



Our Job Number: 210804
10 September 2021

Attn: Laxaland Group Pty Ltd
c/- Walsh Architects: Scott Walsh scott@walsharchitects.com.au

Dear Lucas

STORMWATER CONCEPT DESIGN STATEMENT

RE: STORMWATER MANAGEMENT PLANS FOR A PROPOSED NEW SEPP SENIORS SCHEME DEVELOPMENT WITH BASEMENT CARPARK AT 18 ALEXANDER STREET, COLLAROY NSW

Please find attached the stormwater management concept plans in support of the Development Application (DA) for 18 Alexander Street, Collaroy. You may wish to include this concept design statement with the set of plans issued for DA submission.

At the request of Laxaland Group Pty Ltd, RTS Civil Consulting Engineers Pty Ltd was engaged to prepare a stormwater management plan for the proposed new SEPP Seniors Scheme development with basement carpark at 18 Alexander Street, Collaroy. The stormwater management plans are referenced below:

- CP100A - COVER PAGE, NOTES & CALCULATIONS
- CP101A - COVERPAGE, NOTES & CALCULATIONS CONT.
- SW100A - BASEMENT STORMWATER MANAGEMENT PLAN
- SW101A - UNDERCROFT STORMWATER MANAGEMENT PLAN
- SW102A - LEVEL 1, LEVEL 2 & ROOF STORMWATER MANAGEMENT PLAN
- SW200A - STORMWATER DRAINAGE DETAILS
- SW201A - STORMWATER DRAINAGE DETAILS CONT.
- SW202A - STORMWATER DRAINAGE DETAILS CONT.
- SE100A - SEDIMENT & EROSION CONTROL PLAN
- SE200A - SEDIMENT & EROSION CONTROL PLAN DETAILS

The designed stormwater management plans (referenced above) are in general accordance with the intent of the Building Code of Australia, Australian Standards AS3500.3:2018 – Stormwater Drainage, the National Construction Code, Australian Rainfall & Runoff, and Northern Beaches Council Council's Water Management Policy (2020).

Below is a summary of the stormwater requirements and recommendations:

1. The subject site is described as Lot 8 & 9 DP6984, 18 Alexander Street, Collaroy. Site levels range from approximately RL 14.6m AHD at the rear to RL 9.0m AHD grading to Alexander Street.
2. The total combined site area is approximately 1,156m² - Lot 8 being 581 m² and Lot 9 being 575 m². The total existing site contains a double storey brick residence with tile roof, a shed, a swimming pool and a concrete driveway. The site is located to the southern side of Alexander Street, near the junction of Pittwater Road and Alexander Street.

3. There currently is an existing 750mm diameter reinforced concrete pipe (RCP) Council drainage pipeline adjacent to and through the property frontage. The existing site drainage for the lot is partially connected to Alexander Street below ground drainage pipeline with remaining runoff being directed to Council's kerb and gutter.
4. It is proposed to pipe the development flows to the existing 750mm diameter RCP. Connection to the nearest downstream Council pit has been confirmed as acceptable in principle according to Council engineers (8 September 2021).
5. Onsite stormwater detention (OSD) is required according to Section 9.3.2 Council's Water Management Policy (2020) for region 2.
 - a. The OSD volume required by Council for the development according to Table 8 of Council's Water Management Policy is 11,600L and 11,500L for Lots 8 and 9 respectively.
 - b. The Permissible Site Discharge (PSD) required by Council for the total development site is 46.2L/s according to Table 8 of Council's Water Management Policy.
 - c. Lot 9 is impacted by overland flow floodwaters and should therefore be OSD exempt. However, as a conservative approach, hydrologic and hydraulic modelling considering the total development area has been carried out to ensure the required PSD of 46.2L/s is achieved. The computer program DRAINS has been utilised in accordance with Council requirements. Site specific hydrology has been obtained from Australia's Bureau of Meteorology (BoM). This has been confirmed as acceptable in principle according to Council engineers (8 September 2021).
 - d. The DRAINS model indicates that a minimum OSD volume of 10,300L is required to achieve Council's PSD rate for the total development. Therefore, it is proposed to provide a minimum of 11,600L to comply with Council's OSD and PSD requirements.
 - e. Figure 1.0 of this report considers a summary of the hydrologic and hydraulic calculations. Calculations indicate that the Council required PSD is achieved for the proposed development. It can be seen from the DRAINS model that the Council required volume exceeds the minimum OSD requirements.

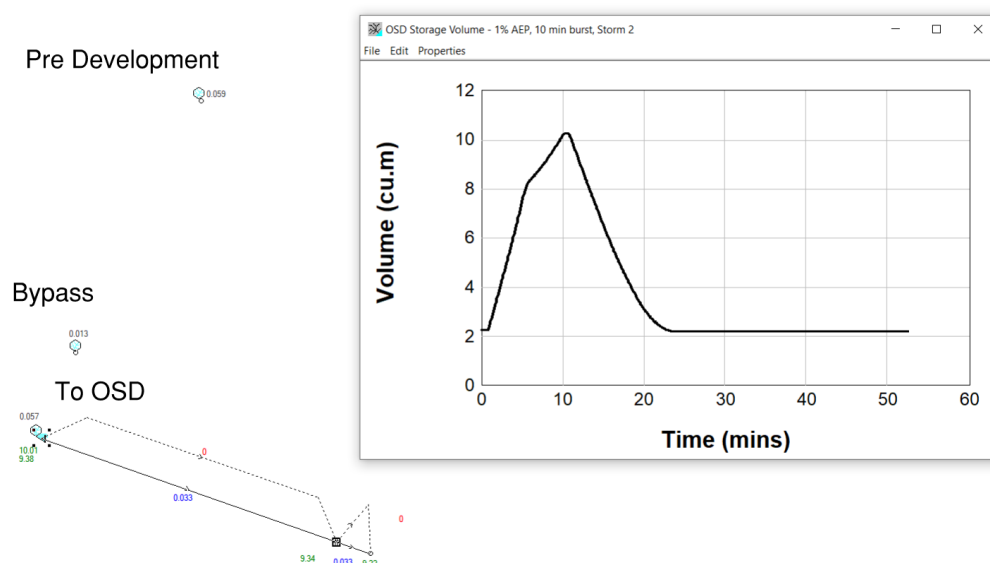


Figure 1.0 - Calculation Summary of the Development DRAINS Model

- f. The OSD is proposed to be contained in a belowground cast insitu concrete tank located below the front garden within a common area.
 - g. The OSD outlet pipe is proposed to be directed to the new Council pipeline fronting the site via a grated boundary junction pit.
6. Although there is no Council rainwater harvesting requirement, the development is required by BASIX to provide a minimum of 10,000L of rainwater harvesting. This is proposed to be located on the mezzanine floor level within 2 x 5,000L prefabricated tanks.
- a. The rainwater tank shall provide for the development to service outdoor irrigation and toilet flushing in accordance with the requirements of the BASIX certificate, Sydney Water and AS3500.3:2018.
 - b. The tanks are to be fully watertight in accordance with HB 230-2008 Rainwater Tank Design and Installation Handbook of Australia.
 - c. The rainwater tanks are to overflow into the OSD tank.
7. Water Sensitive Urban Design (WSUD) is required to ensure the stormwater quality targets are achieved according to Section 2.2.1 of Council's WSUD & MUSIC Modelling Guidelines.
- a. The computer program MUSIC was used to model the water quality requirements. Figure 2.0 of this report displays the MUSIC model calculations which indicate the proposed development meets the stormwater pollutant reduction targets required by Council.
 - b. The rainwater tank and Stormwater Quality Improvement Devices (SQID) located within the OSD tank and also in two other associated pits will achieve the Council targets on the treatment train.
 - c. The SQID's proposed to treat the development size, in addition to the rainwater harvesting tank, are 2 x Oceanguard filtration devices produced by Ocean Protect or an equivalent approved device located within 2 x 450 x 450 grated pits as well as 1 x 690 Stormfilter Cartridge produced by Ocean Protect or an equivalent approved device located within the OSD tank. Refer Figures 3.0 a d 4.0 of this report. The has been confirmed as acceptable in principle according to Council engineers (8 September 2021).

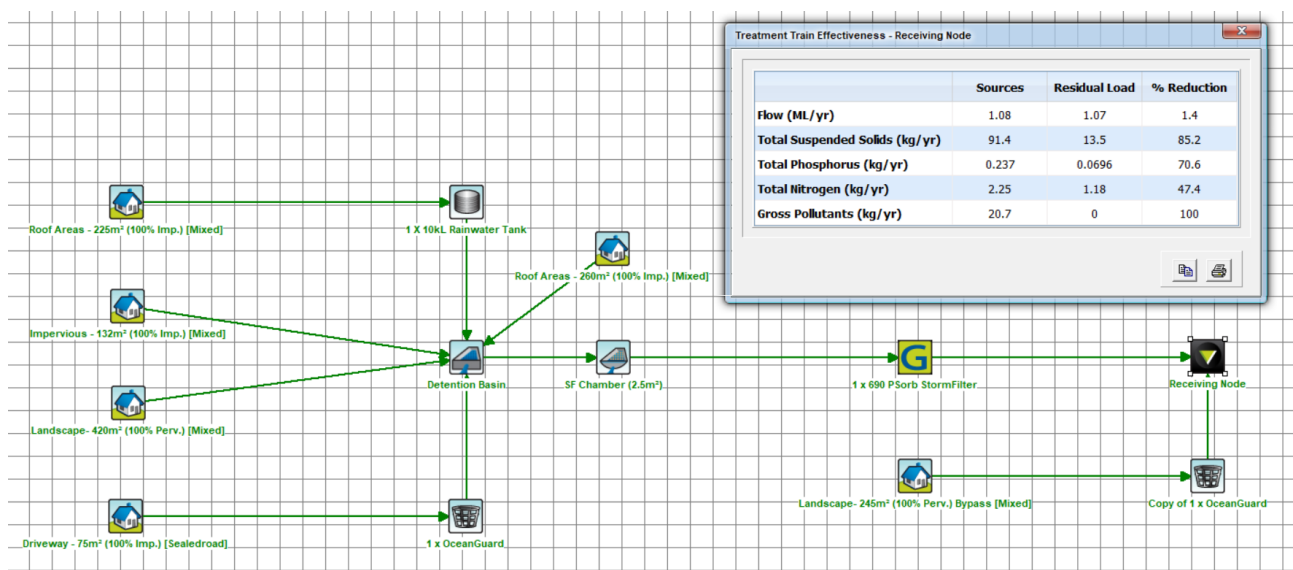


Figure 2.0 - Calculation Summary of the Development MUSIC Model

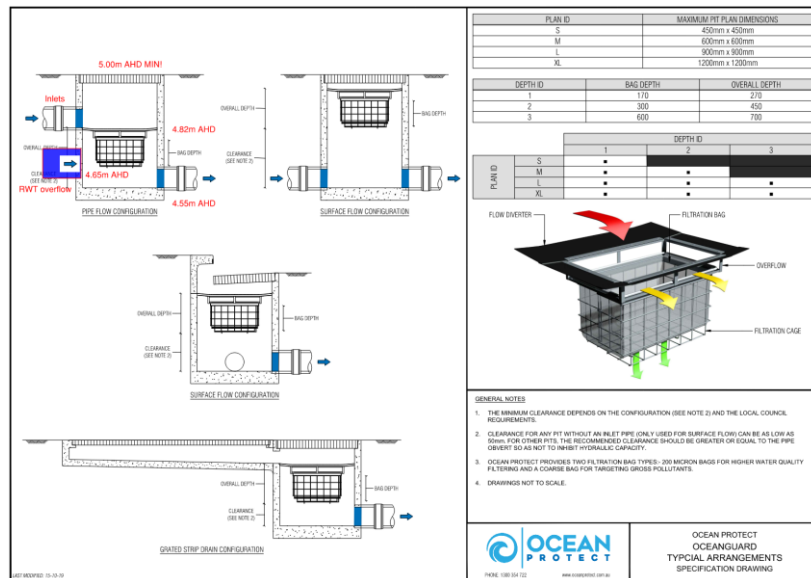


Figure 3.0 - Oceanguard Filtration Device Produced by Ocean Protect

STORMFILTER DESIGN TABLE																	
<ul style="list-style-type: none"> STORMFILTER TREATMENT CAPACITY VARIES BY NUMBER OF FILTER CARTRIDGES INSTALLED. THE STANDARD CONFIGURATION IS SHOWN. ACTUAL CONFIGURATION OF THE SPECIFIED STRUCTURE(S) PER CERTIFYING ENGINEER WILL BE SHOWN ON SUBMITTAL DRAWING(S). FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF-CLEANING. RADIAL MEDIA DEPTH SHALL BE 178mm. 																	
CARTRIDGE NAME / SIPHON HEIGHT (mm)	690	460	310														
CARTRIDGE PHYSICAL HEIGHT (mm)	840	600	600														
TYPICAL WEIR HEIGHT [H] (mm)	920	690	540														
CARTRIDGE FLOW RATE FOR ZPG MEDIA (L/s)	1.6	1.1	0.7														
CARTRIDGE FLOW RATE FOR PSORB MEDIA (L/s)	0.9	0.46	0.39														
<p>STORMFILTER CARTRIDGE DETAIL</p>	<p align="center">SITE SPECIFIC DATA REQUIREMENTS</p> <table border="1"> <tr> <td>STRUCTURE ID</td> <td>[]</td> </tr> <tr> <td>NUMBER OF CARTRIDGES REQ'D</td> <td>[]</td> </tr> <tr> <td>SIPHON HEIGHT (310 / 460 / 690)</td> <td>[]</td> </tr> <tr> <td>MEDIA TYPE (ZPG / PSORB)</td> <td>[]</td> </tr> <tr> <td>WATER QUALITY FLOW RATE (L/S)</td> <td>[]</td> </tr> <tr> <td>DIMENSION A</td> <td>[]</td> </tr> <tr> <td>DIMENSION B</td> <td>[]</td> </tr> </table> <p align="center">TOTAL CARTRIDGE BAY AREA (A x B) TO MATCH AREA REQUIRED BY MUSIC MODELLING OR COUNCIL SPECIFIC REQUIREMENTS</p>			STRUCTURE ID	[]	NUMBER OF CARTRIDGES REQ'D	[]	SIPHON HEIGHT (310 / 460 / 690)	[]	MEDIA TYPE (ZPG / PSORB)	[]	WATER QUALITY FLOW RATE (L/S)	[]	DIMENSION A	[]	DIMENSION B	[]
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WATER QUALITY FLOW RATE (L/S)	[]																
DIMENSION A	[]																
DIMENSION B	[]																

Figure 4.0 - Stormfilter Cartridge Produced by Ocean Protect

8. A 6,000L minimum volume pump-out tank with 2 x 10 L/s pumps are required to comply based on the following requirements:
 - i. The pump-out system has been designed in accordance with AS3500.3:2018 and Council requirements.
 - ii. The pump-out system is to comprise of two (2) submersible type pumps. The two pumps are to be designed and installed to work on an alternative basis to ensure both pumps receive equal use and neither remains continuously idle.



- iii. Each pump shall have a minimum capacity of 10L/s or shall be based on the flow rate generated from a 1% AEP 2-hour duration storm event of the area of the basement that is draining into the system, whichever is greater.
 - iv. An alarm warning device (including signage and flashing strobe light) shall be provided for the pump-out system to advise the occupant of pump failure. The location of the signage and flashing strobe light shall be shown on the stormwater management plans.
 - v. The volume of the pump-out tank shall be designed with a minimum storage capacity equivalent to the runoff volume generated from of the area of the ramp that is draining into the tank for a 1% AEP 2-hour duration storm event.
 - vi. Backflow prevention devices and measures shall be provided to the outlet of the pump-out system to minimise or eliminate the risk of backflows into the basement.
9. The property is impacted by overland flows. A flood study has been prepared by RTS Civil Consulting Engineers Pty Ltd in general accordance with Section 10.0 of Council's Water Management Policy.

We trust that this letter and corresponding documentation meets the requirements set by Northern Beaches Council. Please contact the author if further clarification is required (or if the DRAINS or MUSIC files are required) on 0448 448 960 or via email at rhys@rtscivil.com.au.

Yours sincerely

RTS CIVIL CONSULTING ENGINEERS PTY LTD

A handwritten signature in black ink, appearing to read 'R. Mikhail', written in a cursive style.

Rhys Mikhail

Director | Principal Engineer | Design Practitioner
BEng (Civil) Hons MIEAust CPEng NER RPEQ APEC IntPE(Aus)

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