PROPOSED MANUFACTURED HOUSING ESTATE
'CLIFTON YAMBA'

110 & 120 CARRS DRIVE, YAMBA NSW 2464
CLARENCE VALLEY COUNCIL
LOT 2 DP733507 & LOT 32 DP1280863
DEVELOPMENT APPLICATION - CIVIL DRAWINGS
ROADWORKS, EARTHWORKS, DRAINAGE & SERVICES

SCHEDULE OF DRAWINGS:

GENERAL DRAWINGS
D01 COVER SHEET
D02 SITE PLAN

ROADWORKS DRAWINGS
D03 ROADWORKS & DRAINAGE PLAN
D04 ROAD TYPICAL DETAIL
D05 ROAD TYPICAL SECTIONS - SHEET 1
D06 ROAD TYPICAL SECTION - SHEET 2
D07 ROAD LONGITUDINAL SECTIONS - SHEET 1
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D09 ROAD LONGITUDINAL SECTIONS - SHEET 3
D10 ROAD LONGITUDINAL SECTIONS - SHEET 4
D11 ROAD LONGITUDINAL SECTIONS - SHEET 5
D12 ROAD LONGITUDINAL SECTIONS - SHEET 6
D13 INTERSECTION DETAIL PLAN - ROAD 1 & CARRS DRIVE

EARTHWORKS DRAWINGS
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STORMWATER DRAWINGS
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D19 STORMWATER LONGITUDINAL SECTION - SHEET 2
D20 STORMWATER LONGITUDINAL SECTION - SHEET 3
D21 STORMWATER LONGITUDINAL SECTION - SHEET 4
D22 STORMWATER LONGITUDINAL SECTION - SHEET 5
D23 STORMWATER LONGITUDINAL SECTION - SHEET 6
D24 STORMWATER LONGITUDINAL SECTION - SHEET 7
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D34 STORMWATER MANAGEMENT PLAN - SHEET 1
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SEWER AND WATER RETICULATION DRAWINGS
D39 SEWER AND WATER RETICULATION PLAN
D40 SEWER AND WATER RETICULATION DETAIL

EROSION & SEDIMENTATION CONTROL DRAWINGS
D41 EROSION SEDIMENTATION PLAN
D42 EROSION SEDIMENTATION DETAIL

TYPICAL SERVICES LAYOUT DRAWING
D43 TYPICAL SERVICES LAYOUT DETAILS

CLIFTON YAMBA



LOCALITY PLAN
N.T.S.

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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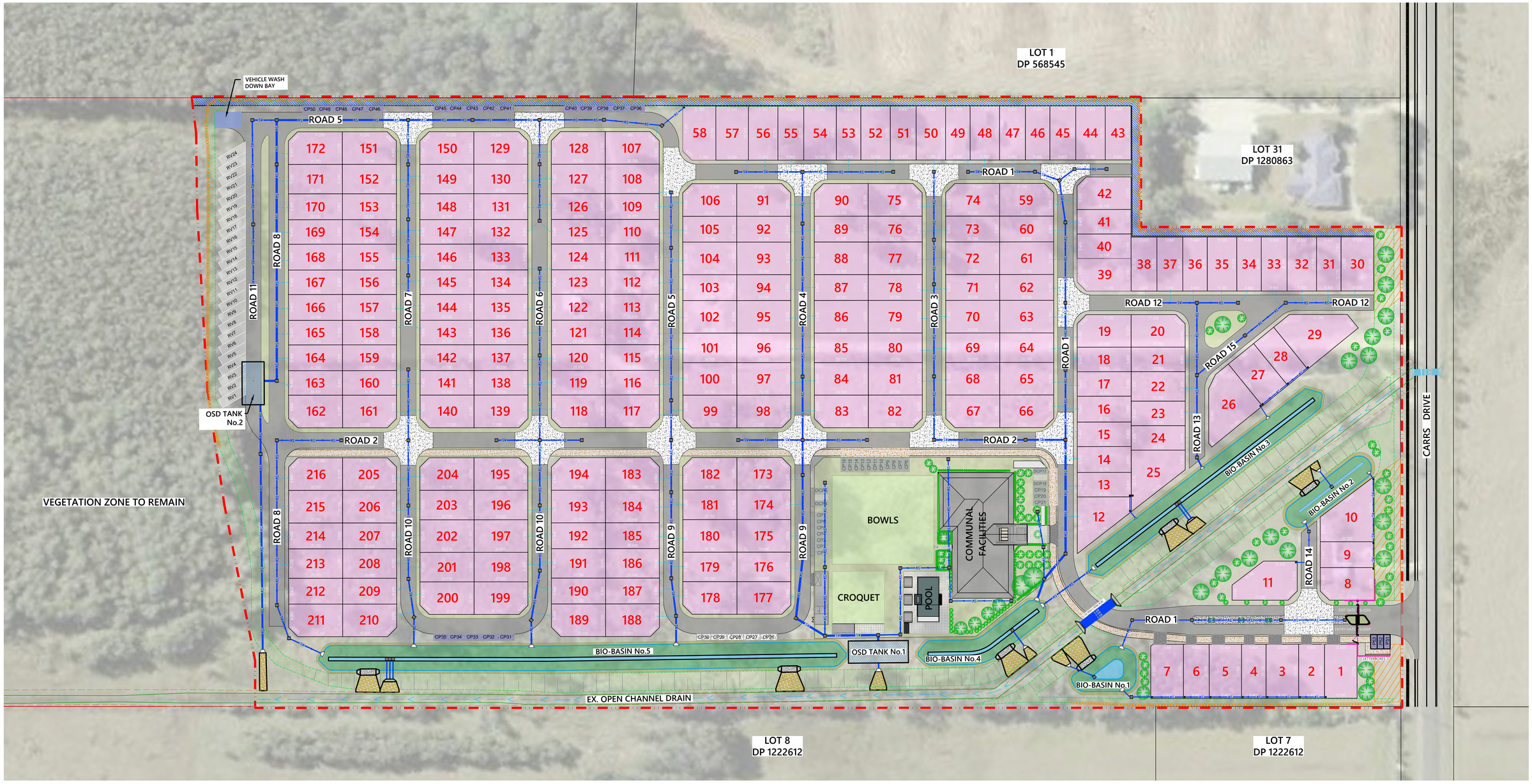
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CLIENT: CLIFTON YAMBA LAND PTY LTD
TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING
DRAWING TITLE: COVER SHEET
DWG No: D01 | SHEET: 01 OF 43 | REV: 1



SITE PLAN

SCALE 1:750

LEGEND

- DEVELOPMENT BOUNDARY
- INTERNAL LOT BOUNDARY
- BIO - BASIN TOP
- CHANNEL TOP OF BANK
- CHANNEL CENTRE LINE
- PROPOSED STORMWATER DRAINAGE
- RETAINING WALL
- STORMWATER DRAINAGE PIT
- HEADWALL
- PROPOSED MHE ALLOTMENT
- NEW INTERNAL CONCRETE ROAD PAVEMENT
- NEW INTERNAL CONCRETE INTERSECTION TREATMENTS & DRIVEWAYS
- NEW 2.5m WIDE SHARED PATH WITHIN SITE BOUNDARY
- MHE BOUNDARY SETBACK 3m WIDE 'NO BUILD ZONE'
- MHE BOUNDARY SETBACK 10m WIDE 'NO BUILD ZONE'
- VISITOR AND RECREATIONAL VEHICLE PARKING
- SCOUR PROTECTION
- BIO-BASIN BREM
- BIO-BASIN GRASSED AREA
- BIO-BASIN WEIR
- BIO-BASIN FLOOR
- GRASSED AREA

PLANS TO BE PRINTED IN COLOUR

PRELIMINARY PLANS FOR DA PURPOSES ONLY NOT FOR CONSTRUCTION

20 10 0 10 20 30 40
Horizontal Scale 1:750 (A1)
1:1500 (A3)

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DA CIVIL DRAWING

DRAWING TITLE: SITE PLAN

DWG No: D02 | SHEET: 02 OF 43 | REV: 1



GENERAL ARRANGEMENT PLAN

SCALE 1:600

ARCHITECTURAL INFORMATION FOR CLUB HOUSE SUPPLIED BY MARK SHAPIRO ARCHITECTS DRAWING NUMBER DA1002WIP REV 2

PRELIMINARY PLANS FOR DA PURPOSES ONLY NOT FOR CONSTRUCTION

PLANS TO BE PRINTED IN COLOUR

LEGEND

- DEVELOPMENT BOUNDARY
- INTERNAL LOT BOUNDARY
- BIO - BASIN TOP
- CHANNEL TOP OF BANK
- CHANNEL CENTRE LINE
- DESIGN CONTOURS
- PROPOSED STORMWATER DRAINAGE
- RETAINING WALL
- PROPOSED LOW PRESSURE SEWER Ø40mm LINE
- PROPOSED LOW PRESSURE SEWER Ø50mm LINE
- PROPOSED LOW PRESSURE SEWER Ø63mm LINE
- PROPOSED LOW PRESSURE SEWER Ø90mm LINE
- GRAVITY SEWER Ø150mm
- WATERMAIN Ø100mm
- LOW PRESSURE SEWER ISOLATION VALVE
- PROPOSED FLUSHING POINT
- SEWER HOUSE CONNECTION
- LOW PRESSURE SEWER FLOW METER
- LOW PRESSURE SEWER BOUNDARY KIT
- AQUATEC LOW PRESSURE SEWER CHAMBER
- WATER MAIN TEE
- WATER METER
- HEADWALL
- DUAL PILLAR HYDRANT
- SLUICE VALVE
- STORMWATER DRAINAGE PIT
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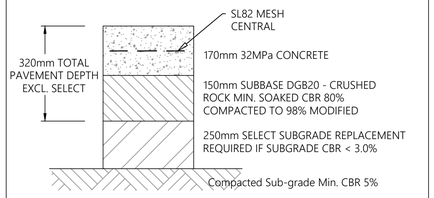
DA CIVIL DRAWING

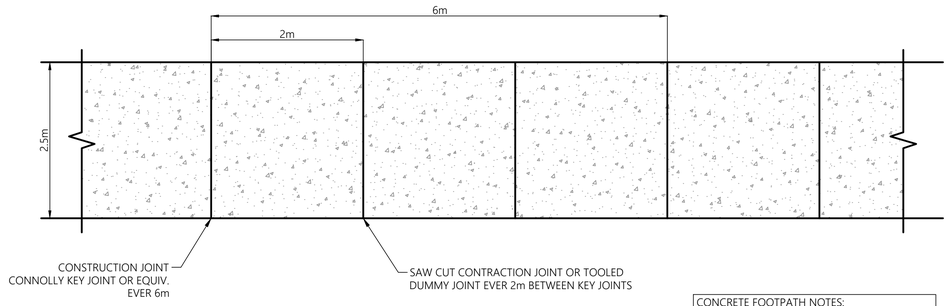
DRAWING TITLE: ROADWORKS & DRAINAGE PLAN

DWG No: D03 | SHEET: 03 OF 43 | REV: 1

RIGID PAVEMENT DESIGN

INTERNAL ROADS
DESIGN TRAFFIC LOAD $1x10^5$ ESA
(25 Year Design Life)



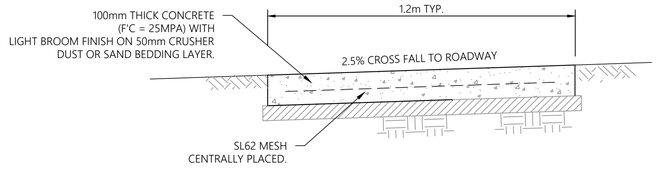


TYPICAL LAYOUT - CONCRETE FOOTPTAH

NOTE: REFER TO NRLG SD R-07 FOR DETAILS

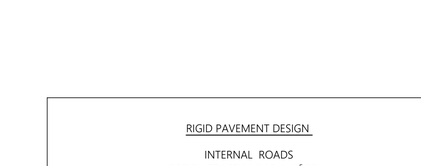
CONCRETE FOOTPATH NOTES:

1. PROVIDE SAW CUT CONTRACTION JOINT OR TOOLED DUMMY JOINTS EVERY 2.0m WITH EXPANSION KEY JOINTS EVERY 6.0m, REFER TO NRLG STD DRAWING No. R-07 FOR DETAILS
2. THICKEN TO RIGID PAVEMENT DESIGN WHEREVER PATH BECOMES TRAFFICABLE
3. RESIDENTIAL DRIVEWAYS TO BE MAINTAINED AT RIGID PAVEMENT DESIGN THICKNESS, DOWEL PATH TO DRIVEWAY AT INTERFACE AS REQUIRED.



TYPICAL SECTION -CONCRETE PATH

NOTE: REFER TO NRLG SD R-07 FOR DETAILS

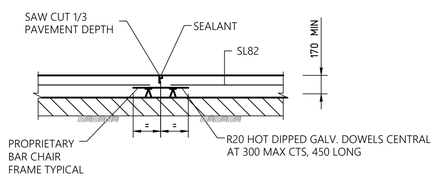


RIGID PAVEMENT EXPANSION JOINT - EJ

SCALE 1:20

NOTE: DOWEL KEY JOINT 'CONNOLLY' OR EQUIV. ACCEPTED FOR RIGID PAVEMENT EXPANSION JOINT UPON AGREEMENT WITH SUPERINTENDENT.

EXPANSION JOINT (EJ) & SAWN DOWEL JOINT (SDJ1) NOTES
1. DOWELS TO BE PLASTIC WRAPPED FULL LENGTH.
2. DOWELS TO BE RIGIDLY SUPPORTED ON BAR CHAIR FRAME WITH DOWELS PERPENDICULAR TO SAW CUT.
3. MARK POSITION OF SAW CUT ON FORMWORK
DO NOT POUR UNTIL POSITION OF MARK AND DOWEL FRAME HAS BEEN VERIFIED BY SUPERINTENDENT.

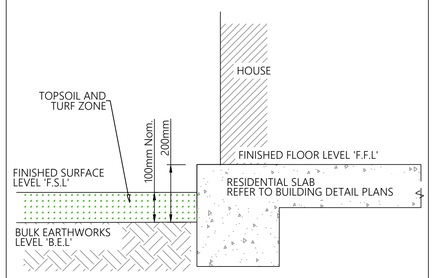


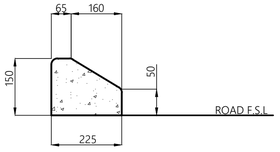
RIGID PAVEMENT SAWN DOWEL JOINT - SDJ

SCALE 1:20

RESIDENTIAL ALLOTMENT - TYPICAL SECTION

NOTES:
1. NOMINAL SETDOWN OF 200mm FROM FINISHED FLOOR LEVEL ' FFL' TO BULK EARTHWORKS LEVEL 'BEL' ON EACH RESIDENTIAL ALLOTMENT, REFER TO BULK EARTHWORKS PLANS FOR LEVEL DETAILS.



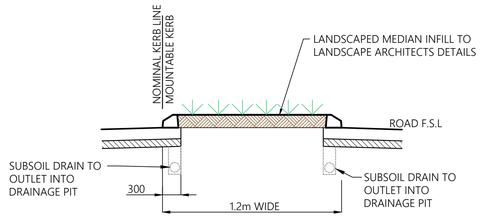


TYPE 'SM3' MOUNTABLE KERB

SCALE 1:10



TYPICAL - EXPOSED AGGREGATE BORAL 'SPITFIRE' OR EQUIV.



TYPICAL MEDIAN ISLAND DETAIL

N.T.S

CONCRETE:

C1 Workmanship and materials to comply with AS3600, AS2870, AS3610, AS1379, AS1478, AS3582 and AS3972 for liquid retaining structures also comply with AS3735.

C2 Concrete Supply
- CONCRETE PAVEMENT 32MPa 80mm SLUMP 20mm AGGREGATE
- CONCRETE PATHS 25MPa 80mm SLUMP 20mm AGGREGATE
- CONCRETE KERB 20MPa KERB MIX

C3 Review location of embedded items to minimize possible zones of poor compaction that may compromise structural integrity.

C4 Concrete quality shall be as follows:
U.N.O. Concrete shall be "Normal Class" to AS1379.

C5 Sampling, testing and acceptance
- Permanent records of plant assessment and project assessment shall be maintained at the plant and project respectively. Copies of these records shall be given promptly to the Engineer.
- Concrete is subject to project assessment.
- Sampling and testing shall comply with AS1379 and this specification and all such costs shall be borne by the contractor.
- The sampling and site treatment of project control test specimens shall be carried out by a NATA laboratory other than that of the supplier.
- Acceptance of concrete prior to placement shall be based on measured slump for compliance with the specification. Acceptance to hardened concrete for design properties shall be in accordance with AS1379.

C6 Construction tolerances to be in accordance with AS3610.

C7 Do not make holes, penetrations, recesses, chases, nor embed pipes (other than those shown on structural drawings) without approval of superintendent. Do not place conduits, pipes etc within cover concrete. Locate conduits, pipes etc only in middle third of slab or beam depth and between reinforcement layers, and spaced at 3 x diameter centres minimum. Do not cut reinforcement at penetrations without approval.

C8 Concrete cover shall be maintained by the use of plastic bar chairs at 750mm maximum centres U.N.O. Plastic tipped ferrous chairs not permitted.

C9 Construction joints where not shown shall be located to the approval of the Engineer in writing.

C10 Symbols on drawings for grade and type of reinforcement are as follows :-
- N Denotes grade 500 normal ductility deformed bar to AS4671
- R Denotes grade 250 normal ductility plain round bar to AS4671
- SL Denotes grade 500 low ductility welded square mesh to AS4671
- RL Denotes grade 500 low ductility welded rectangular mesh to AS4671

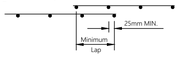
C11 Reinforcement is shown diagramatically and not necessarily in true position.

C12 Splices in reinforcement shall be made only in positions shown or otherwise approved in writing by the Engineer.

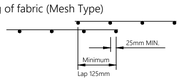
C13 Cogs and hooks to be standard in accordance with AS3600

C14 Reinforcement splices unless noted otherwise on the drawing.
All spices shall conform to the following table:
- i) Plain Bars - Actual lap length for plain (non-deformed) bars shall be 1.5 times the basic lap length.
- ii) Epoxy-Coated Bars - Actual lap length shall be 1.5 times the basic lap length.
- iii) Lightweight Concrete - Actual lap length shall be 1.3 times the basic lap length.
- iv) Structural elements built using slip forms - actual lap length shall be 1.3 times the basic lap length.

C15 Fabric splices shall be made by either of the following methods:-
(1) Lapping of fabric (Standard Fabric)



(2) Lapping of fabric (Mesh Type)



(3) Use of splice bars



Splice bar length is 800mm or 1000mm for horizontal bars where more than 300mm concrete cast below bar.

Fabric Reference	Spacing of Bars mm	
	At sheet ends	At sheet sides
RL1218	75	300
RL1118	100	300
RL1018	125	300
RL918	150	300
RL718, RL818	200	300
SL102, SL81	200	200
SL82, SL92	300	300

C16 Welding of reinforcement is only permitted where shown on the drawings or otherwise approved by the Engineer. Where welding of reinforcement is approved, it shall be carried out in accordance with AS1554. Part 3.

C17 Dowels shall be sawn to length. In skewed joints, dowels shall be aligned with the longitudinal joints. Dowel alignment to be maintained by use of a support assembly suitable to ensure a horizontal and vertical tolerance of 5 in 400.

C18 Minimum lap of fabric shall be two transverse wires plus 30 mm. Minimum 500mm lap length for trench mesh.

C19 All concrete shall be placed and cured in accordance with Australian Standards. Curing must be applied to slabs immediately after finishing and onto walls and columns immediately after removal of formwork. Curing compounds must be compatible with future finishes and comply with AS3799.

C20 Builder shall be responsible for design of formwork, shoring and scaffolding. Formwork and shoring shall comply with AS3610. Scaffolding shall comply with AS1576.

C21 Do not strip formwork until concrete is hardened sufficiently to withstand movement and form removal without damage. Strip formwork to AS3600 Clause 17.6 Remove form tie bolts without damaging concrete, parts of bolts left in concrete must not intrude into cover concrete. Flush fill holes using pre-mixed non-shrink cementitious repair mortar matching concrete surface colour, strength and durability and adequate bond. Remove props and formwork for beams and slabs and ensure concrete has gained adequate strength before constructing walls or placing other permanent loading on work.

C22 Site bending of reinforcement bars shall be done without heating. The bars shall be bent using a re-bending tool and against a flat surface or a pin with a diameter not less than the minimum pin size prescribed in AS3600.

C23 U.N.O. all hold down bolts shall be hot dipped galvanised.

C24 Saw cut crack control joints as soon after casting as practicable to avoid spalling or ravelling of joint edges, and within 16 hours of casting to prevent thermal and/or shrinkage cracking of slab. Immediately after saw cutting, flush out joints to remove sawing residue and insert a temporary foamed plastic bead to keep joint clean prior to filling or sealing protect saw cuts from wheel loads for at least one week after cutting.

C25 Do not install sealants if expected maximum daily temperature exceeds 30° degrees celcius. Ensure recesses are clean and dry prior to installing fillers or sealants, and prepare in accordance with manufacturer's recommendations. Tolerance on sealant widths +5, -0 mm.

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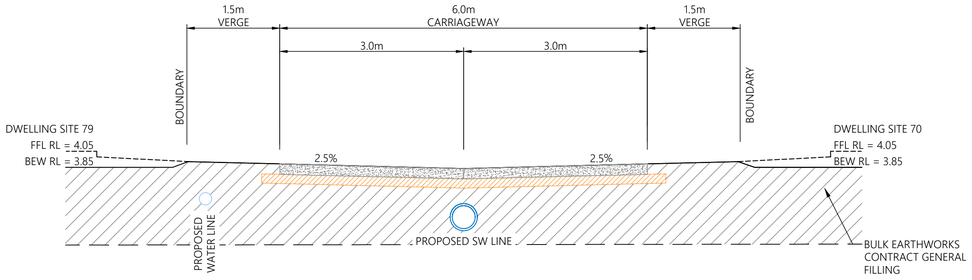
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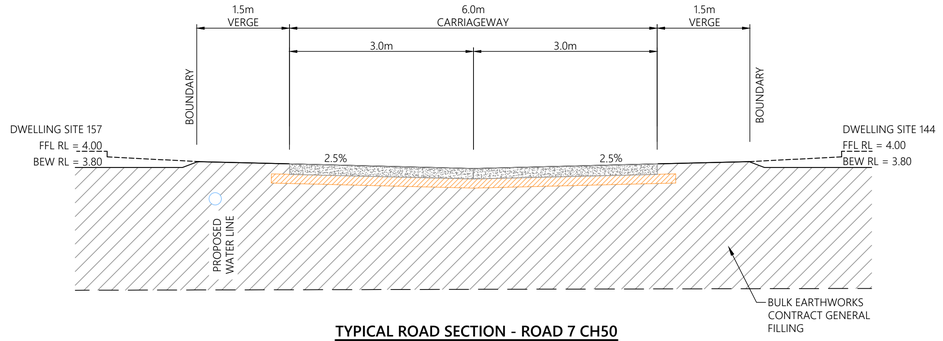
DA CIVIL DRAWING

DRAWING TITLE: ROAD TYPICAL DETAIL

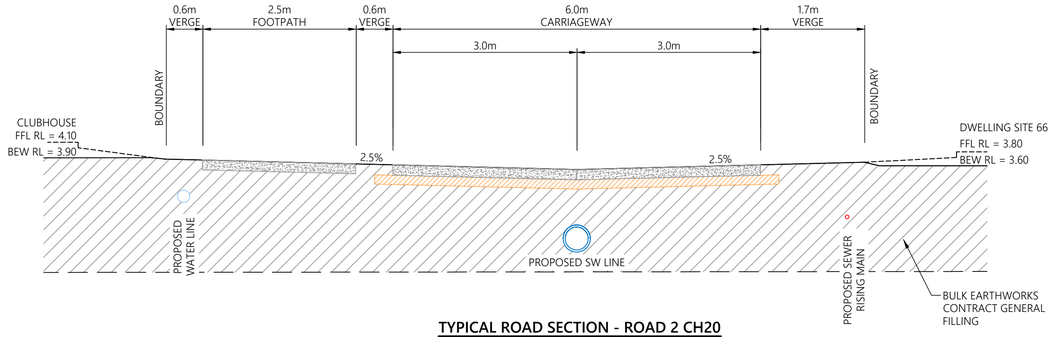
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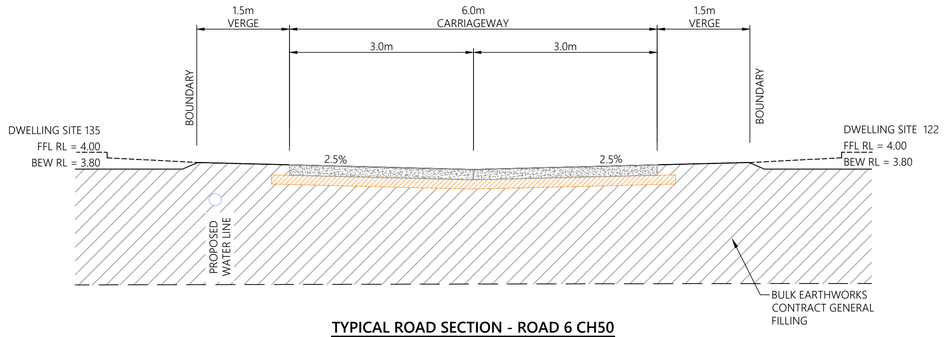
TYPICAL ROAD SECTION - ROAD 3 CH50
SCALE 1:50



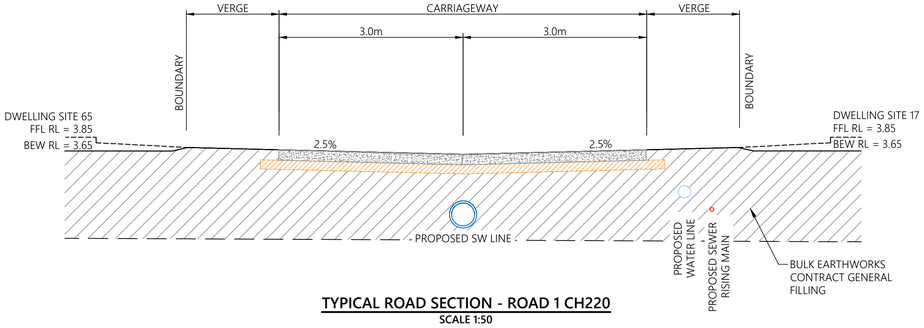
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SCALE 1:50



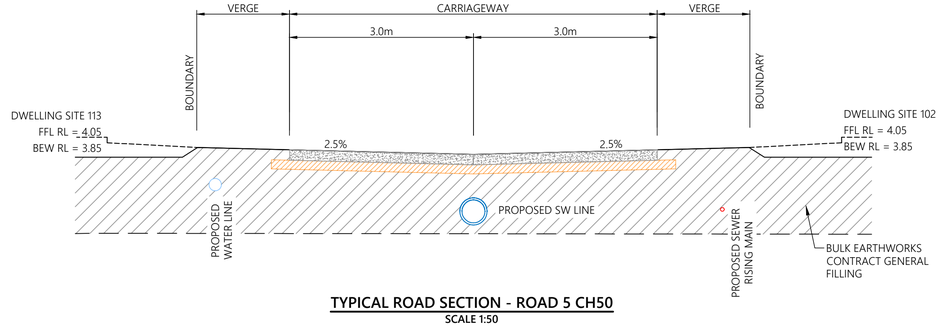
TYPICAL ROAD SECTION - ROAD 2 CH20
SCALE 1:50



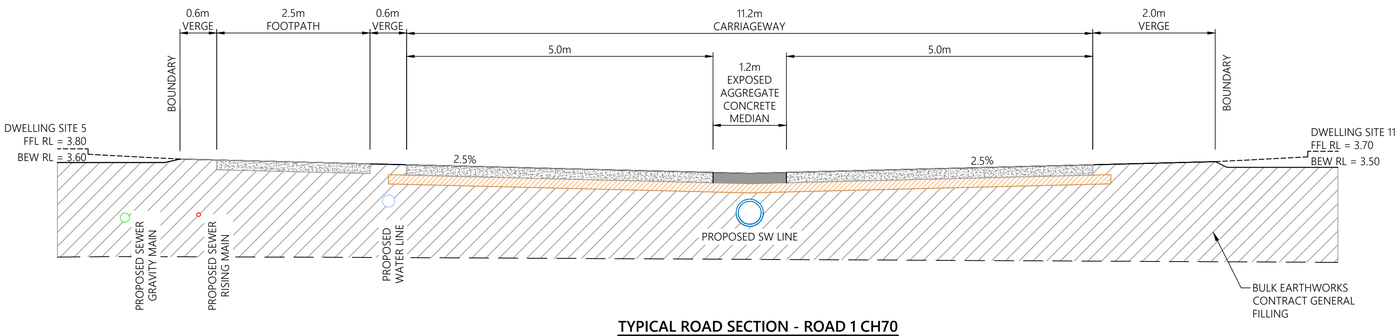
TYPICAL ROAD SECTION - ROAD 6 CH50
SCALE 1:50



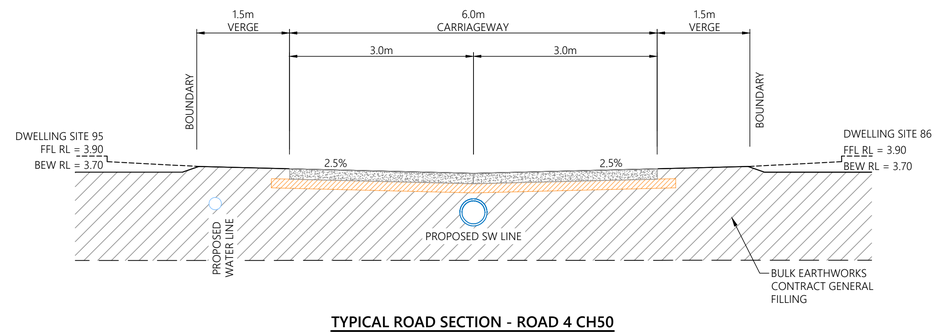
TYPICAL ROAD SECTION - ROAD 1 CH220
SCALE 1:50



TYPICAL ROAD SECTION - ROAD 5 CH50
SCALE 1:50



TYPICAL ROAD SECTION - ROAD 1 CH70
SCALE 1:50



TYPICAL ROAD SECTION - ROAD 4 CH50
SCALE 1:50

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

ISSUED FOR DEVELOPMENT APPROVAL
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MDE Manage Design Engineer

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

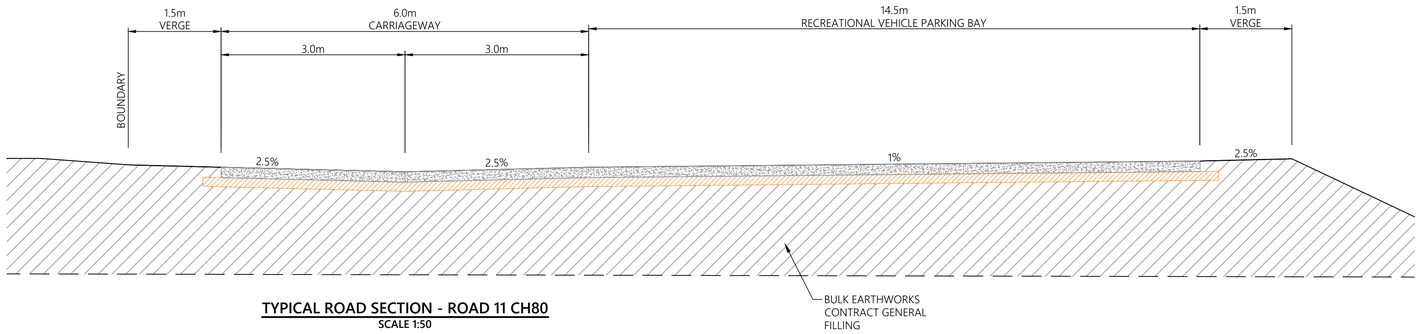
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

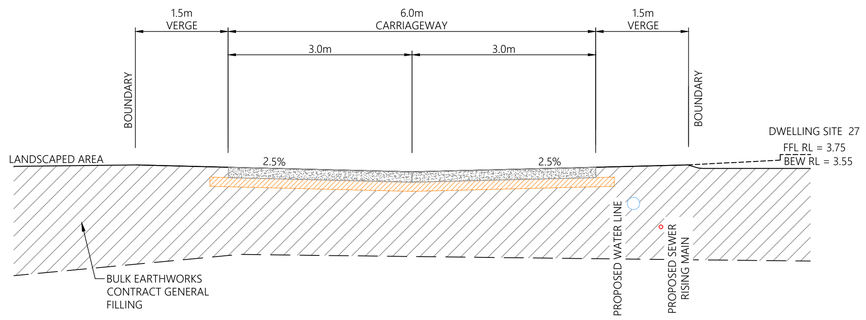
DA CIVIL DRAWING

DRAWING TITLE: ROAD TYPICAL SECTIONS - SHEET 1

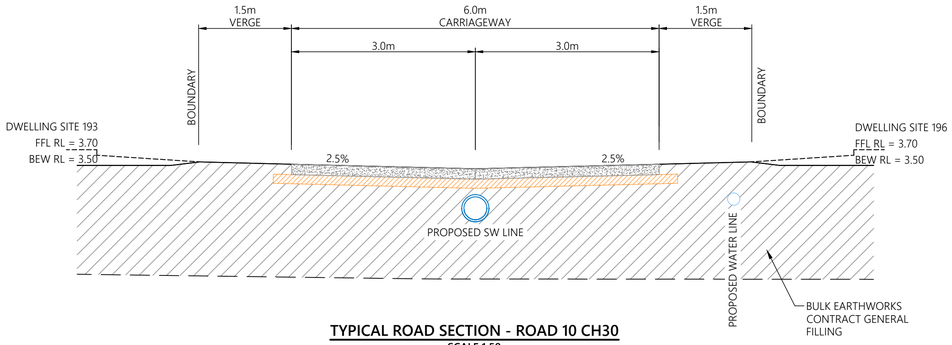
DWG No: D05 | SHEET: 05 OF 43 | REV: 1



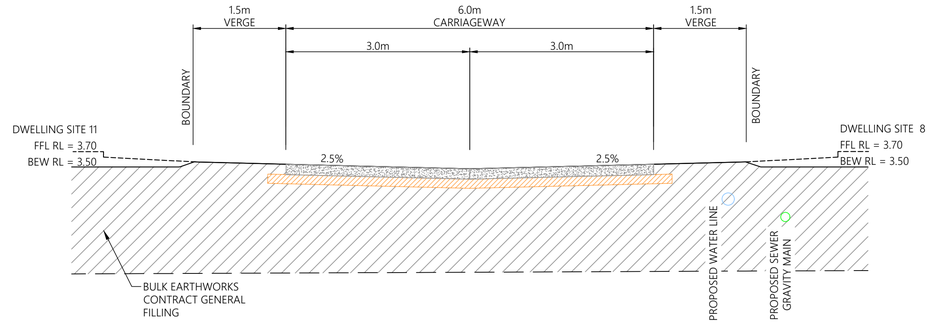
TYPICAL ROAD SECTION - ROAD 11 CH80
SCALE 1:50



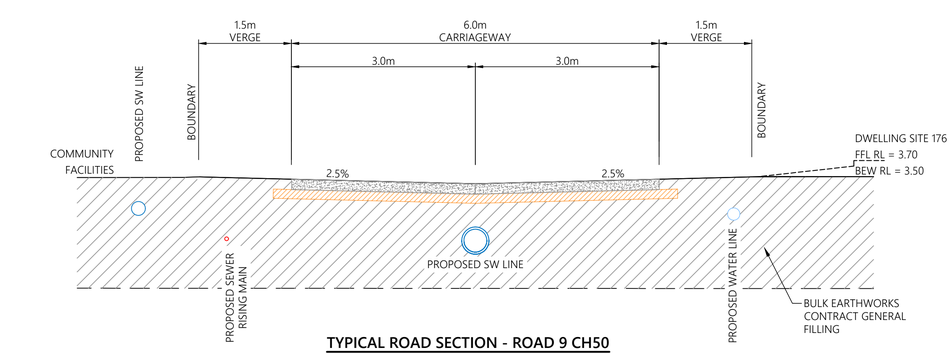
TYPICAL ROAD SECTION - ROAD 15 CH20
SCALE 1:50



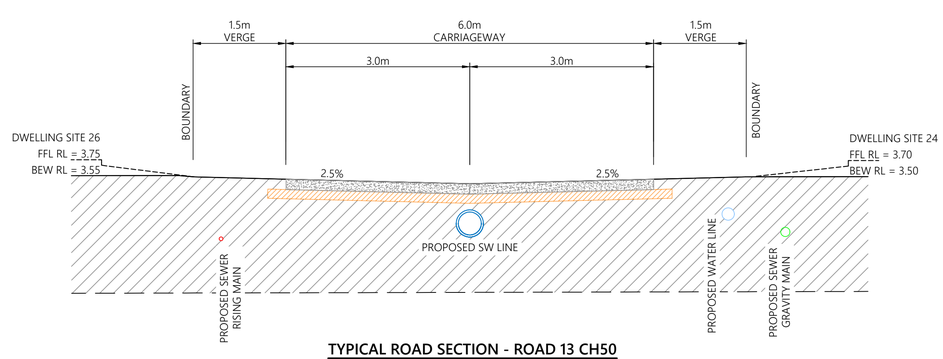
TYPICAL ROAD SECTION - ROAD 10 CH30
SCALE 1:50



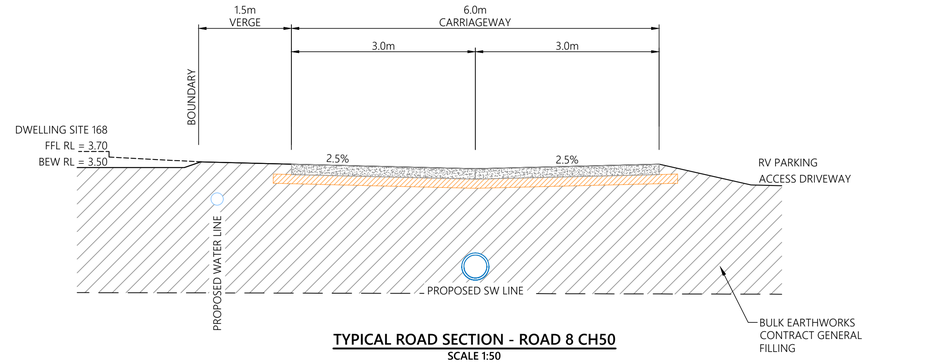
TYPICAL ROAD SECTION - ROAD 14 CH12.1
SCALE 1:50



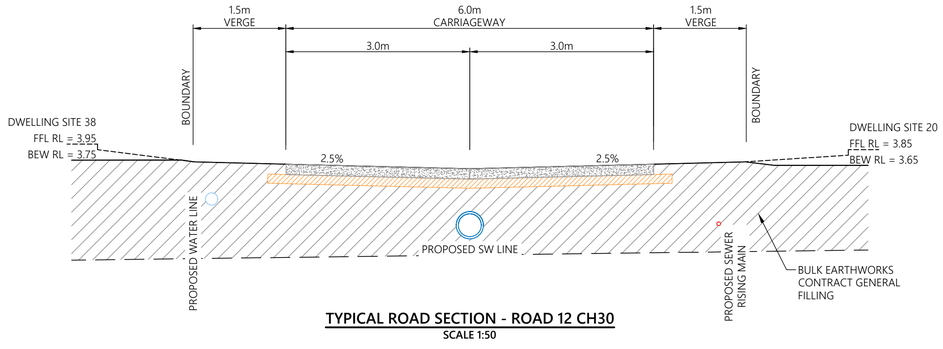
TYPICAL ROAD SECTION - ROAD 9 CH50
SCALE 1:50



TYPICAL ROAD SECTION - ROAD 13 CH50
SCALE 1:50



TYPICAL ROAD SECTION - ROAD 8 CH50
SCALE 1:50



TYPICAL ROAD SECTION - ROAD 12 CH30
SCALE 1:50

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

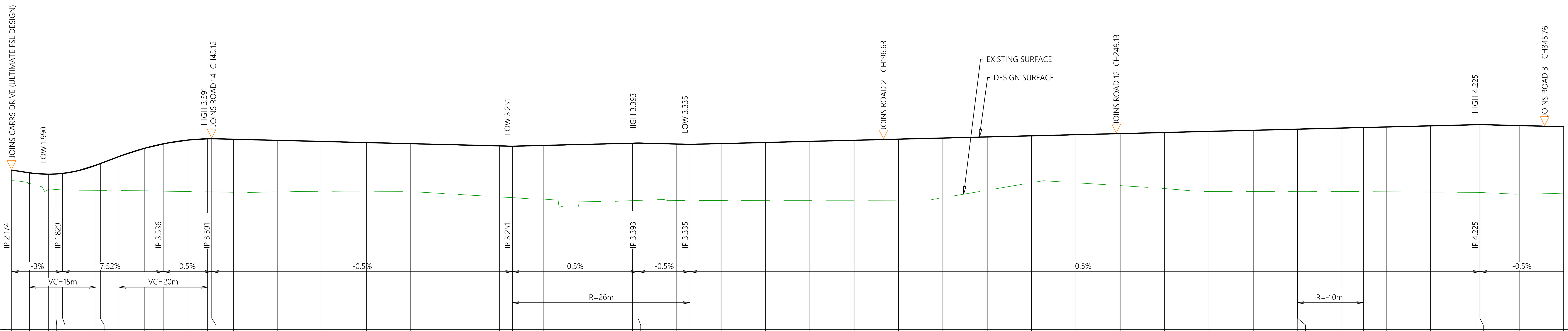
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: ROAD TYPICAL SECTION - SHEET 2

DWG No: D06 | SHEET: 06 OF 43 | REV: 1



CUT / FILL	-0.474	-0.499	-0.697	-0.7	-0.747	-1.13	-1.207	-1.53	-1.921	-2.133	-2.326	-2.391	-2.398
DESIGN SURFACE	2.174	2.054	1.99	2	2.026	2.393	2.468	2.784	3.162	3.36	3.534	3.586	3.591
NATURAL SURFACE	1.700	1.555	1.293	1.301	1.279	1.263	1.261	1.254	1.241	1.227	1.209	1.195	1.192
CHAINAGES	0.000	4.000	8.276	10.000	11.500	19.000	20.000	24.188	30.000	34.188	40.000	44.188	45.119

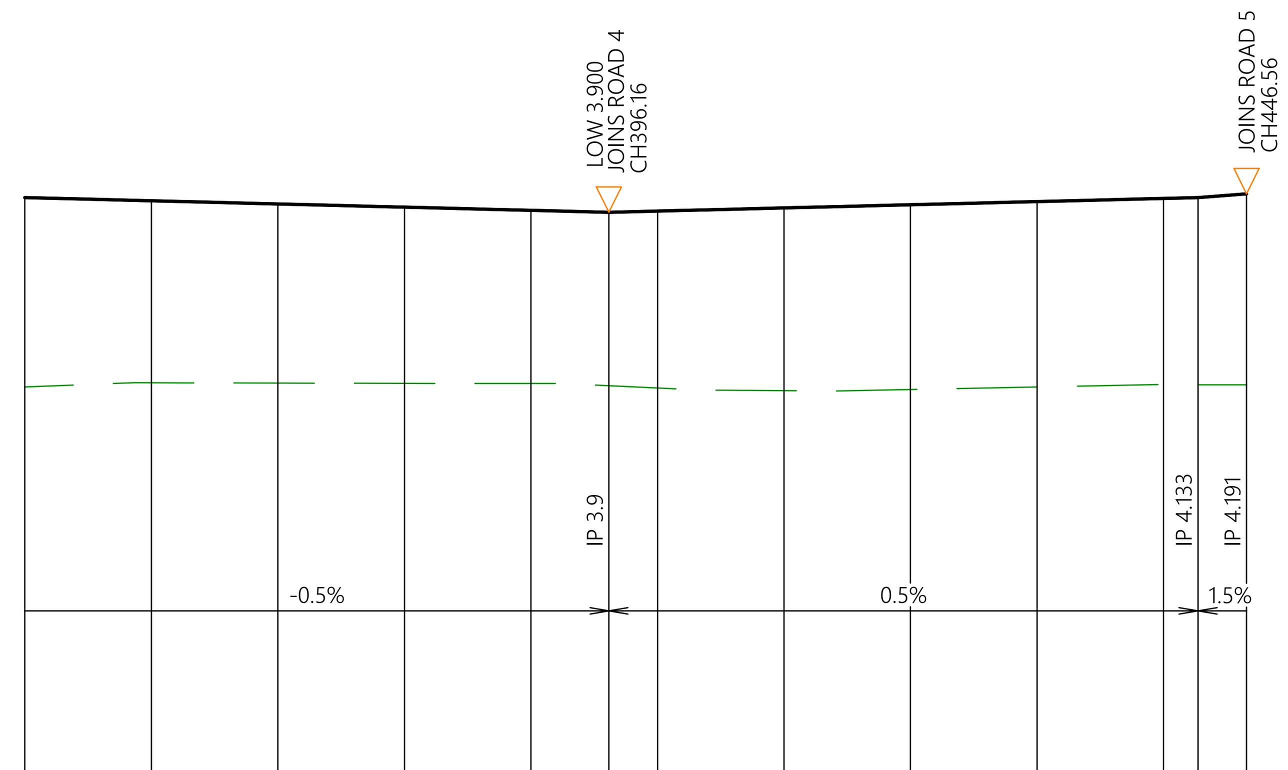
CUT / FILL	-2.39	-2.323	-2.246	-2.192	-2.151	-2.228	-2.298	-2.318	-2.453	-2.567	-2.589	-2.586	-2.547
DESIGN SURFACE	3.566	3.516	3.466	3.416	3.366	3.316	3.266	3.251	3.287	3.337	3.387	3.393	3.349
NATURAL SURFACE	1.176	1.193	1.221	1.224	1.215	1.089	0.968	0.933	0.834	0.769	0.798	0.807	0.803
CHAINAGES	50.000	60.000	70.000	80.000	90.000	100.000	110.000	112.936	120.000	130.000	140.000	141.256	150.000

CUT / FILL	-2.53	-2.563	-2.609	-2.656	-2.703	-2.75	-2.688	-2.401	-2.114	-2.166	-2.343	-2.527
DESIGN SURFACE	3.335	3.37	3.42	3.47	3.52	3.57	3.62	3.67	3.72	3.77	3.82	3.87
NATURAL SURFACE	0.805	0.807	0.810	0.813	0.817	0.820	0.932	1.269	1.606	1.604	1.477	1.342
CHAINAGES	152.987	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000

CUT / FILL	-2.709	-2.756	-2.803	-2.803	-2.858	-2.888	-2.921	-2.985	-3.048	-3.059	-3.088	-2.994
DESIGN SURFACE	3.92	3.97	4.019	4.02	4.07	4.094	4.12	4.17	4.22	4.225	4.181	4.131
NATURAL SURFACE	1.210	1.213	1.216	1.216	1.212	1.206	1.199	1.185	1.172	1.167	1.093	1.137
CHAINAGES	270.000	280.000	289.933	290.000	300.000	304.856	310.000	320.000	330.000	331.133	340.000	350.000

Horizontal 1:500 Vertical 1:100

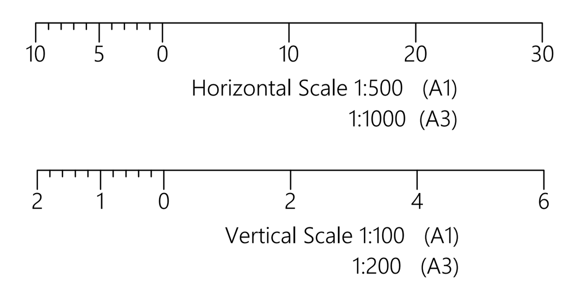
LONGITUDINAL SECTION - ROAD 1



CUT / FILL	-2.994	-2.876	-2.83	-2.785	-2.739	-2.741	-2.797	-2.89	-2.92	-2.93	-2.943	-2.959	-3.021
DESIGN SURFACE	4.131	4.081	4.031	3.981	3.931	3.9	3.919	3.969	4.019	4.069	4.119	4.133	4.191
NATURAL SURFACE	1.137	1.205	1.201	1.196	1.192	1.159	1.123	1.079	1.100	1.139	1.176	1.174	1.170
CHAINAGES	350.000	360.000	370.000	380.000	390.000	396.167	400.000	410.000	420.000	430.000	440.000	442.716	446.556

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 1 (CONTINUATION)



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ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED:	T.RYDEN	DATE:	JAN 2024
DRAWN:	A.SCHMID	SCALE:	AS SHOWN
SURVEYING:	MACRO SURVEYING	SHEET SIZE:	A1

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MDE Manage Design Engineer

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CLIENT
CLIFTON YAMBA LAND PTY LTD

TITLE
110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

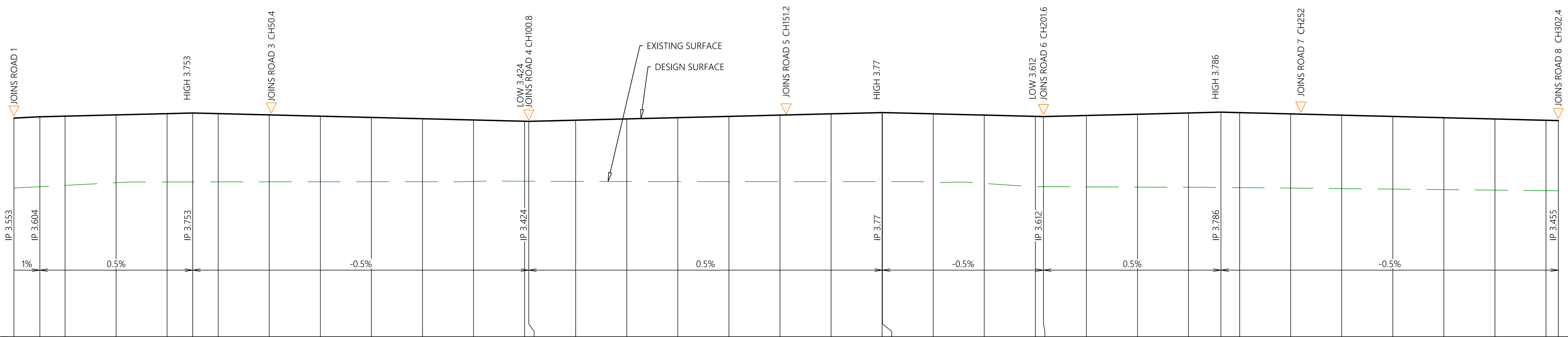
CLIFTON YAMBA

PROJECT
PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: ROAD LONGITUDINAL SECTIONS - SHEET 1

DWG No: D07 SHEET: 07 OF 43 REV: 1



DESIGN GRADELINE

VERTICAL GEOMETRY

HORIZONTAL GEOMETRY

DATUM RL-5.0

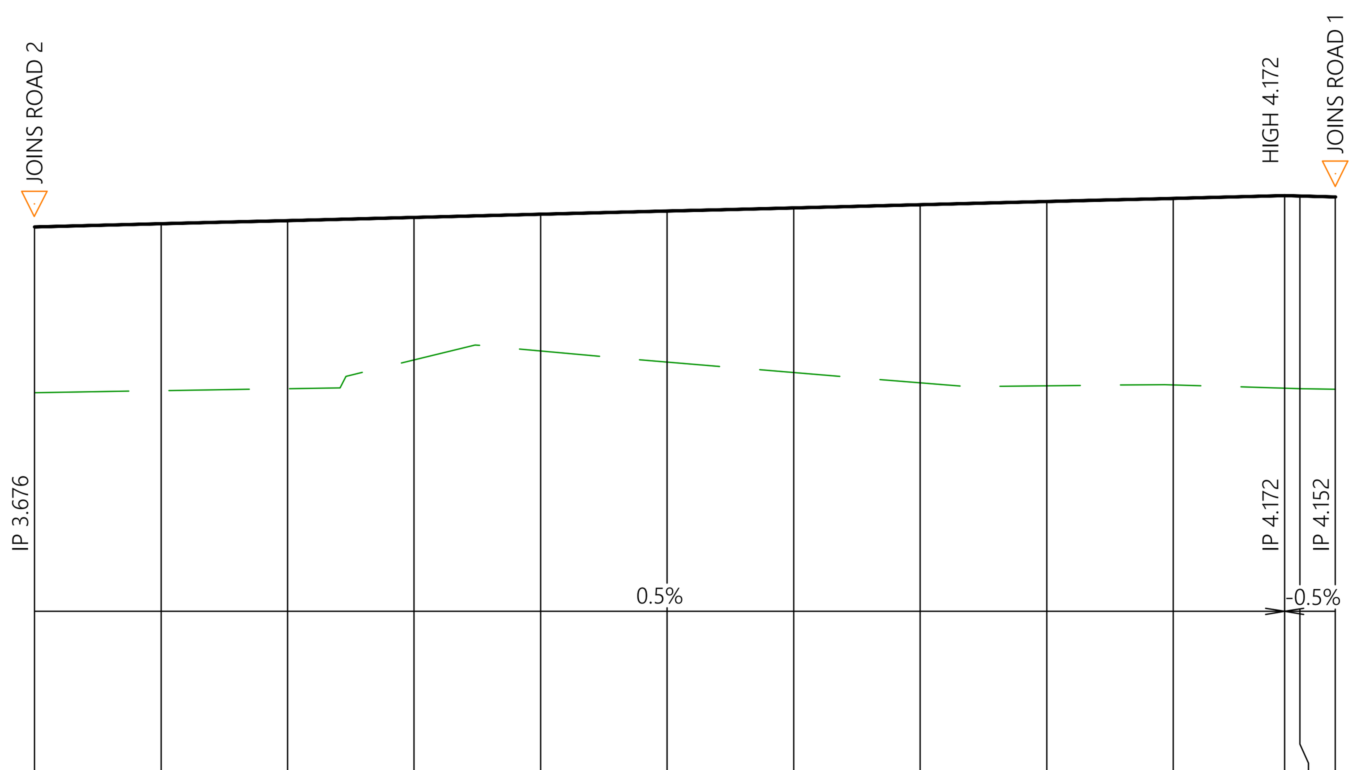
CUT / FILL		-2.735	-2.708	-2.655	-2.676	-2.699	-2.673	-2.621	-2.569	-2.516	-2.466	-2.405	-2.347
DESIGN SURFACE	3.553	3.604	3.628	3.678	3.728	3.753	3.728	3.678	3.628	3.578	3.528	3.478	3.428
NATURAL SURFACE		0.869	0.920	1.024	1.053	1.054	1.055	1.057	1.060	1.062	1.062	1.073	1.081
CHAINAGES	0.000	5.083	10.000	20.000	30.000	35.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000

CUT / FILL	-2.344	-2.394	-2.449	-2.503	-2.553	-2.602	-2.651	-2.703	-2.703	-2.68	-2.673	-2.748	-2.742
DESIGN SURFACE	3.424	3.47	3.52	3.57	3.62	3.67	3.72	3.77	3.77	3.72	3.67	3.62	3.612
NATURAL SURFACE	1.080	1.076	1.071	1.067	1.067	1.068	1.069	1.067	1.067	1.041	0.997	0.872	0.870
CHAINAGES	100.800	110.000	120.000	130.000	140.000	150.000	160.000	170.000	170.053	180.000	190.000	200.000	201.600

CUT / FILL	-2.791	-2.85	-2.909	-2.946	-2.935	-2.905	-2.875	-2.845	-2.814	-2.784	-2.754	-2.746
DESIGN SURFACE	3.654	3.704	3.754	3.786	3.767	3.717	3.667	3.617	3.567	3.517	3.467	3.455
NATURAL SURFACE	0.863	0.854	0.845	0.839	0.832	0.812	0.793	0.773	0.753	0.733	0.714	0.709
CHAINAGES	210.000	220.000	230.000	236.353	240.000	250.000	260.000	270.000	280.000	290.000	300.000	302.400

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 2



DESIGN GRADELINE

VERTICAL GEOMETRY

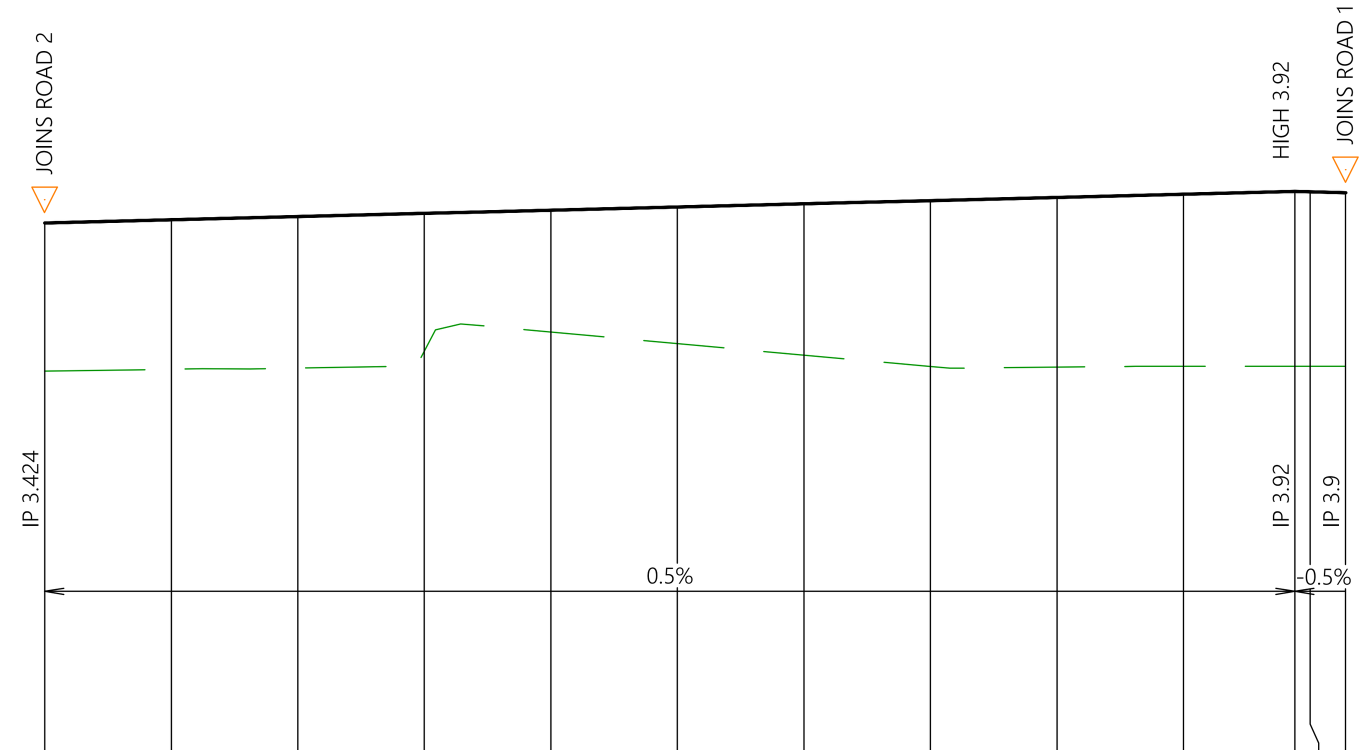
HORIZONTAL GEOMETRY

DATUM RL-5.0

CUT / FILL		-2.638	-2.657	-2.252	-2.161	-2.388	-2.602	-2.816	-2.912	-2.947	-3.045	-3.046	-3.041
DESIGN SURFACE	3.676	3.726	3.777	3.827	3.877	3.927	3.977	4.028	4.078	4.128	4.172	4.166	4.152
NATURAL SURFACE		1.089	1.120	1.575	1.716	1.539	1.375	1.212	1.166	1.181	1.127	1.120	1.111
CHAINAGES	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	98.800	100.000	102.800

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 3



DESIGN GRADELINE

VERTICAL GEOMETRY

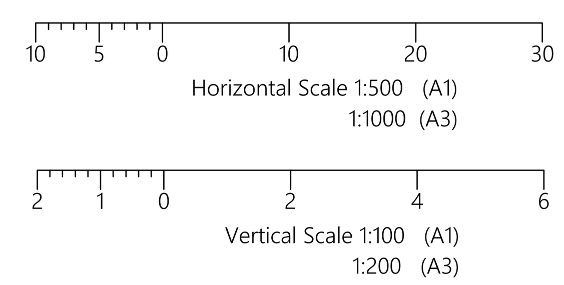
HORIZONTAL GEOMETRY

DATUM RL-5.0

CUT / FILL	-2.344	-2.363	-2.393	-2.178	-1.926	-2.159	-2.391	-2.623	-2.682	-2.719	-2.762	-2.756	-2.741
DESIGN SURFACE	3.424	3.474	3.525	3.575	3.625	3.675	3.725	3.776	3.826	3.876	3.92	3.914	3.9
NATURAL SURFACE	1.080	1.111	1.131	1.396	1.699	1.517	1.335	1.153	1.144	1.157	1.158	1.159	1.159
CHAINAGES	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	98.800	100.000	102.800

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 4



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ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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CLIENT
CLIFTON YAMBA LAND PTY LTD

TITLE
110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

CLIFTON YAMBA

PROJECT
PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: ROAD LONGITUDINAL SECTIONS - SHEET 2

DWG No: D08 | SHEET: 08 OF 43 | REV: 1



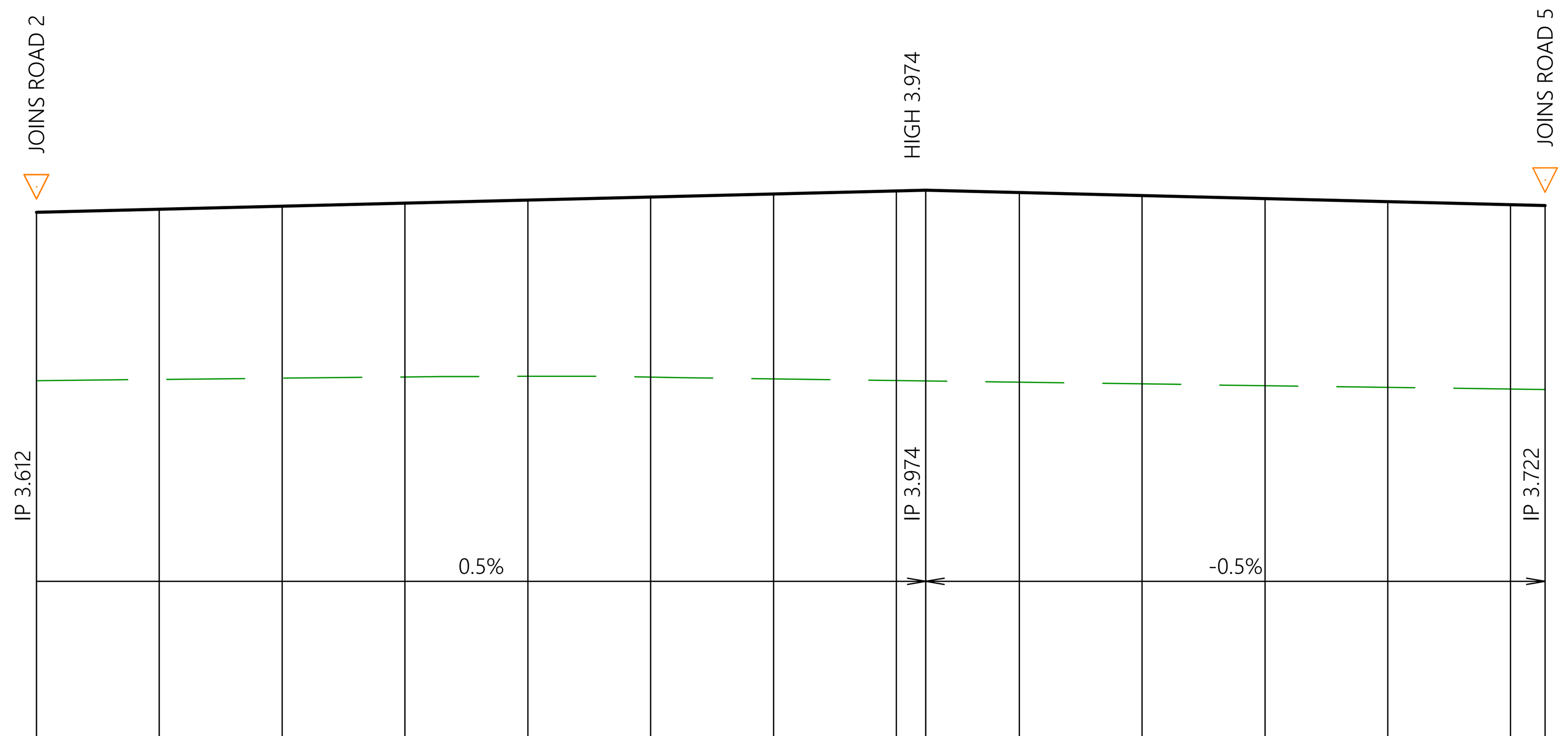
DESIGN GRADELINE
VERTICAL GEOMETRY
HORIZONTAL GEOMETRY

DATUM RL-5.0

CUT / FILL		-2.625	-2.641	-2.485	-2.096	-2.275	-2.455	-2.635	-2.793	-2.886	-2.991	-3.021	-2.998	-2.987	-2.945	-2.846	-2.819	-2.672	-3.068	-3.067	-3.03	-2.993	-2.955	-2.918	-2.881	-2.843	-2.806	-2.769	-2.728	-2.686	-2.645	-2.604	-2.585	-2.616	-2.675	-2.696
DESIGN SURFACE	3.676	3.726	3.776	3.826	3.876	3.926	3.976	4.026	4.077	4.127	4.177	4.191	4.134	4.108	4.055	3.99	3.976	3.897	3.818	3.817	3.768	3.717	3.667	3.617	3.567	3.517	3.467	3.417	3.367	3.317	3.267	3.217	3.194	3.221	3.271	3.29
NATURAL SURFACE		1.101	1.135	1.341	1.781	1.651	1.521	1.392	1.283	1.240	1.185	1.170	1.136	1.121	1.109	1.144	1.156	1.225	0.750	0.750	0.737	0.725	0.712	0.699	0.687	0.674	0.661	0.649	0.640	0.631	0.622	0.614	0.610	0.605	0.597	0.593
CHAINAGES	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	102.799	110.000	113.300	120.000	128.223	130.000	140.000	150.000	150.056	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	274.595	280.000	290.000	293.683

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 5



DESIGN GRADELINE
VERTICAL GEOMETRY
HORIZONTAL GEOMETRY

DATUM RL-5.0

CUT / FILL		-2.772	-2.802	-2.832	-2.87	-2.935	-3.013	-3.09	-3.109	-3.092	-3.07	-3.047	-3.025	-3.002	-2.996
DESIGN SURFACE	3.612	3.662	3.712	3.762	3.812	3.862	3.912	3.962	3.974	3.936	3.886	3.836	3.786	3.736	3.722
NATURAL SURFACE		0.890	0.910	0.930	0.942	0.927	0.899	0.871	0.865	0.844	0.816	0.789	0.761	0.733	0.726
CHAINAGES	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	72.399	80.000	90.000	100.000	110.000	120.000	122.800

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 6



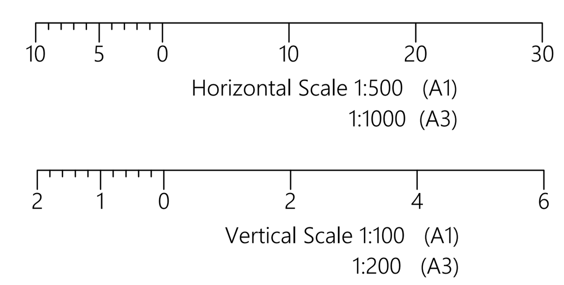
DESIGN GRADELINE
VERTICAL GEOMETRY
HORIZONTAL GEOMETRY

DATUM RL-5.0

CUT / FILL		-2.941	-2.982	-3.024	-3.059	-3.047	-3.001	-2.955	-2.912	-2.893	-2.874	-2.856	-2.837	-2.814	-2.808
DESIGN SURFACE	3.707	3.758	3.808	3.858	3.896	3.884	3.834	3.784	3.734	3.684	3.634	3.584	3.534	3.484	3.47
NATURAL SURFACE		0.817	0.825	0.834	0.837	0.836	0.833	0.829	0.822	0.791	0.759	0.728	0.697	0.670	0.662
CHAINAGES	0.000	10.000	20.000	30.000	37.623	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	122.800

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 7



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ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED:	T.RYDEN	DATE:	JAN 2024
DRAWN:	A.SCHMID	SCALE:	AS SHOWN
SURVEYING:	MACRO SURVEYING	SHEET SIZE:	A1

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

MDE Manage Design Engineer

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CLIENT
CLIFTON YAMBA LAND PTY LTD

TITLE
110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

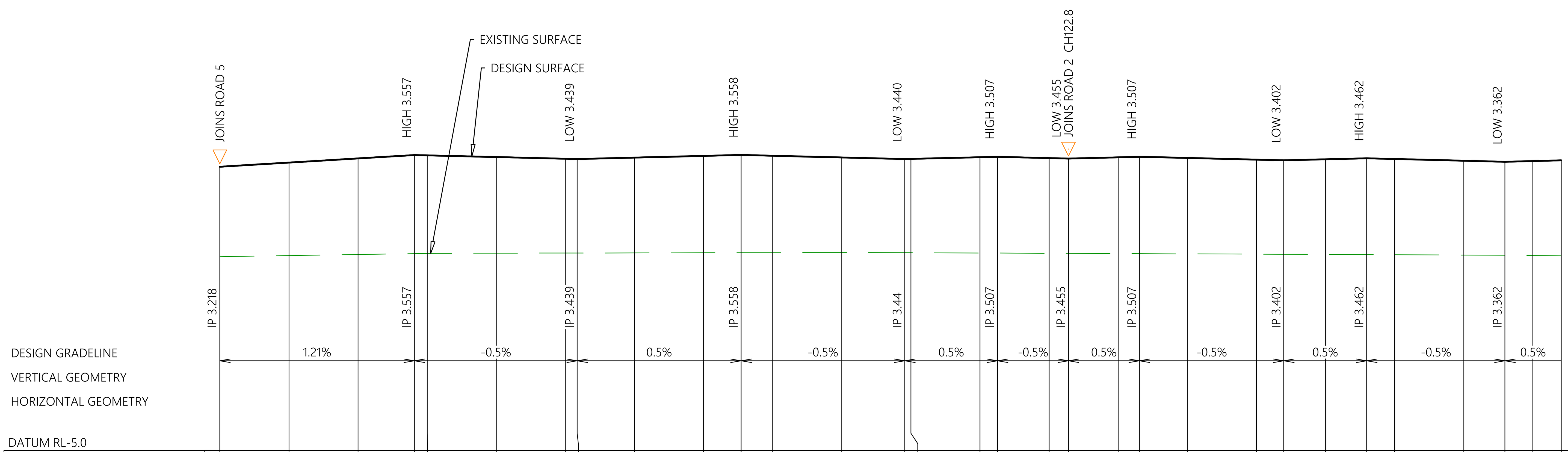
CLIFTON YAMBA

PROJECT
PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: ROAD LONGITUDINAL SECTIONS - SHEET 3

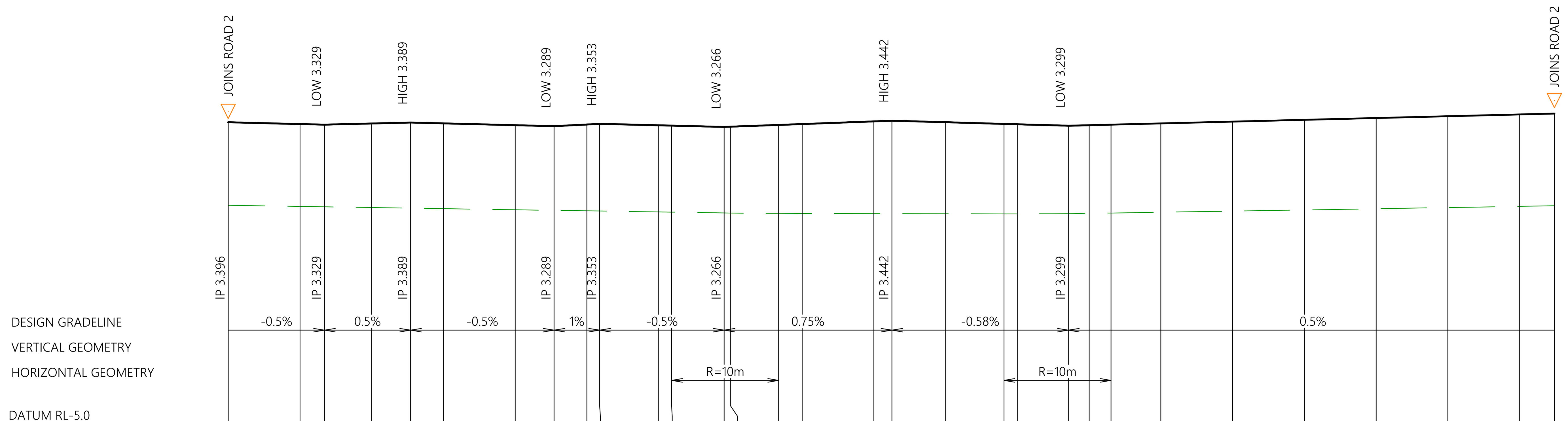
DWG No: D09 | SHEET: 09 OF 43 | REV: 1



CHAINAGES	CUT / FILL	DESIGN SURFACE	NATURAL SURFACE
0.000	-2.604	3.218	0.614
10.000	-2.693	3.338	0.645
20.000	-2.783	3.459	0.676
28.153	-2.856	3.557	0.702
30.000	-2.841	3.548	0.707
40.000	-2.783	3.498	0.715
50.000	-2.729	3.448	0.719
51.714	-2.72	3.439	0.719
60.000	-2.759	3.481	0.722
70.000	-2.805	3.531	0.726
75.437	-2.83	3.558	0.728
80.000	-2.806	3.535	0.729
90.000	-2.752	3.485	0.733
99.118	-2.711	3.44	0.729
100.000	-2.716	3.444	0.728
110.000	-2.774	3.494	0.720
112.534	-2.789	3.507	0.718
120.000	-2.758	3.469	0.711
122.800	-2.746	3.455	0.709
130.000	-2.788	3.491	0.703
133.066	-2.806	3.507	0.700
140.000	-2.778	3.472	0.694
150.000	-2.736	3.422	0.686
153.960	-2.719	3.402	0.683
160.000	-2.755	3.432	0.678
165.960	-2.79	3.462	0.673
170.000	-2.773	3.442	0.669
180.000	-2.731	3.392	0.661
185.960	-2.707	3.362	0.656
190.000	-2.735	3.382	0.648
194.100	-2.763	3.403	0.639

Horizontal 1:500 Vertical 1:100

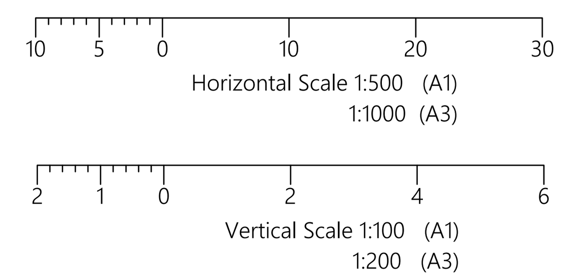
LONGITUDINAL SECTION - ROAD 8



CHAINAGES	CUT / FILL	DESIGN SURFACE	NATURAL SURFACE
0.000		3.396	
10.000	-2.297	3.346	1.050
13.412	-2.29	3.329	1.039
20.000	-2.343	3.362	1.019
25.412	-2.387	3.389	1.003
30.000	-2.378	3.366	0.989
40.000	-2.358	3.316	0.958
45.412	-2.348	3.289	0.941
50.000	-2.408	3.335	0.927
51.773	-2.431	3.353	0.922
60.000	-2.415	3.312	0.897
61.800	-2.412	3.303	0.891
69.117	-2.397	3.266	0.870
70.000	-2.405	3.273	0.867
76.723	-2.466	3.323	0.857
80.000	-2.492	3.348	0.856
90.000	-2.572	3.423	0.851
92.500	-2.592	3.442	0.849
100.000	-2.553	3.398	0.846
108.123	-2.51	3.351	0.841
110.000	-2.499	3.34	0.841
117.100	-2.45	3.299	0.850
120.000	-2.457	3.314	0.857
123.045	-2.464	3.329	0.866
130.000	-2.477	3.364	0.887
140.000	-2.495	3.414	0.919
150.000	-2.512	3.464	0.952
160.000	-2.529	3.514	0.985
170.000	-2.545	3.564	1.019
180.000	-2.562	3.614	1.052
184.845	-2.57	3.638	1.068

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 9



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ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED:	T.RYDEN	DATE:	JAN 2024
DRAWN:	A.SCHMID	SCALE:	AS SHOWN
SURVEYING:	MACRO SURVEYING	SHEET SIZE:	A1

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Manage Design Engineer

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CLIENT
CLIFTON YAMBA LAND PTY LTD

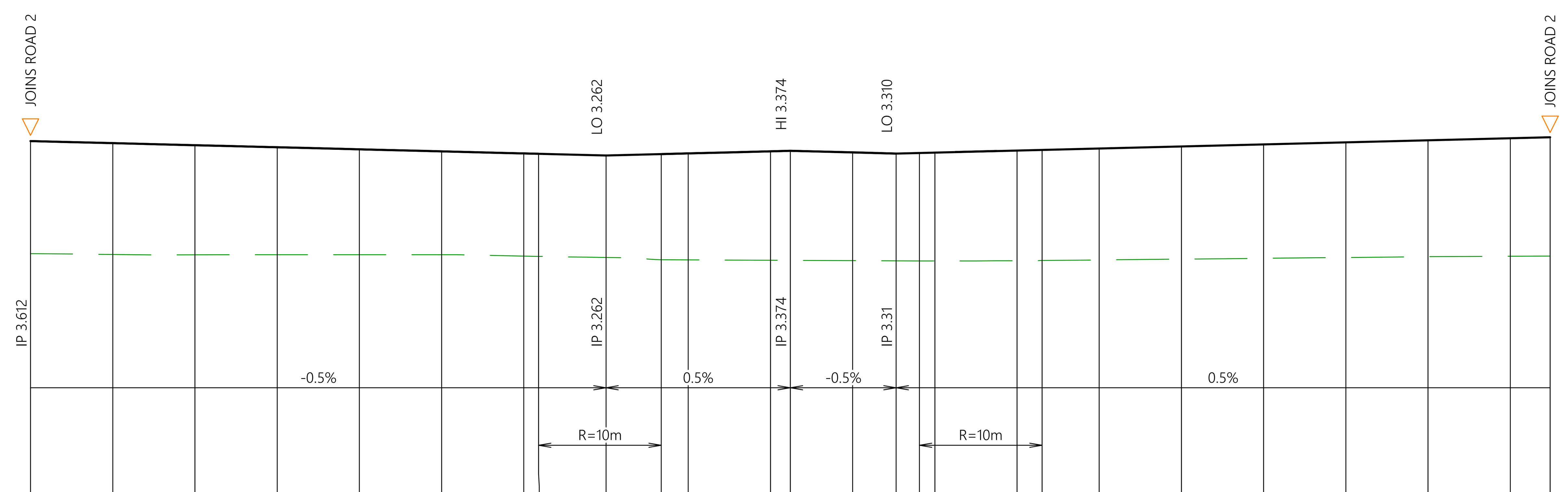
TITLE
110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

PROJECT
PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: ROAD LONGITUDINAL SECTIONS - SHEET 4

DWG No: D10 | SHEET: 10 OF 43 | REV: 1

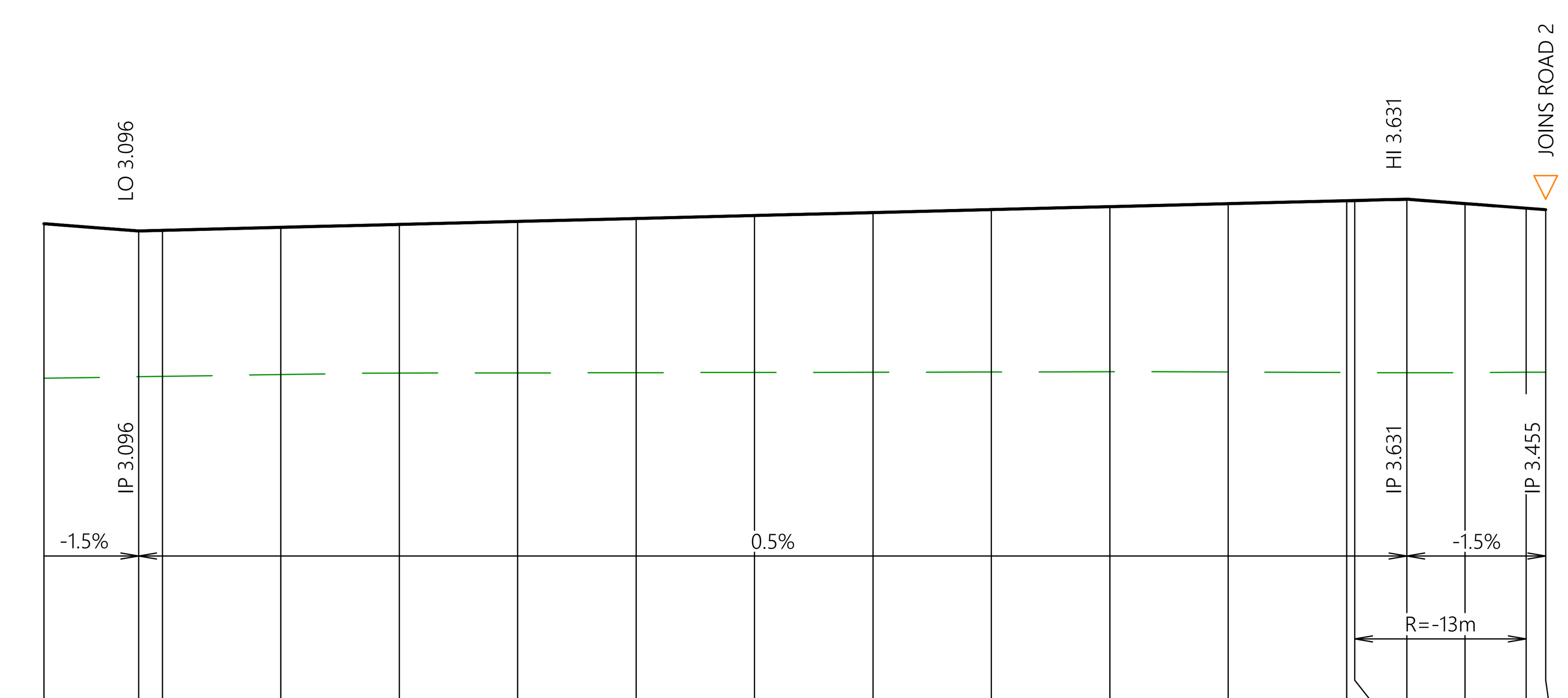


DATUM RL-5.0

CHAINAGES	CUT / FILL	DESIGN SURFACE	NATURAL SURFACE
0.000		3.612	
10.000	-2.712	3.562	0.850
20.000	-2.67	3.512	0.842
30.000	-2.62	3.462	0.842
40.000	-2.569	3.412	0.843
50.000	-2.518	3.362	0.844
60.000	-2.501	3.312	0.811
61.800	-2.499	3.303	0.804
70.000	-2.486	3.262	0.776
76.723	-2.575	3.296	0.720
80.000	-2.595	3.312	0.717
90.000	-2.653	3.362	0.708
92.419	-2.668	3.374	0.706
100.000	-2.637	3.336	0.700
105.289	-2.615	3.31	0.695
108.122	-2.631	3.324	0.692
110.000	-2.642	3.333	0.691
120.000	-2.686	3.383	0.697
123.045	-2.696	3.398	0.703
130.000	-2.717	3.433	0.717
140.000	-2.747	3.483	0.737
150.000	-2.777	3.533	0.756
160.000	-2.807	3.583	0.776
170.000	-2.837	3.633	0.796
180.000	-2.879	3.683	0.804
184.845	-2.899	3.707	0.808

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 10

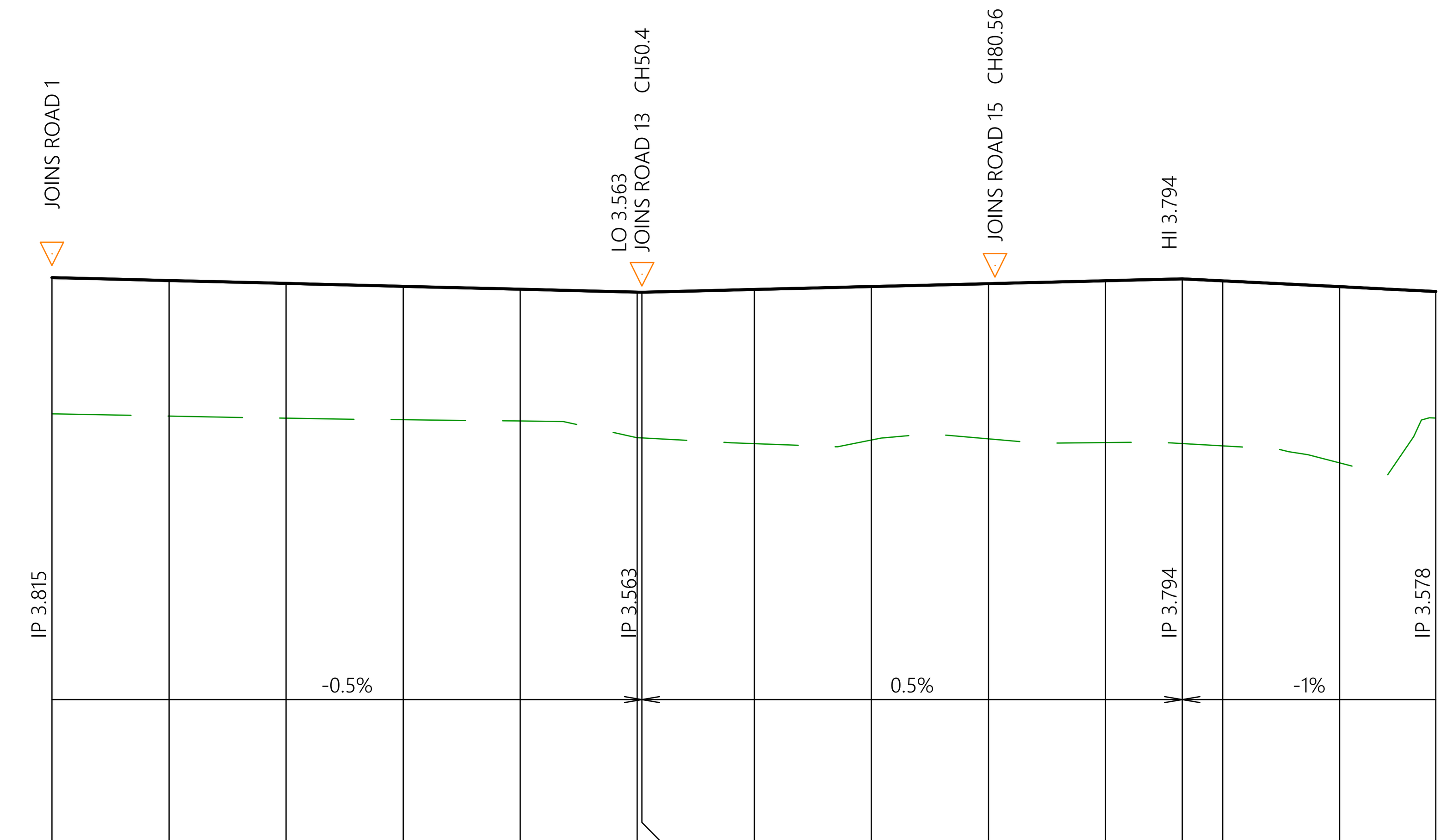


DATUM RL-5.0

CHAINAGES	CUT / FILL	DESIGN SURFACE	NATURAL SURFACE
0.000	-2.61	3.216	0.606
8.000	-2.465	3.096	0.631
10.000	-2.469	3.106	0.637
20.000	-2.488	3.156	0.668
30.000	-2.514	3.206	0.692
40.000	-2.56	3.256	0.696
50.000	-2.606	3.306	0.700
60.000	-2.653	3.356	0.703
70.000	-2.699	3.406	0.707
80.000	-2.745	3.456	0.710
90.000	-2.792	3.506	0.714
100.000	-2.845	3.556	0.710
110.000	-2.904	3.606	0.702
110.686	-2.908	3.609	0.701
115.097	-2.932	3.631	0.699
120.000	-2.857	3.558	0.701
125.156	-2.774	3.48	0.706
126.815			0.709

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 11



DATUM RL-6.0

CHAINAGES	CUT / FILL	DESIGN SURFACE	NATURAL SURFACE
0.000		3.815	
10.000	-2.317	3.765	1.448
20.000	-2.303	3.715	1.412
30.000	-2.28	3.665	1.385
40.000	-2.253	3.615	1.362
50.000	-2.487	3.565	1.079
50.401	-2.489	3.563	1.074
60.000	-2.636	3.611	0.975
70.000	-2.624	3.661	1.038
80.000	-2.652	3.711	1.059
90.000	-2.767	3.761	0.995
96.556	-2.816	3.794	0.978
100.000	-2.823	3.76	0.937
110.000	-3.014	3.66	0.645
118.200	-2.164	3.578	1.413

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 12

10 5 0 10 20 30
Horizontal Scale 1:500 (A1)
1:1000 (A3)

2 1 0 2 4 6
Vertical Scale 1:100 (A1)
1:200 (A3)

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ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN
DATE: JAN 2024
DRAWN: A.SCHMID
SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING
SHEET SIZE: A1

ISSUED FOR DEVELOPMENT APPROVAL
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CLIENT
CLIFTON YAMBA LAND PTY LTD

TITLE
110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

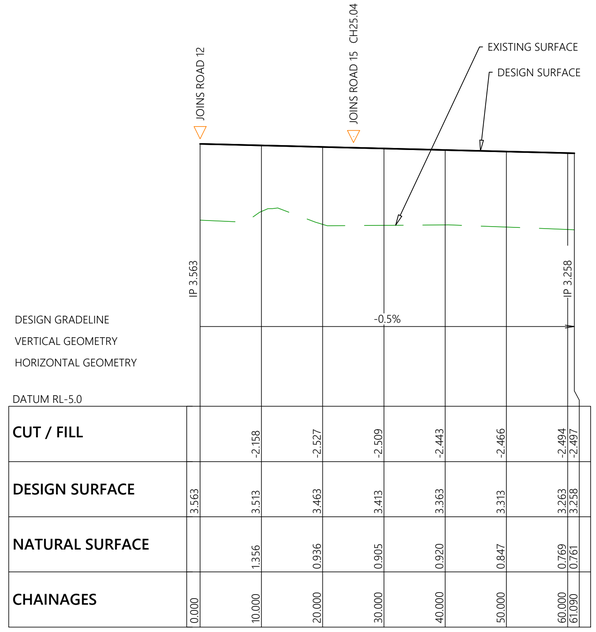
CLIFTON YAMBA

PROJECT
PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: ROAD LONGITUDINAL SECTIONS - SHEET 5

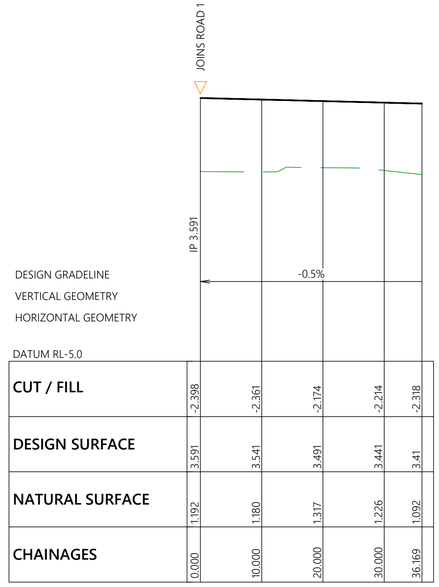
DWG No: D11
SHEET: 11 OF 43
REV: 1



DESIGN GRADELINE								
VERTICAL GEOMETRY								
HORIZONTAL GEOMETRY								
DATUM RL-5.0								
CUT / FILL		-2.158	-2.527	-2.509	-2.443	-2.466	-2.494	-2.497
DESIGN SURFACE	3.563	3.513	3.463	3.413	3.363	3.313	3.263	3.258
NATURAL SURFACE		1.356	0.936	0.905	0.920	0.847	0.769	0.761
CHAINAGES	0.000	10.000	20.000	30.000	40.000	50.000	60.000	61.090

Horizontal 1:500 Vertical 1:100

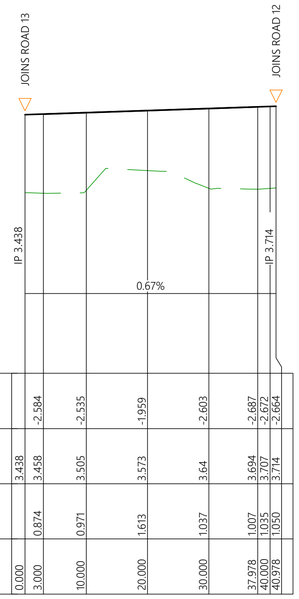
LONGITUDINAL SECTION - ROAD 13



DESIGN GRADELINE						
VERTICAL GEOMETRY						
HORIZONTAL GEOMETRY						
DATUM RL-5.0						
CUT / FILL	-2.398	-2.361	-2.174	-2.214	-2.318	
DESIGN SURFACE	3.591	3.541	3.491	3.441	3.41	
NATURAL SURFACE	1.192	1.180	1.317	1.226	1.092	
CHAINAGES	0.000	10.000	20.000	30.000	36.169	

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 14



DESIGN GRADELINE							
VERTICAL GEOMETRY							
HORIZONTAL GEOMETRY							
DATUM RL-5.0							
CUT / FILL		-2.584	-2.535	-1.959	-2.603	-2.687	-2.672	-2.664
DESIGN SURFACE	3.438	3.458	3.505	3.573	3.64	3.694	3.707	3.714
NATURAL SURFACE		0.874	0.971	1.613	1.037	1.007	1.035	1.050
CHAINAGES	0.000	3.000	10.000	20.000	30.000	37.978	40.000	46.978

Horizontal 1:500 Vertical 1:100

LONGITUDINAL SECTION - ROAD 15

10 5 0 10 20 30
Horizontal Scale 1:500 (A1)
1:1000 (A3)

2 1 0 2 4 6
Vertical Scale 1:100 (A1)
1:200 (A3)

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ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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MDE Manage Design Engineer

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

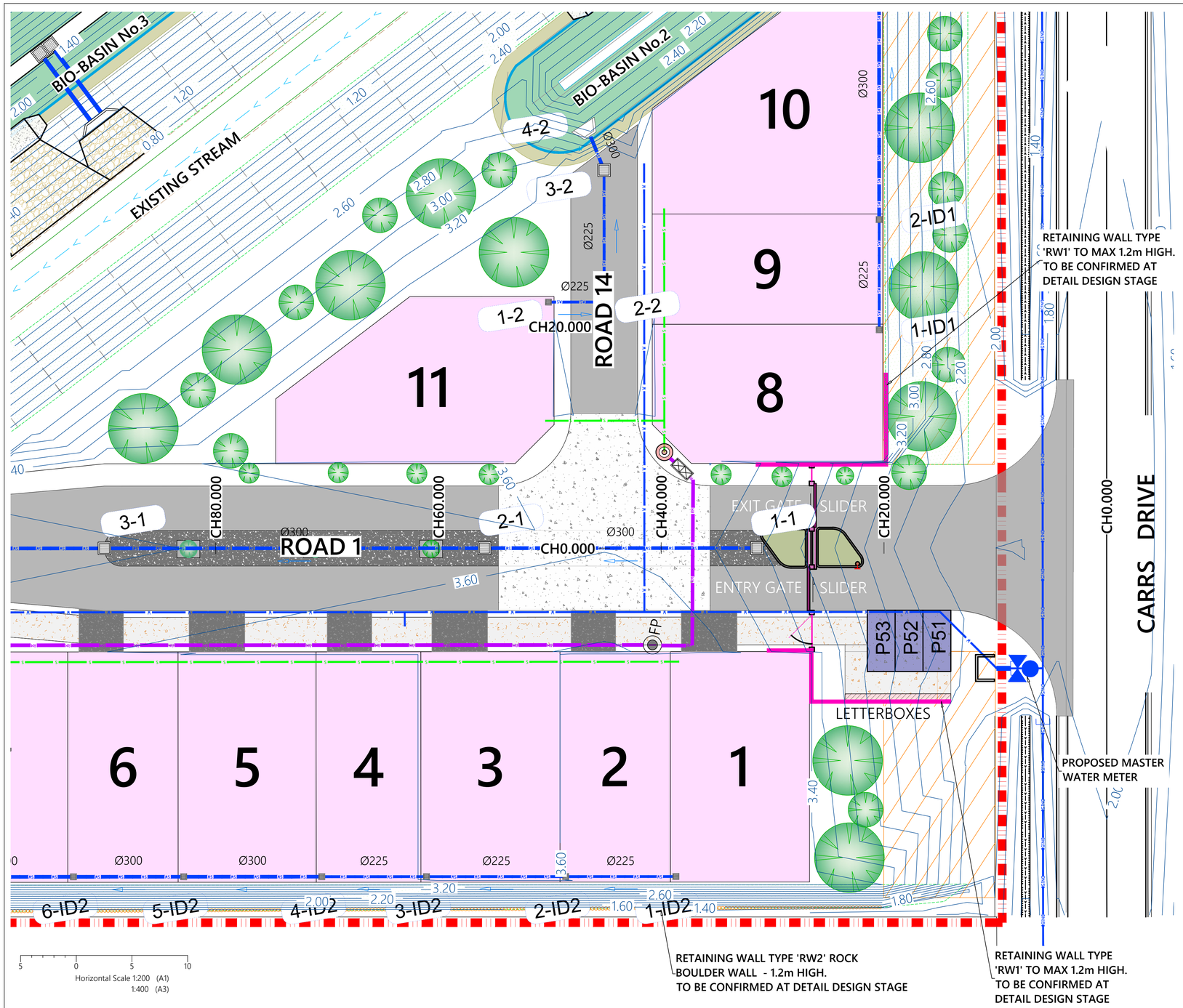
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

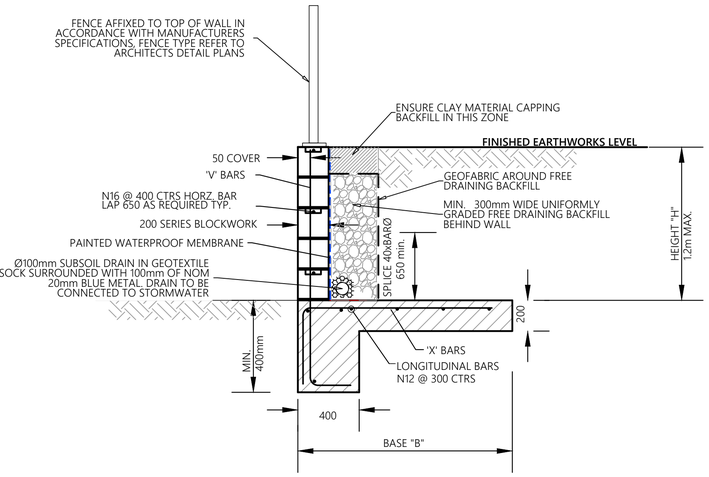
DRAWING TITLE: ROAD LONGITUDINAL SECTIONS - SHEET 6

DWG No: D12 | SHEET: 12 OF 43 | REV: 1



INTERSECTION DETAIL PLAN - ROAD 1 & CARRS DRIVE

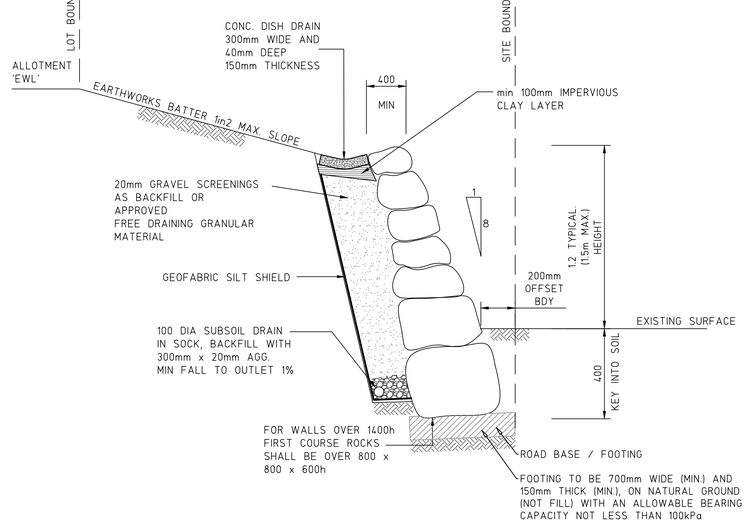
SCALE 1:200



TYPICAL - RETAINING WALL - TYPE 'RW1'

NOTE:
BLOCK WALL TO BE CORE FILLED

BLOCK RETAINING WALL SCHEDULE TYPE RW1				
WALL HEIGHT 'H'	WALL THICKNESS	BASE WIDTH 'B'	BARS	
			"V" - BARS	"X" - BARS
600 TO 1000	200	1000	N16 @ 400 CTRS	N16 @ 400 CTRS
1000 TO 1200	200	1200	N16 @ 400 CTRS	N16 @ 400 CTRS



NOTE: EXCAVATIONS FOR FOOTING SHALL BE INSPECTED BY A GEOTECHNICAL ENGINEER AT THE TIME OF BULK EXCAVATION TO CONFIRM THE NOMINATED SOIL BEARING CAPACITIES HAVE BEEN ACHIEVED.

RETAINING WALL TYPE RW2 - LOW HEIGHT ROCK BOULDER WALL

N.T.S

PRELIMINARY PLANS FOR DA PURPOSES ONLY NOT FOR CONSTRUCTION

PLANS TO BE PRINTED IN COLOUR

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

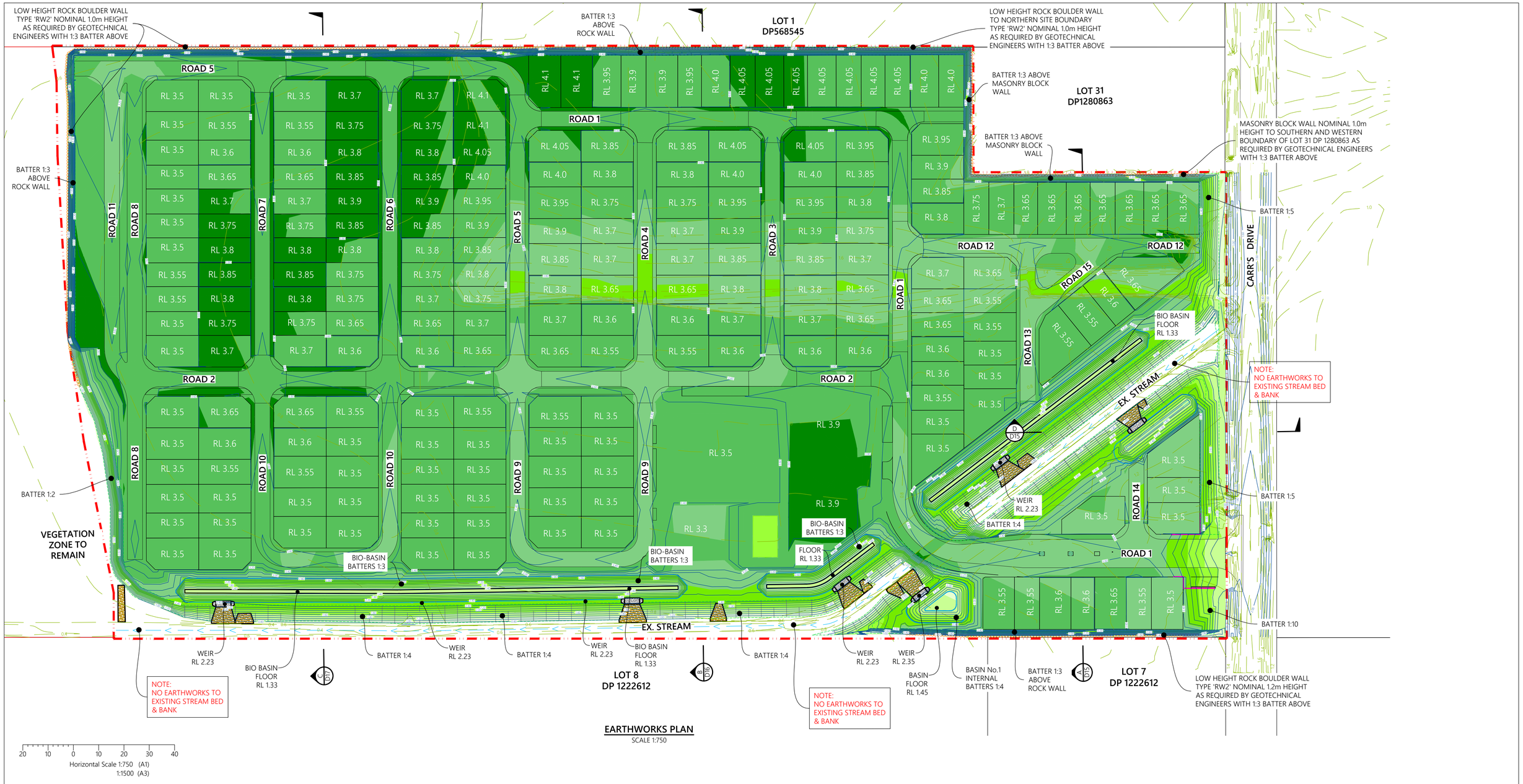
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: INTERSECTION DETAIL PLAN - ROAD 1 & CARRS DRIVE

DWG No: D13 | SHEET: 13 OF 43 | REV: 1



EARTHWORKS PLAN

SCALE 1:750

20 10 0 10 20 30 40

Horizontal Scale 1:750 (A1)
1:1500 (A3)

LEGEND

- FILL 0.0 - 0.5m DEPTH
- FILL 0.5 - 1.0m DEPTH
- FILL 1.0 - 1.5m DEPTH
- FILL 1.5 - 2.0m DEPTH
- FILL 2.0 - 2.5m DEPTH
- FILL 2.5 - 3.0m DEPTH
- FILL 3.0- 3.2m DEPTH
- 6.6 EXISTING SITE CONTOURS 0.1m INTERVAL
- 2.6 PROPOSED RE-GRADING CONTOURS 0.2m INTERVAL

PRELIMINARY EARTHWORKS ESTIMATE

EARTHWORKS CUT TO FILL FROM NOMINAL 100mm DEEP STRIPPED SURFACE. TOPSOIL DEPTH TO BE CONFIRMED AT DETAILED DESIGN STAGE.

VOLUMES INCLUDING NOMINAL INTERNAL ROADWAY BOXING 320mm DEEP

AREA OF EARTHWORKS =9.67Ha (EXCL. CARRS DRIVE RECONSTRUCTION)
TOPSOIL STRIPPED TO STOCKPILE = 9,670m^3

GENERAL BULK EARTHWORKS
TOTAL CUT = 0m^3
TOTAL FILL = 239,700m^3 (IMPORTED FROM APPROVED SOURCE or QUARRY)

* NOTES:
AMENDED LOWER CLARENCE FLOOD MODEL 2022 WITH 1% AEP FLOOD LEVEL RL=3.5m AHD

ALLOTMENT EARTHWORKS LEVELS TO BE NO LESS THAN THE 100 YEAR (1% AEP) FLOOD LEVEL RL=3.5m AHD.

PLANS TO BE PRINTED IN COLOUR

PRELIMINARY PLANS FOR DA PURPOSES ONLY NOT FOR CONSTRUCTION

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

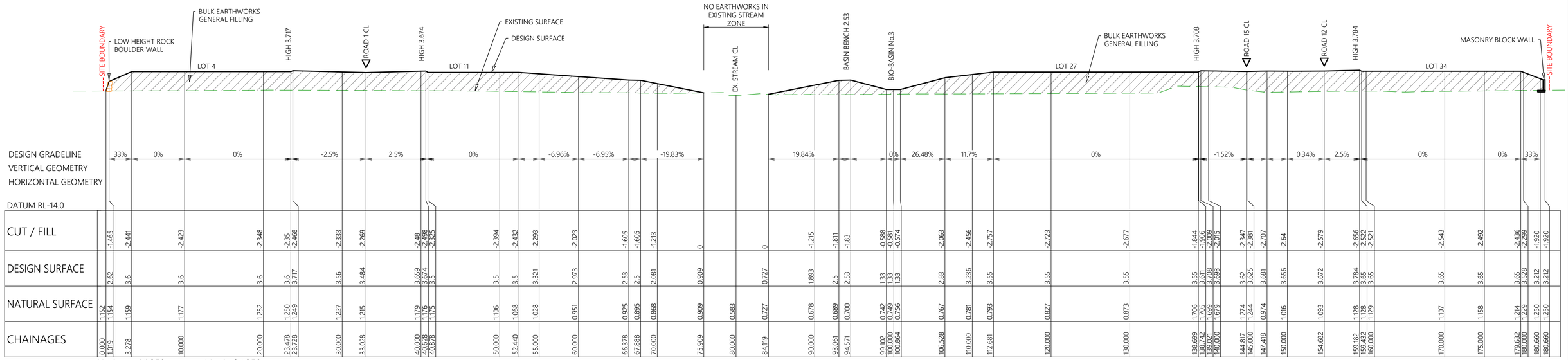
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

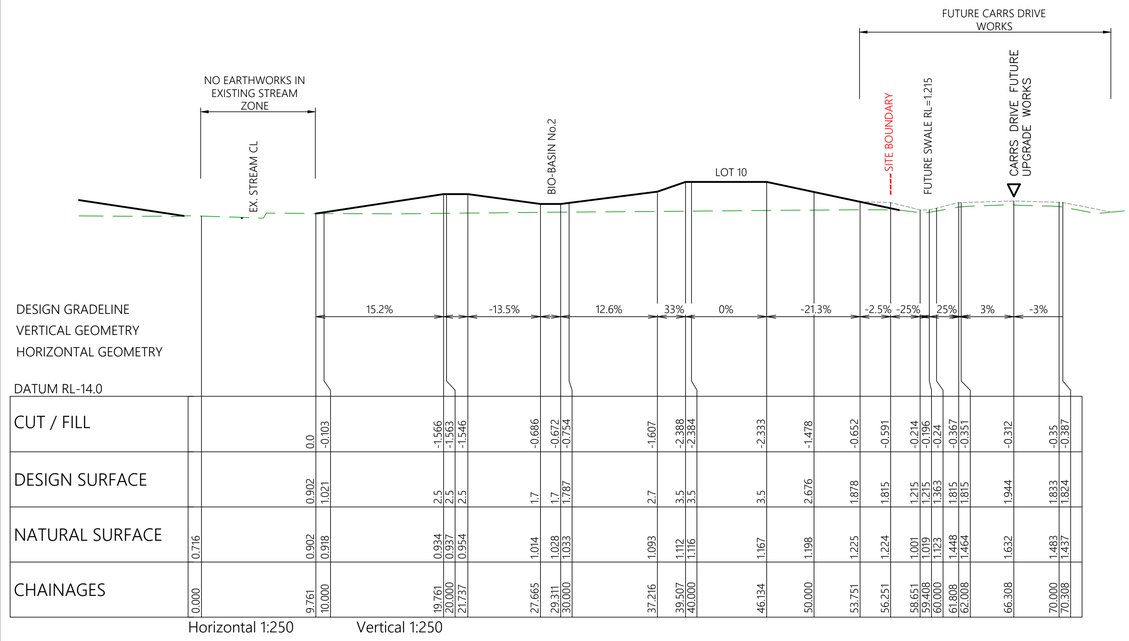
DA CIVIL DRAWING

DRAWING TITLE: EARTHWORKS PLAN

DWG No: D14 | SHEET: 14 OF 43 | REV: 1



BULK EARTHWORKS SECTION - A



BULK EARTHWORKS SECTION - D

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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DEVELOPMENT APPLICATION CIVIL WORKS PLANS

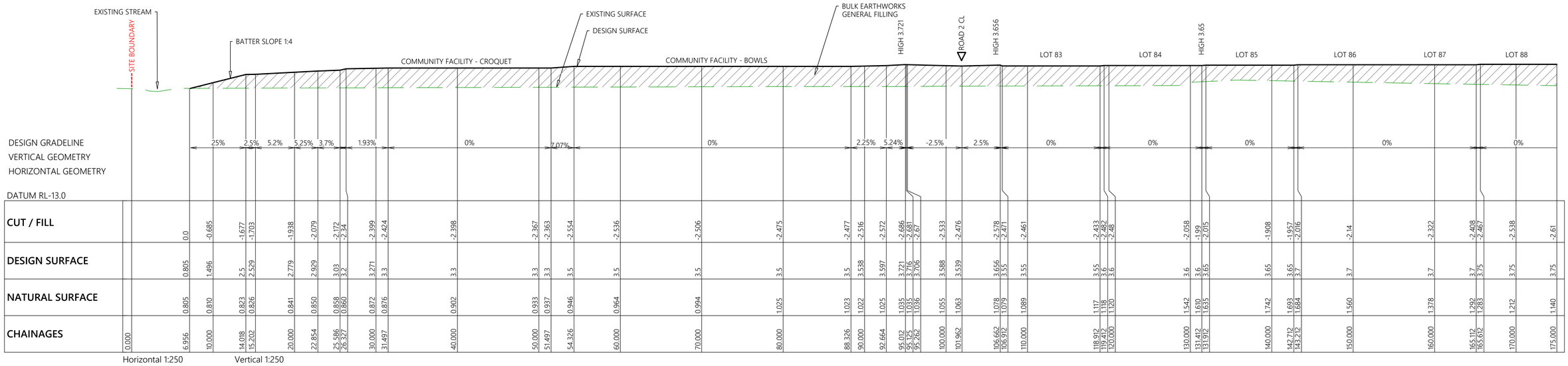
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PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

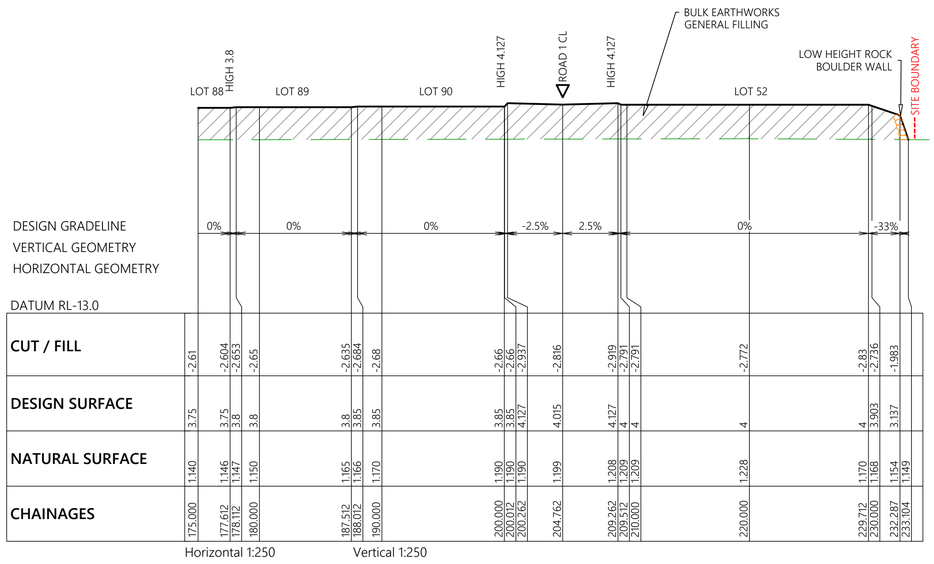
DA CIVIL DRAWING

DRAWING TITLE: EARTHWORKS SECTIONS - SHEET 1 OF 3

DWG No: D15 | SHEET: 15 OF 43 | REV: 1



BULK EARTHWORKS SECTION - B



CONTINUATION SECTION - B

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
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SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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CLIENT: CLIFTON YAMBA LAND PTY LTD

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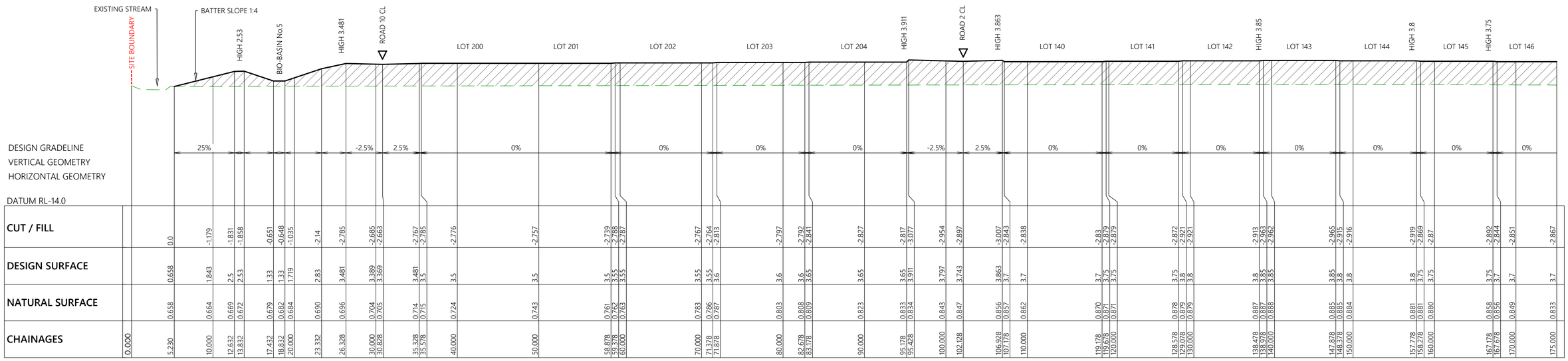
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110 & 120 CARRS DRIVE
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LOT 2 DP733507 & LOT 32 DP128863

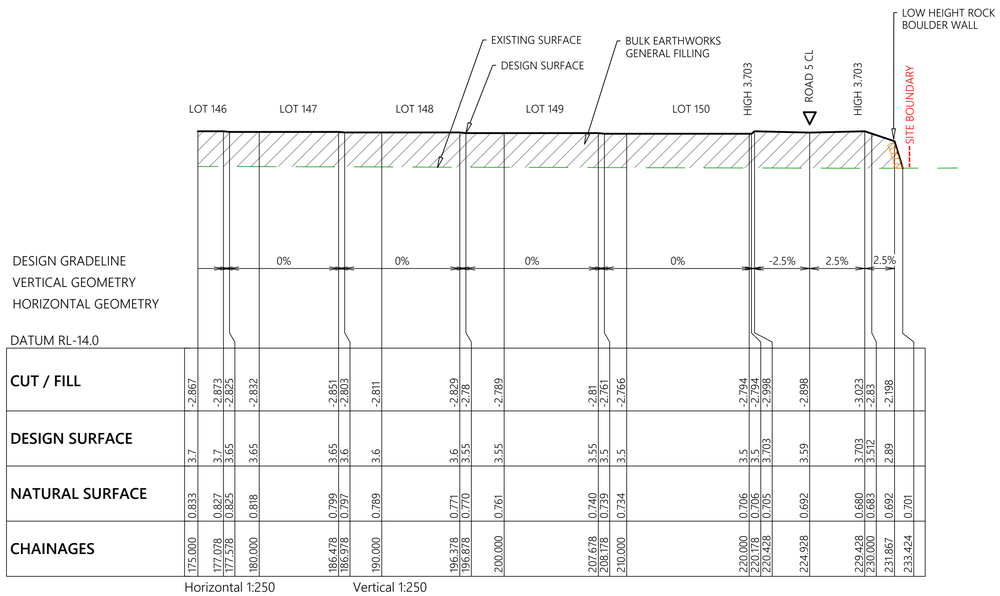
DA CIVIL DRAWING

DRAWING TITLE: EARTHWORKS SECTIONS - SHEET 2 OF 3

DWG No: D16 | SHEET: 16 OF 43 | REV: 1



BULK EARTHWORKS SECTION - C



CONTINUATION SECTION - C

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

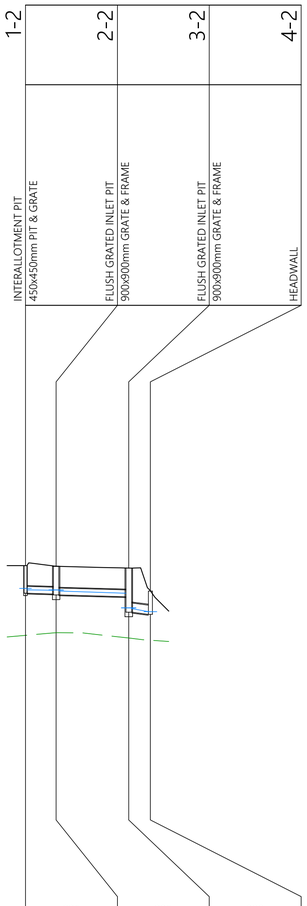
DA CIVIL DRAWING

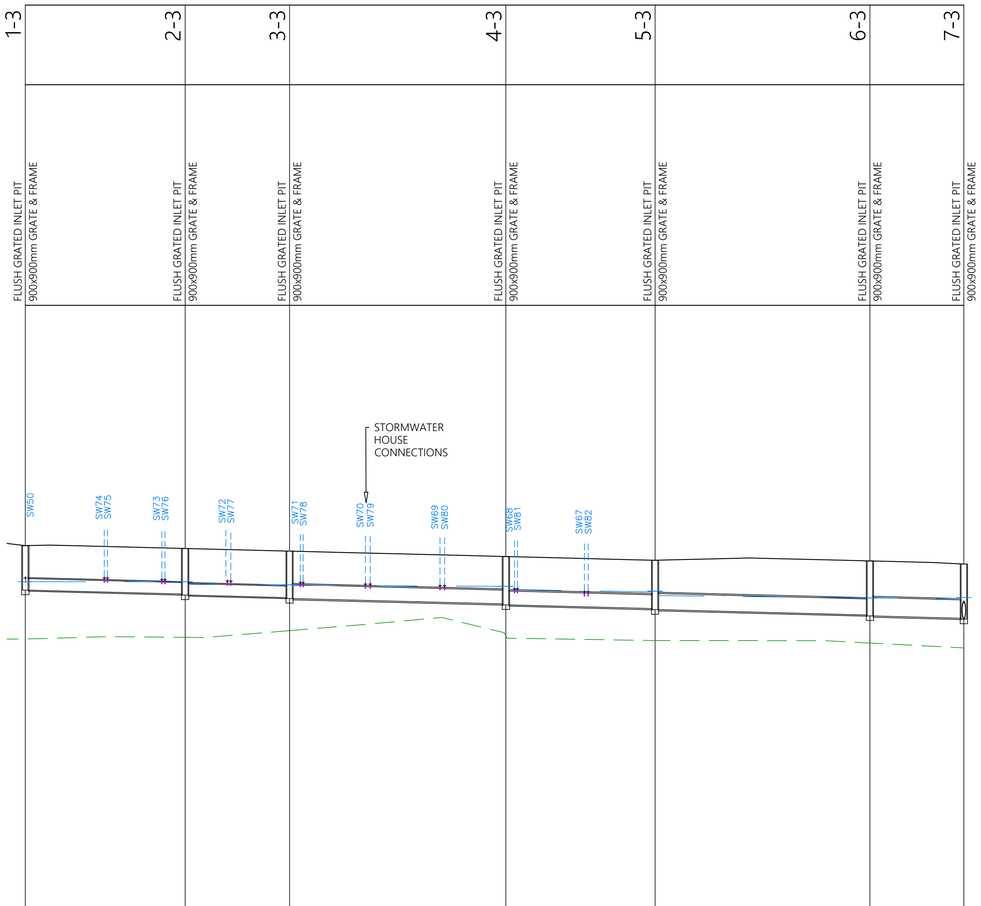
DRAWING TITLE: EARTHWORKS SECTIONS - SHEET 3 OF 3

DWG No: D17 | SHEET: 17 OF 43 | REV: 1

STRUCTURE NAME	1-1	2-1	3-1	4-1	5-1	1-2	2-2	3-2	4-2	1-3	2-3	3-3	4-3	5-3	6-3	7-3
STRUCTURE DESCRIPTION	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	HEADWALL	INTERALLOTMENT PIT 450x450mm PIT & GRATE	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	HEADWALL	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME
PIPE SIZE (mm)	300	300	300	300		225	225	300		375	375	450	450	525	600	
PIPE SIZE / CLASS	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO		STORM-PRO	STORM-PRO	STORM-PRO		STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	
PIPE GRADE (%)	0.50%	0.50%	0.50%	0.50%		0.50%	0.50%	2.00%		0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	
PIPE SLOPE (1 in X)	200.0	200.0	200.0	200.0		200.0	200.0	50.0		200.0	200.0	200.0	200.0	200.0	200.0	
PIPE FLOW (cumecs)	0.011	0.027	0.045	0.078		0.014	0.019	0.025		0.000	0.054	0.086	0.161	0.222	0.229	
CAPACITY FLOW (cumecs)	0.068	0.068	0.068	0.068		0.032	0.032	0.137		0.124	0.124	0.202	0.202	0.304	0.434	
FULL PIPE VELOCITY (m/s)	0.15	0.39	0.63	1.10		0.36	0.49	0.35		0.00	0.49	0.54	1.01	1.03	0.81	
NORMAL DEPTH VELOCITY (m/s)	0.71	0.91	1.03	1.10		0.78	0.84	1.47		0.00	1.08	1.22	1.41	1.53	1.56	
DATUM RL	-14.000					-14.000				-14.000						
HGL 10% AEP (10YR)	2.177 2.169	2.140 2.116	2.096 2.059	2.010 2.022	1.853	2.757 2.710	2.699 2.705	2.672 2.601	2.720 2.103	1.998	2.976	2.976 2.890	2.876 2.855	2.825 2.721	2.644 2.669	2.524 2.446	2.426 2.459
DEPTH TO INVERT	1.139	1.571	1.601 1.632	1.632 1.662	1.116	0.900	0.905	0.935	1.438	0.762	1.449	1.488	1.518 1.548	1.547	1.577	1.610	1.764 1.794	1.768
INVERT LEVEL AT PIT	2.088	1.965	1.935 1.735	1.620 1.590	1.534	2.600	2.575	2.545	2.486	1.983	1.912	2.703	2.573	2.543 2.458	2.428 2.251	2.221 2.099	2.066 1.891	1.861 1.784
DESIGN SURFACE LEVEL	3.227 (1.236)	3.537 (1.177)	3.366 (1.215)	3.251 (0.933)	2.650 (1.063)	3.500 (1.226)	3.480 (1.313)	3.421 (1.140)	2.674 (1.068)		4.152 (1.111)	4.061 (1.160)	3.976 (1.381)	3.798 (1.211)	3.676 (1.057)	3.655 (0.975)	3.553 (0.819)	
SETOUT COORDINATES	532130.557E 6742991.048N	532106.398E 6742994.854N	532072.683E 6743000.165N	532050.026E 6743003.734N	532044.457E 6742994.043N	532115.520E 6743015.789N	532120.460E 6743015.014N	532122.303E 6743026.714N	532121.520E 6743030.174N		532001.791E 6743185.386N	531997.727E 6743159.620N	531995.076E 6743142.778N	531989.588E 6743107.899N	531985.801E 6743083.837N	532020.441E 6743078.387N	532035.589E 6743076.003N	
CHAINAGE	0.000	24.457 24.457	34.131 58.588	22.936 81.524	11.177 92.701	0.000	5.000 5.000	11.844 16.844	3.547 20.391		0.000	26.085 26.085	17.049 43.134	35.309 78.443	24.357 102.800	35.066 137.866	15.334 153.200	
LINE	1					2					3							







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Horizontal Scale 1:500 (A1) 1:1000 (A3)

Vertical Scale 1:100 (A1) 1:200 (A3)

ISSUE	DESCRIPTION	DATE
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DESIGNED: T.RYDEN | DATE: JAN 2024
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TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

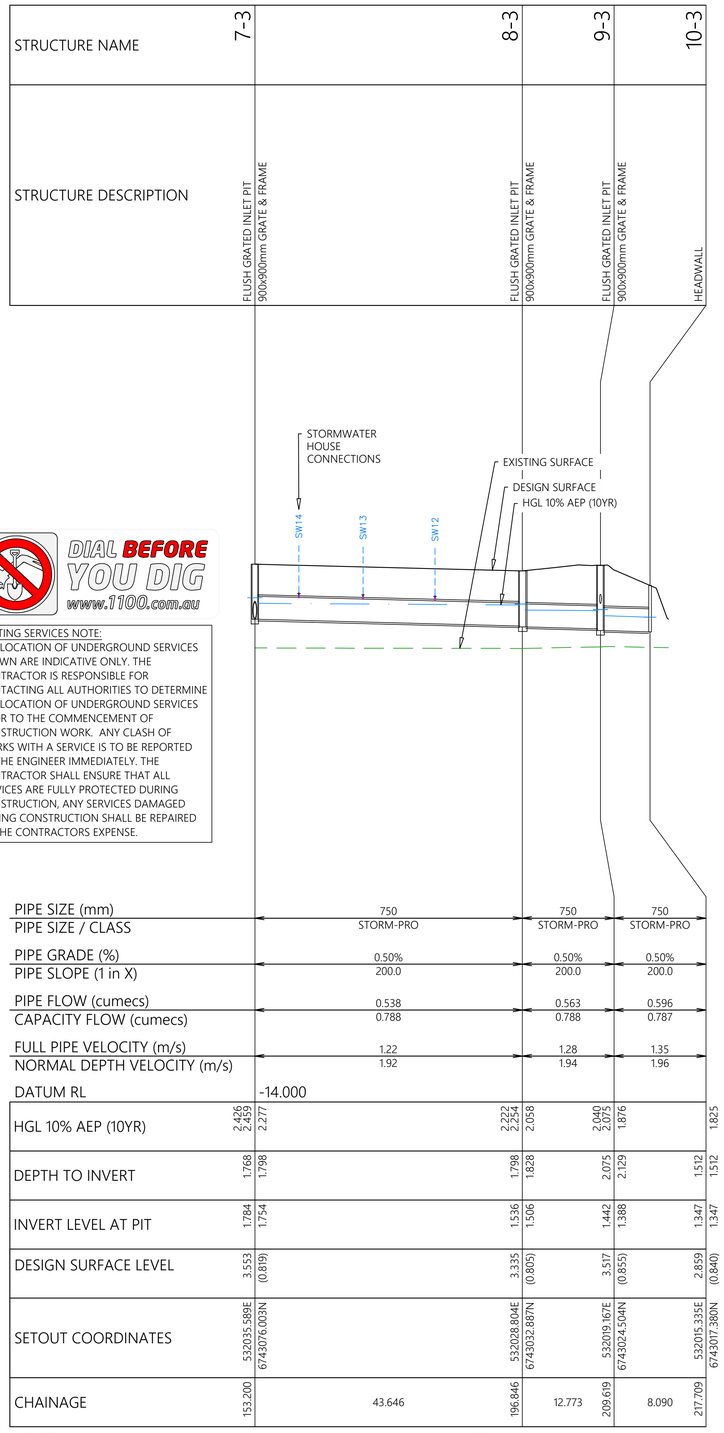
CLIFTON YAMBA

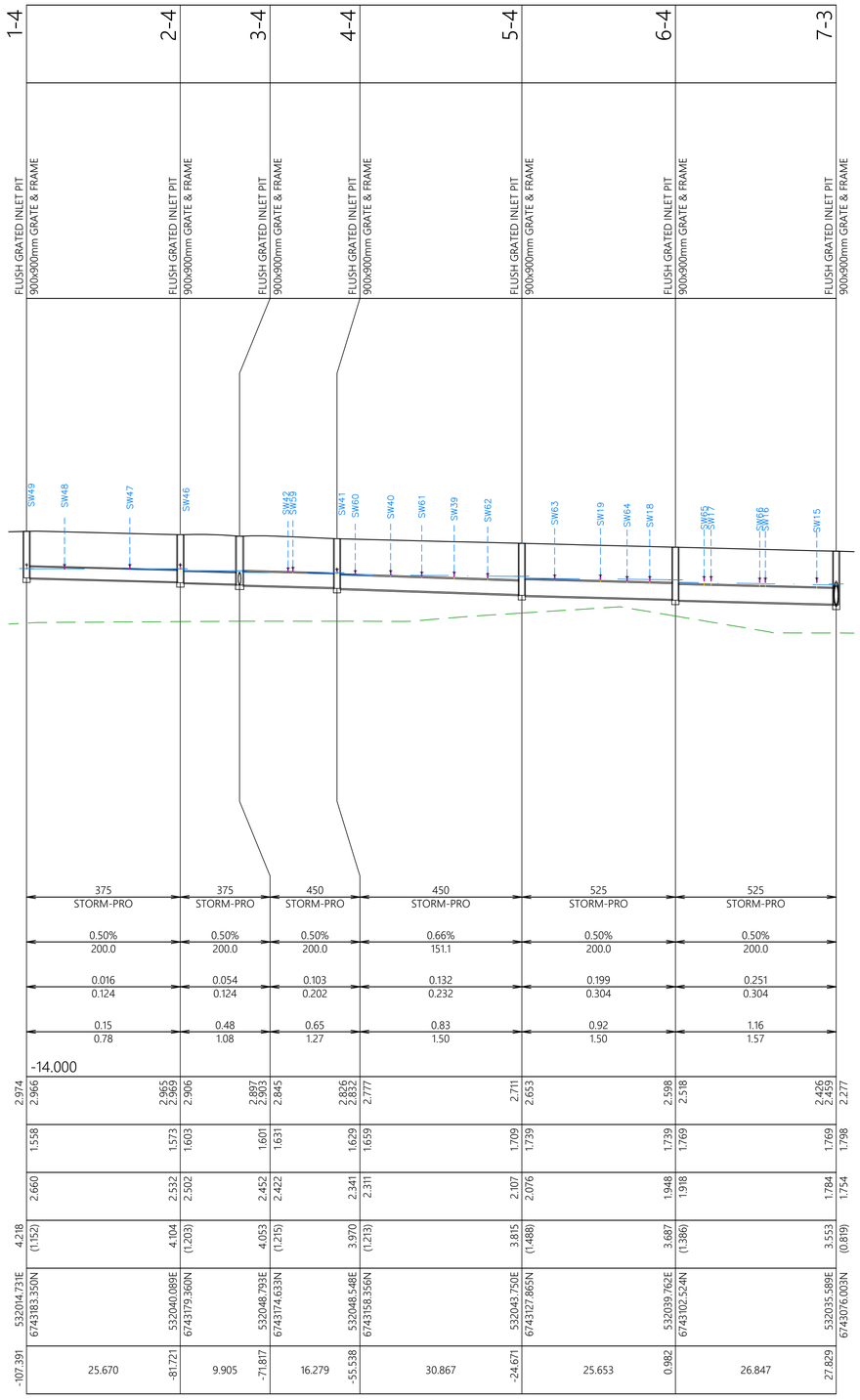
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YAMBA, NSW 2464
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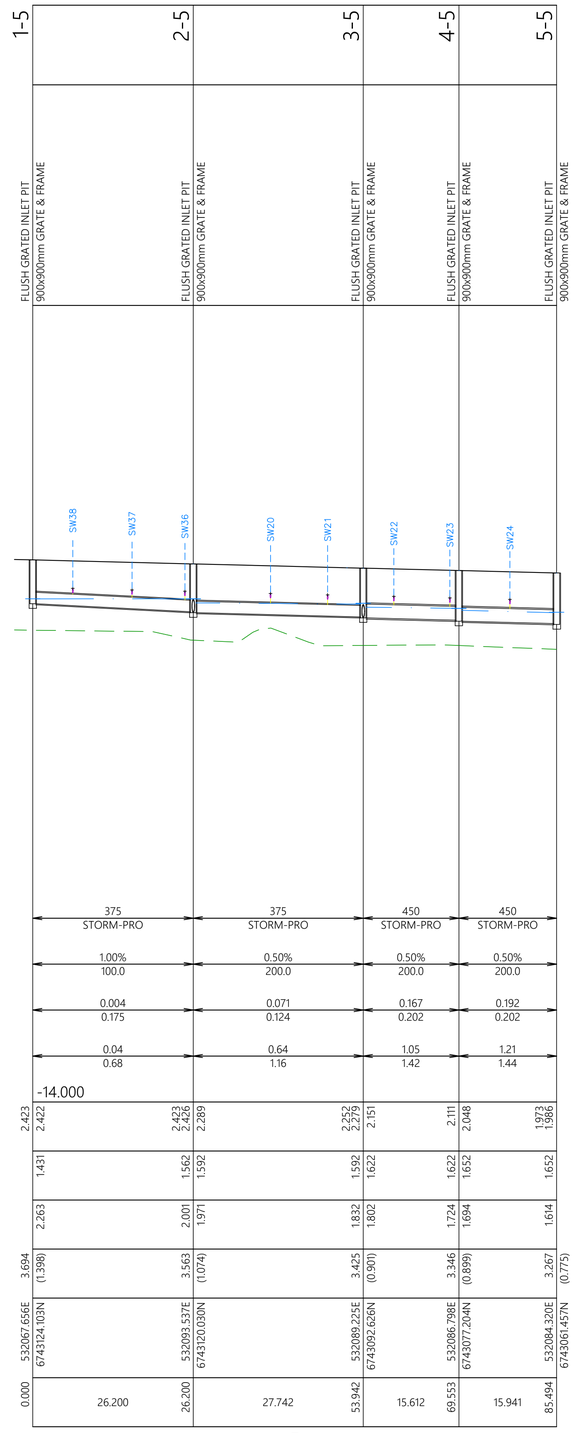
DA CIVIL DRAWING

DRAWING TITLE: STORMWATER LONGITUDINAL SECTION - SHEET 1

DWG No: D18 | SHEET: 18 OF 43 | REV: 1







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STRUCTURE NAME	7-3	8-3	9-3	10-3
STRUCTURE DESCRIPTION	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	HEADWALL
PIPE SIZE (mm)	750	750	750	
PIPE SIZE / CLASS	STORM-PRO	STORM-PRO	STORM-PRO	
PIPE GRADE (%)	0.50%	0.50%	0.50%	
PIPE SLOPE (1 in X)	200.0	200.0	200.0	
PIPE FLOW (cumecs)	0.538	0.563	0.596	
CAPACITY FLOW (cumecs)	0.788	0.788	0.787	
FULL PIPE VELOCITY (m/s)	1.22	1.28	1.35	
NORMAL DEPTH VELOCITY (m/s)	1.92	1.94	1.96	
DATUM RL	-14.000			
HGL 10% AEP (10YR)	2.426 / 2.459	2.277 / 2.222 / 2.254	2.058 / 2.040 / 2.075	1.876 / 1.825
DEPTH TO INVERT	1.768	1.798 / 1.798	1.828 / 2.075	2.129 / 1.512 / 1.512
INVERT LEVEL AT PIT	1.784 / 1.754	1.536	1.506 / 1.442	1.388 / 1.347 / 1.347
DESIGN SURFACE LEVEL	3.553 (0.819)	3.335 (0.805)	3.517 (0.855)	2.859 (0.840)
SETOUT COORDINATES	532035.589E 6743076.003N	532028.804E 6743032.887N	532019.167E 6743024.504N	532015.335E 6743017.380N
CHAINAGE	153.200	43.646 / 196.846	12.773 / 209.619	8.090 / 217.709
LINE	3			

STRUCTURE NAME	1-4	2-4	3-4	4-4	5-4	6-4	7-3
STRUCTURE DESCRIPTION	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME
PIPE SIZE (mm)	375	375	450	450	525	525	
PIPE SIZE / CLASS	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	
PIPE GRADE (%)	0.50%	0.50%	0.50%	0.66%	0.50%	0.50%	
PIPE SLOPE (1 in X)	200.0	200.0	200.0	151.1	200.0	200.0	
PIPE FLOW (cumecs)	0.016	0.054	0.103	0.132	0.199	0.251	
CAPACITY FLOW (cumecs)	0.124	0.124	0.202	0.232	0.304	0.304	
FULL PIPE VELOCITY (m/s)	0.15	0.48	0.65	0.83	0.92	1.16	
NORMAL DEPTH VELOCITY (m/s)	0.78	1.08	1.27	1.50	1.50	1.57	
DATUM RL	-14.000						
HGL 10% AEP (10YR)	2.974 / 2.966	2.965 / 2.969 / 2.906	2.897 / 2.903	2.845 / 2.826 / 2.832	2.777 / 2.711	2.653 / 2.598 / 2.518	2.426 / 2.459 / 2.277
DEPTH TO INVERT	1.558	1.573 / 1.603	1.601 / 1.631	1.629 / 1.659	1.709 / 1.739	1.739 / 1.769	1.769 / 1.798
INVERT LEVEL AT PIT	2.660	2.532 / 2.502	2.452 / 2.422	2.341 / 2.311	2.107 / 2.076	1.948 / 1.918	1.784 / 1.754
DESIGN SURFACE LEVEL	4.218 (1.152)	4.104 (1.203)	4.053 (1.215)	3.970 (1.213)	3.815 (1.488)	3.687 (1.386)	3.553 (0.819)
SETOUT COORDINATES	532014.731E 6743183.350N	532040.089E 6743179.360N	532048.793E 6743174.633N	532048.548E 6743158.356N	532043.750E 6743127.865N	532039.762E 6743102.524N	532035.589E 6743076.003N
CHAINAGE	-107.391	25.670 / -81.721	9.905 / -71.817	16.279 / -55.538	30.867 / -24.671	25.653 / 0.982	26.847 / 27.829
LINE	4						

STRUCTURE NAME	1-5	2-5	3-5	4-5	5-5
STRUCTURE DESCRIPTION	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME
PIPE SIZE (mm)	375	375	450	450	
PIPE SIZE / CLASS	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	
PIPE GRADE (%)	1.00%	0.50%	0.50%	0.50%	
PIPE SLOPE (1 in X)	100.0	200.0	200.0	200.0	
PIPE FLOW (cumecs)	0.004	0.071	0.167	0.192	
CAPACITY FLOW (cumecs)	0.175	0.124	0.202	0.202	
FULL PIPE VELOCITY (m/s)	0.04	0.64	1.05	1.21	
NORMAL DEPTH VELOCITY (m/s)	0.68	1.16	1.42	1.44	
DATUM RL	-14.000				
HGL 10% AEP (10YR)	2.423 / 2.422	2.423 / 2.426 / 2.289	2.252 / 2.279 / 2.151	2.111 / 2.048	1.973 / 1.986
DEPTH TO INVERT	1.431	1.562 / 1.592	1.592 / 1.622	1.622 / 1.652	1.652
INVERT LEVEL AT PIT	2.263	2.001 / 1.971	1.832 / 1.802	1.724 / 1.694	1.614
DESIGN SURFACE LEVEL	3.694 (1.398)	3.563 (1.074)	3.425 (0.901)	3.346 (0.899)	3.267 (0.775)
SETOUT COORDINATES	532067.656E 6743124.103N	532093.537E 6743120.030N	532089.225E 6743092.626N	532086.798E 6743077.204N	532084.320E 6743061.457N
CHAINAGE	0.000	26.200 / 26.200	27.742 / 53.942	15.612 / 69.553	15.941 / 85.494
LINE	5				

Horizontal Scale 1:500 (A1) 1:1000 (A3)

Vertical Scale 1:100 (A1) 1:200 (A3)

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

MDE Manage Design Engineer

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

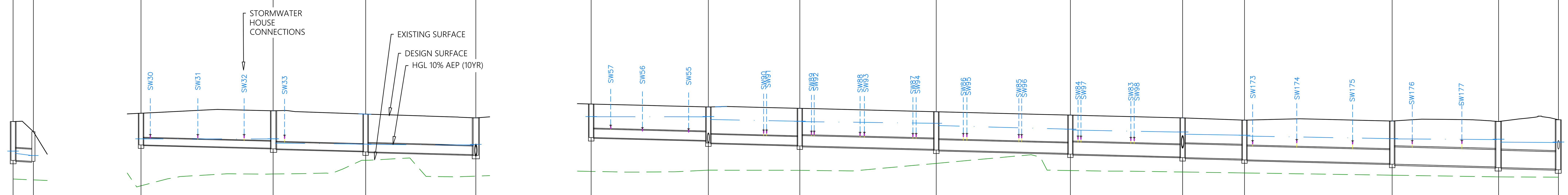
DA CIVIL DRAWING

DRAWING TITLE: STORMWATER LONGITUDINAL SECTION - SHEET 2

DWG No: D19 | SHEET: 19 OF 43 | REV: 1

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EXISTING SERVICES NOTE:
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LINE 5 (DATUM RL -14.000)

STRUCTURE NAME	STRUCTURE DESCRIPTION	HGL 10% AEP (10YR)	DEPTH TO INVERT	INVERT LEVEL AT PIT	DESIGN SURFACE LEVEL	SETOUT COORDINATES	CHAINAGE
5-5	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	1.973 / 1.986 / 1.890	1.652 / 1.682	1.614 / 1.584	3.267 (0.775)	532084.320E 6743061.457N	85.494
6-5	HEADWALL	1.796	1.290 / 1.290	1.540 / 1.540	2.830 (0.738)	532085.633E 6743057.249N	89.903

PIPE	PIPE SIZE (mm)	PIPE SIZE / CLASS	PIPE GRADE (%)	PIPE SLOPE (1 in X)	PIPE FLOW (cumecs)	CAPACITY FLOW (cumecs)	FULL PIPE VELOCITY (m/s)	NORMAL DEPTH VELOCITY (m/s)	LENGTH
5-5 to 6-5	525	STORM-PRO	1.00%	100.0	0.206	0.430	0.95	1.96	4.408

LINE 6 (DATUM RL -14.000)

STRUCTURE NAME	STRUCTURE DESCRIPTION	HGL 10% AEP (10YR)	DEPTH TO INVERT	INVERT LEVEL AT PIT	DESIGN SURFACE LEVEL	SETOUT COORDINATES	CHAINAGE
1-6	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	2.521 / 2.517	1.374	2.255	3.629 (0.483)	532155.477E 6743110.284N	-44.324
2-6	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	2.515 / 2.520 / 2.333	1.622 / 1.652	2.112 / 2.082	3.734 (0.994)	532127.186E 6743114.735N	-15.685
3-6	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	2.290 / 2.276	1.611 / 1.641	1.981 / 1.951	3.592 (1.590)	532109.783E 6743104.790N	4.360
3-5	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	2.252 / 2.279 / 2.151	1.593 / 1.622	1.832 / 1.802	3.425 (0.901)	532089.225E 6743092.626N	28.247

PIPE	PIPE SIZE (mm)	PIPE SIZE / CLASS	PIPE GRADE (%)	PIPE SLOPE (1 in X)	PIPE FLOW (cumecs)	CAPACITY FLOW (cumecs)	FULL PIPE VELOCITY (m/s)	NORMAL DEPTH VELOCITY (m/s)	LENGTH
1-6 to 2-6	300	STORM-PRO	0.50%	200.0	0.007	0.068	0.11	0.63	28.640
2-6 to 3-6	300	STORM-PRO	0.50%	200.0	0.051	0.068	0.72	1.06	20.044
3-6 to 3-5	375	STORM-PRO	0.50%	200.0	0.062	0.124	0.56	1.12	23.887

LINE 7 (DATUM RL -14.000)

STRUCTURE NAME	STRUCTURE DESCRIPTION	HGL 10% AEP (10YR)	DEPTH TO INVERT	INVERT LEVEL AT PIT	DESIGN SURFACE LEVEL	SETOUT COORDINATES	CHAINAGE
1-7	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	3.485 / 3.477	1.453	2.574	4.027 (1.106)	531926.895E 6743197.172N	-45.223
2-7	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	3.473 / 3.486 / 3.359	1.453 / 1.562	2.447 / 2.338	3.900 (1.159)	531951.983E 6743193.224N	-19.826
3-7	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	3.281 / 3.265	1.602 / 1.632	2.239 / 2.209	3.841 (1.150)	531948.912E 6743173.638N	0.000
4-7	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	3.194 / 3.094	1.631 / 1.661	2.061 / 2.031	3.692 (1.455)	531944.315E 6743144.423N	29.574
5-7	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	2.939 / 2.899	1.661 / 1.691	1.886 / 1.856	3.546 (1.145)	531939.796E 6743115.706N	58.644
6-7	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	2.810 / 2.815 / 2.720	1.690 / 1.720	1.734 / 1.704	3.424 (1.080)	531936.014E 6743091.672N	82.974
7-7	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	2.678 / 2.639	1.692 / 1.722	1.637 / 1.607	3.329 (1.039)	531933.929E 6743078.423N	96.386
8-7	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	2.527 / 2.530 / 2.516	1.842 / 1.872	1.447 / 1.417	3.289 (0.941)	531928.955E 6743046.812N	128.386
9-7	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	2.488 / 2.502 / 2.377	1.965 / 1.995	1.302 / 1.272	3.267 (0.870)	531922.824E 6743024.577N	151.451
10-7	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	2.358 / 2.381	2.138	1.207	3.344 (0.855)	531932.742E 6743016.195N	164.437

PIPE	PIPE SIZE (mm)	PIPE SIZE / CLASS	PIPE GRADE (%)	PIPE SLOPE (1 in X)	PIPE FLOW (cumecs)	CAPACITY FLOW (cumecs)	FULL PIPE VELOCITY (m/s)	NORMAL DEPTH VELOCITY (m/s)	LENGTH
1-7 to 2-7	375	STORM-PRO	0.50%	200.0	0.022	0.124	0.20	0.85	25.397
2-7 to 3-7	375	STORM-PRO	0.50%	200.0	0.110	0.124	1.00	1.27	19.826
3-7 to 4-7	450	STORM-PRO	0.50%	200.0	0.139	0.202	0.88	1.37	29.574
4-7 to 5-7	450	STORM-PRO	0.50%	200.0	0.208	0.202	1.31	1.44	29.070
5-7 to 6-7	525	STORM-PRO	0.50%	200.0	0.260	0.304	1.20	1.58	24.330
6-7 to 7-7	600	STORM-PRO	0.50%	200.0	0.346	0.434	1.22	1.70	13.412
7-7 to 8-7	600	STORM-PRO	0.50%	200.0	0.364	0.434	1.29	1.72	32.000
8-7 to 9-7	750	STORM-PRO	0.50%	200.0	0.391	0.788	0.89	1.78	23.065
9-7 to 10-7	750	STORM-PRO	0.50%	200.0	0.425	0.788	0.96	1.82	12.985

Horizontal Scale 1:500 (A1) 1:1000 (A3)
Vertical Scale 1:100 (A1) 1:200 (A3)

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DESIGNED: T.RYDEN | DATE: JAN 2024
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CLIENT
CLIFTON YAMBA LAND PTY LTD

TITLE
110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

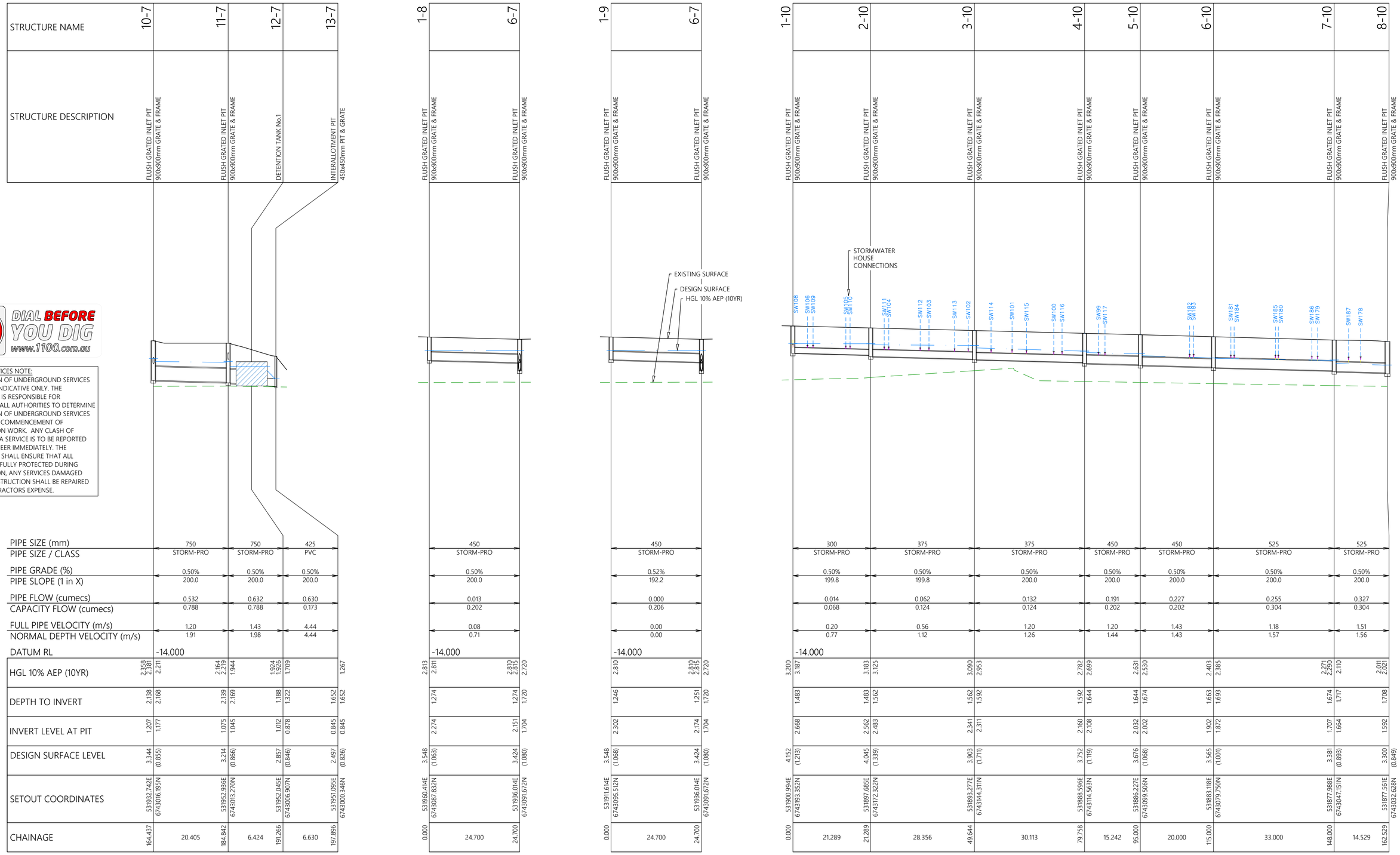
CLIFTON YAMBA

PROJECT
PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE:
STORMWATER LONGITUDINAL SECTION - SHEET 3

DWG No: D20 | SHEET: 20 OF 43 | REV: 1



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TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

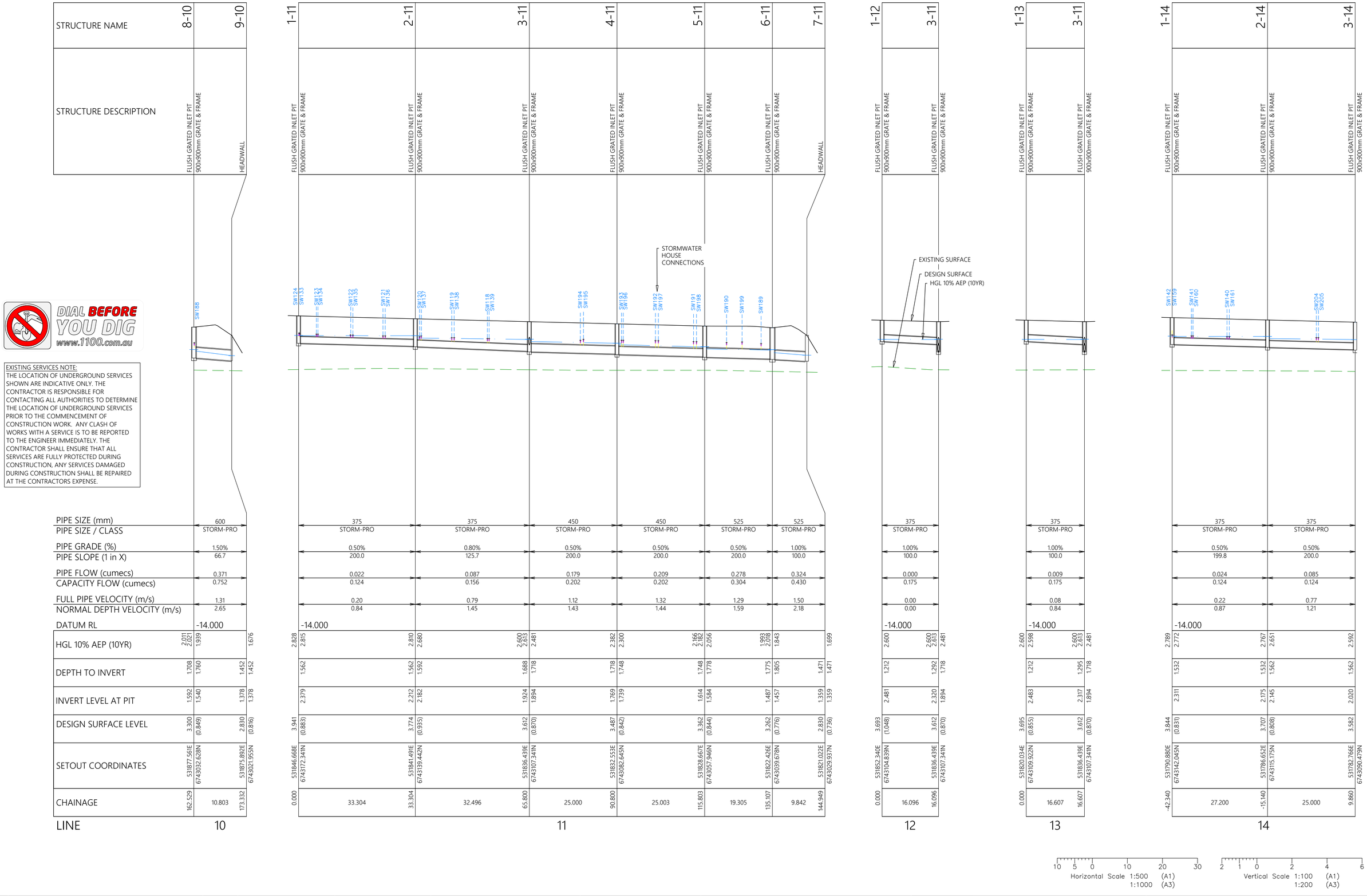
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: STORMWATER LONGITUDINAL SECTION - SHEET 4

DWG No: D21 | SHEET: 21 OF 43 | REV: 1



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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

CLIFTON YAMBA

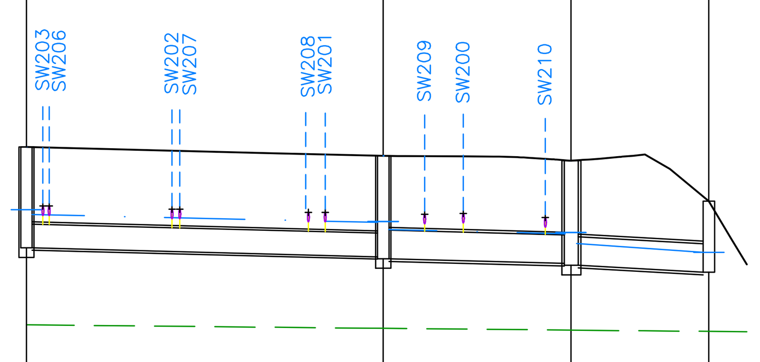
PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

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DRAWING TITLE: STORMWATER LONGITUDINAL SECTION - SHEET 5

DWG No: D22 | SHEET: 22 OF 43 | REV: 1

LINE 14

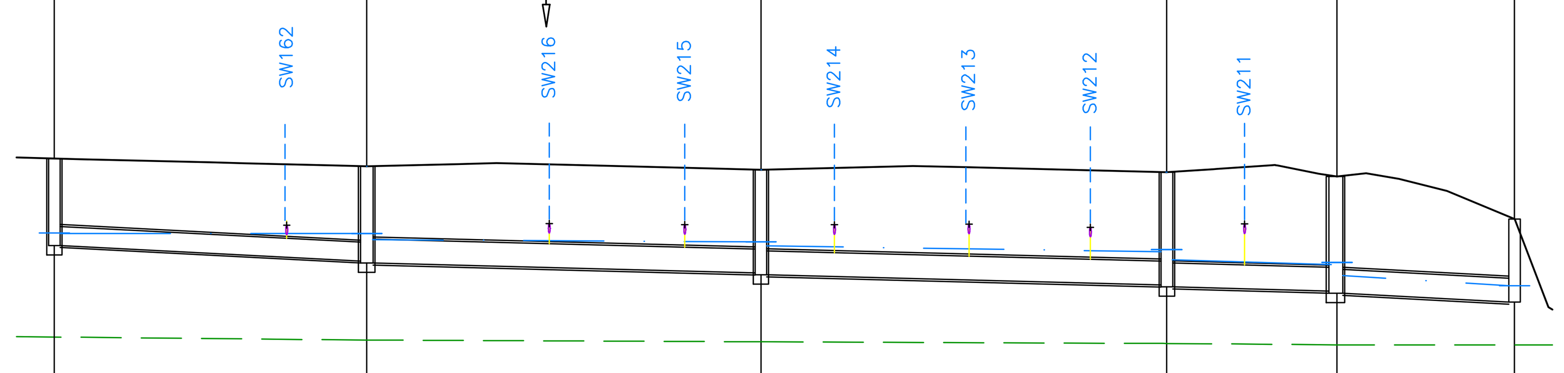


STRUCTURE NAME	3-14	4-14	5-14	6-14
STRUCTURE DESCRIPTION	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	HEADWALL
HGL 10% AEP (10YR)	2.592 2.516	2.393 2.406 2.278	2.213 2.234 2.058	1.919
DEPTH TO INVERT	1.562 1.592	1.592 1.622	1.621 1.651	1.121 1.121
INVERT LEVEL AT PIT	2.020 1.990	1.849 1.819	1.745 1.715	1.606 1.606
DESIGN SURFACE LEVEL	3.582 (0.776)	3.442 (0.720)	3.366 (0.693)	2.728 (0.671)
SETOUT COORDINATES	531782.766E 6743090.479N	531778.387E 6743062.649N	531778.247E 6743047.824N	531776.446E 6743037.077N
CHAINAGE	9.860	38.032	52.859	63.755

	3-14 to 4-14	4-14 to 5-14	5-14 to 6-14
PIPE SIZE (mm)	375	450	450
PIPE SIZE / CLASS	STORM-PRO	STORM-PRO	STORM-PRO
PIPE GRADE (%)	0.50%	0.50%	1.00%
PIPE SLOPE (1 in X)	200.0	200.0	100.0
PIPE FLOW (cumecs)	0.116	0.190	0.236
CAPACITY FLOW (cumecs)	0.124	0.202	0.285
FULL PIPE VELOCITY (m/s)	1.05	1.19	1.49
NORMAL DEPTH VELOCITY (m/s)	1.28	1.44	2.00
CHAINAGE (length)	28.172	14.826	10.896

DATUM RL -14.000

LINE 15

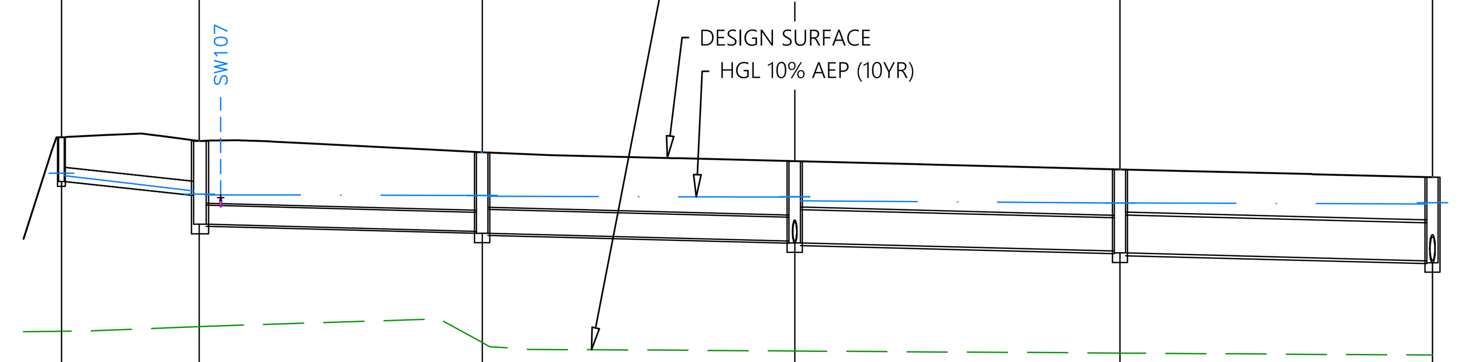


STRUCTURE NAME	1-15	2-15	3-15	4-15	5-15	6-15
STRUCTURE DESCRIPTION	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	HEADWALL
HGL 10% AEP (10YR)	2.402 2.395	2.393 2.395 2.295	2.262 2.198	2.107 2.138 1.979	1.902 1.935 1.729	1.567
DEPTH TO INVERT	1.374	1.498 1.528	1.630 1.660	1.781 1.811	1.812 1.847	1.314 1.314
INVERT LEVEL AT PIT	2.205	1.958 1.928	1.772 1.742	1.582 1.552	1.484 1.450	1.309 1.309
DESIGN SURFACE LEVEL	3.579 (0.758)	3.455 (0.709)	3.402 (0.683)	3.363 (0.655)	3.297 (0.634)	2.623 (0.634)
SETOUT COORDINATES	531761.264E 6743119.170N	531736.865E 6743123.010N	531732.021E 6743092.228N	531727.035E 6743060.544N	531729.587E 6743047.319N	531741.219E 6743039.473N
CHAINAGE	0.000	24.700	55.860	87.935	101.404	115.434

	1-15 to 2-15	2-15 to 3-15	3-15 to 4-15	4-15 to 5-15	5-15 to 6-15
PIPE SIZE (mm)	300	375	375	375	375
PIPE SIZE / CLASS	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO
PIPE GRADE (%)	1.00%	0.50%	0.50%	0.50%	1.00%
PIPE SLOPE (1 in X)	100.0	200.0	200.0	200.0	100.0
PIPE FLOW (cumecs)	0.011	0.058	0.094	0.133	0.144
CAPACITY FLOW (cumecs)	0.097	0.124	0.124	0.124	0.175
FULL PIPE VELOCITY (m/s)	0.15	0.52	0.85	1.20	1.30
NORMAL DEPTH VELOCITY (m/s)	0.90	1.10	1.23	1.26	1.77
CHAINAGE (length)	24.700	31.160	32.074	13.469	14.030

DATUM RL -14.000

LINE 16



STRUCTURE NAME	1-16	2-16	3-16	4-16	5-16	6-16
STRUCTURE DESCRIPTION	INTERALLOTMENT PIT 450x450mm PIT & GRATE	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME
HGL 10% AEP (10YR)	3.532 3.494	3.251 3.203 3.191	3.181 3.182 3.168	3.155 3.160 3.095	3.063	3.047 3.067
DEPTH TO INVERT	0.700	0.859 1.315	1.247 1.277	1.260 1.290	1.290 1.320	1.320
INVERT LEVEL AT PIT	3.400	3.182 2.727	2.615 2.585	2.462 2.432	2.303 2.273	2.150
DESIGN SURFACE LEVEL	4.100 (1.039)	4.042 (1.112)	3.862 (0.860)	3.722 (0.726)	3.593 (0.693)	3.470 (0.662)
SETOUT COORDINATES	531910.985E 6743224.679N	531901.567E 6743219.203N	531879.928E 6743224.809N	531855.528E 6743228.648N	531830.141E 6743232.643N	531805.741E 6743236.483N
CHAINAGE	0.000	10.894	33.248	57.948	83.648	108.348

	1-16 to 2-16	2-16 to 3-16	3-16 to 4-16	4-16 to 5-16	5-16 to 6-16
PIPE SIZE (mm)	225	300	375	525	600
PIPE SIZE / CLASS	uPVC	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO
PIPE GRADE (%)	2.00%	0.50%	0.50%	0.50%	0.50%
PIPE SLOPE (1 in X)	50.0	200.0	200.0	200.0	200.0
PIPE FLOW (cumecs)	0.013	0.021	0.041	0.151	0.159
CAPACITY FLOW (cumecs)	0.064	0.068	0.124	0.304	0.434
FULL PIPE VELOCITY (m/s)	0.33	0.29	0.37	0.70	0.56
NORMAL DEPTH VELOCITY (m/s)	1.26	0.85	1.01	1.40	1.42
CHAINAGE (length)	10.894	22.354	24.700	25.700	24.700

DATUM RL -14.000

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Horizontal Scale 1:500 (A1) 1:1000 (A3)
Vertical Scale 1:100 (A1) 1:200 (A3)

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DEVELOPMENT APPLICATION CIVIL WORKS PLANS

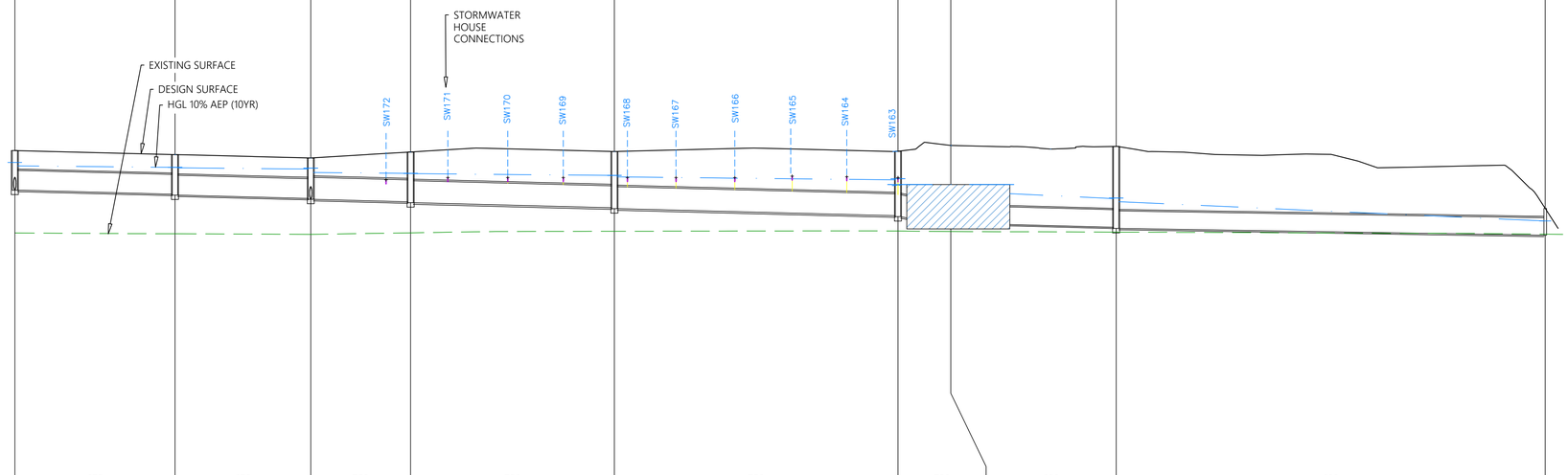
CLIFTON YAMBA

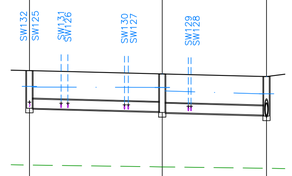
PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

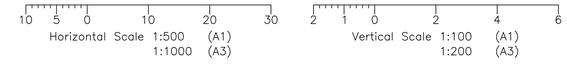
DRAWING TITLE: STORMWATER LONGITUDINAL SECTION - SHEET 6

DWG No: D23 | | REV: 1





STRUCTURE NAME	6-16	7-16	8-16	9-16	10-16	11-16	12-16	13-16	14-16	1-17	2-17	4-16
STRUCTURE DESCRIPTION	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	DETENTION TANK No.2	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	HEADWALL	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME
PIPE SIZE (mm)	675	675	750	750	750	750	600	600		300	300	
PIPE SIZE / CLASS	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO		STORM-PRO	STORM-PRO	
PIPE GRADE (%)	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.33%	0.32%		0.50%	0.50%	
PIPE SLOPE (1 in X)	200.0	200.0	200.0	200.0	200.0	200.0	300.0	312.8		200.0	200.0	
PIPE FLOW (cumecs)	0.352	0.358	0.461	0.458	0.511	0.566	0.565	0.559		0.023	0.072	
CAPACITY FLOW (cumecs)	0.595	0.595	0.788	0.788	0.788	0.788	0.355	0.347		0.068	0.068	
FULL PIPE VELOCITY (m/s)	0.98	1.00	1.04	1.04	1.16	1.28	2.00	1.98		0.33	1.02	
NORMAL DEPTH VELOCITY (m/s)	1.73	1.74	1.85	1.85	1.90	1.94	2.00	1.98		0.88	1.09	
DATUM RL	-14.000									-14.000		
HGL 10% AEP (10YR)	3.047 3.067 2.947	2.900	2.882	2.840 2.860 2.723	2.693	2.682	2.624	2.573	2.472 2.512 2.296	2.273 2.310 2.001	1.835 1.845 1.729	1.070	3.400 3.378	3.365	3.250	3.155 3.160 3.095
DEPTH TO INVERT	1.320 1.350	1.350	1.380	1.380	1.410 1.730	1.700	1.920 1.950	2.196	2.226	1.137	1.360	2.757	2.797	0.917 0.917	1.230	1.230	1.260	1.260 1.290
INVERT LEVEL AT PIT	2.150 2.119	1.983	1.953	1.837	1.808 1.692	1.722	1.519 1.489	1.248	1.218	1.173	0.950	0.856	0.816	0.583 0.583	2.686	2.577	2.547	2.462 2.432
DESIGN SURFACE LEVEL	3.470 (0.662)	3.333 (0.634)	3.218 (0.614)	3.423 (0.667)	3.439 (0.719)	3.444 (0.728)	3.643 (0.710)	3.613 (0.692)	1.499 (0.621)	3.915 (0.833)	3.807 (0.773)	3.722 (0.726)
SETOUT COORDINATES	531805.741E 6743236.483N	531778.797E 6743240.723N	531755.954E 6743244.317N	531753.311E 6743227.523N	531747.915E 6743193.232N	531740.409E 6743145.533N	531731.518E 6743146.932N	531729.888E 6743118.821N	531719.251E 6743046.522N	531849.512E 6743190.419N	531852.883E 6743211.840N	531855.528E 6743228.648N
CHAINAGE	108.348	27.276	135.624	23.124	158.748	17.001	175.749	34.713	210.462	48.286	258.748	9.000	267.748	28.158	295.907	73.077	368.983	0.000	21.685	21.685	17.015	38.700
LINE						16														17		



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ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

MDE Manage Design Engineer

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

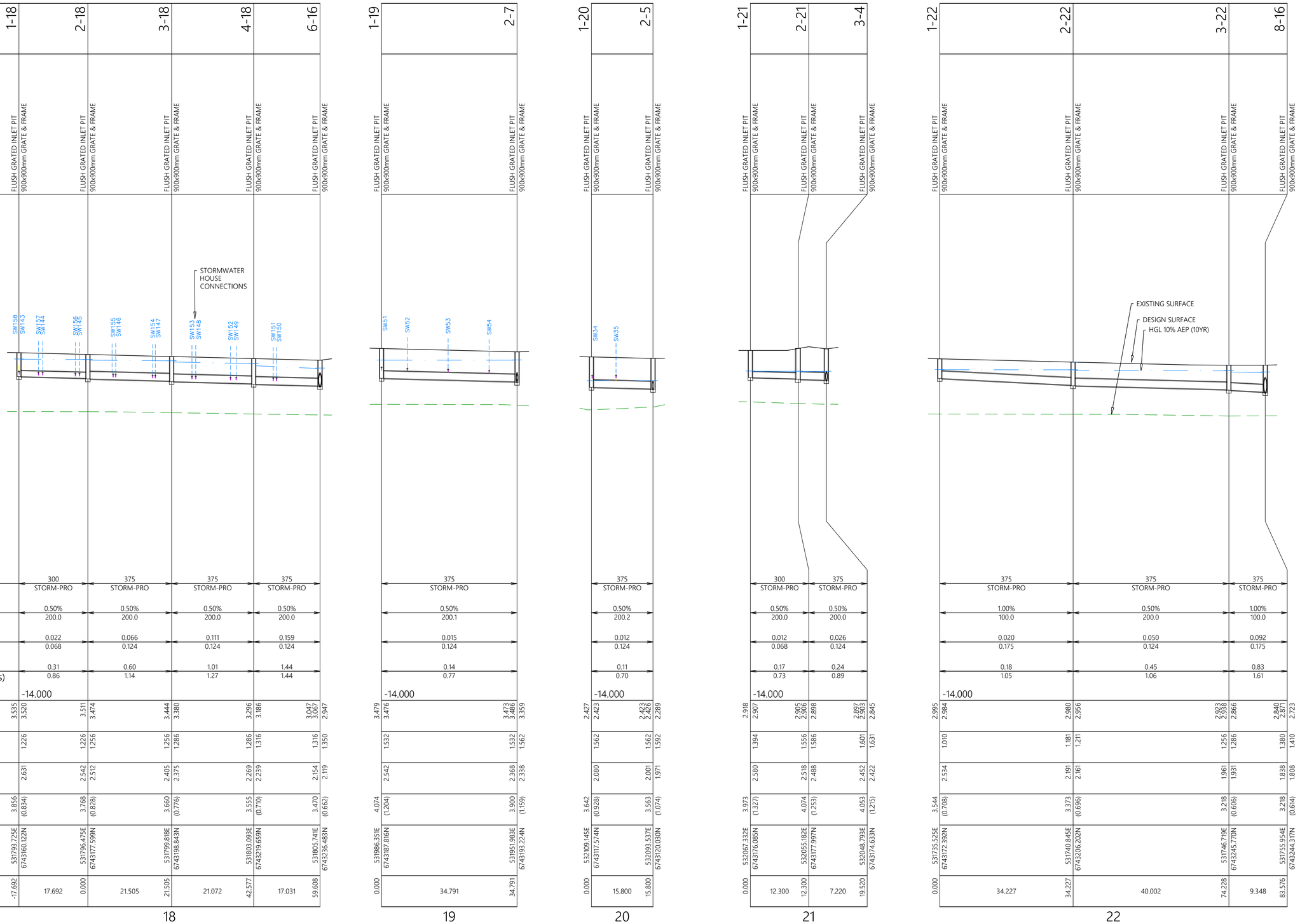
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: STORMWATER LONGITUDINAL SECTION - SHEET 7

DWG No: D24 | SHEET: 24 OF 43 | REV: 1



STRUCTURE NAME	1-18	2-18	3-18	4-18	6-16	1-19	2-7	1-20	2-5	1-21	2-21	3-4	1-22	2-22	3-22	8-16
STRUCTURE DESCRIPTION	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME															
PIPE SIZE (mm)	300	375	375	375		375		375		300	375		375	375	375	
PIPE SIZE / CLASS	STORM-PRO	STORM-PRO	STORM-PRO	STORM-PRO		STORM-PRO		STORM-PRO		STORM-PRO	STORM-PRO		STORM-PRO	STORM-PRO	STORM-PRO	
PIPE GRADE (%)	0.50%	0.50%	0.50%	0.50%		0.50%		0.50%		0.50%	0.50%		1.00%	0.50%	1.00%	
PIPE SLOPE (1 in X)	200.0	200.0	200.0	200.0		200.1		200.2		200.0	200.0		100.0	200.0	100.0	
PIPE FLOW (cumecs)	0.022	0.066	0.111	0.159		0.015		0.012		0.012	0.026		0.020	0.050	0.092	
CAPACITY FLOW (cumecs)	0.068	0.124	0.124	0.124		0.124		0.124		0.068	0.124		0.175	0.124	0.175	
FULL PIPE VELOCITY (m/s)	0.31	0.60	1.01	1.44		0.14		0.11		0.17	0.24		0.18	0.45	0.83	
NORMAL DEPTH VELOCITY (m/s)	0.86	1.14	1.27	1.44		0.77		0.70		0.73	0.89		1.05	1.06	1.61	
DATUM RL	-14.000					-14.000		-14.000		-14.000			-14.000			
HGL 10% AEP (10YR)	3.535 3.520	3.511 3.474	3.444 3.380	3.296 3.186	3.047 3.067 2.947	3.479 3.476	3.473 3.466 3.359	2.427 2.423	2.423 2.426 2.289	2.918 2.907	2.905 2.906 2.898	2.897 2.903 2.845	2.995 2.984	2.980 2.956	2.923 2.958 2.866	2.840 2.871 2.723
DEPTH TO INVERT	1.226	1.226 1.256	1.256 1.286	1.286 1.316	1.316 1.350	1.532	1.532 1.562	1.562	1.562 1.592	1.394	1.556 1.586	1.601 1.631	1.010	1.181 1.211	1.256 1.286	1.380 1.410
INVERT LEVEL AT PIT	2.631	2.542 2.512	2.405 2.375	2.269 2.239	2.154 2.119	2.542	2.368 2.338	2.080	2.001 1.971	2.580	2.518 2.488	2.452 2.422	2.534	2.191 2.161	1.961 1.931	1.838 1.808
DESIGN SURFACE LEVEL	3.856 (0.834)	3.768 (0.828)	3.660 (0.776)	3.555 (0.710)	3.470 (0.662)	4.074 (1.204)	3.900 (1.159)	3.642 (0.928)	3.563 (1.074)	3.973 (1.327)	4.074 (1.253)	4.053 (1.215)	3.544 (0.708)	3.373 (0.696)	3.218 (0.606)	3.218 (0.614)
SETOUT COORDINATES	531793.725E 6743160.122N	531796.475E 6743177.599N	531799.818E 6743198.843N	531803.093E 6743219.659N	531805.741E 6743236.483N	531986.351E 6743187.816N	531951.983E 6743193.224N	532109.145E 6743117.574N	532093.537E 6743120.030N	532067.332E 6743176.085N	532055.182E 6743177.997N	532048.793E 6743174.633N	531735.525E 6743172.392N	531740.845E 6743206.202N	531746.719E 6743245.770N	531755.954E 6743244.317N
CHAINAGE	-17.692	17.692 0.000	21.505 21.505	21.072 42.577	17.031 59.608	0.000	34.791 34.791	0.000	15.800 15.800	0.000	12.300 12.300	7.220 19.520	0.000	34.227 34.227	40.002 74.228	9.348 83.576
LINE	18					19		20		21			22			

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10 5 0 10 20 30
Horizontal Scale 1:500 (A1)
1:1000 (A3)

2 1 0 2 4 6
Vertical Scale 1:100 (A1)
1:200 (A3)

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

MDE Manage Design Engineer

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

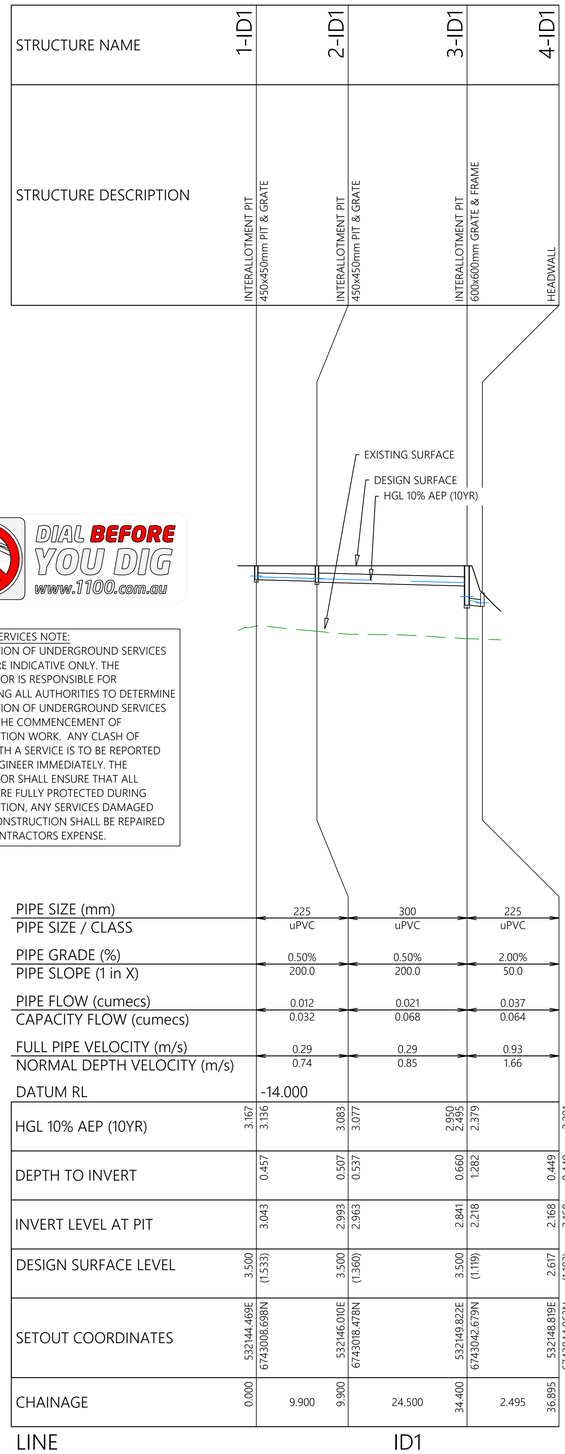
CLIFTON YAMBA

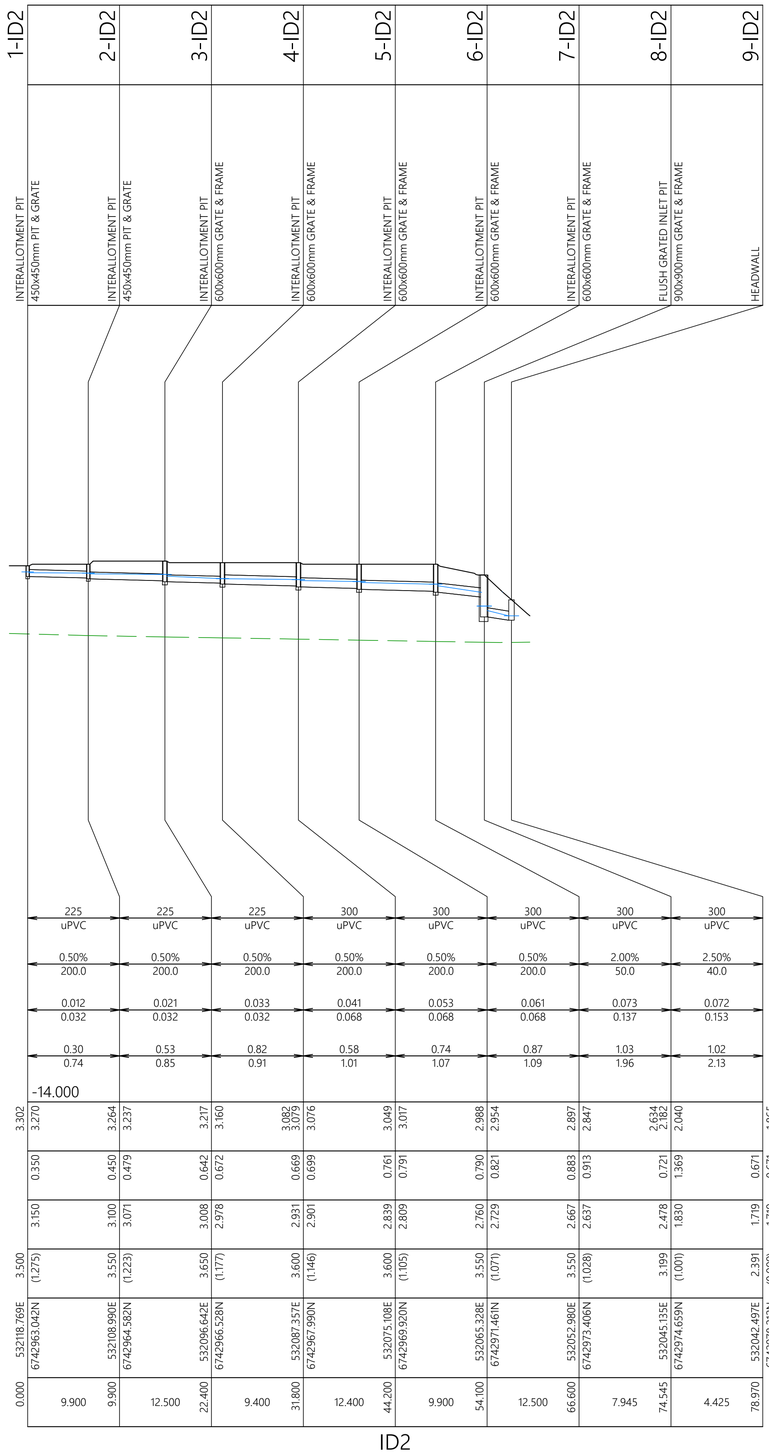
PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

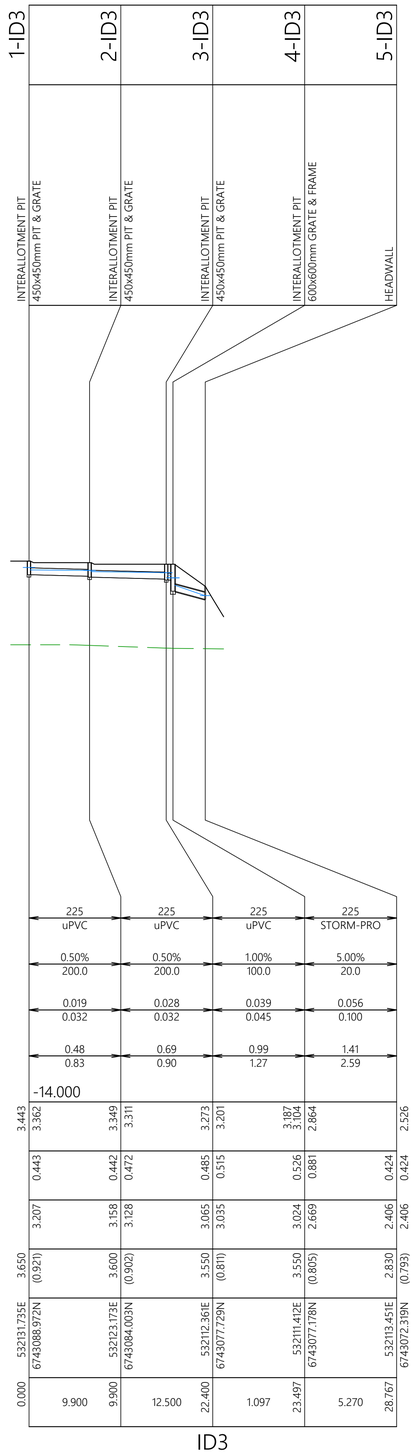
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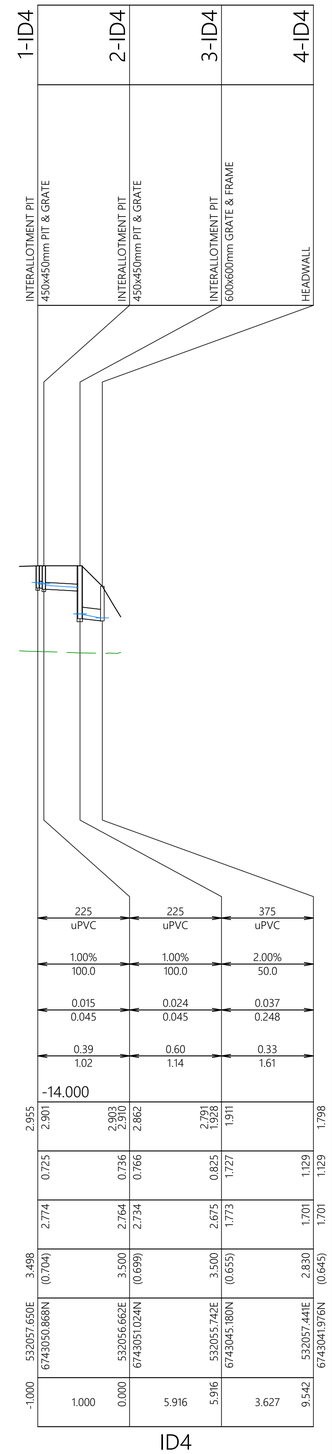
DRAWING TITLE: STORMWATER LONGITUDINAL SECTION - SHEET 8

DWG No: D25 | SHEET: 25 OF 43 | REV: 1









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STRUCTURE NAME	1-ID1	2-ID1	3-ID1	4-ID1
STRUCTURE DESCRIPTION	INTERALLOTMENT PIT 450x450mm PIT & GRATE	INTERALLOTMENT PIT 450x450mm PIT & GRATE	INTERALLOTMENT PIT 600x600mm GRATE & FRAME	HEADWALL
PIPE SIZE (mm)	225	300	225	
PIPE SIZE / CLASS	uPVC	uPVC	uPVC	
PIPE GRADE (%)	0.50%	0.50%	2.00%	
PIPE SLOPE (1 in X)	200.0	200.0	50.0	
PIPE FLOW (cumecs)	0.012	0.021	0.037	
CAPACITY FLOW (cumecs)	0.032	0.068	0.064	
FULL PIPE VELOCITY (m/s)	0.29	0.29	0.93	
NORMAL DEPTH VELOCITY (m/s)	0.74	0.85	1.66	
DATUM RL	-14.000			
HGL 10% AEP (10YR)	3.167 / 3.136	3.083 / 3.077	2.950 / 2.495 / 2.379	2.291
DEPTH TO INVERT	0.457	0.507 / 0.537	0.660 / 1.282	0.449 / 0.449
INVERT LEVEL AT PIT	3.043	2.993 / 2.963	2.841 / 2.218	2.168 / 2.168
DESIGN SURFACE LEVEL	3.500 (1.533)	3.500 (1.360)	3.500 (1.119)	2.617 (1.103)
SETOUT COORDINATES	532144.469E 6743008.698N	532146.010E 6743018.478N	532149.822E 6743042.679N	532148.819E 6743044.963N
CHAINAGE	0.000	9.900 / 9.900	24.500	34.400 / 2.495 / 36.895

LINE ID1

STRUCTURE NAME	1-ID2	2-ID2	3-ID2	4-ID2	5-ID2	6-ID2	7-ID2	8-ID2	9-ID2
STRUCTURE DESCRIPTION	INTERALLOTMENT PIT 450x450mm PIT & GRATE	INTERALLOTMENT PIT 450x450mm PIT & GRATE	INTERALLOTMENT PIT 600x600mm GRATE & FRAME	INTERALLOTMENT PIT 600x600mm GRATE & FRAME	INTERALLOTMENT PIT 600x600mm GRATE & FRAME	INTERALLOTMENT PIT 600x600mm GRATE & FRAME	INTERALLOTMENT PIT 600x600mm GRATE & FRAME	FLUSH GRATED INLET PIT 900x900mm GRATE & FRAME	HEADWALL
PIPE SIZE (mm)	225	225	225	300	300	300	300	300	
PIPE SIZE / CLASS	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC	uPVC	
PIPE GRADE (%)	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	2.00%	2.50%	
PIPE SLOPE (1 in X)	200.0	200.0	200.0	200.0	200.0	200.0	50.0	40.0	
PIPE FLOW (cumecs)	0.012	0.021	0.033	0.041	0.053	0.061	0.073	0.072	
CAPACITY FLOW (cumecs)	0.032	0.032	0.032	0.068	0.068	0.068	0.137	0.153	
FULL PIPE VELOCITY (m/s)	0.30	0.53	0.82	0.58	0.74	0.87	1.03	1.02	
NORMAL DEPTH VELOCITY (m/s)	0.74	0.85	0.91	1.01	1.07	1.09	1.96	2.13	
DATUM RL	-14.000								
HGL 10% AEP (10YR)	3.302 / 3.270	3.264 / 3.237	3.217 / 3.160	3.082 / 3.079 / 3.076	3.049 / 3.017	2.988 / 2.954	2.897 / 2.847	2.684 / 2.682 / 2.040	1.865
DEPTH TO INVERT	0.350	0.450 / 0.479	0.642 / 0.672	0.669 / 0.699	0.761 / 0.791	0.790 / 0.821	0.883 / 0.913	0.721 / 1.369	0.671 / 0.671
INVERT LEVEL AT PIT	3.150	3.100 / 3.071	3.008 / 2.978	2.931 / 2.901	2.839 / 2.809	2.760 / 2.729	2.667 / 2.637	2.478 / 1.830	1.719 / 1.719
DESIGN SURFACE LEVEL	3.500 (1.275)	3.550 (1.223)	3.650 (1.177)	3.600 (1.146)	3.600 (1.105)	3.550 (1.071)	3.550 (1.028)	3.199 (1.001)	2.391 (0.999)
SETOUT COORDINATES	532118.769E 6742963.042N	532108.990E 6742964.582N	532096.642E 6742966.528N	532087.357E 6742967.990N	532075.108E 6742969.920N	532065.328E 6742971.461N	532052.980E 6742973.406N	532045.135E 6742974.659N	532042.497E 6742978.212N
CHAINAGE	0.000	9.900 / 9.900	12.500 / 22.400	9.400 / 31.800	12.400 / 44.200	9.900 / 54.100	12.500 / 66.600	7.945 / 74.545	4.425 / 78.970

ID2

STRUCTURE NAME	1-ID3	2-ID3	3-ID3	4-ID3	5-ID3
STRUCTURE DESCRIPTION	INTERALLOTMENT PIT 450x450mm PIT & GRATE	INTERALLOTMENT PIT 450x450mm PIT & GRATE	INTERALLOTMENT PIT 450x450mm PIT & GRATE	INTERALLOTMENT PIT 600x600mm GRATE & FRAME	HEADWALL
PIPE SIZE (mm)	225	225	225	225	
PIPE SIZE / CLASS	uPVC	uPVC	uPVC	STORM-PRO	
PIPE GRADE (%)	0.50%	0.50%	1.00%	5.00%	
PIPE SLOPE (1 in X)	200.0	200.0	100.0	20.0	
PIPE FLOW (cumecs)	0.019	0.028	0.039	0.056	
CAPACITY FLOW (cumecs)	0.032	0.032	0.045	0.100	
FULL PIPE VELOCITY (m/s)	0.48	0.69	0.99	1.41	
NORMAL DEPTH VELOCITY (m/s)	0.83	0.90	1.27	2.59	
DATUM RL	-14.000				
HGL 10% AEP (10YR)	3.443 / 3.362	3.349 / 3.311	3.273 / 3.201	3.187 / 3.104 / 2.864	2.526
DEPTH TO INVERT	0.443	0.442 / 0.472	0.485 / 0.515	0.526 / 0.881	0.424 / 0.424
INVERT LEVEL AT PIT	3.207	3.158 / 3.128	3.065 / 3.035	3.024 / 2.669	2.406 / 2.406
DESIGN SURFACE LEVEL	3.650 (0.921)	3.600 (0.902)	3.550 (0.811)	3.550 (0.805)	2.830 (0.793)
SETOUT COORDINATES	532131.735E 6743088.972N	532123.172E 6743084.003N	532112.361E 6743077.729N	532111.412E 6743077.178N	532113.451E 6743072.319N
CHAINAGE	0.000	9.900 / 9.900	12.500 / 22.400	1.097 / 23.497	5.270 / 28.767

ID3

STRUCTURE NAME	1-ID4	2-ID4	3-ID4	4-ID4
STRUCTURE DESCRIPTION	INTERALLOTMENT PIT 450x450mm PIT & GRATE	INTERALLOTMENT PIT 450x450mm PIT & GRATE	INTERALLOTMENT PIT 600x600mm GRATE & FRAME	HEADWALL
PIPE SIZE (mm)	225	225	375	
PIPE SIZE / CLASS	uPVC	uPVC	uPVC	
PIPE GRADE (%)	1.00%	1.00%	2.00%	
PIPE SLOPE (1 in X)	100.0	100.0	50.0	
PIPE FLOW (cumecs)	0.015	0.024	0.037	
CAPACITY FLOW (cumecs)	0.045	0.045	0.248	
FULL PIPE VELOCITY (m/s)	0.39	0.60	0.33	
NORMAL DEPTH VELOCITY (m/s)	1.02	1.14	1.61	
DATUM RL	-14.000			
HGL 10% AEP (10YR)	2.955 / 2.901	2.903 / 2.910 / 2.862	2.791 / 1.928 / 1.911	1.798
DEPTH TO INVERT	0.725	0.736 / 0.766	0.825 / 1.727	1.129 / 1.129
INVERT LEVEL AT PIT	2.774	2.764 / 2.734	2.675 / 1.773	1.701 / 1.701
DESIGN SURFACE LEVEL	3.498 (0.704)	3.500 (0.699)	3.500 (0.655)	2.830 (0.645)
SETOUT COORDINATES	532057.650E 6743050.869N	532056.662E 6743051.024N	532055.742E 6743045.180N	532057.441E 6743041.976N
CHAINAGE	-1.000	1.000 / 0.000	5.916 / 5.916	3.627 / 9.542

ID4

Horizontal Scale 1:500 (A1) 1:1000 (A3)

Vertical Scale 1:100 (A1) 1:200 (A3)

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

MDE Manage Design Engineer

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CLIENT
CLIFTON YAMBA LAND PTY LTD

TITLE
110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

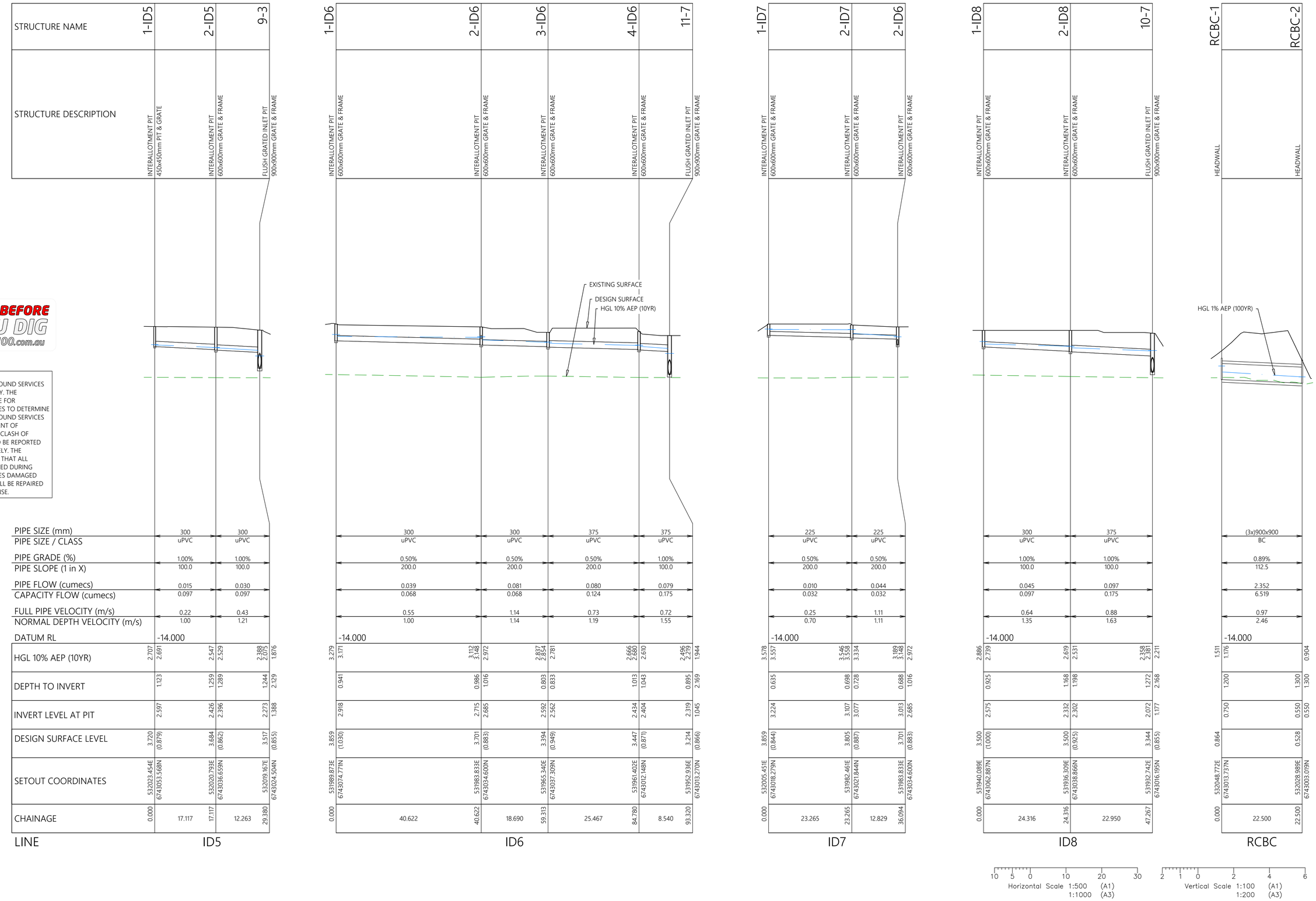
CLIFTON YAMBA

PROJECT
PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE:
STORMWATER LONGITUDINAL SECTION - SHEET 9

DWG No: D26 | SHEET: 26 OF 43 | REV: 1



	1-ID5		2-ID5		9-3	
PIPE SIZE (mm)	300		300			
PIPE SIZE / CLASS	uPVC		uPVC			
PIPE GRADE (%)	1.00%		1.00%			
PIPE SLOPE (1 in X)	100.0		100.0			
PIPE FLOW (cumecs)	0.015		0.030			
CAPACITY FLOW (cumecs)	0.097		0.097			
FULL PIPE VELOCITY (m/s)	0.22		0.43			
NORMAL DEPTH VELOCITY (m/s)	1.00		1.21			
DATUM RL	-14.000					
HGL 10% AEP (10YR)	2.707	2.691		2.547	2.529	2.388 2.075 1.876
DEPTH TO INVERT	1.123		1.259	1.289		1.244 2.129
INVERT LEVEL AT PIT	2.597		2.426	2.396		2.273 1.388
DESIGN SURFACE LEVEL	3.720	(0.879)	3.684	(0.862)		3.517 (0.855)
SETOUT COORDINATES	532023.454E 6743053.568N		532020.793E 6743036.659N			532019.167E 6743024.504N
CHAINAGE	0.000	17.117	17.117	12.263		29.380

	1-ID6		2-ID6		3-ID6		4-ID6		11-7	
PIPE SIZE (mm)	300		300		375		375			
PIPE SIZE / CLASS	uPVC		uPVC		uPVC		uPVC			
PIPE GRADE (%)	0.50%		0.50%		0.50%		1.00%			
PIPE SLOPE (1 in X)	200.0		200.0		200.0		100.0			
PIPE FLOW (cumecs)	0.039		0.081		0.080		0.079			
CAPACITY FLOW (cumecs)	0.068		0.068		0.124		0.175			
FULL PIPE VELOCITY (m/s)	0.55		1.14		0.73		0.72			
NORMAL DEPTH VELOCITY (m/s)	1.00		1.14		1.19		1.55			
DATUM RL	-14.000									
HGL 10% AEP (10YR)	3.279	3.171		3.112 3.148	2.972		2.837 2.854	2.781		2.666 2.680 2.610 2.496 2.219 1.944
DEPTH TO INVERT	0.941		0.986	1.016		0.803	0.833		1.013	1.043 0.895 2.169
INVERT LEVEL AT PIT	2.918		2.715	2.685		2.592	2.562		2.434	2.404 2.319 1.045
DESIGN SURFACE LEVEL	3.859	(1.030)	3.701	(0.883)	3.394	(0.949)		3.447	(0.871)	3.214 (0.866)
SETOUT COORDINATES	531989.873E 6743074.771N		531983.833E 6743034.600N		531965.340E 6743037.309N			531961.402E 6743012.148N		531952.936E 6743013.270N
CHAINAGE	0.000	40.622	40.622	18.690	59.313	25.467		84.780	8.540	93.320

	1-ID7		2-ID7		2-ID6	
PIPE SIZE (mm)	225		225			
PIPE SIZE / CLASS	uPVC		uPVC			
PIPE GRADE (%)	0.50%		0.50%			
PIPE SLOPE (1 in X)	200.0		200.0			
PIPE FLOW (cumecs)	0.010		0.044			
CAPACITY FLOW (cumecs)	0.032		0.032			
FULL PIPE VELOCITY (m/s)	0.25		1.11			
NORMAL DEPTH VELOCITY (m/s)	0.70		1.11			
DATUM RL	-14.000					
HGL 10% AEP (10YR)	3.578	3.557		3.546 3.558	3.334	3.189 3.148 2.972
DEPTH TO INVERT	0.635		0.698	0.728		0.688 1.016
INVERT LEVEL AT PIT	3.224		3.107	3.077		3.013 2.685
DESIGN SURFACE LEVEL	3.859	(0.844)	3.805	(0.887)	3.701	(0.883)
SETOUT COORDINATES	532005.451E 6743018.279N		531982.461E 6743021.844N			531983.833E 6743034.600N
CHAINAGE	0.000	23.265	23.265	12.829		36.094

	1-ID8		2-ID8		10-7	
PIPE SIZE (mm)	300		375			
PIPE SIZE / CLASS	uPVC		uPVC			
PIPE GRADE (%)	1.00%		1.00%			
PIPE SLOPE (1 in X)	100.0		100.0			
PIPE FLOW (cumecs)	0.045		0.097			
CAPACITY FLOW (cumecs)	0.097		0.175			
FULL PIPE VELOCITY (m/s)	0.64		0.88			
NORMAL DEPTH VELOCITY (m/s)	1.35		1.63			
DATUM RL	-14.000					
HGL 10% AEP (10YR)	2.886	2.739		2.619	2.531	2.358 2.381 2.211
DEPTH TO INVERT	0.925		1.168	1.198		1.272 2.168
INVERT LEVEL AT PIT	2.575		2.332	2.302		2.072 1.177
DESIGN SURFACE LEVEL	3.500	(1.000)	3.500	(0.925)		3.344 (0.855)
SETOUT COORDINATES	531940.089E 6743062.887N		531936.309E 6743038.866N			531932.742E 6743016.195N
CHAINAGE	0.000	24.316	24.316	22.950		47.267

	RCBC-1		RCBC-2
PIPE SIZE (mm)			(3x)900x900
PIPE SIZE / CLASS			BC
PIPE GRADE (%)			0.89%
PIPE SLOPE (1 in X)			112.5
PIPE FLOW (cumecs)			2.352
CAPACITY FLOW (cumecs)			6.519
FULL PIPE VELOCITY (m/s)			0.97
NORMAL DEPTH VELOCITY (m/s)			2.46
DATUM RL	-14.000		
HGL 10% AEP (10YR)	1.511	1.176	0.904
DEPTH TO INVERT	1.200		1.300 1.300
INVERT LEVEL AT PIT	0.750		0.550 0.550
DESIGN SURFACE LEVEL	0.864		0.528
SETOUT COORDINATES	532048.772E 6743013.737N		532028.989E 6743003.019N
CHAINAGE	0.000	22.500	22.500

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EXISTING SERVICES NOTE:
THE LOCATION OF UNDERGROUND SERVICES SHOWN ARE INDICATIVE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL AUTHORITIES TO DETERMINE THE LOCATION OF UNDERGROUND SERVICES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORK. ANY CLASH OF WORKS WITH A SERVICE IS TO BE REPORTED TO THE ENGINEER IMMEDIATELY. THE CONTRACTOR SHALL ENSURE THAT ALL SERVICES ARE FULLY PROTECTED DURING CONSTRUCTION, ANY SERVICES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

MDE Manage Design Engineer

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CLIENT
CLIFTON YAMBA LAND PTY LTD

TITLE
110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

CLIFTON YAMBA

PROJECT
PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE:
STORMWATER LONGITUDINAL SECTION - SHEET 10

DWG No: D27 | SHEET: 27 OF 43 | REV: 1

12D MODEL - HYDROLOGICAL DESIGN SHEET

Project:	Clifton YAMBA No2
Drainage Model:	Drainage Design REV 1
Rainfall File:	AUS NSW YAMBA AEP.12dhydrc
Tc Method:	Kinematic Wave
Rainfall Method:	IFD Table
Runoff C Method:	QUDM 2007

Minor 10.00 AEP(%)

Node Name (-)	Node Type (-)	Setout Easting (m)	Setout Northing (m)	Setout RL (m)	Grate RL (m)	Catch ID (-)	Catch Length (m)	Catch Slope (%)	Catch Retardance (-)	Time Tc (min)	Intensity I (mm/hr)	Runoff C (-)	Area A (ha)	Full CA (ha)	Full Sum CA (ha)	Full Qc=CIA (L/s)	Partial CA (ha)	Partial Sum CA (ha)	Partial Qc=CIA (L/s)	Approach Flow Qa (L/s)
1-1	GSIP	532130.56	6742991.05	3.23	3.23	1P	15.00	0.5	0.200	8.53	165.04	0.58	0.0030	0.0017	0.0171	7.8	0.0003	0.0156	10.9	10.9
						1I	14.95	0.5	0.013	1.40	250.70	0.90	0.0171	0.0154			0.0154			
2-1	GSIP	532106.40	6742994.85	3.54	3.54	1P	22.00	0.5	0.200	11.18	148.93	0.58	0.0053	0.0031	0.0299	12.4	0.0005	0.0274	17.3	17.3
						1I	22.76	0.5	0.013	1.87	227.83	0.90	0.0300	0.0269			0.0269			
3-1	GSIP	532072.68	6743000.17	3.37	3.37	1P	27.00	0.5	0.200	12.96	140.14	0.58	0.0059	0.0034	0.0334	13.0	0.0006	0.0305	18.6	18.6
						1I	27.42	0.5	0.013	2.12	219.81	0.90	0.0335	0.0300			0.0300			
4-1	GSIP	532050.03	6743003.73	3.25	3.25	1P	26.00	0.5	0.200	12.60	141.89	0.58	0.0106	0.0061	0.0602	23.7	0.0010	0.0550	33.7	33.7
						1I	26.35	0.5	0.013	2.07	220.51	0.90	0.0603	0.0540			0.0540			
5-1	HW	532044.46	6742994.04	2.65	2.65															
1-2	IAD-450SQ	532115.52	6743015.79	3.50	3.50	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0047	0.0027	0.0266	9.0	0.0004	0.0243	14.3	14.3
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0267	0.0239			0.0239			
2-2	GSIP	532120.46	6743015.01	3.48	3.48	1P	12.00	0.5	0.200	7.31	173.50	0.58	0.0017	0.0010	0.0094	4.5	0.0002	0.0086	6.0	6.0
						1I	14.38	0.5	0.013	1.36	252.47	0.90	0.0094	0.0084			0.0084			
3-2	GSIP	532122.30	6743026.71	3.42	3.42	1P	12.00	0.5	0.200	7.31	173.50	0.58	0.0018	0.0010	0.0101	4.9	0.0002	0.0093	6.5	6.5
						1I	14.00	0.5	0.013	1.34	253.64	0.90	0.0101	0.0091			0.0091			
4-2	HW	532121.52	6743030.17	2.67	2.67															
1-3	GSIP	532001.79	6743185.39	4.15	4.15															0.0
2-3	GSIP	531997.73	6743159.62	4.06	4.06	1P	20.00	0.5	0.200	10.46	152.51	0.58	0.0169	0.0098	0.0956	40.5	0.0018	0.0876	54.1	54.1
						1I	24.71	0.5	0.013	1.98	222.31	0.90	0.0958	0.0858			0.0858			
3-3	GSIP	531995.08	6743142.78	3.98	3.98	1P	18.00	0.5	0.200	9.71	156.80	0.58	0.0101	0.0058	0.0571	24.8	0.0012	0.0524	32.3	32.3
						1I	25.00	0.5	0.013	2.00	221.48	0.90	0.0572	0.0512			0.0512			
4-3	GSIP	531989.59	6743107.90	3.80	3.80	1P	36.00	0.5	0.200	16.05	126.33	0.58	0.0257	0.0148	0.1452	50.9	0.0025	0.1328	78.2	78.2
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.1455	0.1303			0.1303			
5-3	GSIP	531985.80	6743083.84	3.68	3.68	1P	24.00	0.5	0.200	11.90	145.40	0.58	0.0209	0.0121	0.1183	47.8	0.0023	0.1085	65.7	65.7
						1I	30.00	0.5	0.013	2.24	218.15	0.90	0.1185	0.1062			0.1062			
6-3	GSIP	532020.44	6743078.39	3.65	3.65	1P	10.00	0.5	0.200	6.47	179.38	0.58	0.0032	0.0019	0.0183	9.1	0.0004	0.0169	11.7	11.7
						1I	15.00	0.5	0.013	1.40	250.56	0.90	0.0184	0.0165			0.0165			
7-3	GSIP	532035.59	6743076.00	3.55	3.55	1P	30.00	0.5	0.200	14.01	134.89	0.58	0.0223	0.0129	0.1263	47.3	0.0023	0.1157	69.1	69.1
						1I	35.00	0.5	0.013	2.47	215.04	0.90	0.1266	0.1134			0.1134			
8-3	GSIP	532028.80	6743032.89	3.33	3.33	1P	30.00	0.5	0.200	14.01	134.89	0.58	0.0123	0.0071	0.0694	26.0	0.0012	0.0635	38.1	38.1
						1I	33.00	0.5	0.013	2.38	216.27	0.90	0.0695	0.0623			0.0623			
9-3	GSIP	532019.17	6743024.50	3.52	3.52	1P	15.00	0.5	0.200	8.53	165.04	0.58	0.0024	0.0014	0.0134	6.2	0.0002	0.0123	8.6	8.6
						1I	15.00	0.5	0.013	1.40	250.56	0.90	0.0135	0.0121			0.0121			
10-3	HW	532015.34	6743017.38	2.86	2.86															
1-4	GSIP	532014.73	6743183.35	4.22	4.22	1P	25.00	0.5	0.200	12.25	143.64	0.58	0.0052	0.0030	0.0296	11.8	0.0006	0.0271	16.4	16.4
						1I	30.00	0.5	0.013	2.24	218.15	0.90	0.0297	0.0266			0.0266			
2-4	GSIP	532040.09	6743179.36	4.10	4.10	1P	45.00	0.5	0.200	18.98	116.06	0.58	0.0127	0.0073	0.0720	23.2	0.0012	0.0658	37.8	37.8
						1I	50.00	0.5	0.013	3.11	206.87	0.90	0.0721	0.0646			0.0646			
3-4	GSIP	532048.79	6743174.63	4.05	4.05	1P	30.00	0.5	0.200	14.01	134.89	0.58	0.0080	0.0046	0.0451	16.9	0.0008	0.0413	24.7	24.7
						1I	35.00	0.5	0.013	2.47	215.04	0.90	0.0452	0.0405			0.0405			
4-4	GSIP	532048.55	6743158.36	3.97	3.97	1P	25.00	0.5	0.200	12.25	143.64	0.58	0.0099	0.0057	0.0562	22.4	0.0010	0.0515	31.4	31.4
						1I	28.00	0.5	0.013	2.15	219.43	0.90	0.0563	0.0505			0.0505			
5-4	GSIP	532043.75	6743127.86	3.82	3.82	1P	45.00	0.5	0.200	18.98	116.06	0.58	0.0239	0.0138	0.1349	43.5	0.0023	0.1234	70.9	70.9
						1I	50.00	0.5	0.013	3.11	206.87	0.90	0.1352	0.1212			0.1212			
6-4	GSIP	532039.76	6743102.52	3.69	3.69	1P	27.00	0.5	0.200	12.96	140.14	0.58	0.0183	0.0105	0.1032	40.2	0.0018	0.0945	57.3	57.3
						1I	30.00	0.5	0.013	2.24	218.15	0.90	0.1035	0.0927			0.0927			
1-5	GSIP	532067.66	6743124.10	3.69	3.69	1P	12.00	0.5	0.200	7.31	173.50	0.58	0.0097	0.0056	0.0093	4.5	0.0009	0.0046	3.4	4.5
						1I	12.00	0.5	0.013	1.21	259.96	0.90	0.0042	0.0037			0.0037			
2-5	GSIP	532093.54	6743120.03	3.56	3.56	1P	35.00	0.5	0.200	15.72	127.47	0.58	0.0184	0.0106	0.1040	36.8	0.0017	0.0951	56.8	56.8
						1I	35.28	0.5	0.013	2.49	214.87	0.90	0.1043	0.0934			0.0934			
3-5	GSIP	532089.22	6743092.63	3.42	3.42	1P	32.00	0.5	0.200	14.72	131.38	0.58	0.0124	0.0072	0.0701	25.6	0.0011	0.0641	38.6	38.6
						1I	32.00	0.5	0.013	2.34	216.89	0.90	0.0702	0.0629			0.0629			
4-5	GSIP	532086.80	6743077.20	3.35	3.35	1P	25.00	0.5	0.200	12.25	143.64	0.58	0.0087	0.0050	0.0489	19.5	0.0008	0.0447	27.5	27.5
						1I	25.00	0.5	0.013	2.00	221.48	0.90	0.0490	0.0439			0.0439			
5-5	GSIP	532084.32	6743061.46	3.27	3.27	1P	24.00	0.5	0.200	11.90	145.40	0.58	0.0050	0.0029	0.0281	11.4	0.0005	0.0257	16.0	16.0
						1I	24.00	0.5	0.013	1.94	224.31	0.90	0.0282	0.0253			0.0253			
6-5	HW	532085.63	6743057.25	2.83	2.83															
1-6	GSIP	532155.48	6743110.28	3.63	3.63	1P	15.00	1.0	0.200	6.73	177.57	0.58	0.0036	0.0021	0.0119	5.9	0.0003	0.0101	7.4	7.4
						1I	15.00	1.0	0.013	1.11	264.52	0.90	0.0109	0.0098			0.0098			
2-6	GSIP	532127.19	6743114.74	3.73	3.73	1P	12.00	0.5	0.200	7.31	173.50	0.58	0.0119	0.0068	0.0671	32.3	0.0011	0.0613	44.3	44.3
						1I	12.00	0.5	0.013	1.21	259.96	0.90	0.0672	0.0602			0.0602			
3-6	GSIP	532109.78	6743104.79	3.59	3.59	1P	45.00	0.5	0.200	18.98	116.06	0.58	0.0063	0.0036	0.0356	11.5	0.0006	0.0326	18.9	18.9
						1I	45.00	0.5	0.013	2.91	209.22	0.90	0.0357	0.0320			0.0320			
1-7	GSIP	531926.89	6743197.17	4.03	4.03	1P	20.00	0.5	0.200	10.46	152.51	0.58	0.0069	0.0040	0.0393	16.6	0.0008	0.0360	22.2	22.2
						1I	24.99	0.5	0.013	2.00	221.50	0.90	0.0394	0.0353			0.0353			
2-7	GSIP	531951.98	6743193.22	3.90	3.90	1P	45.00	0.5	0.200	18.98	116.06	0.58	0.0250	0.0144	0.1414	45.6	0.0024	0.1293	74.3	74.3
						1I	50.00	0.5	0.013	3.11	206.87	0.90	0.1417	0.1270			0.1270			
3-7	GSIP	531948.91	6743173.64	3.84	3.84	1P	20.00	0.5	0.200	10.46	152.51	0.58	0.0099	0.0057	0.0562	23.8	0.0011	0.0515	31.7	31.7
						1I	25.00	0.5	0.013	2.00	221.48	0.90	0.0563	0.0505			0.0505			
4-7	GSIP	531944.31	6743144.42	3.69	3.69	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0241	0.0139	0.1360	46.0	0.0023	0.1244	72.3	72.3
						1I	45.00	0.5	0.013	2.91	209.22	0.90	0.1363	0.1221			0.1221			
5-7	GSIP	531939.80	6743115.71	3.55	3.55	1P	30.00	0.5	0.200	14.01	134.89	0.58	0.0187	0.0108	0.1055	39.5	0.0019	0.0966	57.7	57.7
						1I	35.00	0.5	0.013	2.47	215.04	0.90	0.1057	0.0947			0.0947			
6-7	GSIP	531936.01	6743091.67	3.42	3.42	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0267	0.0154	0.1511	51.1	0.0026	0.1383	80.4	80.4
						1I	45.00	0.5	0.013	2.91	209.22	0.90	0.1515	0.1357			0.1357			
7-7	GSIP	531933.93	6743078.42	3.33	3.33	1P	20.00	0.5	0.200	10.46	152.51	0.58	0.0070	0.0040	0.0394	16.7	0.0008	0.0362	22.3	22.3
						1I	25.00	0.5	0.013	2.00	221.48	0.90	0.0395	0.0354			0.0354			
8-7	GSIP	531928.95	6743046.81	3.29	3.29	1P	30.00	0.5	0.200	14.01	134.89	0.58	0.0109	0.0063	0.0619	23.2	0.0011	0.0567	33.9	33.9
						1I	35.00	0.5	0.013	2.47	215.04	0.90	0.0620	0.0556			0.0556			
9-7	GSIP	531922.82	6743024.58	3.27	3.27	1P	35.00	0.5	0.200	15.72	127.47	0.58	0.0131	0.0076	0.0741	26.2	0.0013	0.0678	40.0	40.0
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0743	0.0665			0.0665			
10-7	GSIP	531932.74	6743016.19	3.34	3.34	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0066	0.0038	0.0371	12.5	0.0006	0.0339	20.0	20.0
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0372	0.0333			0.0333			
11-7	GSIP	531952.94	6743013.27	3.21	3.21	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0104	0.0060	0.0587	19.8	0.0009	0.0536	31.6	31.6
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0588	0.0527			0.0527			
12-7	TANK	531952.04	6743006.91	2.20	2.20															0.0
13-7	IAD-450SQ	531951.09	6743000.35	2.50	2.50															
1-8	GSIP	531960.41	6743087.83	3.55	3.55	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0042	0.0024	0.0236	8.0	0.0004	0.0216	12.7	12.7
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0236	0.0212			0.0212			
1-9	GSIP	531911.61	6743095.51	3.55	3.55															0.0
1-10	GSIP	531900.99	6743193.35	4.15	4.15	1P	25.00	0.5	0.200	12.25	143.64	0.58	0.0046	0.0026	0.0258	10.3	0.0005	0.0236	14.4	14.4
						1I	27.42	0.5	0.013	2.12	219.81	0.90	0.0258	0.0231			0.0231			
2-10	GSIP	531897.68	6743172.32	4.05	4.05	1P	35.00	0.5	0.200	15.72	127.47	0.58	0.0156	0.0090	0.0881	31.2	0.0015	0.0806	47.7	47.7
						1I	38.00	0.5	0.013	2.61	213.25	0.90	0.0883	0.0791			0.0791			
3-10	GSIP	531893.28	6743144.31	3.90	3.90	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0238	0.0137	0.1346	45.5	0.0023	0.1232	71.6	71.6
						1I	45.00	0.5	0.013	2.91	209.22	0.90	0.1349	0.1209			0.1209			
4-10	GSIP	531888.60	6743114.56	3.75	3.75	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0203	0.0117	0.1146	38.8	0.0020	0.1049	61.0	61.0
						1I	45.00	0.5	0.013	2.91	209.22	0.90	0.1149	0.1029			0.1029			
5-10	GSIP	531886.23	6743099.51	3.68	3.68	1P	25.00	0.5	0.200	12.25	143.64	0.58	0.0126	0.0073	0.0715	28.5	0.0013	0.0655	39.7	39.7
						1I	30.00	0.5	0.013	2.24	218.15	0.90	0.0716	0.0642			0.0642			
6-10	GSIP	531883.12	6743079.75	3.56	3.56	1P	20.00	0.5	0.200	10.46	152.51	0.58	0.0101	0.0058	0.0571	24.2	0.0011	0.0524	32.3	32.3
						1I	25.00	0.5	0.013	2.00	221.48	0.90	0.0573	0.0513			0.0513			
7-10	GSIP	531877.99	6743047.15	3.38	3.38	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0257	0.0149	0.1455	49.2	0.0025	0.1331	77.4	77.4
						1I	45.00	0.5	0.013	2.91	209.22	0.90	0.1458	0.1307			0.1307			
8-10	GSIP	531877.56	6743032.63	3.30	3.30	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0162	0.0094	0.0917	31.0	0.0015	0.0838	49.4	49.4
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0919	0.0824			0.0824			
9-10	HW outlet	531875.89	6743021.95	1.38	2.83															
1-11	GSIP	531846.67	6743172.34	3.94	3.94	1P	27.00	0.5	0.200	12.96	140.14	0.58	0.0068	0.0039	0.0385	15.0	0.0006	0.0352	21.5	21.5
						1I	27.00	0.5	0.013	2.10	220.09	0.90	0.0386	0.0346			0.0346			
2-11	GSIP	531841.49	6743139.44	3.77	3.77	1P	45.00	0.5	0.200	18.98	116.06	0.58	0.0224	0.0129	0.1265	40.8	0.0021	0.1157	66.5	66.5
						1I	50.00	0.5	0.013	3.11	206.87	0.90	0.1268	0.1136			0.1136			
3-11	GSIP	531836.44	6743107.34	3.61	3.61	1P	45.00	0.5	0.200	18.98	116.06	0.58	0.0286	0.0165	0.1618	52.2	0.0027	0.1480	85.1	85.1
						1I	50.00	0.5	0.013	3.11	206.87	0.90	0.1622	0.1453			0.1453			
4-11	GSIP	531832.55	6743082.64	3.49	3.49	1P	25.00	0.5	0.200	12.25	143.64	0.58	0.0110	0.0063	0.0620	24.7	0.0012	0.0568	34.4	34.4
						1I	30.00	0.5	0.013	2.24	218.15	0.90	0.0621	0.0557			0.0557			
5-11	GSIP	531828.67	6743057.95	3.36	3.36	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0247	0.0143	0.1398	47.3	0.0024	0.1279	74.3	74.3
						1I	45.00	0.5	0.013	2.91	209.22	0.90	0.1401	0.1255			0.1255			
6-11	GSIP	531822.43	6743039.68	3.26	3.26	1P	35.00	0.5	0.200	15.72	127.47	0.58	0.0167	0.0096	0.0944	33.4	0.0017	0.0864	50.9	50.9
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0946	0.0847			0.0847			
7-11	HW outlet	531821.02	6743029.94	1.36	2.83															
1-12	GSIP	531852.34	6743104.84	3.69	3.69															0.0
1-13	GSIP	531820.03	6743109.92	3.69	3.69	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0030	0.0017	0.0171	5.8	0.0003	0.0156	9.2	9.2

Node Name (-)	Node Type (-)	Setout Easting (m)	Setout Northing (m)	Setout RL (m)	Grate RL (m)	Catch ID (-)	Catch Length (m)	Catch Slope (%)	Catch Retardance (-)	Time Tc (min)	Intensity I (mm/hr)	Runoff C (-)	Area A (ha)	Full CA (ha)	Full Sum CA (ha)	Full Qc=CIA (L/s)	Partial CA (ha)	Partial Sum CA (ha)	Partial Qc=CIA (L/s)	Approach Flow Qa (L/s)
1-14	GSIP	531790.88	6743142.04	3.84	3.84	1P	20.00	0.5	0.200	10.46	152.51	0.58	0.0075	0.0043	0.0423	17.9	0.0008	0.0388	23.9	23.9
						1I	25.00	0.5	0.013	2.00	221.48	0.90	0.0424	0.0380			0.0380			
2-14	GSIP	531786.65	6743115.18	3.71	3.71	1P	35.00	0.5	0.200	15.72	127.47	0.58	0.0203	0.0117	0.1148	40.6	0.0020	0.1050	61.9	61.9
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.1150	0.1030			0.1030			
3-14	GSIP	531782.77	6743090.48	3.58	3.58	1P	20.00	0.5	0.200	10.46	152.51	0.58	0.0106	0.0061	0.0600	25.4	0.0012	0.0551	33.9	33.9
						1I	25.00	0.5	0.013	2.00	221.48	0.90	0.0602	0.0539			0.0539			
4-14	GSIP	531778.39	6743062.65	3.44	3.44	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0252	0.0146	0.1426	48.2	0.0024	0.1305	75.8	75.8
						1I	45.00	0.5	0.013	2.91	209.22	0.90	0.1429	0.1280			0.1280			
5-14	GSIP	531778.25	6743047.82	3.37	3.37	1P	30.00	0.5	0.200	14.01	134.89	0.58	0.0161	0.0093	0.0911	34.2	0.0016	0.0835	49.9	49.9
						1I	35.00	0.5	0.013	2.47	215.04	0.90	0.0913	0.0818			0.0818			
6-14	HW	531776.45	6743037.08	2.73	2.73															
1-15	GSIP	531761.26	6743119.17	3.58	3.58	1P	15.00	0.5	0.200	8.53	165.04	0.58	0.0029	0.0017	0.0166	7.6	0.0003	0.0151	10.5	10.5
						1I	15.00	0.5	0.013	1.40	250.56	0.90	0.0166	0.0149			0.0149			
2-15	GSIP	531736.86	6743123.01	3.46	3.46	1P	32.00	0.5	0.200	14.72	131.38	0.58	0.0156	0.0090	0.0879	32.1	0.0014	0.0804	48.4	48.4
						1I	32.00	0.5	0.013	2.34	216.89	0.90	0.0881	0.0789			0.0789			
3-15	GSIP	531732.02	6743092.23	3.40	3.40	1P	38.00	0.5	0.200	16.70	124.05	0.58	0.0121	0.0070	0.0683	23.6	0.0011	0.0625	37.0	37.0
						1I	38.00	0.5	0.013	2.61	213.25	0.90	0.0685	0.0614			0.0614			
4-15	GSIP	531727.04	6743060.54	3.36	3.36	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0135	0.0078	0.0762	25.8	0.0012	0.0696	41.0	41.0
						1I	40.31	0.5	0.013	2.71	211.90	0.90	0.0764	0.0684			0.0684			
5-15	GSIP	531729.59	6743047.32	3.30	3.30	1P	20.00	0.5	0.200	10.46	152.51	0.58	0.0039	0.0023	0.0220	9.3	0.0004	0.0202	13.2	13.2
						1I	20.00	0.5	0.013	1.70	235.75	0.90	0.0221	0.0198			0.0198			
6-15	HW	531741.22	6743039.47	2.62	2.62															
1-16	IAD-450SQ	531910.99	6743224.68	4.10	4.10	1P	20.00	0.5	0.200	10.46	152.51	0.58	0.0038	0.0022	0.0218	9.2	0.0004	0.0199	13.0	13.0
						1I	20.00	0.5	0.013	1.70	235.75	0.90	0.0218	0.0195			0.0195			
2-16	GSIP	531901.57	6743219.20	4.04	4.04	1P	16.00	0.5	0.200	8.93	162.27	0.58	0.0024	0.0014	0.0134	6.1	0.0002	0.0123	8.4	8.4
						1I	16.00	0.5	0.013	1.46	247.53	0.90	0.0135	0.0121			0.0121			
3-16	GSIP	531879.93	6743224.81	3.86	3.86	1P	30.00	0.5	0.200	14.01	134.89	0.58	0.0068	0.0039	0.0384	14.4	0.0006	0.0351	21.3	21.3
						1I	30.00	0.5	0.013	2.24	218.15	0.90	0.0385	0.0345			0.0345			
4-16	GSIP	531855.53	6743228.65	3.72	3.72	1P	38.00	0.5	0.200	16.70	124.05	0.58	0.0130	0.0075	0.0737	25.4	0.0012	0.0674	39.9	39.9
						1I	38.00	0.5	0.013	2.61	213.25	0.90	0.0739	0.0662			0.0662			
5-16	GSIP	531830.14	6743232.64	3.59	3.59	1P	27.00	0.5	0.200	12.96	140.14	0.58	0.0033	0.0019	0.0188	7.3	0.0003	0.0172	10.5	10.5
						1I	27.47	0.5	0.013	2.12	219.78	0.90	0.0189	0.0169			0.0169			
6-16	GSIP	531805.74	6743236.48	3.47	3.47	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0130	0.0075	0.0735	24.8	0.0012	0.0671	39.5	39.5
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0736	0.0660			0.0660			
7-16	GSIP	531778.80	6743240.72	3.33	3.33	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0036	0.0021	0.0202	6.8	0.0003	0.0185	10.9	10.9
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0203	0.0182			0.0182			
8-16	GSIP	531755.95	6743244.32	3.22	3.22	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0055	0.0032	0.0312	10.6	0.0005	0.0285	16.8	16.8
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0313	0.0280			0.0280			
9-16	GSIP	531753.31	6743227.52	3.42	3.42															0.0
10-16	GSIP	531747.91	6743193.23	3.44	3.44	1P	58.00	0.5	0.200	23.05	104.48	0.58	0.0207	0.0120	0.1173	34.0	0.0018	0.1071	60.6	60.6
						1I	58.00	0.5	0.013	3.42	203.77	0.90	0.1175	0.1053			0.1053			
11-16	GSIP	531740.41	6743145.53	3.44	3.44	1P	65.00	0.5	0.200	25.23	98.90	0.58	0.0230	0.0133	0.1298	35.7	0.0019	0.1185	66.2	66.2
						1I	65.00	0.5	0.013	3.68	201.16	0.90	0.1301	0.1165			0.1165			
12-16	TANK	531731.52	6743146.93	2.31	2.31															0.0
13-16	GSIP	531729.89	6743118.82	3.61	3.61															0.0
14-16	HW	531719.25	6743046.52	1.50	1.50															
1-17	GSIP	531849.51	6743190.42	3.92	3.92	1P	27.00	0.5	0.200	12.96	140.14	0.58	0.0074	0.0043	0.0420	16.3	0.0007	0.0384	23.5	23.5
						1I	27.00	0.5	0.013	2.10	220.09	0.90	0.0421	0.0377			0.0377			
2-17	GSIP	531852.88	6743211.84	3.81	3.81	1P	36.00	0.5	0.200	16.05	126.33	0.58	0.0161	0.0093	0.0908	31.9	0.0015	0.0830	49.4	49.4
						1I	36.00	0.5	0.013	2.52	214.44	0.90	0.0910	0.0815			0.0815			
1-18	GSIP	531793.72	6743160.12	3.86	3.86	1P	26.00	0.5	0.200	12.60	141.89	0.58	0.0068	0.0039	0.0386	15.2	0.0006	0.0353	21.6	21.6
						1I	26.00	0.5	0.013	2.05	220.75	0.90	0.0387	0.0346			0.0346			
2-18	GSIP	531796.47	6743177.60	3.77	3.77	1P	32.00	0.5	0.200	14.72	131.38	0.58	0.0144	0.0083	0.0814	29.7	0.0013	0.0744	44.8	44.8
						1I	32.00	0.5	0.013	2.34	216.89	0.90	0.0816	0.0731			0.0731			
3-18	GSIP	531799.82	6743198.84	3.66	3.66	1P	33.00	0.5	0.200	15.07	129.75	0.58	0.0149	0.0086	0.0840	30.3	0.0014	0.0768	46.1	46.1
						1I	33.00	0.5	0.013	2.38	216.27	0.90	0.0842	0.0754			0.0754			
4-18	GSIP	531803.09	6743219.66	3.55	3.55	1P	32.00	0.5	0.200	14.72	131.38	0.58	0.0160	0.0093	0.0907	33.1	0.0015	0.0829	49.9	49.9
						1I	32.00	0.5	0.013	2.34	216.89	0.90	0.0909	0.0814			0.0814			
1-19	GSIP	531986.35	6743187.82	4.07	4.07	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0051	0.0029	0.0287	9.7	0.0005	0.0262	15.4	15.4
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0288	0.0258			0.0258			
1-20	GSIP	532109.15	6743117.57	3.64	3.64	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0038	0.0022	0.0216	7.3	0.0003	0.0197	11.6	11.6
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0216	0.0194			0.0194			
1-21	GSIP	532067.33	6743176.09	3.97	3.97	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0040	0.0023	0.0225	7.6	0.0004	0.0206	12.1	12.1
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0226	0.0202			0.0202			
2-21	GSIP	532055.18	6743178.00	4.07	4.07	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0047	0.0027	0.0264	8.9	0.0004	0.0241	14.2	14.2
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0264	0.0237			0.0237			
1-22	GSIP	531735.52	6743172.39	3.54	3.54	1P	27.00	0.5	0.200	12.96	140.14	0.58	0.0062	0.0036	0.0352	13.7	0.0006	0.0322	19.6	19.6
						1I	27.42	0.5	0.013	2.12	219.81	0.90	0.0352	0.0316			0.0316			
2-22	GSIP	531740.85	6743206.20	3.37	3.37	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0065	0.0037	0.0560	18.9	0.0006	0.0529	31.1	31.1
						1I	40.31	0.5	0.013	2.71	211.90	0.90	0.0583	0.0523			0.0523			
3-22	GSIP	531746.72	6743245.77	3.22	3.22	1P	46.00	0.5	0.200	19.31	114.91	0.58	0.0091	0.0053	0.0789	25.2	0.0008	0.0744	43.2	43.2
						1I	45.89	0.5	0.013	2.95	208.72	0.90	0.0822	0.0736			0.0736			
1-ID1	IAD-450SQ	532144.47	6743008.70	3.50	3.50	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0038	0.0022	0.0215	7.3	0.0003	0.0196	11.6	11.6
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0215	0.0193			0.0193			
2-ID1	IAD-450SQ	532146.01	6743018.48	3.50	3.50	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0031	0.0018	0.0174	5.9	0.0003	0.0159	9.4	9.4
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0174	0.0156			0.0156			
3-ID1	IAD-600SQ	532149.82	6743042.68	3.50	3.50	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0055	0.0032	0.0309	10.4	0.0005	0.0282	16.6	16.6
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0309	0.0277			0.0277			
4-ID1	HW	532148.82	6743044.96	2.62	2.62															
1-ID2	IAD-450SQ	532118.77	6742963.04	3.50	3.50	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0039	0.0022	0.0220	7.4	0.0003	0.0201	11.8	11.8
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0220	0.0197			0.0197			
2-ID2	IAD-450SQ	532108.99	6742964.58	3.55	3.55	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0031	0.0018	0.0174	5.9	0.0003	0.0159	9.4	9.4
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0174	0.0156			0.0156			
3-ID2	IAD-600SQ	532096.64	6742966.53	3.65	3.65	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0039	0.0022	0.0220	7.4	0.0003	0.0201	11.8	11.8
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0220	0.0197			0.0197			
4-ID2	IAD-600SQ	532087.36	6742967.99	3.60	3.60	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0029	0.0017	0.0165	5.6	0.0003	0.0151	8.9	8.9
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0166	0.0148			0.0148			
5-ID2	IAD-600SQ	532075.11	6742969.92	3.60	3.60	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0039	0.0022	0.0218	7.4	0.0003	0.0199	11.7	11.7
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0218	0.0196			0.0196			
6-ID2	IAD-600SQ	532065.33	6742971.46	3.55	3.55	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0031	0.0018	0.0174	5.9	0.0003	0.0159	9.4	9.4
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0174	0.0156			0.0156			
7-ID2	IAD-600SQ	532052.98	6742973.41	3.55	3.55	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0039	0.0022	0.0220	7.4	0.0003	0.0201	11.8	11.8
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0220	0.0197			0.0197			
8-ID2	GSIP	532045.13	6742974.66	3.20	3.20															0.0
9-ID2	HW	532042.50	6742978.21	2.39	2.39															
1-ID3	IAD-450SQ	532131.74	6743088.97	3.65	3.65	1P	25.00	0.5	0.200	12.25	143.64	0.58	0.0060	0.0034	0.0337	13.4	0.0006	0.0308	18.9	18.9
						1I	25.27	0.5	0.013	2.01	221.24	0.90	0.0337	0.0302			0.0302			
2-ID3	IAD-450SQ	532123.17	6743084.00	3.60	3.60	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0031	0.0018	0.0174	5.9	0.0003	0.0159	9.4	9.4
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0174	0.0156			0.0156			
3-ID3	IAD-450SQ	532112.36	6743077.73	3.55	3.55	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0039	0.0022	0.0220	7.4	0.0003	0.0201	11.8	11.8
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0220	0.0197			0.0197			
4-ID3	IAD-600SQ	532111.41	6743077.18	3.55	3.55	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0055	0.0032	0.0313	10.6	0.0005	0.0286	16.8	16.8
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0314	0.0281			0.0281			
5-ID3	HW	532113.45	6743072.32	2.41	2.83															
1-ID4	IAD-450SQ	532057.65	6743050.87	3.50	3.50	1P	25.00	0.5	0.200	12.25	143.64	0.58	0.0048	0.0028	0.0273	10.9	0.0005	0.0250	15.4	15.4
						1I	25.00	0.5	0.013	2.00	221.48	0.90	0.0274	0.0245			0.0245			
2-ID4	IAD-450SQ	532056.66	6743051.02	3.50	3.50	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0029	0.0017	0.0165	5.6	0.0003	0.0151	8.9	8.9
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0166	0.0148			0.0148			
3-ID4	IAD 600x900 CONC	532055.74	6743045.18	3.50	3.50	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0043	0.0025	0.0241	8.1	0.0004	0.0220	13.0	13.0
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0241	0.0216			0.0216			
4-ID4	HW	532057.44	6743041.98	2.83	2.83															
1-ID5	IAD-450SQ	532023.45	6743053.57	3.72	3.72	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0050	0.0029	0.0285	9.6	0.0005	0.0260	15.3	15.3
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0285	0.0256			0.0256			
2-ID5	IAD-600SQ	532020.79	6743036.66	3.68	3.68	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0049	0.0028	0.0279	9.4	0.0004	0.0255	15.0	15.0
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0279	0.0250			0.0250			
1-ID6	IAD-600SQ	531989.87	6743074.77	3.86	3.86	1P	40.00	1.0	0.200	13.41	137.89	0.58	0.0078	0.0045	0.0673	25.8	0.0007	0.0635	38.8	38.8
						1I	38.05	1.0	0.013	2.09	220.15	0.90	0.0700	0.0628			0.0628			
2-ID6	IAD-600SQ	531983.83	6743034.60	3.70	3.70															0.0
3-ID6	IAD-600SQ	531965.34	6743037.31	3.39	3.39															0.0
4-ID6	IAD-600SQ	531961.40	6743012.15	3.45	3.45															0.0
1-ID7	IAD-600SQ	532005.45	6743018.28	3.86	3.86	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0032	0.0019	0.0183	6.2	0.0003	0.0167	9.8	9.8
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0183	0.0164			0.0164			
2-ID7	IAD-600SQ	531982.46	6743021.84	3.81	3.81	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0115	0.0066	0.0648	21.9	0.0010	0.0592	34.9	34.9
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0649	0.0582			0.0582			
1-ID8	IAD-600SQ	531940.09	6743062.89	3.50	3.50	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0149	0.0086	0.0841	28.4	0.0013	0.0768	45.3	45.3
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0843	0.0755			0.0755			
2-ID8	IAD-600SQ	531936.31	6743038.87	3.50	3.50	1P	40.00	0.5	0.200	17.35	121.77	0.58	0.0175	0.0101	0.0988	33.4	0.0016	0.0903	53.2	53.2
						1I	40.00	0.5	0.013	2.70	212.08	0.90	0.0991	0.0888			0.0888			

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN
DRAWN: A.SCHMID
SURVEYING: MACRO SURVEYING
DATE: JAN 2024
SCALE: AS SHOWN
SHEET SIZE: A1

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

MDE
Manage Design Engineer

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CLIENT
CLIFTON YAMBA LAND PTY LTD

TITLE
110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

CLIFTON YAMBA

PROJECT
PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE:
STORMWATER COMPUTATION -
CATCHMENT HYDROLOGY

DWG No: D28

REV: 1

12D MODEL - HYDRAULIC DESIGN SHEET

Project:	Clifton YAMBA No2
Drainage Model:	Drainage Design REV 1
Rainfall File:	AUS NSW YAMBA AEP.12dhydro
Rainfall Method:	IFD Table
Runoff C Method:	QUDM 2007
Manning n Roughness:	0.013
Freeboard Limit:	0.15 m

Minor 10.00 AEP(%) Storm Event

Pipe ID (-)	Pipe Type (-)	Pipe Length (m)	Pipe Size (mm)	Full Pipe Area Af (sq.m)	Pipe Grade (%)	Full-area Tct (min)	Full-area I (mm/hr)	Full-area Sum CA (ha)	Full-area Qc=CIA (L/s)
1-1 to 2-1	STORM-PRO	24.46	300	0.071	0.50	8.53	165.04	0.0171	7.8
2-1 to 3-1	STORM-PRO	34.13	300	0.071	0.50	11.18	148.93	0.0470	19.5
3-1 to 4-1	STORM-PRO	22.94	300	0.071	0.50	12.96	140.14	0.0804	31.3
4-1 to 5-1	STORM-PRO	11.18	300	0.071	0.50	13.15	139.19	0.1406	54.4
1-2 to 2-2	STORM-PRO	5.00	225	0.040	0.50	17.35	121.77	0.0266	9.0
2-2 to 3-2	STORM-PRO	11.84	225	0.040	0.50	17.39	121.63	0.0360	12.2
3-2 to 4-2	STORM-PRO	3.55	300	0.071	2.00	17.49	121.28	0.0461	15.5
1-3 to 2-3	STORM-PRO	26.08	375	0.110	0.50				
2-3 to 3-3	STORM-PRO	17.05	375	0.110	0.50	10.46	152.51	0.0956	40.5
3-3 to 4-3	STORM-PRO	35.31	450	0.159	0.50	10.60	151.81	0.1526	64.4
4-3 to 5-3	STORM-PRO	24.36	450	0.159	0.50	16.05	126.33	0.2978	104.5
5-3 to 6-3	STORM-PRO	35.07	525	0.216	0.50	16.25	125.62	0.4160	145.2
6-3 to 7-3	STORM-PRO	15.33	600	0.283	0.50	16.55	124.59	0.4344	150.3
7-3 to 8-3	STORM-PRO	43.65	750	0.442	0.50	19.89	112.87	1.0507	329.4
8-3 to 9-3	STORM-PRO	12.77	750	0.442	0.50	20.26	111.82	1.1201	347.9
9-3 to 10-3	STORM-PRO	8.09	750	0.442	0.50	20.36	111.54	1.1899	368.7
1-4 to 2-4	STORM-PRO	25.67	375	0.110	0.50	12.25	143.64	0.0296	11.8
2-4 to 3-4	STORM-PRO	9.90	375	0.110	0.50	18.98	116.06	0.1016	32.7
3-4 to 4-4	STORM-PRO	16.28	450	0.159	0.50	19.06	115.78	0.1956	62.9
4-4 to 5-4	STORM-PRO	30.87	450	0.159	0.66	19.20	115.30	0.2518	80.6
5-4 to 6-4	STORM-PRO	25.65	525	0.216	0.50	19.46	114.40	0.3867	122.9
6-4 to 7-3	STORM-PRO	26.85	525	0.216	0.50	19.67	113.65	0.4900	154.7
1-5 to 2-5	STORM-PRO	26.20	375	0.110	1.00	7.31	173.50	0.0093	4.5
2-5 to 3-5	STORM-PRO	27.74	375	0.110	0.50	17.48	121.31	0.1350	45.5
3-5 to 4-5	STORM-PRO	15.61	450	0.159	0.50	19.18	115.37	0.3196	102.4
4-5 to 5-5	STORM-PRO	15.94	450	0.159	0.50	19.31	114.91	0.3685	117.6
5-5 to 6-5	STORM-PRO	4.41	525	0.216	1.00	19.44	114.45	0.3967	126.1
1-6 to 2-6	STORM-PRO	28.64	300	0.071	0.60	6.73	177.57	0.0119	5.9
2-6 to 3-6	STORM-PRO	20.04	300	0.071	0.50	7.31	173.50	0.0789	38.0
3-6 to 3-5	STORM-PRO	23.89	375	0.110	0.50	18.98	116.06	0.1146	36.9
1-7 to 2-7	STORM-PRO	25.40	375	0.110	0.50	10.46	152.51	0.0393	16.6
2-7 to 3-7	STORM-PRO	19.83	375	0.110	0.50	18.98	116.06	0.2094	67.5
3-7 to 4-7	STORM-PRO	29.57	450	0.159	0.50	19.15	115.49	0.2656	85.2
4-7 to 5-7	STORM-PRO	29.07	450	0.159	0.50	19.39	114.62	0.4016	127.9
5-7 to 6-7	STORM-PRO	24.33	525	0.216	0.50	19.64	113.78	0.5071	160.3
6-7 to 7-7	STORM-PRO	13.41	600	0.283	0.50	19.84	113.07	0.6818	214.1
7-7 to 8-7	STORM-PRO	32.00	600	0.283	0.50	19.95	112.67	0.7212	225.7
8-7 to 9-7	STORM-PRO	23.07	750	0.442	0.50	20.22	111.93	0.7831	243.5
9-7 to 10-7	STORM-PRO	12.99	750	0.442	0.50	20.41	111.43	0.8572	265.3
10-7 to 11-7	STORM-PRO	20.40	750	0.442	0.50	20.52	111.14	1.0773	332.6
11-7 to 12-7	STORM-PRO	6.42	750	0.442	0.50	20.69	110.69	1.2862	395.5
12-7 to 13-7	PVC	6.63	425	0.142	0.50	20.74	110.55	1.2862	395.0
1-8 to 6-7	STORM-PRO	24.70	450	0.159	0.50	17.35	121.77	0.0236	8.0
1-9 to 6-7	STORM-PRO	24.70	450	0.159	0.52				
1-10 to 2-10	STORM-PRO	21.29	300	0.071	0.50	12.25	143.64	0.0258	10.3
2-10 to 3-10	STORM-PRO	28.36	375	0.110	0.50	15.72	127.47	0.1139	40.3
3-10 to 4-10	STORM-PRO	30.11	375	0.110	0.50	17.35	121.77	0.2485	84.1
4-10 to 5-10	STORM-PRO	15.24	450	0.159	0.50	17.60	120.90	0.3632	122.0
5-10 to 6-10	STORM-PRO	20.00	450	0.159	0.50	17.73	120.45	0.4347	145.4
6-10 to 7-10	STORM-PRO	33.00	525	0.216	0.50	17.89	119.87	0.4918	163.8
7-10 to 8-10	STORM-PRO	14.53	525	0.216	0.50	18.17	118.91	0.6373	210.5
8-10 to 9-10	STORM-PRO	10.80	600	0.283	1.50	18.29	118.48	0.7291	239.9
1-11 to 2-11	STORM-PRO	33.30	375	0.110	0.50	12.96	140.14	0.0385	15.0
2-11 to 3-11	STORM-PRO	32.50	375	0.110	0.80	18.98	116.06	0.1650	53.2
3-11 to 4-11	STORM-PRO	25.00	450	0.159	0.50	19.25	115.12	0.3440	110.0
4-11 to 5-11	STORM-PRO	25.00	450	0.159	0.50	19.46	114.39	0.4060	129.0
5-11 to 6-11	STORM-PRO	19.30	525	0.216	0.50	19.67	113.66	0.5458	172.3
6-11 to 7-11	STORM-PRO	9.84	525	0.216	1.00	19.83	113.09	0.6402	201.1
1-12 to 3-11	STORM-PRO	16.10	375	0.110	1.00				
1-13 to 3-11	STORM-PRO	16.61	375	0.110	1.00	17.35	121.77	0.0171	5.8
1-14 to 2-14	STORM-PRO	27.20	375	0.110	0.50	10.46	152.51	0.0423	17.9
2-14 to 3-14	STORM-PRO	25.00	375	0.110	0.50	15.72	127.47	0.1571	55.6
3-14 to 4-14	STORM-PRO	28.17	375	0.110	0.50	15.93	126.74	0.2171	76.4
4-14 to 5-14	STORM-PRO	14.83	450	0.159	0.50	17.35	121.77	0.3597	121.7
5-14 to 6-14	STORM-PRO	10.90	450	0.159	1.00	17.47	121.34	0.4508	152.0
1-15 to 2-15	STORM-PRO	24.70	300	0.071	1.00	8.53	165.04	0.0166	7.6
2-15 to 3-15	STORM-PRO	31.16	375	0.110	0.50	14.72	131.38	0.1045	38.1
3-15 to 4-15	STORM-PRO	32.07	375	0.110	0.50	16.70	124.05	0.1728	59.6
4-15 to 5-15	STORM-PRO	13.47	375	0.110	0.50	17.35	121.77	0.2490	84.2
5-15 to 6-15	STORM-PRO	14.03	375	0.110	1.00	17.46	121.38	0.2710	91.4
1-16 to 2-16	uPVC	10.89	225	0.040	2.00	10.46	152.51	0.0218	9.2
2-16 to 3-16	STORM-PRO	22.35	300	0.071	0.50	10.55	152.06	0.0352	14.9
3-16 to 4-16	STORM-PRO	24.70	375	0.110	0.50	14.01	134.89	0.0736	27.6
4-16 to 5-16	STORM-PRO	25.70	525	0.216	0.50	16.70	124.05	0.2801	96.5
5-16 to 6-16	STORM-PRO	24.70	600	0.283	0.50	16.91	123.30	0.2989	102.4
6-16 to 7-16	STORM-PRO	27.28	675	0.358	0.50	17.35	121.77	0.6670	225.6
7-16 to 8-16	STORM-PRO	23.12	675	0.358	0.50	17.58	120.98	0.6872	231.0
8-16 to 9-16	STORM-PRO	17.00	750	0.442	0.50	19.39	114.64	0.8886	283.0
9-16 to 10-16	STORM-PRO	34.71	750	0.442	0.50	19.53	114.14	0.8886	281.7
10-16 to 11-16	STORM-PRO	48.29	750	0.442	0.50	23.05	104.48	1.0058	291.9
11-16 to 12-16	STORM-PRO	9.00	750	0.442	0.50	25.23	98.90	1.1356	312.0
12-16 to 13-16	STORM-PRO	28.16	600	0.283	0.33	25.31	98.75	1.1356	311.5
13-16 to 14-16	STORM-PRO	73.08	600	0.283	0.32	25.54	98.28	1.1356	310.0
1-17 to 2-17	STORM-PRO	21.69	300	0.071	0.50	12.96	140.14	0.0420	16.3
2-17 to 4-16	STORM-PRO	17.01	300	0.071	0.50	16.05	126.33	0.1328	46.6
1-18 to 2-18	STORM-PRO	17.69	300	0.071	0.50	12.60	141.89	0.0386	15.2
2-18 to 3-18	STORM-PRO	21.51	375	0.110	0.50	14.72	131.38	0.1199	43.8
3-18 to 4-18	STORM-PRO	21.07	375	0.110	0.50	15.07	129.75	0.2039	73.5
4-18 to 6-16	STORM-PRO	17.03	375	0.110	0.50	15.25	129.14	0.2946	105.7
1-19 to 2-7	STORM-PRO	34.79	375	0.110	0.50	17.35	121.77	0.0287	9.7
1-20 to 2-5	STORM-PRO	15.80	375	0.110	0.50	17.35	121.77	0.0216	7.3
1-21 to 2-21	STORM-PRO	12.30	300	0.071	0.50	17.35	121.77	0.0225	7.6
2-21 to 3-4	STORM-PRO	7.22	375	0.110	0.50	17.45	121.42	0.0489	16.5
1-22 to 2-22	STORM-PRO	34.23	375	0.110	1.00	12.96	140.14	0.0352	13.7
2-22 to 3-22	STORM-PRO	40.00	375	0.110	0.50	17.35	121.77	0.0912	30.8
3-22 to 8-16	STORM-PRO	9.35	375	0.110	1.00	19.31	114.91	0.1701	54.3
1-ID1 to 2-ID1	uPVC	9.90	225	0.040	0.50	17.35	121.77	0.0215	7.3
2-ID1 to 3-ID1	uPVC	24.50	300	0.071	0.50	17.43	121.49	0.0388	13.1
3-ID1 to 4-ID1	uPVC	2.49	225	0.040	2.00	17.64	120.77	0.0697	23.4
1-ID2 to 2-ID2	uPVC	9.90	225	0.040	0.50	17.35	121.77	0.0220	7.4
2-ID2 to 3-ID2	uPVC	12.50	225	0.040	0.50	17.43	121.49	0.0394	13.3
3-ID2 to 4-ID2	uPVC	9.40	225	0.040	0.50	17.54	121.12	0.0613	20.6
4-ID2 to 5-ID2	uPVC	12.40	300	0.071	0.50	17.62	120.85	0.0779	26.1
5-ID2 to 6-ID2	uPVC	9.90	300	0.071	0.50	17.72	120.49	0.0997	33.4
6-ID2 to 7-ID2	uPVC	12.50	300	0.071	0.50	17.80	120.20	0.1170	39.1
7-ID2 to 8-ID2	uPVC	7.95	300	0.071	2.00	17.91	119.83	0.1390	46.3
8-ID2 to 9-ID2	uPVC	4.43	300	0.071	2.50	17.97	119.60	0.1390	46.2
1-ID3 to 2-ID3	uPVC	9.90	225	0.040	0.50	12.25	143.64	0.0337	13.4
2-ID3 to 3-ID3	uPVC	12.50	225	0.040	0.50	17.35	121.77	0.0511	17.3
3-ID3 to 4-ID3	uPVC	1.10	225	0.040	1.00	17.45	121.41	0.0730	24.6
4-ID3 to 5-ID3	STORM-PRO	5.27	225	0.040	5.00	17.46	121.38	0.1043	35.2
1-ID4 to 2-ID4	uPVC	1.00	225	0.040	1.00	12.25	143.64	0.0273	10.9
2-ID4 to 3-ID4	uPVC	5.92	225	0.040	1.00	17.35	121.77	0.0438	14.8
3-ID4 to 4-ID4	uPVC	3.63	375	0.110	2.00	17.40	121.60	0.0679	22.9
1-ID5 to 2-ID5	uPVC	17.12	300	0.071	1.00	17.35	121.77	0.0285	9.6
2-ID5 to 9-3	uPVC	12.26	300	0.071	1.00	17.49	121.28	0.0564	19.0
1-ID6 to 2-ID6	uPVC	40.62	300	0.071	0.50	13.41	137.89	0.0673	25.8
2-ID6 to 3-ID6	uPVC	18.69	300	0.071	0.50	17.65	120.72	0.1503	50.4
3-ID6 to 4-ID6	uPVC	25.47	375	0.110	0.50	17.81	120.18	0.1503	50.2
4-ID6 to 11-7	uPVC	8.54	375	0.110	1.00	18.02	119.43	0.1503	49.9
1-ID7 to 2-ID7	uPVC	23.26	225	0.040	0.50	17.35	121.77	0.0183	6.2
2-ID7 to 2-ID6	uPVC	12.83	225	0.040	0.50	17.54	121.10	0.0830	27.9
1-ID8 to 2-ID8	uPVC	24.32	300	0.071	1.00	17.35	121.77	0.0841	28.4
2-ID8 to 10-7	uPVC	22.95	375	0.110	1.00	17.55	121.07	0.1829	61.5

Pipe ID (-)	Part-area Tct (min)	Part-area I (mm/hr)	Part-area Sum CA (ha)	Part-area Qc=CIA (L/s)	Pipe Flow Q (L/s)	Capacity Flow Qcap (L/s)	Q/Qcap Ratio (-)	Full Pipe Vel Vf=Q/Af (m/s)	Norm Depth Vel Vn=Q/An (m/s)	Crit Depth Vel Vc=Q/Ac (m/s)	Capacity Vel Vcap=Qcap/Af (m/s)
1-1 to 2-1	1.40	250.70	0.0156	10.9	10.9	68.4	0.16	0.15	0.71	0.74	0.97
2-1 to 3-1	1.87	227.83	0.0431	27.3	27.3	68.4	0.40	0.39	0.91	0.97	0.97
3-1 to 4-1	2.15	219.36	0.0736	44.9	44.9	68.4	0.66	0.63	1.03	1.14	0.97
4-1 to 5-1	2.34	216.80	0.1288	77.6	77.6	68.4	1.13	1.10	1.10	1.42	0.97
1-2 to 2-2	2.70	212.08	0.0243	14.3	14.3	31.8	0.45	0.36	0.78	0.86	0.80
2-2 to 3-2	2.74	211.52	0.0331	19.4	19.4	31.8	0.61	0.49	0.84	0.95	0.80
3-2 to 4-2	2.84	210.20	0.0426	24.9	24.9	136.8	0.18	0.35	1.47	0.94	1.94
1-3 to 2-3					0.0	124.0	0.00	0.00	0.00	0.00	1.12
2-3 to 3-3	1.98	222.31	0.0876	54.1	54.1	124.0	0.44	0.49	1.08	1.12	1.12
3-3 to 4-3	2.12	219.75	0.1401	85.5	85.5	201.7	0.42	0.54	1.22	1.23	1.27
4-3 to 5-3	2.70	212.08	0.2734	161.1	161.1	201.7	0.80	1.01	1.41	1.54	1.27
5-3 to 6-3	2.90	209.36	0.3825	222.5	222.5	304.2	0.73	1.03	1.53	1.62	1.41
6-3 to 7-3	3.19	206.09	0.3999	228.9	228.9	434.4	0.53	0.81	1.56	1.55	1.54
7-3 to 8-3	3.55	202.50	0.9558	537.6	537.6	787.5	0.68	1.22	1.92	1.93	1.78
8-3 to 9-3	3.91	198.86	1.0200	563.5	563.5	787.5	0.72	1.28	1.94	1.96	1.78
9-3 to 10-3	4.02	197.83	1.0846	596.0	596.0	787.5	0.76	1.35	1.96	2.01	1.78
1-4 to 2-4	2.24	218.15	0.0271	16.4	16.4	124.0	0.13	0.15	0.78	0.79	1.12
2-4 to 3-4	3.11	206.87	0.0931	53.5	53.5	124.0	0.43	0.48	1.08	1.12	1.12
3-4 to 4-4	3.20	206.05	0.1795	102.7	102.7	201.7	0.51	0.65	1.27	1.31	1.27
4-4 to 5-4	3.33	204.69	0.2315	131.6	131.6	232.1	0.57	0.83	1.50	1.42	1.46
5-4 to 6-4	3.59	202.12	0.3553	199.5	199.5	304.2	0.66	0.92	1.50	1.56	1.41
6-4 to 7-3	3.80	199.98	0.4511	250.6	250.6	304.2	0.82	1.16	1.57	1.70	1.41
1-5 to 2-5	1.21	259.96	0.0046	3.4	4.5	175.4	0.03	0.04	0.68	0.56	1.59
2-5 to 3-5	2.83	210.31	0.1208	70.6	70.6	124.0	0.57	0.64	1.16	1.23	1.12
3-5 to 4-5	3.11	206.92	0.2912	167.4	167.4	201.7	0.83	1.05	1.42	1.56	1.27
4-5 to 5-5	3.19	206.11	0.3357	192.2	192.2	201.7	0.95	1.21	1.44	1.65	1.27
5-5 to 6-5	3.32	204.79	0.3618	205.8	205.8	430.2	0.48	0.95	1.96	1.57	1.99
1-6 to 2-6	1.11	264.52	0.0101	7.4	7.4	74.9	0.10	0.11	0.68	0.67	1.06
2-6 to 3-6	1.21	259.96	0.0702	50.7	50.7	68.4	0.74	0.72	1.06	1.19	0.97
3-6 to 3-5	2.91	209.22	0.1059	61.5	61.5	124.0	0.50	0.56	1.12	1.17	1.12
1-7 to 2-7	2.00	221.50	0.0360	22.2	22.2	124.0	0.18	0.20	0.85	0.86	1.12
2-7 to 3-7	3.11	206.87	0.1920	110.3	110.3	124.0	0.89	1.00	1.27	1.45	1.12
3-7 to 4-7	3.28	205.22	0.2442	139.2	139.2	201.7	0.69	0.88	1.37	1.45	1.27
4-7 to 5-7	3.52	202.76	0.3691	207.9	207.9	201.7	1.03	1.31	1.44	1.71	1.27
5-7 to 6-7	3.77	200.33	0.4667	259.7	259.7	304.2	0.85	1.20	1.58	1.72	1.41
6-7 to 7-7	3.97	198.31	0.6277	345.8	345.8	434.4	0.80	1.22	1.70	1.81	1.54
7-7 to 8-7	4.08	197.32	0.6647	364.3	364.3	434.4	0.84	1.29	1.72	1.84	1.54
8-7 to 9-7	4.35	195.08	0.7222	391.4	391.4	787.5	0.50	0.89	1.78	1.72	1.78
9-7 to 10-7	4.54	193.46	0.7909	425.1	425.1	787.5	0.54	0.96	1.82	1.77	1.78
10-7 to 11-7	4.65	192.56	0.9942	531.8	531.8	787.5	0.68	1.20	1.91	1.92	1.78
11-7 to 12-7	4.69	192.19	1.1831	631.6	631.6	787.5	0.80	1.43	1.98	2.06	1.78
12-7 to 13-7	4.74	191.74	1.1831	630.1	630.1	173.2	3.64	4.44	4.44	4.45	1.22
1-8 to 6-7	2.70	212.08	0.0216	12.7	12.7	201.7	0.06	0.08	0.71	0.72	1.27
1-9 to 6-7					0.0	205.7	0.00	0.00	0.00	0.00	1.29
1-10 to 2-10	2.12	219.81	0.0236	14.4	14.4	68.4	0.21	0.20	0.77	0.80	0.97
2-10 to 3-10	2.61	213.25	0.1043	61.8	61.8	124.1	0.50	0.56	1.12	1.17	1.12
3-10 to 4-10	2.91	209.22	0.2275	132.2	132.2	124.0	1.07	1.20	1.26	1.56	1.12
4-10 to 5-10	3.16	206.40	0.3326	190.7	190.7	201.7	0.95	1.20	1.44	1.65	1.27
5-10 to 6-10	3.29	205.13	0.3987	227.2	227.2	201.7	1.13	1.43	1.43	1.78	1.27
6-10 to 7-10	3.45	203.47	0.4520	255.4	255.4	304.2	0.84	1.18	1.57	1.71	1.41
7-10 to 8-10	3.73	200.72	0.5858	326.6	326.6	304.2	1.07	1.51	1.56	1.91	1.41
8-10 to 9-10	3.85	199.50	0.6703	371.4	371.4	752.3	0.49	1.31	2.65	1.86	2.66
1-11 to 2-11	2.10	220.09	0.0352	21.5	21.5	124.0	0.17	0.20	0.84	0.86	1.12
2-11 to 3-11	3.11	206.87	0.1512	86.9	86.9	156.4	0.56	0.79	1.45	1.32	1.42
3-11 to 4-11	3.38	204.17	0.3151	178.7	178.7	201.7	0.89	1.12	1.43	1.60	1.27
4-11 to 5-11	3.59	202.08	0.3726	209.2	209.2	201.7	1.04	1.32	1.44	1.72	1.27
5-11 to 6-11	3.80	200.00	0.5013	278.5	278.5	304.2	0.92	1.29	1.59	1.77	1.41
6-11 to 7-11	3.96	198.39	0.5885	324.3	324.3	430.2	0.75	1.50	2.18	1.90	1.99
1-12 to 3-11					0.0	175.4	0.00	0.00	0.00	0.00	1.59
1-13 to 3-11	2.70	212.08	0.0156	9.2	9.2	175.4	0.05	0.08	0.84	0.68	1.59
1-14 to 2-14	2.00	221.48	0.0388	23.9	23.9	124.1	0.19	0.22	0.87	0.88	1.12
2-14 to 3-14	2.70	212.08	0.1441	84.9	84.9	124.0	0.68	0.77	1.21	1.31	1.12
3-14 to 4-14	2.90	209.29	0.1997	116.1	116.1	124.0	0.94	1.05	1.28	1.48	1.12
4-14 to 5-14	3.14	206.61	0.3303	189.6	189.6	201.7	0.94	1.19	1.44	1.64	1.27
5-14 to 6-14	3.26	205.38	0.4143	236.4	236.4	285.2	0.83	1.49	2.00	1.82	1.79
1-15 to 2-15	1.40	250.56	0.0151	10.5	10.5	96.7	0.11	0.15	0.90	0.73	1.37
2-15 to 3-15	2.34	216.89	0.0957	57.6	57.6	124.0	0.46	0.52	1.10	1.15	1.12
3-15 to 4-15	2.61	213.25	0.1581	93.7	93.7	124.0	0.76	0.85	1.23	1.36	1.12
4-15 to 5-15	2.88	209.67	0.2278	132.7	132.7	124.0	1.07	1.20	1.26	1.57	1.12
5-15 to 6-15	2.99	208.16	0.2483	143.5	143.5	175.4	0.82	1.30	1.77	1.63	1.59
1-16 to 2-16	1.70	235.75	0.0199	13.0	13.0	63.5	0.21	0.33	1.26	0.83	1.60
2-16 to 3-16	1.80	231.33	0.0322	20.7	20.7	68.4	0.30	0.29	0.85	0.89	0.97
3-16 to 4-16	2.24	218.15	0.0674	40.9	40.9	124.0	0.33	0.37	1.01	1.03	1.12
4-16 to 5-16	2.66	212.54	0.2564	151.4	151.4	304.2	0.50	0.70	1.40	1.41	1.41
5-16 to 6-16	2.88	209.67	0.2738	159.4	159.4	434.4	0.37	0.56	1.42	1.38	1.54
6-16 to 7-16	3.08	207.19	0.6112	351.8	351.8	594.6	0.59	0.98	1.73	1.73	1.66
7-16 to 8-16	3.31	204.92	0.6298	358.5	358.5	594.6	0.60	1.00	1.74	1.74	1.66
8-16 to 9-16	3.45	203.52	0.8163	461.5	461.5	787.5	0.59	1.04	1.85	1.82	1.78
9-16 to 10-16	3.59	202.10	0.8163	458.3	458.3	787.5	0.58	1.04	1.85	1.82	1.78
10-16 to 11-16	3.88	199.21	0.9236	511.1	511.1	787.5	0.65	1.16	1.90	1.89	1.78
11-16 to 12-16	4.28	195.63	1.0424	566.5	566.5	787.5	0.72	1.28	1.94	1.97	1.78
12-16 to 13-16	4.36	195.00	1.0424	564.7	564.7	354.6	1.59	2.00	2.00	2.28	1.25
13-16 to 14-16	4.59	193.03	1.0424	558.9	558.9	347.3	1.61	1.98	1.98	2.27	1.23
1-17 to 2-17	2.10	220.09	0.0384	23.5	23.5	68.4	0.34	0.33	0.88	0.92	0.97
2-17 to 4-16	2.52	214.44	0.1215	72.4	72.4	68.4	1.06	1.02	1.09	1.37	0.97
1-18 to 2-18	2.05	220.75	0.0353	21.6	21.6	68.4	0.32	0.31	0.86	0.90	0.97
2-18 to 3-18	2.34	216.89	0.1097	66.1	66.1	124.0	0.53	0.60	1.14	1.20	1.12
3-18 to 4-18	2.52	214.48	0.1866	111.2	111.2	124.0	0.90	1.01	1.27	1.45	1.12
4-18 to 6-16	2.69	212.13	0.2697	158.9	158.9	124.0	1.28	1.44	1.44	1.71	1.12
1-19 to 2-7	2.70	212.08	0.0262	15.4	15.4	124.0	0.12	0.14	0.77	0.78	1.12
1-20 to 2-5	2.70	212.08	0.0197	11.6	11.6	124.0	0.09	0.11	0.70	0.72	1.12
1-21 to 2-21	2.70	212.08	0.0206	12.1	12.1	68.4	0.18	0.17	0.73	0.76	0.97
2-21 to 3-4	2.80	210.70	0.0447	26.2	26.2	124.0	0.21	0.24	0.89	0.90	1.12
1-22 to 2-22	2.12	219.81	0.0322	19.6	19.6	175.4	0.11	0.18	1.05	0.83	1.59
2-22 to 3-22	2.71	211.90	0.0851	50.1	50.1	124.0	0.40	0.45	1.06	1.10	1.12
3-22 to 8-16	3.04	207.57	0.1596	92.0	92.0	175.4	0.52	0.83	1.61	1.35	1.59
1-ID1 to 2-ID1	2.70	212.08	0.0196	11.6	11.6	31.8	0.36	0.29	0.74	0.80	0.80
2-ID1 to 3-ID1	2.78	210.97	0.0355	20.8	20.8	68.4	0.30	0.29	0.85	0.89	0.97
3-ID1 to 4-ID1	2.98	208.24	0.0638	36.9	36.9	63.5	0.58	0.93	1.66	1.21	1.60
1-ID2 to 2-ID2	2.70	212.08	0.0201	11.8	11.8	31.8	0.37	0.30	0.74	0.81	0.80
2-ID2 to 3-ID2	2.78	210.97	0.0360	21.1	21.1	31.8	0.66	0.53	0.85	0.97	0.80
3-ID2 to 4-ID2	2.88	209.58	0.0561	32.6	32.6	31.8	1.03	0.82	0.91	1.15	0.80
4-ID2 to 5-ID2	2.96	208.53	0.0712	41.2	41.2	68.4	0.60	0.58	1.01	1.10	0.97
5-ID2 to 6-ID2	3.06	207.36	0.0912	52.5	52.5	68.4	0.77	0.74	1.07	1.20	0.97
6-ID2 to 7-ID2	3.15	206.53	0.1071	61.4	61.4	68.4	0.90	0.87	1.09	1.28	0.97
7-ID2 to 8-ID2	3.25	205.49	0.1272	72.6	72.6	136.8	0.53	1.03	1.96	1.37	1.94
8-ID2 to 9-ID2	3.32	204.83	0.1272	72.4	72.4	153.0	0.47	1.02	2.13	1.37	2.16
1-ID3 to 2-ID3	2.01	221.24	0.0308	18.9	18.9	31.8	0.60	0.48	0.83	0.94	0.80
2-ID3 to 3-ID3	2.70	212.08	0.0469	27.6	27.6	31.8	0.87	0.69	0.90	1.07	0.80
3-ID3 to 4-ID3	2.80	210.68	0.0669	39.2	39.2	44.9	0.87	0.99	1.27	1.25	1.13
4-ID3 to 5-ID3	2.81	210.56	0.0956	55.9	55.9	100.4	0.56	1.41	2.59	1.53	2.53
1-ID4 to 2-ID4	2.00	221.48	0.0250	15.4	15.4	44.9	0.34	0.39	1.02	0.88	1.13
2-ID4 to 3-ID4	2.70	212.08	0.0402	23.7	23.7	44.9	0.53	0.60	1.14	1.01	1.13
3-ID4 to 4-ID4	2.75	211.42	0.0623	36.6	36.6	248.1	0.15	0.33	1.61	1.00	2.25
1-ID5 to 2-ID5	2.70	212.08	0.0260	15.3	15.3	96.7	0.16	0.22	1.00	0.81	1.37
2-ID5 to 9-3	2.84	210.17	0.0515	30.1	30.1	96.7	0.31	0.43	1.21	1.00	1.37
1-ID6 to 2-ID6	2.09	220.15	0.0635	38.8	38.8	68.4	0.57	0.55	1.00	1.08	0.97
2-ID6 to 3-ID6	2.80	210.64	0.1383	80.9	80.9	68.4	1.18	1.14	1.14	1.44	0.97
3-ID6 to 4-ID6	2.96	208.56	0.1383	80.1	80.1	124.0	0.65	0.73	1.19	1.28	1.12
4-ID6 to 11-7	3.36	204.36	0.1396	79.2	79.2	175.4	0.45	0.72	1.55	1.28	1.59
1-ID7 to 2-ID7	2.70	212.08	0.0167	9.8	9.8	31.8	0.31	0.25	0.70	0.76	0.80
2-ID7 to 2-ID6	2.89	209.48	0.0759	44.2	44.2	31.8	1.39	1.11	1.11	1.33	0.80
1-ID8 to 2-ID8	2.70	212.08	0.0768	45.3	45.3	96.7	0.47	0.64	1.35	1.14	1.37
2-ID8 to 10-7	2.90	209.36	0.1673	97.3	97.3	175.4	0.55	0.88	1.63	1.38	1.59

Pipe ID (-)	US Node Grate RL (m)	Pipe US IL (m)	Pipe DS IL (m)	DS Node Grate RL (m)	Pipe DS Bend (deg)	Pipe DS Drop (m)	US Node Ku (-)	US Node Kw (-)	Pipe V'head (m)
1-1 to 2-1	3.23	2.09	1.97	3.54	0.0	0.030	7.00		0.00
2-1 to 3-1	3.54	1.94	1.76	3.37	0.0	0.030	3.17		0.01
3-1 to 4-1	3.37	1.73	1.62	3.25	-69.1	0.030	1.79		0.02
4-1 to 5-1	3.25	1.59	1.53	2.65	0.0		2.55	2.75	0.06
1-2 to 2-2	3.50	2.60	2.58	3.48	-90.0	0.030	7.00		0.01
2-2 to 3-2	3.48	2.54	2.49	3.42	-21.7	0.503	2.22	2.66	0.01
3-2 to 4-2	3.42	1.98	1.91	2.67	0.0		2.21	2.75	0.01
1-3 to 2-3	4.15	2.70	2.57	4.06	-0.0	0.030			0.00
2-3 to 3-3	4.06	2.54	2.46	3.98	0.0	0.030	7.00		0.01
3-3 to 4-3	3.98	2.43	2.25	3.80	0.0	0.030	1.38		0.01
4-3 to 5-3	3.80	2.22	2.10	3.68	-90.0	0.033	1.98		0.05
5-3 to 6-3	3.68	2.07	1.89	3.65	0.0	0.030	2.22	2.69	0.05
6-3 to 7-3	3.65	1.86	1.78	3.55	90.0	0.030			0.03
7-3 to 8-3	3.55	1.75	1.54	3.33	40.0	0.030	1.98	2.41	0.08
8-3 to 9-3	3.33	1.51	1.44	3.52	-20.7	0.055	1.98	2.36	0.08
9-3 to 10-3	3.52	1.39	1.35	2.86	0.0	0.030	1.78	2.15	0.09
1-4 to 2-4	4.22	2.66	2.53	4.10	19.6	0.030	7.00		0.00
2-4 to 3-4	4.10	2.50	2.45	4.05	62.4	0.030	4.93	5.23	0.01
3-4 to 4-4	4.05	2.42	2.34	3.97	8.1	0.030	2.43	2.72	0.02
4-4 to 5-4	3.97	2.31	2.11	3.82	0.0	0.030	1.41	1.59	0.03
5-4 to 6-4	3.82	2.08	1.95	3.69	0.0	0.030	1.35		0.04
6-4 to 7-3	3.69	1.92	1.78	3.55	0.0	0.030	1.17		0.07
1-5 to 2-5	3.69	2.26	2.00	3.56	90.0	0.030	7.00		0.00
2-5 to 3-5	3.56	1.97	1.83	3.42	0.0	0.030	6.42	6.59	0.02
3-5 to 4-5	3.42	1.80	1.72	3.35	0.0	0.030	1.78	2.26	0.06
4-5 to 5-5	3.35	1.69	1.61	3.27	-26.3	0.030	0.84		0.07
5-5 to 6-5	3.27	1.58	1.54	2.83	0.0		1.80	2.08	0.05
1-6 to 2-6	3.63	2.28	2.11	3.73	-38.7	0.030	7.00		0.00
2-6 to 3-6	3.73	2.08	1.98	3.59	-0.9	0.030	6.96	7.12	0.03
3-6 to 3-5	3.59	1.95	1.83	3.42	-50.4	0.030	0.83	0.85	0.02
1-7 to 2-7	4.03	2.57	2.45	3.90	90.0	0.109	3.90		0.00
2-7 to 3-7	3.90	2.34	2.24	3.84	0.0	0.030	2.24	2.50	0.05
3-7 to 4-7	3.84	2.21	2.06	3.69	0.0	0.030	0.41		0.04
4-7 to 5-7	3.69	2.03	1.89	3.55	0.0	0.030	1.16		0.09
5-7 to 6-7	3.55	1.86	1.73	3.42	0.0	0.030	0.55		0.07
6-7 to 7-7	3.42	1.70	1.64	3.33	0.0	0.030	1.18	1.24	0.08
7-7 to 8-7	3.33	1.61	1.45	3.29	6.5	0.030	0.46		0.08
8-7 to 9-7	3.29	1.42	1.30	3.27	-65.2	0.030	0.26	0.35	0.04
9-7 to 10-7	3.27	1.27	1.21	3.34	-32.0	0.030	2.35	2.66	0.05
10-7 to 11-7	3.34	1.18	1.07	3.21	89.7	0.030	1.99	2.30	0.07
11-7 to 12-7	3.21	1.04	1.01	2.20	0.3	0.134	2.11	2.64	0.10
12-7 to 13-7	2.20	0.88	0.84	2.50	0.0		0.21		1.01
1-8 to 6-7	3.55	2.27	2.15	3.42	-90.0	0.447	7.00		0.00
1-9 to 6-7	3.55	2.30	2.17	3.42	90.0	0.470			0.00
1-10 to 2-10	4.15	2.67	2.56	4.05	0.0	0.079	5.81		0.00
2-10 to 3-10	4.05	2.48	2.34	3.90	0.0	0.030	3.61		0.02
3-10 to 4-10	3.90	2.31	2.16	3.75	0.0	0.052	1.88		0.07
4-10 to 5-10	3.75	2.11	2.03	3.68	-0.0	0.030	1.12		0.07
5-10 to 6-10	3.68	2.00	1.90	3.56	0.0	0.030	0.97		0.10
6-10 to 7-10	3.56	1.87	1.71	3.38	-7.3	0.043	0.25		0.07
7-10 to 8-10	3.38	1.66	1.59	3.30	7.2	0.051	1.39	1.55	0.12
8-10 to 9-10	3.30	1.54	1.38	2.83	0.0		0.81	0.92	0.09
1-11 to 2-11	3.94	2.38	2.21	3.77	0.0	0.030	7.00		0.00
2-11 to 3-11	3.77	2.18	1.92	3.61	0.0	0.030	4.12		0.03
3-11 to 4-11	3.61	1.89	1.77	3.49	0.0	0.030	1.85	2.05	0.06
4-11 to 5-11	3.49	1.74	1.61	3.36	9.9	0.030	0.93		0.09
5-11 to 6-11	3.36	1.58	1.49	3.26	-10.7	0.030	1.30	1.49	0.08
6-11 to 7-11	3.26	1.46	1.36	2.83	0.0		1.31	1.52	0.11
1-12 to 3-11	3.69	2.48	2.32	3.61	-90.0	0.426			0.00
1-13 to 3-11	3.69	2.48	2.32	3.61	90.0	0.423	7.00		0.00
1-14 to 2-14	3.84	2.31	2.18	3.71	-0.0	0.030	7.00		0.00
2-14 to 3-14	3.71	2.15	2.02	3.58	0.0	0.030	3.87		0.03
3-14 to 4-14	3.58	1.99	1.85	3.44	-8.4	0.030	1.35		0.06
4-14 to 5-14	3.44	1.82	1.75	3.37	9.0	0.030	1.58	1.76	0.07
5-14 to 6-14	3.37	1.72	1.61	2.73	0.0	0.030	1.38	1.57	0.11
1-15 to 2-15	3.58	2.20	1.96	3.46	-90.0	0.030	7.00		0.00
2-15 to 3-15	3.46	1.93	1.77	3.40	0.0	0.030	7.05	7.20	0.01
3-15 to 4-15	3.40	1.74	1.58	3.36	-19.9	0.030	1.74		0.04
4-15 to 5-15	3.36	1.55	1.48	3.30	-45.1	0.035	1.73	2.16	0.07
5-15 to 6-15	3.30	1.45	1.31	2.62	0.0		2.01	2.39	0.09
1-16 to 2-16	4.10	3.40	3.18	4.04	44.7	0.455	7.00		0.01
2-16 to 3-16	4.04	2.73	2.62	3.86	-5.6	0.030	2.22	2.69	0.00
3-16 to 4-16	3.86	2.58	2.46	3.72	0.0	0.030	1.81	1.93	0.01
4-16 to 5-16	3.72	2.43	2.30	3.59	-0.0	0.030	2.38	2.60	0.02
5-16 to 6-16	3.59	2.27	2.15	3.47	0.0	0.030	0.02		0.02
6-16 to 7-16	3.47	2.12	1.98	3.33	-0.0	0.030	2.01	2.43	0.05
7-16 to 8-16	3.33	1.95	1.84	3.22	-90.0	0.030	0.35		0.05
8-16 to 9-16	3.22	1.81	1.72	3.42	-0.0	0.030	2.11	2.66	0.06
9-16 to 10-16	3.42	1.69	1.52	3.44	0.0	0.030	0.20		0.05
10-16 to 11-16	3.44	1.49	1.25	3.44	90.0	0.030	0.74		0.07
11-16 to 12-16	3.44	1.22	1.17	2.31	-95.6	0.223	2.09	2.57	0.08
12-16 to 13-16	2.31	0.95	0.86	3.61	5.1	0.040	1.92	2.18	0.14
13-16 to 14-16	3.61	0.82	0.58	1.50	0.0		0.53	0.60	0.20
1-17 to 2-17	3.92	2.69	2.58	3.81	0.0	0.030	4.00		0.01
2-17 to 4-16	3.81	2.55	2.46	3.72	-90.0	0.030	2.15		0.05
1-18 to 2-18	3.86	2.63	2.54	3.77	0.0	0.030	3.14		0.00
2-18 to 3-18	3.77	2.51	2.40	3.66	0.0	0.030	2.02		0.02
3-18 to 4-18	3.66	2.37	2.27	3.55	0.0	0.030	1.23		0.05
4-18 to 6-16	3.55	2.24	2.15	3.47	-90.0	0.035	1.03		0.11
1-19 to 2-7	4.07	2.54	2.37	3.90	-90.0	0.030	3.75		0.00
1-20 to 2-5	3.64	2.08	2.00	3.56	-90.0	0.030	7.00		0.00
1-21 to 2-21	3.97	2.58	2.52	4.07	-36.7	0.030	7.00		0.00
2-21 to 3-4	4.07	2.49	2.45	4.05	-61.4	0.030	2.39	2.58	0.00
1-22 to 2-22	3.54	2.53	2.19	3.37	-0.5	0.030	7.00		0.00
2-22 to 3-22	3.37	2.16	1.96	3.22	90.5	0.030	2.25	2.26	0.01
3-22 to 8-16	3.22	1.93	1.84	3.22	90.0	0.030	1.63	2.03	0.04
1-ID1 to 2-ID1	3.50	3.04	2.99	3.50	0.0	0.030	7.00		0.00
2-ID1 to 3-ID1	3.50	2.96	2.84	3.50	-32.7	0.623	1.44		0.00
3-ID1 to 4-ID1	3.50	2.22	2.17	2.62	0.0		2.26	2.65	0.04
1-ID2 to 2-ID2	3.50	3.15	3.10	3.55	0.0	0.030	7.00		0.00
2-ID2 to 3-ID2	3.55	3.07	3.01	3.65	0.0	0.030	1.89		0.01
3-ID2 to 4-ID2	3.65	2.98	2.93	3.60	0.0	0.030	1.65		0.03
4-ID2 to 5-ID2	3.60	2.90	2.84	3.60	0.0	0.030	0.17		0.02
5-ID2 to 6-ID2	3.60	2.81	2.76	3.55	0.0	0.030	1.17		0.03
6-ID2 to 7-ID2	3.55	2.73	2.67	3.55	0.1	0.030	0.89		0.04
7-ID2 to 8-ID2	3.55	2.64	2.48	3.20	44.3	0.648	0.93		0.05
8-ID2 to 9-ID2	3.20	1.83	1.72	2.39	0.0		2.09	2.66	0.05
1-ID3 to 2-ID3	3.65	3.21	3.16	3.60	0.0	0.030	7.00		0.01
2-ID3 to 3-ID3	3.60	3.13	3.07	3.55	0.0	0.030	1.55		0.02
3-ID3 to 4-ID3	3.55	3.04	3.02	3.55	-82.6	0.355	1.45		0.05
4-ID3 to 5-ID3	3.55	2.67	2.41	2.83	0.0	0.332	1.94	2.38	0.10
1-ID4 to 2-ID4	3.50	2.77	2.76	3.50	-90.0	0.030	7.00		0.01
2-ID4 to 3-ID4	3.50	2.73	2.67	3.50	-36.9	0.901	2.25	2.66	0.02
3-ID4 to 4-ID4	3.50	1.77	1.70	2.83	0.0	0.909	2.25	3.05	0.01
1-ID5 to 2-ID5	3.72	2.60	2.43	3.68	-1.3	0.030	7.00		0.00
2-ID5 to 9-3	3.68	2.40	2.27	3.52	20.7	0.886	2.01	2.05	0.01
1-ID6 to 2-ID6	3.86	2.92	2.72	3.70	89.8	0.030	7.00		0.02
2-ID6 to 3-ID6	3.70	2.69	2.59	3.39	-89.4	0.030	2.09	2.63	0.07
3-ID6 to 4-ID6	3.39	2.56	2.43	3.45	88.6	0.030	2.10	2.72	0.03
4-ID6 to 11-7	3.45	2.40	2.32	3.21	-89.6	1.274	2.11	2.67	0.03
1-ID7 to 2-ID7	3.86	3.22	3.11	3.81	87.3	0.030	6.67		0.00
2-ID7 to 2-ID6	3.81	3.08	3.01	3.70	-87.8	0.328	3.36	3.55	0.06
1-ID8 to 2-ID8	3.50	2.58	2.33	3.50	0.0	0.030	7.00		0.02
2-ID8 to 10-7	3.50	2.30	2.07	3.34	-90.7	0.896	2.22		0.04

Pipe ID (-)	P'head Loss (Ku.V'head) (m)	WSE Loss (Kw.V'head) (m)	Pipe T'head Loss (m)	US Node HGL (m)	Pipe US HGL (m)	Pipe DS HGL (m)	DS Node HGL (m)	HGL Grade (%)	F'board US (m)
1-1 to 2-1	0.01		0.05	2.18	2.17	2.14	2.14	0.12	1.05
2-1 to 3-1	0.02		0.03	2.14	2.12	2.10	2.10	0.06	1.40
3-1 to 4-1	0.04		0.05	2.10	2.06	2.01	2.02	0.22	1.27
4-1 to 5-1	0.16	0.17	0.07	2.02	1.85	1.75	1.75	0.91	1.23
1-2 to 2-2	0.05		0.02	2.76	2.71	2.70	2.70	0.21	0.74
2-2 to 3-2	0.03	0.03	0.06	2.70	2.67	2.60	2.12	0.60	0.78
3-2 to 4-2	0.01	0.02	0.04	2.12	2.10	2.00	2.00	2.95	1.30
1-3 to 2-3			0.00	2.98	2.98	2.98	2.98	0.00	1.18
2-3 to 3-3	0.09		0.02	2.98	2.89	2.88	2.88	0.08	1.09
3-3 to 4-3	0.02		0.03	2.88	2.86	2.83	2.83	0.09	1.10
4-3 to 5-3	0.10		0.08	2.83	2.72	2.64	2.67	0.32	0.97
5-3 to 6-3	0.12	0.14	0.09	2.67	2.52	2.45	2.45	0.22	1.01
6-3 to 7-3			0.02	2.45	2.45	2.43	2.46	0.13	1.21
7-3 to 8-3	0.15	0.18	0.11	2.46	2.28	2.22	2.25	0.12	1.09
8-3 to 9-3	0.16	0.20	0.04	2.25	2.06	2.04	2.08	0.14	1.08
9-3 to 10-3	0.16	0.20	0.04	2.08	1.88	1.82	1.82	0.63	1.44
1-4 to 2-4	0.01		0.00	2.97	2.97	2.96	2.97	0.01	1.24
2-4 to 3-4	0.06	0.06	0.01	2.97	2.91	2.90	2.90	0.09	1.14
3-4 to 4-4	0.05	0.06	0.02	2.90	2.84	2.83	2.83	0.11	1.15
4-4 to 5-4	0.05	0.06	0.07	2.83	2.78	2.71	2.71	0.21	1.14
5-4 to 6-4	0.06		0.06	2.71	2.65	2.60	2.60	0.21	1.10
6-4 to 7-3	0.08		0.09	2.60	2.52	2.43	2.46	0.34	1.09
1-5 to 2-5	0.00		0.00	2.42	2.42	2.42	2.43	-0.00	1.27
2-5 to 3-5	0.13	0.14	0.04	2.43	2.29	2.25	2.28	0.13	1.14
3-5 to 4-5	0.10	0.13	0.05	2.28	2.15	2.11	2.11	0.26	1.15
4-5 to 5-5	0.06		0.08	2.11	2.05	1.97	1.99	0.47	1.24
5-5 to 6-5	0.08	0.10	0.02	1.99	1.89	1.80	1.80	2.13	1.28
1-6 to 2-6	0.00		0.00	2.52	2.52	2.52	2.52	0.00	1.11
2-6 to 3-6	0.18	0.19	0.05	2.52	2.33	2.29	2.29	0.22	1.21
3-6 to 3-5	0.01	0.01	0.03	2.29	2.28	2.25	2.28	0.10	1.30
1-7 to 2-7	0.01		0.00	3.48	3.48	3.47	3.49	0.02	0.54
2-7 to 3-7	0.11	0.13	0.08	3.49	3.36	3.28	3.28	0.40	0.41
3-7 to 4-7	0.02		0.07	3.28	3.26	3.19	3.19	0.24	0.56
4-7 to 5-7	0.10		0.15	3.19	3.09	2.94	2.94	0.53	0.50
5-7 to 6-7	0.04		0.09	2.94	2.90	2.81	2.81	0.36	0.61
6-7 to 7-7	0.09	0.09	0.04	2.81	2.72	2.68	2.68	0.32	0.61
7-7 to 8-7	0.04		0.11	2.68	2.64	2.53	2.53	0.35	0.65
8-7 to 9-7	0.01	0.01	0.03	2.53	2.52	2.49	2.50	0.12	0.76
9-7 to 10-7	0.11	0.13	0.02	2.50	2.38	2.36	2.38	0.15	0.76
10-7 to 11-7	0.15	0.17	0.05	2.38	2.21	2.16	2.22	0.23	0.96
11-7 to 12-7	0.22	0.27	0.02	2.22	1.94	1.92	1.93	0.32	0.99
12-7 to 13-7	0.22		0.44	1.93	1.71	1.27	1.27	6.66	0.27
1-8 to 6-7	0.00		0.00	2.81	2.81	2.81	2.81	0.00	0.73
1-9 to 6-7			0.00	2.81	2.81	2.81	2.81	0.00	0.74
1-10 to 2-10	0.01		0.00	3.20	3.19	3.18	3.18	0.02	0.95
2-10 to 3-10	0.06		0.04	3.18	3.13	3.09	3.09	0.12	0.86
3-10 to 4-10	0.14		0.17	3.09	2.95	2.78	2.78	0.57	0.81
4-10 to 5-10	0.08		0.07	2.78	2.70	2.63	2.63	0.45	0.97
5-10 to 6-10	0.10		0.13	2.63	2.53	2.40	2.40	0.63	1.05
6-10 to 7-10	0.02		0.11	2.40	2.38	2.27	2.29	0.34	1.16
7-10 to 8-10	0.16	0.18	0.08	2.29	2.11	2.01	2.02	0.68	1.09
8-10 to 9-10	0.07	0.08	0.08	2.02	1.94	1.68	1.68	2.44	1.28
1-11 to 2-11	0.01		0.01	2.83	2.81	2.81	2.81	0.02	1.11
2-11 to 3-11	0.13		0.08	2.81	2.68	2.60	2.61	0.25	0.96
3-11 to 4-11	0.12	0.13	0.10	2.61	2.48	2.38	2.38	0.39	1.00
4-11 to 5-11	0.08		0.13	2.38	2.30	2.17	2.18	0.54	1.10
5-11 to 6-11	0.11	0.13	0.07	2.18	2.06	1.99	2.02	0.33	1.18
6-11 to 7-11	0.15	0.17	0.09	2.02	1.84	1.70	1.70	1.46	1.24
1-12 to 3-11			0.00	2.60	2.60	2.60	2.61	0.00	1.09
1-13 to 3-11	0.00		0.00	2.60	2.60	2.60	2.61	-0.01	1.09
1-14 to 2-14	0.02		0.01	2.79	2.77	2.77	2.77	0.02	1.05
2-14 to 3-14	0.12		0.06	2.77	2.65	2.59	2.59	0.23	0.94
3-14 to 4-14	0.08		0.12	2.59	2.52	2.39	2.41	0.44	0.99
4-14 to 5-14	0.11	0.13	0.07	2.41	2.28	2.21	2.23	0.44	1.04
5-14 to 6-14	0.16	0.18	0.10	2.23	2.06	1.92	1.92	1.27	1.13
1-15 to 2-15	0.01		0.00	2.40	2.39	2.39	2.40	0.01	1.18
2-15 to 3-15	0.10	0.10	0.03	2.40	2.30	2.26	2.26	0.11	1.06
3-15 to 4-15	0.06		0.09	2.26	2.20	2.11	2.14	0.29	1.14
4-15 to 5-15	0.13	0.16	0.08	2.14	1.98	1.90	1.93	0.57	1.22
5-15 to 6-15	0.17	0.21	0.14	1.93	1.73	1.57	1.57	1.15	1.36
1-16 to 2-16	0.04		0.20	3.53	3.49	3.25	3.20	2.23	0.57
2-16 to 3-16	0.01	0.01	0.01	3.20	3.19	3.18	3.18	0.05	0.84
3-16 to 4-16	0.01	0.01	0.01	3.18	3.17	3.15	3.16	0.05	0.68
4-16 to 5-16	0.06	0.06	0.03	3.16	3.10	3.06	3.06	0.12	0.56
5-16 to 6-16	0.00		0.02	3.06	3.06	3.05	3.07	0.07	0.53
6-16 to 7-16	0.10	0.12	0.05	3.07	2.95	2.90	2.90	0.17	0.40
7-16 to 8-16	0.02		0.04	2.90	2.88	2.84	2.87	0.18	0.43
8-16 to 9-16	0.12	0.15	0.03	2.87	2.72	2.69	2.69	0.17	0.35
9-16 to 10-16	0.01		0.06	2.69	2.68	2.62	2.62	0.17	0.73
10-16 to 11-16	0.05		0.10	2.62	2.57	2.47	2.51	0.21	0.82
11-16 to 12-16	0.18	0.22	0.02	2.51	2.30	2.27	2.31	0.26	0.93
12-16 to 13-16	0.27	0.31	0.17	2.31	2.00	1.83	1.85	0.59	0.00
13-16 to 14-16	0.11	0.12	0.60	1.85	1.73	1.07	1.07	0.90	1.76
1-17 to 2-17	0.02		0.01	3.40	3.38	3.37	3.37	0.06	0.52
2-17 to 4-16	0.12		0.10	3.37	3.25	3.15	3.16	0.56	0.44
1-18 to 2-18	0.01		0.01	3.54	3.52	3.51	3.51	0.05	0.32
2-18 to 3-18	0.04		0.03	3.51	3.47	3.44	3.44	0.14	0.26
3-18 to 4-18	0.06		0.08	3.44	3.38	3.30	3.30	0.40	0.22
4-18 to 6-16	0.11		0.14	3.30	3.19	3.05	3.07	0.82	0.26
1-19 to 2-7	0.00		0.00	3.48	3.48	3.47	3.49	0.01	0.59
1-20 to 2-5	0.00		0.00	2.43	2.42	2.42	2.43	0.00	1.22
1-21 to 2-21	0.01		0.00	2.92	2.91	2.91	2.91	0.02	1.06
2-21 to 3-4	0.01	0.01	0.00	2.91	2.90	2.90	2.90	0.02	1.17
1-22 to 2-22	0.01		0.00	3.00	2.98	2.98	2.98	0.01	0.55
2-22 to 3-22	0.02	0.02	0.03	2.98	2.96	2.92	2.94	0.08	0.39
3-22 to 8-16	0.06	0.07	0.03	2.94	2.87	2.84	2.87	0.28	0.28
1-ID1 to 2-ID1	0.03		0.05	3.17	3.14	3.08	3.08	0.54	0.33
2-ID1 to 3-ID1	0.01		0.12	3.08	3.08	2.95	2.50	0.52	0.42
3-ID1 to 4-ID1	0.10	0.12	0.02	2.50	2.38	2.29	2.29	3.52	1.01
1-ID2 to 2-ID2	0.03		0.01	3.30	3.27	3.26	3.26	0.06	0.20
2-ID2 to 3-ID2	0.03		0.03	3.26	3.24	3.22	3.22	0.16	0.29
3-ID2 to 4-ID2	0.06		0.06	3.22	3.16	3.08	3.08	0.83	0.43
4-ID2 to 5-ID2	0.00		0.04	3.08	3.08	3.05	3.05	0.21	0.52
5-ID2 to 6-ID2	0.03		0.04	3.05	3.02	2.99	2.99	0.29	0.55
6-ID2 to 7-ID2	0.03		0.06	2.99	2.95	2.90	2.90	0.45	0.56
7-ID2 to 8-ID2	0.05		0.11	2.90	2.85	2.63	2.18	2.69	0.65
8-ID2 to 9-ID2	0.11	0.14	0.04	2.18	2.04	1.86	1.86	3.96	1.02
1-ID3 to 2-ID3	0.08		0.02	3.44	3.36	3.35	3.35	0.13	0.21
2-ID3 to 3-ID3	0.04		0.04	3.35	3.31	3.27	3.27	0.30	0.25
3-ID3 to 4-ID3	0.07		0.01	3.27	3.20	3.19	3.10	1.29	0.28
4-ID3 to 5-ID3	0.20	0.24	0.11	3.10	2.86	2.53	2.53	6.42	0.45
1-ID4 to 2-ID4	0.05		0.00	2.95	2.90	2.90	2.91	-0.14	0.54
2-ID4 to 3-ID4	0.04	0.05	0.06	2.91	2.86	2.79	1.93	1.20	0.59
3-ID4 to 4-ID4	0.01	0.02	0.03	1.93	1.91	1.80	1.80	3.11	1.57
1-ID5 to 2-ID5	0.02		0.16	2.71	2.69	2.55	2.55	0.84	1.01
2-ID5 to 9-3	0.02	0.02	0.12	2.55	2.53	2.39	2.08	1.15	1.14
1-ID6 to 2-ID6	0.11		0.06	3.28	3.17	3.11	3.15	0.15	0.58
2-ID6 to 3-ID6	0.14	0.18	0.12	3.15	2.97	2.84	2.85	0.72	0.55
3-ID6 to 4-ID6	0.06	0.07	0.12	2.85	2.78	2.67	2.68	0.45	0.54
4-ID6 to 11-7	0.06	0.07	0.08	2.68	2.61	2.50	2.22	1.34	0.77
1-ID7 to 2-ID7	0.02		0.01	3.58	3.56	3.55	3.56	0.05	0.28
2-ID7 to 2-ID6	0.21	0.22	0.12	3.56	3.33	3.19	3.15	1.13	0.25
1-ID8 to 2-ID8	0.15		0.17	2.89	2.74	2.62	2.62	0.50	0.61
2-ID8 to 10-7	0.09		0.21	2.62	2.53	2.36	2.38	0.75	0.88

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED:	T.RYDEN	DATE:	JAN 2024
DRAWN:	A.SCHMID	SCALE:	AS SHOWN
SURVEYING:	MACRO SURVEYING	SHEET SIZE:	A1

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

MDE Manage Design Engineer

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: STORMWATER COMPUTATIONS - 10% AEP
MINOR STORM HYDRAULICS

DWG No: D29 | SHEET: 29 OF 43 | REV: 1

12D MODEL - HYDRAULIC DESIGN SHEET

Project:	Clifton YAMBA No2
Drainage Model:	Drainage Design REV 1
Rainfall File:	AUS NSW YAMBA AEP.12dhydro
Rainfall Method:	IFD Table
Runoff C Method:	QUDM 2007
Manning n Roughness:	0.013
Freeboard Limit:	0.15 m

Major 1.00 AEP(%) Storm Event

Pipe ID	Pipe Type	Pipe Length	Pipe Size	Full Pipe Area Af	Pipe Grade	Full-area Tct	Full-area I	Full-area Sum CA	Peak Flow Qrat	Net Bypass Flow Qb	Pipe Flow Q	Excess Pipe Flow Qx	Capacity Flow Qcap	Q/Qcap Ratio	Full Pipe Vel Vf=Q/Af	Norm Depth Vel Vn=Q/An	Crit Depth Vel Vc=Q/Ac	Capacity Vel Vcap=Qcap/Af	US Node Grate RL	Pipe US IL	Pipe DS IL	DS Node Grate RL	Pipe DS Bend	Pipe DS Drop	US Node Ku	US Node Kw	Pipe V'head	P'head Loss (Ku.V'head)	WSE Loss (Kw.V'head)	Pipe T'head Loss	US Node HGL	Pipe US HGL	Pipe DS HGL	DS Node HGL	HGL Grade	F'board US
(-)	(-)	(m)	(mm)	(sq.m)	(%)	(min)	(mm/hr)	(ha)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(-)	(m/s)	(m/s)	(m/s)	(m/s)	(m)	(m)	(m)	(m)	(deg)	(m)	(-)	(-)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(m)
1-1 to 2-1	STORM-PRO	24.46	300	0.071	0.50	7.08	262.89	0.0192	14.1		14.1		68.4	0.21	0.20	0.76	0.79	0.97	3.23	2.09	1.97	3.54	0.0	0.030	7.00		0.00	0.01		0.00	2.37	2.36	2.35	2.35	0.02	0.85
2-1 to 3-1	STORM-PRO	34.13	300	0.071	0.50	9.25	239.16	0.0529	35.2		35.2		68.4	0.51	0.50	0.97	1.05	0.97	3.54	1.94	1.76	3.37	0.0	0.030	3.17		0.01	0.04		0.05	2.35	2.31	2.27	2.27	0.13	1.18
3-1 to 4-1	STORM-PRO	22.94	300	0.071	0.50	10.71	225.71	0.0905	56.7		56.7		68.4	0.83	0.80	1.08	1.24	0.97	3.37	1.73	1.62	3.25	-69.1	0.030	1.61		0.03	0.05		0.08	2.27	2.22	2.14	2.16	0.34	1.10
4-1 to 5-1	STORM-PRO	11.18	300	0.071	0.50	10.90	224.28	0.1582	98.6		98.6		68.4	1.44	1.39	1.39	1.60	0.97	3.25	1.59	1.53	2.65	0.0		2.19	2.46	0.10	0.22	0.24	0.11	2.16	1.92	1.78	1.78	1.27	1.09
1-2 to 2-2	STORM-PRO	5.00	225	0.040	0.50	14.25	199.22	0.0300	16.6	-0.1	16.5		31.8	0.52	0.41	0.81	0.90	0.80	3.50	2.60	2.58	3.48	-90.0	0.030	7.00		0.01	0.06		0.01	2.79	2.73	2.72	2.73	0.16	0.71
2-2 to 3-2	STORM-PRO	11.84	225	0.040	0.50	14.29	198.90	0.0405	22.4		22.4		31.8	0.70	0.56	0.87	0.99	0.80	3.48	2.54	2.49	3.42	-21.7	0.503	2.24	2.66	0.02	0.04	0.04	0.06	2.73	2.68	2.61	2.13	0.63	0.75
3-2 to 4-2	STORM-PRO	3.55	300	0.071	2.00	14.39	198.17	0.0519	28.5		28.5		136.8	0.21	0.40	1.53	0.98	1.94	3.42	1.98	1.91	2.67	0.0		2.22	2.75	0.01	0.02	0.02	0.04	2.13	2.11	2.00	2.00	3.02	1.29
1-3 to 2-3	STORM-PRO	26.08	375	0.110	0.50				0.0		0.0		124.0	0.00	0.00	0.00	0.00	1.12	4.15	2.70	2.57	4.06	-0.0	0.030			0.00			0.00	2.91	2.91	2.91	2.91	0.00	1.24
2-3 to 3-3	STORM-PRO	17.05	375	0.110	0.50	8.64	245.82	0.1075	73.4		73.4		124.0	0.59	0.66	1.17	1.24	1.12	4.06	2.54	2.46	3.98	0.0	0.030	7.00		0.02	0.16		0.08	2.91	2.75	2.68	2.68	0.42	1.15
3-3 to 4-3	STORM-PRO	35.31	450	0.159	0.50	8.78	244.27	0.1717	116.5	-13.3	103.2		201.7	0.51	0.65	1.28	1.31	1.27	3.98	2.43	2.25	3.80	0.0	0.030	1.06		0.02	0.02		0.17	2.68	2.66	2.50	2.50	0.44	1.30
4-3 to 5-3	STORM-PRO	24.36	450	0.159	0.50	13.16	207.33	0.3351	193.0	-75.6	117.4		201.7	0.58	0.74	1.32	1.37	1.27	3.80	2.22	2.10	3.68	-90.0	0.033	1.22		0.03	0.03		0.12	2.50	2.47	2.36	2.37	0.44	1.30
5-3 to 6-3	STORM-PRO	35.07	525	0.216	0.50	13.37	205.81	0.4681	267.6	-129.8	137.8		304.2	0.45	0.64	1.37	1.37	1.41	3.68	2.07	1.89	3.65	0.0	0.030	2.19	2.69	0.02	0.05	0.06	0.10	2.37	2.31	2.28	2.28	0.09	1.31
6-3 to 7-3	STORM-PRO	15.33	600	0.283	0.50	13.66	203.63	0.4888	276.5	-137.7	138.8		434.4	0.32	0.49	1.37	1.32	1.54	3.65	1.86	1.78	3.55	90.0	0.030			0.01			0.01	2.28	2.28	2.28	2.29	0.02	1.37
7-3 to 8-3	STORM-PRO	43.65	750	0.442	0.50	16.48	185.86	1.1823	610.4	-282.4	328.0		787.5	0.42	0.74	1.70	1.63	1.78	3.55	1.75	1.54	3.33	40.0	0.030	1.93	2.34	0.03	0.05	0.07	0.05	2.29	2.22	2.21	2.22	0.03	1.26
8-3 to 9-3	STORM-PRO	12.77	750	0.442	0.50	16.84	183.95	1.2603	644.0	-298.2	345.8		787.5	0.44	0.78	1.72	1.65	1.78	3.33	1.51	1.44	3.52	-20.7	0.055	1.97	2.37	0.03	0.06	0.07	0.01	2.22	2.15	2.14	2.21	0.05	1.11
9-3 to 10-3	STORM-PRO	8.09	750	0.442	0.50	16.95	183.40	1.3389	682.1		682.1		787.5	0.87	1.54	2.01	2.12	1.78	3.52	1.39	1.35	2.86	0.0	0.030	1.80	2.38	0.12	0.22	0.29	0.04	2.21	1.92	1.86	1.86	0.79	1.30
1-4 to 2-4	STORM-PRO	25.67	375	0.110	0.50	10.15	229.88	0.0333	21.3		21.3		124.0	0.17	0.19	0.84	0.85	1.12	4.22	2.66	2.53	4.10	19.6	0.030	7.00		0.00	0.01		0.01	2.83	2.82	2.82	2.82	0.01	1.39
2-4 to 3-4	STORM-PRO	9.90	375	0.110	0.50	15.56	190.64	0.1143	60.5		60.5		124.0	0.49	0.55	1.12	1.17	1.12	4.10	2.50	2.45	4.05	62.4	0.030	4.48	4.81	0.02	0.07	0.07	0.02	2.82	2.75	2.74	2.75	0.07	1.28
3-4 to 4-4	STORM-PRO	16.28	450	0.159	0.50	15.65	190.21	0.2201	116.3		116.3		201.7	0.58	0.73	1.31	1.36	1.27	4.05	2.42	2.34	3.97	8.1	0.030	2.43	2.72	0.03	0.07	0.07	0.06	2.75	2.67	2.65	2.66	0.16	1.31
4-4 to 5-4	STORM-PRO	30.87	450	0.159	0.66	15.78	189.50	0.2833	149.1		149.1		232.1	0.64	0.94	1.55	1.49	1.46	3.97	2.31	2.11	3.82	0.0	0.030	1.47	1.65	0.04	0.07	0.07	0.20	2.66	2.58	2.40	2.40	0.60	1.31
5-4 to 6-4	STORM-PRO	25.65	525	0.216	0.50	16.04	188.15	0.4352	227.4	-48.7	178.8		304.2	0.59	0.83	1.46	1.50	1.41	3.82	2.08	1.95	3.69	0.0	0.030	0.53		0.03	0.02		0.08	2.40	2.38	2.35	2.35	0.11	1.42
6-4 to 7-3	STORM-PRO	26.85	525	0.216	0.50	16.25	187.03	0.5513	286.4	-89.7	196.7		304.2	0.65	0.91	1.49	1.55	1.41	3.69	1.92	1.78	3.55	0.0	0.030	0.88		0.04	0.04		0.05	2.35	2.31	2.28	2.29	0.13	1.34
1-5 to 2-5	STORM-PRO	26.20	375	0.110	1.00	6.09	273.65	0.0109	8.3		8.3		175.4	0.05	0.07	0.81	0.66	1.59	3.69	2.26	2.00	3.56	90.0	0.030	7.00		0.00	0.00		0.09	2.33	2.33	2.26	2.26	0.27	1.37
2-5 to 3-5	STORM-PRO	27.74	375	0.110	0.50	14.38	198.23	0.1523	83.8	-36.3	47.5		124.0	0.38	0.43	1.05	1.08	1.12	3.56	1.97	1.83	3.42	0.0	0.030	3.68	3.98	0.01	0.03	0.04	0.02	2.26	2.22	2.21	2.23	0.04	1.30
3-5 to 4-5	STORM-PRO	15.61	450	0.159	0.50	15.76	189.60	0.3601	189.7	-51.8	137.9		201.7	0.68	0.87	1.36	1.45	1.27	3.42	1.80	1.72	3.35	0.0	0.030	1.83	2.32	0.04	0.07	0.09	0.04	2.23	2.14	2.12	2.12	0.15	1.20
4-5 to 5-5	STORM-PRO	15.94	450	0.159	0.50	15.89	188.92	0.4152	217.9	-55.2	162.7		201.7	0.81	1.02	1.41	1.54	1.27	3.35	1.69	1.61	3.27	-26.3	0.030	1.03		0.05	0.06		0.05	2.12	2.06	2.02	2.05	0.23	1.23
5-5 to 6-5	STORM-PRO	4.41	525	0.216	1.00	16.03	188.22	0.4469	233.6	3.0	236.6		430.2	0.55	1.09	2.03	1.66	1.99	3.27	1.58	1.54	2.83	0.0		1.82	2.23	0.06	0.11	0.14	0.02	2.05	1.91	1.82	1.82	2.15	1.22
1-6 to 2-6	STORM-PRO	28.64	300	0.071	0.60	5.62	278.87	0.0135	10.4		10.4		74.9	0.14	0.15	0.75	0.73	1.06	3.63	2.28	2.11	3.73	-38.7	0.030	7.00		0.00	0.01		0.00	2.61	2.60	2.60	2.61	0.01	1.02
2-6 to 3-6	STORM-PRO	20.04	300	0.071	0.50	6.09	273.65	0.0889	67.6		67.6		68.4	0.99	0.96	1.10	1.33	0.97	3.73	2.08	1.98	3.59	-0.9	0.030	5.73	5.85	0.05	0.27	0.27	0.09	2.61	2.33	2.25	2.25	0.43	1.13
3-6 to 3-5	STORM-PRO	23.89	375	0.110	0.50	15.56	190.64	0.1290	68.3		68.3		124.0	0.55	0.62	1.15	1.21	1.12	3.59	1.95	1.83	3.42	-50.4	0.030	0.67	0.68	0.02	0.01	0.01	0.03	2.25	2.23	2.21	2.23	0.10	1.35
1-7 to 2-7	STORM-PRO	25.40	375	0.110	0.50	8.64	245.82	0.0442	30.2		30.2		124.0	0.24	0.27	0.93	0.94	1.12	4.03	2.57	2.45	3.90	90.0	0.109	2.75		0.00	0.01		0.01	3.91	3.90	3.90	3.90	0.03	0.11
2-7 to 3-7	STORM-PRO	19.83	375	0.110	0.50	15.56	190.64	0.2356	124.8		124.8	42.6	124.0	1.01	1.13	1.28	1.52	1.12	3.90	2.34	2.24	3.84	0.0	0.030	1.75	1.93	0.03	0.05	0.05	0.04	3.90	3.85	3.80	3.80	0.22	0.00
3-7 to 4-7	STORM-PRO	29.57	450	0.159	0.50	15.73	189.78	0.2988	157.5		157.5		201.7	0.78	0.99	1.40	1.52	1.27	3.84	2.21	2.06	3.69	0.0	0.030	0.40		0.05	0.02		0.09	3.80	3.78	3.69	3.69	0.31	0.04
4-7 to 5-7	STORM-PRO	29.07	450	0.159	0.50	15.98	188.49	0.4519	236.6		236.6	11.4	201.7	1.17	1.49	1.49	1.82	1.27	3.69	2.03	1.89	3.55	0.0	0.030	1.02		0.10	0.10		0.18	3.69	3.59	3.41	3.41	0.62	0.00
5-7 to 6-7	STORM-PRO	24.33	525	0.216	0.50	16.22	187.22	0.5706	296.7		296.7		304.2	0.98	1.37	1.60	1.82	1.41	3.55	1.86	1.73	3.42	0.0	0.030	0.45		0.10	0.04		0.12	3.41	3.36	3.25	3.25	0.48	0.14
6-7 to 7-7	STORM-PRO	13.41	600	0.283	0.50	16.42	186.16	0.7672	396.7		396.7		434.4	0.91	1.40	1.74	1.91	1.54	3.42	1.70	1.64	3.33	0.0	0.030	0.99	1.04	0.10	0.10	0.10	0.06	3.25	3.15	3.09	3.09	0.42	0.17
7-7 to 8-7	STORM-PRO	32.00	600	0.283	0.50	16.53	185.57	0.8116	418.3		418.3		434.4	0.96	1.48	1.75	1.96	1.54	3.33	1.61	1.45	3.29	6.5	0.030	0.44		0.11	0.05		0.15	3.09	3.04	2.90	2.90	0.46	0.24
8-7 to 9-7	STORM-PRO	23.07	750	0.442	0.50	16.80	184.17	0.8812	450.8		450.8		787.5	0.57	1.02	1.84	1.81	1.78	3.29	1.42	1.30	3.27	-65.2	0.030	0.20	0.25	0.05	0.01	0.01	0.04	2.90	2.88	2.85	2.87	0.16	0.39
9-7 to 10-7	STORM-PRO	12.99	750	0.442	0.50	16.99	183.16	0.9646	490.8		490.8		787.5	0.62	1.11	1.88	1.87	1.78	3.27	1.27	1.21	3.34	-32.0	0.030	1.98	2.33	0.06	0.12	0.15	0.03	2.87	2.72	2.70	2.71	0.19	0.40
10-7 to 11-7	STORM-PRO	20.40	750	0.442	0.50	17.10	182.60	1.2122	614.8		614.8		787.5	0.78	1.39	1.97	2.03	1.78	3.34	1.18	1.07	3.21	89.7	0.030	1.83	1.97	0.10	0.18	0.19	0.06	2.71	2.52	2.45	2.52	0.30	0.63
11-7 to 12-7	STORM-PRO	6.42	750	0.442	0.50	17.27	181.71	1.4471	730.4		730.4		787.5	0.93	1.65	2.02	2.19	1.78	3.21	1.04	1.01	2.20	0.3	0.134	2.04	2.48	0.14	0.28	0.35	0.03	2.52	2.17	2.14	2.15	0.43	0.70
12-7 to 13-7	PVC	6.63	425	0.142	0.50	17.32	181.43	1.4471	729.3		729.3		173.2	4.21	5.14	5.14	5.14	1.22	2.20	0.88	0.84	2.50	0.0		0.21		1.35	0.28		0.59	2.15	1.86	1.27	1.27	8.89	0.05
1-8 to 6-7	STORM-PRO	24.70	450	0.159	0.50	14.25	199.22	0.0265	14.7		14.7		201.7	0.07	0.09	0.74	0.75	1.27	3.55	2.27	2.15	3.42	-90.0	0.447	4.44		0.00	0.00		0.00	3.25	3.25	3.25	3.25	0.00	0.30
1-9 to 6-7	STORM-PRO	24.70	450	0.159	0.52				0.0		0.0		205.7	0.00	0.00	0.00	0.00	1.29	3.55	2.30	2.17	3.42	90.0	0.470			0.00			0.00	3.25	3.25	3.25	3.25	0.00	0.30
1-10 to 2-10	STORM-PRO	21.29	300	0.071	0.50	10.15	229.88	0.0290	18.5		18.5		68.4	0.27	0.26	0.82	0.86	0.97	4.15	2.67	2.56	4.05	0.0	0.079	3.11		0.00	0.01		0.01	3.59	3.58	3.57	3.57	0.04	0.57
2-10 to 3-10	STORM-PRO	28.36	375	0.110	0.50	12.89	209.36	0.1281	74.5		74.5		124.1	0.60	0.67	1.17	1.25	1.12	4.05	2.48	2.34	3.90	0.0	0.030	2.23		0.02	0.05		0.05	3.57	3.52	3.46	3.46	0.18	0.48
3-10 to 4-10	STORM-PRO	30.11	375	0.110	0.50	14.25	199.22	0.2797	154.8		154.8		124.0	1.25	1.40	1.40	1.69	1.12	3.90	2.31	2.16	3.75	0.0	0.052	1.44		0.10	0.14		0.23	3.46	3.32	3.09	3.09	0.78	0.44
4-10 to 5-10	STORM-PRO	15.24	450	0.159	0.50	14.50	197.34	0.4086	224.0		224.0		201.7	1.11	1.41	1.41	1.77	1.27	3.75	2.11	2.03	3.68	-0.0	0.030	0.83		0.10	0.08		0.09	3.09	3.00	2.91	2.91	0.62	0.67
5-10 to 6-10	STORM-PRO	20.00	450	0.159	0.50	14.63	196.39	0.4891	266.8		266.8		201.7	1.32	1.68	1.68	1.94	1.27	3.68	2.00	1.90	3.56	0.0	0.030	0.87		0.14	0.12		0.18	2.91	2.78	2.61	2.61	0.88	0.77
6-10 to 7-10	STORM-PRO	33.00	525	0.216	0.50	14.79	195.14	0.5534	300.0		300.0		304.2	0.99	1.39	1.60	1.83	1.41	3.56	1.87	1.71	3.38	-7.3	0.043	0.35		0.10	0.03		0.16	2.61	2.57	2.41	2.44	0.49	0.96
7-10 to 8-10	STORM-PRO	14.53	525	0.216	0.50	15.07	193.24	0.7171	384.9		384.9		304.2	1.27	1.78	1.78	2.08	1.41	3.38	1.66	1.59	3.30	7.2	0.051	1.39	1.54	0.16	0.22	0.25	0.10	2.44	2.19	2.07	2.09	0.81	0.94
8-10 to 9-10	STORM-PRO	10.80	600	0.283	1.50	15.19	192.60	0.8204	438.9		438.9		752.3	0.58	1.55	2.76	2.00	2.66	3.30	1.54	1.38	2.83	0.0		0.80	0.92	0.12	0.10	0.11	0.08	2.09	1.97	1.71	1.71	2.47	1.21
1-11 to 2-11	STORM-PRO	33.30	375	0.110	0.50	10.71	225.71	0.0434	27.2		27.2		124.0	0.22	0.25	0.90	0.91	1.12	3.94	2.38	2.21	3.77	0.0	0.030	5.19		0.00	0.02		0.01	3.10	3.08	3.07	3.07	0.02	0.85
2-11 to 3-11	STORM-PRO	32.50	375	0.110	0.80	15.56	190.64	0.1857	98.4		98.4		156.4	0.63	0.89	1.50	1.38	1.42	3.77	2.18	1.92	3.61	0.0	0.030	2.71		0.04	0.11		0.10	3.07	2.96	2.86	2.87	0.31	0.70
3-11 to 4-11	STORM-PRO	25.00	450	0.159	0.50	15.83	189.22	0.3871	203.5		203.5		201.7	1.01	1.28	1.44	1.69	1.27	3.61	1.89	1.77	3.49	0.0	0.030	1.61	1.73	0.08	0.13	0.14	0.13	2.87	2.73	2.60	2.60	0.51	0.74
4-11 to 5-11	STORM-PRO	25.00	450	0.159	0.50	16.04	188.13	0.4568	238.7		238.7		201.7	1.18	1.50	1.50	1.83	1.27	3.49	1.74	1.61	3.36	9.9	0.030	0.88		0.11	0.10		0.18	2.60	2.50	2.32	2.34	0.70	0.89
5-11 to 6-11	STORM-PRO	19.30	525	0.216	0.50	16.25	187.04	0.6141	319.1		319.1		304.2	1.05	1.47	1.59	1.89	1.41	3.36	1.58	1.49	3.26	-10.7	0.030	1.32	1.51	0.11	0.15	0.17	0.11	2.34	2.18	2.07	2.10	0.55	1.02
6-11 to 7-11	STORM-PRO	9.84	525	0.216	1.00	16.41	186.20	0.7204	372.6		372.6		430.2	0.87	1.72	2.24	2.04	1.99	3.26	1.46	1.36	2.83	0.0		1.33	1.54	0.15	0.20	0.23	0.09	2.10	1.87	1.74	1.74	1.36	1.16
1-12 to 3-11	STORM-PRO	16.10	375	0.110	1.00				0.0		0.0		175.4	0.00	0.00	0.00	0.00	1.59	3.69	2.48	2.32	3.61	-90.0	0.426			0.00			0.00	2.86	2.86	2.86	2.87	0.00	0.83
1-13 to 3-11	STORM-PRO	16.61	375	0.110	1.00	14.25	199.22	0.0193	10.7		10.7		175.4	0.06	0.10	0.88	0.71	1.59	3.69	2.48	2.32	3.61	90.0	0.423	7.00		0.00	0.00		0.00	2.86	2.86	2.86	2.87	0.00	0.83
1-14 to 2-14	STORM-PRO	27.20	375	0.110	0.50	8.64	245.82	0.0476	32.5		32.5		124.1	0.26	0.29	0.95	0.96	1.12	3.84	2.31	2.18	3.71	-0.0	0.030	4.87		0.00	0.02		0.01	3.06	3.03	3.02	3.02	0.03	0.79
2-14 to 3-14	STORM-PRO	25.00	375	0.110	0.50	12.89	209.36	0.1768	102.8		102.8		124.0	0.83	0.93	1.25	1.41	1.12	3.71	2.15	2.02	3.58	0.0	0.030	2.55		0.04	0.11		0.09	3.02	2.91	2.83	2.83	0.34	0.68
3-14 to 4-14	STORM-PRO	28.17	375	0.110	0.50	13.10	207.80	0.2443	141.0		141.0		124.0	1.14	1.28	1.28	1.61	1.12	3.58	1.99	1.85	3.44	-8.4	0.030	1.18		0.08	0.10		0.18	2.83	2.73	2.55	2.56	0.65	0.76
4-14 to 5-14	STORM-PRO	14.83	450	0.159	0.50	14.25	199.22	0.4047	224.0		224.0		201.7	1.11	1.41	1.41	1.77	1.27	3.44	1.82	1.75	3.37	9.0	0.030	1.49	1.65	0.10	0.15	0.17	0.09	2.56	2.39	2.30	2.33	0.62	0.88
5-14 to 6-14	STORM-PRO	10.90	450	0.159	1.00	14.37	198.29	0.5073	279.4		279.4		285.2	0.98	1.76	2.04	2.00	1.79	3.37	1.72	1.61	2.73	0.0	0.030	1.39	1.57	0.16	0.22	0.25	0.11	2.33	2.09	1.97	1.97	1.08	1.03
1-15 to 2-15	STORM-PRO	24.70	300	0.071	1.00	7.08	262.89	0.0186	13.6		13.6		96.7	0.14	0.19	0.97	0.79	1.37	3.58	2.20	1.96	3.46	-90.0	0.030	7.00		0.00	0.01		0.00	2.64	2.63	2.62	2.62	0.02	0.94
2-15 to 3-15	STORM-PRO	31.16	375	0.110	0.50	12.08	215.45	0.1176	70.4		70.4		124.0	0.57	0.64	1.16	1.23	1.12	3.46	1.93	1.77	3.40	0.0	0.030	5.65	5.80	0.02	0.12	0.12	0.05	2.62	2.50	2.45	2.45	0.16	0.83
3-15 to 4-15	STORM-PRO	32.07	375	0.110	0.50	13.71	203.28	0.1945	109.8		109.8		124.0	0.89	0.99	1.27	1.44	1.12	3.40	1.74	1.58	3.36	-19.9	0.030	1.48		0.05	0.07		0.13	2.45	2.38	2.25	2.28	0.39	0.95
4-15 to 5-15	STORM-PRO	13.47	375	0.110	0.50	14.25	199.22	0.2802	155.1		155.1		124.0	1.25	1.40	1.40	1.69	1.12	3.36	1.55	1.48	3.30	-45.1	0.035	1.66	1.93	0.10	0.17	0.19	0.11	2.28	2.09	1.98	2.02	0.78	1.08
5-15 to 6-15	STORM-PRO	14.03	375	0.110	1.00	14.36	198.38	0.3050	168.1		168.1		175.4	0.96	1.52	1.81	1.77	1.59	3.30	1.45	1.31	2.62	0.0		1.95	2.26	0.12	0.23	0.27	0.14	2.02	1.75	1.60	1.60	1.05	1.28
1-16 to 2-16	uPVC	10.89	225	0.040	2.00	8.64	245.82	0.0245	16.7		16.7		63.5	0.26	0.42	1.35	0.90	1.60	4.10	3.40	3.18	4.04	44.7	0.455	7.00		0.01	0.06		0.11	3.57	3.51	3.43	3.44	0.67	0.53
2-16 to 3-16	STORM-PRO	22.35	300	0.071	0.50	8.73	244.83	0.0396	26.9		26.9		68.4	0.39	0.38	0.91	0.96	0.97	4.04	2.73	2.62	3.86	-5.6	0.030	1.95	2.33	0.01	0.01	0.02	0.02	3.44	3.42	3.40	3.40	0.08	0.60
3-16 to 4-16	STORM-PRO	24.70	375	0.110	0.50	11.53	219.53	0.0828	50.5		50.5		124.0	0.41	0.46	1.07	1.10	1.12	3.86	2.58	2.46	3.72	0.0	0.030	1.44	1.50	0.01	0.02	0.02	0.02	3.40	3.39	3.37	3.37	0.08	0.46
4-16 to 5-16	STORM-PRO	25.70	525	0.216	0.50	13.71	203.28	0.3152	178.0		178.0		304.2	0.59	0.82	1.46	1.49	1.41	3.72	2.43	2.30	3.59	-0.0	0.030	2.13	2.38	0.03	0.07	0.08	0.04	3.37	3.29	3.25	3.25	0.17	0.35
5-16 to 6-16	STORM-PRO	24.70	600	0.283	0.50	13.92	201.67	0.3364	188.4		188.4		434.4	0.43	0.67	1.48	1.46	1.54	3.59	2.27	2.15	3.47	0.0	0.030	0.03		0.02	0.00		0.02	3.25	3.25	3.22	3.25	0.09	0.34
6-16 to 7-16	STORM-PRO	27.28	675	0.358	0.50	14.25	199.22	0.7505	415.3		415.3		594.6	0.70	1.16	1.80	1.83	1.66	3.47	2.12	1.98	3.33	-0.0	0.030	1.98	2.31	0.07	0.14	0.16	0.07	3.25	3.09	3.02	3.02	0.24	0.22
7-16 to 8-16	STORM-PRO	23.12	675	0.358	0.50	14.48	197.52	0.7733	424.3		424.3		594.6	0.71	1.19	1.80	1.85	1.66	3.33	1.95	1.84	3.22	-90.0	0.030	0.34		0.07	0.02		0.06	3.02	3.00	2.94	2.98	0.25	0.31
8-16 to 9-16	STORM-PRO	17.00	750	0.442	0.50	15.89	188.92	0.9994	524.5		524.5		787.5	0.67	1.19	1.91	1.91	1.78	3.22	1.81	1.72	3.42	-0.0	0.030	2.10	2.64	0.07	0.15	0.19	0.04	2.98	2.79	2.75	2.75	0.22	0.24
9-16 to 10-16	STORM-PRO	34.71	750	0.442	0.50	16.03	188.18	0.9994	522.4		522.4		787.5	0.66	1.18	1.91	1.91	1.78	3.42	1.69	1.52	3.44	0.0	0.030	0.20		0.07	0.01		0.08	2.75	2.74	2.66	2.66	0.22	0.67
10-16 to 11-16	STORM-PRO	48.29	750	0.442	0.50	18.82	173.61	1.1314	545.6		545.6		787.5	0.69	1.23	1.92	1.94	1.78	3.44	1.49	1.25	3.44	90.0	0.030	0.69		0.08	0.05		0.12	2.66	2.61	2.49	2.53	0.24	0.78
11-16 to 12-16	STORM-PRO	9.00	750	0.442	0.50	20.54	165.32	1.2774	586.6		586.6		787.5	0.74	1.33	1.95	2.00	1.78	3.44	1.22	1.17	2.31	-95.6	0.223	2.08	2.56	0.09	0.19	0.23	0.02	2.53	2.30	2.28	2.31	0.28	0.91
12-16 to 13-16	STORM-PRO	28.16	600	0.283	0.33	20.62	165.03	1.2774	585.6		585.6	147.7	354.6	1.65	2.07	2.07	2.33	1.25	2.31	0.95	0.86	3.61	5.1	0.040	1.92	2.18	0.12	0.23	0.27	0.14	2.31	2.04	1.90	1.91	0.51	0.00
13-16 to 14-16	STORM-PRO	73.08	600	0.283	0.32	20.85	164.14	1.2774	582.4		582.4		347.3	1.68	2.06	2.06	2.33	1.23	3.61	0.82	0.58	1.50	0.0		0.52	0.58	0.22	0.11	0.13	0.65	1.91	1.79	1.08	1.08	0.97	1.70
1-17 to 2-17	STORM-PRO	21.69	300	0.071	0.50	10.71	225.71	0.0472	29.6		29.6		68.4	0.43	0.42	0.93	0.99	0.97	3.92	2.69	2.58	3.81	0.0	0.030	2.93		0.01	0.03		0.02	3.68	3.65	3.63	3.63	0.09	0.24
2-17 to 4-16	STORM-PRO	17.01	300	0.071	0.50	13.16	207.33	0.1494	86.1		86.1		68.4	1.26	1.22	1.22	1.49	0.97	3.81	2.55	2.46	3.72	-90.0	0.030	1.75		0.08	0.13		0.13	3.63	3.50	3.37	3.37	0.79	0.17
1-18 to 2-18	STORM-PRO	17.69	300	0.071	0.50	10.43	227.79	0.0434	27.5		27.5		68.4	0.40	0.39	0.91	0.97	0.97	3.86	2.63	2.54	3.77	0.0	0.030	2.55		0.01	0.02		0.01	3.79	3.77	3.75	3.75	0.08	0.07
2-18 to 3-18	STORM-PRO	21.51	375	0.110	0.50	12.08	215.45	0.1350	80.8		80.8		124.0	0.65	0.73	1.20	1.29	1.12	3.77	2.51	2.40	3.66	0.0	0.030	1.69		0.03	0.05		0.05	3.75	3.71	3.66	3.66	0.21	0.02
3-18 to 4-18	STORM-PRO	21.07	375	0.110	0.50	12.35	213.41	0.2295	136.0		136.0	41.1	124.0	1.10	1.23	1.23	1.59	1.12	3.66	2.37	2.27	3.55	0.0	0.030	1.15		0.04	0.04		0.06	3.66	3.62	3.55	3.55	0.29	0.00
4-18 to 6-16	STORM-PRO	17.03	375	0.110	0.50	12.53	212.10	0.3315	195.3		195.3	9.4	124.0	1.57	1.77	1.77	1.94	1.12	3.55	2.24	2.15	3.47	-90.0	0.035	0.96		0.14	0.14		0.19	3.55	3.42	3.22	3.25	1.12	0.00
1-19 to 2-7	STORM-PRO	34.79	375	0.110	0.50	14.25	199.22	0.0323	17.9		17.9		124.0	0.14	0.16	0.80	0.81	1.12	4.07	2.54	2.37	3.90	-90.0	0.030	2.71		0.00	0.00		0.00	3.90	3.90	3.90	3.90	0.01	0.17
1-20 to 2-5	STORM-PRO	15.80	375	0.110	0.50	14.25	199.22	0.0243	13.4		13.4		124.0	0.11	0.12	0.73	0.75	1.12	3.64	2.08	2.00	3.56	-90.0	0.030	7.00		0.00	0.01		0.00	2.26	2.26	2.26	2.26	0.00	1.38
1-21 to 2-21	STORM-PRO	12.30	300	0.071	0.50	14.25	199.22	0.0253	14.0		14.0		68.4	0.21	0.20	0.76	0.79	0.97	3.97	2.58	2.52	4.07	-36.7	0.030	7.00		0.00	0.01		0.00	2.77	2.75	2.75	2.75	0.01	1.21
2-21 to 3-4	STORM-PRO	7.22	375	0.110	0.50	14.35	198.45	0.0550	30.3		30.3		124.0	0.24	0.27	0.93	0.94	1.12	4.07	2.49	2.45	4.05	-61.4	0.030	2.39	2.58	0.00	0.01	0.01	0.00	2.75	2.74	2.74	2.75	0.01	1.32
1-22 to 2-22	STORM-PRO	34.23	375	0.110	1.00	10.71	225.71	0.0396	24.8		24.8		175.4	0.14	0.22	1.12	0.89	1.59	3.54	2.53	2.19	3.37	-0.5	0.030	6.66		0.00	0.02		0.01	3.13	3.11	3.10	3.10	0.02	0.42
2-22 to 3-22	STORM-PRO	40.00	375	0.110	0.50	14.25	199.22	0.1024	56.7		56.7		124.0	0.46	0.51	1.10	1.14	1.12	3.37	2.16	1.96	3.22	90.5	0.030	1.87	1.87	0.01	0.03	0.03	0.04	3.10	3.08	3.03	3.05	0.10	0.27
3-22 to 8-16	STORM-PRO	9.35	375	0.110	1.00	15.81	189.33	0.1910	100.4		100.4		175.4	0.57	0.91	1.64	1.39	1.59	3.22	1.93	1.84	3.22	90.0	0.030	1.53	1.92	0.04	0.06	0.08	0.03	3.05	2.97	2.94	2.98	0.33	0.17
1-ID1 to 2-ID1	uPVC	9.90	225	0.040	0.50	14.25	199.22	0.0241	13.4		13.4		31.8	0.42	0.34	0.76	0.84	0.80	3.50	3.04	2.99	3.50	0.0	0.030	7.00		0.01	0.04		0.05	3.18	3.14	3.09	3.09	0.50	0.32
2-ID1 to 3-ID1	uPVC	24.50	300	0.071	0.50	14.33	198.60	0.0437	24.1		24.1		68.4	0.35	0.34	0.88	0.93	0.97	3.50	2.96	2.84	3.50	-32.7	0.623	1.44		0.01	0.01		0.12	3.09	3.09	2.96	2.54	0.52	0.41
3-ID1 to 4-ID1	uPVC	2.49	225	0.040	2.00	14.54	197.07	0.0784	42.9		42.9		63.5	0.68	1.08	1.72	1.31	1.60	3.50	2.22	2.17	2.62	0.0		2.16	2.57	0.06	0.13	0.15	0.02	2.54	2.39	2.30	2.30	3.52	0.96
1-ID2 to 2-ID2	uPVC	9.90	225	0.040	0.50	14.25	199.22	0.0247	13.7		13.7		31.8	0.43	0.34	0.77	0.84	0.80	3.50	3.15	3.10	3.55	0.0	0.030	7.00		0.01	0.04		0.01	3.40	3.36	3.35	3.35	0.08	0.10
2-ID2 to 3-ID2	uPVC	12.50	225	0.040	0.50	14.33	198.60	0.0443	24.4		24.4		31.8	0.77	0.61	0.88	1.03	0.80	3.55	3.07	3.01	3.65	0.0	0.030	1.89		0.02	0.04		0.04	3.35	3.31	3.28	3.28	0.30	0.20
3-ID2 to 4-ID2	uPVC	9.40	225	0.040	0.50	14.44	197.82	0.0690	37.9		37.9		31.8	1.19	0.95	0.95	1.23	0.80	3.65	2.98	2.93	3.60	0.0	0.030	1.64		0.05	0.08		0.06	3.28	3.20	3.14	3.14	0.66	0.37
4-ID2 to 5-ID2	uPVC	12.40	300	0.071	0.50	14.51	197.23	0.0876	48.0		48.0		68.4	0.70	0.68	1.05	1.17	0.97	3.60	2.90	2.84	3.60	0.0	0.030	0.17		0.02	0.00		0.03	3.14	3.14	3.11	3.11	0.17	0.46
5-ID2 to 6-ID2	uPVC	9.90	300	0.071	0.50	14.62	196.46	0.1121	61.2		61.2		68.4	0.89	0.87	1.09	1.28	0.97	3.60	2.81	2.76	3.55	0.0	0.030	1.16		0.04	0.04		0.03	3.11	3.07	3.04	3.04	0.31	0.49
6-ID2 to 7-ID2	uPVC	12.50	300	0.071	0.50	14.70	195.84	0.1317	71.6		71.6		68.4	1.05	1.01	1.10	1.36	0.97	3.55	2.73	2.67	3.55	0.1	0.030	0.88		0.05	0.05		0.06	3.04	2.99	2.93	2.93	0.49	0.51
7-ID2 to 8-ID2	uPVC	7.95	300	0.071	2.00	14.80	195.06	0.1564	84.8		84.8		136.8	0.62	1.20	2.04	1.48	1.94	3.55	2.64	2.48	3.20	44.3	0.648	0.93		0.07	0.07		0.11	2.93	2.86	2.65	2.25	2.70	0.62
8-ID2 to 9-ID2	uPVC	4.43	300	0.071	2.50	14.87	194.57	0.1564	84.5		84.5		153.0	0.55	1.20	2.22	1.48	2.16	3.20	1.83	1.72	2.39	0.0		2.08	2.61	0.07	0.15	0.19	0.04	2.25	2.06	1.88	1.88	4.02	0.95
1-ID3 to 2-ID3	uPVC	9.90	225	0.040	0.50	10.15	229.88	0.0379	24.2	-7.7	16.5		31.8	0.52	0.41	0.81	0.90	0.80	3.65	3.21	3.16	3.60	0.0	0.030	7.00		0.01	0.06		0.01	3.51	3.45	3.44	3.44	0.13	0.14
2-ID3 to 3-ID3	uPVC	12.50	225	0.040	0.50	14.25	199.22	0.0575	31.8	-2.0	29.8		31.8	0.94	0.75	0.91	1.11	0.80	3.60	3.13	3.07	3.55	0.0	0.030	2.04		0.03	0.06		0.05	3.44	3.38	3.33	3.33	0.44	0.16
3-ID3 to 4-ID3	uPVC	1.10	225	0.040	1.00	14.35	198.44	0.0822	45.3		45.3		44.9	1.01	1.14	1.29	1.34	1.13	3.55	3.04	3.02	3.55	-82.6	0.355	1.60		0.07	0.11		0.01	3.33	3.22	3.20	3.15	1.60	0.22
4-ID3 to 5-ID3	STORM-PRO	5.27	225	0.040	5.00	14.36	198.37	0.1174	64.7	-3.0	61.7		100.4	0.61	1.55	2.65	1.64	2.53	3.55	2.67	2.41	2.83	0.0	0.332	1.87	2.25	0.12	0.23	0.28	0.12	3.15	2.87	2.53	2.53	6.41	0.40
1-ID4 to 2-ID4	uPVC	1.00	225	0.040	1.00	10.15	229.88	0.0307	19.6		19.6		44.9	0.44	0.49	1.09	0.95	1.13	3.50	2.77	2.76	3.50	-90.0	0.030	7.00		0.01	0.09		0.00	3.01	2.93	2.93	2.94	-0.06	0.49
2-ID4 to 3-ID4	uPVC	5.92	225	0.040	1.00	14.25	199.22	0.0493	27.3		27.3		44.9	0.61	0.69	1.18	1.07	1.13	3.50	2.73	2.67	3.50	-36.9	0.901	2.24	2.66	0.02	0.05	0.06	0.06	2.94	2.87	2.80	1.94	1.19	0.56
3-ID4 to 4-ID4	uPVC	3.63	375	0.110	2.00	14.30	198.85	0.0764	42.2		42.2		248.1	0.17	0.38	1.67	1.04	2.25	3.50	1.77	1.70	2.83	0.0	0.909	2.25	3.05	0.01	0.02	0.02	0.03	1.94	1.92	1.81	1.81	3.20	1.56
1-ID5 to 2-ID5	uPVC	17.12	300	0.071	1.00	14.25	199.22	0.0320	17.7		17.7		96.7	0.18	0.25	1.04	0.85	1.37	3.72	2.60	2.43	3.68	-1.3	0.030	7.00		0.00	0.02		0.15	2.72	2.70	2.56	2.56	0.78	1.00
2-ID5 to 9-3	uPVC	12.26	300	0.071	1.00	14.39	198.15	0.0634	34.9		34.9		96.7	0.36	0.49	1.26	1.05	1.37	3.68	2.40	2.27	3.52	20.7	0.886	2.01	2.05	0.01	0.03	0.03	0.12	2.56	2.54	2.40	2.21	1.15	1.12
1-ID6 to 2-ID6	uPVC	40.62	300	0.071	0.50	11.06	223.05	0.0755	46.8		46.8		68.4	0.68	0.66	1.04	1.15	0.97	3.86	2.92	2.72	3.70	89.8	0.030	5.81		0.02	0.13		0.09	3.45	3.32	3.22	3.26	0.23	0.41
2-ID6 to 3-ID6	uPVC	18.69	300	0.071	0.50	14.55	196.97	0.1689	92.4		92.4		68.4	1.35	1.31	1.31	1.55	0.97	3.70	2.69	2.59	3.39	-89.4	0.030	2.05	2.50	0.09	0.18	0.22	0.17	3.26	3.05	2.88	2.90	0.91	0.44
3-ID6 to 4-ID6	uPVC	25.47	375	0.110	0.50	14.71	195.80	0.1689	91.9		91.9		124.0	0.74	0.83	1.23	1.35	1.12	3.39	2.56	2.43	3.45	88.6	0.030	2.10	2.72	0.04	0.07	0.10	0.12	2.90	2.80	2.70	2.72	0.40	0.50
4-ID6 to 11-7	uPVC	8.54	375	0.110	1.00	14.92	194.21	0.1689	91.1		91.1		175.4	0.52	0.82	1.60	1.34	1.59	3.45	2.40	2.32	3.21	-89.6	1.274	2.11	2.67	0.03	0.07	0.09	0.08	2.72	2.63	2.51	2.52	1.35	0.73
1-ID7 to 2-ID7	uPVC	23.26	225	0.040	0.50	14.25	199.22	0.0205	11.4		11.4		31.8	0.36	0.29	0.73	0.80	0.80	3.86	3.22	3.11	3.81	87.3	0.030	4.87		0.00	0.02		0.01	3.67	3.65	3.63	3.65	0.06	0.19
2-ID7 to 2-ID6	uPVC	12.83	225	0.040	0.50	14.44	197.77	0.0934	51.3		51.3		31.8	1.62	1.29	1.29	1.45	0.80	3.81	3.08	3.01	3.70	-87.8	0.328	2.82	2.98	0.09	0.24	0.25	0.17	3.65	3.40	3.22	3.26	1.33	0.16
1-ID8 to 2-ID8	uPVC	24.32	300	0.071	1.00	14.25	199.22	0.0946	52.4		52.4		96.7	0.54	0.74	1.40	1.20	1.37	3.50	2.58	2.33	3.50	0.0	0.030	5.47		0.03	0.15		0.07	3.13	2.98	2.91	2.91	0.29	0.37
2-ID8 to 10-7	uPVC	22.95	375	0.110	1.00	14.45	197.70	0.2059	113.0		113.0		175.4	0.64	1.02	1.69	1.46	1.59	3.50	2.30	2.07	3.34	-90.7	0.896	2.11		0.05	0.11		0.10	2.91	2.79	2.70	2.71	0.42	0.59

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN
DATE: JAN 2024
DRAWN: A.SCHMID
SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING
SHEET SIZE: A1

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

MDE
Manage Design Engineer

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CLIENT
CLIFTON YAMBA LAND PTY LTD

TITLE
110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

CLIFTON YAMBA

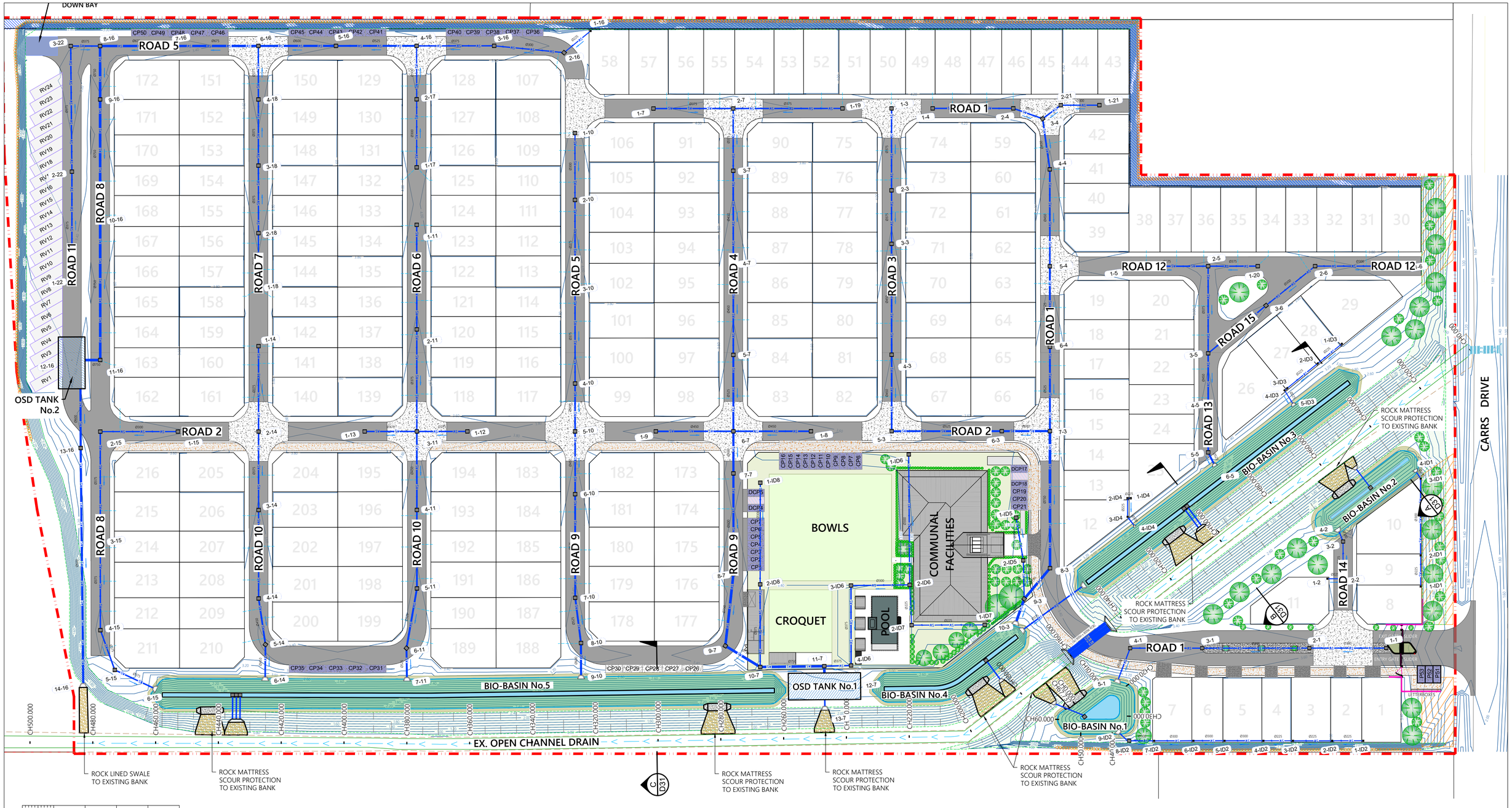
PROJECT
PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE:
STORMWATER COMPUTATIONS - 1% AEP
MAJOR STORM HYDRAULICS

DWG No: D30

REV: 1



OPEN CHANNEL DETAIL PLAN

SCALE 1:600

LEGEND

- DEVELOPMENT BOUNDARY
- INTERNAL LOT BOUNDARY
- BIO - BASIN TOP
- CHANNEL TOP OF BANK
- CHANNEL CENTRE LINE
- PROPOSED STORMWATER DRAINAGE
- RETAINING WALL
- STORMWATER DRAINAGE PIT
- HEADWALL
- NEW INTERNAL CONCRETE ROAD PAVEMENT
- NEW INTERNAL CONCRETE INTERSECTION TREATMENTS & DRIVEWAYS
- NEW 2.5m WIDE SHARED PATH WITHIN SITE BOUNDARY
- MHE BOUNDARY SETBACK 3m WIDE 'NO BUILD ZONE'
- MHE BOUNDARY SETBACK 10m WIDE 'NO BUILD ZONE'
- VISITOR AND RECREATIONAL VEHICLE PARKING
- SCOUR PROTECTION
- BIO-BASIN BREM
- BIO-BASIN GRASSED AREA
- BIO-BASIN WEIR
- BIO-BASIN FLOOR
- GRASSED AREA

PLANS TO BE PRINTED IN COLOUR

PRELIMINARY PLANS FOR DA PURPOSES ONLY NOT FOR CONSTRUCTION

ARCHITECTURAL INFORMATION FOR CLUB HOUSE SUPPLIED BY MARK SHAPIRO ARCHITECTS DRAWING NUMBER DA1002WIP REV 2

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

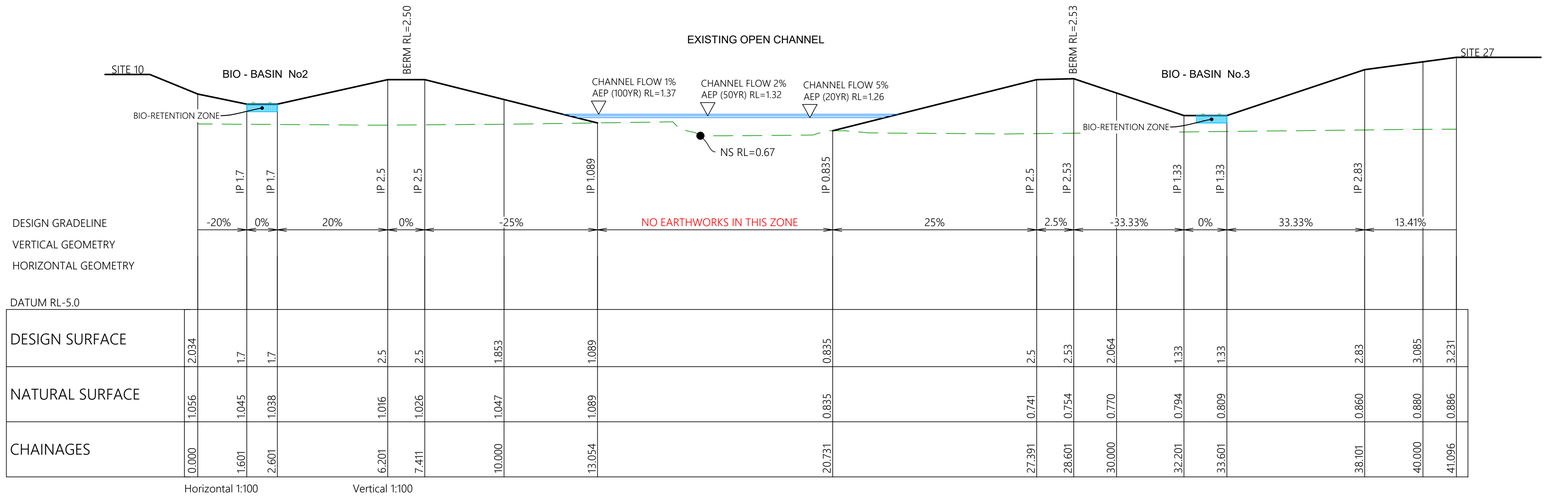
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: OPEN CHANNEL DETAIL PLAN

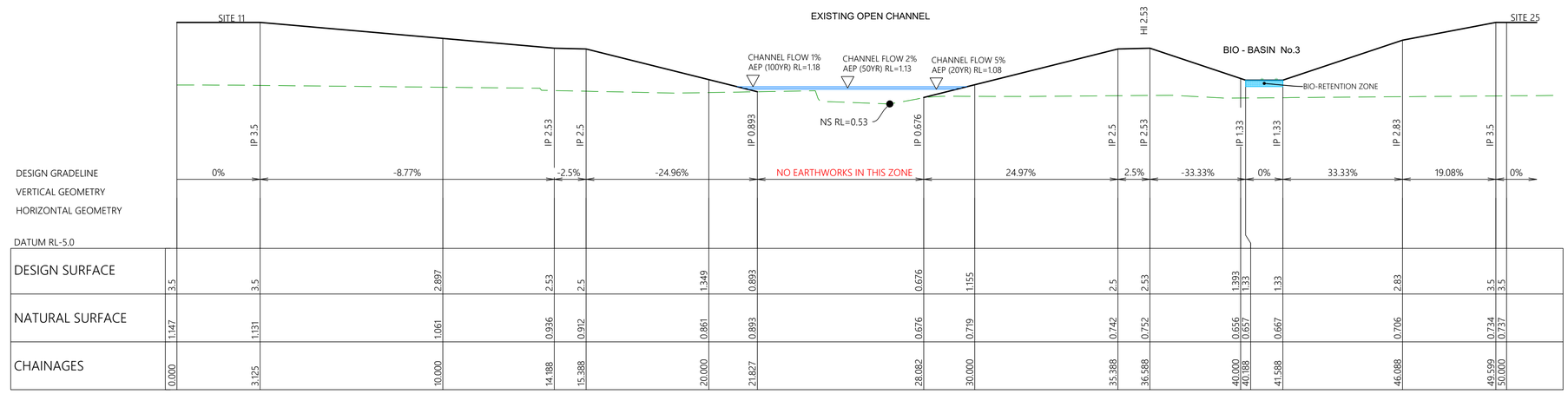
DWG No: D31 | SHEET: 31 OF 43 | REV: 1



NOTE: FOR DETAILED CHANNEL FLOW ANALYSIS REFER TO STORMWATER MANAGEMENT REPORT BY MANAGE DESIGN ENGINEER PTY LTD AND ASSOCIATED DRAINS MODEL DATA

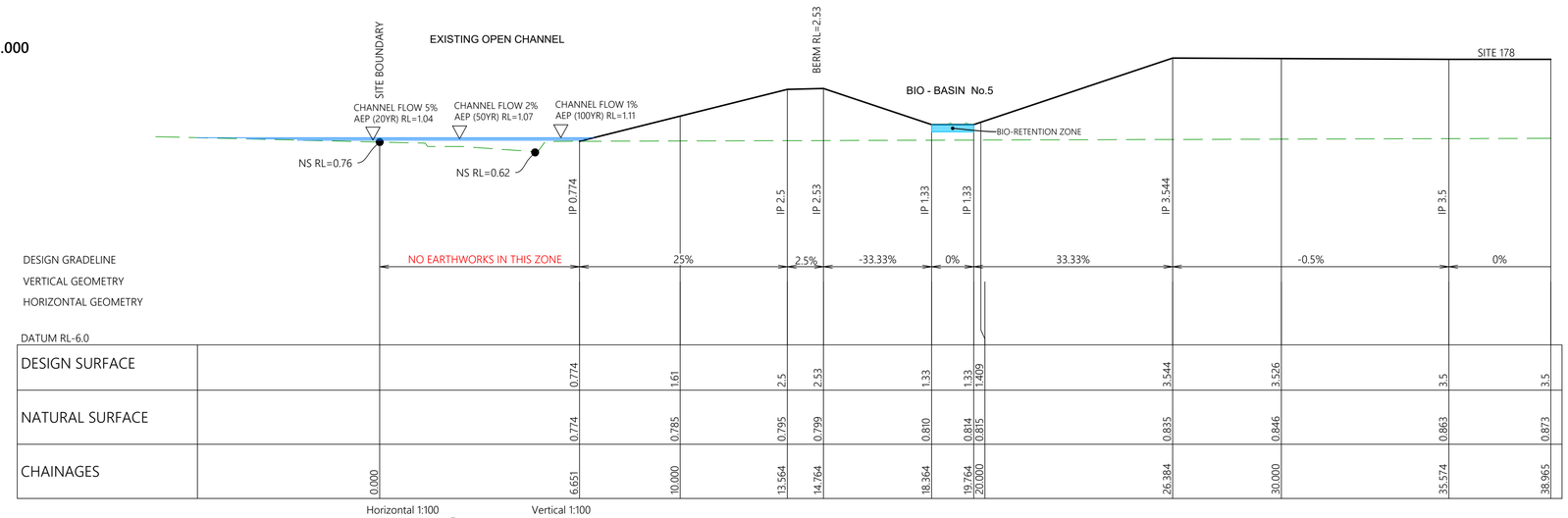
SECTION A / D31

EXISTING OPEN CHANNEL - CH 40.000



SECTION B / D31

EXISTING OPEN CHANNEL - CH 100.000



SECTION C / D31

EXISTING OPEN CHANNEL - CH 300.000

Horizontal Scale 1:100 (A1)
1:200 (A3)

Vertical Scale 1:100 (A1)
1:200 (A3)

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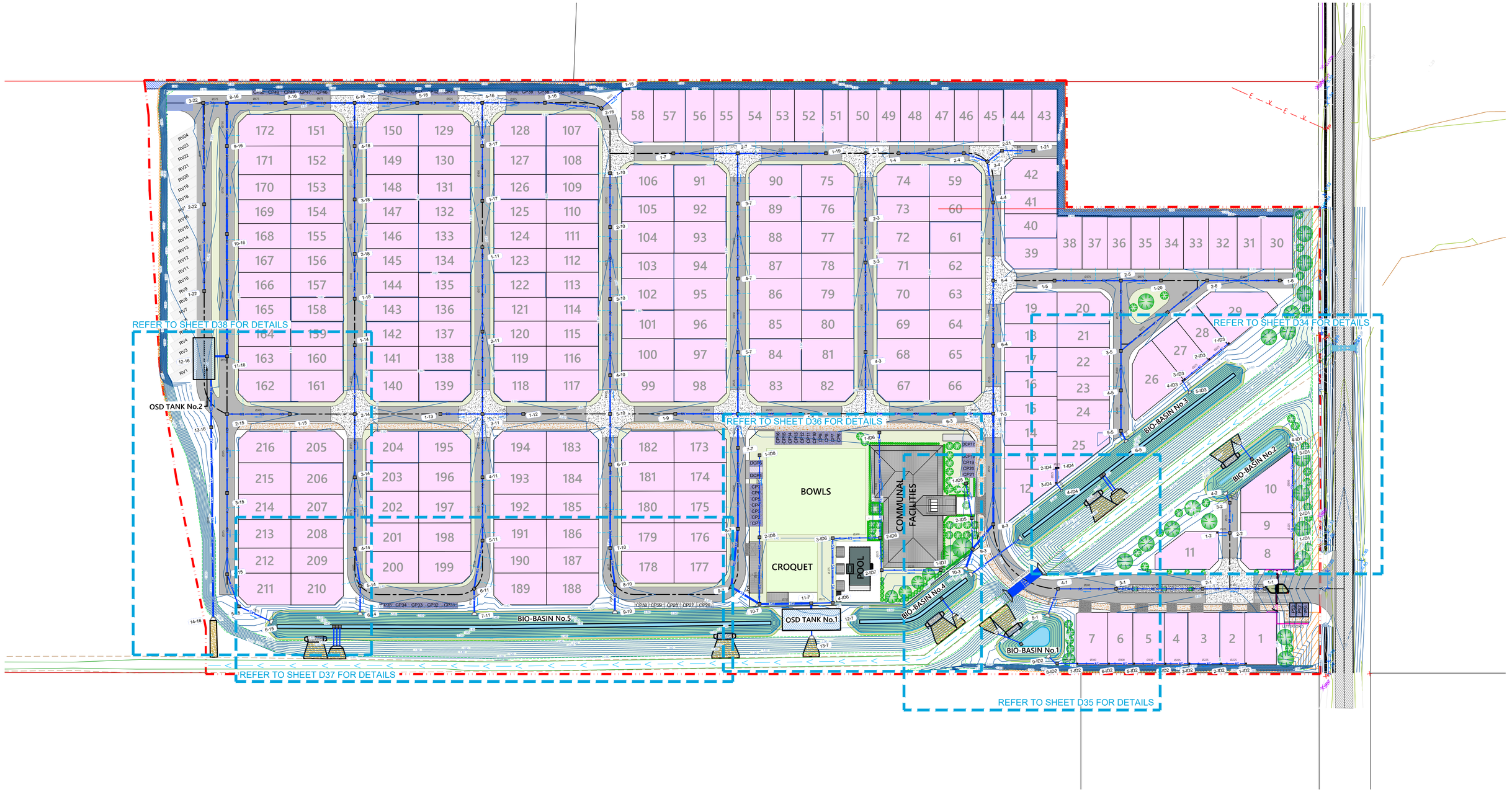
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
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YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: OPEN CHANNEL TYPICAL SECTIONS

DWG No: D32 | SHEET: 32 OF 43 | REV: 1



20 10 0 10 20 30 40
Horizontal Scale 1:750 (A1)
1:1500 (A3)

STORMWATER MANAGEMENT PLAN
SCALE 1:750

PLANS TO BE PRINTED IN COLOUR

PRELIMINARY PLANS FOR DA PURPOSES ONLY NOT FOR CONSTRUCTION

ARCHITECTURAL INFORMATION FOR CLUB HOUSE SUPPLIED BY MARK SHAPIRO ARCHITECTS DRAWING NUMBER DA1002WIP REV 2

LEGEND

- DEVELOPMENT BOUNDARY
- INTERNAL LOT BOUNDARY
- BIO - BASIN TOP
- CHANNEL TOP OF BANK
- CHANNEL CENTRE LINE
- PROPOSED STORMWATER DRAINAGE
- RETAINING WALL
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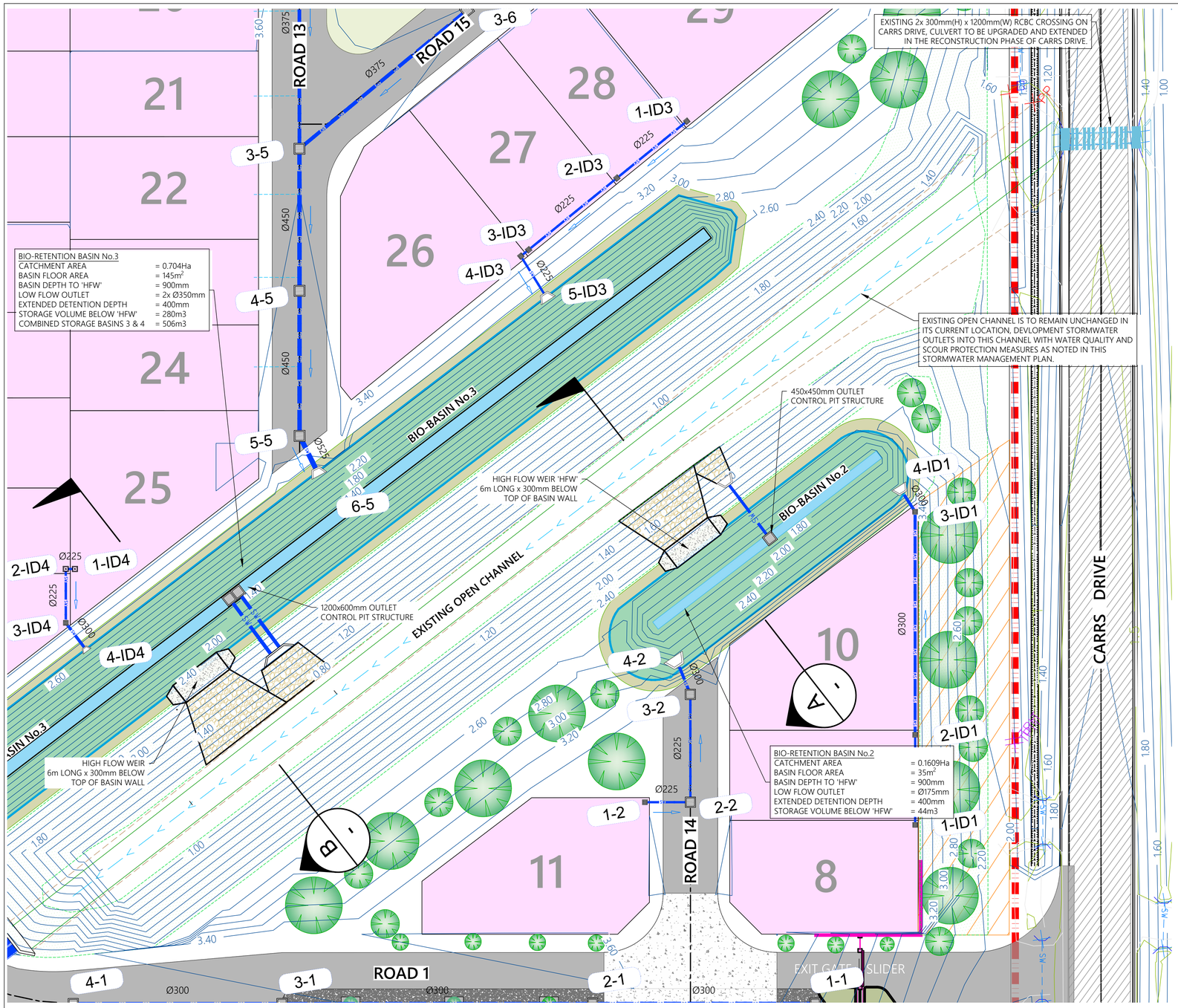
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
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YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: STORMWATER MANAGEMENT PLAN

DWG No: D33 | SHEET: 33 OF 43 | REV: 1



Horizontal Scale 1:250 (A1)
1:500 (A3)

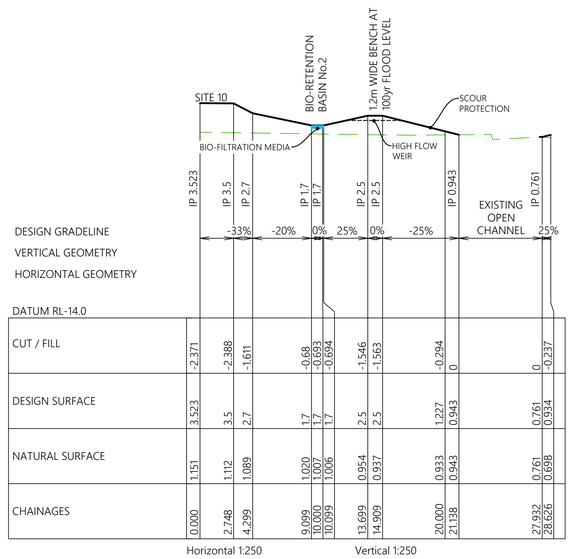
PLANS TO BE PRINTED IN COLOUR

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ARCHITECTURAL INFORMATION FOR CLUB HOUSE SUPPLIED BY MARK SHAPIRO ARCHITECTS DRAWING NUMBER DA1002WIP REV 2

LEGEND

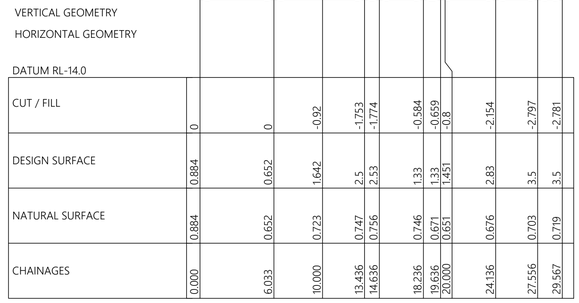
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- INTERNAL LOT BOUNDARY
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CUT / FILL	-2.371		-2.388		-1.611			-0.68	-0.693	-0.694		-1.546	-1.563		-0.294	0		0	-0.237					
DESIGN SURFACE	3.523		3.5		2.7			1.7	1.7	1.7		2.5	2.5		1.227	0.943		0.761	0.934					
NATURAL SURFACE	1.151		1.112		1.089			1.020	1.007	1.006		0.954	0.937		0.933	0.943		0.761	0.698					
CHAINAGES	0.000		2.748		4.299			9.099	10.000	10.099		13.699	14.909		20.000	21.138		27.932	28.626					

Horizontal 1:250 Vertical 1:250

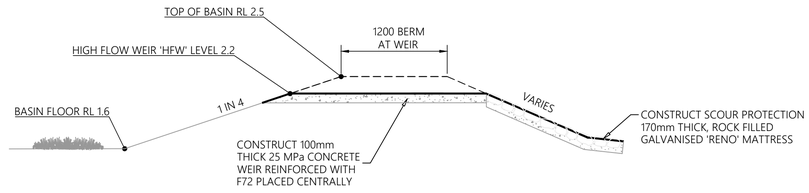
SECTION-A (BIO-BASIN No.2)



CUT / FILL	0		0			-0.92		-1.753	-1.774		-0.584	-0.659	-0.8		-2.154			-2.797	-2.781					
DESIGN SURFACE	0.884		0.652			1.642		2.5	2.53		1.33	1.33	1.451		2.83			3.5	3.5					
NATURAL SURFACE	0.884		0.652			0.723		0.747	0.756		0.746	0.671	0.651		0.676			0.703	0.719					
CHAINAGES	0.000		6.033			10.000		13.436	14.636		18.236	19.636	20.000		24.136			27.556	29.567					

Horizontal 1:250 Vertical 1:250

SECTION-B (BIO-BASIN No.3)



TYPICAL - HIGH FLOW WEIR DETAIL
N.T.S

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DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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MDE Manage Design Engineer

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CLIENT: CLIFTON YAMBA LAND PTY LTD

TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

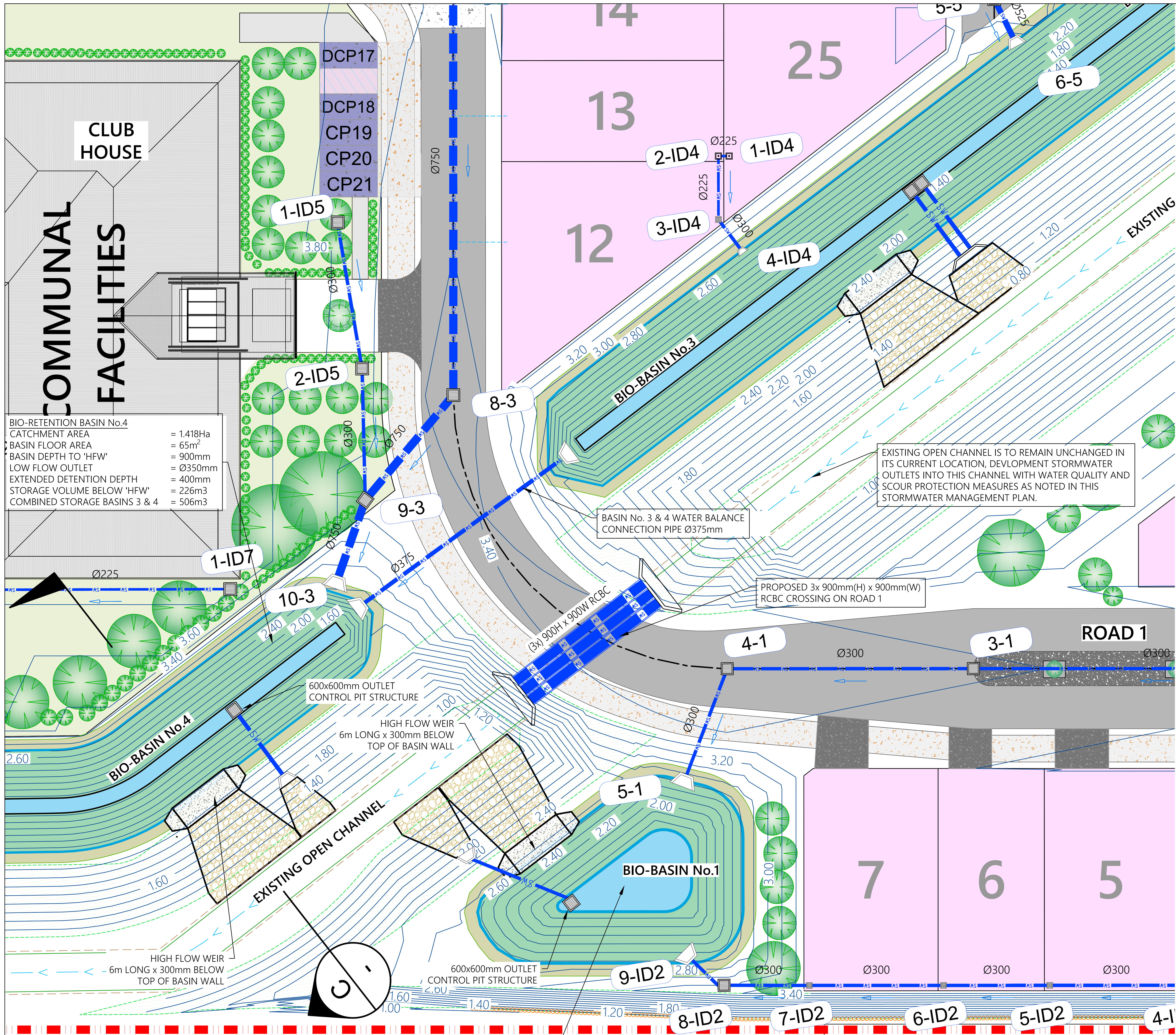
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: STORMWATER MANAGEMENT PLAN - SHEET 1

DWG No: D34 | SHEET: 34 OF 43 | REV: 1



BIO-RETENTION BASIN No.4

CATCHMENT AREA	= 1.418Ha
BASIN FLOOR AREA	= 65m^2
BASIN DEPTH TO 'HFW'	= 900mm
LOW FLOW OUTLET	= Ø350mm
EXTENDED DETENTION DEPTH	= 400mm
STORAGE VOLUME BELOW 'HFW'	= 226m3
COMBINED STORAGE BASINS 3 & 4	= 506m3

BIO-RETENTION BASIN No.1

CATCHMENT AREA	= 0.411Ha
BASIN FLOOR AREA	= 80m^2
BASIN DEPTH TO 'HFW'	= 900mm
LOW FLOW OUTLET	= Ø300mm
EXTENDED DETENTION DEPTH	= 400mm
STORAGE VOLUME BELOW 'HFW'	= 134m3

5 0 5 10 15
Horizontal Scale 1:250 (A1)
1:500 (A3)

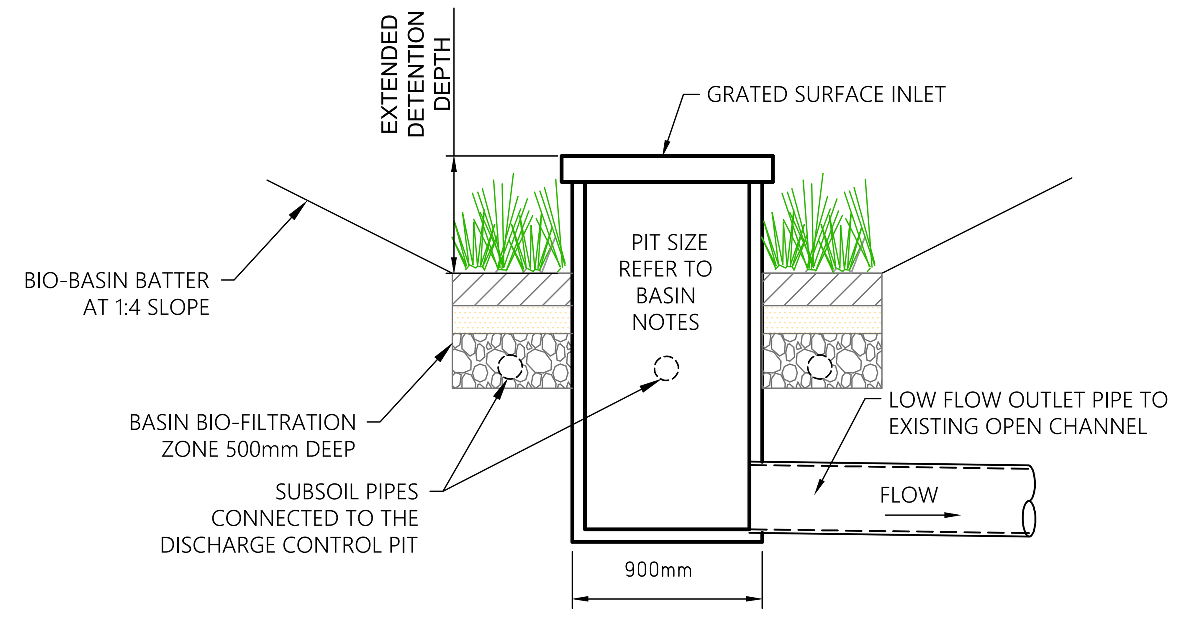
PLANS TO BE PRINTED IN COLOUR

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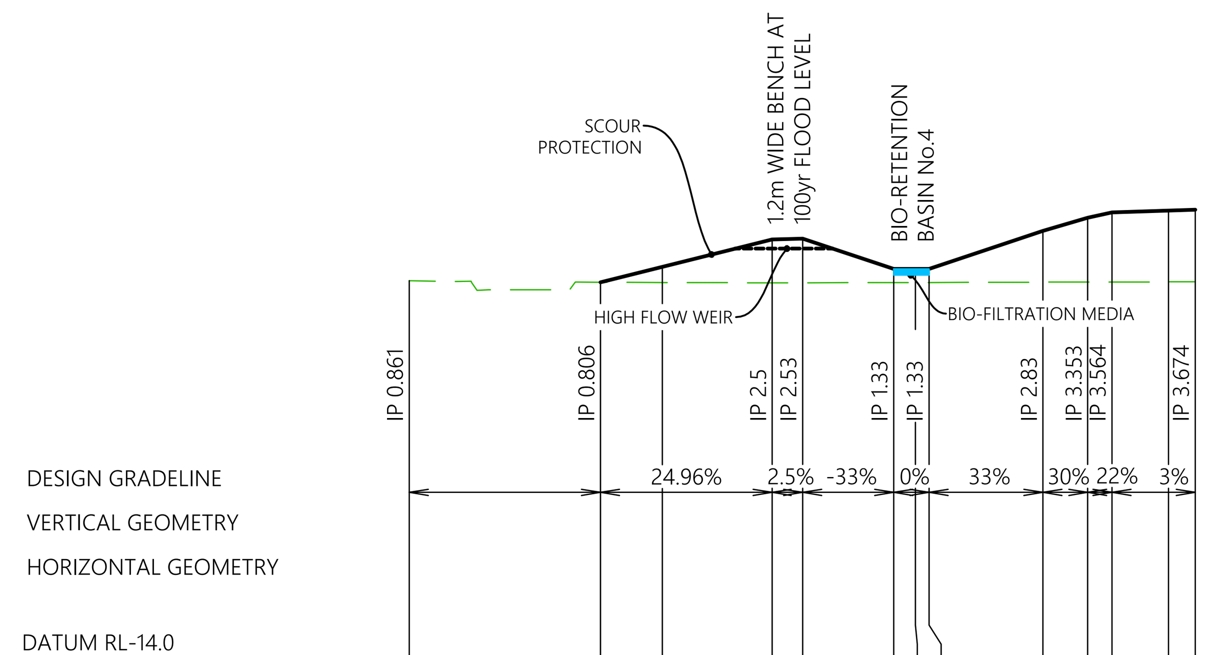
ARCHITECTURAL INFORMATION FOR CLUB HOUSE SUPPLIED BY MARK SHAPIRO ARCHITECTS DRAWING NUMBER DA1002WIP REV 2

LEGEND

- DEVELOPMENT BOUNDARY
- INTERNAL LOT BOUNDARY
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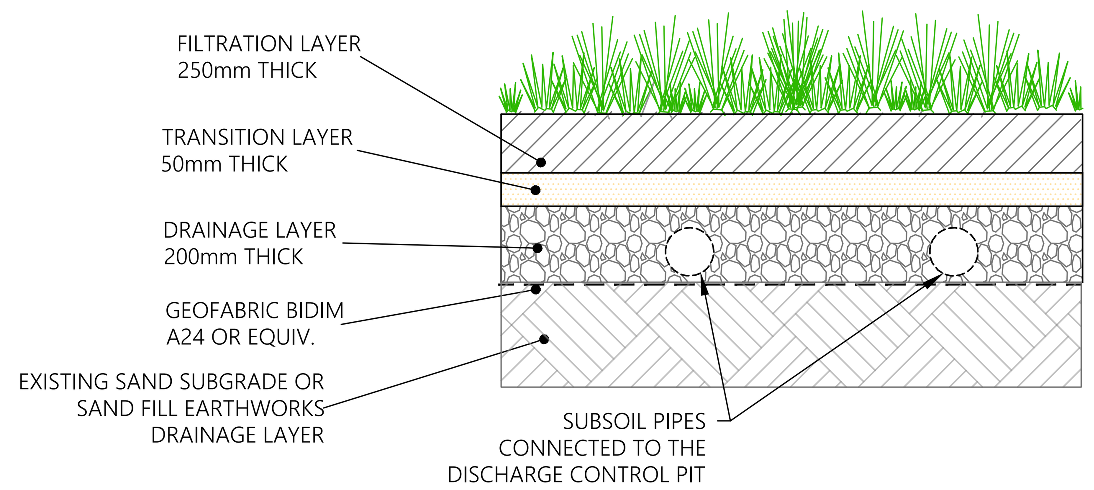
TYPICAL - BIO-RETENTION DISCHARGE CONTROL PIT
N.T.S



CUT / FILL	0	0	-0.619	-1.719	-1.746	-0.538	-0.535	-0.534	-2.023	-2.541	-2.75	-2.819	-2.852
DESIGN SURFACE	0.861	0.806	1.416	2.5	2.53	1.33	1.33	1.33	2.83	3.353	3.564	3.638	3.674
NATURAL SURFACE	0.861	0.806	0.797	0.781	0.784	0.792	0.795	0.796	0.807	0.811	0.814	0.819	0.822
CHAINAGES	0.000	7.558	10.000	14.343	15.543	19.143	20.000	20.543	25.043	26.811	27.768	30.000	31.062

Horizontal 1:250 Vertical 1:250

SECTION-C (BIO-BASIN No.4)



TYPICAL BIO-FILTRATION ZONE PROFILE (400mm THICK)
N.T.S

FILTER MEDIA - GENERAL DESCRIPTION

THE MATERIAL CAN BE OF SILICEOUS OR CALCAREOUS ORIGIN.
THE MATERIAL MUST BE TESTED FOR DESIRED HYDRAULIC CONDUCTIVITY USING THE AUSTRALIAN STANDARD (AS4419-2003).

REFER TYPICAL SPECIFICATION BELOW.

SPECIFICATION FOR BIORETENTION FILTER MEDIA:

BIORETENTION FILTER MEDIA SHALL COMPRISE OF TWO LAYERS

1. THE FILTRATION LAYER IS TO BE 250mm THICK AND CONFORM TO THE FOLLOWING SOIL SPECIFICATIONS.

pH	5.5 - 7.5	(pH 1:5 IN WATER)
ELECTRICAL CONDUCTIVITY (dS/cm)	< 1.2	
TOTAL SALTS (ppm)	< 600	
CLAY	2 - 4%	(<0.002mm)
SILT	4 - 8%	(0.002 - 0.05mm)
VERY FINE SAND	5 - 10%	(0.05 - 0.15mm)
FINE SAND	10 - 25%	(0.15 - 0.25mm)
MEDIUM TO COARSE SAND	60 - 70%	(0.25 - 1.0mm)
COARSE SAND	7 - 10%	(1.0 - 2.0mm)
FINE GRAVEL	< 3%	(2.0 - 3.4mm)
HYDRAULIC CONDUCTIVITY (mm/hr)	200 (+/- 20%)	

THE FILTRATION LAYER WILL BE AMELIORATED TO PROVIDE ADEQUATE INITIAL GROWTH. THIS LAYER IS TO CONSIST OF PREMIXED ZEOLITE 20% BY VOLUME PRIOR TO DELIVERY AND PLACEMENT. PRIOR TO PLANTING THE FOLLOWING SHALL BE PLACED INTO THE TOP 75MM.

AGRICULTURAL LIME - RATE TO BE DETERMINED DEPENDING ON SELECTED FILTER MATERIAL	10-30 kg/100sq.m INDICATIVE RANGE
SUPERPHOSPHATE AT	2 kg/100sq.m
MAGNESIUM SULPHATE AT	3 kg/100sq.m
POTASSIUM SULPHATE AT	2 kg/sq.m
TRACE ELEMENTS MIX	1 kg/100sq.m
FERTILISER NPK16.4.14 AT	4 kg/100sq.m

2. TRANSITION LAYER IS TO BE 50mm THICK WELL GRADED COARSE SAND

3. THE DRAINAGE LAYER IS TO BE 200mm THICK WITH 5-7mm WASHED AGGREGATE

* THERE SHOULD BE NO GEOFABRIC INTERFACE BETWEEN THE TWO LAYERS, ONLY AT THE INTERFACE WITH THE SAND SUBGRADE

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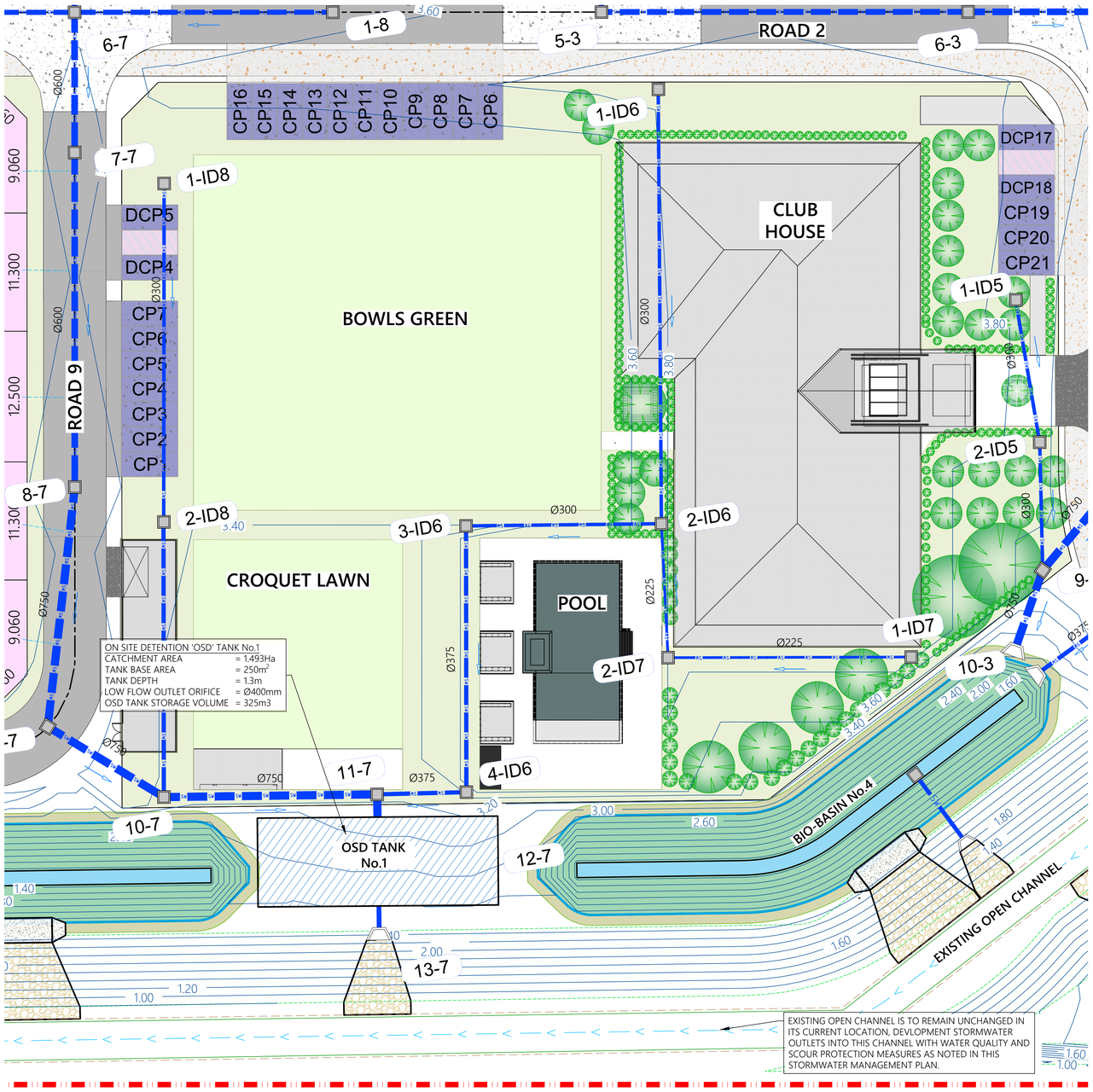
CLIFTON YAMBA

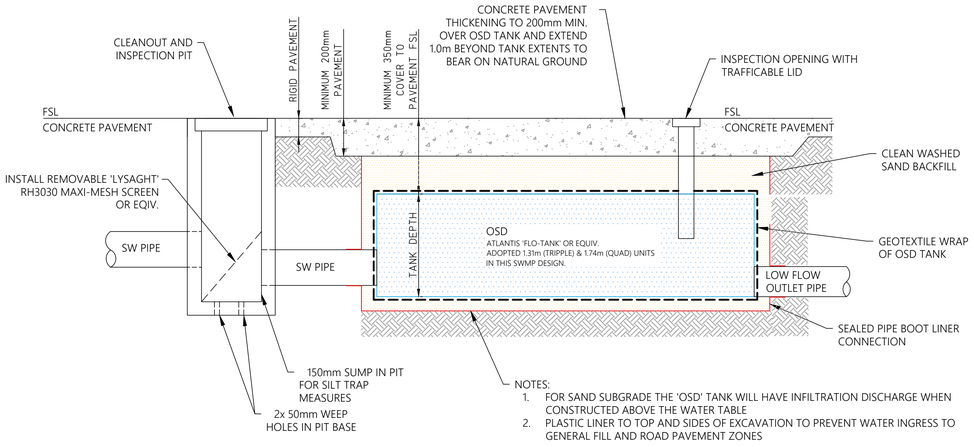
PROJECT
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LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: STORMWATER MANAGEMENT PLAN - SHEET 2

DWG No: D35 | SHEET: 35 OF 43 | REV: 1





TYPICAL DETAIL - SECTION VIEW
OSD ATLANTIS 'FLO-TANK'
N.T.S

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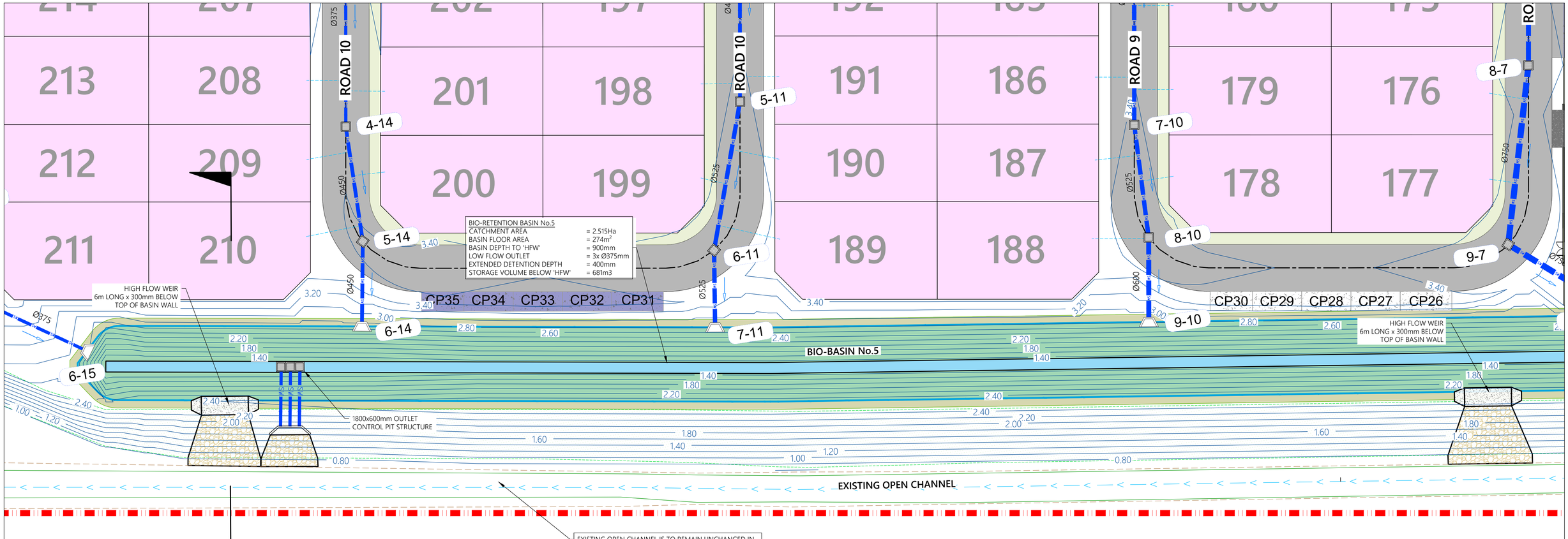
CLIFTON YAMBA

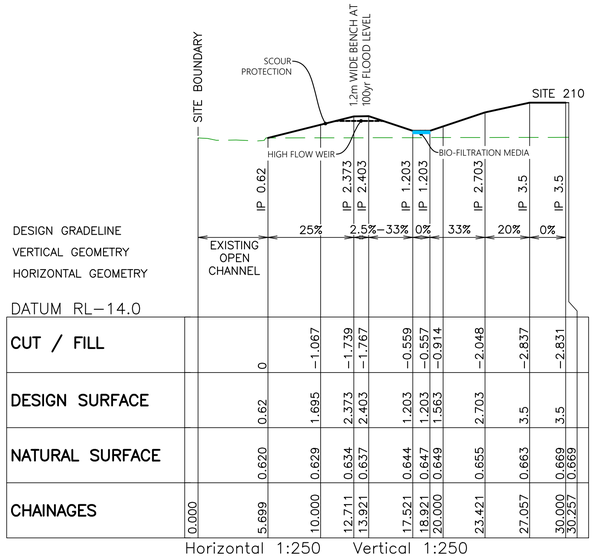
PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: STORMWATER MANAGEMENT PLAN - SHEET 3

DWG No: D36 | SHEET: 36 OF 43 | REV: 1





SECTION-D (BIO-BASIN No.5)

LEGEND

- DEVELOPMENT BOUNDARY
- INTERNAL LOT BOUNDARY
- BIO - BASIN TOP
- CHANNEL TOP OF BANK
- CHANNEL CENTRE LINE
- PROPOSED STORMWATER DRAINAGE
- RETAINING WALL
- STORMWATER DRAINAGE PIT
- HEADWALL
- PROPOSED MHE ALLOTMENT
- NEW INTERNAL CONCRETE ROAD PAVEMENT
- NEW INTERNAL CONCRETE INTERSECTION TREATMENTS & DRIVEWAYS
- NEW 2.5m WIDE SHARED PATH WITHIN SITE BOUNDARY
- MHE BOUNDARY SETBACK 3m WIDE 'NO BUILD ZONE'
- MHE BOUNDARY SETBACK 10m WIDE 'NO BUILD ZONE'
- VISITOR AND RECREATIONAL VEHICLE PARKING
- SCOUR PROTECTION
- BIO-BASIN BREM
- BIO-BASIN GRASSED AREA
- BIO-BASIN WEIR
- BIO-BASIN FLOOR
- GRASSED AREA

PLANS TO BE PRINTED IN COLOUR

PRELIMINARY PLANS FOR DA PURPOSES ONLY NOT FOR CONSTRUCTION

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

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DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

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TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

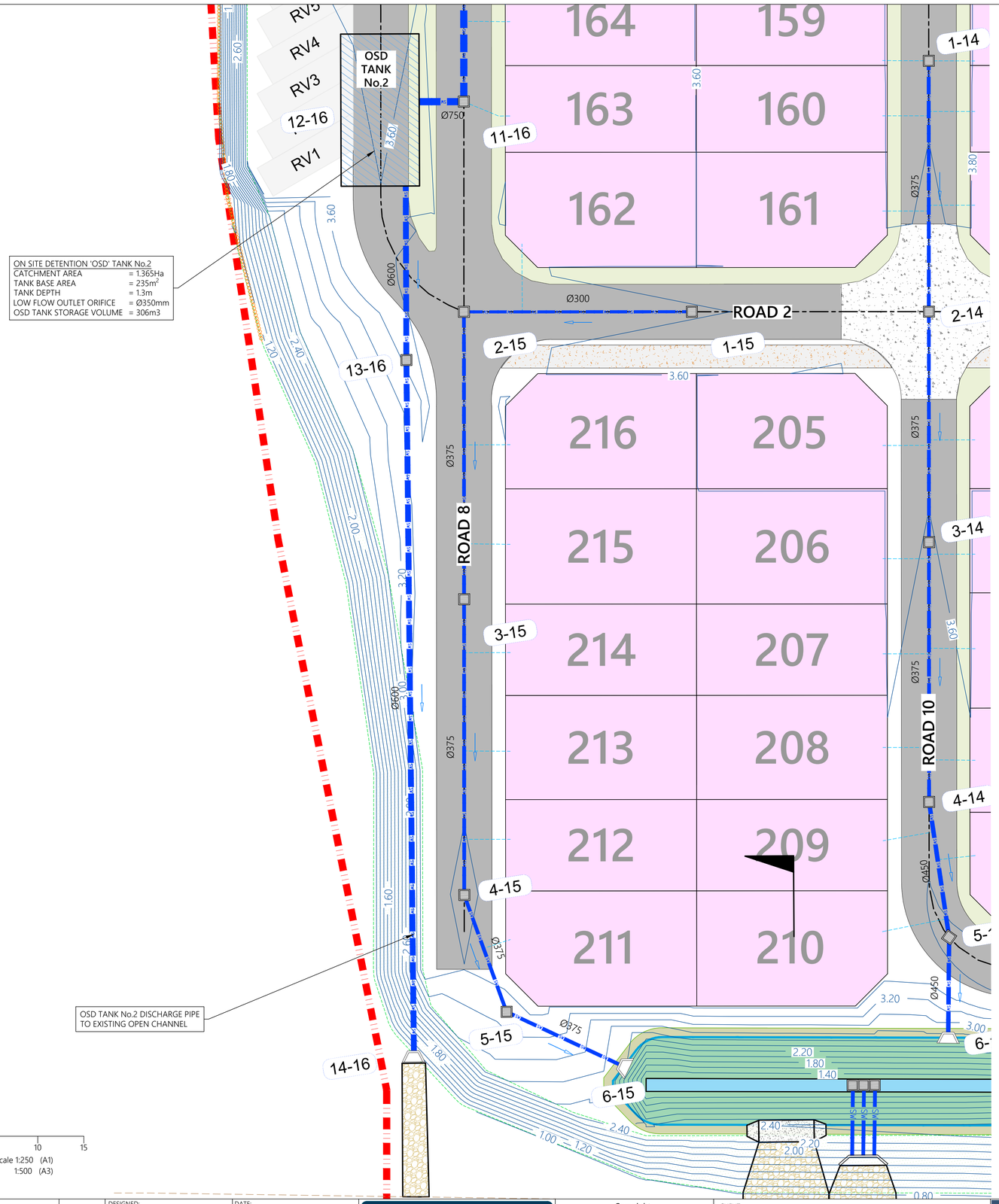
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: STORMWATER MANAGEMENT PLAN - SHEET 4

DWG No: D37 | SHEET: 37 OF 43 | REV: 1



LEGEND

- DEVELOPMENT BOUNDARY
- INTERNAL LOT BOUNDARY
- BIO - BASIN TOP
- CHANNEL TOP OF BANK
- CHANNEL CENTRE LINE
- PROPOSED STORMWATER DRAINAGE
- RETAINING WALL
- STORMWATER DRAINAGE PIT
- HEADWALL
- PROPOSED MHE ALLOTMENT
- NEW INTERNAL CONCRETE ROAD PAVEMENT
- NEW INTERNAL CONCRETE INTERSECTION TREATMENTS & DRIVEWAYS
- NEW 2.5m WIDE SHARED PATH WITHIN SITE BOUNDARY
- MHE BOUNDARY SETBACK 3m WIDE 'NO BUILD ZONE'
- MHE BOUNDARY SETBACK 10m WIDE 'NO BUILD ZONE'
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- SCOUR PROTECTION
- BIO-BASIN BREM
- BIO-BASIN GRASSED AREA
- BIO-BASIN WEIR
- BIO-BASIN FLOOR
- GRASSED AREA

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DRAWN: A.SCHMID | SCALE: AS SHOWN
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TITLE: 110 & 120 CARRS DRIVE, YAMBA
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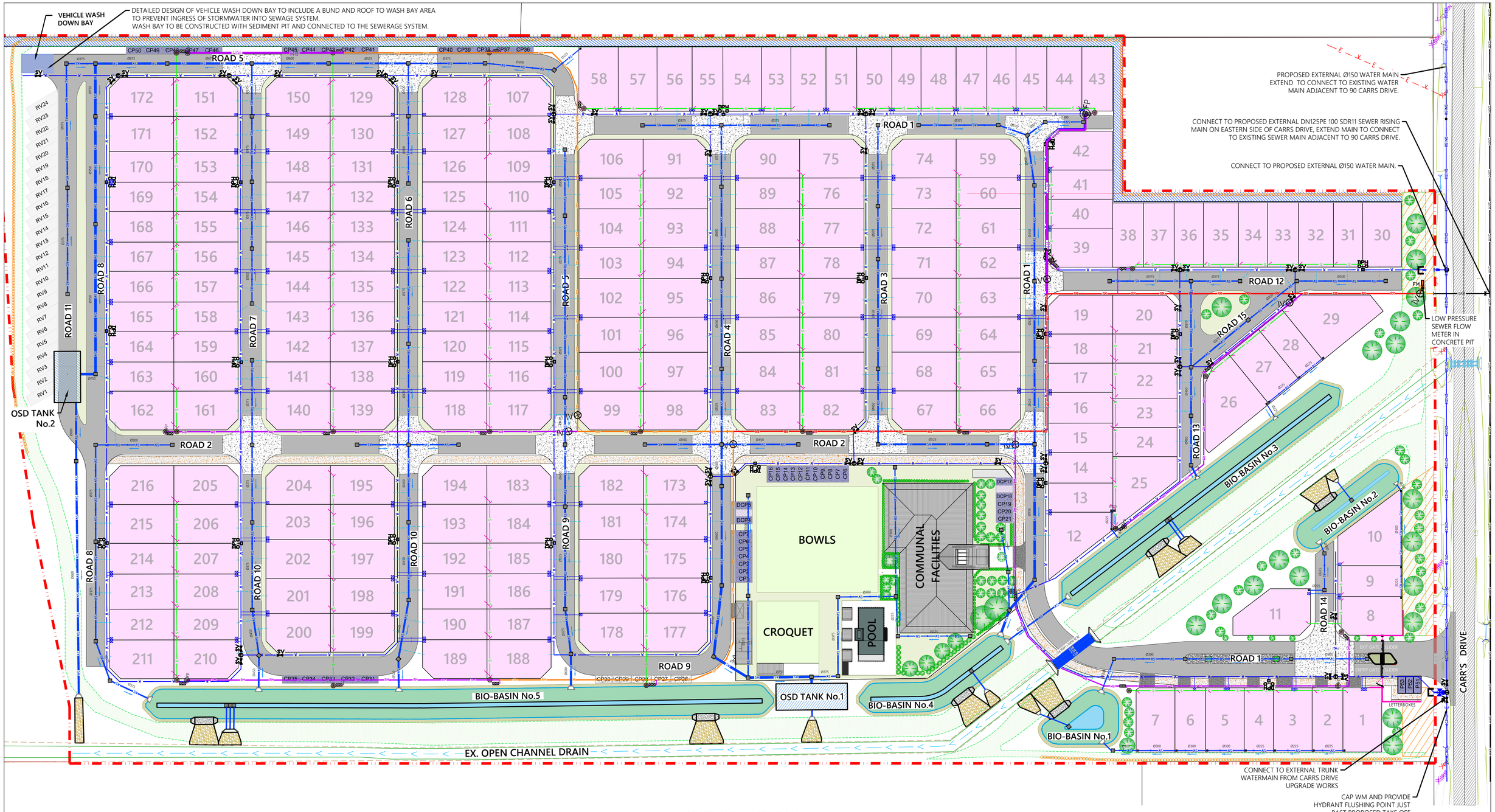
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YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: STORMWATER MANAGEMENT PLAN - SHEET 5

DWG No: D38 | SHEET: 38 OF 43 | REV: 1



10 5 0 10 20 30 40
Horizontal Scale 1:600 (A1)
1:1200 (A3)

SEWER AND WATER PLAN
SCALE 1:600

NOTE: DA CONCEPT DESIGN PHASE
SEWER AND WATERMAIN PIPE SIZES, PUMP & CHAMBER SIZES ARE PRELIMINARY ONLY AND SUBJECT TO DETAILED DESIGN

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ARCHITECTURAL INFORMATION FOR CLUB HOUSE SUPPLIED BY MARK SHAPIRO ARCHITECTS DRAWING NUMBER DA1002WIP REV 2

LEGEND

- DEVELOPMENT BOUNDARY
- INTERNAL LOT BOUNDARY
- BIO - BASIN TOP
- CHANNEL TOP OF BANK
- CHANNEL CENTRE LINE
- DESIGN CONTOURS
- PROPOSED STORMWATER DRAINAGE
- PROPOSED LOW PRESSURE SEWER Ø40mm LINE
- PROPOSED LOW PRESSURE SEWER Ø50mm LINE
- PROPOSED LOW PRESSURE SEWER Ø63mm LINE
- PROPOSED LOW PRESSURE SEWER Ø90mm LINE
- GRAVITY SEWER Ø150mm
- WATERMAIN Ø100mm
- LOW PRESSURE SEWER ISOLATION VALVE
- EXTERNAL WATERMAIN Ø150mm
- EXTERNAL SEWER MAIN
- PROPOSED FLUSHING POINT
- SEWER HOUSE CONNECTION
- LOW PRESSURE SEWER FLOW METER
- LOW PRESSURE SEWER BOUNDARY KIT
- AQUATEC LOW PRESSURE SEWER CHAMBER
- WATER MAIN TEE
- WATER METER
- HEADWALL
- DUAL PILLAR HYDRANT
- SLUICE VALVE
- STORMWATER DRAINAGE PIT
- PROPOSED MHE ALLOTMENT
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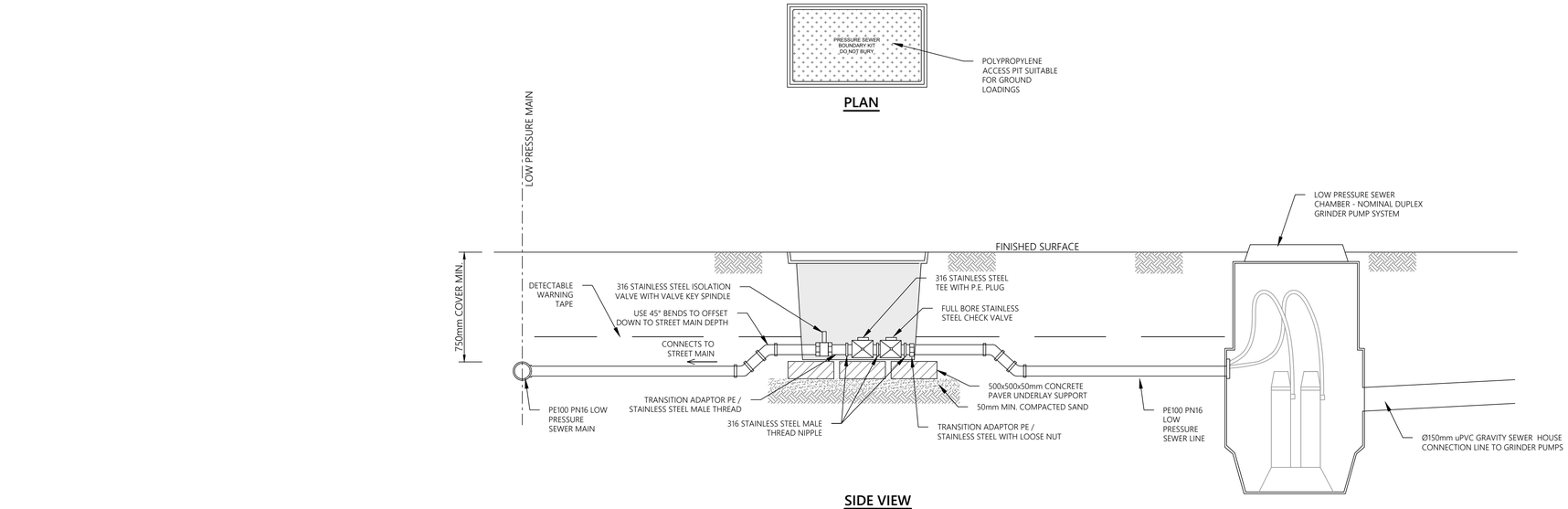
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YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

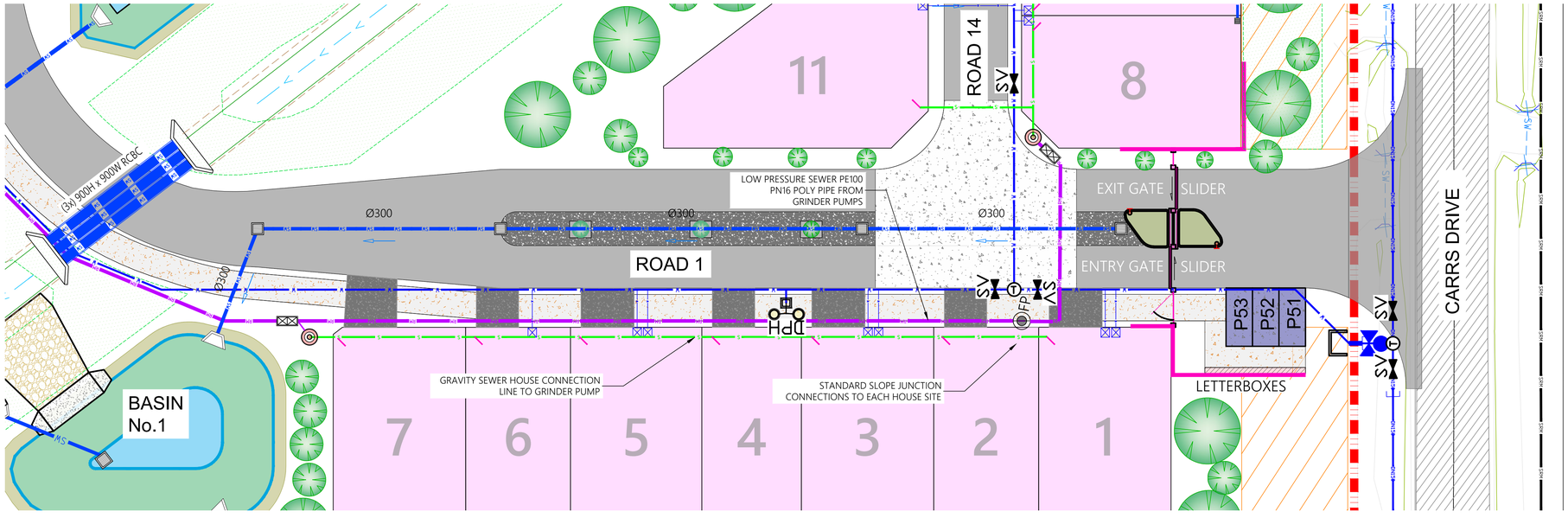
DA CIVIL DRAWING

DRAWING TITLE: SEWER AND WATER RETICULATION PLAN

DWG No: D39 | SHEET: 39 OF 43 | REV: 1



SIDE VIEW
TYPICAL - LOW PRESSURE SEWER BOUNDARY VALVE KIT
N.T.S



5 0 5 10 15
Horizontal Scale 1:250 (A1)
1:500 (A3)

TYPICAL SEWER CONNECTION LAYOUT
SCALE 1:250

NOTE: DA CONCEPT DESIGN PHASE
SEWER AND WATERMAIN PIPE SIZES, PUMP & CHAMBER SIZES ARE PRELIMINARY ONLY AND SUBJECT TO DETAILED DESIGN

LEGEND

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- INTERNAL LOT BOUNDARY
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- CHANNEL TOP OF BANK
- CHANNEL CENTRE LINE
- DESIGN CONTOURS
- PROPOSED STORMWATER DRAINAGE
- PROPOSED LOW PRESSURE SEWER Ø40mm LINE
- PROPOSED LOW PRESSURE SEWER Ø50mm LINE
- PROPOSED LOW PRESSURE SEWER Ø63mm LINE
- PROPOSED LOW PRESSURE SEWER Ø90mm LINE
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- PROPOSED FLUSHING POINT
- SEWER HOUSE CONNECTION
- LOW PRESSURE SEWER FLOW METER
- LOW PRESSURE SEWER BOUNDARY KIT
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- WATER MAIN TEE
- WATER METER
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DEVELOPMENT APPLICATION CIVIL WORKS PLANS

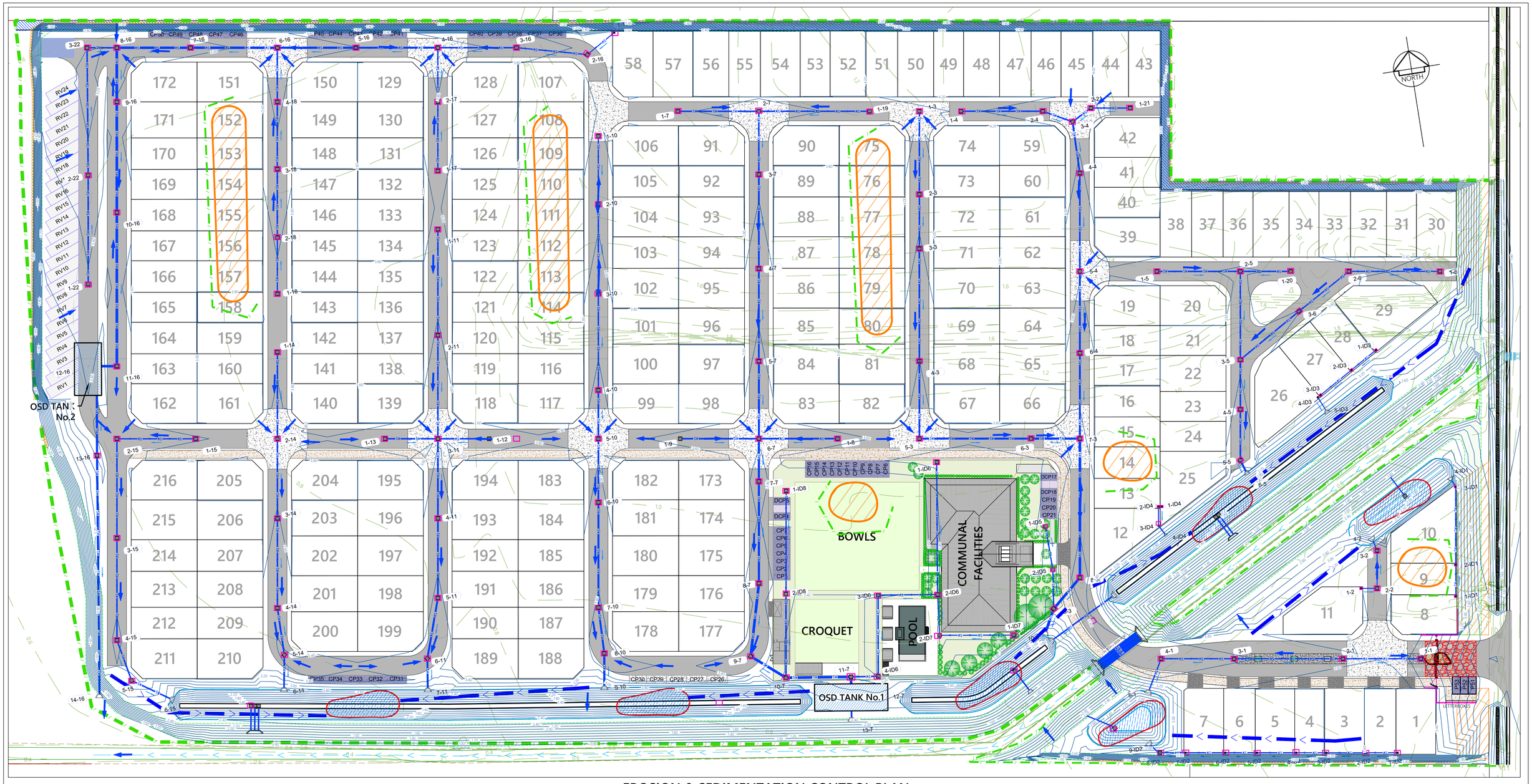
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

DA CIVIL DRAWING

DRAWING TITLE: SEWER AND WATER RETICULATION DETAIL

DWG No: D40 | SHEET: 40 OF 43 | REV: 1



10 5 0 10 20 30 40
Horizontal Scale 1:600 (A1)
1:1200 (A3)

LEGEND

- GEOTEXTILE INLET FILTER FOR FIELD INLET PIT
- SEDIMENT FENCE - REFER TO SED 6-8 & 01.01 DETAILS SHEET D42
- HAY BALE SEDIMENT TRAP
- TOPSOIL WINDROW & DESIGN SWALE
- FLOW DIRECTION
- SUGGESTED STOCKPILE SITE - REFER TO SED 4-1 ON DETAILS SHEET D42
- STABILISED SITE ACCESS - REFER TO SED 09.01 ON DETAILS SHEET D42
- TEMPORARY SEDIMENT BASIN

EROSION & SEDIMENTATION CONTROL PLAN

SCALE 1:600

LEGEND

- INTERNAL LOT BOUNDARY
- BIO - BASIN TOP
- CHANNEL TOP OF BANK
- CHANNEL CENTRE LINE
- PROPOSED STORMWATER DRAINAGE
- RETAINING WALL
- 6.0 NATURAL SURFACE CONTOURS
- STORMWATER DRAINAGE PIT
- HEADWALL
- VISITOR AND RECREATIONAL VEHICLE PARKING
- NEW INTERNAL CONCRETE ROAD PAVEMENT
- NEW INTERNAL CONCRETE INTERSECTION TREATMENTS & DRIVEWAYS
- NEW 2.5m WIDE SHARED PATH WITHIN SITE BOUNDARY
- MHE BOUNDARY SETBACK 3m WIDE 'NO BUILD ZONE'
- MHE BOUNDARY SETBACK 10m WIDE 'NO BUILD ZONE'

EROSION & SEDIMENT CONTROL NOTES:

1. SOIL STOCKPILES TO BE NO HIGHER THAN 2.0 METRES (1.0m PREFERABLE) IN LOCATIONS DIRECTED BY THE SUPERINTENDENT.
2. CONSTRUCT SEDIMENT FENCE AT LOCATIONS SHOWN AND AS DIRECTED BY SITE SUPERINTENDENT. SEDIMENT FENCE OR EQUIVALENT TO BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH COUNCILS ENGINEERING REQUIREMENTS.
3. UPON COMPLETION OF FINAL EARTHWORKS OR AFTER WRITTEN DIRECTION OF COUNCIL, IMMEDIATE SOIL CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF IN 14 DAYS.
4. ALL PERIMETER AND SILTATION CONTROL MEASURES ARE TO BE THE FIRST STEP IN CLEARING OR EARTHWORKS.
6. TEMPORARY SEDIMENTATION BASIN TO BE FLOCCULATED AND PUMPED OUT AFTER EVERY STORM EVENT. ALL FLOCCULATED SEDIMENT TO BE REMOVED FROM THE BASIN AT THE CONCLUSION OF THE CONTRACT PERIOD.
7. ALL TEMPORARY EARTH BERMS AND DIVERSION BANKS ARE TO BE TRACK ROLLED AND SEEDED OR MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
8. PROVIDE FILTER SAUSAGE KERB INLET SEDIMENT TRAPS OR EQUIVALENT (TO THE SATISFACTION OF THE SUPERINTENDENT) TO ALL CONSTRUCTED INLET PITS AND STORMWATER PIPING.
9. ALL TOPSOIL IS TO BE STOCKPILED ON SITE FOR RE-USE (AWAY FROM TREES AND DRAINAGE LINES). MEASURES SHALL BE APPLIED TO PREVENT EROSION FROM THE STOCKPILES.
10. SOIL/GRASS - TOPSOIL, 100mm THICK SHALL BE APPLIED TO ALL DISTURBED AREAS. ALL REMAINING EXPOSED TOPSOIL SHALL BE SEEDED IMMEDIATELY UPON COMPLETION OF THE SOIL SPREADING OPERATION.

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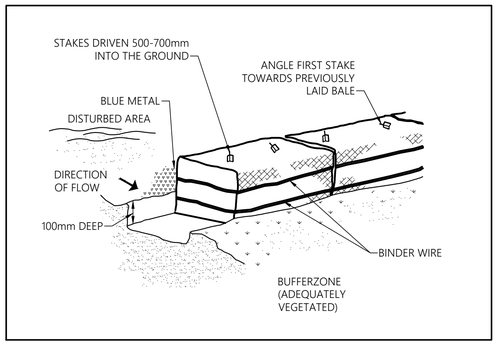
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

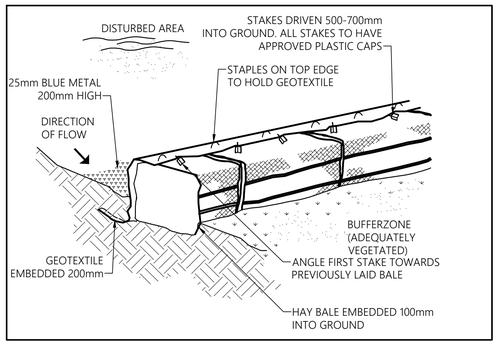
DA CIVIL DRAWING

DRAWING TITLE: EROSION & SEDIMENTATION CONTROL PLAN

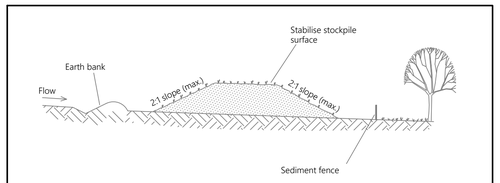
DWG No: D41 | SHEET: 41 OF 43 | REV: 1



SED_02.01: HAY BALE BARRIERS



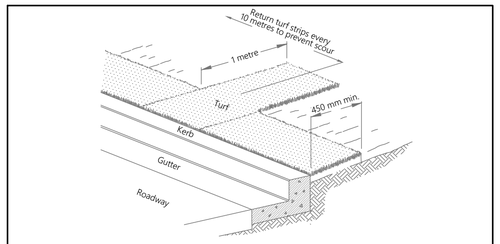
SED_02.02: HAY BALE & GEOTEXTILE FENCE



CONSTRUCTION NOTES:

1. Place stockpiles more than 2 (preferably 5) metres 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 2 metres 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 2 metres downslope.

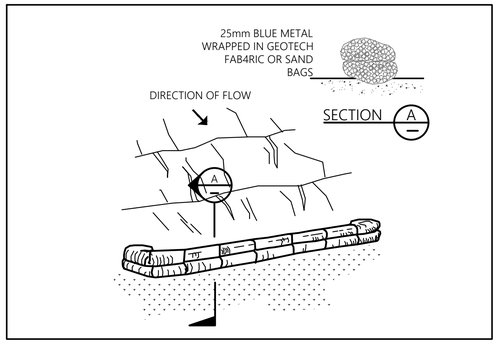
SED_4-1 STOCKPILES



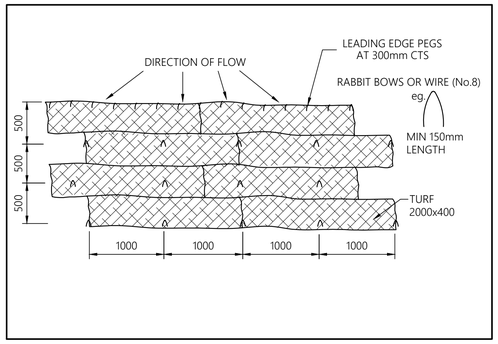
CONSTRUCTION NOTES:

1. Install a 450 mm minimum wide roll of turf on the footpath next to the kerb and at the same level as the top of the kerb.
2. Lay 1.4 metre long turf strips normal to the kerb every 10 metres.
3. Rehabilitate disturbed soil behind the turf strip following the ESCP/SWMP.

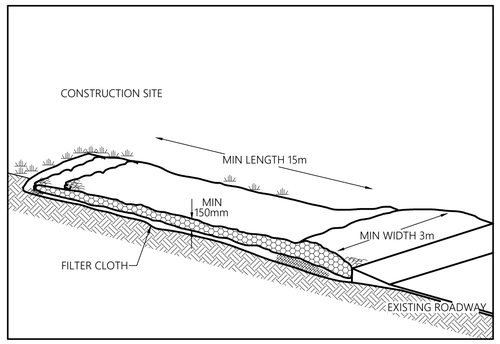
SED_6-13 KERBSIDE TURF STRIP



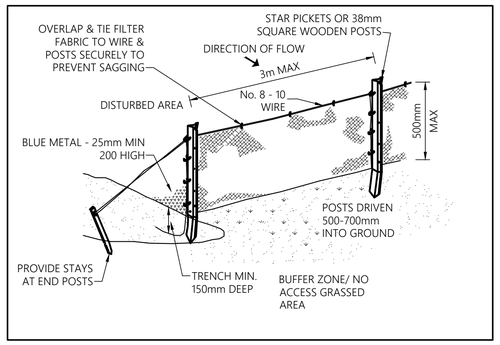
SED_03.01: ROCK GROYNE OR SAUSAGE



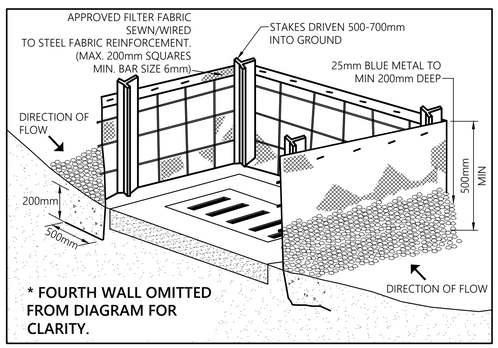
SED_07.02: TURF LAYING CONFIGURATION



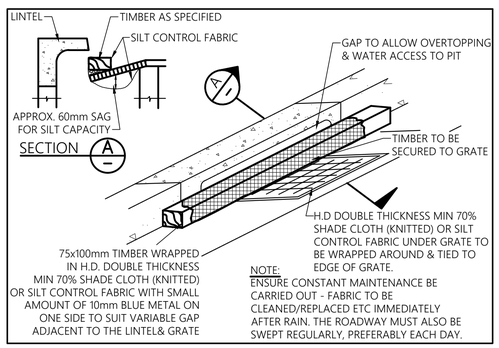
SED_09.01: STABILISED CONSTRUCTION ENTRANCE DETAILS



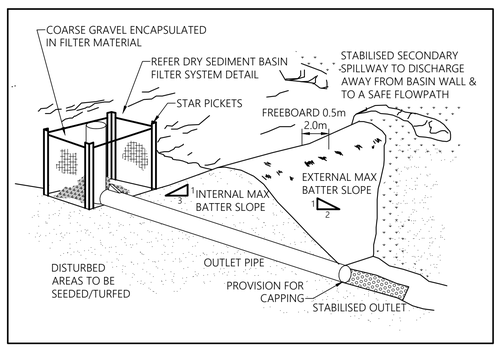
SED_01.01: SILT FENCE - TYPE 1



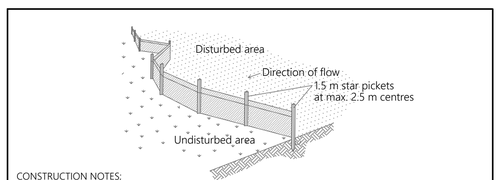
SED_11.05: STORM INLET SEDIMENT TRAP



SED_11.03: KERB INLET CONTROL



SED_10.01: SEDIMENT BASIN OUTLET



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 150-mm 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 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

SED_6-8 SEDIMENT FENCE NOTES

ISSUE	DESCRIPTION	DATE
1	ISSUED FOR DEVELOPMENT APPLICATION - AMENDED SITE FORMATION HEIGHTS	30.01.2024
0	ISSUED FOR DEVELOPMENT APPLICATION	08.09.2022

DESIGNED: T.RYDEN | DATE: JAN 2024
DRAWN: A.SCHMID | SCALE: AS SHOWN
SURVEYING: MACRO SURVEYING | SHEET SIZE: A1

ISSUED FOR DEVELOPMENT APPROVAL
NOT FOR CONSTRUCTION

MDE Manage Design Engineer

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TITLE: 110 & 120 CARRS DRIVE, YAMBA
DEVELOPMENT APPLICATION CIVIL WORKS PLANS

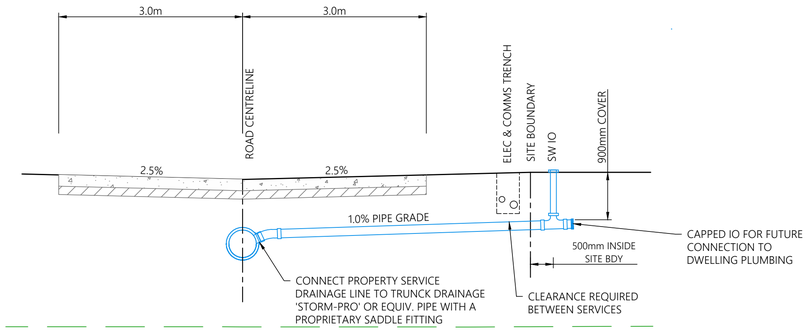
CLIFTON YAMBA

PROJECT: PROPOSED MHE DEVELOPMENT
110 & 120 CARRS DRIVE
YAMBA, NSW 2464
LOT 2 DP733507 & LOT 32 DP128863

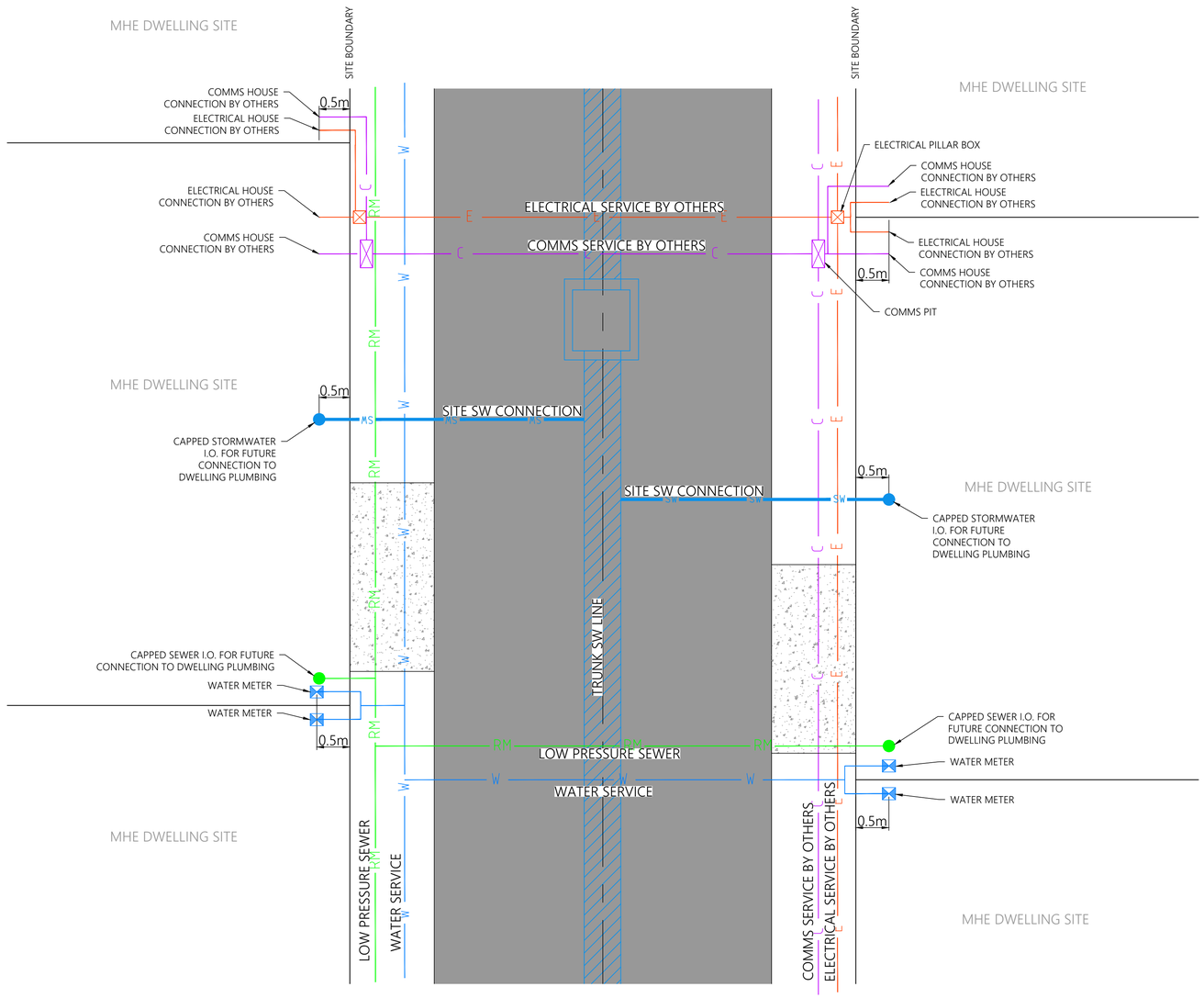
DA CIVIL DRAWING

DRAWING TITLE: EROSION & SEDIMENTATION CONTROL DETAIL

DWG No: D42 | SHEET: 42 OF 43 | REV: 1



ROAD SECTION
WITH TYPICAL STORMWATER CONNECTION
SCALE 1:50



ROAD CORRIDOR
WITH TYPICAL STORMWATER CONNECTION
SCALE 1:50

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DA CIVIL DRAWING

DRAWING TITLE: TYPICAL SERVICES LAYOUT DETAILS

DWG No: D43 | SHEET: 43 OF 43 | REV: 1