DEMLAKIAN
INTELLIGENT THINKING

14 September 2021
REF: 219120rpt20210914_AM_Water Management Report

RE: RESPONSE TO COUNCIL COMMENTS FOR PROPOSED DEVELOPMENT
351 BARRENJOEY ROAD NEWPORT

1. Introduction

Demlakian Consulting Engineers have been commissioned to prepare stormwater and water management concept plans for the proposed development at the above site. These plans and this report have been formulated to address the requirements set out by Pittwater 21 Development Control Plan Section B5.15 Stormwater in accordance with Council's Water Management for Development Policy

This report should be read in conjunction with Demlakian Consulting Engineers Drawings 219120-SW00 to SW04 which outline the proposed storm water management system. Reference should also be made to the Architectural Drawings prepared by Crawford Architects on which basis this report has been prepared.

The proposed residential apartments are located at 351 Barrenjoey Road Newport. The site is currently a set of residential houses which are to be demolished completely prior to the construction

2. Storm Water Runoff Management

As per the Council's Water Management for Development Policy, the development is in Region 1, which requires "*the development does not increase stormwater discharge downstream of the land over and above that of the existing stormwater discharge conditions up to the 1% AEP storm event*". To achieve this, we are proposing the construction of an OSD with an orifice plate to control all from the site to pre-development conditions. The calculations were completed using Drains and below is the modelling used to calculate and reduce the flows from the developed site.

The results of the calculations have been tabulated in Table 1, outlining the design to be conforming with the council policy.

Storm Event	Pre-Development Discharge	Post Development Discharge	Discharge from Orifice and OSD	Discharge From Bypass	Total Post Development Discharge
50% AEP – Critical Discharge Event	29 L/s	36 L/s	28 L/s	1 L/s	29 L/s
1% AEP-Critical Volume	89 L/s	95L/s	62 L/s	2 L/s	64 L/s

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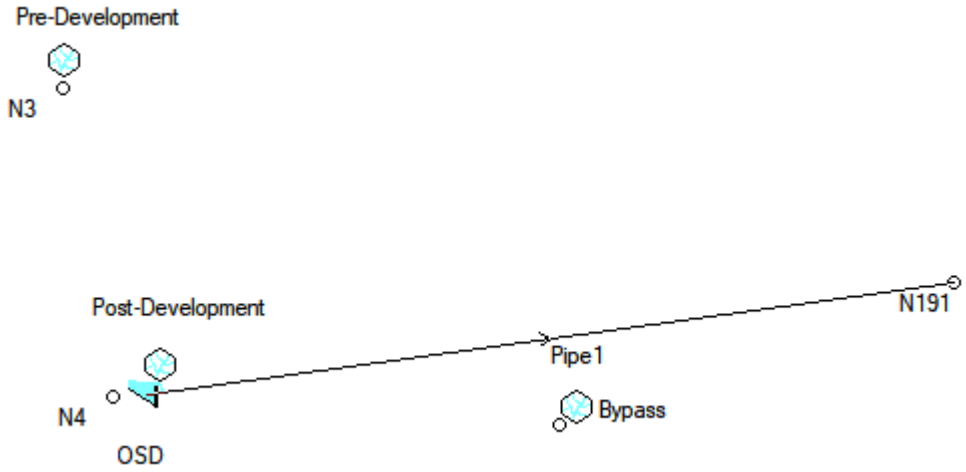


Figure 1: Drains Model

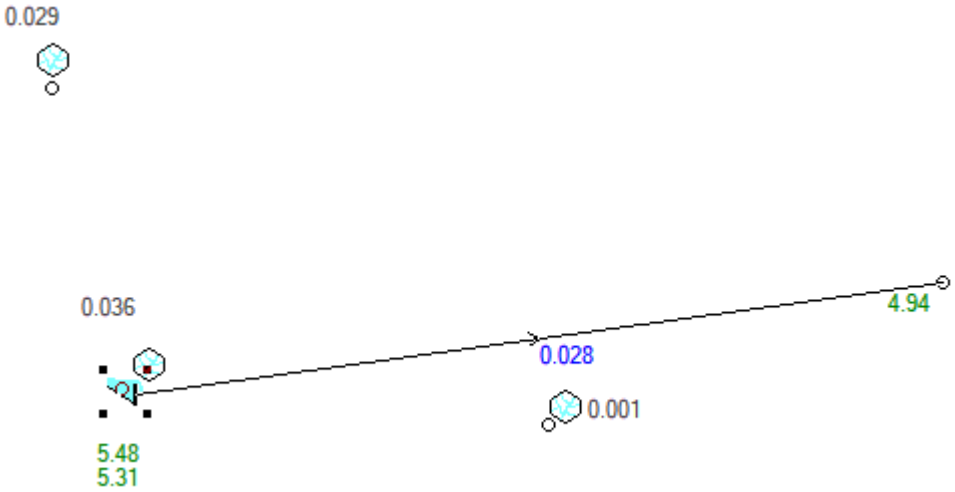


Figure 2: Critical Discharge Event - 1 Year Storm

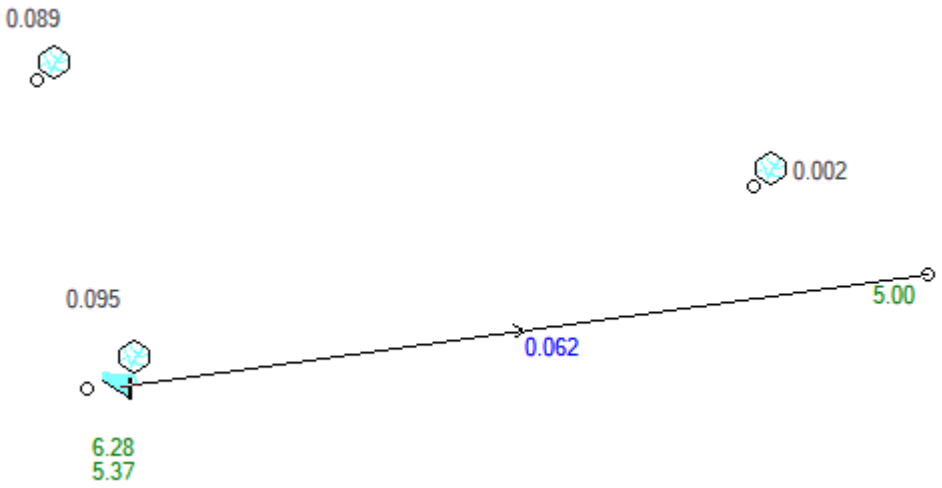


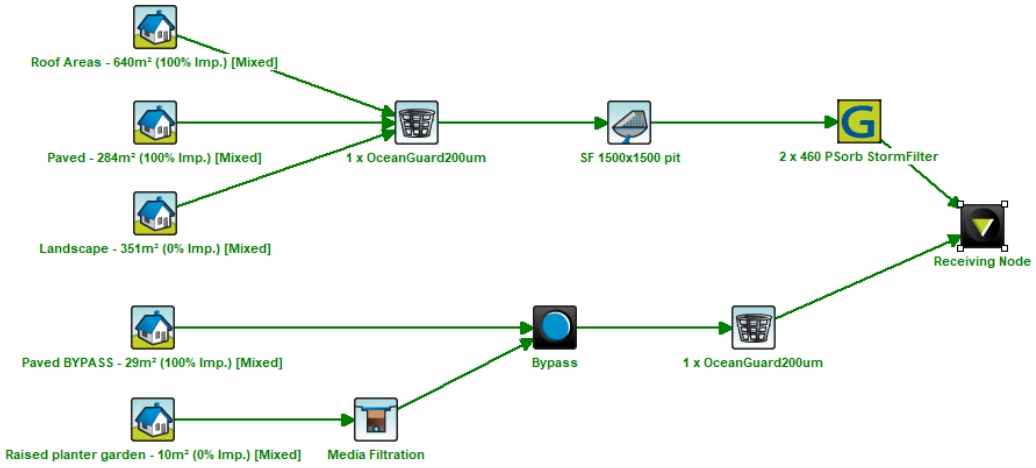
Figure 3: Critical Volume Event – 100 Year Storm Event

3 Storm Water Quality Modelling

The water quality target that are set out by the council are describes in the table below:

Pollutant	Performance Requirements
Total Phosphorous	65% reduction in the post development mean annual load[1]
Total Nitrogen	45% reduction in the post development mean annual load[1]
Total Suspended Solids	85% reduction in the post development mean annual load[1]
Gross Pollutants	90% reduction in the post development mean annual load[1] (for pollutants greater than 5mm in diameter)
pH	6.5 - 8.5
Hydrology	The post-development peak discharge must not exceed the pre-development peak discharge for flows up to the 50% AEP

Using MUSIC, we have modelled the site using proprietary products from OceanProtect to achieve the water quality discharge targets. Below is the model showing the site draining to the StormFilter chamber and bypass area. Using 2 460PSorb Filter and 2 Ocean Baskets, we will be able to reach the targets, specifically the Total Suspended Solids (TSS), being the most critical water quality measure.



Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.25	1.25	0
Total Suspended Solids (kg/yr)	89.8	12.8	85.7
Total Phosphorus (kg/yr)	0.248	0.0846	65.9
Total Nitrogen (kg/yr)	2.67	1.38	48.2
Gross Pollutants (kg/yr)	28.2	0	100

Figure 5: MUSIC Model Schematic

4 Further Comments From Council

1) *"The 225mm stormwater outlet pipe is proposed to be placed under a stand of palm trees that forms part of the existing streetscape landscaping. An alternative discharge point to the next council gully pit in Barrenjoey Road is required to avoid impacts on the stand of palm trees."*

   All pipe running to Barrenjoey have been relocated to ensure that the current stand of palm trees is not disturbed, maintaining the current landscape and street scape of Barrenjoey Street after the completing of the proposed Development.

2) *The design engineer is to provide a long section through the Council footpath detailing the location of all utility services in relation to the proposed stormwater outlet"*

   A long section of the proposed outlet pipe has been provided in Drawing 219120SW02-P7 this clearly shows the outlet pipe running well below the existing services that are running along Robertson Road.

5 Conclusion

The development of the site has been designed to ensure that there is minimal increase to the stormwater runoff flow rate from the site and will mitigate negative impacts on the surrounding properties both in routine and extreme events. The proposed drainage plan complies with the requirement of Pittwater 21 Development Control Plan Section B5.15 which limits the post development flow of water from site to the predevelopment flow.

The stormwater quality and treatment solution proposed has been designed to ensure that treatment targets and requirements as set Norther Beaches Council are reasonably met. The design ensures that stormwater discharging off the site because of the new construction will have limited effects on the downstream water quality and quantity.

The report and drawings demonstrate that the overland slows can be safely and adequately intercepted and bypassed around the proposed buildings, with reduced easements. This report also contains responses to the previously made council comment, justifying, and making the required changes to suit the design as per the councils' additional requirements.

Yours Faithfully,

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Director
DEMLAKIAN CONSULTING ENGINEERS