ALTERATIONS & ADDITIONS

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Architect: RICHARD SMITH ARCHITECT

Prepared By:

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DRAWING SCHEDULE:

DOI A STORMWATER DRAINAGE GENERAL NOTES

DO2 A SITE STORMWATER DRAINAGE PLAN

DO3 A ROOF STORMWATER DRAINAGE PLAN

DO4 A MUSIC MODELLING CATCHMENT PLAN

STORMWATER DRAINAGE DETAILS SHEET

STORMWATER DRAINAGE DETAILS SHEET 2

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Engineer Consulting

REV. A - 17.04.2025

2. DO NOT SCALE FROM THESE DRAWING. 3. ALL DIMENSIONS ARE TO BE VERIFIED ON SITE BY THE BUILDER BEFORE COMMENCING WITH ASSOCIATED WORK.

STORMWATER NOTES:

AI. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT NATIONAL CONSTRUCTION CODE (NCC), AUSTRALIAN STANDARDS (LATEST VERSION), THE REQUIREMENTS OF THE LOCAL COUNCIL AND ANY APPLICABLE AUTHORITIES.

A2. ALL LEVELS SHOWN ARE TO THE AUSTRALIAN HEIGHT DATUM (AHD) UNLESS NOTED OTHERWISE. A3. THE LOCATION OF ALL DRAINAGE ELEMENTS ARE SHOWN INDICATIVELY BASED ON AVAILABLE SURVEY OR OTHER INFORMATION, ALL DRAINAGE ELEMENTS ARE TO BE INSTALLED WITH CONSIDERATION TO SITE CONSTRAINTS AND THE INTENT OF THE DRAINAGE CONCEPT.

A4. ANY MATERIAL VARIATIONS TO THE DRAINAGE CONCEPT OR DETAILED STORMWATER ELEMENTS MUST BE APPROVED BY NORTHERN BEACHES CONSULTING ENGINEERS PTY LTD PRIOR TO COMMENCEMENT. A5. ANY EXCAVATION OR TRENCHING FOR SERVICES ADJACENT TO A STRUCTURE OR PROPERTY BOUNDARY MUST NOT ENCROACH ON THE 'ZONE OF INFLUENCE', REFER TO THE NCC FOR FURTHER

A6. ALL LEVELS SHOWN ON THIS PLAN MUST BE COORDINATED WITH ALL RELEVANT INFORMATION, INCLUDING THE ARCHITECTURAL, CIVIL & STRUCTURAL ENGINEERING PLANS. WHERE A LEVEL IS SHOWN WITHIN A RAMPED AREA (EG A PIT GRATE), THE LEVEL IS APPROXIMATE AND MAY NEED TO BE ADJUSTED TO ACCOMODATE THE SLOPE.

A7. ANY DESIGN CLASHES, INCLUDING WITH SERVICES, STRUCTURE CONFIGURATION OR FINISHED LEVELS MUST BE COMMUNICATED WITH THE PROJECT STORMWATER ENGINEER NOMINATED ON THIS PLAN PRIOR TO CONSTRUCTION.

GENERAL CONSTRUCTION NOTES:

BI. CONTRACTORS TO LOCATE ALL EXISTING SERVICES PRIOR TO EXCAVATION AND NOTIFY ENGINEER OF ANY POTENTIAL CLASHES WITH THE PROPOSED STORMWATER DRAINAGE SYSTEM

B2. ANY ELEMENTS OF THE EXISTING STORMWATER SYSTEM WHICH ARE PROPOSED TO BE RETAINED MUST BE INSPECTED AND APPROVED BY AN ENGINEER PRIOR TO CONSTRUCTION AS BOTH HAVING ADEQUATE CAPACITY TO CATER FOR THE RUNOFF DIRECTED TO IT AND BEING IN ADEQUATE CONDITION FOR USE.

B3. EXISTING STORMWATER SYSTEM ALSO TO BE INSPECTED BY A SUITABLY QUALIFIED PLUMBER PRIOR TO CONSTRUCTION AND UPGRADED AS REQUIRED IN ACCORDANCE WITH AS3500.3.

B4. CARE SHOULD BE TAKEN WHEN UNDERTAKING WORKS IN THE VICINITY OF TREES NOT TO DISTURB THE TREE ROOT SYSTEM. HAND DIGGING OF TRENCHES MAY BE REQUIRED SUBJECT TO THE PROJECT ARBORISTS REQUIREMENTS. REFER TO THE ARBORIST REPORT FOR EXCAVATION REQUIREMENTS

SURROUNDING PROTECTED TREE ROOT ZONES B5. SWIMMING POOL SURCHARGE OVERFLOW TO BE CONNECTED VIA GRAVITY TO THE SEWER IN ACCORDANCE WITH AS3500. DETAILS AND CERTIFICATION BY OTHERS.

B6. EXTENT, ALIGNMENT, DEPTH AND CONDITION OF ANY COUNCIL STORMWATER PIPELINE WITHIN A DEVELOPMENT SITE MUST BE VERIFIED PRIOR TO CONSTRUCTION AND THE ENGINEER MUST BE NOTIFIED UPON VERIFICATION. ANY NEW CONNECTION TO A COUNCIL STORMWATER PIPELINE WILL BE SUBJECT TO COUNCIL APPROVAL AND MUST BE INSTALLED IN ACCORDANCE WITH THE LOCAL COUNCIL SPECIFICATIONS. B7. ALL UNDERGROUND CONFINED SPACES MUST PROVIDE SAFE AND SUFFICIENT MAINTENANCE ACCESS POINTS IN ACCORDANCE WITH WORK HEALTH AND SAFETY BILL 2011, WORK HEALTH AND SAFETY REGULATIONS 2011 AND AUSTRALIAN STANDARDS AS 2865-2009 CONFINED SPACES. ADEQUATE

VENTILATION POINTS MUST BE PROVIDED WHERE GAS BUILD UP IS LIKELY. B8. THE PROJECT ENGINEER MUST BE NOTIFIED IF ANY CHANGES ARE PROPOSED DURING CONSTRUCTION TO WHAT IS SHOWN ON THE LATEST STORMWATER MANAGEMENT PLAN PREPARED BY NBCE. THIS MUST BE CO-ORDINATED AND APPROVED BY NBCE. IF NBCE ARE NOT NOTIFIED OF ANY CHANGES DURING CONSTRUCTION, THIS MAY HINDER FINAL CERTIFICATION.

B9. NBCE MUST CONDUCT A FINAL INSPECTION OF ANY INSTALLED STORMWATER WORKS PRIOR TO ISSUE OF THE FINAL HYDRAULIC CERTIFICATION.

BIO. THE PROJECT BUILDER MUST CONTACT THE PROJECT STORMWATER ENGINEER FOR SITE INSPECTIONS IN ACCORDANCE WITH THE SITE INSPECTION SCHEDULE SHOWN ON THIS DRAWING, U.N.O. IF NBCE DO NOT INSPECT THE ITEMS DETAILED ON THE SITE INSPECTION SCHEDULE, THIS MAY AFFECT THE FINAL HYDRAULIC CERTIFICATION.

PIPEWORK INSTALLATION:

- CI. ALL PIPES TO BE MINIMUM 100mm & UNLESS NOTED OTHERWISE.
- C2. ALL PIPES TO BE UPVC SEWER GRADE TO AS 1254 UNLESS NOTED OTHERWISE.
- C3. ALL PIPES TO BE LAYED AT 1 % MINIMUM GRADE UNLESS NOTED OTHERWISE. C4. ALL CONNECTIONS INTO EXISTING PIPES MUST BE MADE IN THE DIRECTION OF FLOW
- C5. ANY NEW UPVC CONNECTIONS INTO EXISTING R.C. PIPES MUST BE MADE INTO THE TOP HALF OF THE PIPE USING A FLOWCON CONNECTION FITTING U.N.O.

C6. ALL PIPES SHALL BE LAID ON A 75mm SAND BED, COMPACTED TO 100% S.M.D.D. BELOW PAVEMENTS. (NO COMPACTION REQUIRED BELOW LANDSCAPING) COVER TO SURFACE FROM TOP OF PIPE TO BE 300mm MINIMUM. BACKFILL TO BE ADEQUATELY CONSOLIDATED AROUND PIPES BY METHOD OF RAMMING AND WATERING IN. TRENCHES TO BE FILLED WITH NO-FINES GRANULAR MATERIAL AS SPECIFIED.

C7. ALL EXISTING EARTHENWARE PIPES TO BE UPGRADED TO UPVC. C8. MINIMUM PIPE COVER TO ALL IN-GROUND PIPEWORK SHALL BE CARRIED OUT IN ACCORDANCE WITH TABLE 6.2.5 - AS3500.3 (2021).

C9. ALL SUSPENDED PIPE FIXINGS ARE TO BE CARRIED OUT IN ACCORDANCE WITH AS2032. CIO. ENSURE THAT ALL STORMWATER PITS AND PIPES ARE LOCATED CLEAR FROM TREE ROOT SYSTEMS. CII. ALL PIPEWORK MUST BE INSTALLED WITHIN THE SITE BOUNDARY OF THE DEVELOPMENT SITE. ANY

NEW OR EXISTING PIPEWORK EXTENDING THROUGH PRIVATE PROPERTY BEYOND THE BOUNDARY OF THE DEVELOPMENT SITE MUST BE CONTAINED SOLELY WITHIN A DRAINAGE EASEMENT. IF NO DRAINAGE EASEMENT EXISTS, A NEW DRAINAGE EASEMENT MUST BE SOUGHT AND REGISTERED PRIOR TO UTILISING OR INSTALLING PIPEWORK THROUGH NEIGHBOURING PROPERTIES. CONTACT THE ENGINEER IF A DRAINAGE EASEMENT CANNOT BE OBTAINED.

CI2. THE PROJECT STORMWATER ENGINEER MUST BE NOTIFIED AND INSPECT ALL IN-GROUND PIPEWORK AND CONNECTIONS PRIOR TO BACKFILLING. IF ENGINEER DOES NOT INSPECT THE IN-GROUND PIPEWORK, THIS MAY AFFECT THE FINAL HYDRAULIC CERTIFICATION. NBCE WILL NOT APPROVE PIPE GRADES. ALL

PIPE GRADES MUST BE VERIFIED BY A SUITABLY QUALIFIED PERSON. CI3. PIPE ANCHOR BLOCKS TO BE INSTALLED FOR ALL PVC PIPEWORK WHEN THE GRADIENT EXCEEDS 1:5 IN ACCORDANCE WITH AS 3500.3.

ROOF DRAINAGE:

TO COMMENCEMENT OF WORK.

DI. ALL DOWN PIPES TO BE 100mm & UNLESS NOTED OTHERWISE. D2. DOWN PIPE LOCATIONS ARE INDICATIVE ONLY. LOCATIONS TO BE CONFIRMED WITH ARCHITECT PRIOR

D3. PROVIDE CLEANING EYES AT ALL DOWNPIPES.

D4. GUTTER GUARDS MUST BE INSTALLED ON ALL GUTTERS UNLESS NOTED OTHERWISE.

D5. ALL EAVES GUTTER AND VALLEY GUTTER SYSTEMS MUST BE INSTALLED IN ACCORDANCE WITH

D6. ALL BOX GUTTER SYSTEMS MUST BE INSTALLED STRICTLY IN ACCORDANCE WITH THE DETAILS

SHOWN ON THE APPROVED STORMWATER MANAGEMENT PLAN. IF NO DETAILS ARE SHOWN, THE BOX GUTTER SYSTEM MUST BE INSTALLED IN ACCORDANCE WITH AS3500.3. IF ANY CHANGE TO THE BOX GUTTER SYSTEM CONFIGURATION IS PROPOSED, THE ENGINEER MUST BE NOTIFIED FOR A RE-DESIGN. IF THE INSTALLED BOX GUTTER DOES NOT STRICTLY COMPLY WITH THE DESIGN DETAILED ON THE STORMWATER MANAGEMENT PLAN, CERTIFICATION OF THE HYDRAULIC SYSTEM MAY BE REFUSED. D7. ALL GREEN ROOFS, PEBBLED ROOFS AND PLANTERS WITH A CONCRETE BASE MUST BE WATERPROOFED AND HAVE DRAINAGE CELL INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION.



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D8. IF ANY VALLEY GUTTER SHOWN ON THIS PLAN IS BELOW A 12.5-DEGREE ROOF PITCH WITH A CATCHMENT AREA ABOVE 20m? A CUSTOM VALLEY GUTTER, OR BOX GUTTER WILL BE REQUIRED, IF THE ROOF PITCH REQUIREMENT CANNOT BE ACHIEVED, THE PROJECT ENGINEER MUST BE NOTIFIED FOR DESIGN DETAILS AND THE GUTTER SYSTEM MUST BE INSTALLED IN ACCORDANCE WITH AS3500.3 PRIOR

D9. ADEQUATE FLASHING WILL BE REQUIRED TO DIVERT FLOWS AROUND SKYLIGHTS. FLASHING WORKS TO BE CARRIED OUT BY A SUITABLY QUALIFIED PERSON AND BE INSTALLED IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS AND NCC REQUIREMENTS

DIO. ALL EAVES GUTTERS MUST BE MINIMUM 150 HALF ROUND GUTTERS (WITH A CROSS-SECTIONAL AREA OF 9200mm?) OR AN APPROVED EQUIVALENT, UNO. ALL EAVES GUTTER FALLS MUST BE DIRECTED TO THE NOMINATED DOWNPIPES AS SHOWN ON THE STORMWATER MANAGEMENT PLAN. THE PROJECT STORMWATER ENGINEER MUST BE NOTIFIED IF ANY CHANGES ARE PROPOSED OR THE ABOVE CANNOT BE ACHIEVED PRIOR TO CONSTRUCTION.

DII. ALL EAVES GUTTERS AND ASSOCIATED DOWNPIPES MUST BE INSTALLED IN ACCORDANCE WITH TABLE 3.5.2, AS3500.3 (2021), UNLESS NOTHED OTHERWISE.

DI2. NOTIFY THE PROJECT ENGINEER IF THE MINIMUM HEAD PRESSURE HEIGHT (AS SHOWN ON THIS PLAN) BETWEEN THE INVERT OF THE GUTTER AND INVERT OF THE CHARGED SYSTEM OUTLET CANNOT BE ACHIEVED.

EI. ALL STORMWATER PITS MUST BE INSTALLED IN ACCORDANCE WITH AS3500.3.

NOT REQUIRE A SUMP.

E2. ALL CONCRETE PITS TO BE DESIGNED BY STRUCTURAL ENGINEER. E3. MINIMUM INTERNAL DIMENSIONS FOR STORMWATER AND INLET PITS TO BE IN ACCORDANCE WITH TABLE 7.5.2.1, AS3500.3 (2021)

E4. ALL PITS GREATER THAN 1200mm DEEP SHALL HAVE STEP IRONS INSTALLED. STEP IRON INSTALLATION MUST BE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS E5. THE BOUNDARY OR SILT ARRESTOR PIT MUST INCORPORATE A SUMP OF MINIMUM 200mm DEPTH BELOW THE INVERT OF THE OUTLET PIPE AND A MAXI-MESH SCREEN AS PER LOCAL COUNCIL AND THE AUSTRALIAN STANDARD REQUIREMENTS. HOWEVER, UNLESS SPECIFICALLY REQUIRED BY COUNCILS POLICY OR IF THE SITE CONSISTS OF A CLAY OR ROCK SUBGRADE, ALL OTHER DRAINAGE PITS WILL

E6. ALL STORMWATER PITS TO BE LOCATED AT LOW POINTS TO PREVENT PONDED WATER. E7. FOR STORMWATER PITS LOCATED BELOW THE WATER TABLE, CUT INTO ROCK OR IN POORLY DRAINED SOILS, THE PIT SUMP MAY BE FILLED WITH MORTAR AND SCREEDED TOWARDS THE OUTLET AT MINIMUM 1% FALL, SUBJECT TO THE ENGINEERS APPROVAL

E8. A STAINLESS STEEL OR GALVANISED MESH SCREEN (MAXI-MESH RH3030 OR APPROVED EQUIVALENT) MUST BE INSTALLED OVER OUTLETS WITHIN ALL SURFACE PITS AND ORIFICE PLATES, UNO. THE TRASH SCREEN AREA MUST BE A MINIMUM OF 50 TIMES THE ORIFICE AREA FOR ALL ORIFICES BELOW 150mm DIAMETER. IF ABOVE 150mm, TRASH SCREEN AREA MAY BE REDUCED TO 20 TIMES THE ORIFICE AREA. ALL TRASH SCREENS MUST REMAIN A DISTANCE OF 1.5 TIMES THE ORIFICE AREA AWAY FROM THE OUTLET STRUCTURE, OR 200mm, WHICHEVER IS GREATER.

E9. 20mm WEEP HOLES TO BE INSTALLED AT 200mm CENTRES AT THE BASE OF ALL SURFACE PITS UNLESS FOUNDED ON A ROCK FOUNDATION.

SUBSOIL DRAINAGE: FI. ALL SUBSOIL DRAINAGE TO BE INSTALLED AS REQUIRED IN ACCORDANCE WITH AS3500.3 (SPECIFICALLY SECTION 6, 7 AND APPENDIX L) AND THE NCC.

F2. INSTALLATION OF SUBSOIL DRAINAGE LINES IS GENERALLY REQUIRED WHERE SUBSURFACE WATER MOVEMENT COULD DAMAGE BUILDINGS OR CAUSE LOSS OF AMENITY THROUGH THE BUILD-UP OF EXCESSIVE MOISTURE OR LATERAL WATER PRESSURE. THIS INCLUDES ALONG WALLS THAT IMPEDE THE NATURAL FLOW OF GROUNDWATER, ON THE UPHILL SIDE OF CUT AND FILL SITES, ADJACENT TO DEEF FOOTINGS, BEHIND RETAINING WALLS AND ADJACENT TO BASEMENT WALLS. SUBSOIL DRAINAGE IS GENERALLY ALSO REQUIRED IN SHALLOW LANDSCAPED AREAS OVER ROCK OR POORLY DRAINED SOILS TO PREVENT OVERLY SATURATED LANDSCAPED AREAS.

F3. THE INSTALLATION OF SUBSOIL DRAINAGE MAY REQUIRE TRENCHING THROUGH ROCK. F4. ALL SUBSOIL LINES ARE TO BE 100mm uPVC SLOTTED PIPE (UNSOCKED), LAID AT (MIN.) 0.5% FALL

F5. THE SUBSOIL LINE IS TO BE SURROUNDED BY SELECT FILTER MATERIAL, GENERALLY 10-20mm DIAMETER AGGREGATE.

F6. THE TRENCH SHALL BE SIZED TO PROVIDE A MINIMUM 50mm BEDDING AND 100mm COVER ALL AROUND THE SUBSOIL LINE, GENERALLY MINIMUM 300mm WIDE X 300mm DEEP. THE TRENCH IS TO BE WRAPPED ALL-ROUND IN NON-WOVEN, GEOTEXTILE FABRIC OF STRENGTH CLASS A, WITH SUFFICIENT OVERLAP (LESSER OF TRENCH WIDTH OR 500mm)

F7. WHERE THE IN-SITU SOILS HAVE A GRAIN SIZE SMALLER THAN THE GEOTEXTILE FABRIC, COURSE WASHED-SAND SHOULD BE USED AS A FILTER TO PREVENT BLOCKAGE OF THE GEOFABRIC.

F8. THE BACKFILL LAYER OVER THE TRENCH SHALL BE NO-FINES COURSE WASHED-SAND. WHERE LANDSCAPED AREAS ARE PROPOSED OVER THE TRENCH, THE TOP 300mm OF BACKFILL MAY BE MIXED WITH UP TO 20% ORGANIC MATTER

THE PIT OUTLET UNO. THE PROJECT BUILDER IS TO IMPLEMENT APPROPRIATE MEASURES TO PREVENT SUBSOIL LINE BLOCKAGE OR INFESTATION OF VERMIN. FIO. THE HIGH-END OF THE SUBSOIL LINE IS TO BE TURNED UP AT 45° AND TERMINATE AT GROUND

F9. ALL SUBSOIL LINES ARE TO DISCHARGE INTO A GRATED PIT, AT A LEVEL MINIMUM 50mm ABOVE

LEVEL WITH AN INSPECTION CAP TO ENABLE FUTURE FLUSH OUT AND MAINTENANCE FII. 100mm \$\psi\$ x 3000mm LONG TAIL OUT SUBSOIL LINE TO BE PROVIDED ON THE UPSTREAM SIDE OF ALL LARGE PITS OR IN AREAS WITH HIGH SEEPAGE FLOWS. SUBSOIL LINE TO BE COVERED WITH GEOTEXTILE FILTER SOCK FOR THE FULL LENGTH AND END COVERED. BACKFILL MUST BE IN NO-FINES

CHARGED SYSTEM:

GI. ALL PIPEWORK IN A CHARGED SYSTEM TO BE 100mm \$\phi\$ uPVC PRESSURE OR SEWER GRADE PIPES WITH ALL JOINTS PRESSURE SEALED TO A MINIMUM OF 1,000mm (UNLESS NOTED OTHERWISE) ABOVE THE INLET OF THE DISCHARGE POINT. ALL JOINTS TO BE SOLVENT WELDED IN ACCORDANCE WITH THE

G2. ALL CHARGED SYSTEMS MUST HAVE A BLEED OUT LINE AT THE LOW POINT IN THE CHARGED SYSTEM WHICH MUST BE CONNECTED TO A FLUSH OUT PIT VIA GRAVITY. THE BLEED LINE MUST BE MAINTAINED AND REGULARLY FLUSHED OUT.

ON-SITE DETENTION NOTES:

HI. ORIFICE PLATE MUST BE INSTALLED PRIOR TO INSTALLATION OF THE ROOF DRAINAGE SYSTEM AND CONNECTION OF THE SITE STORMWATER SYSTEM TO THE ON-SITE DETENTION TANK.

H2. THE HEIGHT DIFFERENCE (H*) BETWEEN THE ORIFICE CENTRELINE AND THE TOP WATER LEVEL OF THE ON-SITE DETENTION TANK MUST BE CONSTRUCTED IN ACCORDANCE WITH THE STORMWATER MANAGEMENT PLAN. IF H* CHANGES DUE TO SITE CONDITIONS. THE ENGINEER MUST BE NOTIFIED FOR AN ORIFICE PLATE SIZE ADJUSTMENT

H3. ANY PIPE FITTINGS FOR BELOW GROUND ON-SITE DETENTION TANKS MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.

H4. ACCESS HATCHES MUST BE INSTALLED AT BOTH ENDS OF THE ON-SITE DETENTION TANK. IF THE DEPTH OF THE TANK IS GREATER THAN 1200mm, STEPS IRONS MUST BE INSTALLED IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS.

H5. ABOVE GROUND ON-SITE DETENTION BASINS MUST NOT EXCEED A PONDING DEPTH OF 300mm, UNLESS NOTED OTHERWISE. THE BUILDER MUST ENSURE THAT THE REQUIRED DETENTION VOLUME IS ACHIEVED DURING CONSTRUCTION. A WORK-AS-EXECUTED PLAN DETAILING THE FINISHED LEVELS AND VOLUME OF THE ON-SITE DETENTION BASIN MUST BE CARRIED OUT AT THE COMPLETION OF WORKS BY A REGISTERED SURVEYOR AND APPROVED BY THE ENGINEER PRIOR TO FINAL CERTIFICATION.

H6. IF ORIFICE HEIGHT (H*) IS SUBJECT TO CHANGE, THE PROJECT ENGINEER MUST BE NOTIFIED FOR AN ORIFICE PLATE ADJUSTMENT.

H7. PONDING DEPTHS IN LANDSCAPED AREAS MUST NOT EXCEED 300mm UNDER THE DESIGN CONDITIONS FOR ALL RESIDENTIAL DEVELOPMENTS. IF THE PONDING DEPTH EXCEEDS 300mm, POOL FENCING MUST BE DESIGN AND CONSTRUCTED IN ACCORDANCE WITH THE SWIMMING POOLS ACT 1992.

H8. THE MAXIMUM SLOPE AND BATTERS SHOULD NOT EXCEED 1 IN 4, UNO. THE MINIMUM SLOPE IN LANDSCAPED BASINS MUST BE 1.5%, WITH ABSOLUTE MINIMUM BEING 1%, UNO. NO PLANTING IS ALLOWED WITHIN THE LANDSCAPED BASIN AREA.

H9. SUB-SOIL DRAINAGE MUST BE INSTALLED WITHIN LANDSCAPED BASIN AREA IN ACCORDANCE WITH AS3500.3 AND DIRECTED TO THE SITE STORMWATER SYSTEM TO PREVENT PROLONGED SATURATED GROUND CONDITIONS.

SURFACE DRAINAGE:

JI. WHEN LAND FALLS TOWARDS A BUILDING, INCLUDING LAND UPSLOPE OF THE PROPERTY BOUNDARY, GROUND SURFACE LEVELS ADJACENT TO THE BUILDING ARE TO BE REGRADED SUCH THAT THE FIRST METRE HAS MINIMUM 50mm FALL AWAY FROM THE BUILDING, GENERALLY IN ACCORDANCE WITH THE NCC. J2. ANY NEW DEVELOPMENT WORKS MUST NOT CREATE ANY TRAPPED SURFACE AREAS. IN SUCH CASES WHERE TRAPPED AREAS EXIST, SWALE DRAINS OR GRATED PITS WITH PIPED OUTLETS OF ADEQUATE CAPACITY MAY BE REQUIRED TO ROUTE RUNOFF AROUND THE BUILDING TO AN APPROVED DISCHARGE POINT. IF THE TRAPPED AREA IS BELOW THE NATURAL SURFACE LEVEL, A PUMP OUT SYSTEM MAY BE REQUIRED. IN EITHER CASE, THE PROJECT ENGINEER MUST BE CONTACTED FOR DESIGN DETAILS (AS REQUIRED) PRIOR TO CONSTRUCTION.

J3. BUILDER TO PROVIDE A MINIMUM 100mm WIDE x 30mm HIGH OR 50mm DIA OVERFLOW FOR EVERY 6m OF EXPOSED AREA THAT IS TRAPPED OR SURROUNDED BY HOBS/BALUSTRADES/WALLS/ETC. THE FULL OVERFLOW DEPTH MUST BE LOCATED BELOW ANY ADJACENT INTERNAL FLOOR LEVELS OR OPENINGS TO PROTECT AGAINST WATER INGRESS DUE TO BLOCKAGE OF THE PRIMARY OUTLET(S). THE OVERFLOW MUST BE FREE DRAINING TO THE LEGAL POINT OF DISCHARGE.

J4. ALL INTERNAL FINISHED FLOOR LEVELS MUST BE A MINIMUM 50mm ABOVE ALL ADJACENT PAVED EXTERNAL LEVELS AND 150mm ABOVE ALL ADJACENT PERVIOUS EXTERNAL LEVELS, U.N.O. IMMEDIATELY ADJACENT EXTERNAL AREAS (WITHIN IM OF INTERNAL AREAS) MUST SLOPE AWAY FROM THE DWELLING AT A MINIMUM 2.5% FALL. IF ANY ASPECT IS UNACHIEVABLE, NBCE MUST BE NOTIFIED FOR ALTERNATIVE DRAINAGE DETAILING, IF APPLICABLE.

J5. ALL TRAPPED AREAS REQUIRE BOTH PRIMARY DISCHARGE & EMERGENCY (SECONDARY) DISCHARGE PROVISIONS IN CASE THE PRIMARY DISCHARGE BLOCKS. THIS MUST BE COORDINATED WITH THE PROJECT HYDRAULIC ENGINEER PRIOR TO CONSTRUCTION.

NORTHERN BEACHES COUNCIL - REGION 1 ON-SITE DETENTION SYSTEM CALCULATION SHEET

ADDRESS: 9 NORTH AVALON ROAD, AVALON BEACH

ALL WORKS IN ACCORDANCE WITH COUNCIL'S WATER MANAGEMENT FOR DEVELOPMENT POLICY

DEVELOPMENT TYPE ALTERATIONS AND ADDITIONS REGION

SITE DETAILS TOTAL SITE AREA

808.5 m² (66% OF SITE) PRE DEVELOPMENT IMPERVIOUS AREA 766.8 m² (62% OF SITE) POST DEVELOPMENT IMPERVIOUS AREA NO INCREASE

OSD REQUIREMENTS

THE SUBJECT SITE IS LOCATED WITHIN A FLOOD ZONE, THEREFORE OSD IS NOT REQUIRED IN ACCORDANCE WITH DEVELOPMENT ENGINEERING COMMENTS PROVIDED WITHIN THE PRE LODGEMENT MEETING NOTES - PLM2024 0070.

OSD STORAGE REQUIREMENT

NIL m OSD VOLUME REQUIRED

RAINWATER REUSE STORAGE REQUIREMENT

RAINWATER 'BASIX' REQUIRED

OUTLET CONTROL

METHOD OF DISCHARGE KERB AND GUTTER

BEFORE YOU DIG NOTE:

NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE DEVELOPERS \$ EXCAVATORS MAY BE HELD FINANCIALLY RESPONSIBLE BY THE ASSET OWNER SHOULD THEY DAMAGE UNDERGROUND NETWORKS.

CARELESS DIGGING CAN:

- CUT OFF EMERGENCY SERVICES

IS REPAIRED

- CAUSE DEATH OR SERIOUS INJURY TO WORKERS AND THE GENERAL PUBLIC - INCONVENIENCE USERS OF ELECTRICITY, GAS, WATER AND

COMMUNICATIONS

- LEAD TO CRIMINAL PROSECUTION AND DAMAGES CLAIMS - CAUSE EXPENSIVE FINANCIAL LOSSES TO BUSINESS

- DELAY PROJECT COMPLETION TIMES WHILE THE DAMAGE

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ISSUED FOR CONSTRUCTION CERTIFICATE SUBMISSION AND CONSTRUCTION

	STORMWATER INSPECTION SCHEDULE							
	INSPECTION ITEMS	STAGE OF CONSTRUCTION						
)	IN-GROUND PIPEWORK	PRIOR TO BACKFILL						
	IN-GROUND INFILTRATION/DISPERSION TRENCHES	PRIOR TO BACKFILL						
	IN-GROUND PREFABRICATED TANKS	PRIOR TO CONCRETE POUR/BACKFILL						
	PIPEWORK CAST-IN SLABS	PRIOR TO CONCRETE POUR						
	BOX GUTTERS	POST INSTALLATION WITH SAFE ROOF ACCESS MADE AVAILABLE						
	ABOVE GROUND PIPEWORK + FINISHED SURFACE LEVELS	FINAL CERTIFICATION						

IF IN DOUBT ASK

	STORMWATER INSPECT	TION SCHEDULE
	INSPECTION ITEMS	STAGE OF CONSTRUCTION
\mathcal{J}	IN-GROUND PIPEWORK	PRIOR TO BACKFILL
	IN-GROUND INFILTRATION/DISPERSION TRENCHES	PRIOR TO BACKFILL
	IN-GROUND PREFABRICATED TANKS	PRIOR TO CONCRETE POUR/BACKFII
	PIPEWORK CAST-IN SLABS	PRIOR TO CONCRETE POUR
	BOX GUTTERS	POST INSTALLATION WITH SAFE ROOF ACCESS MADE AVAILABLE
	ABOVE GROUND PIPEWORK + FINISHED SURFACE LEVELS	FINAL CERTIFICATION

ALTERATIONS & ADDITIONS

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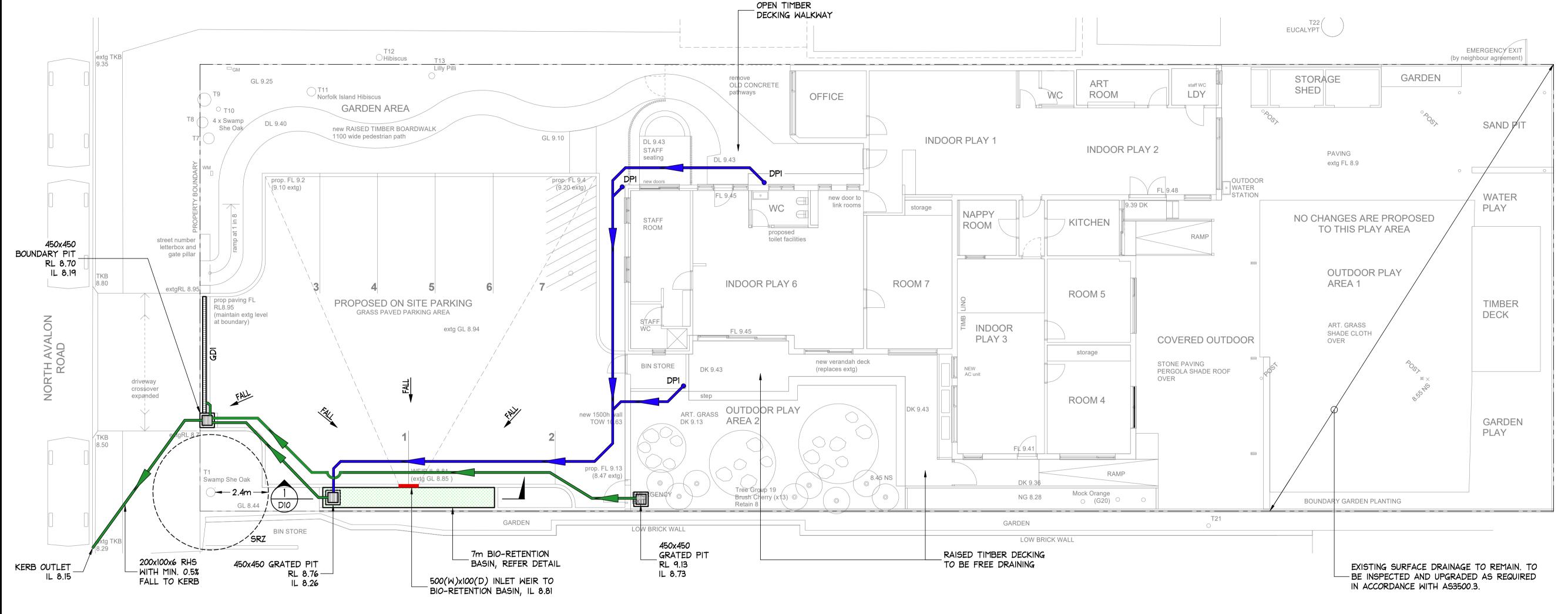
9 NORTH AVALON ROAD, AVALON BEACH Drawing Title: STORMWATER DRAINAGE GENERAL NOTES

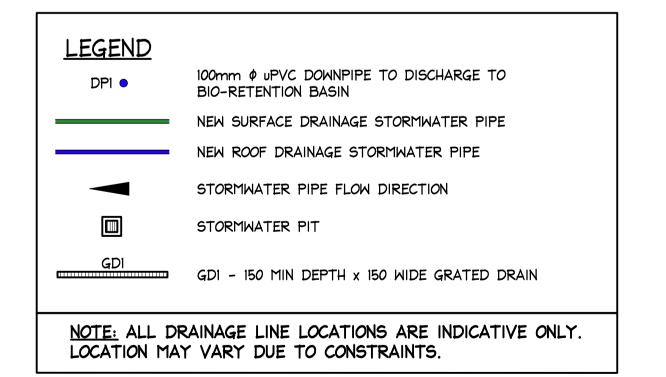
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SITE STORMWATER DRAINAGE PLAN

SCALE = 1 : 100



CERTIFICATE SUBMISSION AND CONSTRUCTION

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					Date: 01/05/2025 Michael Wachjo	
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					(Director NB Consulting Engineers)	
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Project:	ALTERATIONS & ADDITIONS	
9	IORTH AVALON ROAD, AVALON	BEAC
Drawing Title:	SITE	Job No:

STORMWATER DRAINAGE PLAN

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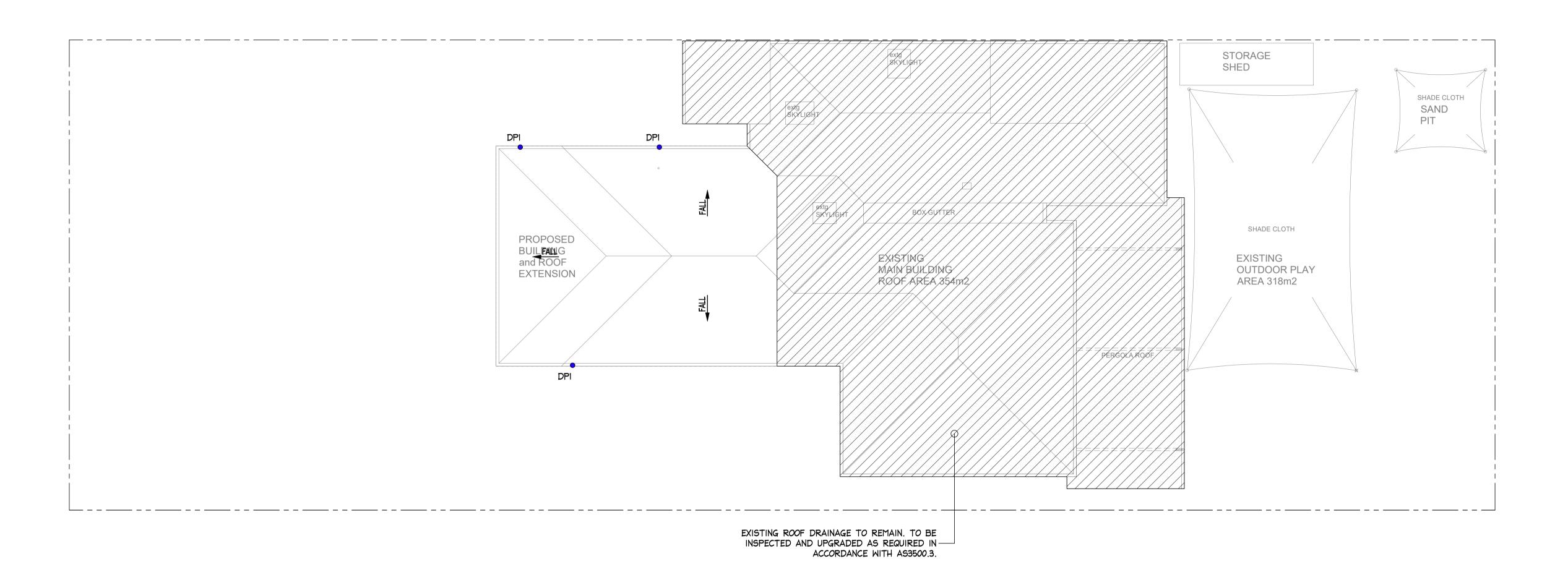
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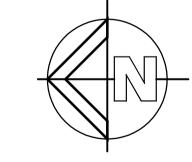
LEGEND

100mm ϕ uPVC DOWNPIPE TO DISCHARGE TO BIO-RETENTION BASIN

NOTE: ALL DRAINAGE LINE LOCATIONS ARE INDICATIVE ONLY. LOCATION MAY VARY DUE TO CONSTRAINTS.

ROOF STORMWATER DRAINAGE PLAN

SCALE = 1 : 100





CERTIFICATE SUBMISSION AND CONSTRUCTION

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					DOCUMENT CERTIFICATION	R
					Date: 01/05/2025 Michael Wachjo	S
7.04.2025	Α	ISSUED FOR CC SUBMISSION & CONSTRUCTION	LS	SAR	B.E.(Civil), MIEAust.,PRE,DEP. (Director NB Consulting Engineers)	G
Date:	Issue:	Description:	Ву:	Review:	The copyright of this drawing remains with NB Consulting Engineers	S E

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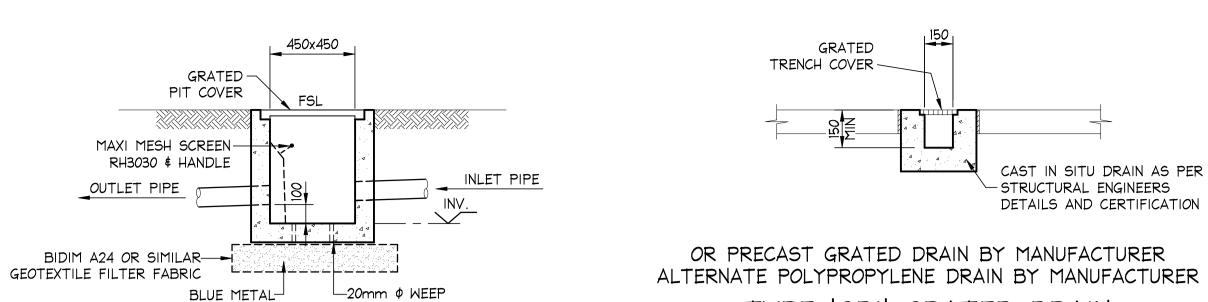
Architect:	RICHARD	SMITH	ARCHITECT
Client:			

HAPPY HEARTS AVALON PTY LTD

ALTERATIONS & ADDITIONS 9 NORTH AVALON ROAD, AVALON	BEAG
Prawing Title: ROOF STORMWATER DRAINAGE PLAN	Job No: 2 4

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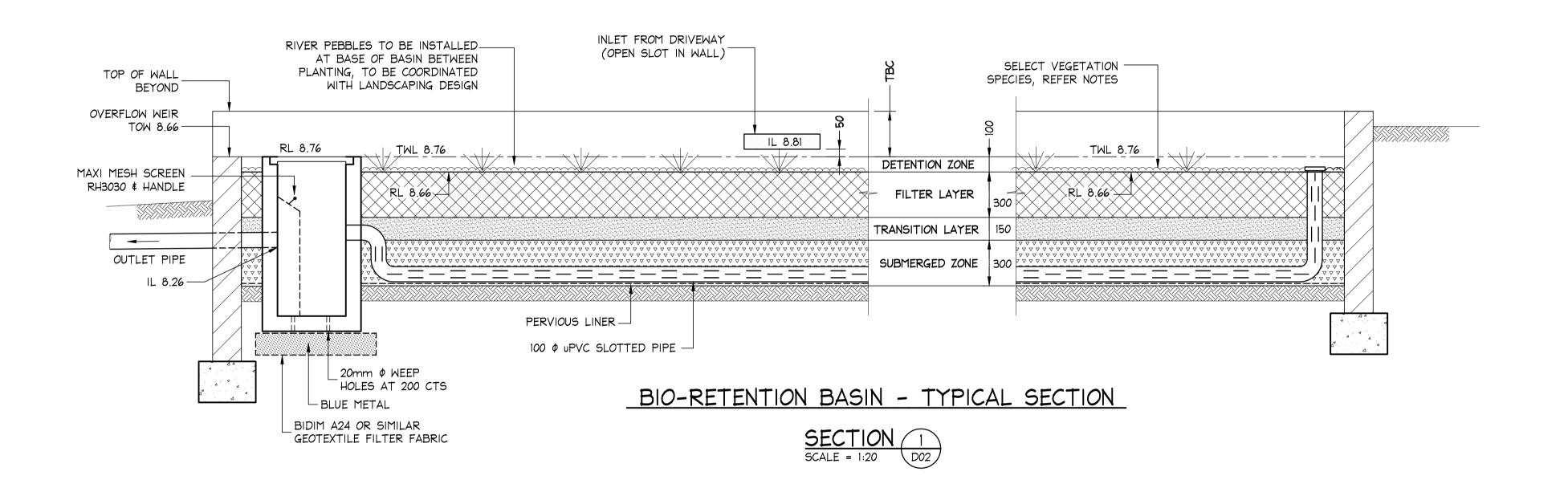


PRECAST OR CAST INSITU PIT REFER STORMWATER NOTES ALTERNATE POLYPROPYLENE PIT BY MANUFACTURER

> 450x450 PIT DETAIL SCALE = 1 : 20

HOLES AT 200 CTS

ALTERNATE POLYPROPYLENE DRAIN BY MANUFACTURER TYPE 'GDI' GRATED DRAIN SCALE = 1 : 20





TRUCTION	
DOUBT ASK	

Drawn:

Engineer

					DOCUMENT CERTIFICATION	R
					Date: 01/05/2025 Michael Wachjo	s
17.04.2025	Α	ISSUED FOR CC SUBMISSION & CONSTRUCTION	LS	-	B.E.(Civil), MIEAust., PRE, DEP. (Director NB Consulting Engineers)	((
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ent:			
	RICHARD	SMITH	ARCHITECT
hitect:			

HAPPY HEARTS AVALON PTY LTD

Project:	ALTERATION			
9 1	NORTH AVALON	N ROAD,	AVALON	BEA
Drawing Title:	STORMWATER	DRAINA	AGE	Job No:

DETAILS AND SECTIONS SHEET 1

LS 2407010

Suite 1, 30B Griffith Street, Coolangatta QLD 4225 E: nb@nbconsulting.com.au W: www.nbconsulting.com.au

- **GENERAL:** A1. THE FOLLOWING NOTES ARE INTENDED AS A SUMMARY ONLY TO ASSIST WITH THE CONSTRUCTION AND MAINTENANCE OF A BIO-FILTRATION BASIN (RAINGARDEN). ALL WORKS ARE TO BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MOST RECENT VERSION OF THE RELEVANT INDUSTRY STANDARDS AND GUIDELINES. THIS MAY INCLUDE THE "ADOPTION GUIDELINES FOR STORMWATER BIOFILTRATION SYSTEMS" BY THE FACILITY FOR ADVANCING WATER BIOFILTRATION (FAWB), MONASH UNIVERSITY, JUNE
- A2. NBCE STRONGLY RECOMMENDS THE BIOFILTRATION BASIN BE INSTALLED ONLY AFTER ALL CONSTRUCTION AND LANDSCAPING UPSTREAM HAS BEEN COMPLETED. IF THE FILTER MEDIA IS INSTALLED BEFORE LANDSCAPING IS COMPLETED, THE UN-VEGETATED BASIN MUST BE COVERED WITH A LAYER OF GEOFABRIC UNTIL ALL BARE SOFT SURFACES UPSTREAM HAVE BEEN TURFED OR APPROPRIATELY COVERED AND CONSTRUCTION DEBRIS/SEDIEMENT IS NO LONGER EXPECTED TO ENTER THE STORMWATER SYSTEM
- A3. BIOFILTRATION BASINS REQUIRE AN ESTABLISHMENT PERIOD OF APPROXIMATELY TWO YEARS TO ALLOW THE FILTER MEDIA TO SETTLE AND THE VEGETATION TO REACH ITS DESIGN CONDITIONS. REGULAR MAINTENANCE OF THE BASIN IS ESPECIALLY IMPORTANT DURING THIS INITIAL PERIOD TO ENSURE THE VEGETATION TAKES HOLD AND DOES NOT CHOKE FROM DEBRIS OR PERIODS OF MINIMAL RAINFALL A4. ADEQUATE SCOUR PROTECTION IS TO BE PROVIDED AROUND ANY INLET ZONE(S), WITH CONSIDERATION GIVEN TO MINIMISING THE REQUIRED ON-GOING SYSTEM MAINTENANCE FOR THE END-CLIENT AND THE DAMAGING EFFECT OF HIGH VELOCITY STORMWATER.

BIOFILTRATION BASIN STRUCTURE: <u>IST LAYER - FILTER MEDIA:</u>

- THE FILTER MEDIA IS RESPONSIBLE FOR REMOVING POLLUTANTS THROUGH BOTH PHYSICAL AND CHEMICAL PROCESSES AS WELL AS TO SUPPORT THE PLANT AND MICROBIAL COMMUNITY THAT ARE RESPONSIBLE FOR BIOLOGICAL TREATMENT. THE FILTRATION LAYER WILL ALSO USUALLY ALLOW STORMWATER TO ABSORB INTO THE SURROUNDING SOIL, THEREBY REDUCING THE VOLUME OF STORMWATER WHICH ENTERS THE DOWNSTREAM SYSTEM
- B2. THE FILTER MEDIA SHOULD HAVE THE FOLLOWING SPECIFICATIONS: - HYDRAULIC CONDUCTIVITY (Ks) RANGE: 100-300 MM/HR (AFTER COMPENSATING FOR LONG-TERM COMPACTION) - LOW NUTRIENT ORGANIC MATTER CONTENT AT LEAST 3% (w/w) TO PROVIDE FOR SUFFICIENT WATER HOLDING CAPACITY TO SUPPORT PLANT GROWTH. THE FILTER MEDIA MUST NOT LEACH NUTRIENTS INTO
 - THE STORMWATER SYSTEM. - TOTAL NITROGEN (TN) CONTENT - <1000 mg/kg - ORTHOPHOSPHATE (PO4,3) CONTENT - <80 mg/kg OR <20mg/kg FOR PLANTS SENSITIVE TO PHOSPHORUS.
 - Ph-AS SPECIFIED FOR PLANTS IN 'NATURAL SOILS AND SOIL BLENDS' (5.5-7.5) - ELECTRICAL CONDUCTIVITY (EC) - AS SPECIFIED FOR 'NATURAL
- SOILS AND SOIL BLENDS' (1.2 dS/m B3. TYPICAL FILTER MEDIA PROFILE:
- CLAY \$ SILT <3% (<0.05 mm) VERY FINE SAND 5-30% (0.05-0.15 mm) FINE SAND 10-30% (0.15-0.25 mm) MEDIUM TO COARSE SAND 40-60% (0.25-1.0 mm) COARSE SAND 7-10% (1.0-2.0 mm)
- FINE GRAVEL (3% (2.0-3.4 mm) B4. DISPERSIBILITY TESTING ON THE FILTER MEDIA SHOULD BE CARRIED OUT WHERE IT IS SUSPECTED THAT THE SOIL MAY BE SUSCEPTIBLE TO STRUCTURAL COLLAPSE. IF IN DOUBT, THEN THIS TESTING SHOULD BE UNDERTAKEN.
- 2ND LAYER TRANSITION LAYER:
- CI. THE PURPOSE OF THE TRANSITION LAYER IS TO MINIMISE THE MIGRATION OF THE FILTER MEDIA INTO THE SUBMERGED ZONE AND/OR DRAINAGE LAYER.
- C2. THE TRANSITION LAYER MATERIAL SHALL BE A CLEAN, WELL-GRADED SAND MATERIAL CONTAINING <2% FINES.
- C3. THE PARTICLE SIZE DISTRIBUTION OF THE SAND SHOULD BE ASSESSED TO ENSURE IT MEETS 'BRIDGING CRITERIA', THAT IS, THE SMALLEST 15% OF THE SAND PARTICLES BRIDGE WITH THE LARGEST 15% OF THE FILTER MEDIA PARTICLES

- <u> 3RD LAYER SUBMERGED ZONE (WHERE DETAILED):</u>
- DI. THE SUBMERGED ZONE IS RESPONSIBLE FOR SUPPORTING THE PLANT AND MICROBIAL COMMUNITY DURING DRY WEATHER AS WELL AS FOR ENHANCED NITROGEN REMOVAL.
- D2. THE SUBMERGED ZONE SHOULD BE COMPRISED OF A MIX OF MEDIUM-TO-COARSE SAND AND CARBON OR A MIX OF FINE GRAVEL AND CARBON. THE CARBON SOURCE SHOULD BE A MIX OF 5% MULCH AND 5% HARDWOOD CHIPS (APPROXIMATELY 6 MM GRADING), BY VOLUME.
- 4TH LAYER DRAINAGE LAYER:
- EI. THE DRAINAGE LAYER CONTAINS THE SLOTTED PIPE UNDERDRAIN AND IS DESIGNED TO COLLECT TREATED STORMWATER FROM THE LAYERS ABOVE WHILST PROTECTING THE UNDERDRAIN FROM BLOCKAGES.
- E2. THE DRAINAGE LAYER MATERIAL IS TO BE A CLEAN, FINE GRAVEL SUCH AS 2-5 mm WASHED BLUE METAL. BRIDGING CRITERIA SHOULD BE APPLIED TO AVOID MIGRATION OF THE SUBMERGED ZONE INTO THE DRAINAGE LAYER (SEE TRANSITION LAYER FOR BRIDGING CRITERIA). <u>UNDERDRAIN:</u>
- FI. THE UNDERDRAIN SHOULD BE INSTALLED AT THE BASE OF THE DRAINAGE LAYER (WITH AT LEAST 50MM COVER) AND IS DESIGNED TO CONVEY TREATED STORMWATER INTO THE OUTLET PIT.
- F2. THE UNDERDRAIN SHOULD BE A 100mm uPVC SLOTTED PIPE WITHOUT ANY GEOFABRIC COVERING. AGG DRAINAGE LINES SHOULD NOT BE USED AS THE RIBS FILL WITH SEDIMENT AND ARE HARDER TO FLUSH-OUT.
- F3. A SERIES OF 45' BENDS RATHER THAN 90' BENDS SHOULD BE USED TO FACILITATE SYSTEM MAINTENANCE AND EFFECTIVE FLUSH-OUT.
- F4. UNDERDRAINS SHOULD CONTAIN ENOUGH SLOTS SO AS TO ADEQUATELY CONVEY THE TREATED FLOW WITHOUT BECOMING A CHOKE ON THE SYSTEM.
- F5. WHERE THE BASIN IS MORE THAN 2m WIDE AND ADDITIONAL UNDERDRAINS ARE SPECIFIED, THEY SHOULD NOT BE SPACED FURTHER THAN 1.5m APART. VEGETATION:
- GI. PROPERLY CHOSEN PLANTS ARE CRUCIAL FOR BOTH REMOVAL OF NUTRIENTS AND THE MAINTENANCE OF HYDRAULIC CONDUCTIVITY (Ks) HOWEVER, THE PLANTS ARE THE MOST SENSITIVE COMPONENT OF THE SYSTEM AND ADEQUATE CARE IS REQUIRED TO ENSURE LONG TERM SURVIVAL.
- G2. ANY PLANTS CHOSEN SHOULD BE ASSESSED AS HAVING THE FOLLOWING CHARACTERISTICS:
 - HIGH RELATIVE GROWTH RATE
 - HIGH TOTAL ROOT, LEAF \$ SHOOT BIOMASS
 - HIGH ROOT DENSITY
 - HIGH ROOT: SHOOT RATIO
 - HIGH LENGTH OF LONGEST ROOT
- HIGH LEAF AREA RATIO
- G3. RECOMMENDED PLANTS FOR NUTRIENT REMOVAL ARE: - CAREX APPRESSA
- MELALEUCA ERICIFOLIA (GOOD FOR MAINTAINING HIGH INFILTRATION
- RATES)
- GOODENIA OVATA - FICINIA NODOSA
- JUNCUS AMABILIS

WEED INVASION.

- JUNCUS FLAVIDUS G4. THE OVERALL PLANTING DENSITY SHOULD BE AT LEAST 10 PLANTS/m2 TO INCREASE ROOT DENSITY, PROTECT SURFACE POROSITY, PROMOTE EVEN DISTRIBUTION OF FLOWS, INCREASE EVAPOTRANSPIRATION LOSSES, AND REDUCE THE POTENTIAL FOR
- G5. MULCH IS NOT RECOMMENDED FOR BIOFILTRATION BASINS A HIGHER PLANTING DENSITY SHOULD BE USED IN LIEU OF MULCH. HOWEVER IF DEEMED NECESSARY, A GRAVEL MULCH MAY BE USED WHERE THERE IS CONCERN TO PROTECT THE SOIL FROM EROSION OR DECREASE THE PHYSICAL DROP TO THE PONDING ZONE (FOR SAFETY REASONS) WHILST MAINTAINING THE PONDING VOLUME. ORGANIC MULCH SHOULD NOT BE USED DUE TO HIGH RISK OF MOBILISATION AND CLOGGING OF

BIOFILTRATION BASIN (RAINGARDEN) NOTES

PART 2: SYSTEM MAINTENANCE **GENERAL:**

- HI. THE INSTALLED BIOFILTRATION BASIN (RAINGARDEN) IS DESIGNED TO TREAT STORMWATER FLOWS AND IMPROVE STORMWATER QUALITY BEFORE IT ENTERS THE DOWNSTREAM SYSTEM. A PROPERLY FUNCTIONING SYSTEM, WHICH INCLUDES ANY UPSTREAM PITS AND TANKS IS ABLE TO EFFECTIVELY TREAT STORMWATER FROM GROSS POLLUTANTS (E.G. RUBBISH), SUSPENDED SOLIDS (E.G. SILTS), TOTAL NITROGEN, TOTAL PHOSPHORUS AND HEAVY METALS. PROPER CONSTRUCTION AND REGULAR MAINTENANCE WILL HELP ENSURE THE SYSTEM EFFECTIVELY TREATS STORMWATER BEFORE IT ENTERS LOCAL WATER BODIES.
- FILTER MEDIA TASKS: H2. SEDIMENT DEPOSITION: REMOVE SEDIMENT BUILD UP FROM FOREBAYS AND OTHER PRE-TREATMENT MEASURES IN BIOFILTRATION SYSTEMS AND FROM THE SURFACE OF BIOFILTRATION VEGETATION.
- FREQUENCY 3 MONTHLY, AFTER RAIN H3. HOLES OR SCOUR: INFILL ANY HOLES IN THE FILTER MEDIA. CHECK FOR EROSION OR SCOUR AND REPAIR. PROVIDE ADDITIONAL ENERGY DISSIPATION (E.G. ROCKS AND PEBBLES AT INLET) IF NECESSARY. - FREQUENCY - 3 MONTHLY, AFTER RAIN
- H4. FILTER MEDIA SURFACE POROSITY: INSPECT FOR THE ACCUMULATION OF AN IMPERMEABLE LAYER (SUCH AS OILY OR CLAYEY SEDIMENT) THAT MAY HAVE FORMED ON THE SURFACE OF THE FILTER MEDIA. A SYMPTOM MAY BE THAT WATER REMAINS PONDED IN THE BIOFILTRATION SYSTEM FOR MORE THAN A FEW HOURS AFTER A RAIN EVENT. REPAIR MINOR ACCUMULATIONS BY RAKING AWAY ANY MULCH ON THE SURFACE AND SCARIFYING THE SURFACE OF THE FILTER MEDIA BETWEEN PLANTS. REMOVE ANY ACCUMULATION OF LEAF LITTER TO HELP MAINTAIN THE SURFACE POROSITY OF THE FILTER
- FREQUENCY 3 MONTHLY, AFTER RAIN H5. LITTER CONTROL: CHECK FOR LITTER (INCLUDING ORGANIC LITTER) IN AND AROUND TREATMENT AREAS. REMOVE BOTH ORGANIC AND ANTHROPOGENIC LITTER TO ENSURE FLOW PATHS AND INFILTRATION THROUGH THE FILTER MEDIA ARE NOT HINDERED.
- FREQUENCY 3 MONTHLY OR AS DESIRED FOR AESTHETICS HORTICULTURAL TASKS:
- H6. PESTS AND DISEASES: ASSESS PLANTS FOR DISEASE, PEST INFECTION, STUNTED GROWTH OR SENESCENT PLANTS. TREAT OR REPLACE AS NECESSARY. REDUCED PLANT DENSITY REDUCES POLLUTANT REMOVAL AND INFILTRATION PERFORMANCE AND ALLOWS WEEDS TO TAKE HOLD.
- FREQUENCY 3 MONTHLY OR AS DESIRED FOR AESTHETICS HT. MAINTAIN ORIGINAL PLANT DENSITIES: INFILL PLANTING - A MINIMUM 8-10 PLANTS PER SQUARE METRE SHOULD BE ADEQUATE (DEPENDING ON SPECIES) TO MAINTAIN A DENSITY WHERE THE PLANTS' ROOTS TOUCH EACH OTHER. PLANTING SHOULD BE EVENLY SPACED TO HELP PREVENT SCOURING DUE TO A CONCENTRATION OF FLOW. - FREQUENCY - 3 MONTHLY OR AS DESIRED FOR AESTHETICS
- H8. WEEDS: IT IS IMPORTANT TO IDENTIFY THE PRESENCE OF ANY RAPIDLY SPREADING WEEDS AS THEY OCCUR. THE PRESENCE OF SUCH WEEDS CAN REDUCE DOMINANT SPECIES DISTRIBUTIONS AND DIMINISH AESTHETICS. WEED SPECIES CAN ALSO COMPROMISE THE SYSTEMS LONG-TERM PERFORMANCE. INSPECT FOR AND MANUALLY REMOVE WEED SPECIES. APPLICATION OF HERBICIDE SHOULD BE LIMITED TO A WAND OR RESTRICTIVE SPOT SPRAYING DUE TO THE FACT THAT RAINGARDENS AND BIOFILTRATION TREE PITS ARE DIRECTLY CONNECTED TO THE STORMWATER SYSTEM. - FREQUENCY - 3 MONTHLY OR AS DESIRED FOR AESTHETICS

DRAINAGE TASKS

- H9. UNDERDRAIN: ENSURE THAT UNDERDRAIN PIPES ARE NOT BLOCKED TO PREVENT FILTER MEDIA AND PLANTS FROM BECOMING WATERLOGGED. IF A SUBMERGED ZONE IS INCLUDED, CHECK THAT THE WATER LEVEL IS AT THE DESIGN LEVEL, NOTING THAT DRAWDOWN DURING DRY PERIODS IS EXPECTED. A SMALL STEADY CLEAR FLOW OF WATER MAY BE OBSERVED DISCHARGING FROM THE UNDERDRAIN AT ITS CONNECTION INTO THE DOWNSTREAM PIT SOME HOURS AFTER RAINFALL. NOTE THAT SMALLER RAINFALL EVENTS AFTER DRY WEATHER MAY BE COMPLETELY ABSORBED BY THE FILTER MEDIA AND NOT RESULT IN FLOW.
- FREQUENCY 6 MONTHLY AND AFTER HEAVY RAINFALL HIO. HIGH FLOW INLET PITS, OVERFLOW PITS AND OTHER STORMWATER JUNCTION PITS: ENSURE INFLOW AREAS AND GRATES OVER PITS ARE CLEAR OF LITTER AND DEBRIS AND IN GOOD AND SAFE CONDITION. A BLOCKED GRATE MAY CAUSE NUISANCE FLOODING. REMOVE SEDIMENT FROM PITS AND INLET ZONE(S), ETC.
 - FREQUENCY MONTHLY AND OCCASIONALLY AFTER RAIN OTHER ROUTINE TASKS
- HII. INSPECTION AFTER RAINFALL: OCCASIONALLY OBSERVE BIOFILTRATION SYSTEM AFTER A RAINFALL EVENT TO CHECK INFILTRATION, IDENTIFY SIGNS OF POOR DRAINAGE (EXTENDED PONDING ON THE FILTER MEDIA SURFACE). IF POOR DRAINAGE IS IDENTIFIED, CHECK LAND USE AND ASSESS WHETHER IT HAS ALTERED FROM DESIGN CAPACITY (E.G. UNUSUALLY HIGH SEDIMENT LOADS MAY REQUIRE INSTALLATION OF A SEDIMENT FOREBAY)

- FREQUENCY - TWICE A YEAR AFTER RAIN

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Consulting Engineers

STRUCTURAL • CIVIL • STORMWATER • REMEDIAL

Architect: A.C.N. 076 121 616 A.B.N. 24 076 121 616 Client:

RICHARD SMITH ARCHITECT

HAPPY HEARTS AVALON PTY LTD

ALTERATIONS & ADDITIONS 9 NORTH AVALON ROAD, AVALON BEACH

DETAILS AND SECTIONS SHEET 2

Drawing Title: STORMWATER DRAINAGE

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