NORTHROP

Suite 4, 257-259 Central Coast Highway
Erina NSW 2250
T (02) 4365 1668 F (02) 4367 6555
E centralcoast@northrop.com.au ABN 81 094 433 100

CONCEPT STORMWATER MANAGEMENT PLAN

for

BRISBANE WATER LEGACY VILLAGE REDEVELOPMENT

at

51-57 MASONS PARADE POINT FREDERICK

Job No: NL201088
Revision: B
Date: 15.09.21

	BY	DATE
Prepared	RS	15.09.21
Checked	DH	15.09.21
Admin	LE	15.09.21

1. INTRODUCTION

Northrop Consulting Engineers has been engaged by Grindley Pty Ltd to undertake conceptual civil and stormwater design and documentation for the development of the proposed Brisbane Water Legacy Village Residential Apartments at 51-57 Masons Parade, Point Frederick. This report accompanies, and should be read in conjunction with, drawings NL201088 C1.1 – C6.1.

The purpose of this report is to summarise the proposed design solutions for the stormwater management for the Development Application submission to Central Coast Council. The proposed design has been considered with regard to Central Coast Council DCP (Gosford 2013), Central Coast Council Civil Works Specification as well as industry best practice.

We note the information contained in this report is not intended to present detailed design solutions but rather provide solutions commensurate with a conceptual design suitable for Development Application assessment.

2. SITE DESCRIPTION

The subject site is bounded by a multi-storey residential developments to the north, east and south; and Masons Parade to the west.

The site is currently consists of an existing low rise aged care facility with an existing open channel running through the northern boundary of the site.

Figure 1 presents an aerial overview of the site.

Figure 1: Aerial Image of Site (obtained from https://maps.six.nsw.gov.au/)

3. PROPOSED DEVELOPMENT

The proposed development consists of a demolition of a number of existing dwellings, and construction of a new multi-story aged care residential development with on-grade carpark, circulation road and additional undercroft carparking. Additional office and communal areas are located on the ground floor of the development. Landscaping, communal and activity areas are provided at the rear of the development.

The proposed development footprint occupies the northern portion of the site, with the remain site area to be retained and unaffected.

Access to the site will be achieved via Masons Parade. The layout for the development can be seen within drawings NL201088 C1.1 – C6.1.

4. PROPOSED STORMWATER MANAGEMENT STRATEGY

4.1 GENERAL STRATEGY

The onsite stormwater management system has been designed to replicate the processes which would naturally occur onsite. The proposed development will incorporate a number of devices and measures aimed at providing adequate and responsible management of stormwater runoff for minor and major storm events.

In line with Chapter 6.7 of Central Coast Council DCP 2013, the conceptual stormwater management strategy has considered the following items which will be discussed in the following sections of this report:

- Stormwater capture and disposal;
- Water conservation;
- Stormwater retention;
- Stormwater quality;
- Onsite detention;
- Local overland drainage;
- Flooding.

4.2 STORMWATER CAPTURE AND DISPOSAL

Concept stormwater management plans have been prepared for the proposed development and are appended to the rear of this report. The majority of the development area is of a suspended structure built form. The methods of stormwater capture and disposal are outlined below and are to be designed in accordance with AS3500.3 as well as Central Coast Council Engineering Guidelines.

- Runoff from the roof of the residential tower will be captured via a conventional roof drainage system. Once the roof runoff is captured, it will then be conveyed to the rainwater harvesting tank.
- The rainwater harvesting will have a high-level overflow to the stormwater system.
- Runoff from the balcony and podium areas will also be captured by conventional drainage systems and conveyed to the stormwater system on the eastern side of the development, bypassing the rainwater tank.
- Runoff from the carpark and circulation road will be captured and conveyed to the stormwater system, discharging into the northern open channel via water quality treatment devices. Small run-off that cannot be drained back to this location will be captured and conveyed to the kerb & gutter along the Masons Parade road frontage.

- A stormwater system will be installed on the southern side of the development site divert any drainage lines that will be impacted by the new development towards the existing stormwater connection to Masons Parade in the west.

4.2 WATER CONSERVATION

The water conservation objective for the proposed development is to reduce potable water demand by 40% using the provisions nominated within the BASIX report. In summary, it is proposed that the redevelopment will incorporate the following water saving measures:

- Using water efficient fixtures for shower heads, toilet cisterns, toilet taps and kitchen taps including undertaking regular maintenance of these fixtures;
- The use of water efficient dishwashers;
- Landscaping with plant species that require minimal watering and irrigation with appropriate systems to minimise water loss and evaporation. This includes native plant species, using mulch around garden beds, avoiding watering when it's windy, watering during the coolest parts of the day and using drip irrigation;
- Harvested rainwater from part of the roof is proposed to be collected and reused for hardstand washdown, carwash bay and irrigation of landscaping areas.

It is our opinion that the measures outlined above will provide adequate reduction in potable demand to meet the intent of the water conservation target. For detailed assessment of the proposed water conservation initiatives proposed for the development, refer to the project specific BASIX report.

4.2 RETENTION

The intent of water retention targets in Chapter 6.7 of DCP 2013 is to mimic the natural catchment hydrology from all development sites, in terms of:

- Quantity - the annual volume of stormwater reaching natural creeks and waterways;
- Rate - the peak flow rates leaving the site; and
- Response - the time it takes for rain to runoff the site.

To satisfy the intent of the retention targets in the DCP it is proposed to incorporate stormwater source controls to the impervious catchments for the site. In order for stormwater source controls to be effective, they need to have sufficient capacity to meet the above targets. Sizing of controls is described in The Hunter & Central Coast Water Smart Model Planning document (HCCREMS, 2012). Sizing is based on the concept of mitigation of increased stormwater runoff arising from impervious surfaces, for rainfall events with an average recurrence interval of 3 months.

The depth of stormwater runoff that must be captured by the stormwater source controls in order to achieve frequent discharge mitigation is termed the mitigation depth. The mitigation depth for various soil types and are shown below in Table 1.

Table 1: Mitigation Depth

Soil Texture	Mitigation Depth (mm)
Sand	14
Sandy Loam	14
Clay Loam	10
Clay	7

Based on geotechnical investigations performed on site, a clay soil profile is considered to best represent the soils to be encountered on site.

The volume of stormwater runoff that must be captured by a source control to achieve frequent discharge mitigation relative to the impervious surfaces that drain to the control is referred to as the mitigation storage and is calculated as shown below:

MS = (MIC x MD) / 1000

where: MS = mitigation storage (m^3)

MIC = managed impervious catchment (m^2)

MD = mitigation depth (mm)

Using this method, the following mitigation storage for the impervious areas of the proposed development is calculated as shown below:

Mitigation depth	= 7mm	(clay soil type)
Mitigation area	= 3 720 m^2	(62% impervious)
Mitigation Storage	= [(3 720) x 7] / 1 000	
	= 26 m^3	

Using this method, the total mitigation storage, or retention storage required is 26 m^3. It is proposed that a roof area of 1450 m^2 will drain to the below ground reuse tank with a total of 42kL storage capacity. The additional storage capacity provided will ensure that there is suitable reuse volume provided to meet the demand of the project. The reuse is proposed to be used for irrigation and hardstand washdown.

To ensure that there is adequate draw down, a MUSIC model was used to assess the efficiency of the reuse tank.

The assumed water usage rates are outlined as follows;

- Irrigation usage = 1 L/m2/day (NSW modelling guidelines)

The reuse tank demand and efficiency are outlined below.

Table 2 – Reuse Tank Demands

Reuse Tank	Tank size	Reuse Demand	Reuse Efficiency	Irrigation Area
Tank 1	42 kL	2.28 kL/Day	79.13%	2 280 m^2

As can be seen from Table 2, adequate draw down can be achieved based on the proposed tank sizing and reuse scheme.

4.2 STORMWATER QUALITY

In order to minimise adverse impacts upon the ecology of downstream watercourses, stormwater treatment devices have been incorporated into the design of the development. The adopted nutrient and pollution targets were taken from the Central Coast Council Engineering Guidelines and are summarised in Table 3:

Table 3 – Required Water Nutrient and Pollution Reductions

Pollutant Criteria	Required Reduction Target (%)
Total Suspended Solids (TSS)	80
Total Phosphorous (TP)	45
Total Nitrogen (TN)	45
Gross Pollutants	90

The performance of the proposed stormwater management strategy was assessed against these targets using the conceptual design software MUSIC (Version 6). The MUSIC model was developed using parameters recommended in the document "NSW MUSIC Modelling Guidelines" (WBM, 2015) and the Central Coast Council (Lowland - Wyong) MUSIC Link.

The total catchment area was divided into separate sub-catchments representing the areas draining to the different treatment devices. A schematic of the MUSIC model is provided in Figure 2.

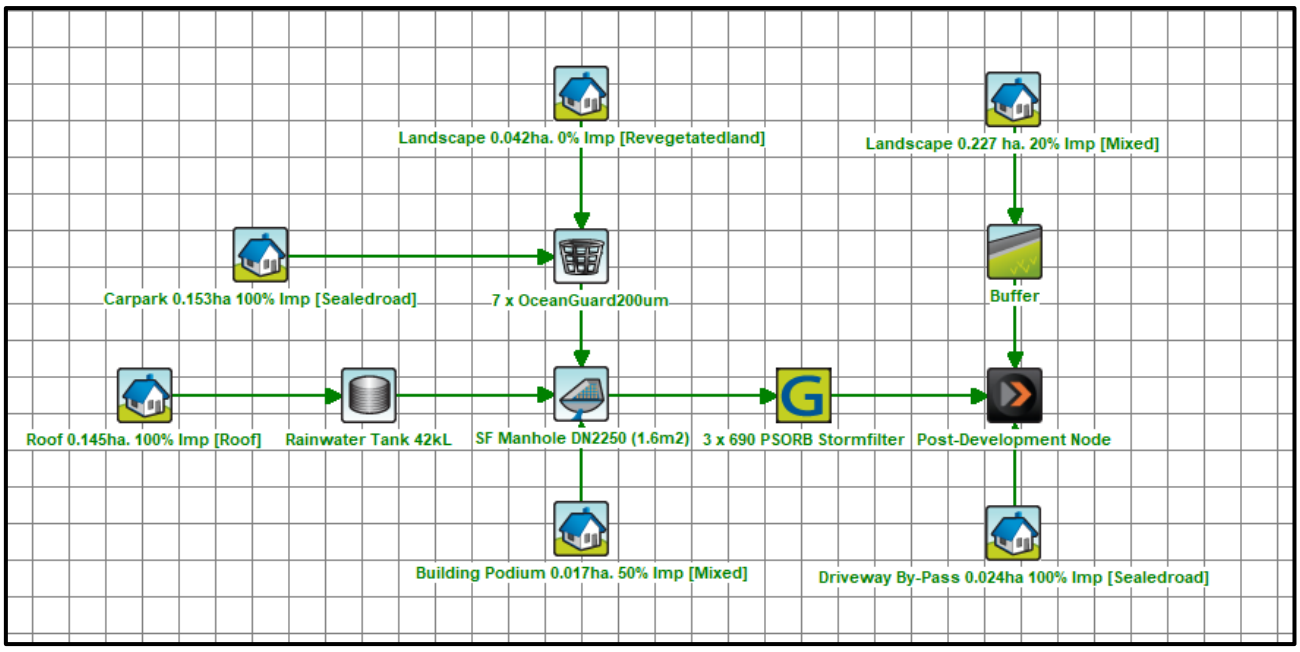


Figure 2 – MUSIC Model Schematic

A number of factors were identified in order to select the most appropriate stormwater quality improvement devices (SQIDs). The proposed development footprint and usage was considered especially significant to this design which eliminated a number of effective treatment options. In addition to the practical constraints, maintenance, operability and aesthetics were considered.

The proposed treatment train incorporates:

- **Rainwater Harvesting Tank** – Runoff from roof areas is to be directed to a below-ground rainwater harvesting tank. The tank is to be fitted with a proprietary first-flush device which will effectively remove dead insects, bird and animal droppings and concentrated tannic acids from the stormwater system. The rainwater tank will also provide secondary treatment by acting as an initial sediment trap, collecting suspended solids and nutrients attached to those sediments. The volume collected in the harvesting tank is to be reused as described previously in this report.

- **SPEL Stormsack** – Pit filter inserts are proposed to provide primary treatment for the ground floor on grade carparking area. The filter inserts will prevent ingress of gross pollutants into the stormwater system.
- **Pit Filter Inserts** – Propriety filter insterts (Psorb filter cartridges or similar) actively filter stormwater runoff, removing suspendered nutrients such as nitrogen and phosphorus, as well as fine suspended solids and small amounts of hydrocarbons.
- **Grass buffer** – runoff from the landscaped spaces will flow over grass buffer strips prior to entering the stormwater system which will allow infiltration and reduce nutrient runoff from the site.

Source node have been adopted from the NSW MUSIC Modelling Guideline (BMT WBM, 2015). Proprietary treatment nodes have been adopted from SPEL and Ocean Protect. The MUSIC modelling results for the above-mentioned treatment strategy are shown below in Table 4:

Table 4 – MUSIC Modelling Results

Pollutant Criteria	Reduction Target (%)	Sources (kg/yr)	Residual Load (kg/yr)	Achieved Reduction (%)
Total Suspended Solids (TSS)	80	951	184	80.7
Total Phosphorous (TP)	45	1.82	0.672	63.2
Total Nitrogen (TN)	45	11.4	5.2	54.5
Gross Pollutants	90	120	10.7	91.1

Note: The MUSIC model can be provided to Council upon request.

Table 4 shows that the proposed stormwater quality management strategy will achieve the required load reduction targets. A copy of the MUSIC Link report has been appended to the rear of this report.

4.5 ONSITE DETENTION

The site is located immediately upstream of the local catchment outlet to Brisbane Water. Providing onsite detention for sites in the lower third of a catchment can have detrimental impacts to the peak discharge from the catchment as providing detention has the potential to delay the peak flow leaving the site and coinciding with the larger peak of the upstream catchment.

As such, onsite detention is not required for this development and has as not been included.

4.6 LOCAL OVERLAND DRAINAGE

An overland flow path has been provided within the site to convey excess stormwater runoff towards the northern open channel via the internal circulation road.

4.7 FLOODING

The site is impacted by two separate flood events, the first being the overland surface flow generated from the upstream catchment and the second being foreshore flooding from the Brisbane Water foreshore.

Both flood events have been detailed in flood studies previously commissioned by Central Coast Council prepared by Cardno. The flood information certificate obtained from Central Coast Council can be found in Appendix A.

Flood behaviour

- **Overland Surface Flow**

Figure 3 presents the 1% AEP peak flood depths for the site as extracted from the Flood Information Certificate provided by Central Coast Council. It is noted that the flood behaviour observed is reflective of the Gosford CBD Local Overland Flow Flood Study prepared by Cardno (2013).

Figure 3 – 1% AEP Peak Flood Depths (Flood Information Certificate - CCC)

It is observed that the site is impacted by overland surface flow flooding, with the majority of the flood extents contained within the existing channel along the northern boundary, and a small extent of flooding observed along the street frontage of Masons Parade to the west. Additional pockets of ponding are identified in the centre of the site. However, these are attributed to localised trapped low points created by the obstruction of existing buildings.

Figure 4 presents the hydraulic category for the flood extents.

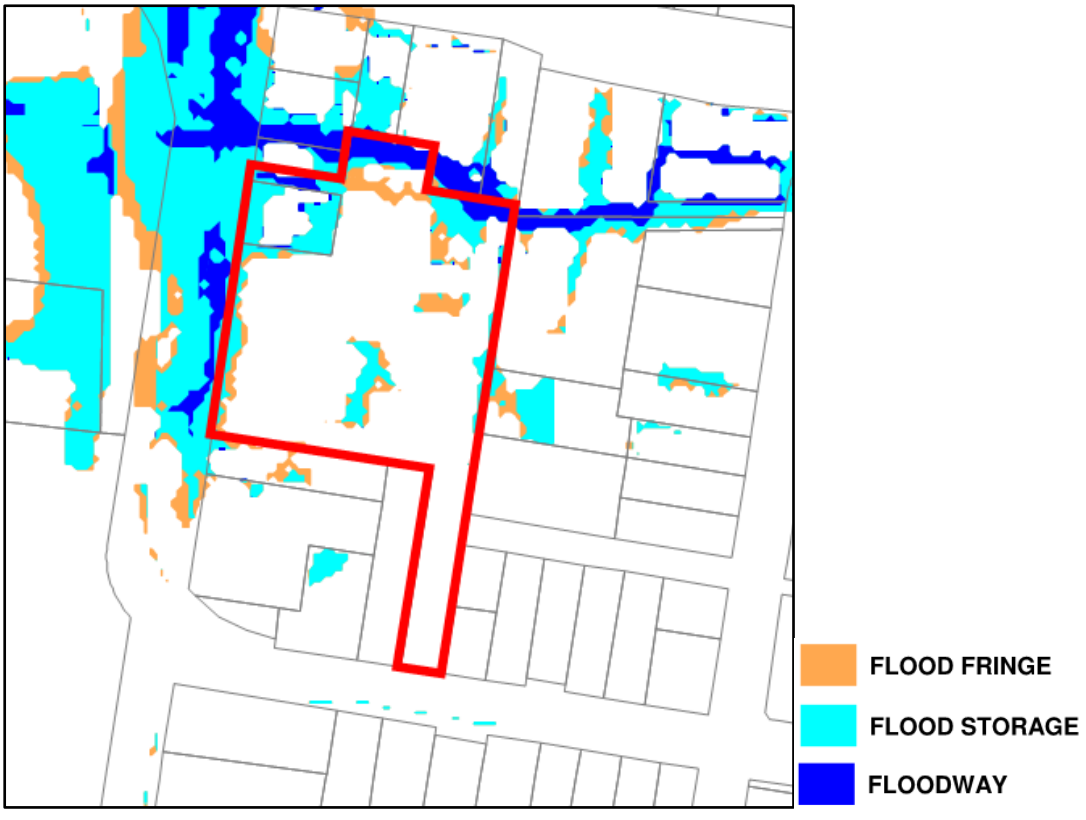


Figure 4 – 1% AEP Flood Hydraulic Categories (Cardno 2013 – Excerpt of Figure 4.21)

A combination of Flood Fringe and Flood Storage are observed scattered on the site with the clearly defined stormwater channel classified as Floodway in the north.

The flood hazard categories are illustrated in Figure 5.

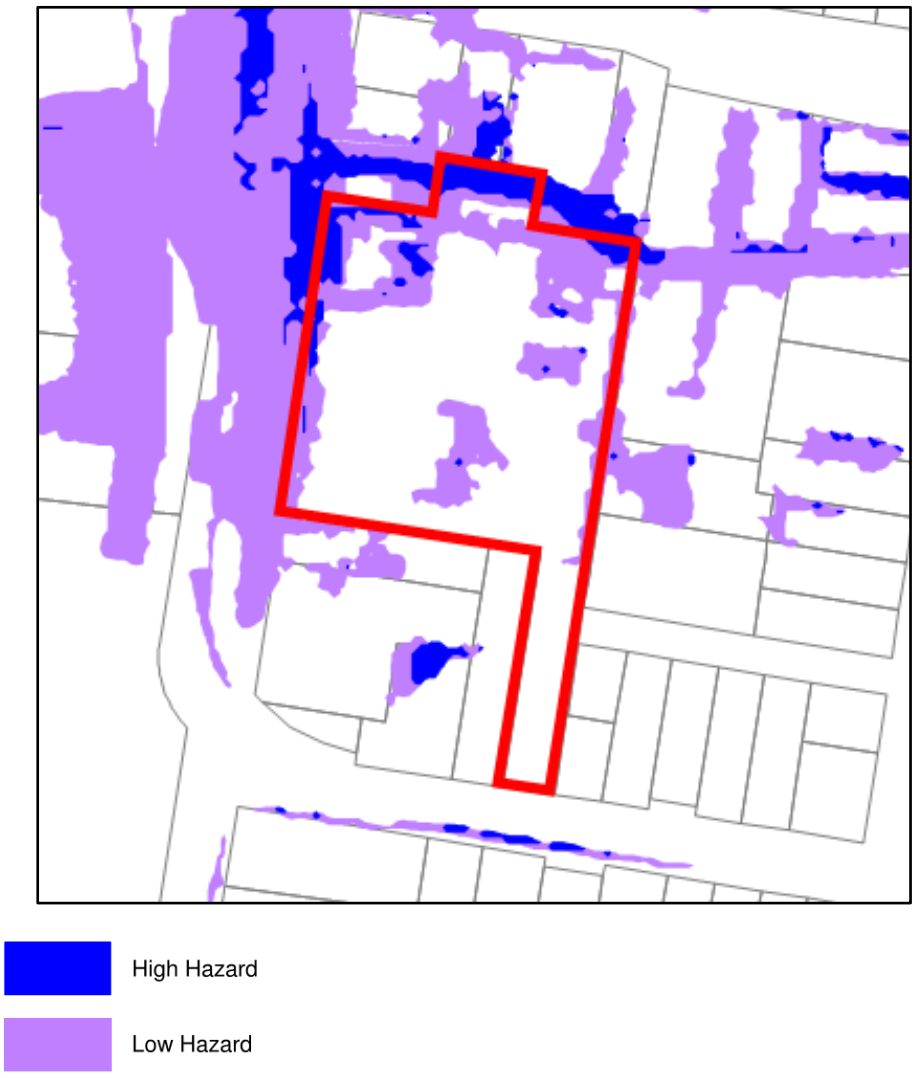


Figure 5 – 1% AEP Flood Hazard Categories (Cardno 2013 – Excerpt of Figure 4.19)

The site is primarily only impacted by low hazard flood extents, with the exception of the channelised flow to the north.

The PMF peak flood depths are presented in Figure 6.

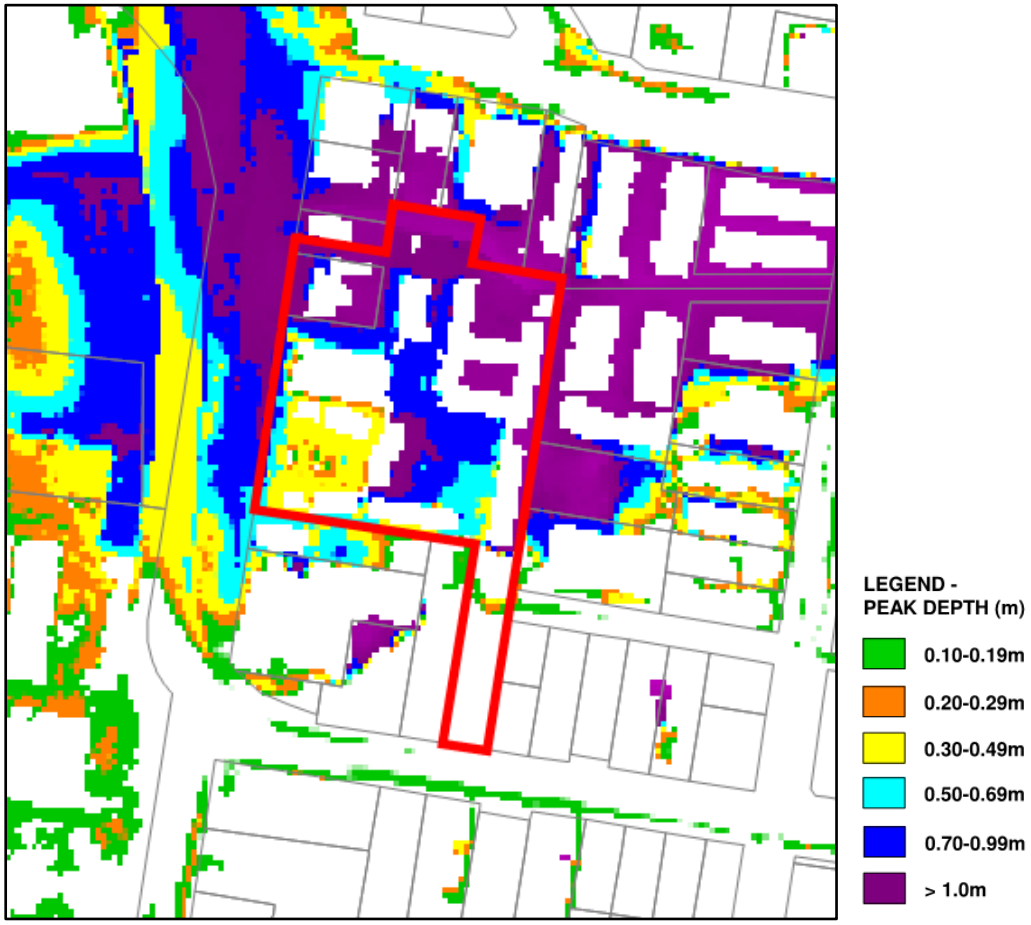


Figure 6 – PMF Peak Flood Depths (Cardno 2013 – Excerpt of Figure 4.5)

It is observed that the site is impacted by the PMF event when assessing the overland flow. The peak depths observed are a result of the impedance and restriction of flow modelled for the existing dwellings on site.

- **Brisbane Water Foreshore Flooding**

The second major flood event that affect the subject site has been detailed in the 'Brisbane Water Foreshore Flood Study' prepared by Cardno (2013). The report details the impacts of flooding as a result of the Brisbane Water Foreshore, including storm bursts, wave effects and sea level rise.

Figure 7 presents an excerpt of the flood extents determined as part of the study.

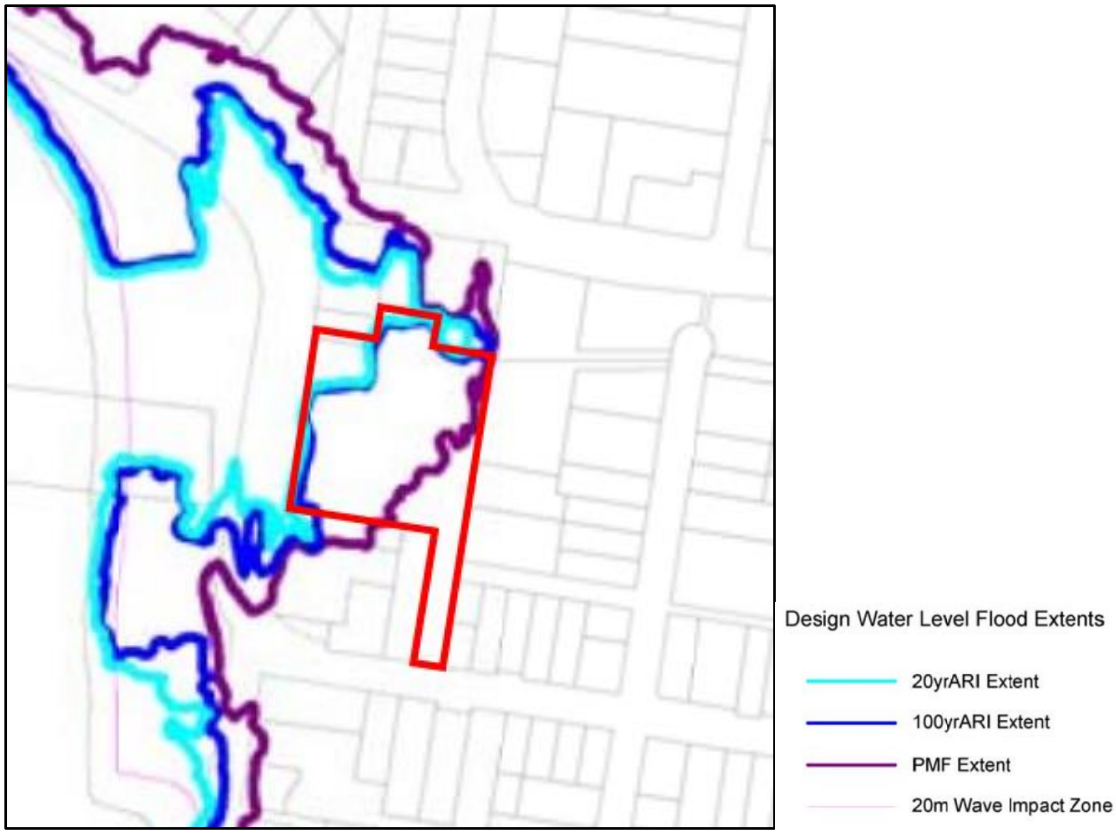


Figure 7 – Design Water Level Flood Extents (Cardno 2013 – Excerpt of Figure 6.16A)

It is observed that the site is only affected on the fringes of the site boundary in both the 5% and 1% AEP storm events. The PMF storm event is seen to inundate the majority of the site.

The flood levels were extracted from the flood study in the location of the subject site.

- 1% AEP = 1.71m AHD
- 1% AEP + 500mm freeboard = 2.21m AHD
- 1% AEP + 0.55m MSLR = 2.26m AHD
- PMF = 2.46m AHD

Flood Impacts - 1% AEP and PMF Flood Events

Figure 8 presents the building extents that was utilised for the Cardno overland flow study with the approximate proposed building extents overlayed. The existing building on the subject site are proposed to be demolished.

Figure 8 – Flood Model Obstructions (Cardno 2013 – Excerpt of Figure 3.5)

It can be observed that the proposed building extent is consistent or less than that currently adopted within the flood study. It can be reasonably determined, that when considering the flood impacts of the proposed development for the 1% AEP and PMF flood events, that the proposed development will not adversely affect the existing flood behaviour for the neighbouring properties. The proposed development may reduce the severity of flooding for surrounding properties as a number of existing buildings will be demolished and removed from the site, reducing the amount of blockage for any flows traversing through the site.

It is also noted that the effective cross-section for the open channel has not been reduced at any location through the site, and the proposed maintenance & garbage building is located outside of the existing 1% AEP flood extents.

Floor Levels

It is proposed that the floor levels of all habitable and non-habitable spaces are to be at or above the PMF level consistent with the controls for 'Seniors Housing'.

The floor level has been proposed to satisfy the highest flood level for the range of events including:

- Overland Flow:
  - 1% AEP + 500mm Freeboard = 2.36m AHD; or
  - PMF Event = **2.78m AHD**

Or

- Foreshore Flooding:
  - 1% AEP Flood Level + Sea Level Rise (50-year Design life) = 2.26m AHD; or
  - 1% AEP Flood Level + 500mm Freeboard = 2.21m AHD; or
  - PMF Flood Level = 2.46m AHD.

Note: Flood levels were obtained from the worst case levels within the footprint of the proposed development.

Access Roads, Driveways and Parking Areas

The requirements for all access roads, driveways and external parking areas to be above the 1% AEP flood level is deemed ineffective for this development, as it is noted that the main street access in Masons Parade is inundated during the 1% AEP flood event preventing the ability to safely receive and evacuate occupants without crossing floodwaters. As such, the inclusion of this requirement in the design is deemed redundant, as it does not achieve the intended outcome.

On-site refuge can be sought on-site during extreme flooding events, as the floor level of habitable and non-habitable spaces will be above the PMF level. Given the relatively short duration of the PMF flooding event, it is proposed that this is deemed acceptable, given the location of the site and surround flood hazards. Emergency access can be achieved towards the Central Coast Highway south of the site.

Earthworks & Site Filling

The site is identified to only contain small areas of flooding extent identified as flood storage, with the remaining areas classified as flood fringe, with the exception of the open channel north of the site.

It is proposed that the filling within the identified flooding extents shall be offset by providing the equivalent storage capacity elsewhere on-site, to ensure no significant adverse impacts on the flood behaviour for neighbouring and adjacent properties.

An 3D earthworks model was developed to compare the volume of storage lost by the proposed development, to the 1% flood level of 1.86m. It was calculated that 380m^3 of potential flood storage would be lost due to the earthworks required to facilitate the development.

It is proposed that the existing open channel is locally widened to provide the 380m3 of offset flood storage required to mitigate any potential impacts.

The extent of filling required for the site when considering the potential flood impacts of the foreshore flooding event is deemed to have an inconsequential impact on the flood behaviour, given the relative volumes of fill compared to the volumes observed within the water body. Any filling will likely have an immeasurable and neglectable impact on surrounding flood levels.

Flood Summary

The flood characteristics of the site have been discussed, outlining the two major flood events that affect the proposed development. A review of Council’s flood studies has been performed including discussion on the existing and proposed site impacts.

It has been demonstrated how the proposed development addresses the requirements of the Gosford DCP 2013, in particular Chapter 6.7 – Water Cycle Management (6.7.7.6 Flooding Targets). Discussion has been provided outlining the justification to not utilise an extensive 2D hydraulic flood model to demonstrate the flooding objectives can be achieved and instead provide qualitative assessment of the proposed development in conjunction with the previously prepared Flood Studies commissioned by Central Coast Council.

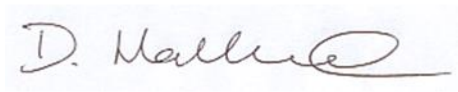
5. CONCLUSION

The proposed stormwater management design presented above has been prepared to comply with Central Coast Council (Gosford) DCP and Central Coast Council Design Guidelines as well as best industry practice. The design philosophy is based on the principle of at source treatment, to reduce conveyance infrastructure and manage water quantity and quality aspects.

Based on the above, our conceptual investigation and concept designs indicate the proposed development can adequately manage and address all items surrounding stormwater runoff. Should you have any queries, please feel free to contact the undersigned on (02) 4365 1668.

Robert Suckling

Civil Engineer



Daniel Holland

Civil Engineer

REFERENCES:

Gosford Development Control Plan 2013

Central Coast Council, Civil Works Specification – Design Guideline 2018

BMT WBM Pty Ltd, New South Wales MUSIC Modelling Guidelines, August 2015

Central Coast Council, Water Sensitive Urban Design – Technical Guideline No 3. – Device Selection Guide, November 2010.

Gosford CBD Overland Flow Flood Study – Cardno 2013

Brisbane Water Foreshore Flood Study – Cardno 2013

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APPENDIX A – SUPPLEMENTARY INFORMATION

- Concept Stormwater Management Plan
- MUSIC Link Report
- Flood Information Certificate

TRANSMITTAL

NORTHROP
Suite 4, 257-259 Central Coast Highway
Erina NSW 2250
T (02) 4365 1668 F (02) 4367 6555
E centralcoast@northrop.com.au ABN 81 094 433 100

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NL201088	BRISBANE WATER LEGACY VILLAGE	1 of 1

From	Robert Suckling

Description	Date			
BRISBANE WATER LEGACY VILLAGE RESIDENTIAL	Day	21	10	15
APARTMENTS 51-57 MASONS PDE, POINT FREDERICK	Month	05	09	09
INTERNAL CIVIL WORKS	Year	21	21	21

Doc No.	Document Title	Current Revision	Revision		
C1.1	COVER SHEET	B	A		B
C2.1	CONCEPT SEDIMENT & EROSION CONTROL PLAN	B	A	A	B
C2.2	SEDIMENT & EROSION CONTROL DETAILS	B	A		B
C4.1	STORMWATER MANAGEMENT & LEVELS PLAN	B	A	A	B
C5.1	LONG SECTIONS & CROSS SECTIONS – SHEET 1	B	A		B
C6.1	VEHICLE SWEPT PATHS	B	A		B

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BRISBANE WATER LEGACY VILLAGE RESIDENTIAL APARTMENTS

51-57 MASONS PDE, POINT FREDERICK
INTERNAL CIVIL WORKS

LOCALITY PLAN

NORTHROP

DRAWING SCHEDULE

DWG No.	DRAWING TITLE
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C2.1	CONCEPT SEDIMENT & EROSION CONTROL PLAN
C2.2	SEDIMENT & EROSION CONTROL DETAILS
C4.1	STORMWATER MANAGEMENT & LEVELS PLAN
C5.1	LONG SECTIONS & CROSS SECTIONS - SHEET 1
C6.1	VEHICLE SWEPT PATHS

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Central Coast
Suite 4, 257-259 Central Coast Hwy, Erina NSW 2250
Ph (02) 4365 1668 Fax (02) 4367 6555
Email centralcoast@northrop.com.au ABN 81 094 433 100

PROJECT: BRISBANE WATER LEGACY VILLAGE RESIDENTIAL APPRATMENTS 51-57 MASONS PDE, POINT FREDERICK

DRAWING TITLE: INTERNAL CIVIL WORKS COVER SHEET

JOB NUMBER: NL201088

DRAWING NUMBER: C1.1

REVISION: B

DRAWING SHEET SIZE = A1

INSTALL SILT FENCE 'SILTMASTER' OR SIMILAR, ALONG EXISTING TOP OF BANK. INSTALLED IN ACCORDANCE WITH DETAIL SD6-8 OF THE BLUEBOOK.

DENOTES SANDBAG or GEOTEXTILE SOCK FILLED WITH NO FINES GRAVEL PLACED IN INVERT OF GUTTER @ 15m CTS

PROVIDE TEMPORARY CONTRACTORS VEHICULAR ACCESS POINT. CONSTRUCT A STABILIZED SITE ACCESS IN ACCORDANCE WITH DETAIL SD6-14 OF THE BLUE BOOK, OR ALTERNATIVELY PROVIDE A SHAKEDOWN CATTLE GRID' AT THE ENTRANCE POINT TO REDUCE THE LIKELIHOOD OF SEDIMENT BEING TRAFFICKED OFF-SITE.

INSTALL SILT FENCE 'SILTMASTER' OR SIMILAR, ALONG EXISTING EDGE OF BANK. INSTALLED IN ACCORDANCE WITH DETAIL SD6-8 OF THE BLUEBOOK.

DENOTES INDICATIVE LOCATION OF STOCKPILE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH DETAIL SD4-1 OF THE BLUE BOOK

PROVIDE PIT PROTECTION INSTALLED IN ACCORDANCE WITH DETAILS SD6-11 OR SD6-12 (AS APPROPRIATE) OF THE BLUE BOOK (TYPICAL)

PROVIDE COMBINED SITE/SILT FENCE 'SILTMASTER' OR SIMILAR, INSTALLED IN ACCORDANCE WITH DETAIL SD6-8 OF THE BLUEBOOK.

PROPOSED SITE BOUNDARY ADJUSTMENT

LEGEND

- DENOTES SITE BOUNDARY LINE
- DENOTES EASEMENT LINE, REFER TO SURVEY FOR DETAILS
- DENOTES COMBINED SITE/SILT FENCE 'SILTMASTER' OR SIMILAR, INSTALLED IN ACCORDANCE WITH DETAIL SD6-8 OF THE BLUEBOOK.
- DENOTES TEMPORARY CONTRACTORS VEHICULAR ACCESS POINT. CONSTRUCT A STABILISED SITE ACCESS IN ACCORDANCE WITH DETAIL SD6-14 OF THE BLUE BOOK OR PROVIDE A SHAKEDOWN CATTLE GRID AT ENTRANCE POINT TO REDUCE LIKELIHOOD OF SEDIMENT BEING TRAFFICKED OFF-SITE
- DENOTES GEOTEXTILE INLET FILTER INSTALLED IN ACCORDANCE WITH DETAIL SD6-12 OF THE BLUE BOOK
- INDICATES MESH & GRAVEL INLET FILTER INSTALLED IN ACCORDANCE WITH DETAILS SD6-11 OF THE BLUE BOOK
- DENOTES SANDBAG or GEOTEXTILE SOCK FILLED WITH NO FINES GRAVEL PLACED IN INVERT OF GUTTER
- DENOTES INDICATIVE LOCATION OF STOCKPILE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH DETAIL SD4-1 OF THE BLUE BOOK

SEDIMENT & EROSION CONTROL NOTES

1. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH RELEVANT ORDINANCES AND REGULATIONS, NOTE IN PARTICULAR THE REQUIREMENTS OF LANDCOMS MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION' (THE 'BLUE BOOK').
2. INSTALL SEDIMENT PROTECTION FILTERS ON ALL NEW AND EXISTING STORMWATER INLET PITS IN ACCORDANCE WITH EITHER THE MESH AND GRAVEL INLET FILTER DETAIL SD6-11 OR THE GEOTEXTILE INLET FILTER DETAIL SD6-12 OF THE 'BLUE BOOK'.
3. ESTABLISH ALL REQUIRED SEDIMENT FENCES IN ACCORDANCE WITH DETAIL SD6-8 OF THE 'BLUE BOOK'.
4. INSTALL SEDIMENT FENCING AROUND INDIVIDUAL BUILDING ZONES/AREAS AS REQUIRED AND AS DIRECTED BY THE SUPERINTENDENT.
5. ALL TRENCHES INCLUDING ALL SERVICE TRENCHES AND SWALE EXCAVATION SHALL BE SIDE-CAST TO THE HIGH SIDE AND CLOSED AT THE END OF EACH DAYS WORK.
6. THE CONTRACTOR SHALL ENSURE THAT ALL VEGETATION (TREE, SHRUB & GROUND COVER) WHICH IS TO BE RETAINED SHALL BE PROTECTED DURING THE DURATION OF CONSTRUCTION. REFER ARCHITECTS PLANS FOR TREES TO BE KEPT.
7. ALL VEGETATION TO BE REMOVED SHALL BE MULCHED ONSITE AND SPREAD/STOCKPILED AS DIRECTED BY THE SUPERINTENDENT.
8. STRIP TOPSOIL IN AREAS DESIGNATED FOR STRIPPING AND STOCKPILE FOR RE-USE AS REQUIRED. ANY SURPLUS MATERIAL SHALL BE REMOVED FROM SITE AND DISPOSED OF IN ACCORDANCE WITH EPA GUIDELINES.
9. CONSTRUCT AND MAINTAIN ALL MATERIAL STOCKPILES IN ACCORDANCE WITH DETAIL SD4-1 OF THE 'BLUE BOOK' (INCLUDING CUT-OFF SWALES TO THE HIGH SIDE AND SEDIMENT FENCES TO THE LOW SIDE)
10. ENSURE STOCKPILES DO NOT EXCEED 2.0m HIGH. PROVIDE WIND AND RAIN EROSION PROTECTION AS REQUIRED IN ACCORDANCE WITH THE 'BLUE BOOK'.
11. PROVIDE WATER TRUCKS OR SPRINKLER DEVICES DURING CONSTRUCTION AS REQUIRED TO SUPPRESS DUST.
12. ONCE CUT/FILL OPERATIONS HAVE BEEN FINALIZED ALL DISTURBED AREAS THAT ARE NOT BEING WORKED ON SHALL BE RE-VEGETATED AS SOON AS IS PRACTICAL.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING A DETAILED WRITTEN RECORD OF ALL EROSION & SEDIMENT CONTROLS ON-SITE DURING THE CONSTRUCTION PERIOD. THIS RECORD SHALL BE UPDATED ON A DAILY BASIS & SHALL CONTAIN DETAILS ON THE CONDITION OF CONTROLS AND ANY/ ALL MAINTENANCE, CLEANING & BREACHES. THIS RECORD SHALL BE KEPT ON-SITE AT ALL TIMES AND SHALL BE MADE AVAILABLE FOR INSPECTION BY THE PRINCIPAL CERTIFYING AUTHORITY AND THE SUPERINTENDENT DURING NORMAL WORKING HOURS.

THE CONTRACTOR SHALL ENSURE COUNCIL ASSETS AND THE UTILITIES ARE PROTECTED AT ALL TIMES. ANY AND ALL DAMAGES TO COUNCIL ASSETS AND/OR UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR TO THE SPECIFICATION OF COUNCIL AND THE UTILITIES AUTHORITY AND AT NO COST TO THE PRINCIPAL OR NORTHROP CONSULTING ENGINEERS.

SEDIMENT BASIN/TANKS SIZING CALCULATION

THE SITE IS LOCATED WITHIN THE ERINA SOIL LANDSCAPE AND PRIMARILY CONSISTS OF SANDY CLAY & SILTY SANDS, WHICH HAS THE FOLLOWING PROPERTIES (IN ACCORDANCE WITH TABLE C17 OF THE 'BLUE BOOK'.

SITE PARAMETERS	
CONSTRAINT	VALUE
SEDIMENT TYPE	D
SOIL HYDROLOGY GROUP	B
K = SOIL ERODIBILITY (K-FACTOR)	0.030
R = RAINFALL EROSIVITY (R-FACTOR)	3900
S = 2 YEAR, 6 HOUR STORM INTENSITY	13.4mm/hr (GOSFORD)
LS = SLOPE LENGTH/GRADIENT	0.34 (50m SLOPE @ 2% GRADE)
P = EROSION CONTROL PRACTICE (P-FACTOR)	1.3 (TYPICAL)
C = GROUND COVER (C-FACTOR)	1.0 (TYPICAL FOR STRIPPED SITE)
SOIL LOSS (RUSLE METHOD) (tonnes/ha/yr)	51.7
DISTURBED AREA	0.54Ha
SOIL LOSS (tonnes/yr)	27.8
EROSION HAZARD (TABLE 4.2 BLUE BOOK)	VERY LOW
TOTAL SITE RUN-OFF IS LESS THAN 150m³/Yr. BASIN/TANKS NOT REQUIRED.	

NOTE THAT ORIGINAL DRAWING IS IN COLOUR

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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B	DEVELOPMENT APPLICATION	KT		DH	15.09.21

CLIENT: Grindley

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ARCHITECT: INTEGRATED DESIGN GROUP

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PLANS 1:200@A1 0 2 4 6 8 10m

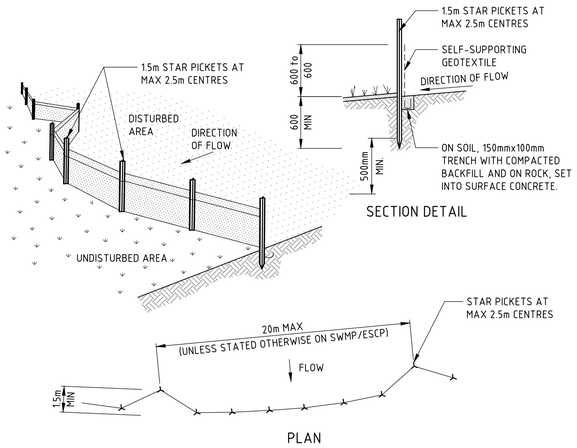
NORTHROP
Central Coast
Suite 4, 257-259 Central Coast Hwy, Erina NSW 2250
Ph (02) 4365 1668 Fax (02) 4367 6555
Email centralcoast@northrop.com.au ABN 81 094 433 100

PROJECT: BRISBANE WATER LEGACY VILLAGE
RESIDENTIAL APPRATMENTS
51-57 MASONS PDE, POINT FREDERICK

DRAWING TITLE: INTERNAL CIVIL WORKS
CONCEPT SEDIMENT & EROSION CONTROL PLAN

JOB NUMBER: NL201088
DRAWING NUMBER: C2.1
REVISION: B
DRAWING SHEET SIZE = A1

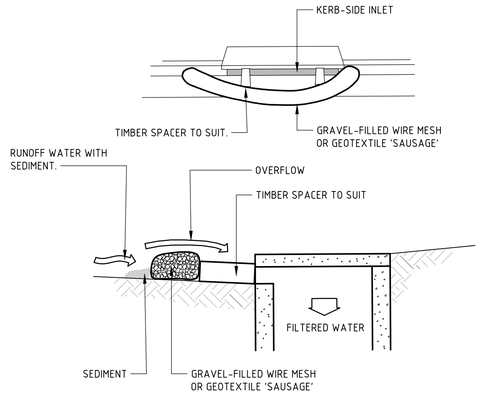
DRAWN KATHLEEN TURTON DESIGNED ROBERT SUCKLING JOB MANAGER DANIEL HOLLAND VERIFIER



CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

SEDIMENT FENCE (SD 6-8)

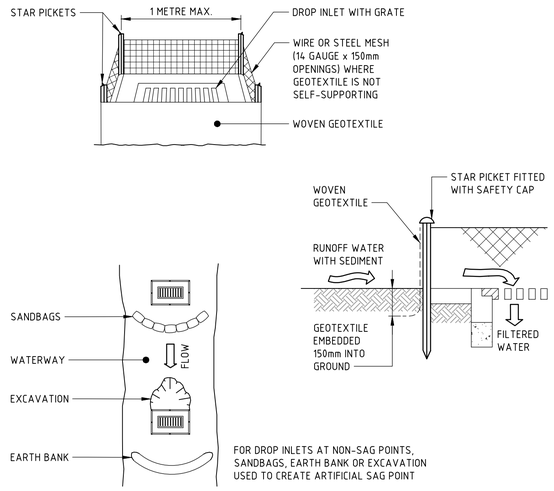


NOTE:THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN APPROVED SWMP/ESCP.

CONSTRUCTION NOTES

1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

MESH AND GRAVEL INLET FILTER (SD 6-11)

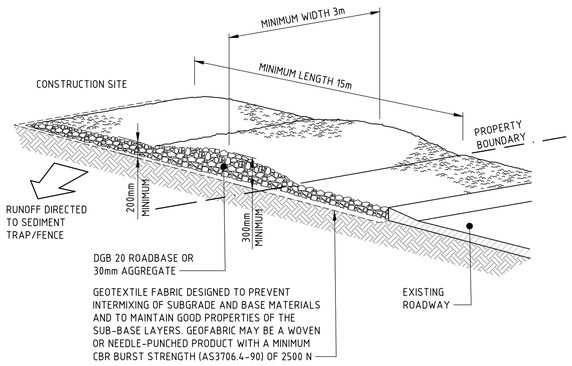


FOR DROP INLETS AT NON-SAG POINTS, SANDBAGS, EARTH BANK OR EXCAVATION USED TO CREATE ARTIFICIAL SAG POINT

CONSTRUCTION NOTES

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

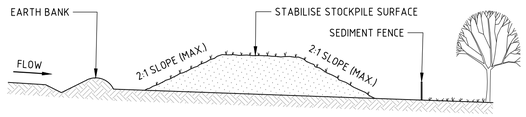
GEOTEXTILE INLET FILTER (SD 6-12)



CONSTRUCTION NOTES

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

STABILISED SITE ACCESS (SD 6-14)



CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2m (PREFERABLY 5m) FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2m DOWNSLOPE.

STOCKPILES (SD 4-1)

DRAWN KATHLEEN TURTON DESIGNED ROBERT SUCKLING JOB MANAGER DANIEL HOLLAND VERIFIER

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NORTHROP
Central Coast
Suite 4, 257-259 Central Coast Hwy, Erina NSW 2250
Ph (02) 4365 1668 Fax (02) 4367 6555
Email centralcoast@northrop.com.au ABN 81 094 433 100

PROJECT: **BRISBANE WATER LEGACY VILLAGE RESIDENTIAL APPRATMENTS 51-57 MASONS PDE, POINT FREDERICK**

DRAWING TITLE: **INTERNAL CIVIL WORKS SEDIMENT & EROSION CONTROL DETAILS**

JOB NUMBER: **NL201088**

DRAWING NUMBER: **C2.2**

REVISION: **B**

DRAWING SHEET SIZE = A1

DENOTES PROPOSED CONCRETE HEADWALL WITH NON-RETURN VALVE & RIP RAP SCOUR PROTECTION

DENOTES RETAINING WALL WITH VEHICLE BARRIER WHERE DROP-OFF >600mm

DENOTES (x3) OCEAN PROTECT FILTER CARTRIDGES (OR APPROVED EQUIVALENT)

DENOTES PROPOSED HEAVY DUTY LAYBACK & VEHICLE CROSSING IN ACCORDANCE WITH CENTRAL COAST COUNCIL STANDARD DRAWING SD0506

DENOTES INDICATIVE MAINTENANCE ACCESS LOCATION FOR WATERCOURSE. MAX GRADE 1V:5H (20% GRADE)

EXISTING OPEN CHANNEL TO BE WIDENED TO PROVIDE ADDITIONAL 380m³ FLOOD STORAGE TO OFFSET IMPACT FROM DEVELOPMENT. REFER TO FLOOD IMPACT ASSESSMENT FOR ADDITIONAL INFORMATION

EXISTING CULVERTS TO BE RETAINED

DENOTES Ø100 PVC PIPE TO CONNECT TO EXISTING STORMWATER PIT

BALCONY & PODIUM DRAINAGE LINES TO BYPASS REUSE TANK & CONNECT TO STORMWATER SYSTEM

CONNECT ALL ROOF DOWNPIPE LINES TO REUSE TANK

EXISTING SEWER MAIN TO BE RETAINED

DENOTES INDICATIVE LOCATION OF RETAINING WALL. TOP OF WALL RL2.20m (APPROX)

NOTE: SURFACE & SUBSOIL DRAINAGE TO BE CONNECTED TO STORMWATER SYSTEM (N.S.O.P). REFER TO LANDSCAPE ARCHITECTS DRAWINGS FOR DETAILS & LEVELS, MINIMUM SURFACE LEVEL RL2.15.

DENOTES EXISTING SW PIT TO BE DEMOLISHED & DISPOSED OFF SITE (TYPICAL)

DENOTES Ø90 PVC PIPE TO CONNECT TO BACK OF KERB WITH KERB ADAPTOR, IN ACCORDANCE WITH CENTRAL COAST COUNCIL STANDARD DRAWING SD0510

PROPOSED SITE BOUNDARY ADJUSTMENT

DENOTES PROPOSED HEAVY DUTY LAYBACK & VEHICLE CROSSING IN ACCORDANCE WITH CENTRAL COAST COUNCIL STANDARD DRAWING SD0506

DENOTES INDICATIVE STORMWATER DIVERSION TO INTERCEPT EXISTING STORMWATER DRAINAGE LINES WHICH MAY CONVEY RUNOFF TOWARDS THE NORTH (IF REQUIRED), TO BE CONFIRMED PRIOR TO CONSTRUCTION

DENOTES EXISTING STORMWATER PITS TO BE RETAINED. REDUNDANT PIPE CONNECTIONS TO BE CAPPED & ABANDONED (TYPICAL)

DENOTES INDICATIVE OVERLAND FLOW PATH TO BE FREE OF OBSTRUCTIONS

LEGEND

- DENOTES SITE BOUNDARY LINE
- DENOTES EASEMENT LINE, REFER TO SURVEY FOR DETAILS
- DENOTES PROPOSED BUILDING EXTENTS, REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR DETAILS
- FFL2.78 — DENOTES PROPOSED FINISHED FLOOR LEVEL
- PL 2.30 — DENOTES PROPOSED FINISHED SURFACE LEVEL
- CL 2.15 — DENOTES PROPOSED STORMWATER PIT COVER LEVEL
- EX 2.15 — DENOTES EXISTING SURFACE LEVEL
- 2.0 — DENOTES EXISTING CONTOURS
- 1.0 — DENOTES DESIGN CONTOURS
- CH0.00 — CL-1 — DENOTES ALIGNMENT CONTROL LINE & CHAINAGE, REFER TO LONG SECTION
- DENOTES PROPOSED STORMWATER PIT. ALL NEW STORMWATER INLET PITS ARE TO BE FITTED WITH FILTER INSERTS IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION
- DENOTES EXISTING STORMWATER PIT / KERB INLET PIT TO BE RETAINED
- GTD-150 — DENOTES GRATED TRENCH DRAIN & WIDTH
- DENOTES CONCRETE HEADWALL WITH NON-RETURN VALVE AND RIP RAP SCOUR PROTECTION
- RWT — DENOTES BELOW GROUND RAINWATER TANK/S WITH 42kL COMBINED CAPACITY. HARVESTED RAINWATER TO BE USED FOR IRRIGATION & TOILET FLUSHING
- DENOTES PROPOSED STORMWATER LINE
- DENOTES OVERLAND FLOW PATH
- RW/VB — DENOTES RETAINING WALL WITH VEHICLE BARRIER (REQUIRED FOR DROP-OFFS GREATER THEN 600mm)
- E — DENOTES APPROXIMATE LOCATION OF EXISTING ELECTRICITY LINE
- G — DENOTES APPROXIMATE LOCATION OF EXISTING GAS MAIN
- T — DENOTES APPROXIMATE LOCATION OF EXISTING TELECOMMUNICATION LINE
- W — DENOTES APPROXIMATE LOCATION OF EXISTING WATER MAIN
- S — DENOTES APPROXIMATE LOCATION OF EXISTING SEWER MAIN

LOCATIONS OF EXISTING SERVICES ARE APPROXIMATE ONLY & MAY NOT BE COMPLETE. THE BUILDER IS RESPONSIBLE FOR LOCATING EXISTING INFRASTRUCTURE (CULVERTS, PITS, PIPES, SERVICES, INVERT & COVER LEVELS ETC) PRIOR TO COMMENCING CONSTRUCTION.

THE BUILDER SHALL ALLOW TO MODIFY ALL EXISTING SERVICE COVERS TO MATCH THE NEW PAVEMENTS, IN ACCORDANCE WITH THE RELEVANT AUTHORITIES REQUIREMENTS.

PROVIDE TEMPORARY TRAFFIC CONTROL IN ACCORDANCE WITH STATE & FEDERAL STATUTORY REQUIREMENTS AND LOCAL COUNCIL SPECIFICATIONS/REQUIREMENTS

NOTE: ALL LEVELS TO AUSTRALIAN HEIGHT DATUM (AHD). ORIGIN OF LEVELS PM 19217, RL1.564

DRAWINGS TO BE READ IN CONJUNCTION WITH CONCEPT STORMWATER MANAGEMENT REPORT & FLOOD IMPACT ASSESSMENT

NOTE THAT ORIGINAL DRAWING IS IN COLOUR

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DESIGNED ROBERT SUCKLING
DRAWN KATHLEEN TURTON
JOB MANAGER DANIEL HOLLAND
VERIFIER

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Central Coast
Suite 4, 257-259 Central Coast Hwy, Erina NSW 2250
Ph (02) 4365 1668 Fax (02) 4367 6555
Email centralcoast@northrop.com.au ABN 81 094 433 100

PROJECT: BRISBANE WATER LEGACY VILLAGE RESIDENTIAL APPRATMENTS 51-57 MASONS PDE, POINT FREDERICK

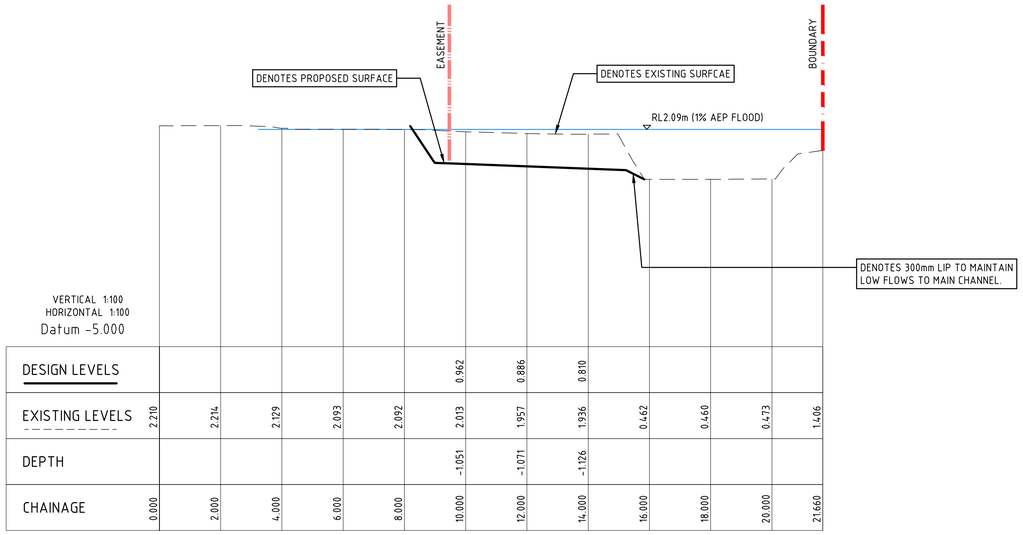
DRAWING TITLE: INTERNAL CIVIL WORKS STORMWATER MANAGEMENT & LEVELS PLAN

JOB NUMBER: NL201088

DRAWING NUMBER: C4.1

REVISION: B

DRAWING SHEET SIZE = A1



DESIGN LEVELS						0.962	0.886	0.810				
EXISTING LEVELS	2.210	2.214	2.129	2.093	2.092	2.013	1.957	1.936	0.462	0.460	0.473	1.406
DEPTH						-1.051	-1.071	-1.126				
CHAINAGE	0.000	2.000	4.000	6.000	8.000	10.000	12.000	14.000	16.000	18.000	20.000	21.660

CL-1 FLOOD OFFSET STORAGE SECTION

DRAWN KATHLEEN TURTON DESIGNED ROBERT SUCKLING JOB MANAGER DANIEL HOLLAND VERIFIER

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VERT 1:100@A1 0 1 2 3 4 5m
HORIZ 1:100@A1 0 1 2 3 4 5m

NORTHROP
Central Coast
Suite 4, 257-259 Central Coast Hwy, Erina NSW 2250
Ph (02) 4365 1668 Fax (02) 4367 6555
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PROJECT
BRISBANE WATER LEGACY VILLAGE
RESIDENTIAL APPRATMENTS
51-57 MASONS PDE, POINT FREDERICK

DRAWING TITLE
INTERNAL CIVIL WORKS
LONG SECTIONS
& CROSS SECTIONS
SHEET 1

JOB NUMBER **NL201088**
DRAWING NUMBER **C5.1**
REVISION **B**
DRAWING SHEET SIZE = A1

SWEPT PATH TO ALLOW FOR PARKED VEHICLES ON OPPOSITE SIDE OF ROAD.

INDICATIVE LAYBACK & VEHICLE CROSSING TO ACCOMMODATE SWEPT PATH

INDICATIVE CHEVRON LINEMARKING ZONE

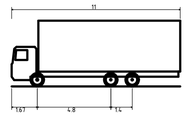
INDICATIVE LAYBACK & VEHICLE CROSSING TO ACCOMMODATE SWEPT PATH

VEHICLE TO MAINTAIN 300mm OFFSET CLEARANCE TO PROPOSED BOUNDARY LINE

PROPOSED SITE BOUNDARY ADJUSTMENT

INDICATIVE LOCATION OF WASTE SERVICING ZONE TO ALLOW CARS TO PASS WHIST IN OPERATION.

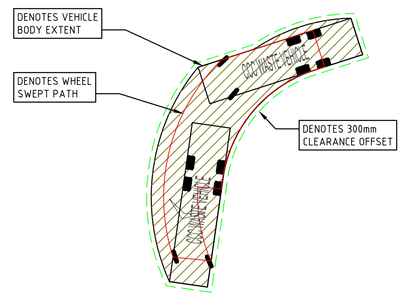
THREE-POINT REVERSING MANOEUVRE FROM SERVICING LOCATION TO EXIT IN FORWARD DIRECTION.



CCC WASTE VEHICLE (11m)

Overall Length	11.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

NOTE: SWEPT PATH SHOWN BASED ON 11m VEHICLE IN ACCORDANCE WITH CENTRAL COAST COUNCIL (GOSFORD CITY) DCP.
- THE TURNING PATHS/TEMPLATES PROVIDED HAVE BEEN PRODUCED USING SIMULATION SOFTWARE AND ARE TO BE USED AS A GUIDE ONLY. THESE SIMULATIONS MAY NOT REFLECT ACTUAL DRIVER BEHAVIOUR AND/OR EXPERIENCE UNDER ACTUAL DRIVING CONDITIONS.



KEY LEGEND

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PROJECT
BRISBANE WATER LEGACY VILLAGE
RESIDENTIAL APPRATMENTS
51-57 MASONS PDE, POINT FREDERICK

DRAWING TITLE
INTERNAL CIVIL WORKS
VEHICLE SWEPT PATHS

JOB NUMBER NL201088
DRAWING NUMBER C6.1
REVISION B
DRAWING SHEET SIZE = A1

MUSIC-*link* Report

Project Details		Company Details	
Project:	NL201088 51-57 Masons Parade	**Company:**	Northrop Consulting Engineers
Report Export Date:	10/09/2021	**Contact:**	Robert Suckling
Catchment Name:	NL201088 DA Issue_RS	**Address:**	Suite 4, 257-259 Central Cost Highway, Erina
Catchment Area:	0.608ha	**Phone:**	02 4365 1668
Impervious Area*:	61.91%	**Email:**	rsuckling@northrop.com.au
Rainfall Station:	66062 SYDNEY		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1974 - 31/12/1993 11:54:00 PM		
Mean Annual Rainfall:	1297mm		
Evapotranspiration:	1261mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.33		
Study Area:	Lowland		
Scenario:	Central Coast Development		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness

Node: Post-Development Node	Reduction
Flow	30.5%
TSS	80.7%
TP	63.2%
TN	54.5%
GP	91.1%

Treatment Nodes

Node Type	Number
Rain Water Tank Node	1
Sedimentation Basin Node	1
Buffer Node	1
GPT Node	1
Generic Node	1

Source Nodes

Node Type	Number
Urban Source Node	6

Comments

Parameters reflective of precast chamber.

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Buffer	Buffer	Proportion of upstream impervious area treated	None	None	1
GPT	7 x OceanGuard200um	Hi-flow bypass rate (cum/sec)	None	99	0.14
Post	Post-Development Node	% Load Reduction	None	None	30.5
Post	Post-Development Node	GP % Load Reduction	90	None	91.1
Post	Post-Development Node	TN % Load Reduction	45	None	54.5
Post	Post-Development Node	TP % Load Reduction	45	None	63.2
Post	Post-Development Node	TSS % Load Reduction	80	None	80.7
Sedimentation	SF Manhole DN2250 (1.6m2)	Exfiltration Rate (mm/hr)	0	0	0
Sedimentation	SF Manhole DN2250 (1.6m2)	Extended detention depth (m)	0.25	1	0.77
Sedimentation	SF Manhole DN2250 (1.6m2)	High Flow Bypass Out (ML/yr)	None	None	0
Urban	Building Podium 0.017ha. 50% Imp	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0.11
Urban	Building Podium 0.017ha. 50% Imp	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	-0.85
Urban	Building Podium 0.017ha. 50% Imp	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	1.2
Urban	Building Podium 0.017ha. 50% Imp	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	Building Podium 0.017ha. 50% Imp	Stormflow Total Phosphorus Mean (log mg/L)	-0.6	-0.6	-0.6
Urban	Building Podium 0.017ha. 50% Imp	Stormflow Total Suspended Solids Mean (log mg/L)	2.15	2.15	2.15
Urban	Carpark 0.153ha 100% Imp	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0.11
Urban	Carpark 0.153ha 100% Imp	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	-0.85
Urban	Carpark 0.153ha 100% Imp	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	1.2
Urban	Carpark 0.153ha 100% Imp	Stormflow Total Nitrogen Mean (log mg/L)	0.34	0.34	0.34
Urban	Carpark 0.153ha 100% Imp	Stormflow Total Phosphorus Mean (log mg/L)	-0.3	-0.3	-0.3
Urban	Carpark 0.153ha 100% Imp	Stormflow Total Suspended Solids Mean (log mg/L)	2.43	2.43	2.43
Urban	Driveway By-Pass 0.024ha 100% Imp	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0.11
Urban	Driveway By-Pass 0.024ha 100% Imp	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	-0.85
Urban	Driveway By-Pass 0.024ha 100% Imp	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	1.2
Urban	Driveway By-Pass 0.024ha 100% Imp	Stormflow Total Nitrogen Mean (log mg/L)	0.34	0.34	0.34
Urban	Driveway By-Pass 0.024ha 100% Imp	Stormflow Total Phosphorus Mean (log mg/L)	-0.3	-0.3	-0.3
Urban	Driveway By-Pass 0.024ha 100% Imp	Stormflow Total Suspended Solids Mean (log mg/L)	2.43	2.43	2.43
Urban	Landscape 0.042ha. 0% Imp	Baseflow Total Nitrogen Mean (log mg/L)	-0.05	-0.05	-0.05
Urban	Landscape 0.042ha. 0% Imp	Baseflow Total Phosphorus Mean (log mg/L)	-1.22	-1.22	-1.22
Urban	Landscape 0.042ha. 0% Imp	Baseflow Total Suspended Solids Mean (log mg/L)	1.15	1.15	1.15
Urban	Landscape 0.042ha. 0% Imp	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	Landscape 0.042ha. 0% Imp	Stormflow Total Phosphorus Mean (log mg/L)	-0.66	-0.66	-0.66
Urban	Landscape 0.042ha. 0% Imp	Stormflow Total Suspended Solids Mean (log mg/L)	1.95	1.95	1.95
Urban	Landscape 0.227 ha. 20% Imp	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0.11
Urban	Landscape 0.227 ha. 20% Imp	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	-0.85
Urban	Landscape 0.227 ha. 20% Imp	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	1.2
Urban	Landscape 0.227 ha. 20% Imp	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	Landscape 0.227 ha. 20% Imp	Stormflow Total Phosphorus Mean (log mg/L)	-0.6	-0.6	-0.6
Urban	Landscape 0.227 ha. 20% Imp	Stormflow Total Suspended Solids Mean (log mg/L)	2.15	2.15	2.15

Only certain parameters are reported when they pass validation

Node Type	Node Name	Parameter	Min	Max	Actual
Urban	Roof 0.145ha. 100% Imp	Baseflow Total Nitrogen Mean (log mg/L)	0.32	0.32	0.32
Urban	Roof 0.145ha. 100% Imp	Baseflow Total Phosphorus Mean (log mg/L)	-0.82	-0.82	-0.82
Urban	Roof 0.145ha. 100% Imp	Baseflow Total Suspended Solids Mean (log mg/L)	1.1	1.1	1.1
Urban	Roof 0.145ha. 100% Imp	Stormflow Total Nitrogen Mean (log mg/L)	0.3	0.3	0.3
Urban	Roof 0.145ha. 100% Imp	Stormflow Total Phosphorus Mean (log mg/L)	-0.89	-0.89	-0.89
Urban	Roof 0.145ha. 100% Imp	Stormflow Total Suspended Solids Mean (log mg/L)	1.3	1.3	1.3

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Sedimentation	SF Manhole DN2250 (1.6m2)	Notional Detention Time (hrs)	8	12	0.0622
Sedimentation	SF Manhole DN2250 (1.6m2)	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	SF Manhole DN2250 (1.6m2)	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	SF Manhole DN2250 (1.6m2)	Total Suspended Solids - k (m/yr)	8000	8000	1

Only certain parameters are reported when they pass validation

Flood Information

26 March 2021

Dear Applicant,

I refer to your recent application for flood information. The information provided below is based on the available Council data at the time of application.

Property Details

Lot	51	DP	732632
Address	51-57 Masons Pde, Point Frederick NSW 2250		

Calculated Flood Levels

Flood event	Flood Level
PMF	3.52m AHD
1% AEP flood (1 in 100 Year Event)	2.37m AHD
5% AEP flood (1 in 20 Year Event)	2.10m AHD

Refer to glossary for definitions

The above flood levels represent the maximum flood level within the lot boundary. The flood data maps are attached in the appendix.

Source of Flooding information: Gosford CBD Local Overland Flood Study 2013, Brisbane Water Foreshore Flood Risk Management Study 2015

Minimum Floor Level (MFL)

The residential minimum floor level is **2.87m AHD**. The minimum floor level at this property is derived from the maximum 1% AEP Flood Level plus allowance for sea level rise plus 500mm freeboard. The minimum floor level may vary at different locations within the lot boundary.

State Environmental Planning Policy- SEPP (Exempt and Complying Development Codes) 2008

In accordance with State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, if whole or part of the property is located within at least one of the exclusionary categories in Clause 3.5, development may not be permitted.

The table below contains hazard and hydraulic categorisation of the property in accordance with the NSW Floodplain Development Manual April 2005; Exclusionary categories listed in SEPP 2008, Clause 3.5

Hazard, Hydraulic, and SEPP 2008 exclusionary Categorisation

Flood Information

1% AEP flood hazard	☐ H1 ☒ H2 ☒ H3 (Complying Development may not be permitted) ☐ H4 (Complying Development may not be permitted) ☐ H5 (Complying Development may not be permitted) ☐ H6 (Complying Development may not be permitted) ☐ N/A
Hydraulic categorisation	☒ All or part of the property is located in a floodway (Complying Development may not be permitted) ☒ All or part of the property is located in a flood storage area (Complying Development may not be permitted) ☒ All or part of property is located in a flood fringe ☐ N/A
Exclusionary categories	☒ Flood Storage Area ☒ Floodway Area ☐ Flow path ☒ High Hazard Area ☐ High Risk Area ☐ N/A (Complying Development may be permitted)

Disclaimer

Flood levels and minimum floor levels are provided in relation to Council`s current records at the time of application. Council reserves the right to review and amend these levels from time to time. These amendments may impact the accuracy of information provided.

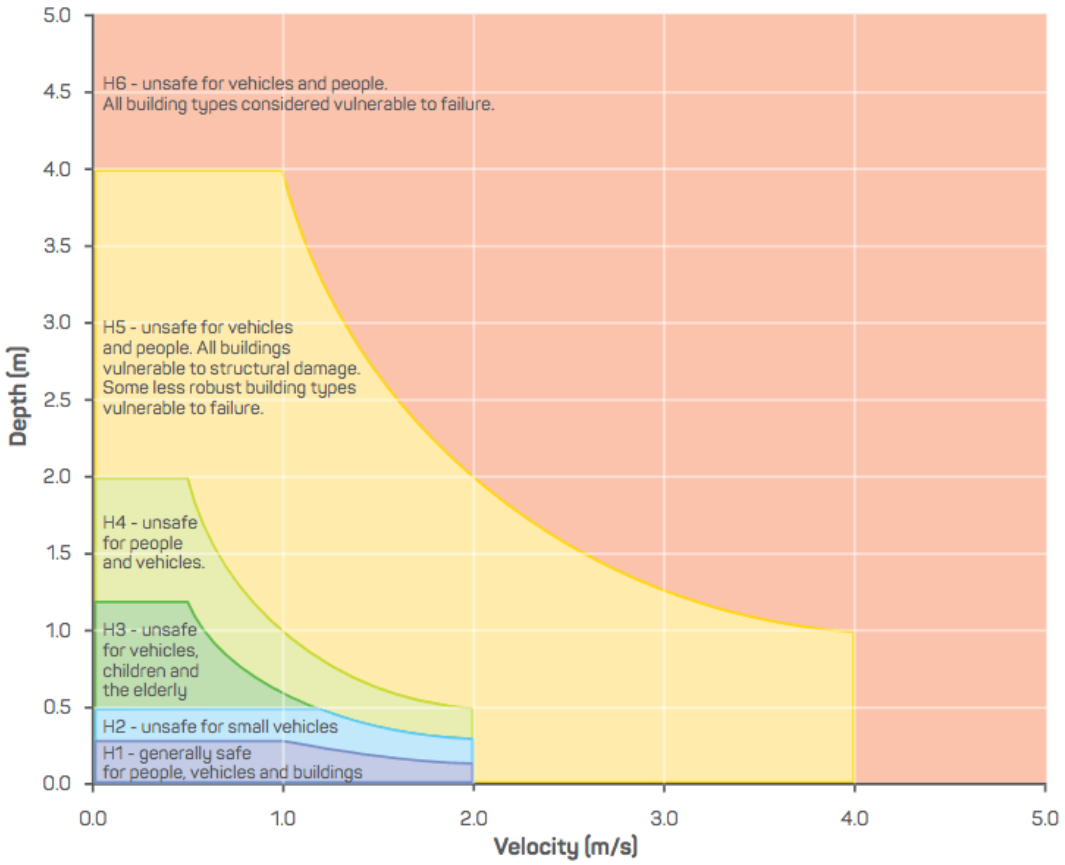
Flood Information

Glossary

AHD	Australian Height Datum is a common national surface level datum approximately corresponding to mean sea level.
PMF	The Probable Maximum Flood is the largest flood that could conceivably occur.
1% AEP flood	The 1% Annual Exceedance Probability flood has a 1% (1:100) probability of occurring in any given year. This flood is also known as 1 in 100, 100yr ARI or Q100.
2% AEP flood	The 2% Annual Exceedance Probability flood has a 2% (1:50) probability of occurring in any given year. This flood is also known as 1 in 50, 50yr ARI or Q50.
5% AEP flood	The 5% Annual Exceedance Probability flood has a 5% (1:20) probability of occurring in any given year. This flood is also known as 1 in 20, 20yr ARI or Q20.
H1 Hazard Categorisation*	Generally safe for people, vehicles and buildings
H2 Hazard Categorisation*	Unsafe for small vehicles
H3 Hazard Categorisation*	Unsafe for vehicles, children and the elderly
H4 Hazard Categorisation*	Unsafe for people and vehicles
H5 Hazard Categorisation*	Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure
H6 Hazard Categorisation*	Unsafe for vehicles and people. All building types considered vulnerable to failure
Floodways*	Those areas where a significant volume of water flows during floods and are often aligned with obvious natural channels. They are areas that, even if only partially blocked, would cause a significant increase in flood levels and/or a significant redistribution of flood flow, which may in turn adversely affect other areas. They are often, but not necessarily, areas with deeper flow or areas where higher velocities occur.
Flood storage*	Those parts of the floodplain that are important for the temporary storage of floodwaters during the passage of flood. If the capacity of a flood storage area is substantially reduced by, for example, the construction of levees or by landfill, flood levels in nearby areas may rise and the peak discharge downstream may be increased. Substantial reduction of the capacity of a flood storage area can also cause a significant redistribution of flood flows.
Flood fringe*	The remaining area of land affected by flooding, after floodway and flood storage areas have been defined.

Source – NSW Floodplain Development Manual April 2005
Hydraulic Hazard AIDR ref https://knowledge.aidr.org.au/media/3518/adr-guideline-7-3.pdf
NSW FDM ref https://www.environment.nsw.gov.au/topics/water/floodplains/floodplain-manual

Flood Information



Source – Australian Institute for Disaster Resilience 2017. Hydraulic Hazard: refer also to Australian Rainfall and Runoff Section 7.2.7 General Flood Hazard Curves (Figure 6.7.9) http://book.arr.org.au.s3-website-ap-southeast-2.amazonaws.com/

The information provided in this letter is provided only to you and is not intended to be provided to a third party.

Should you have any enquiries concerning this letter, please do not hesitate to contact Andrew Dewar on 1300 463 954 during the hours of 8.30am to 5.00pm Monday to Friday.

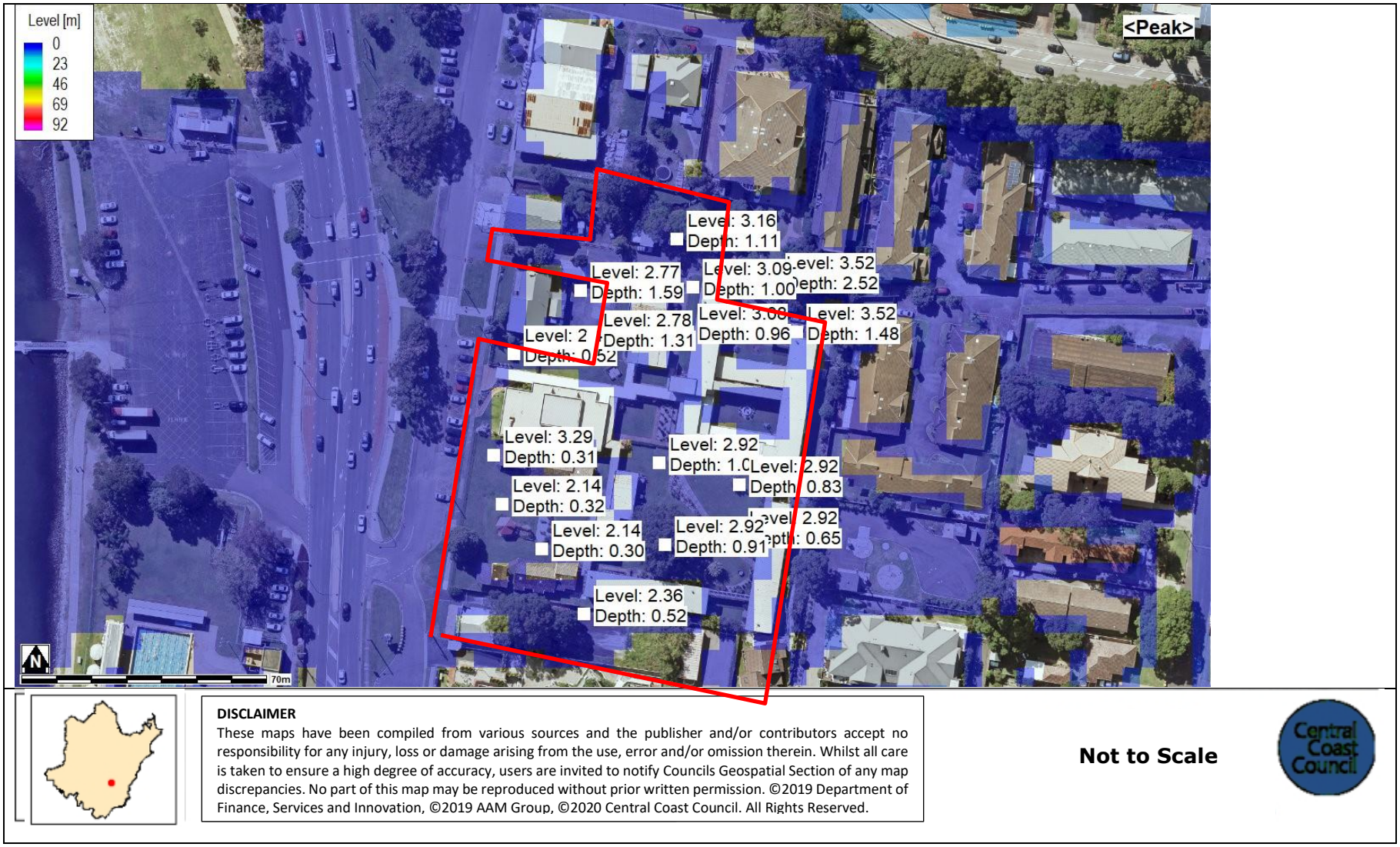
Yours faithfully,

Andrew Dewar
Floodplain Development Engineer

Phone: 1300 463 954

Appendix

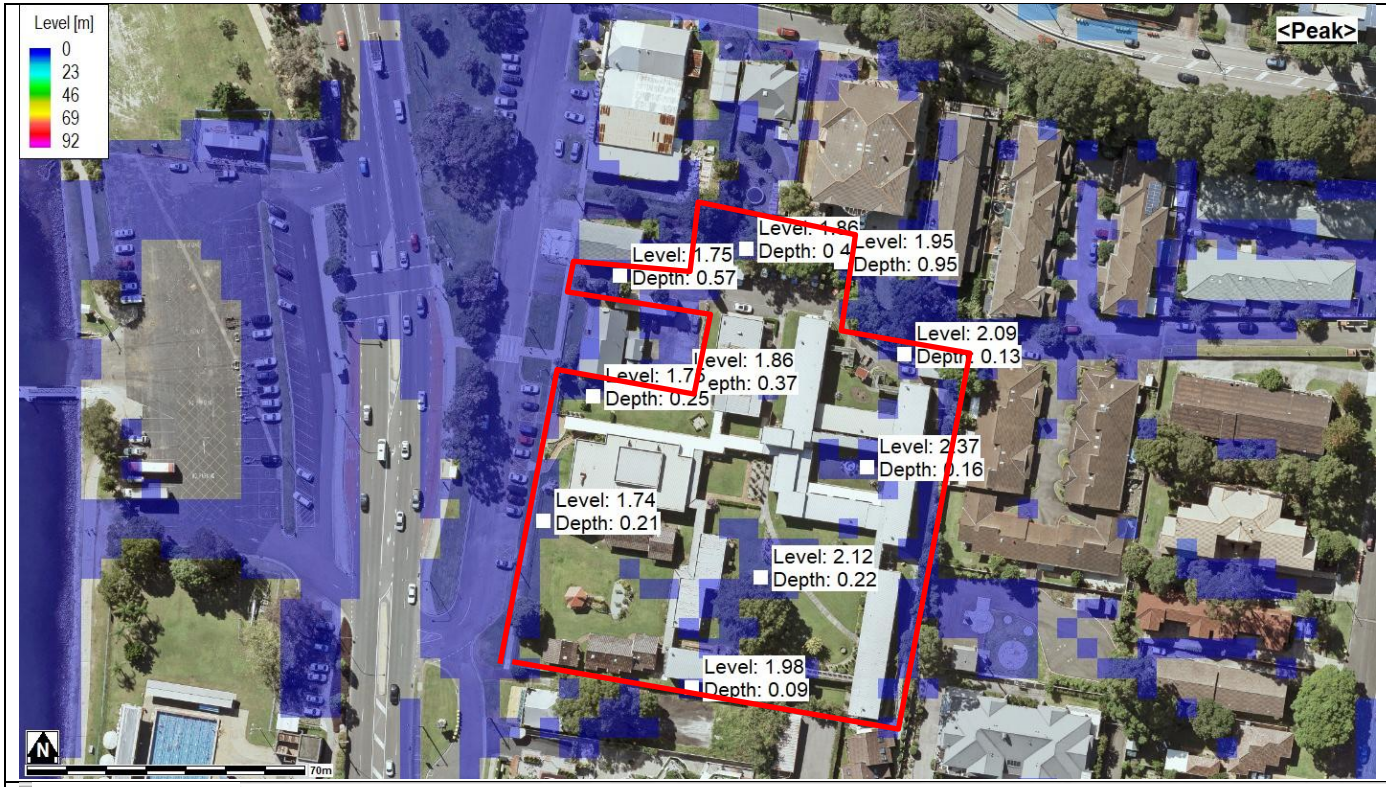
PMF Flood Extent

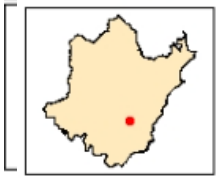


Not to Scale

Flood Information

1% AEP Flood Extent





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Not to Scale

Flood Information

5% AEP Flood Extents

Not to Scale

Flood Information

Hazard Categorisation

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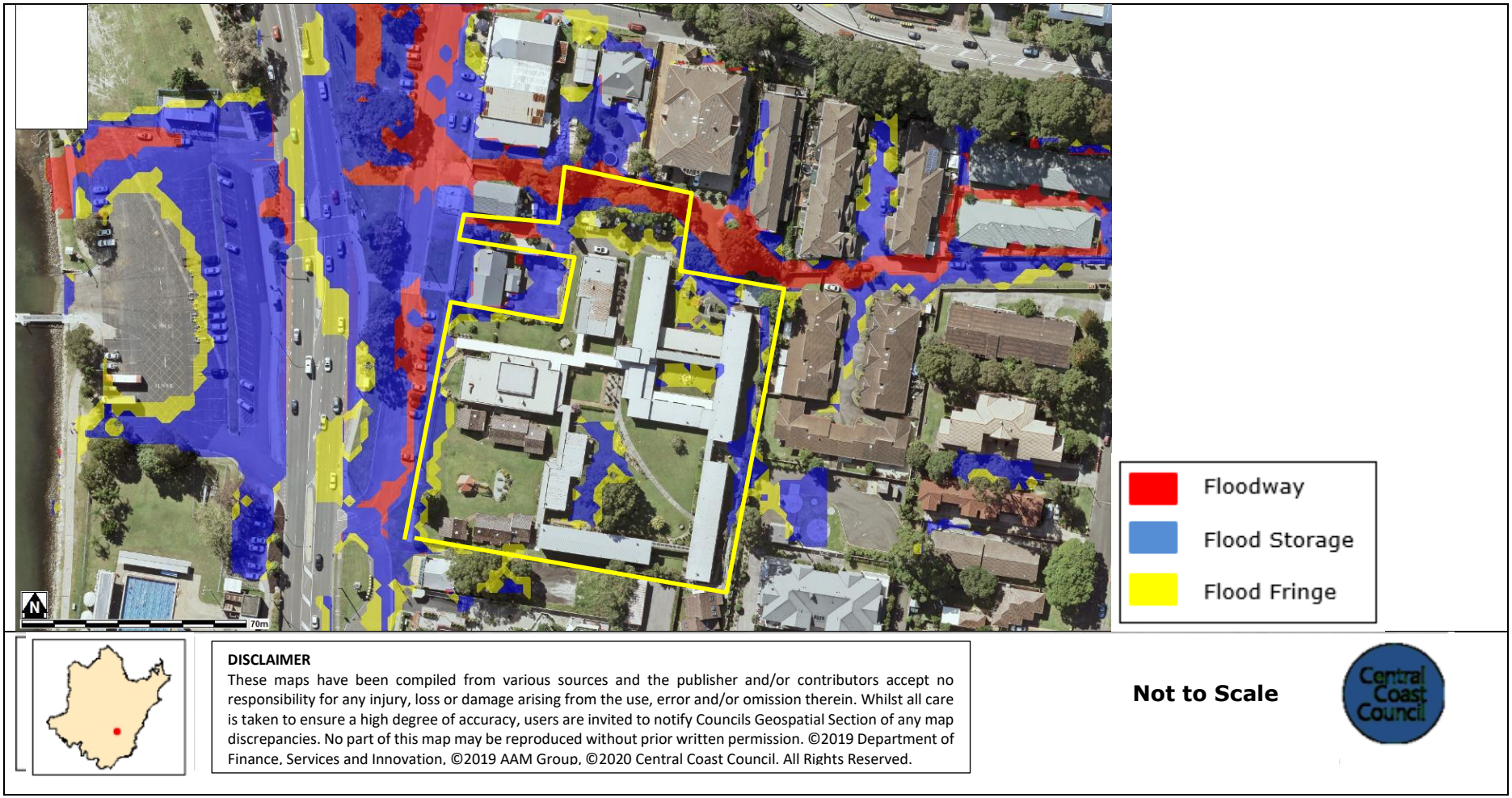
Not to Scale

Flood Information

Hydraulic Categorisation



Not to Scale

BRISBANE WATER LEGACY VILLAGE RESIDENTIAL APARTMENTS

51-57 MASONS PDE, POINT FREDERICK
INTERNAL CIVIL WORKS

LOCALITY PLAN

NORTHROP

DRAWING SCHEDULE

DWG No.	DRAWING TITLE
C1.1	COVER SHEET
C2.1	CONCEPT SEDIMENT & EROSION CONTROL PLAN
C2.2	SEDIMENT & EROSION CONTROL DETAILS
C4.1	STORMWATER MANAGEMENT & LEVELS PLAN
C5.1	LONG SECTIONS & CROSS SECTIONS - SHEET 1
C6.1	VEHICLE SWEPT PATHS

DRAWN: KATHLEEN TURTON DESIGNED: ROBERT SUCKLING JOB MANAGER: DANIEL HOLLAND VERIFIER:

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DEVELOPMENT APPLICATION	KT		DH	21.05.21
B	DEVELOPMENT APPLICATION	KT		DH	15.09.21

CLIENT: Grindley

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT: INTEGRATED DESIGN GROUP

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NORTHROP
Central Coast
Suite 4, 257-259 Central Coast Hwy, Erina NSW 2250
Ph (02) 4365 1668 Fax (02) 4367 6555
Email centralcoast@northrop.com.au ABN 81 094 433 100

PROJECT: BRISBANE WATER LEGACY VILLAGE RESIDENTIAL APPRATMENTS 51-57 MASONS PDE, POINT FREDERICK

DRAWING TITLE: INTERNAL CIVIL WORKS COVER SHEET

JOB NUMBER: NL201088

DRAWING NUMBER: C1.1

REVISION: B

DRAWING SHEET SIZE = A1

INSTALL SILT FENCE 'SILTMASTER' OR SIMILAR, ALONG EXISTING TOP OF BANK. INSTALLED IN ACCORDANCE WITH DETAIL SD6-8 OF THE BLUEBOOK.

DENOTES SANDBAG or GEOTEXTILE SOCK FILLED WITH NO FINES GRAVEL PLACED IN INVERT OF GUTTER @ 15m CTS

PROVIDE TEMPORARY CONTRACTORS VEHICULAR ACCESS POINT. CONSTRUCT A STABILIZED SITE ACCESS IN ACCORDANCE WITH DETAIL SD6-14 OF THE BLUE BOOK, OR ALTERNATIVELY PROVIDE A SHAKEDOWN CATTLE GRID' AT THE ENTRANCE POINT TO REDUCE THE LIKELIHOOD OF SEDIMENT BEING TRAFFICKED OFF-SITE.

INSTALL SILT FENCE 'SILTMASTER' OR SIMILAR, ALONG EXISTING EDGE OF BANK. INSTALLED IN ACCORDANCE WITH DETAIL SD6-8 OF THE BLUEBOOK.

DENOTES INDICATIVE LOCATION OF STOCKPILE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH DETAIL SD4-1 OF THE BLUE BOOK

PROVIDE PIT PROTECTION INSTALLED IN ACCORDANCE WITH DETAILS SD6-11 OR SD6-12 (AS APPROPRIATE) OF THE BLUE BOOK (TYPICAL)

PROVIDE COMBINED SITE/SILT FENCE 'SILTMASTER' OR SIMILAR, INSTALLED IN ACCORDANCE WITH DETAIL SD6-8 OF THE BLUEBOOK.

PROPOSED SITE BOUNDARY ADJUSTMENT

LEGEND

- DENOTES SITE BOUNDARY LINE
- DENOTES EASEMENT LINE, REFER TO SURVEY FOR DETAILS
- DENOTES COMBINED SITE/SILT FENCE 'SILTMASTER' OR SIMILAR, INSTALLED IN ACCORDANCE WITH DETAIL SD6-8 OF THE BLUEBOOK.
- DENOTES TEMPORARY CONTRACTORS VEHICULAR ACCESS POINT. CONSTRUCT A STABILISED SITE ACCESS IN ACCORDANCE WITH DETAIL SD6-14 OF THE BLUE BOOK OR PROVIDE A SHAKEDOWN CATTLE GRID AT ENTRANCE POINT TO REDUCE LIKELIHOOD OF SEDIMENT BEING TRAFFICKED OFF-SITE
- DENOTES GEOTEXTILE INLET FILTER INSTALLED IN ACCORDANCE WITH DETAIL SD6-12 OF THE BLUE BOOK
- INDICATES MESH & GRAVEL INLET FILTER INSTALLED IN ACCORDANCE WITH DETAILS SD6-11 OF THE BLUE BOOK
- DENOTES SANDBAG or GEOTEXTILE SOCK FILLED WITH NO FINES GRAVEL PLACED IN INVERT OF GUTTER
- DENOTES INDICATIVE LOCATION OF STOCKPILE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH DETAIL SD4-1 OF THE BLUE BOOK

SEDIMENT & EROSION CONTROL NOTES

1. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH RELEVANT ORDINANCES AND REGULATIONS, NOTE IN PARTICULAR THE REQUIREMENTS OF LANDCOMS MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION' (THE 'BLUE BOOK').
2. INSTALL SEDIMENT PROTECTION FILTERS ON ALL NEW AND EXISTING STORMWATER INLET PITS IN ACCORDANCE WITH EITHER THE MESH AND GRAVEL INLET FILTER DETAIL SD6-11 OR THE GEOTEXTILE INLET FILTER DETAIL SD6-12 OF THE 'BLUE BOOK'.
3. ESTABLISH ALL REQUIRED SEDIMENT FENCES IN ACCORDANCE WITH DETAIL SD6-8 OF THE 'BLUE BOOK'.
4. INSTALL SEDIMENT FENCING AROUND INDIVIDUAL BUILDING ZONES/AREAS AS REQUIRED AND AS DIRECTED BY THE SUPERINTENDENT.
5. ALL TRENCHES INCLUDING ALL SERVICE TRENCHES AND SWALE EXCAVATION SHALL BE SIDE-CAST TO THE HIGH SIDE AND CLOSED AT THE END OF EACH DAYS WORK.
6. THE CONTRACTOR SHALL ENSURE THAT ALL VEGETATION (TREE, SHRUB & GROUND COVER) WHICH IS TO BE RETAINED SHALL BE PROTECTED DURING THE DURATION OF CONSTRUCTION. REFER ARCHITECTS PLANS FOR TREES TO BE KEPT.
7. ALL VEGETATION TO BE REMOVED SHALL BE MULCHED ONSITE AND SPREAD/STOCKPILED AS DIRECTED BY THE SUPERINTENDENT.
8. STRIP TOPSOIL IN AREAS DESIGNATED FOR STRIPPING AND STOCKPILE FOR RE-USE AS REQUIRED. ANY SURPLUS MATERIAL SHALL BE REMOVED FROM SITE AND DISPOSED OF IN ACCORDANCE WITH EPA GUIDELINES.
9. CONSTRUCT AND MAINTAIN ALL MATERIAL STOCKPILES IN ACCORDANCE WITH DETAIL SD4-1 OF THE 'BLUE BOOK' (INCLUDING CUT-OFF SWALES TO THE HIGH SIDE AND SEDIMENT FENCES TO THE LOW SIDE)
10. ENSURE STOCKPILES DO NOT EXCEED 2.0m HIGH. PROVIDE WIND AND RAIN EROSION PROTECTION AS REQUIRED IN ACCORDANCE WITH THE 'BLUE BOOK'.
11. PROVIDE WATER TRUCKS OR SPRINKLER DEVICES DURING CONSTRUCTION AS REQUIRED TO SUPPRESS DUST.
12. ONCE CUT/FILL OPERATIONS HAVE BEEN FINALIZED ALL DISTURBED AREAS THAT ARE NOT BEING WORKED ON SHALL BE RE-VEGETATED AS SOON AS IS PRACTICAL.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING A DETAILED WRITTEN RECORD OF ALL EROSION & SEDIMENT CONTROLS ON-SITE DURING THE CONSTRUCTION PERIOD. THIS RECORD SHALL BE UPDATED ON A DAILY BASIS & SHALL CONTAIN DETAILS ON THE CONDITION OF CONTROLS AND ANY/ ALL MAINTENANCE, CLEANING & BREACHES. THIS RECORD SHALL BE KEPT ON-SITE AT ALL TIMES AND SHALL BE MADE AVAILABLE FOR INSPECTION BY THE PRINCIPAL CERTIFYING AUTHORITY AND THE SUPERINTENDENT DURING NORMAL WORKING HOURS.

THE CONTRACTOR SHALL ENSURE COUNCIL ASSETS AND THE UTILITIES ARE PROTECTED AT ALL TIMES. ANY AND ALL DAMAGES TO COUNCIL ASSETS AND/OR UTILITIES SHALL BE REPAIRED BY THE CONTRACTOR TO THE SPECIFICATION OF COUNCIL AND THE UTILITIES AUTHORITY AND AT NO COST TO THE PRINCIPAL OR NORTHROP CONSULTING ENGINEERS.

SEDIMENT BASIN/TANKS SIZING CALCULATION

THE SITE IS LOCATED WITHIN THE ERINA SOIL LANDSCAPE AND PRIMARILY CONSISTS OF SANDY CLAY & SILTY SANDS, WHICH HAS THE FOLLOWING PROPERTIES (IN ACCORDANCE WITH TABLE C17 OF THE 'BLUE BOOK'.

SITE PARAMETERS	
CONSTRAINT	VALUE
SEDIMENT TYPE	D
SOIL HYDROLOGY GROUP	B
K = SOIL ERODIBILITY (K-FACTOR)	0.030
R = RAINFALL EROSIVITY (R-FACTOR)	3900
S = 2 YEAR, 6 HOUR STORM INTENSITY	13.4mm/hr (GOSFORD)
LS = SLOPE LENGTH/GRADIENT	0.34 (50m SLOPE @ 2% GRADE)
P = EROSION CONTROL PRACTICE (P-FACTOR)	1.3 (TYPICAL)
C = GROUND COVER (C-FACTOR)	1.0 (TYPICAL FOR STRIPPED SITE)
SOIL LOSS (RUSLE METHOD) (tonnes/ha/yr)	51.7
DISTURBED AREA	0.54Ha
SOIL LOSS (tonnes/yr)	27.8
EROSION HAZARD (TABLE 4.2 BLUE BOOK)	VERY LOW
TOTAL SITE RUN-OFF IS LESS THAN 150m³/Yr. BASIN/TANKS NOT REQUIRED.	

NOTE THAT ORIGINAL DRAWING IS IN COLOUR

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DEVELOPMENT APPLICATION	KT		DH	21.05.21
B	DEVELOPMENT APPLICATION	KT		DH	15.09.21

CLIENT: Grindley

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PLANS 1:200@A1 0 2 4 6 8 10m

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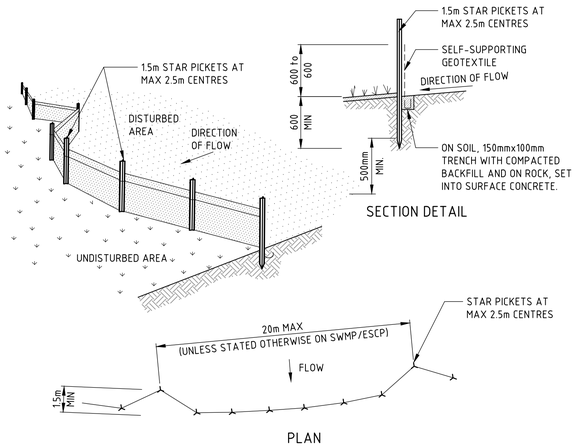
Central Coast
Suite 4, 257-259 Central Coast Hwy, Erina NSW 2250
Ph (02) 4365 1668 Fax (02) 4367 6555
Email centralcoast@northrop.com.au ABN 81 094 433 100

PROJECT: BRISBANE WATER LEGACY VILLAGE
RESIDENTIAL APPRATMENTS
51-57 MASONS PDE, POINT FREDERICK

DRAWING TITLE: INTERNAL CIVIL WORKS
CONCEPT SEDIMENT & EROSION CONTROL PLAN

JOB NUMBER: NL201088
DRAWING NUMBER: C2.1
REVISION: B
DRAWING SHEET SIZE = A1

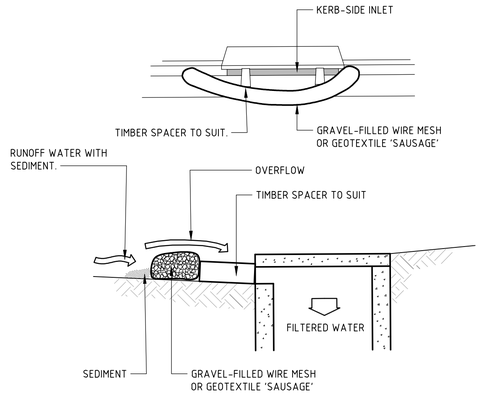
DRAWN KATHLEEN TURTON DESIGNED ROBERT SUCKLING JOB MANAGER DANIEL HOLLAND VERIFIER



CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

SEDIMENT FENCE (SD 6-8)

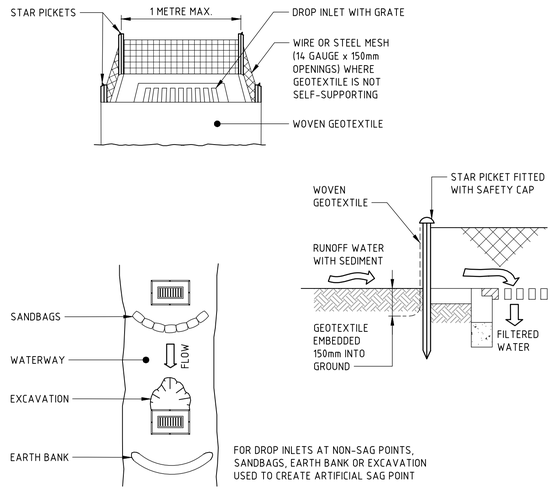


NOTE:THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN APPROVED SWMP/ESCP.

CONSTRUCTION NOTES

1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

MESH AND GRAVEL INLET FILTER (SD 6-11)

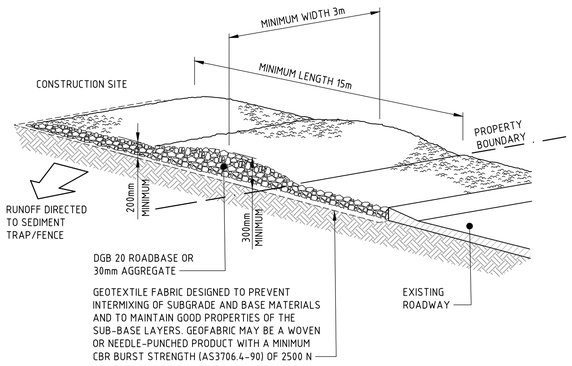


FOR DROP INLETS AT NON-SAG POINTS, SANDBAGS, EARTH BANK OR EXCAVATION USED TO CREATE ARTIFICIAL SAG POINT

CONSTRUCTION NOTES

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

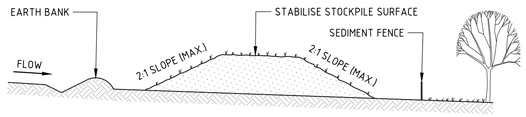
GEOTEXTILE INLET FILTER (SD 6-12)



CONSTRUCTION NOTES

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

STABILISED SITE ACCESS (SD 6-14)



CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2m (PREFERABLY 5m) FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2m DOWNSLOPE.

STOCKPILES (SD 4-1)

DRAWN KATHLEEN TURTON DESIGNED ROBERT SUCKLING JOB MANAGER DANIEL HOLLAND VERIFIER

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DEVELOPMENT APPLICATION	KT		DH	21.05.21
B	DEVELOPMENT APPLICATION	KT		DH	15.09.21

CLIENT: Grindley

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ARCHITECT: INTEGRATED DESIGN GROUP

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NORTHROP
Central Coast
Suite 4, 257-259 Central Coast Hwy, Erina NSW 2250
Ph (02) 4365 1668 Fax (02) 4367 6555
Email centralcoast@northrop.com.au ABN 81 094 433 100

PROJECT: **BRISBANE WATER LEGACY VILLAGE RESIDENTIAL APPRATMENTS 51-57 MASONS PDE, POINT FREDERICK**

DRAWING TITLE: **INTERNAL CIVIL WORKS SEDIMENT & EROSION CONTROL DETAILS**

JOB NUMBER: **NL201088**

DRAWING NUMBER: **C2.2**

REVISION: **B**

DRAWING SHEET SIZE = A1

DENOTES PROPOSED CONCRETE HEADWALL WITH NON-RETURN VALVE & RIP RAP SCOUR PROTECTION

DENOTES RETAINING WALL WITH VEHICLE BARRIER WHERE DROP-OFF >600mm

DENOTES (x3) OCEAN PROTECT FILTER CARTRIDGES (OR APPROVED EQUIVALENT)

DENOTES PROPOSED HEAVY DUTY LAYBACK & VEHICLE CROSSING IN ACCORDANCE WITH CENTRAL COAST COUNCIL STANDARD DRAWING SD0506

DENOTES INDICATIVE MAINTENANCE ACCESS LOCATION FOR WATERCOURSE. MAX GRADE 1V:5H (20% GRADE)

EXISTING OPEN CHANNEL TO BE WIDENED TO PROVIDE ADDITIONAL 380m³ FLOOD STORAGE TO OFFSET IMPACT FROM DEVELOPMENT. REFER TO FLOOD IMPACT ASSESSMENT FOR ADDITIONAL INFORMATION

EXISTING CULVERTS TO BE RETAINED

DENOTES Ø100 PVC PIPE TO CONNECT TO EXISTING STORMWATER PIT

BALCONY & PODIUM DRAINAGE LINES TO BYPASS REUSE TANK & CONNECT TO STORMWATER SYSTEM

CONNECT ALL ROOF DOWNPIPE LINES TO REUSE TANK

EXISTING SEWER MAIN TO BE RETAINED

DENOTES INDICATIVE LOCATION OF RETAINING WALL. TOP OF WALL RL2.20m (APPROX)

NOTE: SURFACE & SUBSOIL DRAINAGE TO BE CONNECTED TO STORMWATER SYSTEM (N.S.O.P). REFER TO LANDSCAPE ARCHITECTS DRAWINGS FOR DETAILS & LEVELS, MINIMUM SURFACE LEVEL RL2.15.

DENOTES EXISTING SW PIT TO BE DEMOLISHED & DISPOSED OFF SITE (TYPICAL)

DENOTES Ø90 PVC PIPE TO CONNECT TO BACK OF KERB WITH KERB ADAPTOR, IN ACCORDANCE WITH CENTRAL COAST COUNCIL STANDARD DRAWING SD0510

PROPOSED SITE BOUNDARY ADJUSTMENT

DENOTES PROPOSED HEAVY DUTY LAYBACK & VEHICLE CROSSING IN ACCORDANCE WITH CENTRAL COAST COUNCIL STANDARD DRAWING SD0506

DENOTES INDICATIVE STORMWATER DIVERSION TO INTERCEPT EXISTING STORMWATER DRAINAGE LINES WHICH MAY CONVEY RUNOFF TOWARDS THE NORTH (IF REQUIRED), TO BE CONFIRMED PRIOR TO CONSTRUCTION

DENOTES EXISTING STORMWATER PITS TO BE RETAINED. REDUNDANT PIPE CONNECTIONS TO BE CAPPED & ABANDONED (TYPICAL)

DENOTES INDICATIVE OVERLAND FLOW PATH TO BE FREE OF OBSTRUCTIONS

LEGEND

- DENOTES SITE BOUNDARY LINE
- DENOTES EASEMENT LINE, REFER TO SURVEY FOR DETAILS
- DENOTES PROPOSED BUILDING EXTENTS, REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR DETAILS
- FFL2.78 — DENOTES PROPOSED FINISHED FLOOR LEVEL
- PL 2.30 — DENOTES PROPOSED FINISHED SURFACE LEVEL
- CL 2.15 — DENOTES PROPOSED STORMWATER PIT COVER LEVEL
- EX 2.15 — DENOTES EXISTING SURFACE LEVEL
- 2.0 — DENOTES EXISTING CONTOURS
- 1.0 — DENOTES DESIGN CONTOURS
- CH0.00 — CL-1 — DENOTES ALIGNMENT CONTROL LINE & CHAINAGE, REFER TO LONG SECTION
- DENOTES PROPOSED STORMWATER PIT. ALL NEW STORMWATER INLET PITS ARE TO BE FITTED WITH FILTER INSERTS IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION
- DENOTES EXISTING STORMWATER PIT / KERB INLET PIT TO BE RETAINED
- GTD-150 — DENOTES GRATED TRENCH DRAIN & WIDTH
- DENOTES CONCRETE HEADWALL WITH NON-RETURN VALVE AND RIP RAP SCOUR PROTECTION
- RWT — DENOTES BELOW GROUND RAINWATER TANK/S WITH 42kL COMBINED CAPACITY. HARVESTED RAINWATER TO BE USED FOR IRRIGATION & TOILET FLUSHING
- DENOTES PROPOSED STORMWATER LINE
- DENOTES OVERLAND FLOW PATH
- RW/VB — DENOTES RETAINING WALL WITH VEHICLE BARRIER (REQUIRED FOR DROP-OFFS GREATER THEN 600mm)
- E — DENOTES APPROXIMATE LOCATION OF EXISTING ELECTRICITY LINE
- G — DENOTES APPROXIMATE LOCATION OF EXISTING GAS MAIN
- T — DENOTES APPROXIMATE LOCATION OF EXISTING TELECOMMUNICATION LINE
- W — DENOTES APPROXIMATE LOCATION OF EXISTING WATER MAIN
- S — DENOTES APPROXIMATE LOCATION OF EXISTING SEWER MAIN

LOCATIONS OF EXISTING SERVICES ARE APPROXIMATE ONLY & MAY NOT BE COMPLETE. THE BUILDER IS RESPONSIBLE FOR LOCATING EXISTING INFRASTRUCTURE (CULVERTS, PITS, PIPES, SERVICES, INVERT & COVER LEVELS ETC) PRIOR TO COMMENCING CONSTRUCTION.

THE BUILDER SHALL ALLOW TO MODIFY ALL EXISTING SERVICE COVERS TO MATCH THE NEW PAVEMENTS, IN ACCORDANCE WITH THE RELEVANT AUTHORITIES REQUIREMENTS.

PROVIDE TEMPORARY TRAFFIC CONTROL IN ACCORDANCE WITH STATE & FEDERAL STATUTORY REQUIREMENTS AND LOCAL COUNCIL SPECIFICATIONS/REQUIREMENTS

NOTE: ALL LEVELS TO AUSTRALIAN HEIGHT DATUM (AHD). ORIGIN OF LEVELS PM 19217, RL1.564

DRAWINGS TO BE READ IN CONJUNCTION WITH CONCEPT STORMWATER MANAGEMENT REPORT & FLOOD IMPACT ASSESSMENT

NOTE THAT ORIGINAL DRAWING IS IN COLOUR

DIAL BEFORE YOU DIG www.1100.com.au

NOT FOR CONSTRUCTION

DESIGNED ROBERT SUCKLING
DRAWN KATHLEEN TURTON
JOB MANAGER DANIEL HOLLAND
VERIFIER

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DEVELOPMENT APPLICATION	KT		DH	21.05.21
B	DEVELOPMENT APPLICATION	KT		DH	15.09.21

CLIENT: Grindley

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PLANS 1:200@A1 0 2 4 6 8 10m

NORTHROP
Central Coast
Suite 4, 257-259 Central Coast Hwy, Erina NSW 2250
Ph (02) 4365 1668 Fax (02) 4367 6555
Email centralcoast@northrop.com.au ABN 81 094 433 100

PROJECT: BRISBANE WATER LEGACY VILLAGE RESIDENTIAL APPRATMENTS 51-57 MASONS PDE, POINT FREDERICK

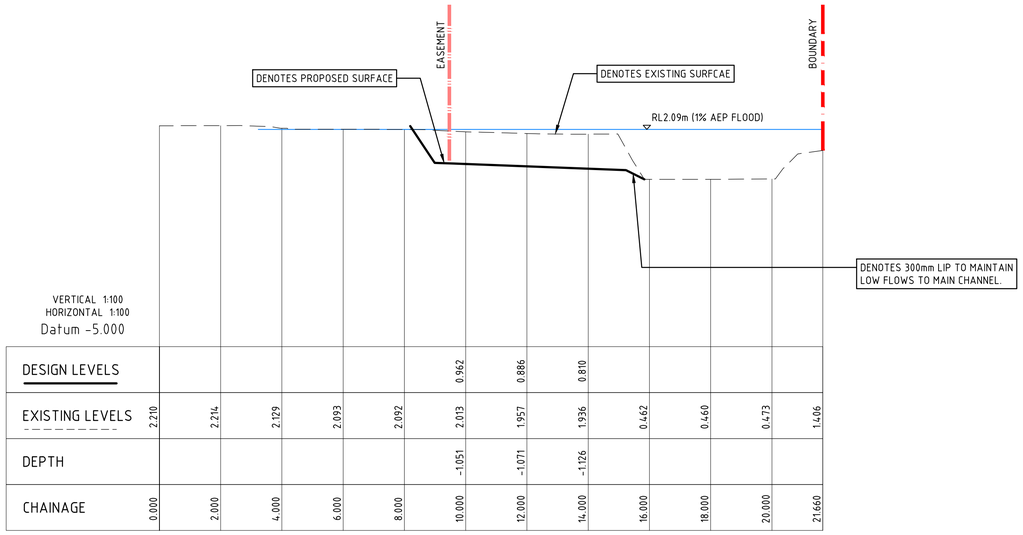
DRAWING TITLE: INTERNAL CIVIL WORKS STORMWATER MANAGEMENT & LEVELS PLAN

JOB NUMBER: NL201088

DRAWING NUMBER: C4.1

REVISION: B

DRAWING SHEET SIZE = A1



DESIGN LEVELS						0.962	0.886	0.810				
EXISTING LEVELS	2.210	2.214	2.129	2.093	2.092	2.013	1.957	1.936	0.462	0.460	0.473	1.406
DEPTH						-1.051	-1.071	-1.126				
CHAINAGE	0.000	2.000	4.000	6.000	8.000	10.000	12.000	14.000	16.000	18.000	20.000	21.660

CL-1 FLOOD OFFSET STORAGE SECTION

DRAWN KATHLEEN TURTON DESIGNED ROBERT SUCKLING JOB MANAGER DANIEL HOLLAND VERIFIER

NOTE THAT ORIGINAL DRAWING IS IN COLOUR

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VERT 1:100@A1 0 1 2 3 4 5m
HORIZ 1:100@A1 0 1 2 3 4 5m

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Central Coast
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PROJECT
BRISBANE WATER LEGACY VILLAGE
RESIDENTIAL APPRATMENTS
51-57 MASONS PDE, POINT FREDERICK

DRAWING TITLE
INTERNAL CIVIL WORKS
LONG SECTIONS
& CROSS SECTIONS
SHEET 1

JOB NUMBER **NL201088**
DRAWING NUMBER **C5.1**
REVISION **B**
DRAWING SHEET SIZE = A1