

PROJECT: PROPOSED RESIDENTIAL DEVELOPMENT

PLANSET: CONCEPT STORMWATER MANAGEMENT PLAN

CLIENT: BRETT CROWTHER

DRAWING LIST		
DWG NO.	REV	DWG TITLE
GENERAL		
PS01-A000	C	COVER SHEET
CONSTRUCTION MANAGEMENT WORKS		
PS01-B300	B	GROUND FLOOR EROSION & SEDIMENT CONTROL PLAN
PS01-B310	A	EROSION & SEDIMENT CONTROL DETAILS
DRAINAGE		
PS01-E100	C	BASEMENT DRAINAGE PLAN
PS01-E101	C	GROUND FLOOR DRAINAGE PLAN
PS01-E200	B	DRAINAGE DETAILS
PS01-E600	A	DRAINS CATCHMENT PLAN, DETAILS, LAYOUT AND RESULTS
PS01-E700	B	MUSIC CATCHMENT PLAN, DETAILS, LAYOUT AND RESULTS



LOCALITY PLAN
NOT TO SCALE

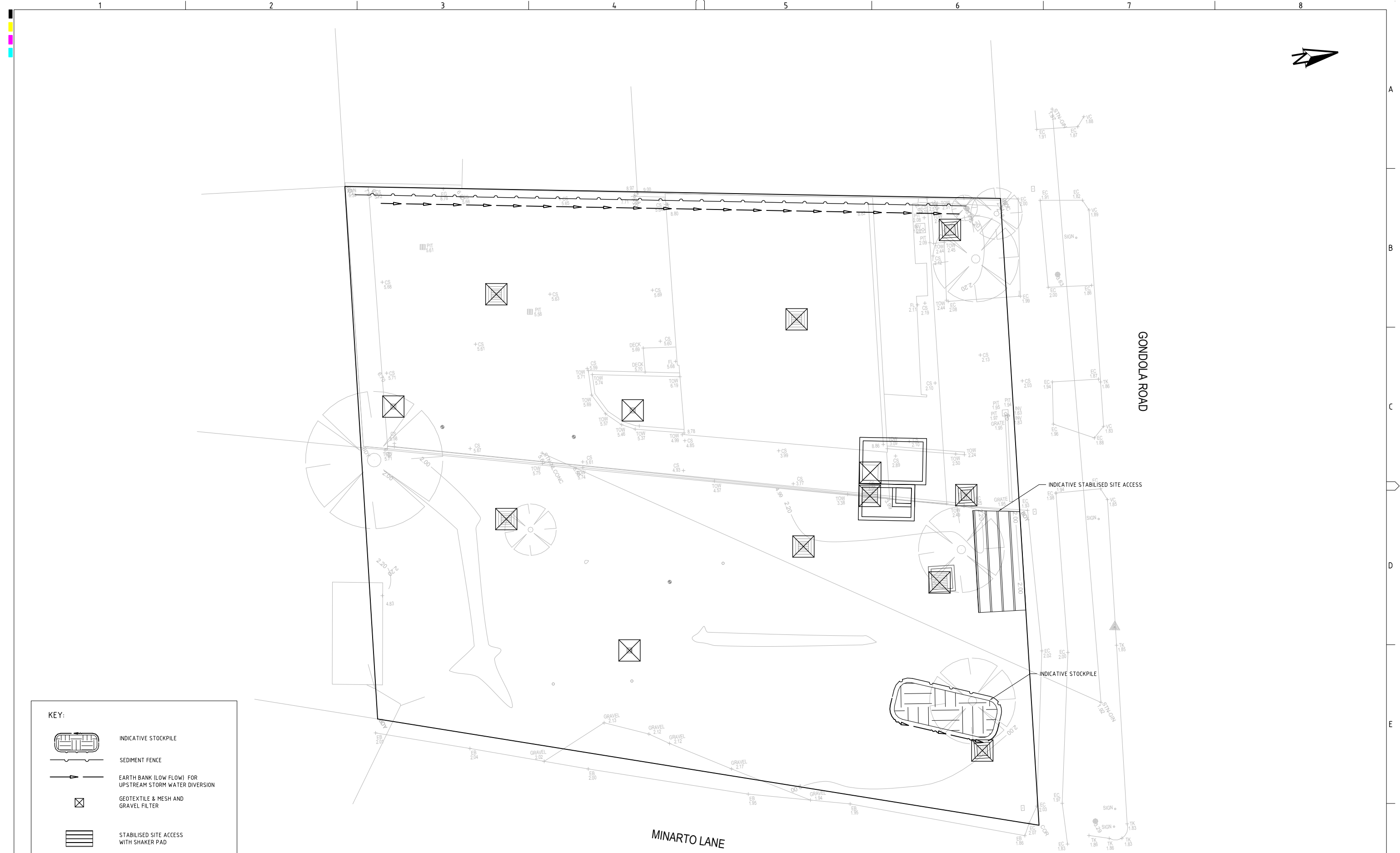
LGA: NORTHERN BEACHES COUNCIL

1-3 GONDOLA STREET, NORTH NARRABEEN, NSW
LOTS 187/DP16719 & 188/DP16719

- GENERAL NOTES:**
- THIS PLAN IS FOR DEVELOPMENT APPLICATION PURPOSE AND NOT FOR CONSTRUCTION. DESIGN TO BE REVIEWED AND UPDATED FOR CONSTRUCTION CERTIFICATE.
 - ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH, AND THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THE RELEVANT AUSTRALIAN STANDARDS, COUNCIL SPECIFICATIONS, AND ALL PROJECT CONSULTANT'S PLANS AND REPORTS.
 - INTERNAL SURVEY INFORMATION AND EXTERNAL SITE BOUNDARY SHOWN BASED ON SURVEY INFORMATION PROVIDED BY C&A SURVEYORS ON 08/03/2024.
 - ARCHITECTURAL INFORMATION SHOWN BASED ON DESIGN BY MACKENZIE ARCHITECTS INTERNATIONAL 29/02/2024.
 - LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD	SCALE	GRID	DATUM	PROJECT MANAGER	CLIENT	DRAWING TITLE		
C	MINOR AMENDMENTS	25/10/2024	NP	PC	AVG	GT		---	---	GT	BRETT CROWTHER	COVER SHEET		
B	TO ADDRESS COUNCIL RFI	24/10/2024	NP	PC	AVG	GT								
A	INITIAL RELEASE	02/04/2024	NP	IS	AVG	GT								
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<p>PROJECT NAME/PLANSET TITLE PROPOSED RESIDENTIAL DEVELOPMENT CONCEPT STORMWATER MANAGEMENT PLAN 1-3 GONDOLA STREET, NORTH NARRABEEN, NSW LOTS 187/DP16719 & 188/DP16719</p>														
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PROJECT NO. P2310036			PLANSET NO. PS01			RELEASE NO. R04			DRAWING NO. PS01-A000			REVISION C		

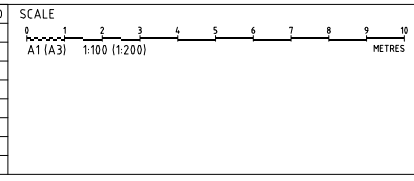


KEY:

	INDICATIVE STOCKPILE
	SEDIMENT FENCE
	EARTH BANK (LOW FLOW) FOR UPSTREAM STORM WATER DIVERSION
	GEOTEXTILE & MESH AND GRAVEL FILTER
	STABILISED SITE ACCESS WITH SHAKER PAD

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	TO ADDRESS COUNCIL RFI	24/10/2024	NP	PC	AVG	GT
A	INITIAL RELEASE	02/04/2024	NP	IS	AVG	GT



GRID --- DATUM mAHD PROJECT MANAGER GT CLIENT

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DRAWING TITLE GROUND FLOOR EROSION & SEDIMENT CONTROL PLAN				
PROJECT NO. P2310036	PLANSET NO. PS01	RELEASE NO. R04	DRAWING NO. PS01-B300	REVISION B

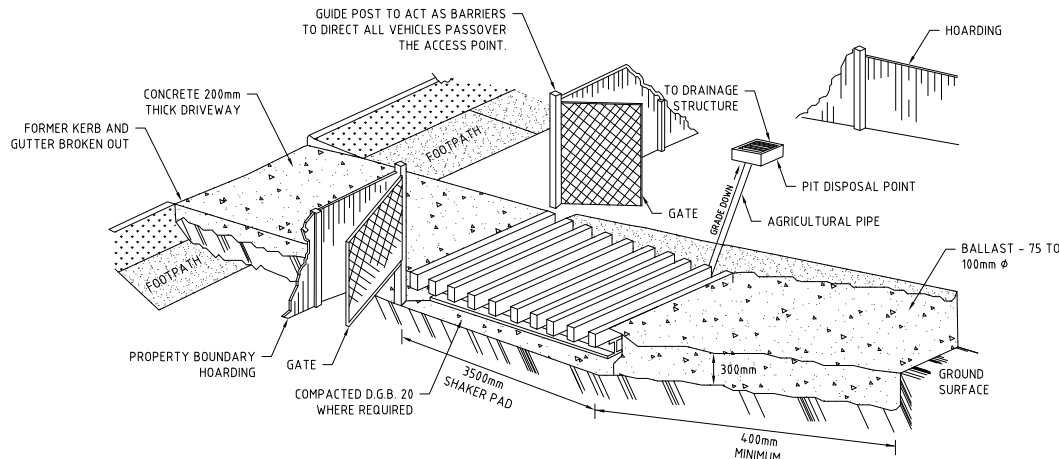
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STABILISED ACCESS POINT

TYPE II SAP

THE TYPE II SAP DESIGN IS MORE DEFINED IN THAT IT REQUIRES AN AREA OF BALLAST WITHIN THE SITE COMBINED WITH A SHAKER PAD, ADJACENT TO THE SHAKER PAD AND IN THE PUBLIC WAY IS A TEMPORARY (CONCRETE) VEHICULAR CROSSING. (SEE DIAGRAM)

STABILISED ACCESS POINT - TYPE 2



IN BOTH TYPE I AND TYPE II SAP'S, THE TEMPORARY VEHICULAR CROSSING MUST:

- CONNECT TO AN EXISTING GUTTER LAYBACK (WHERE THE KERB AND GUTTER EXIST). IF A GUTTER LAYBACK DOES NOT EXIST THEN THE CONNECTION MUST BE MADE TO THE GUTTER BY REMOVING THE ADJACENT KERB SECTION ONLY.
- CONNECT TO A DISH CROSSING (WHERE KERB AND GUTTER DOES NOT EXIST). IF A DISH CROSSING DOES NOT EXIST, THEN IT MUST BE CONSTRUCTED IN ACCORDANCE WITH DETAILS CONTAINED IN COUNCIL'S ISSUED FOOTPATH CROSSING LEVELS.

IT SHOULD BE NOTED THAT THESE TYPES OF SAPS ARE CONSIDERED TO BE APPLICABLE FOR THE MAJORITY OF ACTIVITIES HOWEVER SOME SITES MAY REQUIRE SPECIAL CONSIDERATION.

SHAKER PAD (CATTLE GRID)

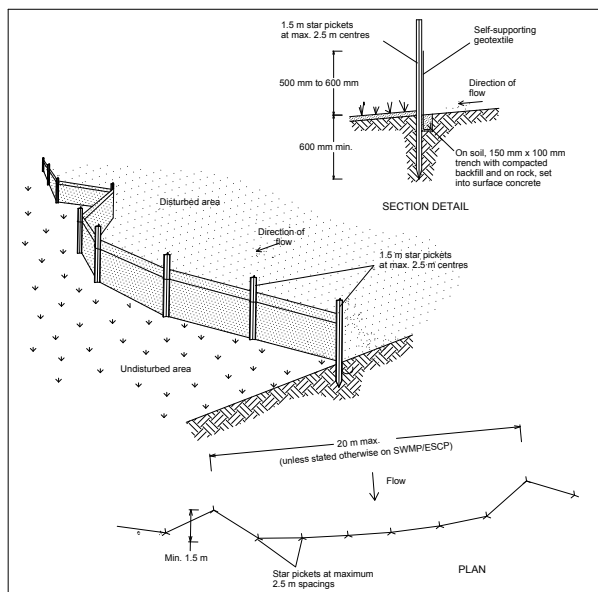
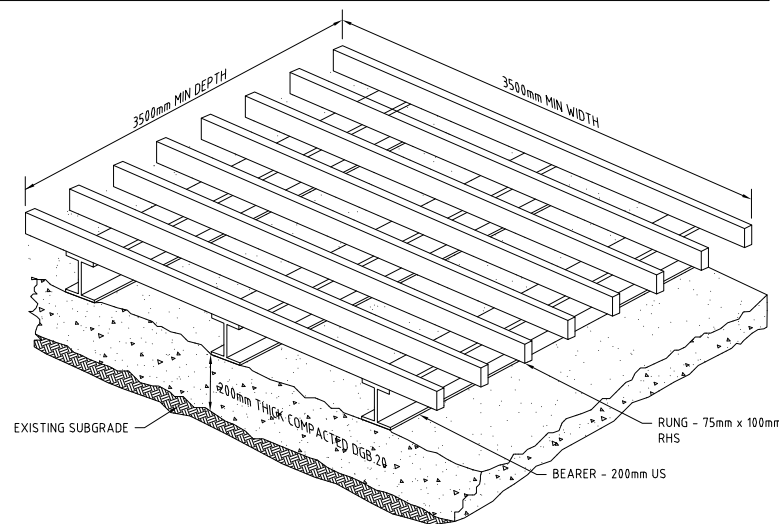
A CORRECTLY DESIGNED AND INSTALLED SHAKER PAD WILL ASSIST IN PREVENTING SEDIMENT TRANSFER FROM A SITE. ANY STABILISED ACCESS POINT (SAP) CAN BE DESIGNED WITH A SHAKER PAD (COMPULSORY IN TYPE II SAP'S)

SHAKER PADS CAN BE DESIGNED AND CONSTRUCTED TO ENABLE RE-USE ON FUTURE PROJECTS.

THE SHAKER PAD:

- MUST BE DESIGNED AND CERTIFIED BY A PRACTISING STRUCTURAL ENGINEER. THE CERTIFIED DESIGN SHOULD BE SUBMITTED WITH THE RELEVANT APPLICATION.
- CAN BE CONSTRUCTED FROM ANY SUITABLE MATERIAL.
- MUST BE LOCATED ON A SUITABLY PREPARED AND COMPACTED SUB-GRADE/BASE MATERIAL.
- MUST BE SITUATED SUCH THAT THE RUNGS OF THE SHAKER PAD ARE LEVEL WITH THE ADJOINING NATURAL SURFACE.
- MUST BE A MINIMUM OF 3.5m IN LENGTH.
- MUST BE A MINIMUM OF 3.5m IN WIDTH.
- MUST HAVE CLEAR SPACING BETWEEN RUNGS OF 200 - 250mm.
- RUNGS MUST HAVE A MAXIMUM WIDTH (BEARING AREA) OF 75mm.
- MUST HAVE A MINIMUM CLEAR DEPTH OF 300mm IE FROM THE TOP OF THE RUNG TO THE FINISHED SUB-GRADE/BASE LEVEL.

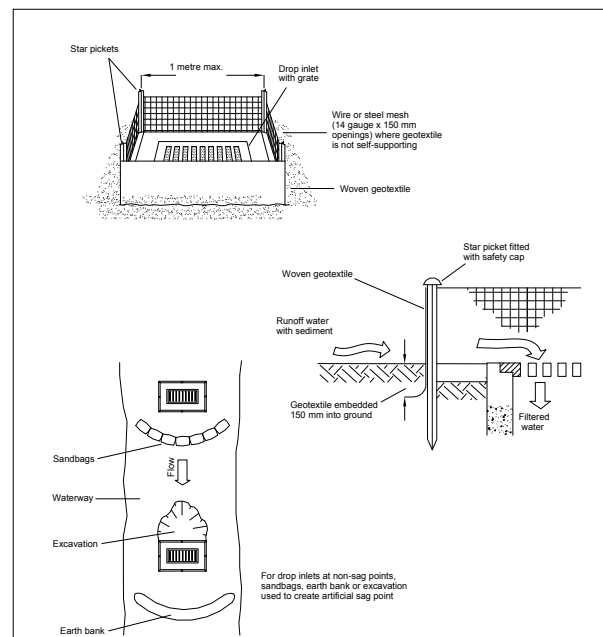
THE SHAKER PAD MUST BE PROVIDED WITH SUITABLE BARRIERS AT THE SIDES TO ENSURE THAT ALL TYERS OF VEHICLES LEAVING THE SITE TRAVERSE THE DEVICE.



Construction Notes

- 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.
- Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
- 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.
- 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.
- Join sections of fabric at a support post with a 150-mm overlap.
- Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

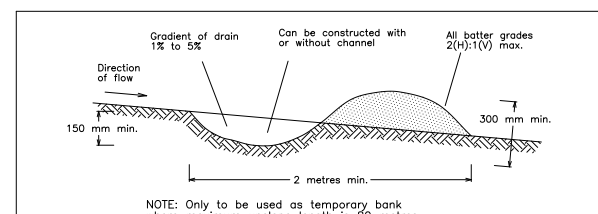
SEDIMENT FENCE SD 6-8



Construction Notes

- Fabricate a sediment barrier made from geotextile or straw bales.
- Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geotextile. Reduce the picket spacing to 1 metre centres.
- In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
- Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

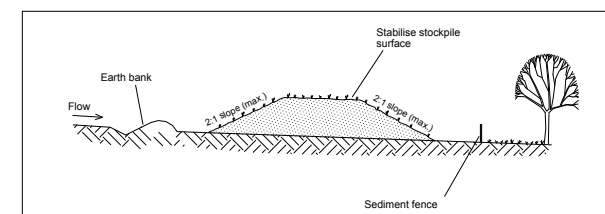
GEOTEXTILE INLET FILTER SD 6-12



Construction Notes

- Build with gradients between 1 percent and 5 percent.
- Avoid removing trees and shrubs if possible - work around them.
- Ensure the structures are free of projections or other irregularities that could impede water flow.
- Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
- Ensure the banks are properly compacted to prevent failure.
- Complete permanent or temporary stabilisation within 10 days of construction.

EARTH BANK (LOW FLOW) SD 5-5



Construction Notes

- Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
- Construct on the contour as low, flat, elongated mounds.
- Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
- 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.
- 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 2 metres downslope.

STOCKPILES SD 4-1

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A	INITIAL RELEASE	02/04/2024	NP	IS	AVG	GT	

GRID	DATUM	PROJECT MANAGER	CLIENT
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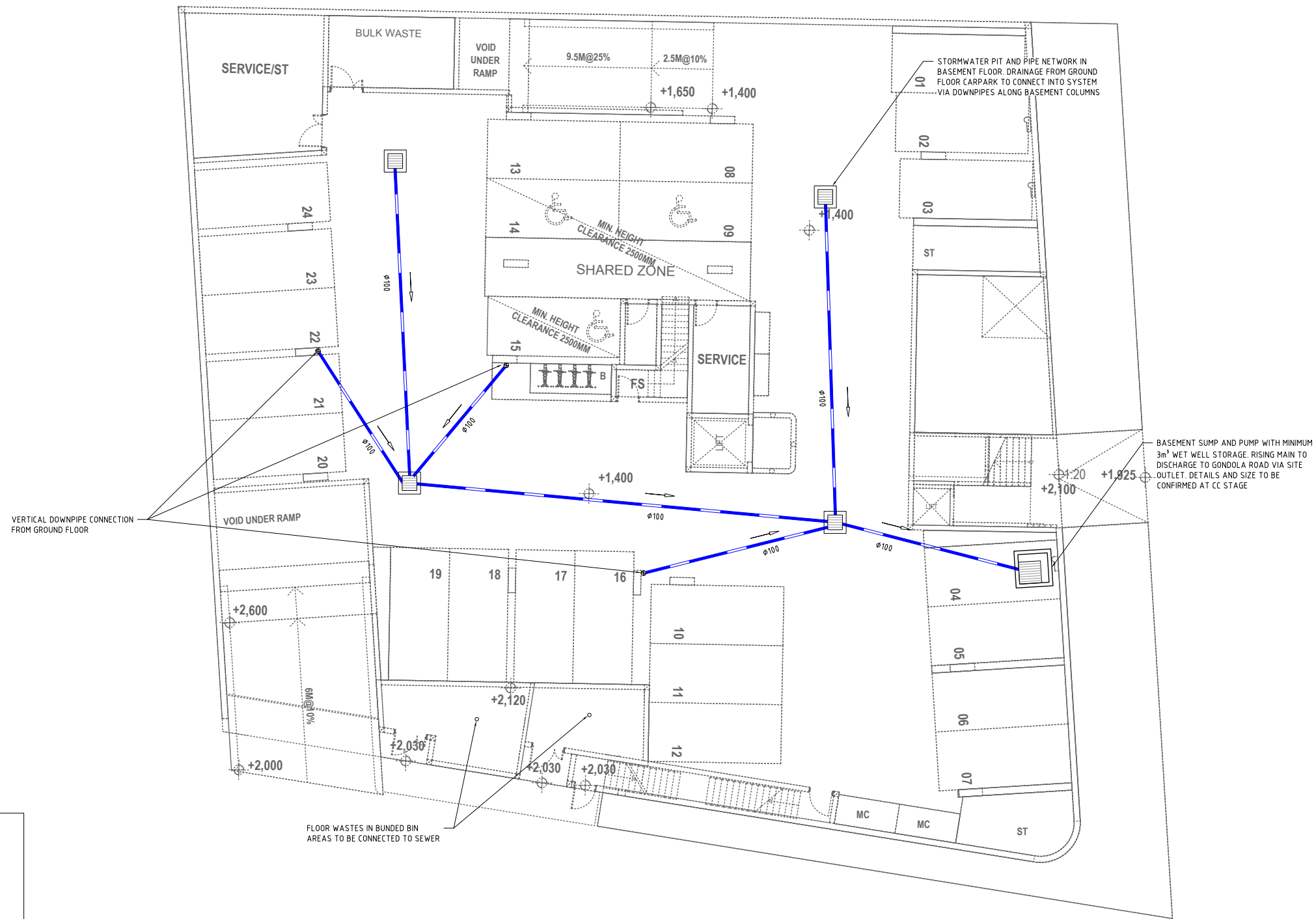
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CONCEPT STORMWATER MANAGEMENT PLAN
1-3 GONDOLA STREET, NORTH NARRABEEN, NSW
LOTS 187/DP16719 & 188/DP16719



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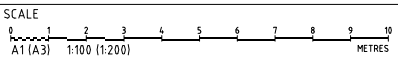
DRAWING TITLE				
EROSION & SEDIMENT CONTROL DETAILS				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2310036	PS01	R04	PS01-B310	A



KEY	
STORMWATER PIPELINE	
SITE BOUNDARY	
DOWNPIPE	
SURFACE INLET PIT	
FLOW DIRECTION	

NOTE:
 1. CONCEPT DESIGN ONLY. ALL PIPE SIZES AND PIT LOCATIONS ARE INDICATIVE AND ARE SUBJECT TO DETAILED DESIGN.
 2. AS PER SECTION 9.2 OF THE PITTWATER DCP - A4.11 NORTH NARRABEEN LOCALITY 'WATER MANAGEMENT FOR DEVELOPMENT POLICY' DOCUMENT, OSD IS NOT REQUIRED FOR THE SITE. THE DEVELOPMENT IS LOCATED WITHIN THE COUNCIL ESTABLISHED FLOOD PLAIN FOR THE 100, 20 AND 5 YR ARI STORM EVENTS AS PER THE PITTWATER OVERLAND FLOW MAPPING AND FLOOD STUDY - VOLUME 2 (2013) DOCUMENT PREPARED BY CARDNO.

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DRAWING TITLE				
BASEMENT DRAINAGE PLAN				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2310036	PS01	R04	PS01-E100	C

RAINWATER OUTLET IN SUSPENDED SLAB. PIPES TO BE SLUNG FROM SLAB AND DRAIN TO THE BASEMENT FLOOR VIA VERTICAL DOWNPIPES ATTACHED TO BASEMENT COLUMNS

VERTICAL DOWNPIPE CONNECTION TO THE BASEMENT FLOOR







8kL RAINWATER TANK BENEATH COMMERCIAL LANDSCAPED AREA. BUILDING DOWNPIPES (DESIGNED BY OTHERS) TO DIRECT ALL ROOF FLOWS TO RAINWATER TANK. OVERFLOWS TO DISCHARGE TO STORMFILTER CHAMBER FOR TREATMENT

3x KERB OUTLET TO GONDOLA ROAD GUTTER VIA 200x100x6mm RHS, SPACED MINIMUM 15m APART. REFER TO DRAWING E600 FOR PRELIMINARY DISCHARGE CALCULATIONS

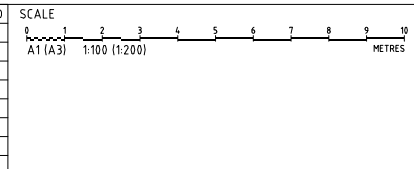
STORMFILTER CHAMBER BENEATH STAIRS AND LANDING (APPROX. 3.7m²). TO CONTAIN 6x PSORB 690 OCEANPROTECT STORMFILTERS (OR EQUIVALENT). BUILDING DOWNPIPES (DESIGNED BY OTHERS) TO DIRECT ALL COMMUNAL OPEN SPACE FLOWS TO CHAMBER

FLOOR WASTE IN CAR WASH AREA TO BE CONNECTED TO SEWER

KEY

- STORMWATER PIPELINE 
- SLUNG DRAINAGE LINE 
- SITE BOUNDARY 
- DOWNPIPE 
- PROPOSED PIT 
- FLOW DIRECTION 

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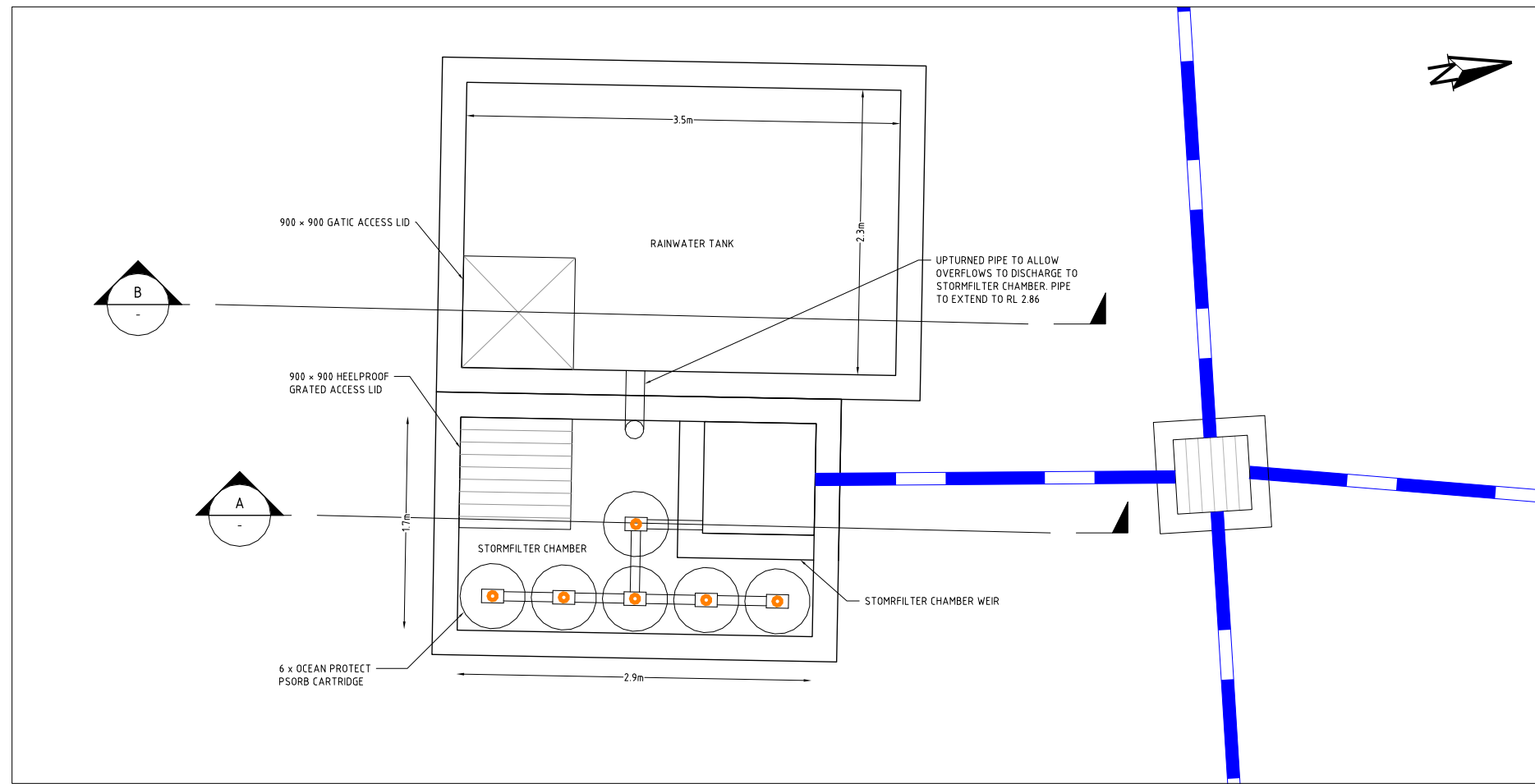
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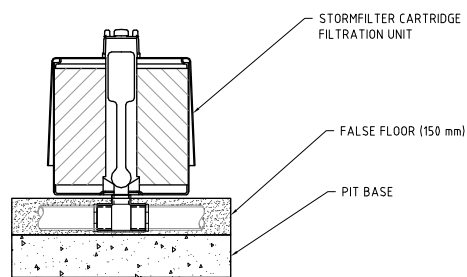
DRAWING TITLE
GROUND FLOOR DRAINAGE PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2310036	PS01	R04	PS01-E101	C



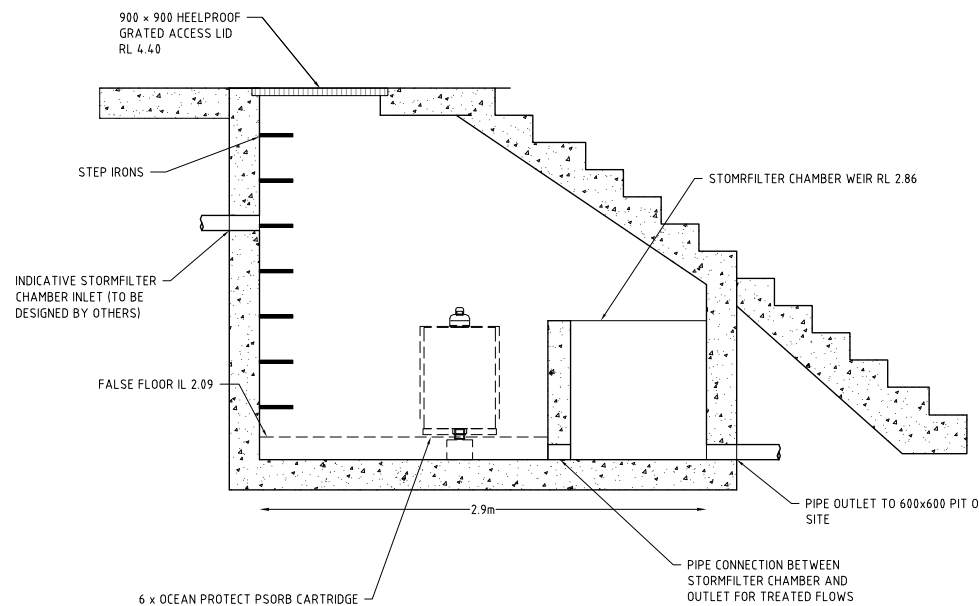
RAINWATER TANK AND STORMWATER CHAMBER PLAN

SCALE 1:25



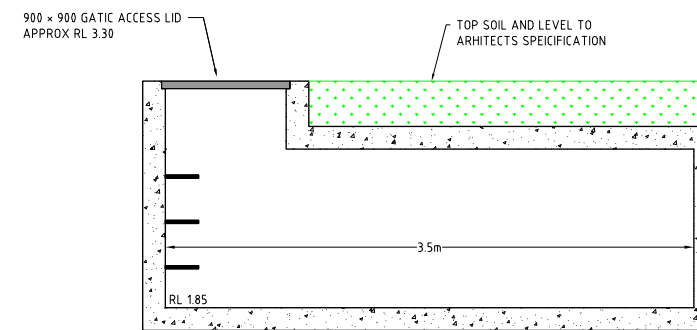
STORMFILTER CARTRIDGE INSTALLATION DETAIL

NOT TO SCALE



SECTION A - STORMFILTER CHAMBER

SCALE 1:25

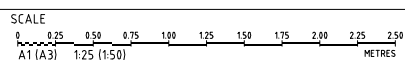


SECTION B - RAINWATER TANK

SCALE 1:25

NOTE:
1. RAISED PLANTER BOXES IN FIRST FLOOR AND COMMUNAL OPEN SPACE ARE TO DRAIN THROUGH PITS FITTED WITH OCEANGUARD PIT INSERTS (OR APPROVED EQUIVALENT)

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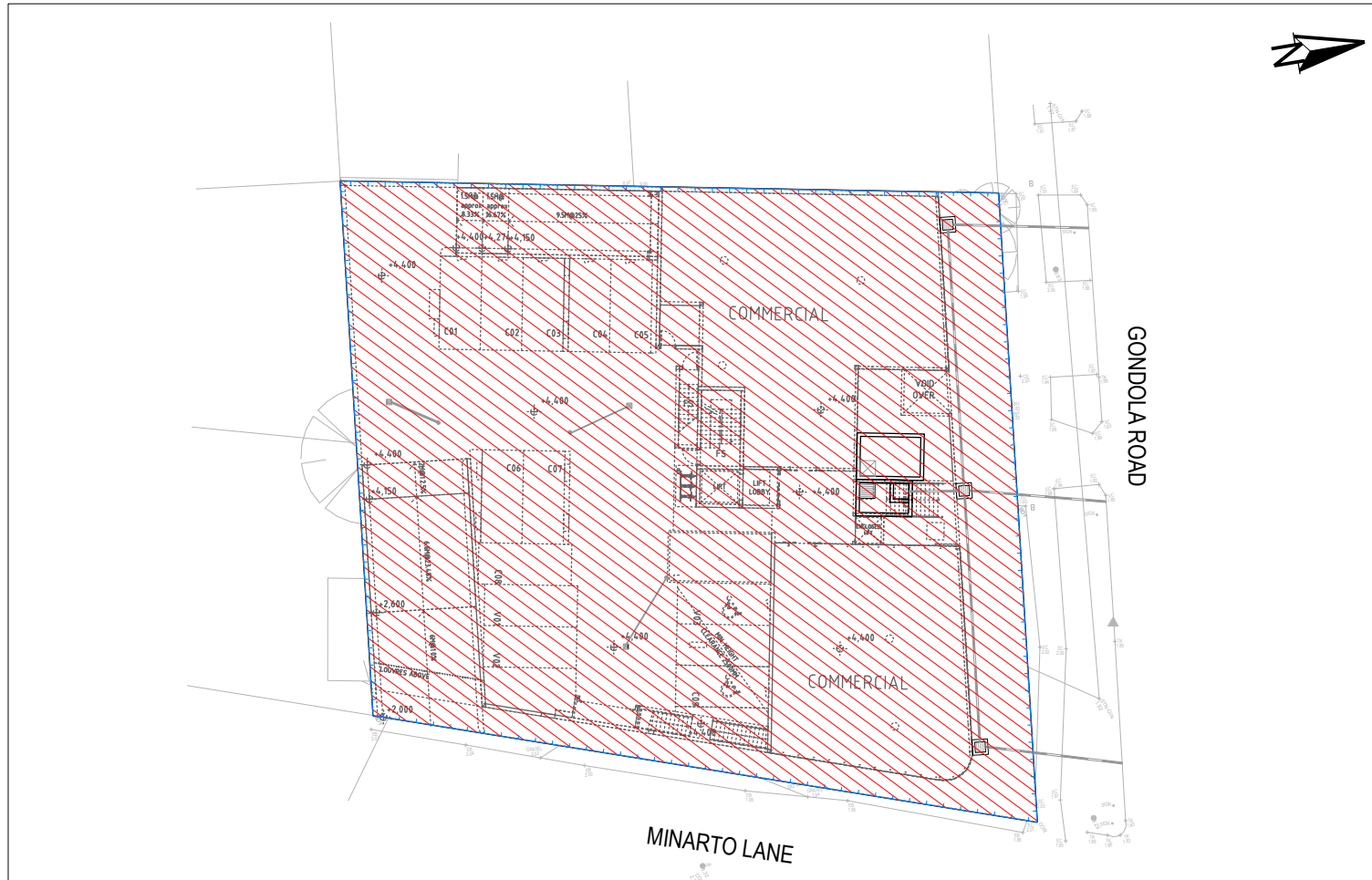
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DRAINAGE DETAILS				
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P2310036	PS01	R04	PS01-E200	B

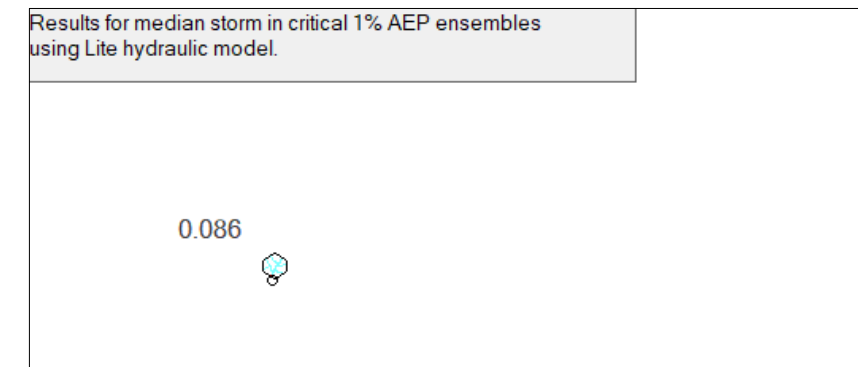
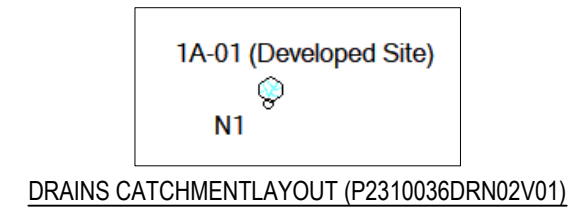
DRAWING ID: P2310036-PS01-R04-E200



DRAINS CATCHMENT PLAN
SCALE 1:200

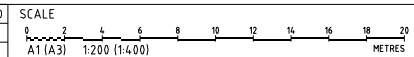
DRAINS CATCHMENT DETAILS (P2310036DRN02V01)				
KEY	DRAINS NODE	NODE DESCRIPTION	AREA (ha)	% IMPERVIOUS AREA
	1A101	ENTIRE SITE	0.129	88%
TOTAL AREA			0.129	= 100% OF TOTAL AREA
TOTAL IMPERVIOUS AREA			0.114	= 88% OF TOTAL AREA
TOTAL PERVIOUS AREA			0.015	= 12% OF TOTAL AREA

- NOTES:**
- AS DISCUSSED WITH COUNCIL'S OFFICER 'UMA' ON 22/10/2024:
 - DISCHARGE FROM ANY INDIVIDUAL OUTLET IS LIMITED TO 30L/s AT EACH DISCHARGE LOCATION.
 - MULTIPLE DISCHARGE POINTS TO THE KERB CAN BE PROPOSED, PROVIDED THEY ARE MINIMUM 15m APART.
 - A DRAINS MODEL (ILSAX) HAS BEEN CREATED BASED ON THE POST DEVELOPMENT SITE. RESULTS INDICATE 86L/s WILL BE GENERATED IN THE 1% AEP STORM.
 - THREE OUTLETS HAVE BEEN PROPOSED TO LIMIT DISCHARGE LESS THAN 30L/s AT EACH DISCHARGE LOCATION.



DRAINS CATCHMENT RESULTS (P2310036DRN02V01)

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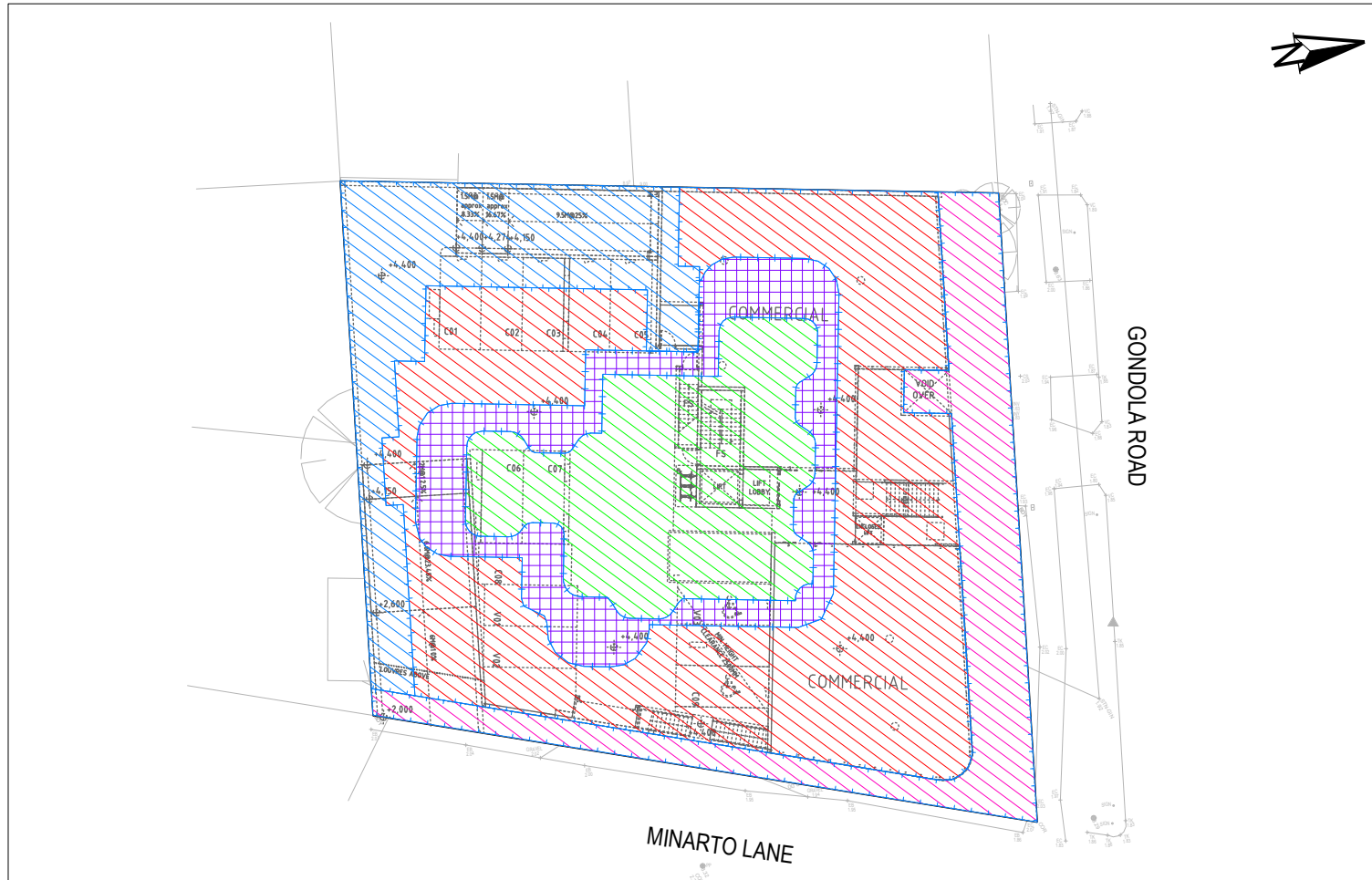
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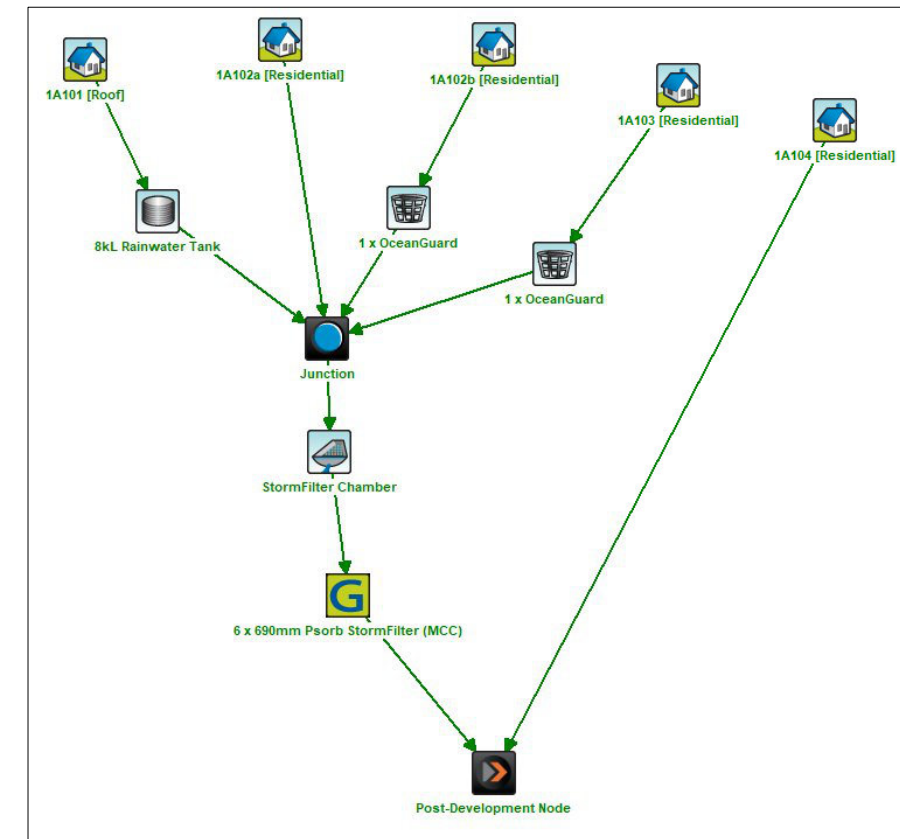
DRAWING TITLE
DRAINS CATCHMENT PLAN, DETAILS, LAYOUT AND RESULTS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2310036	PS01	R04	PS01-E600	A

DRAWING ID: P2310036-PS01-R04-E600



MUSIC CATCHMENT PLAN
SCALE 1:200



MUSIC CATCHMENT LAYOUT (P2310036MUS03V02)

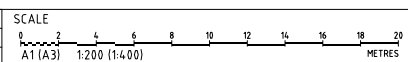
MUSIC CATCHMENT DETAILS (P2310036MUS03V02)				
KEY	MUSIC NODE	NODE DESCRIPTION	AREA (ha)	% PAVED
	1A101	ROOF	0.052	100%
	1A102a	RESIDENTIAL ROOF	0.022	100%
	1A02b	RESIDENTIAL ROOF PLANTER BOX	0.016	100%
	1A103	RESIDENTIAL GROUND FLOOR PLANTER BOX	0.019	100%
	1A104	RESIDENTIAL BYPASS	0.019	20%
TOTAL AREA			0.129	= 100% OF TOTAL AREA
TOTAL IMPERVIOUS AREA			0.114	= 88% OF TOTAL AREA
TOTAL IMPERVIOUS AREA			0.015	= 12% OF TOTAL AREA

Treatment Train Effectiveness - Post-Development Node			
	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.34	1.34	0.1
Total Suspended Solids (kg/yr)	137	19.6	85.7
Total Phosphorus (kg/yr)	0.298	0.0724	75.7
Total Nitrogen (kg/yr)	2.91	1.36	53.2
Gross Pollutants (kg/yr)	33.1	1.76	94.7

MUSIC CATCHMENT RESULTS (P2310036MUS03V02)

NOTE:
1. STORMWATER QUALITY REDUCTION TARGETS ARE TSS 65%, TP 55%, TN 45% AND GP 90%. PROPOSED STORMWATER QUALITY TREATMENT STRATEGY ACHIEVED REDUCTION TARGETS.
2. RAISED PLANTER BOXES IN FIRST FLOOR AND COMMUNAL OPEN SPACE ARE TO DRAIN THROUGH PITS FITTED WITH OCEANGUARD PIT INSERTS (OR APPROVED EQUIVALENT).

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	TO ADDRESS COUNCIL RFI	24/10/2024	NP	PC	AVG	GT
A	INITIAL RELEASE	02/04/2024	NP	IS	AVG	GT



GRID --- DATUM mAHD PROJECT MANAGER GT CLIENT BRET CROWTHER
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PROJECT NAME/PLANSET TITLE
PROPOSED RESIDENTIAL DEVELOPMENT
 CONCEPT STORMWATER MANAGEMENT PLAN
 1-3 GONDOLA STREET, NORTH NARRABEEN, NSW
 LOTS 187/DP16719 & 188/DP16719



Consulting Engineers
 Environment
 Water
 Geotechnical
 Civil

DEVELOPMENT APPLICATION

DRAWING TITLE				
MUSIC CATCHMENT PLAN, DETAILS, LAYOUT AND RESULTS				
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P2310036	PS01	R04	PS01-E700	B

DRAWING ID: P2310036-PS01-R04-E700

A1 / A3 LANDSCAPE (A1LC_02.0.01)