



Brian Betts

Stormwater Management Report

27-29 Charlesworth Bay Road, Coffs Harbour

September 2024

ENGINEERING
PLANNING
PROJECT MANAGEMENT
SURVEYING
CERTIFICATION

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Approved	SGB

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Attachment A – Proposed Development

Attachment B – MUSIC Report

1 Introduction

This report has been prepared to detail the procedures, assumptions and parameters adopted in the preparation of a stormwater management design for a proposed community title lot: subdivision of 5 lots at 27-29 Charlesworth Bay, Coffs Harbour. *Barker Ryan Stewart* has been engaged to undertake the design to assist in the preparation of a development application for the proposed development.

In the preparation of the development application, the following stormwater management components have been considered:

1. The existing site conditions, stormwater runoff and downstream drainage system.
2. The extent and nature of any upstream catchment areas draining to the subject site.
3. The runoff from the proposed development area, including the implementation of Coffs Harbour City Council's (CHCC) Water Sensitive Urban Guideline (WSUD) 2018 and stormwater management requirements.

2 Site Location and Development Proposal

The proposed development site is described as Lot 5 DP 270532 and is located at 27-20 Charlesworth Bay Road, Coffs Harbour. The location of the site is shown in Figure 2.1 below.

2.1 Site Location

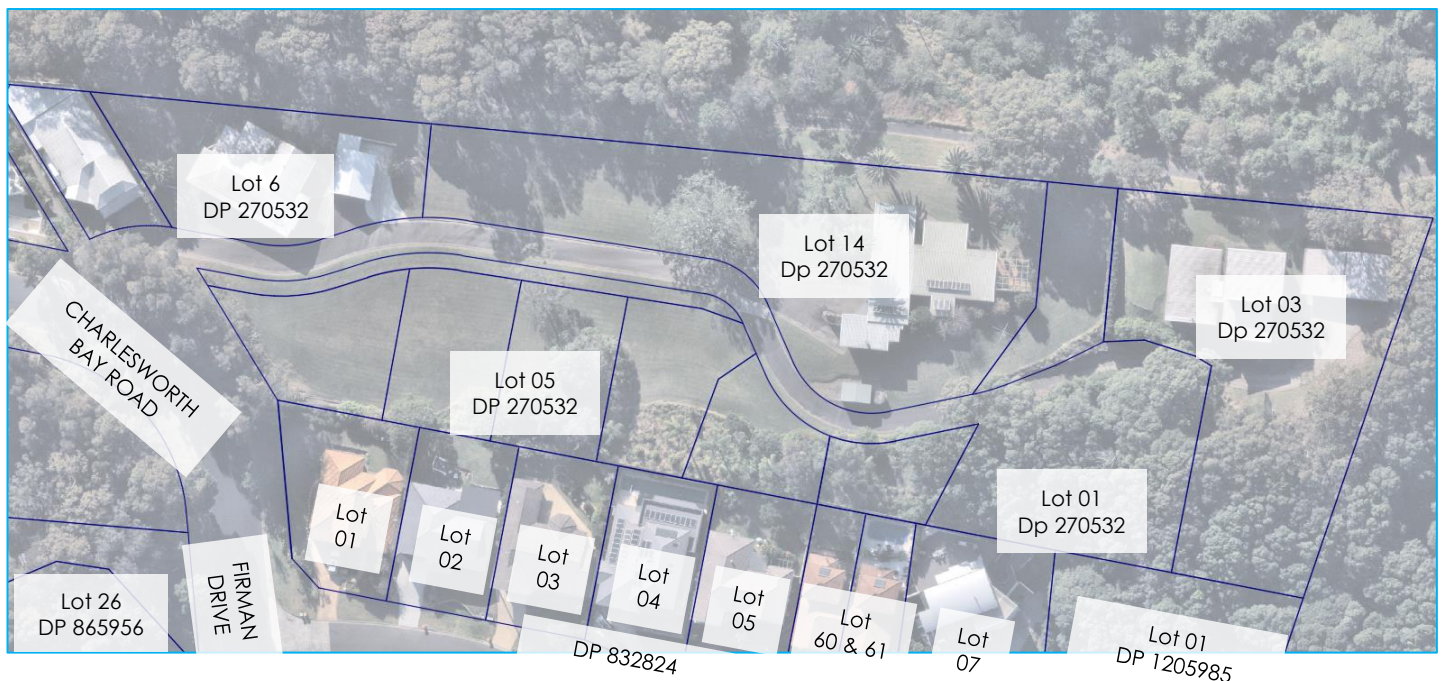


Figure 2.1 Site location (Image Courtesy of Nearmap 2024)

2.2 Existing Site

The proposed development is within the Coffs Harbour City Council Local Government area and is bound by rural residential properties. The site is approximately 3.6ha, comprising of an existing lot (Lot 05 DP 270532) and an adjacent road accessway. The development area is predominantly cleared of native vegetation with several trees retained on the site.

Existing fall across the site ranges from 20% to 17%, varying from approximately 30m AHD down to 18m AHD. The site drains uniformly to its south eastern boundary via an existing kerb/channel towards the existing pit along the downstream, as shown in Figure 2.2.

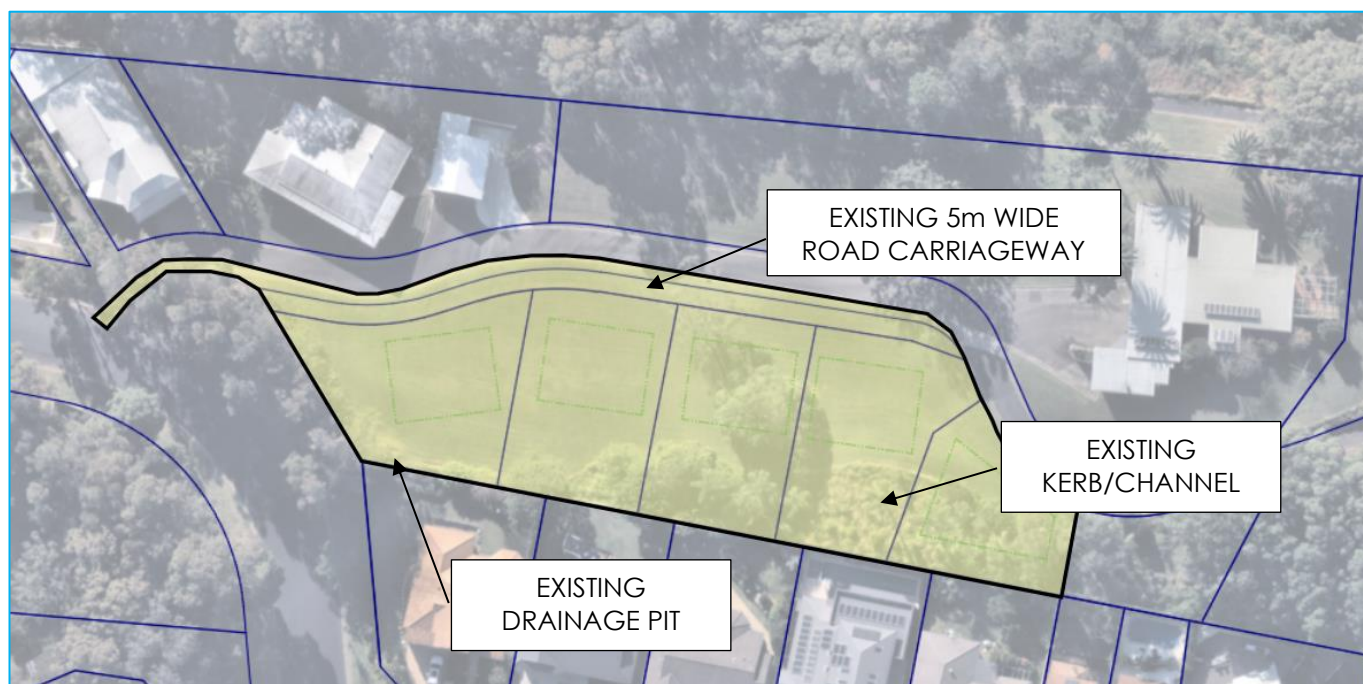


Figure 2.2 Existing Site Condition and Proposed Development Extents (Image Courtesy of Nearmap 2024)

2.3 Proposed Development

The Development Application involves the subdivision of land (Lot 5 DP 270532)at 27-29 Charlesworth Bay in Coffs Harbour to permit a subdivision development. The existing lot will be subdivided to create five (5) community title lots.

The development also includes the provision of an inter-allotment drainage (IAD) line including water quality device for the proposed subdivision within Lot 5, underground utility services design, and the modification of the existing road carriageway (widening from 5m to 6m travel lane) to comply with the Coffs Harbour City Council (CHCC) Development Control Plan (DCP). For further details regarding the development, refer to BRS drawing set 240204-01 series.

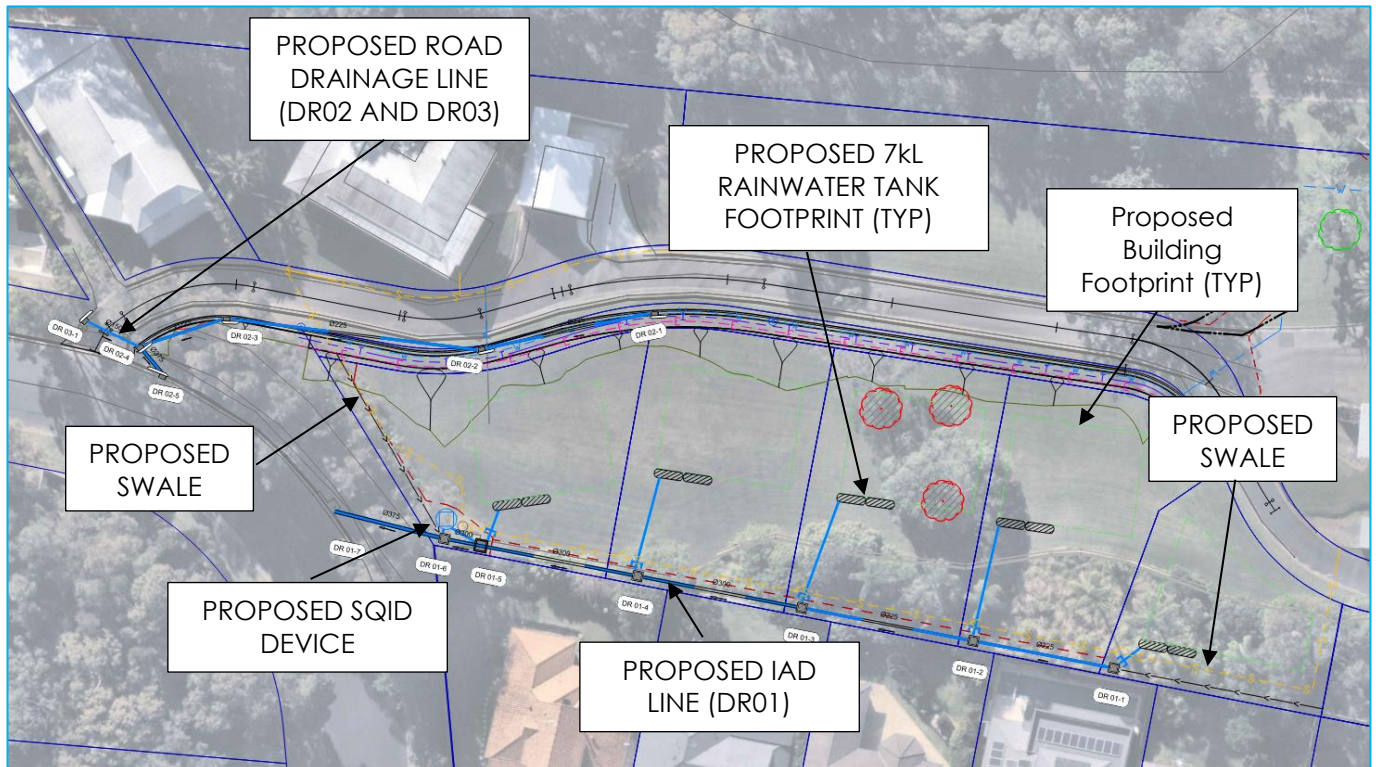


Figure 2.3 Proposed Development (Image Courtesy of Nearmap 2024)

A turfed swale along the southern and western boundary of the proposed development area is proposed to manage the stormwater runoffs from the proposed lot subdivision and associated upstream catchments. The proposed swales will be detailed and designed at the future stage of the project.

Concept Civil engineering drawings have been prepared by BRS (reference 240204-01 series), detailing the proposed stormwater management measures.

3 Site Grading

The earthworks and accessway grading of the site were prepared as part of the development application. The following was considered as part of the design:

- a. Proposed development layout as presented in 240204-01 Civil Engineering Plans.
- b. Site to maintain existing points of stormwater discharge.
- c. Minimum and maximum road grades as defined by the Coffs Harbour City Council's Civil Works Specification and Manual of Planning for Bush Fire Protection (PBFP) 2019.
- d. Road width to comply with CHCC DCP Section C1.6: Subdivision – Design Requirements for Community Title Schemes.

4 Council's Stormwater Management Requirements

4.1 Council's Policy

The following documents from Coffs Harbour City Council were used in determining the requirements for stormwater drainage for the proposed site.

- Water Sensitive Urban Design (WSUD) Guideline 2018;
- Development Specification Design - 0074 – Stormwater Drainage Design.

4.2 On-Site Detention and Water Quality Design Requirements

Council's on-site detention requirements are detailed in Section 4 of the Development Specification for Stormwater Drainage Design, which specifies that:

- Installation of stormwater detention is required on work sites within the Council area where under capacity drainage systems exist.
- Installation of stormwater detention is required on redevelopment sites within the Council area where under capacity drainage system exists.
- A redevelopment site is defined as a site which used to have or was originally zoned to have a lower-density development than is proposed.

The Council's WSUD guideline specifies that CHCC Water Sensitive Urban Design (WSUD) Guideline states that the guideline applies to a development type which consists of a subdivision of land with three or more resulting lots. The proposed development involves subdivision of one (1) lot into five (5) community title lots. Thus, based on the Council's WSUD requirements, on-site detention and water quality is required for the proposed development.

4.2.1 On-Site detention (Rainwater Tank)

Proposed rainwater tanks were sized so that the Permissible Site Discharge (PSD) is the maximum discharge from the post-development site and shall not exceed the pre-developed flows for all storm events up to the 1 in 100 years ARI (1% AEP).

4.2.2 Water Quality

Water Quality devices was designed to meet CHCC'S pollutant reduction target as defined in the Section 3.2 of WSUD 2018 Guidelines. Requirements are summarised in the table below, showing the minimum percentage reduction of the post development pollutants annual load.

Table 4.1 Coffs Harbour City Council Water Quality Reduction Targets

Pollutant Type	Target Reduction
Total Suspended Solids (kg/yr)	85%
Total Phosphorus (kg/yr)	60%
Total Nitrogen (kg/yr)	45%
Gross Pollutants (kg/yr)	90%

5 Stormwater Management Design

5.1 On-Lot Treatments

Rainwater tanks have been provided to ensure that the post development peak flows do not exceed pre-development peak flows up to 1% AEP storm event that drains towards the proposed IAD line.

5.1.3 Rainwater Tank

A provision of a two (2) 7kL rainwater tanks for each lots (detention and reuse) have been designed to manage stormwater for the future dwellings with an assumed footprint of 200m² to be discharged towards the proposed IAD line via underground piped connection.

5.1.4 Interallotment Drainage

The existing site topography grades towards the back of the site which would require an interallotment drainage based on the Council's development design specification: 0074 – Stormwater Drainage Design) Section 5.1. The extract of the section states that:

"...interallotment drainage shall be provided for every allotment which does not drain directly to its frontage street or a natural water course".

Based on Table 5.1 Runoff Contribution to Interallotment Drains of CHCC drainage handbook, the total contributing impervious area flowing towards the proposed IAD line has been adopted to be 40% for each lots.

5.2 Catchments

The catchments for this development were delineated by the natural and finished surface contours for the upstream catchments and proposed accessway, respectively.

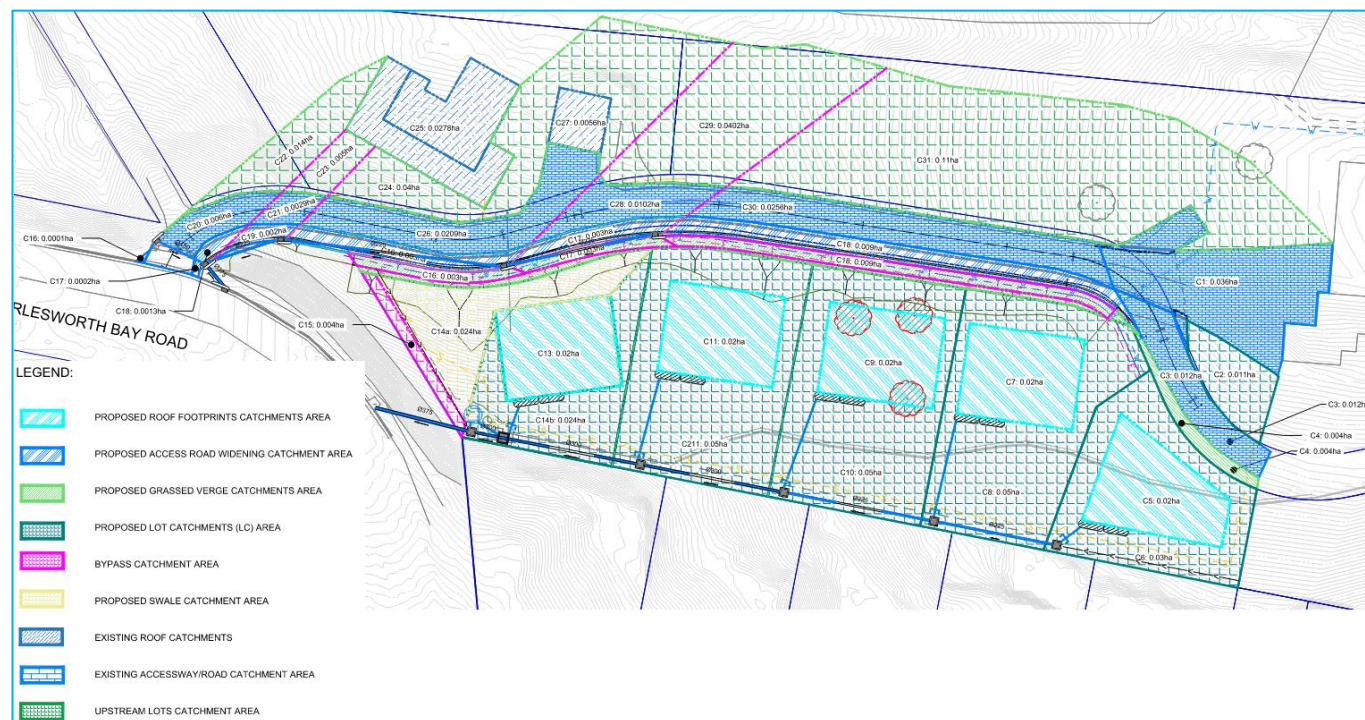


Figure 5.1 Catchment Plan

5.3 Rainfall Data

With reference to the ARR2019 data hub, the rainfall data presented in Table 5.1 has been used in the hydrology model.

Table 5.1 IFD Rainfall Depth Data (Source: Bureau of Meteorology)

Duration	Annual Exceedance Probability (AEP) (mm)						
	63.20%	0.5EY	0.2EY	10%	5%	2%	1%
1 min	2.95	3.33	4.58	5.48	6.4	7.68	8.71
2 min	5.09	5.79	8.18	9.97	11.9	14.9	17.4
3 min	7.07	8.02	11.3	13.7	16.2	20.1	23.4
4 min	8.84	10	14	16.9	19.9	24.4	28.2
5 min	10.4	11.8	16.4	19.7	23.1	28.1	32.2
10 min	16.6	18.7	25.5	30.4	35.4	42.1	47.5
15 min	20.8	23.5	32.1	38.2	44.4	52.7	59.2
20 min	24.1	27.2	37.2	44.4	51.6	61.4	69.2
25 min	26.8	30.2	41.5	49.6	57.8	69	78
30 min	29	32.8	45.2	54.1	63.2	75.8	85.9
45 min	34.2	38.7	53.9	64.9	76.4	92.7	106
1 hour	38.1	43.2	60.6	73.4	86.9	106	123
1.5 hour	44	50.1	70.9	86.6	103	128	149
2 hour	48.6	55.4	79	97	116	146	171
3 hour	55.9	63.9	91.7	113	137	172	203
4.5 hour	64.6	73.9	107	132	160	202	239
6 hour	71.8	82.2	119	148	179	225	265
9 hour	83.9	96.1	139	172	209	261	305
12 hour	94	108	156	193	233	289	336
18 hour	111	127	183	226	271	332	381
24 hour	124	143	205	252	301	365	416
30 hour	136	156	224	274	326	392	445
36 hour	146	168	241	293	347	416	469
48 hour	162	187	268	325	382	455	510
72 hour	185	214	306	369	431	510	569
96 hour	200	231	329	396	462	547	610
120 hour	210	242	344	414	482	572	639
144 hour	216	249	352	424	495	588	658
168 hour	219	252	356	429	501	597	670

5.4 Rainwater Tanks and IAD Modelling Results

DRAINS software was used to model both the pre-development and post-development flows within the proposed system to ensure that post-development flows for 1EY, 0.5EY, 20%AEP, 10% AEP, 5% AEP, 2% AEP, and 1% AEP storm events do not exceed the pre-developed scenario. The layout of the DRAINS model showing the proposed arrangement is presented in the figures below, with results presented in Table 5.2.

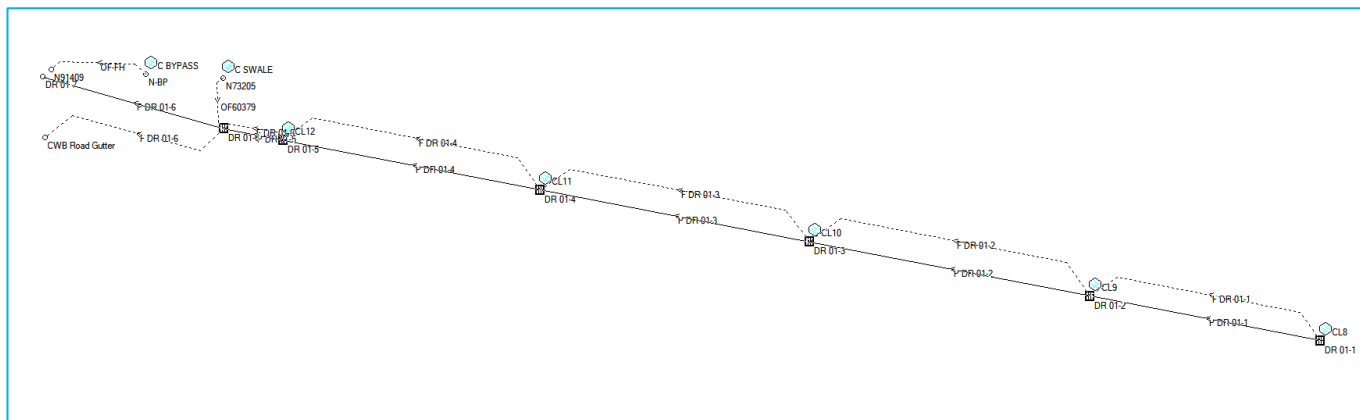


Figure 5.2 Set-up of DRAINS Model Showing the Proposed IAD Line Arrangement

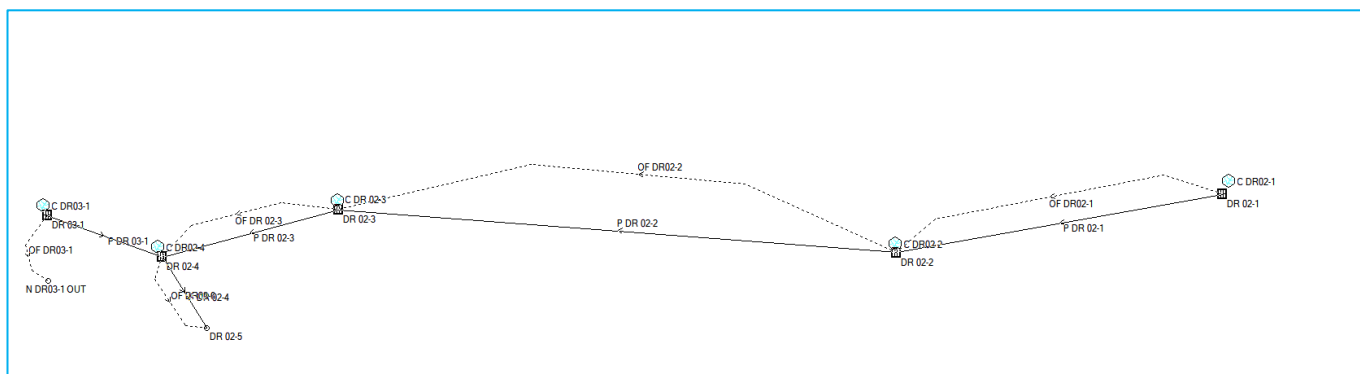


Figure 5.3 Set-up of DRAINS Model Showing the Proposed Kerb Inlet Pits within the Subdivision Accessway

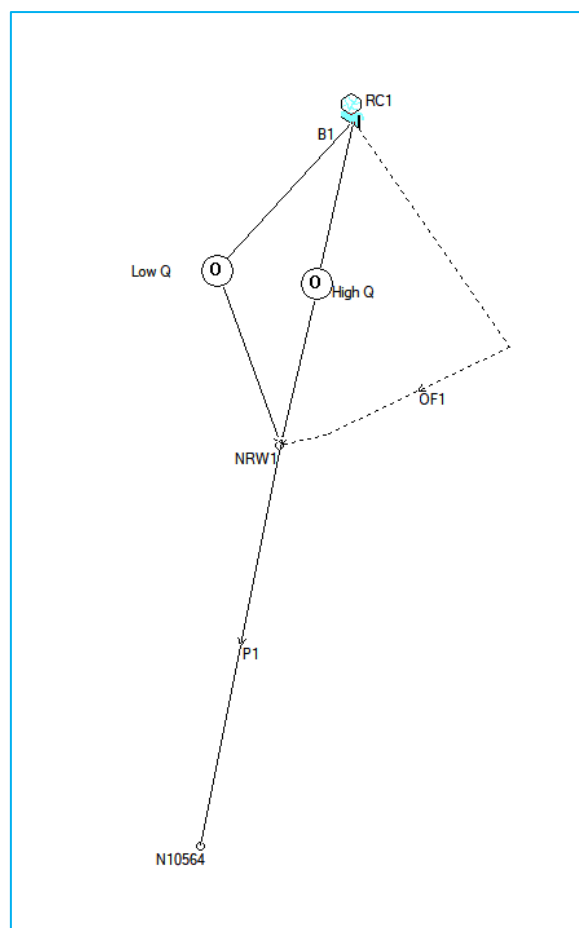


Figure 5.3 Set-up of DRAINS Model Showing the Typical Rainwater Tank Arrangement

Table 5.2 DRAINS Modelling Results Showing Pre and Post Development Flows

Annual Exceedance Probability (AEP)	Overall Site Discharge Post Development			Pre-Development
	Site Discharge	Rainwater Tank	Total Post Development Flow	Pre Development Flow
	(L/s)	(L/s)	(L/s)	(L/s)
63.20%	71	5	76	76
39.35%	103	5	108	112
20%	138	10	148	152
10%	170	20	190	190
5%	204	25	229	231
2%	247	25	272	288
1%	279	30	309	325

6 Water Quality Modelling

6.1 General

The water quality for the site has been designed in accordance with Council's stormwater objectives as documented in Council's DCP and summarised in Section 4 of this report.

To demonstrate compliance with this requirement, a full analysis of water quality pollutant loads was undertaken using The Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software modelling package.

The analysis considered the use of the following devices to improve the quality of stormwater discharge leaving the site:

- Atlan Stormacks pit inserts within all proposed pits (to remove larger pollutants and to avoid blockages within the storm filter tanks), or approved equivalent.
- Atlan Storm Filter (FLF 2500/12) SQID device, or approved equivalent.
- Rainwater Tank Re-use.

6.2 MUSIC Analysis

6.2.5 MUSIC Parameters and Results

Input parameters representing urban catchment areas with varying fractions of effective impervious areas have been adopted in accordance with Coffs Harbour City Council. Council's MUSIC-Link parameters were used for the assessment.

Catchments for the MUSIC model were defined as the area to be disturbed by proposed development. The MUSIC model treatment train network is provided in Figure 6.1. Further, results showing

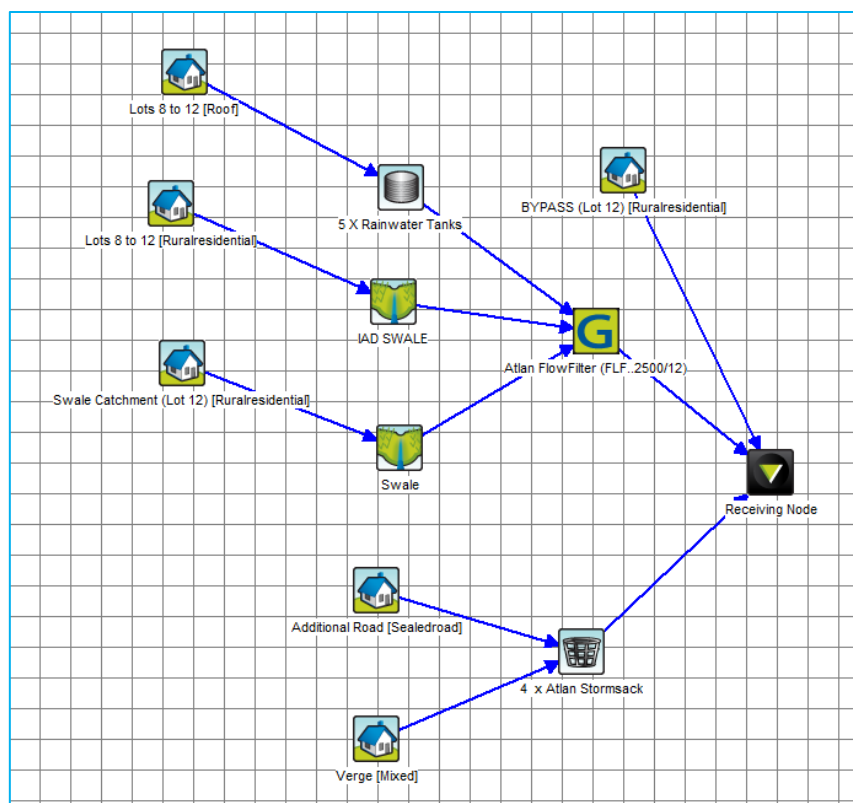


Figure 6.1 Music Model Layout

6.2.6 Rainwater Tank Reuse

Rainwater tank reuse has been utilised in the MUSIC parameters. Each subdivided lot has been assumed to have a single dwelling with an assumed number of occupants of 4 within the dwelling. Further, rainwater tank has been assumed to be utilised only for indoor uses, mainly for toilets and washing machine. Table 6.1 shows the typical water demands for single dwellings, as derived from data provided by Sydney Water, 2015.

Table 6.1 Typical Water Demands for Single Dwellings (Sydney Water, 2015)

Water Use	Single Dwellings (litres/day/dwelling)					
	Number of Occupants					
	1	2	3	3.05	4	5
Indoor Uses						
Toilets	27	54	80	82	107	134
Toilets + Washing Machine	58	115	173	176	231	289
Toilets + Washing Machine + Hotwater	106	212	318	324	425	531
All Uses	162	325	487	495	649	812
Outdoor Uses						
All uses	151	151	151	151	151	151

6.2.7 Results

The modelled mean annual concentrations for each pollutant type; Total Suspended Sediment (TSS), Total Phosphorus (TP), Total Nitrogen (TN), and Gross Pollutants (GP). The result of the analysis has been tabulated in Table 6.2 show

Table 6.2 Water Quality Results

Pollutant Type	Water Quality Assessment Results	
	Council Target	Percent Reduction
Total Suspended Solids (kg/yr)	80	82.5
Total Phosphorus (kg/yr)	60	61.8
Total Nitrogen (kg/yr)	45	51.8
Gross Pollutants (kg/yr)	90	99.6

7 Maintenance Management

To ensure the system functions efficiently over the long term, it will be necessary to carry out regular maintenance on the stormwater system and the water quality devices.

The maintenance of the SQID device and pit inserts will be undertaken during regular inspections and a maintenance schedule will have to be prepared. This schedule will set out the frequency of maintenance inspections and who should undertake them.

A similar maintenance schedule will be provided by the manufacturer.

In addition, during construction, erosion sediment control devices will have to be put in place to protect the downstream drainage system from silt and sediment generated by the works. The installation of the filter cartridges shall not be undertaken until all other works have been completed.

8 Conclusion

This Stormwater Management Report has been prepared to support a Development Application for a proposed community title lot subdivision with an associated accessway upgrade at 27-29 Charlesworth Bay Road, Coffs Harbour.

The investigations undertaken in preparing this report have shown that the stormwater generated from the proposed development can be adequately managed to meet Council's requirements through the provision of appropriate drainage and water quality infrastructure on the site.

Water quality modelling was carried out using the MUSIC software program and Coffs Harbour City Council's MUSIC-Link data.

Further, interallotment drainage and rainwater tanks for each lot were carried out using the DRAINS software program and rainfall data adopted from Australian Rainfall and Runoff, 2019. A rainwater tank is proposed with the outlet configuration designed to restrict peak discharges from the site to no more than under existing conditions for the 1EY, 0.5EY, 50%, 20%, 10%, 5%, 2% and 1% AEP storm events.

This Stormwater Management Report has demonstrated that:

1. Installation of 1 x Atlan Storm Filter FL2500/12, turfed swales, and 4 x OceanGuard Pit Inserts exceed Council's minimum pollutant reduction targets for the site; and
2. Provision of two (2) 7kL rainwater tanks (detention and re-use) for each lot and attenuators such as orifices and weir meet the requirements of Coffs Harbour City Council with respect to allowable post-development Permissible Site Discharge (PSD) and water quality.

9 References

Argue J, 2007, "Basic Procedures for 'source control' of stormwater", Engineering Education Australia, Melbourne

Coffs Harbour City Council (2009). Development Specification Design: 0074 Stormwater Drainage (Design)

Coffs Harbour City Council (2018). Water Sensitive Urban Design (WSUD) Guideline

Fletcher, T, Duncan, H, Poelsma, P. & Lloyd, S., 2004, "Stormwater Flow and Quality, and the effectiveness of non-proprietary stormwater treatment measures – a review and gap analysis", Technical Report 04/8, December 2004

The Institution of Engineers Australia, 1987, "Australian Rainfall and Runoff : A guide to Flood estimation", The Institution of Engineers Australia, Canberra

Institute of Public Works Engineering Australiasia, Queensland Division (2016). Queensland Urban Drainage Manual Fourth Edition

Water by Design (2010). Construction and Establishment Guidelines: Swales, Bioretention Systems and Wetlands, South East Queensland Healthy Waterways Partnership, Brisbane

ATTACHMENT A

Proposed Development

COFFS HARBOUR CITY COUNCIL
27-29 CHARLESWORTH BAY ROAD, COFFS HARBOUR
PROPOSED COMMUNITY TITLE LOT SUBDIVISION
CONCEPT CIVIL ENGINEERING DESIGN FOR DEVELOPMENT APPLICATION



SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
001	COVER SHEET
011	GENERAL NOTES
031	TYPICAL SECTIONS AND DETAILS
101	DETAIL PLAN
201	LONGITUDINAL SECTION MC01
301	CROSS SECTION MC01 SHEET 1
302	CROSS SECTION MC01 SHEET 2
501	DRAINAGE LAYOUT PLAN
511	DRAINAGE CATCHMENT PLAN
521	WATER QUALITY CATCHMENT PLAN
531	DRAINAGE LONGITUDINAL SECTION 1
532	DRAINAGE LONGITUDINAL SECTION 2
541	DRAINAGE RESULTS TABLE
601	PROPOSED UTILITY SERVICING PLAN
801	EROSION AND SEDIMENT CONTROL PLAN
811	EROSION AND SEDIMENT CONTROL DETAILS
901	TURNPATH PLAN

LOCALITY
NOT TO SCALE

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Prepared for: MR BRIAN BETTS



GENERAL NOTES

1. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE DEVELOPMENT CONSENT AND THE COFFS HARBOUR COUNCIL WORKS SPECIFICATIONS SUBDIVISIONS / DEVELOPMENTS AND / OR AS DIRECTED BY THEIR REPRESENTATIVE AND MUST INCLUDE ANY NECESSARY WORKS REQUIRED TO MAKE THE CONSTRUCTION EFFECTIVE. ALL WORKS AND PUBLIC UTILITY RELOCATION SHALL INCUR NO COST TO COUNCIL.
2. THE CONTRACTOR IS TO IDENTIFY, LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORKS AND WHERE NECESSARY MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST WHERE NECESSARY.
3. ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE WORK HEALTH & SAFETY ACT 2017 AND ALL RELEVANT OCCUPATIONAL HEALTH & SAFETY POLICIES AND REGULATIONS.
4. DIMENSIONS SHALL NOT BE SCALED FROM THE PLANS. CLARIFICATION OF DIMENSIONS SHALL BE SOUGHT FROM THE SUPERINTENDENT OR REFERRED TO THE DESIGNER.
5. SURVEY MARKS SHALL BE MAINTAINED AT ALL TIMES. WHERE RETENTION IS NOT POSSIBLE THE ENGINEER SHALL BE NOTIFIED AND CONSENT RECEIVED PRIOR TO THEIR REMOVAL.
6. ALL NEW WORK IS TO MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
7. THE CONTRACTOR IS NOT TO ENTER UPON NOR DO ANY WORK WITHIN OR ON ADJACENT LANDS WITHOUT THE PRIOR APPROVAL OF THE SUPERINTENDENT AND THE WRITTEN PERMISSION OF THE OWNERS.
8. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL THROUGHOUT THE DURATION OF THE PROJECT.
9. FELLED TREES SHALL BE SALVAGED FOR RE-USE AS WOODCHIP MULCH OR LOG FORM FOR SITE REHABILITATION, NON-SALVAGEABLE MATERIAL SUCH AS STUMPS AND ROOTS SHALL BE APPROPRIATELY DISPOSED OF OFF SITE.
10. THE CONTRACTOR SHALL PROVIDE MINIMUM 24 HOURS NOTICE TO CERTIFIERS REPRESENTATIVE FOR ALL INSPECTIONS.
11. ALL NATURAL SURFACE DATA HAS BEEN DETERMINED BY TERRAIN MODELLING. ALL CONSTRUCTION SITE WORKS MUST BE CARRIED OUT USING THE BENCH MARKS SHOWN ON THESE DRAWINGS.
12. THE REUSE AND RECYCLING OF WASTE MATERIALS MUST BE MAXIMISED DURING CONSTRUCTION AND DEMOLITION. THE SEPARATION AND RECYCLING OF THE FOLLOWING WASTE MATERIAL a) MASONRY b) TIMBER c) METALS d) CLEAN WASTE e) MIXED WASTE THIS CAN BE ACHIEVED BY CONSTRUCTING A MINIMUM OF FIVE TRADE WASTE COMPOUNDS ON-SITE COPIES OF ACTUAL WEIGHBRIDGE RECEIPTS VERIFYING RECYCLING/DISPOSAL MUST BE KEPT AND PRESENTED TO COUNCIL OR NOMINATED AUTHORITY WHEN REQUIRED.
13. THE TREES THAT ARE TO BE RETAINED ARE TO BE PROTECTED DURING ALL WORKS WITH 1.8m HIGH CHAINWIRE FENCING WHICH IS TO BE ERECTED AT LEAST THREE METRES FROM THE BASE OF EACH TREE AND IS TO BE IN PLACE PRIOR TO WORKS COMMENCING TO RESTRICT THE FOLLOWING OCCURRING: STOCKPILING OF MATERIALS WITHIN THE ROOT PROTECTION ZONE, PLACEMENT OF FILL WITHIN THE ROOT PROTECTION ZONE, PARKING OF VEHICLES WITHIN THE ROOT PROTECTION ZONE, COMPACTION OF SOIL WITHIN THE ROOT PROTECTION ZONE. ALL AREAS WITHIN THE ROOT PROTECTION ZONE ARE TO BE MULCHED WITH COMPOSTED LEAF MULCH TO A DEPTH NOT LESS THAN 100mm. THE INSTALLATION OF SERVICES WITHIN THE ROOT PROTECTION ZONE IS NOT TO BE UNDERTAKEN WITHOUT CONSULTATION WITH COUNCIL'S TREE MANAGEMENT OFFICER.
14. A COPY OF THE DEVELOPMENT CONSENT AND STAMPED PLANS AND TRAFFIC CONTROL PLAN SHALL BE KEPT ON SITE AT ALL TIMES DURING CONSTRUCTION.
15. IF, DURING THE COURSE OF ANY WORKS, ANY EVIDENCE OF AN ABORIGINAL ARCHAEOLOGICAL SITE OR RELIC IS FOUND, ALL WORKS ON THE SITE ARE TO CEASE AND THE DEPARTMENT OF ENVIRONMENT AND CLIMATE CHANGE AND THE NSW HERITAGE BRANCH ARE TO BE NOTIFIED IMMEDIATELY.
16. IF, DURING THE COURSE OF ANY WORKS, ANY EVIDENCE OF A EUROPEAN ARCHAEOLOGICAL SITE OR RELIC IS FOUND, ALL WORKS ON THE SITE ARE TO CEASE AND THE NSW HERITAGE BRANCH CONTACTED IMMEDIATELY. ALL RELICS ARE TO BE RETAINED IN SITU UNLESS OTHERWISE DIRECTED BY THE NSW HERITAGE BRANCH.
17. ANY NEW INFORMATION, WHICH COMES TO LIGHT DURING CONSTRUCTION WORKS, WHICH HAS THE POTENTIAL TO ALTER PREVIOUS CONCLUSIONS ABOUT SITE CONTAMINATION, SHALL BE IMMEDIATELY NOTIFIED TO COUNCIL.
18. CONSTRUCTION INSPECTIONS ARE REQUIRED FOR THE ENGINEERING WORKS IN ACCORDANCE WITH THE RELEVANT LOCAL COUNCIL WORKS SPECIFICATION.
19. SEDIMENT MEASURES SHALL BE IMPLEMENTED PRIOR TO SOIL DISTURBANCE IN KEEPING WITH THE 4th EDITION OF LANDCOMS "SOILS AND CONSTRUCTION - MANAGING URBAN STORMWATER" MARCH 2004 TO THE SATISFACTION OF COUNCIL'S REPRESENTATIVE AND AS SHOWN IN THESE DRAWINGS.
20. THE CONTRACTOR SHALL CLEAR AND DISPOSE OF ONLY THOSE TREES THAT ARE CONDEMNED BY THE PLANS. COUNCIL'S TREE PRESERVATION ORDER SHALL BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT PRIOR APPROVAL OF COUNCIL.
21. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES, OUT HOUSES, CAR BODIES, DEBRIS, ETC. THE CONTRACTOR SHALL NOT DISPOSE OF ANY DEBRIS BY BURNING OFF IN AN OPEN FIRE.

ROADWORKS NOTES

1. THE CONTRACTOR SHALL UNDERTAKE TRAFFIC CONTROL MEASURES TO COUNCIL'S SATISFACTION AND SHALL DISPLAY ALL APPROPRIATE WARNING SIGNS THROUGHOUT THE DURATION OF CONSTRUCTION.
2. UNSOUND MATERIALS AS DETERMINED BY THE COUNCIL'S REPRESENTATIVE SHALL BE REMOVED FROM ROADS AND LOTS PRIOR TO FILLING.
3. PROVIDE VEHICULAR ENTRIES IN KERB AND GUTTER WHERE SHOWN OR DIRECTED BY THE SUPERINTENDENT.

EARTHWORKS NOTES

1. CARE IS TO BE TAKEN DURING THE CONSTRUCTION OF THE PROPOSED WORKS TO ENSURE NATURAL VEGETATION AND TOPOGRAPHY ON THE SUBJECT SITE IS NOT UNNECESSARILY DISTURBED. ANY EXCAVATION MATERIAL NOT USED IN THE CONSTRUCTION OF THE SUBJECT WORKS IS TO BE REMOVED FROM THE SITE AND UNDER NO CIRCUMSTANCES IS TO BE DEPOSITED IN BUSHLAND AREAS.
2. COUNCIL MUST BE NOTIFIED OF ANY DAMAGE TO THE PUBLIC INFRASTRUCTURE SUCH AS ROAD PAVEMENT, KERB AND GUTTER, CONCRETE FOOTPATHS, DRAINAGE STRUCTURES, UTILITIES AND LANDSCAPING FRONTING THE DEVELOPMENT..
3. UNSOUND MATERIALS AS DETERMINED BY COUNCIL'S REPRESENTATIVE SHALL BE REMOVED FROM ROADS AND LOTS PRIOR TO ANY FILLING.
4. ALL SITE REGRADING AREAS SHALL BE GRADED TO THE SATISFACTION OF COUNCIL'S REPRESENTATIVE. THE CONTRACTOR SHALL TAKE LEVELS ON THE EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING ANY FILL OPERATIONS.
5. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED OR DISPOSED OF IN ACCORDANCE WITH THE CONTRACT, OR AS DIRECTED BY THE SUPERINTENDENT.
6. ALL SITE FILLING SHALL BE PLACED IN LAYERS NOT EXCEEDING COUNCILS AND GEOTECH REQUIREMENTS. FILL IS TO BE COMPACTED IN ACCORDANCE WITH GEOTECH SPECIFICATIONS AND BE TESTED AT THE REQUIRED INTERVALS BY AN APPROVED N.A.T.A. GEOTECHNICAL LABORATORY.
7. MINIMUM 150mm THICK TOPSOIL SHALL BE SPREAD ON ALL BERMS, BATTERS AND SITE REGRADING AREAS. EXCESS TOPSOIL SHALL BE DISPOSED OF AS DIRECTED BY THE SUPERINTENDENT.
8. ALL LAND DISTURBED BY EARTHWORKS SHALL BE SPRAY-GRASSED, TURFED OR SIMILARLY TREATED TO ESTABLISH GRASS COVER. SEED MIXTURES ARE TO BE APPROVED BY COUNCIL PRIOR TO SPRAYING. ALL GRASSED AREAS SHALL BE REGULARLY WATERED AND MAINTAINED UNTIL EXPIRATION OF THE MAINTENANCE PERIOD.
9. THE DISPOSAL / LANDFILL OF SURPLUS EXCAVATED MATERIAL, OTHER THAN TO A DECC LICENSED FACILITY, IS NOT PERMITTED WITHOUT FORMAL APPROVAL FROM COUNCIL PRIOR TO THE COMMENCEMENT OF WORKS. ANY UNAUTHORIZED DISPOSAL OF WASTE, WHICH INCLUDES EXCAVATED MATERIAL, IS A BREACH OF THE PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997 AND SUBJECT TO SUBSTANTIAL PENALTIES. UNLESS COUNCIL APPROVES AN ALTERNATIVE SITE, THEN ALL SURPLUS MATERIAL MUST BE DISPOSED OF AT A LICENSED WASTE FACILITY. COPIES OF ACTUAL WEIGHBRIDGE RECEIPTS VERIFYING RECYCLING / DISPOSAL MUST BE KEPT AND PRESENTED TO COUNCIL WHEN REQUIRED.
10. THE ONLY WASTE DERIVED FILL MATERIAL THAT MAY BE RECEIVED AT THE DEVELOPMENT SITE IS: a) VIRGIN EXCAVATED NATURAL MATERIAL OR b) ANY OTHER WASTE-DERIVED MATERIAL THE SUBJECT OF A RESOURCE RECOVERY UNDER CLAUSE 51A OF THE PROTECTION OF THE ENVIRONMENT OPERATIONS (WASTE) REGULATION 2005 THAT IS PERMITTED TO BE USED AS FILL MATERIAL. ANY WASTE-DERIVED MATERIAL THE SUBJECT OF A RESOURCE RECOVERY EXEMPTION RECEIVED AT THE DEVELOPMENT SITE MUST BE ACCOMPANIED BY DOCUMENTATION AS TO THE MATERIAL'S COMPLIANCE WITH THE EXEMPTION CONDITIONS AND MUST BE PROVIDED TO THE PRINCIPAL CERTIFYING AUTHORITY ON REQUEST.

SERVICE NOTES

1. THE CONTRACTOR IS TO IDENTIFY, LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORKS AND WHERE NECESSARY MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST.
2. BARKER RYAN STEWART DOES NOT ACCEPT ANY LIABILITY FOR INACCURACIES IN THE SERVICE INFORMATION SHOWN.
3. CONDUITS SHALL BE LAID AFTER POSITIONS HAVE BEEN DETERMINED BY THE RELEVANT AUTHORITIES AND BEFORE FINAL A.C. IS LAID.
4. POSITION OF CONDUITS SHALL BE MARKED ON THE KERB.
5. THE CONTRACTOR SHALL MAINTAIN SERVICES AND ALL WEATHER ACCESS AT ALL TIMES TO THE ADJOINING PROPERTIES.
6. CARE SHALL BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES, NO MECHANICAL EXCAVATION SHALL BE MADE OVER TELSTRA OR ELECTRICAL SERVICES, EXCAVATE BY HAND ONLY IN THESE AREAS.

DRAINAGE NOTES

1. ALL PITS DEEPER THAN 1.2m SHALL HAVE STEP IRONS PROVIDED IN ACCORDANCE WITH COUNCIL'S STANDARDS.
2. ALL DRAINAGE LINES THROUGH THE LOTS SHALL BE CONTAINED WITHIN THE EASEMENTS AND CONFORM WITH COUNCIL'S STANDARDS.
3. ALL DRAINAGE LINES ON HIGH SIDE AND UNDER ROADS SHALL BE BACKFILLED WITH SHARP SAND AND HAVE 3.0m OF AGRICULTURAL LINE WRAPPED IN AN APPROVED FILTER FABRIC, DISCHARGING INTO THE DOWNSTREAM PIT.
4. SUBSOIL DRAINS SHALL BE CONSTRUCTED TO THE SATISFACTION OF COUNCIL'S REPRESENTATIVE.
5. PRECAST KERB INLET LINTELS SHALL BE USED ON GULLY PITS. GRATES SHALL BE "WELDLOK" TYPE GG50D OR APPROVED EQUIVALENT.
6. ON COMPLETION OF PIPE INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AREAS, GRASSED AREAS AND ROAD PAVEMENTS.
7. TRENCH WIDTHS ARE TO BE KEPT TO A MINIMUM, CONSISTENT WITH LAYING AND BEDDING OF THE RELEVANT SERVICE AND CONSTRUCTION PERSONNEL ACCESS WAYS AND PITS. REFER TO AUTHORITIES STANDARDS FOR MINIMUM TRENCH WIDTHS, STANDARD TRENCH WIDTHS AND THE DIMENSIONS OF UNSUPPORTED TRENCHES. SUPPORT EXCAVATIONS TO THE REQUIREMENTS OF THE CONSTRUCTION SAFETY REGULATIONS 1950, UNDER THE CONSTRUCTION SAFETY ACT 1912 (AS AMENDED)
8. PITS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH AS3500.3:2021 PLUMBING AND DRAINAGE - STORMWATER DRAINAGE STANDARD UNLESS OTHERWISE SPECIFIED BE THE LOCAL COUNCIL OR AUTHORITY.
9. PIT SIZES IN ACCORDANCE WITH AS3500.3:2021 AND/ OR COUNCIL REQUIREMENTS.
10. IF A PIT IS SHOWN ON THE KERB ALIGNMENT IT IS REQUIRED TO BE CONSTRUCTED AS A KERB INLET PIT UNLESS OTHERWISE NOTED.
11. BACKFILL TRENCHES IN ACCORDANCE WITH COUNCIL REQUIREMENTS WITHOUT DELAY FOR THE SECTION OF PIPE THAT HAS BEEN COMPLETED AND APPROVED, IF POSSIBLE ON THE SAME WORKING DAY.

STRUCTURAL NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600.
2. CONCRETE QUALITY SHALL BE AS SPECIFIED AND SHALL BE VERIFIED BY TESTS.
3. ALL CONCRETE UNLESS OTHERWISE NOTED SHALL HAVE A SLUMP OF 80mm AT POINT OF PLACEMENT, A MAXIMUM AGGREGATE SIZE OF 20mm AND STRENGTH AS SPECIFIED. NO WATER SHALL BE ADDED TO THE MIX PRIOR TO OR DURING THE PLACEMENT.
4. ALL REINFORCEMENT SPECIFIED IS GRADE D500 UNLESS NOTED OTHERWISE.
5. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY, IT IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
6. TOP REINFORCEMENT IS TO BE CONTINUOUS ON SUPPORTS. BOTTOM REINFORCEMENT TO BE LAPPED AT SUPPORTS.
7. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED UNLESS SHOWN ON STRUCTURAL DRAWINGS.
8. PIPES OR CONDUITS SHALL NOT BE PLACED WITHIN THE ZONE OF CONCRETE COVER TO THE REINFORCEMENT WITHOUT THE APPROVAL OF THE ENGINEER.
9. ALL REINFORCING BARS AND FABRIC SHALL COMPLY WITH AS4671.
10. REINFORCEMENT SYMBOLS:

10.1. N - GRADE 500N DEFORMED BAR (D500) NORMAL DUCTILITY

10.2. R - GRADE 250N PLAIN ROUND BAR (R250) NORMAL DUCTILITY

10.3. SL - GRADE 500L WELDED DEFORMED RIBBED MESH (D500) RECTANGULAR LOW DUCTILITY

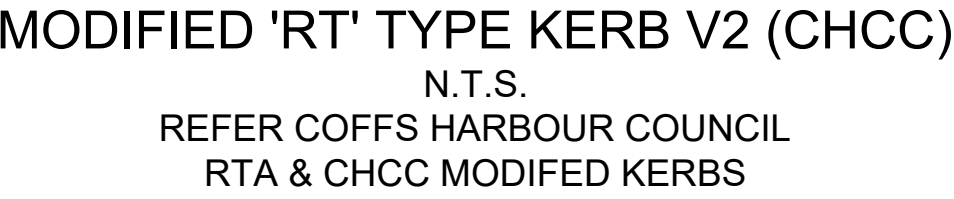
THE NUMBER IMMEDIATELY FOLLOWING THESE SYMBOLS IS THE NUMBER OF MILLIMETERS IN THE BAR DIAMETER.

EXAMPLE:
8 N12-250, DENOTES 8, GRADE 500N DEFORMED BARS, 12mm DIAMETER AT 250 CTS.
11. FABRIC REINFORCEMENT TO BE LAPPED 1 COMPLETE SQUARE + 25mm UNLESS NOTED OTHERWISE.
12. ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON BAR CHAIRS SPACED AT A MAXIMUM OF 750mm CENTRES BOTH WAYS UNDER THE ROD AND FABRIC REINFORCEMENT. REINFORCEMENT SHALL BE TIED AT ALTERNATIVE INTERSECTIONS.

COUNCIL NOTES

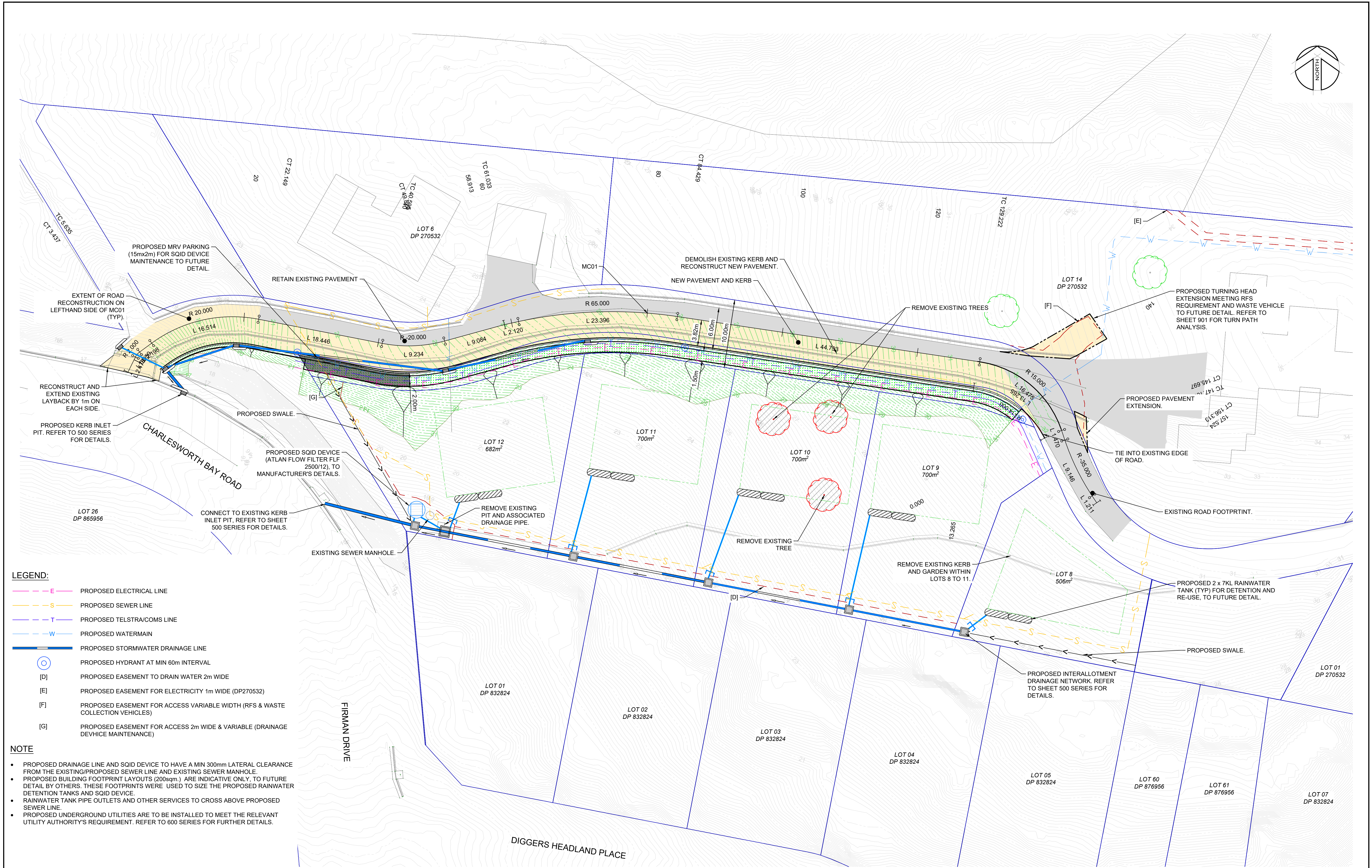
1. WORKS CARRIED OUT TO COFFS HARBOUR COUNCIL STANDARDS AND SPECIFICATIONS.

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
DRAINAGE LINE		
CONTOUR		
GRATED SURFACE INLET PIT		
SEALED PIT		
KERB INLET PIT		
PIT LABEL (LINE / No)		
HANDRAILS		
TREE TO BE REMOVED		
BATTERS		
LIMIT OF WORKS		
ELECTRICITY		
WATER		
COMMUNICATIONS		
SEWER		



1. PAVEMENT AND SUBSOIL DETAILS TO BE CONFIRMED DURING THE FINAL STAGE.

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DETAIL PLAN
SCALE 1:250



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27-29 CHARLESWORTH BAY ROAD, COFFS HARBOUR
PROPOSED COMMUNITY TITLE LOT SUBDIVISION

DETAIL PLAN

Designed: BF
Drawn: DKH
Checked: SGB

Scales: Plan 1:250
@A1 Horiz. -
Vert. -
X-Sect. -

Datum: A.H.D.

Plan No.
240204-01-101

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REV.
A

TIE INTO EXISTING EDGE OF ROAD (CHARLESWORTH BAY ROAD).

HORIZONTAL CURVES

VERTICAL CURVES

VERTICAL GRADES

DATUM RL 11.000

DESIGN SURFACE	16.755	16.865	16.912	16.947	16.995	17.023	17.170	17.507	17.775	18.344	19.089	19.836	20.308	20.525	20.673	21.100	21.238	21.354	21.670	21.747	21.820	21.885	21.940	22.402	22.443	22.638	22.817	23.151	23.171	24.003	24.079	24.134	24.436	24.756	25.159	25.557
EXISTING SURFACE	16.755	16.865	16.912	16.947	16.995	17.023	17.170	17.507	17.775	18.344	19.089	19.836	20.308	20.525	20.673	21.100	21.238	21.354	21.670	21.747	21.820	21.885	21.940	22.402	22.443	22.638	22.817	23.151	23.171	24.003	24.079	24.134	24.436	24.756	25.159	25.557
CUT/FILL	0.000	0.000	0.000	0.006	0.026	0.039	0.072	0.100	0.100	0.100	-0.150	-0.049	-0.050	-0.055	-0.033	0.000	0.000	0.000	-0.002	-0.002	-0.008	-0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CHAINAGE	0	1	1.583	1.94	2.295	2.478	3.437	5.635	7.143	10	13.75	17.5	20	21.25	22.149	25	26	27	30	30.75	31.5	32.25	33	40	40.595	43.333	46.667	48.829	50	58.913	60	61.033	65	70	75	80

MC01 - LONGITUDINAL SECTION

HORZ SCALE 1:150

VERT SCALE 1:100

HORIZONTAL CURVES

VERTICAL CURVES

VERTICAL GRADES

DATUM RL 20.000

DESIGN SURFACE	25.557	25.929	26.612	27.792	29.192	30.444	31.499	31.570	31.875	32.132	32.235	32.294	32.170	32.066	31.877	31.588	31.513	31.443
EXISTING SURFACE	25.557	25.929	26.612	27.792	29.192	30.444	31.499	31.570	31.875	32.132	32.235	32.294	32.170	32.066	31.877	31.588	31.513	31.443
CUT/FILL	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CHAINAGE	80	84.429	90	100	110	120	129.222	130	133.333	136.667	140	143.333	145.697	147.167	150	155	156.313	157.524

MC01 - LONGITUDINAL SECTION

HORZ SCALE 1:150

VERT SCALE 1:100

NOTE

- FINAL GRADING SUBJECT TO DETAILED SITE SURVEY AS PART OF FUTURE DETAILED DESIGN.



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PROPOSED COMMUNITY TITLE LOT SUBDIVISION

LONGITUDINAL SECTION MC01

Designed: BF
Drawn: DKH
Checked: SGB

Scales: Plan -
@A1 Horiz. 1:150
Vert. 1:100
X-Sept. -

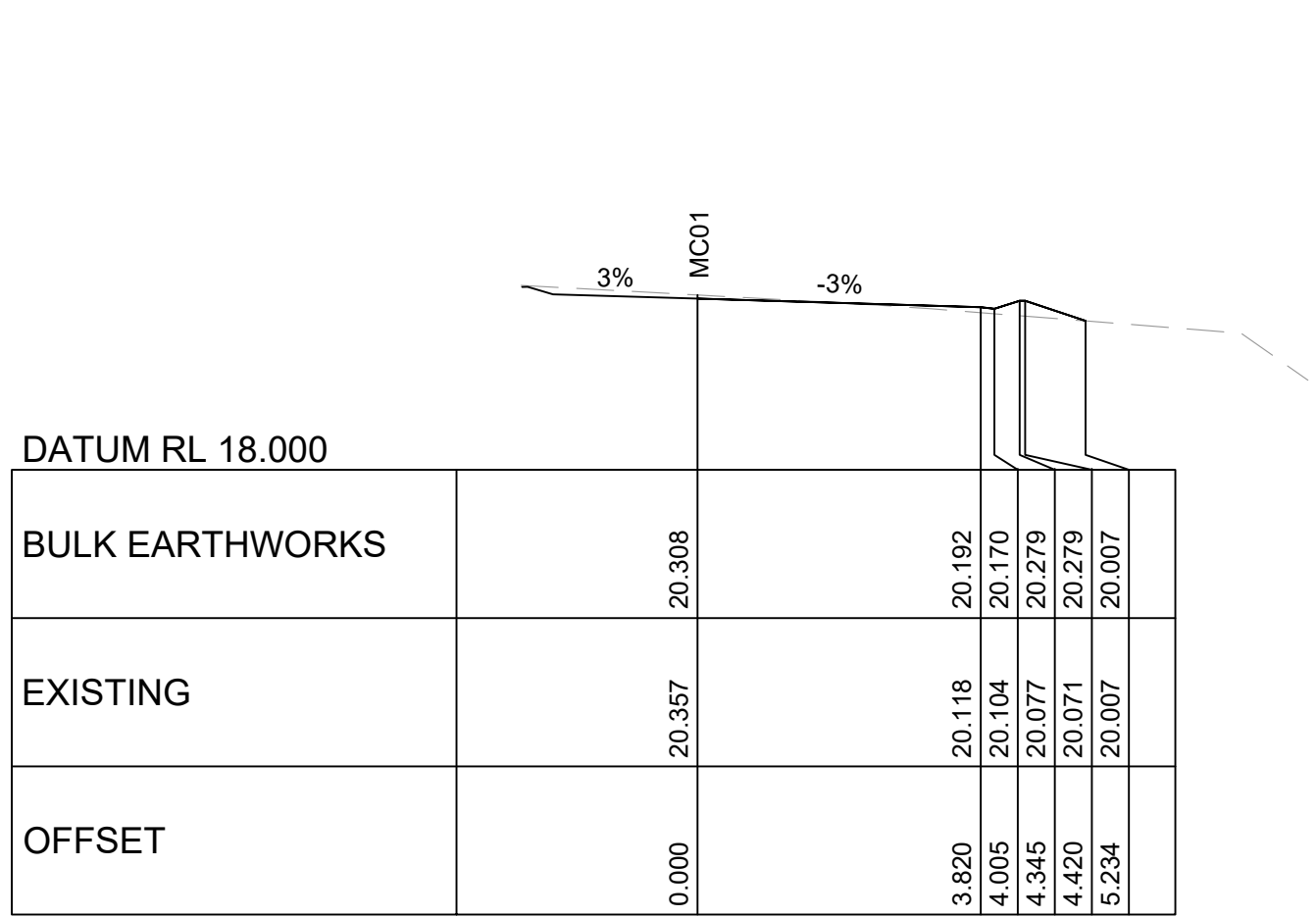
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Plan No.
240204-01-201

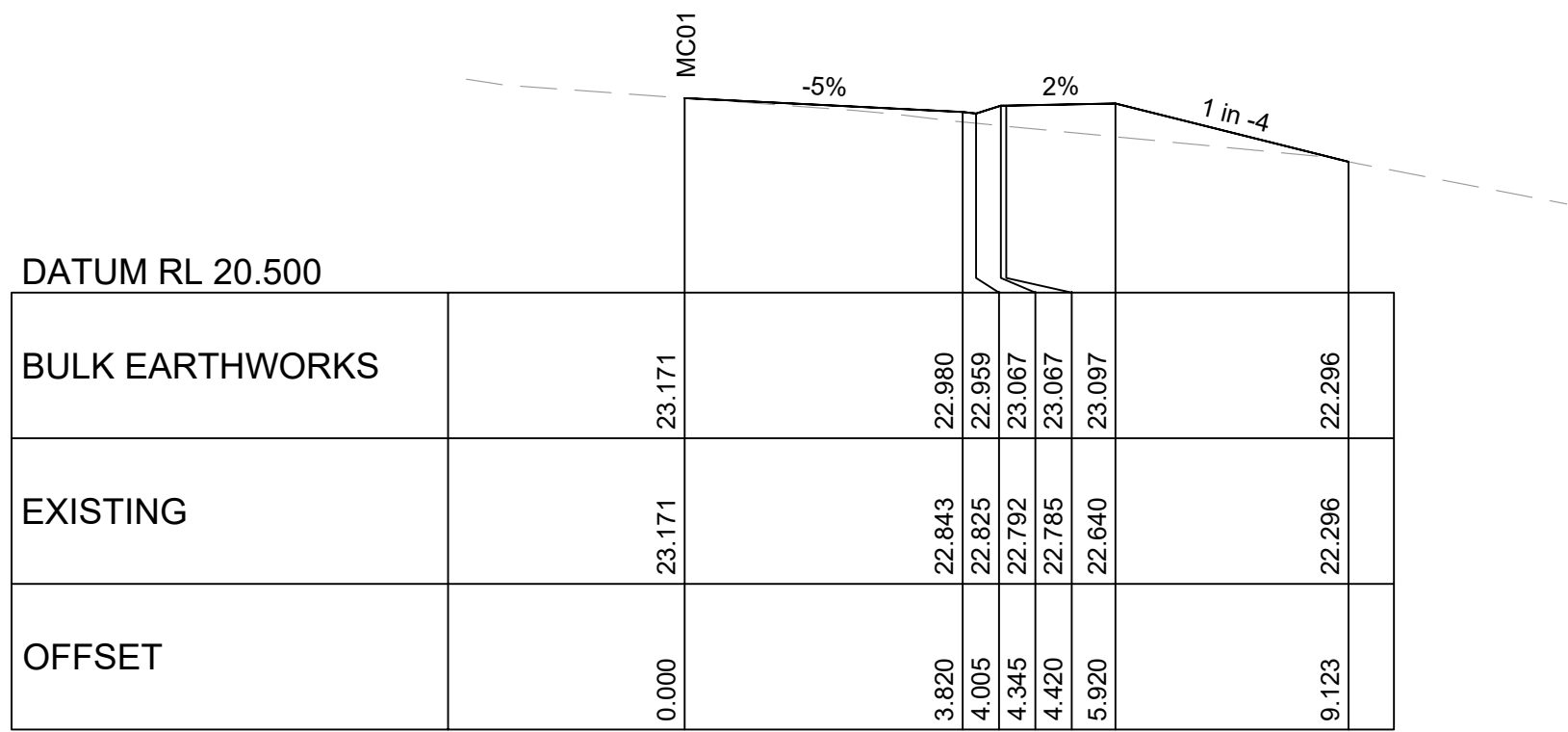
File Ref.
240204

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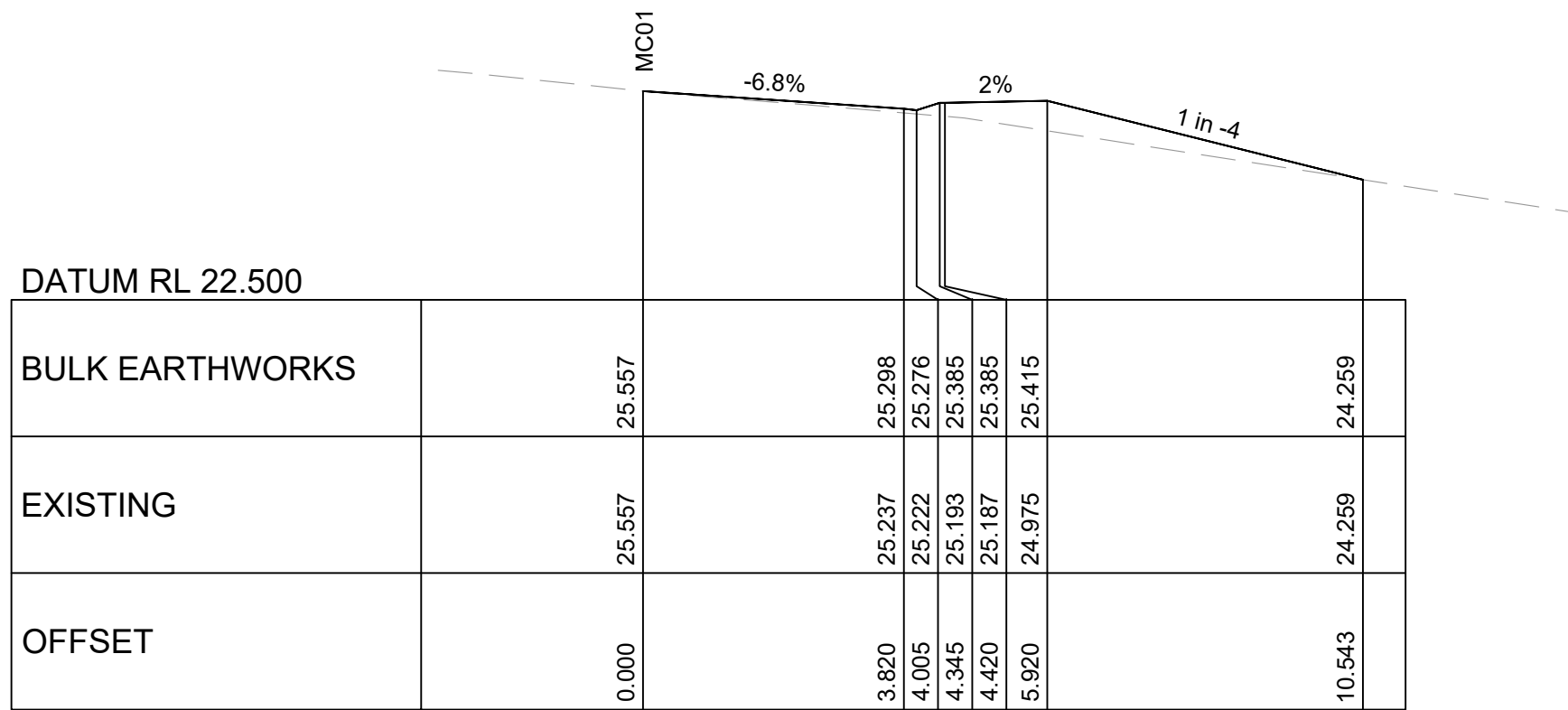
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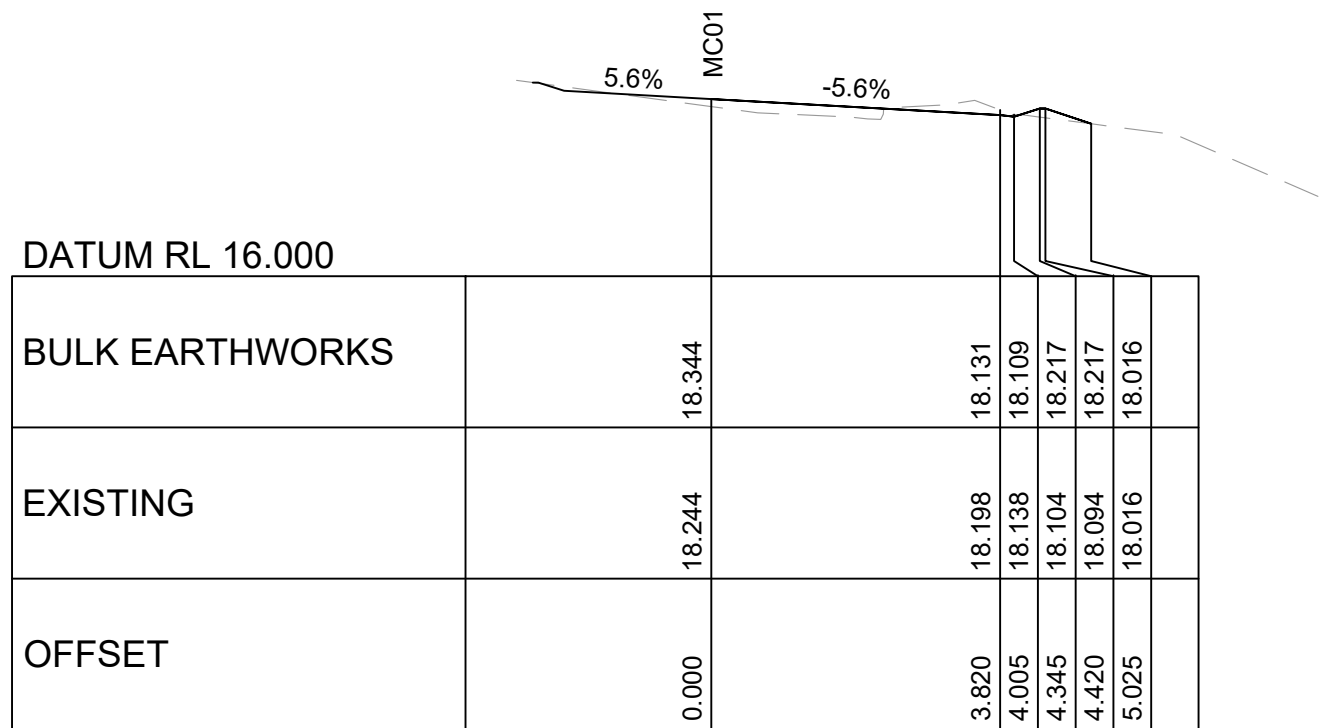
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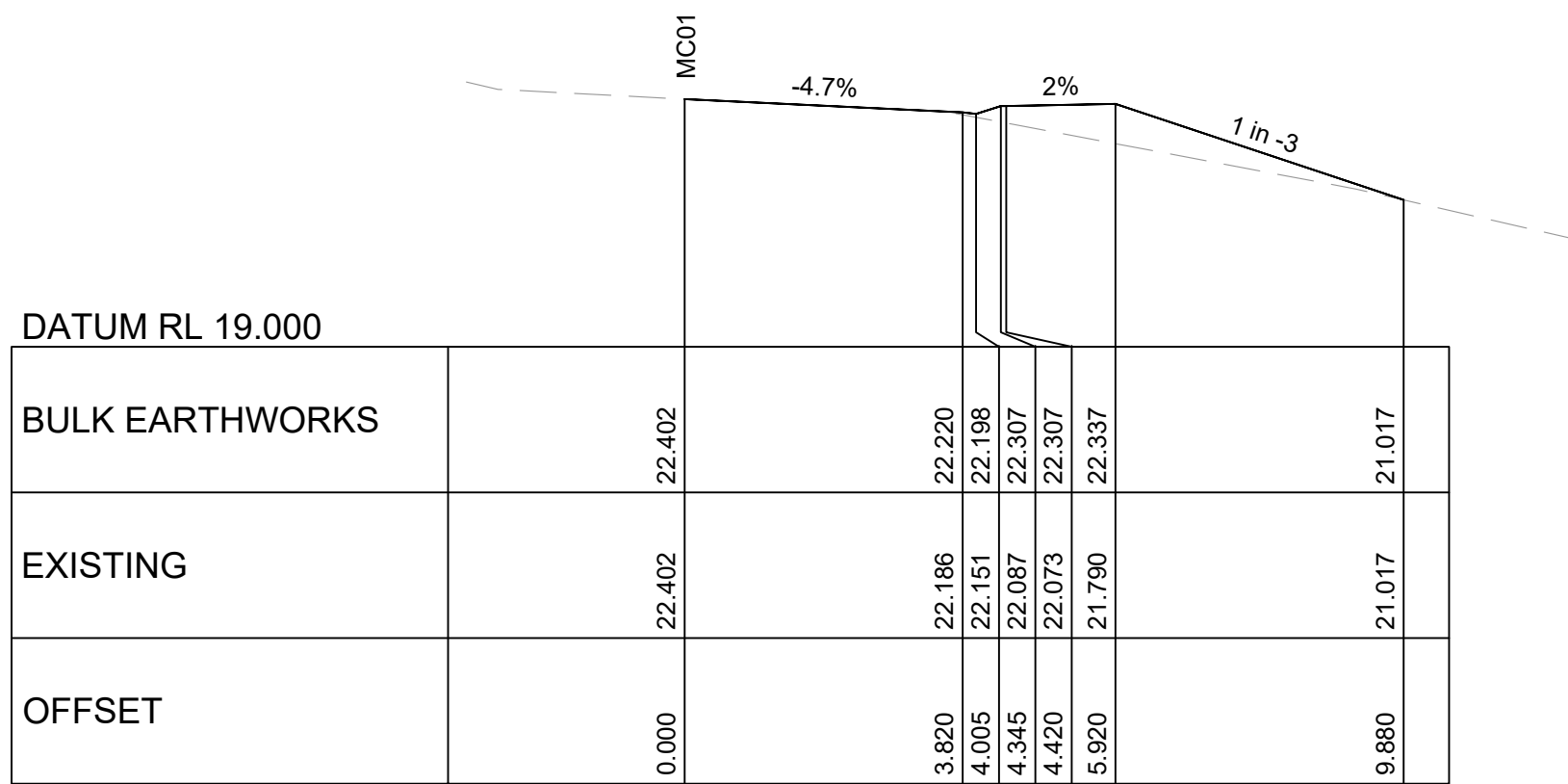
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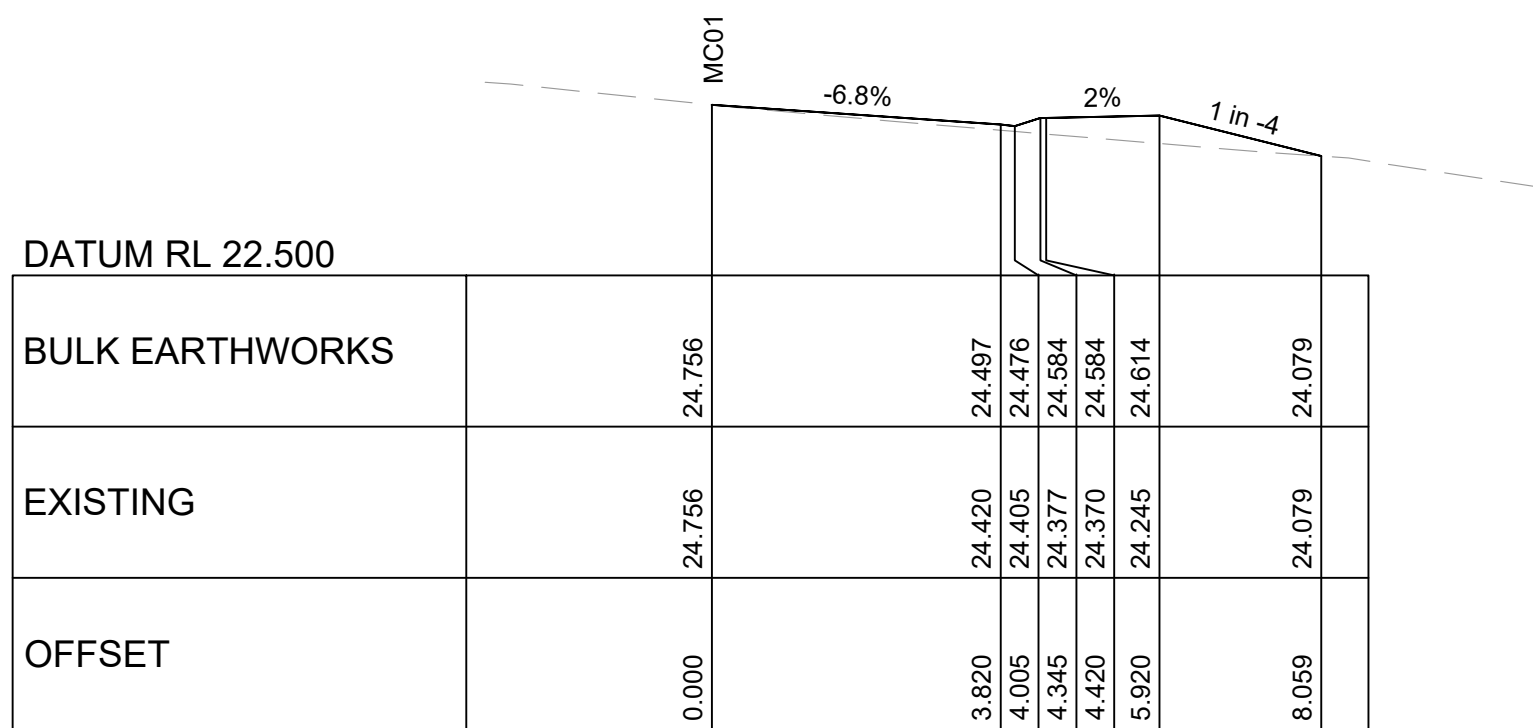
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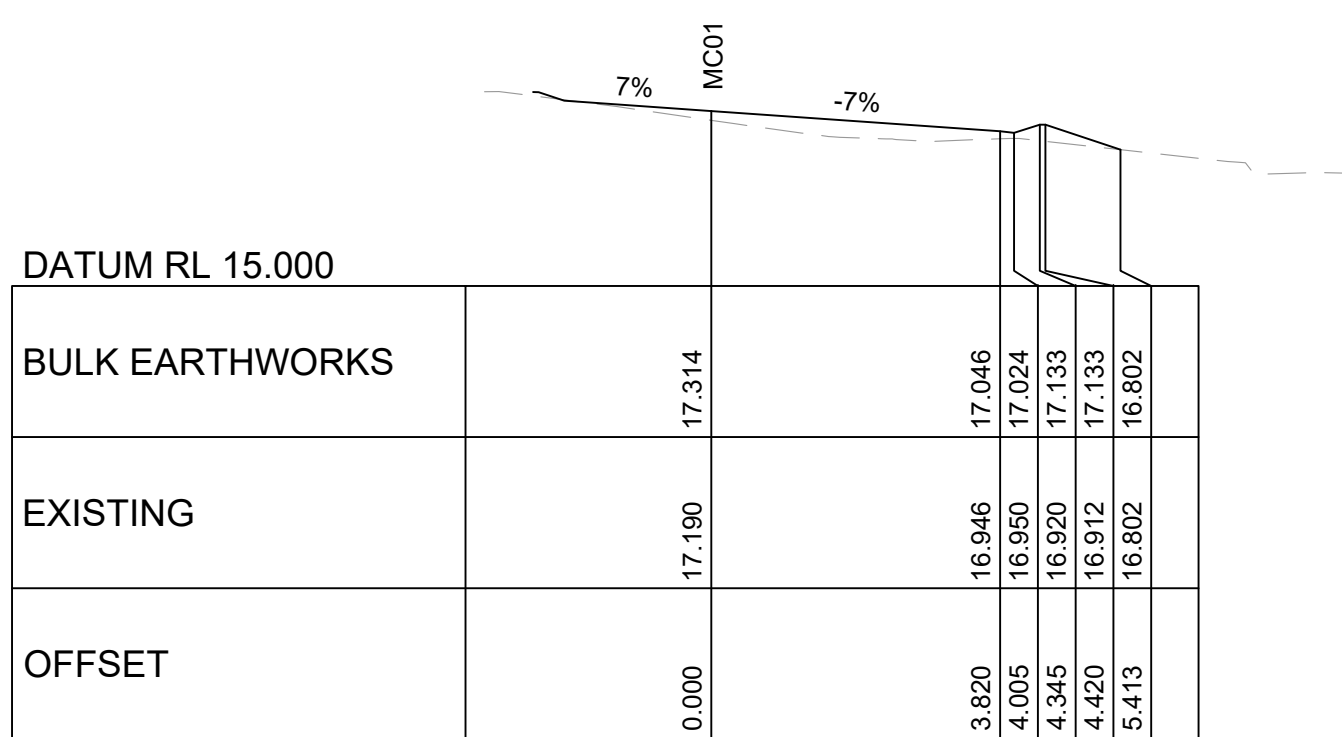
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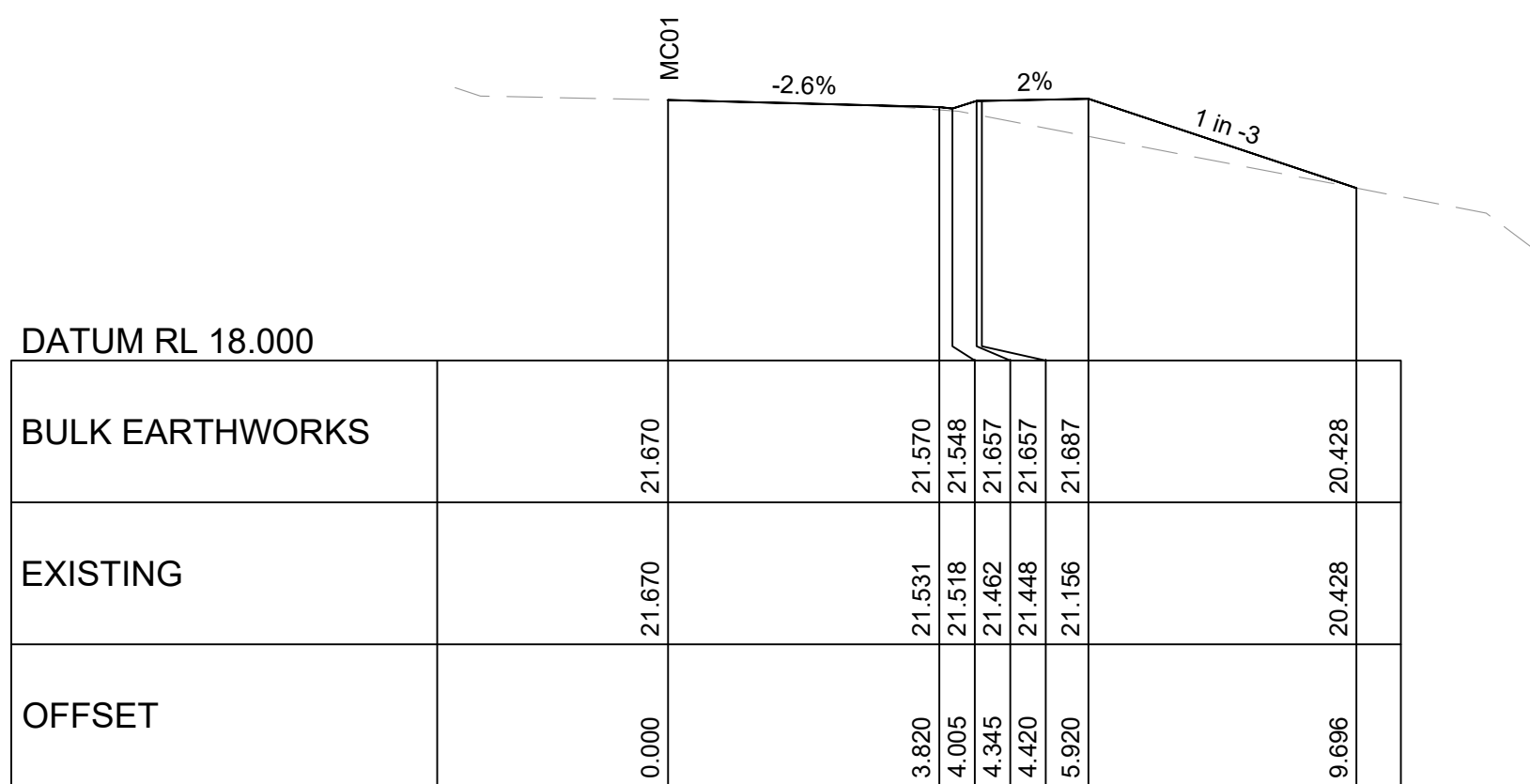
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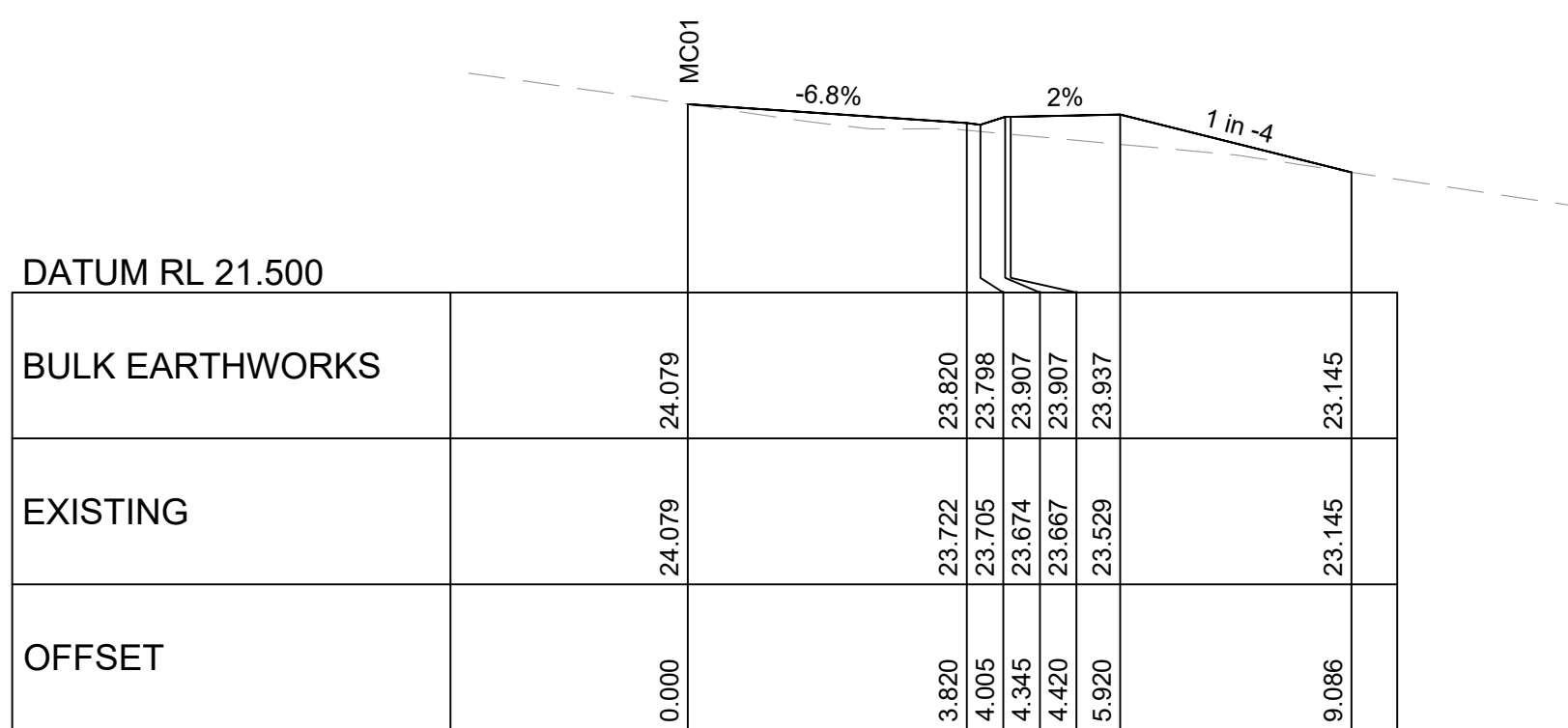
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CH 4.374



CH 30



CH 60

NOTE

- FINAL GRADING SUBJECT TO DETAILED SITE SURVEY AS PART OF FUTURE DETAILED DESIGN.



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PROPOSED COMMUNITY TITLE LOT SUBDIVISION

CROSS SECTION MC01 SHEET 1

Designed: BF
Drawn: DKH
Checked: SGB

Scales: Plan -
@A1 Horiz. -
Vert. -
X-Sect. 1:100

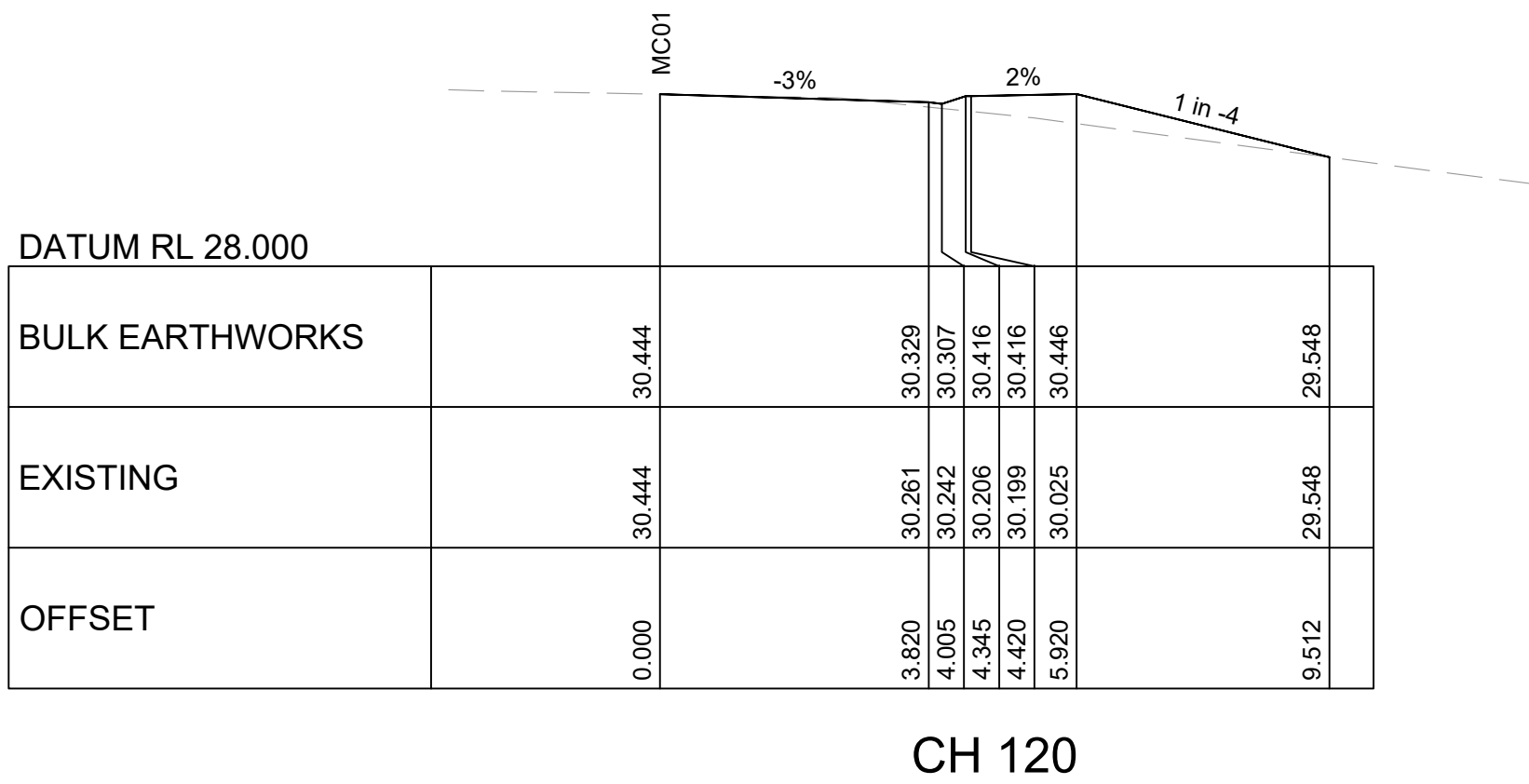
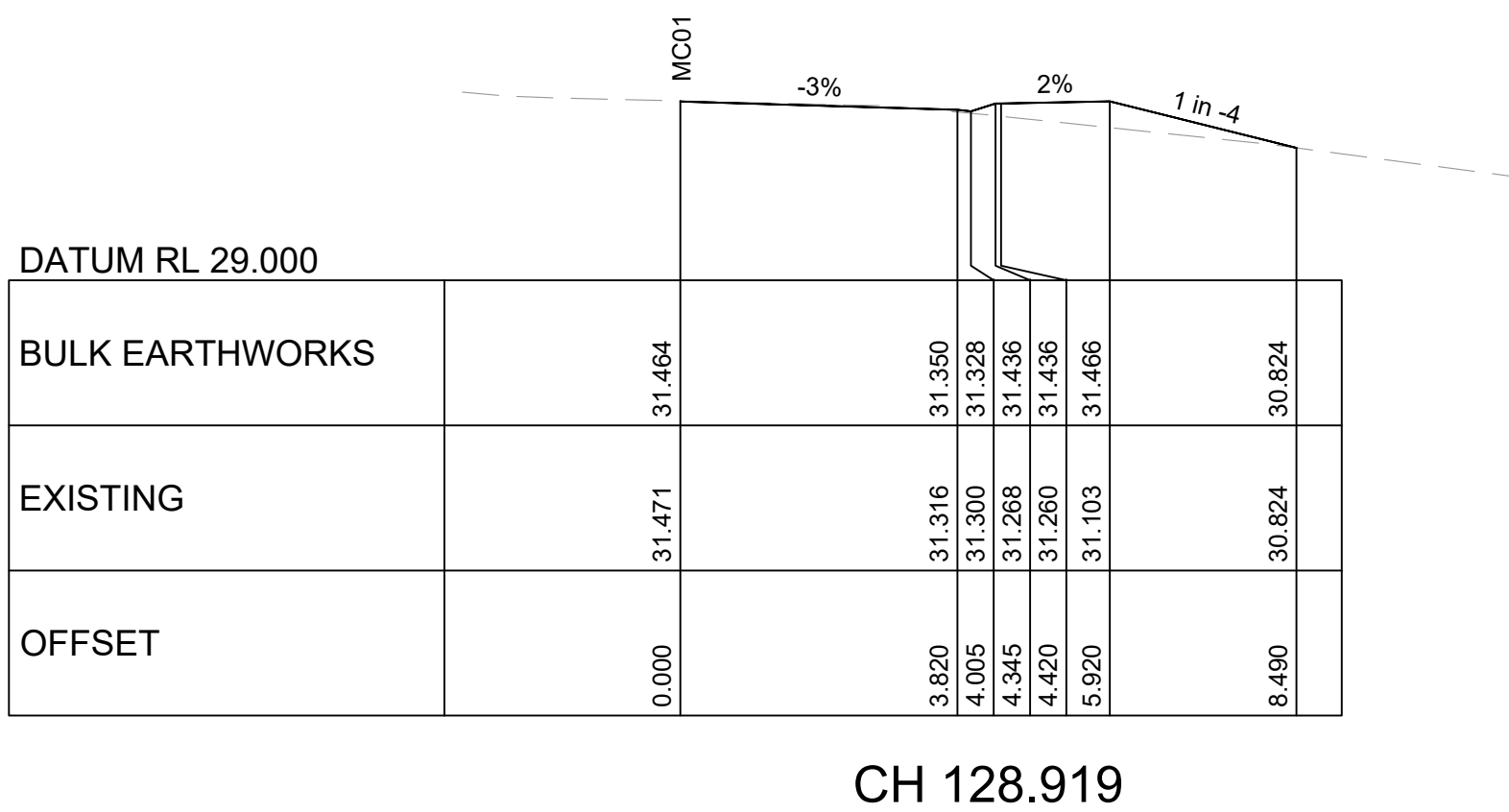
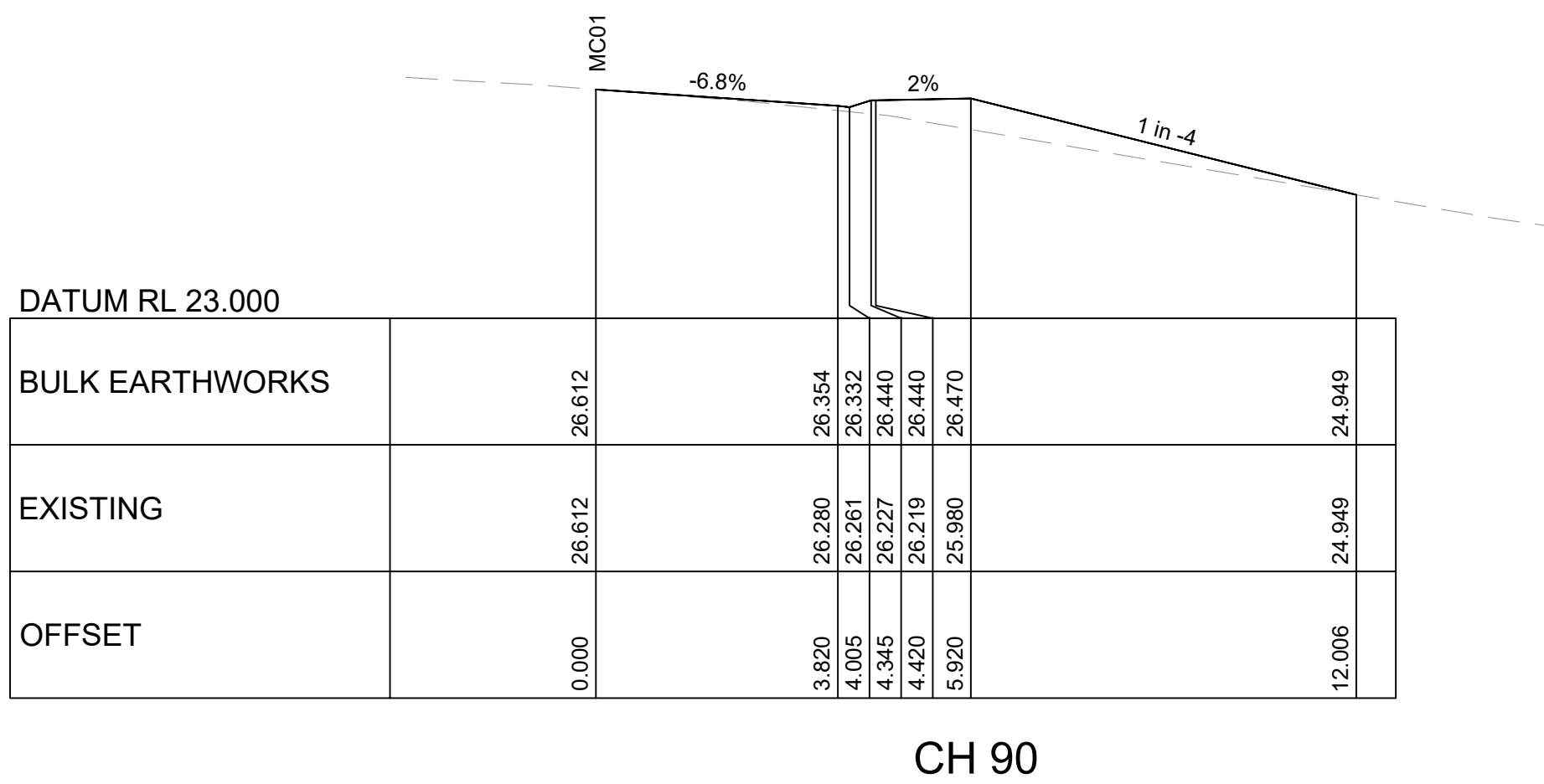
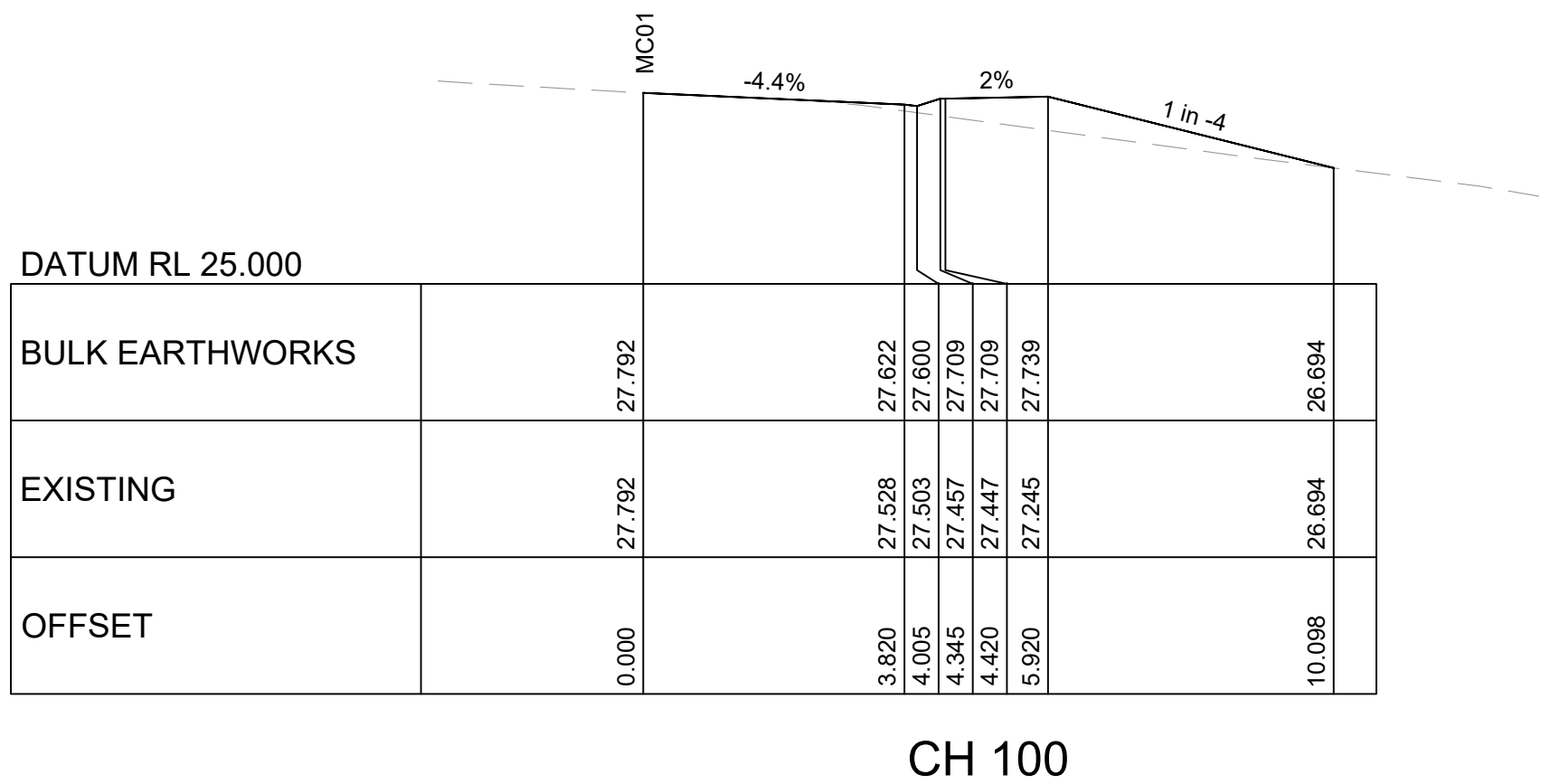
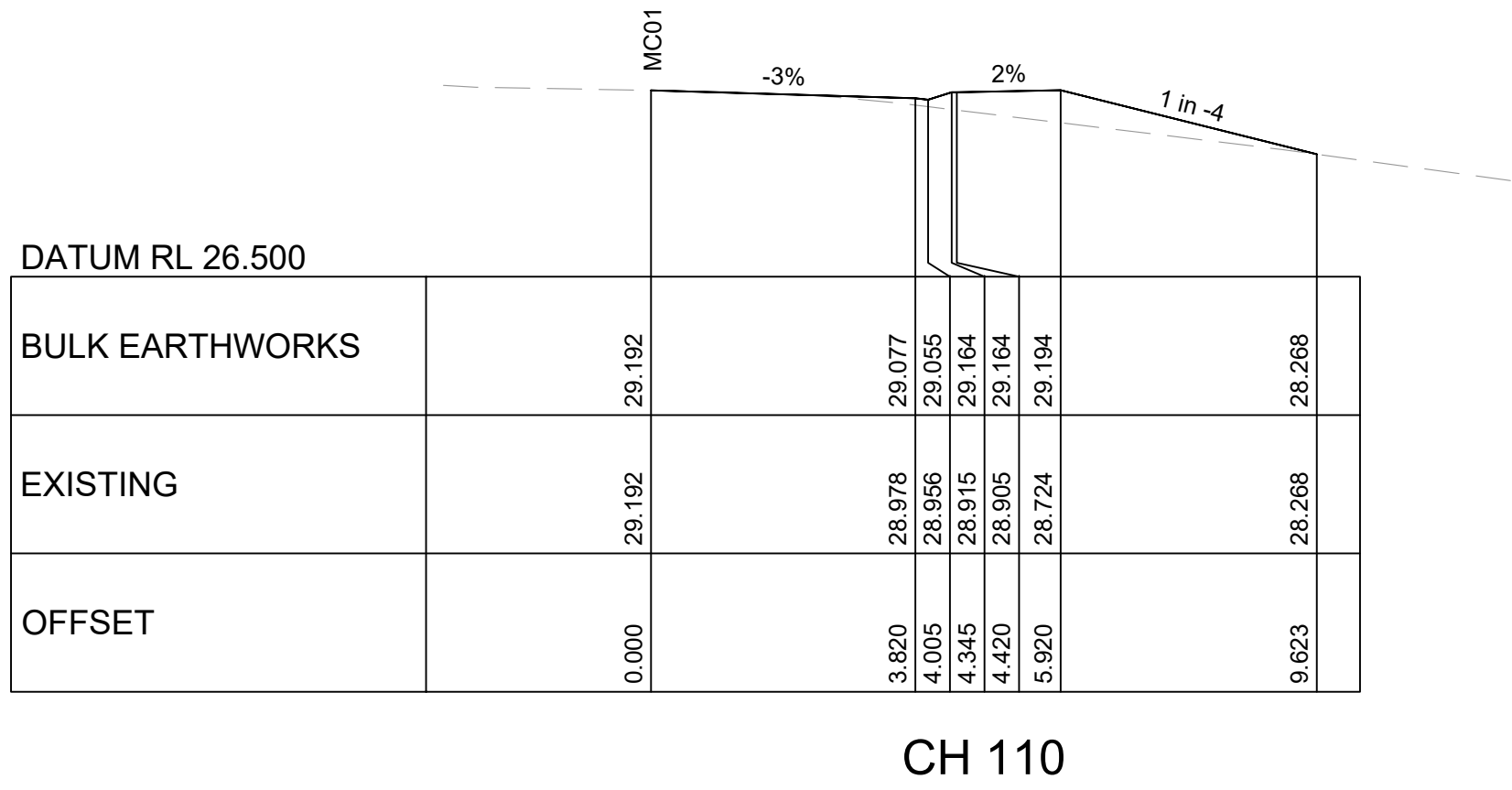
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PROPOSED COMMUNITY TITLE LOT SUBDIVISION

CROSS SECTION MC01 SHEET 2

Designed: BF
Drawn: DKH
Checked: SGB

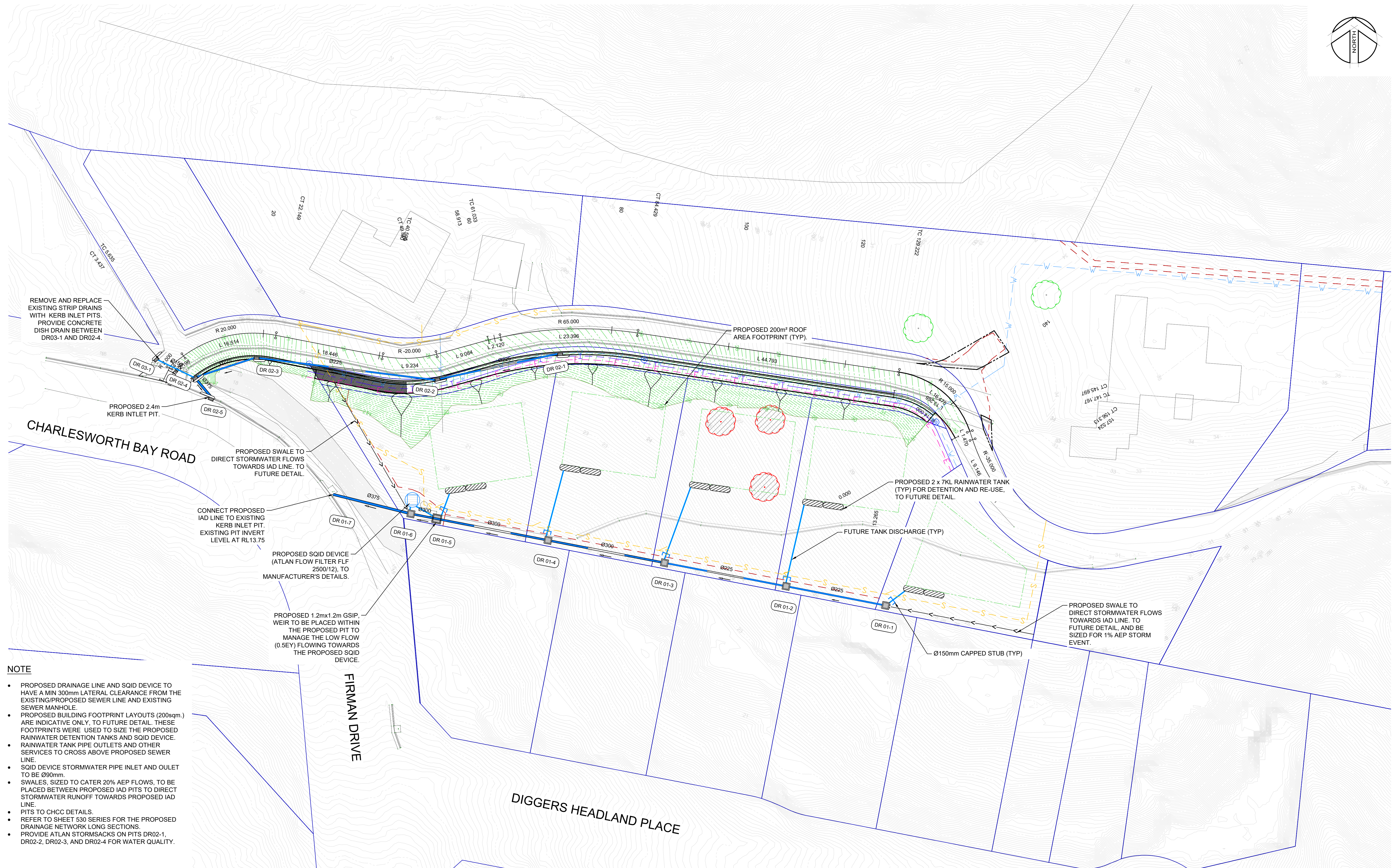
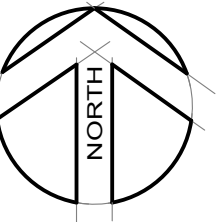
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Vert. -
X-Sept. 1:100

Datum: A.H.D.

Plan No.
240204-01-302

File Ref.
240204

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NOTE

- PROPOSED DRAINAGE LINE AND SQID DEVICE TO HAVE A MIN 300mm LATERAL CLEARANCE FROM THE EXISTING/PROPOSED SEWER LINE AND EXISTING SEWER MANHOLE.
- PROPOSED BUILDING FOOTPRINT LAYOUTS (200sqm.) ARE INDICATIVE ONLY, TO FUTURE DETAIL. THESE FOOTPRINTS WERE USED TO SIZE THE PROPOSED RAINWATER DETENTION TANKS AND SQID DEVICE.
- RAINWATER TANK PIPE OUTLETS AND OTHER SERVICES TO CROSS ABOVE PROPOSED SEWER LINE.
- SQID DEVICE STORMWATER PIPE INLET AND OUTLET TO BE Ø90mm.
- SWALES, SIZED TO CATER 20% AEP FLOWS, TO BE PLACED BETWEEN PROPOSED IAD PITS TO DIRECT STORMWATER RUNOFF TOWARDS PROPOSED IAD LINE.
- PITS TO CHCC DETAILS.
- REFER TO SHEET 530 SERIES FOR THE PROPOSED DRAINAGE NETWORK LONG SECTIONS.
- PROVIDE ATLAN STORMSACKS ON PITS DR02-1, DR02-2, DR02-3, AND DR02-4 FOR WATER QUALITY.

DRAINAGE LAYOUT PLAN
SCALE 1:300



REV	AMENDMENT	ISSUED	DATE
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PROPOSED COMMUNITY TITLE LOT SUBDIVISION

DRAINAGE LAYOUT PLAN

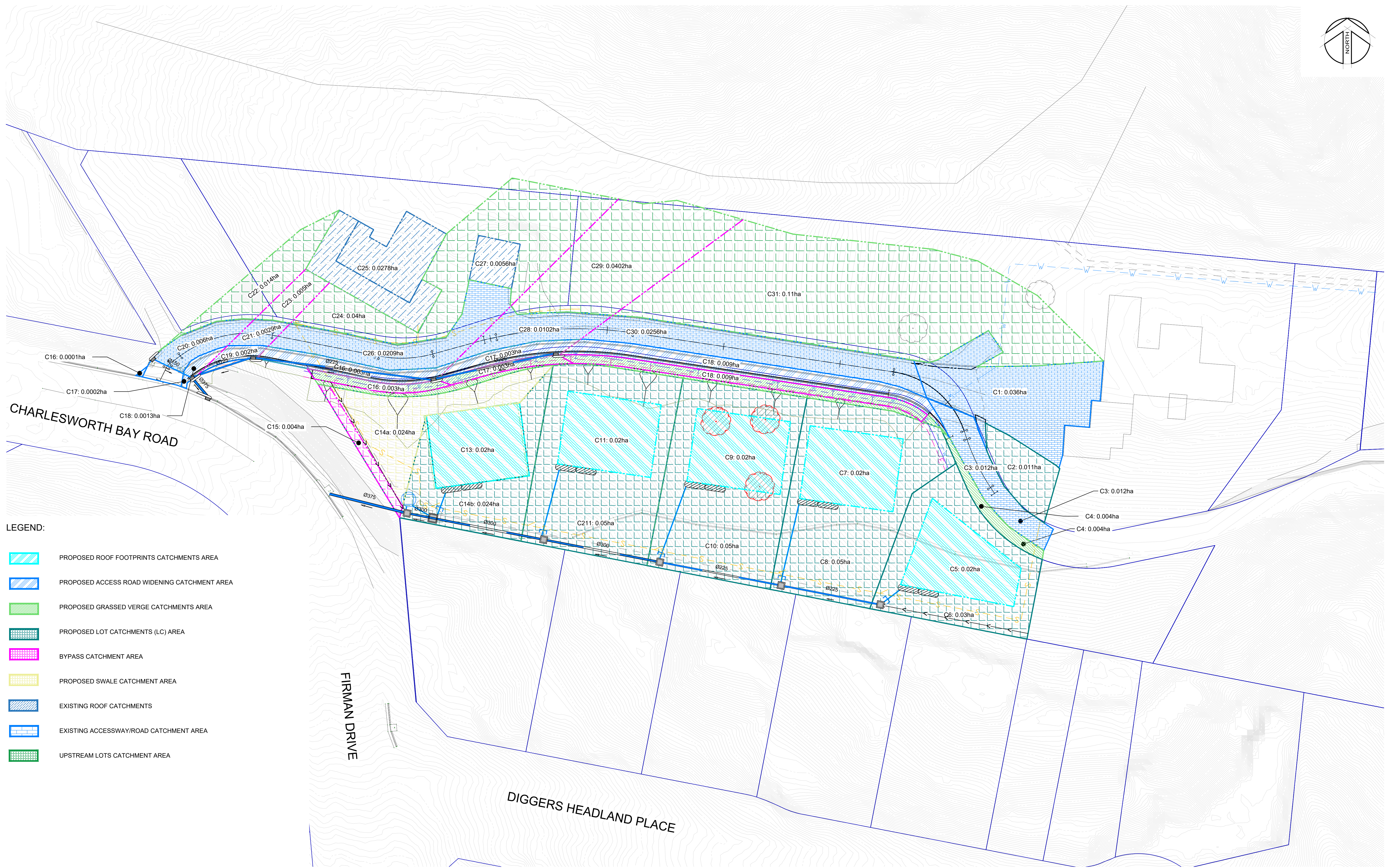
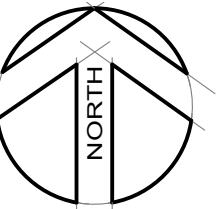
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Vert. -
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Plan No.
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LEGEND:

- PROPOSED ROOF FOOTPRINTS CATCHMENTS AREA
- PROPOSED ACCESS ROAD WIDENING CATCHMENT AREA
- PROPOSED GRASSED VERGE CATCHMENTS AREA
- PROPOSED LOT CATCHMENTS (LC) AREA
- BYPASS CATCHMENT AREA
- PROPOSED SWALE CATCHMENT AREA
- EXISTING ROOF CATCHMENTS
- EXISTING ACCESSWAY/ROAD CATCHMENT AREA
- UPSTREAM LOTS CATCHMENT AREA

DRAINAGE CATCHMENT PLAN
SCALE 1:300



REV	AMENDMENT	ISSUED	DATE
A	FOR DA APPROVAL	BF	06/09/2024



**BARKER
RYAN
STEWART**

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PROPOSED COMMUNITY TITLE LOT SUBDIVISION

DRAINAGE CATCHMENT PLAN

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Drawn: DKH
Checked: SGB

Scales: Plan 1:300
@A1 Horiz. -
Vert. -
X-Sect. -

Datum: A.H.D.

Plan No.
240204-01-511

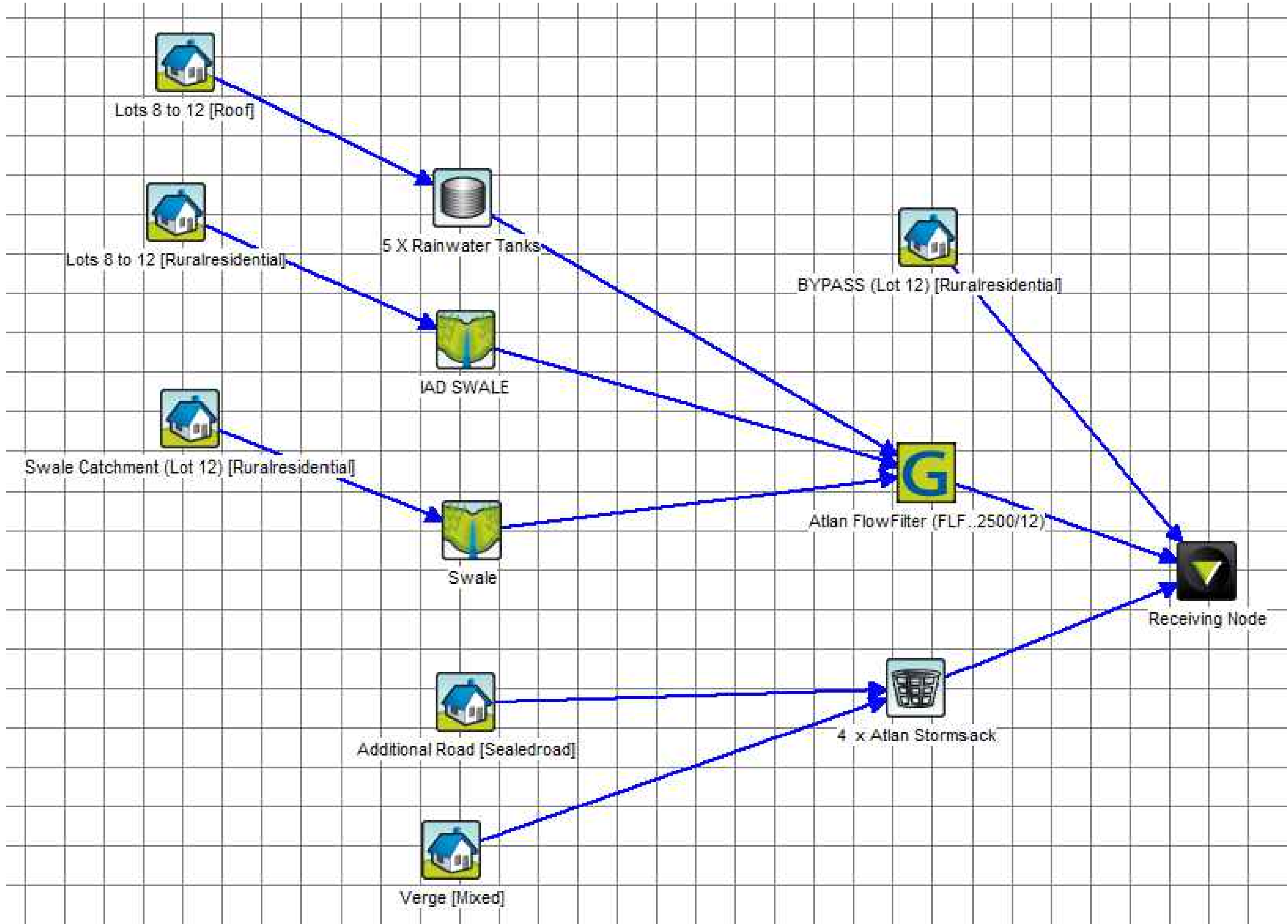
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WATER QUALITY CATCHMENT PLAN

SCALE 1:300



WATER QUALITY ASSESSMENT LAYOUT (MUSIC)

	COUNCIL'S WATER QUALITY REDUCTION TARGET		PERCENT REDUCTION	
% Load Reduction	None	None	8.69	✓
GP % Load Reduction	90	None	99.6	✓
TN % Load Reduction	45	None	51.8	✓
TP % Load Reduction	60	None	61.8	✓
TSS % Load Reduction	80	None	82.5	✓

WATER QUALITY ASSESSMENT RESULTS (MUSIC)



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PROPOSED COMMUNITY TITLE LOT SUBDIVISION

WATER QUALITY CATCHMENT PLAN

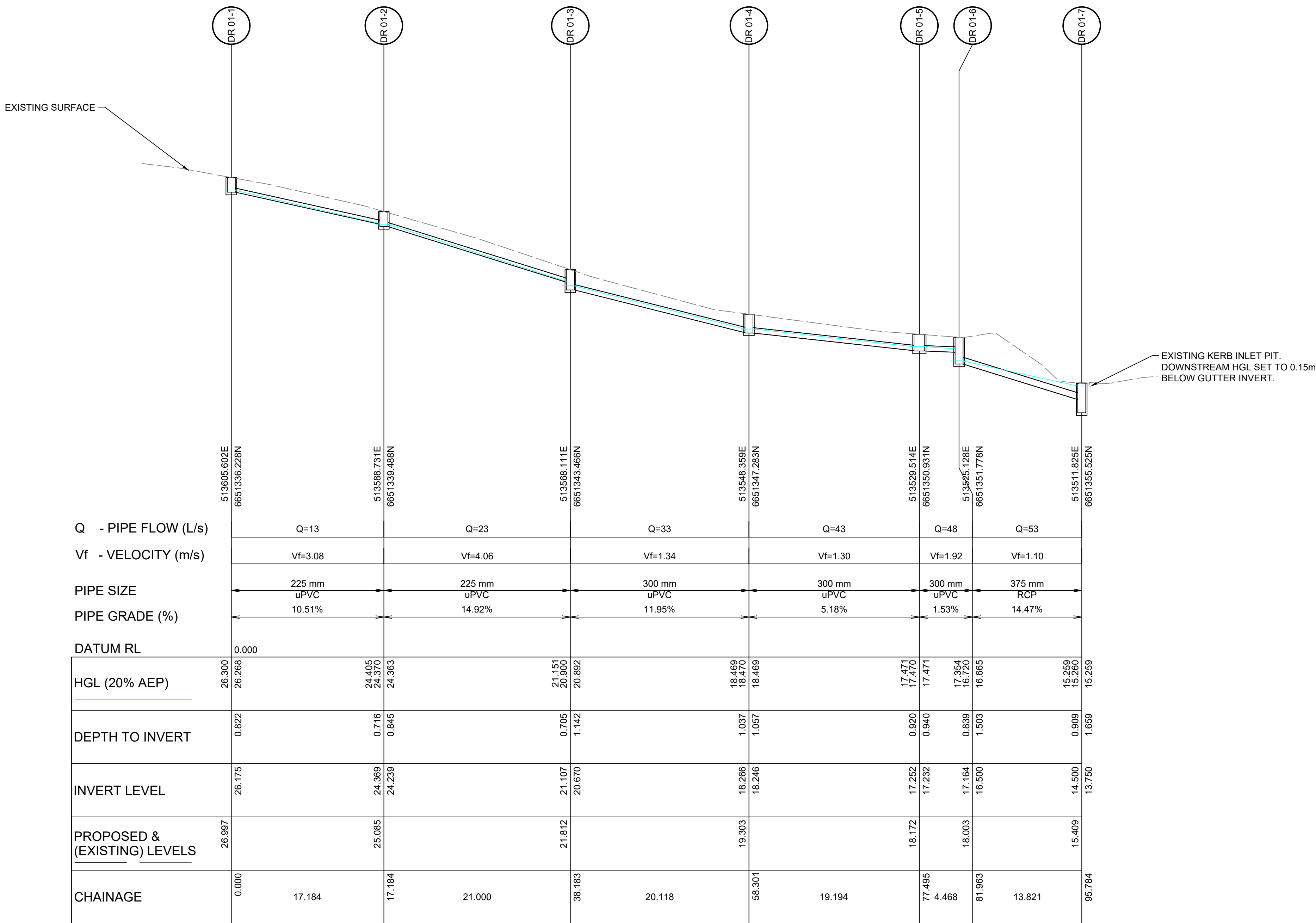
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Drawn: DKH
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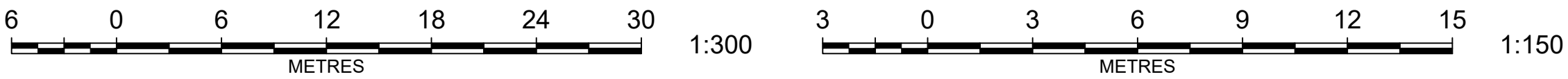
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Plan No.
240204-01-521
File Ref.
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LINE - DR 01



REV	AMENDMENT	ISSUED	DATE
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27-29 CHARLESWORTH BAY ROAD, COFFS HARBOUR
PROPOSED COMMUNITY TITLE LOT SUBDIVISION

DRAINAGE LONGITUDINAL SECTION 1

Designed: BF
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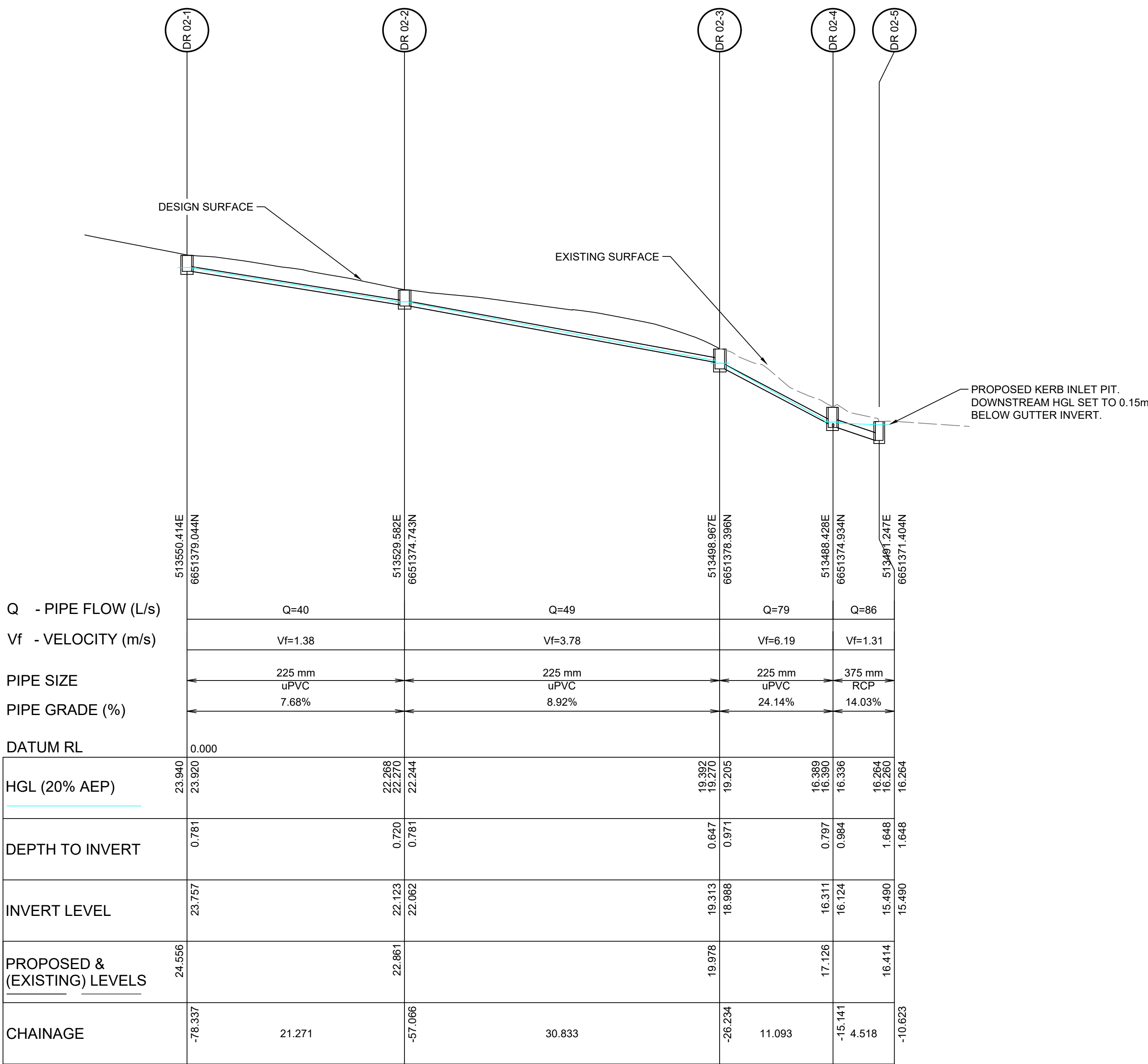
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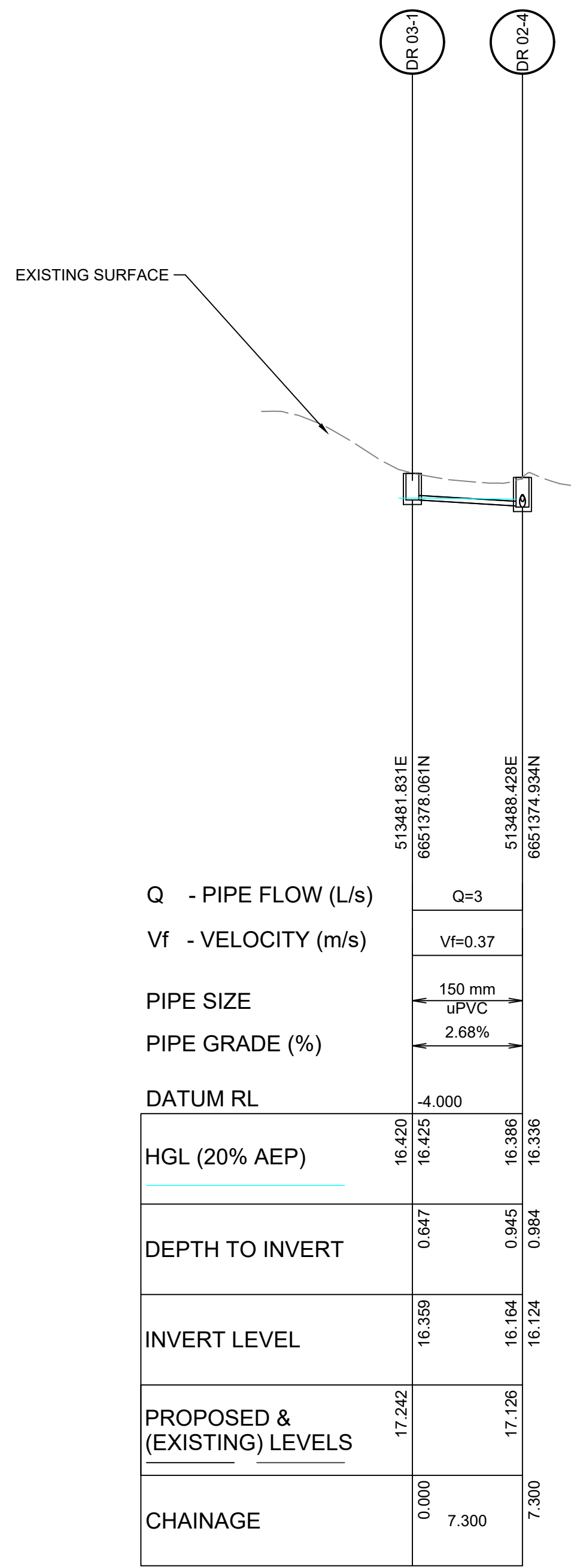
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240204

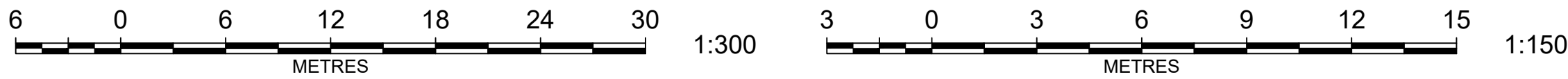
REV.
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LINE - DR 02



LINE - DR 03



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PROPOSED COMMUNITY TITLE LOT SUBDIVISION

DRAINAGE LONGITUDINAL SECTION 2

Designed: BF
Drawn: DKH
Checked: SGB

Scales: Plan -
@A1 Horiz. 1:300
Vert. 1:150
X-Sect. -

Datum: A.H.D.


Plan No.
240204-01-532

File Ref.
240204

REV.
A

LOCATION AND LAND-USE				TIME AND RUNOFF				INLET DESIGN				PIPE SYSTEM DESIGN										PIT RESULTS														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	29a	29b	30	31	32	33	34	
AEP	Pit, Node or Basin Name	Sub-Catchment Area (ha)	Land-Use Type (ILSAX)	Percentage (%)	Constant Flow Time (minutes)	Kinematic Length (m)	Wave Slope (%)	or Friends Formula Parameters Roughness n	Total Entry Time, t _e (minutes)	Peak Sub-Catchment Flowrate (m³/s) *worst storm	Origin of Approach Flows	Overflows Peak Flowrate (m³/s)	Approaching Flow Width (m)	Pit Depth x Velocity (m²/s)	Inlet Family	Inlet Size	Peak Approach Flow (m³/s)	Bypass Flow(s) (m³/s)	Peak Flow in Pipe (m³/s)	Reach Length (m)	Pipe Slope (%)	Pipe Diameter (mm)	U/S Pipe Invert Level (m)	D/S Pipe Invert Level (m)	U/S HGL in Pipe (m)	D/S HGL in Pipe (m)	Pipe Flow Velocity (m/s)	Pressure Change Coeff. Ku	QUDM Chart No. 2008 [2016]	QUDM Chart Ratios	Water Surface Elevation (m)	Ground Surface Level (m)	Pit Free-board (m)	Pit Name	Remarks	
20%	DR 01-1	0.0669	Paved Supp.	13.0	5.0				5	0.014					Grated Sui	GSIP 900	0.014	0	0.013	17.184	10.51	225	26.175	24.369	26.268	24.405	3.08	5.93	A1-4 (A2-3).0, Vo2 / (2qL	26.3	26.997	0.69	DR 01-1			
1%	DR 01-1	0.0669	Grassed Paved	87	15	as above			15	0.029					<--- as above --->		0.029	0	0.032						26.321	24.447	2.5	5.86	A1-4 (A2-3).0, Vo2 / (2qL	26.36	26.997	0.64	DR 01-1			
20%	DR 01-2	0.05	Paved Supp.	11.4	5.0				5	0.01	DR 01-1	0	0	0	Grated Sui	GSIP 900	0.01	0	0.023	21	14.91	225	24.239	21.107	24.363	21.151	4.06	2.03	A1-5 (A2-4 , Qq / Qo = 0.4	24.37	25.085	0.71	DR 01-2			
1%	DR 01-2	0.05	Grassed Paved	88.6	15	as above			15	0.022	DR 01-1	0	0	0	<--- as above --->		0.022	0	0.05						24.422	21.175	4.68	1.94	A1-5 (A2-4 , Qq / Qo = 0.4	24.45	25.085	0.64	DR 01-2			
20%	DR 01-3	0.0511	Paved Supp.	11.4	5.0				5	0.01	DR 01-2	0	0	0	Grated Sui	GSIP 900	0.01	0	0.035	20.118	11.94	225	20.745	18.342	20.898	18.468	1.45	5.87	A1-4 (A2-3).0, Vo2 / (2qL	20.91	21.812	0.9	DR 01-3			
1%	DR 01-3	0.0511	Grassed Paved	88.6	15	as above			15	0.022	DR 01-2	0	0	0	<--- as above --->		0.022	0	0.072						20.956	18.552	1.71	3.3	A1-4 (A2-3).0, Vo2 / (2qL	21.01	21.812	0.8	DR 01-3			
20%	DR 01-4	0.0506	Paved Supp.	11.4	5.0				5	0.01	DR 01-3	0	0	0	Grated Sui	GSIP 900	0.01	0	0.043	19.194	5.18	300	18.322	17.328	18.468	17.474	1.27	0.83	A1-5 (A2-4 , Qq / Qo = 0.4	18.47	19.303	0.83	DR 01-4			
1%	DR 01-4	0.0506	Grassed Paved	88.6	15	as above			15	0.022	DR 01-3	0	0	0	<--- as above --->		0.022	0	0.093						18.552	17.571	1.59	0.88	A1-5 (A2-4 , Qq / Qo = 0.4	18.55	19.303	0.75	DR 01-4			
20%	DR 01-5	0.0243	Paved Supp.	12.2	5.0				5	0.005	DR 01-4	0	0	0	Grated Sui	GSIP 1200	0.005	0	0.048	4.468	1.54	300	17.308	17.239	17.474	17.354	1.91	0.71	A1-5 (A2-4 , Qq / Qo = 0.1	17.47	18.172	0.7	DR 01-5			
1%	DR 01-5	0.0243	Grassed Paved	87.8	15	as above			15	0.01	DR 01-4	0	0	0	<--- as above --->		0.01	0	0.103						17.557	17.414	2.4	0.7	A1-5 (A2-4 , Qq / Qo = 0.1	17.57	18.172	0.6	DR 01-5			
20%	DR 01-6		Paved Supp.								DR 01-5 N-SWALE	0	0	0	Grated Sui	GSIP 900	0	0	0.053	13.821	14.47	375	16.5	14.5	16.665	15.259	1.1	5.93	A1-4 (A2-3).0, Vo2 / (2qL	16.73	18.003	1.28	DR 01-6			
1%	DR 01-6		Grassed Paved								DR 01-5 N-SWALE	0	0	0	<--- as above --->		0	0	0.113						16.743	15.259	1.45	5.68	A1-4 (A2-3).0, Vo2 / (2qL	16.87	18.003	1.14	DR 01-6			
20%	DR 02-1	0.165	Paved Supp.	29.0	5.0				5	0.036					Kerb Inlet G.G.P 1.8m		0.036	0	0.037	21.271	7.68	225	23.757	22.123	23.915	22.263	1.36	5.29	A1-4 (A2-3).0, Vo2 / (2qL	23.94	24.538	0.6	DR 02-1			
1%	DR 02-1	0.165	Grassed Paved	71	15	as above			15	0.073					<--- as above --->		0.073	0.01	0.066						23.963	22.438	1.58	3.73	A1-4 (A2-3).0, Vo2 / (2qL	24.07	24.538	0.47	DR 02-1			
20%	DR 02-2	0.0587	Paved Supp.	39.0	5.2				5	0.014	DR 02-1	0	0	0	Kerb Inlet G.G.P 1.8m		0.014	0	0.051	30.833	8.92	225	22.062	19.313	22.247	19.513	1.35	1.77	7 (A2-8 & A , Qq / Qo = 0.3	22.26	22.8427	0.58	DR 02-2			
1%	DR 02-2	0.0587	Grassed Paved	61	15	as above			15	0.027	DR 02-1	0.001	0.18	0.01	<--- as above --->		0.028	0.001	0.1						22.294	19.956	2.21	1.45	7 (A2-8 & A , Qq / Qo = 0.4	22.44	22.8427	0.4	DR 02-2			
20%	DR 02-3	0.1118	Paved Supp.	58.0	5.2				5	0.031	DR 02-2	0	0	0	Kerb Inlet G.G.P 1.8m		0.031	0	0.077	11.093	24.13	225	18.988	16.311	19.203	16.397	5.25	3.48	A1-4 (A2-3).0, Vo2 / (2qL	19.51	19.9597	0.45	DR 02-3			
1%	DR 02-3	0.1118	Grassed Paved	42	15	as above			15	0.055	DR 02-2	0.033	1.17	0.07	<--- as above --->		0.088	0.033	0.12						19.23	16.591	2.61	2.71	A1-4 (A2-3).0, Vo2 / (2qL	19.96	19.9597	0	DR 02-3			
20%	DR 02-4	0.0179	Paved Supp.	50.0	5.2				5	0.005	DR 02-3 DR 03-1	0	0	0	Kerb Inlet G.G.P 1.8m		0.005	0	0.084	4.518	14.03	375	16.124	15.49	16.334	16.264	1.29	3.43	H-O'L o = 0.09, S / D	16.4	17.1081	0.71	DR 02-4			
1%	DR 02-4	0.0179	Grassed Paved	50	15	as above			15	0.008	DR 02-3 DR 03-1	0.001	0.2	0.01	<--- as above --->		0.009	0.001	0.165						16.42	16.264	1.72	3.02	H-O'L o = 0.43, S / D	16.59	17.1081	0.52	DR 02-4			
20%	DR 03-1	0.0139	Paved Supp.	10.0	5.0				5	0.003					Kerb Inlet G.G.P 1.8m		0.003	0	0.003	7.3	2.67	150	16.359	16.164	16.427	16.397	0.35	5.93	A1-4 (A2-3).0, Vo2 / (2qL	16.43	17.2423	0.82	DR 03-1			
1%	DR 03-1	0.0139	Grassed Paved	90	15	as above			15	0.006					<--- as above --->		0.006	0	0.006						16.597	16.591	0.32	4.37	A1-4 (A2-3).8, Vo2 / (2qL	16.62	17.2423	0.62	DR 03-1			
20%	N-SWALE	0.022	Paved Supp.	10.0	5.0				5	0.004							0.004	0.004																N-SWALE		
1%	N-SWALE	0.022	Grassed Paved	90	15	as above			15	0.009							0.009	0.009																	N-SWALE	
20%	N205169	0.7322	Paved Supp.	23.5	5.0				5	0.152							0.152																		N205169	
1%	N205169	0.7322	Grassed Paved	76.5	15	as above			15	0.325							0.325																		N205169	

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27-29 CHARLESWORTH BAY ROAD, COFFS HARBOUR
PROPOSED COMMUNITY TITLE LOT SUBDIVISION

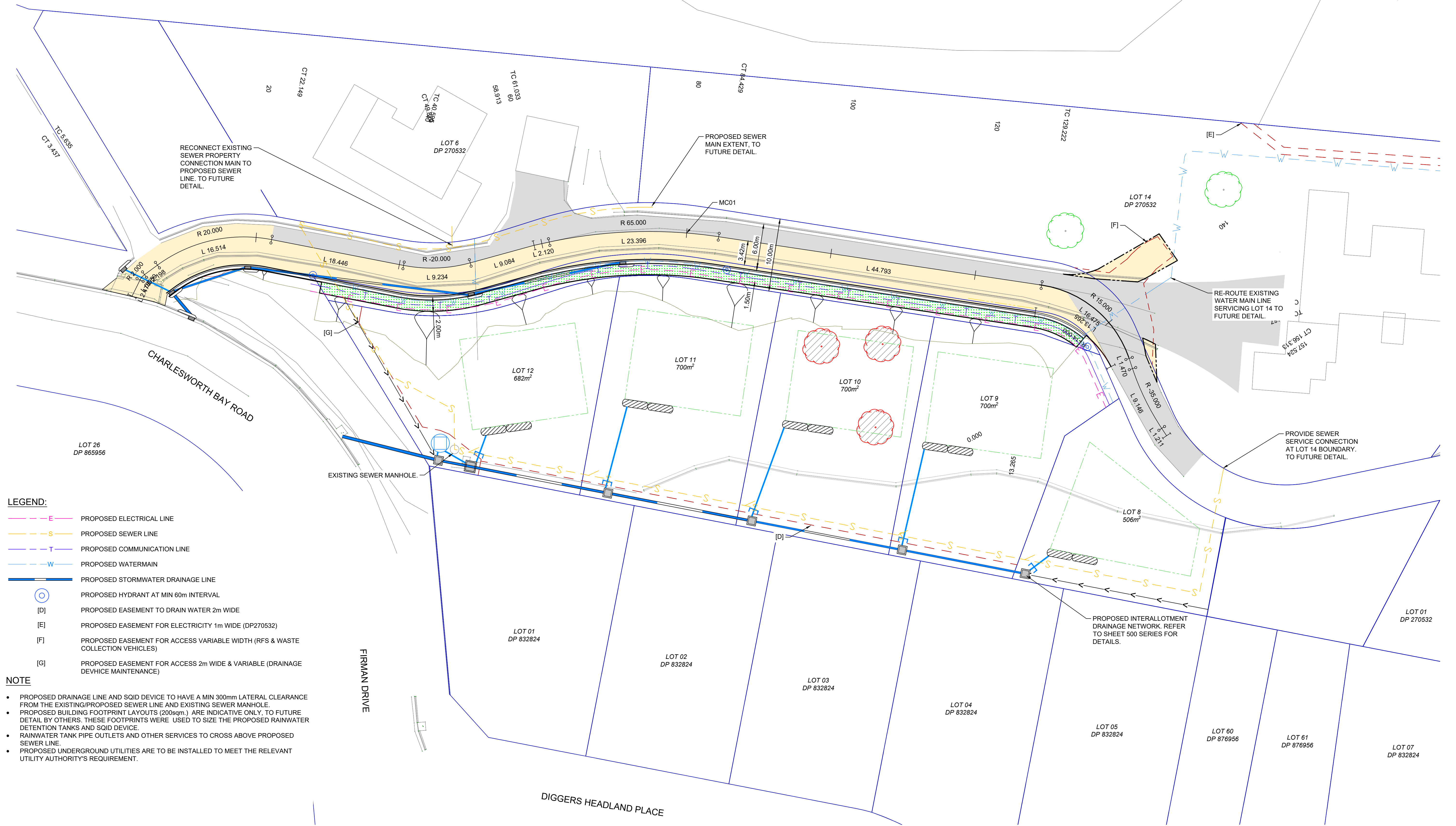
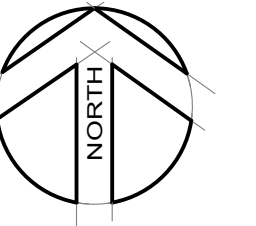
DRAINAGE RESULTS TABLE

Designed: BF
Drawn: DKH
Checked: SGB

Scales: Plan -
@A1 Horiz. -
Vert. -
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Plan No.
240204-01-541
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240204
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- LEGEND:**
- E — PROPOSED ELECTRICAL LINE
 - S — PROPOSED SEWER LINE
 - T — PROPOSED COMMUNICATION LINE
 - W — PROPOSED WATERMAIN
 - PROPOSED STORMWATER DRAINAGE LINE
 - PROPOSED HYDRANT AT MIN 60m INTERVAL
 - [D] PROPOSED EASEMENT TO DRAIN WATER 2m WIDE
 - [E] PROPOSED EASEMENT FOR ELECTRICITY 1m WIDE (DP270532)
 - [F] PROPOSED EASEMENT FOR ACCESS VARIABLE WIDTH (RFS & WASTE COLLECTION VEHICLES)
 - [G] PROPOSED EASEMENT FOR ACCESS 2m WIDE & VARIABLE (DRAINAGE DEVICE MAINTENANCE)
- NOTE**
- PROPOSED DRAINAGE LINE AND SQID DEVICE TO HAVE A MIN 300mm LATERAL CLEARANCE FROM THE EXISTING/PROPOSED SEWER LINE AND EXISTING SEWER MANHOLE.
 - PROPOSED BUILDING FOOTPRINT LAYOUTS (200sqm.) ARE INDICATIVE ONLY, TO FUTURE DETAIL BY OTHERS. THESE FOOTPRINTS WERE USED TO SIZE THE PROPOSED RAINWATER DETENTION TANKS AND SQID DEVICE.
 - RAINWATER TANK PIPE OUTLETS AND OTHER SERVICES TO CROSS ABOVE PROPOSED SEWER LINE.
 - PROPOSED UNDERGROUND UTILITIES ARE TO BE INSTALLED TO MEET THE RELEVANT UTILITY AUTHORITY'S REQUIREMENT.

DETAIL PLAN
SCALE 1:250



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**BARKER
RYAN
STEWART**

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PROPOSED COMMUNITY TITLE LOT SUBDIVISION

PROPOSED UTILITY SERVICING PLAN

Designed: BF
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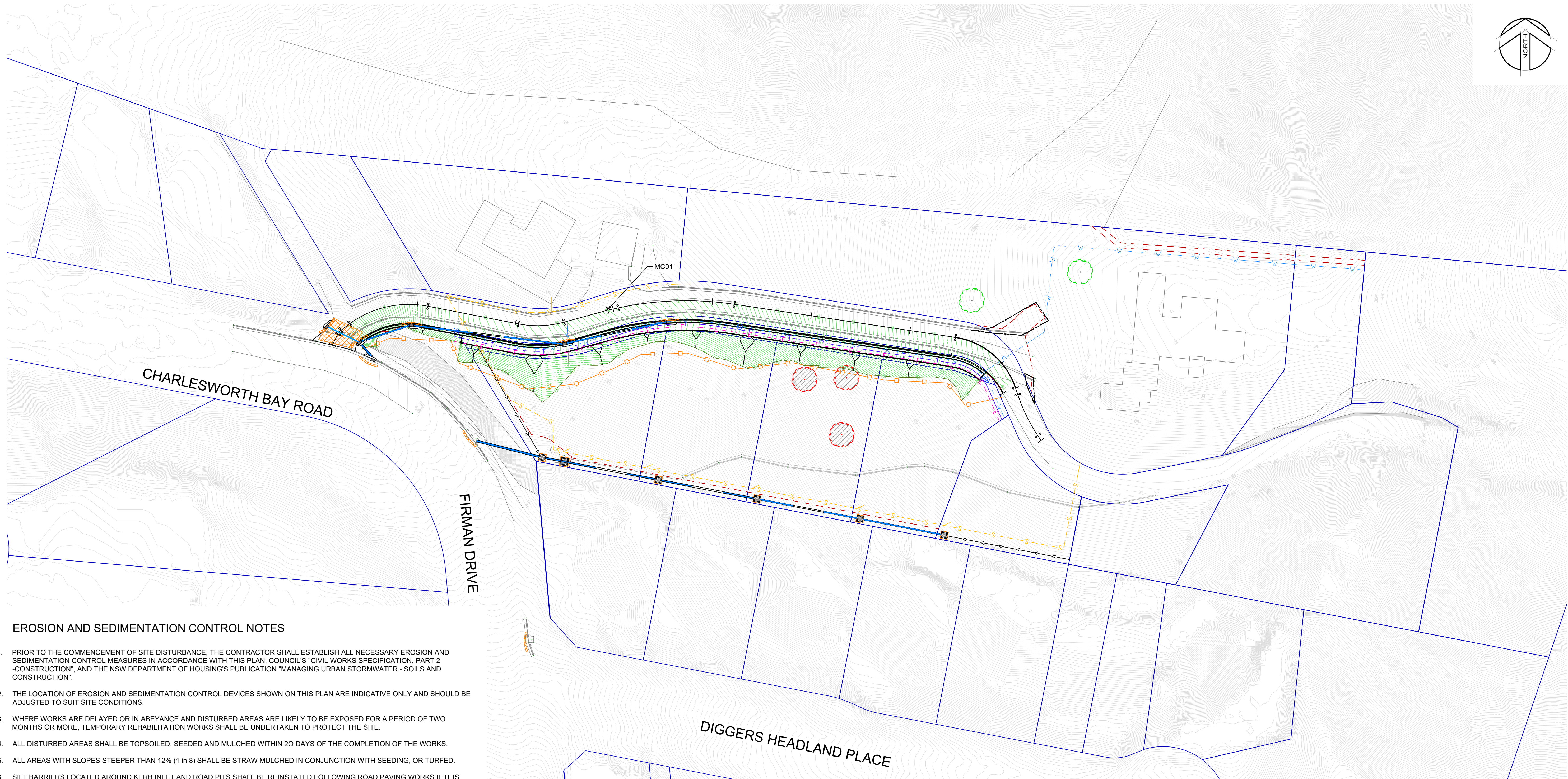
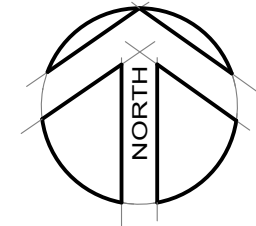
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Plan No.
240204-01-601

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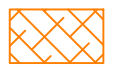




EROSION AND SEDIMENTATION CONTROL NOTES

1. PRIOR TO THE COMMENCEMENT OF SITE DISTURBANCE, THE CONTRACTOR SHALL ESTABLISH ALL NECESSARY EROSION AND SEDIMENTATION CONTROL MEASURES IN ACCORDANCE WITH THIS PLAN, COUNCIL'S "CIVIL WORKS SPECIFICATION, PART 2 -CONSTRUCTION", AND THE NSW DEPARTMENT OF HOUSING'S PUBLICATION "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION".
2. THE LOCATION OF EROSION AND SEDIMENTATION CONTROL DEVICES SHOWN ON THIS PLAN ARE INDICATIVE ONLY AND SHOULD BE ADJUSTED TO SUIT SITE CONDITIONS.
3. WHERE WORKS ARE DELAYED OR IN ABEYANCE AND DISTURBED AREAS ARE LIKELY TO BE EXPOSED FOR A PERIOD OF TWO MONTHS OR MORE, TEMPORARY REHABILITATION WORKS SHALL BE UNDERTAKEN TO PROTECT THE SITE.
4. ALL DISTURBED AREAS SHALL BE TOPSOILED, SEEDED AND MULCHED WITHIN 20 DAYS OF THE COMPLETION OF THE WORKS.
5. ALL AREAS WITH SLOPES STEEPER THAN 12% (1 in 8) SHALL BE STRAW MULCHED IN CONJUNCTION WITH SEEDING, OR TURFED.
6. SILT BARRIERS LOCATED AROUND KERB INLET AND ROAD PITS SHALL BE REINSTATED FOLLOWING ROAD PAVING WORKS IF IT IS LIKELY THAT UNDISTURBED AREAS WILL STILL DRAIN TO THE PIT.
7. SANDBAGS SHALL BE PLACED ACROSS THE END OF ROAD CONSTRUCTION AT THE COMPLETION OF EACH DAYS WORK TO PREVENT EROSION OF THE CONSTRUCTED MATERIAL.
8. THE CONTRACTOR SHALL CONDUCT WEEKLY INSPECTIONS OF THE SITE TO ENSURE THAT ALL DEVICES AND REHABILITATION AREAS HAVE BEEN ADEQUATELY MAINTAINED. THE CONTRACTOR SHALL ALSO KEEP A LOG BOOK DETAILING SUCH INSPECTIONS, AND RECORDING RAINFALL EVENTS AND OTHER RELEVANT EVENTS.
9. TOPSOIL SHALL BE STOCKPILED IN THE LOCATIONS SHOWN ON THIS PLAN OR AS DIRECTED BY COUNCIL'S ENGINEER. WHERE IT IS LIKELY THAT STOCKPILES WILL REMAIN IN PLACE FOR A PERIOD EXCEEDING 4 WEEKS, THEN THE STOCKPILE SHALL BE STABILISED BY SEEDING OR EQUIVALENT METHODS.
10. ALL REVEGETATION WORKS ARE TO BE MAINTAINED, INCLUDING WATERING AND MOWING WHERE NECESSARY UNTIL THE COMPLETION OF THE MAINTENANCE PERIOD.
11. THE MOVEMENT OF VEHICULAR TRAFFIC ON THE SITE SHALL BE CONFINED TO DESIGNATED AREAS DURING CONSTRUCTION WORKS. VEHICULAR ACCESS SHALL BE DENIED TO AREAS TO BE LEFT UNDISTURBED.
12. SITE ACCESS SHALL BE LIMITED TO THE LOCATIONS SHOWN ON THIS PLAN. SHAKE-DOWN AREAS SHALL BE CONSTRUCTED AS SHOWN.
13. DURING CONSTRUCTION WORKS, DUST CONTROL MEASURES SHALL BE IMPLEMENTED TO MINIMISE THE AMOUNT OF DUST GENERATED FROM THE SITE. THESE MEASURES TO BE IMPLEMENTED TO COUNCIL'S SATISFACTION.
14. MAINTENANCE AND CLEANING OF CONSTRUCTION PLANT SHALL BE CARRIED OUT IN AN AREA WHERE RUNOFF CAN BE CONTAINED AND APPROPRIATELY TREATED AND DISPOSED OF.
15. ALL EROSION AND SEDIMENTATION CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS HAVE ADEQUATELY REGENERATED. THIS STAGE SHALL BE DETERMINED BY THE CERTIFIER.

EROSION AND SEDIMENT CONTROL PLAN
SCALE 1:400

LEGEND

-  SEDIMENT FENCE
-  STABILISED SITE ACCESS AT ENTRANCE TO WORKS
-  SURFACE INLET PIT SEDIMENT TRAP
-  SAND SAUAGE SEDIMENT TRAP



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EROSION AND SEDIMENT CONTROL PLAN

Designed: BF
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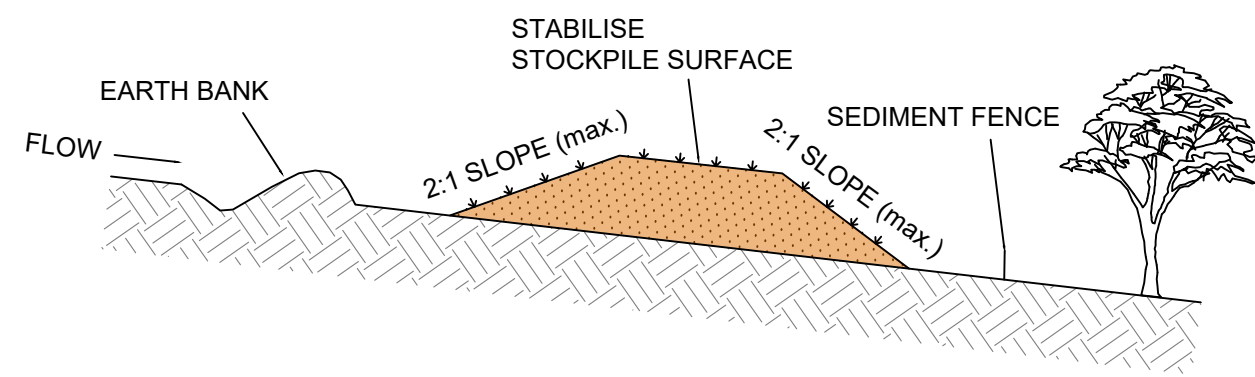
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240204

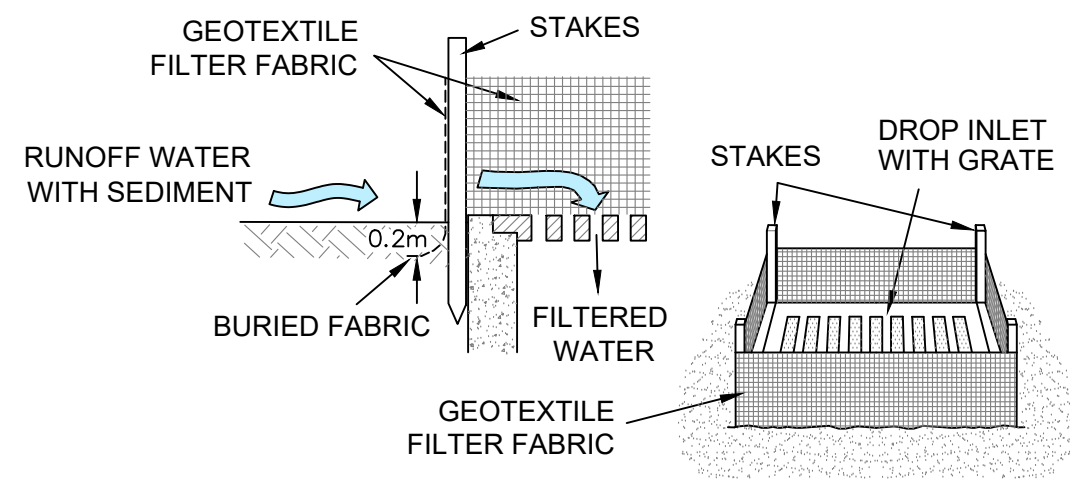
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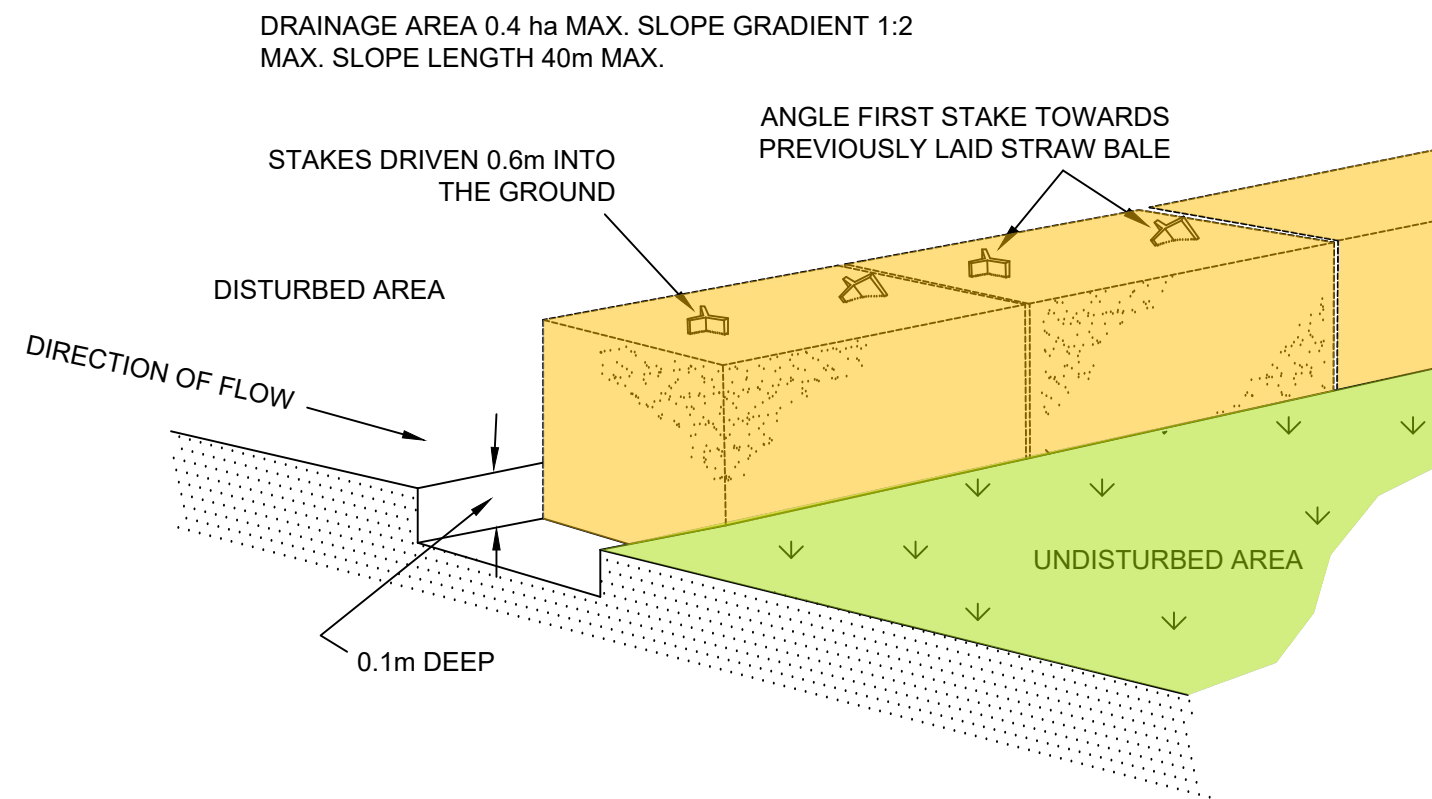
CONSTRUCTION NOTES

1. WHERE POSSIBLE LOCATE STOCKPILE AT LEAST 5 METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOWS, ROADS, HAZARD AREAS AND MIN. 1.5m AWAY FROM EMBANKMENTS.
2. CONSTRUCT ON THE CONTOUR AS A LOW, FLAT ELONGATED MOUND.
3. WHERE THERE IS SUFFICIENT AREA TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. REHABILITATE IN ACCORDANCE WITH THE SWMP/ESCP.
5. CONSTRUCT EARTH BANK (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT RUN OFF AROUND THE STOCKPILE AND A SEDIMENT FENCE (STANDARD DRAWING 6-8) 1 TO 2 METRES DOWNSLOPE OF STOCKPILE.

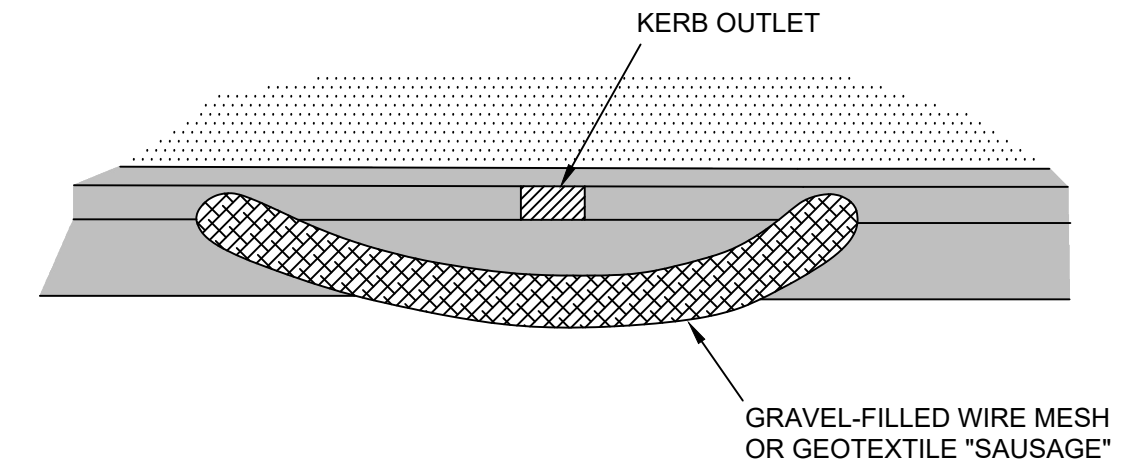
TOPSOIL STOCKPILE



SURFACE INLET PIT SEDIMENT TRAP



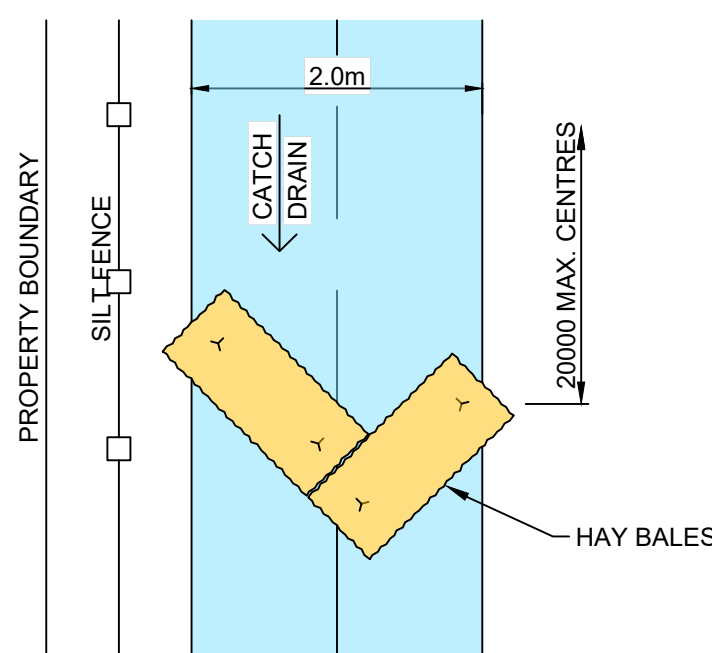
STRAW BALE SEDIMENT FILTER



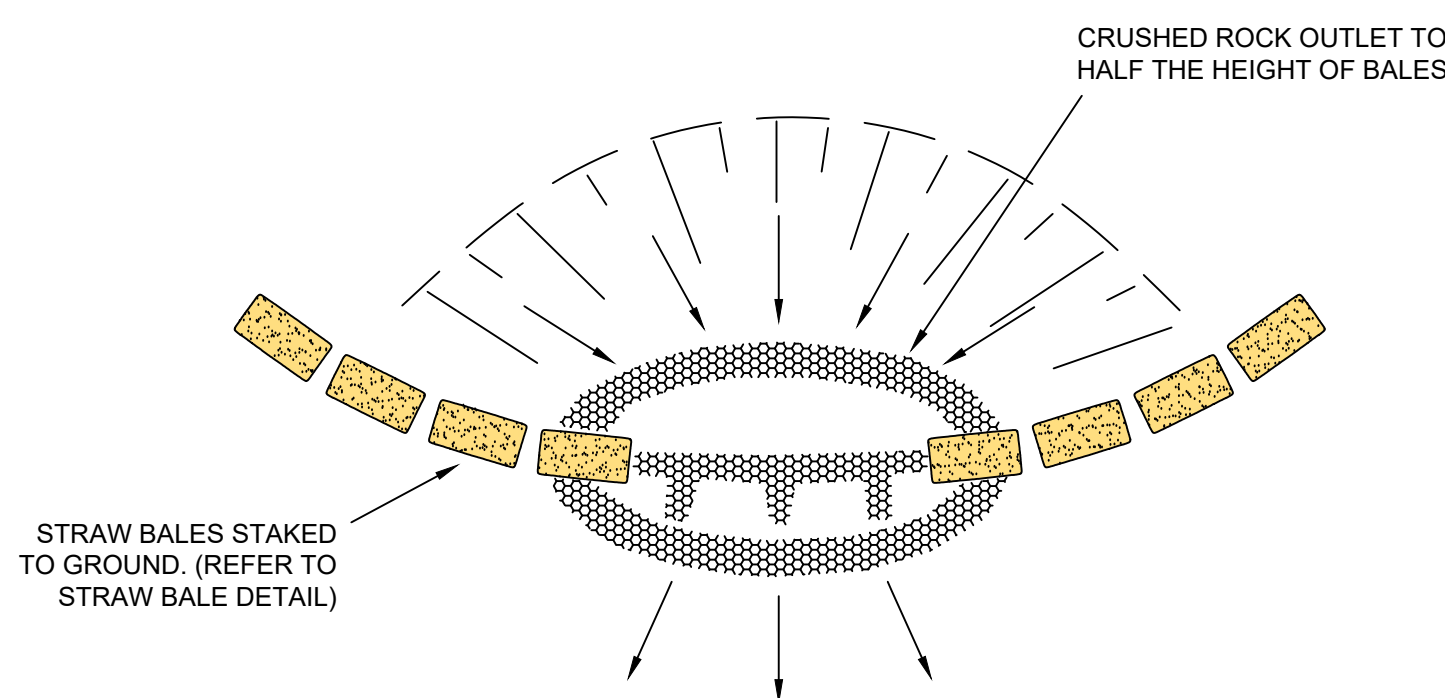
CONSTRUCTION NOTES

1. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH AND FILL IT WITH 25mm TO 50mm GRAVEL.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH X 400mm WIDE.
3. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING FILTER.
4. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

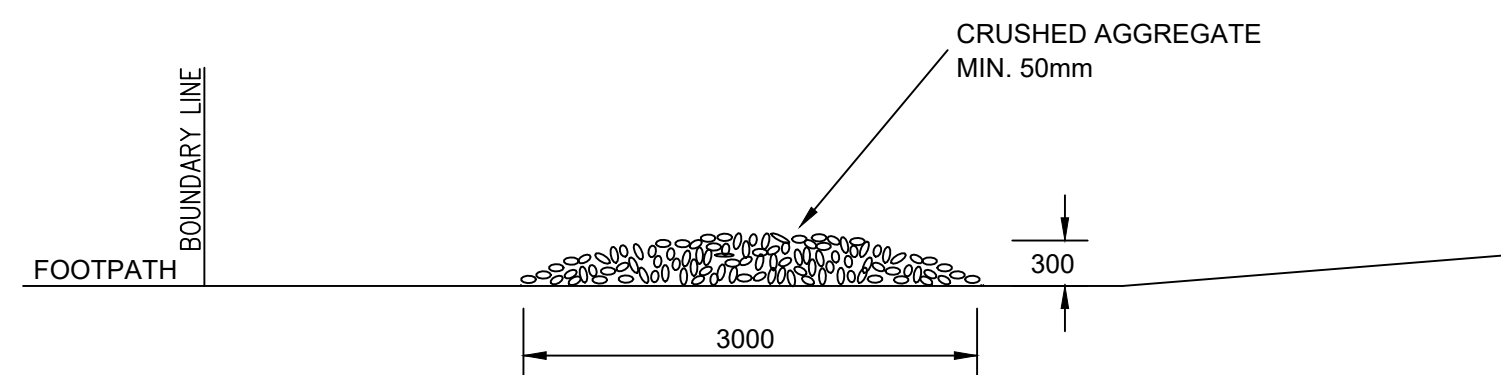
MESH & GRAVEL FILTER "SAUSAGE" BARRIER



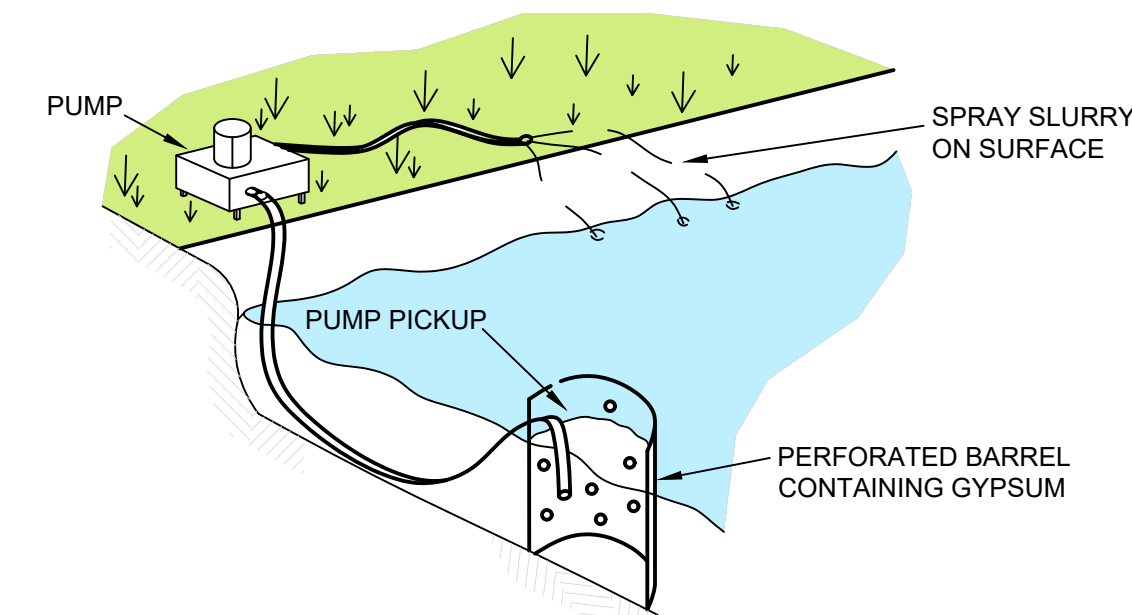
CATCH DRAIN DETAIL



STRAW BALE & CRUSHED ROCK SEDIMENT FILTER

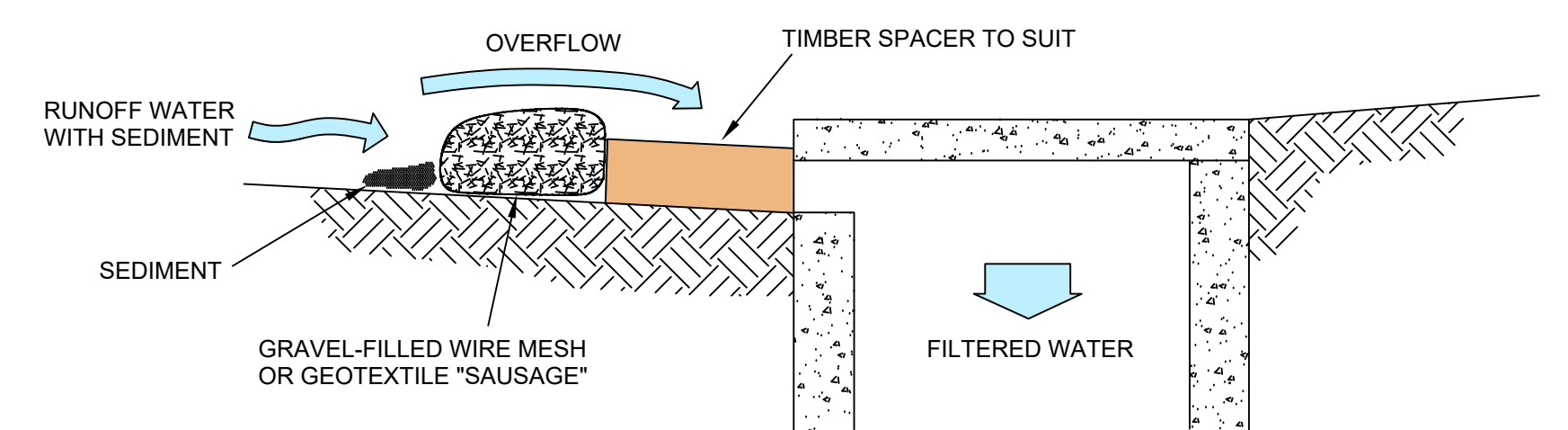
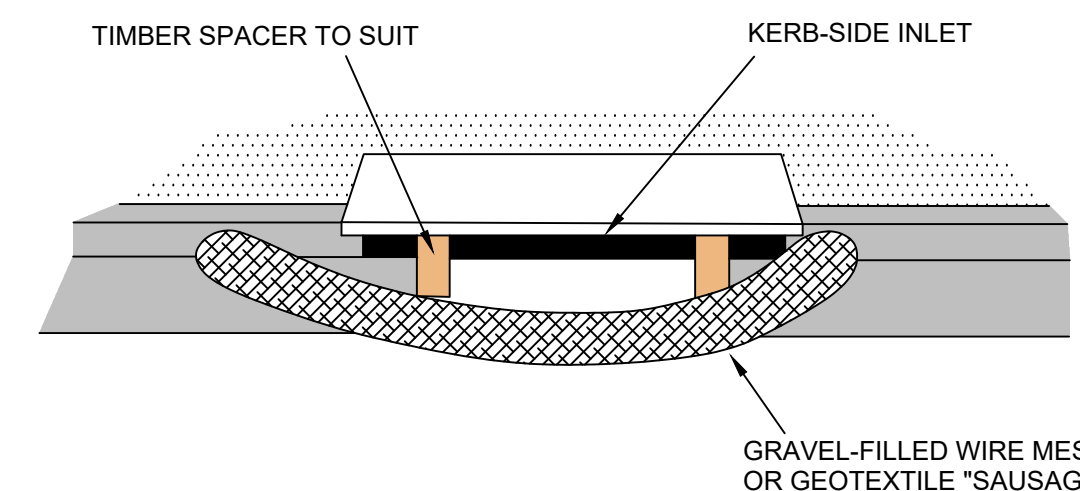


VEHICLE DUST SHAKE DOWN DETAIL



- NOTE:
1. FLOCCULATION TO BE USED IF WATER IS NOT CLEAR (IE: SEDIMENT GREATER THAN 50 mg/L) PRIOR TO DISCHARGING FROM TEMPORARY PUMP OUT
 2. FOR RATES & AGENTS SEE APPENDIX E OF HOUSING NSW "MANAGING URBAN SW SOILS & CONSTRUCTION".

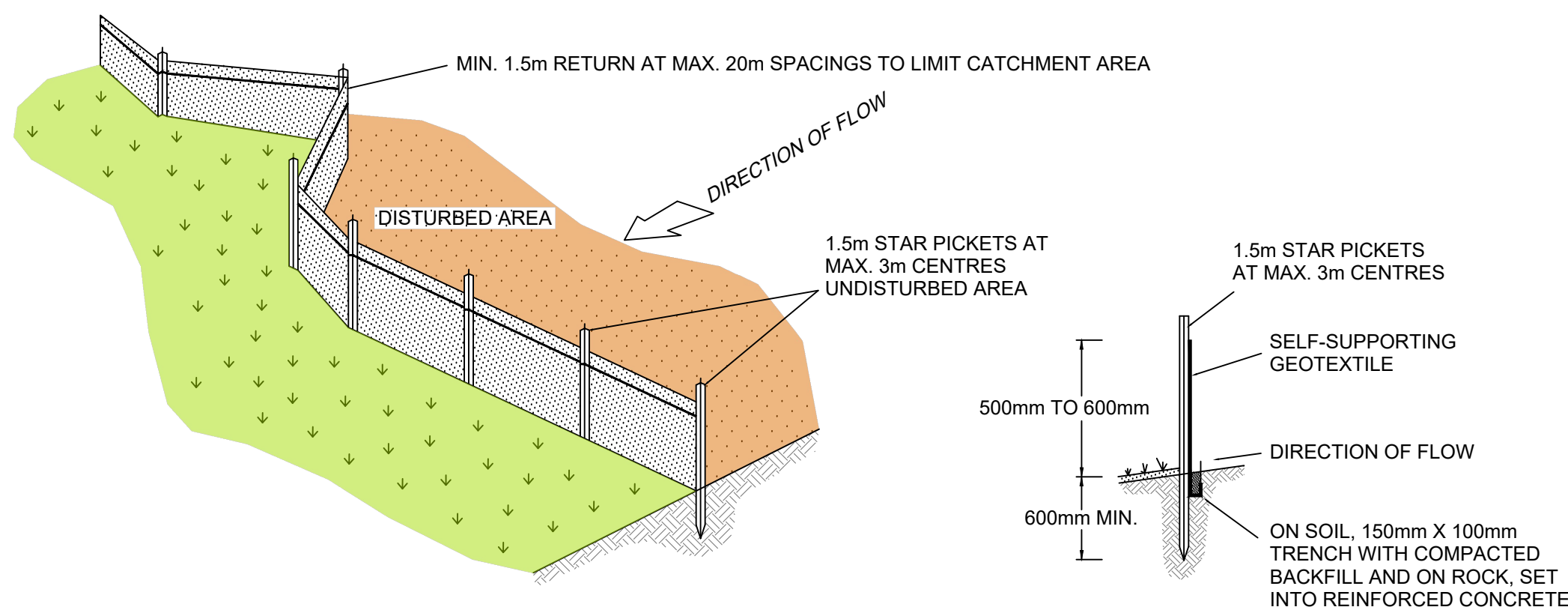
FLOCCULATION DETAIL



CONSTRUCTION NOTES

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

MESH & GRAVEL INLET "SAUSAGE" FILTER



SECTION DETAIL

CONSTRUCTION NOTES

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

SEDIMENT FENCE

CONSTRUCTION NOTES

1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
4. CONSTRUCT 200mm THICK PAD OVER GEOTEXTILE USING ROADBASE OR 30mm AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.
5. CONSTRUCT HUMPS IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP.

GEOTEXTILE FABRIC DESIGNED TO PREVENT INTERMIXING OF SUBGRADE AND BASE MATERIALS AND TO MAINTAIN GOOD PROPERTIES OF THE SUB-BASE LAYERS.

GEOTEXTILE MAY BE A WOVEN OR NEEDLE PUNCHED PRODUCT WITH A MINIMUM CBR BURST STRENGTH (AS3706.4-90) OF 2500 N

STABILISED SITE ACCESS



27-29 CHARLESWORTH BAY ROAD, COFFS HARBOUR
PROPOSED COMMUNITY TITLE LOT SUBDIVISION

EROSION AND SEDIMENT CONTROL DETAILS

Designed: BF
Drawn: DKH
Checked: SGB

Scales: Plan -
@A1 Horiz. -
Vert. -
X-Sect. -
Datum: A.H.D.

Plan No.
240204-01-811
File Ref.
240204

REV.
A

REV	AMENDMENT	ISSUED	DATE
A	FOR DA APPROVAL	BF	06/09/2024



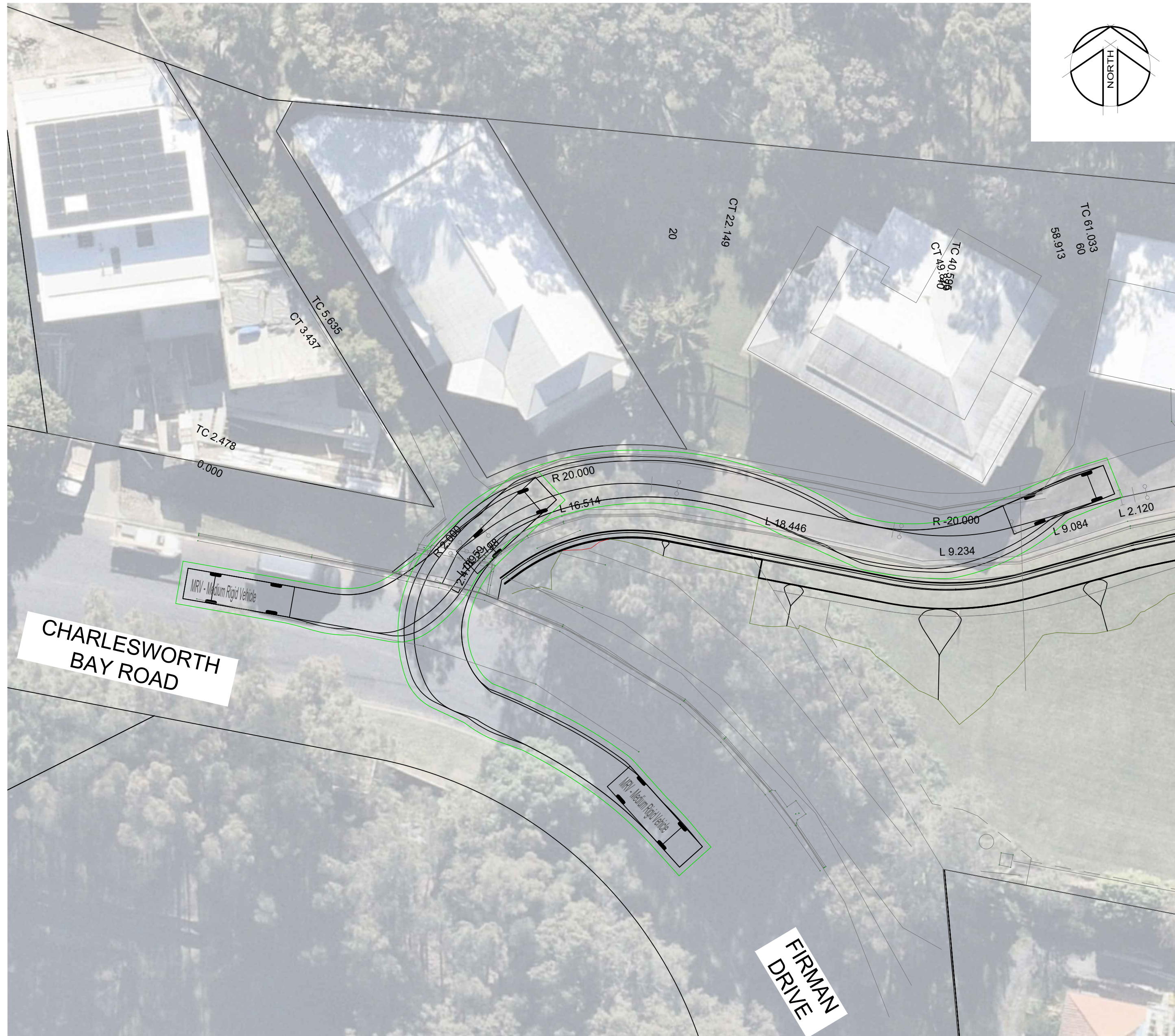
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CENTRAL COAST
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HUNTER
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S.E. QLD
P: 07 5582 6555

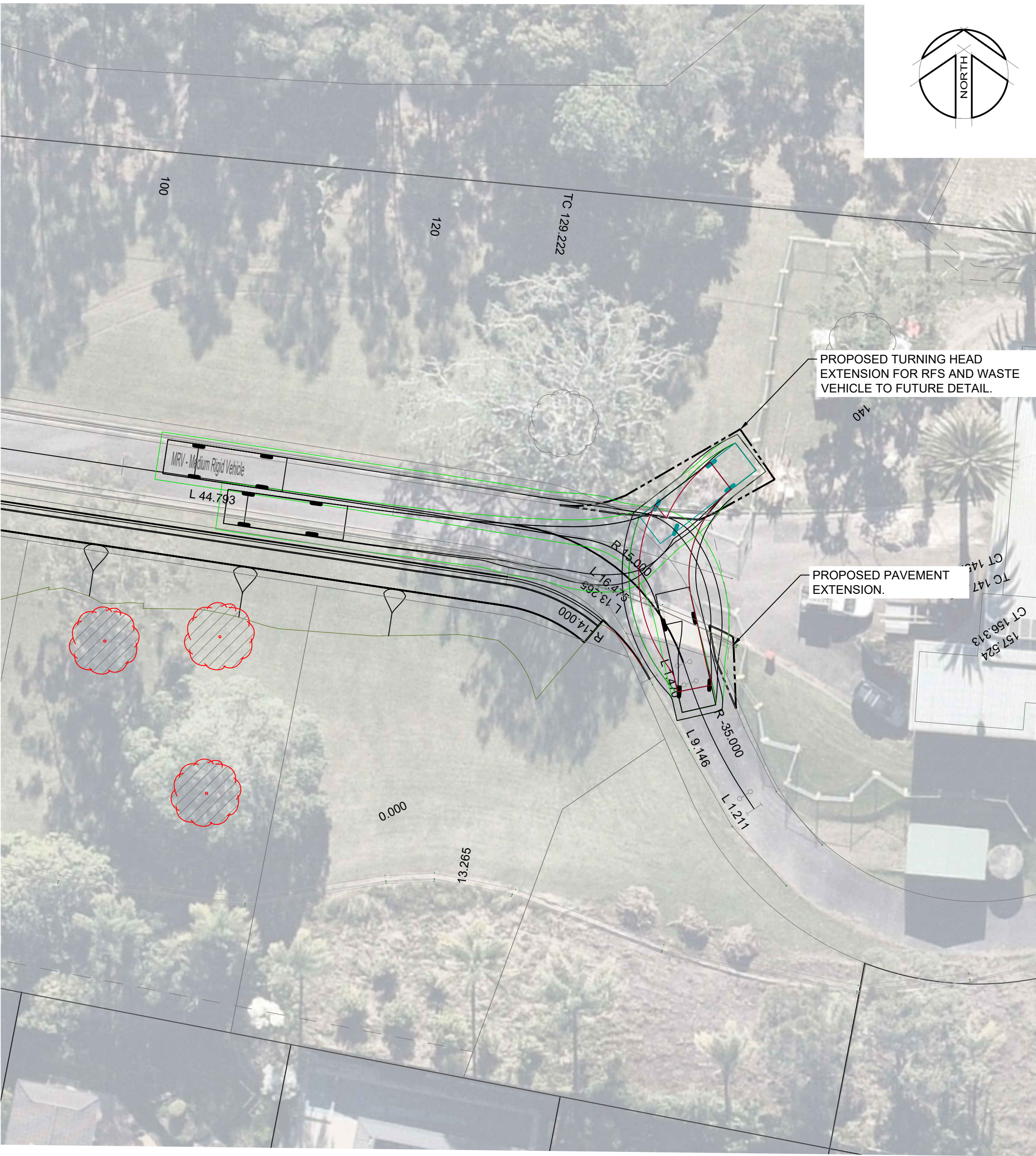
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Client:

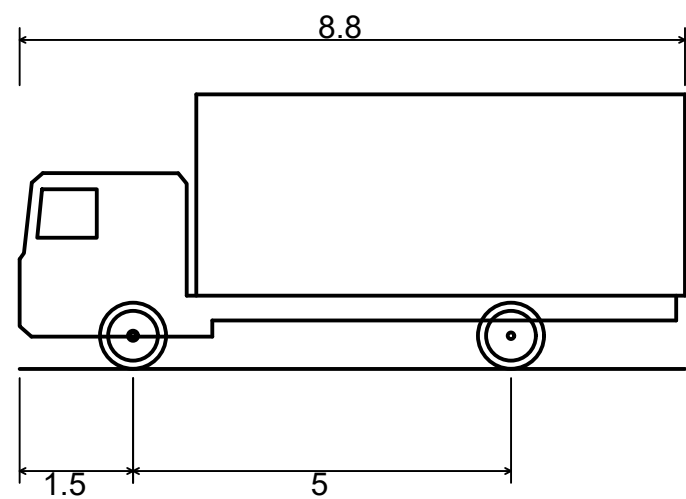
MR BRIAN BETTS



TURNPATH PLAN - DIAGRAM 1
SCALE 1:250



TURNPATH PLAN - DIAGRAM 2
SCALE 1:250



MRV - Medium Rigid Vehicle
Overall Length 8.800m
Overall Width 2.500m
Overall Body Height 3.633m
Min Body Ground Clearance 0.428m
Track Width 2.500m
Lock to lock time 4.00s
Kerb to Kerb Turning Radius 10.000m



REV	AMENDMENT	ISSUED	DATE
A	FOR DA APPROVAL	BF	06/09/2024



SYDNEY
P: 02 9559 0005
CENTRAL COAST
P: 02 4325 5255

HUNTER
P: 02 4955 8388
S.E. QLD
P: 07 5582 6555

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ABN: 26 134 067 842
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Client:

MR BRIAN BETTS

27-29 CHARLESWORTH BAY ROAD, COFFS HARBOUR
PROPOSED COMMUNITY TITLE LOT SUBDIVISION

TURNPATH PLAN

Designed: BF
Drawn: DKH
Checked: SGB

Scales: Plan 1:250
@A1 Horiz. -
Vert. -
X-Sect. -

Datum: A.H.D.

Plan No.
240204-01-901
File Ref.
240204

REV.
A

ATTACHMENT B

MUSIC REPORT

MUSIC-*link* Report

Project Details		Company Details	
Project:	PROPOSED FIVE (5) COMMUNITY TITLE LOT SUBDIVISION AT 27-29 CHARLESWORTH BAY ROAD, COFFS HARBOUR	Company:	BARKER RYAN STEWART
Report Export Date:	2/09/2024	Contact:	BRYAN FAUSTINO
Catchment Name:	240204 - Charlesworth Bay	Address:	22 NEWTON STREET, BROADMEADOW
Catchment Area:	0.385ha	Phone:	02 4966 8388
Impervious Area*:	44.78%	Email:	bryan@brs.com.au
Rainfall Station:	59040 COFFS		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1985 - 31/12/1994 11:54:00 PM		
Mean Annual Rainfall:	1642mm		
Evapotranspiration:	1456mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	Coffs Harbour		
Scenario:	Coffs Harbour Development		

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

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node: Receiving Node	Reduction	Node Type	Number	Node Type	Number
Flow	8.69%	Rain Water Tank Node	1	Urban Source Node	6
TSS	82.5%	Swale Node	2		
TP	61.8%	Generic Node	1		
TN	51.8%	GPT Node	1		
GP	99.6%				

Comments

Water Quality modelling following Council's reduction targets.

Water Quality treatment node are provided by Atlan Stormwater.

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	4 x Atlan Stormsack	Hi-flow bypass rate (cum/sec)	None	99	0.044
Rain	5 X Rainwater Tanks	% Reuse Demand Met	None	None	84.06
Receiving	Receiving Node	% Load Reduction	None	None	8.69
Receiving	Receiving Node	GP % Load Reduction	90	None	99.6
Receiving	Receiving Node	TN % Load Reduction	45	None	51.8
Receiving	Receiving Node	TP % Load Reduction	60	None	61.8
Receiving	Receiving Node	TSS % Load Reduction	80	None	82.5
Swale	IAD SWALE	Bed slope	0.01	0.04	0.01
Swale	Swale	Bed slope	0.01	0.04	0.01
Urban	Additional Road	Area Impervious (ha)	None	None	0.024
Urban	Additional Road	Area Pervious (ha)	None	None	0.002
Urban	Additional Road	Total Area (ha)	None	None	0.027
Urban	BYPASS (Lot 12)	Area Impervious (ha)	None	None	0.000
Urban	BYPASS (Lot 12)	Area Pervious (ha)	None	None	0.003
Urban	BYPASS (Lot 12)	Total Area (ha)	None	None	0.004
Urban	Lots 8 to 12	Area Impervious (ha)	None	None	0.1
Urban	Lots 8 to 12	Area Impervious (ha)	None	None	0.043
Urban	Lots 8 to 12	Area Pervious (ha)	None	None	0
Urban	Lots 8 to 12	Area Pervious (ha)	None	None	0.166
Urban	Lots 8 to 12	Total Area (ha)	None	None	0.1
Urban	Lots 8 to 12	Total Area (ha)	None	None	0.21
Urban	Swale Catchment (Lot 12)	Area Impervious (ha)	None	None	0.002
Urban	Swale Catchment (Lot 12)	Area Pervious (ha)	None	None	0.025
Urban	Swale Catchment (Lot 12)	Total Area (ha)	None	None	0.028
Urban	Verge	Area Impervious (ha)	None	None	0.001
Urban	Verge	Area Pervious (ha)	None	None	0.014
Urban	Verge	Total Area (ha)	None	None	0.016

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Urban	BYPASS (Lot 12)	Baseflow Total Phosphorus Standard Deviation (log mg/L)	0.38	0.38	0.31
Urban	Lots 8 to 12	Baseflow Total Phosphorus Standard Deviation (log mg/L)	0.38	0.38	0.31
Urban	Swale Catchment (Lot 12)	Baseflow Total Phosphorus Standard Deviation (log mg/L)	0.38	0.38	0.31

Only certain parameters are reported when they pass validation