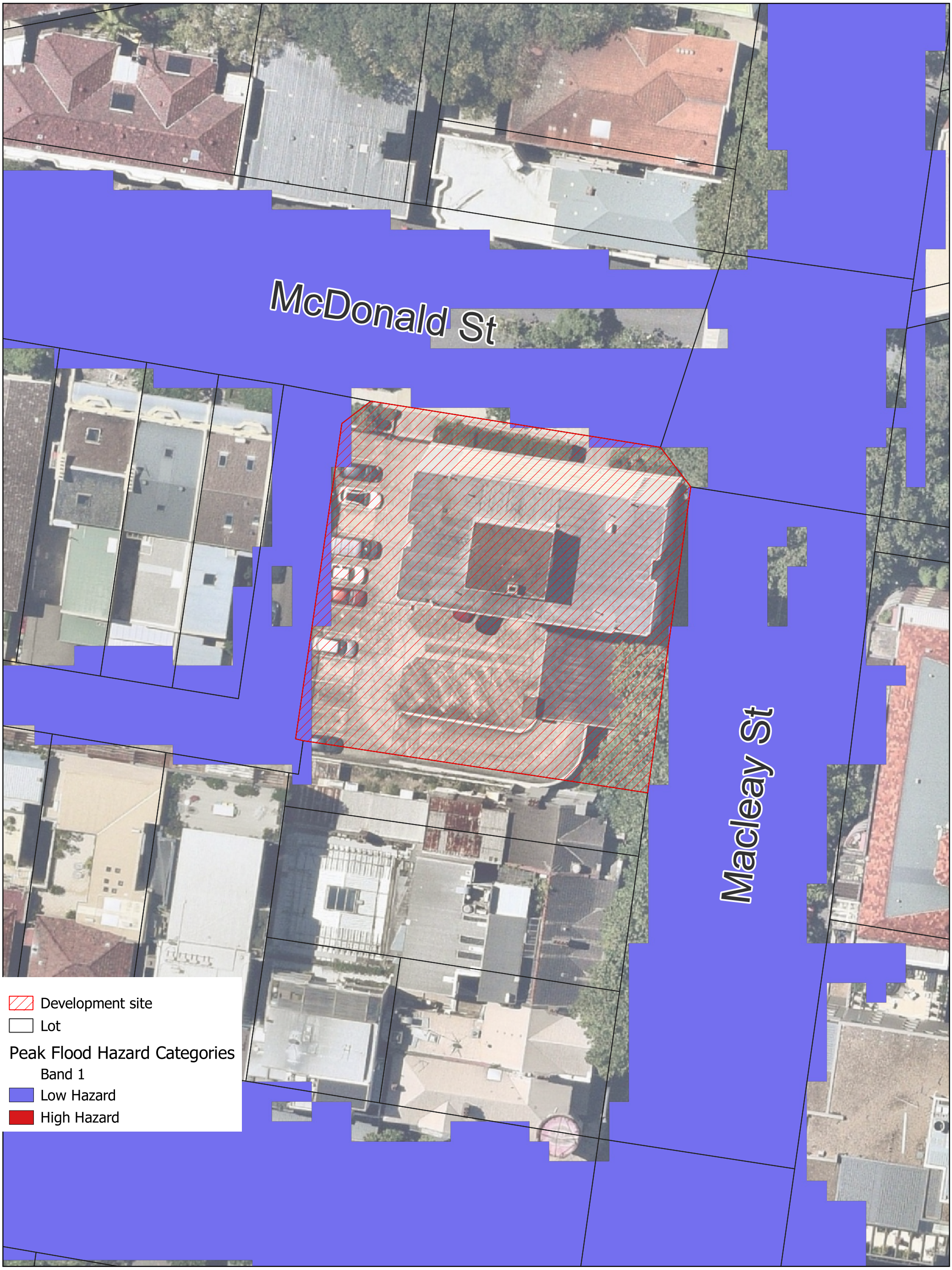
1%AEP_CC Peak Flood Depths and Levels_Existing Case

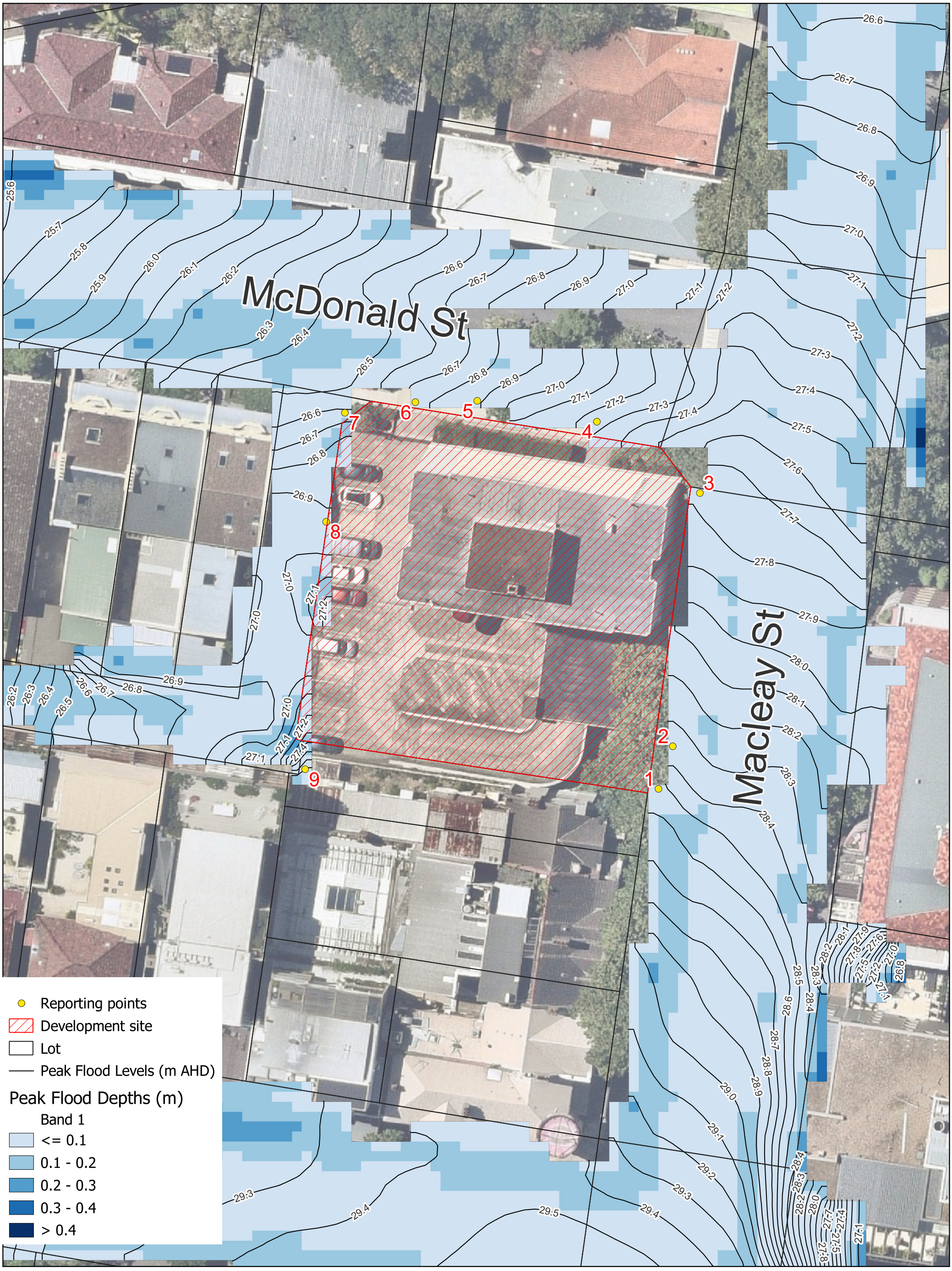


19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP_CC Peak Flood Velocities_Existing Case


McDonald St
Macleay St
Development site
Lot
Peak Flood Hazard Categories
Band 1
Low Hazard
High Hazard
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
1%AEP_CC Peak Flood Hazard_Existing Case


McDonald St
Macleay St
1
2
3
4
5
6
7
8
9
Reporting points
Development site
Lot
Peak Flood Levels (m AHD)
Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
PMF Peak Flood Depths and Levels_Existing Case

McDonald St

Macleay St

Development site

Lot

Peak Flood Velocities (m/s)

Band 1

<= 0.2

0.2 - 0.4

0.4 - 0.6

0.6 - 1.0

1.0 - 1.5

> 1.5

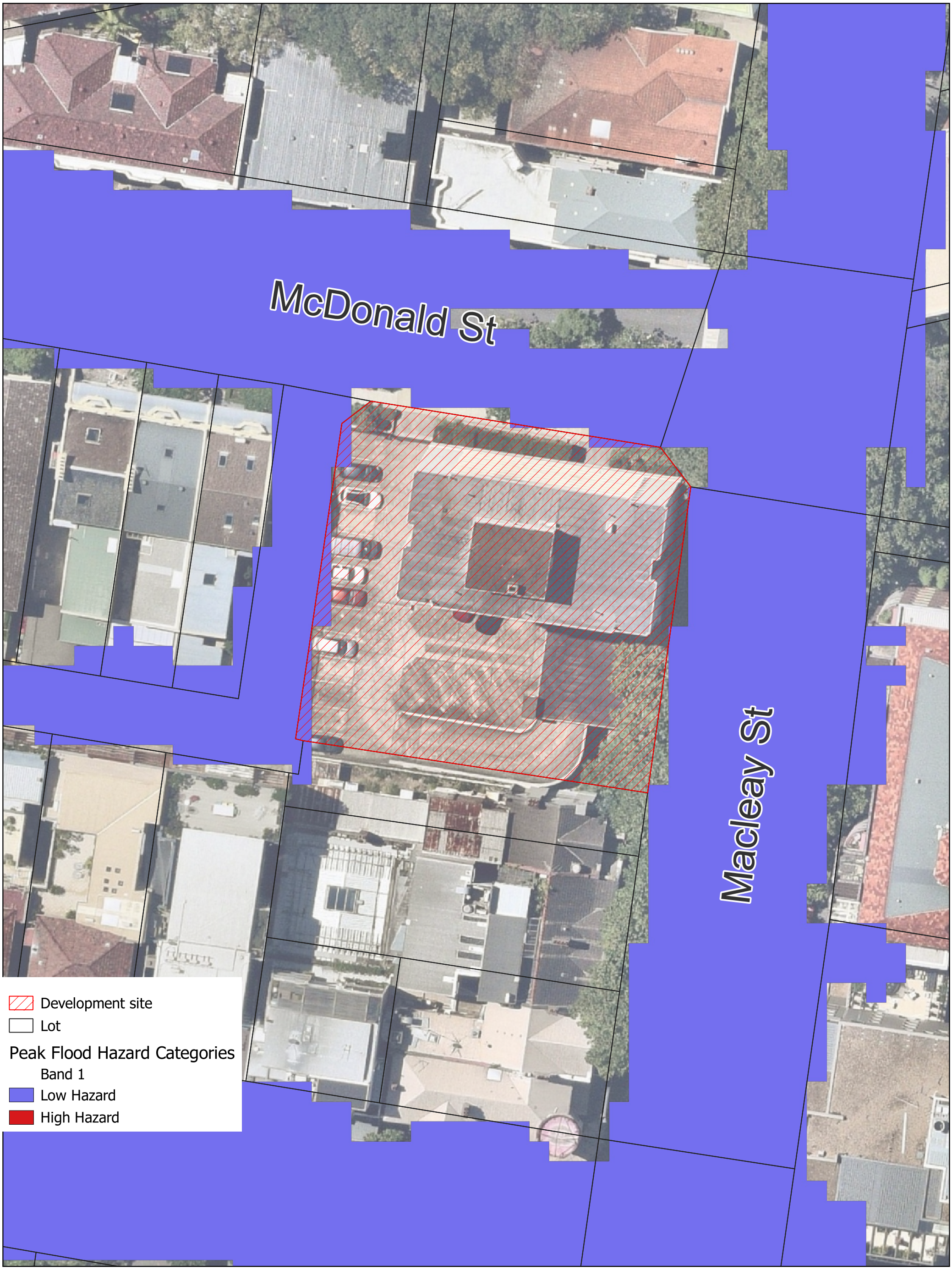
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

PMF Peak Flood Velocities_Existing Case



0 10 20 m

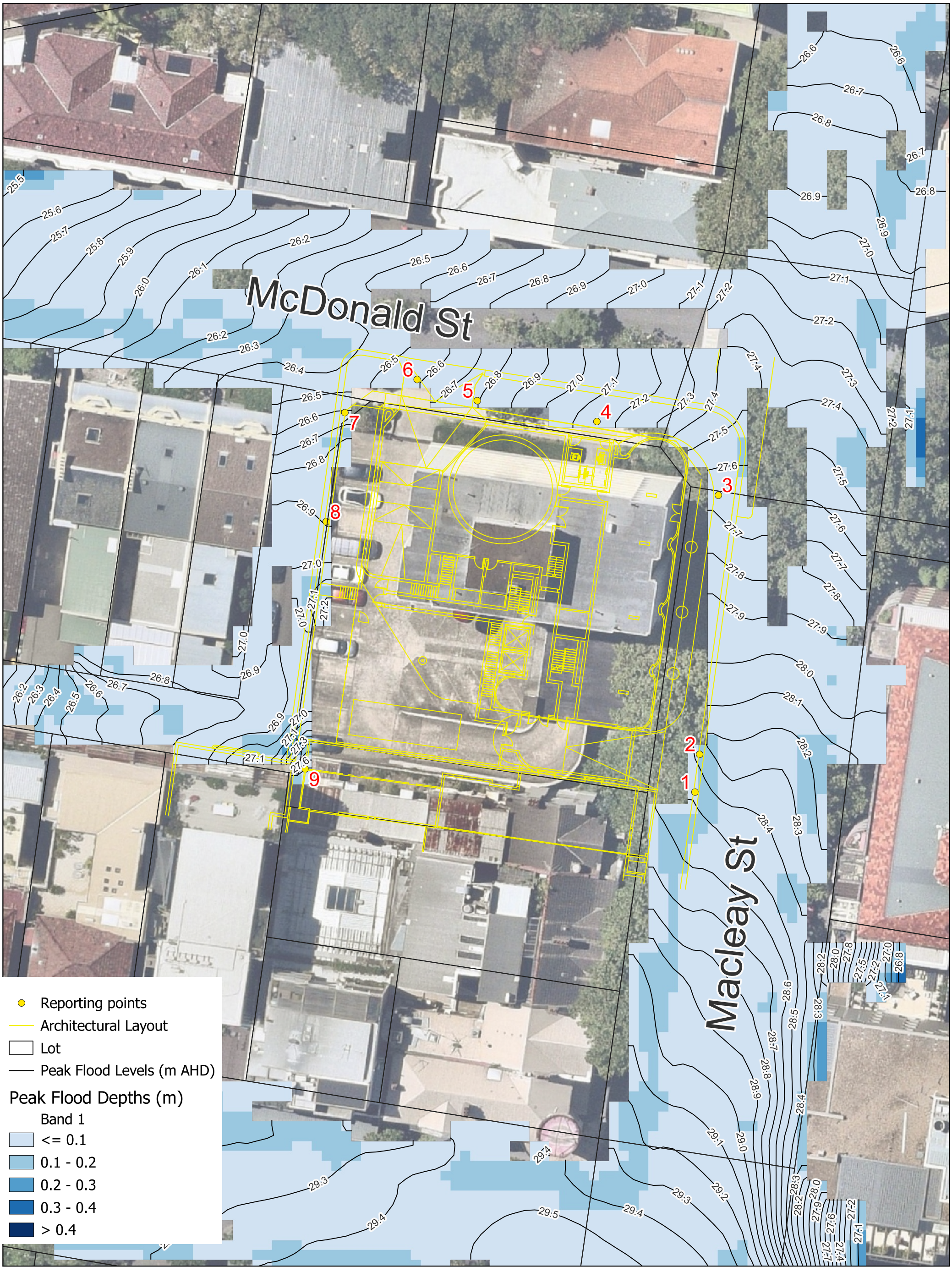
A3 Scale: 1:350

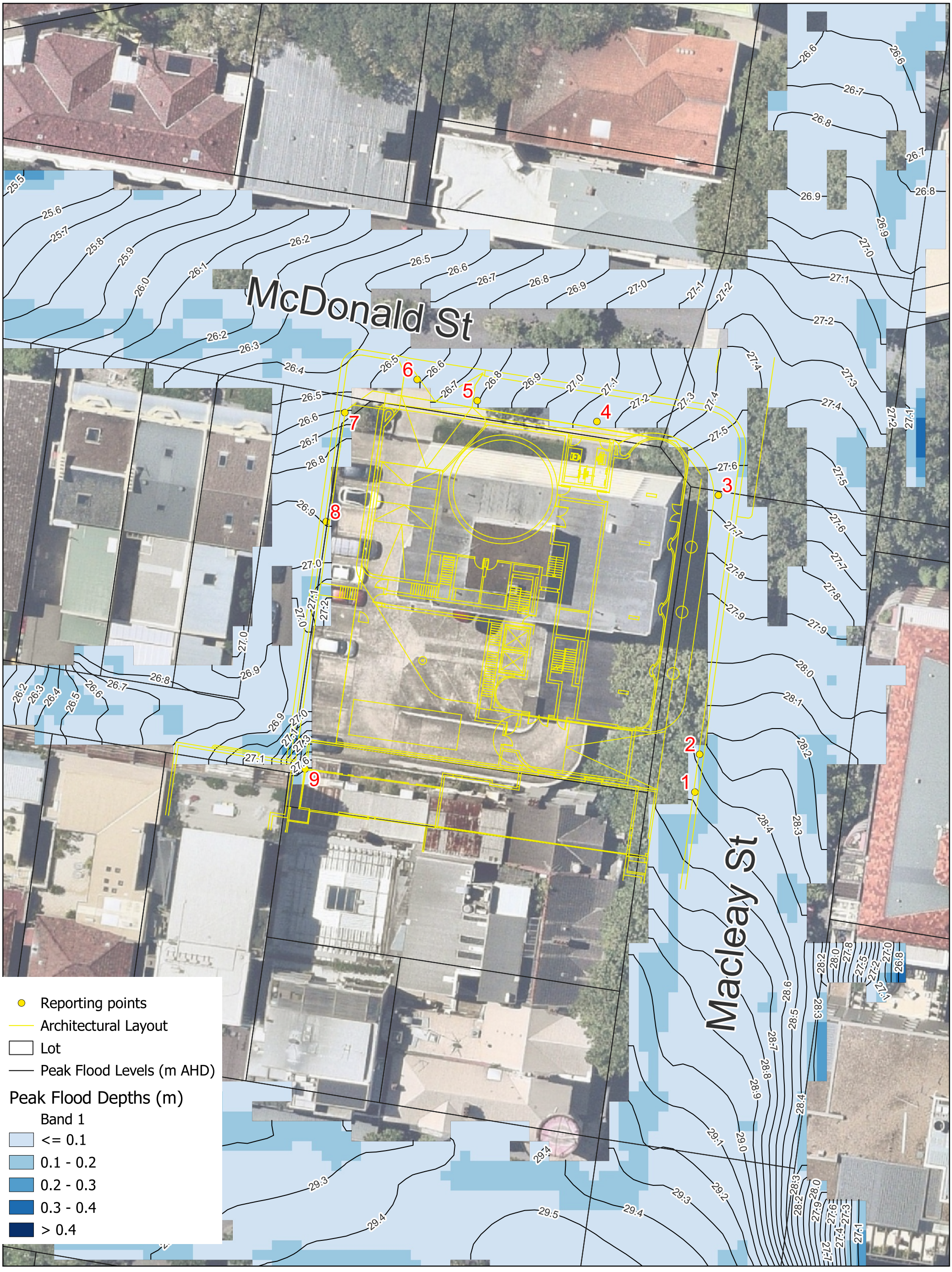
19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

PMF Peak Flood Hazard_Existing Case

9.2 Post-Development Condition Flood Maps

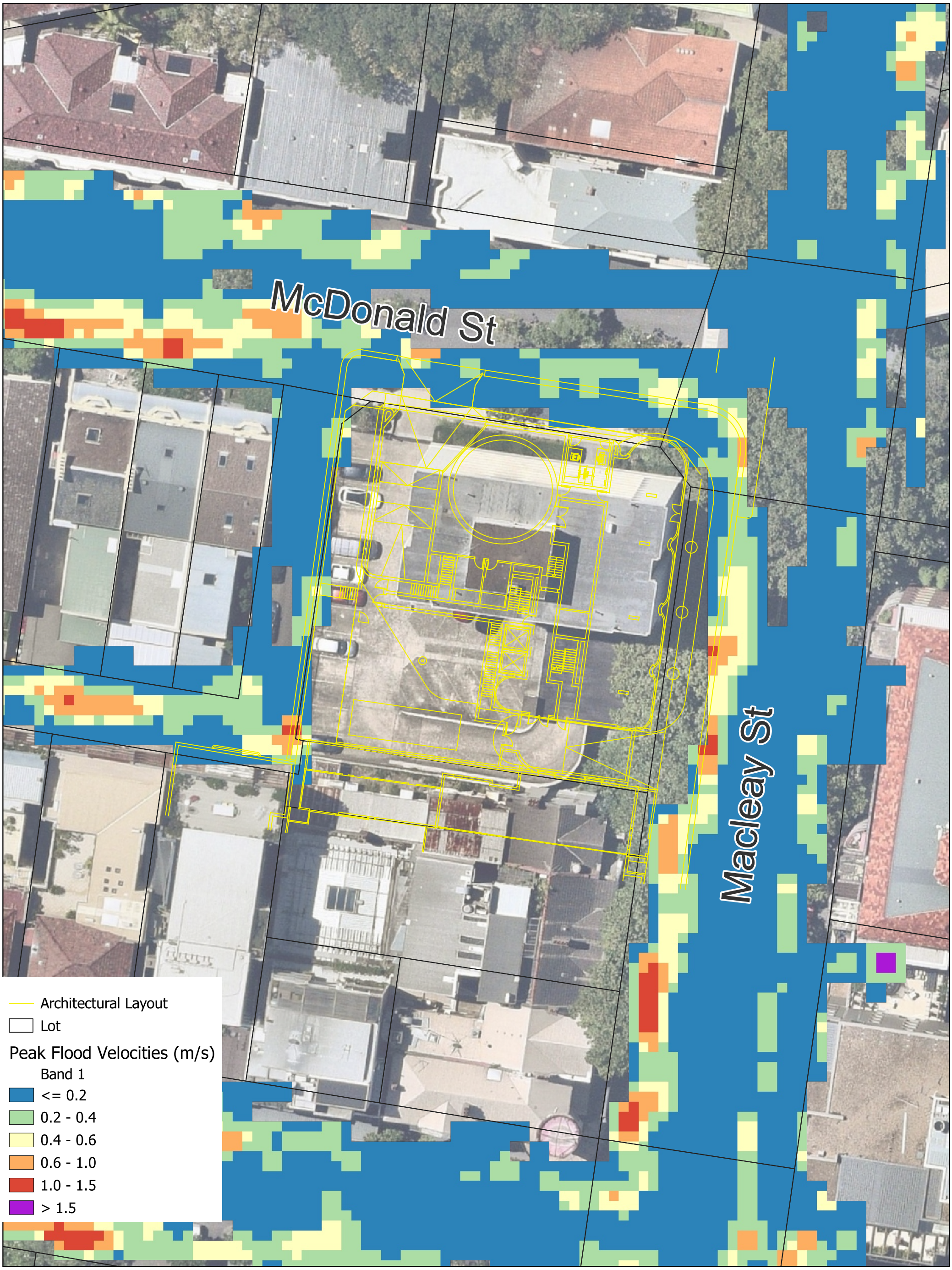

McDonald St
Macleay St
1
2
3
4
5
6
7
8
9
Reporting points
Architectural Layout
Lot
Peak Flood Levels (m AHD)
Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
20%AEP Peak Flood Depths and Levels_Post-Development Case



19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

20%AEP Peak Flood Depths and Levels_Post-Development Case



0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

20%AEP Peak Flood Velocities_Post-Development Case

McDonald St

Macleay St

Architectural Layout

Lot

Peak Flood Hazard Categories

Band 1

Low Hazard

High Hazard

0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

20%AEP Peak Flood Hazard_Post-Development Case

McDonald St

Macleay St

Reporting points
Architectural Layout
Lot
Peak Flood Levels (m AHD)

Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4

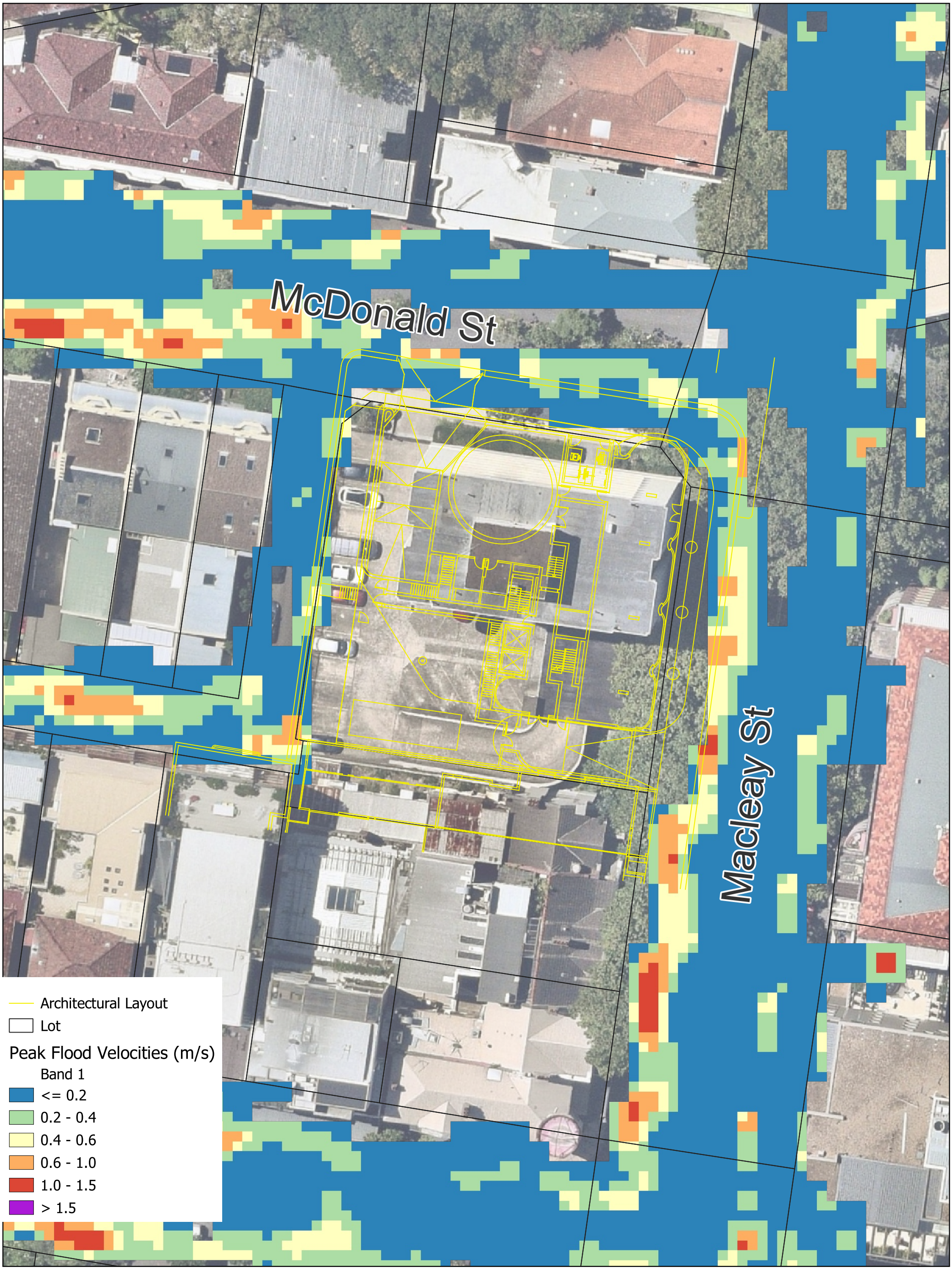
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

10%AEP Peak Flood Depths and Levels_Post-Development Case



0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

10%AEP Peak Flood Velocities_Post-Development Case



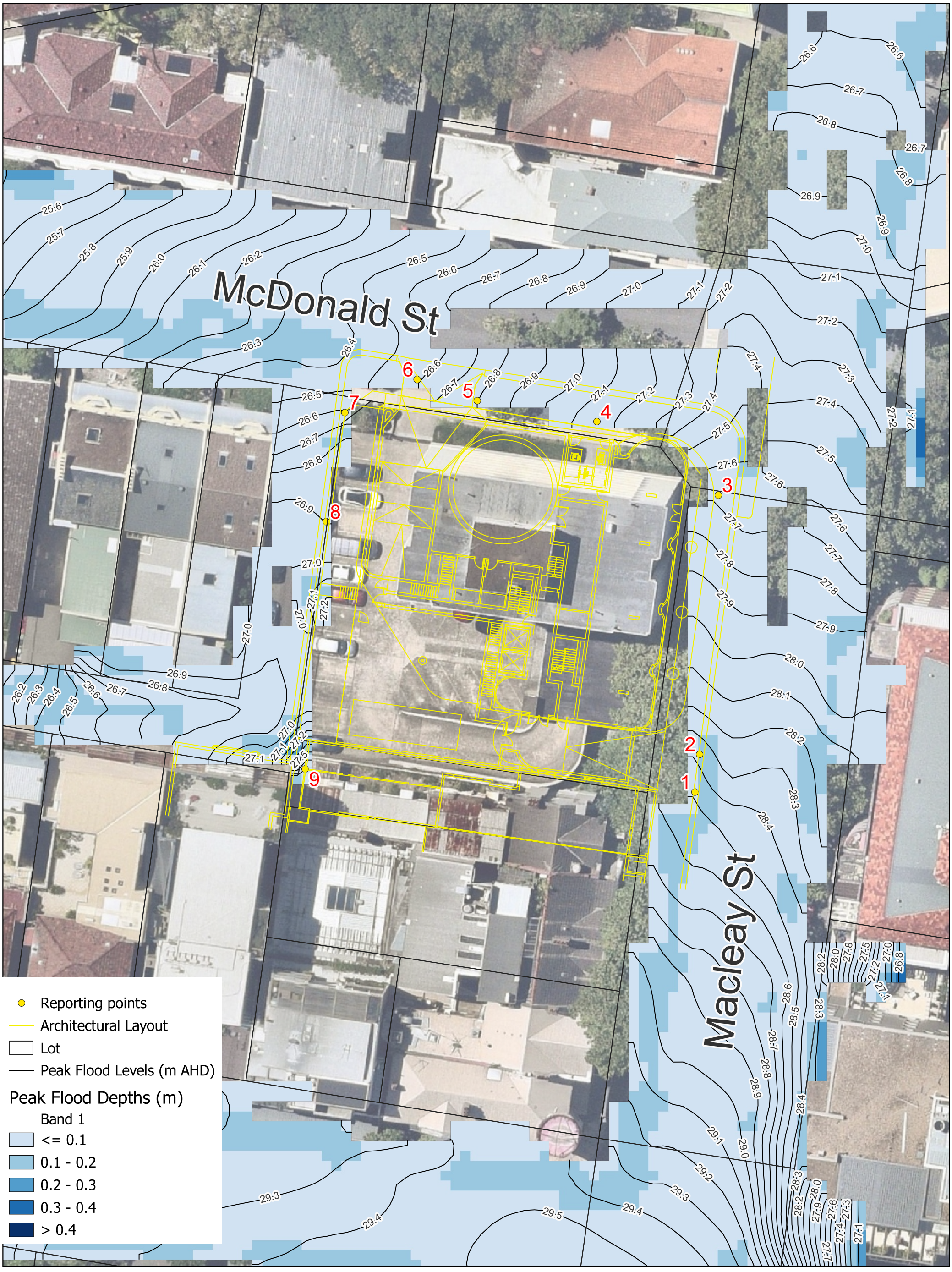
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

10%AEP Peak Flood Hazard_Post-Development Case


McDonald St
Macleay St
1
2
3
4
5
6
7
8
9
Reporting points
Architectural Layout
Lot
Peak Flood Levels (m AHD)
Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4
0
10
20 m
A3 Scale: 1:350
19/2/2025 MGA 56
45-53 Macleay Street, Potts Point
1%AEP Peak Flood Depths and Levels_Post-Development Case

McDonald St

Macleay St

Architectural Layout

Lot

Peak Flood Velocities (m/s)

Band 1

<= 0.2

0.2 - 0.4

0.4 - 0.6

0.6 - 1.0

1.0 - 1.5

> 1.5

0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP Peak Flood Velocities_Post-Development Case



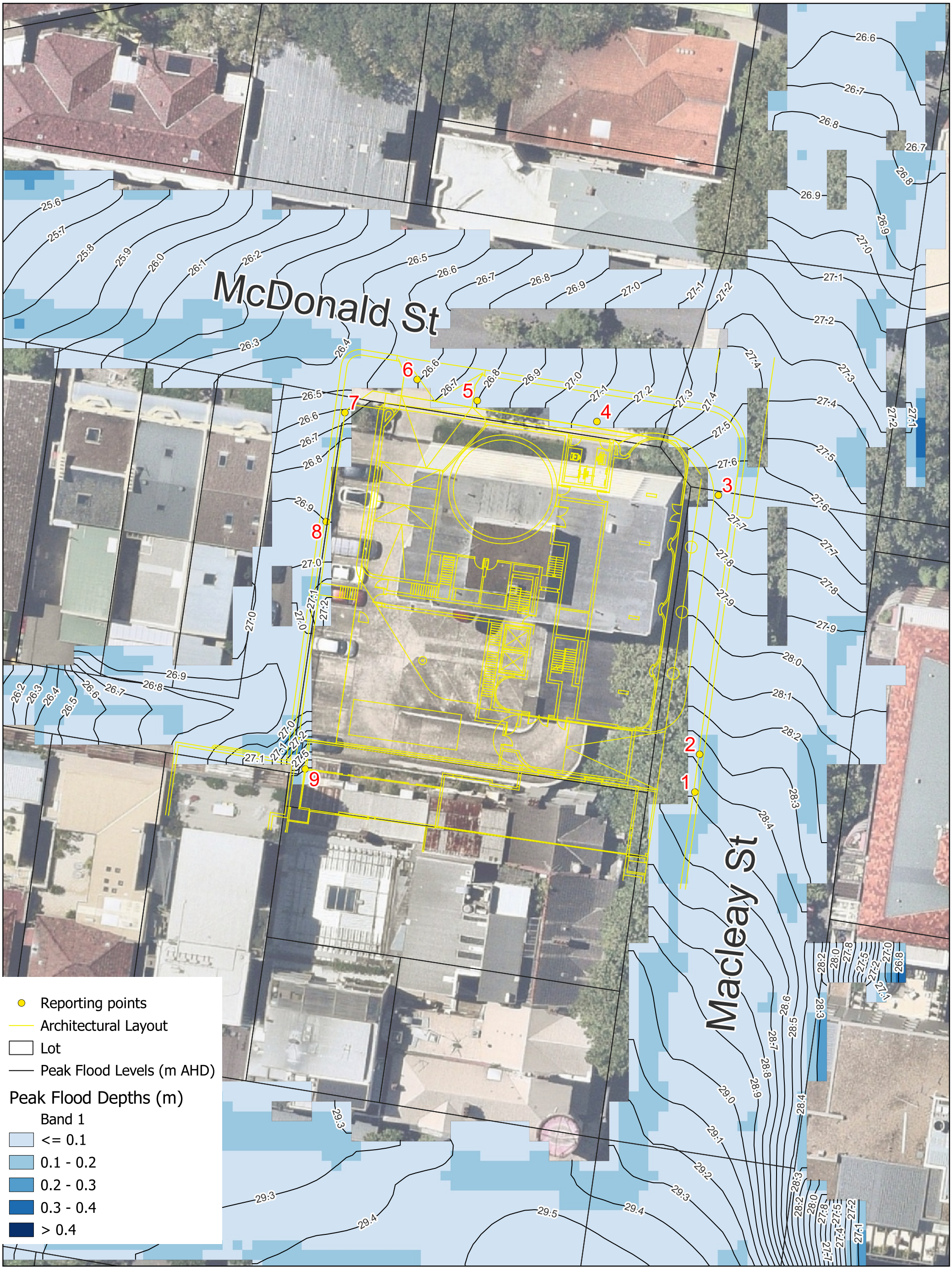
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

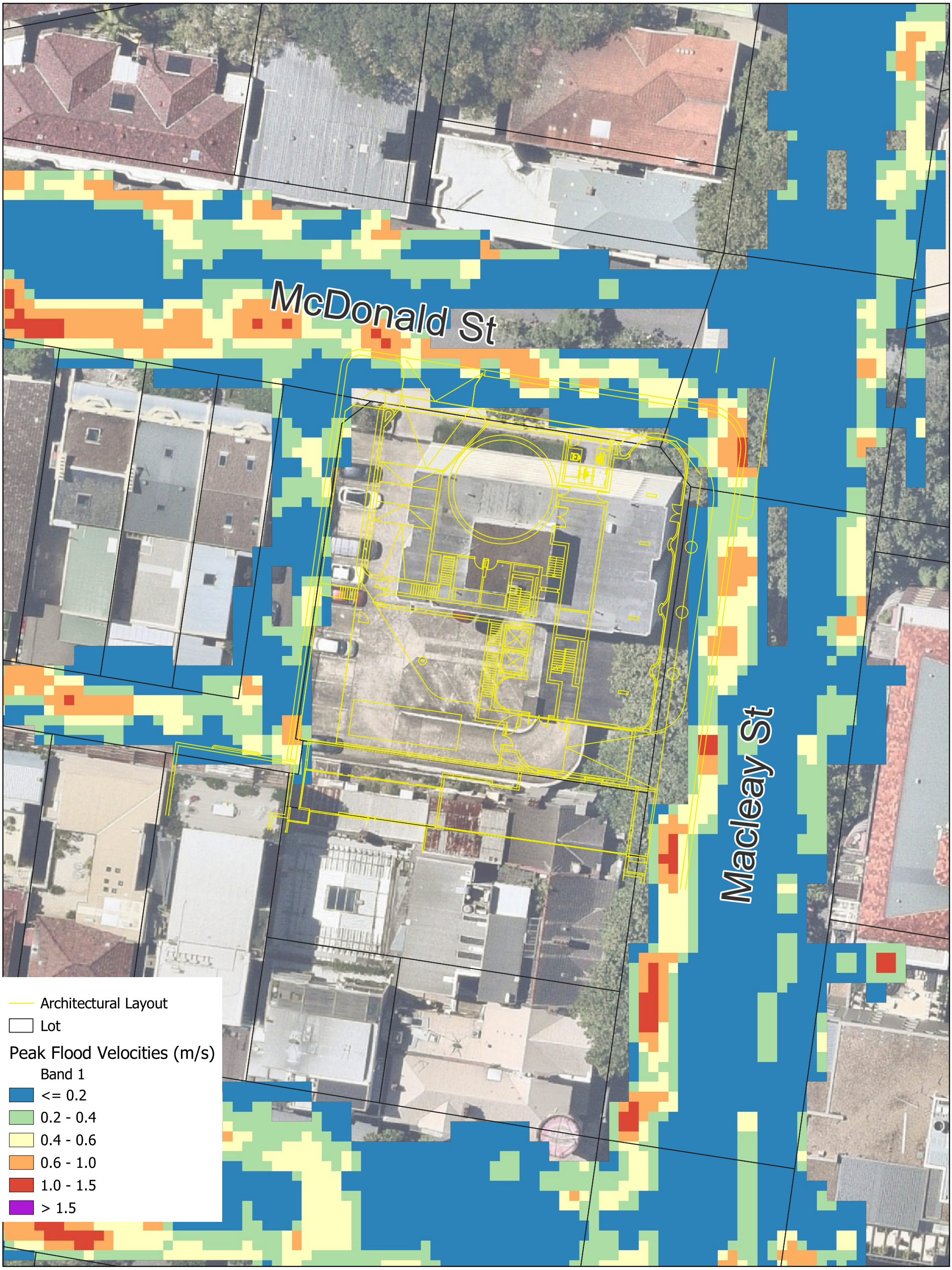
1%AEP Peak Flood Hazard_Post-Development Case



19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP_CC Peak Flood Depths and Levels_Post-Development Case



19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP_CC Peak Flood Velocities_Post-Development Case



0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP_CC Peak Flood Hazard_Post-Development Case

McDonald St

Macleay St

Reporting points
Architectural Layout
Lot
Peak Flood Levels (m AHD)

Peak Flood Depths (m)
Band 1
<= 0.1
0.1 - 0.2
0.2 - 0.3
0.3 - 0.4
> 0.4

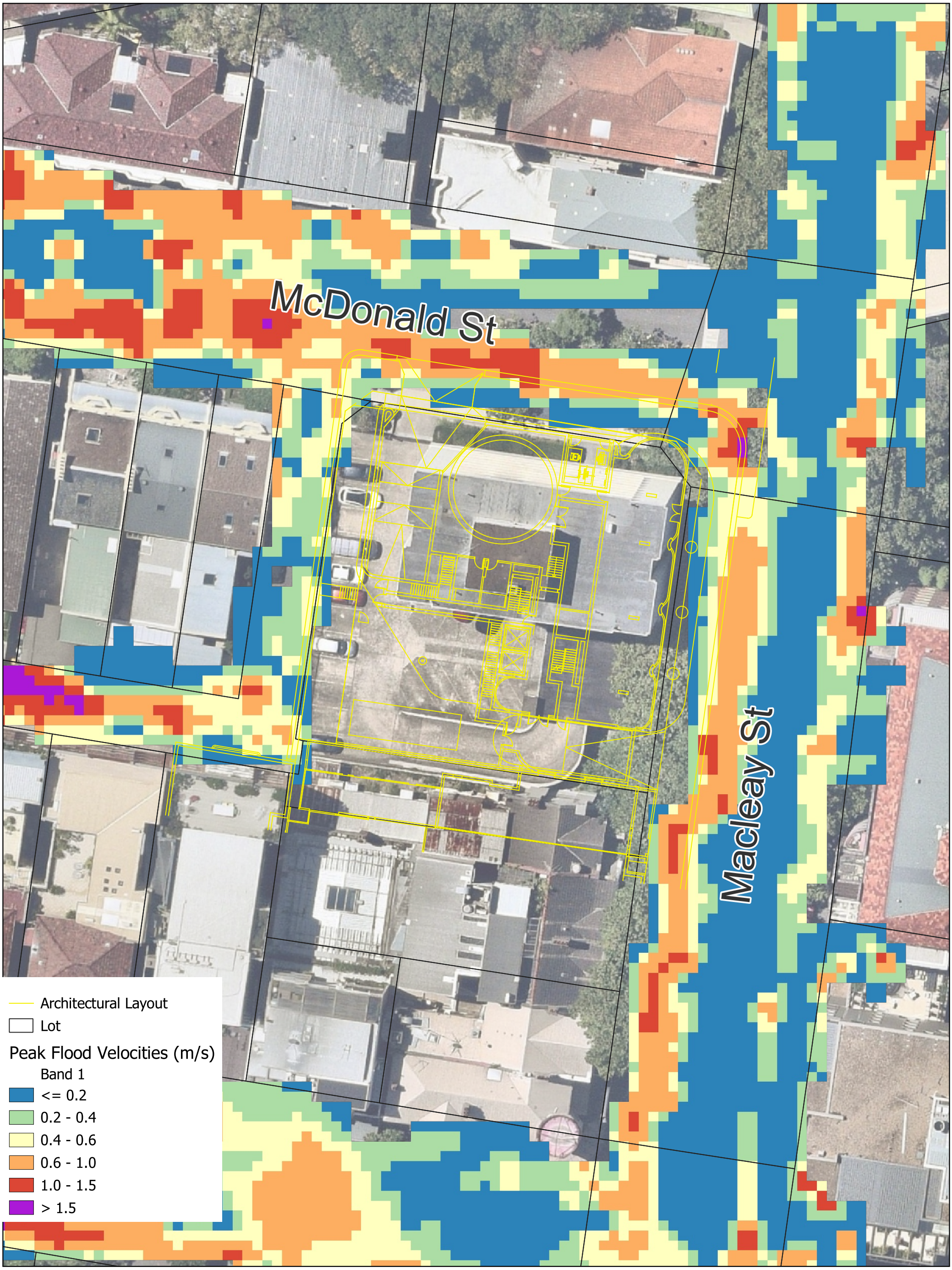
0 10 20 m

A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

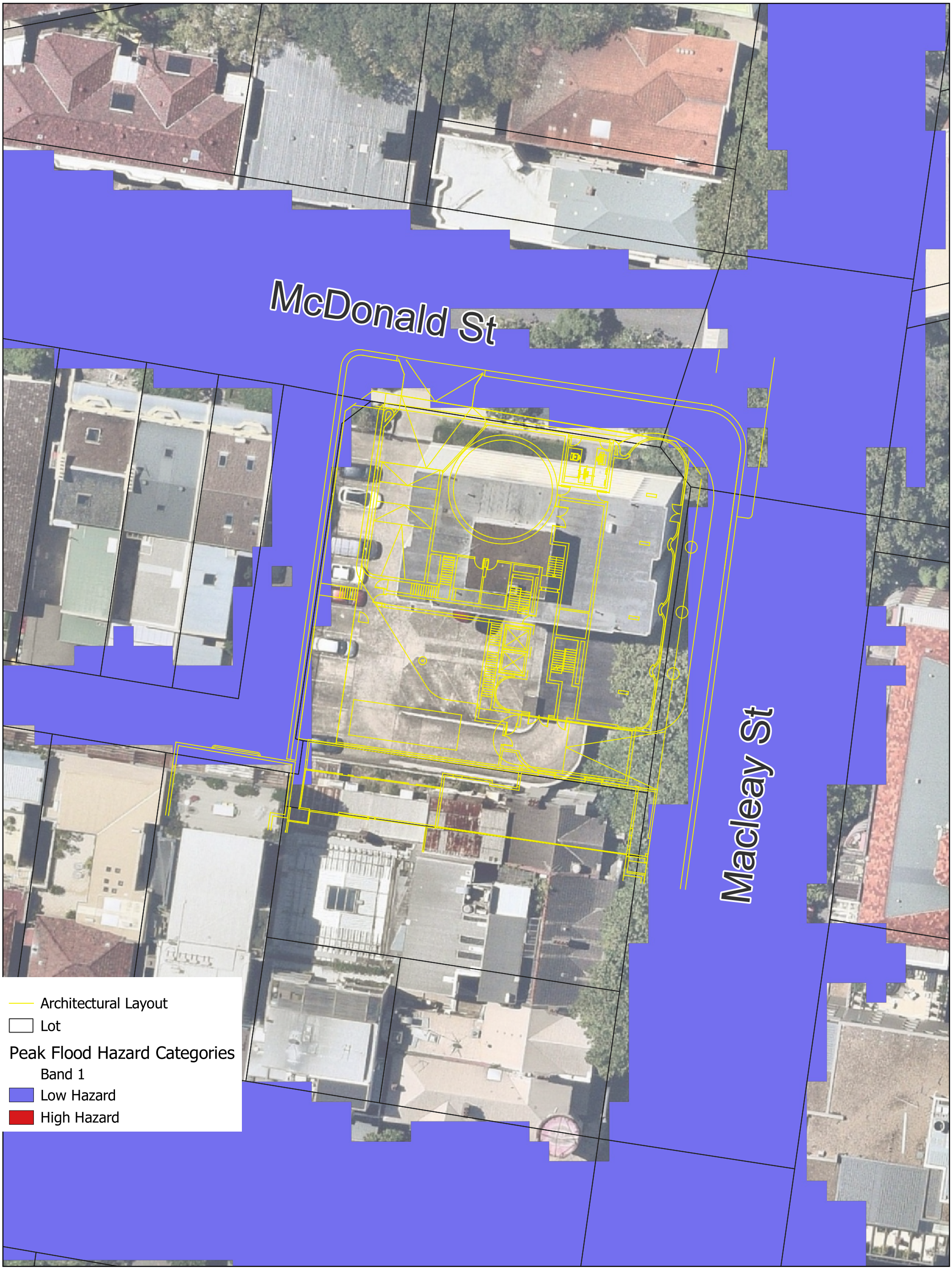
PMF Peak Flood Depths and Levels_Post-Development Case



19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

PMF Peak Flood Velocities_Post-Development Case



0 10 20 m

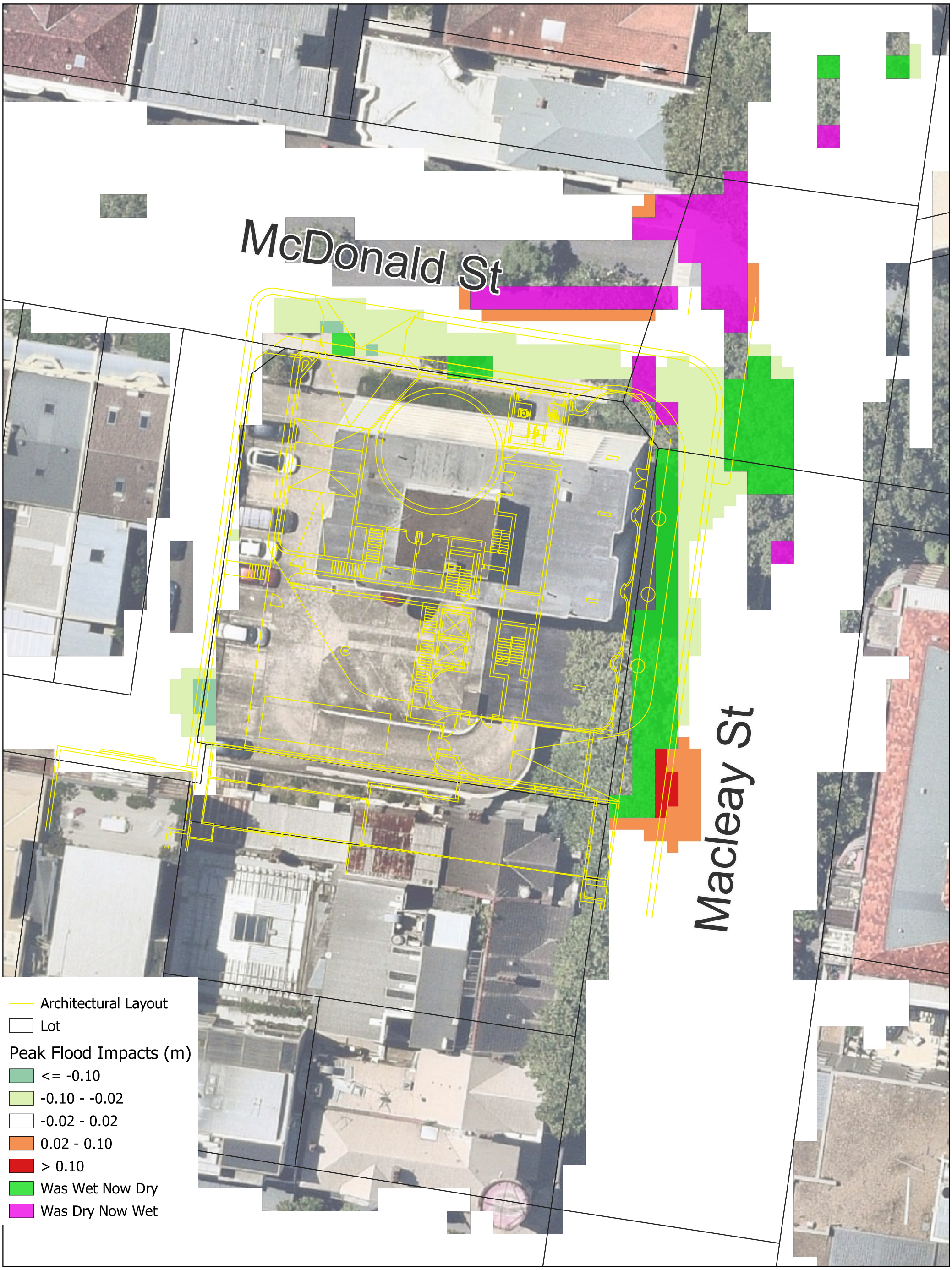
A3 Scale: 1:350

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

PMF Peak Flood Hazard_Post-Development Case

9.3 Flood Impact (Afflux) Maps



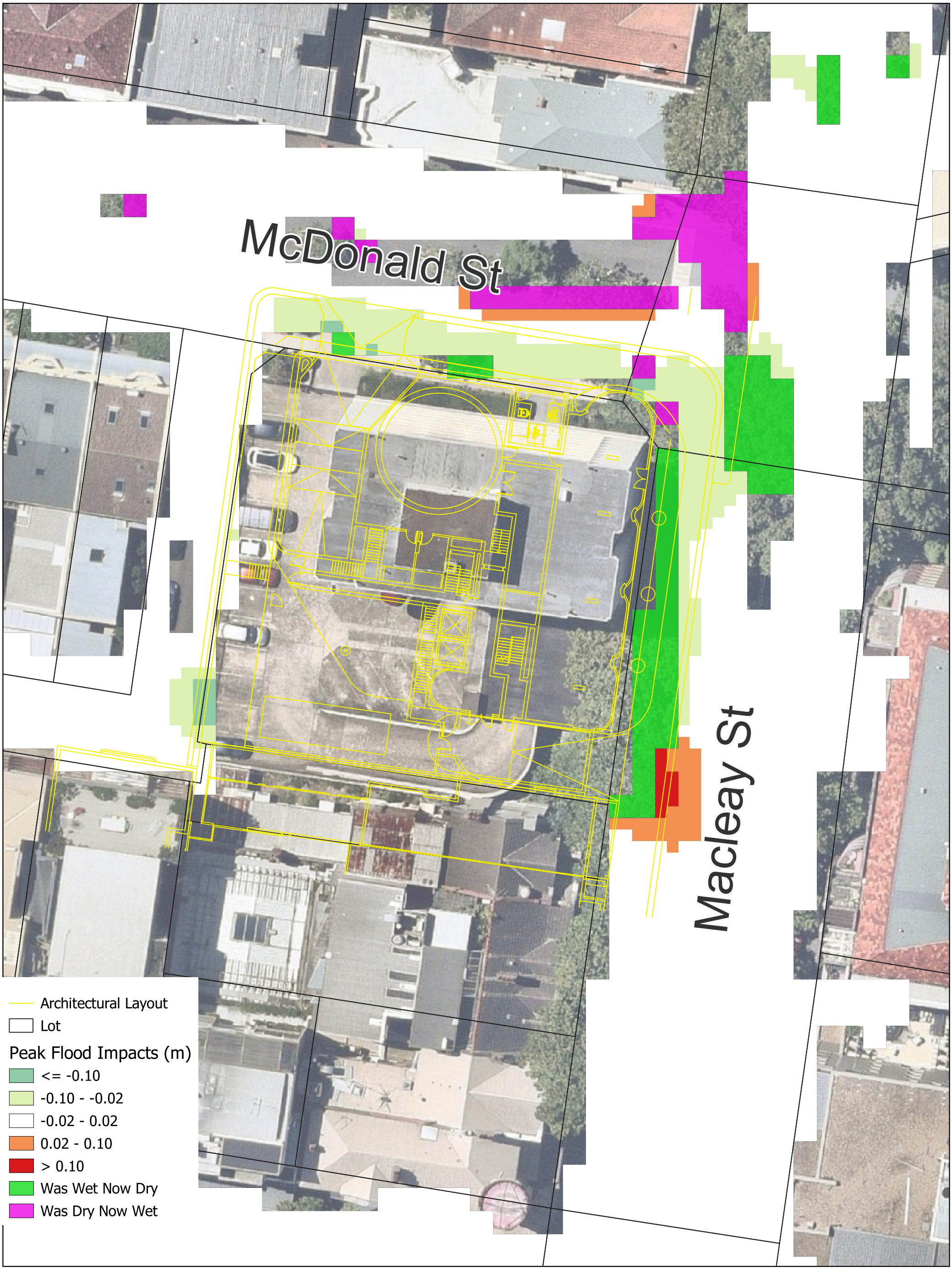
0 10 20 m

A3 Scale: 1:300

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

20%AEP Peak Flood Impact



0 10 20 m

A3 Scale: 1:300

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

10%AEP Peak Flood Impact

McDonald St

Macleay St

Architectural Layout

Lot

Peak Flood Impacts (m)

<= -0.10

-0.10 - -0.02

-0.02 - 0.02

0.02 - 0.10

> 0.10

Was Wet Now Dry

Was Dry Now Wet

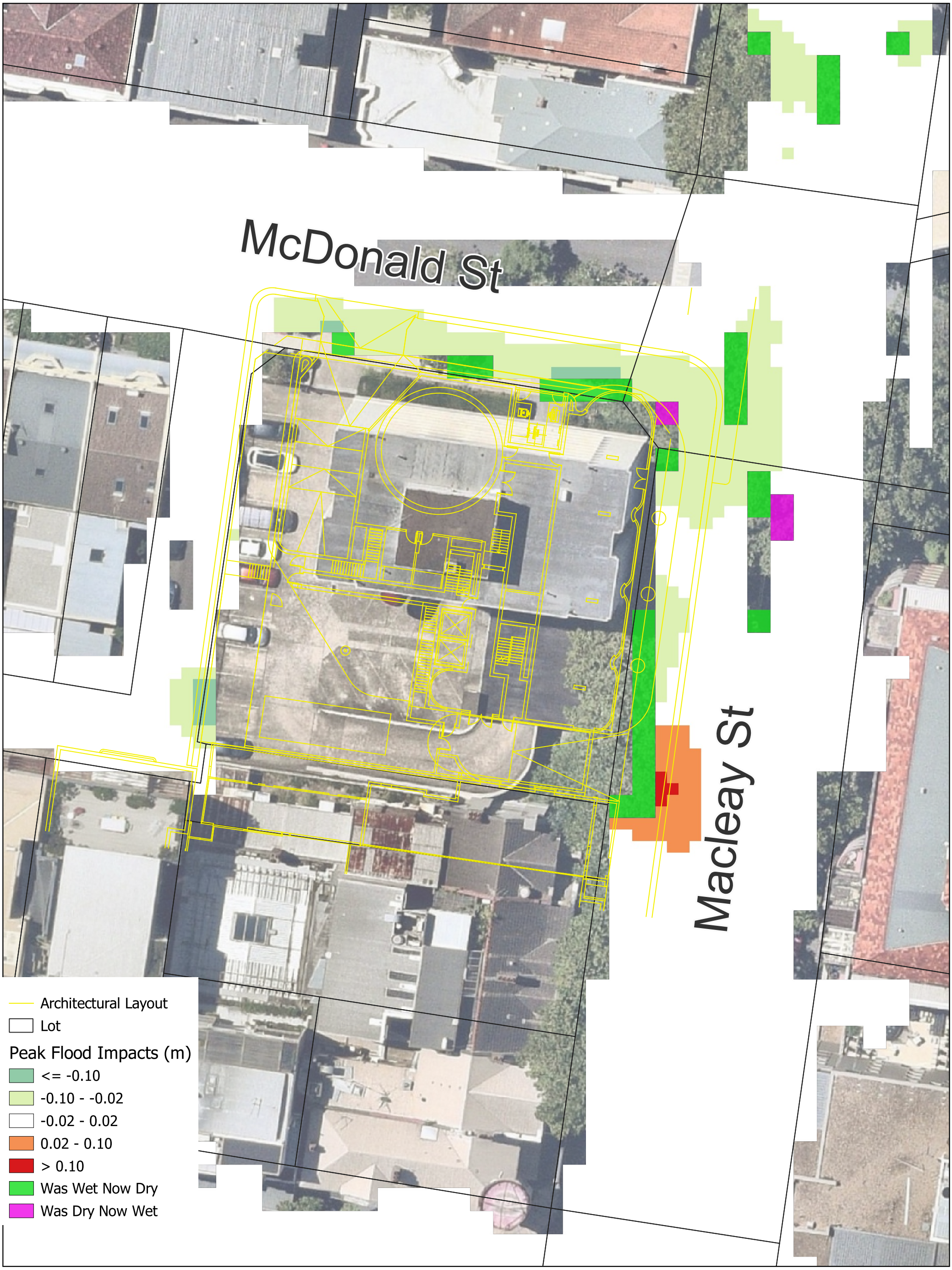
0 10 20 m

A3 Scale: 1:300

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP Peak Flood Impact



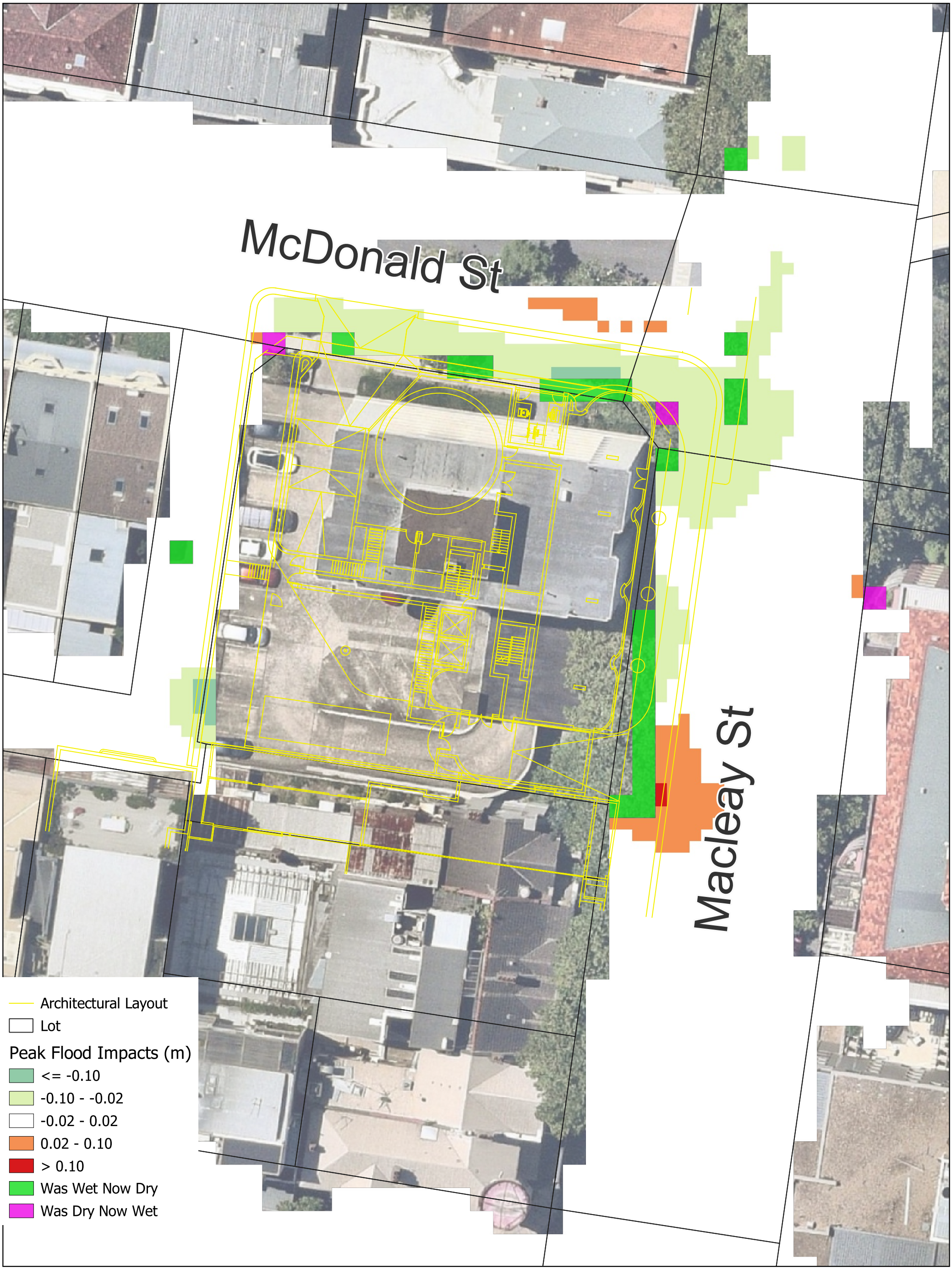
0 10 20 m

A3 Scale: 1:300

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

1%AEP_CC Peak Flood Impact



0 10 20 m

A3 Scale: 1:300

19/2/2025 MGA 56

45-53 Macleay Street, Potts Point

PMF Peak Flood Impact