

Flood Impact Assessment Report

Western Sydney Cricket NSW

Prepared for Cox Architecture / 9 March 2020

191180

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1.0 Introduction

This flood study has been prepared by TTW to determine the flood planning level and flood impact at the proposed development at Wilson Park, Sydney Olympic Park.

1.1 The Site

The site is located at Wilson Park, in the suburb of Sydney Olympic Park, within the Parramatta Local Government Area (LGA) and is situated at the north western corner of the Sydney Olympic Park (SOP) precinct.

The site is located in proximity to a number of regionally significant facilities and amenities including the Olympic Park Railway Station, ANZ Stadium, Qudos Bank Arena and Sydney Showground, which are all approximately 2.5km south east of the site.

The existing site is vacant (greenfield) with an existing field (north-west), car park (west) and a building (north-east). The development site is bound by Parramatta River to the north, vacant land (north-east) and existing properties to the east and Clyde Street to the south and an existing carpark and Silverwater Road to the west as shown in Figure 1.



Figure 1. Existing Site (Near Map)

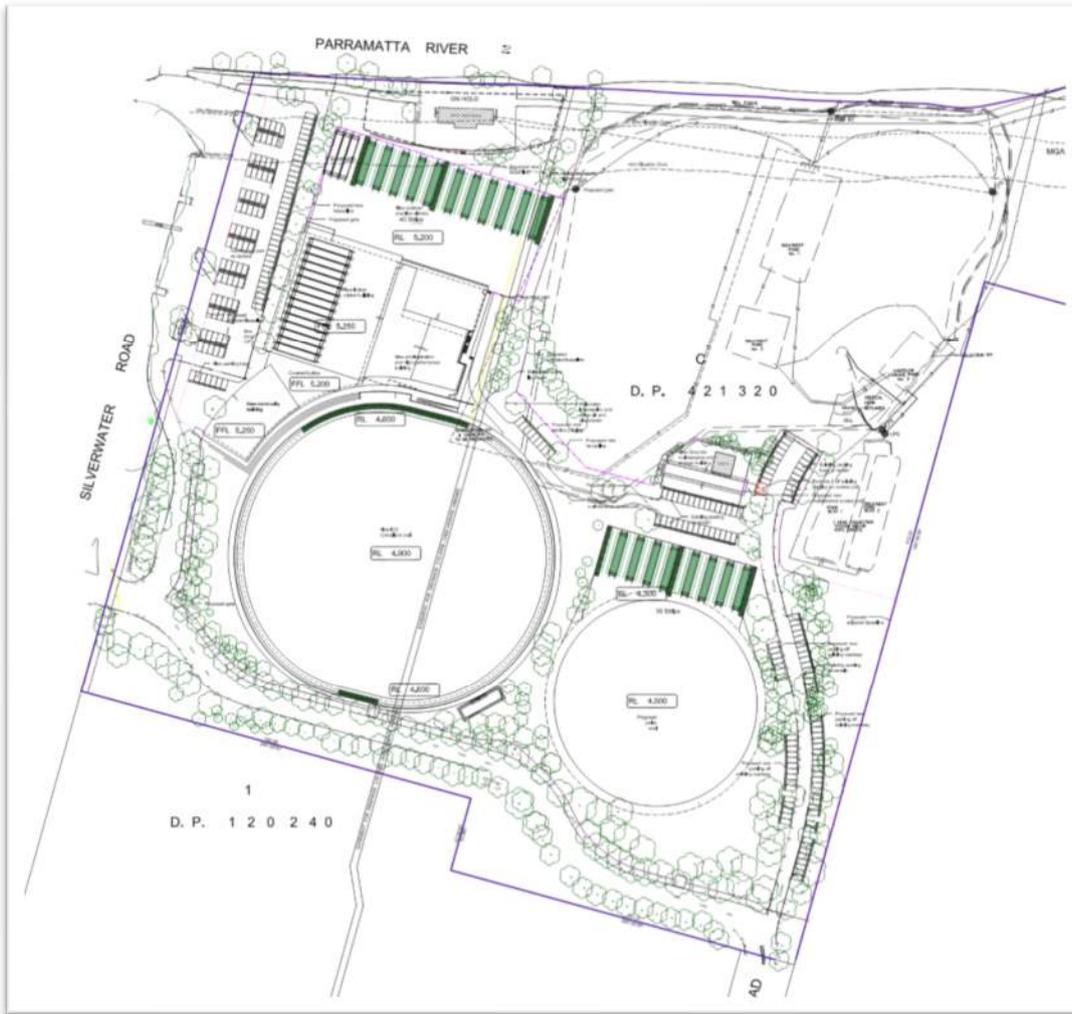


Figure 2. Proposed Site - Cricket NSW Site Layout (Cox Architecture)

2.0 Relevant Documents

The following documents have been reviewed as part of this flood study:

- Lower Parramatta River Floodplain Risk Management Study - Flood Study Review by SKM 2005 (SKM, 2005)
- Parramatta Development Control Plan (DCP) 2011
- Architectural Plans by Cox Architecture
- Survey by Project Surveyors
- Initial Flood Assessment Draft Report by WMAwater 2019 (WMAwater ,2019)

3.0 Flood Modelling and Verification

3.1 TUFLOW

The flood model built by WMAwater was used under a licence agreement through Council by TTW for the purpose of establishing flood levels in this report.

The baseline model was run to verify the results were equivalent to those produced by WMA Water. The difference in flood levels between the 2 models were negligible.

However, the existing TUFLOW model has since been updated to include downstream boundaries for a Probable Maximum Flood (PMF).

In order to model the impact of the development of Cricket NSW on the flood regime, the existing structures/building in the model were removed and replaced with the footprint of the proposed development.

4.0 100-year ARI Flood Results

4.1 Existing Conditions

Existing flood conditions are shown in below figure (Figure 3).



Figure 3. Maximum Flood Depth Results during a 100-year ARI Flood Event in Existing Condition

4.2 Proposed Development

The proposed development of Cricket NSW will include a two-storey building, international cricket oval with seating, community cricket oval, outdoor and indoor wickets, single storey shed, carparking, landscaping and public domain works. The proposed development was added to the model to determine the flood impact of the development.

Figure 4 shows the changes to the flood conditions due to the proposed development.

In conclusion, the proposed development improves the flood levels within the site, where the maximum ponding depth is reduced by 200mm. The proposed development reduces the upstream flood level by 100mm.

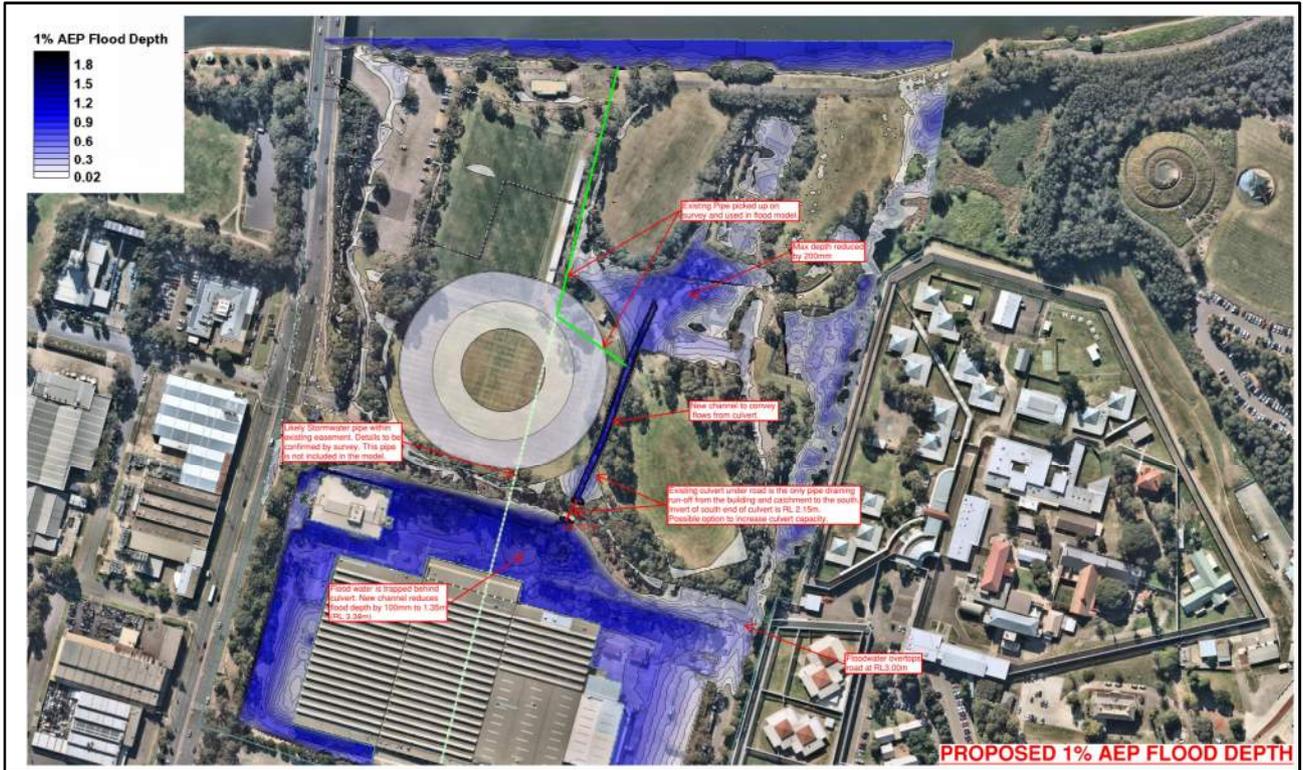


Figure 4. Maximum Flood Depth Results during a 100-year ARI Flood Event in Post-development Condition

5.0 PMF Event Results

The developed TUFLOW model was updated to represent a PMF flood event. In this model, based on the “Lower Parramatta River Floodplain Risk Management Study - Flood Study Review 2005 (SKM, 2005)” by SKM the downstream boundary is 4.95 m AHD in the PMF event (i.e., Parramatta River’s peak water level during the PMF event (refer to below Table, the table information is extracted from Appendix B report (SKM, 2005)).

Flowpath	Chainage (m)	Peak Water Level (m AHD)					Peak flow (m3/s)					Peak velocitis (m/s)				
		20%AEP	5%AEP	2%AEP	1%AEP	PMF	20%AEP	5%AEP	2%AEP	1%AEP	PMF	20%AEP	5%AEP	2%AEP	1%AEP	PMF
Paramatta River	7705	2.00	2.40	2.66	2.85	4.95	862	1070	1224	1344	3057	1.7	1.9	2.1	2.2	3.2

The flood model was used to simulate the PMF event for existing and post-development conditions on the Cricket NSW site.

5.1 Existing Condition

Figure 5 shows a PMF event flood extent in existing condition. The results are very close to the prepared peak flood depths map by WMAwater in “(WMAwater ,2019)” (refer to Figure 6).



Figure 5. Peak Flood Depth Results during a PMF Flood Event in Existing Condition



Figure 6. Peak Flood Depth Results during a PMF Flood Event in Existing Condition (Source: Initial Flood Assessment Draft Report by WMA (2019))

5.2 Post-development Condition

Figure 7 and Figure 8 represents peak flood depth and flood level results in post-development condition.

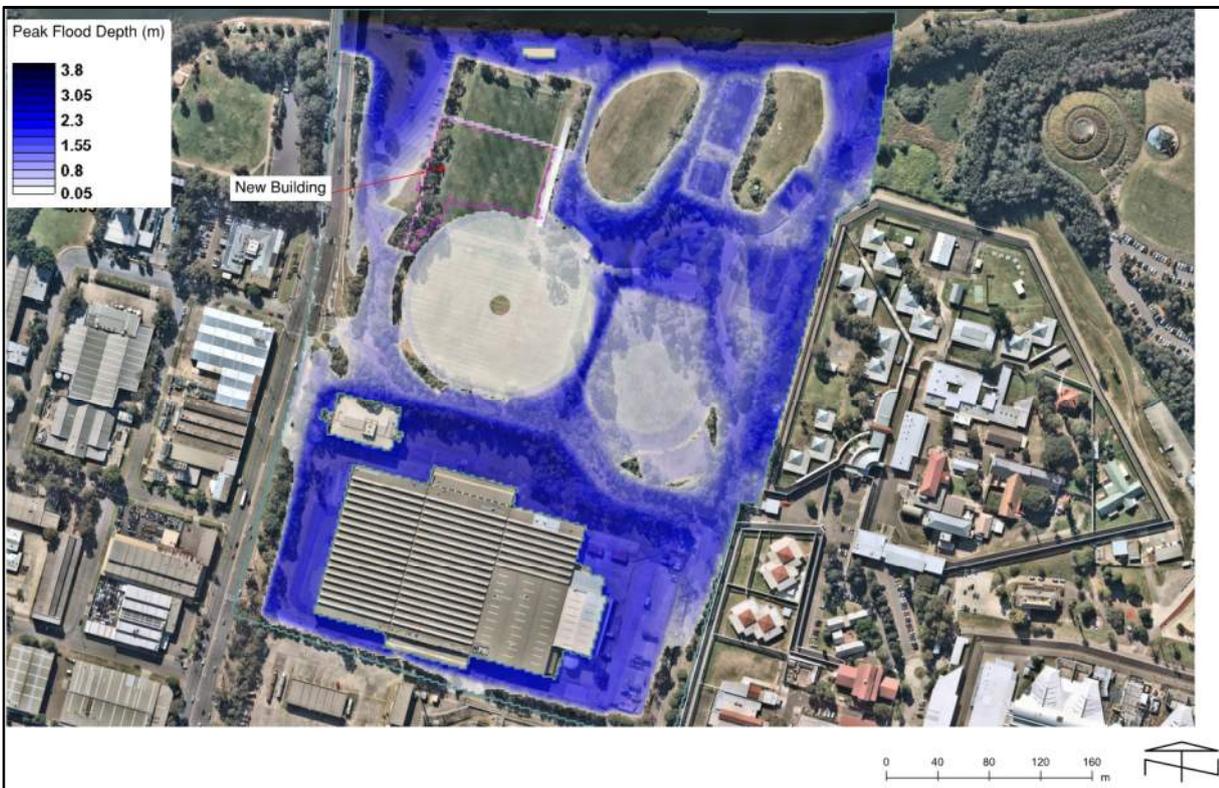
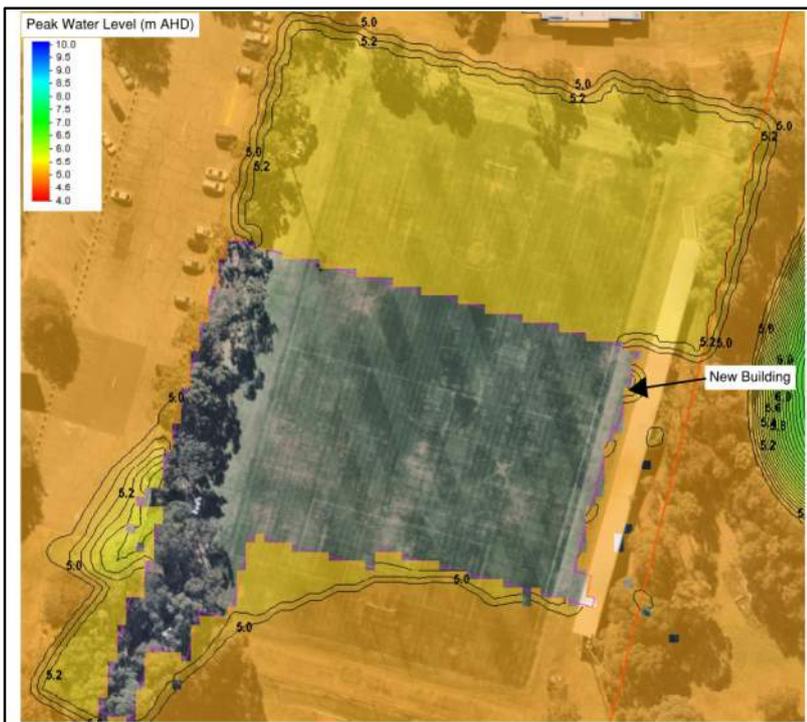


Figure 7. Peak Flood Depth Results during a PMF Flood Event in Post-development Condition



Figure 8. Peak Water Level during a PMF Event in Post-development Condition

PMF level for the proposed development site is 5.20 m AHD (refer to image below) this is below the building floor level of 5.25 RL. The two-storey building is a suitable PMF refuge for the PMF event for refuge in Place.



6.0 Council Requirements

6.1 Flood Planning Levels

All development proposals are to have regard to the City of Parramatta Council DCP Flood Plain Matrix Planning and Development Controls (refer to Table 1 and Table 2) to determine which design standards apply to the proposed development.

According to the City of Parramatta Council DCP land use categories, the development site is classified as “Open Space & Non-Urban”/” Commercial & Industrial” (Refer to Table 1).

Flood hazard mapping is shown in Figure 9 for the post-development condition confirm that during a PMF even the development site is predicted to be exposed to low flood hazard.

The Council DCP flood level requirement for “Commercial & Industrial” development which is predicted to be exposed to low flood hazard is that the habitable floor levels must be equal to or greater than the 100-year flood level plus freeboard.

As the finished floor level for the proposed building is 5.25 RL and located above the flood planning level (i.e., $3.18+0.5= 3.68$ RL), development meets this requirement.

The proposed development is also above the PMF flood level 5.2 m AHD.

The proposed development does not have any negative impact with respect to flooding on neighbouring properties.

The car parking proposed in the plan is located outside of the 100-year flood extent and meets the council DCP requirements.

Table 1. Land Used Categories (Source: City of Parramatta Council DCP (2011))

Commercial or Industrial	Bulky goods premises; Business Premises; Car parks; Depots; Entertainment facilities; Food and drink premises; Freight transport facilities; Funeral chapels; Funeral homes; Function centres; Hardware and building supplies; Heavy industries; Hotel accommodation; Industries; Landscape and garden supplies; Light industries; Materials recycling or recovery centres; Medical centres; Mixed use development; Office premises; Passenger transport facilities; Places of public worship; Public administration buildings (other than an essential community facility); Pubs; Recreation facilities (indoor); Registered clubs; Restricted premises; Retail Premises; Service stations; Sex services premises; Shop top housing; Tourist and visitor accommodation; Vehicle body repair workshops; Vehicle repair stations; Vehicle showrooms; Veterinary hospitals; Warehouse or distribution centres.
Open Space or Non-urban Uses	Animal boarding and training establishments; Boat launching ramps; Boat repair facilities; Boat sheds; Environmental facilities; Helipad; Jetty; Recreation areas and minor ancillary structures (e.g. Toilet blocks or kiosks); Recreation facilities (outdoor).

Table 2. Flood Plain Matrix Planning and Development Controls (Source: City of Parramatta Council DCP (2011))

Flood Risk Precincts (FRP's)	Planning Consideration	Floor Level	Building Components	Structural Soundness	Flood Affection	Car Parking & Driveway Access	Evacuation	Management & Design
High Flood Risk	Concessional Development	4, 5	1	1	1	1, 5	3, 4, 6	2, 3, 4
	Open Space & Non-Urban	1, 5	1	1	1	2, 4, 6, 7	1, 4	2, 3, 4
	Tourist Related Development	X	X	X	X	X	X	X
	Commercial & Industrial	X	X	X	X	X	X	X
	Residential*	X	X	X	X	X	X	X
	Filling	X	X	X	X	X	X	X
	Subdivision	X	X	X	X	X	X	X
	Critical Uses & Facilities	X	X	X	X	X	X	X
	Sensitive Uses & Facilities	X	X	X	X	X	X	X
Medium Flood Risk	Concessional Development	4, 5	1	1	1	1, 5	3, 6	2, 3, 4
	Open Space & Non-Urban	1, 5	1	1	2	2, 4, 6, 7	1, 4	2, 3, 4
	Tourist Related Development	2, 5	1	1	1	1, 3, 5, 6, 7	3, 4, 6	2, 3, 4
	Commercial & Industrial	2, 5	1	1	1	1, 3, 5, 6, 7	3, 4, 6	2, 3, 4
	Residential*	2, 5	1	1	1	1, 3, 5, 6, 7	3, 4, 6	2, 3, 4
	Filling	X	X	X	X	X	X	X
	Subdivision				1		5, 3, 4	1
	Critical Uses & Facilities	X	X	X	X	X	X	X
	Sensitive Uses & Facilities	X	X	X	X	X	X	X
Low Flood Risk	Concessional Development							
	Open Space & Non-Urban					2, 4, 6, 7		
	Tourist Related Development	2, 5			2	1, 3, 5, 6	4	
	Commercial & Industrial	2, 5			2	1, 3, 5, 6	4	
	Residential*	2, 5			2	1, 3, 5, 6	3, 4	
	Filling				1			
	Subdivision				2		5	1
	Critical Uses & Facilities	3	2	2	2	1, 3, 5, 6	2, 4, 6	2, 3, 4
	Sensitive Uses & Facilities	X	X	X	X	X	X	X



Figure 9-Flood Hazard Map for the Post-Development Condition during a PMF Event

7.0 Flood Emergency Response

No flood hazard is predicted across the development site under the post-development condition during the 100-year ARI flood.

During a PMF (probable maximum flood) event, a low hazard condition is predicted to occur across the CNSW site. The proposed Centre of Excellence building ground floor level is above the PMF flood level and is flood free. Therefore, 'shelter in place' flood management is proposed for this site. In our opinion the proposed two storey Centre of Excellence building will provide suitable space for shelter in a flood event up to the PMF event.

8.0 Conclusion and Recommendations

This report confirms the flooding behaviour and flood impact associated with proposed development – Western Sydney Cricket NSW.

The results of TUFLOW 2D flood modelling confirms that under existing condition during significant rainfall events (e.g. 100-year ARI and PMF events) there is potential for inundation of the development site.

In post-development condition, for the PMF flood event we recommend shelter in place in The Centre of Excellence Building as the appropriate flood management response.

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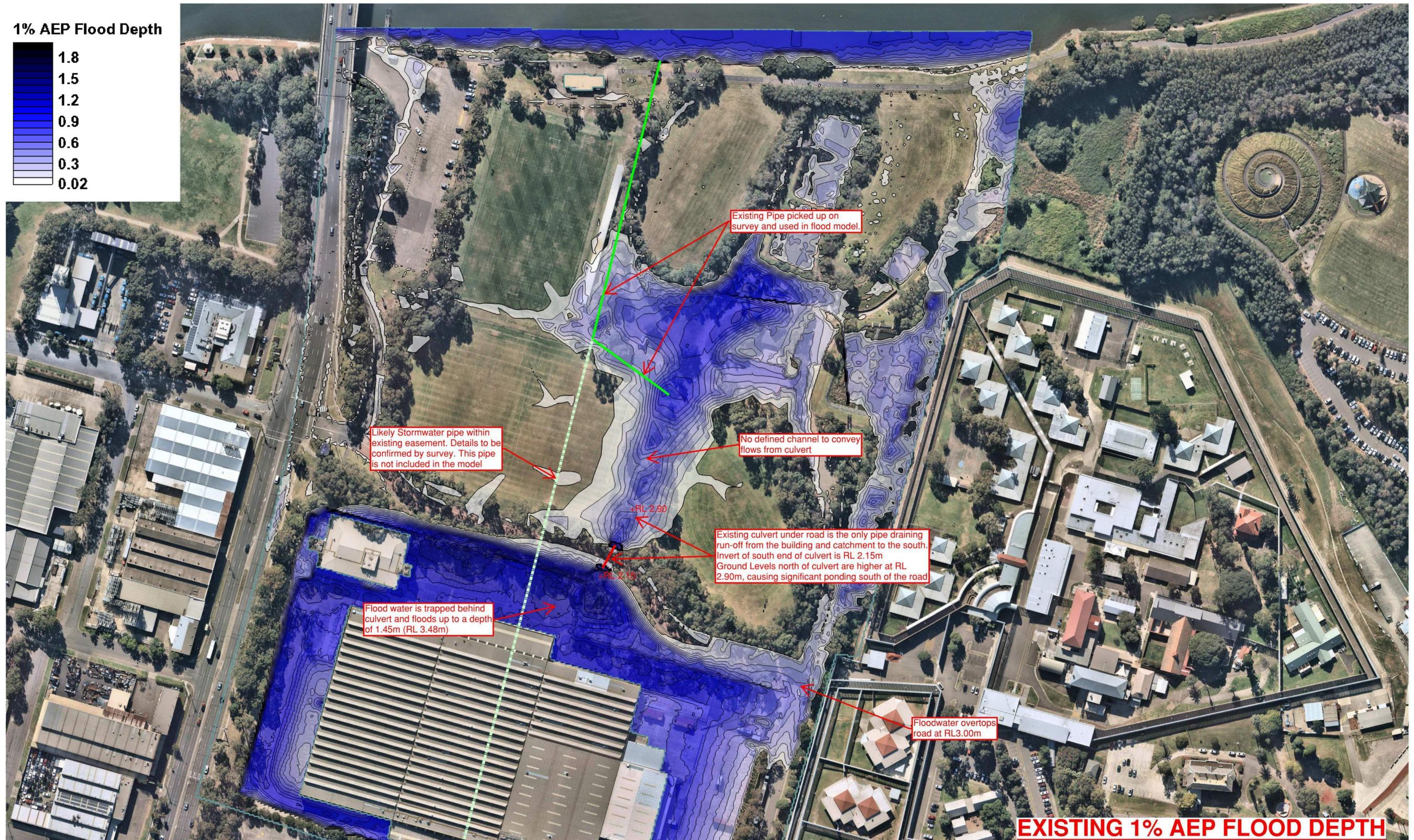
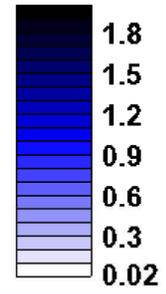
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Appendix A

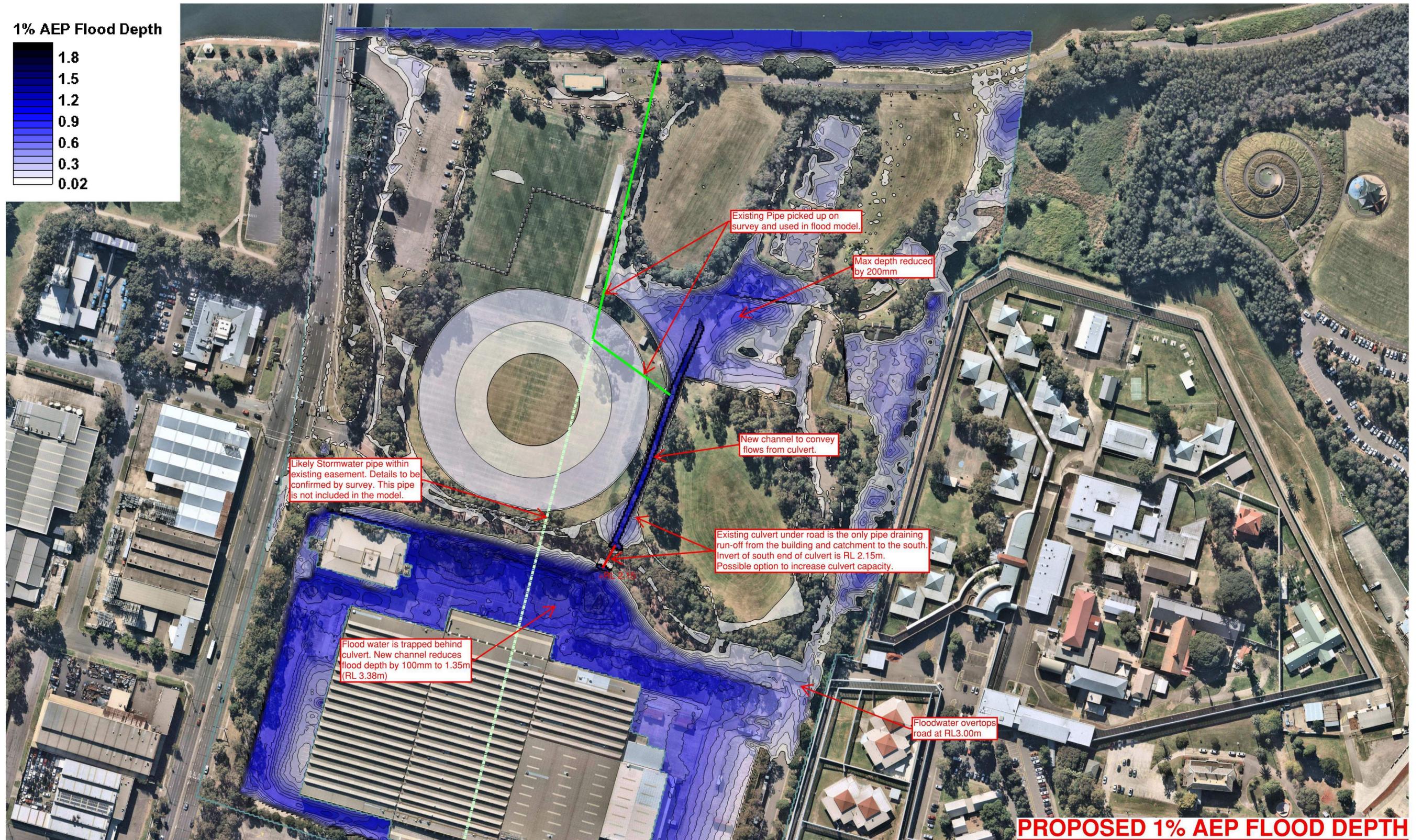
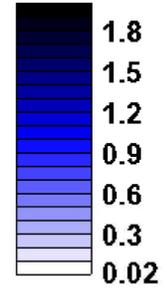
Proposed Development Plans

1% AEP Flood Depth

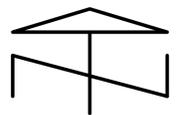
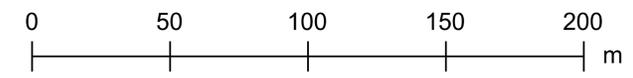


EXISTING 1% AEP FLOOD DEPTH

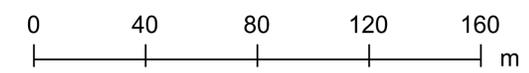
1% AEP Flood Depth



Peak Flood Depth Results during the PMF Event in Existing Condition



Peak Flood Depth Results during the PMF Event in Post-development Condition



Peak Flood Level Results during the PMF Event in the Post-development Condition

Peak Water Level (m AHD with 0.25m interval)

