

Figure 16 100 yr ARI Level Differences - (Landfill Strategy – Existing Conditions)



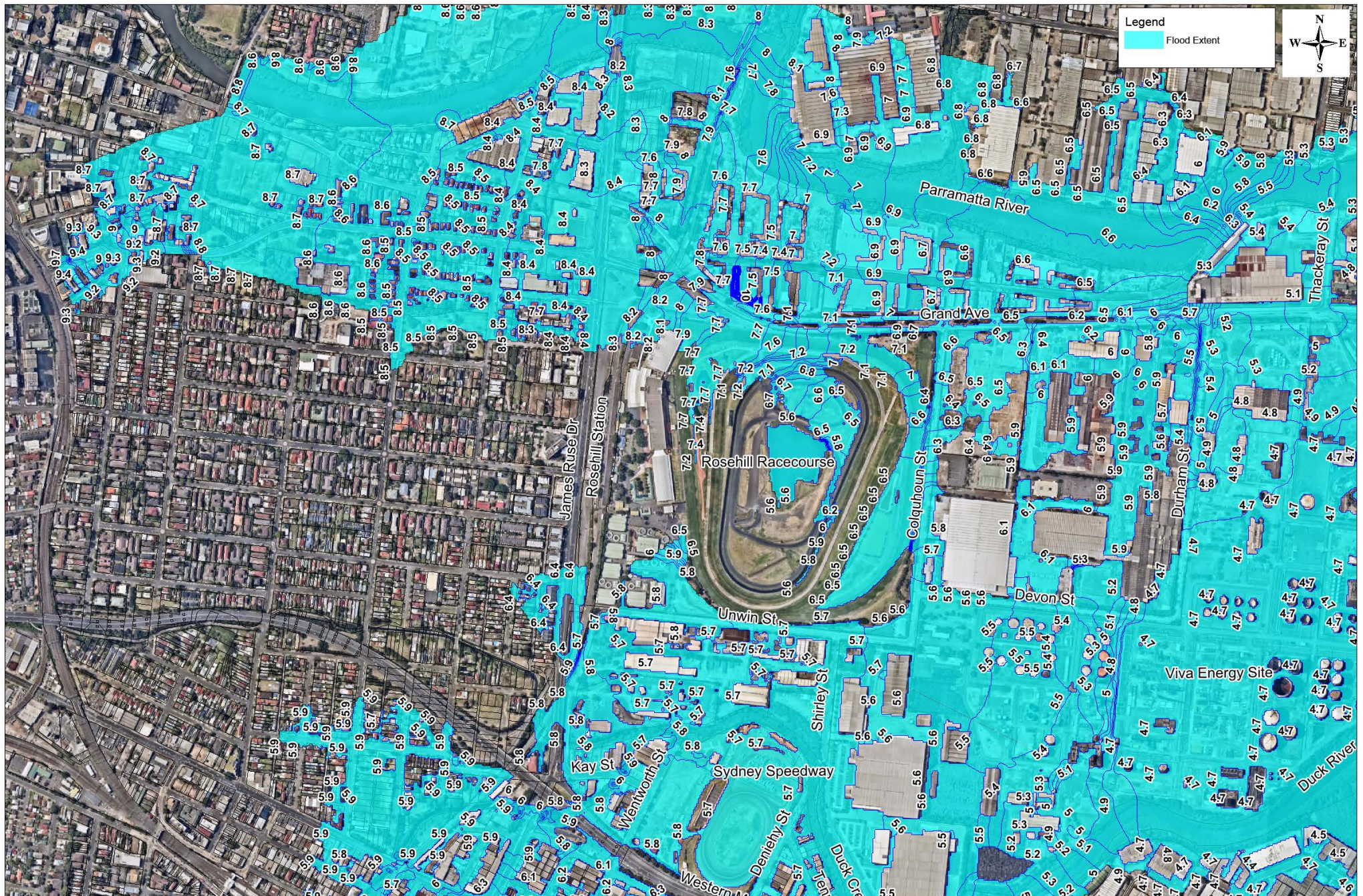


Figure 17 PMF Extent and Levels Overall –Future Conditions



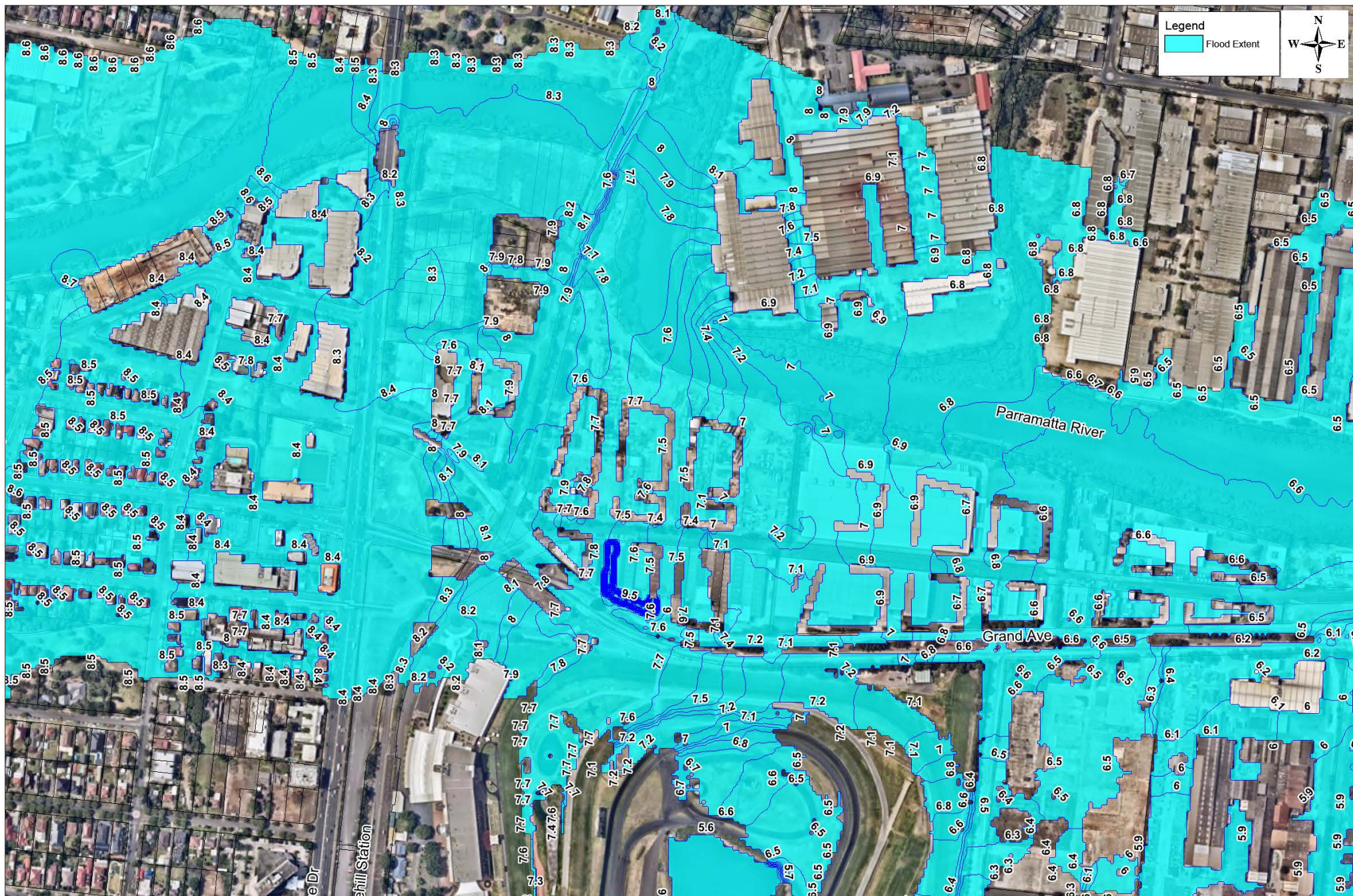


Figure 18 PMF Extent and Levels –Future Conditions



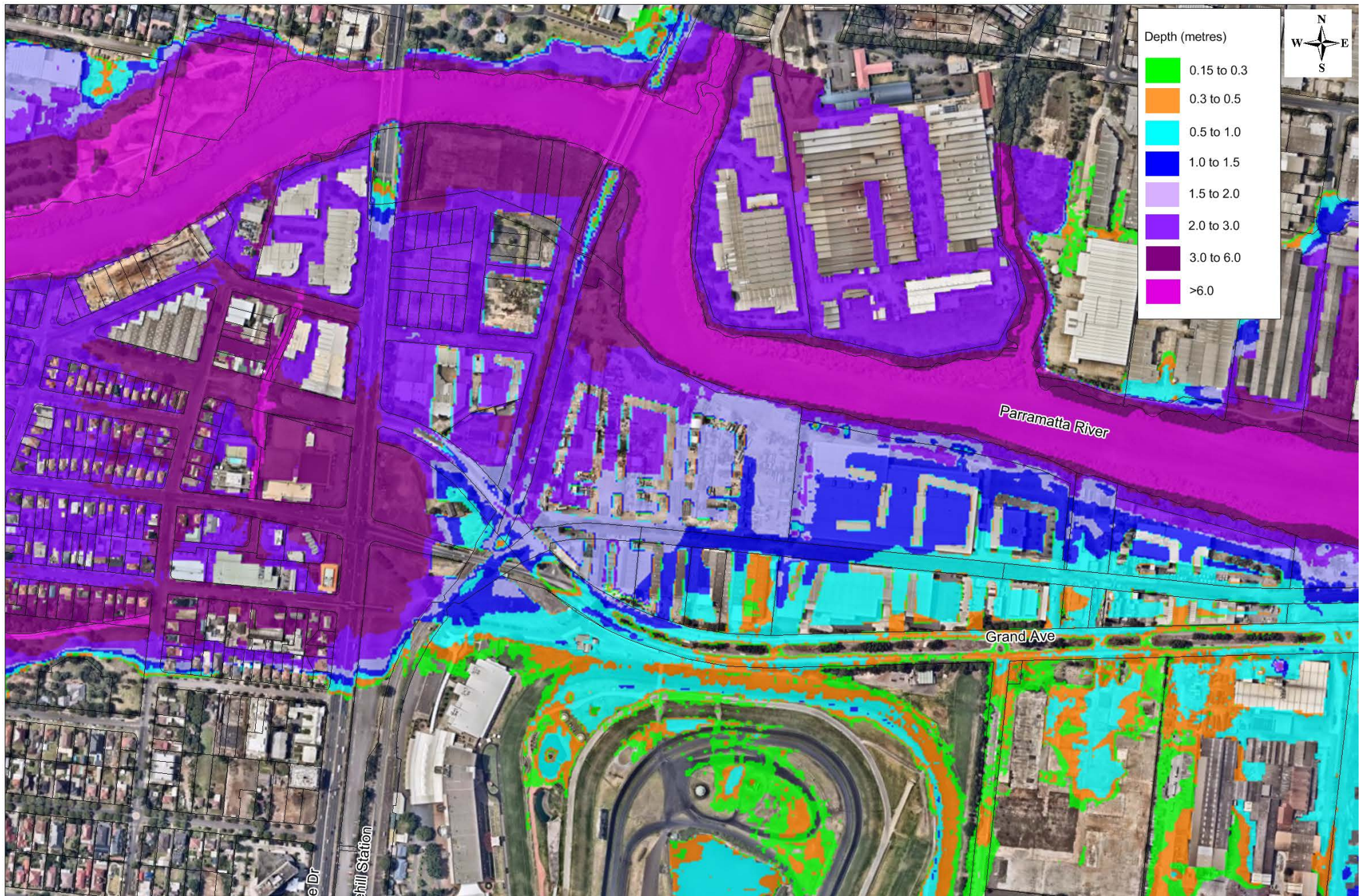


Figure 19 PMF Depths – Landfill Strategy





Figure 20 PMF Velocities – Landfill Strategy



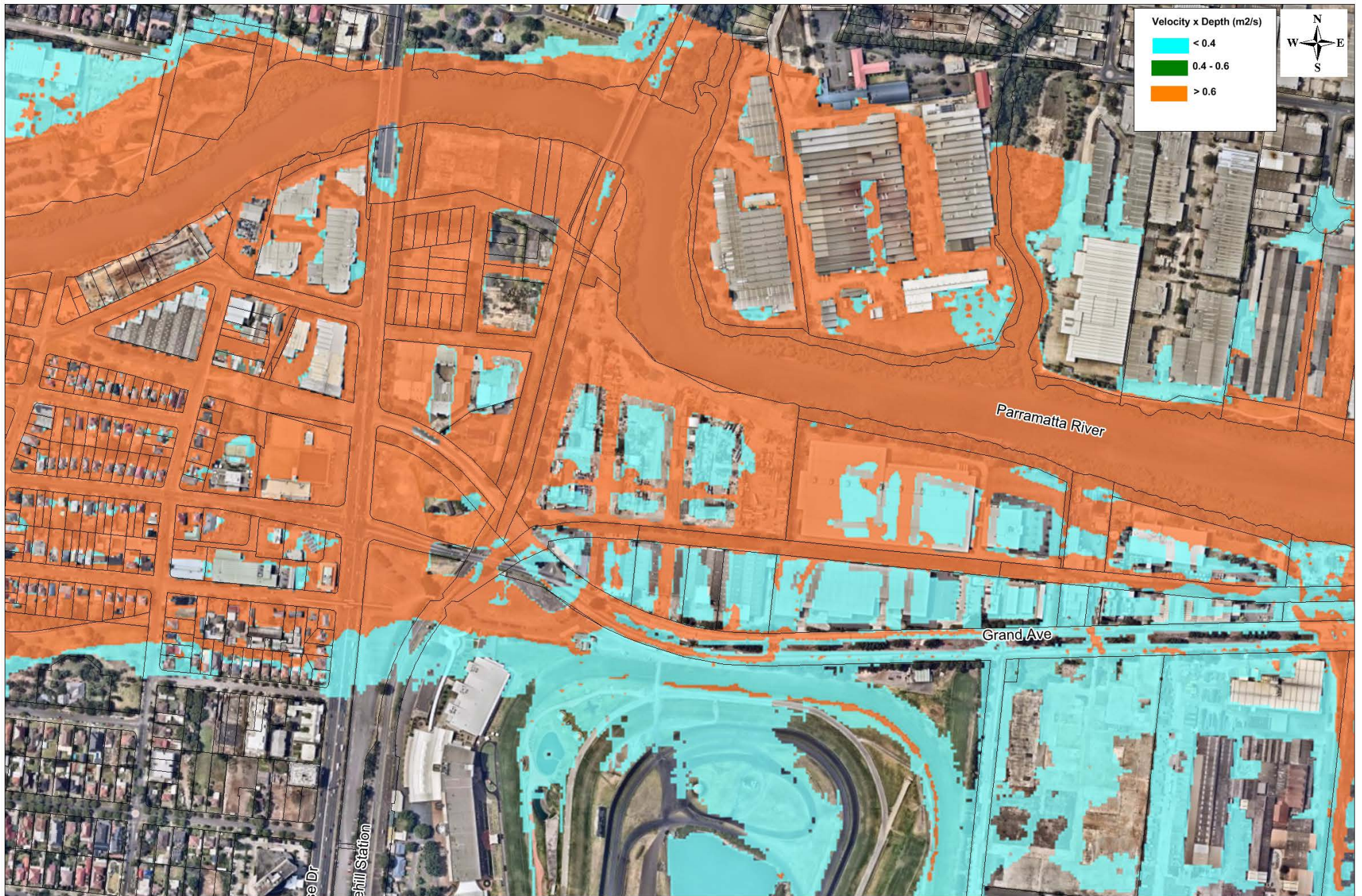


Figure 21 PMF Velocity x Depths – Landfill Strategy



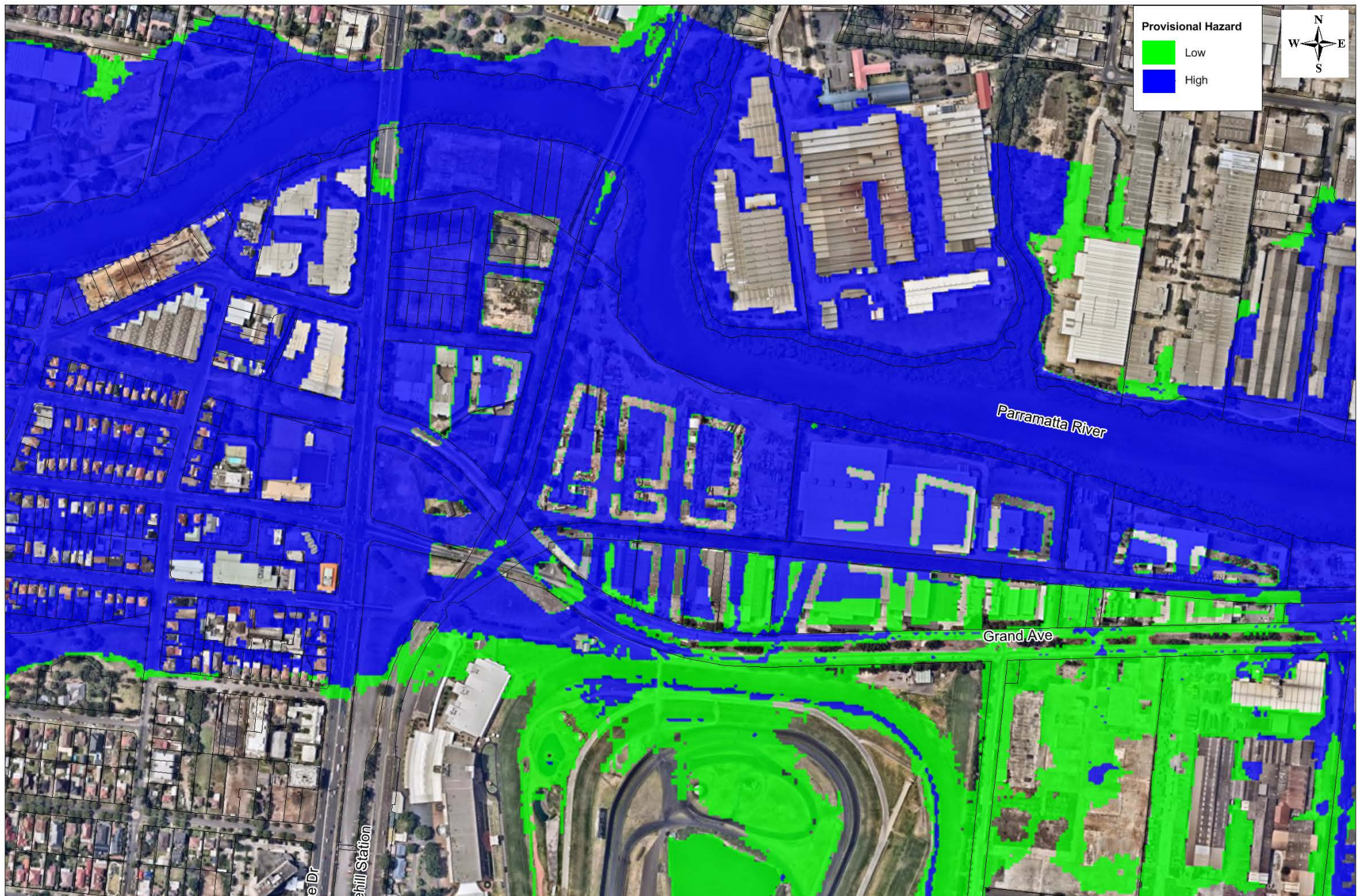


Figure 22 PMF Flood Hazards – Landfill Strategy



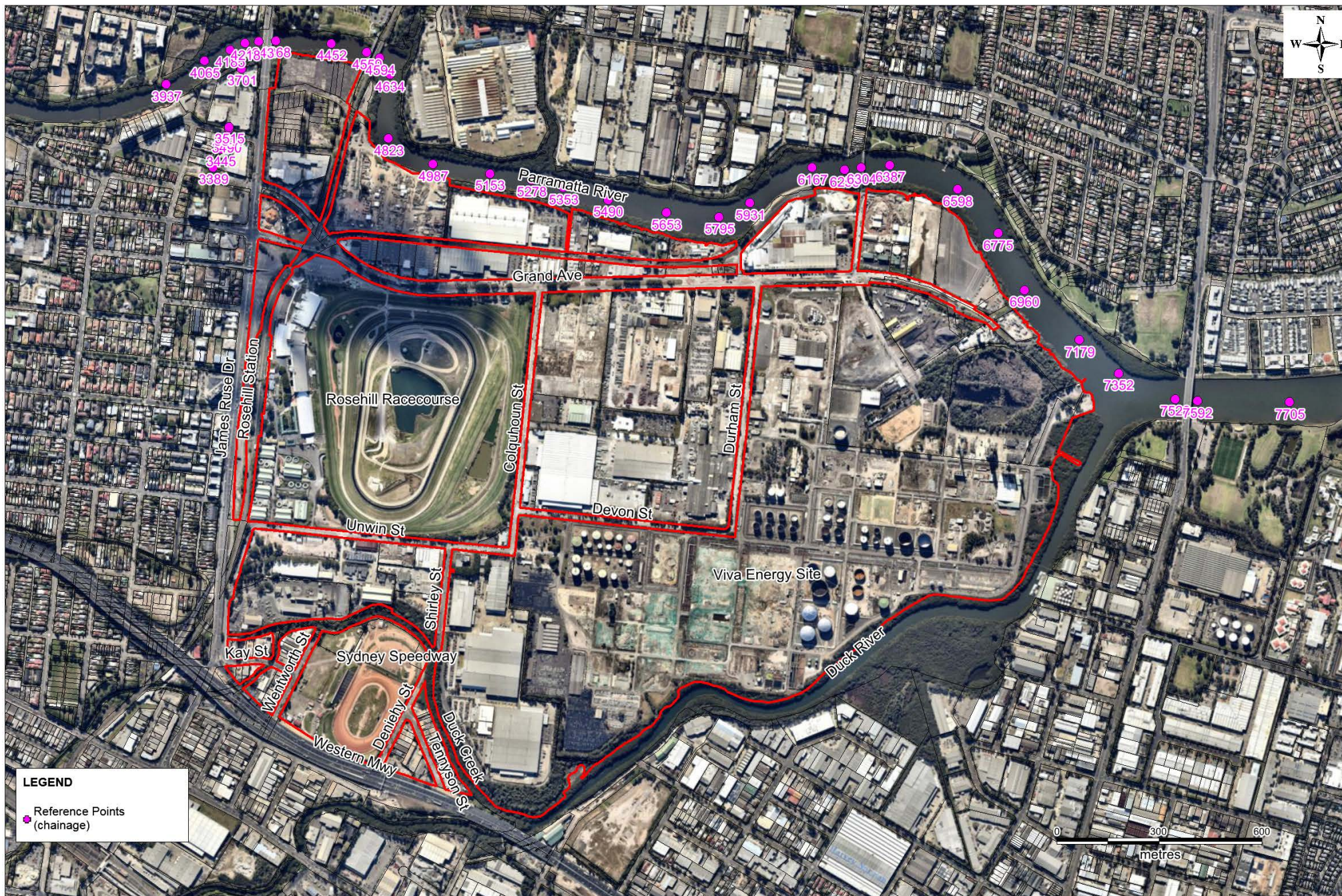
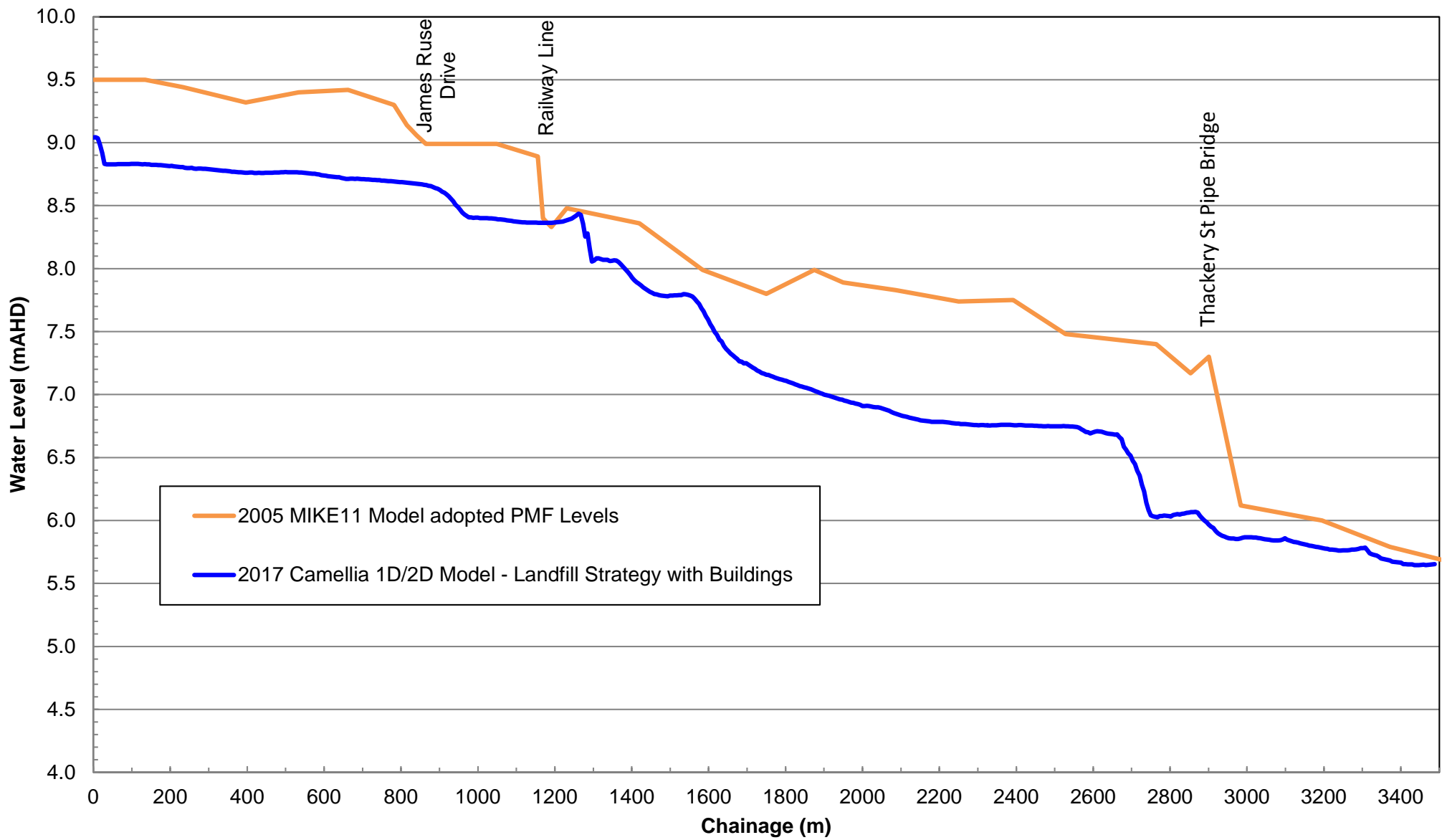


Figure 23 Reference Locations





**Figure 24** Comparison of Adopted PMF Levels and PMF Levels under Landfill Strategy along the Parramatta River



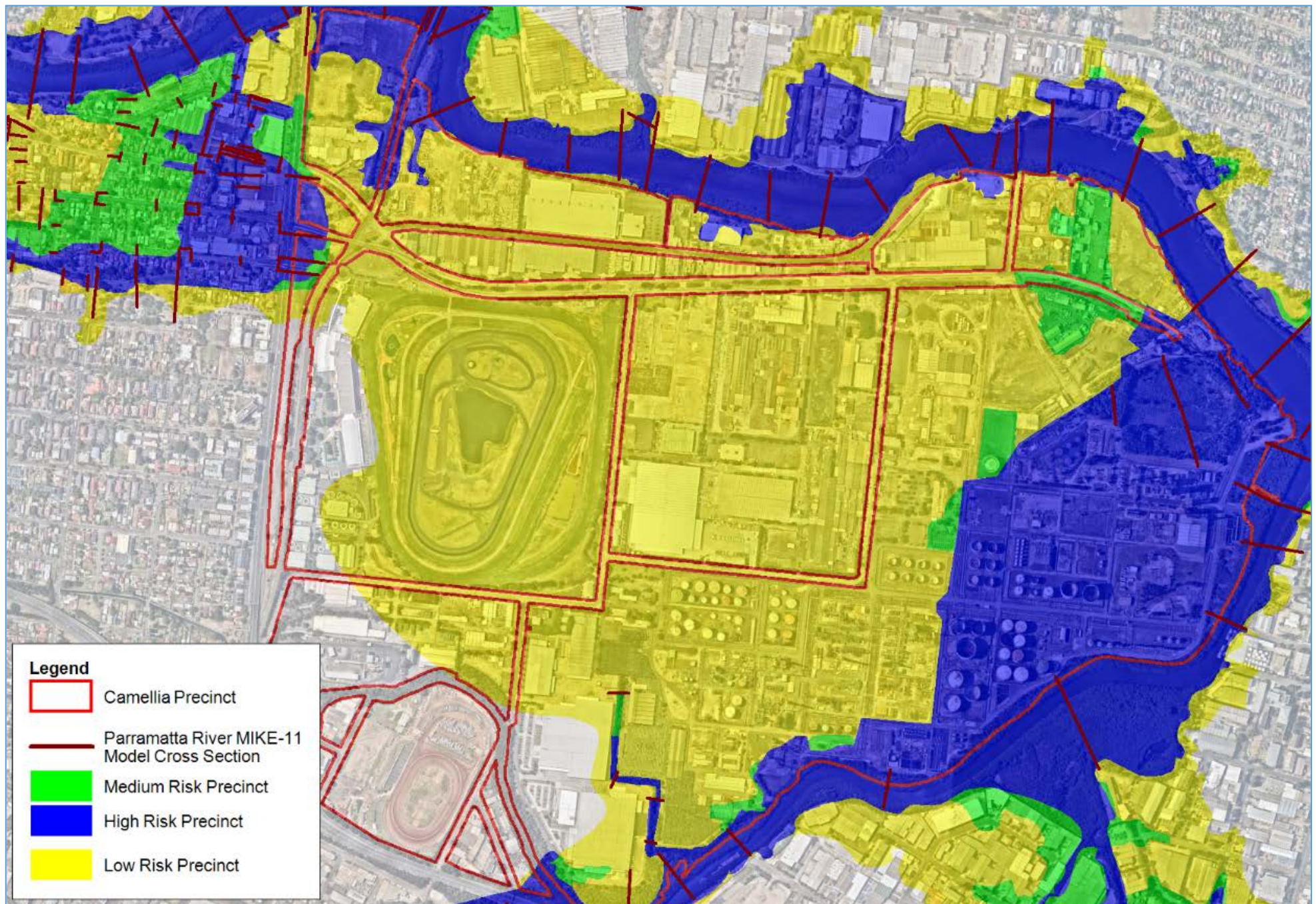


Figure 25 Camellia Flood Risk Precincts (Source: Parramatta City Council, 2015)



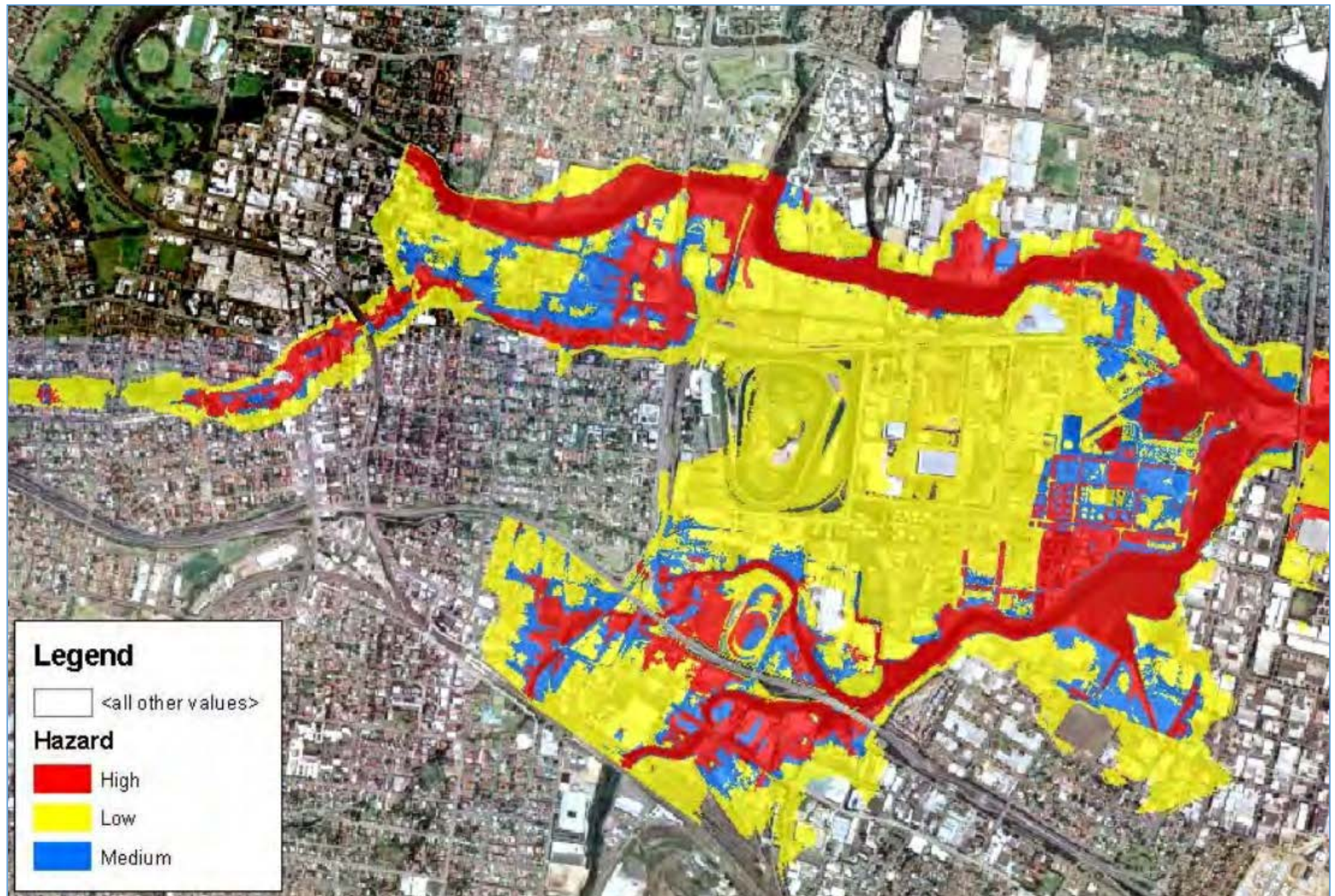


Figure 26 Camellia Flood Risk Precincts (Source: Figure 3-3, Volume 1, SKM, 2005)



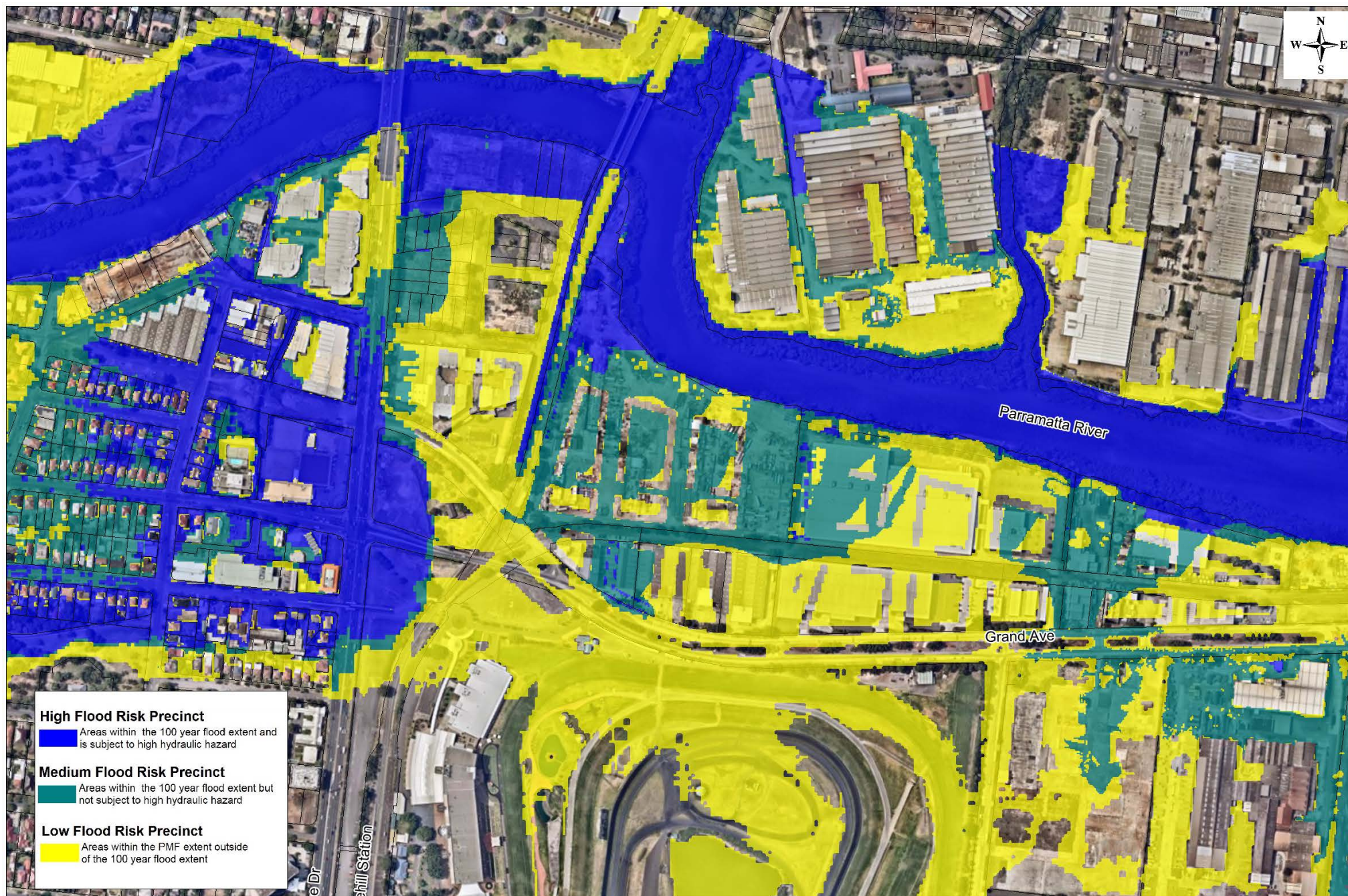


Figure 27 Interim Camellia Flood Risk Precincts (based on Landfill Strategy)







# APPENDIX A

## LANDFILL STRATEGY EARTHWORKS VOLUMES



## A.1 Typical Sections

The concept landfill strategy evolved through the iterative testing of a total of 13 landfill scenarios to identify a landfill strategy which is viewed as having acceptable impacts. The aim was for the landfill strategy to have minimal impacts on 100 yr ARI flood levels and acceptable impacts in the PMF levels in any areas adjoining the Camellia Town Centre and in particular on residential and light industrial properties located west of James Ruse Drive.

In order to document the intent of the landfill strategy and the proposed finished levels various section were plotted to compare existing ground levels and proposed future finished ground levels.

**Figure A.1** identifies the alignment and direction of cross sections AA to GG.

Sections AA, BB, CC, GG, FF, DD and EE are plotted in **Figure A.2, A.3, A.4, A.5, A.6, A.7** and **A.8** respectively.

It is noted that:

- Sections CC, GG, FF and DD highlight the way the future ground levels were interpolated between Grand Ave, the Light Rail corridor and the northern limit of fill (refer **Figure 5**). These sections also disclose that the existing terrain appears to project ground levels on the southern side of building fronting Grand Ave through the existing buildings.
- Section GG passes between two existing buildings fronting Grande Ave and appears to disclose a platform this is less pronounced than Section CC.
- Section FF discloses a similar platform under Existing Conditions while the platform in Section DD is less pronounced.
- Section EE discloses areas of fill and cut.

These cross sections explain why **Figure 6** shows areas of cut between Grand Avenue and the goods rail line (future Light Rail corridor).

## A.2 Earthworks Volumes

The volumes of cut and fill under the landfill strategy were estimated also in the two areas identified in **Figure A.9**.

The estimated cut and fill volumes are summarised in **Table A.1**.

### Concept Future Surface Levels Only

A copy of the maximum future ground levels is identified as **Figure 28**.

The indicative cut volume is 27,300 m<sup>3</sup>.

This cut is primarily in the zone between Grande Ave and the Light Rail corridor as highlighted in **Figure A.9**. It coincides with a number of existing building footprints in this area.

The indicative fill volume is 102,500 m<sup>3</sup>.

Around 47,000 m<sup>3</sup> is between James Ruse Drive and the Railway line (Area 2) while the remaining 55,500 m<sup>3</sup> is primarily located between the Light Rail corridor and the Parramatta River.

### Concept Future Surface Levels with 0.5 m Capping Layer

There is no allowance in the above calculated volume for additional cut of contaminated soils anywhere within the Town Centre in order to replace soils with clean fill in order to achieve a minimum 500 mm capping layer throughout the Town Centre.



Assuming all soil is contaminated then if the ground level was excavated 500 mm below the concept future ground levels and this was then replaced by clean fill to ensure not less than 500 mm of clean fill beneath the future ground levels across the whole town centre then the overall cut volume would be around 104,100 m<sup>3</sup> and the overall fill volume would be 179,300 m<sup>3</sup>.

It should be further noted that these estimates are based on ALS data with its associated limit of accuracy. ALS is also unable to provide any levels with the existing industrial buildings located within the precinct.

**Table A.1 Estimated Earthworks Volumes**

	Area1	Difference	Area2	Difference	Total (m3)
Area (m2)	211,393		55,946		
<b>Future Surface Only</b>					
Cut (m3)	24,961		2,364		27,325
Fill (m3)	55,500		47,003		102,503
<b>Future Surface with 0.5 m Capping Layer</b>					
Cut (m3)	91,398	66,437	12,708	10,344	104,106
Fill (m3)	16,241	-39,259	29,374	-17,629	179,285
	Note4				
	121,938		57,347		
	Note1	Note2	Note1	Note2	Note3
Check Vols	105,697	105,696	27,973	27,973	133,670
Note1 Vol = 0.5 m cut uniformly over complete area Note2 Vol = Change in cut Volume - change in Fill volume Note3 Sum of Note1 volumes Note4 Vol = residual fill vol + volume of cut to lower finished surface level by 0.5 m					



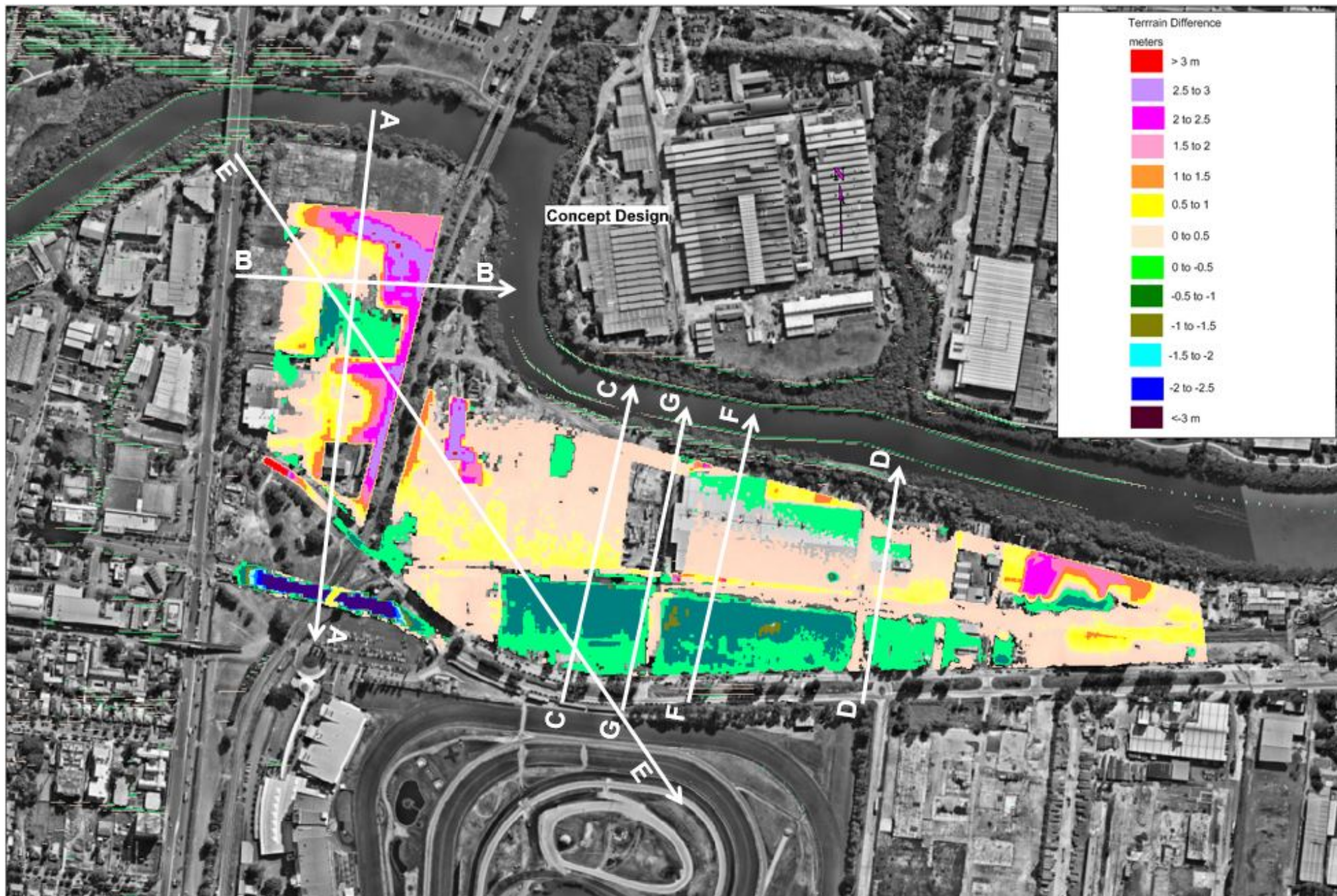


Figure A.1 Cross Sections Locations and Extents



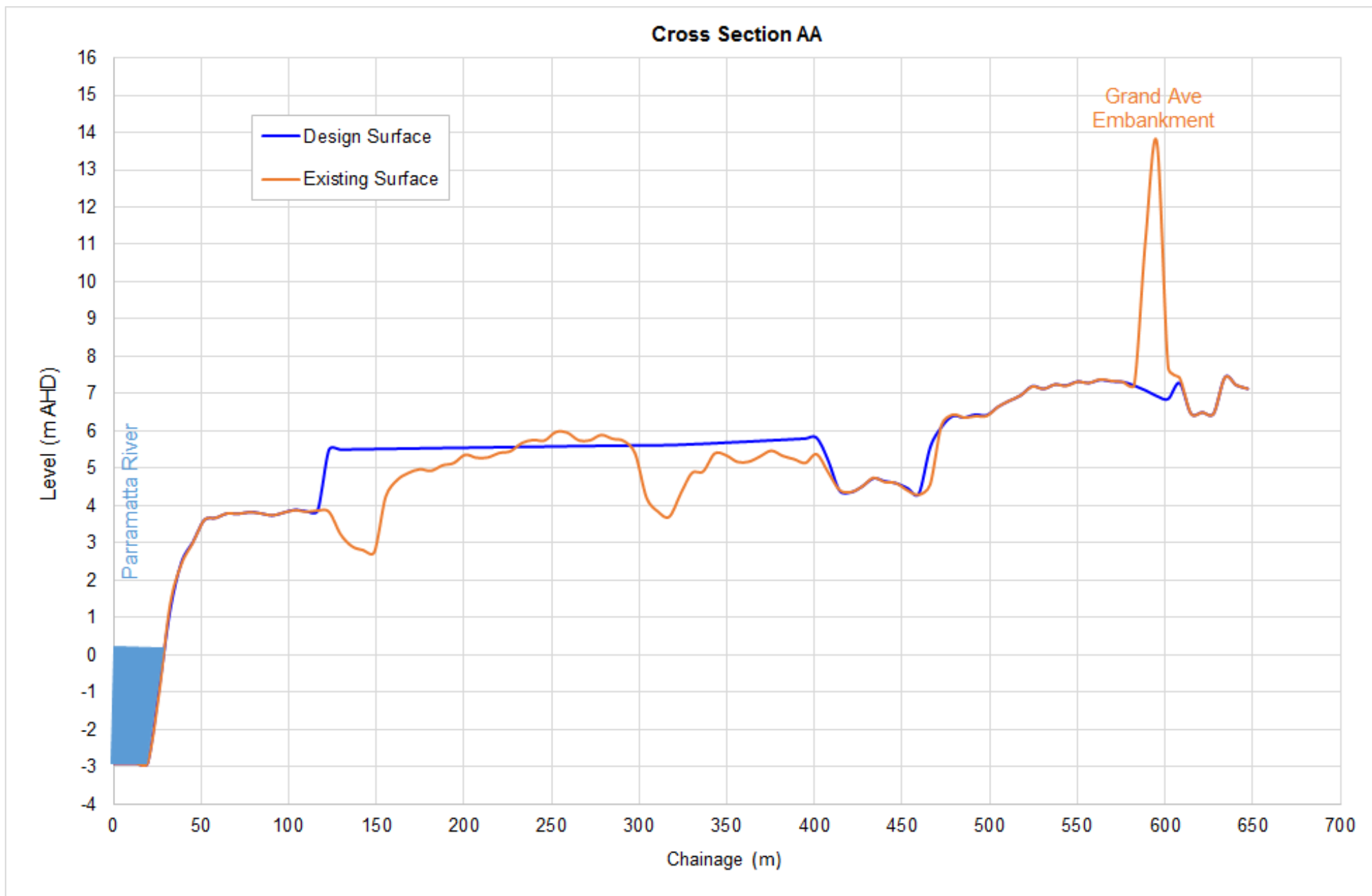


Figure A.2 Section AA



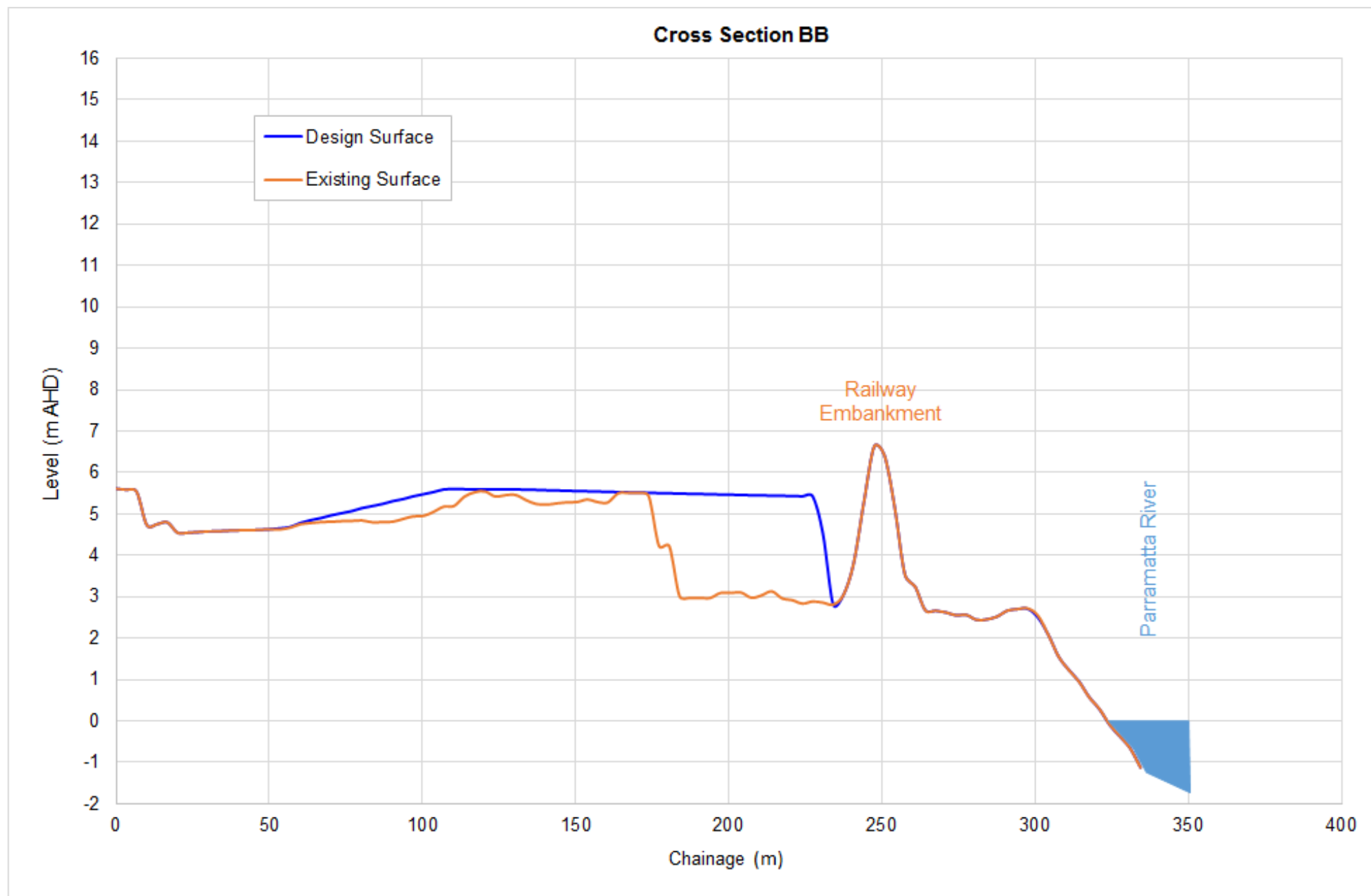


Figure A.3 Section BB



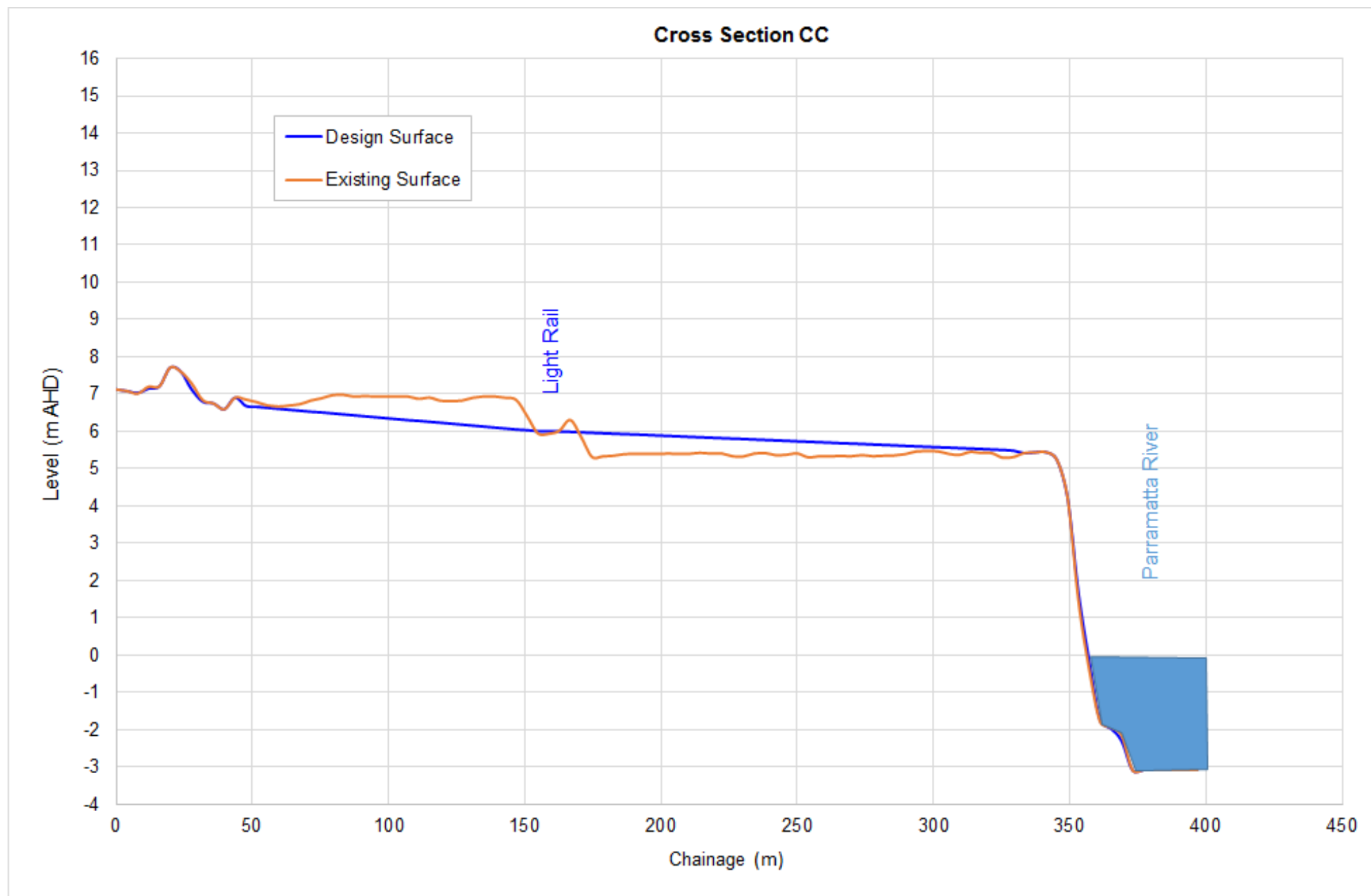


Figure A.4 Section CC



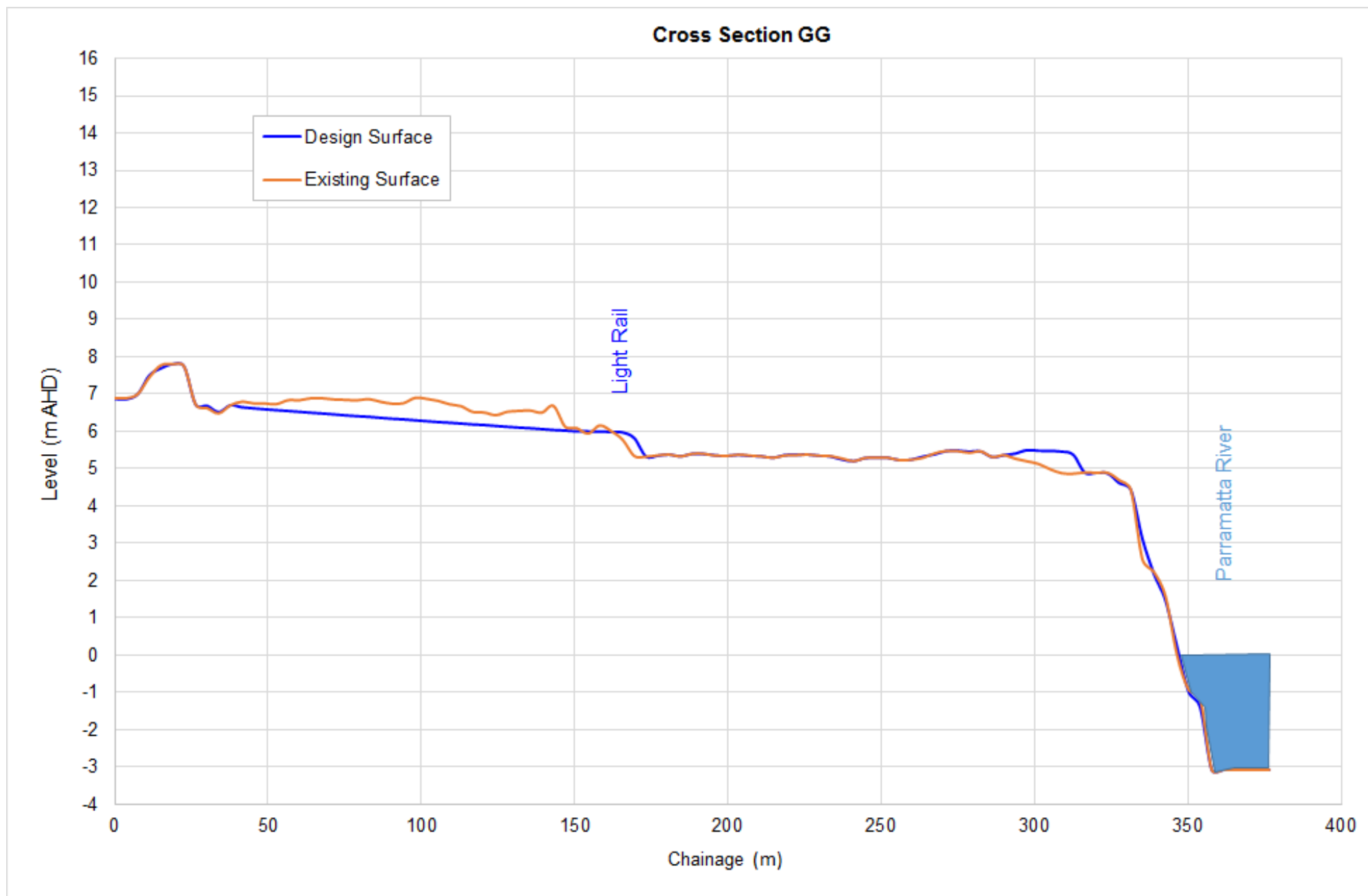


Figure A.5 Section GG



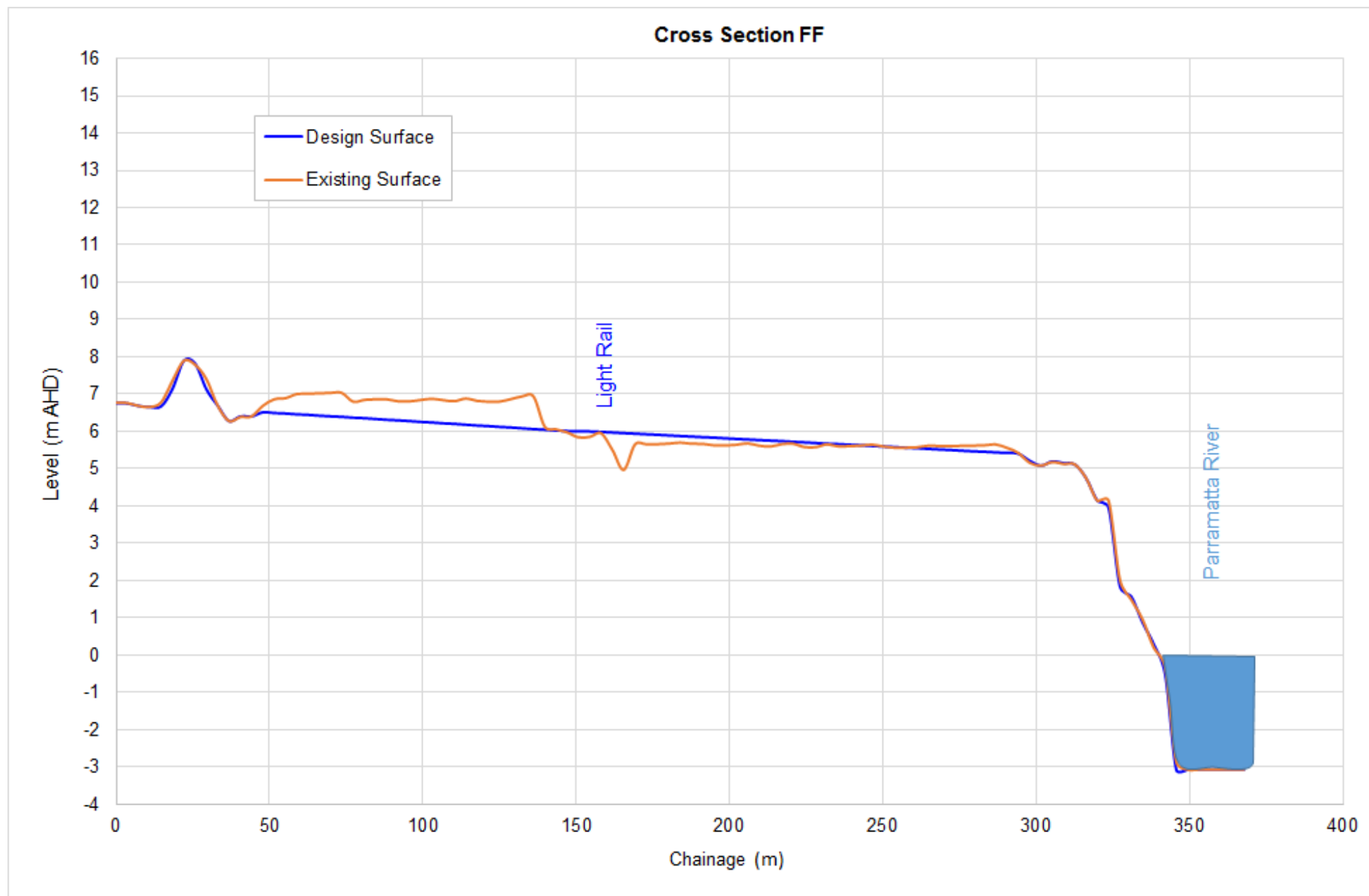


Figure A.6 Section FF



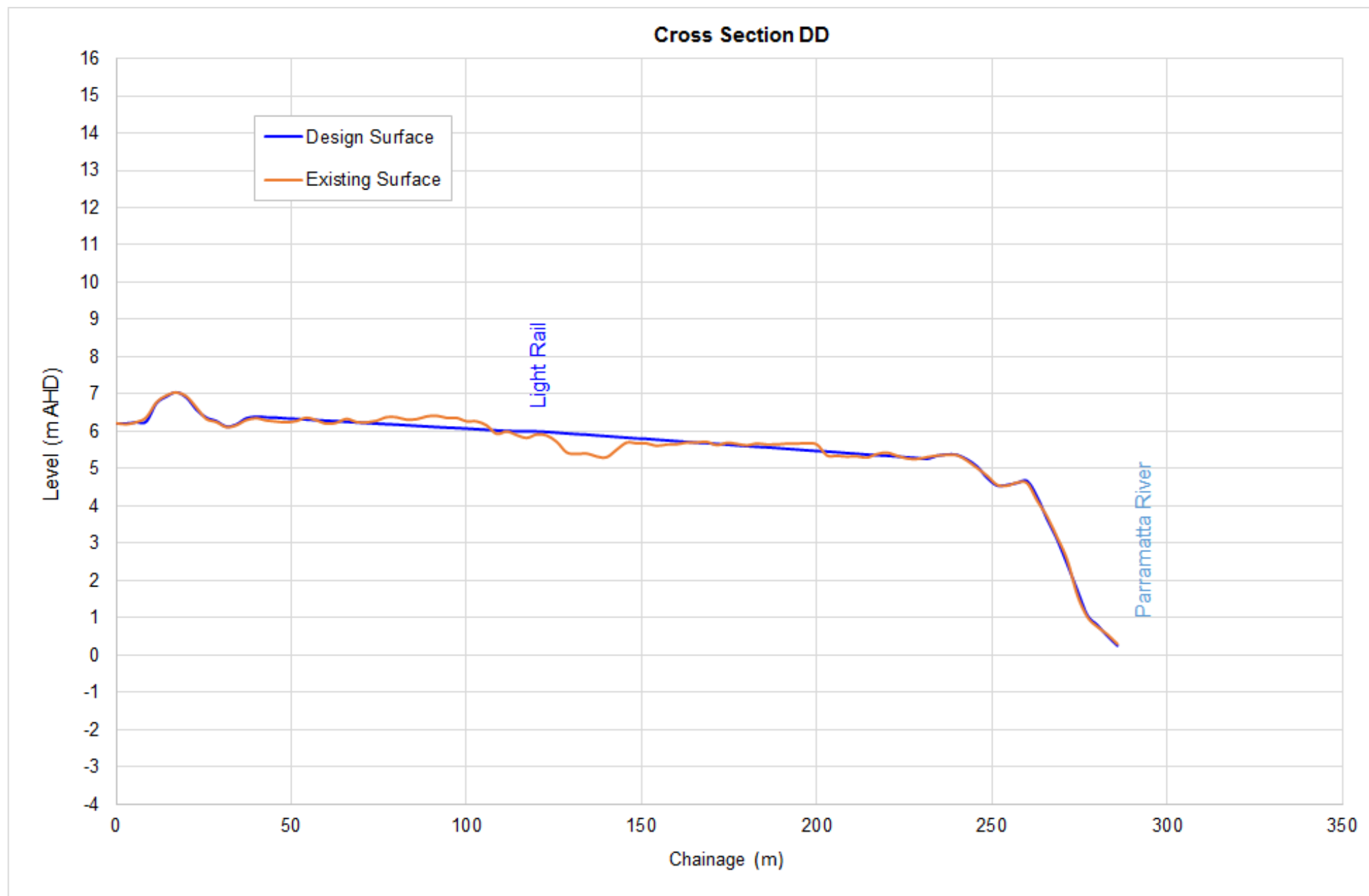


Figure A.7 Section DD



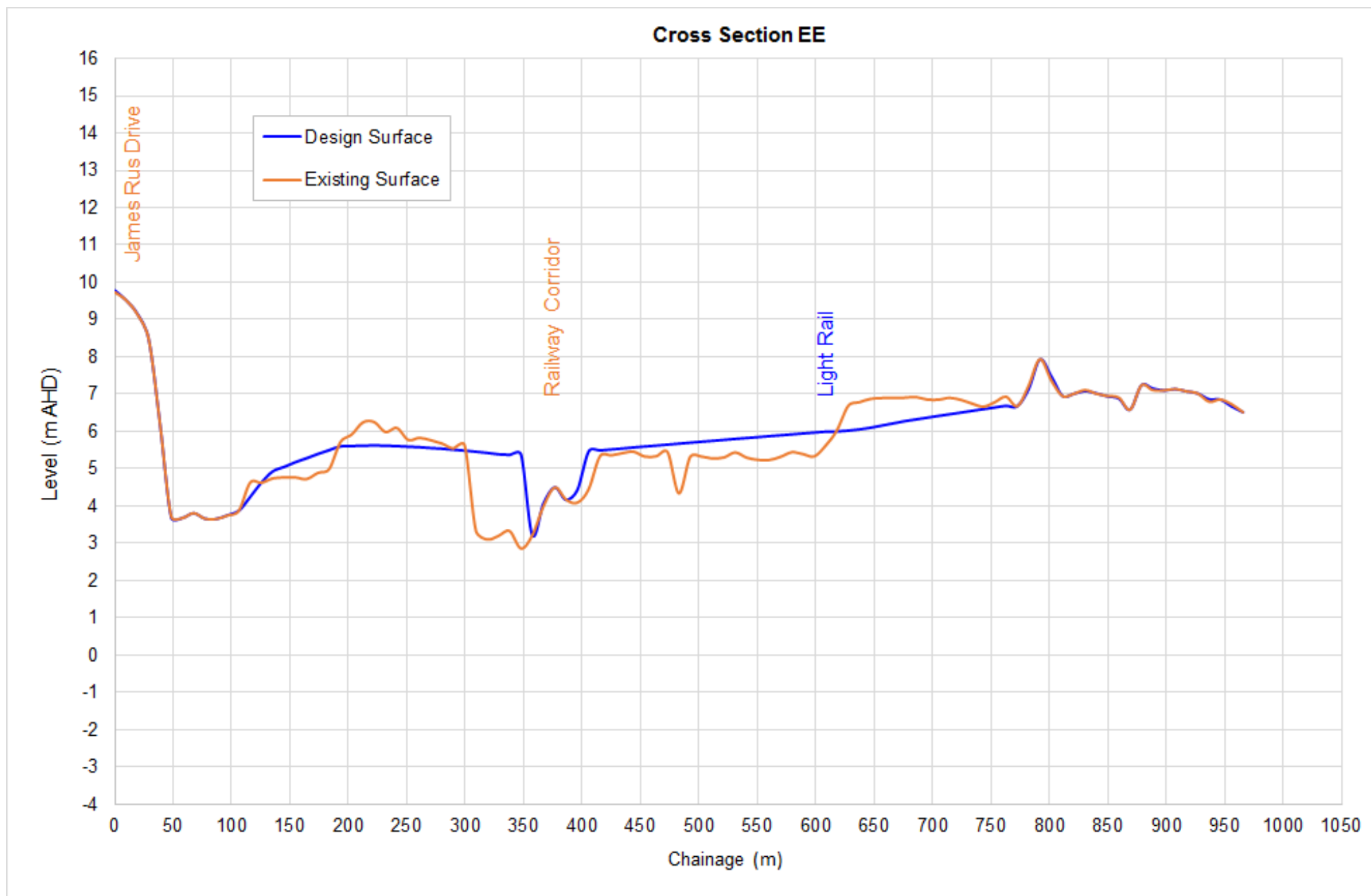


Figure A.8 Section EE



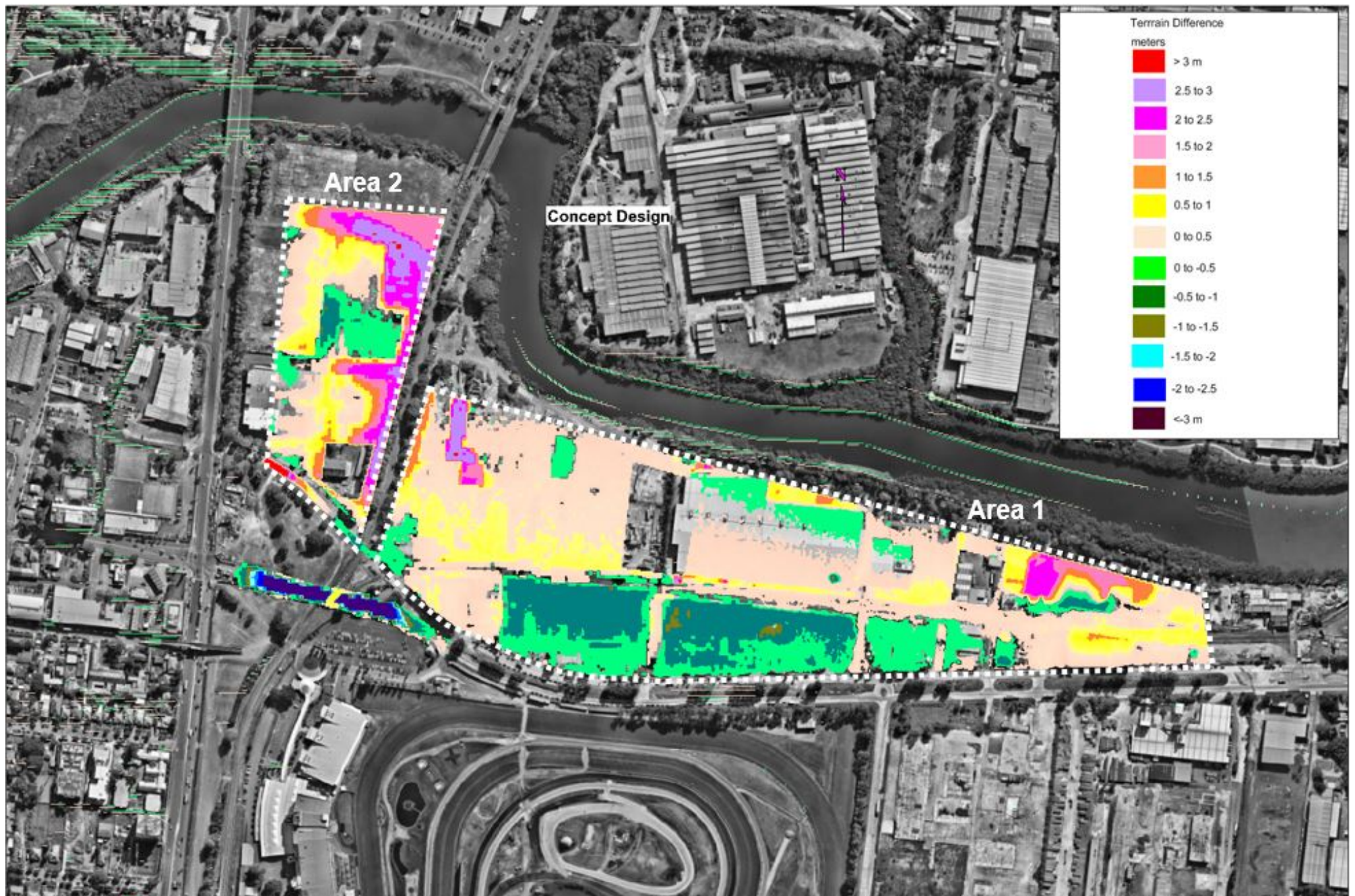


Figure A.9 Location of Areas for Cut and Fill Calculations



# APPENDIX B

181 JAMES RUSE DRIVE



## B.1 181 James Ruse Drive Flood Impact Assessment

In 2012 Mott MacDonald was engaged by Statewide Planning Pty Ltd to prepare a flood assessment in support of the proposed development works for the site identified as Camellia West, located at 181 James Ruse Drive, Camellia. This assessment was described by Mott MacDonald, 2012 as follows:

*It is proposed that the site be redeveloped with an end use of mixed commercial and high-rise residential activities.*

*Based on the findings of a Flood Enquiry application submitted to Parramatta City Council, we understand previous flood studies have shown the subject site to be flood affected from the Parramatta River.*

*An assessment of the Parramatta City Council flood map has indicated the following levels are relevant to the subject site:*

- *The 20 year ARI flood level is RL 4.14m AHD;*
- *The 100 year ARI flood level is RL 4.75m AHD; and*
- *The PMF level is RL 8.99m AHD.*

*Parramatta's Local Floodplain Risk Management Policy divides land within the catchment into flood categories based on the level of potential flood risk. By incorporating the above mentioned flood levels and interpreting Council's flood risk map as well as accounting for the general location of the site, we can make the assumption that the site is categorised as a High Flood Risk Precinct. We note however, that portions of the site are not subject to high hydraulic hazard and appropriate evacuation systems can be incorporated for the premises in the case of a major flood event. It can therefore be argued that sections (namely residential areas) of the site be categorised as falling within the Medium Flood Risk Precinct.*

*Mott MacDonald has undertaken two-dimensional (2D) flood modelling to determine the effect the development will have on flood storage and flow conveyance through the subject site, as well as demonstrating that the proposed development will have no adverse impacts on upstream/downstream properties. This report will outline the methodology and findings of the study as well as demonstrate the developments compliance with the Floodplain Matrix controls outlined in Parramatta Council's Local Flood Risk Management Plan.*

*The aim of this report is to:*

- *compare the extent of flooding within the site in a pre-to-post scenario; and*
- *demonstrate that the necessary requirements regarding floodplain risk management have been identified and that the proposed development complies with these requirements.*

## B.2 Modified Landfill Strategy

During stakeholder consultation regarding the landfill strategy, the possibility of merging the landform proposed under the planning proposal for 181 James Ruse Drive with the proposed landfill strategy elsewhere in the Town Centre to create a modified landfill strategy was raised. The impact of this approach on 100 yr ARI flooding is summarised as follows.

**Figure B.1** plots the 100 yr ARI flood extent and flood levels through 181 James Ruse Drive and in adjoining areas under Pre-Development Conditions estimated by Mott MacDonald in August 2012. It is noted that the very local model assembled by Mott MacDonald did not allow flows from the Parramatta River to spill across the Clay Cliff Creek floodplain and across James Ruse Drive into 181 James Ruse Drive.



It is also noted that the 100 yr ARI flood levels estimated between James Ruse Drive and the railway line under the proposed landfill strategy are slightly higher than estimated by the 2005 MIKE-11 model and the 2012 Mott MacDonald local model.

**Figure B.2** is an annotated 100 yr ARI flood extent and flood levels under Post-Development Conditions plotted by Mott MacDonald in August 2012. It is noted that the corridor of low lying land adjacent to the railway line which lies within 181 James Ruse Drive is not filled in the 2012 flood impact assessment but is proposed to be filled under the proposed landfill strategy.

The assumed intent of the planning proposal for 181 James Ruse Drive is to fill the development to a level which is just above the 100 yr ARI flood level within the proposed development ie. to achieve the flood extents plotted in **Figure B.2**.

In view of the uncertainty as to the local impact that this fill may have on 100 yr ARI flood levels the development footprint was filled to a level well above the 100 yr ARI flood level.

The resulting indicative 100 yr ARI flood levels are plotted in **Figure B.3**.

The estimated 100 yr ARI flood level differences under the modified landfill strategy in comparison with Existing Conditions are plotted in **Figure B.4**.

It is concluded that the modified landfill strategy would locally increase the 100 yr ARI flood levels west of James Ruse Drive by up to 0.8 m over a widespread area. It is expected that this would be unacceptable to the City of Parramatta and that the concept landform within 181 James Ruse Drive will need to be modified from the landform proposed in 2012.





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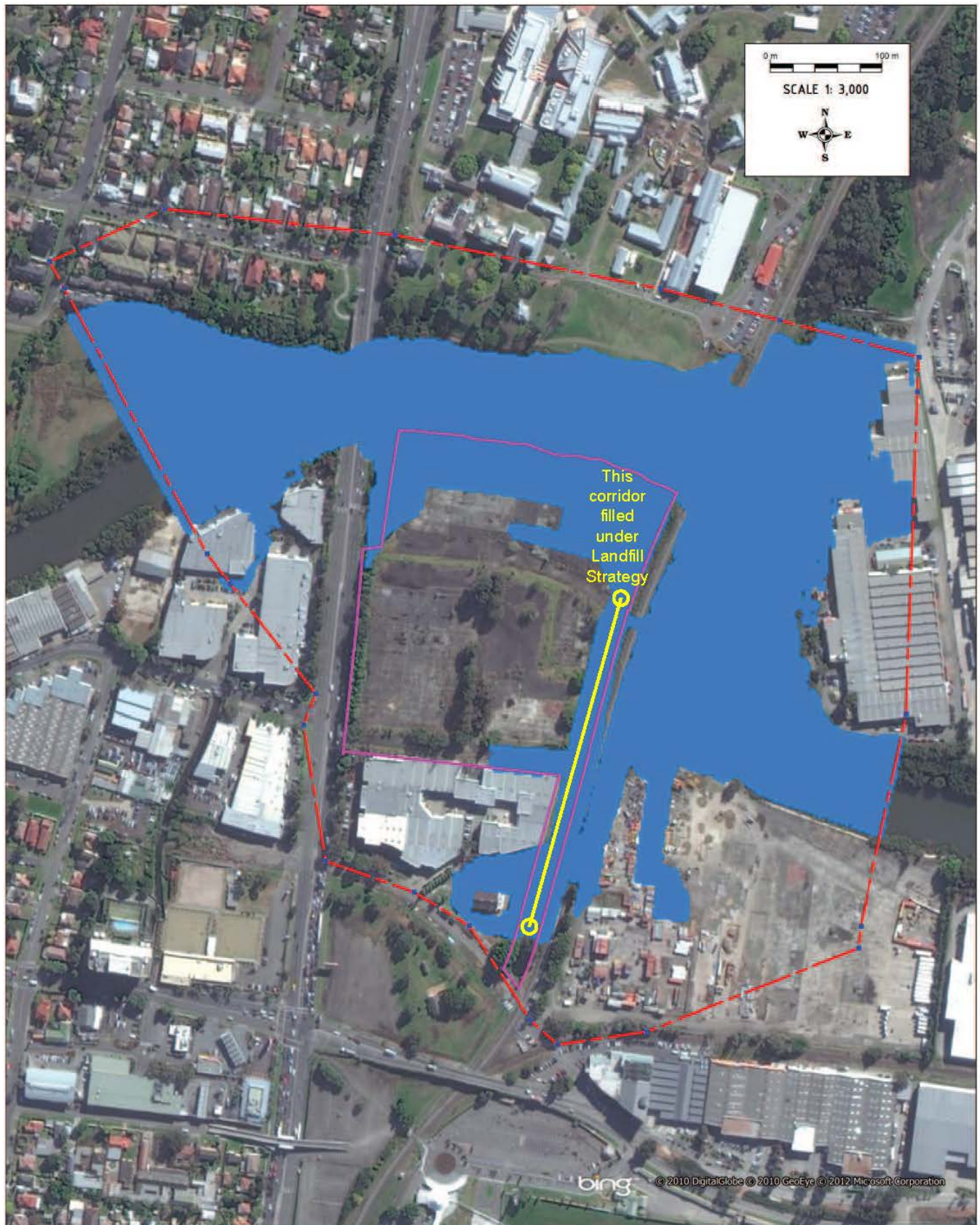
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**308388-CIV-FL-SK-001**  
**CAMELLIA WEST FLOOD MODELLING**  
**PRE-DEVELOPMENT**  
**100 YEAR ARI FLOOD EXTENTS**



**Figure B.1 100 yr ARI Pre-Development Flood Extents**  
 (after Figure 308388-CIV-FL-SK-001, Mott MacDonald, 2012)





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**308388-CIV-FL-SK-002**  
**CAMELLIA WEST FLOOD MODELLING**  
**POST-DEVELOPMENT**  
**100 YEAR ARI FLOOD EXTENTS**



**Figure B.2 100 yr ARI Post-Development Flood Extents**  
(after Figure 308388-CIV-FL-SK-001, Mott MacDonald, 2012)





Figure B.3 100 yr ARI Flood Extent and Levels – Modified Landfill Strategy



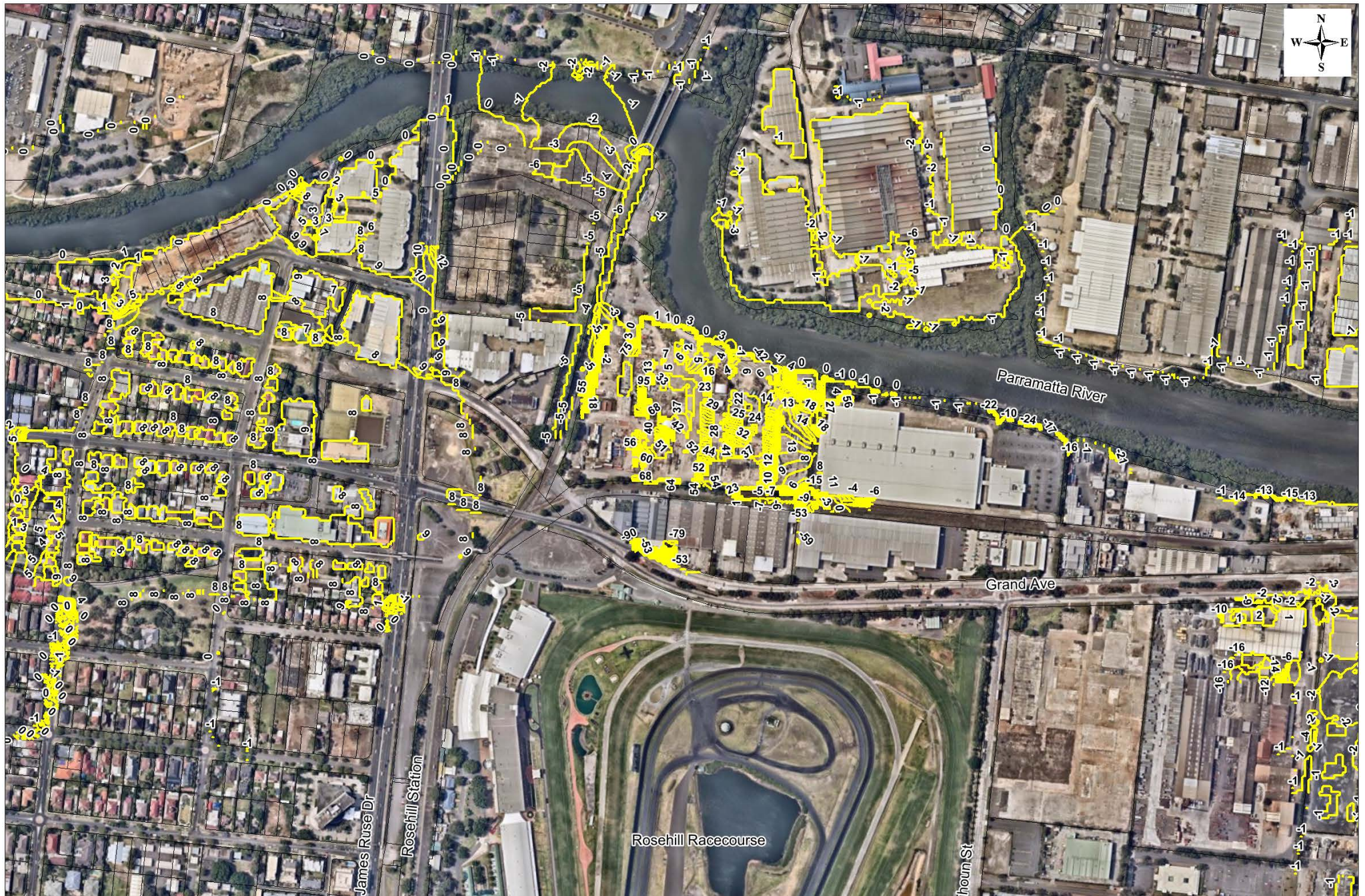


Figure B.4 100 yr ARI Level Differences - (Modified Landfill Strategy – Existing Conditions)