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SUSTAINABLE WATER
STORMWATER & RUNOFF
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Dear Rowan

RE: 20&21 Boorea Ave Lakemba – Flooding Assessment Addendum

Introduction

Council has requested *“expanded flood modelling that assesses upstream and downstream impact of making changes to the site”*. It is well understood that the proposed development increases the flood width which is expected to decrease or maintain existing flood levels however Council seeks proof by way of modelling.

This letter describes the assessment undertaken and the key assumptions adopted.

Hydraulic Modelling

The 1-dimensional hydraulic model has been conducted using a HEC-RAS which is commonly used for these types of assessments. HEC-RAS is a computer program for modelling water flowing through systems of open channels and computing water surface profiles. A peak flow rate is applied to the model comprising of multiple cross-sections with appropriate roughness coefficients.

The flood levels and flow rate for 1% AEP event in Coxs Creek channel have been sourced from Canterbury-Bankstown Council. The flowrate provided by Council and subsequently adopted is 63.52m³/s. The flooding levels of the existing were compared to the flood levels provided by Council to verify the model including roughness coefficients.

The cross sections are extracted using combination of LiDAR, survey completed by Craig & Rhodes, Google Map and Nearmap. The cross sections are created for the existing conditions and future development condition. The location of the cross sections and the comparison of existing and future development cross sections for the site (cross sections C and D) are presented in Figures 1 and 2. The model has been calibrated to match the existing flood levels provided by Council at cross sections A and E.

The schematic of the developed model is shown in Figure 3.

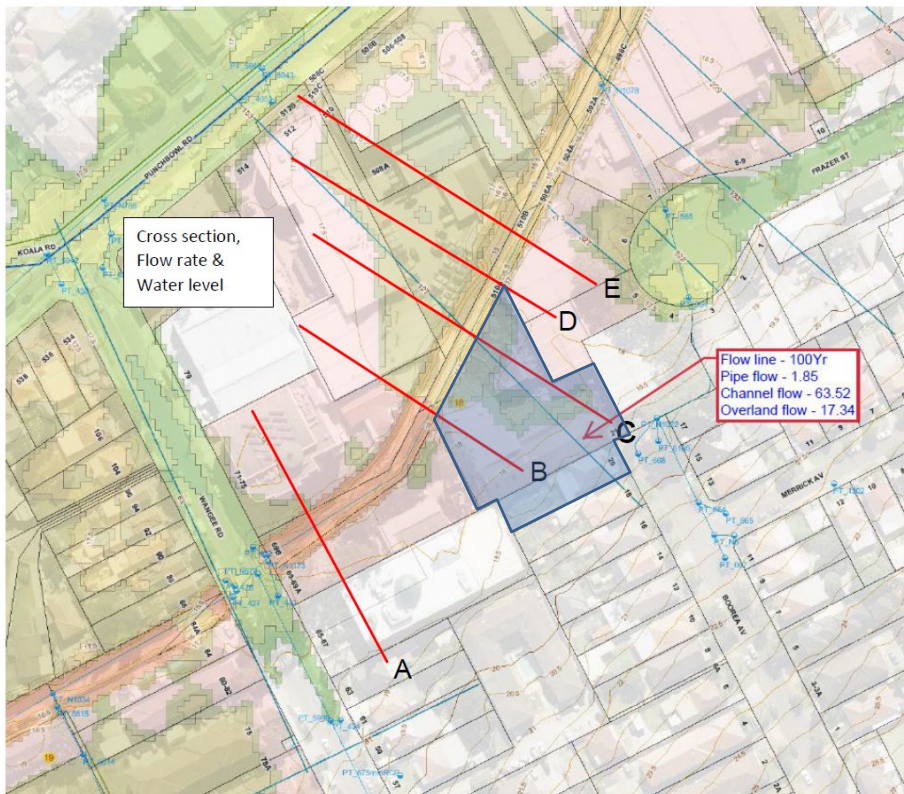


Figure 1: Locations of the cross sections

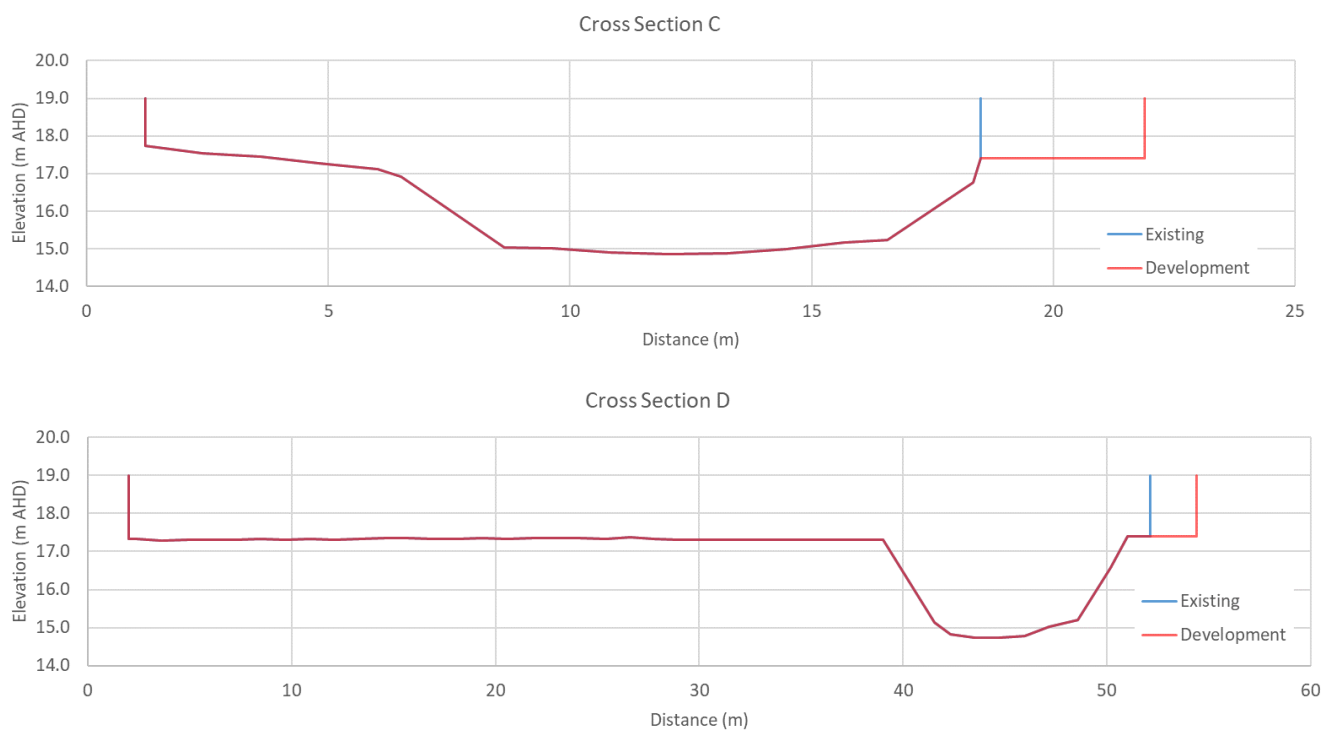


Figure 2: Existing and future development cross sections

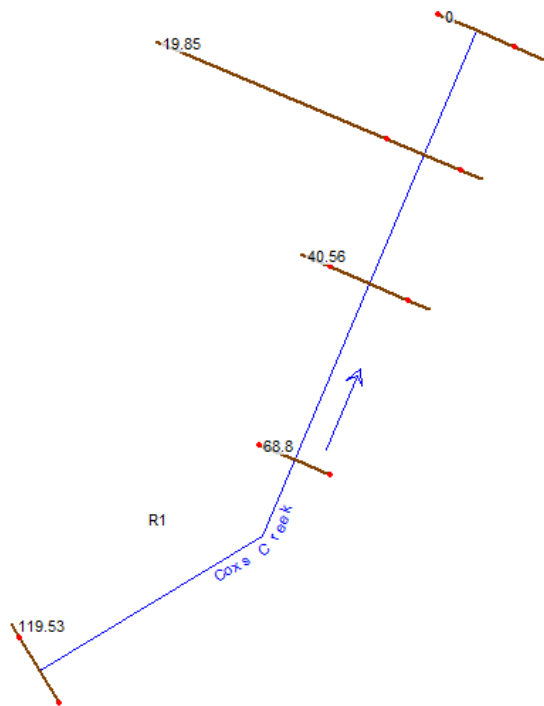


Figure 3: Schematic of the model in HEC-RAS

Modelling Results

The model was calibrated for the existing condition and subsequently re-run for the proposed development condition. The flood levels were then compared to calculate the flood afflux. The results show that the flood levels at the five cross section locations are reduced between 0 to 7mm.

The primary sections of interest are cross sections C and D and these are provided in Figure 4. The results for all cross sections have been provided in Figure 5 showing the long-section or water surface profile and Table 1 providing the calculated change in flooding levels with the proposed development.

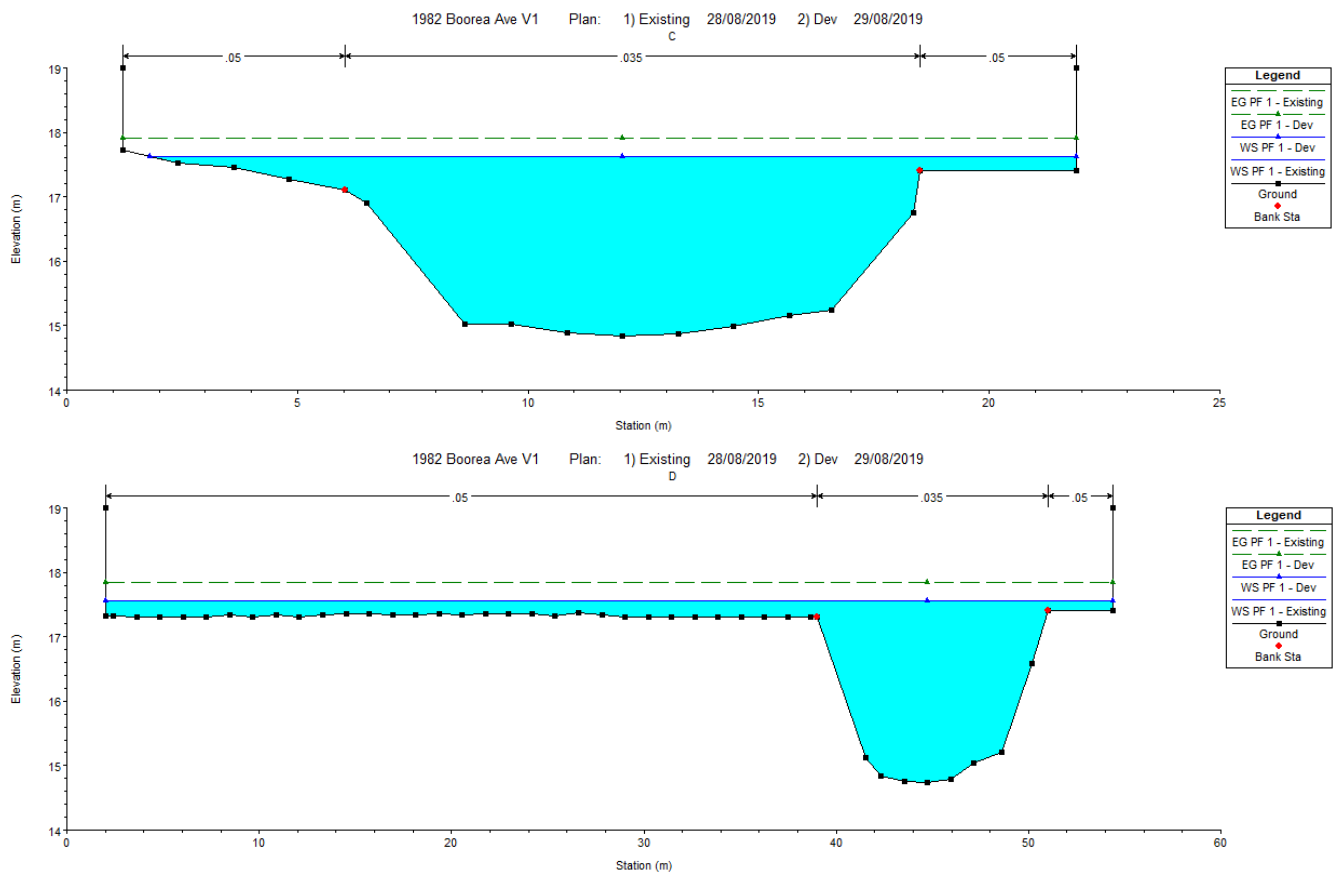


Figure 4: Results from the HEC-RAS model at the cross sections next to the site

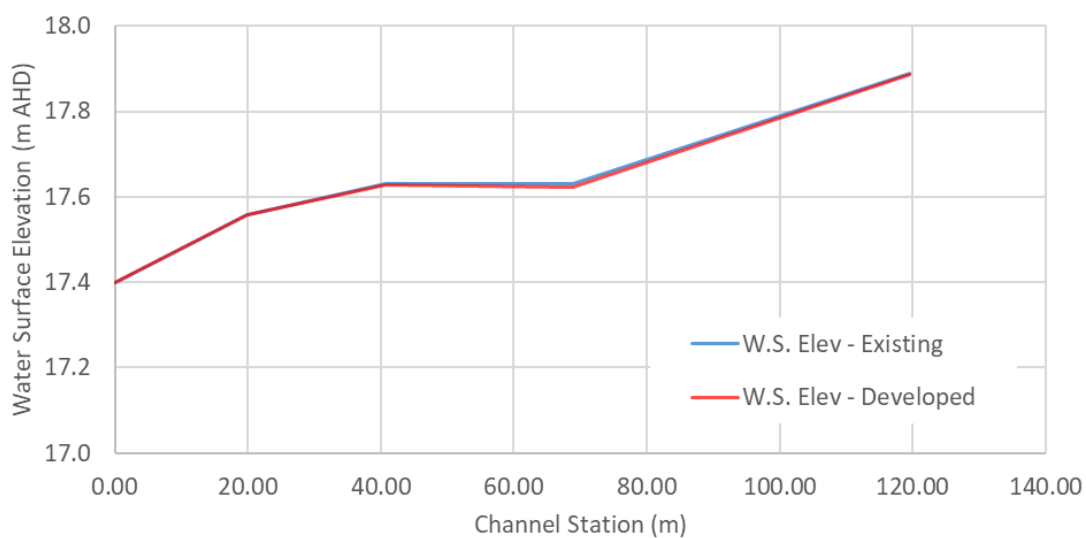


Figure 5: Flood levels for the existing and future conditions for 1% AEP

Table 1: Modelled afflux for the cross sections

Cross section	Afflux (mm)
A	-2
B	-7
C	-3
D	0
E	-1

Conclusion

The results of the 1-dimensional hydraulic modelling of the Coxs Creek for 1% AEP flood has shown that the proposed development will slightly reduce the flood levels in the Coxs Creek near the site location between 0 and 7mm which is consistent with previous expectations. Therefore, the proposed development has a small beneficial impact on flood levels experienced by neighbouring properties.

Yours sincerely



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