Warren Smith
Consulting Engineers

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CIVIL ENGINEERING SERVICES

Warriewood Valley Community Centre

Development Application Report

Hydraulic Fire Civil Utilities Infrastructure

DOCUMENT CONTROL

01	16th December 2020	Issued for Development Application	Current
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APPROVALS

01	Robert Xu *Engineer – Civil & Water Engineering*	Laura Shaughnessy *Project Manager – Civil & Water Engineering*
Rev #	**Author**	**Approver**

PREPARED BY:

WARREN SMITH CONSULTING ENGINEERS PTY LTD

Consulting Engineers

ACN 002 197 088 **ABN** 36 300 430 126

Level 9, 233 Castlereagh Street

Sydney 2000 NSW Australia

T 02 9299 1312

PREPARED FOR:

TERROIR

Architects

ABN 37 101 656 535

LEVEL 2, 79 Myrtle St

Chippendale 2008 NSW Australia

T 02 9698 2198 F 02 9698 2353

Warren Smith
Consulting Engineers

CONTENTS

SCHEDULES

CIVIL ENGINEERING SERVICES

1. INTRODUCTION

Warren Smith Consulting Engineers (WSC) has been engaged by Terroir to prepare a Development Application (DA) report for the proposed development for Warriewood Valley Community Centre.

This report shall address the following:-

- On-Site Detention (OSD) system and stormwater drainage system;
- Water Sensitive Urban Design (WSUD) requirements, and;
- Sediment and Erosion Control.

1.1 BACKGROUND

The existing site is located at 2 Jackson Road, Warriewood approximately 30km North-East of the Sydney CBD. The development site is bound by Boondah Reserve Field Number 5 to the north, Pittwater Road to the east, Jackson Road to the south, and Boondah Road to the west. Please refer to Figure 1.1 which shows the extent of the development site area in which the proposed works are to be undertaken.

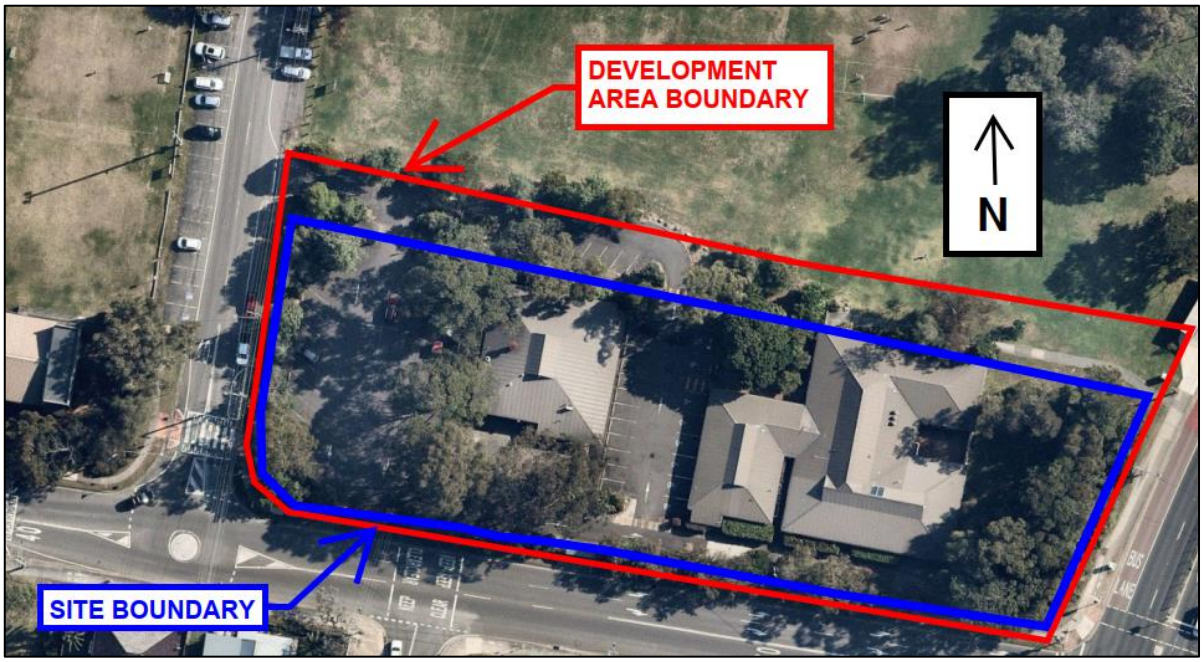


Figure 1.1: Aerial View of Property Boundary (Source: Nearmap)

The development shall see the construction of the community center and a parking lot consisting of 75 regular parking spots and 5 disabled parking spaces.

2. ABBREVIATIONS AND DEFINITIONS

AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ARI	Average Recurrence Interval
DN	Diameter (mm)
EY	Exceedances per Year
IFD	Intensity-Frequency-Duration
L/s	Litres per second
m/s	Metres per second
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
OSD	On-Site Detention
PSD	Permissible Site Discharge
RCP	Reinforced Concrete Pipe
RWT	Rainwater Reuse Tank
SID	Safety In Design
SSR	Site Storage Requirement
WSC	Water Services Coordinator
WSUD	Water Sensitive Urban Design

The Use of Must, Shall & Should:

In accordance with the International Organisation for Standardisation (ISO) Directives, the word “shall” is used to state that a requirement is strictly to be followed in order to conform to a Performance Requirement. Consequently, there can be no deviation from that requirement, other than a specific tolerance.

It is noted that in legislation and specifications it is common to use the word “must” to express a requirement. The word “shall” in this document should be considered as equivalent to “must” in the legislation.

The word “should” introduces a suggestion or recommendation that is not a requirement. It is not necessary that such recommendations or suggestions be followed in order to comply with the Performance Requirement.

3. CIVIL SERVICES GENERAL

3.1 PURPOSE OF THIS DOCUMENT

The purpose of this document is to conceptually describe the Civil & Stormwater services concerning the DA submission for the Warriewood Valley Community Centre.

3.1.1 REFERENCE DOCUMENTS

This report is based on the following reference documents:-

- Survey plan;
- Service location plan
- Architectural plan by Terroir,
- Landscape Plan
- Arborist Report
- Traffic Management Plan
- Pre-DA Council Advice, dated 31st of March 2020 (Refer Schedule 1)

3.1.2 SCOPE OF WORK

The Civil Services scope consists of the following services:-

- Stormwater Drainage works and OSD;
- Concept design of site levels;
- Overland flow paths;
- WSUD requirements, and;
- Sediment and erosion control;

The Civil scope for stormwater drainage will comprise of an OSD tank, situated below the Western car park and an above ground basin in the Eastern car park.

3.1.3 LIMITATIONS

This report is based on information provided by the Architects, Design Team, survey drawings, site inspections, and information communicated during the design development process. Any assumptions made in the design process have been communicated in the design development report.

WSC has based this report on the assumption that the information provided throughout the design development stage can be taken at face value and in general terms accurately reflects the installation on site. WSC does not accept any liability in regard to the accuracy of the existing documentation.

3.1.4 DESIGN CRITERIA

Table 3.1: Design Criteria

Item	Design Criteria
Stormwater Drainage Works	AS/NZS 3500.3 – 2015 – Stormwater Drainage AS 2865 – 2009 Safe Working in a Confined Space Northern Beaches Council -PL850 Water Management Policy (Adopted July 2017) Pittwater 21 Development Control Plan Section C6.1
On-Site Detention (OSD)	AS/NZS 3500.3 – 2015 – Stormwater Drainage AS 2865 – 2009 Safe Working in a Confined Space Pittwater 21 DCP Section 5.7 Warringah Council On-site Stormwater Detention Technical Specifications
Water Quality Requirements and Proposed Treatment System	Draft NSW MUSIC Modelling Guidelines 2010 Pittwater 21 DCP Section B5.9 Stormwater Management – Water Quality - Other than low-Density Residential
Sediment and Erosion Control	Landcom 'Blue Book' – Managing Urban Stormwater Soils and Construction Guideline Edition 4

With reference to the above-mentioned documents, the Council requirements are as presented below:-

- An On-Site Detention (OSD) facility is to be installed where the development results in additional hard surface area of greater than 50m^2 and on land designated through mapping as requiring OSD facility;
- OSD facilities are to be designed and installed to temporarily detain stormwater on a a site to limit the discharge leaving the property to ensure that 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;
- Roof surface areas of the development are to be drained to the rainwater tank which is to be fitted with an overflow pipework system connected to the OSD facility;
- All additional ground surface hardstand (impervious) areas are to be drained via a stormwater tank/pit to the OSD facility;

4. STORMWATER DRAINAGE WORKS

4.1 EXISTING SITE AND DRAINAGE INFRASTRUCTURE

A desktop review was conducted by WSC to determine the existing drainage infrastructure within the development site. The desktop review revealed the following: -

- A localised high point is observed within the natural topography at the south-eastern quarter of the site;
- The site grades north with the existing buildings being at the highest point with an approximate average slope of 1%; however, the steepest grade on-site reaches 25%;
- Visual observations have indicated there is currently an existing stormwater system located on-site consisting of four (4) square grated pits and one (1) drain on the southeast side of the Eastern existing building;
- The survey plan by C.M.S. Surveyors Pty Ltd dated 7th of December 2020 has indicated the pit and pipe systems were full of debris. Duct rodding was able to locate the 150 PVC pipes to the east and middle of the site;
- The outlet to the 150mm PVC pipe to the west of the site was not able to be located due to blockages within the pits and pipes. It is recommended by the surveyor; the lines would require cleaning before any CCTV or location works can commence;
- Council's records have indicated the property on 2 & 4 Jacksons Road is burdened by five 150mm PVC stormwater pipelines and a 200mm PVC pipeline. It is indicated that the stormwater drainage infrastructure is for commercial internal drainage purposes for the car park and building facilities and not a part of the Council's Public infrastructure
- The diagrammatic layout of the existing pipes can be found is illustrated in Figure 4.2

Refer to Figure 4.1 below for an illustration of the existing site grading.

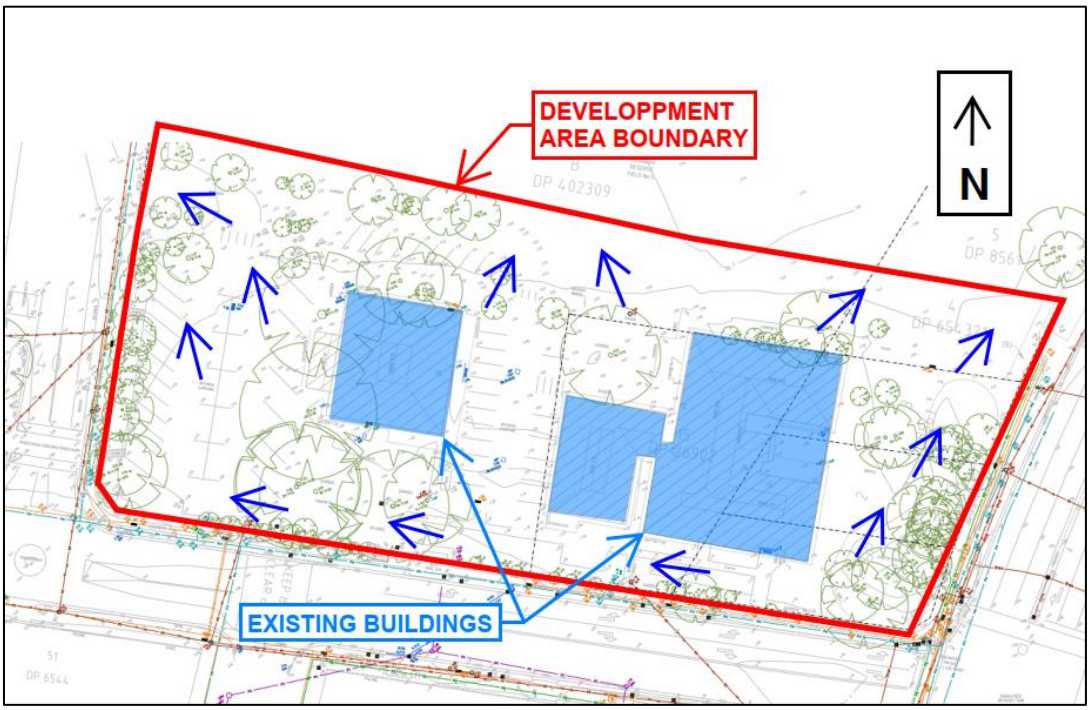


Figure 4.1: Existing Site Grading

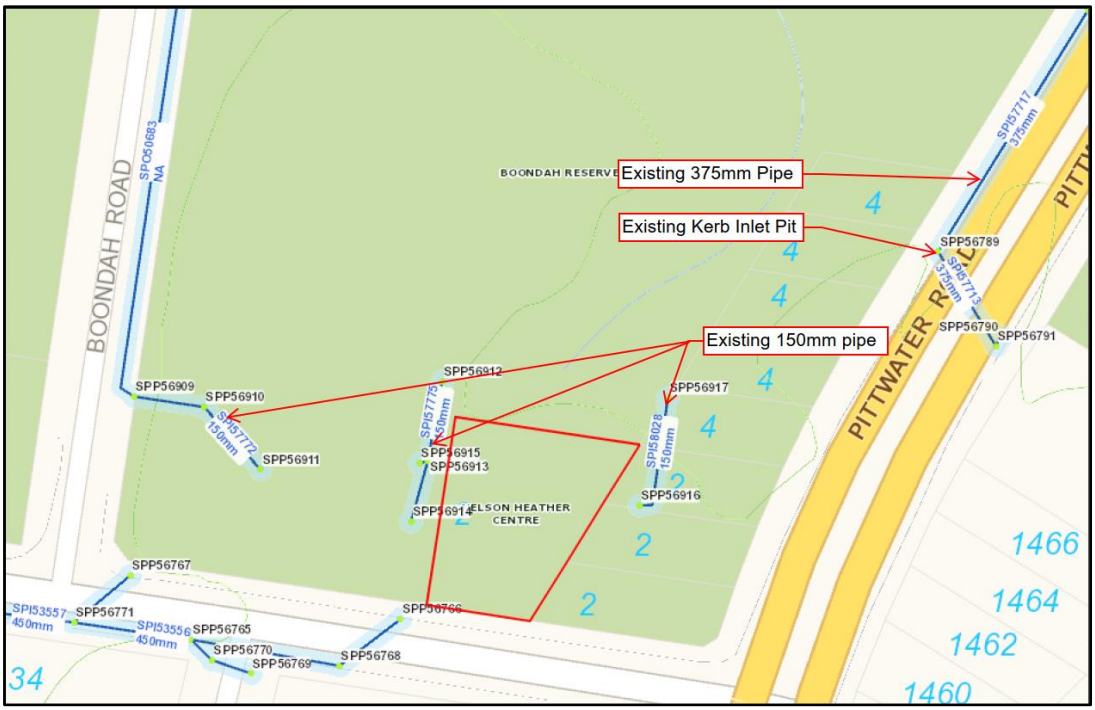


Figure 4.2: Layout of Existing pipes (www.northernbeaches.nsw.gov.au)

4.2 OVERLAND FLOW AND FLOODING

The natural site topography shows the site grades towards Pittwater Road to the east and Boondah Road to the west from a natural high point towards the eastern side of the site. The subject development site is observed to be situated on a crest and the existing public domain to the east, south, and west are falling away from the site.

The council's flood maps have indicated the subject development site is generally not affected by the 1% AEP flood. Flood affectation is observed in the west and northern parts of the site during the PMF flood. It is generally considered (based on the available information) that the subject development site is not affected by flood issues. For further information on flooding, refer to the GRC Hydro flooding assessment

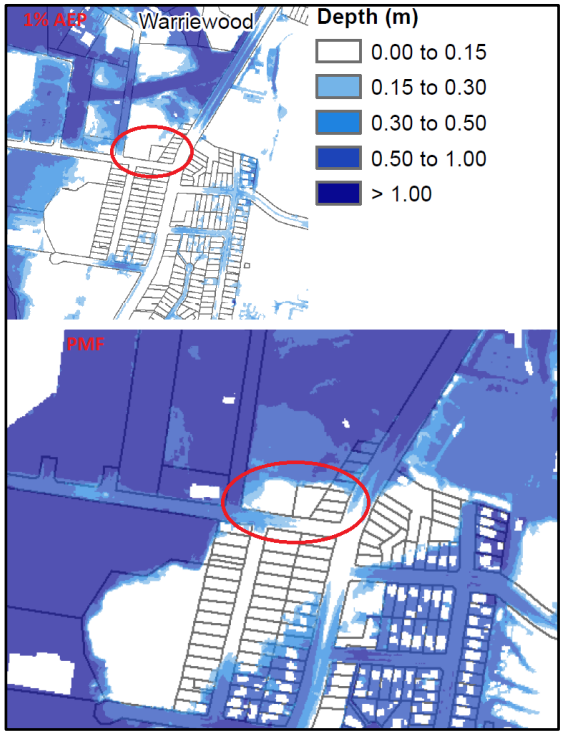


Figure 4.3: Indicative 1% AEP and PMF flood depths (www.northernbeaches.nsw.gov.au)

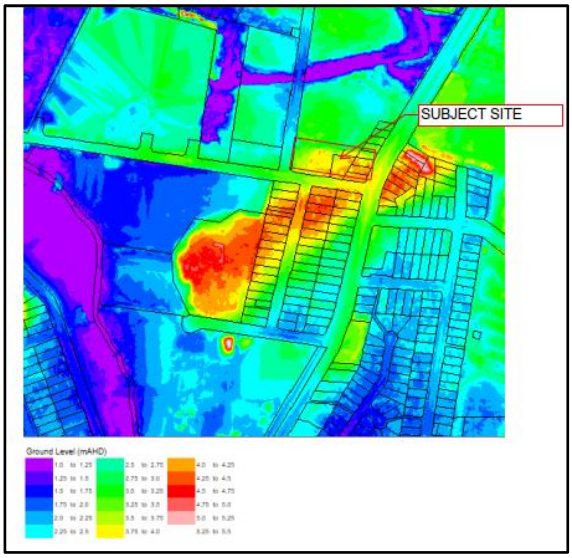


Figure 4.4: Site elevation Lidar data

5. AUTHORITY AND REGULATORY REQUIREMENTS

With reference to Northern Beaches Council Water Management Policy, Northern Beaches Council On-Site Stormwater Detention Technical Specifications, Northern Beaches Council WSUD & MUSIC Modelling Guidelines, and the Pittwater 21 DCP, the Council requirements are as outlined in the following sub-sections:

5.1 STORMWATER DRAINAGE AND ON-SITE DETENTION (OSD) REQUIREMENTS

- OSD is required for all developments where the total existing and proposed impervious areas exceed 40% of the total site area;
- Stormwater drainage for all properties shall be discharged from the site via gravity;
- Only 20% of hardstand area will be allowed to bypass the OSD system;
- The total post-development site runoff shall be limited to the pre-development site runoff for the 20%, 5%, and 1% AEP storm events, and;
- For all developments, except single residential dwelling developments, the PSD is to be calculated based on a maximum allowable impervious fraction of 0%.

5.2 WATER SENSITIVE URBAN DESIGN (WSUD) REQUIREMENTS

Refer to Table 5.1 for the stormwater quality reduction targets to be achieved for the proposed site.

Table 5.1: WSUD Stormwater Quality Reduction Targets

Pollutant Type	Reduction Target (%)
Gross Pollutants (GP)	90%
Total Suspended Solids (TSS)	85%
Total Phosphorus (TP)	65%
Total Nitrogen (TN)	45%

6. PROPOSED STORMWATER DRAINAGE DESIGN

The total site development area is 0.903 Ha. Refer to Table 6.1 for a catchment breakdown.

Table 6.1: Catchment Breakdown

Catchment	Total Area (Ha)
Roof Area	**0.2471**
Car Parking and Driveway	**0.3124**
Landscape Area	**0.2817**
Bypass	**0.0618**
Total Area (Ha)	**0.903**

The western portion of the catchment shall be captured via the piped stormwater system and shall reticulate to an OSD tank situated in the north-western corner of the car parking area. The eastern portion of the catchment shall be captured via the piped stormwater system and shall reticulate to the above car park basins situated at the sag points along the eastern side of the car parking area. The aforementioned stormwater drainage systems shall discharge to the public drainage system located on Boondah Road and Pittwater Road.

A maximum of 20% of the proposed hardstand is permissible to bypass the OSD system. For this development, a total area of 0.0618 Ha shall bypass the OSD system, which equates to approximately 6.84% of the total site area, therefore satisfying the Council's requirements. A detailed copy of the stormwater management plan has been included as a part of the DA submission.

Please refer to **Figure 6.1** below for an illustration of the proposed stormwater and OSD system.

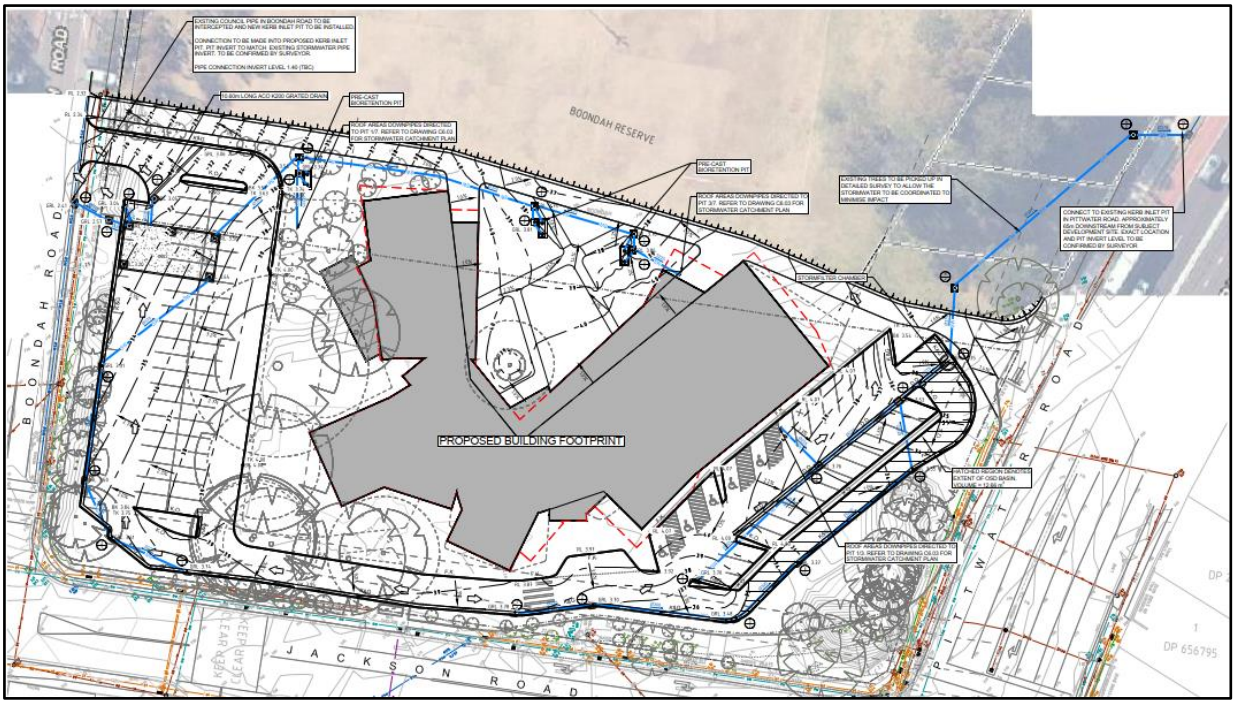


Figure 6.1: Proposed Stormwater Drainage Layout

6.1 ON-SITE DETENTION SYSTEM

6.1.1 DRAINS INPUT PARAMETERS

The drainage system shall be modeled utilising DRAINS to ensure the system is designed to meet the Council's stormwater requirements. DRAINS is a stormwater drainage design and analysis program which performs hydraulic grade line analysis and generates the flows which would occur for a particular AEP storm event.

The catchment characteristic factor values which have been used in the DRAINS model are summarised below:-

- Paved (impervious) Area Depression Storage 1mm
- Supplementary Area Depression Storage 1mm
- Grassed (Pervious) Area Depression Storage 5mm
- Soil Type - Normal 2.5
- Antecedent Moisture Condition (AMC) 3.0
- Minimum Pit Freeboard 150mm
- Blockage Factor for On-Grade Pits 50%
- Blockage Factor for Sag Pits 50%

Please refer to Table 6.2 for the OSD tank details.

Table 6.2: OSD Tank Details

Item	Detail
Total Catchment Area Draining to the OSD Tank	0.5252 Ha
Average Base IL of OSD	1.77 mAHD
Orifice	310 mm
IL of Orifice	1.70 mAHD
OSD Top Water Level	2.77 mAHD
Effective Volume	106.15 m^3
Total Catchment Area Draining to the OSD Basin	0.3160 Ha
Average Base IL of OSD	3.42 mAHD
OSD Top Water Level	3.50 mAHD
Effective Volume	12.66 m^3

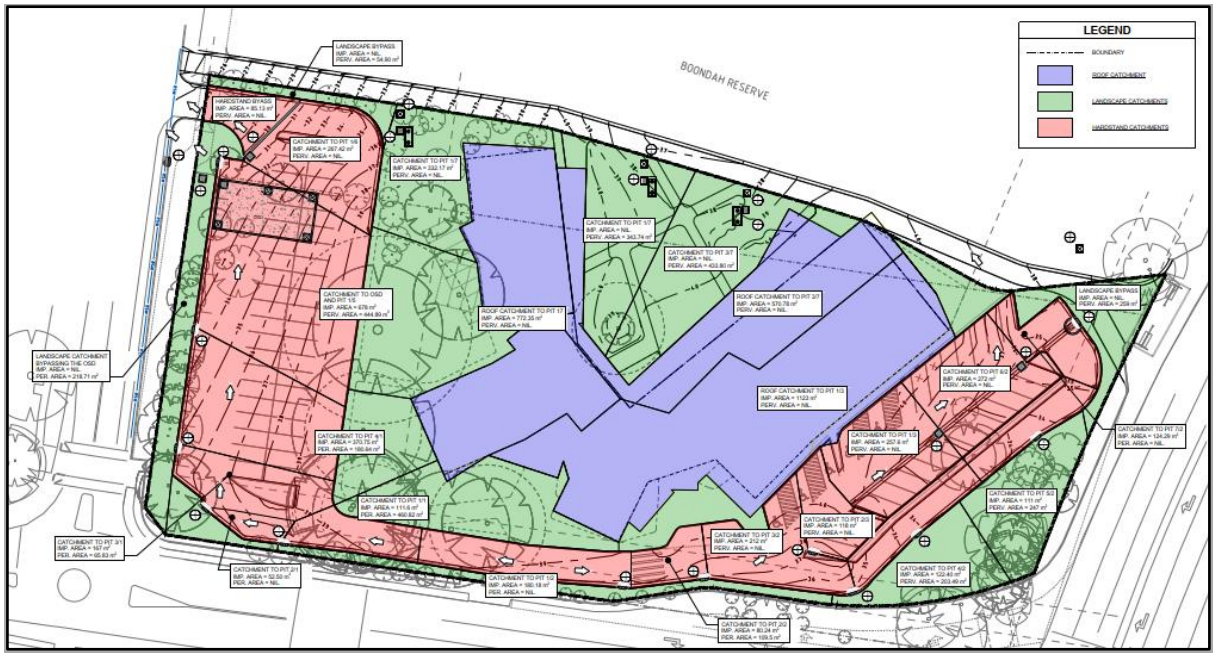


Figure 6.*2*: Proposed Catchment Plan

6.1.2 SITE DISCHARGE RESULTS

Table 6.3: Site Discharge Results

	20% AEP Storm Event	5% AEP Storm Event	1% AEP Storm Event
Pre-Development Site Discharge (L/s)	226	347	521
Post Development Site Discharge (L/s)	213	303	405

7. WATER QUALITY MANAGEMENT

To adhere to the Northern Beaches Council's requirements for the adequate treatment of the stormwater runoff, a treatment plan has been formulated for the development area to remove the suspended solids and nutrients before being discharged from the site.

7.1 POTENTIAL POLLUTANTS GENERATED

The pollutants that could potentially be generated as a result of the development are as follows:-

- Gross Pollutants, e.g. Litter;
- Sediments;
- Nutrients (Phosphorus and Nitrogen), and;
- Hydrocarbons.

The development has been modeled to demonstrate the performance of the stormwater treatment system utilising a program called MUSIC (Model for Urban Stormwater Improvements Conceptualisation). MUSIC models the proposed stormwater treatment devices and estimates their respective performance against the performance targets of the project. The pollutants modeled in MUSIC are Gross Pollutants (GP), Total Suspended Solids (TSS), Total Phosphorus (TP), and Total Nitrogen (TN).

7.2 RAINFALL

The rainfall data used in the MUSIC model was based on the Bureau of Meteorology data and is presented in Table 7.1. A five (5) year continuous rainfall period with the maximum available data has been adopted in accordance with the Northern Beaches Council's WSUD & MUSIC Modelling Guidelines.

Table 7.1: Rainfall Data for MUSIC Modelling

Rainfall Station	Rainfall Period	Rainfall Period Dates	Time Step
066062 Sydney Observatory	5 years	1 Jan 1981 – 31 Dec 1985	6 minutes

The average potential evapotranspiration (PET) data used in the MUSIC model was based on the average monthly PET data for the Sydney region and is presented in Table 7.2.

Table 7.2: Monthly Evapotranspiration Data for MUSIC Modelling

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PET (mm)	180	135	128	85	58	43	43	58	88	127	152	163

7.3 RAINFALL RUNOFF PROPERTIES

Table 7.3 and Table 7.4 present the rainfall-runoff properties which have been utilised in the MUSIC model.

Table 7.3: Soil Properties for MUSIC Source Nodes

Parameter	Units	Rainfall Period Dates	
Impervious Area Parameters			
Rainfall Threshold	mm	0.3 (Roofs) 1.5 (Roads/Pathways)	
Pervious Area Parameters			
		Sand	**Sandy Clay Loam**
Soil Capacity	mm	350	108
Initial Storage	%	30	30
Field Capacity	mm	144	73
Infiltration Capacity Coefficient – a		360	250
Infiltration Capacity Coefficient – b		0.5	1.3
Groundwater Properties			
		Sand	**Sandy Clay Loam**
Initial Depth	mm	10	10
Daily Recharge Rate	%	100	60
Daily Baseflow Rate	%	50	45
Deep Seepage	%	0	0

Table 7.4: Stormwater Water Quality Parameters for MUSIC Source Nodes*

Land Use Category		Log_{10}TSS (mg/L)		Log_{10}TP (mg/L)		Log_{10}TN (mg/L)	
		Storm Flow	**Base Flow**	**Storm Flow**	**Base Flow**	**Storm Flow**	**Base Flow**
Roofs	Mean	1.30	*	-0.89	*	0.30	*
	Std Dev	0.32	*	0.25	*	0.19	*
Sealed Roads with Pervious Fractions	Mean	2.43	*	0.30	*	0.34	*
	Std Dev	0.32	*	0.25	*	0.19	*
Landscaped Areas	Mean	2.15	1.20	-0.60	-0.85	0.30	0.11
	Std Dev	0.32	0.17	0.25	0.19	0.19	0.12

*Base flows are only generated from pervious areas; therefore, these parameters are not relevant to impervious areas

7.4 STORMWATER TREATMENT PLAN

The proposed site shall utilise three (3) products by Ocean Protect. The first level of treatment will include Ocean Guards, which intercept surface water runoff at the pit grates and filter the runoff prior to entering the piped stormwater system. It is proposed that four-teen (14) grated inlet pits be fitted with Ocean Guard filter baskets. The Ocean Guard is fitted with a monofilament 200-micron pore size filter bag that removes gross pollutants such as sediment, trash, and debris, as well as suspended solids. Please refer to Figure 7.1 below for an illustration of a typical Ocean Guard.

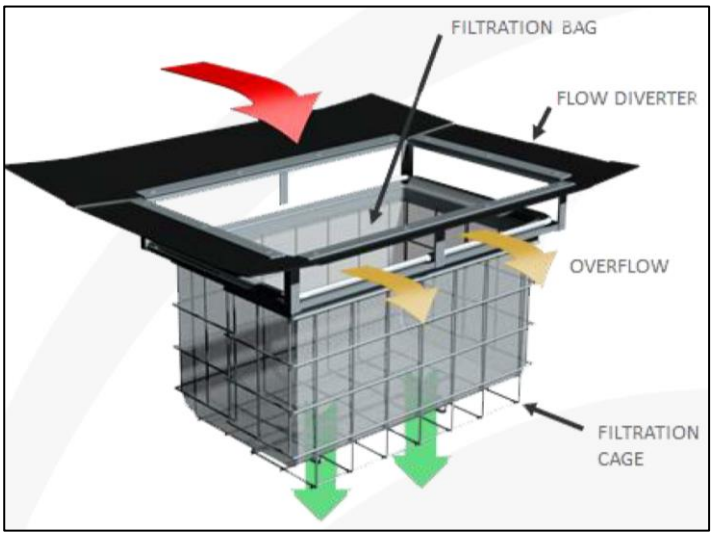


Figure 7.1: Typical Ocean Guard

The second treatment device to be utilised is the storm filters. The stormfilters will be located within a portioned section of the OSD tank and a pre-cast Manhole. There will be eight (5) Psorb 690mm stormfilters and three (3) Psorb 690mm stormfilters fitted in the OSD tank and the pre-cast Manhole, respectively. A Psorb stormfilter cartridge system is provided to remove any remaining suspended sediments, hydrocarbons, and nutrients which have entered the stormwater system. Please refer to Figure 7.2 below for an illustration of a typical Psorb stormfilter.

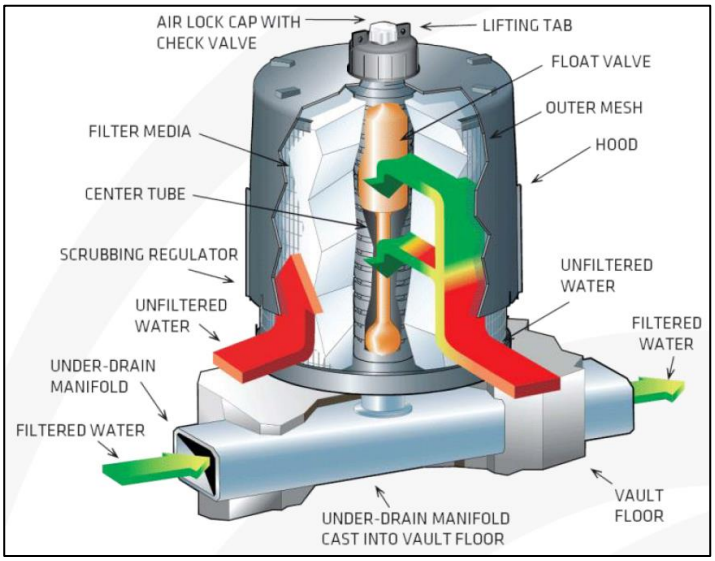


Figure 7.2: Typical Psorb 690mm Stormfilter

The third treatment device to be utilised is the Filterra Bioretention System. There will be three (3) pre-cast 2.80 m (W) x 1.10 (L) Filterra Bioretention pits situated within the northern landscaped areas. The filterra bioretention system will degrade metals and hydrocarbons through the organics and microorganisms within the mulch layer. The stormwater then flows through a series of engineered high flow media which filters the pollutants and nutrients. Treated water then exits through the underdrain to the OSD tank. Please refer to Figure 7.23 below for an illustration of a typical Filterra system.

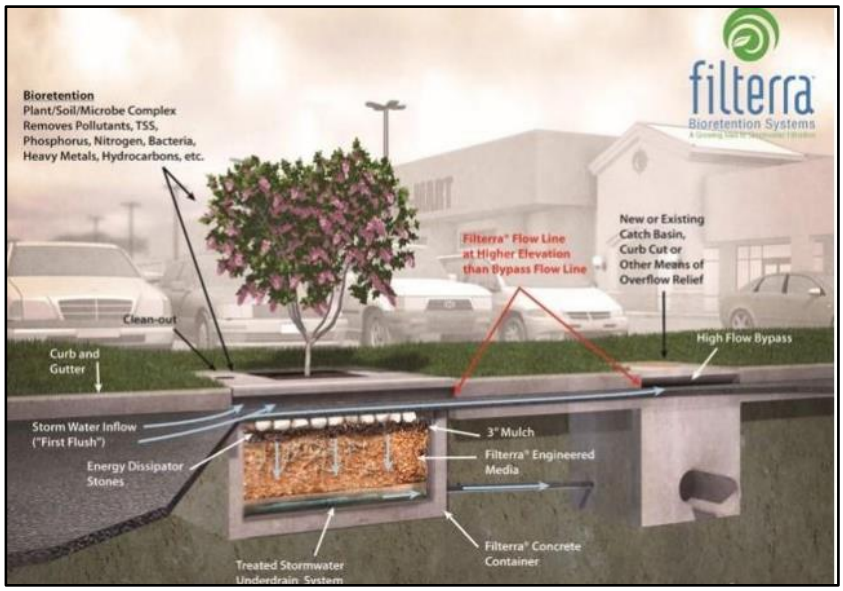


Figure 7.3: Typical Filterra – Bioretention System

7.5 MUSIC MODEL TREATMENT RESULTS

The stormwater quality treatment system has been modeled using the MUSIC software. Please refer to Figure 7.4 for the treatment plan and Table 7.5 for the treatment results.

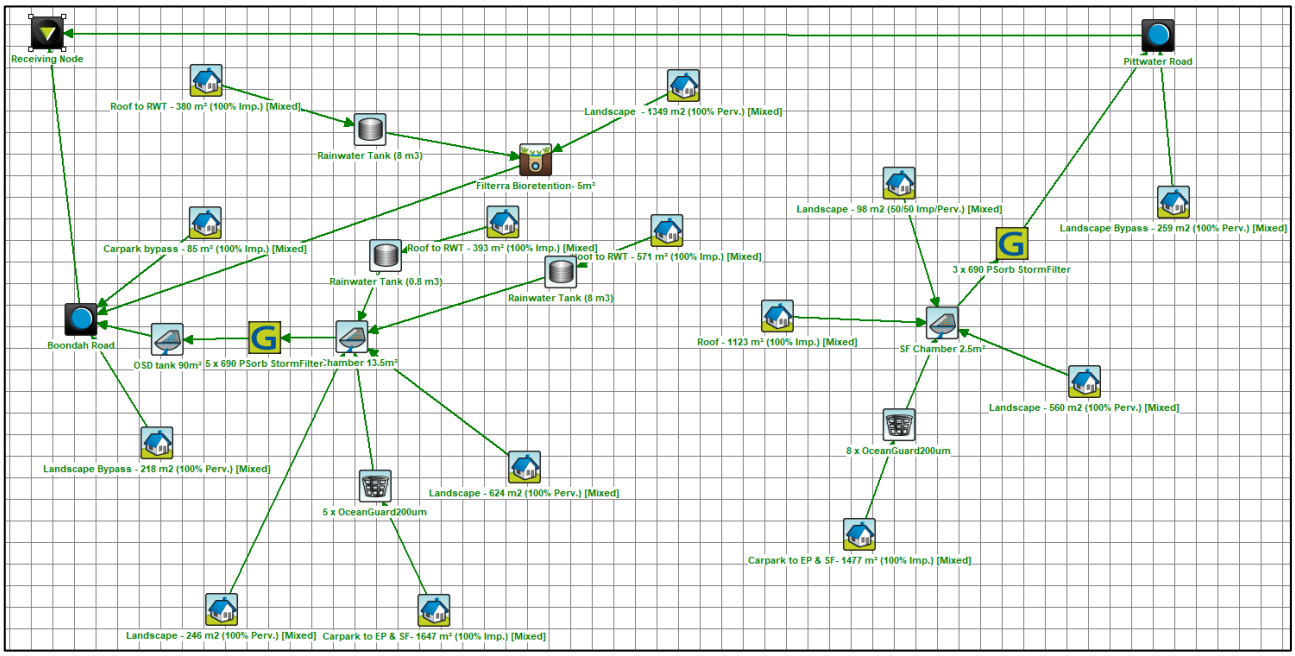


Figure 7.4: MUSIC Model Treatment Plan

Table 7.5: Percentage Based Load Reduction in Pollutant Results

Pollutant Type	Source (kg/yr)	Residual Load (kg/yr)	Reduction % Achieved	The Northern Beaches Council Target Reduction %
Gross Pollutants (GP)	164	2.40	98.5	90.0
Total Suspended Solids (TSS)	1410	188	86.7	85.0
Total Phosphorus (TP)	2.79	0.852	69.4	65.0
Total Nitrogen (TN)	17.2	8.5	50.7	45.0

As is demonstrated by the results, the development is achieving The Northern Beaches Council's targets for pollutant load reduction.

8. SEDIMENT AND EROSION CONTROL

The Contractor for the works is required to provide Sedimentation and Erosion Control in accordance with the guidelines set out in Landcom's Managing Urban Stormwater Soils & Construction Guidelines and the general requirements outlined below.

8.1 SITE PROTECTION MEASURES

The Contractor for the works is required to provide Sedimentation and Erosion Control in accordance with the requirements outlined below to inhibit the movement of sediment off the site during demolition and construction phases.

8.1.1 SITE ACCESS

Construction vehicles leaving the site shall be required to pass over a Temporary Construction Vehicle Entry consisting of a 1.5m long by 3m wide 'cattle rack'.

8.1.2 SEDIMENT CONTROL

All exposed earth areas where it may be possible for runoff to transport silt downslope shall be protected with a sediment and erosion control silt fence generally installed along the boundaries of the site.

The fence will be constructed in accordance with details provided by the Department of Conservation and Land Management incorporating geotextile fabric which will not allow suspended particles greater than 50mg/L non-filterable solids to pass through, and as such comply with the appropriate provisions of the Clean Waters Act 1970.

The construction of the silt fence will include the following: -

- Geotextile fabric buried to a maximum of 150mm below the surface. Refer to Figure 8.1 for details;
- Overlapping any joins in the fabric;
- Turning up on the ends for a length of 1 meter in order to prevent volumes of suspended solids escaping in a storm event;
- Any Council-owned road kerb entry and or gully pits will be protected by Atlantis Filter Bales and EcoSock. Additional protection will be provided by inserting Water Clean Filter Cartridges into the gully opening, and;
- Internal site drainage pits shall be protected by Sediment Traps consisting of hay bales.

Refer to Figure 8.2, Figure 8.3, and Figure 8.4 for details.

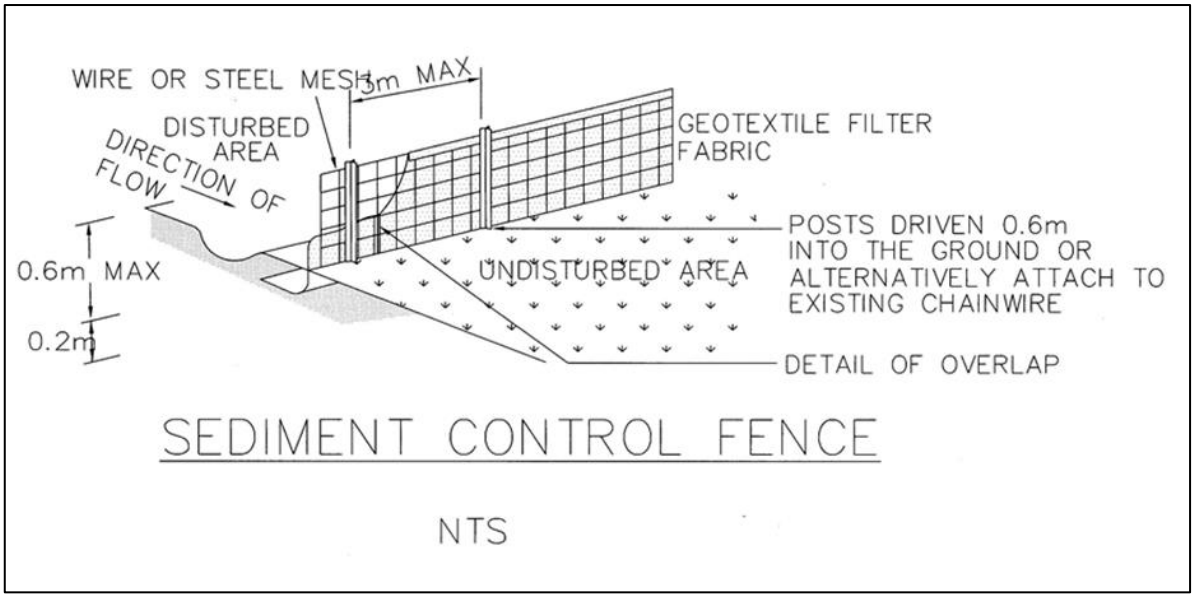


Figure 8.1: Sediment Control Fence Detail

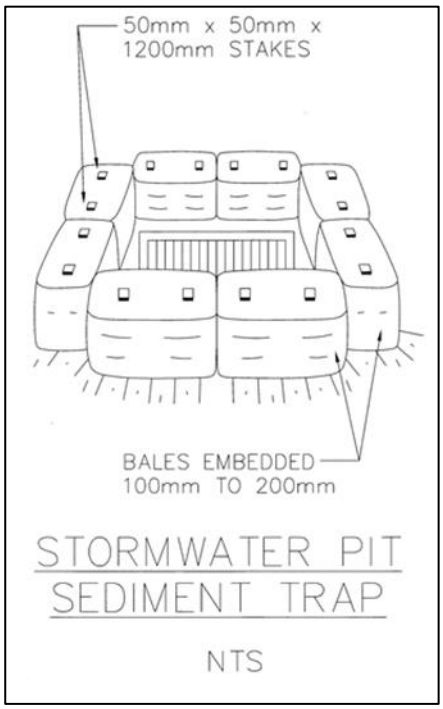


Figure 8.2: Stormwater Pit Sediment Trap Detail

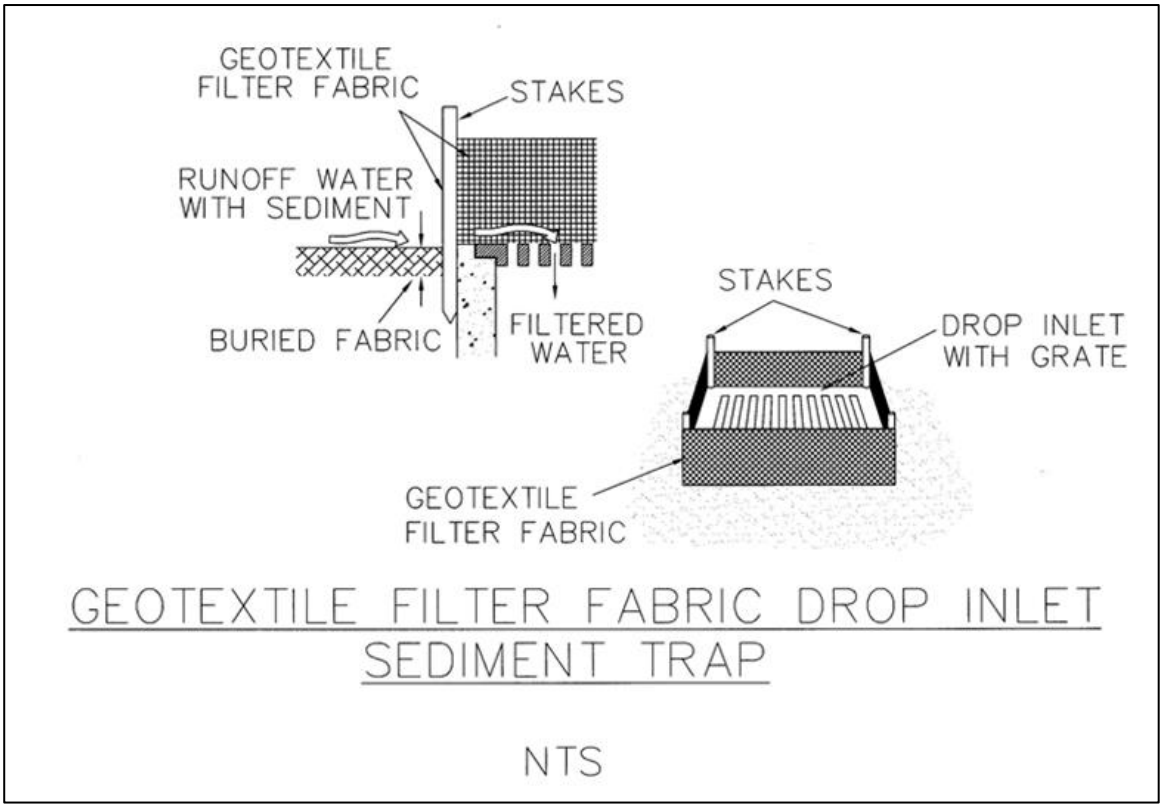


Figure 8.3: Geotextile Filter Fabric Drop Inlet Sediment Trap Detail

Atlantis Sediment Control Filter Bales

What are FilterBales?

Water Clean FilterBales are a unique new patented 7 stage sediment filter device developed to substantially reduce the migration of sediment and contaminants into drainage systems while allowing filtered water to easily pass through. FilterBales reduce customers' time and money by providing solutions to comply witht environmental and regulatory requirements.

Durable, Dependable, Reusable.
Replacing hay bales and other inadequate attempts to stop sediment run-off, FilterBales are durable and re-useable, effectively stopping your money from "pouring down the drain". They are also lightweight and easy to handle. Replaceable Water Clean Filter Cartridges guarantee peak performance is maintained.

Ask your local FilterBales stockist about replacement frequencies in your area. Cartridges and filter covers should be changed when the infiltration rate decreases. Water Clean FilterBales are suitable for a wide range of sediment and water management situations and can be easily secured in place for long term use. The unique multi-directional filter system allows you to position Water Clean FilterBales in any direction without reducing performance.

Water Clean FilterBales can be fixed to concrete or bitumen surfaces using an epoxy mortar-binder or fixed to earth surfaces using 6-10 mm pegs or stakes. When positioning, the side with the red reflective marker should be facing traffic.

www.atlantiscorp.com.au

1. FilterBales frames are a perforated plastic structure made from recycled wheelie bins, battery cases, milk bottles etc.

2. Filter medium (bio engineered soil media) used in the filter cartridges is made from a special blend of recycled organic (RO) materials from kerbside and vegetation drop off centres. The RO hosts enhanced naturally occurring micro-organisms. The blend also contains natural minerals to capture nutrients. The filter medium is as safe as normal soil.

3. FilterBales have a seven (7) stage filtration system:

1. **In through the filter bag**
2. **Through the perforated plastic structure wall**
3. **In through the filter cartridge bag**
4. **Through the bio engineered filter medium**
5. **Out through the filter cartridge bag**
6. **Out through the perforated plastic structure wall**
7. **Out through the filter bag**

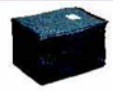
4. The filter bag is made from 300-micron (one third of a millimetre) pore size geotextile. This is the first stage that filters much of the sediment and other suspended solids from the run-off water. The geotextile is designed to stop sediment and reduce clogging but allow water to pass through easily. The filter cartridge bags are made from a similar geotextile.

5. FilterBales work effectively up to "a one-in-one-year 48 hours, 100 mm "storm events". This is the largest storm event experienced since the commercialisation of FilterBales. Having handled this easily, Filter Bales are considered capable of handling much greater "storm events'. During these storm events FilterBales were used inside gully pits in one application and on the ground surrounding the gully pit in another application.

6. EcoSocks are made from a similar geotextile to the filter cartridge bags and contain the same bio engineered soil media as the FilterBales. They appear able to stand up to as much wear and tear as a sandbag.

7. FilterBales are much lighter (at around 15 kgs dry weight) than hay bales. This reduces exposure to Occupational Health and Safety problems

Product Range

Item No.	Description	
HFB001	**High FilterBale,** suitable for high flow situations and higher retention time applications. Contains two standard size WaterClean Filter Cartridges in upright formation to treat contaminated waters. (605mm x 485mm x 460mm)	
LFB002	**Low FilterBale,** suitable for low flow situations and kerb & gutter applications. Multi-directional module containing two standard size WaterClean Filter Cartridges. (605mm x 485mm x 220mm)	
ESF004	**Directional EcoSock,** can be used in conjunction with FilterBales to direct water. Will also provide some sediment filtration from seepage through bio-remediating media contained within the EcoSock (1135mm x 160mm x 30mm)	

Accessories

Item No.	Description	
FCR004	**WaterClean Filter Cartridges** contain a unique blend of fixating and bio-remediating products that treat common pollutants. To achieve maximum performance, each FilterBale uses two WaterClean Filter Cartridges. (440mm x 400mm x 100mm)	
HBC005 (High bale)	**Replaceable FilterBale covers,** made from specially designed geotextile. FilterBale covers have a standard aperture of 300 microns.	
HBC006 (Low bale)	**Replaceable FilterBale covers,** made from specially designed geotextile. FilterBale covers have a standard aperture of 300 microns.	

Atlantis Water Management Rebirth Pty Ltd trading as Atlantis Water Management

Suite 402/781 Pacific Highway Chatswood NSW, 2067 Australia
Phone • + 61 2 9419 6000 **Fax** • + 61 2 9419 6710
Email • info@atlantiscorp.com.au **Web Site** • www.atlantiscorp.com.au

Atlantis Water Management

V3-20/06/01

Figure 8.4: Atlantis Sediment Control Filter Bale Detail

8.1.3 TEMPORARY STORMWATER SYSTEM (WHERE REQUIRED)

Site runoff within the zones of the excavation will be drained into a central holding well within the excavation. The runoff will be allowed to settle out suspended particles and debris, and acceptable water of 50mg per liter of Non-Filterable Residues (NFR) is required to be achieved before discharge.

8.1.4 DUST CONTROL

The following dust control procedures will be adhered to:

- Loose loads entering or leaving the site will be securely covered by a tarpaulin or like material in accordance with RMS and local Council Guidelines;
- Soil transport vehicles will use the single main access to the site;
- There will be no burning of any materials on site;
- Water sprays will be used across the site to suppress dust. The water will be applied either by water sprinklers or water carts across ground surfaces whenever the surface has dried out and has the potential to generate visible levels of dust either by the operation of equipment over the surface or by the wind. The watercraft will be equipped with a pump and sprays;
- Spraying water at the rate of not less than three (3) L/s and not less than 700kPa pressure. The area covered will be small enough that surfaces are maintained in a damp condition and large enough that runoff is not generated. The water spray equipment will be kept on-site during the construction of the works;
- During excavation all trucks/machinery leaving the site will have their wheels washed and/or agitated prior to traveling on Council Roads, and;
- Fences will have shade cloth or similar fabric fixed to the inside of the fence.

8.1.5 SEDIMENT PUMP OUT PITS

Sediment pump out pits shall be installed where lift pits are to be excavated. A perforated riser outlet pipe shall be installed to pump any rainwater collected in these pits and shall discharge into a grated inlet pit along the southern boundary of the site. Refer to Figure 8.5 for details of a perforated riser outlet pipe.

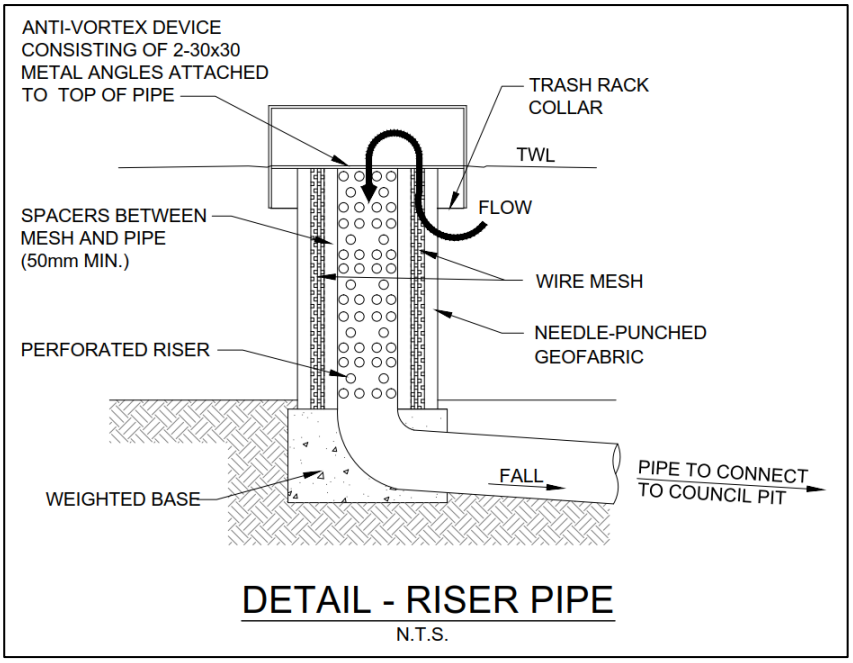


Figure 8.5: Pump Out Pit Outlet Pipe Detail

8.1.6 MAINTENANCE

Generally, the following maintenance measures shall be adhered to during construction:-

- It will be the responsibility of the site foreman for the building contractor to ensure sediment and erosion control devices on site are maintained. The devices shall be checked daily and the appropriate maintenance is undertaken as necessary;
- Prior to the closing of the site each day, the road shall be swept and materials deposited back onto the site;
- Gutters and roadways will be kept clean regularly to maintain them free of sediment;
- Appropriate covering techniques, such as the use of plastic sheeting will be used to cover excavation faces, stockpiles, and any unsealed surfaces;
- If dust is being generated from a given surface, and water sprays fail;
- If fugitive emissions have the potential to cause the ambient quality to foul the ambient air quality;
- The area of soils exposed at any one time will be minimised wherever possible by excavating in a localised progressive manner over the site;
- Materials processing equipment suitable to comply with regulatory requirements. The protection will include the covering of feed openings with rubber curtains or socks, and;
- Suitable and approved bins shall be utilised for the containment of hard waste, including concrete slurries, building waste, and litter. In the case of accidental spills, particularly within the public reserve, the material shall be swept and contained, and not washed into a gutter or waterway.

It is considered that by complying with the above, appropriate levels of protection are afforded to the site and the adjacent public roads, footpaths, and environment.

SCHEDULE 1 PRE-DA COUNCIL ADVICE

northern beaches council

Application No:	PLM2020/0049
Meeting Date:	31 March 2020
Property Address:	2 Jacksons Road, Warriewood
Proposal:	Demolition works and construction of a community centre with associated carparking
Attendees for Council:	Steve Findlay – Manager Development Assessment Lashta Haidari – Principal Planner Dominic Chung – Senior Urban Designer Joseph Tramonte – Senior Landscape Architect Jeremy Smith – Manager, Park Assets
Attendees for applicant:	Michael England Joshua Lynch Isabella Buddee Gerard Reinmuth Michael Baker

General Comments/Limitations of these Notes

These notes have been prepared by Council on the basis of information provided by the applicant and a consultation meeting with Council staff. Council provides this service for guidance purposes only. These notes are an account of the specific issues discussed and conclusions reached at the pre-lodgement meeting. These notes are not a complete set of planning and related comments for the proposed development. Matters discussed and comments offered by Council will in no way fetter Council's discretion as the Consent Authority. A determination can only be made following the lodgement and full assessment of the development application.

In addition to the comments made within these notes, it is a requirement of the applicant to address ALL relevant pieces of legislation including (but not limited to) any SEPP and any applicable clauses of Pittwater Local Environment Plan 2014 and Pittwater 21 Development Control Plan within the supporting documentation of a development application including the Statement of Environmental Effects.

You are advised to carefully review these notes. If there is an area of concern or non-compliance that cannot be supported by Council, you are strongly advised to review and reconsider the appropriateness of the design of your development for your site and the adverse impacts that may arise as a result of your development prior to the lodgement of any development application.

SPECIFIC ISSUES RAISED BY APPLICANT FOR DISCUSSION

PITTWATER LOCAL ENVIRONMENTAL PLAN 2014 (PLEP 2014)

Note: PLEP 2014 can be viewed at the NSW Government Legislation Website

Zoning and Permissibility	
Definition of proposed development: (ref. PLEP 2014 Dictionary)	A ***community facility*** is defined as follows: a) owned or controlled by a public authority or non-profit community organisation, and b) used for the physical, social, cultural or intellectual development or welfare of the community, But does not include an educational establishment, hospital, retail premises, place of public worship or residential accommodation.
Zone:	SP2 Infrastructure
Permitted with Consent or Prohibited:	Permitted with consent

Principal Development Standards:	
Clause 4.3 Height of Buildings	
Standard	**Proposed**
8.5m	<8.5m
Comment From the architectural plans, it would appear that the proposal complies with the prescribed height limit.	

Part 7 - Additional local provisions
7.1 Acid sulphate soils
A ***preliminary acid sulphate soil assessment*** and an ***acid sulphate soils management plan*** is required to accompany any future application, particularly noting the likely presence of acid sulphate soils within the creekline corridor.
7.3 Flood planning
The site is subject to flooding. Any future application will be required to address the provisions of this clause, in addition to the specific requirements of clause C6.1 of P21 DCP and the Water Management Specification.
7.7 Geotechnical hazards
Given the extent of earthworks required, the application is to be supported by a geotechnical risk management report identifying consistency with this clause and clause B8.1 of P21 DCP.
7.10 Essential services

The application is to demonstrate that development has adequate access to all essential services, being the supply of water and electricity, the disposal and management of sewerage, stormwater drainage and suitable vehicular access.

PITTWATER 21 DEVELOPMENT CONTROL PLAN (P21 DCP)

Note: P21 DCP can be accessed via Council's Website www.northernbeaches.nsw.gov.au

Section A: Shaping Development in Pittwater
A4 Localities

Comment

The site is located within the ***Warriewood Valley*** Locality

Clause A4.16 requires that future development:

Warriewood Valley Release Area continues to be developed as a desirable urban community in accordance with the adopted planning strategy for the area, and will include a mix of low to medium density housing, industrial/commercial development, open space and community services. The creekline corridors, roads and open space areas form the backbone of the new community, complemented with innovative water management systems, the natural environment, pedestrian/cycle path network, public transport, and recreation facilities.

Stage 1 Release, has a residential component and a business/industrial component. The residential area is characterised by two storey residential attached dwellings with the area fully developed. The industrial/business area is defined by up to three storey large complexes that generally contain smaller units. The majority of the business/industrial zoned land has been developed with some smaller parcels still to be developed in the northern industrial area.

The Warriewood Valley locality is characterised by a mix of residential, retail, commercial, industrial, recreational, and educational land uses.

Warriewood Valley is affected by various hazards and contains heavily vegetated areas, threatened species, or areas of natural environmental significance, which are identified on various maps within the Pittwater LEP 2014.

Comment

Every effort must be made to ensure that the bulk and scale is appropriate and new native vegetation is incorporated into the design. From the proposed plans, it would appear that there is little opportunity for meaningful landscaping to be incorporated into the current design to assist in minimising the bulk and scale of the built form, particularly within the front setbacks to Jacksons Road and Pittwater Road.

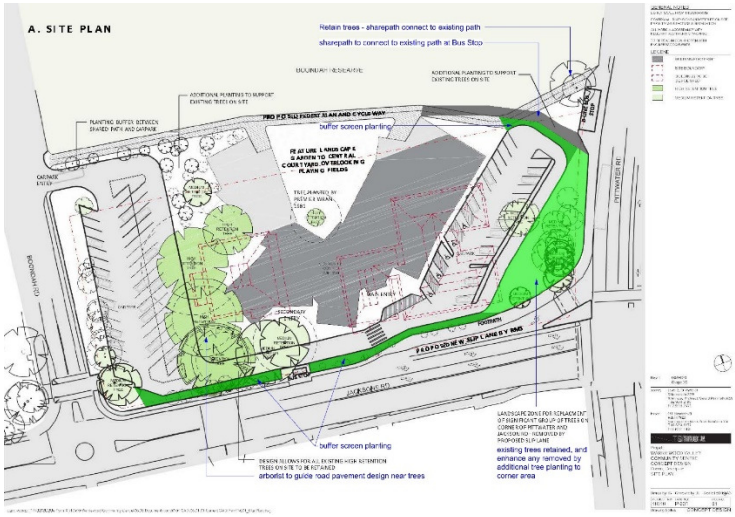
However, the amended plans submitted by the applicant has attempted address this issue but further consideration is required to ensure that landscaping is an integrated part of the proposed development to screen the visual impact of the built form from the public roads. The buildings are to give the appearance of being secondary to landscaping and vegetation.

Section B: General Controls

B4 Controls Relating to the Natural Environment
Comment An arborist report will be required if the proposal involves the removal of existing canopy trees (excluding exempt species) or if the proposal involves works within 5m of existing significant trees to be retained.

Section C: Development Type Controls
C5 Design Criteria for Other Development
C5.1 Landscaping
To satisfy the provisions of C5.1 of P21 DCP, a landscape plan is to be provided to demonstrate the landscape treatment of the curtilage of the building. Refer to Landscape comments below in the notes.
C5.5 Accessibility
Comment A suitably qualified access consultant is to provide certification that the proposed additions will achieve compliance with the provisions of C5.5 of P21 DCP and the relevant provisions of the BCA.
C5.8 Waste and recycling facilities
Comment A ***waste management plan*** is required to address demolition, construction and ongoing waste management for the site, specifically if the intended use of the site is to include any food or drink premises.
C5.17 Pollution Control
Comment Any future application will be required to demonstrate that pollution and contamination will not occur in the event of inundation or flooding, with fuel and chemicals stored above the likely levels of wave inundation/flooding.

Specialist Advice	
Referral Body	**Comments**
Landscape Architect	The updated plans have been amended in consideration of the concerns communicated at the meeting around the site planning of the proposal raised by Parks & Recreation staff. The updated plans incorporate the following supported proposals: • Retains the majority of trees in the group located at the corner of the site, that are a prominent landscape and visual amenity along Pittwater Road, • Existing trees required to be removed for the proposed slip-lane to be replaced within the corner landscape area to enhance the landscape and visual amenity, • Continue to retain high retention value trees elsewhere on the site,

Specialist Advice	
	• Realign the proposed building to reduce the impact upon the playing fields, • Provide a landscape buffer strip to the Jackson Road and Boondah Road boundaries, • Provide a sharepath connection, subject to clarification of connection to bus stop. The selected location of the sharepath at the Bus Stop is not supported due to the removal of significant trees. An alternative alignment is shown in the sketch below which utilises the existing sharepath location as it connects to the Bus Stop. It is unknown if the sharepath connection at the Bus Stop as shown on the amended plans is based on the location of the relocation traffic light crossing, and this shall be represented on the DA plans. Should the traffic light crossing be located north of the Bus Stop, the sharepath connection shall avoid the existing trees regardless. Additionally, on the DA plans as noted in blue, additional tree planting at the corner landscape area, buffer screen planting around the perimeter shall be demonstrated on the DA plans as highlighted.  At DA stage, the following information is required: **Landscape Plan** A Landscape Plan in accordance with Council's DA Lodgement Requirements shall be submitted to satisfy the landscape controls of Pittwater 21 DCP, including: The bulk and scale of buildings must be minimised. Landscaping is to be integrated with the building design to screen the visual impact of the built form. The buildings are to give the appearance of being secondary to landscaping and vegetation.

Specialist Advice	
	All canopy trees, and a majority (more than 50%) of other vegetation, shall be locally native species. In all development a range of low lying shrubs, medium high shrubs and canopy trees shall be retained or provided to soften the built form. Additional tree planting at the corner landscape area, buffer screen planting around the boundaries of Jackson Road and Boondah Road shall be utilised to ensure the built form is softened when viewed from the streetscape. The existing two trees shown within the new carpark area are unlikely to survive excavation and shall be removed, with new small tree planting to be shown within the carpark. **Arboricultural Impact Assessment** An ***Arboricultural Impact Assessment Report***, prepared by a qualified Arborist with a minimum AQF level 5 qualification in horticulture/arboriculture shall be submitted. The report shall document the impact from the proposed development from excavation and construction works, in accordance with the Northern Beaches Council DA Lodgement requirements, when works are proposed within 5.0m of a tree. The Arboricultural Impact Assessment is required to provide clarification on which trees are to be retained, including tree protection measures, and which trees are proposed for removal. A proposal to remove existing trees of High and Medium significance shall be justified, and otherwise shall be refused if an alternative design layout or construction techniques is available. Existing trees within proposed carpark areas shall be reported in terms of the recommendations for surface treatment, selection of carpark surface materials, and limitations to excavation, and proposals for type of construction materials and techniques to be utilised to ensure long-term survival of all trees to be retained. The Arboricultural Impact Assessment report shall indicate the impact of development upon the existing trees within the site, within the road frontage, and for any existing tree on adjoining properties site (building and associated excavation zones), and shall consider the requirements of Australian Standard AS4970-2009 Protection of Trees on Development Sites.
Bushland and Biodiversity	The following biodiversity-related provisions apply to the development site: - SEPP (Coastal Management) – Coastal Wetlands Proximity Area

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	- Pittwater LEP Clause 7.6 (Biodiversity) - Pittwater DCP Clause B4.5 (Landscape and Flora and Fauna Enhancement Category 3 Land) - Pittwater DCP Clause B4.6 (Wildlife Corridors) **SEPP (Coastal Management) – Coastal Wetlands Proximity Area** A portion of the subject site is located within the Coastal Wetlands Proximity Area under SEPP (Coastal Management) (see overleaf). This policy requires that a consent authority not provide consent to a development unless it is satisfied that the development will not significantly impact on: a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland; or b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland. Compliance with this provision is to be addressed in the Statement of Environmental Effects. **Pittwater LEP** The preliminary proposal seeks to remove an unspecified number of protected native trees. PLEP Clause 7.6 seeks to maintain terrestrial, riparian and aquatic biodiversity by protecting and encouraging the conservation and recovery of native fauna and flora and their habitats. Under this clause, the consent authority must not grant development consent unless it is satisfied that: a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or b) if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or c) if that impact cannot be minimised—the development will be managed to mitigate that impact. In order to achieve compliance, the submitted plans and documentation are to address what measures have been incorporated within the design to avoid impact to native vegetation. Furthermore, appropriate compensatory planting is to be provided to mitigate the impact of any proposed native tree removals. **Pittwater DCP** Applicable DCP B4 (Natural Environment) controls require developments to result in no net loss of native canopy trees. As per above, the proposal is to demonstrate any measures that have been incorporated to avoid impacts to native vegetation, and any mitigation measures (including compensatory planting) to offset the impact of any proposed native tree removals.

Specialist Advice	
	General Comments In order to achieve consistency with applicable LEP/DCP controls, the applicant is encouraged to consider design options which enable safe retention of existing native canopy trees. Alternatively, the applicant may consider provision of appropriate compensatory planting elsewhere within the lot, in order to achieve no net loss of native canopy trees. Any compensatory plantings are to be species consistent with the determination for the Swamp Sclerophyll Forest Endangered Ecological Community (EEC): https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/final-determinations/2004-2007/swamp-sclerophyll-forest-coastal-floodplains-endangered-ecological-listing The applicant is to secure written agreement of the relevant asset owner (depending on proposed location of the plantings) at Council for any proposed compensatory plantings: - Mown areas within the lot: Parks and Recreation Business Unit - Bushland/riparian land along Narrabeen creek: Bushland & Biodiversity Team (ECC Business Unit) **Required Information** - Arboricultural Impact Assessment, prepared by a minimum AQF Level 5 arborist, assessing all trees within 5m of the disturbance area. The report is to include all components of the development including any required services (e.g. stormwater) and bushfire asset protection requirements. - Landscape Plan, prepared by a suitably qualified landscape architect, providing details of proposed landscaping and any compensatory plantings. Species selected are to be locally native and consistent with the Swamp Sclerophyll Forest EEC determination and/or the Pittwater Ward Native Plant Guide: https://www.northernbeaches.nsw.gov.au/node/34932
Urban Design	1. Generally the proposal is a low scale and low impact development despite the big rooms and spaces it has to accommodate. The dark colour scheme and strong forms in a cluster format - designed to retain existing trees and vistas is a sensitive and fitting approach. 2. The encroachment of the site past the existing community centre site boundary allows the ‘courtyard’ / ‘open arms’ scheme to be possible and in a way ‘blurs’ the boundary to the sports field is a good outcome but will be subjected to Parks and Reserves team’s feedback. 3. Parks and Reserves team’s comment on keeping more existing trees could be balanced by reducing car parking requirement would be a good compromise as

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	public transport is available near-by. 4. The possibility of extending the eastern carpark to provide a drop off and pick up point to the B-line bus stop at Pittwater Road especially for peak hours should be explored. 5. Future development of the design to let more natural light into the entry lobby through the roof should be explored.
Development Engineer	The following comments are provided by development engineering and certification: 1) On site stormwater detention will be required in accordance with Pittwater DCP 21 Section 5.7 if the increase in hard surface area is greater than 50m2. Stormwater drainage plans/Calculations in accordance with the DCP are to be provided with the Development Application. The provision of any OSD storage shall comply with the DCP. 2) The development will be required to provide kerb and gutter for the full Boondah Road frontage. 3) A boundary adjustment corner Jacksons Road and Pittwater Road will be required to facilitate the proposed left hand turn. Concurrence/approvals for the left hand turn is required from the RMS is required as they are the Roads Authority.
Stormwater Asset Engineer	• Council's records indicate that the property 2 & 4 Jacksons Rd, Warriewood is burdened by five 150mm PVC stormwater pipelines (SPI57772, SPI57773, SPI577775, SPI58028, SPI57776), one 200mm PVC stormwater pipeline (SPI57774) and associated stormwater infrastructure. This is shown on Council's stormwater map which is available on the webpage. (Please follow the relevant link below and select the 'Stormwater' map from the 'No Overlay Map' drop down menu. You can then search by address and use the zoom functionality to see pipe diameters and asset id numbers. I.e. 600 mm and SPP or SPI etc.). • **Council's Stormwater Planning Map:** https://services.northernbeaches.nsw.gov.au/icongis/index.html • According to the plans submitted for this Pre-lodgement meeting, the proposed building footprint will be located over stormwater pipelines (SPI57774, SPI57776, SPI7775). However, based on the size and material of the pipes within the property boundary, it is believed that the stormwater infrastructure shown is commercial internal drainage for the carpark and building facilities and not part of Council's public

Specialist Advice	
	stormwater network. This should be confirmed as part of the DA by accurately locating, confirming dimensions (including depth) and plotting to scale the existing stormwater pipelines and associated infrastructure on the site plans that outline the proposal. This should be carried out by a service locating contractor and registered surveyor. Should the stormwater infrastructure within the property be confirmed as commercial drainage, the new drainage for the facility would need to be detailed in the Stormwater Management Plan for the DA. Further comments on this to be provided by the Development Engineering team. Any new commercial drainage infrastructure will be managed and maintained by the Council asset owner. • To demonstrate compliance with *Pittwater 21 Development Control Plan – Section B5.12 Stormwater Drainage Systems* and *Natural Watercourse, and Council's Water Management Policy PL 850 Water (Section 6 – Building Over or Adjacent to Council Drainage System and Easement)*. It is recommended that the following details be submitted with any application: ➢ Accurately locate, confirm dimensions (including depth) and plot to scale Council's stormwater pipelines and associated infrastructure on the DA site plans that outline the proposal. This should be carried out by a service locating contractor and registered surveyor. (Evidence of methodology used for locating stormwater system should be provided); ➢ If the applicant proposes to use a CCTV pipeline survey to confirm the location of the pipeline, it is recommended that the survey is carried out in accordance with Council's guideline attached; ➢ All structures are to be located clear of any Council pipeline, pit or easement and comply with minimum vertical and horizontal clearances; ➢ Footings of any structure adjacent to an easement or pipeline are to be designed in accordance with the above-mentioned policy; and ➢ Structural details prepared by a suitably qualified Civil Engineer demonstrating compliance with Council's policy are to be submitted.

Specialist Advice	
	Pittwater DCP 2013: https://eservices.northernbeaches.nsw.gov.au/ePlanning/live/pages/plan/Book.aspx?exhibit=PDCP&hid=11881 **Water Management Policy PL850:** https://files.northernbeaches.nsw.gov.au/sites/default/files/documents/policies-register/water-management/water-management-policy/2017327805watermanagementpolicy.pdf **Building Over or Adjacent to Constructed Council Drainage Systems and Easements Technical Specifications (Section 6):** https://files.northernbeaches.nsw.gov.au/sites/default/files/documents/general-information/engineering-specifications/building-over-or-adjacent-constructed-council-drainage-systems-and-easements-technical-specification.pdf

Documentation to accompany the Development Application

- Electronic copies (USB)
- Statement of Environmental Effects
- Request to vary a development standard (if applicable)
- Cost of works estimate/ Quote
- Site Plan
- Floor Plan
- Elevations and sections
- A4 Notification Plans
- Survey Plan
- Site Analysis Plan
- Demolition Plan
- Excavation and fill Plan
- Waste Management Plan (Construction & Demolition)
- Waste Management Plan Ongoing
- Certified Shadow Diagrams
- Energy Performance Report
- Schedule of colours and materials
- Landscape Plan and Landscape Design Statement
- Arboriculture Impact Assessment Report
- Photo Montage
- 3D Electronic Model
- Road design Plan
- Advertising Structure / Sign Plan (if any proposed)
- Erosion and Sediment Control Plan / Soil and Water Management Plan
- Stormwater Management Plan / Stormwater Plans and On-site Stormwater Detention (OSD) Checklist
- Stormwater Drainage Assets Plan
- Geotechnical Report
- Acid Sulfate Soil Report
- Acoustic Report

Documentation to accompany the Development Application
• Flood Risk Assessment Report • Water Table Report • Overland Flows Study • Flora and Fauna Assessment • Traffic and Parking Report • Construction Traffic Management Plan • Construction Methodology Plan • Access Report • Integrated Development Fees (if applicable) • Contaminated Land Report [Amend list as applicable – as per Development Application Checklist] *Please refer to Development Application Checklist for further detail.*

Concluding Comments
These notes are in response to a pre-lodgement meeting held on 31 March 2020 to discuss demolition works and construction of community centre with the associated parking. The notes reference concept plans that amended on 9 April 2020 prepared by Terrior. The amendments proposed development is considered to be supportable provided the matters raised in these notes are satisfactorily addressed in any forthcoming Development Application. Based upon the above comments you are advised to satisfactorily address the matters raised in these notes prior to lodging a development application.

SCHEDULE 2 MUSIC MODEL RESULTS

	Sources	Residual Load	% Reduction
Flow (ML/yr)	7.85	7.02	10.5
Total Suspended Solids (kg/yr)	1410	188	86.7
Total Phosphorus (kg/yr)	2.79	0.852	69.4
Total Nitrogen (kg/yr)	17.2	8.5	50.7
Gross Pollutants (kg/yr)	164	2.4	98.5