

SY200096

11 December 2023

Mark Butterfield
Central Coast Council
PO Box 20 Wyong, NSW 2259

CC: Hugo Cottier (Lahznimmo Architects)

Dear Mark,

Re: Memorandum – Gosford Regional Library - Overland Flow Study & Calculations

1. Introduction

Development Condition B25 of the Development Consent (DA21/14779) required the following:

“Prior to the issue of any relevant Construction Certificate an Overland Flow Study must be submitted to the satisfaction of the Secretary confirming that:

- a) Regarding at the interface between the loading dock and vehicular access at the southeastern corner of the site to discourage overland flows from the existing car park on the adjoining site to the rear entering the loading dock, and*
- b) The raised hump at the top of the vehicle crossing for the proposed loading dock and the re-instatement of the existing kerb t the rear of the proposed building to redirect overland flows away of the ingress of the building, and*
- c) Any other measures proposed to mitigate overland flow impacts on development would not have any impacts on surrounding properties.”*

This memorandum is intended to provide information regarding the calculations for the overland flow study performed to ensure that the intent of this condition has been satisfied.

2. Methodology

2.1 Catchment & Hydrology

The upstream catchment was determined using a combination of site-specific survey, LiDAR data as well as observation from site visits & google street view. Figure 1 presents the delineation of the upstream catchment, with a total area of 0.147ha.



CIVIL



STRUCTURAL



BUILDING
SERVICES



SUSTAINABILITY



Figure 1 - Upstream Catchment Extent

An ILSAX hydrological model was prepared using the run-off routing software DRAINS, using ARR2016 rainfall data obtained from the Bureau of Meteorology. Figure 2 presents a summary of the catchment characteristics adopted to determine the design flow rate. The catchment was conservatively adopted as 100% impervious area with a time of concentration of 5 minutes due to the steep topography.

Sub-Catchment Data

Sub-catchment name

Upstream_Cat

Sub-catchment area (ha)

0.1473

Use

Hydrological Model

☒ Default model
 ☐ You specify

☒ abbreviated data
 ☐ more detailed data

	Paved	Supplementary	Grassed
Percentage of area	100	0	0
Time of concentration (mins)	5	2	5

Notes

OK

Cancel

Customise Storms

Help

0.121

Figure 2 - Upstream Catchment Characteristics

The 1% AEP design flow rate was determined to be 121L/s.

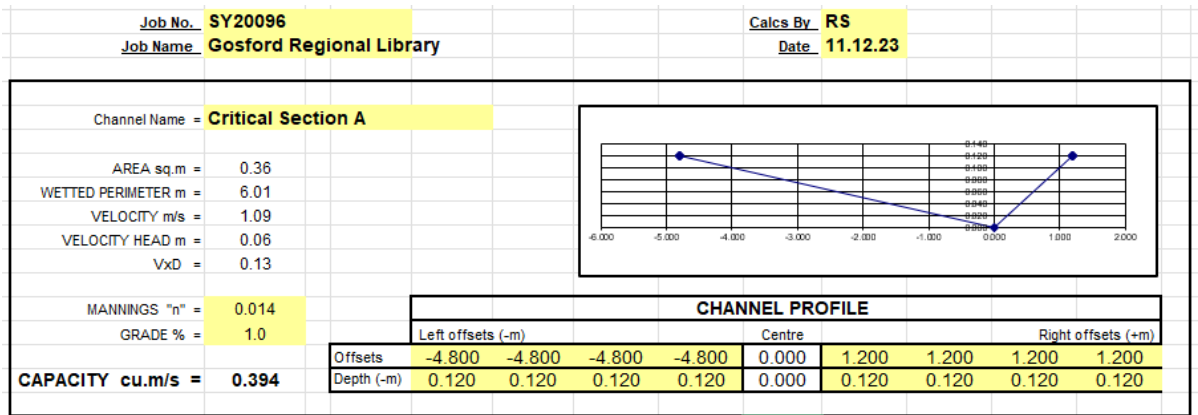


Figure 4 - Mannings Calculation - Critical Section A

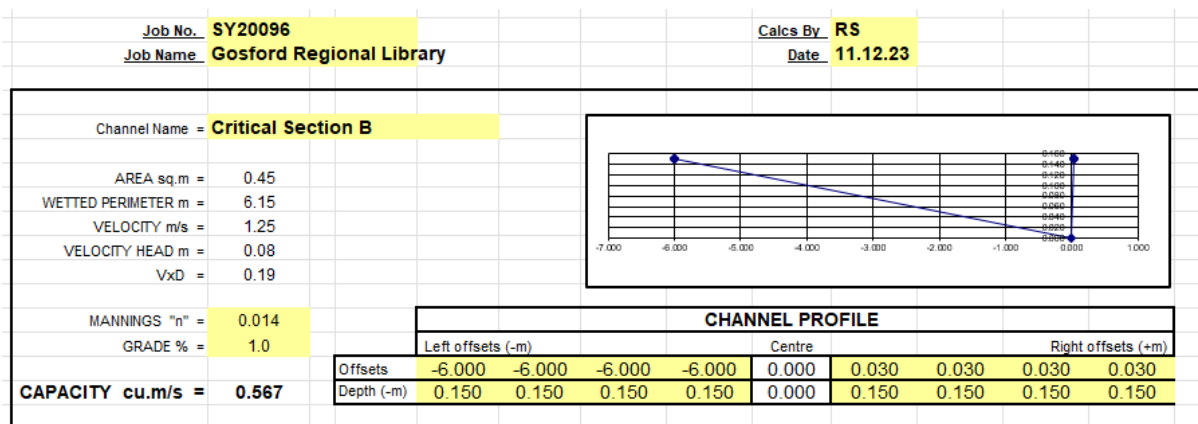


Figure 5 - Mannings Calculation - Critical Section B

As can be observed, the critical section (Section A) has a design capacity of 394L/s assuming the channel profile is flowing full. This has at least three times the capacity of the 1% design storm event, demonstrating there is sufficient redundancy to ensure overland flow does not risk overtopping the crest of the vehicle access.

3. Conclusion

Calculations have been presented for the overland surface flow study that was performed to ensure the intent of DA condition B25 was satisfied within the proposed civil design. It was demonstrated that the proposed levels and grading provides more than three times the design capacity of the peak flow anticipated in the 1% AEP design storm event.

We trust this meets your requirements. If you require clarification on the above, please feel free to contact the undersigned on (02) 4365 1668.



Robert Suckling

Civil Engineer

BE Civil (Hons 1), MIEAust