

NOT FOR CONSTRUCTION

LOT 1 & 2 DP 585621

24-26 RAYNER ROAD, WHALE BEACH

PROPOSED RESIDENTIAL DWELLING

CIVIL ENGINEERING PLANS - D.A. STAGE

GENERAL SPECIFICATION

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH OTHER SUCH WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
2. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES, UNO (UNLESS NOTED OTHERWISE).
3. NO DIMENSION SHALL BE OBTAINED BY SCALING THE DRAWINGS.
4. ALL LEVELS AND SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORK.
5. DURING EXCAVATION WORK THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED.
6. DETAIL SURVEY DATA WAS OBTAINED FROM RYGATE SURVEYORS, DRAWING DATED 22/01/2016.
7. ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS, THE SPECIFICATIONS AND COUNCIL REQUIREMENTS.
8. EXISTING SERVICES WHERE SHOWN HAVE BEEN PLOTTED FROM SUPPLIED DATA AND SUCH THEIR ACCURACY CAN NOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK.
9. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACK FILLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NORTHERN BEACHES COUNCIL. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
10. ON COMPLETION OF STORMWATER INSTALLATION, ALL DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL CONDITION, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS AND ROAD PAVEMENTS, UNLESS DIRECTED OTHERWISE.

STORMWATER DRAINAGE

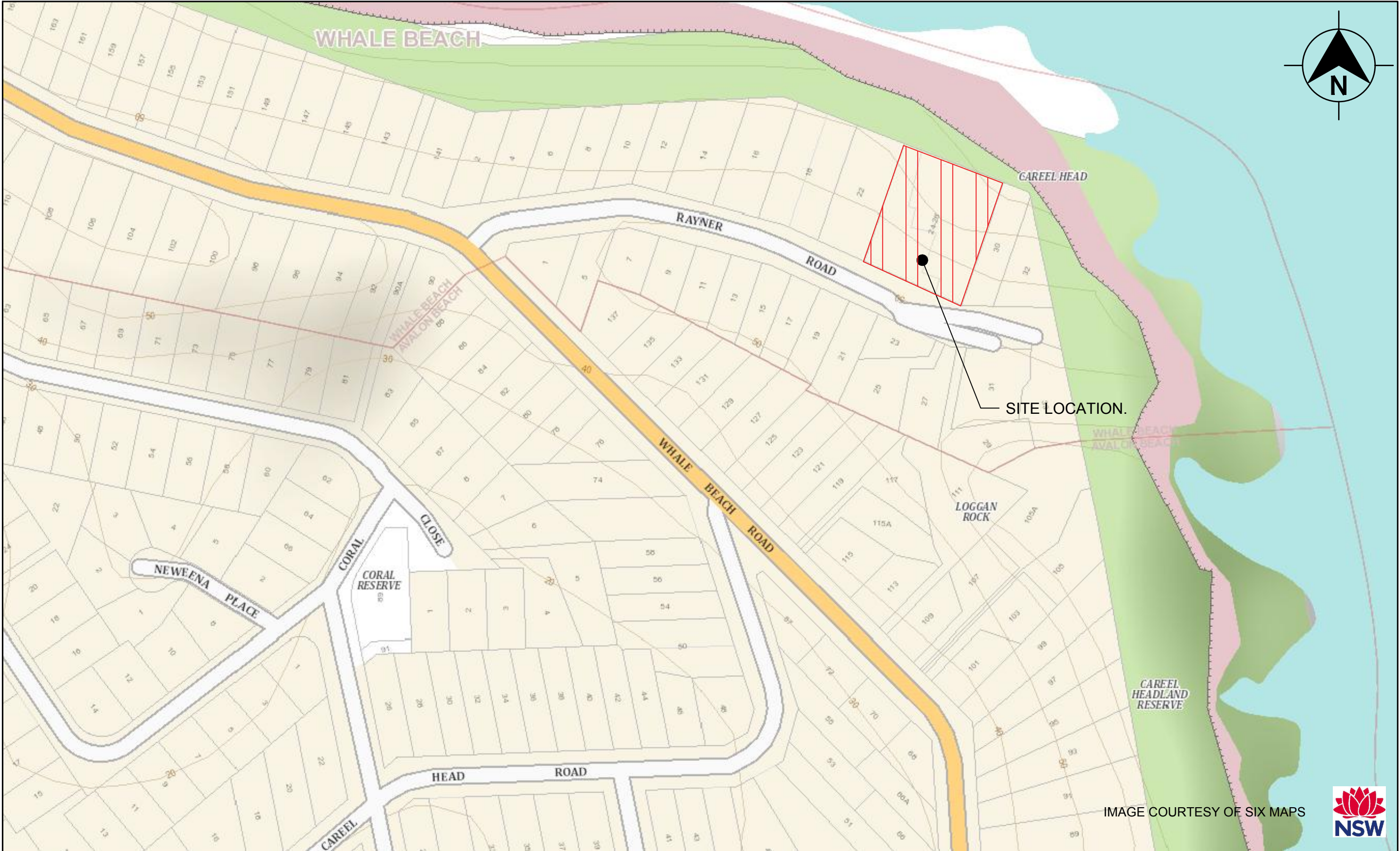
1. PIPES GREATER THAN OR EQUAL TO Ø300mm ARE TO BE MINIMUM CLASS 2 RUBBER-RING JOINTED RCP (UNO).
2. ALL PIPES ARE TO BE LAID AT (min) 1.0% GRADE (UNO).
3. COVERS AND GRATES SHALL COMPLY WITH RELEVANT AUSTRALIAN AND COUNCIL STANDARDS.
4. UNLESS DETAILED OR SPECIFIED OTHERWISE COVERS AND GRATES TO BE CLASS "C" IN VEHICULAR PAVEMENTS AND CLASS "B" ELSEWHERE.
5. ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT PIPE PENETRATIONS SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
6. U.N.O. MATERIAL USED FOR BEDDING OF PIPES SHALL BE APPROVED NON-COHESIVE GRANULAR MATERIAL HAVING HIGH PERMEABILITY AND HIGH STABILITY WHEN SATURATED AND FREE OF ORGANIC AND CLAY MATERIAL.
7. BEDDING SHALL BE (UNO) TYPE HS2 UNDER ROADS; H2 GENERAL AREAS, IN ACCORDANCE WITH CURRENT RELEVANT INDUSTRY STANDARDS AND GUIDELINES.
8. NOTE THAT THE PIT COVER LEVEL NOMINATED IN GUTTERS ARE TO THE INVERT OF THE GUTTER WHICH ARE 40mm LOWER THAN THE PAVEMENT LEVEL AT LIP OF GUTTER.
9. Ø100mm SUB-SOIL DRAINAGE LINES WITH NON-WOVEN GEOTEXTILE SOCK SURROUND SHALL BE CONNECTED TO A STORMWATER DRAINAGE PIT (AT min. 1% LONGITUDINAL GRADE) AND PROVIDED IN THE FOLLOWING LOCATION:
 - A) THE HIGH SIDE OF PROPOSED TRAFFICKED AND CARPARK PAVEMENT AREAS.
 - B) ALL PLANTER AND TREE BEDS PROPOSED ADJACENT TO PAVEMENT AREAS.
 - C) BEHIND RETAINING WALLS (IN ACCORDANCE WITH DRAWINGS)
 - D) ALL OTHER AREAS SHOWN ON THE DRAWINGS.
10. WHERE SUBSOIL DRAINAGE LINES PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS SEALED UPVC SEWER GRADE PIPE SHALL BE USED.

RAINWATER TANK NOTES

1. RAINWATER STORAGE TO BE PROVIDED TO SUPPLY WATER FOR TOILET FLUSHING, LAUNDRY AND IRRIGATION PURPOSES ONLY.
2. PRESSURE PUMP/TAP TO BE PROVIDED FOR USE OF CAPTURED TANK WATER.
3. A PERMANENT SIGN IS TO BE LOCATED AT ANY TAP SUPPLIED BY RAINWATER STATING THAT THE WATER IS "RAINWATER" AND IN THE VICINITY OF THE TANK STATING THE WATER IS NOT FOR POTABLE USE.
4. ALL RAINWATER SERVICES SHALL BE CLEARLY LABELLED "NON POTABLE WATER" WITH APPROPRIATE HAZARD IDENTIFICATION.
5. PIPEWORK USED FOR RAINWATER SERVICES SHALL BE COLOURED LILAC IN ACCORDANCE WITH AS1345.
6. ALL VALVES AND APERTURES SHALL BE CLEARLY AND PERMANENTLY LABELLED WITH SAFETY SIGNS TO COMPLY WITH AS1319.
7. RAINWATER TANK RETICULATION SYSTEM AND MAINS TOP ARRANGEMENT TO BE INSTALLED IN ACCORDANCE WITH AS/NZS 3500.1.2-2003 AND THE NSW CODE OF PRACTICE: PLUMBING AND DRAINING.

HYDROLOGY

1. DESIGN INTENSITY-FREQUENCY-DURATION (IFD) RAINFALL HAS BEEN DERIVED IN ACCORDANCE WITH ARR 2019.



SITE LOCALITY PLAN

ALL DESIGN MEASURES SHOWN ON THESE DRAWINGS HAVE BEEN PREPARED FOR DEVELOPMENT APPLICATION PURPOSES TO DEMONSTRATE FEASIBILITY. ALL DESIGN MEASURES WILL BE SUBJECT TO DETAIL DESIGN AT THE CONSTRUCTION CERTIFICATE STAGE AND MAY BE SUBJECT TO VARIATION PROVIDED THAT THE DESIGN INTENT IS MAINTAINED.

CAD File Name: N:\(B) Projects\20XXX\20049 24-26 Rayner Road, Whale Beach\E) Drawings\20049_DAO1_Cover Sheet and Specification Notes.dwg

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01	C.N.	C.D.	E.B.		21/08/20	ISSUED FOR CO-ORDINATION
02	C.N.	C.B.	E.B.	C.N.	31/08/20	ISSUED FOR DEVELOPMENT APPLICATION APPROVAL
03	C.N.	C.B.	E.B.	C.N.	16/10/20	ISSUED FOR DEVELOPMENT APPLICATION APPROVAL

SCALE

N/A

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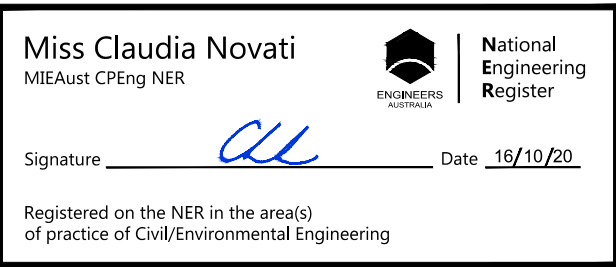
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PROJECT

24-26 RAYNER ROAD, WHALE BEACH

DRAWING TITLE

COVER SHEET AND SPECIFICATION NOTES

PROJECT No.

20049

SUB-PROJECT No.

01

DRAWING No.

DA01

ISSUE

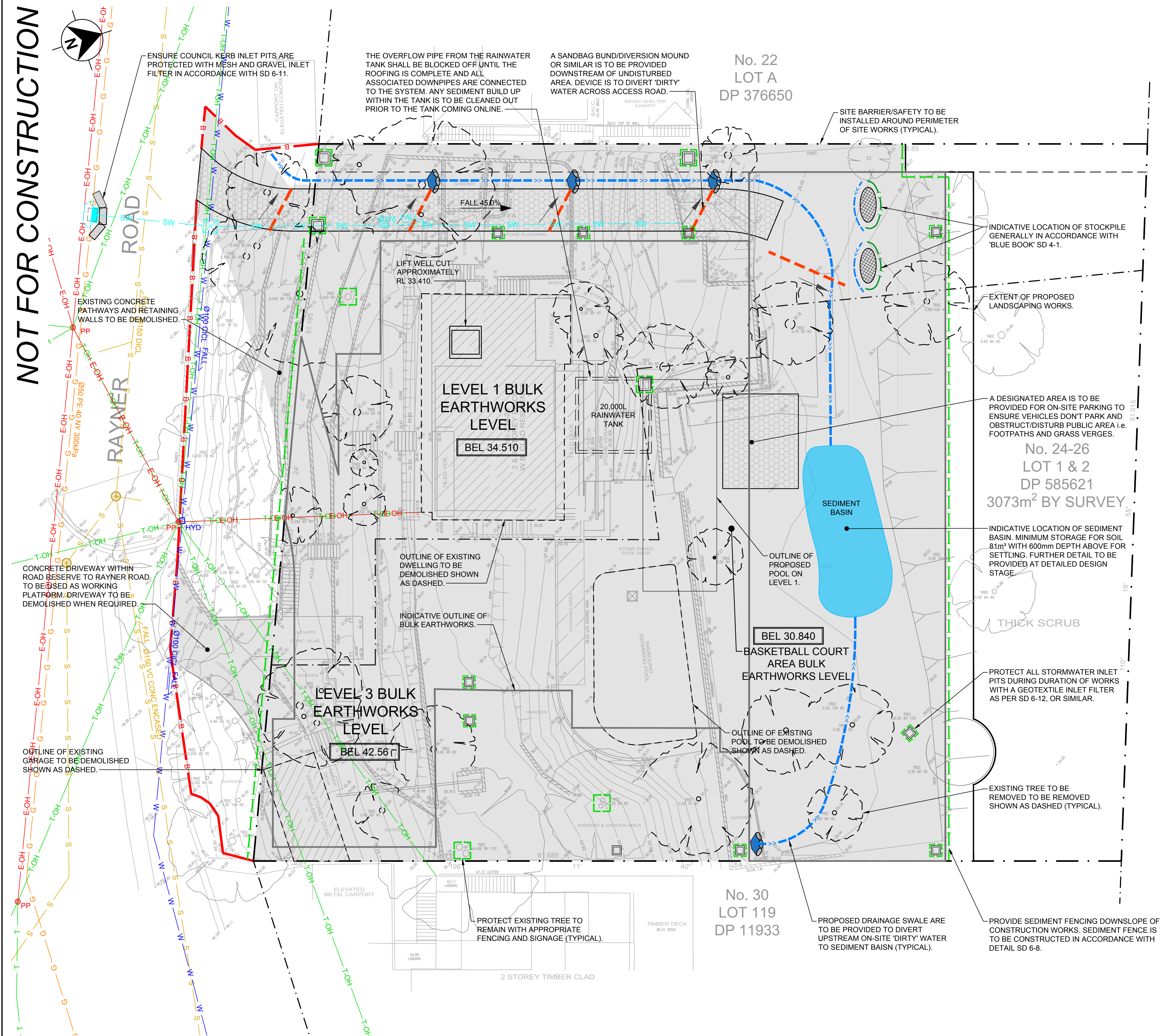
03

SHEET

A1

DRAWING SHEET 01 OF 04

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EROSION AND SEDIMENT CONTROL NOTES

- TOTAL AREA OF DISTURBANCE TO BE KEPT TO A MINIMUM. 'NO-GO' AREAS FOR WORKERS ARE TO BE SET OUT TO ENSURE DISTURBED AREAS ARE KEPT AT A MINIMUM.
- SITE WORKS WILL NOT START UNTIL THE EROSION AND SEDIMENT CONTROL WORKS OUTLINED IN CLAUSES 2 TO 4 BELOW, ARE INSTALLED AND FUNCTIONAL.
- THE INGRESS TO AND EGRESS FROM THE SITE WILL BE CONFINED TO ONE STABILISED POINT. SEDIMENT OR BARRIER FENCING WILL BE USED TO RESTRICT ALL VEHICULAR MOVEMENTS TO THAT POINT. STABILISATION WILL BE ACHIEVED BY EITHER:
 - CONSTRUCTING A SEALED (e.g. CONCRETE OR ASPHALT) DRIVEWAY TO THE STREET; OR
 - CONSTRUCTING A STABILISED SITE ACCESS, ACCORDING TO STANDARD DRAWING SD 6-14 OR OTHER SUITABLE TECHNIQUE APPROVED BY THE COUNCIL.
- SEDIMENT (SD 6-8) AND BARRIER FENCES TO BE INSTALLED.
- MESH AND GRAVEL 'SAUSAGE' PROTECTION (SD 6-11) TO BE PROVIDED TO PROTECT GUTTER INLETS NEAR THE ALLOTMENT.
- TOPSOIL TO BE STRIPPED AND STOCKPILED (SD 4-1) FOR LATER USE IN LANDSCAPING THE SITE.
- ALL STOCKPILES TO BE PLACED IN THE LOCATION SHOWN ON THE SWMP AND AT LEAST 2 METRES CLEAR OF ALL AREAS OF POSSIBLE AREAS OF CONCENTRATED WATER FLOW, INCLUDING DRIVEWAYS.
- LANDS TO THE REAR AND SIDES OF THE ALLOTMENT AND ON THE FOOTPATH WILL NOT BE DISTURBED DURING WORKS EXCEPT WHERE ESSENTIALS, e.g. DRAINAGE WORKS ACROSS THE FOOTPATH, WHERE WORKS ARE NECESSARY, THEY WILL BE UNDERTAKEN IN SUCH A WAY TO LEAVE THE LANDS IN A CONDITION OF HIGH EROSION HAZARDS FOR AS SHORT A PERIOD AS PRACTICABLE. THEY WILL BE REHABILITATED AS SOON AS POSSIBLE. STOCKPILES WILL NOT BE PLACED ON THESE LANDS AND THEY WILL NOT BE USED AS VEHICLE PARKING AREAS.
- ALL PIPE TRENCHES TO BE BACKFILLED AS QUICKLY AS POSSIBLE. IF TRENCH IS TO REMAIN OPEN WHILE SITE IS UNATTENDED/AFTER THE END OF A SHIFT, CONTRACTOR IS TO ENSURE THAT THE TRENCH IS APPROPRIATELY COVERED TO NOT ALLOW THE INGRESS OF WATER.
- APPROVED BINS FOR BUILDING WASTE, CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS AND LITTER WILL BE PROVIDED AND ARRANGEMENTS MADE FOR REGULAR COLLECTION AND DISPOSAL.
- TOPSOIL WILL BE RE-SPREAD AND ALL DISTURBED AREAS TO BE REHABILITATED WITHIN 20 WORKING DAYS OF THE COMPLETION OF WORKS.
- COUNCIL'S PERMISSION WILL BE SOUGHT IF ANY MATERIALS NEED TO BE PLACED ON FOOTPATHS OR NATURE STRIPS. SUCH MATERIALS WILL BE PLACED ON PLASTIC AND COVERED.

LEGEND

- E-OH ELECTRICAL - OVERHEAD
- T-OH TELSTRA - OVERHEAD
- SEDIMENT FENCE (SD 6-8)
- STABILISED SITE ACCESS (SD 6-14)
- DISTURBED AREA
- SANDBAG/GRAVEL BUND
- WATER DIVERSION MOUND/BUND (SD 5-5)
- STOCKPILE (SD 4-1)
- MESH AND GRAVEL INLET FILTER (SD 6-11)
- PIT PROTECTION (SD 6-12)
- DIRECTION/SLOPE OF 'ON-SITE' OVERLAND FLOW
- CHECK DAM (SD 5-4)
- EXISTING CONTOUR
- PROPOSED STORMWATER PIPE
- EXISTING STORMWATER PIPE
- EXISTING TREE TO BE REMOVED
- PROPERTY BOUNDARY
- ADJACENT PROPERTY BOUNDARY
- DRAINAGE EASEMENT

NOTE:
1. STANDARD DRAWINGS (SD) ARE TO BE PROVIDED AS PER THE "BLUE BOOK" MANAGING URBAN STORMWATER (LANDCOM, 2004). FURTHER DETAIL IS TO BE PROVIDED AT CONSTRUCTION STAGE.

TABLE '1' - ESCP SITE CHARACTERISTICS

	VALUES	NOTES
DISTURBED SITE AREA	0.254 ha	
SOIL TEXTURE GROUP	TYPE C	TABLE C22, APPENDIX C
RAINFALL EROSIVITY (R)	3800	MAP 10, APPENDIX B
SOIL ERODIBILITY (K)	0.034	TABLE C22, APPENDIX C
LENGTH	39m	
GRADIENT	33%	
LENGTH/GRADIENT (LS)	7.19	
P-FACTOR	1.30	SURFACE ASSUMED TO BE COMPACTED AND SMOOTH
C-FACTOR	1	SURFACE ASSUMED TO BE STRIPPED
SOIL LOSS (A)	1208 t/ha/yr	
SITE SPECIFIC SOIL LOSS	236 m3/yr	
SOIL LOSS CLASS	6	TABLE 4.2, SECTION 4.4.2
POTENTIAL EROSION HAZARD	VERY HIGH	TABLE 4.2, SECTION 4.4.2

THE "BLUE BOOK" REQUIRES THE INSTALLATION OF A SEDIMENT BASIN IF THE SOIL LOSS > 200 tonnes/yr FROM THE SITE. THEREFORE A SEDIMENT BASIN WILL BE REQUIRED. FURTHER DETAIL TO BE PROVIDED AT DETAILED DESIGN STAGE.
RUSLE: A = SOIL LOSS (tonnes/ha/yr) = R.K.LS.P.C.
THE AVERAGE ANNUAL SOIL LOSS CALCULATION (A) IS UNDERTAKEN USING THE "BLUE BOOK" - MANAGING URBAN STORMWATER (LANDCOM, 2004)

WARNING: UTILITY INFORMATION SHOWN ON THIS PLAN DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF WORKS. CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES CONTRACTOR IS TO NOTIFY THE DESIGN ENGINEER IF A CLASH WITH ANY EXISTING UTILITIES OCCURS ON SITE.

Miss Claudia Novati
MIEAust CPEng NER
Signature: Date: 16/10/20
Registered on the NER in the area(s) of practice of Civil/Environmental Engineering

National Engineering Register
REGISTERED ENGINEER
REGISTERED ENGINEER

CAD File Name: N:\(B) Projects\20XX\20049 24-26 Rayner Road, Whale Beach(E) Drawings\20049_DA02_Concept Soil and Water Management Plan.dwg

DESIGN	DRAWN	CHECKED	VERIFIED	DATE	AMENDMENTS/REVISION DETAILS
01	E.B.	C.B.	C.N.	21/08/20	ISSUED FOR CO-ORDINATION
02	E.B.	C.B.	C.N.	31/08/20	ISSUED FOR DEVELOPMENT APPLICATION APPROVAL
03	E.B.	C.B.	C.N.	16/10/20	ISSUED FOR DEVELOPMENT APPLICATION APPROVAL

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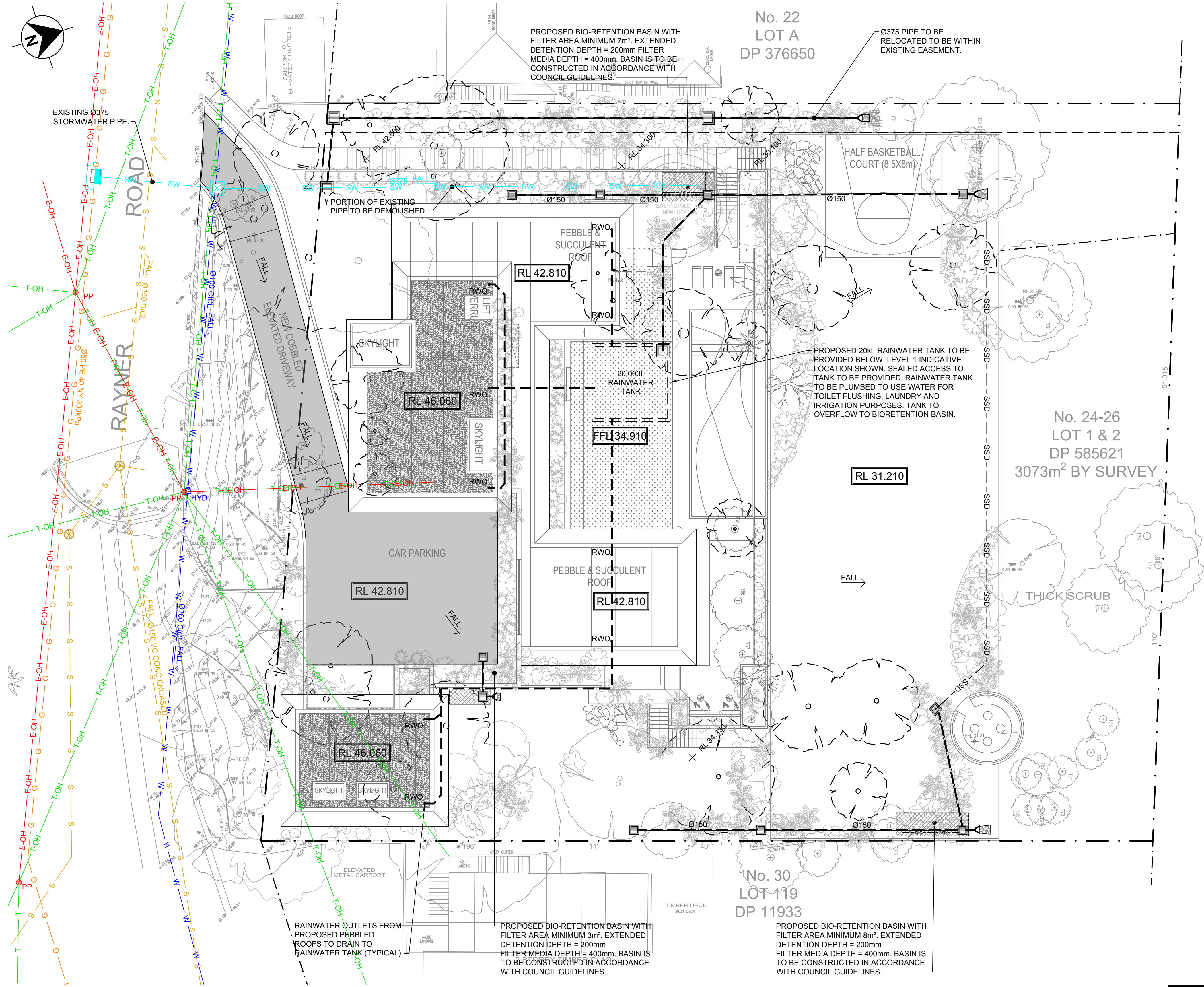
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PROJECT 24-26 RAYNER ROAD, WHALE BEACH				
DRAWING TITLE CONCEPT SOIL AND WATER MANAGEMENT AND TREE REMOVAL PLAN				
PROJECT No.	SUB-PROJECT No.	DRAWING No.	ISSUE	SHEET SIZE
20049	01	DA02	03	A1

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LEGEND

- × RL 100.000 PROPOSED REDUCED LEVEL
- FALL → GENERAL SURFACE FALL
- FFL FINISHED FLOOR LEVEL
- RWO PROPOSED RAINWATER OUTLET
- PROPOSED STORMWATER PIT
- EXISTING STORMWATER PIT
- EXISTING KERB INLET PIT
- PROPOSED HEADWALL
- SW EXISTING STORMWATER PIPE
- PROPOSED STORMWATER PIPE
- PROPOSED PIPE TO RAINWATER TANK
- SSD PROPOSED SUB-SOIL DRAINAGE
- EXTENT OF BIORETENTION BASIN
- EXTENT OF PROPOSED PAVEMENT AREA
- PROPERTY BOUNDARY
- ADJOINING PROPERTY BOUNDARY
- EASEMENT

DESIGN SUMMARY

- PROPOSED NEW RESIDENTIAL DEVELOPMENT
- A SUMMARY OF THE SITE CATCHMENT AREAS IS AS FOLLOWS:
 - TOTAL SITE AREA = 3073m²
 - PRE-DEVELOPMENT
 - IMPERVIOUS AREA = 605 m²
 - PERVIOUS AREA = 2469 m²
 - POST-DEVELOPMENT
 - IMPERVIOUS AREA = 1049 m²
 - PERVIOUS AREA = 2025 m²
- TOTAL INCREASE IN IMPERVIOUS AREA = 444m²
- 100% OF THE ROOF AREA FROM THE DWELLING IS TO DRAIN TO THE RAINWATER TANK.
- WATER FROM THE RAINWATER TANKS IS TO BE USED FOR TOILET FLUSHING AND IRRIGATION PURPOSES.

ALL STORMWATER MANAGEMENT MEASURES SHOWN ON THIS DRAWING HAVE BEEN PREPARED FOR THE DEVELOPMENT APPLICATION PURPOSES TO DEMONSTRATE FEASIBILITY. ALL MEASURES WILL BE SUBJECT TO DETAIL DESIGN AT THE CONSTRUCTION CERTIFICATE STAGE AND MAY BE SUBJECT TO VARIATION PROVIDED THAT THE DESIGN INTENT IS MAINTAINED.

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CAD File Name: N:\(B) Projects\20XXX\20049 24-26 Rayner Road, Whale Beach\E Drawings\20049_DA03_Concept Stormwater Drainage Plan.dwg

DESIGN	DRAWN	CHECKED	VERIFIED	DATE	AMENDMENTS/REVISION DETAILS
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02	C.N.	C.B.	E.B.	31/08/20	ISSUED FOR DEVELOPMENT APPLICATION APPROVAL
03	C.N.	C.B.	E.B.	16/10/20	ISSUED FOR DEVELOPMENT APPLICATION APPROVAL

SCALE
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SCALE: 1:150 (A1 SHEET)

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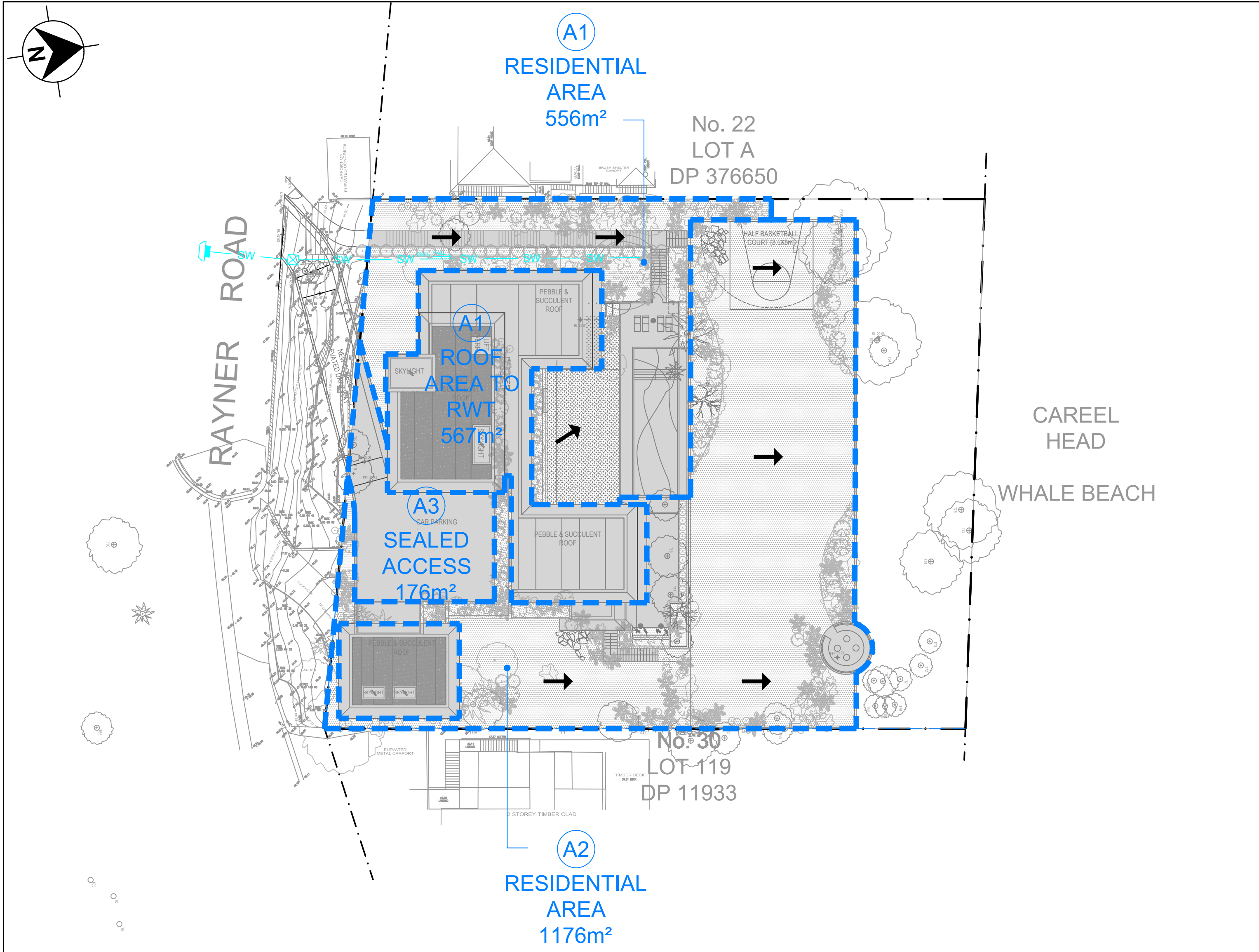


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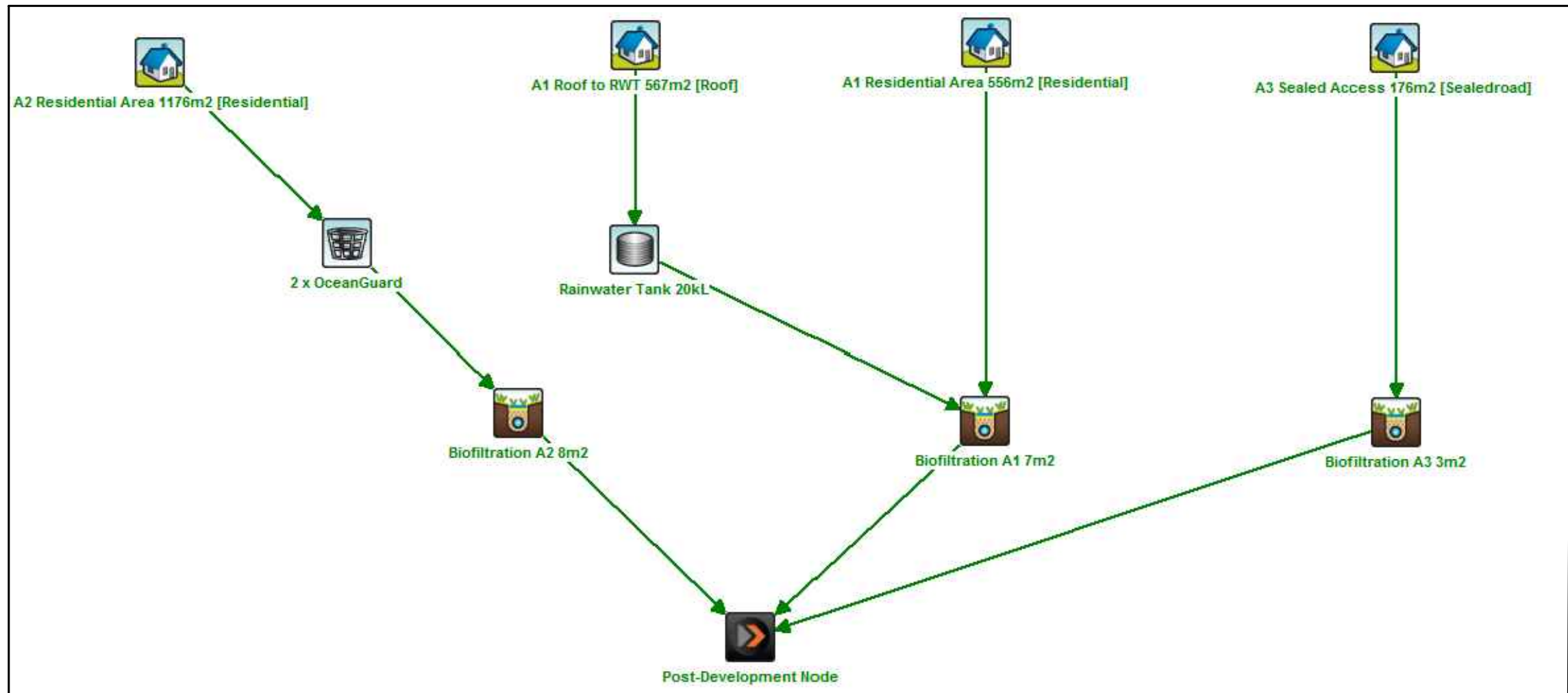
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PROJECT				
24-26 RAYNER ROAD, WHALE BEACH				
DRAWING TITLE				
CONCEPT STORMWATER DRAINAGE PLAN				
PROJECT No.	SUB-PROJECT No.	DRAWING No.	ISSUE	SHEET SIZE
20049	01	DA03	03	A1

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POST-DEVELOPMENT CATCHMENT PLAN



'MUSIC' MODEL DIAGRAM

NOTE:
1. MODELLING DIAGRAM FROM 'MUSIC' MODEL FILE 24-26 RAYNER ROAD, WHALE BEACH_MUSIC_RUN02.

CAD File Name: N:\(B) Projects\20XXX\20049 24-26 Rayner Road, Whale Beach\E Drawings\20049_DA04_Stormwater Quality and 'MUSIC' Model Plan.dwg

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03	C.B.	C.B.	C.N.	C.N.	16/10/20	ISSUED FOR DEVELOPMENT APPLICATION APPROVAL



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PROJECT					
24-26 RAYNER ROAD, WHALE BEACH					
DRAWING TITLE					
STORMWATER QUALITY AND 'MUSIC' MODEL PLAN					
PROJECT No.	SUB-PROJECT No.	DRAWING No.	ISSUE	SHEET SIZE	
20049	01	DA04	03	A1	

Land use/surface type	MUSIC Zoning/Surface type	Total area (ha)	Sub-catchment areas (ha) (Imp.)					
Post-development			A1		A2		A3	
Residential Area	Residential	0.174	0.056	31%	0.118	9%		
Roof area to RWT	Roofs	0.057	0.057	100%				
Sealed Access	Sealed roads	0.018					0.018	100%
Total		0.248	0.113		0.118		0.018	

TABLE '1' - SUMMARY OF SITE CATCHMENT AREAS

	Sandy loam
Soil storage capacity	98mm
Initial storage	25%
Field capacity	70mm
Infiltration capacity coefficient	250
Infiltration capacity exponent	1.3
Groundwater initial depth	10mm
Daily recharge rate	60%
Daily baseflow rate	45%
Daily deep seepage rate	0%

Notes:
Initial storage capacity =25% is specified by Water NSW
Groundwater initial depth = 10mm is specified by Water NSW
Root zone soil depth (0.5m)

TABLE '2' - SOIL PARAMETERS

Internal Use	
Rural/urban	Urban
No. of bedrooms	>3
Reuse Plumbed for	Laundry and Toilet
Daily internal use (L/person/day)	47
Residential Occupancy Rate (person/dwelling)	3.3
Total daily use (kL)	0.155

Outdoor Use	
Annual Irrigation (mm/yr)	548
Landscaped Area (m²)	2056
Landscaped Area Irrigated (m²)	1542
Total daily use (kL)	845

TABLE '3' - WATER DEMAND SUMMARY

Flow Type	Surface Type	TSS log ¹⁰ Values		TP log ¹⁰ Values		TN log ¹⁰ Values	
		Mean	St. Dev	Mean	St. Dev	Mean	St. Dev
Urban Residential							
Baseflow parameters	Roof	N/A	N/A	N/A	N/A	N/A	N/A
	Roads	1.00	0.34	-0.97	0.31	0.20	0.20
	Ground level	1.00	0.34	-0.97	0.31	0.20	0.20
Stormflow parameters	Roof	1.30	0.39	-0.89	0.31	0.26	0.23
	Roads	2.43	0.39	-0.30	0.31	0.26	0.23
	Ground level	2.18	0.39	-0.47	0.31	0.26	0.23

TABLE '4' - STORMFLOW POLLUTANTS*

* FROM MUSIC MODELLING GUIDELINES 2018 PUBLISHED BY 'WATER BY DESIGN' TABLE 3.9.

	Sources	Residual Load	% Reduction
Flow (ML/yr)	2.15	1.64	23.8
Total Suspended Solids (kg/yr)	271	40.7	85
Total Phosphorus (kg/yr)	0.643	0.169	73.8
Total Nitrogen (kg/yr)	4.38	1.74	60.4
Gross Pollutants (kg/yr)	41.4	0	100

TABLE '5' - TREATMENT TRAIN EFFECTIVENESS

NOTE:
1. AS PER COUNCIL REQUIREMENTS, MINIMUM PERCENTAGE IS TSS = 85%, TP = 65% AND TN = 45%.

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Registered on the NER in the area(s) of practice of Civil/Environmental Engineering

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DRAWING SHEET 04 OF 04