Geotechnical Investigation Report

559 Anambah Road, Gosforth NSW 2320

Prepared for: Thirdi Anambah Pty Ltd c/- Vara Consulting
EP3627.002 29 August 2024

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559 Anambah Road, Gosforth NSW 2320

Thirdi Anambah Pty Ltd c/- Vara Consulting
53 Hume St, Crows Nest NSW 2065

29 August 2024

Our Ref: EP3627.002

LIMITATIONS

This Geotechnical Investigation Report was conducted on the behalf of Thirdi Anambah Pty Ltd c/- Vara Consulting for the purpose/s stated in **Section 1**.

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QUALITY CONTROL

Version	Author	Date	Reviewer	Date	Quality Review	Date
v01	O. Pruteanu	22/05/2024	J. Young	24/05/2024	O. Pruteanu	27/05/2024
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DOCUMENT CONTROL

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v01	*27/05/2024*	*Geotechnical Investigation Report*	*Thirdi Anambah Pty Ltd c/- Vara Consulting*
v02	*26/06/2024*	*Geotechnical Investigation Report*	*Thirdi Anambah Pty Ltd c/- Vara Consulting*
v03	*29/08/2024*	*Geotechnical Investigation Report*	*Thirdi Anambah Pty Ltd c/- Vara Consulting*

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1 Introduction

EP Risk Management Pty Ltd (EP Risk) was engaged by Thirdi Anambah Pty Ltd c/- Vara Consulting to undertake a Geotechnical Investigation at 559 Anambah Road, Gosforth NSW 2320 for the proposed approximately 900 residential lots as part of the "Anambah Urban Release Area".

The masterplan creates a new urban subdivision within the Anambah Urban Release Area accommodating a mix of housing types incorporating open space, roads, pedestrian networks, utilities and services, intersection upgrade and drainage infrastructure.

The proposed development will be undertaken in stages with Stage A comprising of approximately 240 lots that includes subdivision of the land, construction of the roads, services, bulk earth works and the dedication of reserves.

The geotechnical investigation is required for the entre master plan area included in **Appendix A – Masterplanning Development Application Civil Engineering Package.**

The engagement was undertaken in line with the conditions of engagement and the investigation scope as outlined in our proposal EP17828 dated 25 March 2024.

1.1 Objectives and Scope of Works

It is understood that the geotechnical investigation is required to inform the preliminary site classification, pavement design, excavatability assessment and general construction notes.

EP Risk carried out the following scope of works for the geotechnical investigation:

- Prepared all the WHS documentation and procure Before You Dig Australia plans for the site.
- Excavation of twenty-five (25) test pits to a maximum depth of 3.0m below ground level (BGL) or prior bedrock refusal within the proposed road alignments to inform the pavement design including the classified roads within the development.
- Excavation of fifteen (15) test pits to a maximum depth of 3.0m BGL or prior bedrock refusal to inform the preliminary site classification and service excavations.
- Dynamic Cone Penetrometer was conducted adjacent to the test pits to assess the consistency of the strata.
- Collection representative undisturbed, disturbed, and bulk samples for laboratory testing.
- Upon completion the test pits were filled with spoil and light compaction by excavator bucket, mounded and tracked over.
- Preparation of a geotechnical report including the investigation findings, pavement design, preliminary site classification, excavatability assessment and laboratory test results.

2 Site Location and Description

The Site is located at 559 Anambah Road, Gosforth NSW 2320, legal described as Lot 177 in DP874171 and Lot 55 in DP874170. The site is bounded by Anambah Road to the east and undeveloped land to the north, west and south.

The elevation of the site ranges from approximately 50m AHD in the north-western part of the site to approximately 20m AHD in the southern sections of the site. Rock outcrops were observed on the elevated part of the site in the north-west area.

The drainage of the site is assumed to follow the contour lines in a predominantly south and south-east direction and towards the north along natural drainage lines to lower elevated areas of the site. Part of the site drains also towards north to lower elevations. The fieldwork was undertaken following a prolonged period of rain and water ponding was observed in several areas across the site. Water dams associated with the grazing were also observed on site, constructed in natural drainage lines. The site vegetation comprised of short pasture grass used for grazing and scattered trees. Several erosion scarps were observed along the drainage lines. Photos collected during site investigation are shown in **Appendix B – Photolog**.

An excerpt from SixMaps showing the indicative location of the site is presented in Figure 1.

Figure 1. Indicative Site Location

3 Desktop Study

3.1 Regional Geology

Based on geological data sourced from NSW Government website (www.minview.geoscience.nsw.gov.au), the Site is underlain by:

- Carboniferous Aged - Seaham Formation (Curs) known to contain tillite, varved siltstone, tuff, red and green zeolitic mudstone with dropstones interbedded in thick-bedded lithic sandstone and conglomerate.
- Permian Aged - Lochinvar Formation (Pdal and Pdal_b) containing basalt, siltstone, sandstone.

An excerpt of the geological map is shown in Figure 2.

Figure 2. Geological Map Excerpt

3.2 Soil Landscape

NSW Department of Industry, Resources and Energy (www.environment.nsw.gov.au), onsite soil landscapes have been identified to comprise of Rothbury (SI5601ro).

The Rothbury soil landscape covers undulating to rolling hills with elevations ranging from 60 – 140 m. Average slopes are 6 – 10% with some to 12%. Slope lengths are 800 – 1,000 m with local relief of 60 – 80 m. Drainage lines are common throughout the area and occur at intervals of 200 – 1,000 m. As limitations or this type of soil are erosion hazard, localised waterlogging, and poor drainage.

3.3 Mine Subsidence

Reference to the Mine Subsidence District Data Source, the Site is not located within a Mine Subsidence District. The closest Mine Subsidence District Maitland West Mine Subsidence District is located more than 5km away from the site.

3.4 Acid Sulphate Soils (ASS)

The NSW Government data available on www.geo.seed.nsw.gov.au indicates the site is located within Class 5 acid sulphate soil classification. Acid sulfate soils are not typically found in Class 5 areas. Areas classified as Class 5 are located within 500 metres on adjacent class 1,2,3 or 4 land. An extract of the acid sulphate soil map is shown in Figure 3.

Figure 3. Acid Sulphate Soil Map Extract

4 Geotechnical Investigation

4.1 Investigation Methodology

The site investigation was carried out from 22 to 24 April 2024 under full time supervision of an experienced EP Risk Geotechnical Professional in accordance with AS1726-2017 Geotechnical Site Investigations and comprised the following:

- Preparation of a Safe Work Method Statement (SWMS) for all the fieldwork and procuring the site service plans rom Before You Dig Australia.
- Excavating forty (40) test pits at locations of interest within the footprint of the proposed development.
- Logging of soil/rocks encountered and collection of representative soil and rock samples to be tested by a NATA-accredited laboratory.
- Reinstatement test pits with spoil. Upon completion the soil placed in test pits was compacted by the excavator bucket and by excavator run over.

The test pits were excavated using a Kobelco Geospec 24T excavator fitted with a 600mm bucket. Ripper attachment was used to advance the test pits in medium to high strength bedrock. The locations of the test pits are presented in **Appendix C- Geotechnical Investigation Locations**.

4.2 Subsurface Profile

A project geological classification has been developed based on the results of the investigation and a summary of the units and their distribution is presented in Table 1 and Table 2. The borehole logs and accompanying explanatory notes are presented in **Appendix D – Test Pit Logs**.

Table 1. Observed Geotechnical Units

Unit #	Origin	Material	Description
Unit 1	Topsoil	Silty/Sandy CLAY	Low to medium plasticity, black, grey, dark brown, fine to medium grained sand
Unit 2	Slopewash	Silty CLAY	Medium to high plasticity, grey
Unit 3	Residual soil	Sandy/Silty CLAY	Medium to high plasticity, grey, brown, red, yellow, fine to coarse grained sand
Unit 4a	XW* Material	MUDSTONE	Silty/Sandy CLAY, medium to high plasticity, yellow and brown
Unit 4b		SANDSTONE	Sandy CLAY/ Clayey Gravelly SAND, medium to high plasticity, grey, red, brown, fine to coarse grained sand, fine to coarse grained, sub-angular to angular gravel

XW-extremely weathered.

Table 2. Distribution of Subsurface Geological units Across the Investigated Locations					
TP - ID	Depth Below Ground Level (m BGL)				
	Topsoil	Slopewash	Residual Soil	XW Material	
	Unit 1	Unit 2	Unit 3	Unit 4a	Unit 4b
TP01-L	0.0-0.15	0.15-0.7	0.7-1.3	1.3-3.0*	NE
TP02-P	0.0-0.3	NE	0.3-1.1	1.1-2.1*	NE
TP03-L	0.0-0.18	NE	0.18-0.6	0.6-2.5*	NE
TP04-P	0.0-0.21	NE	0.21-0.8	0.8-2.7*	NE
TP05-P	0.0-0.14	NE	0.14-0.5	0.5-3.0*	NE
TP06-L	0.0-0.2	NE	0.2-1.4	1.4-3.2*	NE
TP07-P	0.0-0.2	NE	0.2-0.6	NE	0.6-3.0*
TP08-L	0.0-0.3	NE	0.3-0.5	1.9-3.0*	0.5-1.9
TP09-P	0.0-0.23	0.23-1.1	1.1-2.5	2.5-3.0*	NE
TP10-P	0.0-0.17	NE	0.17-0.7	0.7-3.0*	NE
TP11-L	0.0-0.13	NE	0.13-0.7	0.7-3.0*	NE
TP12-P	0.0-0.15	NE	0.15-0.6	0.6-3.0*	NE
TP13-L	0.0-0.2	0.2-0.5	0.5-0.7	0.7-3.0*	NE
TP14-P	0.0-0.2	NE	0.3-0.7	0.7-2.8*	NE
TP15-P	0.0-0.16	NE	0.16-0.6	0.6-3.0*	NE
TP16-L	0.0-0.2	NE	0.2-0.6	0.6-3.0*	NE
TP17-P	0.0-0.15	0.15-0.5	0.5-0.7	0.7-3.0*	NE
TP18-L	0.0-0.2	0.2-0.5	0.5-0.7	0.7-3.2*	NE
TP19-L	0.0-0.18	0.15-0.6	0.6-1.0	1.0-2.5*	NE
TP20-P	0.0-0.21	0.21-0.7	0.7-1.0	1.0-2.4*	NE
TP21-P	0.0-0.18	0.18-0.6	0.6-0.8	NE	0.8-3.2*
TP22-P	0.0-0.15	0.15-0.4	0.4-0.7	0.7-3.2*	NE
TP23-L	0.0-0.16	0.16-0.8	0.8-1.6	1.6-3.0*	NE
TP24-P	0.0-0.16	0.16-0.9	0.9-1.1	1.1-3.2*	NE
TP25-P	0.0-0.15	0.15-0.6	0.6-1.0	NE	1.0-3.0*
TP26-P	0.0-0.22	NE	0.22-0.7	NE	0.7-3.0*
TP27-L	0.0-0.12	NE	0.12-0.7	NE	0.7-1.6*
TP28-P	0.0-0.22	NE	0.22-0.5	NE	0.5-1.3*
TP29-P	0.0-0.12	NE	0.12-0.5	0.5-2.7*	NE
TP30-P	0.0-0.12	NE	0.12-0.4	0.4-3.2*	NE
TP31-L	0.0-0.13	NE	0.13-0.4	NE	0.4-3.2*
TP32-P	0.0-0.1	NE	0.1-0.4	NE	0.4-1.2*
TP33-P	0.0-0.15	NE	0.15-0.4	NE	0.4-1.8*
TP34-L	0.0-0.16	NE	0.16-0.6	0.6-3.0*	NE
TP35-P	0.0-0.13	NE	0.13-0.6	NE	0.6-3.0*
TP36-L	0.0-0.18	NE	0.18-0.8	0.8-3.0*	NE
TP37-P	0.0-0.14	NE	0.14-0.5	1.7-3.2*	0.5-1.7
TP38-P	0.0-0.15	0.15-0.4	0.4-0.7	NE	0.7-3.0*
TP39-L	0.0-0.12	0.12-0.5	0.5-0.8	NE	0.8-3.0*
TP40-P	0.0-0.21	NE	0.21-0.6	NE	0.6-3.0
*)-limit of the investigation					

4.3 Groundwater

Groundwater was not encountered during the investigation. It should be noted that the groundwater conditions will vary with seasonal and weather conditions along with construction related Site conditions.

4.4 Laboratory Test Results

Geotechnical laboratory testing was carried out on selected bulk, disturbed and undisturbed samples collected during the site investigation. All testing was performed by Australian Soil and Concrete Testing (Newcastle) and Eurofins - NATA accredited laboratories in accordance with the relevant Australian Standards and technical procedures. The detailed results of laboratory testing are presented in **Appendix E – Laboratory Test Results** and are summarised in the following sections.

4.4.1 Atterberg Limits

A summary of Atterberg Limits and Linear Shrinkage test results are presented in Table 3 and are plotted graphically in Figure 4. Testing indicates that clayey materials are medium to high plasticity.

Table 3. Atterberg Limits Test Results

Test Pit ID	Depth (m BGL)	Soil	Classification	Atterberg Limits			Linear Shrinkage (%)
				LL (%)	PL (%)	PI (%)	
TP01-L	1.5-2.5	Sandy CLAY	CI	40	17	23	10.5
TP07-P	1.0-1.5	Clayey Gravelly SAND	CI-CH	39	17	22	8.5
TP18-L	0.2-0.5	Silty CLAY	CI-CH	64	17	47	16.0
TP25-P	1.5-2.5	Clayey Sandy GRAVEL	CI-CH	42	17	25	11.0
TP35-P	1.5-2.0	Clayey Gravelly SAND	CL-CI	38	20	18	6.5

LL – Liquid Limit
PL – Plastic Limit
PI – Plasticity Index

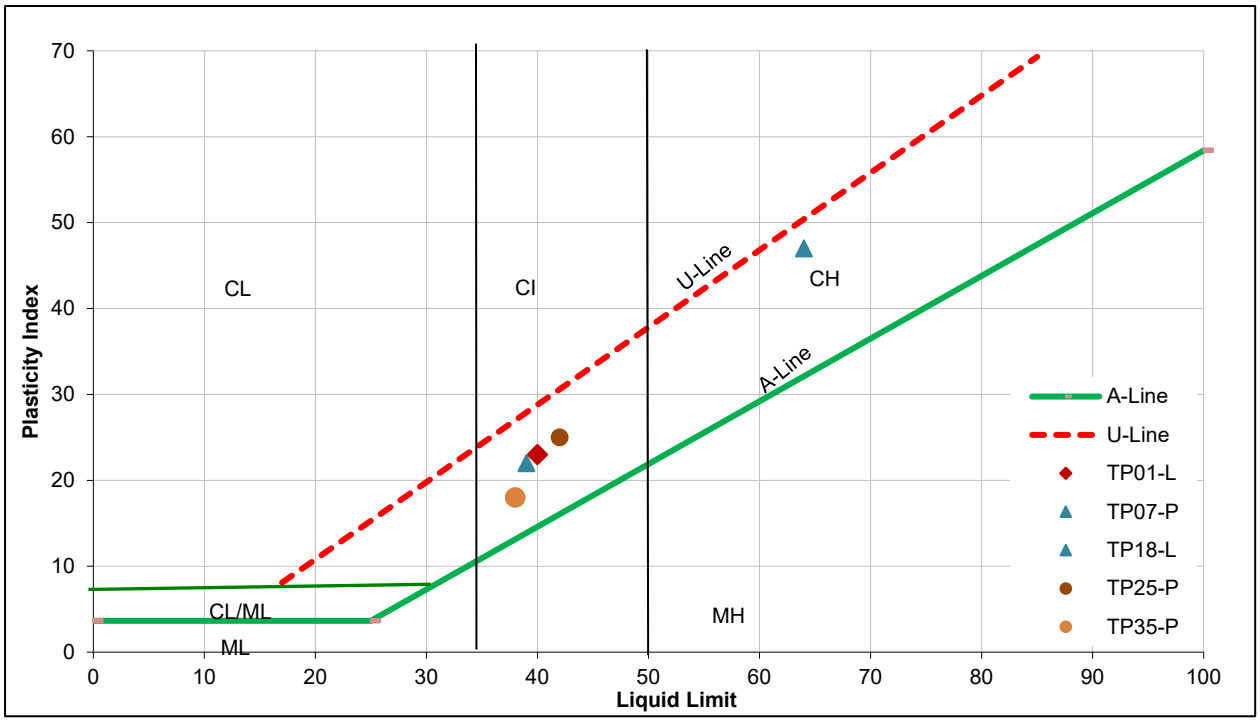


Figure 4. Atterberg Limit Plot

4.4.2 Particle Size Distribution

Particle Size Distribution (PSD) test results undertaken on samples of soil are presented in Table 4 and confirms the material description on the test pit logs.

Table 4. Particle Size Distribution Test Results

Test Pit ID	Depth (m BGL)	% passing 2.36 mm sieve	% passing 75 µm sieve	Sample Description
TP01-L	1.5-2.5	74	44	Sandy CLAY with gravel
TP07-P	1.0-1.5	51	15	Clayey Sandy GRAVEL
TP18-L	0.2-0.5	100	87	Silty CLAY
TP25-P	1.5-2.5	47	14	Clayey Sandy GRAVEL
TP35-P	1.5-2.0	66	18	Clayey Gravelly SAND

4.4.3 California Bearing Ratio (CBR)

CBR tests were undertaken on eight soil samples to inform the design CBR for the proposed road within the proposed development and the results are summarised in Table 6.

Table 5. California Bearing Ratio Test Results

Test ID	Depth (m BGL)	Sample Description	W[1](%)	SOMC[2] (%)	SMDD[3] (t/m^3)	Swell (%)	CBR (%)
TP02-P	1.5-2.1	XW Sandstone-Sandy CLAY	31.8	32.0	1.38	3.0	2.0[5]
TP09-P	1.1-1.5	Residual Soil-Silty CLAY	26.3	26.5	1.54	2.0	3.0[5]
TP15-P	0.2-0.6	Residual Soil-Silty CLAY	33.2	29.0	1.46	3.0	2.0[5]
TP20-P	0.3-0.8	Slopewash-Silty CLAY	30.1	30.5	1.44	1.5	3.5[5]
TP24-P	0.5-1.0	Slopewash-Silty CLAY	33.2	33.0	1.38	3.0	1.5[4]
TP29-P	1.5-2.0	XW Sandstone-Sandy CLAY	12.5	15.0	1.87	0.5	25[4]
TP37-P	1.7-2.5	XW Mudstone-Sandy CLAY	31.8	33.5	1.34	1.5	3.0[5]
TP38-P	1.0-1.75	XW Sandstone-Clayey SAND	12.5	14.5	1.80	0.5	15.0[4]

[1] Field Moisture Content
[2] Standard Optimum Moisture Content
[3] Standard Maximum Dry Density
[4] CBR at 2.5mm (%)
[5] CBR at 5mm (%)
*XW-extremely weathered

4.4.4 Shrink-Swell

Undisturbed soil samples have been collected during field investigation and the results are shown in Table 5.

Table 6. Shrink-Swell Index Test Results

Test Pit ID	Soil Type	Depth (m BGL)	Shrinkage		Swell			Shrink – Swell Index (Iss%)
			Shrinkage Field Moisture Content (%)	Dried Shrinkage (%)	Field Moisture Content (%)	Inundated Moisture Content (%)	Swell Strain (%)	
TP01-L	Silty CLAY	0.7-1.2	26.0	-7.89	29.5	31.9	1.64	**4.8**
TP19-L	Silty CLAY	0.3-0.8	27.1	-7.56	25.4	29.4	2.59	**4.9**
TP23-L	Silty CLAY	0.3-0.8	26.8	-7.7	25.1	28.5	2.04	**4.8**

4.4.5 Point Load Testing

It is noted the rock samples collected from test pits are competent bedrock fragments as the lower strength bedrock was broken down into soil during excavation. All the rock samples were collected dry and were tested dry which could potentially contribute to a higher strength rock interpretation. Point load testing has been conducted on selected rock samples collected from test pits and the test results are shown in Table 7.

Table 7. Point Load Test Results

TP ID	Rock	Depth (m BGL)	Moisture condition	Is (MPa)	Is (50) MPa	Rock strength
TP05-P	Mudstone	2.5-3.0	Moist	0.22	0.28	Low Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.19	0.23	Low Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.19	0.24	Low Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.15	0.2	Low Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.25	0.31	Medium Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.26	0.32	Medium Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.29	0.32	Medium Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.24	0.32	Medium Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.23	0.26	Low Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.42	0.44	Medium Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.24	0.3	Medium Strength
TP05-P	Mudstone	2.5-3.0	Moist	0.23	0.28	Low Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.066	0.075	Very Low Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.2	0.27	Low Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.38	0.48	Medium Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.16	0.2	Low Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.61	0.69	Medium Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.51	0.58	Medium Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.61	0.75	Medium Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.88	1.0	High Strength

Table 7. Point Load Test Results

TP ID	Rock	Depth (m BGL)	Moisture condition	Is (MPa)	Is (50) MPa	Rock strength
TP28-P	Sandstone	1.0-1.3	Moist	0.67	0.86	Medium Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.63	0.83	Medium Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.24	0.3	Medium Strength
TP28-P	Sandstone	1.0-1.3	Moist	0.64	0.84	Medium Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.42	0.52	Medium Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.24	0.28	Low Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.14	0.17	Low Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.17	0.22	Low Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.74	0.8	Medium Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.3	0.6	Medium Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.22	0.26	Low Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.28	0.35	Medium Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.34	0.43	Medium Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.29	0.37	Medium Strength
TP32-P	Sandstone	0.5-1.2	Moist	0.47	0.6	Medium Strength
TP32-P	Sandstone	0.5-1.2	Moist	1.2	1.5	High Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.033	0.039	Very Low Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.48	0.57	Medium Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.29	0.29	Low Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.085	0.1	Very Low Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.019	0.023	-
TP33-P	Sandstone	1.0-1.8	Moist	0.2	0.24	Low Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.31	0.35	Medium Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.25	0.29	Low Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.3	0.36	Medium Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.8	0.9	Medium Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.21	0.22	Low Strength
TP33-P	Sandstone	1.0-1.8	Moist	0.13	0.17	Low Strength

-) below the minimum rock strength of very low

4.4.6 Aggressivity

The Australian Standard AS2159-2009 provides criteria for assessment of the level of exposure classification for steel and concrete to enable the designers to incorporate protective measures for each element into the design. The assessment criteria are based upon the pH, concentrations of Sulphate and Chloride in soil, the soil permeability, and the groundwater level.

Soil aggressivity testing was undertaken on three (3) sample recovered from boreholes. An assessment of the exposure classification for the soil sample tested based on the above criteria is presented in Table 8.

Table 8. Aggressivity Test Results

Test Pit ID	Soil type	Sulphates (SO_4) in soil (mg/kg - ppm)	pH	Chlorides in groundwater (mg/kg-ppm)	Resistivity ohm.cm	Exposure classification	
						Aggressive to steel	Aggressive to concrete
TP11-L	Sandy CLAY	<25	9.0	100	7500	Non-Aggressive	Non-Aggressive
TP36-L	Sandy CLAY	<25	8.7	100	6800	Non-Aggressive	Non-Aggressive
TP40-P	Clayey SAND	<25	9.5	220	3200	Mild	Mild

5 Pavement Design

5.1 Design Traffic Loadings

Design traffic loadings have been selected and pavement thickness design calculations have been undertaken by EP Risk in accordance with *Maitland City Council - Manual of Engineering Standards*.

The design traffic data has been determined based on the following assumptions in Table 9.

Table 9. Recommended Road Type and Design ESA's

Road Type	Roads Identification	Design ESA's
Local - Secondary	TBC	2×10^5
Local - Primary	TBC	5×10^5
Collector - Secondary	TBC	1×10^6
Collector - Primary	TBC	1.5×10^6
Distributor– Secondary (Bus Route)	TBC	2×10^6

Where traffic data varies from the above assumptions a review of pavement design will be required particularly considering connectivity with adjacent developments.

5.2 Design Parameters

Pavement thickness has been undertaken in accordance with Austroads AGPT02-17 Guide to Pavement Technology, Part 2: Pavement Structural Design based on the following parameters:

- Design subgrade CBR of 2% for Silty CLAY (TP02-P and TP15-P).
- Design CBR of 3% for extremely weathered Mudstone/Sandstone-Sandy CLAY and residual soil.
- Design CBR of 6% for extremely weathered Sandstone – Clayey SAND.
- CBR of 10% for distinctly weathered Mudstone/Sandstone. CBR 10% is likely to be appropriate for the areas of deeper cut in the north-western part of the site.
- Design traffic as per Table 9.

The design subgrade has been determined in accordance with Section 5 of Austroads 2017 based on laboratory testing results and field interpretation.

The CBR Swell results when compared to Table 5.2 in Austroads Guide to pavement Technology Part 2: Pavement Structural Design indicate that the soils tested have generally a moderate to high expansive nature and specific strategies are likely required to address potential volume change due to moisture variation in the subgrade. This will largely be dependent on the vertical alignment of roads and the material present within 0.5 m of design subgrade level (DSL).

Where filling is undertaken within the road alignments, the CBR of the fill material should be considered specifically regarding the final pavement design subgrade CBR. All fill materials should generally be a minimum of CBR 3% based on 4-day soak when compacted to 100% standard relative density and SOMC except where the final pavement design is based on a subgrade design CBR of 10%. Subgrade replacement with suitable site won materials is recommended for isolated areas of lower strength subgrade (TP24-P).

5.3 Pavement Design – Flexible Unbound Pavement

The option of pavement construction utilising flexible unbound pavement materials for Silty/Sandy CLAY, XW Mudstone/ Sandstone and slightly weathered/fresh Mudstone/Sandstone are detailed in Table 11, Table 12, Table 13 and Table 14.

In accordance with latest Council directive any subgrade with CBR <3 or with CBR swell ≥2.5% will require a minimum 300mm select layer. The select layer could be sourced from the areas of cut across the site subject to laboratory testing and Council approval. It is noted the *Maitland City Council - Manual of Engineering Standards (MoES)* requires 100 mm minimum base thickness and 125 mm minimum sub-base thickness with overall pavement thickness being a minimum of 300mm. Due to the profile of standard SA kerb and roll kerb and gutter. Basecourse is normally specified as a minimum of 150mm for construction practicality.

Table 10. Recommended Flexible Pavement Composition – CBR 2%

Road Type	Distributor - Bus Route	Collector Primary	Collector Secondary	Local - Primary	Local Secondary
Wearing Course (mm)	45 AC14 HD*	45 AC14 HD*	45 AC14 HD*	30 AC10*	30 AC10*
Basecourse (mm)	150	150	150	160**	160**
Subbase (mm)	185	165	140	125	125
Select (mm)	300	300	300	300	300
Total Thickness (mm)	680	660	635	615	615
Subgrade CBR	min 2%	min 2%	min 2%	min 2%	min 2%
Design ESA	2.0×10^6	1.5×10^6	1.0×10^6	5.0×10^5	2.0×10^5

AC14/AC10 with 10mm primer seal placed under the asphaltic concrete wearing surface
** Basecourse layer will be 160mm to suit standard kerb & gutter (modified SA) or roll kerb.

Table 11. Recommended Flexible Pavement Composition – CBR 3%

Road Type	Distributor - Bus Route	Collector Primary	Collector Secondary	Local - Primary	Local Secondary
Wearing Course (mm)	45 AC14 HD*	45 AC14 HD*	45 AC14 HD*	30 AC10*	30 AC10*
Basecourse (mm)	150	150	150	160**	160**
Subbase (mm)	125	125	125	290 (125)	250 (125)
Select (mm)***	300	220	200	(300)	(300)
Total Thickness (mm)	620	540	520	480 (615)	425 (615)
Subgrade CBR	min 3%	min 3%	min 3%	min 3%	min 3%
Design ESA	2.0×10^6	1.5×10^6	1.0×10^6	5.0×10^5	2.0×10^5

AC14/AC10 with 10mm primer seal placed under the asphaltic concrete wearing surface
** Basecourse layer will be 160mm to suit standard kerb & gutter (modified SA) or roll kerb.
*** Minimum CBR 30% required for the CBR 3% option. Where CBR swell is ≥2.5% select should be increased to 300mm with subbase thickness reduced accordingly as per bracketed values.

Table 12. Recommended Flexible Pavement Composition – CBR 6%

Road Type	Distributor - Bus Route	Collector Primary	Collector Secondary	Local - Primary	Local Secondary
Wearing Course (mm)	45 AC14 HD*	45 AC14 HD*	45 AC14 HD*	30 AC10*	30 AC10*
Basecourse (mm)	150	150	150	160**	160**
Subbase (mm)	250	205	180	140	140
Total Thickness (mm)	445	400	375	330	330
Subgrade CBR	min 6%	min 6%	min 6%	min 6%	min 6%
Design ESA	2.0×10^6	1.5×10^6	1.0×10^6	5.0×10^5	2.0×10^5

AC14/AC10 with 10mm primer seal placed under the asphaltic concrete wearing surface
** Basecourse layer will be 160mm to suit standard kerb & gutter (modified SA) or roll kerb.

Table 13. Recommended Flexible Pavement Composition – CBR 10%

Road Type	Distributor - Bus Route	Collector Primary	Collector Secondary	Local - Primary	Local Secondary
Wearing Course (mm)	45 AC14 HD*	45 AC14 HD*	45 AC14 HD*	30 AC10*	30 AC10*
Basecourse (mm)	150	150	150	160**	160**
Subbase (mm)	150	150	150	125	125
Total Thickness (mm)	345	445	345	315	315
Subgrade CBR	min 10%	min 10%	min 10%	min 10%	min 10%
Design ESA	2.0×10^6	1.5×10^6	1.0×10^6	5.0×10^5	2.0×10^5

AC14/AC10 with 10mm primer seal placed under the asphaltic concrete wearing surface
** Basecourse layer will be 160mm to suit standard kerb & gutter (modified SA) or roll kerb.

A minimum of fourteen days duration shall apply prior to application of asphalt layer. That period may be extended or shortened subject to approval by Council. It is noted Maitland City Council requires minimum 40mm AC (14) "Heavy Duty" for Classified Roads a 45mm AC14 wearing course has been specified to comply with 3-time nominal size of aggregate and provide improved durability.

For areas where the clay subgrade has a CBR <3 or swell ≥2.5%, the pavement design incorporate a 300mm select layer with minimum CBR of 15% or other measures detailed in Austroads Guidelines for managing soils with a swell potential. Select with CBR of 30% is specified for the design Subgrade of 2% and 3%. The design CBR needs to be confirmed on road alignment following the regrade activities on site. Where subgrade is at elevated moisture content at the time of construction a select layer will be likely be required and should be provisioned for particularly in lower lying areas in the southern section of the site.

5.4 Subgrade Preparation

Where construction of a new pavement is proposed, subgrade preparation should be in general accordance with the following procedures.

- Remove topsoil and excavated to design subgrade level.
- Ripping the encountered weathered Mudstone/Sandstone to 300-350mm below DSL and recompact to a minimum 100% of SMDD. Moisture contents should be within 70% to 90% of SOMC for weathered

bedrock and closer to SOMC where highly expansive subgrade materials are encountered or used as fill.

- Static proof-rolling of the exposed subgrade using a heavy (minimum 10 tonne) roller under the direction of an experienced geotechnical consultant.
- Loose or yielding areas should be excavated and replaced with compacted select fill or suitable subgrade replacement comprising material of similar consistency to the subgrade.
- Confirmation of design subgrade parameters by geotechnical consultant.
- Where filling or subgrade replacement is required, the materials employed should be free of organics or other deleterious material. The material should also have a maximum particle size of 100mm or one third of the layer thickness, with a minimum soaked CBR >3%. Low to moderate expansive/reactive material should be used as subgrade and general fill where possible in the top 1m to design levels.

Following satisfactory preparation of the subgrade, the pavement should be constructed in accordance with the recommendations or this report and *Maitland City Council – Manual of Engineering Standards Construction*. In case of discrepancy clarification should be obtained from Council.

5.5 Drainage

The moisture regime associated with a pavement has a major influence on the performance considering the stiffness/strength of the pavement materials is dependent on the moisture content of the material used. Accordingly, to protect the pavement materials from wetting up and softening, particular care would be required to provide a waterproof seal for the pavement materials, together with adequate surface and sub-surface drainage of the pavement and adjacent areas.

It is recommended that subsoil drainage be installed along both side of all roads within the development in accordance with Council requirements, with subsoil installed at subgrade level in highly expansive subgrade. CBR swell results from the preliminary investigation range from moderate to highly expansive. Design measures and subsurface drainage measures to control subgrade swell are provided in Austroads Pavement Guide to Pavement Technology and the relevant Transport for New South Wales Supplement(s). Preferred measures shall also be discussed with Council's Representative prior to adoption in any pavement construction. Designs utilising a 300mm select layer are provided in Tables 11 and 12.

The pavement thickness designs presented above assume drained pavement conditions. The selection, construction and maintenance of appropriate drainage infrastructure would be required for adequate performance. The selection of appropriate construction materials that are relatively insensitive to moisture change is also essential in area subject to periodic inundation, even if for a relatively short period of time.

5.6 Materials

5.6.1 Specifications and Compaction Requirements

Pavement materials and compaction requirements for new pavement construction should conform to Council requirements outlined in MoES and the following requirements outlined in Table 15.

Table 14. Material Specification and Compaction Requirements		
Pavement Course	Material Specification	Compaction Requirements
Base Course DGB20 (Class 1 &2) & NGB20** MoES (Cl 9.1.2)	Material complying with Council MoES Table 242.3 for the appropriate traffic category	Min 98% Modified (AS 1289 5.2.1)
Subbase Subbase quality crushed rock (DGS20, DGS40, GMS40, NGS20, NGS40) MoES (Cl 9.1.2)	Material complying with Council MoES	Min 95% Modified (AS 1289 5.2.1)
Select Granular material	Minimum CBR 15%, (min 30% for Design CBR of ≤3%) and PI ≤15% conforming to Council MoES	Min 100% Standard (AS 1289 5.1.1)
Subgrade or replacement	Minimum CBR as appropriate for the design option.	Min 100% Standard (AS 1289 5.1.1)
*) - Class 1 material should be used on sub-arterial category roads **) NGB and NGS material cannot be used on collector category road or higher due to higher design traffic. Material should comply with Council MoES Appendix D – Pavement Material Properties for the appropriate traffic category		

Minimum testing on all potential imported pavement materials should be in accordance with TfNSW 3051 Ed 7. Pre-treatment of material prior to testing would be advisable for materials subject to breakdown.

5.6.2 Wearing Course

Wearing courses should be in accordance with Council's specifications with reference to TfNSW QA Specifications R116 for Dense Graded Asphalt. It is noted that a minimum of 40mm AC14 (Heavy Duty) wearing course is utilised for classified roads in accordance with Council Specifications. 45mm of AC14 heavy duty has been specified to meet the minimum 3 time the nominal size of aggregate. Recent trials have also shown that 48mm of AC14 is the optimal thickness for durability.

The design and construction of wearing courses should be in in consultation with the preferred supplier considering traffic volume and type. All pavement surfaces should be primer sealed prior to the application of the AC wearing course. A minimum delay of 14 days is required after the primer seal before placement of the AC wearing course.

5.6.3 Inspections

The subgrade will require inspection by an experienced geotechnical consultant after boxing out or filling to design subgrade level. The purpose of inspections is to confirm design parameters, assess the suitability of the subgrade to support the pavement, and delineate areas which may require subgrade replacement or remedial treatment prior to construction.

6 Preliminary Site Classification

Australian Standard AS 2870-2011 establishes performance requirements and specific designs for common foundation conditions as well as providing guidance on the design of footing systems using engineering principles. Site classes as defined on Table 2.1 and 2.3 of AS 2870 are presented in Table 16.

Table 15. General Definition of Site Classes

Site Class	Foundation	Characteristic Surface Movement
A	Most sand and rock sites with little or no ground movement from moisture changes	-
S	Slightly reactive clay sites, which may experience only slight ground movement from moisture changes	0 – 20 mm
M	Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes	20 – 40 mm
H1	Highly reactive clay sites, which may experience high ground movement from moisture changes	40 – 60 mm
H2	Highly reactive clay sites, which may experience very high ground movement from moisture changes	60 – 75 mm
E	Extremely reactive sites, which may experience extreme ground movement from moisture changes	> 75 mm
A to P	Filled sites (refer to clause 2.4.6 of AS 2870)	-
P	Sites which include soft soils, such as soft clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise.	

Reactive sites are sites consisting of clay soils that swell on wetting and shrink on drying, resulting in ground movements that can damage lightly loaded structures. The amount of ground movement is related to the physical properties of the clay and environmental factors such as climate, vegetation, and watering. A higher probability of damage can occur on reactive sites where abnormal moisture conditions occur, as defined in AS 2870, due to factors such as:

- Presence of trees on the building site or adjacent site, removal of trees prior to or after construction, and the growth of trees too close to a footing. The proximity of mature trees and their effect on foundations should be considered when determining building areas within each allotment (refer to AS 2870).
- Failure to provide adequate site drainage or lack of maintenance of site drainage, failure to repair plumbing leaks and excessive or irregular watering of gardens.
- Unusual moisture conditions caused by removal of structures, ground covers (such as pavements), drains, dams, swimming pools, tanks etc.

Regarding the performance of footings systems, AS 2870 states “footing systems designed and constructed in accordance with this Standard on a normal site (see Clause 1.3.2) that is:

a) not subject to abnormal moisture conditions; and

b) maintained, such that the original site classification remains valid and abnormal moisture conditions do not develop, are expected to usually experience no damage, a low incidence of damage category 1 and an occasional incidence of damage category 2.”

Damage categories are defined in Appendix C of AS 2870, which is reproduced in CSIRO Information Sheet BTF 18, Foundation Maintenance and Footing Performance: A Homeowner’s Guide attached as **Appendix F – Foundation Maintenance and Footing Performance**.

The laboratory Shrink Swell test results summarised in Table 5 indicate that the tested Silty CLAY soil returned an I_{ss} value of 4.8% in TP01-L and TP23-L and an Iss value of 4.9% for TP19-L. Atterberg limit testing is also indicative of highly reactive material in the residual clay materials.

The classification of sites with controlled fill of depths greater than 0.4m (deep fill) comprising of material other than sand would be Class P. An alternative classification may however be given to sites with controlled fill where consideration is made to the potential for movement of the fill and underlying soil based on the moisture conditions at the time of construction and the long-term equilibrium moisture conditions.

Based on the subsurface profiles encountered during the Site inspection and in accordance with the AS 2870-2011; the Site in its existing condition and in the absence of abnormal moisture conditions would likely be classified as detailed in Table 17.

Table 16. Anticipated Site Classifications

Gosforth - Anambah Road	Site Classification
In Existing Condition prior to regrade	**Class H1 and Class H2**, highly reactive
Following regrade activities	**Class H1 and Class H2,** highly reactive

A characteristic surface movement (y_s) of 45mm to 65mm has been calculated for the site dependent on the soil profile in its existing state prior to regrade, using a depth of design suction (Hs) change of 2.3m. Following regrade characteristic surface movement (ys) in the order of 93mm to 109mm have been calculated using worst case scenarios as the depth of the cracked zone is considered zero as per AS2870-2011 Clause 2.3.2. Actual site classifications will be dependent on regrade activities including depth to rock and filling depth along with the materials utilised as fill.

NB: Careful material management will be required to avoid Class E classifications and ensure best outcomes for site classifications and pavements design especially in the southern part of the site. Reactive fill material should be placed below 1.5m of finished design levels.

The above site classifications and footing recommendations are for the site conditions present at the time of fieldwork and consequently the site classification may need to be reviewed with consideration of any site works that may be undertaken after the investigation and this report.

Site works may include:

- Changes to the existing soil profile by cutting and filling.
- Landscaping, including trees removed or planted in the general building area; and
- Drainage and watering systems.

Designs and design methods presented in AS 2870-2011 are based on the performance requirement that significant damage can be avoided if site conditions are properly maintained. Performance requirements and foundation maintenance are outlined in Appendix B of AS 2870. The above site classification assumes that the performance requirements as set out in Appendix B of AS 2870 are acceptable and that site foundation maintenance is undertaken to avoid extremes of wetting and drying.

Details on appropriate site and foundation maintenance practices are presented in Appendix B of AS 2870-2011 and in CSIRO Information Sheet BTF 18, Foundation Maintenance and Footing Performance: A Homeowner's Guide. Adherence to the detailing requirement outlined in Section 5 of AS 2870-2011 is essential, Section 5.6. Additional requirements for Classes M, H1, H2 and E sites, including architectural restrictions, plumbing and drainage requirements.

7 General Construction Considerations

7.1 Excavatability Assessment

Practical machine refusal for the 24-tonne excavator was encountered on a combination of mudstone and sandstone in seven (7) test pits out of the forty (40) excavated test pits. Refusal depths ranged from 1.2m BGL to 2.5m BGL. The strength of bedrock encountered in test pits assessed by point load testing ranges from very low to high strength. To assess the excavatability of the bedrock, the strength range is plotted on the graph in Figure 6 for excavatability as per the suggested method by Pettifer and Fookes. The area of the chart covered indicates that hard to very hard ripping by a D9 will be typically the excavation method for the type of rock encountered within the Site area.

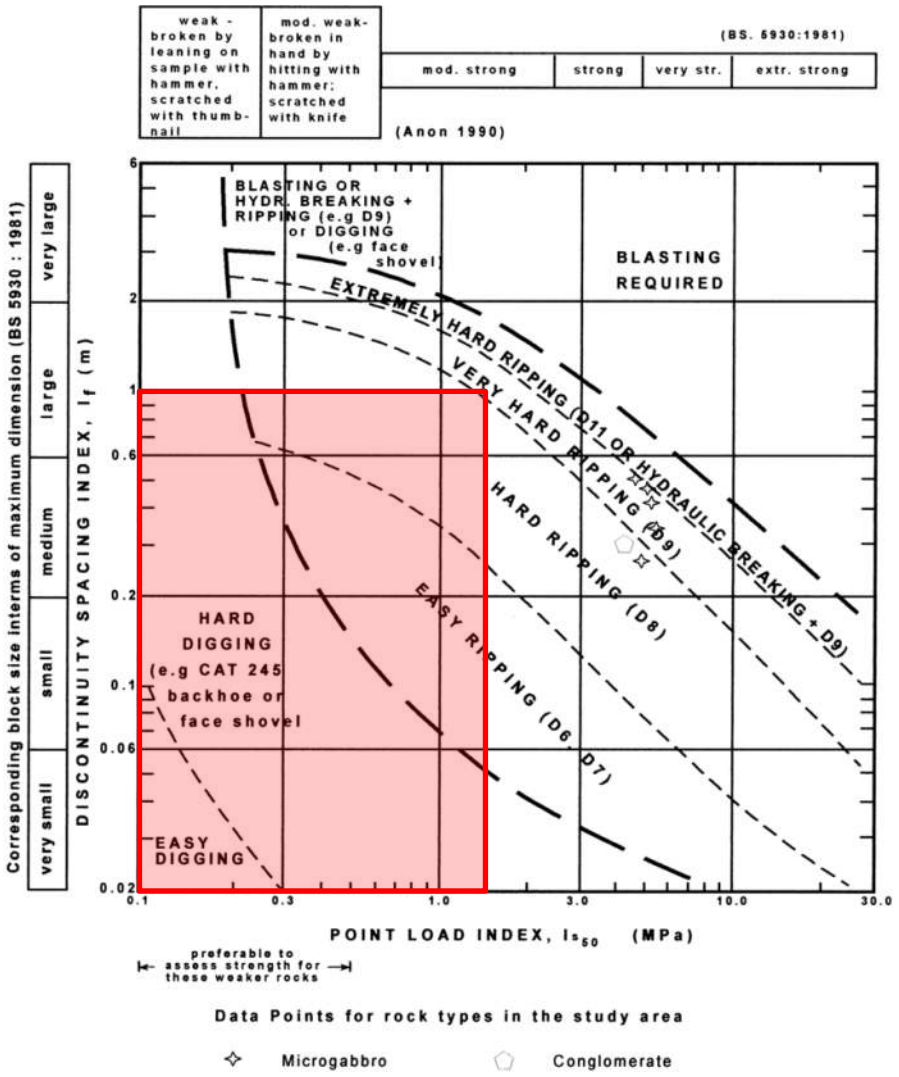


Figure 5. Excavatability Assessment (Pettifer and Fookes)

Excavations to depths of 1.5m-1.8 m BGL in weathered bedrock are expected to be readily achievable using larger (>25T) conventional earthmoving equipment. Excavations below 2m deep (especially in confined space like trenches) in slightly weathered/fresh bedrock may require excavators fitted with tiger teeth buckets or single ripper attachment and potential hydraulic hammering in isolated confined areas where high strength rock is encountered.

Excavatability conditions have not been assessed beyond the depths to which the test pits were excavated; however, the following general comments regarding rock mass excavatability conditions can be made:

- Rock strength as well as rock mass defect (joint) spacing could be expected to control rock mass excavatability. Rock strength is likely to be variable and layers of weaker rock can underlie stronger bedrock.
- Excavatability could be expected to be dependent on the plant used, the experience of the operator and the degree of confinement within the excavation.

It is recommended that long-term excavations are either battered at 2H:1V or flatter and protected against erosion or be supported by engineer designed and suitably constructed retaining walls. Excavations may be battered steeper than 2H:1V in rock materials, subject to specific geotechnical Investigation.

Excavations or trenches in the Silty/Sandy CLAY and extremely weathered material could be expected to stand close to vertical in the short-term. Where personnel are to enter excavations, options for short-term excavations stability include benching or battering back of the excavations to 1H:1V or the support of excavations within the residual soil and extremely weathered rock profile.

The excavation recommendations provided above should be considered with reference to the Safe Work Australia Code of Practice 'Excavation Work', dated January 2020.

7.2 Retaining Structures

All retaining structures should be designed by an engineer. Design of retaining walls should:

- Count surcharge loading from slopes and structures above the wall.
- Consider loading from any proposed compaction of fill behind the wall.
- Provide adequate surface and subsurface drainage behind all retaining walls, including a free draining granular backfill to prevent the build-up of hydrostatic pressures behind the wall.
- Utilise materials that are not susceptible to deterioration.
- Ensure walls are founded in materials appropriate for the loading conditions.

Footings for proposed retaining walls should be founded below any topsoil or slopewash within stiff or better consistency clay or weathered rock.

7.3 Filling and Material Management

Fill should be placed and compacted in accordance with AS 3798-2007. It is expected that construction of a suitable fill platform to support structural loads, such as pavements, ground slabs, footing and stiffened raft slabs, would include the following:

- Stripping of topsoil.
- Removal of any unsuitable soil (if applicable).
- Wet material where encountered (along the drainage lines across the site and in the southern part of the site) will likely require treatment or moisture re-conditioning (drying and blending with dryer fill material) prior to placement and compaction.
- Proof rolling of the exposed subgrade to detect any weak or deforming areas of subgrade that should be excavated and replaced with controlled fill.

- Placement of fill in horizontal layers with compaction of each layer to a minimum dry density ratio of 95% Standard Relative Density (SRD) as per Australian Standard AS 1289 Clause 5.1.) at moisture contents of 85- 115% of SOMC and 98% SRD for fill ≥1m depth. Fill within 0.5m of design subgrade in road alignments is to be compacted to 100% standard relative density at a 70-100% of SOMC.
- All fill materials should be supported by properly designed and constructed retaining walls or else battered at a slope of 2H:1V or flatter and protected against erosion by vegetation or similar and the provision of adequate drainage.

7.3.1 Material Management

The material management during regrade for this site will be critical due to the presence of highly reactive cohesive soils (I_{ss} ≥4.8%) and depth to the rock 1.6m BGL in some areas of the site.

Good material management practices should be employed for this site to avoid lot classification with Class E. Reactive / Expansive clay materials should be placed as close to SOMC as practical to minimise their swell potential and preferentially placed in lower layers of the deeper fill areas (≥1.15m BGSL). It will also be critical not to over compact material dry of SOMC.

Materials excavated on Site apart from topsoil and slopewash are considered suitable for re-use as engineering fill. Some materials such as slopewash will likely require treatment such as blending and moisture re-conditioning to produce suitable structural fill, subject to further assessment and weather conditions prior to and during construction. Material should be managed during regrade to allow use of required design CBR and lower reactivity material in the top 1m of filling and subgrade preparation to provide better outcome for pavement construction and site classification. Higher CBR material used in the upper 0.3-0.5m of subgrade will influence the design CBR which can be adopted.

7.4 Geotechnical Design Parameters

The geotechnical parameters for the proposed development have been assessed based on results of the site and laboratory tests of the ground investigation. These are provided for the different geological units: soils in Table 18 and for bedrock in Table 16. The design parameters for bedrock have been assumed based on the observations during site investigation.

The low consistency topsoil layer has been considered unsuitable for shallow foundations and no design parameters have been calculated for these units.

Table 17. Geotechnical Design Parameters-soil

Geotechnical Units	Bulk Unit Weight (kN/m3)	Undrained Cohesion Cu (kPa)	Drained Cohesion c' (kPa)	Drained friction angle ϕ' (°)	Poisson's Ratio (-)	Elastic Modulus E' (MPa)	Earth Pressure coefficient ka	Earth pressure coefficient kp
RESIDUAL SOIL/ SLOPEWASH Silty/Sandy CLAY (stiff or better)	19	50-75	3-5	26	0.3	10	0.39	2.56

The allowable bearing capacity for the stiff or better residual soil is estimated to 100kPa.

Table 18 - Geotechnical Design Parameters-Rock

Geotechnical Unit (strength)	Bulk Unit Weight (kN/m3)	Allowable Bearing Pressure (MPa)*	Ultimate shaft adhesion (kPa)**	Poisson's Ratio (-)	Elastic Modulus E' (MPa)
MUDSTONE very low strength (Class V)	20	0.7	50	0.3	50
SANDSTONE very low strength (Class V)	20	0.8	150	0.35	50
SANDSTONE low strength (Class IV)	21	2	250	0.3	100
SANDSTONE medium strength (Class III)	22	3.5	800	0.25	350

*) Bearing pressure to limit the settlement to <1% of minimum footing size
**) clean socket of roughness category R2 or better

8 References

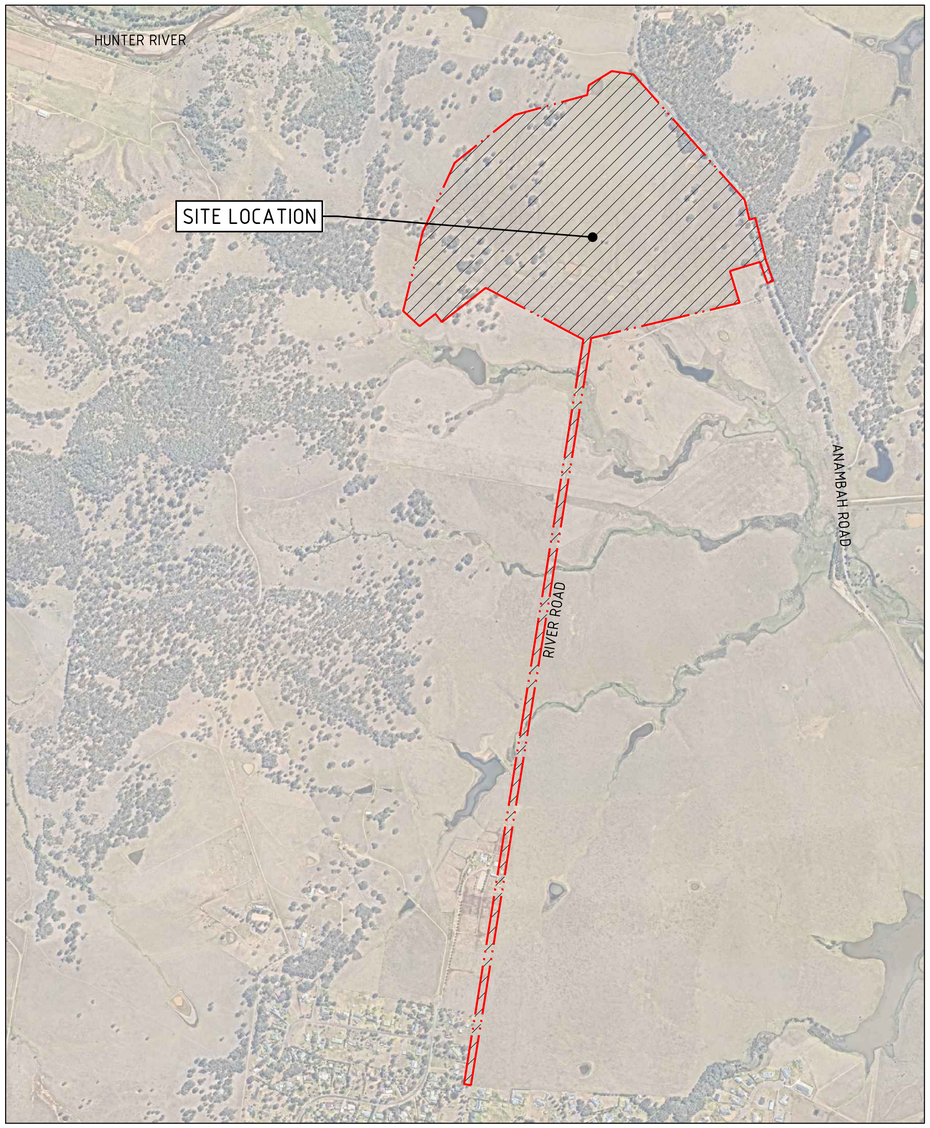
- Austroads AGPT05-19, “Guide to Pavement Technology Part 5: Pavement Evaluation and Treatment Design,” Austroads Ltd, October 2019
- Austroads AGPT02-17, “Guide to Pavement Technology Part 2: Pavement Structural Design,” Austroads Ltd, 2017.
- Australian Standard AS2870-2011 “Residential slabs and footing”
- Australian Standard AS3798-2007 “Guideline on earthworks for commercial and residential developments”.
- Australian Standard AS2159-2009, “Piling - Design & Installation,” Standards Australia, 2009
- eSPADE, Online website of NSW Office of Environment and heritage (www.environment.nsw.gov.au)
- NSW Department of Planning and Environment, Resources and Geoscience (www.resourcesandgeoscience.nsw.gov.au)
- Maitland City Council – Manual of Engineering Standards April 2023.
- TfNSW QA Specification 3051 (Ed 7 Rev 0), “Granular Base and Subbase Materials for Surfaced Road Pavements,” Roads and Maritime Services, April 2011
- TfNSW QA Specification 3051 (Ed 7 Rev 0), “Granular Base and Subbase Materials for Surfaced Road Pavements,” Roads and Maritime Services, August 2018.

Appendix A

MASTERPLANNING DEVELOPMENT APPLICATION – CIVIL ENGINEERING PACKAGE

PROPOSED SUBDIVISION, 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DEVELOPMENT APPLICATION
CIVIL ENGINEERING PACKAGE



LOCALITY PLAN

IMAGE SOURCE : NEARMAPS

DRAWING SCHEDULE

DWG NO.	DRAWING TITLE
MP-C01.01	COVER SHEET, DRAWING SCHEDULE AND LOCALITY PLAN
MP-C02.01	STAGING PLAN
MP-C03.01	CONCEPT BULK EARTHWORKS PLAN
MP-C03.11	BULK EARTHWORKS SITE SECTIONS - SHEET 1
MP-C03.12	BULK EARTHWORKS SITE SECTIONS - SHEET 2
MP-C03.13	BULK EARTHWORKS SITE SECTIONS - SHEET 3
MP-C04.01	CONCEPT CIVIL WORKS PLAN - SHEET 1
MP-C04.02	CONCEPT CIVIL WORKS PLAN - SHEET 2
MP-C04.03	CONCEPT CIVIL WORKS PLAN - SHEET 3
MP-C04.04	CONCEPT CIVIL WORKS PLAN - SHEET 4
MP-C05.01	FOOTPATH AND SHARED PATH PLAN
MP-C05.21	ROAD TYPICAL SECTIONS - SHEET 1
MP-C05.22	ROAD TYPICAL SECTIONS - SHEET 2
MP-C05.25	TYPICAL SECTIONS THROUGH LOTS
MP-C05.26	TYPICAL CIVIL DETAILS
MP-C05.31	ROAD LONGITUDINAL SECTIONS - SHEET 1
MP-C05.32	ROAD LONGITUDINAL SECTIONS - SHEET 2
MP-C05.33	ROAD LONGITUDINAL SECTIONS - SHEET 3
MP-C05.34	ROAD LONGITUDINAL SECTIONS - SHEET 4
MP-C05.35	ROAD LONGITUDINAL SECTIONS - SHEET 5
MP-C05.36	ROAD LONGITUDINAL SECTIONS - SHEET 6
MP-C05.37	ROAD LONGITUDINAL SECTIONS - SHEET 7
MP-C05.38	ROAD LONGITUDINAL SECTIONS - SHEET 8
MP-C05.39	ROAD LONGITUDINAL SECTIONS - SHEET 9
MP-C05.40	ROAD LONGITUDINAL SECTIONS - SHEET 10
MP-C05.41	ROAD LONGITUDINAL SECTIONS - SHEET 11
MP-C05.42	ROAD LONGITUDINAL SECTIONS - SHEET 12
MP-C05.43	ROAD LONGITUDINAL SECTIONS - SHEET 13
MP-C05.44	ROAD LONGITUDINAL SECTIONS - SHEET 14
MP-C05.45	ROAD LONGITUDINAL SECTIONS - SHEET 15
MP-C05.46	ROAD LONGITUDINAL SECTIONS - SHEET 16
MP-C05.47	ROAD LONGITUDINAL SECTIONS - SHEET 17
MP-C05.48	ROAD LONGITUDINAL SECTIONS - SHEET 18
MP-C05.49	ROAD LONGITUDINAL SECTIONS - SHEET 19
MP-C05.50	ROAD LONGITUDINAL SECTIONS - SHEET 20
MP-C05.51	ROAD LONGITUDINAL SECTIONS - SHEET 21
MP-C05.52	ROAD LONGITUDINAL SECTIONS - SHEET 22
MP-C05.53	ROAD LONGITUDINAL SECTIONS - SHEET 23
MP-C05.54	ROAD LONGITUDINAL SECTIONS - SHEET 24
MP-C05.55	ROAD LONGITUDINAL SECTIONS - SHEET 25
MP-C05.56	ROAD LONGITUDINAL SECTIONS - SHEET 26
MP-C05.57	ROAD LONGITUDINAL SECTIONS - SHEET 27
MP-C05.58	ROAD LONGITUDINAL SECTIONS - SHEET 28
MP-C05.59	ROAD LONGITUDINAL SECTIONS - SHEET 29
MP-C05.60	ROAD LONGITUDINAL SECTIONS - SHEET 30
MP-C05.61	ROAD LONGITUDINAL SECTIONS - SHEET 31
MP-C05.62	ROAD LONGITUDINAL SECTIONS - SHEET 32
MP-C05.63	ROAD LONGITUDINAL SECTIONS - SHEET 33
MP-C05.64	ROAD LONGITUDINAL SECTIONS - SHEET 34
MP-C05.65	ROAD LONGITUDINAL SECTIONS - SHEET 35
MP-C05.66	ROAD LONGITUDINAL SECTIONS - SHEET 36
MP-C06.01	CREEK PLAN AND LONGITUDINAL SECTION
MP-C06.11	CREEK CROSS SECTIONS
MP-C08.01	CONCEPT CIVIL WORKS PLAN RIVER ROAD - SHEET 1
MP-C08.02	CONCEPT CIVIL WORKS PLAN RIVER ROAD - SHEET 2
MP-C08.03	CONCEPT CIVIL WORKS PLAN RIVER ROAD - SHEET 3
MP-C08.04	CONCEPT CIVIL WORKS PLAN RIVER ROAD - SHEET 4
MP-C08.05	CONCEPT CIVIL WORKS PLAN RIVER ROAD - SHEET 5
MP-C08.21	ROAD TYPICAL SECTIONS RIVER ROAD
MP-C08.31	ROAD LONGITUDINAL SECTIONS RIVER ROAD - SHEET 1
MP-C08.32	ROAD LONGITUDINAL SECTIONS RIVER ROAD - SHEET 2
MP-C08.33	ROAD LONGITUDINAL SECTIONS RIVER ROAD - SHEET 3
MP-C08.34	ROAD LONGITUDINAL SECTIONS RIVER ROAD - SHEET 4

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:10000 @ A1 (0 100 200 300 400 500m)

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ABN 81 094 433 100

PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

COVER SHEET, DRAWING SCHEDULE AND LOCALITY PLAN

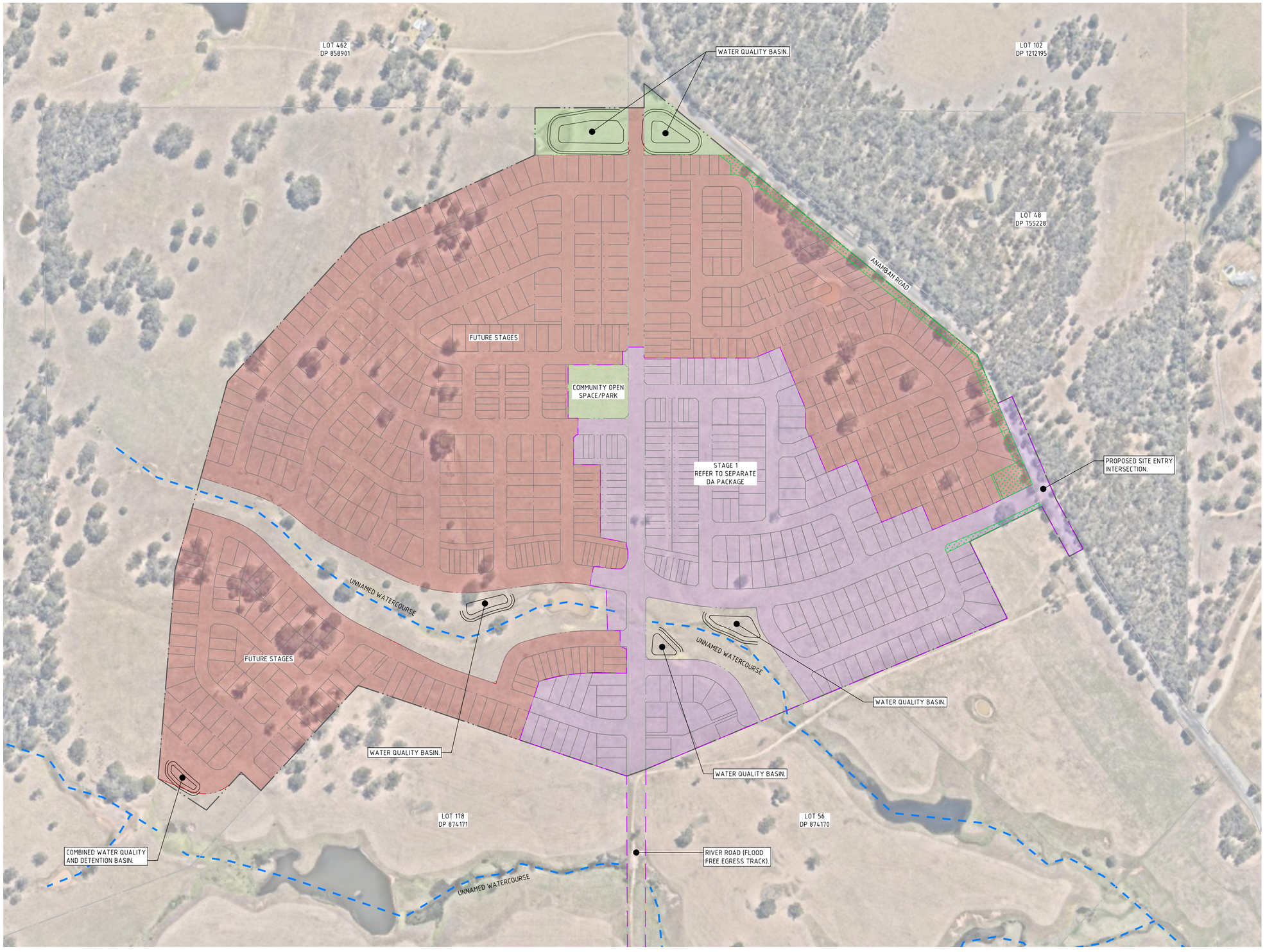
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C01.01

REVISION: C

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:52 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\n\D - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C01.01-COVER.dwg



LEGEND

- SITE BOUNDARY LINE
- EXISTING BOUNDARY LINE
- STAGE 1 WORKS EXTENT
- STAGE 1
- FUTURE STAGE
- OPEN SPACE
- LANDSCAPE SETBACK
- INDICATIVE LINE OF EXISTING WATERCOURSE.

DRAWN: JSTAUB
DESIGNED: A TURNBULL
JOB MANAGER: L MCRAE
VERIFIER: L MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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SCALE 1:2500@ A1

0 25 50 75 100 125m

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PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

STAGING PLAN

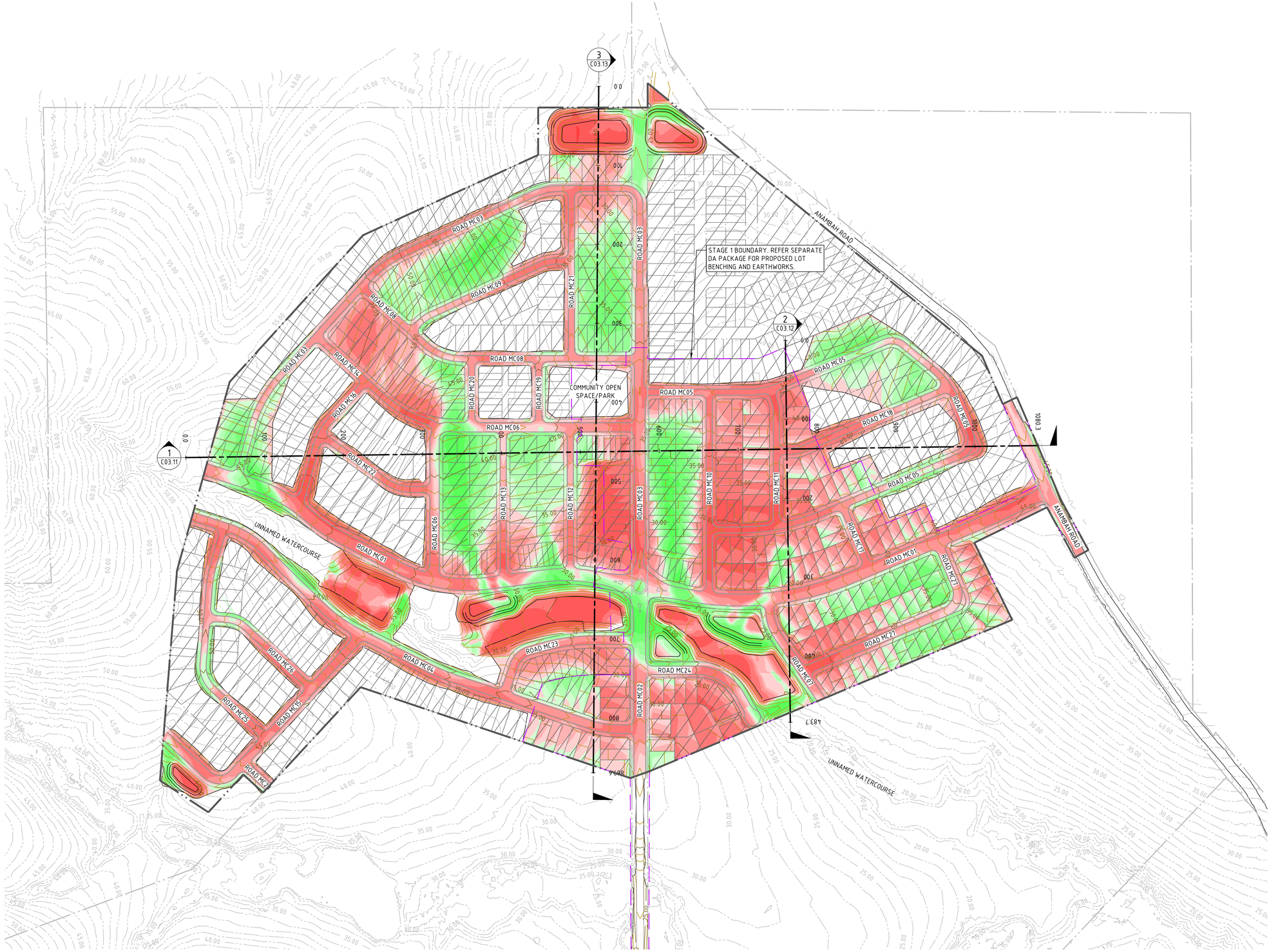
JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C02.01**

REVISION: **C**

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:52 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\02 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C02.01-STAGING PLAN.dwg



LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- STAGE 1 WORKS EXTENT
- LOT RE-GRADING TO BE UNDERTAKEN AT SUBDIVISION WORKS STAGE VIA CONSTRUCTING RETAINING WALLS AND BATTERS. DETAILS TO BE PROVIDED AT SWC STAGE. REFER TO C05.25, TYPICAL LOT SECTIONS FOR STANDARD RESIDENTIAL LOT ARRANGEMENTS.
- DESIGN CONTOURS (1.0m INTERVAL)
- EXISTING CONTOURS (1.0m INTERVAL)
- SECTION MARKER

DEPTH OF CUT

- 999m	TO	- 15.0m
- 15.0m	TO	- 10.0m
- 10.0m	TO	- 5.0m
- 5.0m	TO	- 2.0m
- 2.0m	TO	- 1.0m
- 1.0m	TO	- 0.5m
- 0.5m	TO	- 0.25m
- 0.25m	TO	- 0.0m

DEPTH OF FILL

0.0m	TO	0.25m
0.25m	TO	0.5m
0.5m	TO	1.0m
1.0m	TO	2.0m
2.0m	TO	5.0m
5.0m	TO	10.0m
10.0m	TO	15.0m
15.0m	TO	999m

NOTES

THIS PLAN IS PROVIDED FOR INFORMATION PURPOSES ONLY AND IT IS EXPECTED THAT ADDITIONAL AREAS OF CUT AND FILLING WILL BE REQUIRED BEYOND THE EXTENTS SHOWN ON THIS PLAN. FURTHER LEVELS/DEPTHS OF CUT AND FILL WILL CONTINUE TO BE ALTERED AND THIS WILL BE CONFIRMED AS PART OF THE DETAILED DESIGN PHASE FOR SUBDIVISION WORKS CERTIFICATE PLAN PREPARATION.

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DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:2500@ A1 (0 25 50 75 100 125m)

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PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

CONCEPT BULK EARTHWORKS PLAN

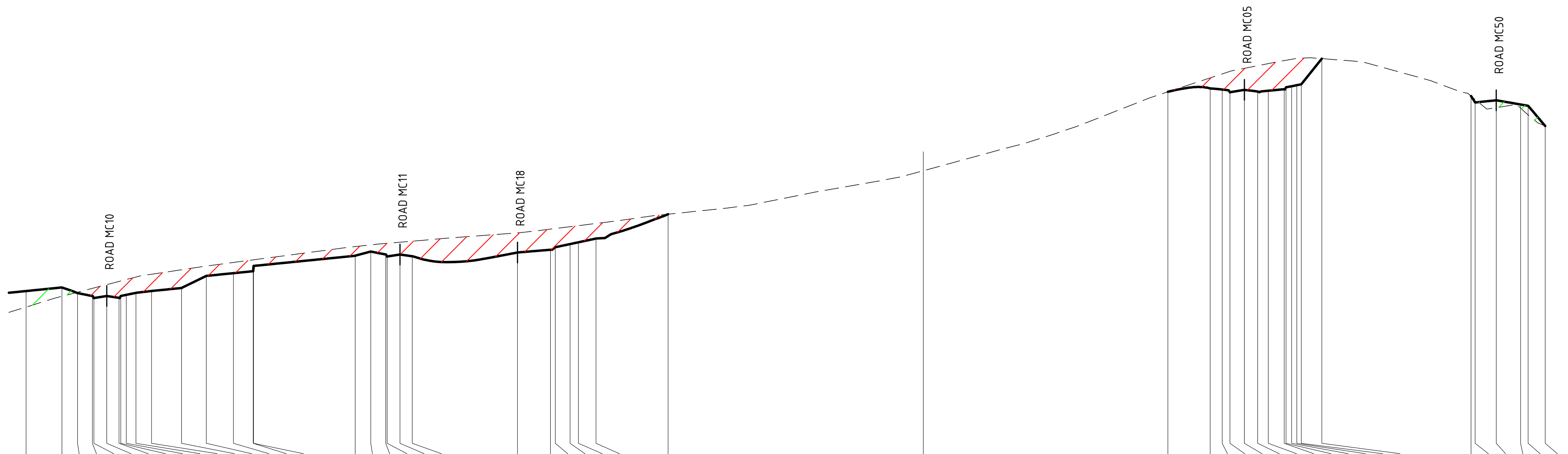
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C03.01

REVISION: C

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:53 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\0 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C03.01-BULK EW.dwg

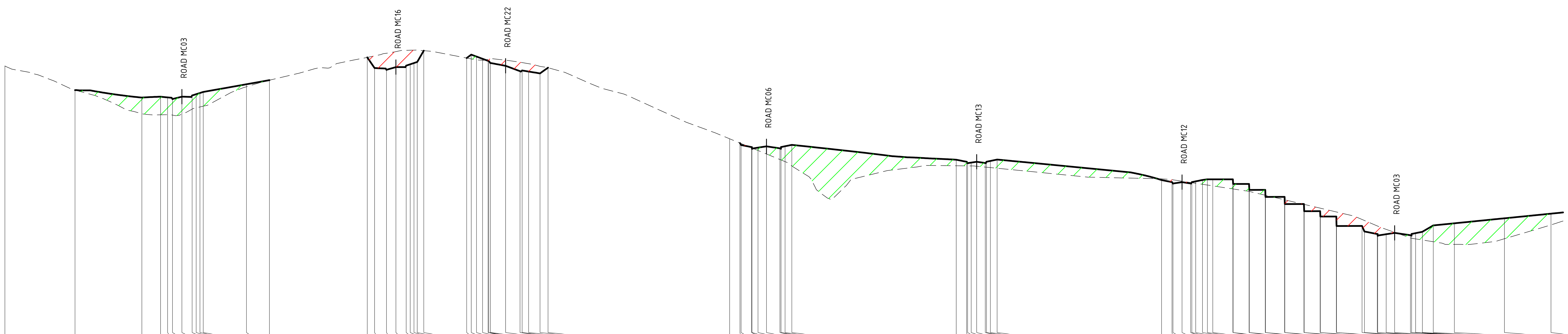


DATUM RL 26.0

FINISHED SURFACE	EXISTING SURFACE	CHAINAGE
35.83	34.897	639.9
36.037	35.524	650.283
35.709	35.76	654.814
35.54	35.984	659.134
35.415	36.006	659.549
35.54	36.201	663.284
35.437	36.385	666.835
35.547	36.413	667.36
35.609	36.496	668.955
35.724	36.642	671.755
35.832	36.803	676.286
36.005	37.063	684.965
36.707	37.278	692.136
36.864	37.486	700
36.979	37.637	705.739
37.284	37.64	705.839
37.873	38.405	735.291
38.119	38.504	739.822
37.949	38.589	744.142
37.824	38.596	744.557
37.948	38.66	748.293
37.843	38.72	751.843
38.064	39.201	782.363
38.223	39.419	791.906
38.372	39.454	793.317
38.552	39.56	797.603
38.655	39.619	800
38.874	39.746	805.126
40.282	40.282	826.025
43.906	42.803	900
47.38	47.38	970.906
47.573	48.186	983.169
47.511	48.415	986.646
47.345	48.564	988.905
47.491	48.738	993.087
47.397	48.89	996.933
47.45	49.011	1000
47.53	49.188	1004.629
47.64	49.207	1005.159
47.702	49.264	1006.764
47.762	49.308	1008.27
47.814	49.324	1009.575
49.301	49.301	1015.525
47.131	47.124	1058.791
46.76	46.931	1059.974
46.887	46.46	1066.095
46.643	46.428	1073.163
46.568	46.038	1075.338
45.398	45.398	1080.278

LONGITUDINAL SECTION ALONG 1

HORIZONTAL SCALE 1:1000@A1
VERTICAL SCALE 1:200@A1



DATUM RL 25.0

FINISHED SURFACE	EXISTING SURFACE	CHAINAGE
48.051	48.051	0
46.049	46.049	29.031
45.433	44.101	56.701
45.507	44.008	64.425
45.449	44.019	67.344
45.304	43.985	69.361
45.509	44.058	73.255
45.612	44.48	77.503
45.714	44.586	79.166
45.813	44.657	80.729
45.9	44.717	82.084
46.536	46.332	100
46.875	46.875	109.511
48.759	48.759	149.998
47.877	48.882	153.033
47.723	49.099	157.969
47.956	49.234	161.863
48.08	49.344	166.111
48.187	49.353	167.773
48.29	49.361	169.337
48.38	49.361	170.692
49.314	49.314	173.382
48.704	48.704	191.153
48.987	48.631	193.029
48.828	48.546	195.214
48.64	48.525	197.736
48.468	48.597	200
48.446	48.609	200.29
48.284	48.638	200.988
48.06	48.531	207.265
47.617	48.36	213.232
47.678	48.329	214.114
47.588	48.236	216.795
47.435	48.019	221.501
47.906	47.906	224.814
42.007	42.023	300
41.673	41.673	304.257
41.509	41.632	304.75
41.338	41.276	309.07
41.189	41.261	309.25
41.292	41.056	311.75
41.399	40.767	315.251
41.235	40.31	320.801
41.346	40.271	321.281
41.407	40.133	322.951
41.521	39.77	325.752
40.293	39.792	393.788
40.123	39.782	398.109
39.998	39.782	398.524
40.048	39.78	400
40.123	39.754	402.259
40.019	39.685	405.809
40.129	39.674	406.334
40.191	39.643	407.93
40.305	39.588	410.73
38.611	38.71	478.796
38.44	38.642	483.117
38.315	38.629	483.532
38.438	38.516	487.267
38.333	38.408	490.818
38.443	38.392	491.343
38.505	38.343	492.938
38.618	38.258	495.738
38.669	38.197	497.768
38.67	38.13	500
38.672	37.878	508.319
38.287	37.875	508.419
38.289	37.676	515.02
37.797	37.671	515.12
37.799	37.356	521.721
37.217	37.351	521.821
37.219	36.978	529.721
36.626	36.973	529.821
36.629	36.603	537.722
36.036	36.598	537.822
36.037	36.288	544.423
35.592	36.284	544.523
35.594	35.974	551.123
34.81	35.97	551.223
34.813	35.352	561.775
34.357	35.267	562.767
34.147	34.813	568.088
33.998	34.798	568.268
34.131	34.533	571.768
34.239	34.288	575.268
34.047	33.829	581.819
34.157	33.798	582.299
34.219	33.744	583.969
34.333	33.653	586.769
34.858	33.507	591.277
35.033	33.291	600
35.447	33.756	620.73
35.832	34.903	640

LONGITUDINAL SECTION ALONG 1

HORIZONTAL SCALE 1:1000@A1
VERTICAL SCALE 1:200@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	15.08.24
B	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:1000@A1 (0 10 20 30 40 50m)
SCALE 1:200@A1 (0 2 4 6 8 10m)

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PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320 — MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE — BULK EARTHWORKS SITE SECTIONS - SHEET 1

JOB NUMBER: NL222055-01

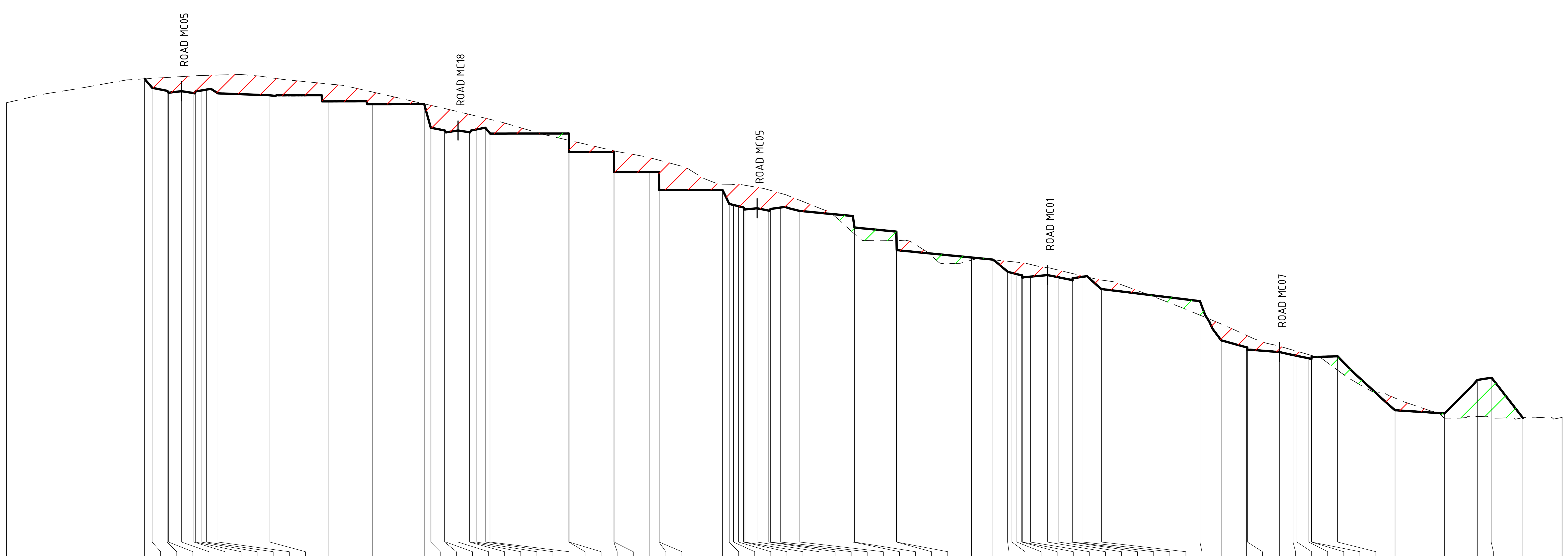
DRAWING NUMBER: MP-C03.11

REVISION: B

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:53 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C03.01-BULK EW.dwg

VERIFIER: L.MCRAE
JOB MANAGER: L.MCRAE
DESIGNED: A.TURNBULL
DRAWN: J.STAUB



DATUM RL 11.0

CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
0	39.315	39.315
42.922	40.801	40.801
45.285	40.244	40.829
49.942	40.054	40.885
50.389	39.927	40.891
54.415	40.033	40.939
58.241	39.913	40.986
58.807	40.02	40.993
60.527	40.075	41.008
62.144	40.129	41.017
65.733	39.898	41.036
81.868	39.777	40.88
100	39.464	40.485
113.855	39.225	39.979
129.868	39.229	39.246
131.898	37.763	39.153
136.218	37.59	38.955
136.633	37.465	38.936
140.369	37.587	38.76
143.919	37.48	38.589
144.444	37.59	38.564
146.039	37.651	38.487
148.839	37.763	38.352
150.37	37.396	38.278
174.822	37.403	36.978
174.922	36.244	36.973
188.823	36.245	36.328
188.923	34.994	36.323
200	34.995	35.892
202.824	34.996	35.746
202.924	33.888	35.741
222.621	33.89	34.212
224.693	33.024	34.217
226.025	32.957	34.235
227.561	32.88	34.253
229.117	32.802	34.199
229.541	32.672	34.184
233.363	32.752	34.053
236.993	32.608	33.893
237.529	32.712	33.863
240.692	32.801	33.683
246.654	32.589	33.246
263.131	32.27	31.248
263.658	31.555	31.152
276.657	31.301	30.748
276.758	30.15	30.748
300	29.695	29.526
306.664	29.565	29.551
311.261	28.802	29.459
312.579	28.735	29.433
314.1	28.658	29.402
315.64	28.58	29.371
315.823	28.428	29.367
318.356	28.502	29.261
323.624	28.6	29.056
327.169	28.457	28.901
330.966	28.304	28.72
331.452	28.409	28.697
334.661	28.496	28.544
340.439	27.73	28.288
371.064	26.977	26.108
377.673	24.542	25.56
385.487	24.108	24.855
385.812	23.948	24.825
395.761	23.815	24.172
400	23.629	23.931
401.188	23.577	23.864
404.896	23.429	23.653
405.71	23.371	23.605
405.764	23.52	23.602
413.85	23.552	22.685
431.74	20.186	20.95
447.114	19.992	19.703
457.29	22.079	19.806
461.603	22.216	19.755
471.459	19.723	19.732
483.691	19.753	19.753

LONGITUDINAL SECTION ALONG 2

HORIZONTAL SCALE 1:1000@A1
VERTICAL SCALE 1:200@A1

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SCALE 1:1000@A1 0 10 20 30 40 50m
SCALE 1:200@A1 0 2 4 6 8 10m

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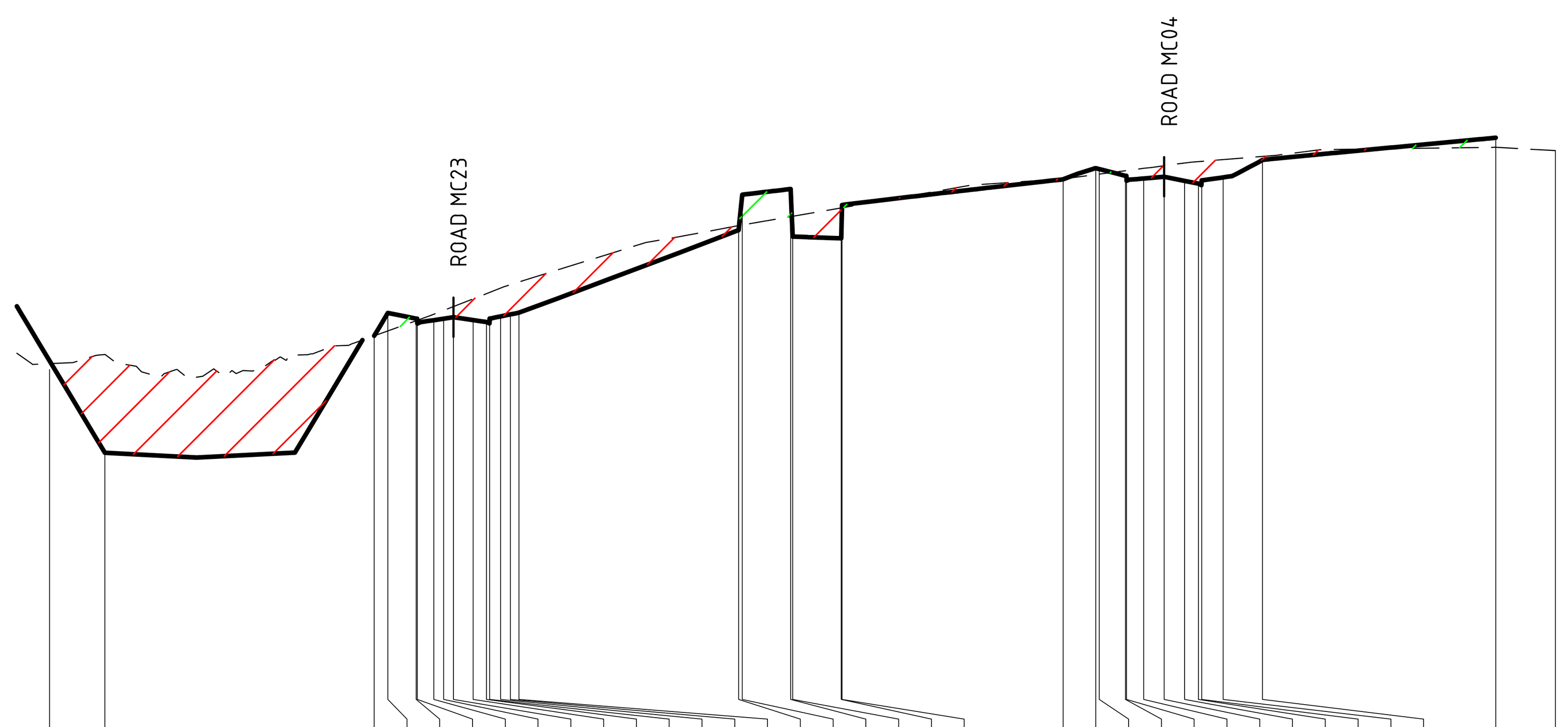
PROJECT
PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320
MASTERPLANNING DA

DRAWING TITLE
CIVIL ENGINEERING PACKAGE
BULK EARTHWORKS SITE SECTIONS - SHEET 2

JOB NUMBER NL222055-01
DRAWING NUMBER MP-C03.12
REVISION B
DRAWING SHEET SIZE = A1

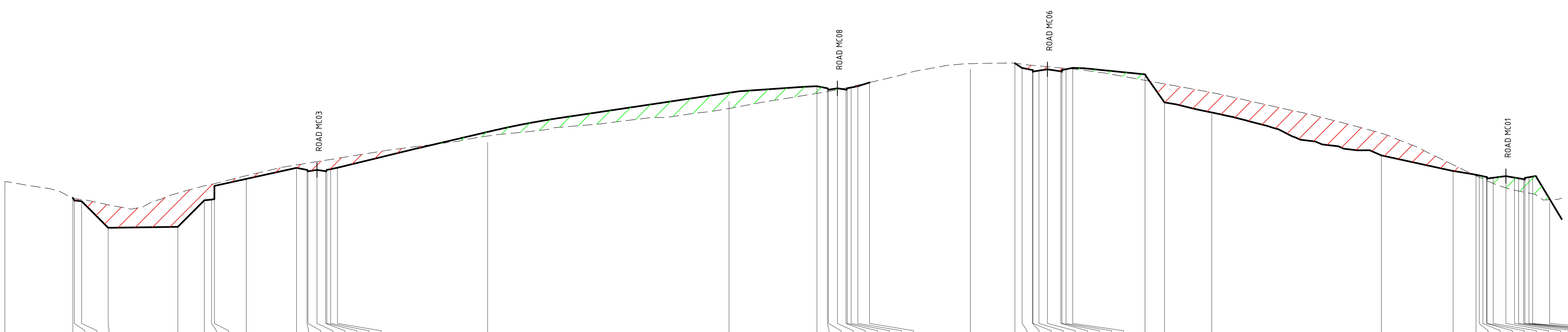
Date: 22.08.2024 4:53 PM Plotted By: ANDREW KILLEN



DATUM RL 16.0

CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
639.9	27.058	27.236
648.344	24.518	27.513
689.411	28.085	28.085
691.495	28.78	28.235
695.815	28.61	28.547
695.995	28.46	28.56
698.495	28.562	28.742
700	28.608	28.859
701.496	28.654	28.976
704.496	28.565	29.211
706.546	28.505	29.371
707.026	28.615	29.409
708.696	28.677	29.54
710.196	28.737	29.642
711.496	28.79	29.724
745.007	31.31	31.447
745.553	32.387	31.466
752.925	32.561	31.719
753.245	31.11	31.73
760.664	31.056	31.985
760.764	32.072	31.988
794.487	32.854	32.872
799.477	33.197	32.999
800	33.17	33.013
803.991	32.964	33.117
804.179	32.811	33.122
806.783	32.88	33.191
809.902	32.933	33.269
813.014	32.808	33.353
815.137	32.724	33.396
815.634	32.828	33.404
818.911	32.916	33.457
824.907	33.449	33.555
860.486	34.122	33.831
869.576	33.731	33.731

LONGITUDINAL SECTION ALONG 3
HORIZONTAL SCALE 1:1000@A1
VERTICAL SCALE 1:200@A1



DATUM RL 16.0

CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
0	28.738	28.738
28.14	27.387	27.353
28.786	27.172	27.334
31.786	27.112	27.249
42.787	24.914	26.814
71.633	24.991	27.783
82.633	27.19	28.381
85.633	27.25	28.51
86.799	28.381	28.564
100	28.96	29.228
120.83	29.874	30.114
125.15	29.703	30.254
125.565	29.579	30.267
129.301	29.702	30.388
132.851	29.597	30.502
133.376	29.707	30.519
134.971	29.769	30.571
137.771	29.882	30.661
200	31.995	32.507
300	35.391	34.786
336.441	36.628	36.041
340.761	36.456	36.193
341.176	36.331	36.207
344.911	36.454	36.338
348.462	36.348	36.49
348.987	36.458	36.514
350.582	36.519	36.588
353.382	36.632	36.716
358.223	36.939	36.939
400	38.041	38.492
418.454	38.528	38.528
421.414	38.14	38.455
425.734	37.969	38.356
425.914	37.819	38.353
428.414	37.921	38.307
431.914	38.028	38.244
437.464	37.864	38.142
437.944	37.974	38.133
439.614	38.035	38.103
442.415	38.148	38.052
472.366	37.609	37.113
480.416	35.288	36.822
500	34.332	36.102
570.281	30.904	32.731
600	29.691	30.13
609.494	29.303	29.208
610.812	29.246	29.092
612.332	29.18	28.958
613.874	29.114	28.821
614.056	28.963	28.805
616.592	29.054	28.581
621.868	29.188	28.214
625.422	29.067	28.018
627.149	29.009	27.951
629.232	28.938	27.869
629.719	29.045	27.85
631.417	29.098	27.783
632.942	29.151	27.725
640	27.028	27.237

LONGITUDINAL SECTION ALONG 3
HORIZONTAL SCALE 1:1000@A1
VERTICAL SCALE 1:200@A1

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DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE
DRAWN: J.STAUB

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	15.08.24
B	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:1000@A1 — 0 10 20 30 40 50m
SCALE 1:200@A1 — 0 2 4 6 8 10m

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ABN 81 094 433 100

PROJECT: PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320

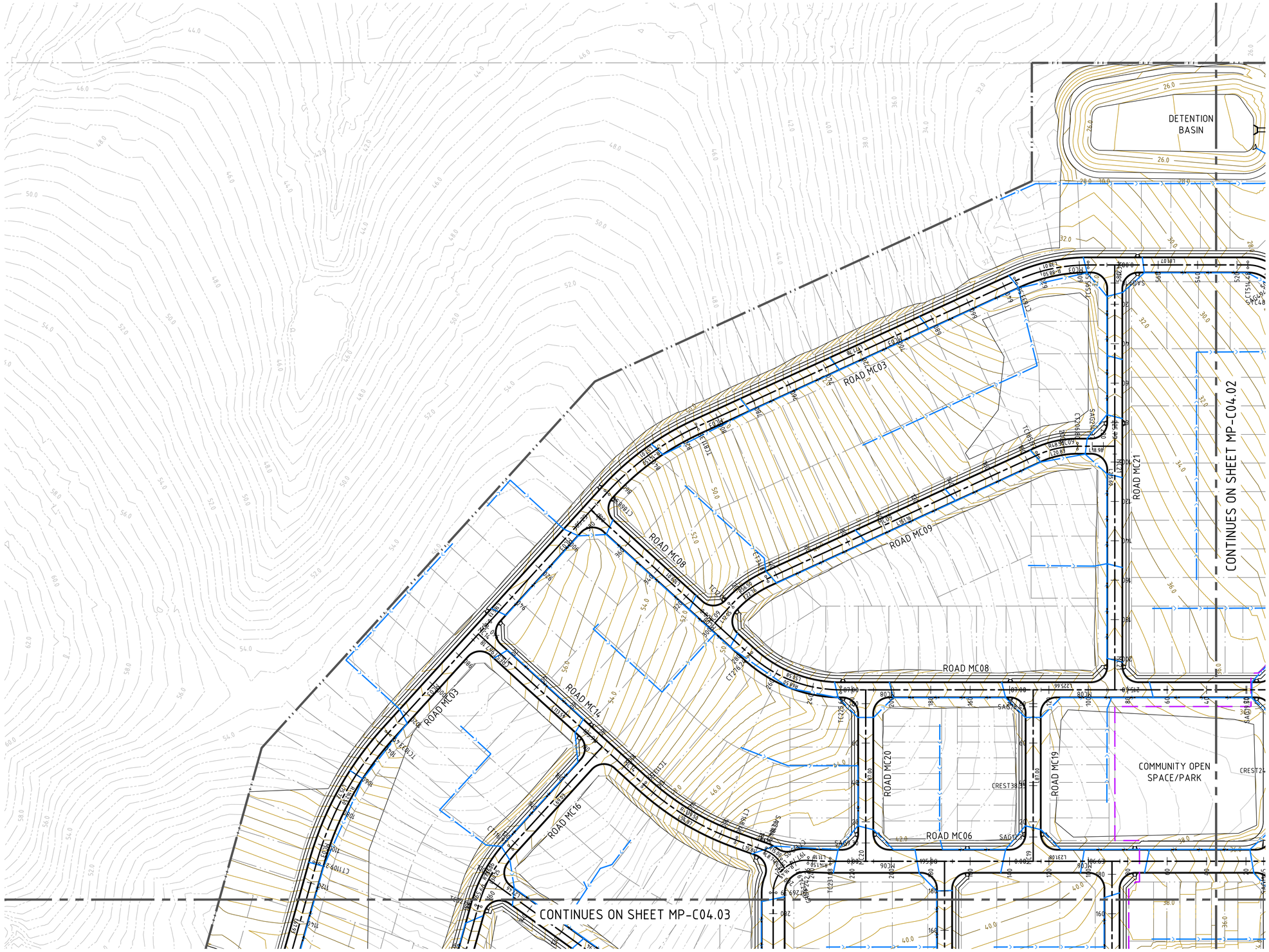
MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

BULK EARTHWORKS SITE SECTIONS - SHEET 3

JOB NUMBER: NL222055-01
DRAWING NUMBER: MP-C03.13
REVISION: B
DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:53 PM Plotted By: ANDREW KILLEN Found: O:\6 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\03 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C03.01-BULK EW.dwg



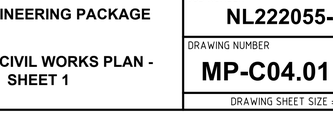
LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- STAGE BOUNDARY LINE
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER OUTLET WITH SCOUR PROTECTION
- DESIGN CONTOURS (0.5m INTERVALS)
- EXISTING CONTOURS (0.5m INTERVALS)
- LANDSCAPE SETBACK

NOTES

1. REFER TO DRAWING MP-C05.01 FOR FOOTPATH AND SHARED PATH LAYOUTS.
2. REQUIRED RETAINING WALLS TO MAITLAND CITY COUNCIL REQUIREMENTS ON LOT BOUNDARIES NOT SHOWN. DETAILS TO BE PROVIDED AT SWC STAGE.
3. INDICATIVE LOT GRADING SHOWN ONLY. SUBJECT TO DETAILED DESIGN AT SUBDIVISION WORKS CERTIFICATE STAGE.

KEYPLAN



DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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0 10 20 30 40 50m

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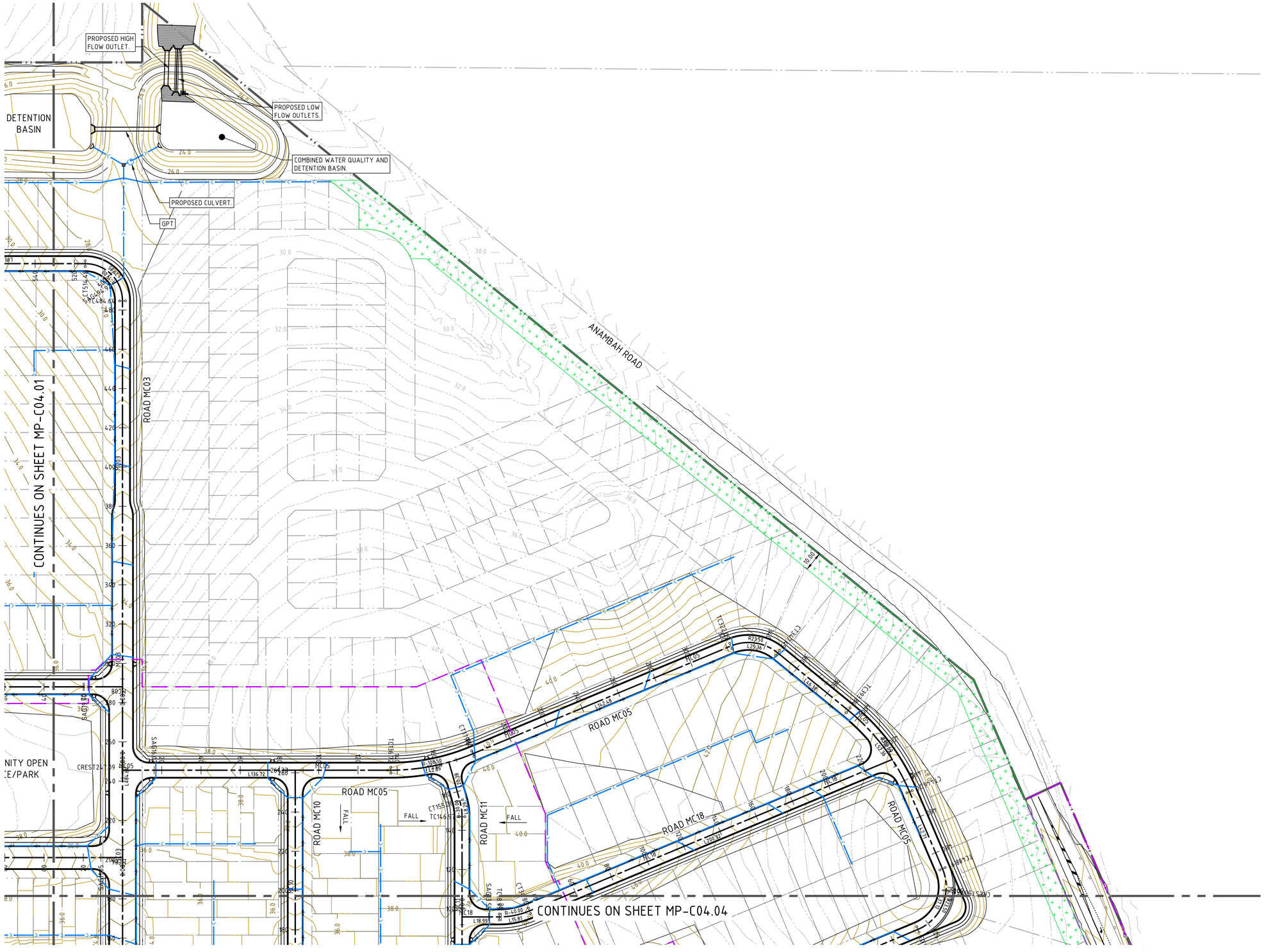
PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320
MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
CONCEPT CIVIL WORKS PLAN - SHEET 1

JOB NUMBER: NL222055-01
DRAWING NUMBER: MP-C04.01
REVISION: C
DRAWING SHEET SIZE = A1

Date: 22.08.2024 5:02 PM Plotted By: ANDREW KILLEN Found: O:\S Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C04.01-CIVIL WORKS.dwg



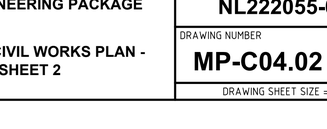
LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- STAGE BOUNDARY LINE
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER OUTLET WITH SCOUR PROTECTION
- DESIGN CONTOURS (0.5m INTERVALS)
- EXISTING CONTOURS (0.5m INTERVALS)
- LANDSCAPE SETBACK

NOTES

1. REFER TO DRAWING MP-C05.01 FOR FOOTPATH AND SHARED PATH LAYOUTS.
2. REQUIRED RETAINING WALLS TO MAITLAND CITY COUNCIL REQUIREMENTS ON LOT BOUNDARIES NOT SHOWN. DETAILS TO BE PROVIDED AT SWC STAGE.
3. INDICATIVE LOT GRADING SHOWN ONLY. SUBJECT TO DETAILED DESIGN AT SUBDIVISION WORKS CERTIFICATE STAGE.

KEYPLAN



DESIGNED: A.TURNBULL
DRAWN: J.STAUB
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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SCALE 1:1000 @ A1

0 10 20 30 40 50m

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PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

CONCEPT CIVIL WORKS PLAN - SHEET 2

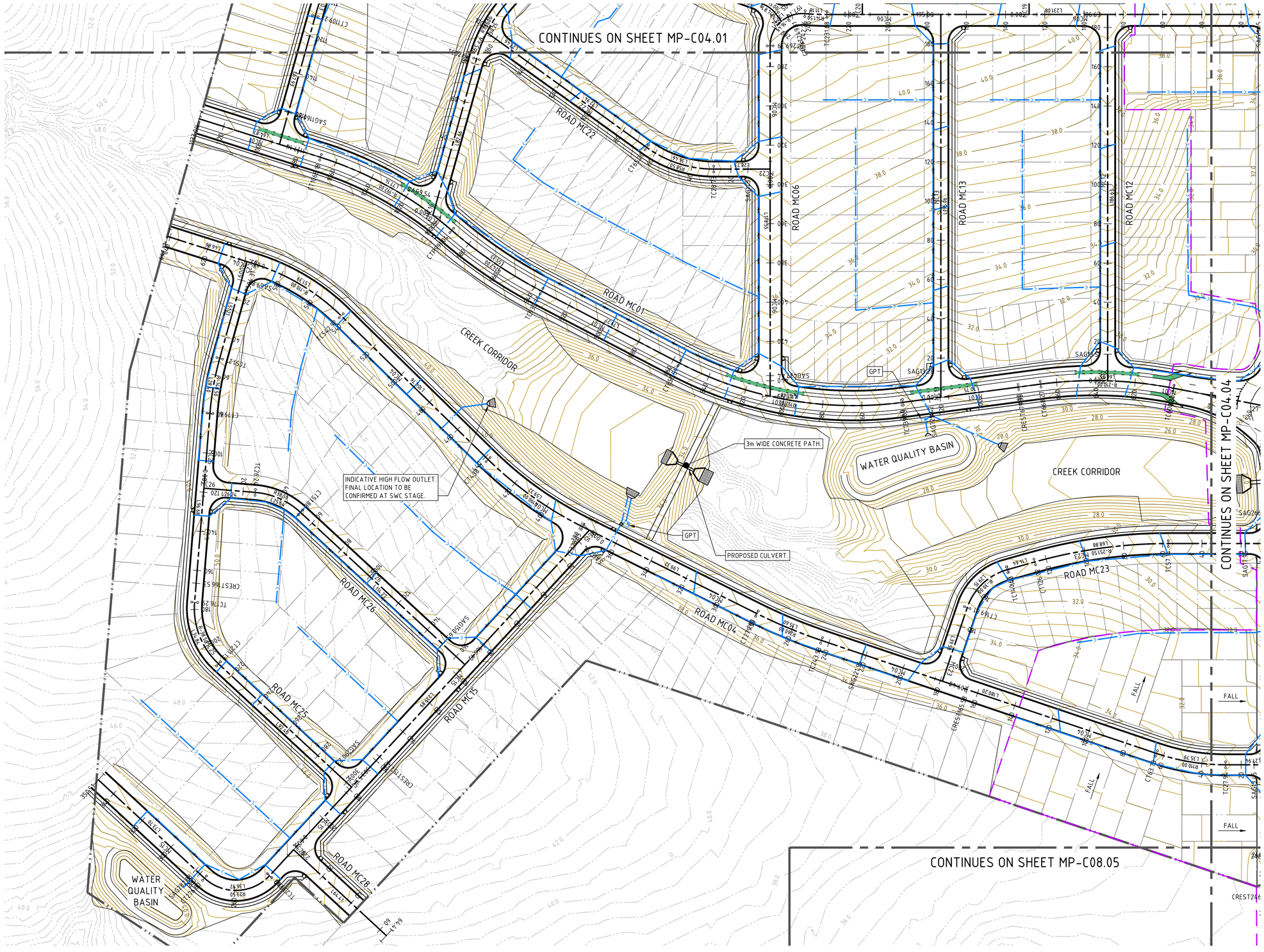
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C04.02

REVISION: C

DRAWING SHEET SIZE = A1

Date: 22.08.2024 5:02 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING_222055-01-MP-C04.01-CIVIL WORKS.dwg



LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- STAGE BOUNDARY LINE
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER OUTLET WITH SCOUR PROTECTION
- DESIGN CONTOURS (0.5m INTERVALS)
- EXISTING CONTOURS (0.5m INTERVALS)
- LANDSCAPE SETBACK

NOTES

1. REFER TO DRAWING MP-C05.01 FOR FOOTPATH AND SHARED PATH LAYOUTS.
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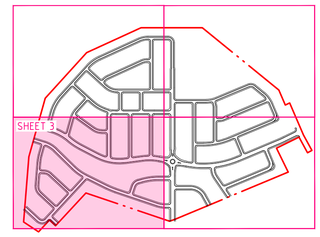
3. INDICATIVE LOT GRADING SHOWN ONLY. SUBJECT TO DETAILED DESIGN AT SUBDIVISION WORKS CERTIFICATE STAGE.

KEYPLAN



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DESIGNED: A.TURNBULL
DRAWN: JSTAUB
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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DRAWING TITLE: CIVIL ENGINEERING PACKAGE

CONCEPT CIVIL WORKS PLAN - SHEET 3

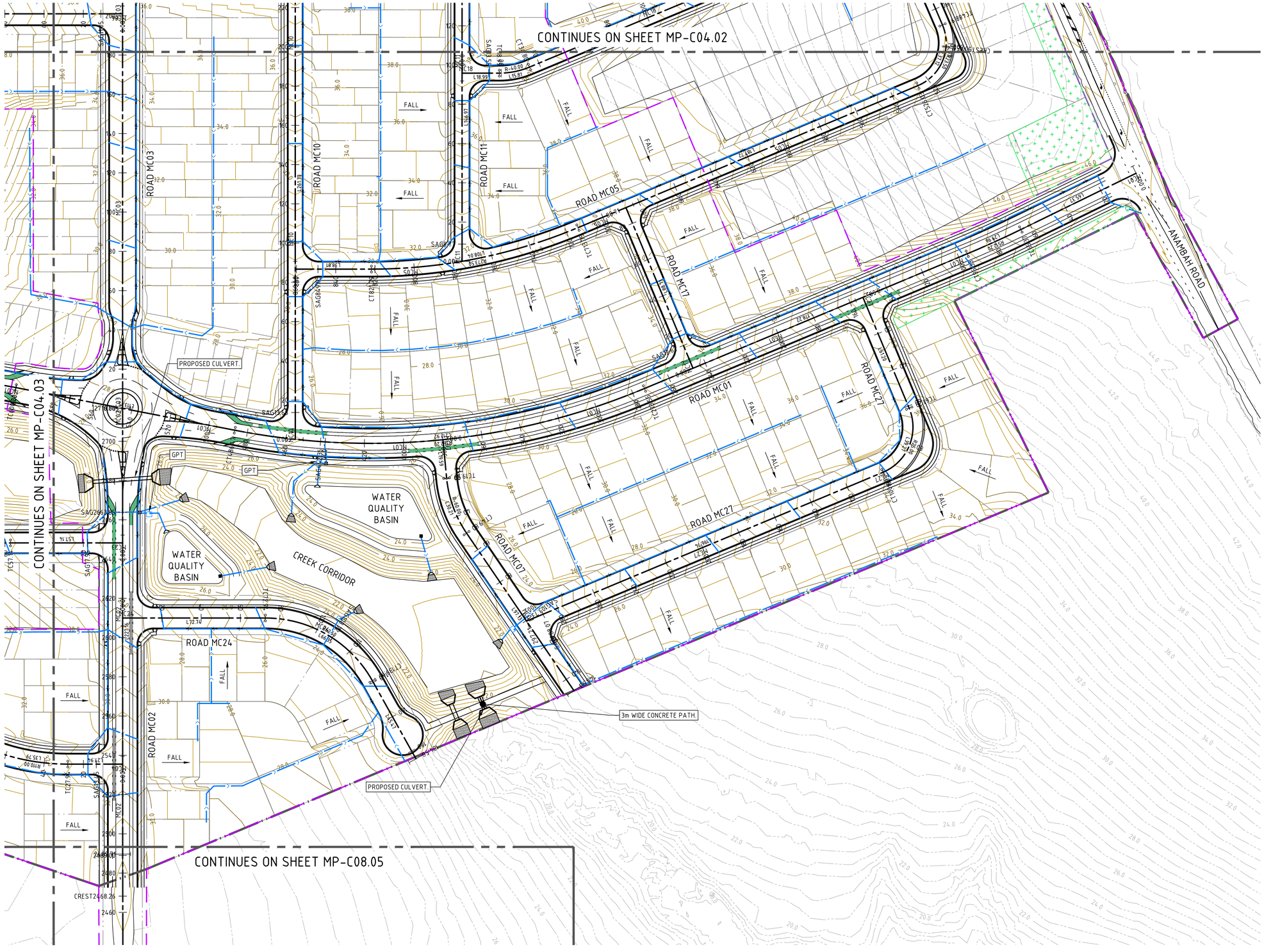
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C04.03

REVISION: C

DRAWING SHEET SIZE = A1

Date : 22.08.2024 5:02 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\HO - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C04.01-CIVIL WORKS.dwg



LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- STAGE BOUNDARY LINE
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER OUTLET WITH SCOUR PROTECTION
- DESIGN CONTOURS (0.5m INTERVALS)
- EXISTING CONTOURS (0.5m INTERVALS)
- LANDSCAPE SETBACK

NOTES

1. REFER TO DRAWING MP-C05.01 FOR FOOTPATH AND SHARED PATH LAYOUTS.
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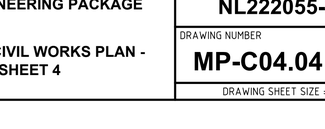
3. INDICATIVE LOT GRADING SHOWN ONLY. SUBJECT TO DETAILED DESIGN AT SUBDIVISION WORKS CERTIFICATE STAGE.

KEYPLAN



DESIGNED: A.TURNBULL
DRAWN: J.STAUB
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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DRAWING TITLE: CIVIL ENGINEERING PACKAGE

CONCEPT CIVIL WORKS PLAN - SHEET 4

JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C04.04

REVISION: C

DRAWING SHEET SIZE = A1

Date: 22.08.2024 5:02 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING_222055-01-MP-C04.01-CIVIL WORKS.dwg

LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- STAGE 1 WORKS EXTENT
- 1.5m WIDE FOOTPATH
- 2.5m WIDE SHARED PATH
- PROPOSED ON ROAD BIKE LANE

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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D	DRAFT ISSUE	JS		AK	09.08.24
E	DRAFT ISSUE	JS		AK	15.08.24
F	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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COUNCIL
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SCALE 1:2000@ A1
0 20 40 60 80 100m

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PROJECT
PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE
CIVIL ENGINEERING PACKAGE

FOOTPATH AND SHARED PATH PLAN

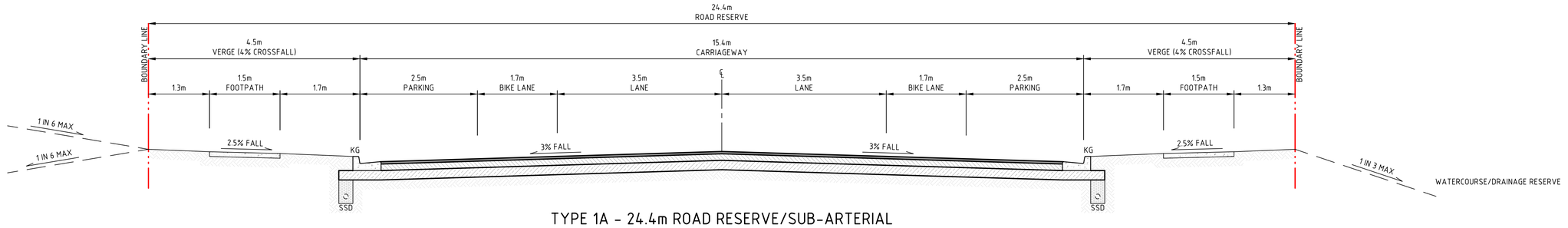
JOB NUMBER
NL222055-01

DRAWING NUMBER
MP-C05.01

REVISION
F

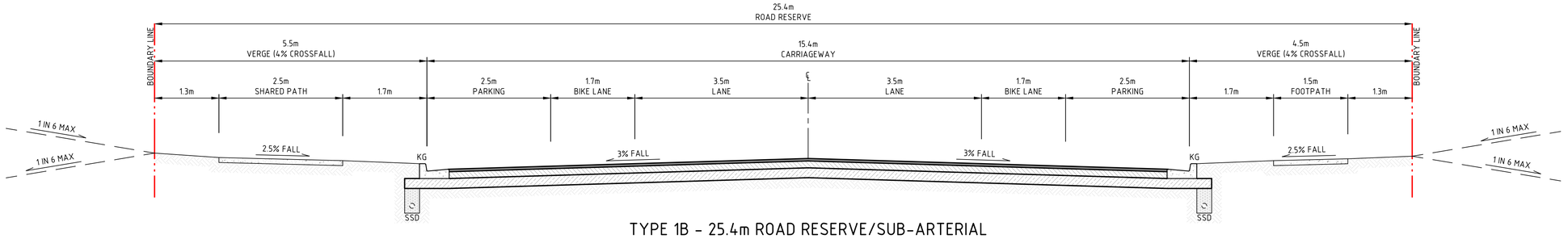
DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:54 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.01-PATH PLAN.dwg



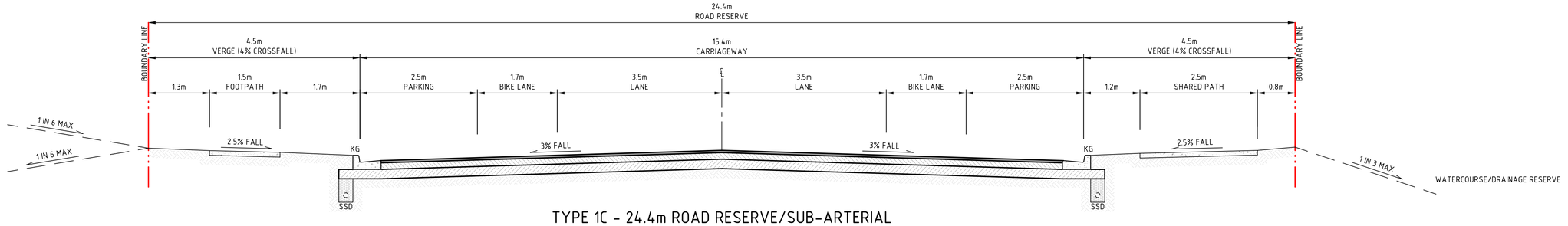
TYPE 1A - 24.4m ROAD RESERVE/SUB-ARTERIAL

SECTION 1A C05.01
SCALE 1:50



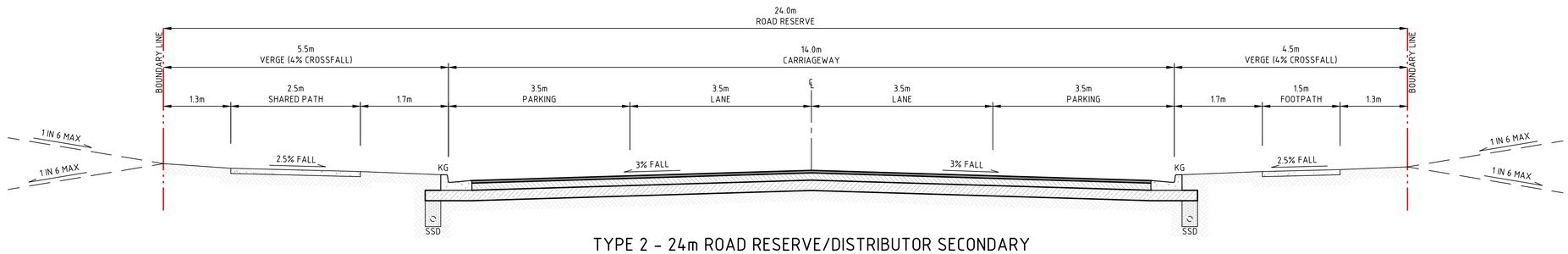
TYPE 1B - 25.4m ROAD RESERVE/SUB-ARTERIAL

SECTION 1B C05.01
SCALE 1:50



TYPE 1C - 24.4m ROAD RESERVE/SUB-ARTERIAL

SECTION 1C C05.01
SCALE 1:50



TYPE 2 - 24m ROAD RESERVE/DISTRIBUTOR SECONDARY

SECTION 2 C05.01
SCALE 1:50

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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C	DRAFT ISSUE	JS		AK	06.08.24
D	DRAFT ISSUE	JS		AK	09.08.24
E	DRAFT ISSUE	JS		AK	15.08.24
F	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:50@A1 — 0 0.5 1 1.5 2 2.5m

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ABN 81 094 433 100

PROJECT: PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD TYPICAL SECTIONS - SHEET 1

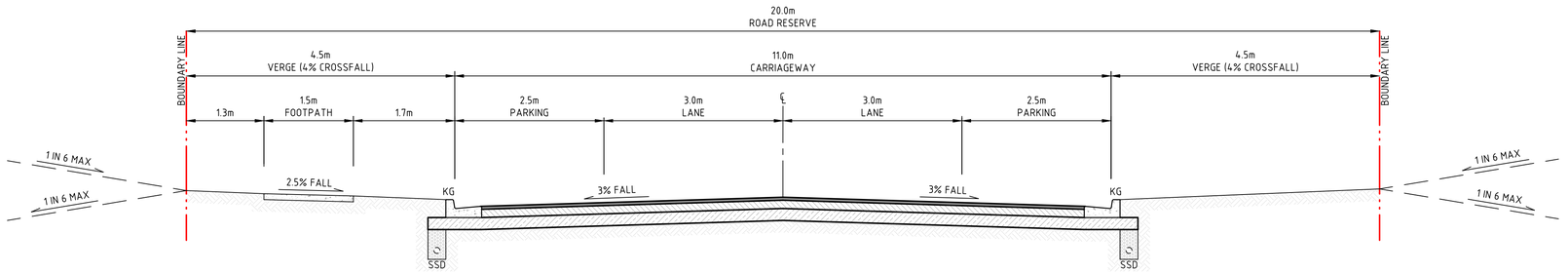
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.21

REVISION: F

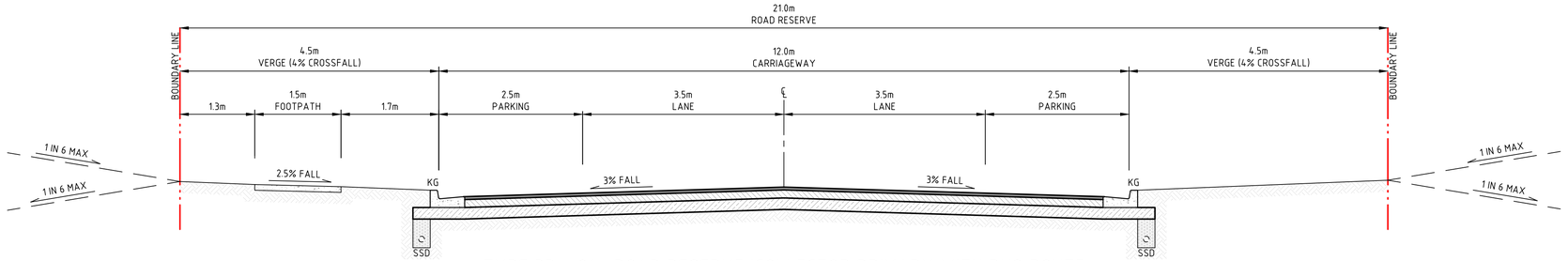
DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:54 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\D - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.21-TYPICAL SECTIONS.dwg



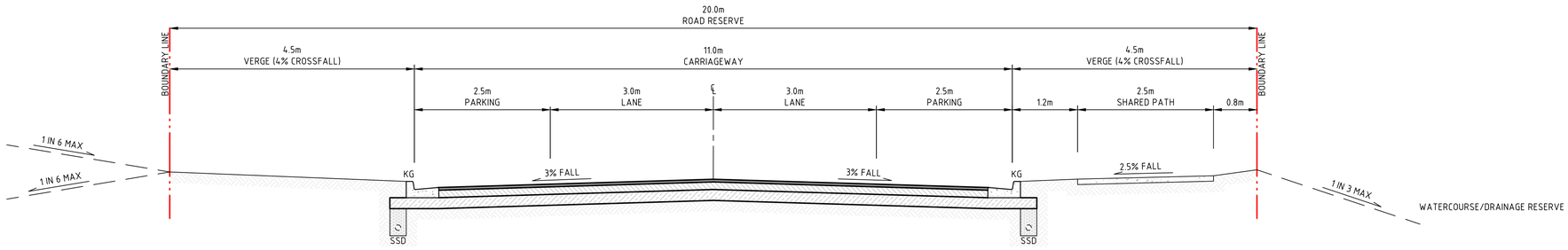
TYPE 3A – 20m ROAD RESERVE/COLLECTOR PRIMARY WITHOUT BUS ROUTE

SECTION 3A C05.01
SCALE 1:50



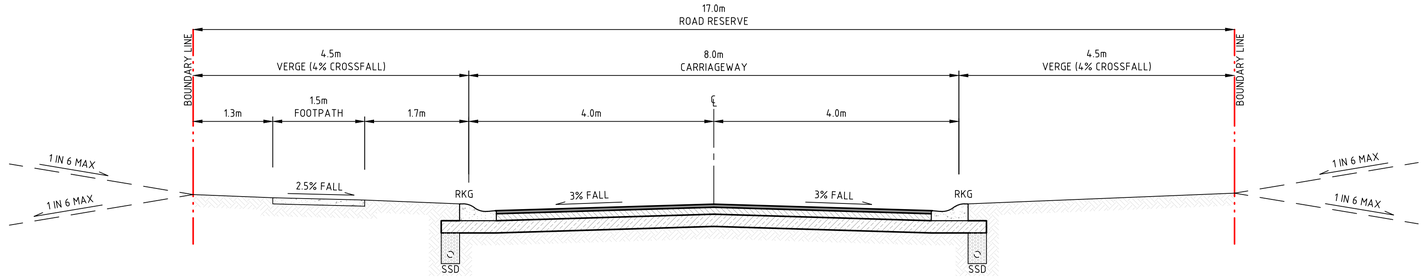
TYPE 3B – 21m ROAD RESERVE/COLLECTOR PRIMARY WITH BUS ROUTE

SECTION 3B C05.01
SCALE 1:50



TYPE 3C – 20m ROAD RESERVE/COLLECTOR PRIMARY WITHOUT BUS ROUTE

SECTION 3C C05.01
SCALE 1:50



TYPE 4 – 17m ROAD RESERVE – PARKING ON ONE SIDE ONLY – PLANNING FOR BUSH FIRE PROTECTION (NOVEMBER 2019)

SECTION 4 C05.01
SCALE 1:50

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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A	DRAFT ISSUE	JS		AK	25.07.24
B	DRAFT ISSUE	JS		AK	02.08.24
C	DRAFT ISSUE	JS		AK	06.08.24
D	DRAFT ISSUE	JS		AK	09.08.24
E	DRAFT ISSUE	JS		AK	15.08.24
F	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:50@ A1 — 0 0.5 1 1.5 2 2.5m

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ABN 81 094 433 100

PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD TYPICAL SECTIONS - SHEET 2

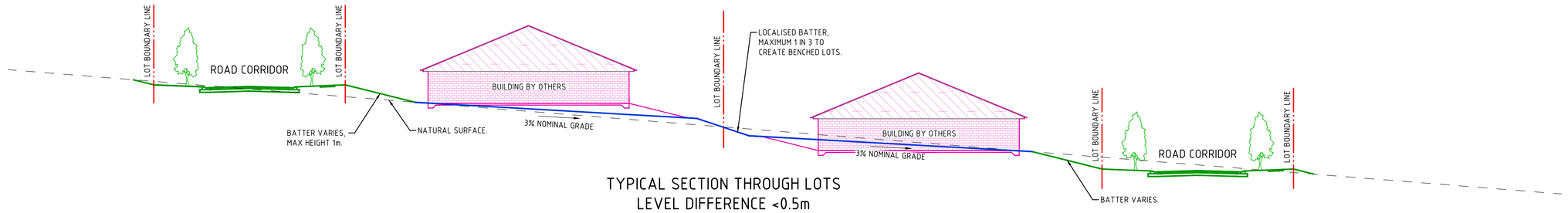
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.22

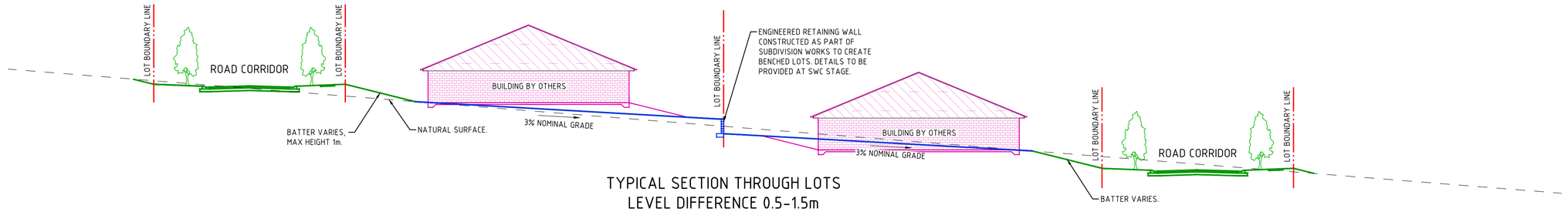
REVISION: F

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:54 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.21-TYPICAL SECTIONS.dwg



TYPICAL SECTION THROUGH LOTS
LEVEL DIFFERENCE <0.5m



TYPICAL SECTION THROUGH LOTS
LEVEL DIFFERENCE 0.5-1.5m

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	15.08.24
B	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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PROJECT
PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320

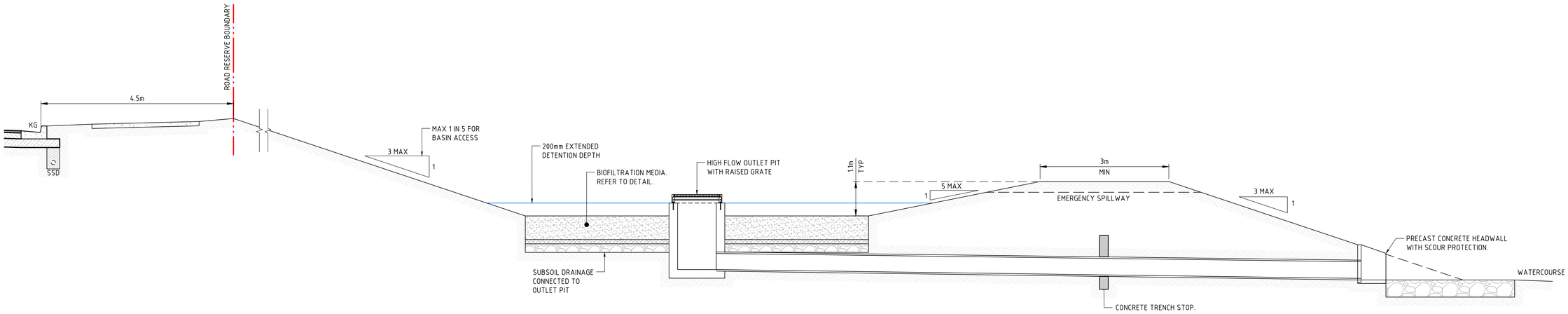
MASTERPLANNING DA

DRAWING TITLE
CIVIL ENGINEERING PACKAGE

TYPICAL SECTIONS THROUGH LOTS

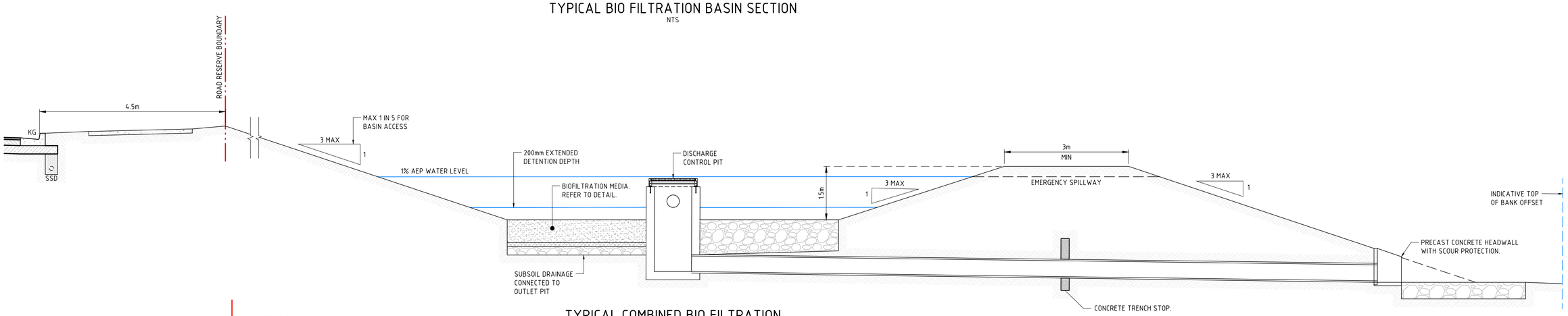
JOB NUMBER: **NL222055-01**
DRAWING NUMBER: **MP-C05.25**
REVISION: **B**
DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:54 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\0 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.25-TYPICAL DETAILS.dwg



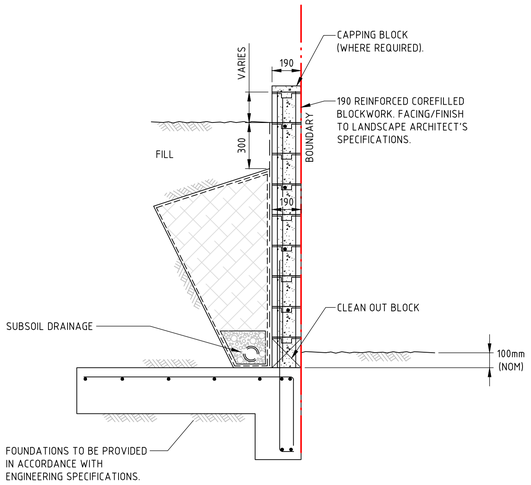
TYPICAL BIO FILTRATION BASIN SECTION

NTS



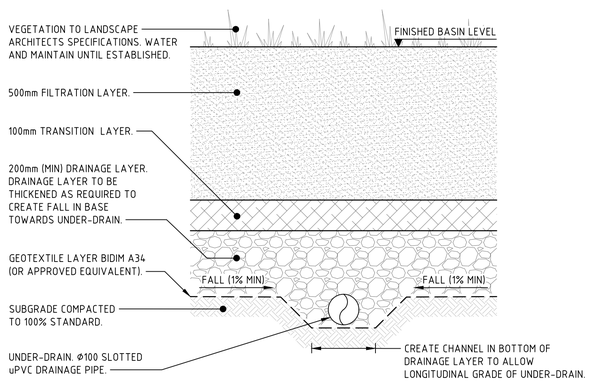
TYPICAL COMBINED BIO FILTRATION AND DETENTION BASIN SECTION

NTS



TYPICAL RETAINING WALL UP TO 1.5m HEIGHT

BLOCKWORK RETAINING WALL OPTION SHOWN. FINAL WALL TYPE AND STRUCTURAL DETAILING TO BE CONFIRMED AT SWC STAGE.



BIOFILTRATION MEDIA DETAIL

DESIGNED: A.TURNBULL
DRAWN: J.STAUB
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

TYPICAL CIVIL DETAILS

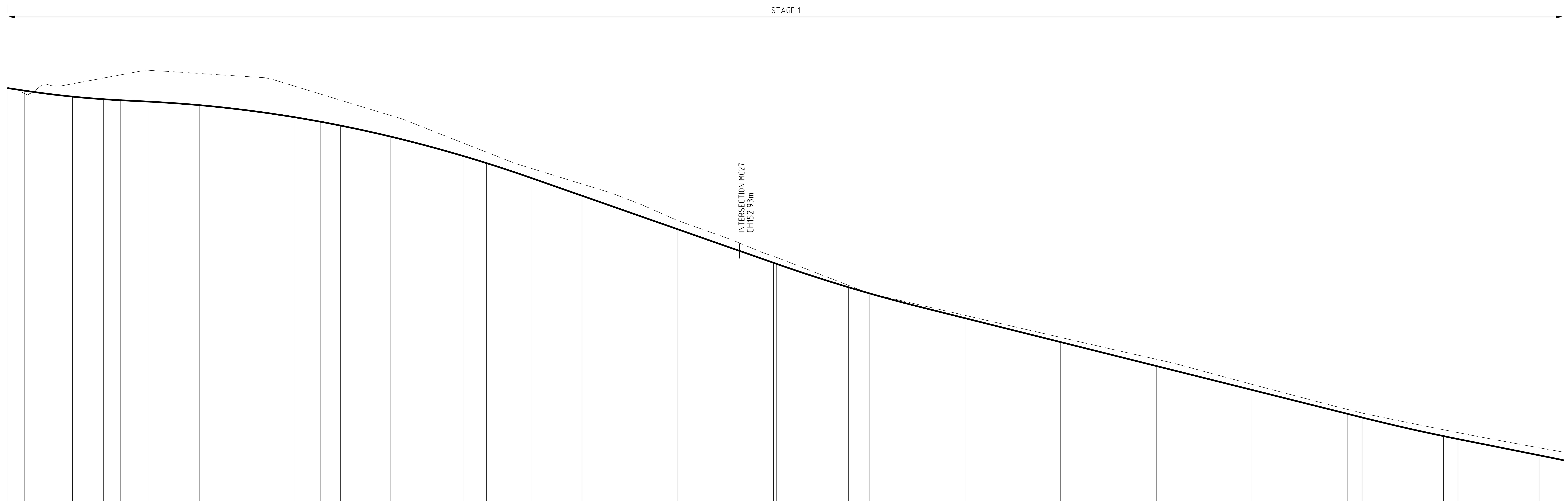
JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.26**

REVISION: **B**

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:54 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.25-TYPICAL DETAILS.dwg



DESIGN GRADELINE: -3.000% | -1.000% | -7.000% | -5.000% | -4.000%

VERTICAL GEOMETRY: 20.00m V.C. | 80.00m V.C. | 30.00m V.C. | 20.00m V.C.

HORIZONTAL GEOMETRY: 512.2m RAD | 362.2m RAD

DATUM RL 25.0

FINISHED SURFACE	45.766	45.661	45.411	45.302	45.261	45.201	45.055	44.548	44.36	44.201	43.74	42.919	42.633	42.001	41.267	39.867
EXISTING SURFACE	45.771	45.539	45.946	46.189	46.319	46.512	46.379	45.843	45.513	45.259	44.622	43.457	43.092	42.403	41.759	40.23
CHAINAGE	0	3.5	13.5	20	23.5	29.521	40	60	65.374	69.521	80	95.331	100	109.521	120	140

FINISHED SURFACE	38.467	38.421	37.446	37.192	36.621	36.154	35.154	34.154	33.154	32.477	32.154	32.003	31.528	31.226	31.103	30.424
EXISTING SURFACE	38.736	38.69	37.525	37.193	36.702	36.272	35.35	34.436	33.387	32.67	32.338	32.187	31.772	31.491	31.371	30.737
CHAINAGE	160	160.653	175.653	180	190.653	200	220	240	260	273.552	280	283.015	293.015	300	303.015	320

LONGITUDINAL SECTION ALONG MC01

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
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SCALE 1:500@A1: 0 5 10 15 20 25m
SCALE 1:100@A1: 0 1 2 3 4 5m

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559 ANAMBAH ROAD
GOSFORTH NSW 2320

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DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 1

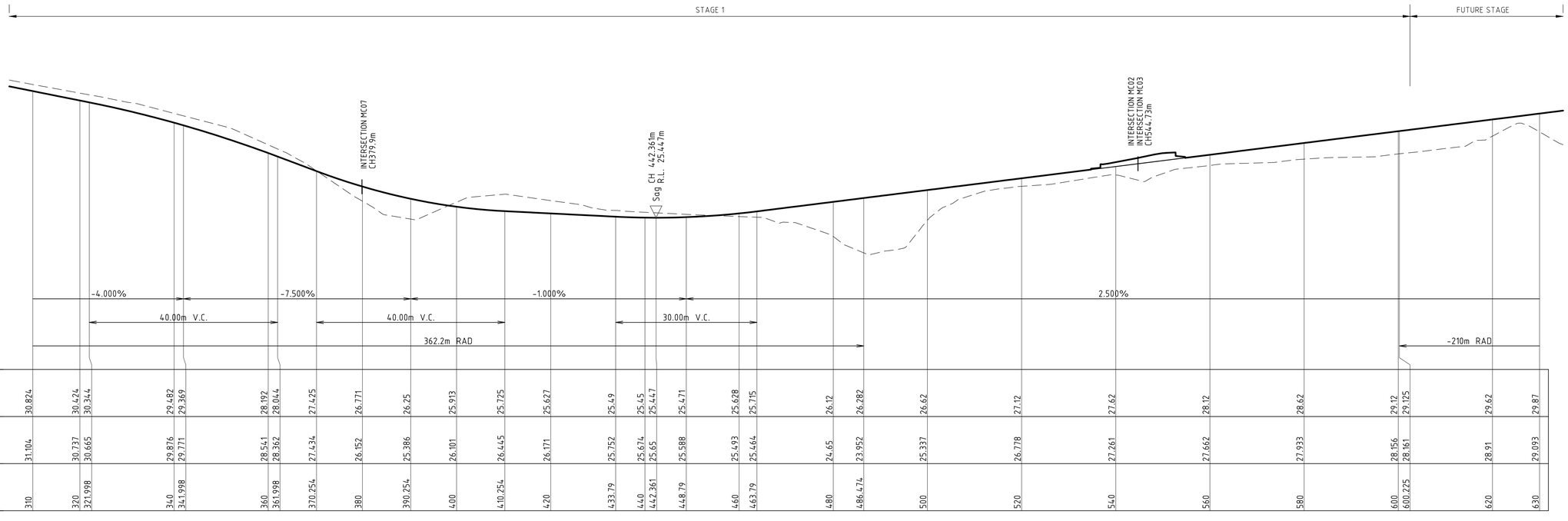
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.31

REVISION: C

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:50 PM Plotted By: ANDREW KILLEN Found: O:\ 6 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\03 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC01

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: JSTAUB DESIGNED: ATURNBULL JOB MANAGER: LMCRAE VERIFIER: LMCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 2

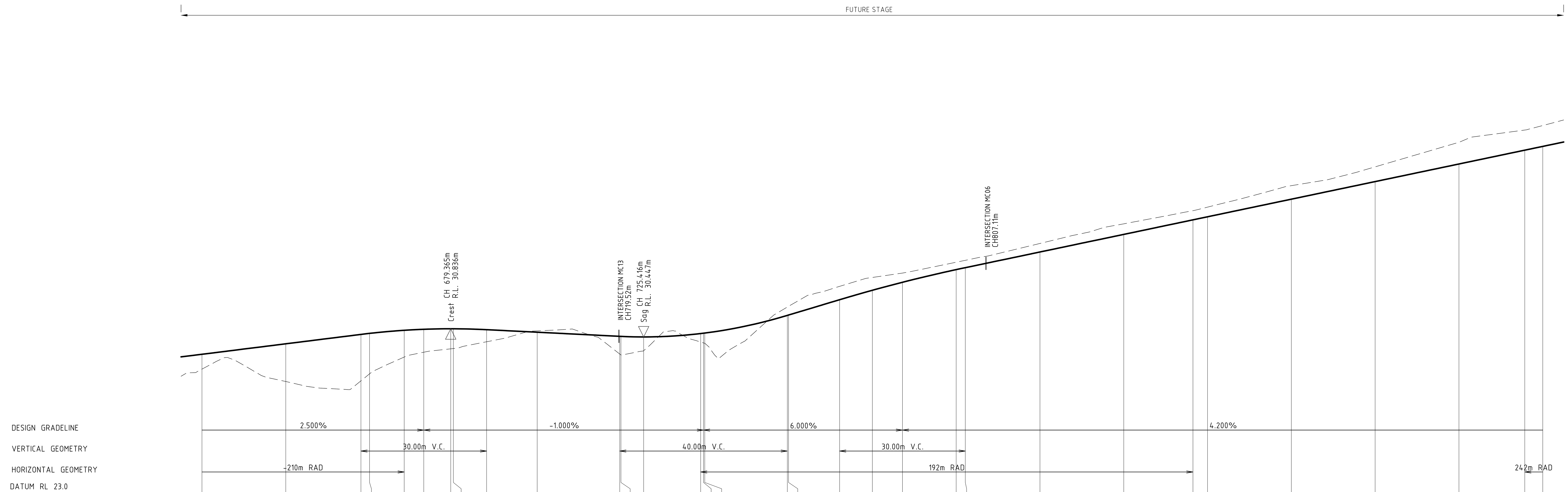
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.32

REVISION: C

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\D - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING_222055-01-MP-C05.31-LONG SECTIONS.dwg



CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
620	29.62	28.91
640	30.12	28.32
657.936	30.568	28.351
660	30.617	28.686
668.273	30.764	29.485
672.936	30.812	29.717
679.365	30.836	29.878
680	30.836	29.892
687.936	30.793	30.217
700	30.673	30.737
719.702	30.476	29.63
720	30.473	29.589
725.416	30.447	29.791
739.027	30.609	30.204
739.702	30.626	30.162
740	30.633	30.143
759.702	31.476	31.873
760	31.493	31.908
772.186	32.225	32.86
780	32.675	33.286
787.186	33.057	33.494
800	33.661	34.013
802.186	33.755	34.104
820	34.503	34.909
840	35.343	35.846
856.507	36.036	36.473
860	36.183	36.644
880	37.023	37.668
900	37.863	38.567
920	38.703	39.74
935.715	39.363	40.324
940	39.543	40.538

LONGITUDINAL SECTION ALONG MC01

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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SCALE 1:500@ A1 — 0 5 10 15 20 25m
SCALE 1:100@ A1 — 0 1 2 3 4 5m

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559 ANAMBAH ROAD
GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 3

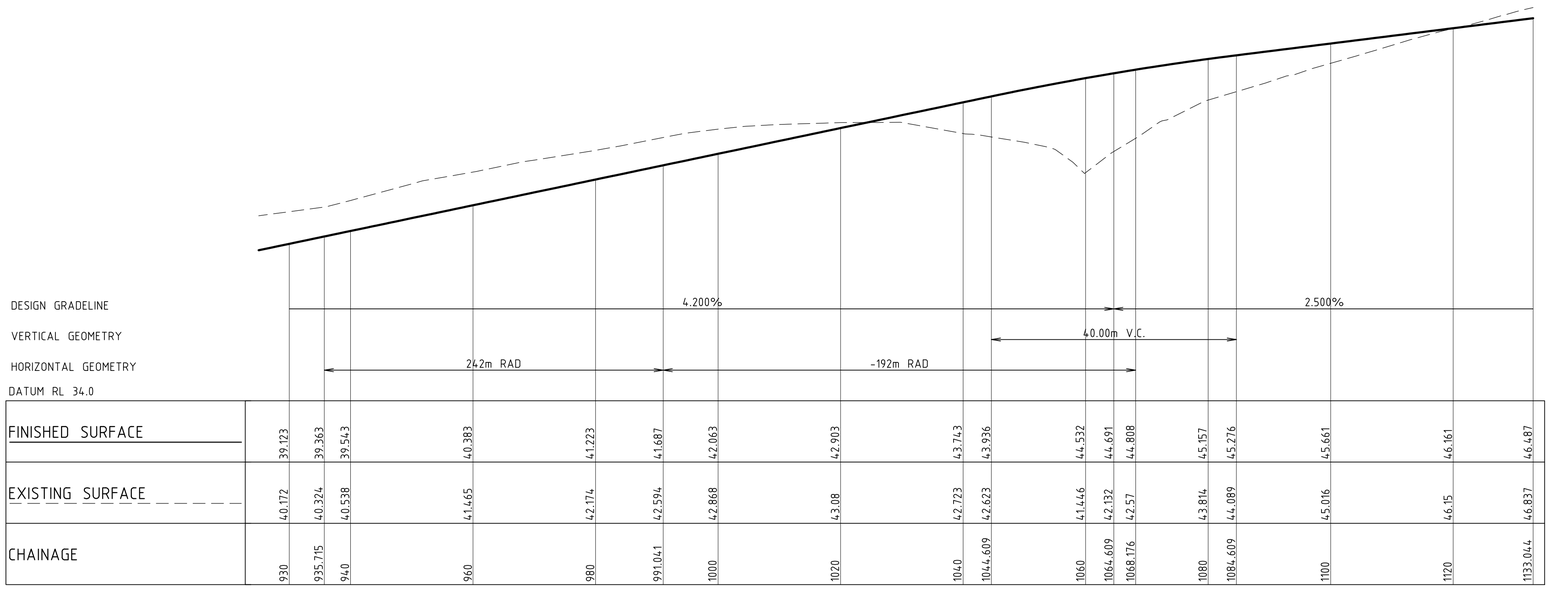
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.33

REVISION: C

DRAWING SHEET SIZE = A1

FUTURE STAGE



LONGITUDINAL SECTION ALONG MC01

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: JSTAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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SCALE 1:500@A1 (0 5 10 15 20 25m)
SCALE 1:100@A1 (0 1 2 3 4 5m)

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MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

ROAD LONGITUDINAL SECTIONS - SHEET 4

JOB NUMBER: **NL222055-01**

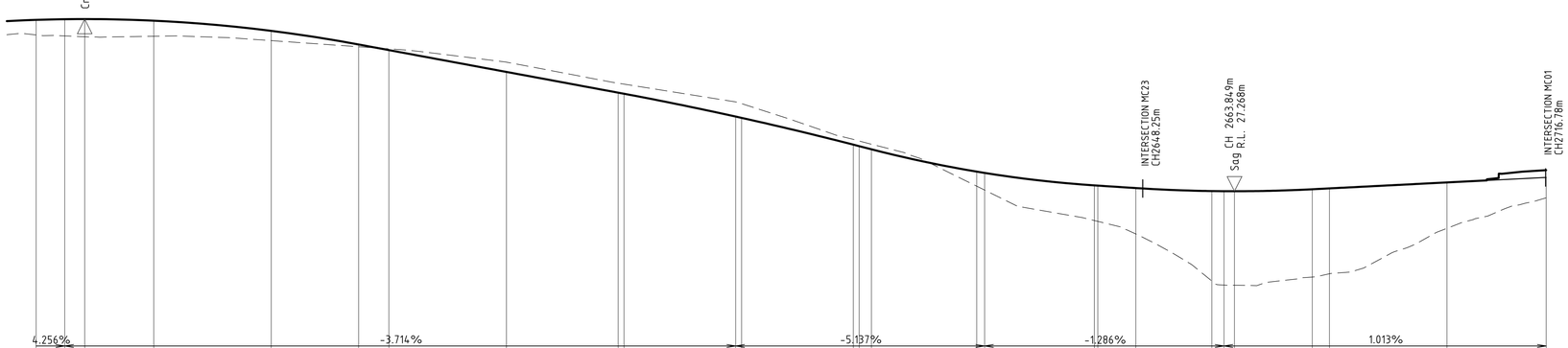
DRAWING NUMBER: **MP-C05.34**

REVISION: **C**

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\0 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg

STAGE 1



LONGITUDINAL SECTION ALONG MC02

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

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DRAWN: JSTAUB DESIGNED: ATURNBULL JOB MANAGER: LMCRAE VERIFIER: LMCRAE

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 (0 5 10 15 20 25m)
SCALE 1:100@A1 (0 1 2 3 4 5m)

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PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 5

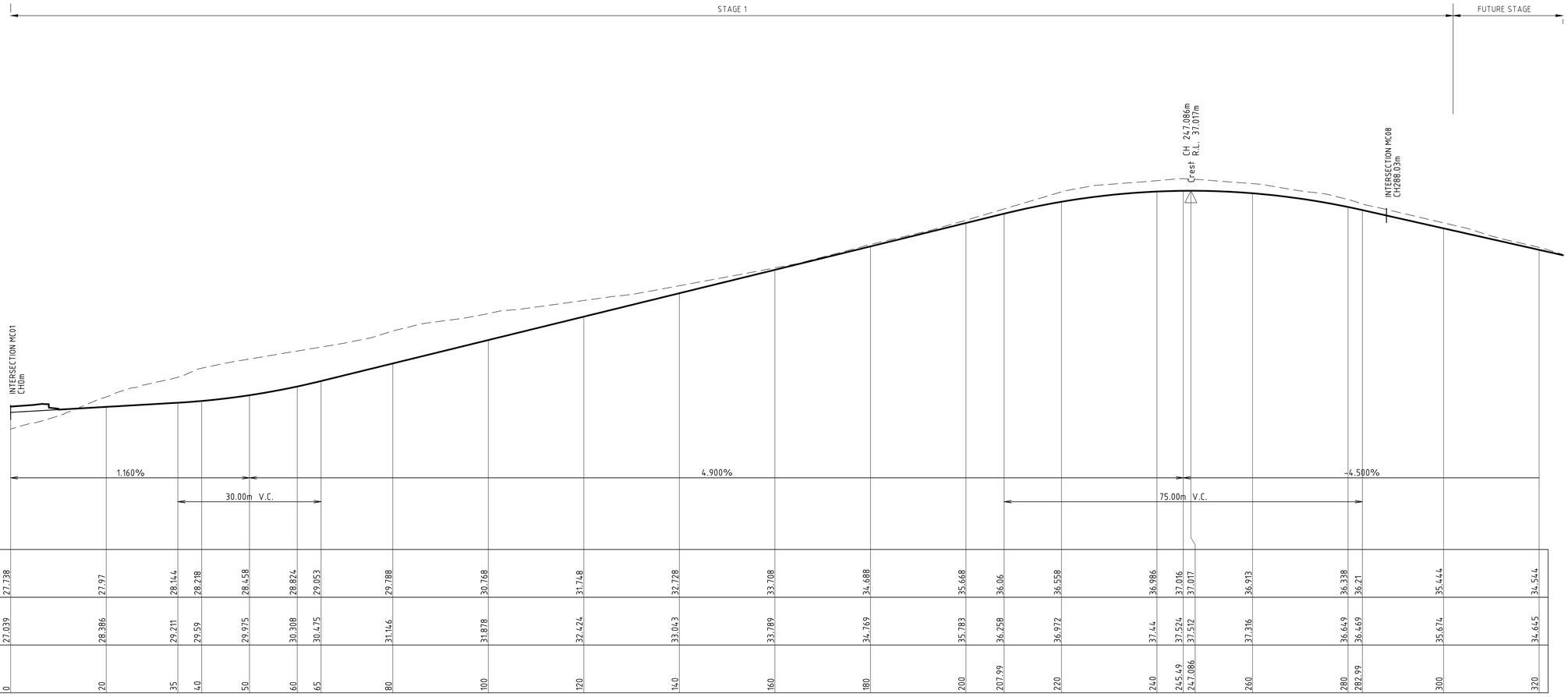
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.35

REVISION: C

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING\222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC03

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DESIGNED: A.TURNBULL
DRAWN: J.STAUB
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

CLIENT: Third.i COMMUNITIES

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COUNCIL: maitland city council

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SCALE 1:500@A1
SCALE 1:100@A1
0 5 10 15 20 25m
0 1 2 3 4 5m

NORTHROP
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Level 1, 215 Pacific Hwy, Charlestown NSW 2290
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ABN 81 094 433 100

PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 6

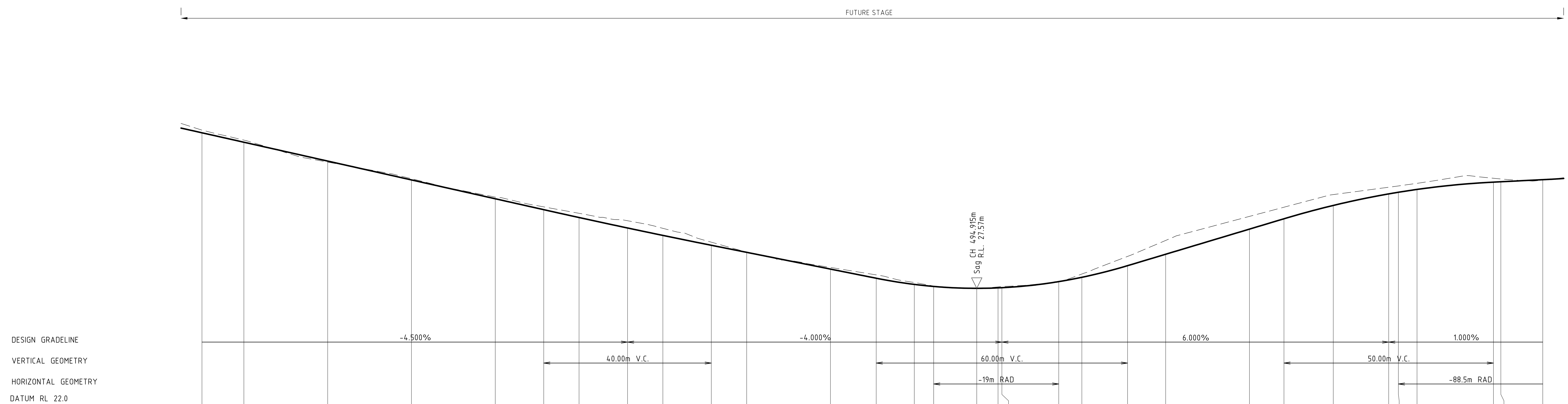
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.36

REVISION: C

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\3 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
310	34.994	35.122
320	34.544	34.645
340	33.644	33.594
360	32.744	32.802
380	31.844	31.923
391.568	31.324	31.457
400	30.949	31.15
411.568	30.449	30.795
420	30.095	30.432
431.568	29.624	29.771
440	29.286	29.296
460	28.486	28.565
470.915	28.05	28.209
480	27.755	27.845
484.638	27.658	27.678
494.915	27.57	27.567
500	27.591	27.636
500.915	27.6	27.657
514.483	27.889	27.907
520	28.094	28.251
530.915	28.65	29.093
540	29.195	29.854
560	30.395	31.003
568.239	30.889	31.441
580	31.526	32.043
593.239	32.077	32.395
595.551	32.155	32.457
600	32.29	32.58
618.239	32.639	32.821
620	32.657	32.789
630	32.757	32.734

LONGITUDINAL SECTION ALONG MC03

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

CLIENT: Third.i COMMUNITIES

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COUNCIL: maitland city council

SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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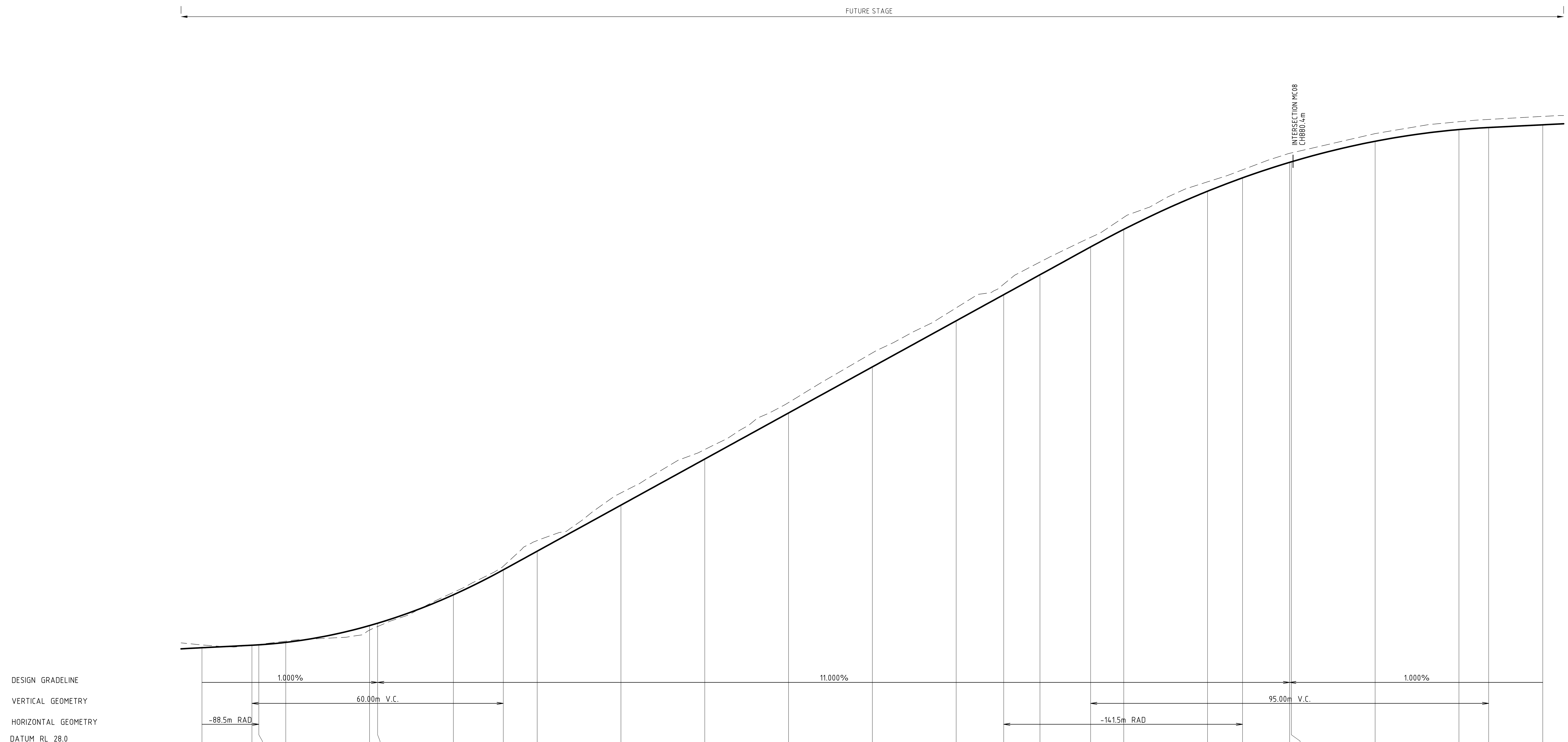
PROJECT: PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320
MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
ROAD LONGITUDINAL SECTIONS - SHEET 7

JOB NUMBER: NL222055-01
DRAWING NUMBER: MP-C05.37
REVISION: C
DRAWING SHEET SIZE = A1



FINISHED SURFACE	32.657	32.776	32.795	32.911	33.714	33.826	35.183	36.376	37.265	39.465	41.665	43.865	46.065
EXISTING SURFACE	32.789	32.777	32.816	32.969	33.496	33.669	35.298	36.549	37.772	40.048	42.119	44.362	46.733
CHAINAGE	620	631.917	633.564	640	660	661.917	680	691.917	700	720	740	760	780

FINISHED SURFACE	48.265	49.513	50.465	51.795	52.632	54.455	55.092	55.833	55.857	56.838	57.398	57.495	57.625
EXISTING SURFACE	48.883	50.015	51.071	52.251	53.204	54.901	55.476	56.263	56.281	57.203	57.771	57.881	58.026
CHAINAGE	800	811.346	820	832.095	840	860	868.356	879.595	880	900	920	927.095	940

LONGITUDINAL SECTION ALONG MC03

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

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DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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COUNCIL: maitland city council

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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PROJECT: PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 8

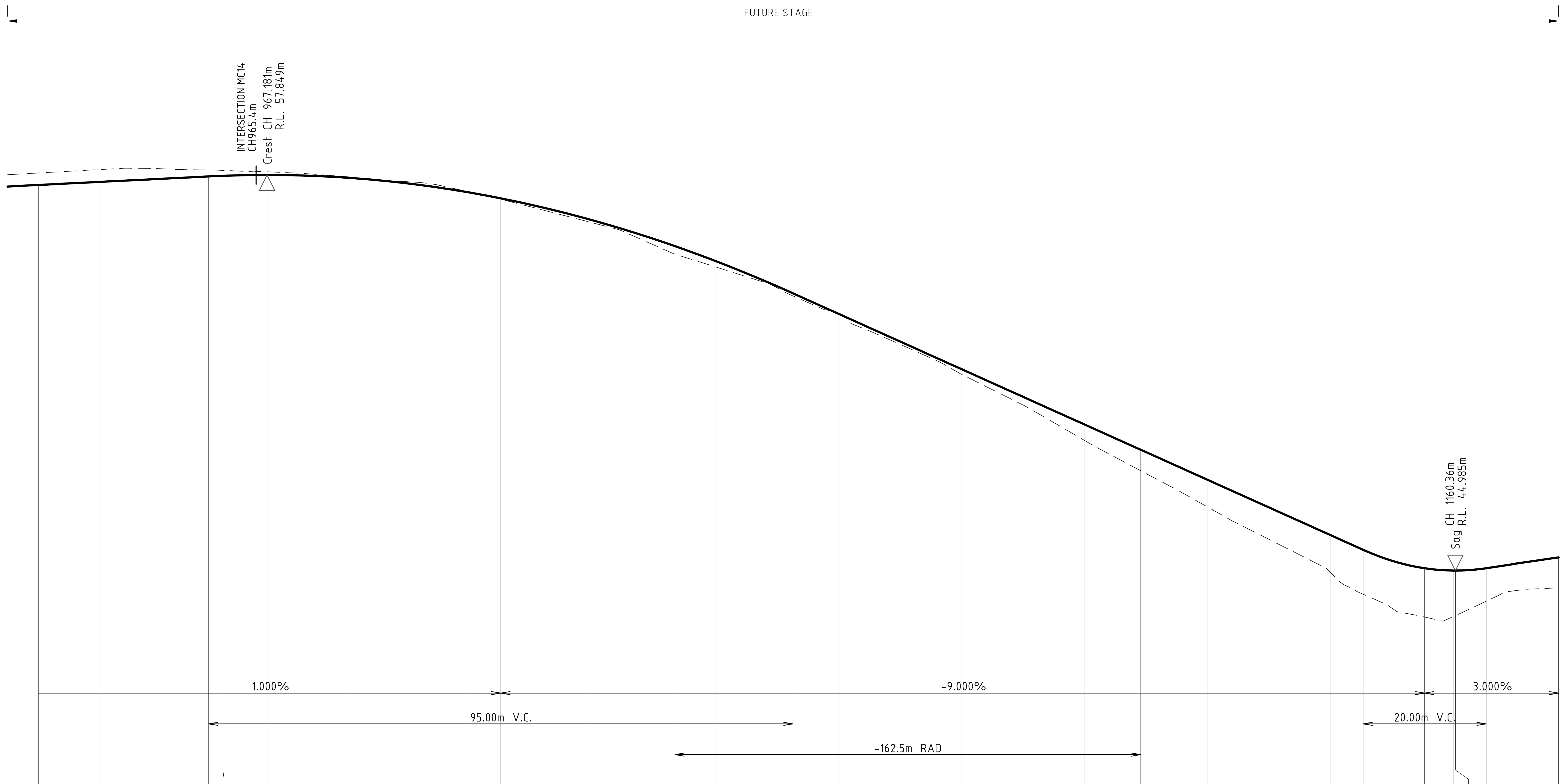
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.38

REVISION: C

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:50 PM Plotted By: ANDREW KILLEN File: O:\6 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\03 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



DESIGN GRADELINE: 1.000% | -9.000% | 3.000%

VERTICAL GEOMETRY: 95.00m V.C. | 20.00m V.C.

HORIZONTAL GEOMETRY: -162.5m RAD

DATUM RL 38.0

CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
930	57.525	57.914
940	57.625	58.026
957.681	57.801	58.012
960	57.822	57.998
967.181	57.849	57.952
980	57.762	57.795
1000	57.282	57.303
1005.181	57.089	57.059
1020	56.38	56.298
1033.489	55.535	55.272
1040	55.058	54.866
1052.681	54.001	53.921
1060	53.343	53.322
1080	51.543	51.374
1100	49.743	49.224
1109.211	48.914	48.23
1120	47.943	47.06
1140	46.143	44.938
1145.36	45.66	44.216
1155.36	45.06	43.474
1160	44.986	43.491
1160.36	44.985	43.522
1165.36	45.06	43.987
1177.14	45.414	44.422

LONGITUDINAL SECTION ALONG MC03

HORIZONTAL SCALE 1:500@A1

VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB

DESIGNED: A.TURNBULL

JOB MANAGER: L.MCRAE

VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

CLIENT: Third.i COMMUNITIES

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COUNCIL: maitland city council

SCALE 1:500@A1 0 5 10 15 20 25m

SCALE 1:100@A1 0 1 2 3 4 5m

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MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 9

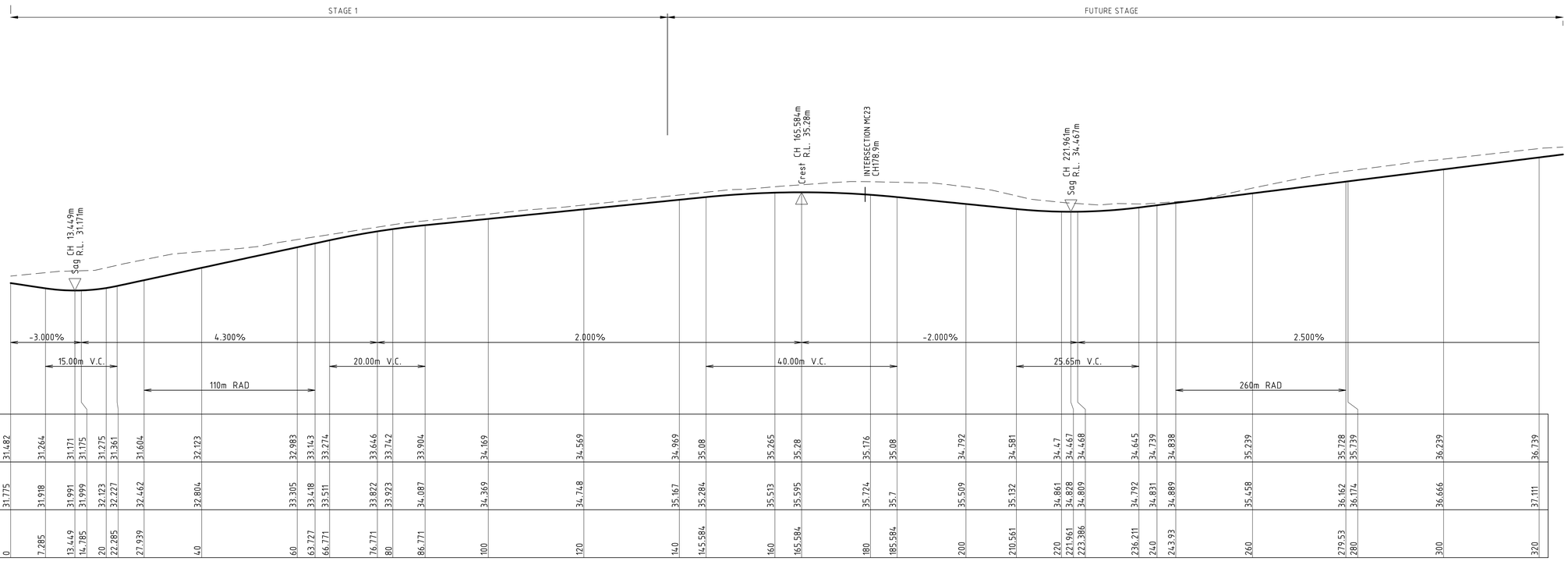
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.39

REVISION: C

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:50 PM Plotted By: ANDREW KILLEN



LONGITUDINAL SECTION ALONG MC04

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

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NOT FOR CONSTRUCTION

DRAWN: JSTAUB DESIGNED: ATURNBULL JOB MANAGER: LMCRAE VERIFIER: LMCRAE

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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COUNCIL: maitland city council

SCALE 1:500@A1
SCALE 1:100@A1
0 5 10 15 20 25m
0 1 2 3 4 5m

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PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

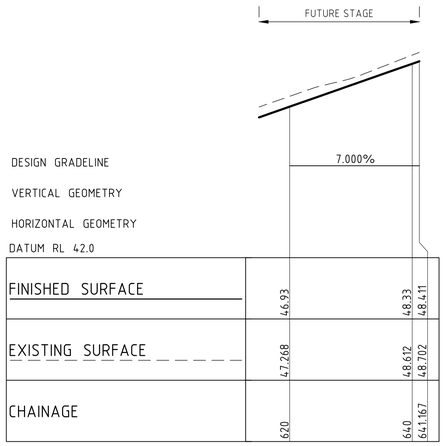
ROAD LONGITUDINAL SECTIONS - SHEET 10

JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.40** REVISION: **C**

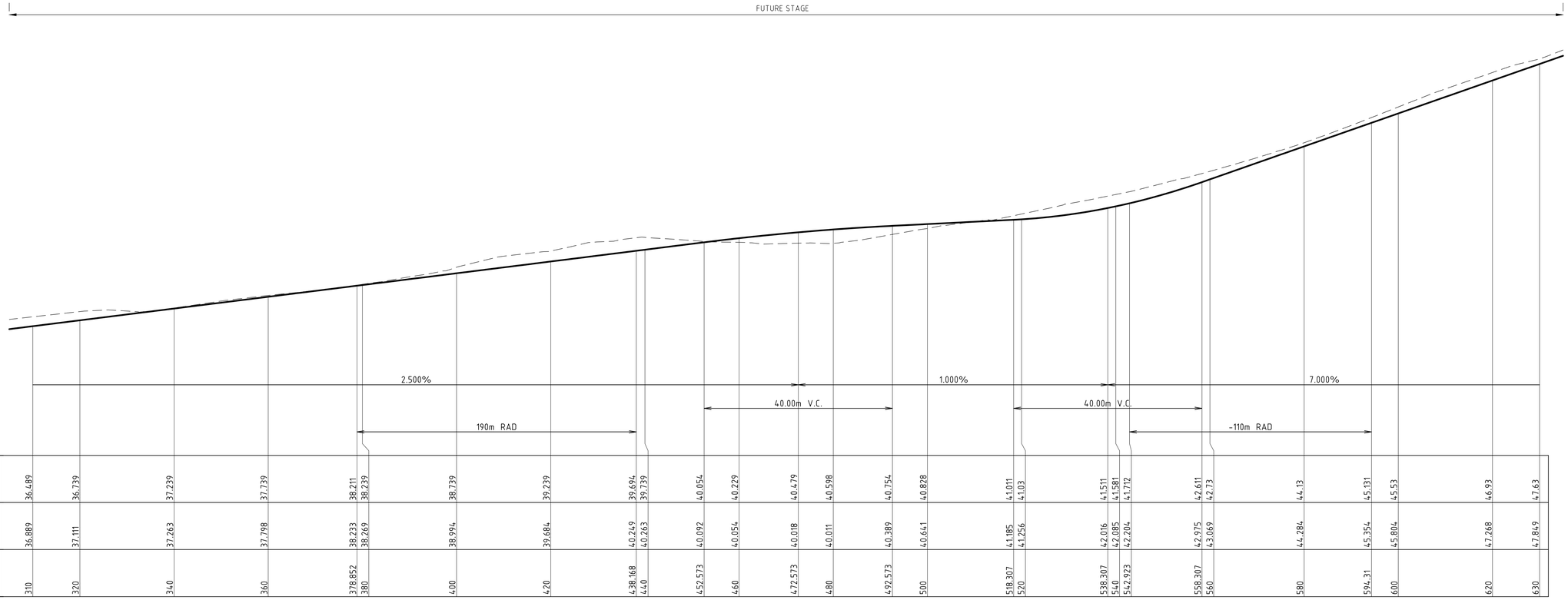
DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\D - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING_222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC04

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1



LONGITUDINAL SECTION ALONG MC04

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 — 0 5 10 15 20 25m
SCALE 1:100@A1 — 0 1 2 3 4 5m

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ABN 81 094 433 100

PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

ROAD LONGITUDINAL SECTIONS - SHEET 11

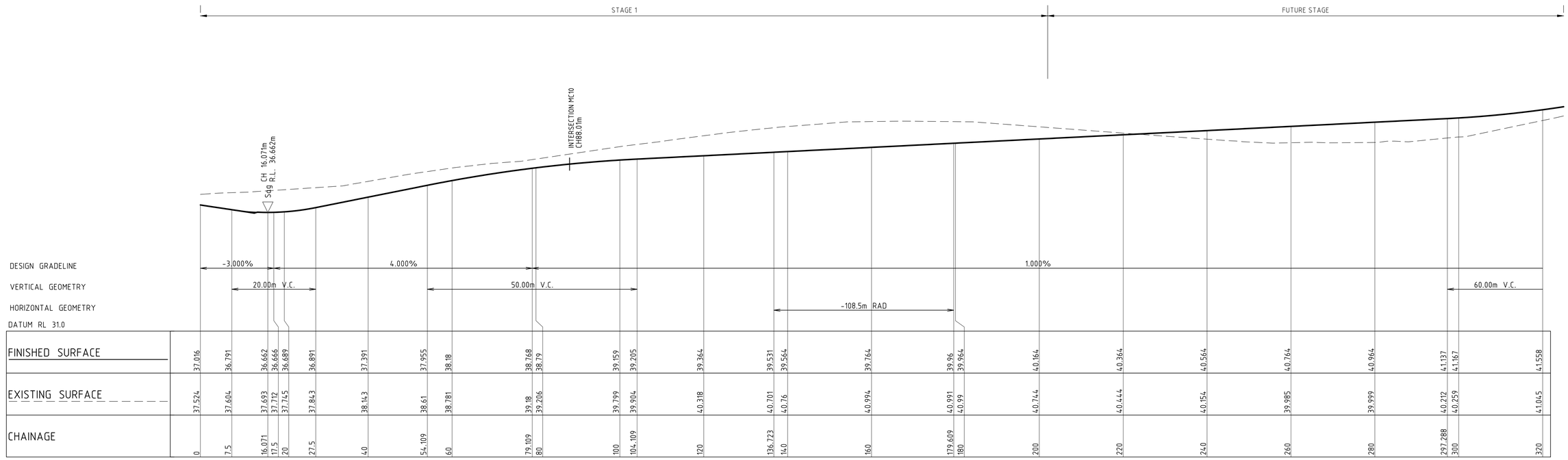
JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.41**

REVISION: **C**

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLANNL222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC05

HORIZONTAL SCALE 1:500@A1

VERTICAL SCALE 1:100@A1

DRAWN: JSTAUB DESIGNED: A TURNBULL JOB MANAGER: LMCRAE VERIFIER: L MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@ A1 0 5 10 15 20 25m

SCALE 1:100 @ A1 0 1 2 3 4 5m

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MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

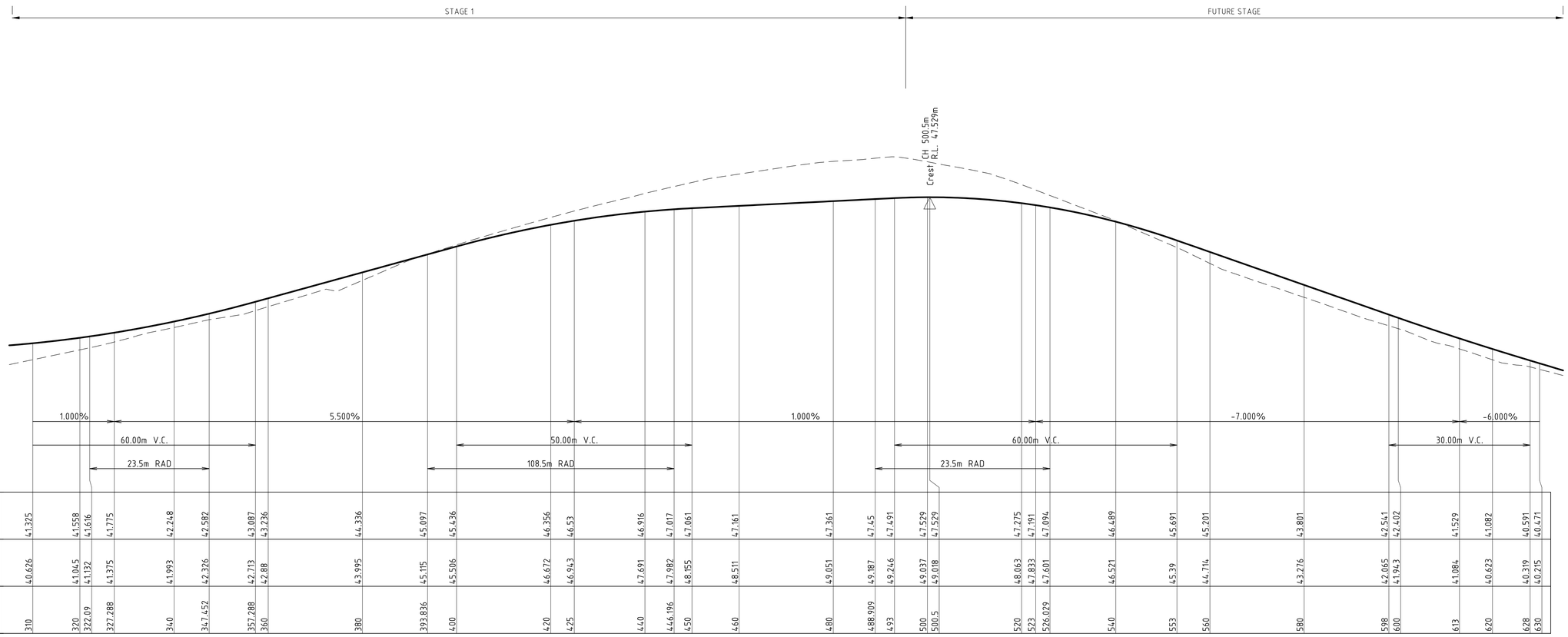
ROAD LONGITUDINAL SECTIONS - SHEET 12

JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.42** REVISION: **C**

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLANNL222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC05

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

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DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 (0 5 10 15 20 25m)
SCALE 1:100@A1 (0 1 2 3 4 5m)

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MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

ROAD LONGITUDINAL SECTIONS - SHEET 13

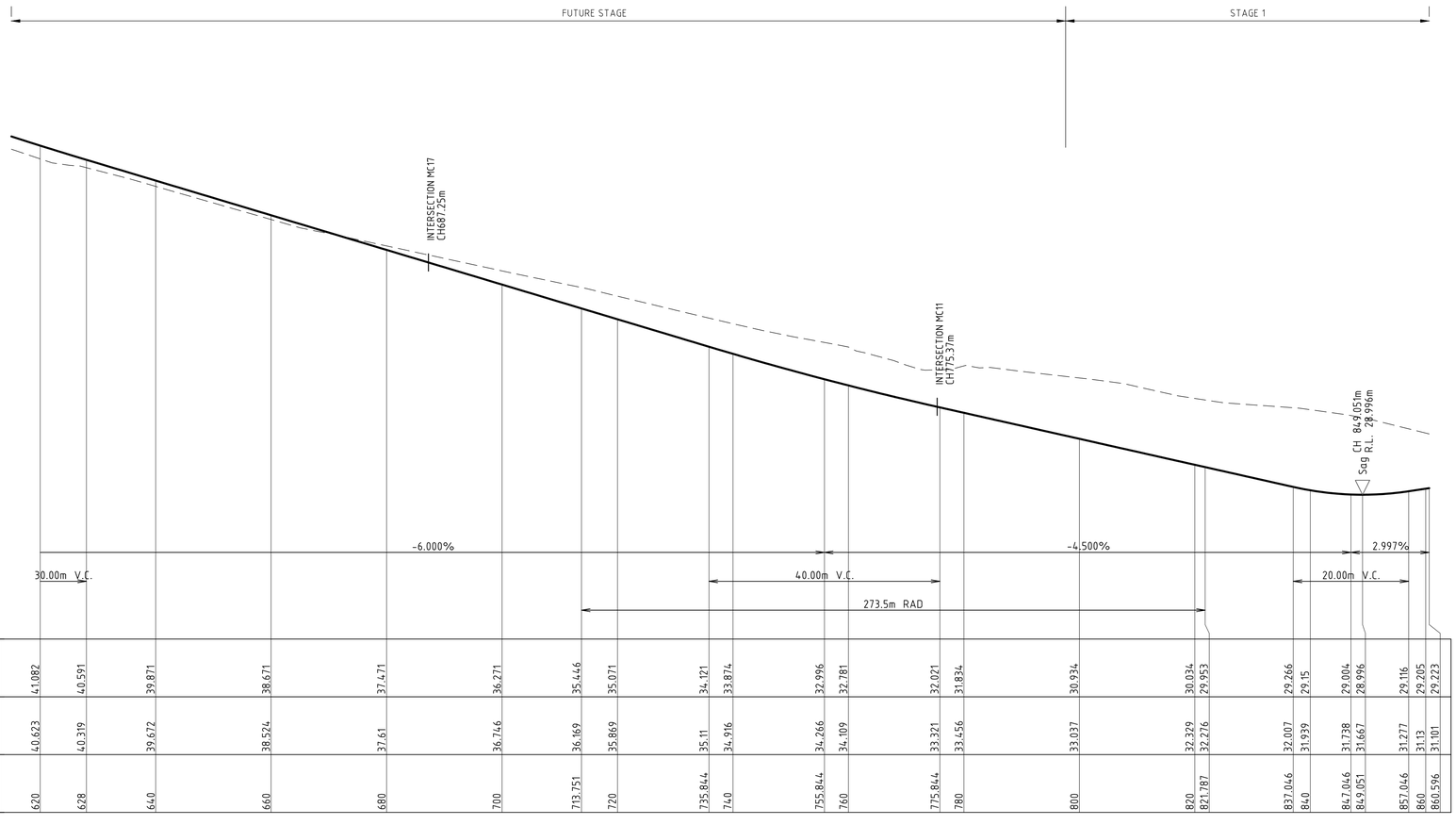
JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.43**

REVISION: **C**

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC05

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: JSTAUB DESIGNED: ATURNBULL JOB MANAGER: LMCRAE VERIFIER: LMCRAE

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 (0 5 10 15 20 25m)
SCALE 1:100@A1 (0 1 2 3 4 5m)

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PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 14

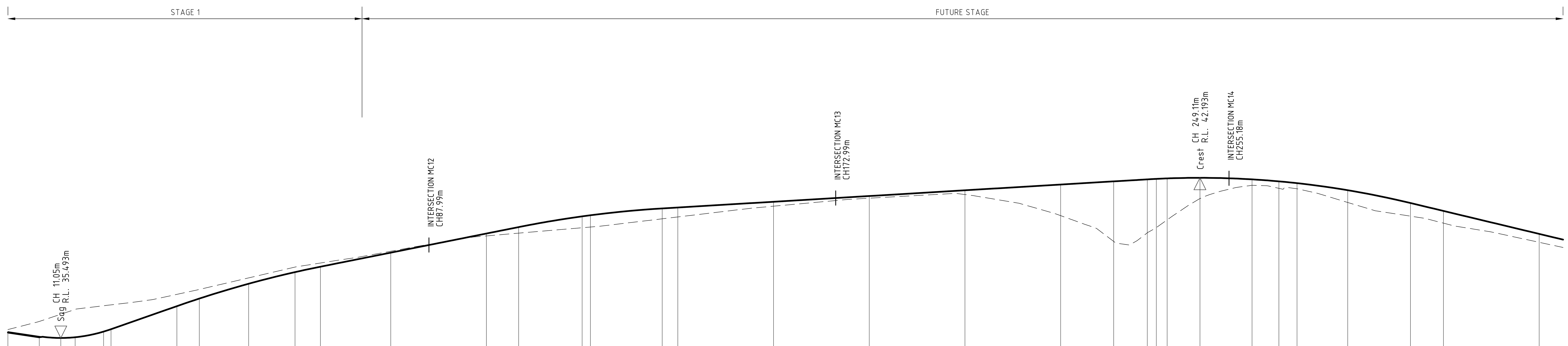
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.44

REVISION: C

DRAWING SHEET SIZE = A1

Date 22.08.2024 4:55 PM Plotted By ANDREW KILLEN Found O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING_222055-01-MP-C05.31-LONG SECTIONS.dwg



DESIGN GRADELINE: -3.000% | 7.000% | 4.000% | 1.200% | -4.800%

VERTICAL GEOMETRY: 15.00m V.C. | 30.00m V.C. | 30.00m V.C. | 55.00m V.C.

HORIZONTAL GEOMETRY: 141.5m RAD | -16.45m RAD

DATUM RL 30.0

CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
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6.55	35.56	36.183
11.05	35.493	36.485
14.05	35.523	36.687
20	35.76	36.84
21.55	35.86	36.878
35.309	36.823	37.317
40	37.141	37.523
50.309	37.761	38.005
60	38.247	38.459
65.309	38.473	38.628
80	39.061	39.12
100	39.861	39.762
106.729	40.13	39.877
120	40.579	40.102
121.729	40.625	40.132
136.729	40.91	40.476
140	40.949	40.554
160	41.189	41.005
180	41.429	41.34
200	41.669	41.49
220	41.909	40.61
231.077	42.042	39.532
238.11	42.127	39.89
240	42.147	40.111
242.256	42.167	40.434
249.11	42.193	41.325
260	42.128	41.879
265.61	42.044	41.76
269.395	41.968	41.733
280	41.672	41.16
293.11	41.137	40.588
300	40.806	40.295
320	39.846	39.494

LONGITUDINAL SECTION ALONG MC06

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB | DESIGNED: A.TURNBULL | JOB MANAGER: L.MCRAE | VERIFIER: L.MCRAE

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A	DRAFT ISSUE	JS		AK	09.08.24
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C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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COUNCIL: maitland city council

SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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PROJECT: PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

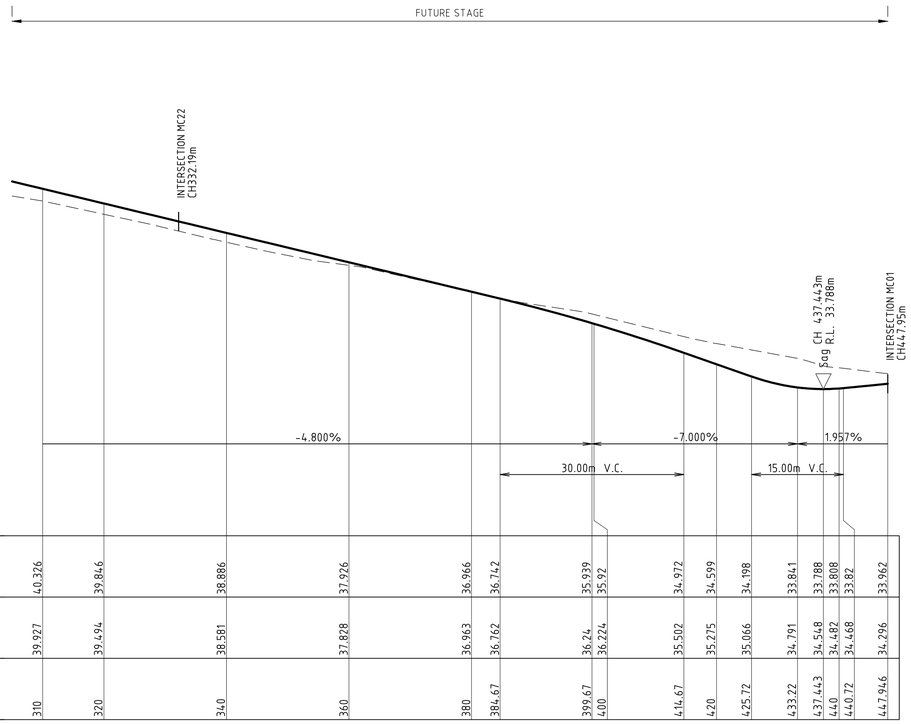
ROAD LONGITUDINAL SECTIONS - SHEET 15

JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.45 | REVISION: C

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:50 PM Plotted By: ANDREW KILLEN



LONGITUDINAL SECTION ALONG MC06

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: JSTAUB
DESIGNED: ATURNBULL
JOB MANAGER: LMCRAE
VERIFIER: LMCRAE

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SCALE 1:500@A1
SCALE 1:100@A1
0 5 10 15 20 25m
0 1 2 3 4 5m

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PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

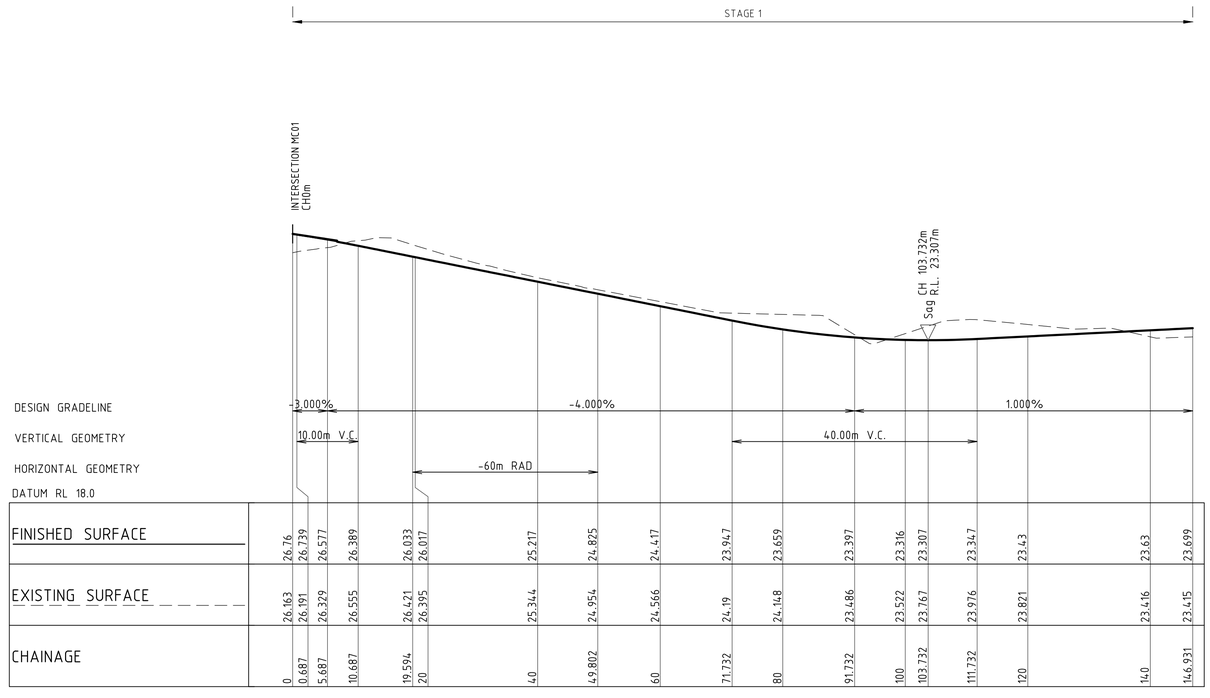
MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

ROAD LONGITUDINAL SECTIONS - SHEET 16

JOB NUMBER: **NL222055-01**
DRAWING NUMBER: **MP-C05.46**
REVISION: **C**
DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC07

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 17

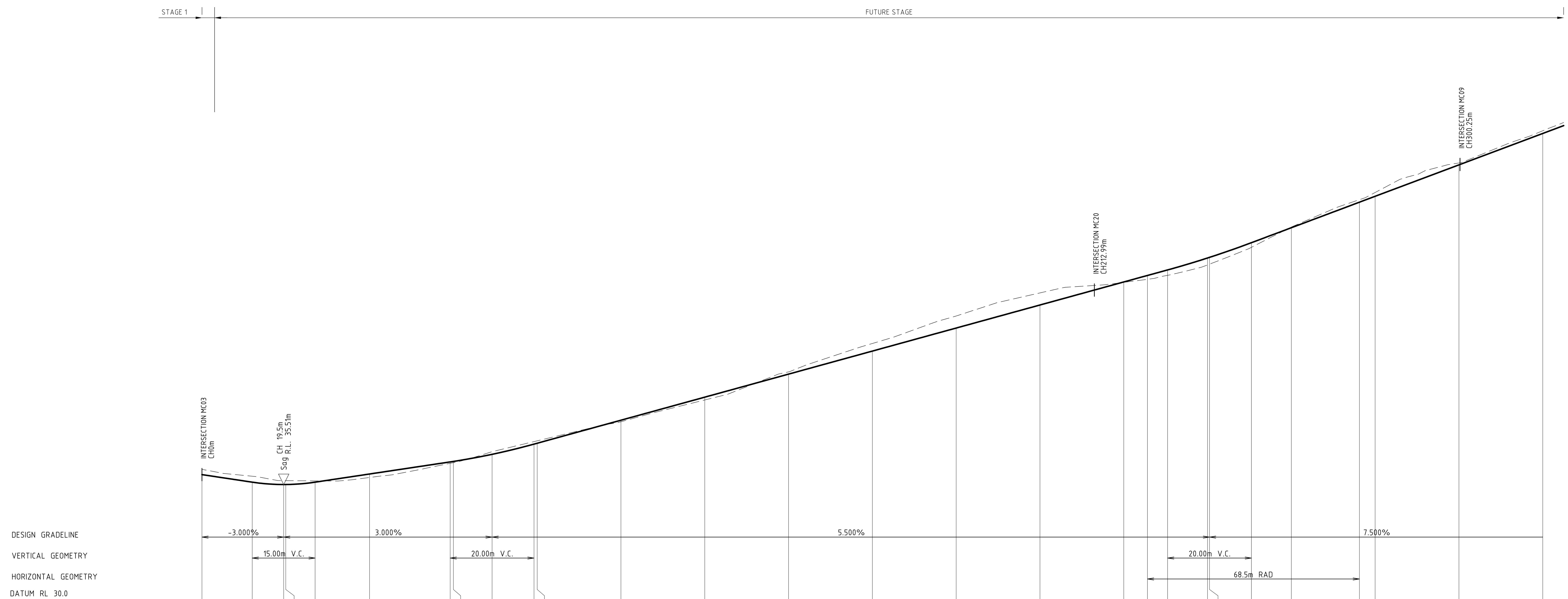
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.47

REVISION: C

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\0 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



FINISHED SURFACE	EXISTING SURFACE	CHAINAGE
35.983	36.233	0
35.623	35.907	12
35.51	35.697	19.5
35.511	35.696	20
35.623	35.683	27
36.013	35.846	40
36.59	36.521	59.24
36.613	36.552	60
36.952	37.078	69.24
37.44	37.559	79.24
37.482	37.596	80
38.582	38.507	100
39.682	39.547	120
40.782	40.889	140
41.882	42.244	160
42.982	43.556	180
44.082	44.659	200
45.182	45.163	220
45.493	45.308	225.66
45.757	45.499	230.471
46.327	45.994	240
46.357	46.03	240.471
47.057	46.834	250.471
47.772	47.806	260
48.99	49.11	276.239
49.272	49.454	280
50.772	50.862	300
52.272	52.401	320

LONGITUDINAL SECTION ALONG MC08

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

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DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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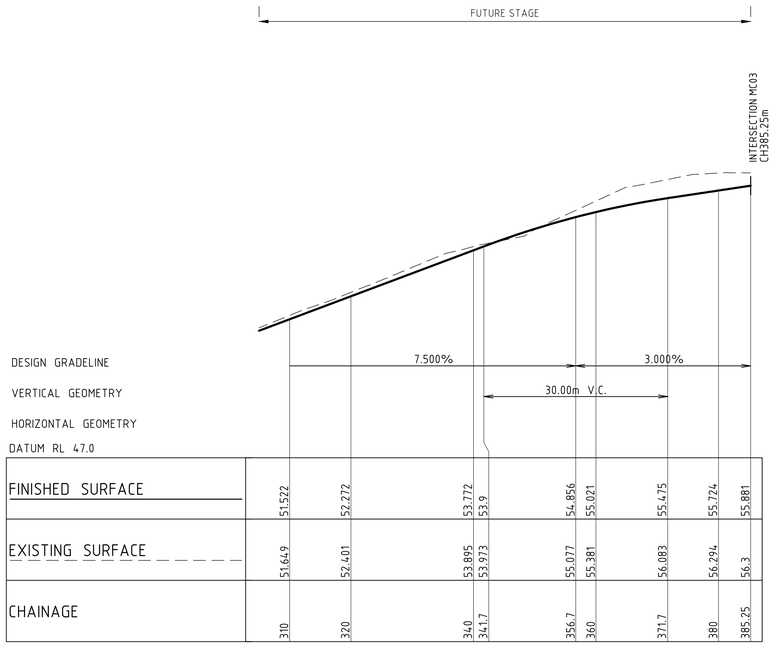
MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
ROAD LONGITUDINAL SECTIONS - SHEET 18

JOB NUMBER: NL222055-01
DRAWING NUMBER: MP-C05.48
REVISION: C
DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:50 PM Plotted By: ANDREW KILLEN



LONGITUDINAL SECTION ALONG MC08

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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SCALE 1:100@A1 0 1 2 3 4 5m

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DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 19

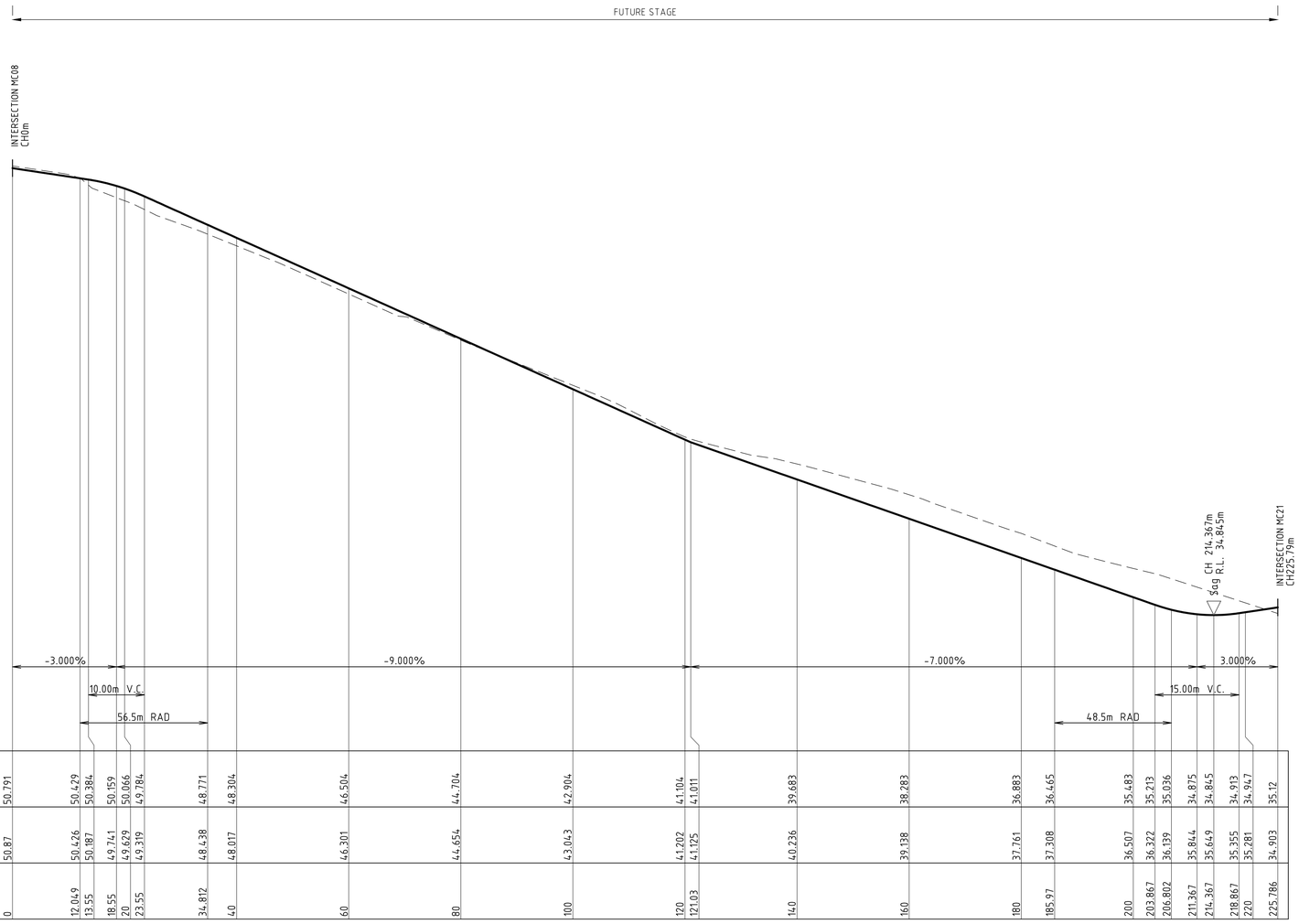
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.49

REVISION: C

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



FINISHED SURFACE	50.791	50.429	50.384	50.159	50.066	49.784	48.771	48.304	46.504	44.704	42.904	41.104	41.011	39.683	38.283	36.883	36.465	35.483	35.213	35.036	34.875	34.845	34.913	34.947	35.12
EXISTING SURFACE	50.87	50.426	50.187	49.741	49.629	49.319	48.438	48.017	46.301	44.654	43.043	41.202	41.125	40.236	39.138	37.761	37.308	36.507	36.322	36.139	35.844	35.649	35.355	35.281	34.903
CHAINAGE	0	12.049	13.55	18.55	20	23.55	34.812	40	60	80	100	120	121.03	140	160	180	185.97	200	203.867	206.802	211.367	216.367	218.867	220	225.786

LONGITUDINAL SECTION ALONG MC09

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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SCALE 1:500@A1 — 0 5 10 15 20 25m
SCALE 1:100@A1 — 0 1 2 3 4 5m

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DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 20

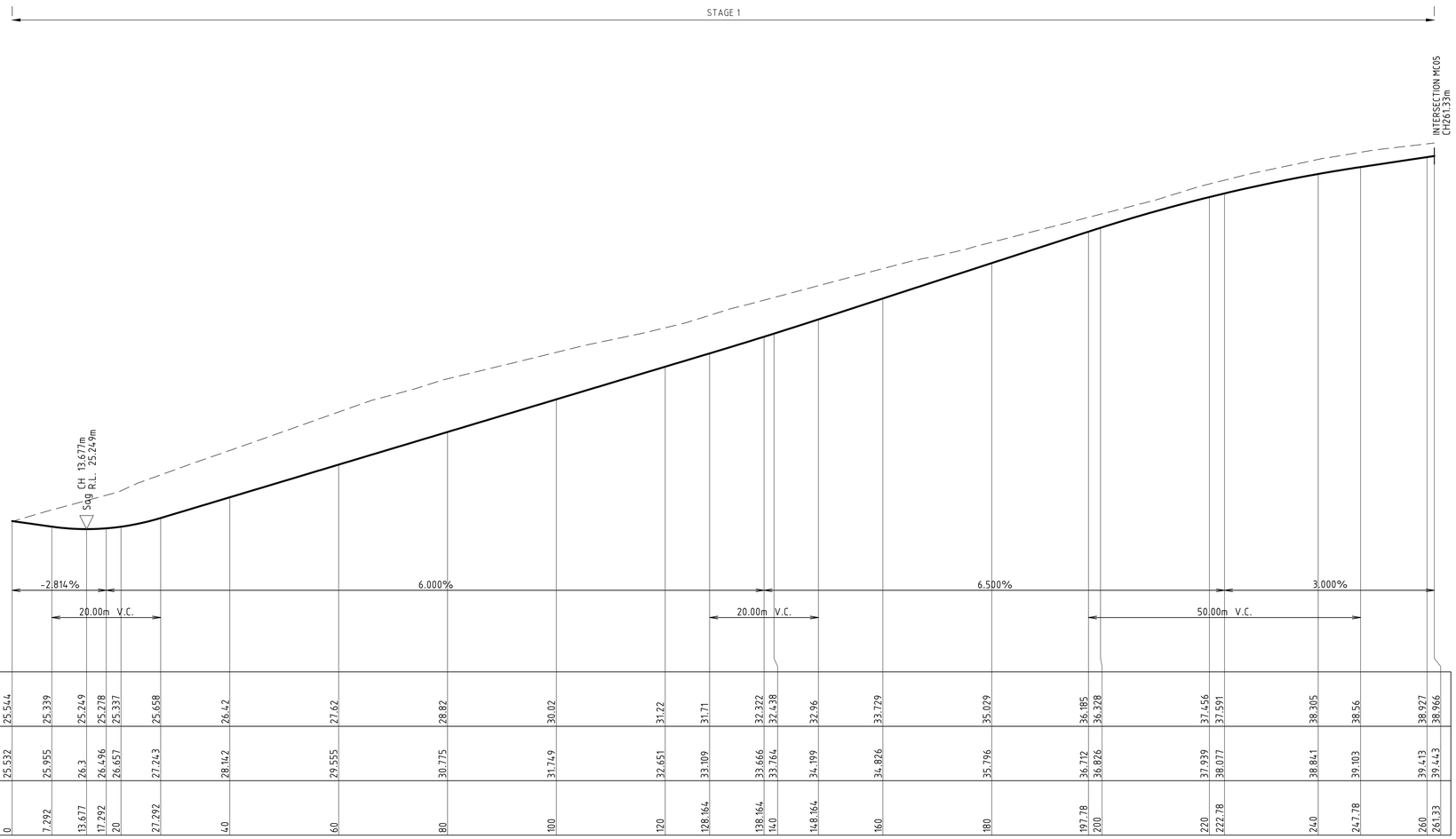
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.50

REVISION: C

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\3 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC10

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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SCALE 1:100@A1 0 1 2 3 4 5m

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DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

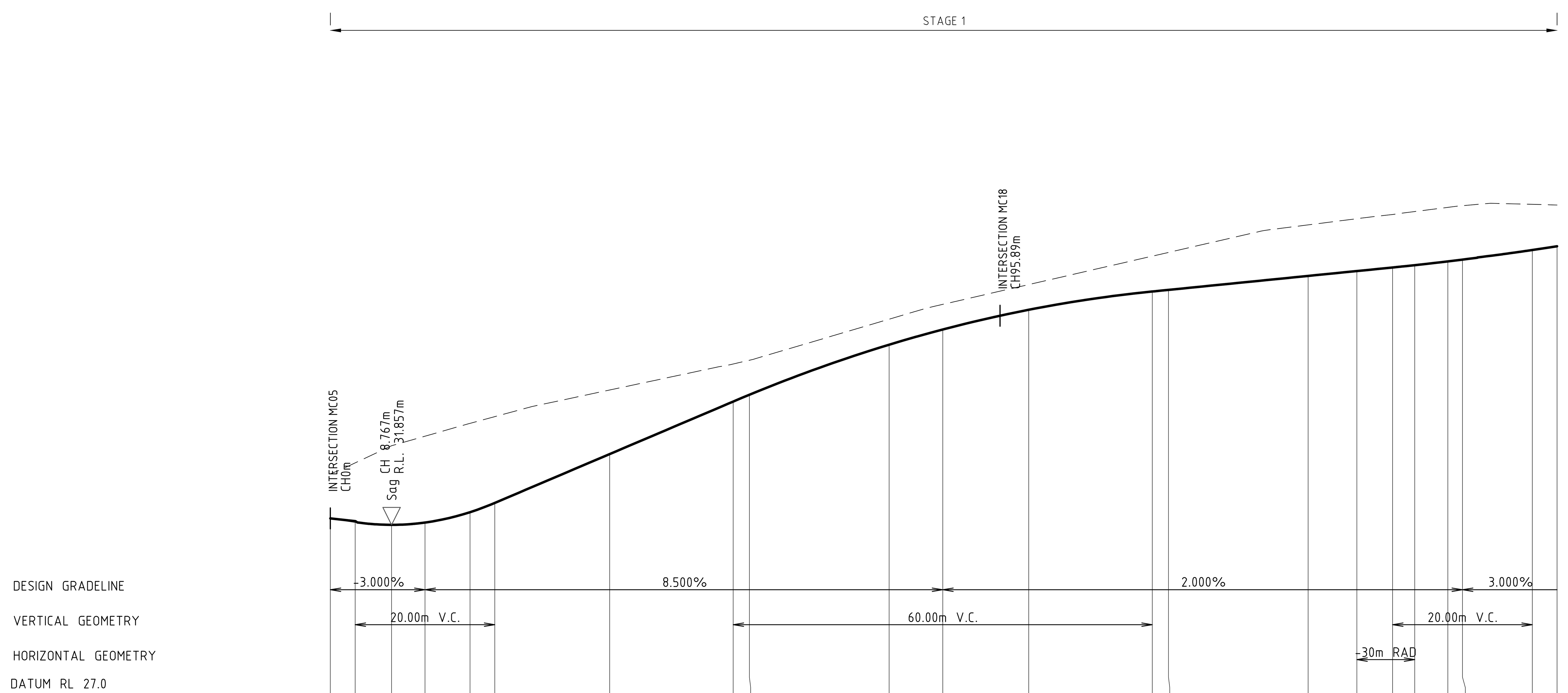
ROAD LONGITUDINAL SECTIONS - SHEET 21

JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.51** REVISION: **C**

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING_222055-01-MP-C05.51-LONG SECTIONS.dwg



FINISHED SURFACE	32.042	31.935	31.857	31.923	32.22	32.485	33.884	35.386	35.581	37.014	37.449	38.013	38.536	38.583	38.983	39.122	39.225	39.29	39.398	39.45	39.725	39.831
EXISTING SURFACE	33.318	33.63	34.122	34.395	34.762	34.955	35.717	36.461	36.57	37.744	38.168	38.735	39.548	39.655	40.444	40.621	40.743	40.825	40.945	40.993	41.032	41.011
CHAINAGE	0	3.55	8.767	13.55	20	23.55	40	57.679	60	80	87.679	100	117.679	120	140	146.972	152.093	155.258	160	162.093	172.093	175.643

LONGITUDINAL SECTION ALONG MC11

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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SCALE 1:500@ A1 0 5 10 15 20 25m
SCALE 1:100@ A1 0 1 2 3 4 5m

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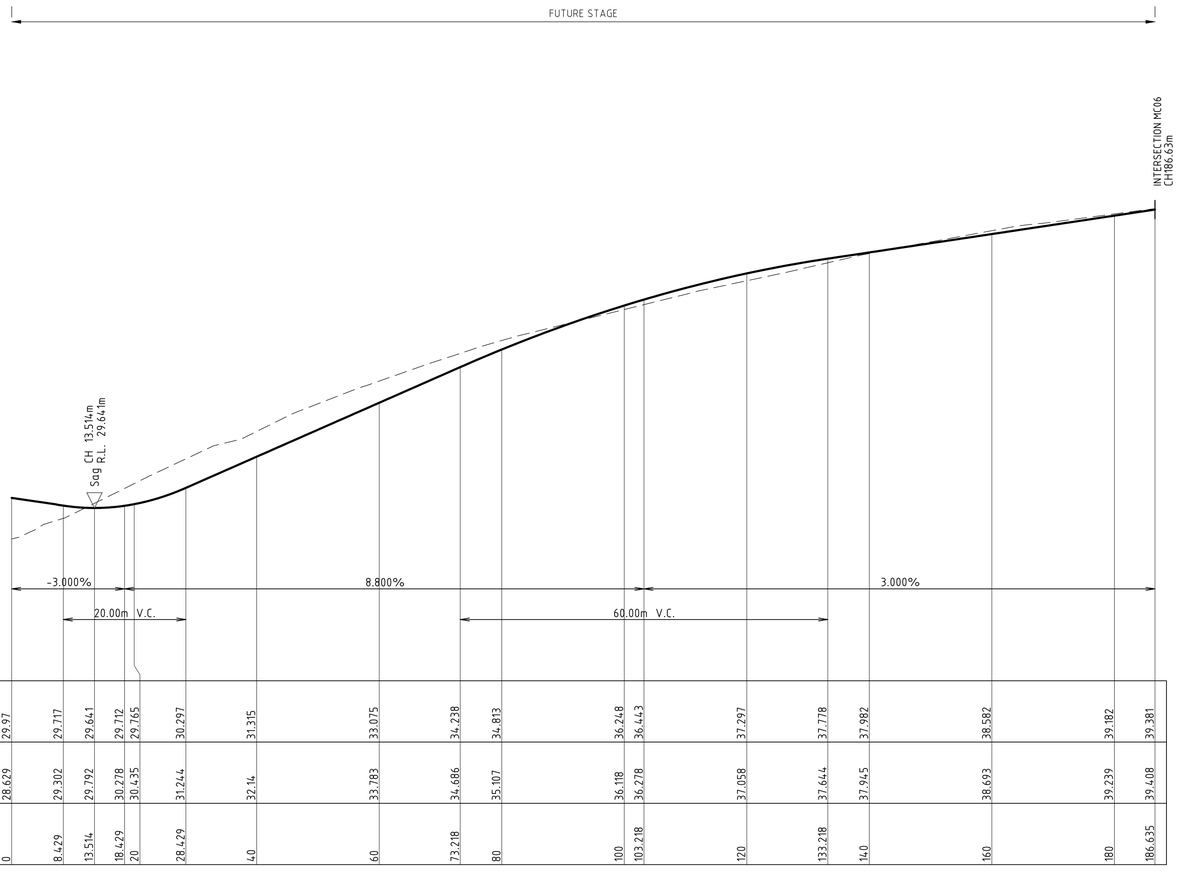
DRAWING TITLE: CIVIL ENGINEERING PACKAGE
ROAD LONGITUDINAL SECTIONS - SHEET 22

JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.52 REVISION: C

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:50 PM Plotted By: ANDREW KILLEN



LONGITUDINAL SECTION ALONG MC12

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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SCALE 1:500@A1 — 0 5 10 15 20 25m
SCALE 1:100@A1 — 0 1 2 3 4 5m

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DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

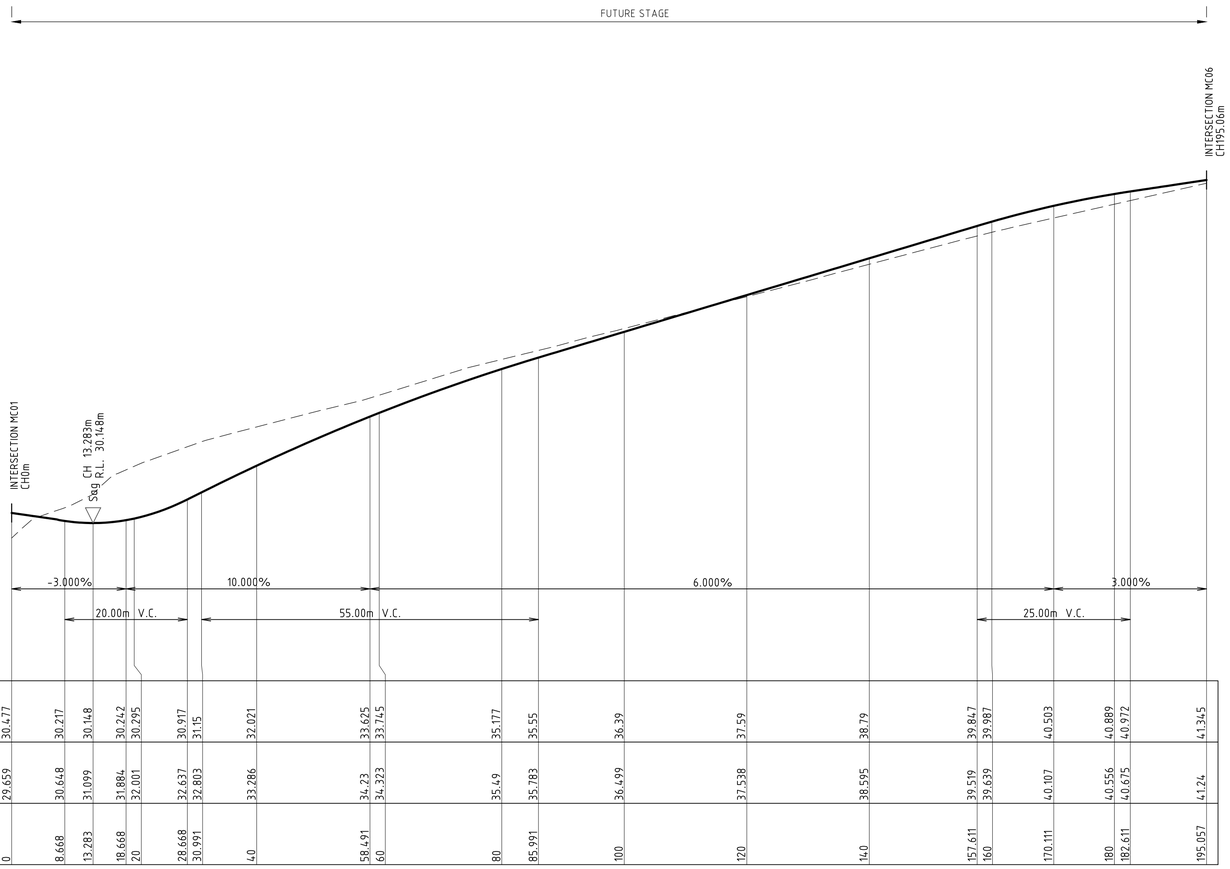
ROAD LONGITUDINAL SECTIONS - SHEET 23

JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.53** REVISION: **C**

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING_222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC13

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: JSTAUB
DESIGNED: ATURNBULL
JOB MANAGER: LMCRAE
VERIFIER: LMCRAE

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SCALE 1:500@A1
SCALE 1:100 @ A1
0 5 10 15 20 25m
0 1 2 3 4 5m

NORTHROP
Newcastle
Level 1, 215 Pacific Hwy, Charlestown NSW 2290
Ph (02) 4943 1777 Email newcastle@northrop.com.au
ABN 81 094 433 100

PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

ROAD LONGITUDINAL SECTIONS - SHEET 24

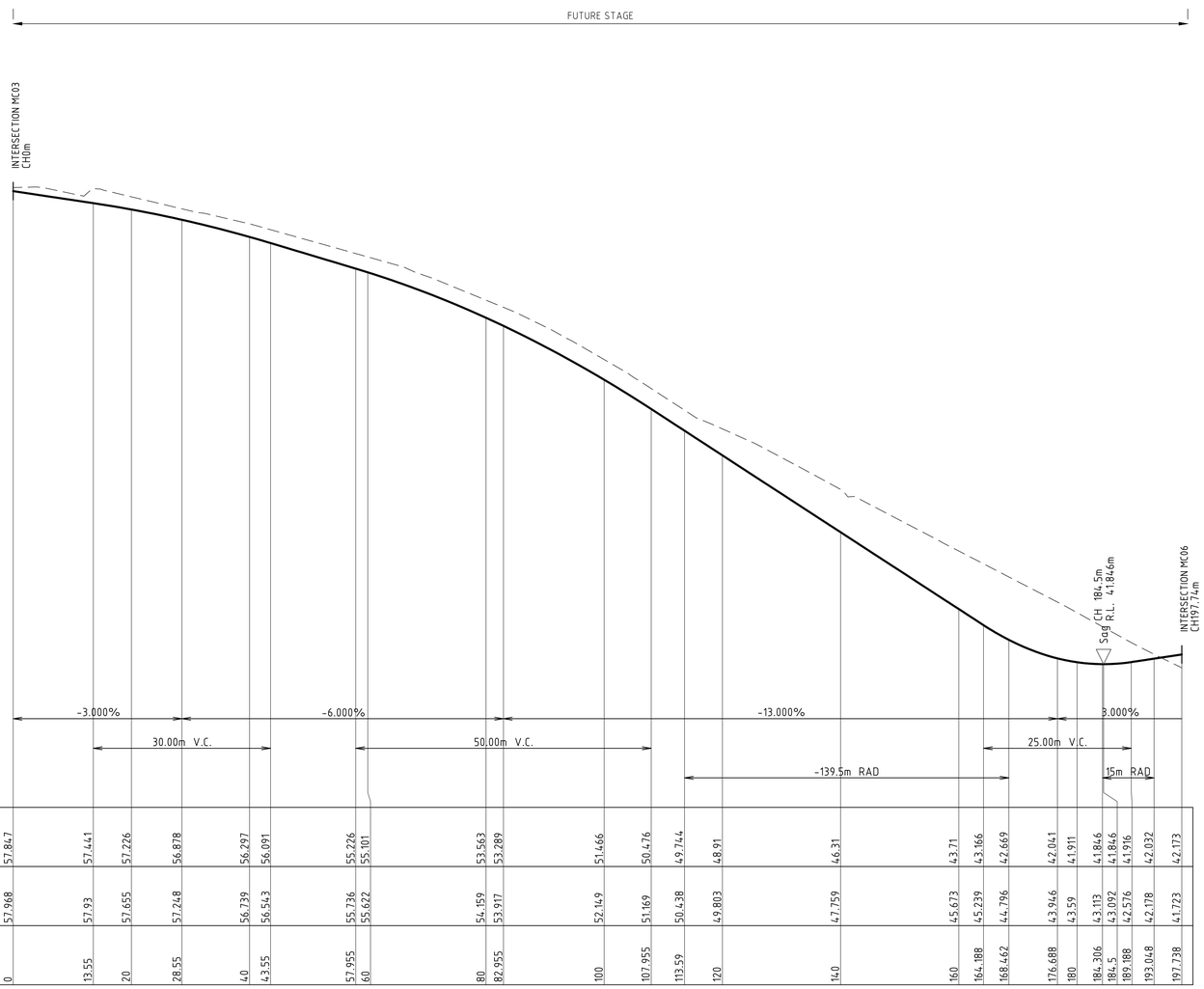
JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.54**

REVISION: **C**

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\C - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING\222055-01-MP-C05.51-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC14

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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COUNCIL
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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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ABN 81 094 433 100

PROJECT
PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320

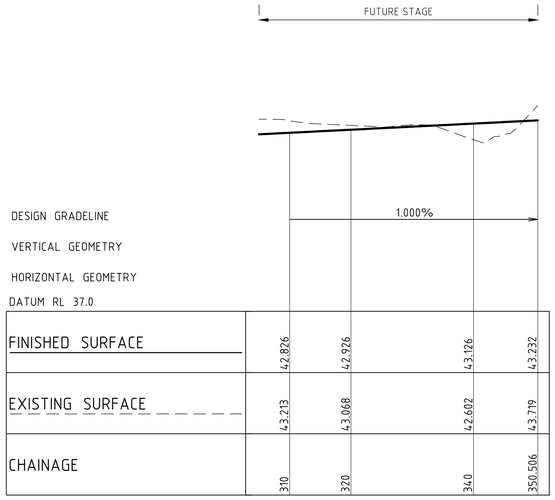
MASTERPLANNING DA

DRAWING TITLE
CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 25

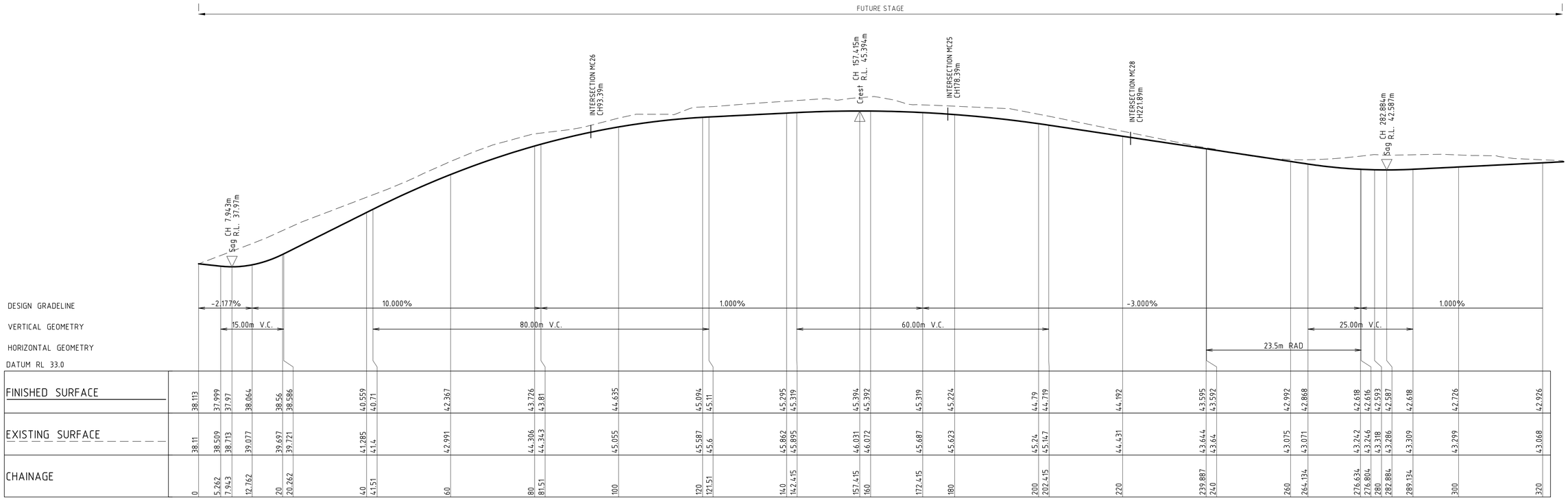
JOB NUMBER **NL222055-01**
DRAWING NUMBER **MP-C05.55**
REVISION **C**
DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\3D - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC15

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1



LONGITUDINAL SECTION ALONG MC15

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 26

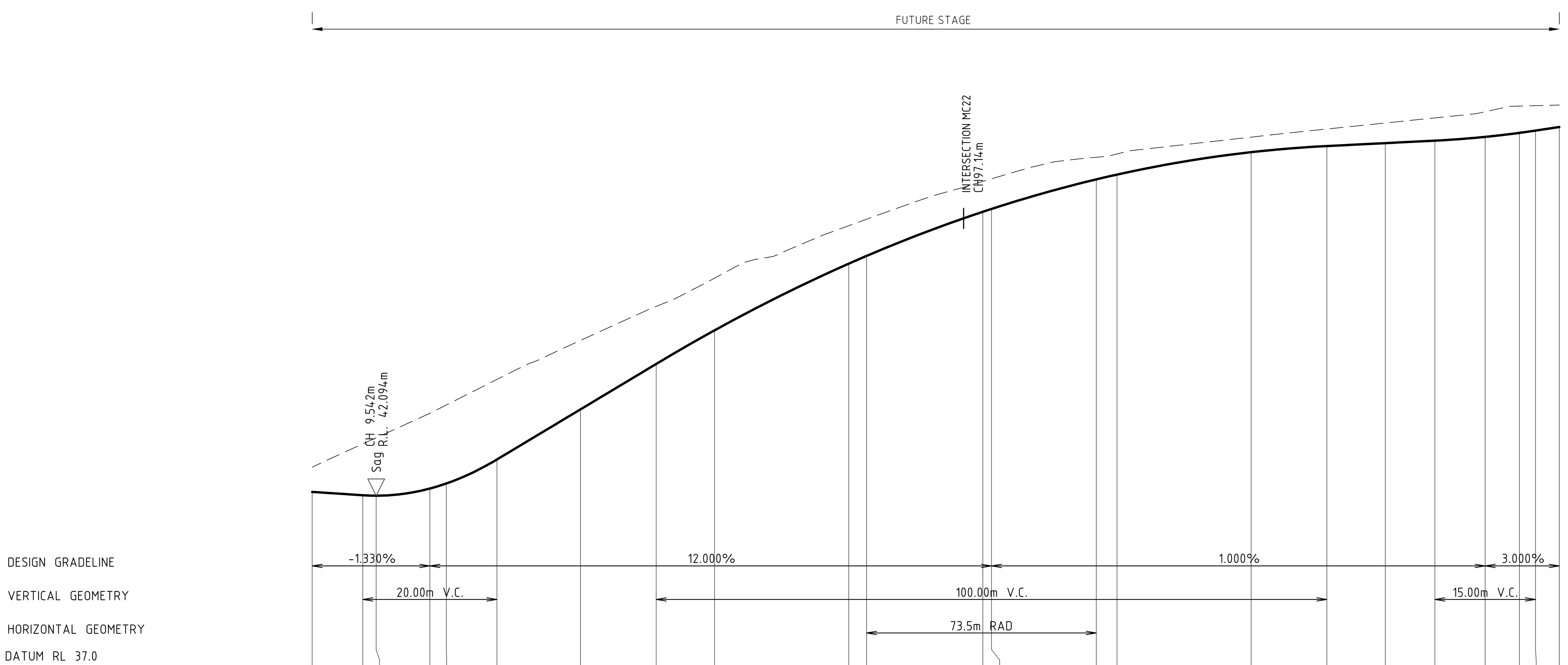
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.56

REVISION: C

DRAWING SHEET SIZE = A1

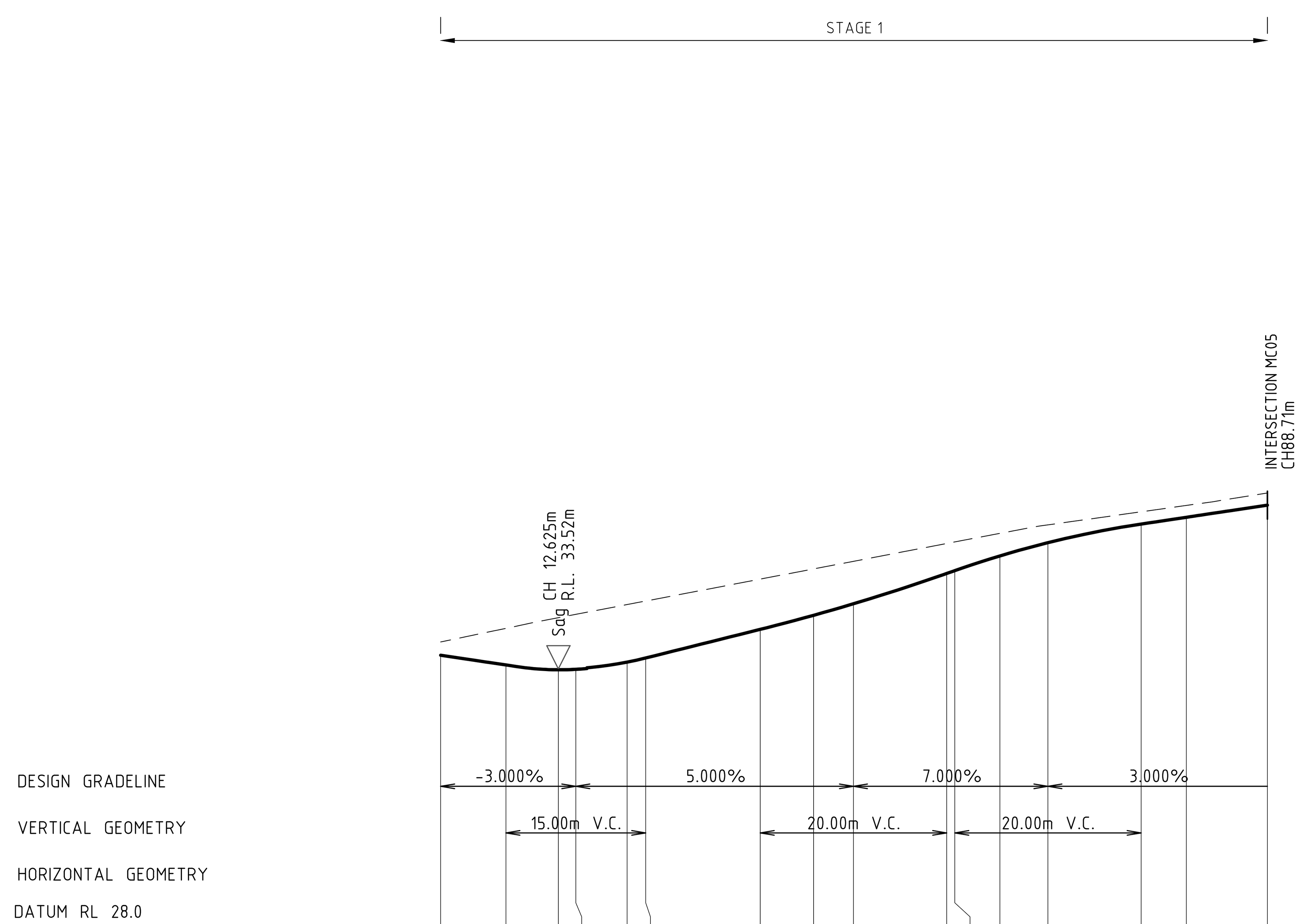
Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
0	42.208	42.944
7.547	42.107	43.641
9.542	42.094	43.822
17.547	42.308	44.553
20	42.459	44.8
27.547	43.174	45.562
40	44.669	46.725
51.295	46.024	47.741
60	47.027	48.585
80	49.016	50.148
82.661	49.247	50.342
100	50.564	51.472
101.295	50.649	51.55
116.91	51.53	52.19
120	51.673	52.289
140	52.341	52.789
151.295	52.524	53.032
160	52.611	53.211
167.394	52.685	53.364
174.894	52.798	53.548
180	52.917	53.714
182.394	52.985	53.728
185.944	53.092	53.748

LONGITUDINAL SECTION ALONG MC16

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1



CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
0	33.815	34.1
7	33.605	34.391
12.625	33.52	34.619
14.5	33.53	34.691
20	33.666	34.901
22	33.755	34.978
34.289	34.369	35.448
40	34.671	35.666
44.289	34.919	35.83
54.289	35.569	36.213
55.156	35.63	36.246
60	35.946	36.431
65.156	36.23	36.613
75.156	36.63	36.893
80	36.775	37.029
88.706	37.036	37.297

LONGITUDINAL SECTION ALONG MC17

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

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DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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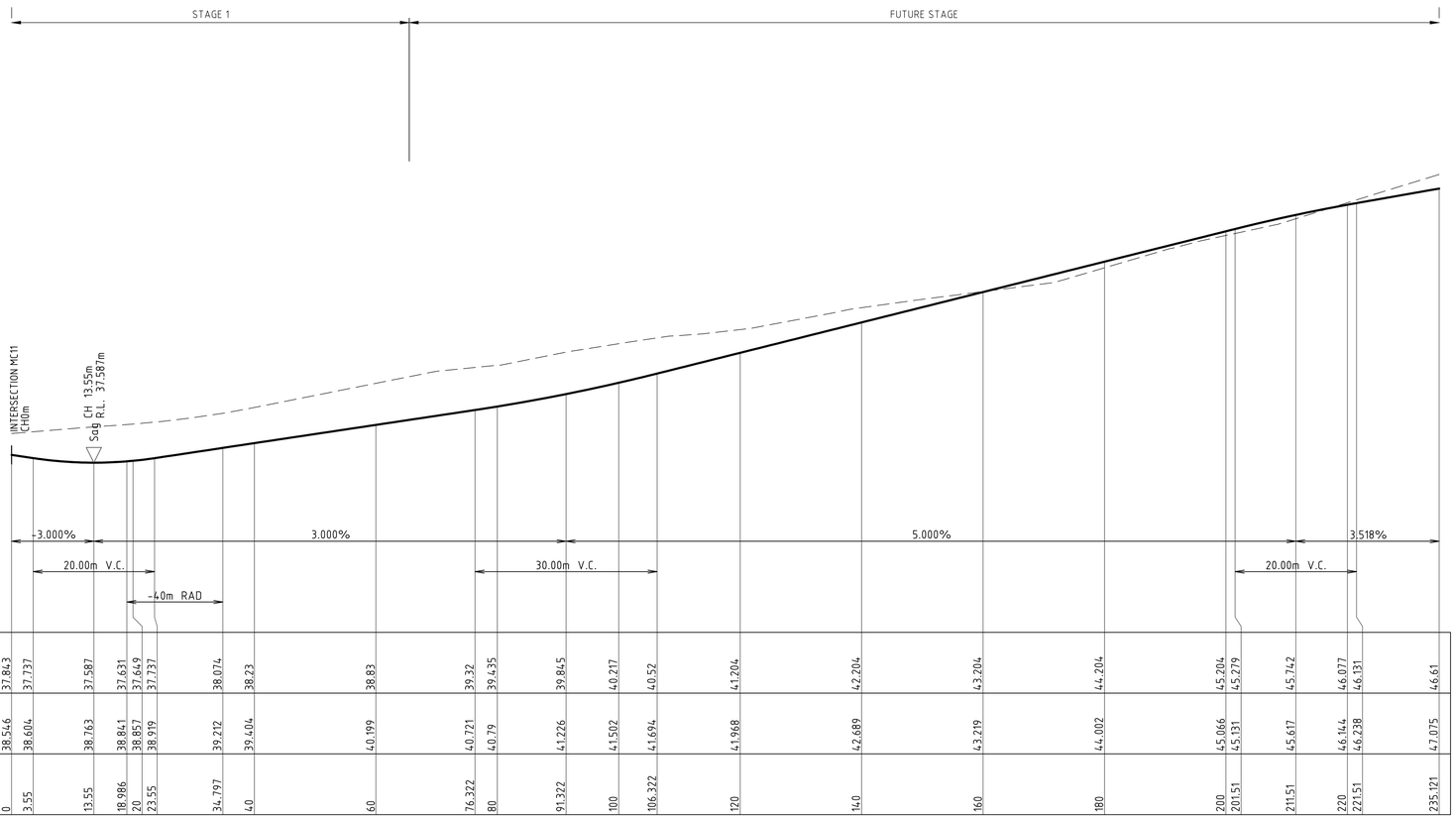
ABN 81 094 433 100

PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320
MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
ROAD LONGITUDINAL SECTIONS - SHEET 27

JOB NUMBER: NL222055-01
DRAWING NUMBER: MP-C05.57
REVISION: C
DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:50 PM Plotted By: ANDREW KILLEN Found: O:\3 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\3 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC18

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
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C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

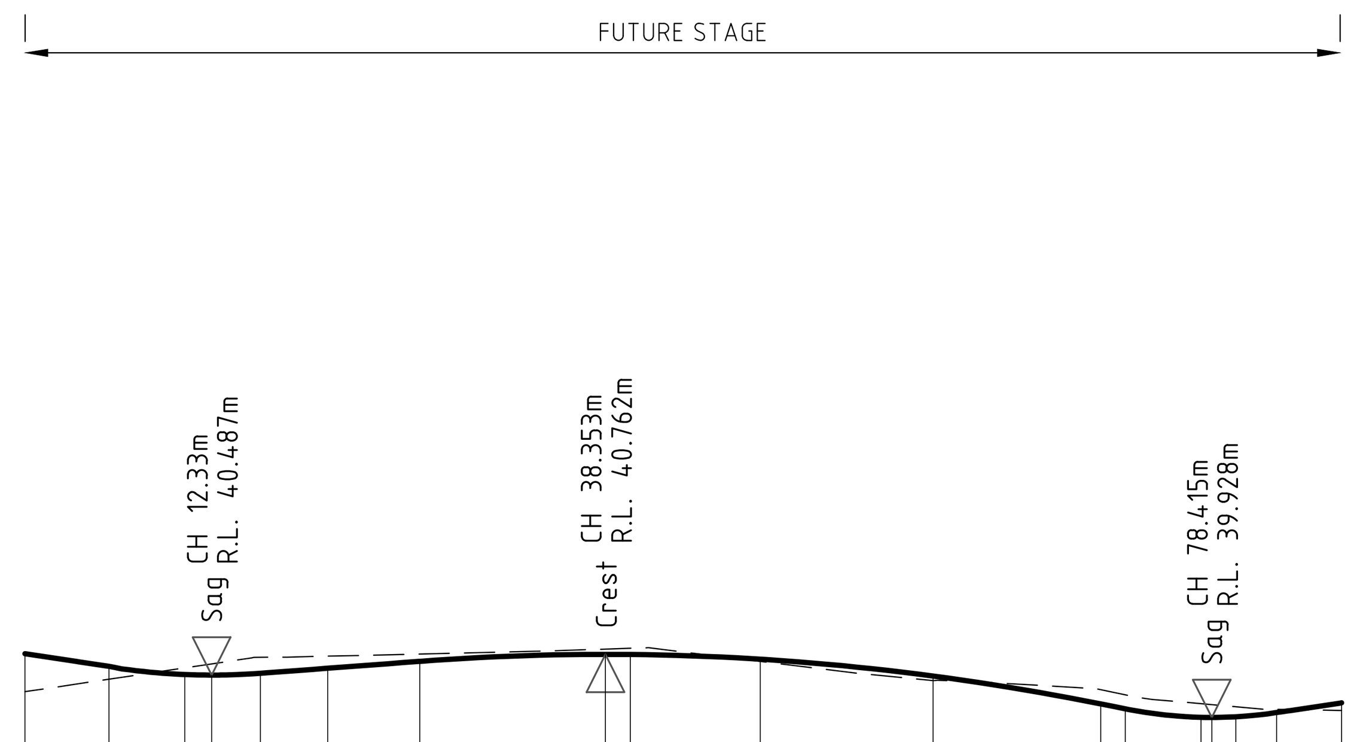
MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

ROAD LONGITUDINAL SECTIONS - SHEET 28

JOB NUMBER: **NL222055-01**
DRAWING NUMBER: **MP-C05.58**
REVISION: **C**
DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



DESIGN GRADELINE: -3.158% | 1.500% | -4.000% | 3.000%

VERTICAL GEOMETRY: 10.00m V.C. | 45.00m V.C. | 10.00m V.C.

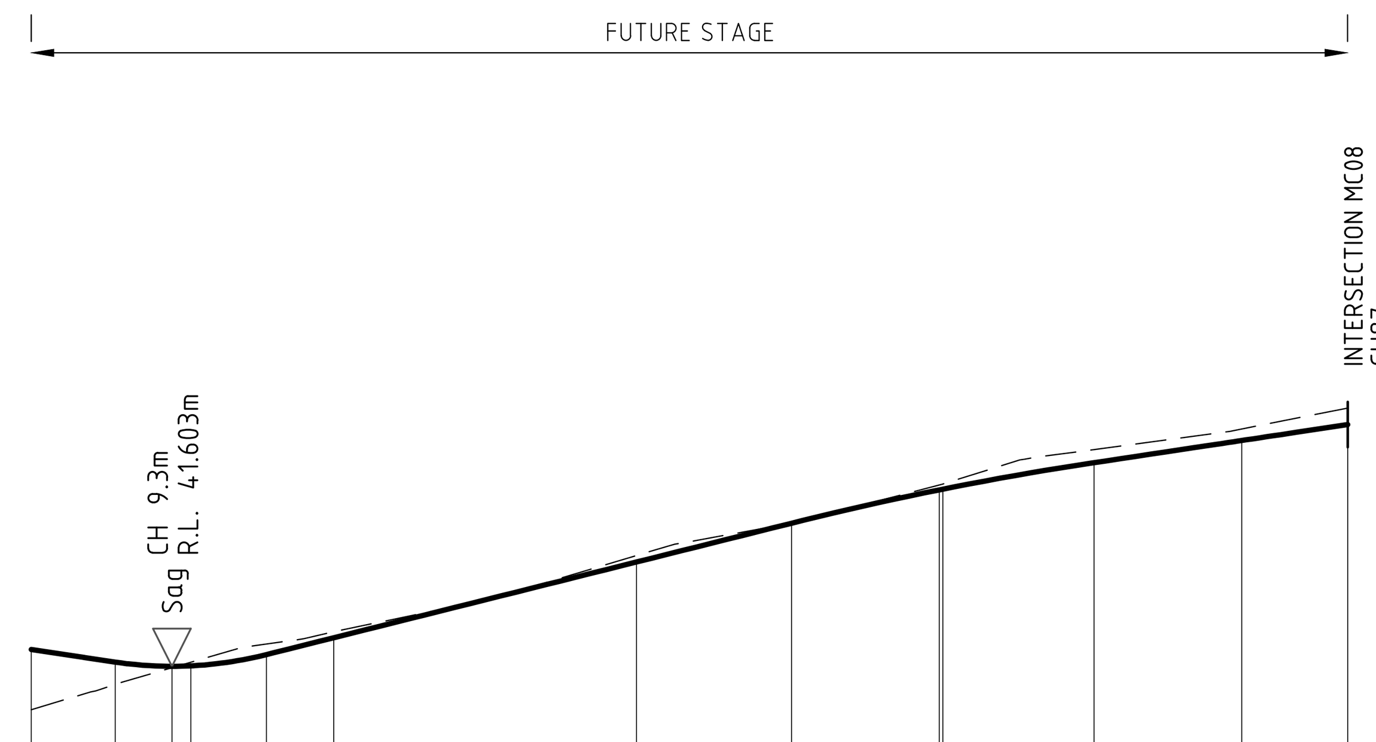
HORIZONTAL GEOMETRY

DATUM RL 35.0

FINISHED SURFACE	40.77	40.594	40.495	40.487	40.512	40.578	40.669	40.762	40.76	40.698	40.475	40.107	40.042	39.93	39.928	39.937	39.992	40.121
EXISTING SURFACE	40.268	40.434	40.583	40.636	40.722	40.738	40.766	40.831	40.842	40.668	40.416	40.296	40.226	40.11	40.098	40.07	40.035	40.021
CHAINAGE	0	5.55	10.55	12.33	15.55	20	26.08	38.353	40	48.58	60	71.08	72.701	77.701	78.415	80	82.701	87

LONGITUDINAL SECTION ALONG MC19

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1



DESIGN GRADELINE: -3.000% | 5.000% | 3.000%

VERTICAL GEOMETRY: 10.00m V.C. | 20.00m V.C.

HORIZONTAL GEOMETRY

DATUM RL 36.0

FINISHED SURFACE	41.825	41.659	41.603	41.609	41.759	41.981	42.981	43.493	43.934	43.943	44.293	44.586	44.796
EXISTING SURFACE	41.03	41.364	41.585	41.658	41.898	42.062	43.066	43.493	43.998	44.011	44.466	44.738	45.015
CHAINAGE	0	5.55	9.3	10.55	15.55	20	40	50.244	60	60.244	70.244	80	87

LONGITUDINAL SECTION ALONG MC20

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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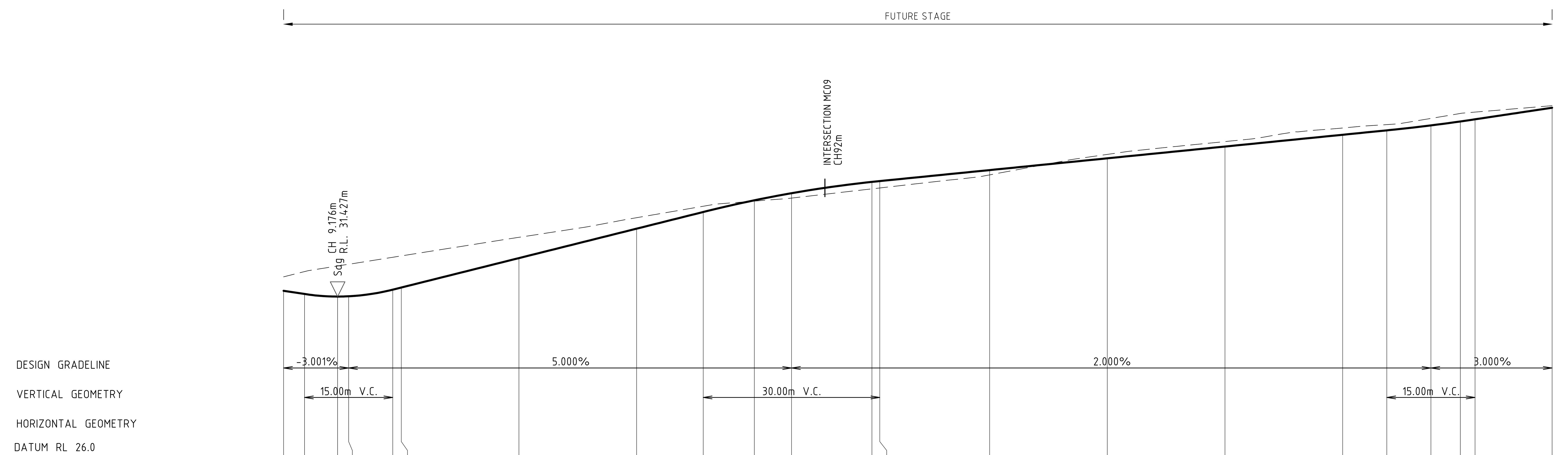
ABN 81 094 433 100

PROJECT: PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320
MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
ROAD LONGITUDINAL SECTIONS - SHEET 29

JOB NUMBER: NL222055-01
DRAWING NUMBER: MP-C05.59
REVISION: C
DRAWING SHEET SIZE = A1



FINISHED SURFACE	31.618	31.511	31.427	31.436	31.661	31.734	32.734	33.734	34.3	34.696	34.938	35.323
EXISTING SURFACE	32.097	32.274	32.465	32.524	32.762	32.808	33.439	34.106	34.496	34.669	34.773	35.086
CHAINAGE	0	3.55	9.176	11.05	18.55	20	40	60	71.326	80	86.326	100

FINISHED SURFACE	35.35	35.724	36.124	36.524	36.924	37.074	37.242	37.376	37.449	37.842
EXISTING SURFACE	35.116	35.561	36.256	36.692	37.154	37.269	37.48	37.647	37.694	37.911
CHAINAGE	101.326	120	140	160	180	187.502	195.002	200	202.502	215.604

LONGITUDINAL SECTION ALONG MC21

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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COUNCIL
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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320
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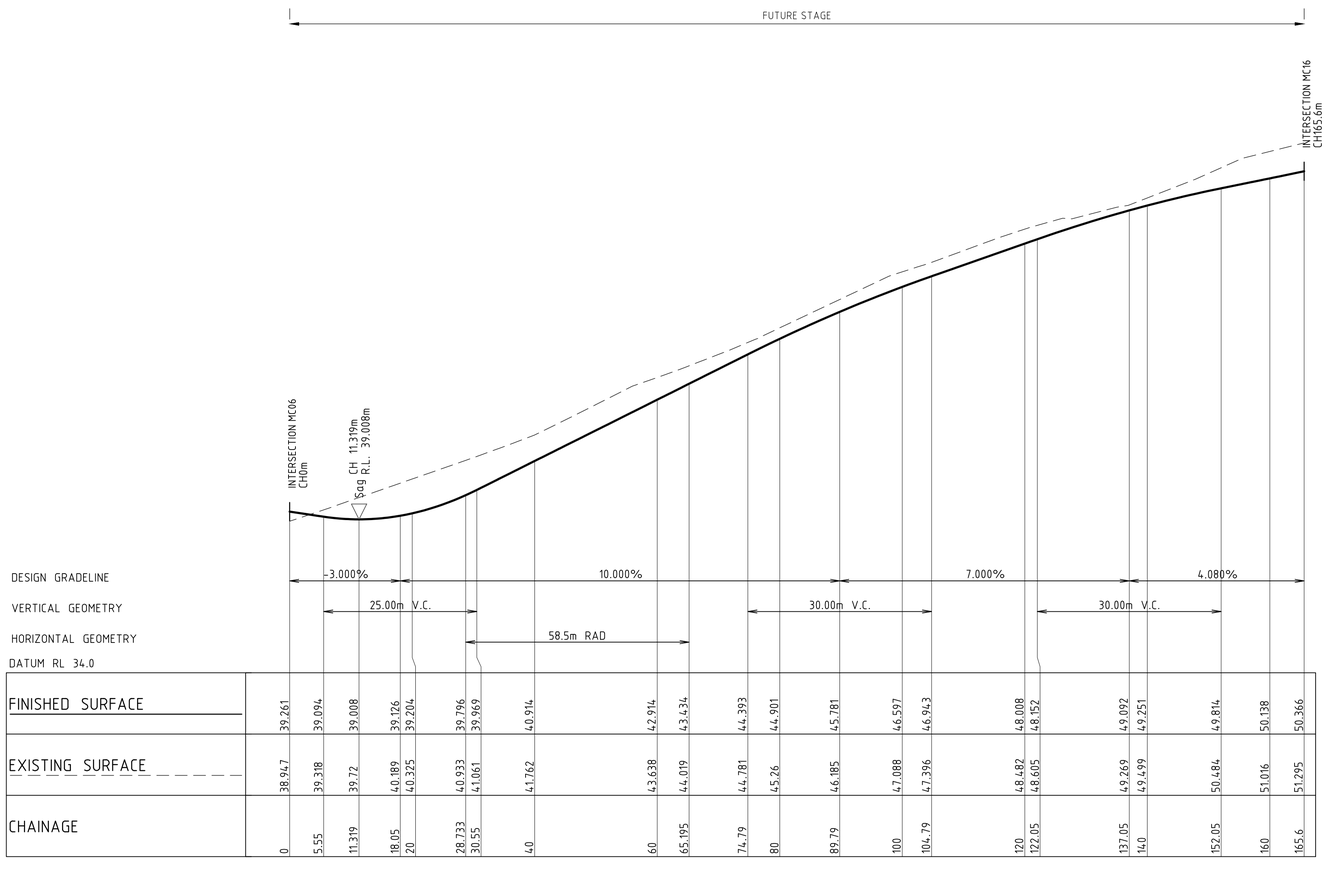
DRAWING TITLE
CIVIL ENGINEERING PACKAGE
ROAD LONGITUDINAL SECTIONS - SHEET 30

JOB NUMBER NL222055-01
DRAWING NUMBER MP-C05.60
REVISION C
DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:50 PM Plotted By: ANDREW KILLEN



LONGITUDINAL SECTION ALONG MC22

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DESIGNED: A.TURNBULL
DRAWN: J.STAUB
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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ABN 81 094 433 100

PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 31

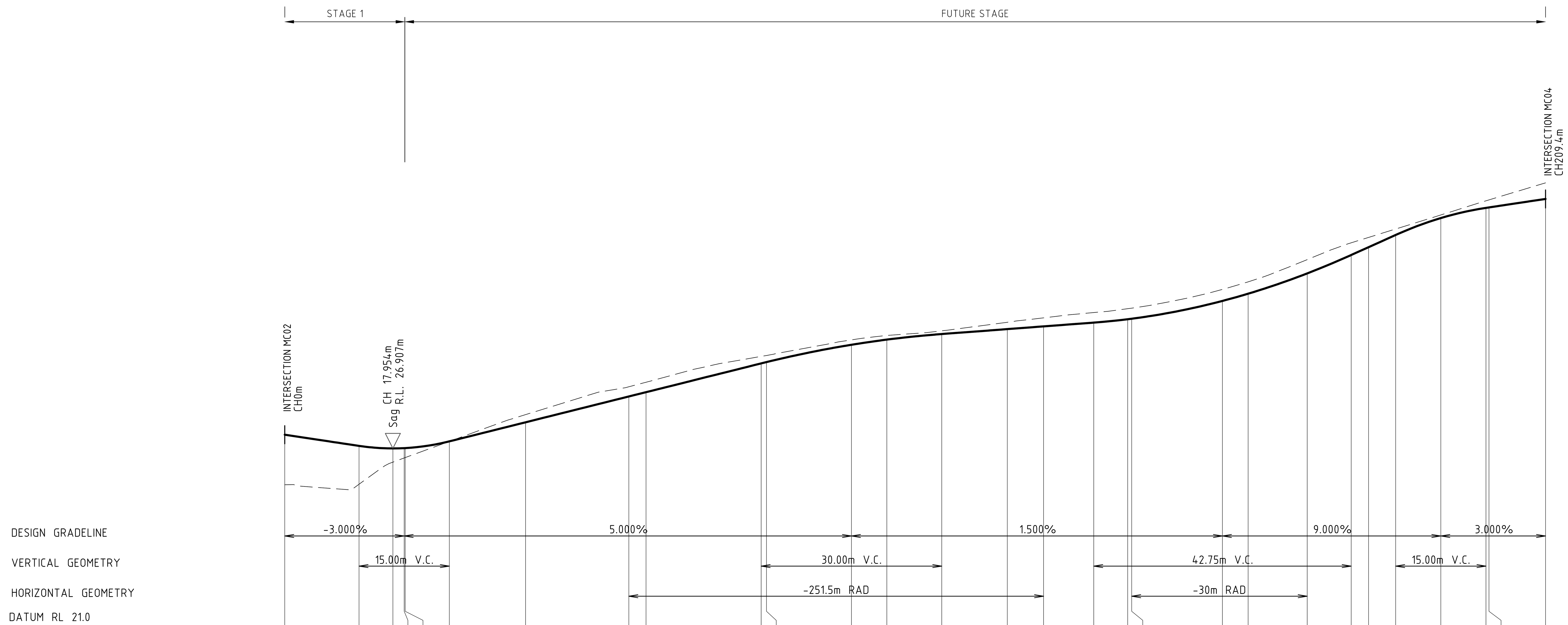
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C05.61

REVISION: C

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\HO - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



FINISHED SURFACE	27.362	26.992	26.907	26.917	26.919	27.142	27.775	28.632	28.775	29.731
EXISTING SURFACE	25.7	25.718	26.453	26.59	26.603	27.14	28.029	28.954	29.104	29.961
CHAINAGE	0	12.329	17.954	19.829	20	27.329	40	57.143	60	79.12

FINISHED SURFACE	29.775	30.35	30.521	30.706	30.869	30.96	31.085	31.197	31.214	31.806
EXISTING SURFACE	29.993	30.507	30.659	30.811	31.095	31.242	31.419	31.547	31.564	32.186
CHAINAGE	80	94.12	100	109.12	120	126.025	134.361	140	140.665	155.736

FINISHED SURFACE	32.046	32.719	33.329	33.589	33.995	34.557	34.895	34.91	35.192
EXISTING SURFACE	32.437	33.177	33.734	33.913	34.193	34.659	35.131	35.16	35.726
CHAINAGE	160	169.812	177.111	180	184.506	192.006	199.506	200	209.396

LONGITUDINAL SECTION ALONG MC23

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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ABN 81 094 433 100

PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

ROAD LONGITUDINAL SECTIONS - SHEET 32

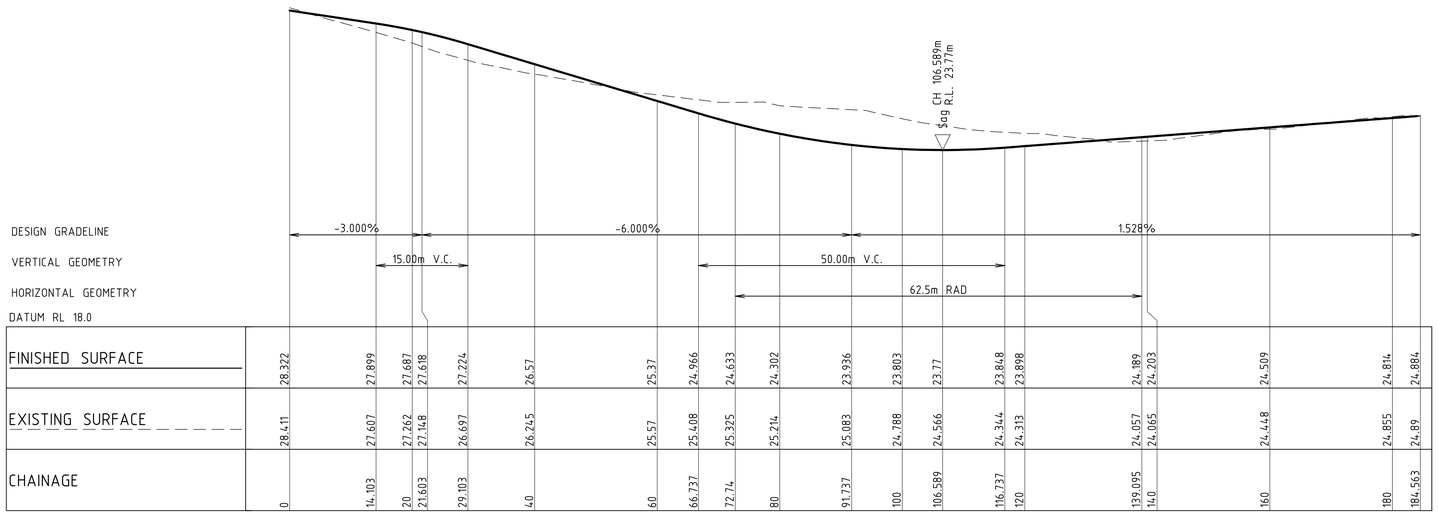
JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.62** REVISION: **C**

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:50 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\03 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg

STAGE 1



LONGITUDINAL SECTION ALONG MC24

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: JSTAUB DESIGNED: ATURNBULL JOB MANAGER: LMCRAE VERIFIER: LMCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

NORTHROP
Newcastle
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ABN 81 094 433 100

PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

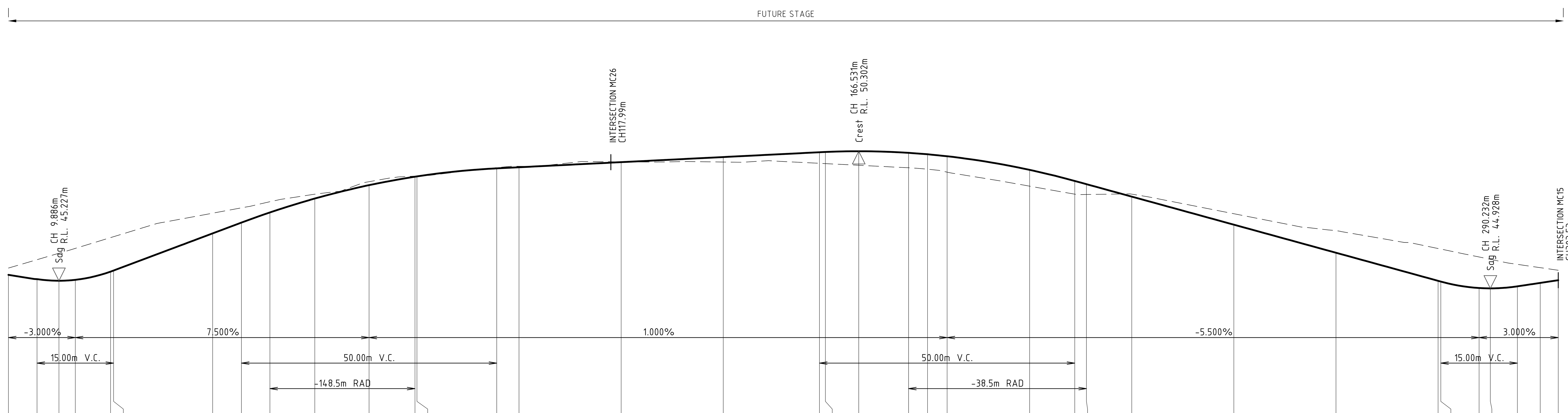
ROAD LONGITUDINAL SECTIONS - SHEET 33

JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.63** REVISION: **C**

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg



CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
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9.886	45.227	46.304
13.1	45.263	46.496
20	45.585	46.917
20.6	45.628	46.954
40	47.083	47.875
45.634	47.506	48.083
51.21	47.904	48.324
60	48.449	48.619
70.634	48.975	49.111
79.611	49.304	49.33
80	49.316	49.333
95.634	49.631	49.661
100	49.675	49.713
120	49.875	49.888
140	50.075	49.88
158.839	50.263	49.829
160	50.274	49.818
166.531	50.302	49.752
176.291	50.24	49.654
180	50.184	49.599
183.839	50.107	49.483
200	49.573	48.933
208.839	49.138	48.619
211.127	49.012	48.607
220	48.524	48.621
240	47.424	47.853
260	46.324	47.191
280	45.224	46.49
280.526	45.195	46.468
288.026	44.942	46.158
290.232	44.928	46.068
295.526	45.008	45.869
300	45.142	45.74
303.526	45.248	45.638

LONGITUDINAL SECTION ALONG MC25

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

NOT FOR CONSTRUCTION

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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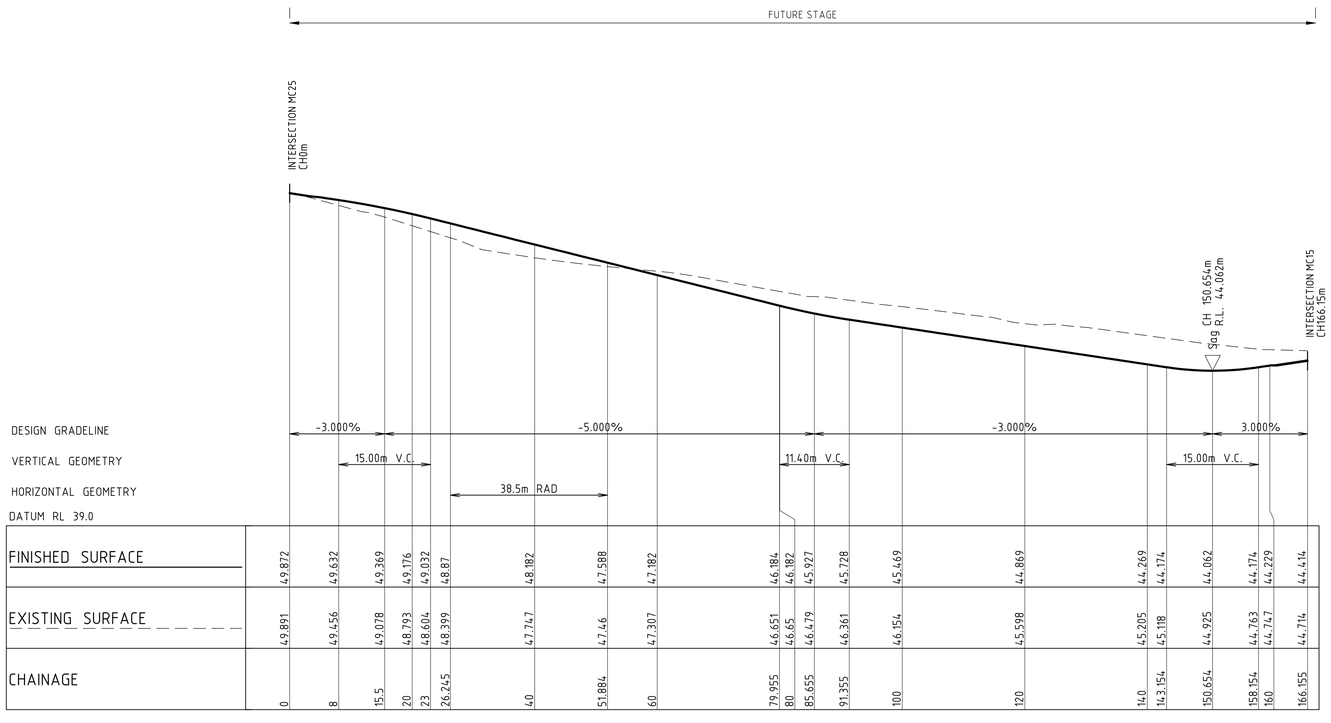
PROJECT: PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320
MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
ROAD LONGITUDINAL SECTIONS - SHEET 34

JOB NUMBER: NL222055-01
DRAWING NUMBER: MP-C05.64
REVISION: C
DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:50 PM Plotted By: ANDREW KILLEN



LONGITUDINAL SECTION ALONG MC26

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: JSTAUB
DESIGNED: A TURNBULL
JOB MANAGER: LMCRAE
VERIFIER: LMCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 — 0 5 10 15 20 25m
SCALE 1:100 @A1 — 0 1 2 3 4 5m

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PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

ROAD LONGITUDINAL SECTIONS - SHEET 35

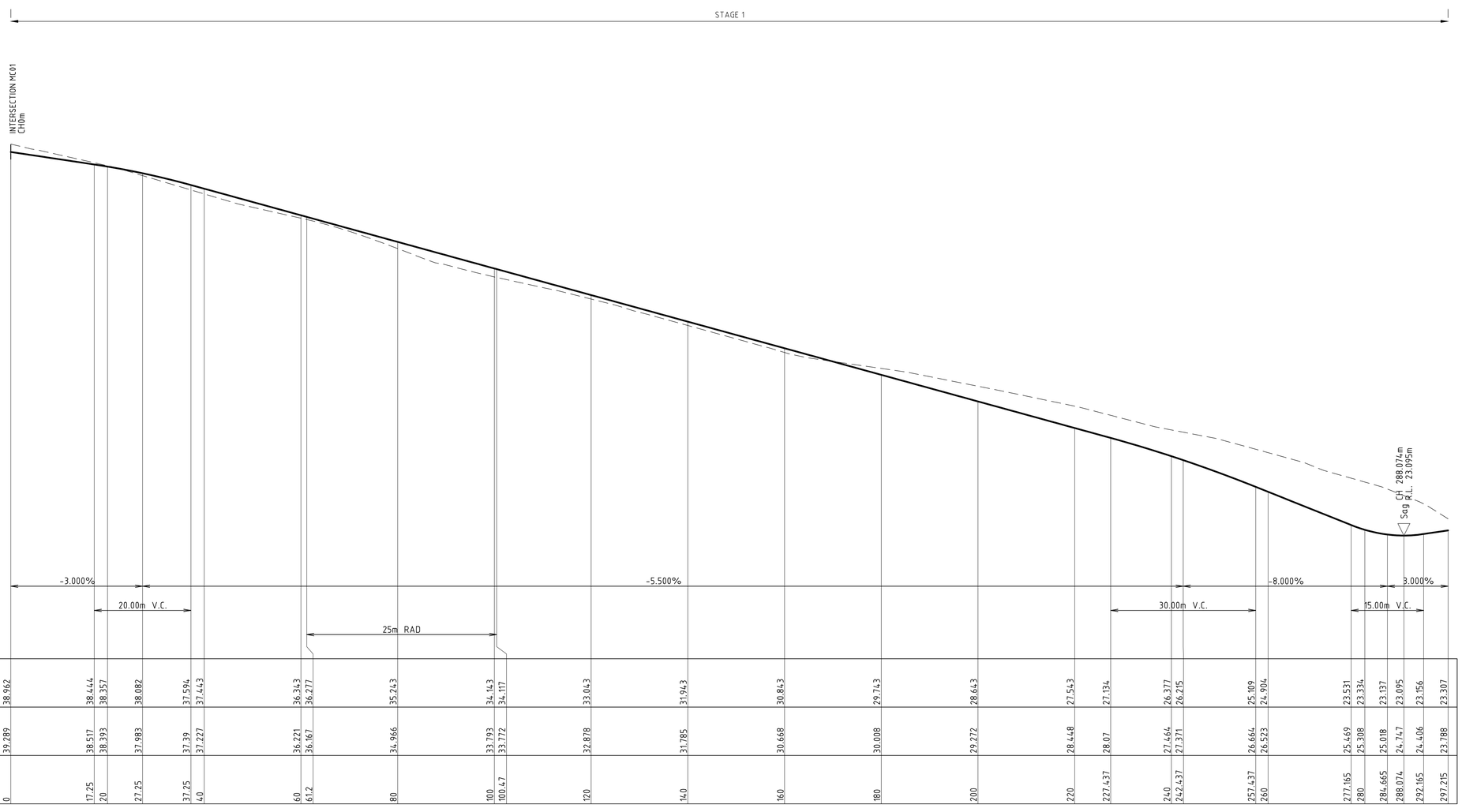
JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C05.65**

REVISION: **C**

DRAWING SHEET SIZE = A1

Date: 22.08.2024 4:55 PM Plotted By: ANDREW KILLEN Found: O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLANNING_222055-01-MP-C05.31-LONG SECTIONS.dwg



LONGITUDINAL SECTION ALONG MC27

HORIZONTAL SCALE 1:500@A1
VERTICAL SCALE 1:100@A1

DRAWN: JSTAUB DESIGNED: A TURNBULL JOB MANAGER: LMCRAE VERIFIER: LMCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	09.08.24
B	DRAFT ISSUE	JS		AK	15.08.24
C	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:500@A1 0 5 10 15 20 25m
SCALE 1:100@A1 0 1 2 3 4 5m

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PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS - SHEET 36

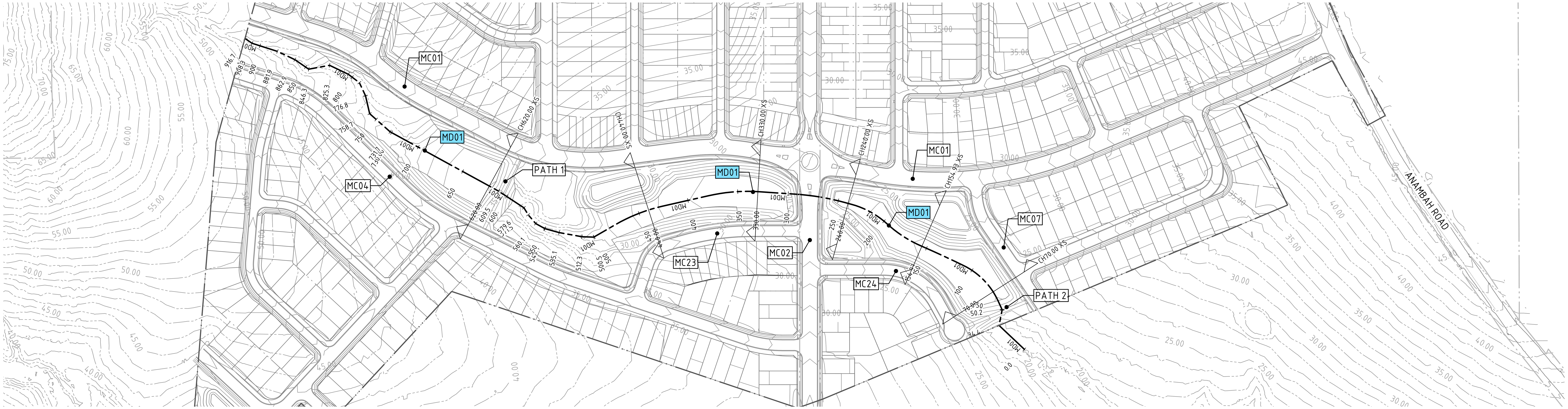
JOB NUMBER: NL222055-01

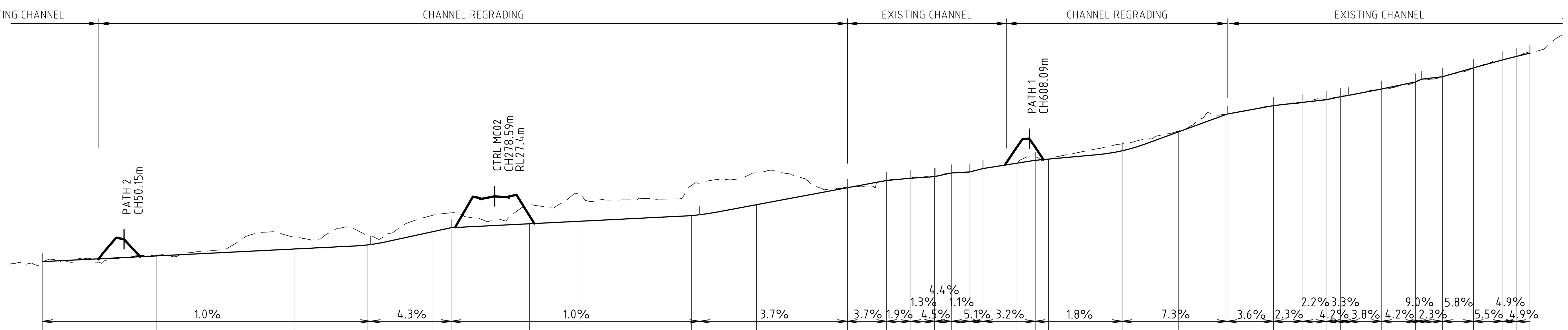
DRAWING NUMBER: MP-C05.66

REVISION: C

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:55 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C05.31-LONG SECTIONS.dwg





CHAINAGE	FINISHED SURFACE	EXISTING SURFACE	SETOUT COORDS (EASTINGS)	SETOUT COORDS (NORTHINGS)
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70	20.059	20.147	358272.223	6384256.807
100	20.359	20.618	358255.030	6384281.128
154.934	20.908	22.362		
200	21.412	22.568	358177.150	6384343.051
240	23.023	25.045	358144.938	6384366.174
251.793	23.534	25.363	358134.160	6384370.957
300	24.016	26.287	358088.168	6384385.174
330	24.316	27.719	358058.952	6384391.988
400	25.034	28.744	357989.310	6384394.600
440	26.374	30.302	357949.438	6384391.563
496.015	28.464	28.464	357895.942	6384375.439
520.153	29.35	29.35	357872.780	6384378.774
535.132	29.634	29.634	357858.675	6384383.817
549.697	29.824	29.824	357845.446	6384389.909
560.109	30.285	30.285	357837.265	6384396.350
571.513	30.409	30.409	357831.347	6384406.097
579.6	30.819	30.819	357828.304	6384413.590
600	31.469	31.536	357813.291	6384427.402
611.802	31.844	32.246	357804.484	6384435.249
620	31.992	32.076	357798.023	6384440.295
665.385	33.015	33.861	357762.254	6384468.230
700	35.336	35.438	357734.973	6384489.537
730	37.526	37.536	357711.329	6384508.002
758.663	38.571	38.571		
776.772	38.982	38.982	357691.782	6384548.008
791.128	39.304	39.304	357687.868	6384561.821
800	39.679	39.679	357681.746	6384568.242
825.305	40.622	40.622	357661.625	6384583.460
846.259	41.495	41.495	357640.676	6384583.000
862.866	42.134	42.134	357628.705	6384594.510
881.895	43.231	43.231	357613.051	6384605.330
900	44.22	44.22	357596.922	6384613.552
908.252	44.628	44.628	357589.570	6384617.300
916.702	45.041	45.041	357583.422	6384623.098

LONGITUDINAL SECTION ALONG MD01

HORIZONTAL SCALE 1:2000@A1
VERTICAL SCALE 1:400@A1

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	06.08.24
B	DRAFT ISSUE	JS		AK	09.08.24
C	DRAFT ISSUE	JS		AK	15.08.24
D	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:2000@A1 — 0 20 40 60 80 100m

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ABN 81 094 433 100

PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320 — MASTERPLANNING DA

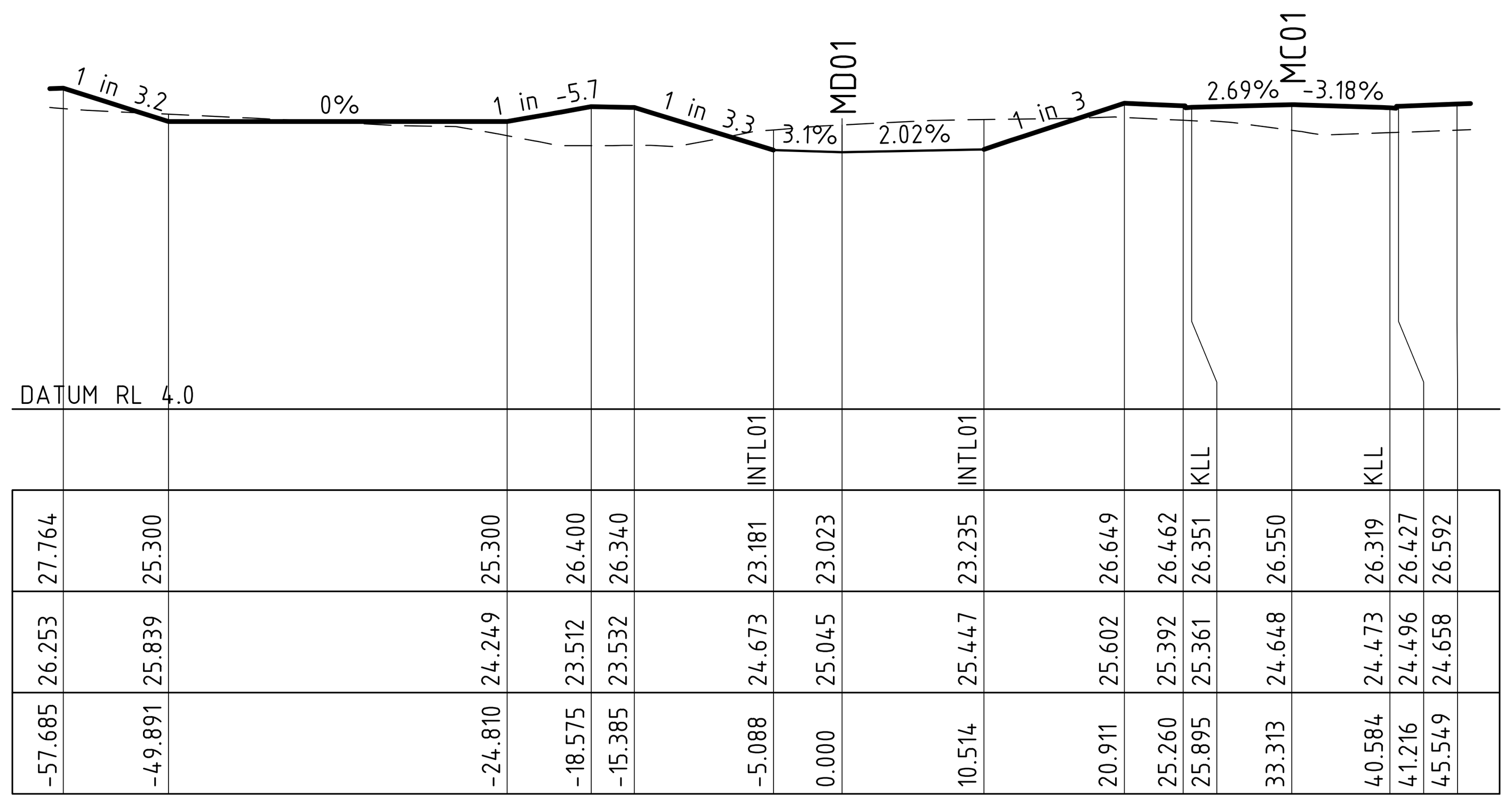
DRAWING TITLE: CIVIL ENGINEERING PACKAGE — CREEK PLAN AND LONGITUDINAL SECTION

JOB NUMBER: NL222055-01

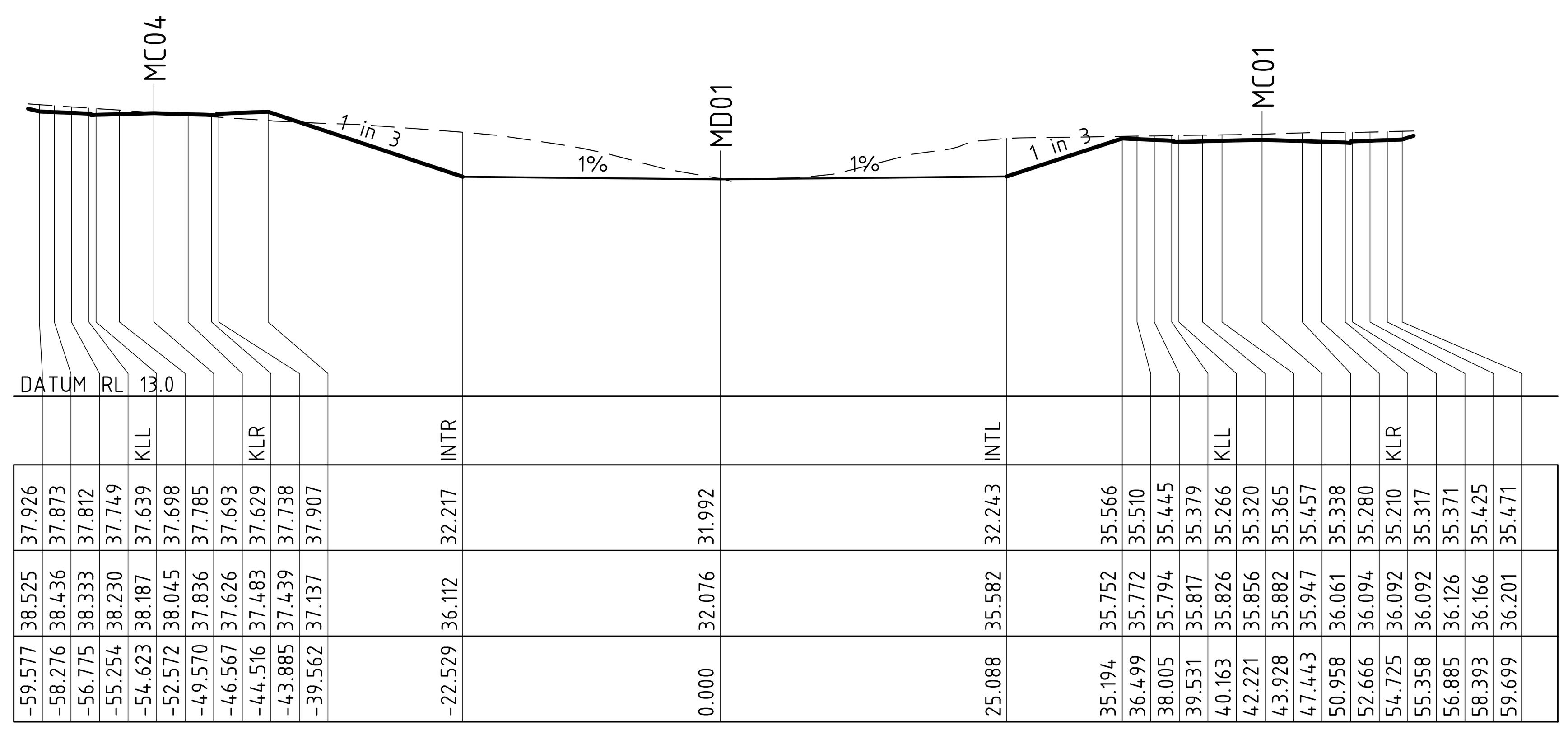
DRAWING NUMBER: MP-C06.01

REVISION: D

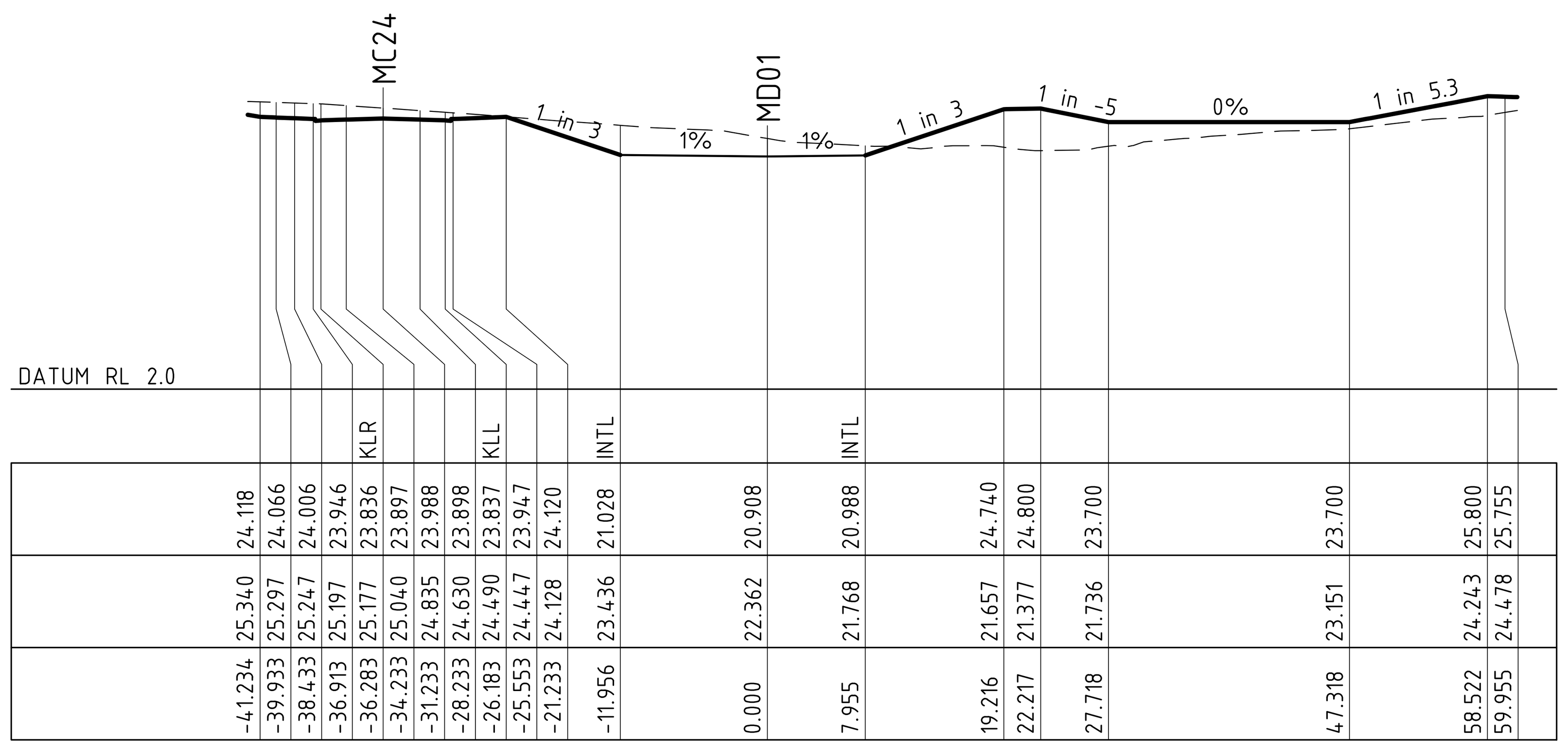
DRAWING SHEET SIZE = A1



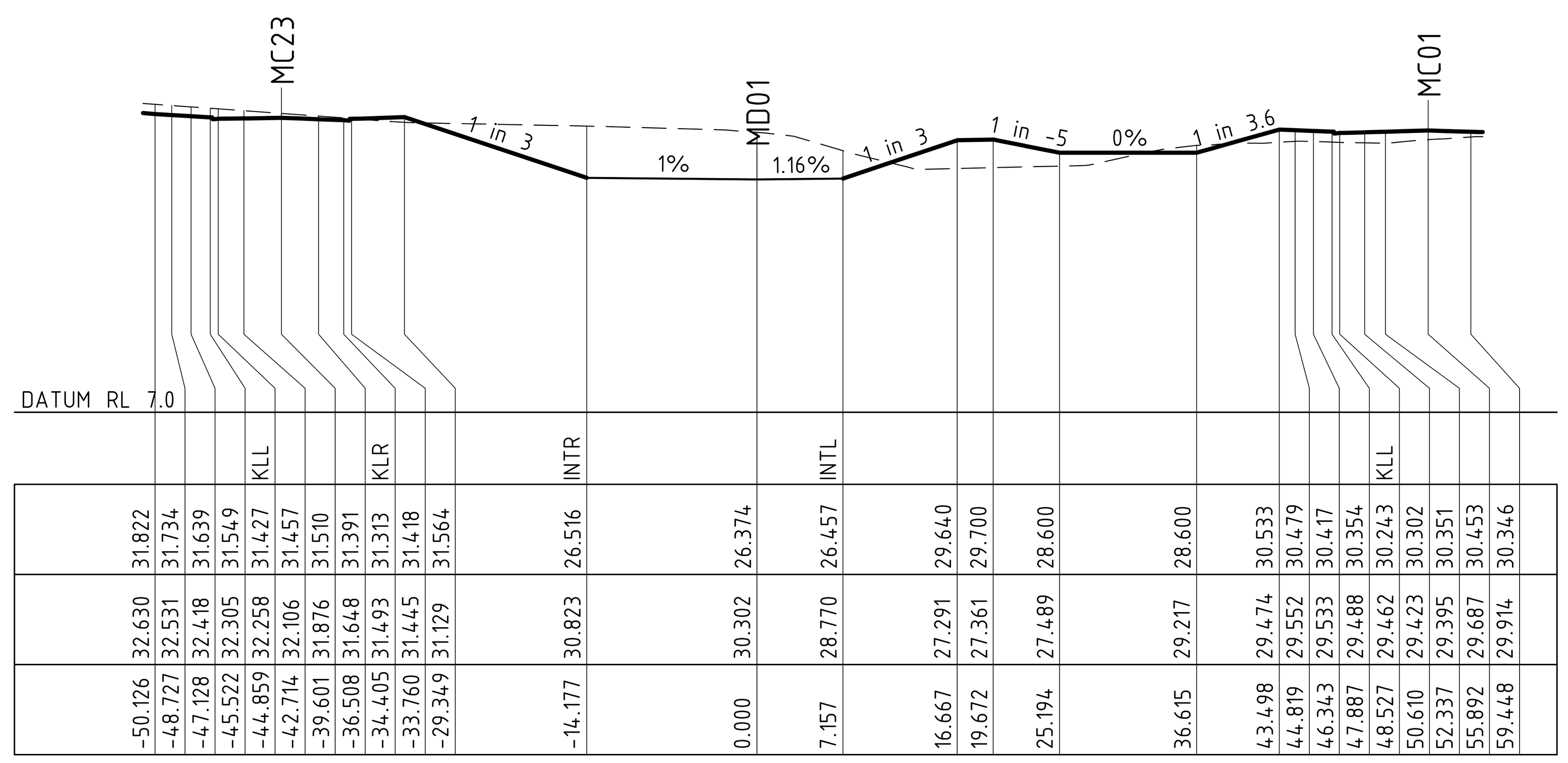
CHAINAGE 240.000



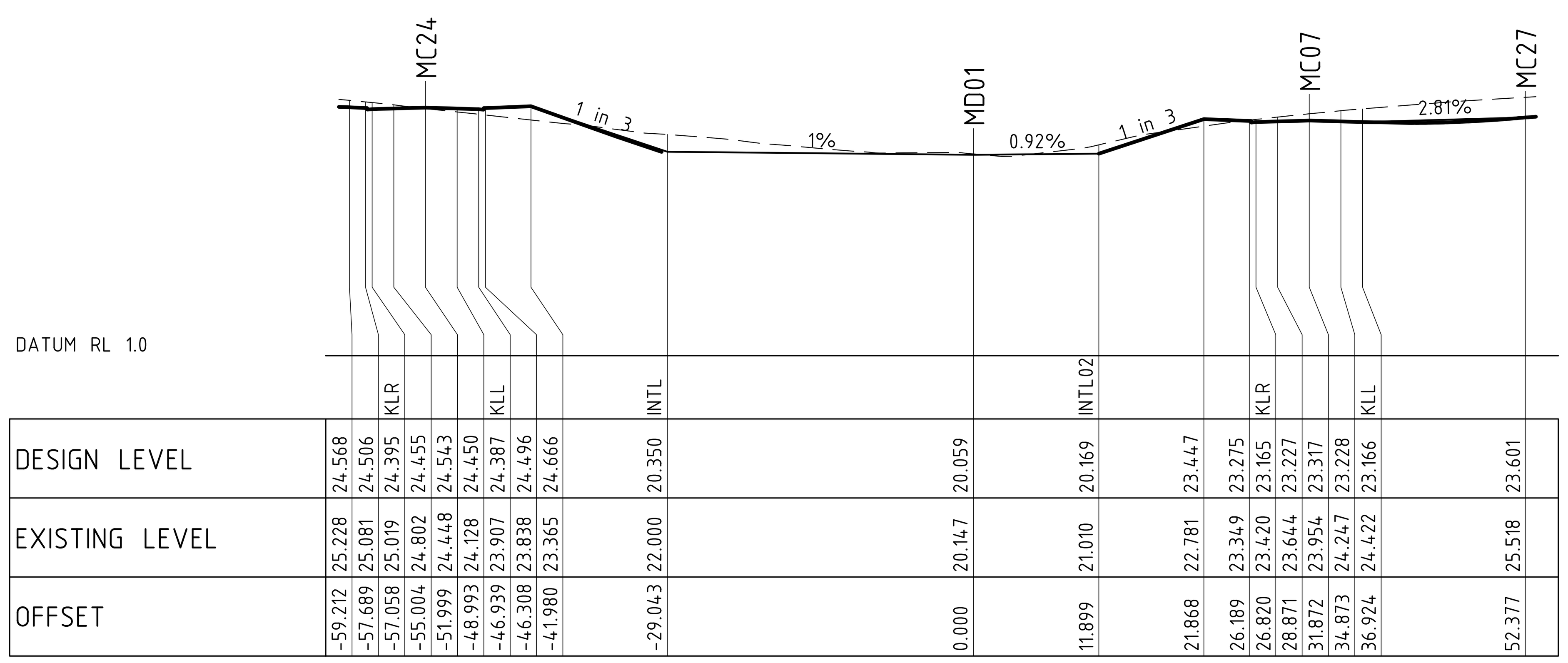
CHAINAGE 620.000



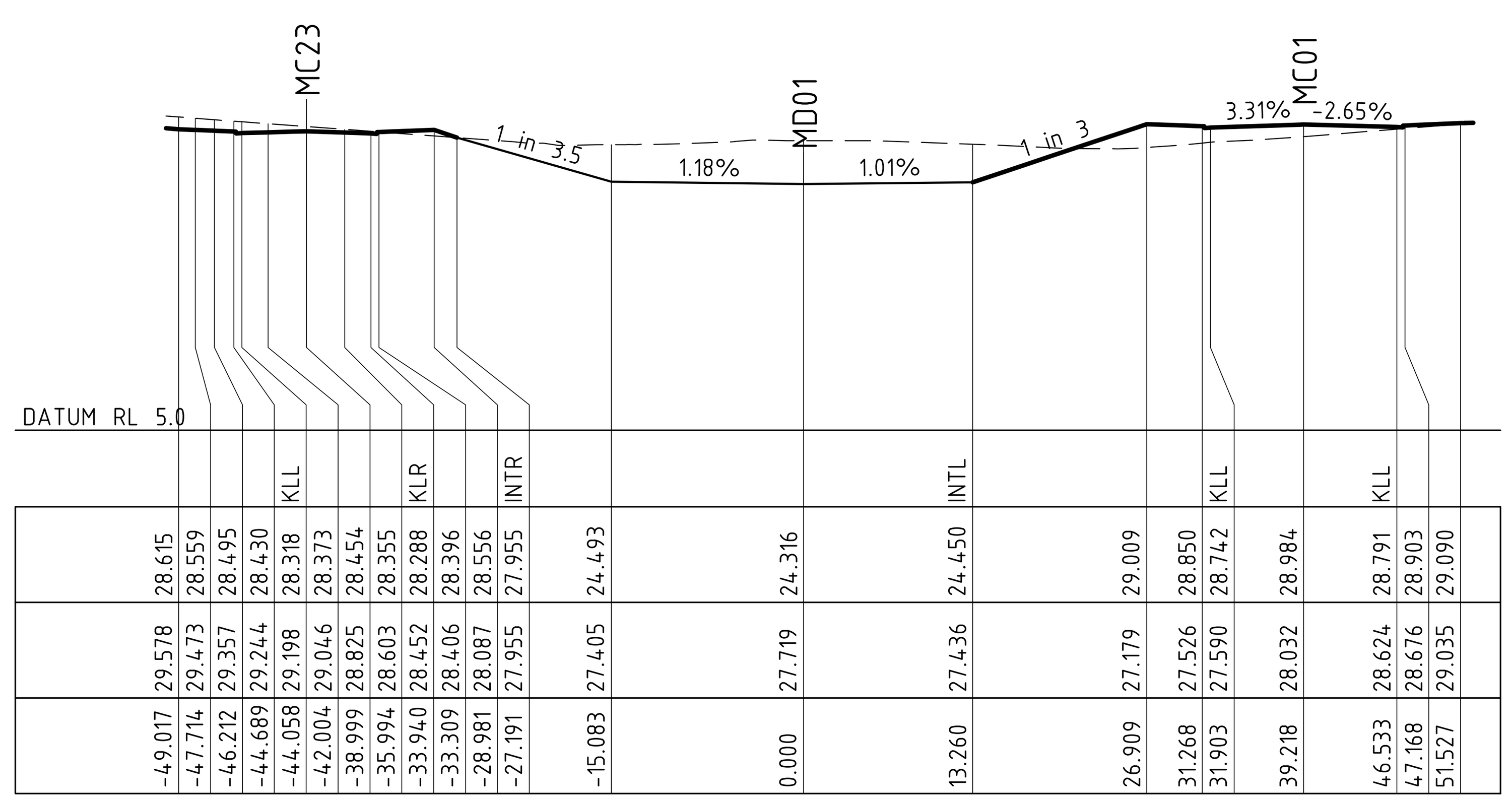
CHAINAGE 154.934



CHAINAGE 440.000



CHAINAGE 70.000



CHAINAGE 330.000

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	06.08.24
B	DRAFT ISSUE	JS		AK	09.08.24
C	DRAFT ISSUE	JS		AK	15.08.24
D	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:2000@ A1 0 20 40 60 80 100m

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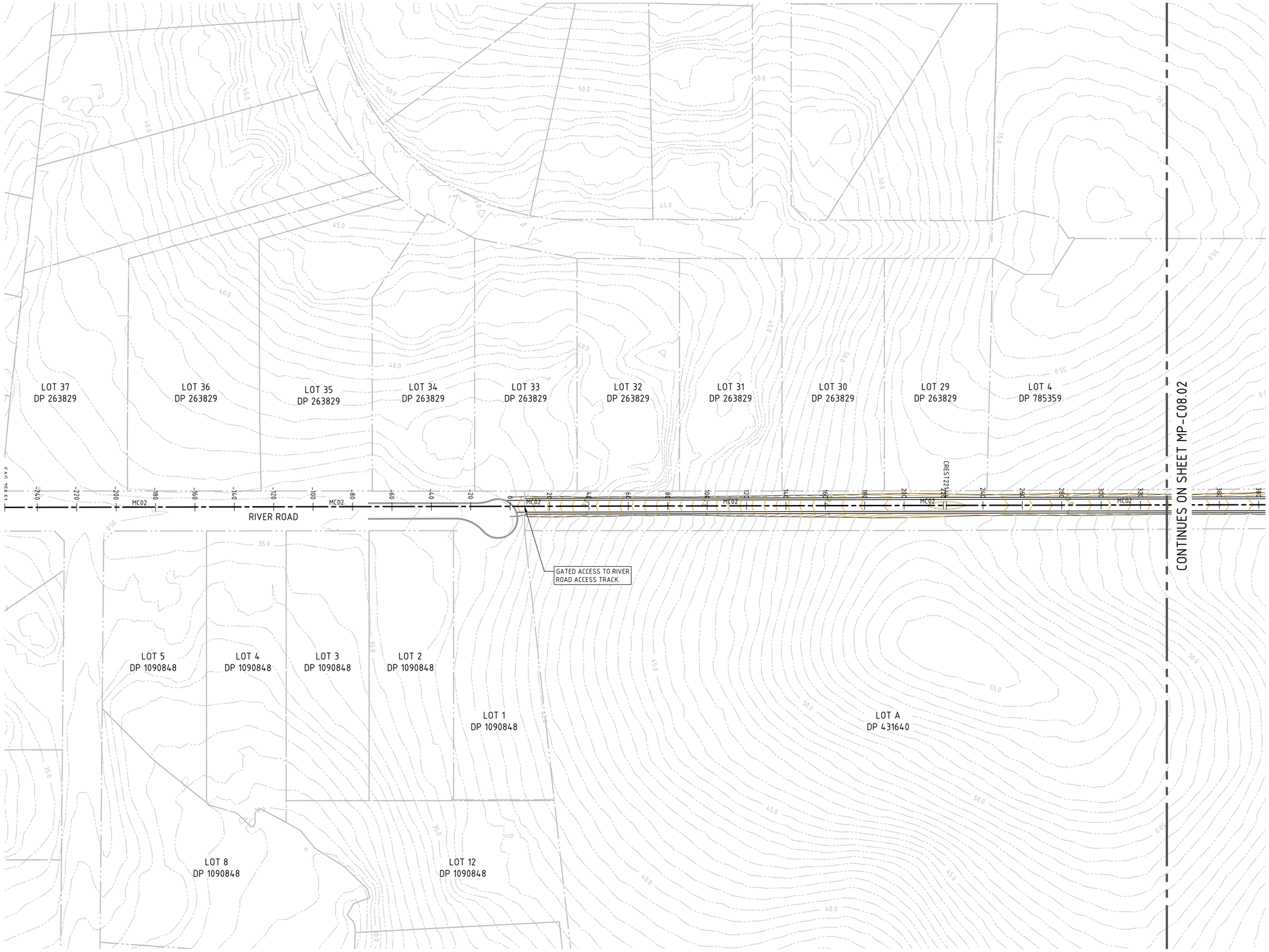
ABN 81 094 433 100

PROJECT: PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320
MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
CREEK CROSS SECTIONS

JOB NUMBER: NL222055-01
DRAWING NUMBER: MP-C06.11
REVISION: D
DRAWING SHEET SIZE = A1



LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER OUTLET WITH SCOUR PROTECTION
- DESIGN CONTOURS (0.5m INTERVALS)
- EXISTING CONTOURS (0.5m INTERVALS)

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	15.08.24
B	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:1000 @ A1

0 10 20 30 40 50m

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Level 1, 215 Pacific Hwy, Charlestown NSW 2290
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ABN 81 094 433 100

PROJECT
PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320

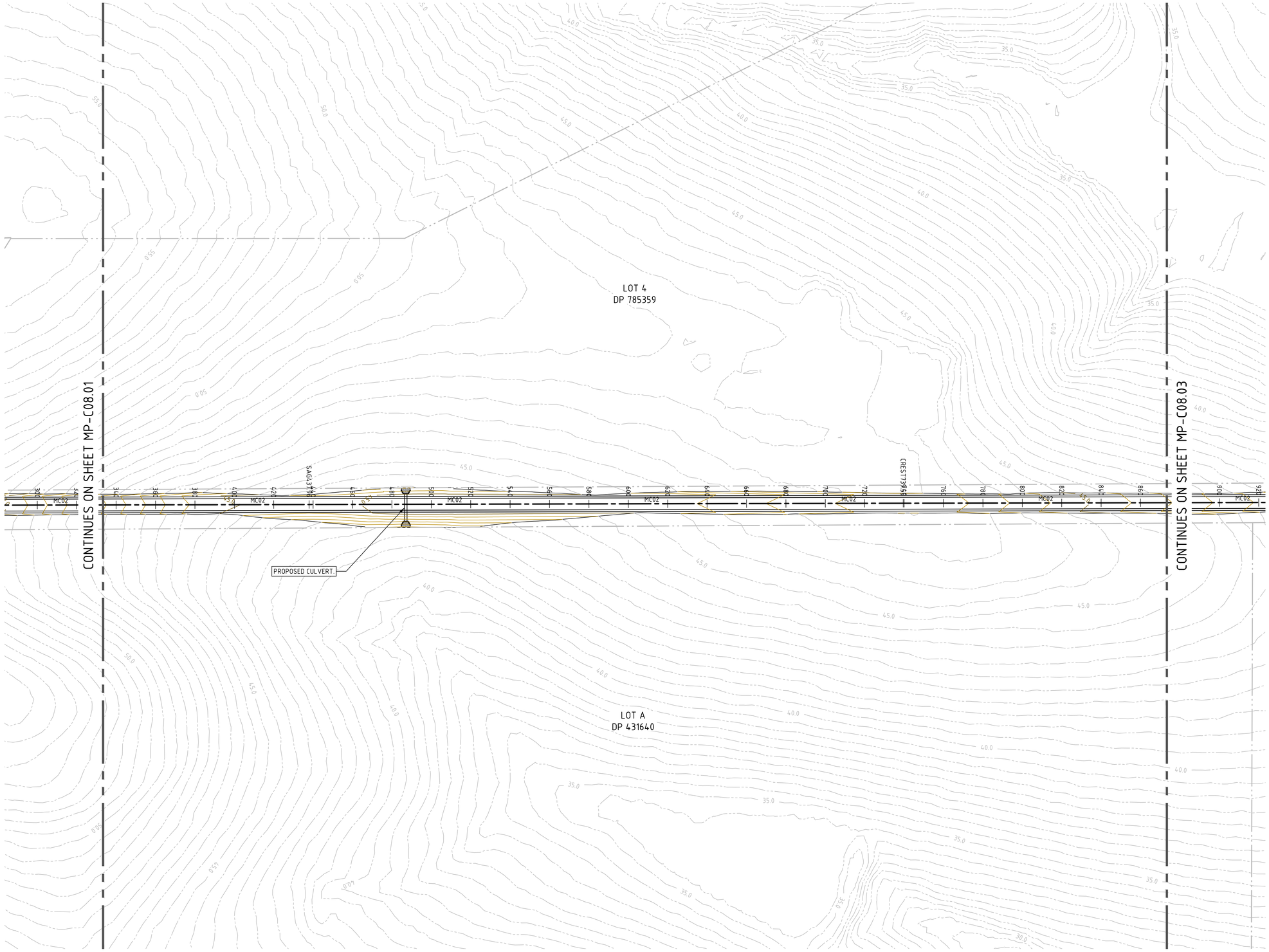
MASTERPLANNING DA

DRAWING TITLE
CIVIL ENGINEERING PACKAGE

CONCEPT CIVIL WORKS PLAN
RIVER ROAD - SHEET 1

JOB NUMBER: **NL222055-01**
DRAWING NUMBER: **MP-C08.01**
REVISION: **B**
DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:56 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C08.01-CIVIL WORKS (RIVER RD).dwg



LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER OUTLET WITH SCOUR PROTECTION
- DESIGN CONTOURS (0.5m INTERVALS) — XX.XX
- EXISTING CONTOURS (0.5m INTERVALS) — XX.XX

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	DRAFT ISSUE	JS		AK	15.08.24
B	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:1000 @ A1

0 10 20 30 40 50m

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ABN 81 094 433 100

PROJECT
PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320

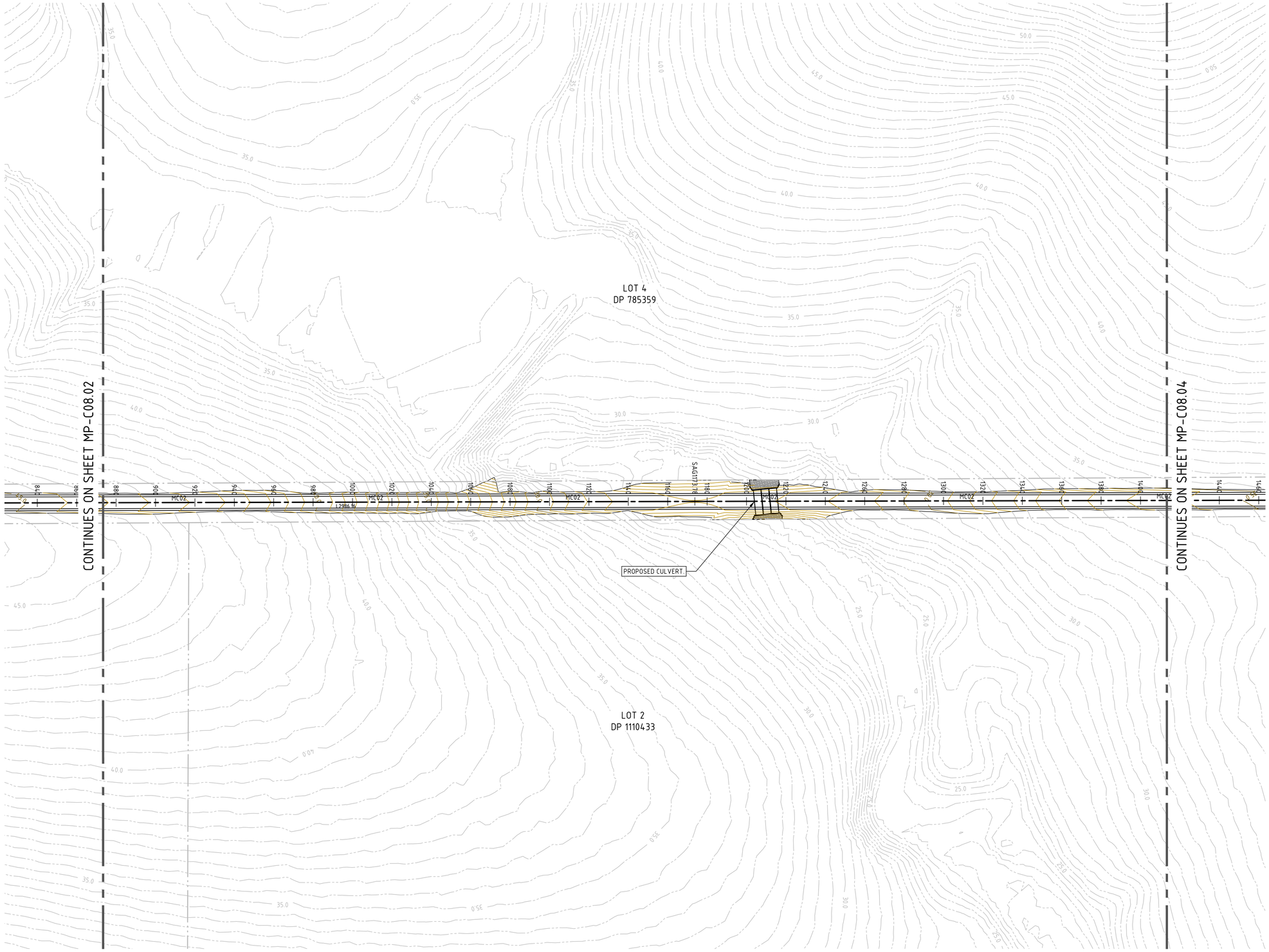
MASTERPLANNING DA

DRAWING TITLE
CIVIL ENGINEERING PACKAGE

CONCEPT CIVIL WORKS PLAN
RIVER ROAD - SHEET 2

JOB NUMBER: **NL222055-01**
DRAWING NUMBER: **MP-C08.02**
REVISION: **B**
DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:56 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\0 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C08.01-CIVIL WORKS (RIVER RD).dwg



LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER OUTLET WITH SCOUR PROTECTION
- DESIGN CONTOURS (0.5m INTERVALS)
- EXISTING CONTOURS (0.5m INTERVALS)

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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A	DRAFT ISSUE	JS		AK	15.08.24
B	ISSUED FOR APPROVAL	JS	LM	AK	22.08.24

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SCALE 1:1000 @ A1

0 10 20 30 40 50m

NORTHROP
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Ph (02) 4943 1777 Email newcastle@northrop.com.au
ABN 81 094 433 100

PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

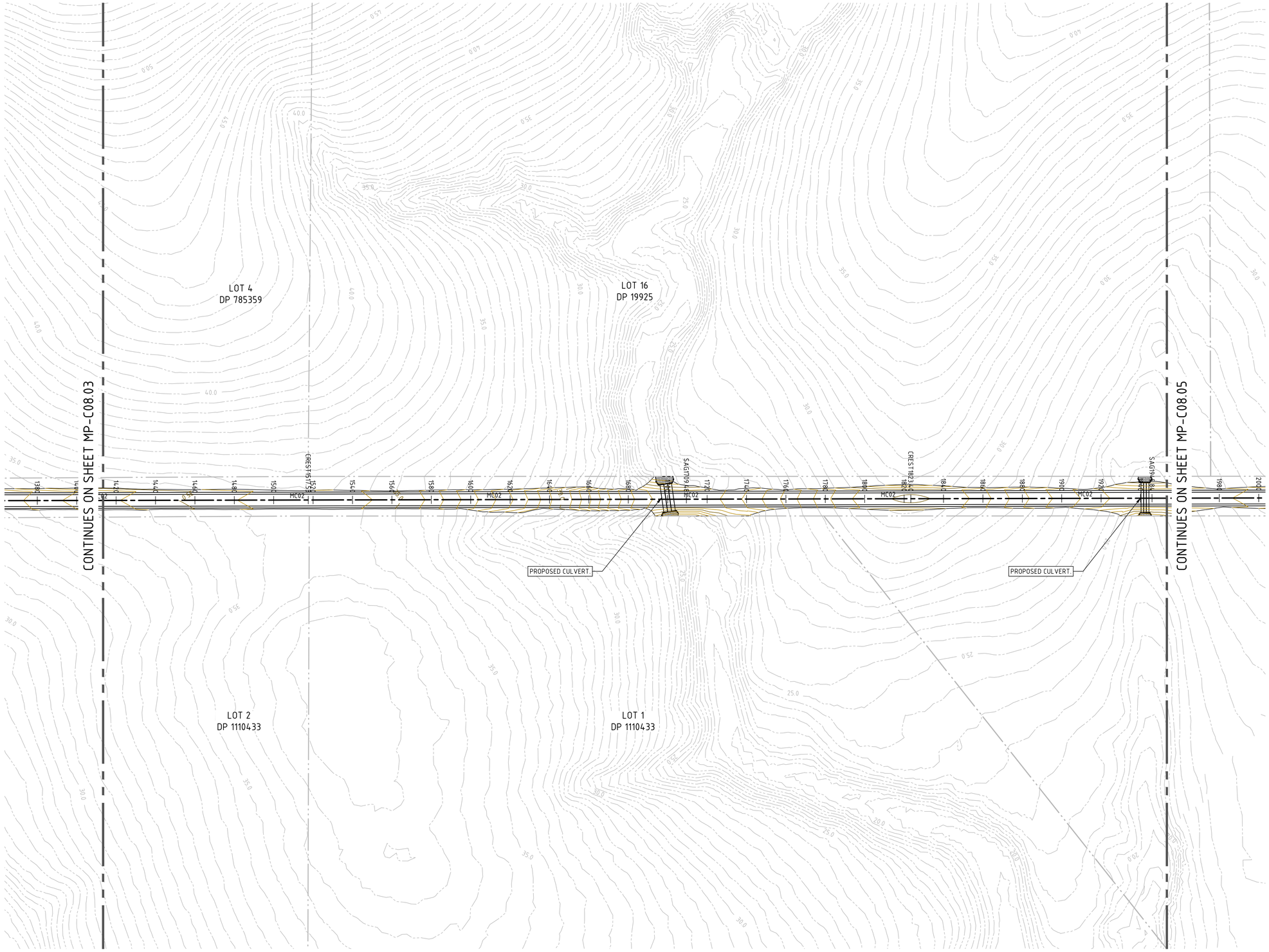
CONCEPT CIVIL WORKS PLAN RIVER ROAD - SHEET 3

JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C08.03** REVISION: **B**

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:56 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C08.01-CIVIL WORKS (RIVER RD).dwg



LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER OUTLET WITH SCOUR PROTECTION
- DESIGN CONTOURS (0.5m INTERVALS)
- EXISTING CONTOURS (0.5m INTERVALS)

DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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PROJECT
PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320

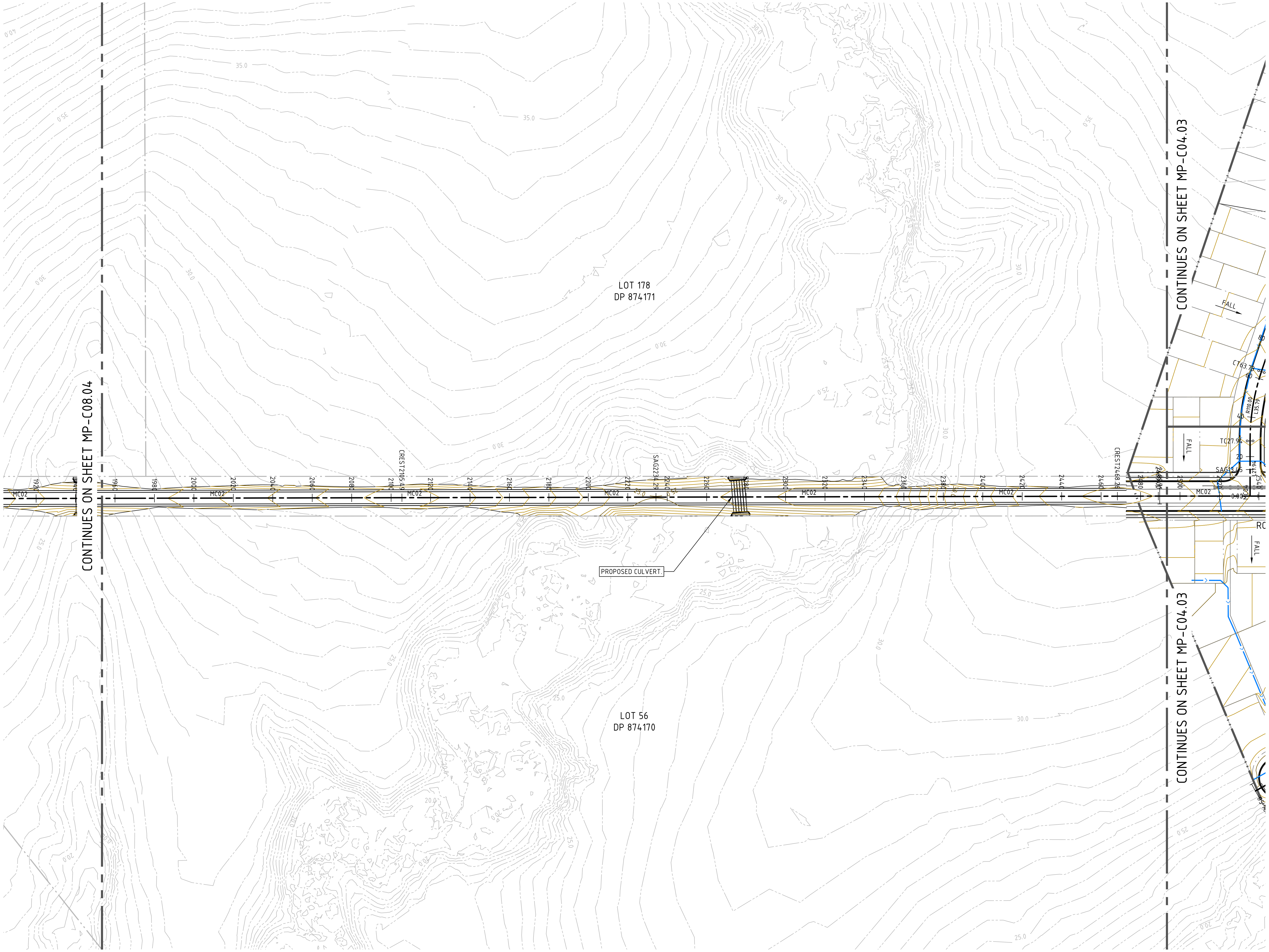
MASTERPLANNING DA

DRAWING TITLE
CIVIL ENGINEERING PACKAGE

CONCEPT CIVIL WORKS PLAN
RIVER ROAD - SHEET 4

JOB NUMBER: **NL222055-01**
DRAWING NUMBER: **MP-C08.04**
REVISION: **B**
DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:56 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C08.01-CIVIL WORKS (RIVER RD).dwg



LEGEND

- SITE BOUNDARY LINE
- PROPOSED BOUNDARY LINE
- EXISTING BOUNDARY LINE
- PROPOSED STORMWATER PIPE
- PROPOSED STORMWATER OUTLET WITH SCOUR PROTECTION
- DESIGN CONTOURS (0.5m INTERVALS)
- EXISTING CONTOURS (0.5m INTERVALS)

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DRAWN: J.STAUB DESIGNED: A.TURNBULL JOB MANAGER: L.MCRAE VERIFIER: L.MCRAE

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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PROJECT: PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320
MASTERPLANNING DA

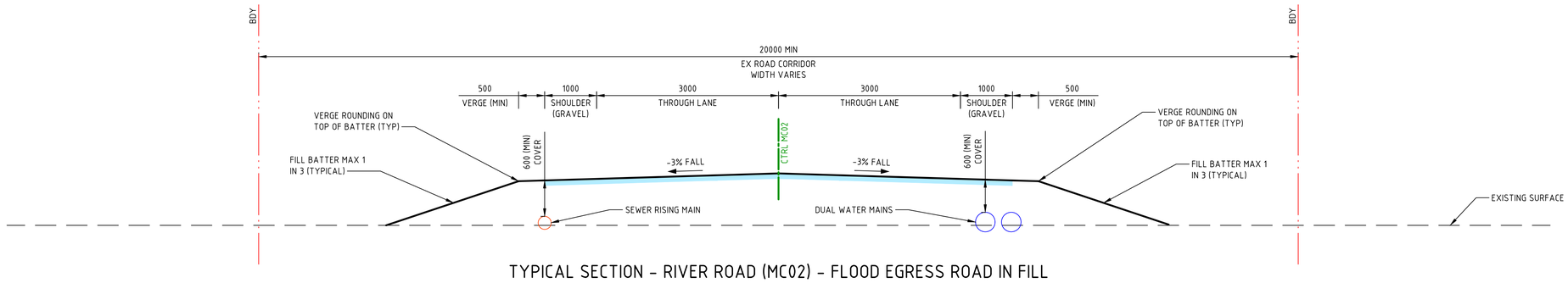
DRAWING TITLE: CIVIL ENGINEERING PACKAGE
CONCEPT CIVIL WORKS PLAN
RIVER ROAD - SHEET 5

JOB NUMBER: NL222055-01

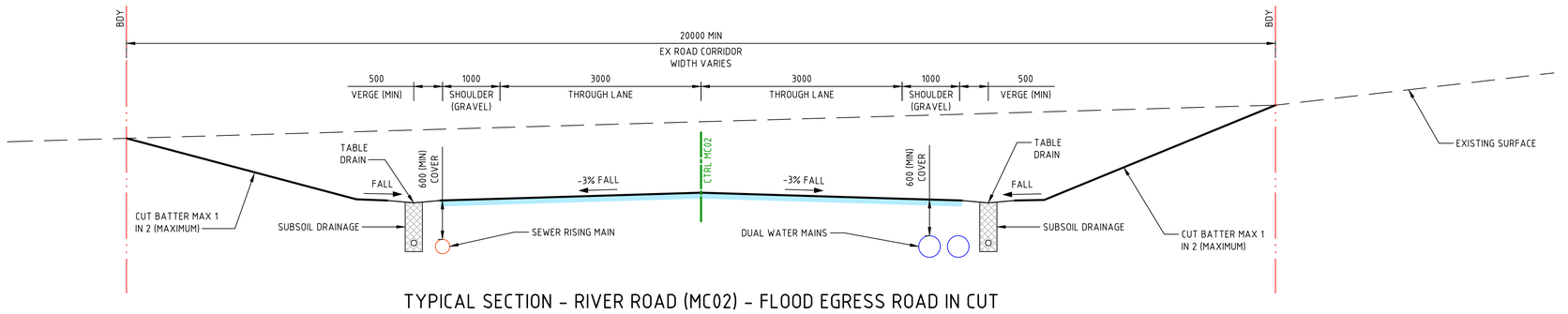
DRAWING NUMBER: MP-C08.05

REVISION: B

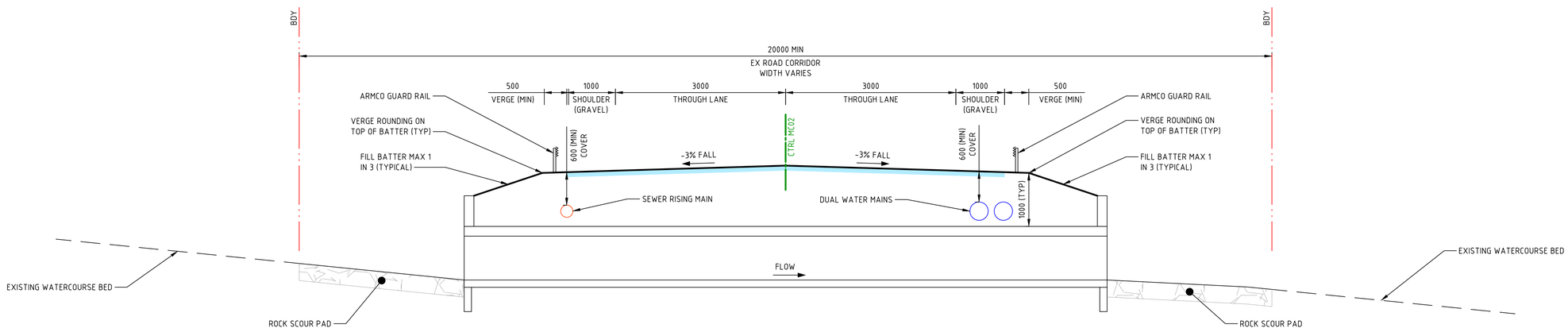
DRAWING SHEET SIZE = A1



TYPICAL SECTION - RIVER ROAD (MC02) - FLOOD EGRESS ROAD IN FILL



TYPICAL SECTION - RIVER ROAD (MC02) - FLOOD EGRESS ROAD IN CUT



TYPICAL SECTION - RIVER ROAD (MC02) - FLOOD EGRESS ROAD CULVERT CROSSING

DRAWN: J.STAUB
DESIGNED: A.TURNBULL
JOB MANAGER: L.MCRAE
VERIFIER: L.MCRAE

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SCALE 1:50@ A1 (0 0.5 1 1.5 2 2.5m)

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PROJECT: **PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320**

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DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

ROAD TYPICAL SECTIONS RIVER ROAD

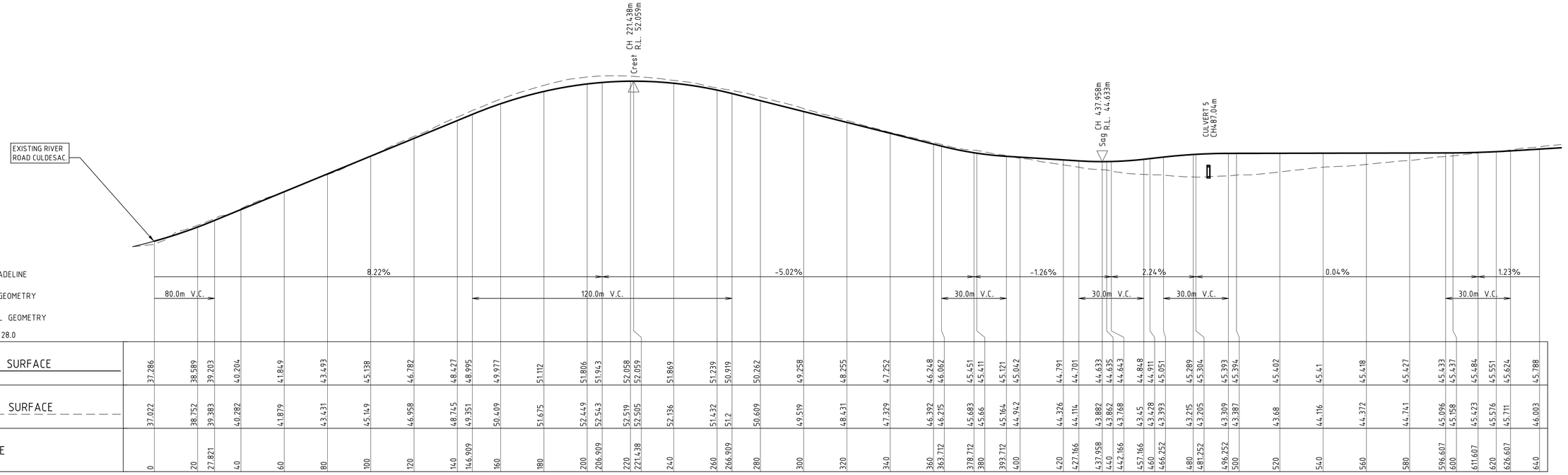
JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C08.21**

REVISION: **B**

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:57 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C08.21-TYPICAL SECTIONS (RIVER RD).dwg



LONGITUDINAL SECTION ALONG MC02

HORIZONTAL SCALE 1:1000@A1

VERTICAL SCALE 1:200@A1

DESIGNED: A.TURNBULL

DRAWN: J.STAUB

VERIFIER: L.MCRAE

JOB MANAGER: L.MCRAE

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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SCALE 1:1000@A1 0 10 20 30 40 50m

SCALE 1:200@A1 0 2 4 6 8 10m

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MASTERPLANNING DA

DRAWING TITLE: **CIVIL ENGINEERING PACKAGE**

ROAD LONGITUDINAL SECTIONS RIVER ROAD - SHEET 1

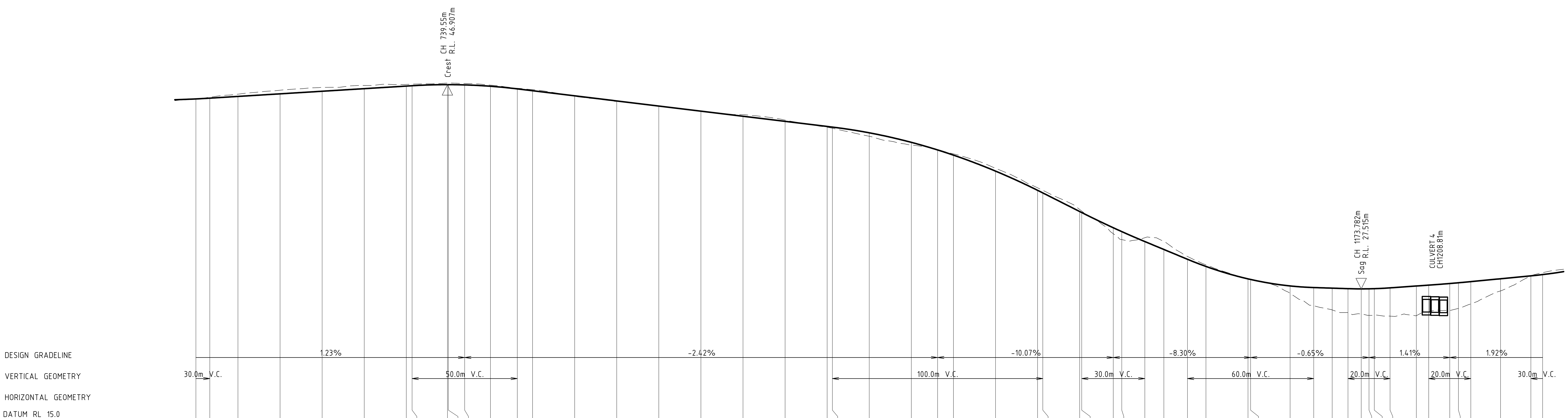
JOB NUMBER: **NL222055-01**

DRAWING NUMBER: **MP-C08.31**

REVISION: **B**

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:57 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\0 - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C08.31-LONG SECTIONS (RIVER RD).dwg



CHAINAGE	FINISHED SURFACE	EXISTING SURFACE
620	45.551	45.576
626.607	45.624	45.711
640	45.788	46.003
660	46.034	46.376
680	46.279	46.649
700	46.525	46.832
720	46.77	46.929
722.74	46.804	46.954
739.55	46.907	47.055
740	46.907	47.059
747.74	46.882	47.019
760	46.754	46.86
772.74	46.505	46.567
780	46.329	46.433
800	45.844	45.802
820	45.359	45.306
840	44.875	44.83
860	44.39	44.392
880	43.905	44.063
900	43.42	43.539
920	42.936	42.866
922.472	42.876	42.763
940	42.333	42.006
960	41.427	41.174
972.472	40.708	40.762
980	40.215	40.335
1000	38.697	38.966
1020	36.873	37.109
1022.472	36.627	36.872
1040	34.861	35.053
1040.962	34.764	34.905
1055.962	33.319	32.754
1060	32.953	32.196
1070.962	32.008	32.371
1080	31.257	32.016
1091.23	30.325	30.592
1100	29.646	29.799
1120	28.465	28.438
1121.23	28.409	28.4
1140	27.794	27.089
1151.23	27.641	25.915
1160	27.584	25.516
1167.497	27.536	25.267
1173.782	27.515	25.13
1177.497	27.522	25.002
1180	27.535	25.005
1187.497	27.612	24.928
1200	27.788	24.97
1205.87	27.871	25.344
1215.87	28.025	25.463
1220	28.096	25.659
1225.87	28.204	26.09
1240	28.475	27.322
1254.409	28.751	28.743
1260	28.872	29.062

LONGITUDINAL SECTION ALONG MC02

HORIZONTAL SCALE 1:1000@A1
VERTICAL SCALE 1:200@A1

VERIFIER: L.MCRAE
JOB MANAGER: L.MCRAE
DESIGNED: A.TURNBULL
DRAWN: J.STAUB

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REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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SCALE 1:1000@A1 0 10 20 30 40 50m
SCALE 1:200@A1 0 2 4 6 8 10m

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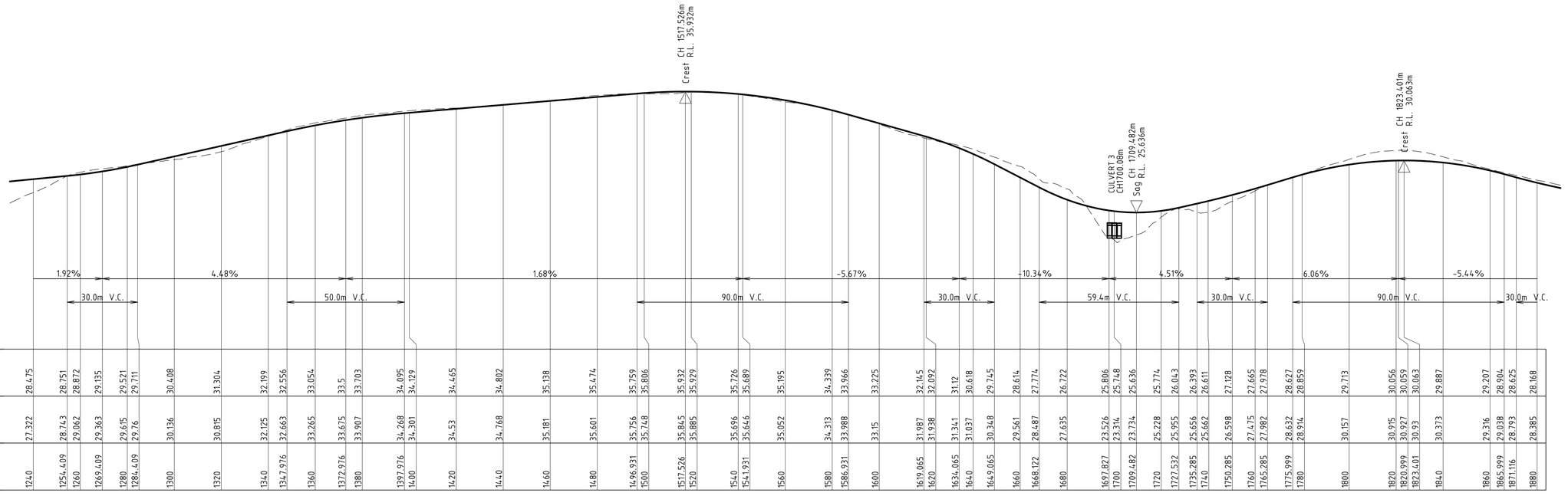
PROJECT: PROPOSED SUBDIVISION
559 ANAMBAH ROAD
GOSFORTH NSW 2320
MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
ROAD LONGITUDINAL SECTIONS
RIVER ROAD - SHEET 2

JOB NUMBER: NL222055-01
DRAWING NUMBER: MP-C08.32
REVISION: B
DRAWING SHEET SIZE = A1



VERIFIER: L.MCRAE
JOB MANAGER: L.MCRAE
DESIGNED: A.TURNBULL
DRAWN: J.STAUB

LONGITUDINAL SECTION ALONG MC02

HORIZONTAL SCALE 1:1000@A1
VERTICAL SCALE 1:200@A1

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
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SCALE 1:1000 @ A1
SCALE 1:200 @ A1
0 10 20 30 40 50m
0 2 4 6 8 10m

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PROJECT: PROPOSED SUBDIVISION 559 ANAMBAH ROAD GOSFORTH NSW 2320

MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE

ROAD LONGITUDINAL SECTIONS RIVER ROAD - SHEET 3

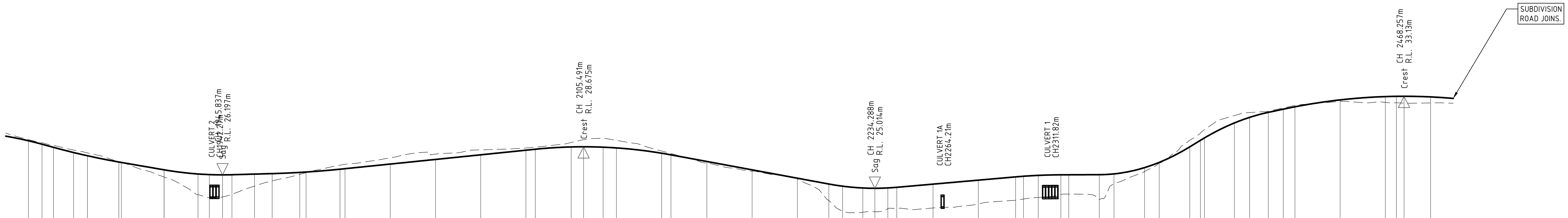
JOB NUMBER: NL222055-01

DRAWING NUMBER: MP-C08.33

REVISION: B

DRAWING SHEET SIZE = A1

Date : 22.08.2024 4:57 PM Plotted By : ANDREW KILLEN Found : O:\5 Pre-July 24 Projects\Newcastle\YEAR 2022 Jobs\NL222055-01 - 559 Anambah Road, Gosforth\O - Drawings\CIVIL\03-CAD\MP-MASTERPLAN\NL222055-01-MP-C08.31-LONG SECTIONS (RIVER RD).dwg



DESIGN GRADELINE: -5.44% | -3.44% | 0.56% | 2.04% | -3.69% | 1.75% | 0.08% | 12.20% | 4.26% | -3.71%

VERTICAL GEOMETRY: 90.0m V.C. | 30.0m V.C. | 30.0m V.C. | 30.0m V.C. | 60.0m V.C. | 30.0m V.C. | 20.0m V.C. | 40.0m V.C. | 30.0m V.C. | 100.0m V.C.

HORIZONTAL GEOMETRY

DATUM RL 13.0

FINISHED SURFACE	29.207	28.904	28.625	28.168	27.884	27.331	27.292	26.642	26.642	26.276	26.22	26.197	26.209	26.265	26.308	26.413
EXISTING SURFACE	29.316	29.038	28.793	28.385	28.137	27.363	27.303	26.01	26.009	24.444	24.193	24.254	24.49	25.208	25.664	26.243
CHAINAGE	1860	1865.999	1871.116	1880	1886.116	1900	1901.116	1920	1920.004	1935.004	1940	1945.837	1950.004	1960	1967.775	1980

FINISHED SURFACE	26.447	26.697	26.742	27.15	27.558	27.965	28.373	28.457	28.661	28.675	28.639	28.575	28.107	27.963	27.378	26.64
EXISTING SURFACE	26.391	27.051	27.125	27.693	28.029	28.402	28.567	28.64	29.05	29.298	29.441	29.242	28.3	28.079	27.233	26.512
CHAINAGE	1982.775	1997.775	2000	2020	2040	2060	2080	2084.127	2100	2105.491	2114.127	2120	2140	2144.127	2160	2180

FINISHED SURFACE	25.903	25.389	25.199	25.039	25.014	25.043	25.098	25.379	25.729	26.018	26.074	26.151	26.201	26.204	26.214	26.283
EXISTING SURFACE	25.834	23.923	22.997	22.898	22.949	23.21	23.251	23.276	23.631	23.962	24.065	24.201	24.479	24.502	24.019	25.415
CHAINAGE	2200	2213.945	2220	2228.945	2234.288	2240	2243.945	2260	2280	2296.515	2300	2306.515	2316.515	2320	2333.51	2340

FINISHED SURFACE	26.835	27.298	28.669	29.243	29.456	30.775	31.272	31.711	31.994	32.202	32.812	33.103	33.125	33.13	33.075
EXISTING SURFACE	26.481	27.229	29.258	29.883	30.182	31.428	31.696	31.812	32.101	32.325	32.675	32.591	32.556	32.527	32.545
CHAINAGE	2353.51	2360	2373.51	2378.22	2380	2393.22	2400	2408.22	2414.86	2420	2440	2460	2464.86	2468.257	2480

LONGITUDINAL SECTION ALONG MC02

HORIZONTAL SCALE 1:1000@A1
VERTICAL SCALE 1:200@A1

VERIFIER: L.MCRAE
JOB MANAGER: L.MCRAE
DESIGNED: A.TURNBULL
DRAWN: J.STAUB

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SCALE 1:1000@A1 — 0 10 20 30 40 50m
SCALE 1:200@A1 — 0 2 4 6 8 10m

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GOSFORTH NSW 2320
MASTERPLANNING DA

DRAWING TITLE: CIVIL ENGINEERING PACKAGE
ROAD LONGITUDINAL SECTIONS
RIVER ROAD - SHEET 4

JOB NUMBER: NL222055-01
DRAWING NUMBER: MP-C08.34
REVISION: B
DRAWING SHEET SIZE = A1

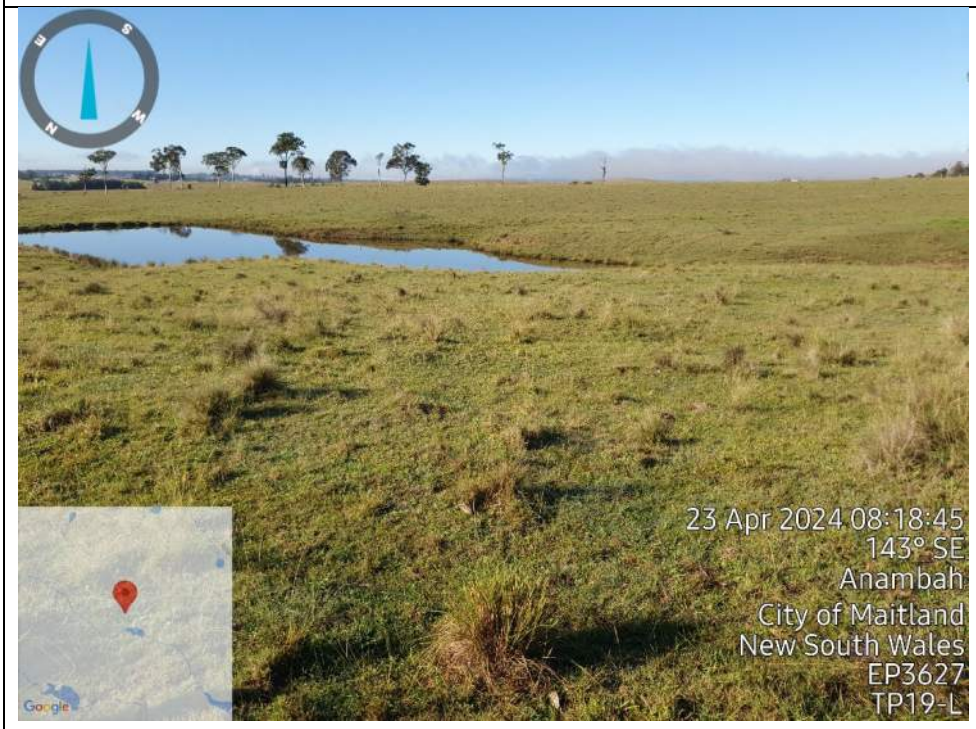
Date: 22.08.2024 4:57 PM Plotted By: ANDREW KILLEN

Appendix B
PHOTOLOG

	**Plate 1** **Description:** Looking west from the TP01-L location. **Date:** 22.04.24
	**Plate 2** **Description:** The site facing north-east. **Date:** 22.04.24

	**Plate 3** **Description:** The site facing east. **Date:** 22.04.24
	**Plate 4** **Description:** The site facing south. **Date:** 22.04.24

	**Plate 5** **Description:** The site facing north. **Date:** 22.04.24
	**Plate 6** **Description:** Looking west from the TP12-P location. **Date:** 22.04.24

	**Plate 7** **Description:** The site facing south. **Date:** 23.04.24
	**Plate 8** **Description:** Water dam close to TP19-L **Date:** 23.04.24

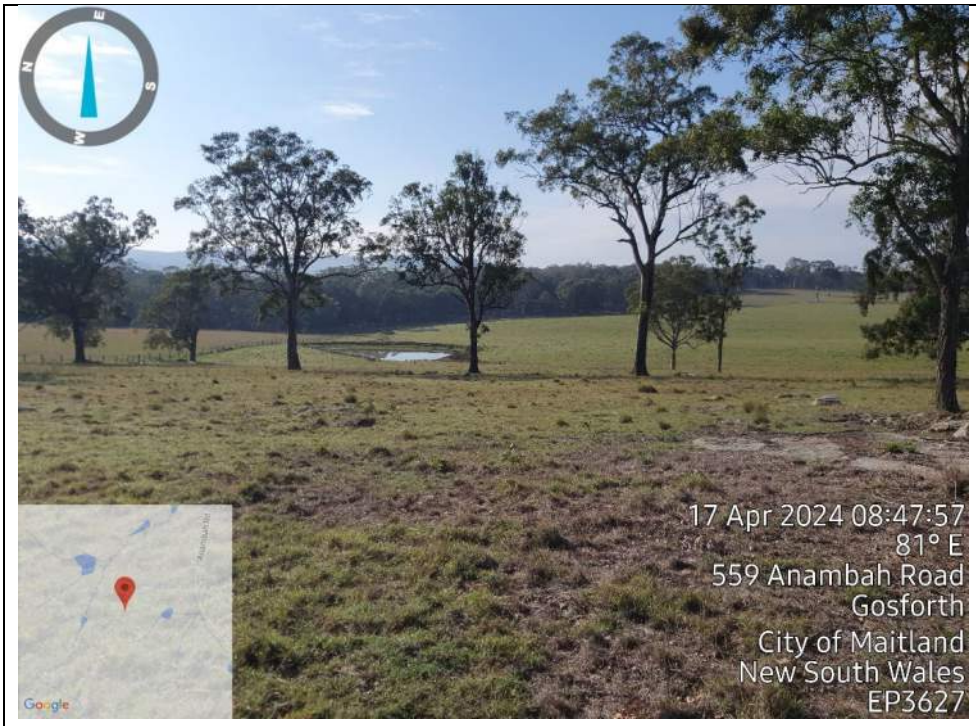
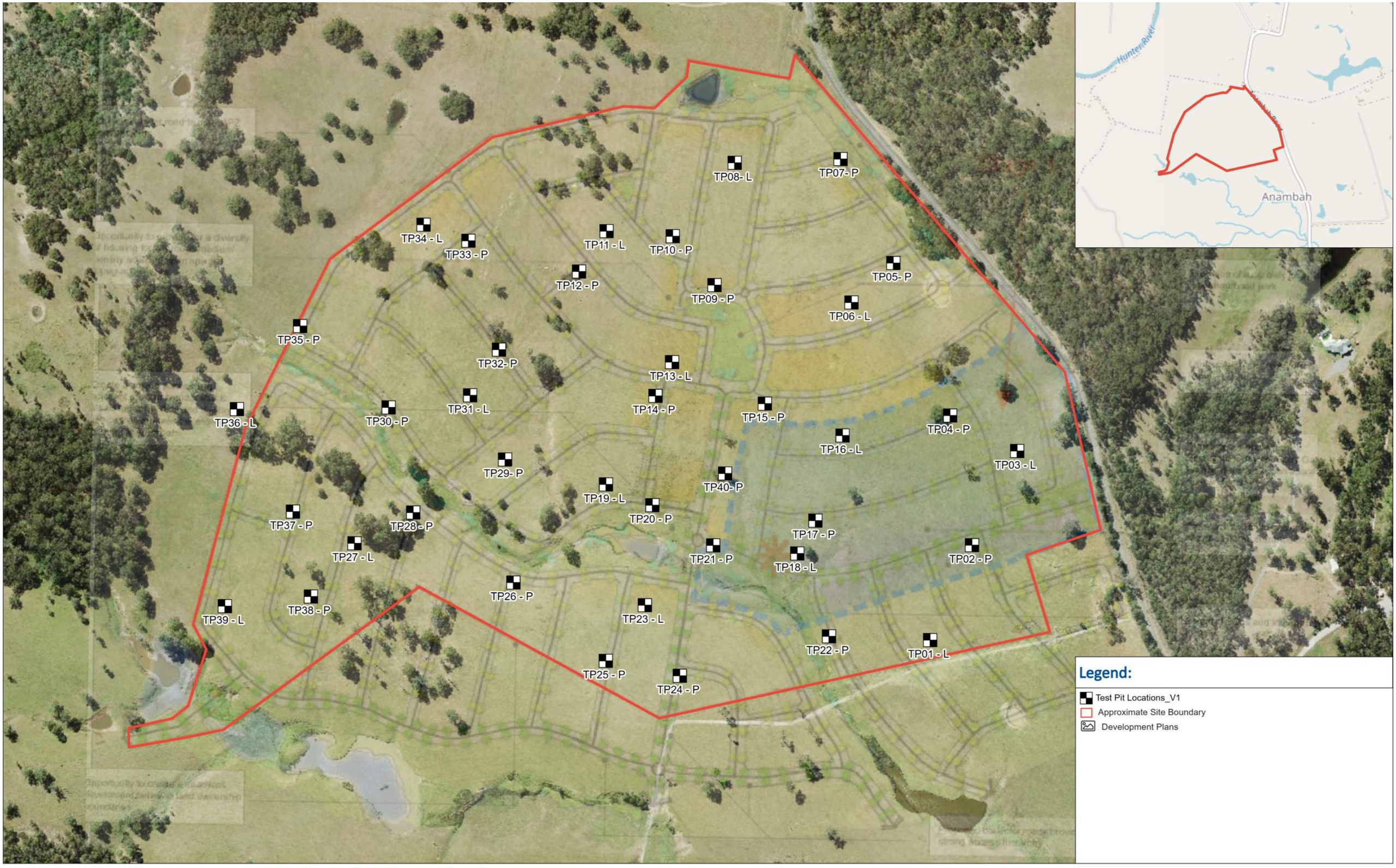
	**Plate 9** **Description:** The site facing east. **Date:** 17.04.24
	**Plate 10** **Description:** The site facing south. **Date:** 17.04.24

	**Plate 11** **Description:** Rock outcrops on top of the hill. **Date:** 17.04.24
	**Plate 12** **Description:** Erosion scarps on site. **Date:** 17.04.24

	**Plate 13** **Description:** The site facing northeast. **Date:** 17.04.24
	**Plate 14** **Description:** Water ponding on the surface. **Date:** 22.04.24

Appendix C

GEOTECHNICAL INVESTIGATION LOCATIONS



EP RISK

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Geotechnical Investigation
559 Anambah Road, Gosforth NSW, Australia

Job No: EP3627
Date: 14-05-2024
Version: draft

N

0 50 m 100 m
Approximate Scale Only

Figure 1 - Test Pit Locations

Coordinate System: WGS 84
Drawn By: MC Checked By: OP
Scale of regional map not shown

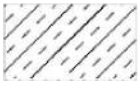
ISO 9001 Quality
ISO 45001 OH&S
ISO 14001 Environment

Appendix D
TEST PIT LOGS

Soil Logging Symbols

CLAYS

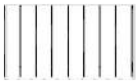

CLAY


silty CLAY

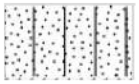

sandy CLAY


gravelly CLAY

SILTS

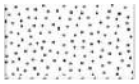

SILT

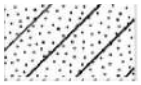

clayey SILT

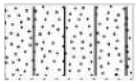

sandy SILT

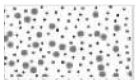

gravelly SILT

SANDS


SAND

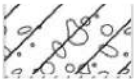

clayey SAND

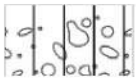

silty SAND

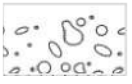

gravelly SAND

GRAVELS


GRAVEL


clayey GRAVEL


silty GRAVEL


sandy GRAVEL

SEDIMENTARY ROCK

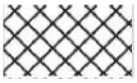

SANDSTONE


SILTSTONE


SHALE


CONGLOMERATE

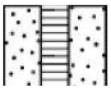
FILL

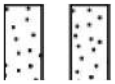

FILL

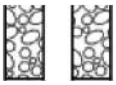

CONCRETE


ASPHALT

GROUNDWATER WELL SYMBOLS

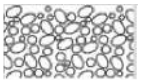

WELL SCREEN


CASING – filter pack


CASING – backfill


CASING – bentonite seal


CASING – grout seal


BACKFILL

OTHER


TOPSOIL – sandy SILT


TOPSOIL – highly organic

Rock Description Explanation Sheet (1 of 2)

Weathering Condition (Degree of Weathering):

The degree of weathering is a continuum from fresh rock to soil. Boundaries between weathering grades may be abrupt or gradational.

Rock Material Weathering Classification		
Weathering Grade	**Symbol**	**Definition**
Residual Soil	RS	Soil-like material developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume, but the material has not been significantly transported.
Extremely Weathered Rock	XW	Rock is weathered to such an extent that it has 'soil' properties, i.e. it either disintegrates or can be remoulded in water, but substance fabric and rock structure still recognisable.
Highly Weathered Rock	HW	Strong discolouration is evident throughout the rock mass, often with significant change in the constituent minerals. The intact rock strength is generally much weaker than that of the fresh rock.
Moderately Weathered Rock	MW	Modest discolouration is evident throughout the rock fabric, often with some change in the constituent minerals. The intact rock strength is usually noticeably weaker than that of the fresh rock.
Slightly Weathered Rock	SW	Rock is slightly discoloured but shows little or no change of strength from fresh rock.
Fresh Rock	FR	Rock shows no sign of decomposition or staining.

Notes:

1. Minor variations within broader weathering grade zones will be noted on the engineering borehole logs.
2. Extremely weathered rock is described in terms of soil engineering properties.
3. Weathering may be pervasive throughout the rock mass or may penetrate inwards from discontinuities to some extent.
4. The 'Distinctly Weathered (DW)' class as defined in AS1726-2017 is divided to incorporate HW and MW in the above table. The symbol DW should not be used.

Strength Condition (Intact Rock Strength):

Strength of Rock Material (Based on Point Load Strength Index, corrected to 50mm diameter – $I_{s(50)}$. Field guide used if no tests available. Refer to AS 4133.4.1-2007.			
Term	**Symbol**	**Point Load Index (MPa)** $I_{s(50)}$	**Field Guide to Strength**
Very Low	VL	>0.03 ≤0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 3cm thick can be broken by finger pressure.
Low	L	>0.1 ≤0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium	M	>0.3 ≤1.0	Readily scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High	H	>1 ≤3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High	VH	>3 ≤10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High	EH	>10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Notes:

1. These terms refer to the strength of the rock material and not to the strength of the rock mass which may be considerably weaker due to the effect of rock defects.
2. Anisotropy of rock material samples may affect the field assessment of strength.
3. Extremely Low Strength ('EL') is now not considered a description of rock strength in line with the updated AS1726-2017 as by definition EL rock should be described in terms of soil properties.

Rock Description Explanation Sheet (2 of 2)

Discontinuity Description: Refer to AS1726-2017, Table A10.

Anisotropic Fabric	
BED	Bedding
FOL	Foliation
LIN	Mineral lineation
Defect Type	
LP	Lamination Parting
Pt	Bedding Parting
FP	Cleavage / Foliation Parting
Jt	Joint
SZ	Sheared Zone
CZ	Crushed Zone
BZ	Broken Zone
HFZ	Highly Fractured Zone
AZ	Alteration Zone
VN	Vein

Roughness (e.g. Planar, Smooth is abbreviated Pln / Sm)		**Class**
Stepped (Stp)	Rough or irregular (R or Irr)	I
	Smooth (Sm)	II
	Slickensided (Sl)	III
Undulating (Un)	Rough (R)	IV
	Smooth (Sm)	V
	Slickensided (Sl)	VI
Planar (Pln)	Rough (R)	VII
	Smooth (Sm)	VIII
	Slickensided (Sl)	IX

Aperture		**Infilling**		
Closed	CD	No visible coating or infill	Clean	Cn
Open	OP	Surfaces discoloured by mineral/s	Stain	St
Filled	FL	Visible mineral or soil infill <1mm	Veneer	Vr
Tight	TI	Visible mineral or soil infill >1mm	Coating	Ct

Other	
Clay	Clay
Fe	Iron
Co	Coal
Carb	Carbonaceous
Sinf	Soil Infill Zone
Qz	Quartz
Ca	Calcite
Chl	Chlorite
Py	Pyrite
Int	Intersecting
Inc	Incipient
DI	Drilling Induced
H	Horizontal
V	Vertical

Note: Describe 'Zones' and 'Coatings' in terms of composition and thickness (mm).

Discontinuity Spacing: On the geotechnical borehole log, a graphical representation of defect spacing vs depth is shown. This representation takes into account all the natural rock defects occurring within a given depth interval, excluding breaks induced by the drilling / handling of core. Refer to AS1726-2017, BS5930-1999.

Defect Spacing			**Bedding Thickness (Sedimentary Rock Stratification)**	
Spacing/Width (mm)	Descriptor	Symbol	Descriptor	Spacing/Width (mm)
			Thinly Laminated	< 6
<20	Extremely Close	EC	Thickly Laminated	6 – 20
20 – 60	Very Close	VC	Very Thinly Bedded	20 – 60
60 – 200	Close	C	Thinly Bedded	60 – 200
200 – 600	Medium	M	Medium Bedded	200 – 600
600 – 2000	Wide	W	Thickly Bedded	600 – 2000
2000 – 6000	Very Wide	VW	Very Thickly Bedded	> 2000
>6000	Extremely Wide	EW		

Defect Spacing in 3D	
Term	**Description**
Blocky	Equidimensional
Tabular	Thickness much less than length or width
Columnar	Height much greater than cross section

Defect Persistence
(areal extent)
Trace length of defect given in metres

Symbols: The list below provides an explanation of terms and symbols used on the geotechnical borehole, test pit and penetrometer logs.

Test Results			
PI	Plasticity Index	c'	Effective Cohesion
LL	Liquid Limit	c_u	Undrained Cohesion
LI	Liquidity Index	c'_R	Residual Cohesion
DD	Dry Density	ϕ'	Effective Angle of Internal Friction
WD	Wet Density	ϕ_u	Undrained Angle of Internal Friction
LS	Linear Shrinkage	ϕ'_R	Residual Angle of Internal Friction
MC	Moisture Content	c_v	Coefficient of Consolidation
OC	Organic Content	m_v	Coefficient of Volume Compressibility
WPI	Weighted Plasticity Index	$c_{\alpha\varepsilon}$	Coefficient of Secondary Compression
WLS	Weighted Linear Shrinkage	e	Voids Ratio
DoS	Degree of Saturation	ϕ'_{cv}	Constant Volume Friction Angle
APD	Apparent Particle Density	q_t / q_c	Piezocone Tip Resistance (corrected / uncorrected)
s_u	Undrained Shear Strength	q_d	PANDA Cone Resistance
q_u	Unconfined Compressive Strength	$I_{s(50)}$	Point Load Strength Index
TCR	Total Core Recovery	*RQD*	Rock Quality Designation

Test Symbols	
DCP	Dynamic Cone Penetrometer
SPT	Standard Penetration Test
CPTu	Cone Penetrometer (Piezocone) Test
PANDA	Variable Energy DCP
PP	Pocket Penetrometer Test
U50	Undisturbed Sample 50 mm (nominal diameter)
U100	Undisturbed Sample 100mm (nominal diameter)
UCS	Uniaxial Compressive Strength
Pm	Pressuremeter
FSV	Field Shear Vane
DST	Direct Shear Test
PR	Penetration Rate
PLI	Point Load Index Test (axial)
D	Point Load Test (diametral)
L	Point Load Test (irregular lump)

Groundwater level	Water Inflow	Water Outflow

Test Pit No: TP01-L

Engineering Log - Test Pit

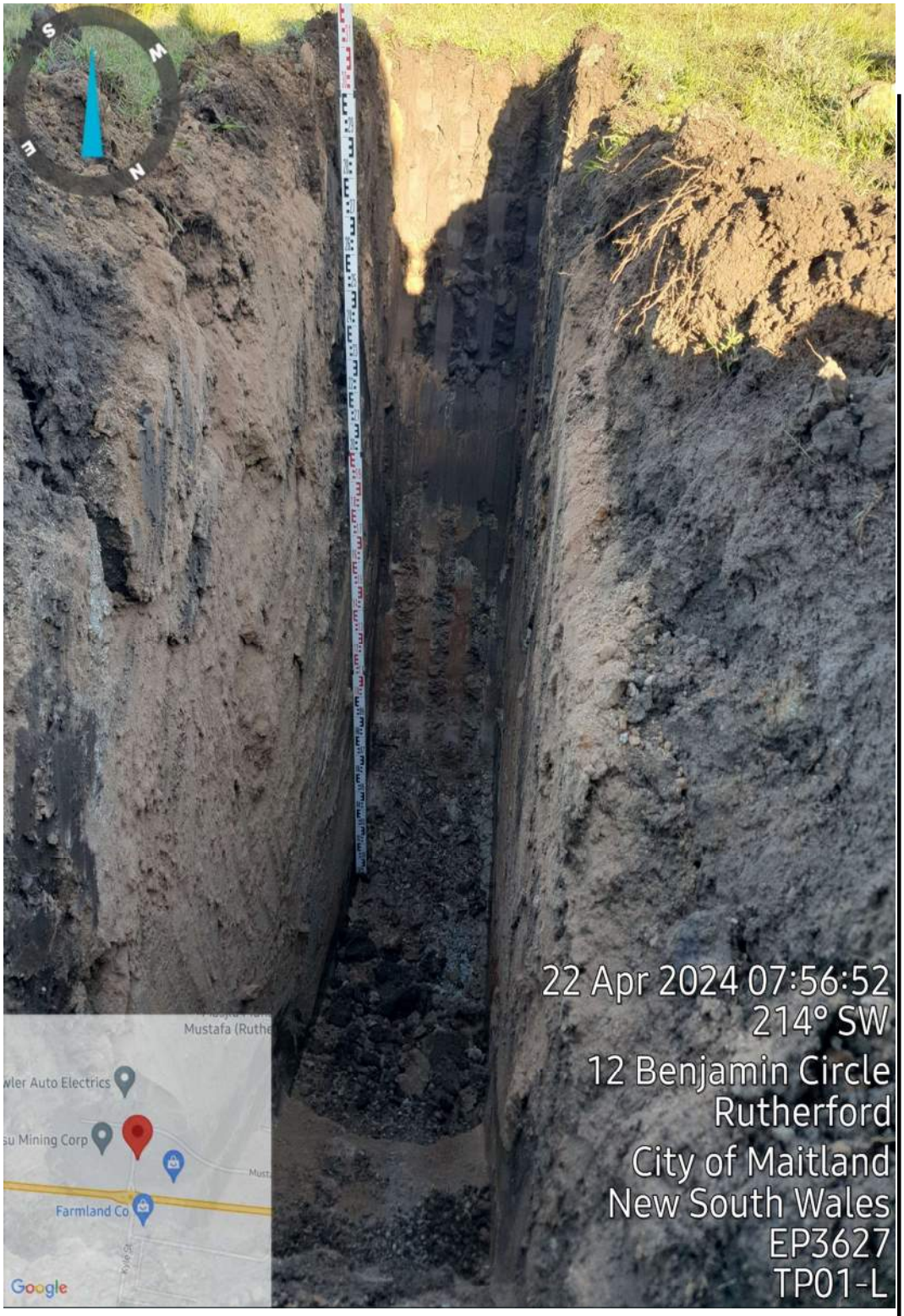
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384280.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358404.00	Bearing	---	Ground Level	29 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, black, grey	~PL	VS to F	0 0		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, grey			1 1 1 1 2		SLOPE WASH
		28	1		CI-CH	Silty CLAY: medium to high plasticity, grey, brown, red		St to VSt	4 5 5 8 8	U50	RESIDUAL SOIL
					CI	Extremely weathered Sandstone recovered as Sandy CLAY, medium plasticity, grey, brown and red, fine to coarse grained sand, with fine to coarse grained, subangular gravel and ferruginous cementations (50-100mm)	<PL	H	11 15 17	B	EXTREMELY WEATHERED ROCK
		27	2								
		26	3			Test Pit TP01-L Terminated at 3.00 m					Target depth
		25	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP01-L	

Test Pit No: TP02-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384408.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358463.00	Bearing	---	Ground Level	38 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		38	0		CL-CI	TOPSOIL: Sandy CLAY: low to medium plasticity, dark grey, fine to medium grained sand	~PL	F	1 1 1		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, grey, brown			2 1 2		RESIDUAL SOIL
		37	1					St to VSt	3 4 9 10 16		
		36	2		CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, grey, brown and red, fine to coarse grained sand, with ferruginous cementations (50-100mm)	<PL	H	12	B	EXTREMELY WEATHERED ROCK
		35	3			Test Pit TP02-P Terminated at 2.10 m					Target depth
		34	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP02-P	

Test Pit No: TP03-L

Engineering Log - Test Pit

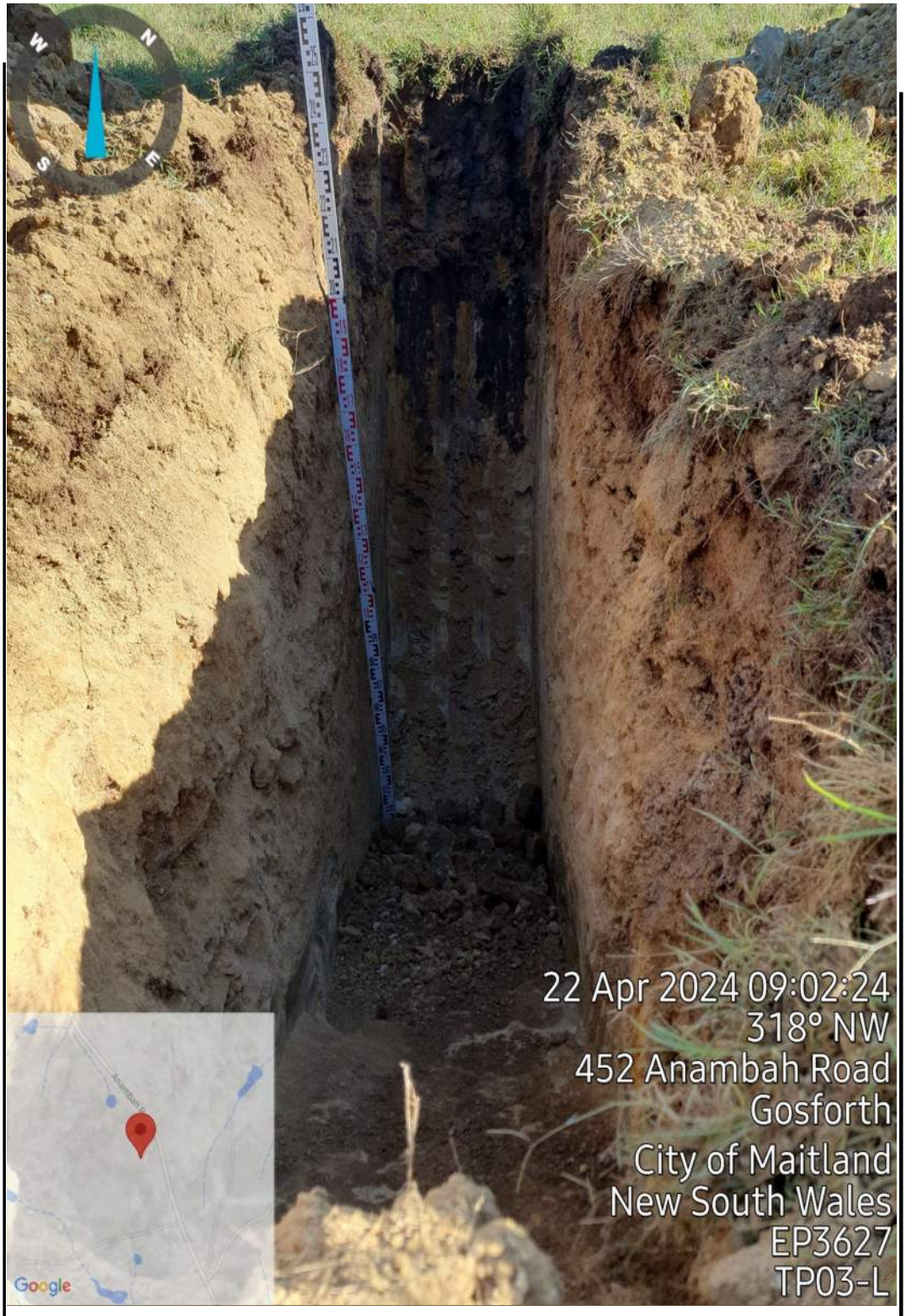
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384547.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358531.00	Bearing	---	Ground Level	47 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		46	1		CL-CI	TOPSOIL: Sandy CLAY: low to medium plasticity, grey, fine to medium grained sand	>PL	VS to F	0 1		TOPSOIL
					CI-CH	Sandy CLAY: medium to high plasticity, brown, yellow, fine to coarse grained sand	<PL		2 2		RESIDUAL SOIL
					CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, yellow, brown, fine to coarse grained sand	<PL	VSt to H	13 9 4		EXTREMELY WEATHERED ROCK DCP:-/5mm HB
		45	2								
						Test Pit TP03-L Terminated at 2.50 m					Refusal
		44	3								
		43	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP03-L	

Test Pit No: TP04-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384575.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358435.00	Bearing	---	Ground Level	42 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Sandy CLAY: low to medium plasticity, dark grey, fine to medium grained sand	>PL	F and St	1 1		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, grey, brown	~PL		2 2 3 2	B	RESIDUAL SOIL
								VSt	5 7		
		41	1		CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, grey, brown and red, fine to coarse grained sand,	<PL	H	20		EXTREMELY WEATHERED ROCK
		40	2								
		39	3			Test Pit TP04-P Terminated at 2.70 m					Target depth
		38	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP04-P	

Test Pit No: TP05-P

Engineering Log - Test Pit

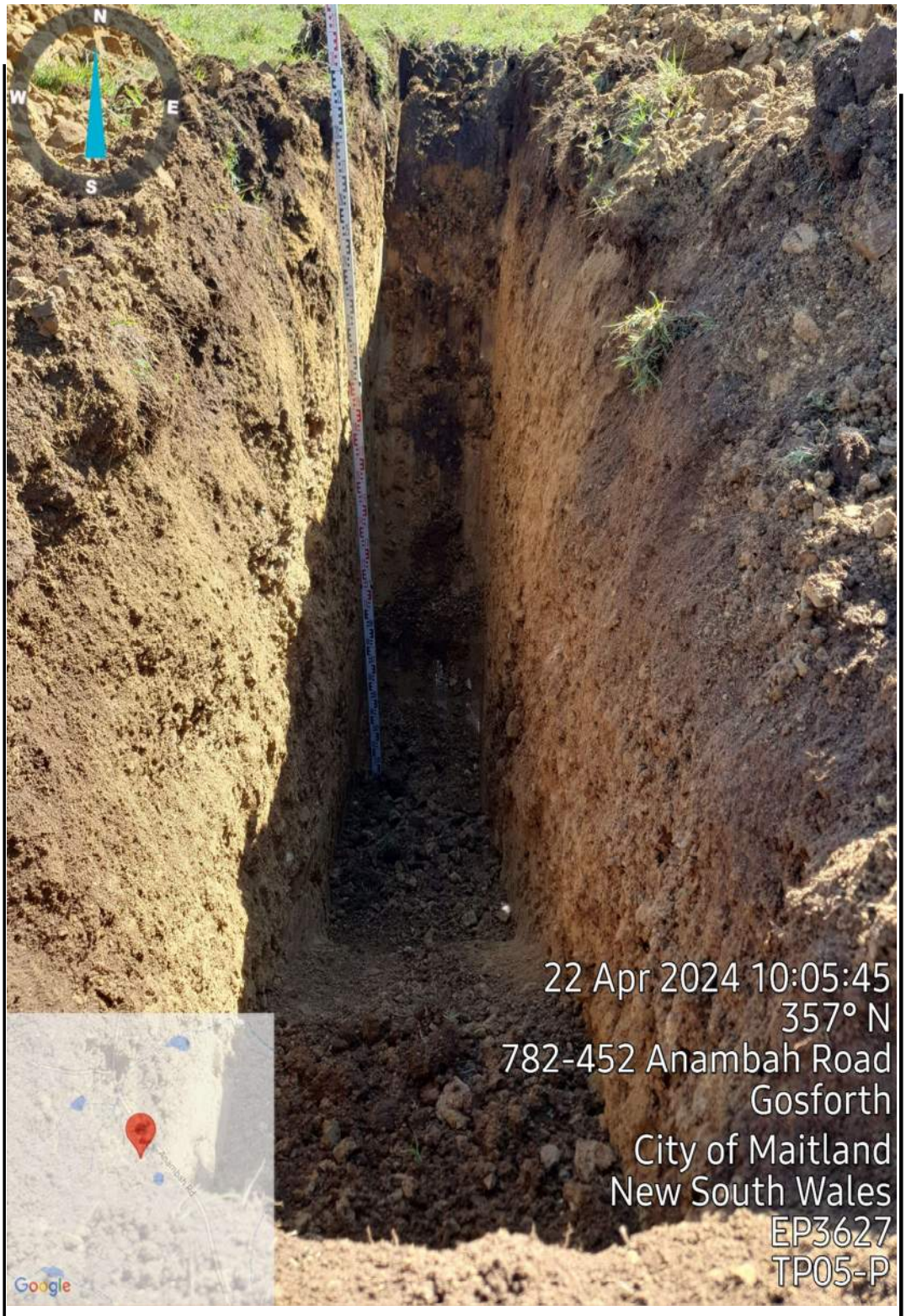
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384819.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358352.00	Bearing	---	Ground Level	35 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown			1 2 4 10		RESIDUAL SOIL
					CI-CH	Extremely weathered Mudstone recovered as Silty CLAY (Marl), medium to high plasticity, yellow and brown, with fine to coarse grained sand	<PL	VSt to H	10 15	B	EXTREMELY WEATHERED ROCK DCP:-HB
		34	1								
		33	2								
		32	3							B	
						Test Pit TP05-P Terminated at 3.00 m					Target depth
		31	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP05-P	

Test Pit No: TP06-L

Engineering Log - Test Pit

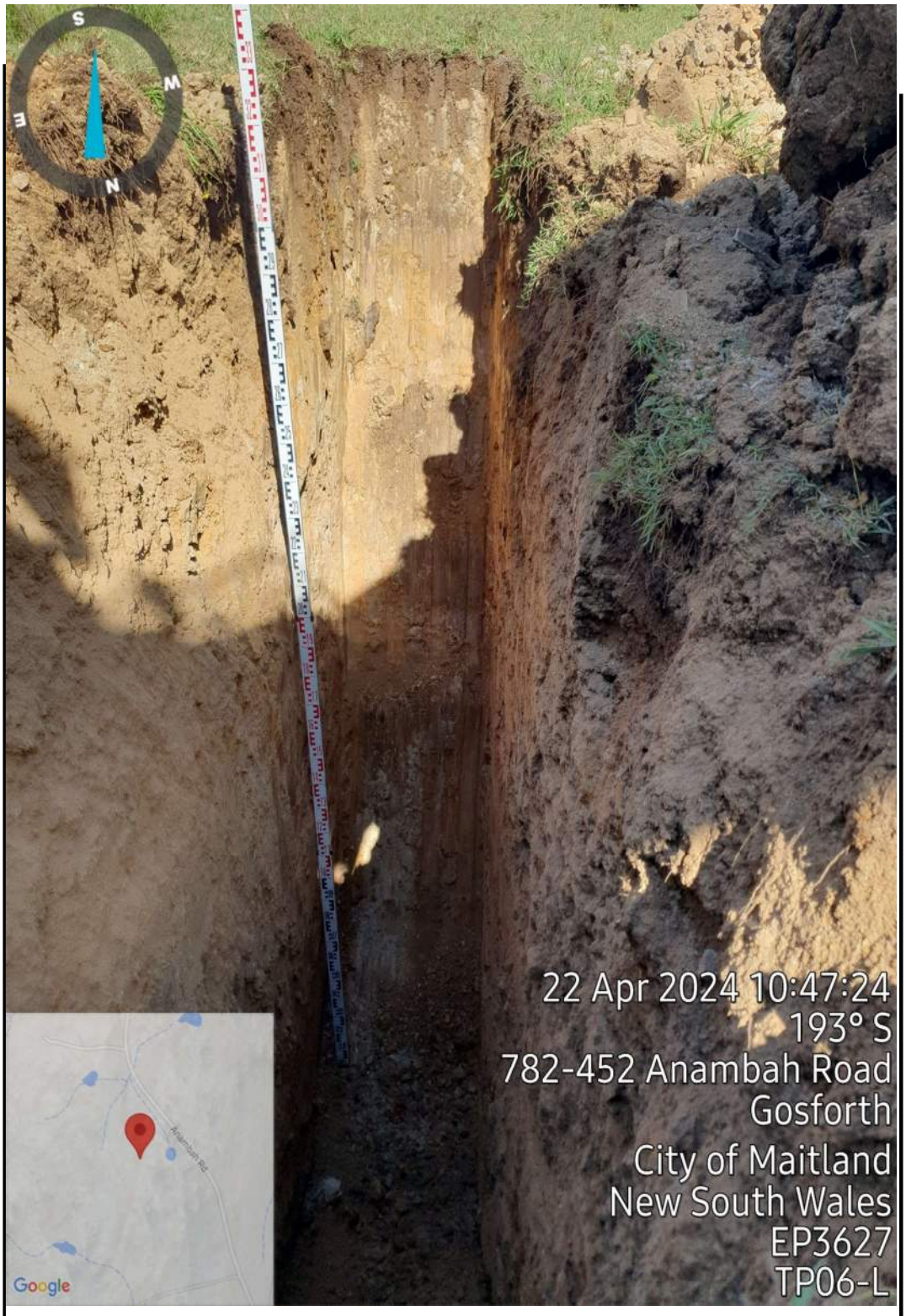
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384711.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358296.00	Bearing	---	Ground Level	39 AHD

EXCAVATION				MATERIAL DESCRIPTION						TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark brown	~PL	F	1 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown			2 2 2 2 2 2		RESIDUAL SOIL
		38	1			0.90m: becomes pale brown and brown		St to VSt	4 6 6 5 6 6		
					CI-CH	Extremely weathered Mudstone recovered as Silty CLAY (Marl), medium to high plasticity, dark brown, with fine to coarse grained sand	<PL	H	10 8 10 6 6		EXTREMELY WEATHERED ROCK DCP:-/5mm HB
		37	2								
		36	3								
						Test Pit TP06-L Terminated at 3.20 m					Target depth
		35	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP06-L	

Test Pit No: TP07-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384917.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358304.00	Bearing	---	Ground Level	29 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	2 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown			1 1 2 4		RESIDUAL SOIL
		28	1		SC	Extremely weathered Sandstone, recovered as Clayey Gravelly SAND, fine to coarse grained, brown, fine to coarse grained, sub-angular to angular gravel interbedded with Mudstone/MARL with ferruginous cementations (30-50mm)	M to D	D to VD	9 15	B	EXTREMELY WEATHERED ROCK
		27	2								
		26	3			Test Pit TP07-P Terminated at 3.00 m					Target depth
		25	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP07-P	

Test Pit No: TP08-L

Engineering Log - Test Pit

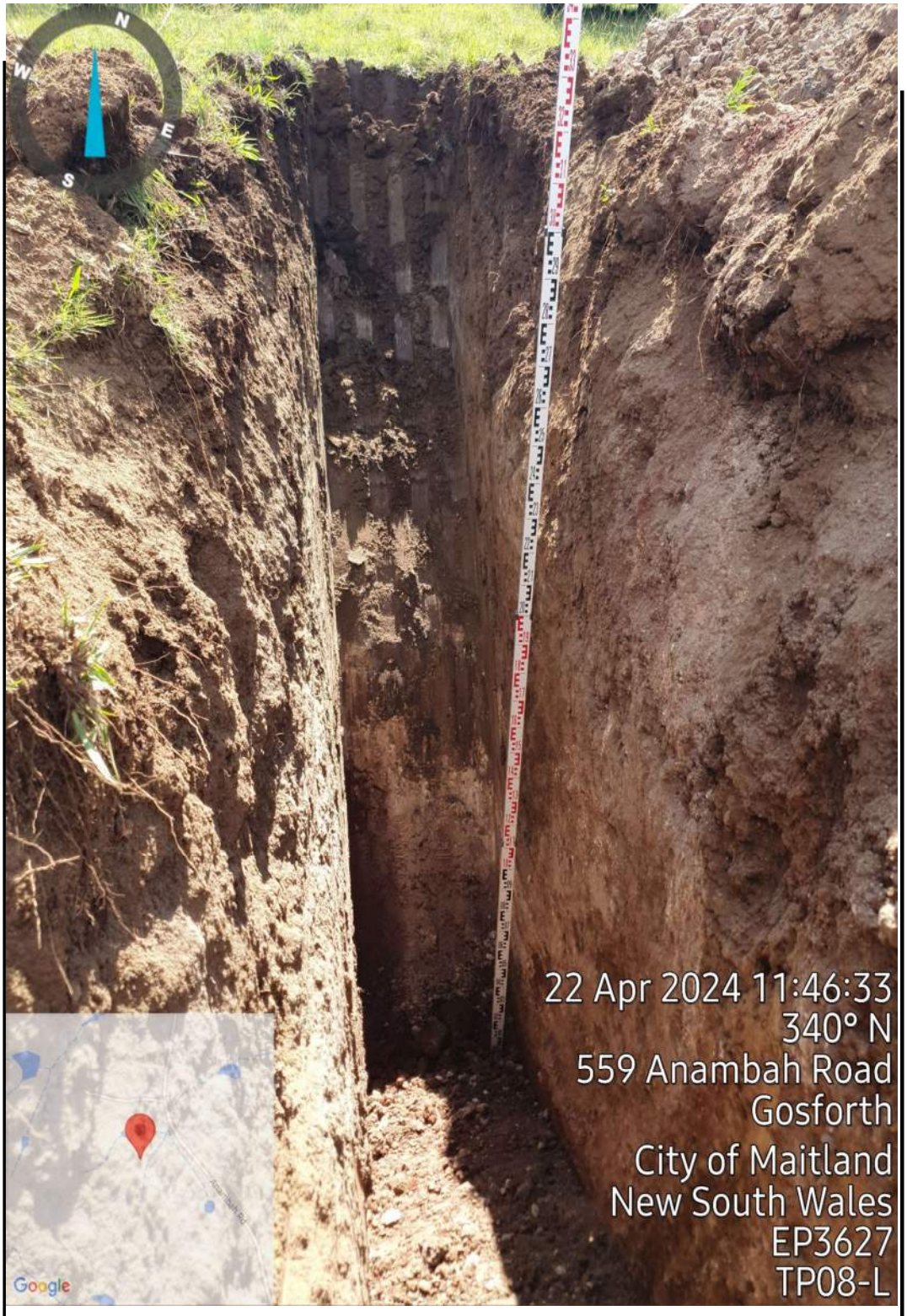
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384909.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358149.00	Bearing	---	Ground Level	30 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		30	0		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark brown	~PL		2 2 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown	~PL		3 5		RESIDUAL SOIL
		29	1		SC	Extremely weathered Sandstone recovered as Clayey SAND, brown, fine to coarse grained sand	D		15 25		EXTREMELY WEATHERED ROCK
		28	2		CI-CH	Extremely weathered interbedded Sandstone and Mudstone (MARL) recovered as Sandy CLAY, medium to high plasticity, dark brown and pale brown, with lime cementations, fine to coarse grained sand	<PL				
		27	3			Test Pit TP08-L Terminated at 3.00 m					Target depth
		26	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP08-L	

Test Pit No: TP09-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384744.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358131.00	Bearing	---	Ground Level	34 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		33	1		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark brown	~PL	F	1 1		TOPSOIL
					CL-CI	Silty CLAY: low to medium plasticity, brown	~PL to <PL		1 1 1 1 2 1 2 2 2		SLOPE WASH
		32	2		CI-CH	Silty CLAY: medium to high plasticity, brown, red	~PL		1 2 3 2 5 5 5 5 7	B	RESIDUAL SOIL
							<PL	VSt to H	7 9 9 8 8		
		31	3		CI-CH	Extremely weathered Mudstone (MARL) recovered as Silty CLAY, medium to high plasticity, dark brown with fine to coarse grained sand	<<PL		10 9		EXTREMELY WEATHERED ROCK
						Test Pit TP09-P Terminated at 3.00 m					Target depth
		30	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP09-P	

Test Pit No: TP10-P

Engineering Log - Test Pit

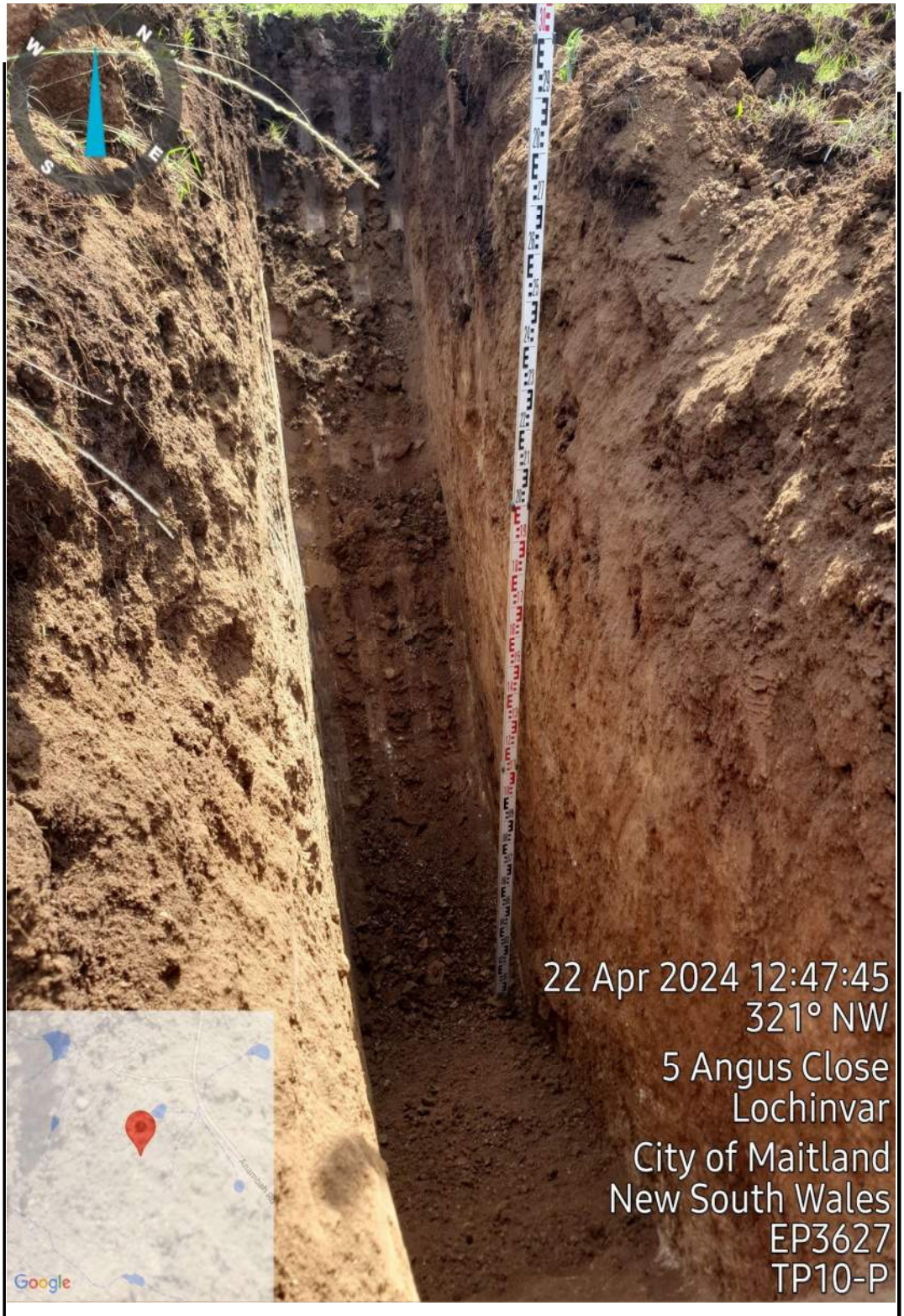
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384841.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358029.00	Bearing	---	Ground Level	38 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	2		TOPSOIL
									2		
					CI-CH	Silty CLAY: medium to high plasticity, brown			2		RESIDUAL SOIL
									3		
									2		
									4		
									5		
					CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, brown, interbedded with Mudstone (MARL), fine to coarse grained sand	<PL	VSt to H	12		EXTREMELY WEATHERED ROCK
									10		DCP:-/80mm HB
		37	1							B	
		36	2								
		35	3								
						Test Pit TP10-P Terminated at 3.00 m					Target depth
		34	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP10-P	

Test Pit No: TP11-L

Engineering Log - Test Pit

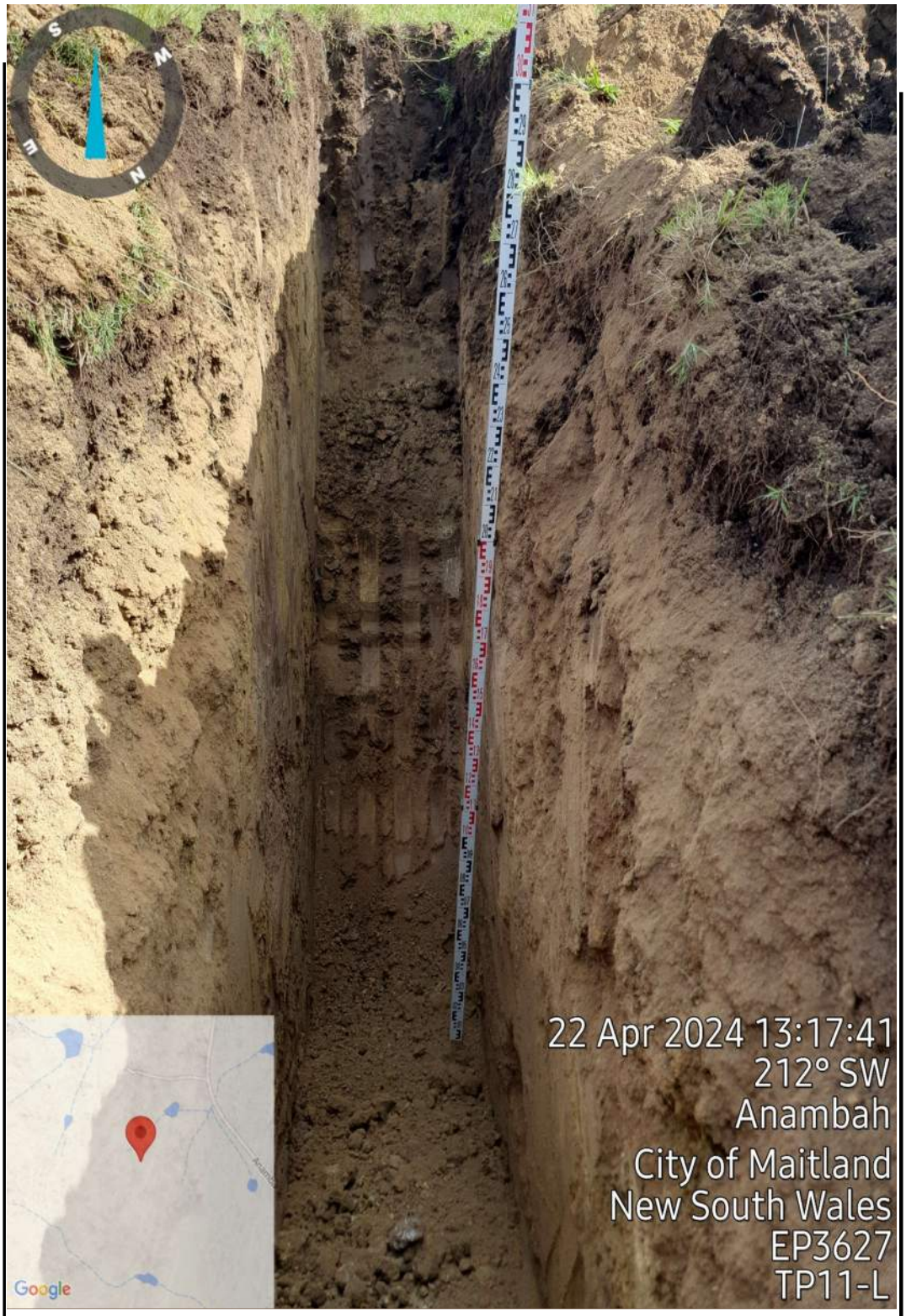
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384806.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	357982.00	Bearing	---	Ground Level	43 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark brown	~PL	F to St	2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown			1 2 1 2 2 3		RESIDUAL SOIL
		42	1		CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, brown and dark grey, fine to coarse grained sand	<PL	VSt to H	9 10 14 15		EXTREMELY WEATHERED ROCK
		41	2								
		40	3							D	
						Test Pit TP11-L Terminated at 3.00 m					Target depth
		39	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP11-L	

Test Pit No: TP12-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384748.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	357953.00	Bearing	---	Ground Level	46 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F	2		TOPSOIL
									2		
					CI-CH	Silty CLAY: medium to high plasticity, grey, brown			2		RESIDUAL SOIL
									2		
									2		
									8		
					CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, grey-yellow, fine to coarse grained sand	<PL	VSt to H	23		EXTREMELY WEATHERED ROCK
		45	1						21		
		44	2								
		43	3								
						Test Pit TP12-P Terminated at 3.00 m					Target depth
		42	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP12-P	

Test Pit No: TP13-L

Engineering Log - Test Pit

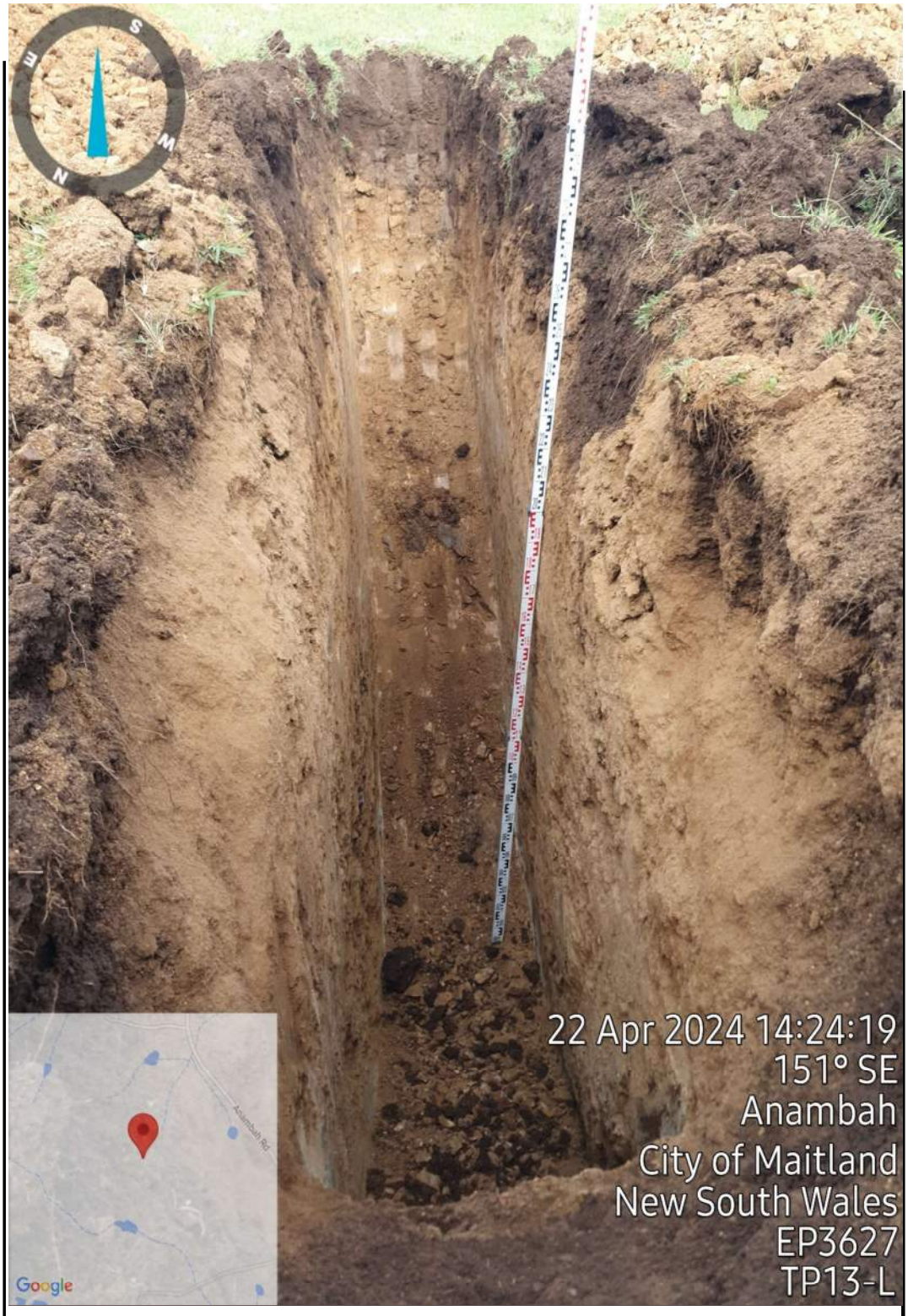
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384644.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358074.00	Bearing	---	Ground Level	39 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey			1 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, grey	~PL	F	2 2 1		SLOPE WASH
					CI-CH	Silty CLAY: medium to high plasticity, brown		S to VSt	4 3		RESIDUAL SOIL
		38	1		CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, brown, fine to coarse grained Sand	<PL		9 18		EXTREMELY WEATHERED ROCK
		37	2					H			
					CI-CH	Extremely weathered Sandstone interbedded with Mudstone (MARL), recovered as Sandy CLAY, medium to high plasticity, dark brown, fine to coarse grained sand	<<PL				
		36	3			Test Pit TP13-L Terminated at 3.00 m					Target depth
		35	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP13 - L	

Test Pit No: TP14-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384591.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358046.00	Bearing	---	Ground Level	39 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	2 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, grey			2 2 2 2 4		RESIDUAL SOIL
		38	1		CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, brown, fine to coarse grained sand	<PL	VSt to H	9 13 13 15		EXTREMELY WEATHERED ROCK
		37	2								
		36	3			Test Pit TP14-P Terminated at 2.80 m					Refusal
		35	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP14 - P	

Test Pit No: TP15-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384588.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358209.00	Bearing	---	Ground Level	35 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey			2 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown	~PL	F and St	3 2 2 3	B	RESIDUAL SOIL
		34	1		CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, brown, fine to coarse grained sand	<PL	H	12 10 15		EXTREMELY WEATHERED ROCK
		33	2		CI-CH	Extremely weathered Sandstone interbedded with Mudstone (MARL), recovered as Sandy CLAY, medium to high plasticity, dark brown, fine to coarse grained sand	<<PL				
		32	3			Test Pit TP15-P Terminated at 3.00 m					Target depth
		31	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP15 - P	

Test Pit No: TP16-L

Engineering Log - Test Pit

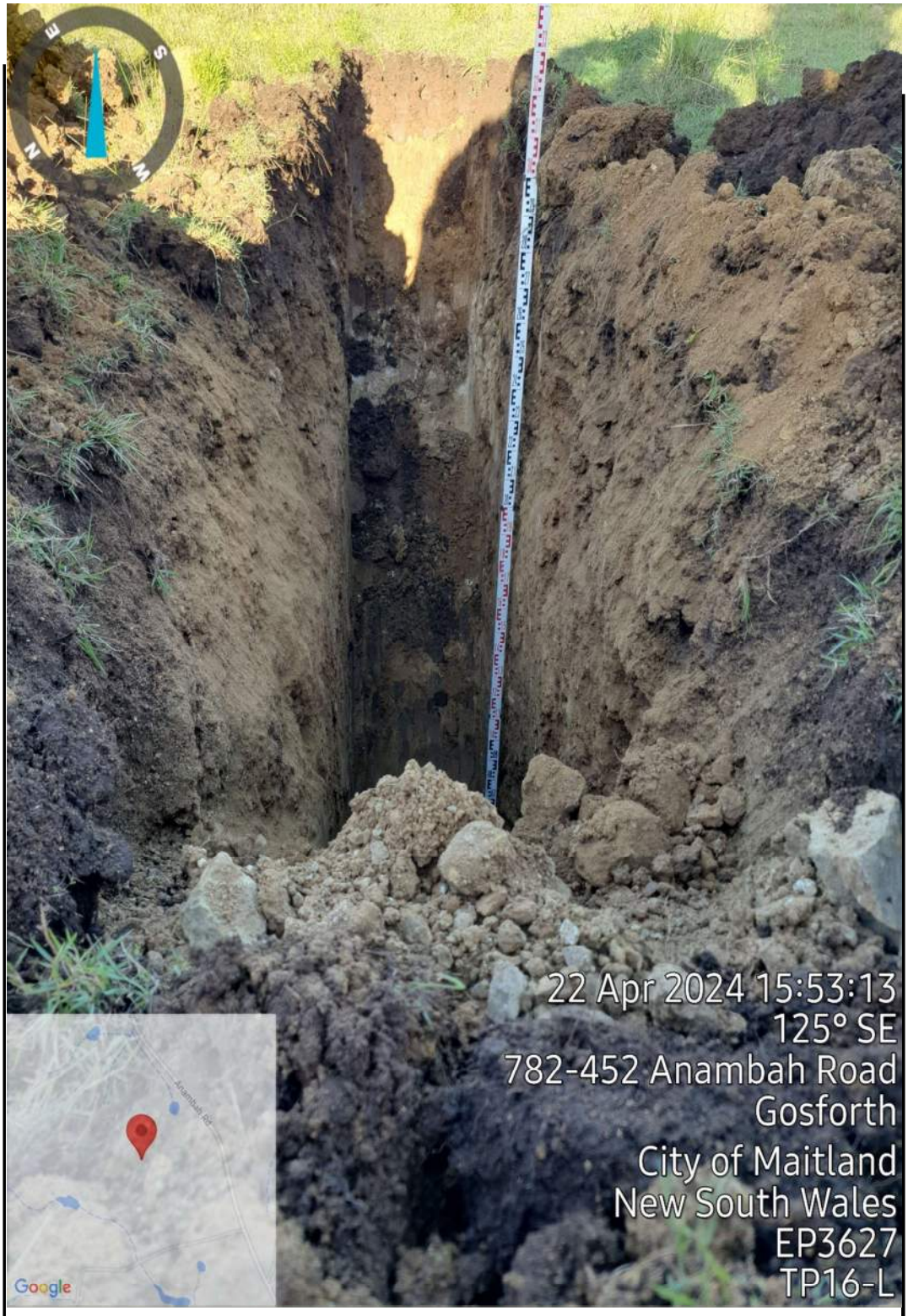
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384553.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358308.00	Bearing	---	Ground Level	38 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests / DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey			1 1		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, grey	~PL	F	1 1 2 5		RESIDUAL SOIL
		37	1		CI-CH	Extremely weathered Sandstone interbedded with Mudstone (MARL), recovered as Sandy CLAY, medium to high plasticity, dark brown, fine to coarse grained sand	<PL	VSt to H	11 15 15		EXTREMELY WEATHERED ROCK
		36	2								
		35	3			Test Pit TP16-L Terminated at 3.00 m					Target depth
		34	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP16 - L	

Test Pit No: TP17-P

Engineering Log - Test Pit

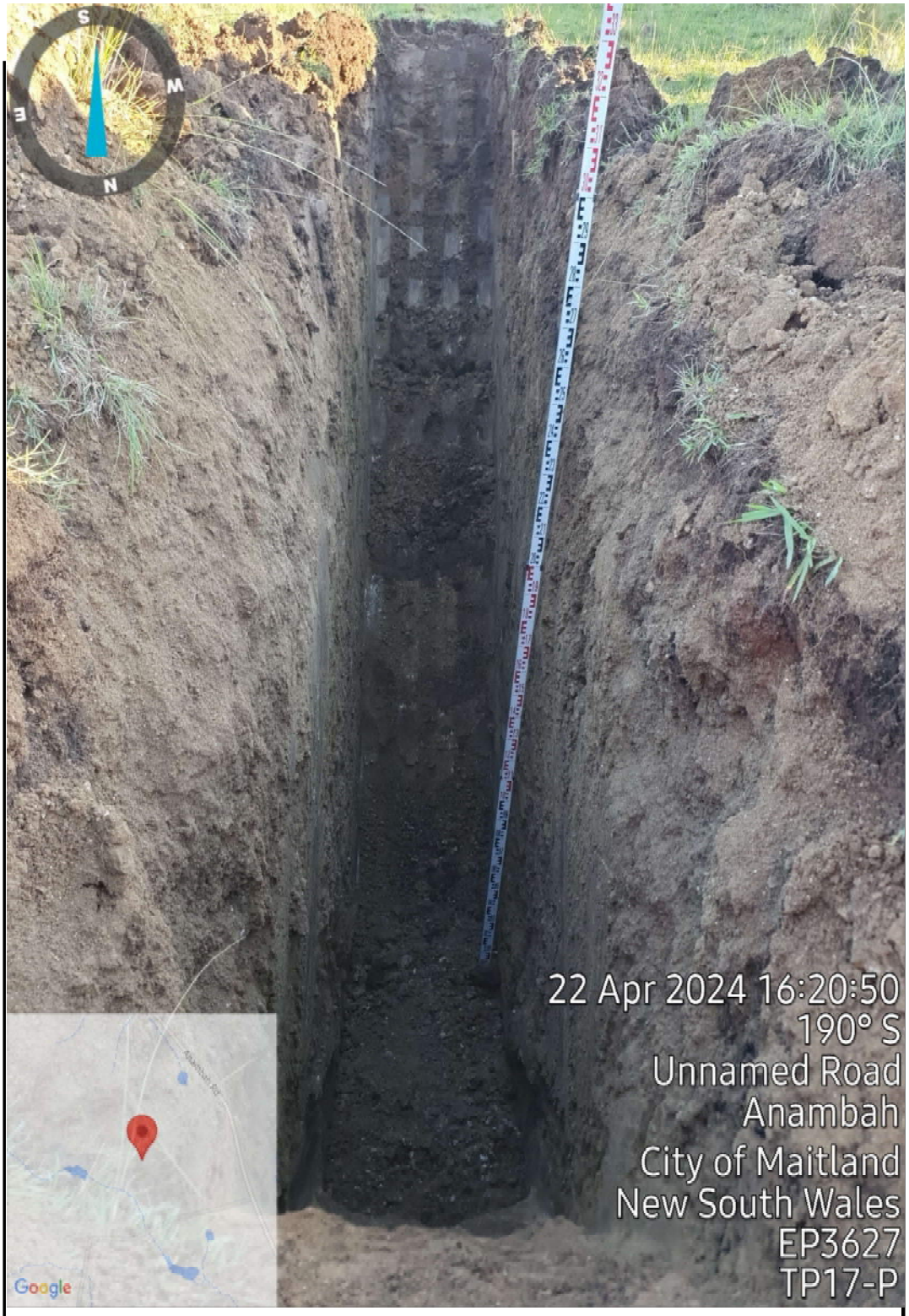
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	22.4.24	Northing	6384433.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	22.4.24	Easting	358262.00	Bearing	---	Ground Level	31 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey			1		TOPSOIL
									1		
					CI-CH	Silty CLAY: medium to high plasticity, grey	~PL	F	1		SLOPE WASH
									1		
									1		
					CI-CH	Silty CLAY: medium to high plasticity, brown	<PL		5		RESIDUAL SOIL
									10		
					CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, brown, fine to coarse grained sand			13		EXTREMELY WEATHERED ROCK
		30	1						14		
										B	
							<<PL	VSt to H			
		29	2								
		28	3								
						Test Pit TP17-P Terminated at 3.00 m					Target depth
		27	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP17 - P	

Test Pit No: TP18-L

Engineering Log - Test Pit

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384392.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	358227.00	Bearing	---	Ground Level	28 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	1 1		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, dark brown			2 3 3	B	SLOPE WASH
					CI-CH	Gravelly CLAY: medium to high plasticity, brown, fine to coarse grained, angular to subangular gravel			6 8		RESIDUAL SOIL
		27	1		CI-CH	Extremely weathered Sandstone and Mudstone, recovered as Sandy CLAY, medium to high plasticity, dark brown, fine to coarse sand	<PL	VSt to H	25		EXTREMELY WEATHERED ROCK
		26	2								
		25	3								
						Test Pit TP18-L Terminated at 3.20 m					Target depth
		24	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP18 - L	

Test Pit No: TP19-L

Engineering Log - Test Pit

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384484.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	357971.00	Bearing	---	Ground Level	32 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		32	0		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	2 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown			3 3 3 4	U500.29	SLOPE WASH
					CI-CH	Sandy CLAY: medium to high plasticity, brown, fine to medium grained sand			4 5 5 7		RESIDUAL SOIL
		31	1		CI-CH	Extremely weathered Sandstone and Mudstone, recovered as Sandy CLAY, medium to high plasticity, dark brown, fine to coarse grained sand	<PL	VSt to H	9 7 9 10 9 13 16		EXTREMELY WEATHERED ROCK
		30	2								
		29	3			Test Pit TP19-L Terminated at 2.50 m					Target depth
		28	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP19 - L	

Test Pit No: TP20-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384451.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	358060.00	Bearing	---	Ground Level	30 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F and St	2 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, dark brown			2 1 3 2 3	B	SLOPE WASH
					CI-CH	Gravelly CLAY: medium to high plasticity, brown, fine to medium grained, angular to subangular gravel			8 15 12		RESIDUAL SOIL
		29	1		CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, grey and brown, fine to coarse grained sand	<PL	VSt to H	17		EXTREMELY WEATHERED ROCK
		28	2								
		27	3			Test Pit TP20-P Terminated at 2.40 m					Target depth
		26	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP20 - P	

Test Pit No: TP21-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384398.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	358132.00	Bearing	---	Ground Level	27 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	2 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown			2 3 3 3		SLOPE WASH
					CI-CH	Sandy CLAY: medium to high plasticity, brown, fine to coarse grained sand	<PL to ~PL		3 4		RESIDUAL SOIL
		26	1		SC	Extremely weathered Sandstone recovered as Clayey SAND, fine to coarse, brown	D	VD	10 10 15	B	EXTREMELY WEATHERED ROCK
		25	2								
		24	3								
						Test Pit TP21-P Terminated at 3.20 m					Target depth
		23	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP21 - P	

Test Pit No: TP22-P

Engineering Log - Test Pit

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384289.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	358289.00	Bearing	---	Ground Level	23 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	1 1		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown			1 2		SLOPE WASH
					CI-CH	Silty CLAY: medium to high plasticity, yellow, brown			3 5 8		RESIDUAL SOIL
		22	1		CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, pale brown, fine to coarse grained sand	<PL	VSt to H	12 12		EXTREMELY WEATHERED ROCK
		21	2								
		20	3								
		19	4			Test Pit TP22-P Terminated at 3.20 m					Target depth

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP22 - P	

Test Pit No: TP23-L

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384325.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	358042.00	Bearing	---	Ground Level	30 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests / DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey			1		TOPSOIL
									1		
					CI-CH	Silty CLAY: medium to high plasticity, brown			2		SLOPE WASH
									2		
							~PL	F	2		
									2		
									2	U50	
									1		
									2		
					CI-CH	Gravelly CLAY: medium to high plasticity, brown, fine to medium grained, angular gravel			4		RESIDUAL SOIL
		29	1						5		
									6		
									7		
							<PL	VSt	6		
									8		
									7		
									8		
					CI-CH	Extremely weathered Sandstone interbedded with Mudstone (MARL), recovered as Sandy CLAY, medium to high plasticity, brown, fine to coarse grained sand			12		EXTREMELY WEATHERED ROCK
									7		
									9		
		28	2						12		
									17		
									15		
							<<PL	H			
		27	3								
						Test Pit TP23-L Terminated at 3.20 m					Target depth
		26	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP23 - L	

Test Pit No: TP24-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384221.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	358092.00	Bearing	---	Ground Level	31 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey			1 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown, red		F to St	1 2 2 3 3		SLOPE WASH
							~PL		5 5	B	
		30	1		CI-CH	Silty CLAY: medium to high plasticity, brown, grey			8 7		RESIDUAL SOIL
					CI-CH	Extremely weathered Sandstone interbedded with Mudstone (MARL), recovered as Sandy CLAY, medium to high plasticity, brown, fine to coarse grained sand		VSt to H	10 16		EXTREMELY WEATHERED ROCK
		29	2				<<PL				
		28	3								
						Test Pit TP24-P Terminated at 3.20 m					Target depth
		27	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP24 - P	

Test Pit No: TP25-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384248.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	358009.00	Bearing	---	Ground Level	34 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	2		TOPSOIL
									2		
					CI-CH	Silty CLAY: medium to high plasticity, brown			3		SLOPE WASH
									3		
									3		
									3		
					CI-CH	Gravelly CLAY: medium to high plasticity, brown, fien to coarse grained, angular to subangular gravel			4		RESIDUAL SOIL
								VSt to H	6		
									8		
		33	1						10		
					GP	Extremely weathered Sandstone recovered as Clayey Sandy GRAVEL, fine to coarse grained, sub-angular to angular, brown to dark brown, fine to coarse grained sand, with ferruginous cementations (50-70mm)	M to D	VD	14		EXTREMELY WEATHERED ROCK
									12		
									11		
									15		
		32	2							B	
		31	3			Test Pit TP25-P Terminated at 3.00 m					Target depth
		30	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP25 - P	

Test Pit No: TP26-P

Engineering Log - Test Pit

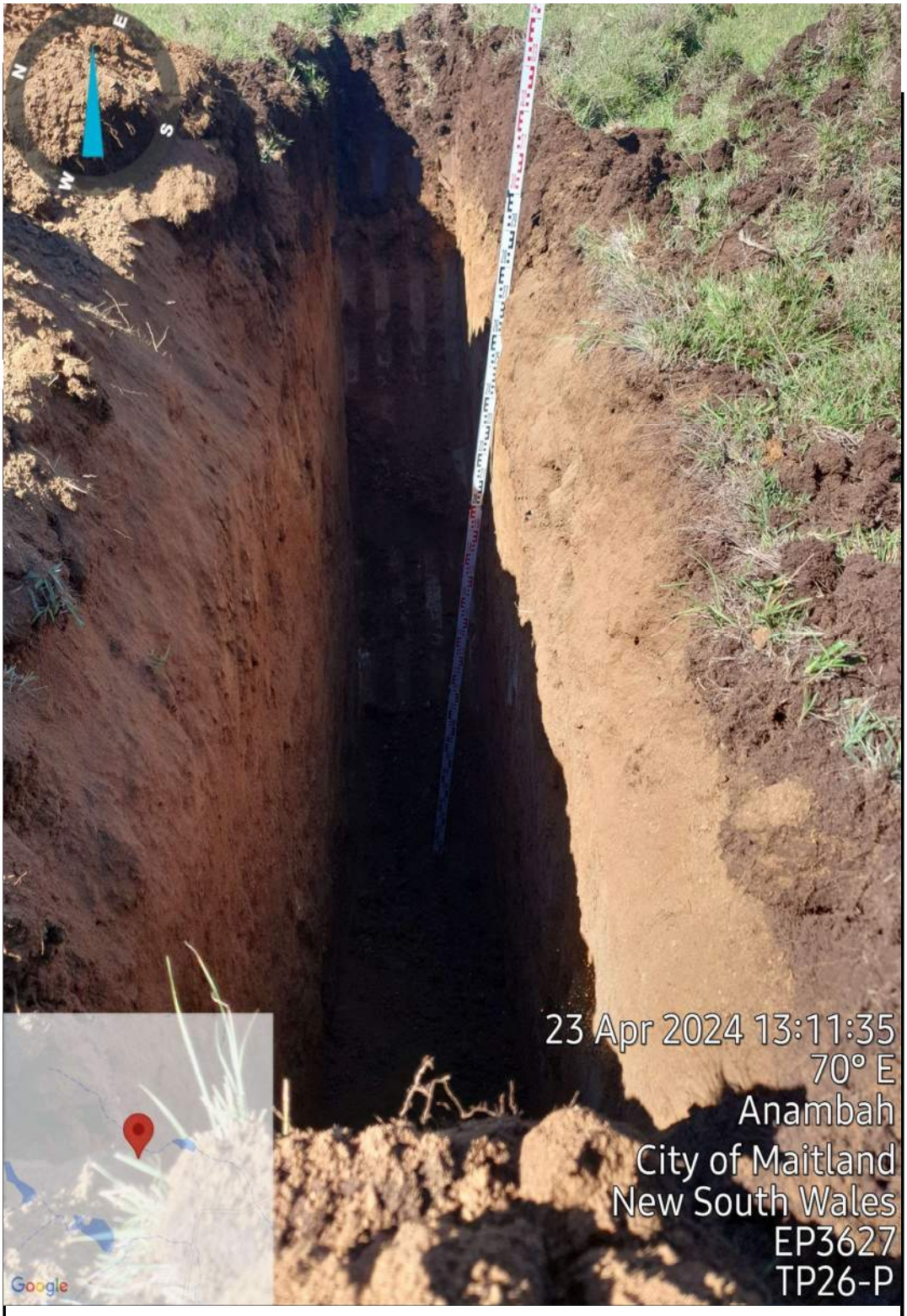
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384349.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	357850.00	Bearing	---	Ground Level	33 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		33	0		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F	2 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown		St to VSt	3 3 3 3 5		RESIDUAL SOIL
		32	1		SC	Extremely weathered Sandstone recovered as Clayey SAND, dark brown to dark brown, fine to coarse grained sand	M to D	VD	12 10 9 9 17		EXTREMELY WEATHERED ROCK
		31	2								
		30	3			Test Pit TP26-P Terminated at 3.00 m					Target depth
		29	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP26 - P	

Test Pit No: TP27-L

Engineering Log - Test Pit

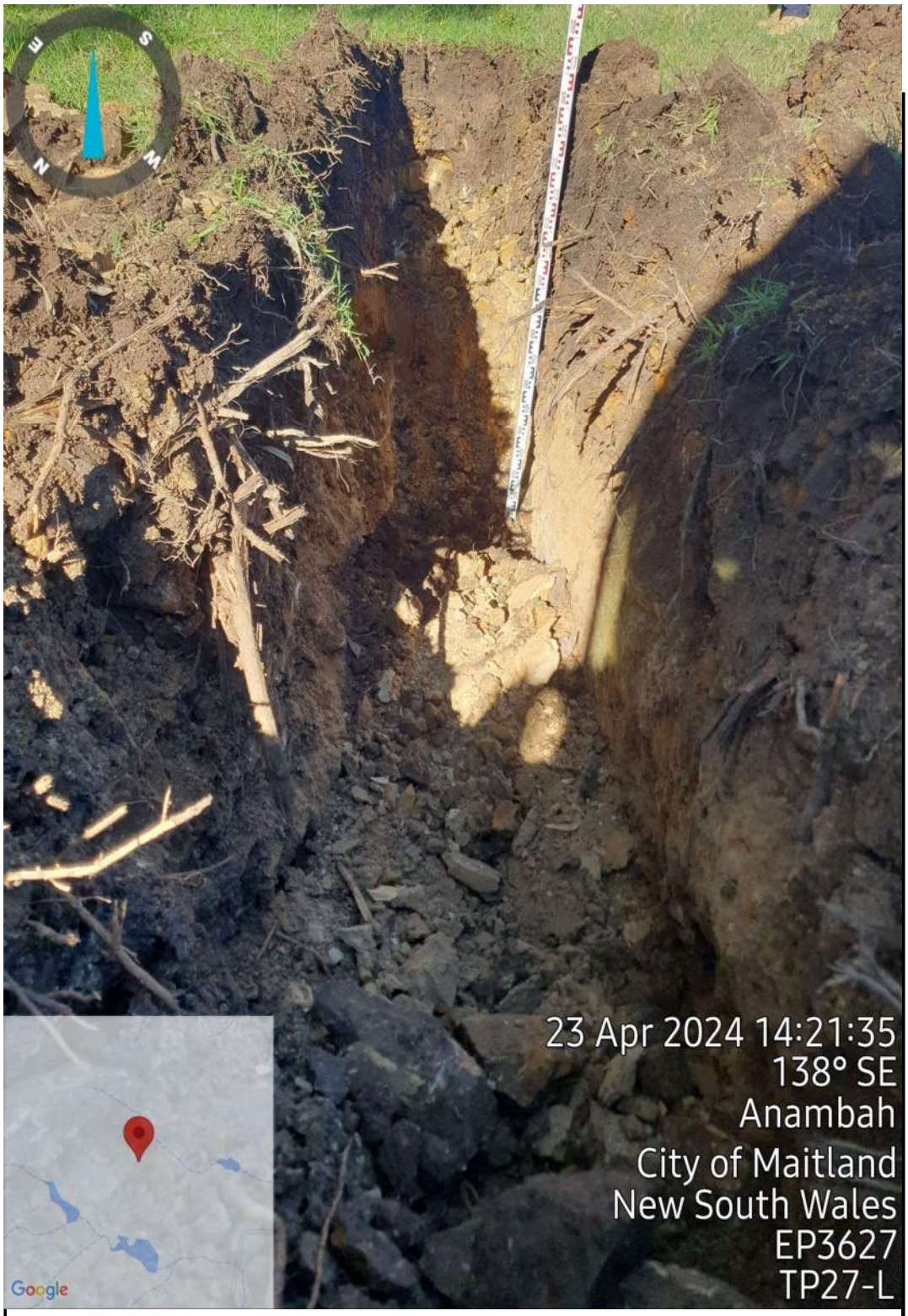
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384402.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	357675.00	Bearing	---	Ground Level	46 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey, with 300mm boulders			2		TOPSOIL
					CI-CH	Sandy CLAY: medium to high plasticity, brown, fine to coarse grained sand	~PL	F	1 2 2 2		RESIDUAL SOIL
								St	3 4		
E		45	1		SC	Extremely weathered Sandstone recovered as Clayey SAND, fine to coarse grained, brown	D	VD	7		EXTREMELY WEATHERED ROCK DCP:-/80mm HB
		44	2			Test Pit TP27-L Terminated at 1.60 m					Refusal
		43	3								
		42	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP27 - L	

Test Pit No: TP28-P

Engineering Log - Test Pit

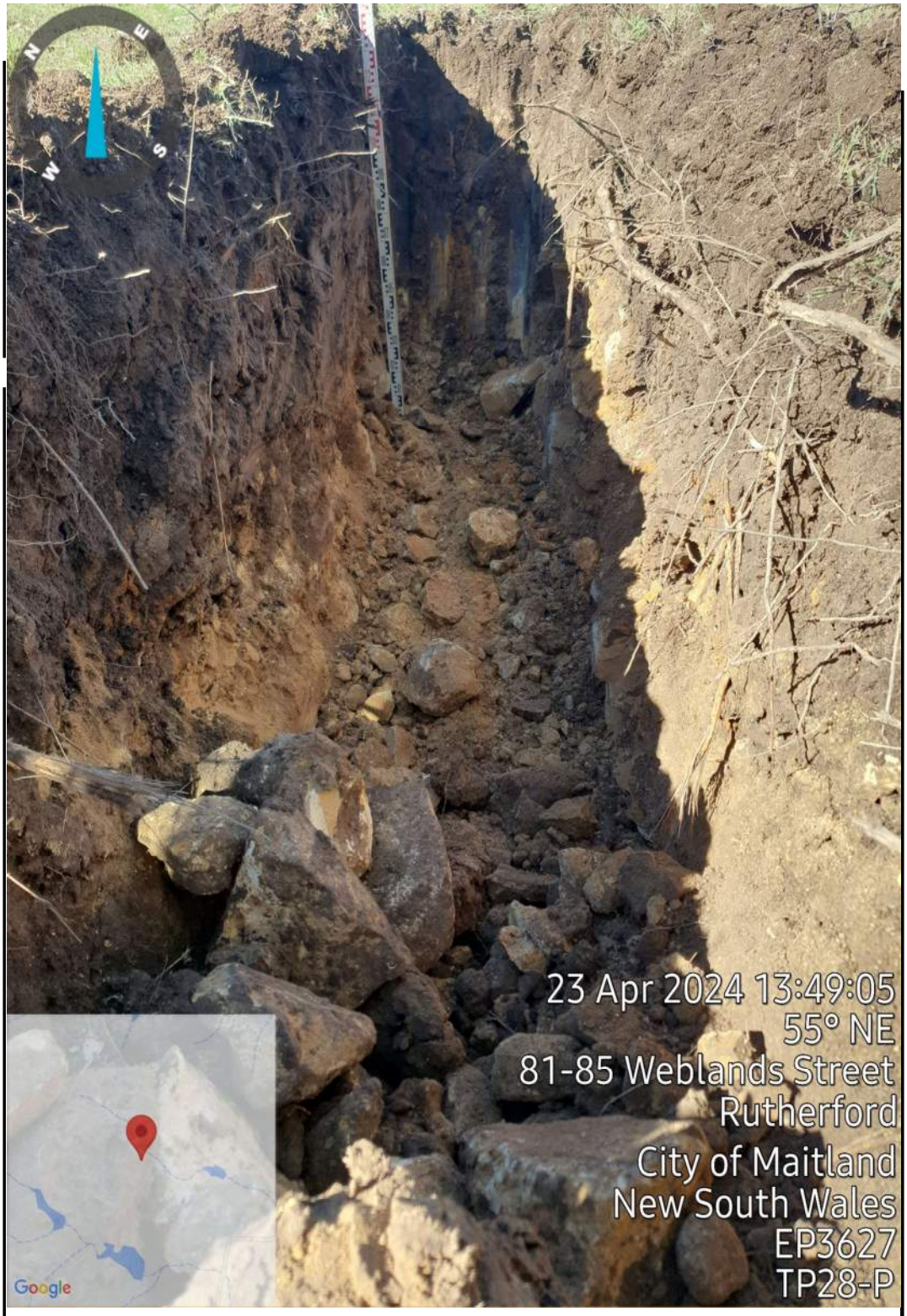
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384445.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	357731.00	Bearing	---	Ground Level	38 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		38	0		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F	2 1		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, grey			1 1 2		RESIDUAL SOIL
					SC	Extremely weathered Sandstone recovered as Clayey SAND, fine to coarse grained, pale brown	D	VD	5		EXTREMELY WEATHERED ROCK DCP:-/50mm HB
R		37	1							B	
		36	2			Test Pit TP28-P Terminated at 1.30 m					Refusal
		35	3								
		34	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP28 - P	

Test Pit No: TP29-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	24.4.24	Northing	6384503.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	24.4.24	Easting	357850.00	Bearing	---	Ground Level	35 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		35	0		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	1		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown, grey			2 2 2 4		RESIDUAL SOIL
					CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, pale brown, fine to coarse grained sand			15 7		EXTREMELY WEATHERED ROCK DCP:-/20mm HB
		34	1								
R							<PL	H		B	
		33	2								
						Test Pit TP29-P Terminated at 2.70 m					Refusal
		32	3								
		31	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP29 - P	

Test Pit No: TP30-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	24.4.24	Northing	6384571.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	24.4.24	Easting	357708.00	Bearing	---	Ground Level	43 AHD

EXCAVATION				MATERIAL DESCRIPTION						TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		43	0		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, grey	>PL to ~PL	VS to St	0		TOPSOIL
					CI-CH	Silty Gravelly CLAY: medium to high plasticity, grey, brown, fine to coarse grained, angular to subangular gravel	~PL to <PL		1 2 3		RESIDUAL SOIL
					CI-CH	Extremely weathered Mudstone recovered as Silty CLAY, medium to high plasticity, brown and grey		St to VSt	9 8		EXTREMELY WEATHERED ROCK
		42	1						10 6 9 14 20		
		41	2				<<PL	VSt and H			
		40	3								
		39	4			Test Pit TP30-P Terminated at 3.20 m					Target depth

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP30 - P	

Test Pit No: TP31-L

Engineering Log - Test Pit

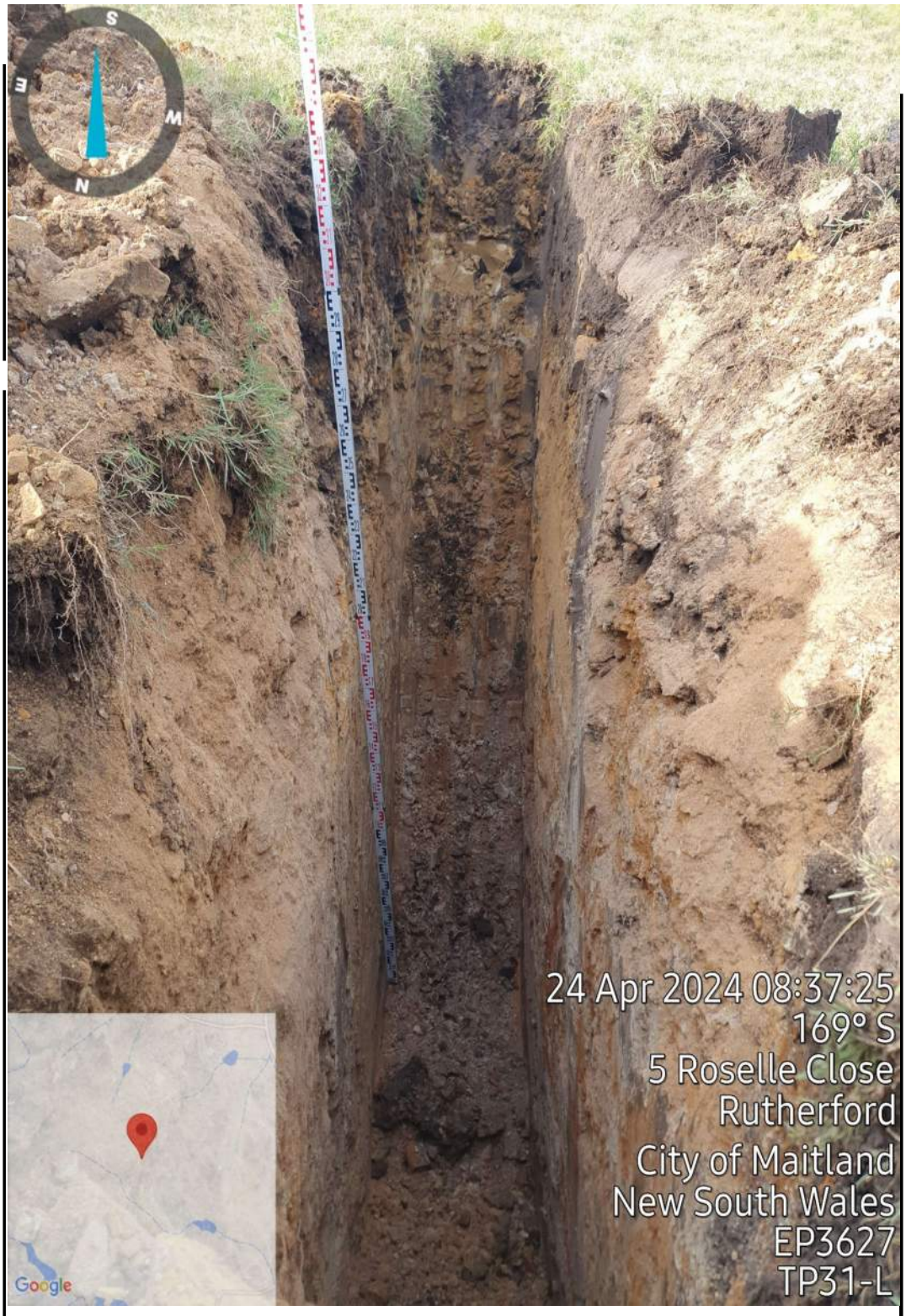
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	24.4.24	Northing	6384632.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	24.4.24	Easting	357777.00	Bearing	---	Ground Level	47 AHD

EXCAVATION				MATERIAL DESCRIPTION						TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		47	0		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL to >PL	F to St	1		TOPSOIL
					CI-CH	Sandy Gravelly CLAY: medium to high plasticity, grey, brown, fine to coarse grained, angular to subangular gravel, fine to coarse grained sand	~PL to >PL		1		RESIDUAL SOIL
							<PL to ~PL		3		
									5		DCP:-/10mm HB
		46	1		SC	Extremely weathered Sandstone recovered as Clayey SAND, fine to coarse grained, brown, grey					EXTREMELY WEATHERED ROCK
		45	2				D	VD			
		44	3								
						Test Pit TP31-L Terminated at 3.20 m					Target depth
		43	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP31 - L	

Test Pit No: TP32-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	24.4.24	Northing	6384658.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	24.4.24	Easting	357844.00	Bearing	---	Ground Level	46 AHD

EXCAVATION				MATERIAL DESCRIPTION						TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, grey			1		TOPSOIL
					CI-CH	Sandy Gravelly CLAY: medium to high plasticity, grey, brown, fine to coarse grained, angular to subangular gravel, fine to medium grained sand	>PL	F	1		RESIDUAL SOIL
									1		
									7		DCP:-/90mm HB
					SC	Extremely weathered Sandstone recovered as Clayey SAND, fine to coarse grained, brown, grey					EXTREMELY WEATHERED ROCK
R		45	1				D	VD		B	
		44	2			Test Pit TP32-P Terminated at 1.20 m					Refusal
		43	3								
		42	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP32 - P	

Test Pit No: TP33-P

Engineering Log - Test Pit

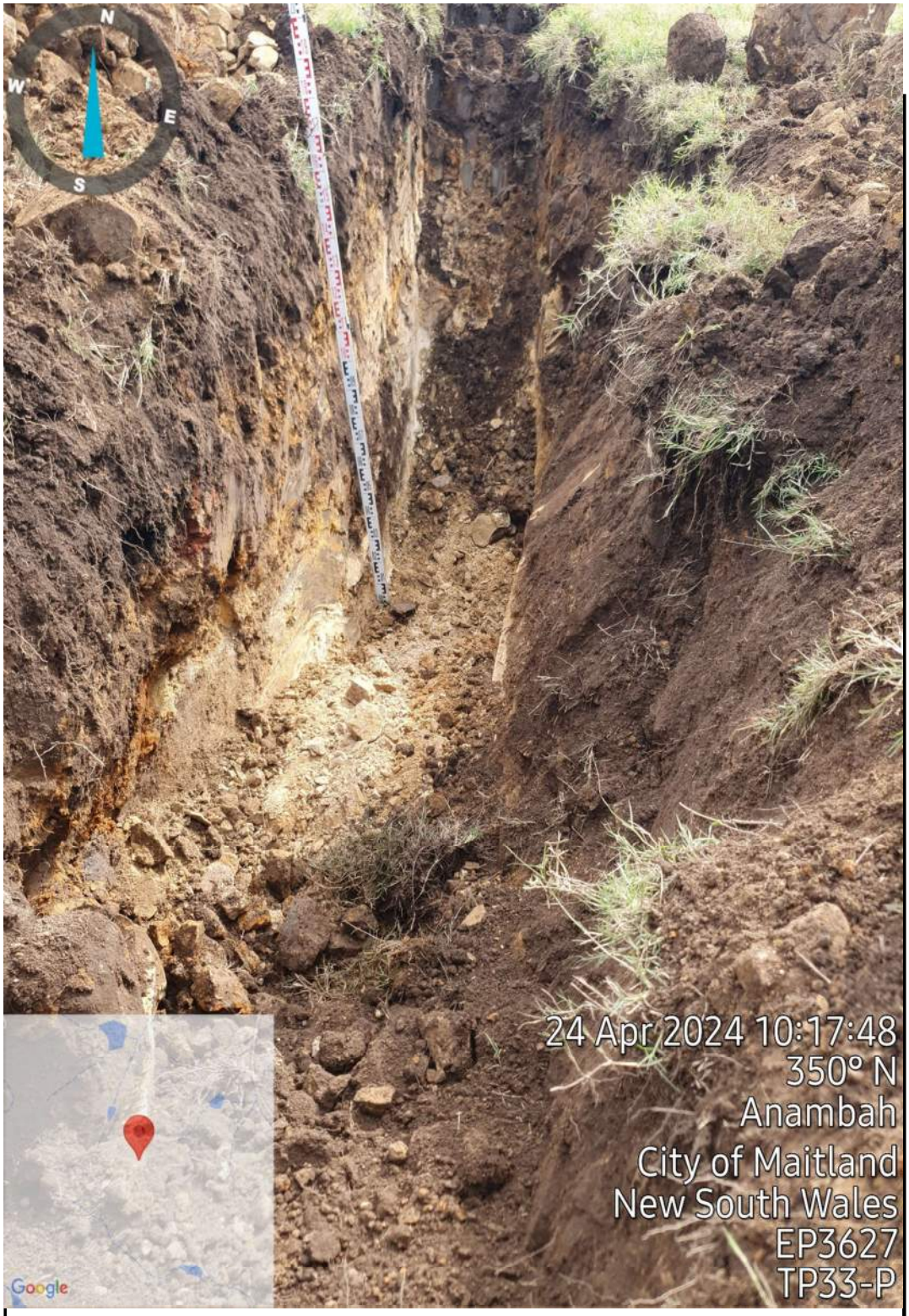
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	24.4.24	Northing	6384794.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	24.4.24	Easting	357810.00	Bearing	---	Ground Level	58 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	2		TOPSOIL
									2		
					CI-CH	Sandy CLAY: medium to high plasticity, grey, brown, fine to medium grained grained sand	~PL to >PL		2		RESIDUAL SOIL
									5		DCP:-HB
E					SC	Extremely weathered Sandstone recovered as Clayey SAND, fine to coarse grained, brown, grey					EXTREMELY WEATHERED ROCK
		57	1								
R							D	VD		B	
						Test Pit TP33-P Terminated at 1.80 m					Refusal
		56	2								
		55	3								
		54	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP33 - P	

Test Pit No: TP34-L

Engineering Log - Test Pit

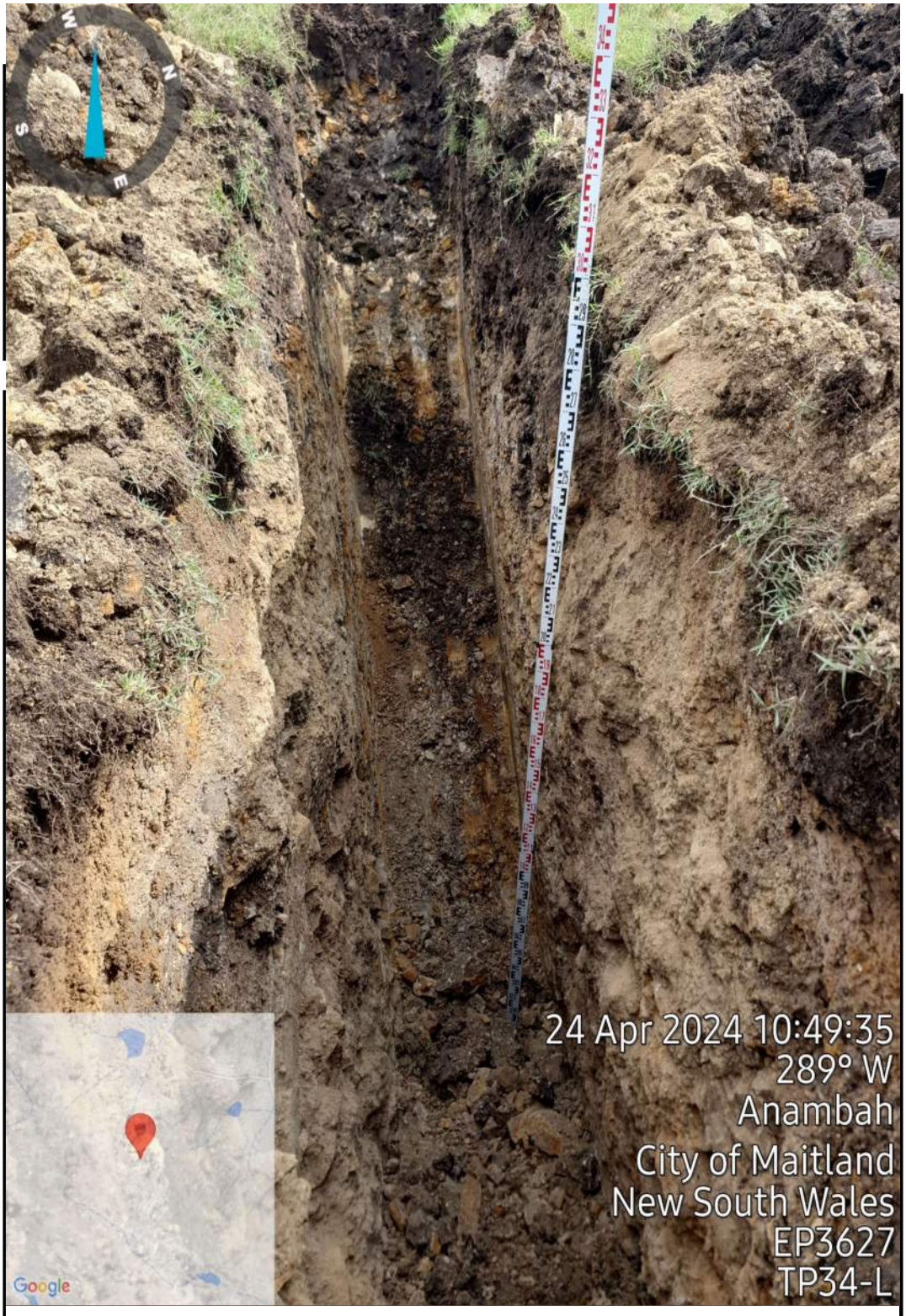
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	24.4.24	Northing	6384824.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	24.4.24	Easting	357735.00	Bearing	---	Ground Level	57 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey			3 5		TOPSOIL
					CI-CH	Sandy Gravelly CLAY: medium to high plasticity, grey, brown, fine to coarse grained, angular to subangular gravel, fine to medium grained sand, with (Sandstone) boulders	~PL	St to VSt	5 3 7 7		RESIDUAL SOIL
		56	1		CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, brown to grey, fine to coarse grained	<PL	H	9 9 7		EXTREMELY WEATHERED ROCK DCP:-/40mm HB
		55	2								
		54	3			Test Pit TP34-L Terminated at 3.00 m					Target depth
		53	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP34 - L	

Test Pit No: TP35-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	24.4.24	Northing	6384677.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	24.4.24	Easting	357584.00	Bearing	---	Ground Level	48 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		48	0		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	1		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, grey, red			1		RESIDUAL SOIL
									3		
									4		
								St to VSt	6		
									7		
		47	1		SC	Extremely weathered Sandstone recovered as Clayey Gravelly SAND, fine to coarse grained, brown to grey, fine to coarse grained sand, fine to coarse grained, subangular to angular gravel	D	VD	13	B	EXTREMELY WEATHERED ROCK
									19		
		46	2								
		45	3			Test Pit TP35-P Terminated at 3.00 m					Target depth
		44	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP35 - P	

Test Pit No: TP36-L

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384570.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	357500.00	Bearing	---	Ground Level	56 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		56	0		CL-CI	TOPSOIL: Sandy CLAY: low to medium plasticity, dark grey, fine to medium sand	<PL	F and St	1 2		TOPSOIL
					CI-CH	Sandy Gravelly CLAY: medium to high plasticity, grey, fine to coarse grained, subangular to angular gravel, fine to medium grained sand	>PL	F and St	1 1 3 2		RESIDUAL SOIL
								VSt	5 10		
		55	1		CI-CH	Extremely weathered Sandstone recovered as Sandy CLAY, medium to high plasticity, brown, fine to coarse grained sand	<PL	H	15		EXTREMELY WEATHERED ROCK DCP:-HB
		54	2								
		53	3							B	
						Test Pit TP36-L Terminated at 3.00 m					Target depth
		52	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP36 - L	

Test Pit No: TP37-P

Engineering Log - Test Pit

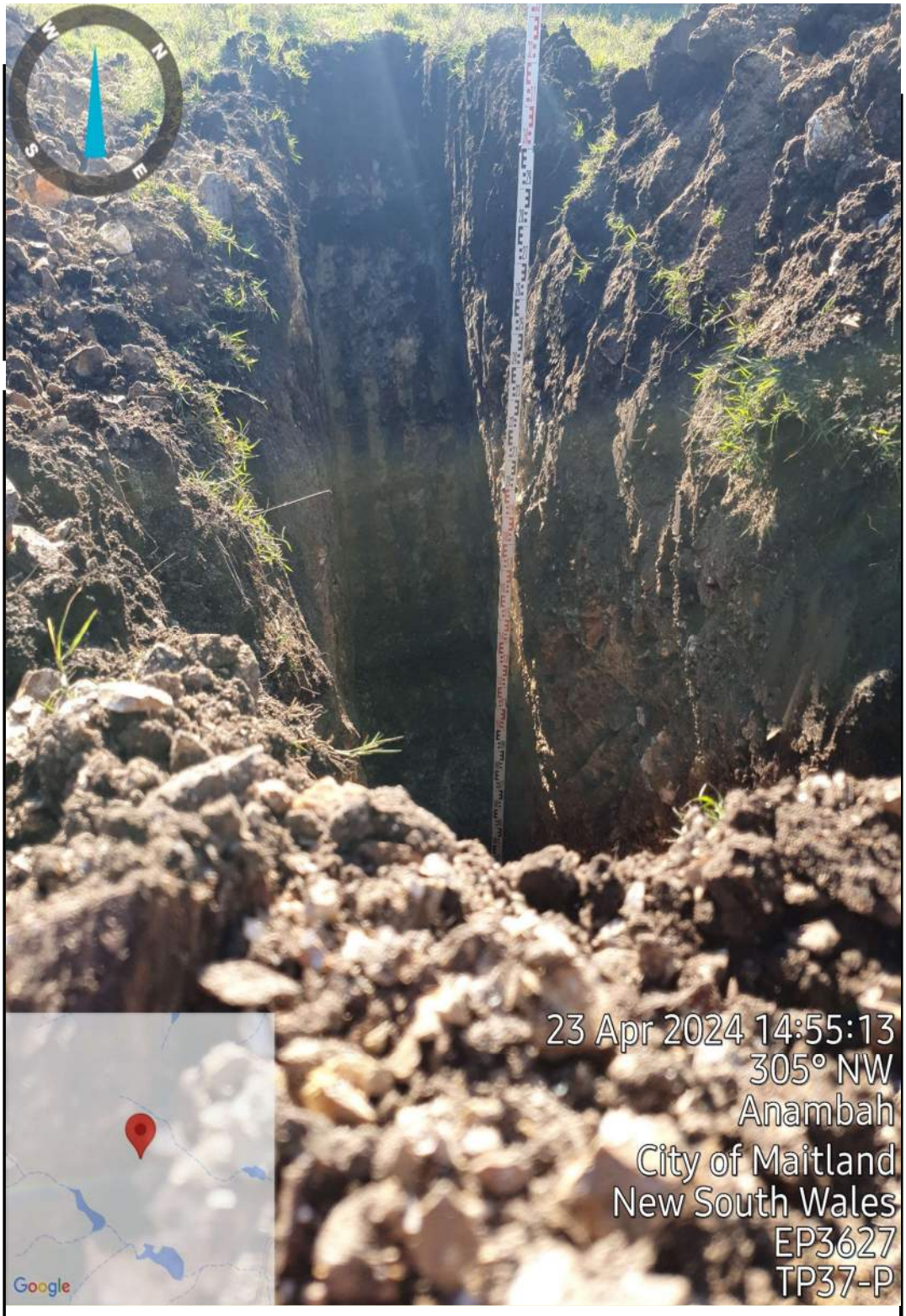
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384452.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	357571.00	Bearing	---	Ground Level	49 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F and St	1		TOPSOIL
									3		
					CI-CH	Sandy Gravelly CLAY: medium to high plasticity, grey, brown, fine to coarse grained, angular to subangular gravel, fine to coarse grained sand	<PL		2		RESIDUAL SOIL
									2		
									2		
					SC	Extremely weathered Sandstone recovered as Clayey SAND, fine to coarse grained, grey, red and brown,	D	VD	12		EXTREMELY WEATHERED ROCK
		48	1						13		
						1.50m: Becomes grey, green and brown					
					CI-CH	Extremely weathered Mudstone recovered as Sandy CLAY, medium to high plasticity, grey, brown, fine to coarse gained sand				B	
		47	2				<<PL	H			
		46	3								
						Test Pit TP37-P Terminated at 3.20 m					Target depth
		45	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP37 - P	

Test Pit No: TP38-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384336.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	357610.00	Bearing	---	Ground Level	47 AHD

EXCAVATION				MATERIAL DESCRIPTION						TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		47	0		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F	1 1		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown			1 1		SLOPE WASH
					CI-CH	Sandy CLAY: medium to high plasticity, grey, brown, fine to coarse grained sand	>PL	St to VSt	4 4 6		RESIDUAL SOIL
		46	1		SC	Extremely weathered Sandstone recovered as Clayey SAND, fine to coarse, grey, red and brown, with ferruginous cementations (50-150mm)	D to M	VD	13 6	B	EXTREMELY WEATHERED ROCK DCP:-/50mm HB
		45	2								
		44	3			Test Pit TP38-P Terminated at 3.00 m					Target depth
		43	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP38 - P	

Test Pit No: TP39-L

Engineering Log - Test Pit

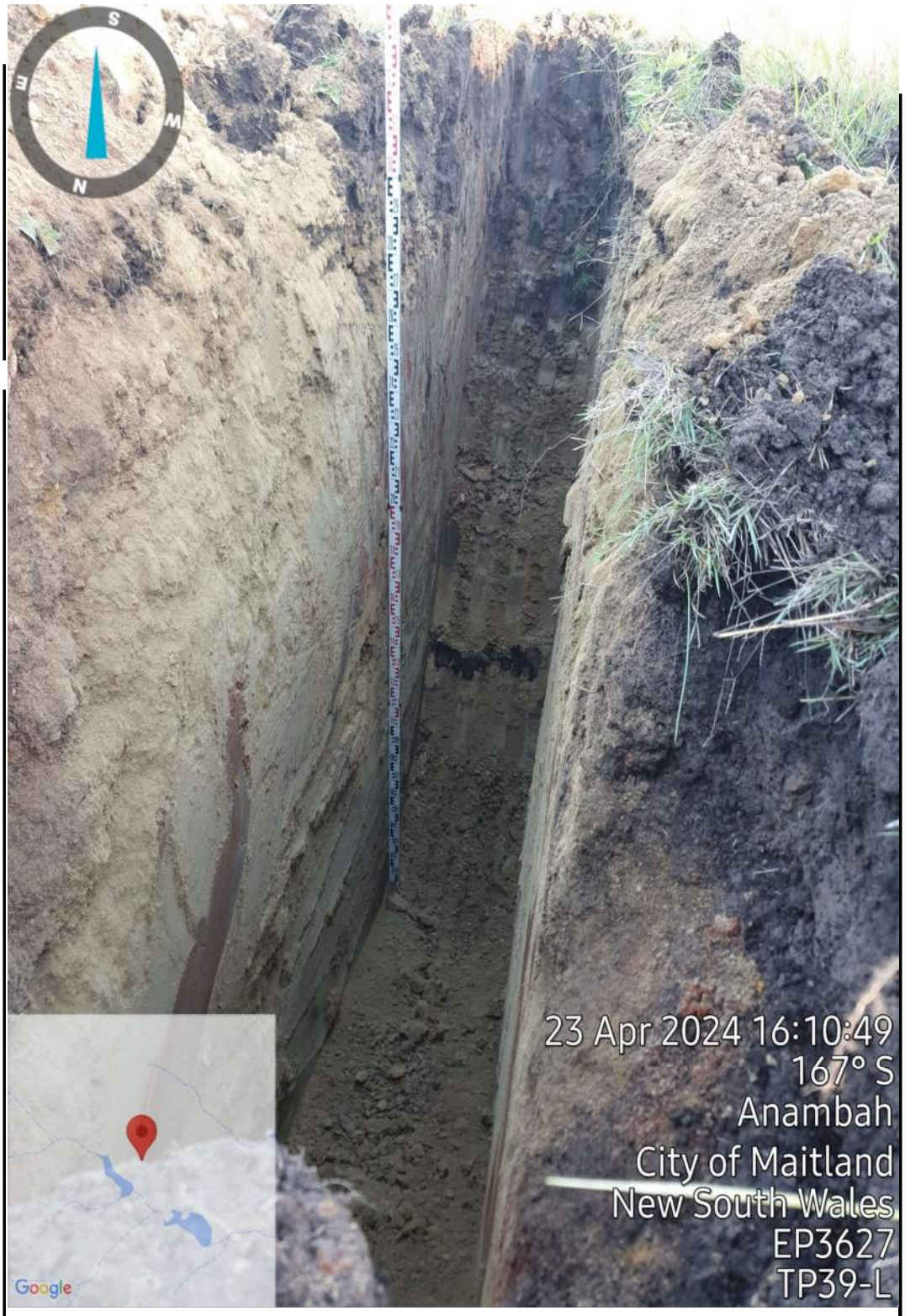
SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	23.4.24	Northing	6384306.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	23.4.24	Easting	357472.00	Bearing	---	Ground Level	43 AHD

EXCAVATION				MATERIAL DESCRIPTION						TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E					CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	VS to F	1		TOPSOIL
					CL-CI	Silty Sandy CLAY: low to medium plasticity, grey, fine to medium grained sand	>PL	VS to F	0 1 1		SLOPE WASH
								F to St	2 4		
					CI-CH	Sandy CLAY: medium to high plasticity, brown, grey, fine to coarse grained sand		VS to H	10 11		RESIDUAL SOIL
		42	1		SC	Extremely weathered Sandstone recovered as Clayey SAND, fine to coarse grained, grey, red and brown	D to M	VD	16		EXTREMELY WEATHERED ROCK DCP:-/90mm HB
		41	2								
		40	3			Test Pit TP39-L Terminated at 3.00 m					Target depth
		39	4								

Remarks:



EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP39 - L	

Test Pit No: TP40-P

Engineering Log - Test Pit

SHEET 1 OF 1

Client	Thirdi Group c/- Vara Consulting	Project No.	EP3627
Project	Thirdi Gosforth Anambah Rd	Logged By	AN
Location	559 Anambah Rd, Gosforth NSW 2320	Checked By	OP

Started Excavation	24.4.24	Northing	6384496.00	Slope	90°	Equipment	23T Excavator
Completed Excavation	24.4.24	Easting	358135.00	Bearing	---	Ground Level	33 AHD

EXCAVATION				MATERIAL DESCRIPTION					TESTING, SAMPLING & OTHER INFORMATION		
Method	Water	RL (m)	Depth (m)	Graphic Log	Classification	Description of Soil (soil type: plasticity/grainsize, colour and other components)	Moisture Condition	Consistency	Tests DCP Results (blows/ 100mm)	Samples	Additional Comments (material origin, pocket penetrometer values, investigation observations)
E		33	0		CL-CI	TOPSOIL: Silty CLAY: low to medium plasticity, dark grey	~PL	F to St	2 2		TOPSOIL
					CI-CH	Silty CLAY: medium to high plasticity, brown, yellow	~PL		2 2 2 3		RESIDUAL SOIL
		32	1		SC	Extremely weathered Sandstone recovered as Clayey SAND, fine to coarse grained, dark brown with fine to coarse grained, subangular gravel	M to D	VD	7 7 7 10 12 9 10 10		EXTREMELY WEATHERED ROCK DCP:-/50mm HB
		31	2								
		30	3							D	
						Test Pit TP40-P Terminated at 3.00 m					Target depth
		29	4								

Remarks:

EP RISK	EP3627 - Thirdi Anambah Geotechnical Investigation	
	TP40 - P	

Appendix E
LABORATORY TEST RESULTS

ASCT Hunter Branch
Postal: 2/15 Miall Way Albion Park Rail NSW 2527
Lab: 13/31 Riverside Drive, Mayfield West NSW 2304
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E-Mail: joe.stallard@asct.com.au
Mobile: 0421 989 919
A.B.N. 34 635 062 609

WB080 - Rev 32, 28/11/2023

Report on Material Quality

Client:	EP Risk	Report No:	**17-22-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 1 of 2
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 07/05/2024	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12419	**22/04/2024**	**TP01-L**	**-**	**-**	**1.50-2.50**

Sampling & Test Methods (Results relate only to the items sampled/tested) **(** NATA accreditation does not cover the performance of this service)**

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS 1289.3.6.1 Coarse: (2009)Particle size distribution of a soil
AS 1289.3.6.1 Fine: (2009)Particle size distribution of a soil
AS 1289.3.1.1: (2009)Determination of Liquid Limit (4 point Casagrande)
AS 1289.3.2.1: (2009) Determination of the Plastic Limit
AS 1289.3.3.1: (2009)Calculation of the Plastic Index of a soil
AS 1289.3.4.1: (2008)Determination of the Linear Shrinkage of a soil

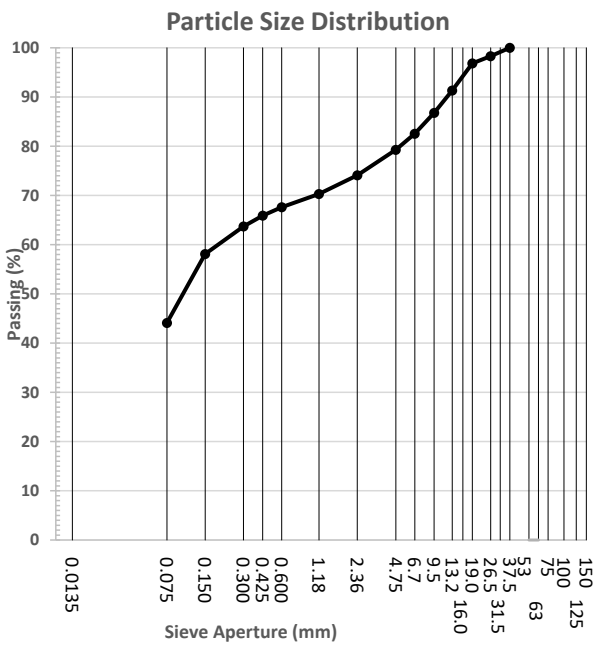
Report Remarks & Endorsement

NATA
Accredited for compliance with ISO/IEC 17025 - Testing.

Issued By: J.Edmunds
Approved Signatory

Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

Specification Name				**Graphical Representation**
Particle Size Distribution (WASHED)	Units	**Result**	**Specification Limits**	
Passing 150mm Sieve	%			
Passing 125mm Sieve	%			
Passing 100mm Sieve	%			
Passing 75.0mm Sieve	%			
Passing 63.0mm Sieve	%			
Passing 53.0mm Sieve	%			
Passing 37.5mm Sieve	%	**100**		
Passing 31.5mm Sieve	%			
Passing 26.5mm Sieve	%	**98**		
Passing 19.0mm Sieve	%	**97**		
Passing 16.0mm Sieve	%			
Passing 13.2mm Sieve	%	**91**		
Passing 9.5mm Sieve	%	**87**		
Passing 6.7mm Sieve	%	**83**		
Passing 4.75mm Sieve	%	**79**		
Passing 2.36mm Sieve	%	**74**		
Passing 1.18mm Sieve	%	**70**		
Passing 0.600mm Sieve	%	**68**		
Passing 0.425mm Sieve	%	**66**		
Passing 0.300mm Sieve	%	**64**		
Passing 0.150mm Sieve	%	**58**		
Passing 0.075mm Sieve	%	**44**		
Passing 0.0135mm Sieve	%			



ASCT Hunter Branch
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WB080 - Rev 32, 28/11/2023

Report on Material Quality

Client:	EP Risk	Report No:	**17-22-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 2 of 2
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 07/05/2024	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12419	**22/04/2024**	**TP01-L**	**-**	**-**	**1.50-2.50**

Plasticity	Units	Result	Specification Limits	Remarks
Liquid Limit	%	**40**		Oven Dried & Dry Sieved
Plastic Limit	%	**17**		Oven Dried & Dry Sieved
Plastic Index	%	**23**		Oven Dried & Dry Sieved
Linear Shrinkage	%	**10.5**		

ASCT Hunter Branch
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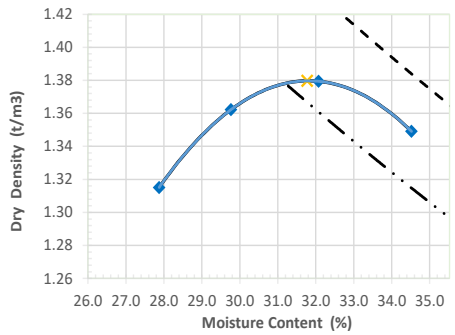
Report on AS CBR and MDD

Client:	EP Risk	Report No:	**17-23-CBR**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	15/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used(Source):	-	Test Request/Order:	**EP3627**
Material Description:	Refer to logs	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 29/04/2024 to 15/05/2024	Control Line:	-

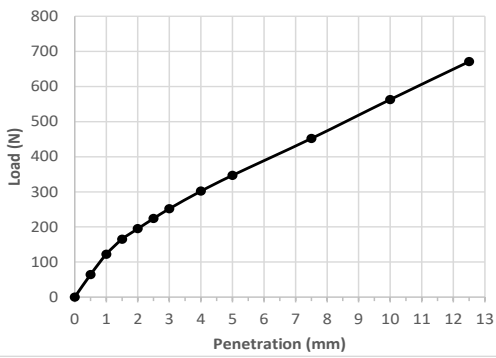
Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12420	**22/04/2024**	**TP02-P**	**-**	**-**	**1.50-2.10**

Parameters	Units	Test Results		Information
Pretreatment Regime	--	No Pretreatment		
Portion Retained on AS Sieve	%	0% on 19mm		Retained material excluded from CBR
Material Plasticity (Liquid Limit)	--	High (More than 50%)		By Technician's Assessment
Sample Curing Time	hrs	MDD = 96 hrs	CBR = 112 hrs	
Soil Particle Density	t/m3	2.65		Estimated value only**
Maximum Dry Density (MDD)	t/m3	1.38		Standard compactive effort
Optimum Moisture Content (OMC)	%	32.0		
Field Moisture Content	%	Field 31.8 %		Passing 19.0mm portion
Compaction Moisture Content	%	Achieved 31.6 %	LMR = 99.5%	Specified LMR = 100%
Compaction Dry Density	t/m3	Achieved 1.38 t/m3	LDR = 100.5%	Specified LDR = 100%
Surcharge Load	kg	4.5		
Period of Soaking	Days	Soaked - 4 Days		Dry Density (after soaking) = 1.35 t/m3.
Specimen Swell	%	3.0		
Moisture Content - Top 30mm	%	37.3		After Penetration
Moisture Content - Remaining	%	33.0		After Penetration

Dry Density Vs Moisture Content



Load-Penetration Curve



Material CBR Value (%)

2.0

California Bearing Ratios

CBR $_{2.5}$ = 1.5

CBR $_{5.0}$ = 2.0

Including an Applied Correction of 0.0 mm

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS1289.2.1.1: (2005) Moisture Content of a Soil (Oven Drying)
AS1289.5.1.1: (2017)Dry Density/Moisture content relation of a soil (Standard)
AS1289.6.1.1: (2014)California Bearing Ratio of a soil (remoulded specimen)

** **NATA accreditation does not cover the performance of this service**

Report Remarks & Endorsement

NATA

Accredited for compliance with ISO/IEC 17025 - Testing.
Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

Issued By: J.Edmunds
Approved Signatory

ASCT Hunter Branch
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WB080 - Rev 32, 28/11/2023

Report on Material Quality

Client:	EP Risk	Report No:	**17-25-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 1 of 2
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 06/05/2024	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12422	**22/04/2024**	**TP07-P**	**-**	**-**	**1.00-1.50**

Sampling & Test Methods (Results relate only to the items sampled/tested) **(** NATA accreditation does not cover the performance of this service)**

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.3.6.1 Coarse: (2009)Particle size distribution of a soil
AS 1289.3.1.1: (2009)Determination of Liquid Limit (4 point Casagrande)
AS 1289.3.3.1: (2009)Calculation of the Plastic Index of a soil
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS 1289.3.6.1 Fine: (2009)Particle size distribution of a soil
AS 1289.3.2.1: (2009) Determination of the Plastic Limit
AS 1289.3.4.1: (2008)Determination of the Linear Shrinkage of a soil

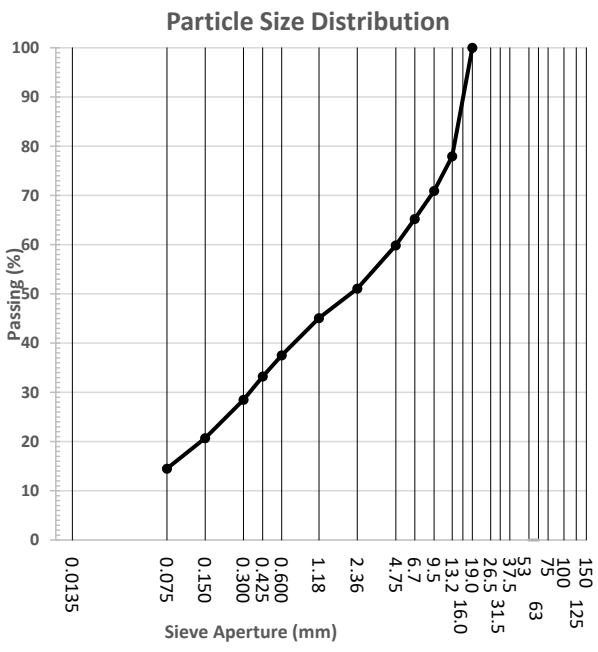
Report Remarks & Endorsement

Accredited for compliance with ISO/IEC 17025 - Testing.

Issued By: J.Edmunds
Approved Signatory

Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

Specification Name				
Particle Size Distribution (WASHED)	Units	**Result**	**Specification Limits**	**Graphical Representation**
Passing 150mm Sieve	%			
Passing 125mm Sieve	%			
Passing 100mm Sieve	%			
Passing 75.0mm Sieve	%			
Passing 63.0mm Sieve	%			
Passing 53.0mm Sieve	%			
Passing 37.5mm Sieve	%			
Passing 31.5mm Sieve	%			
Passing 26.5mm Sieve	%			
Passing 19.0mm Sieve	%	**100**		
Passing 16.0mm Sieve	%			
Passing 13.2mm Sieve	%	**78**		
Passing 9.5mm Sieve	%	**71**		
Passing 6.7mm Sieve	%	**65**		
Passing 4.75mm Sieve	%	**60**		
Passing 2.36mm Sieve	%	**51**		
Passing 1.18mm Sieve	%	**45**		
Passing 0.600mm Sieve	%	**38**		
Passing 0.425mm Sieve	%	**33**		
Passing 0.300mm Sieve	%	**28**		
Passing 0.150mm Sieve	%	**21**		
Passing 0.075mm Sieve	%	**15**		
Passing 0.0135mm Sieve	%			



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WB080 - Rev 32, 28/11/2023

Report on Material Quality

Client:	EP Risk	Report No:	**17-25-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 2 of 2
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 06/05/2024	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12422	**22/04/2024**	**TP07-P**	**-**	**-**	**1.00-1.50**

Plasticity	Units	Result	Specification Limits	Remarks
Liquid Limit	%	**39**		Oven Dried & Dry Sieved
Plastic Limit	%	**17**		Oven Dried & Dry Sieved
Plastic Index	%	**22**		Oven Dried & Dry Sieved
Linear Shrinkage	%	**8.5**		

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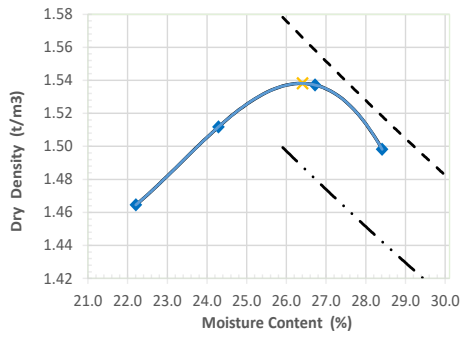
Report on AS CBR and MDD

Client:	EP Risk	Report No:	**17-26-CBR**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	15/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used(Source):	-	Test Request/Order:	**EP3627**
Material Description:	Refer to logs	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 29/04/2024 to 15/05/2024	Control Line:	-

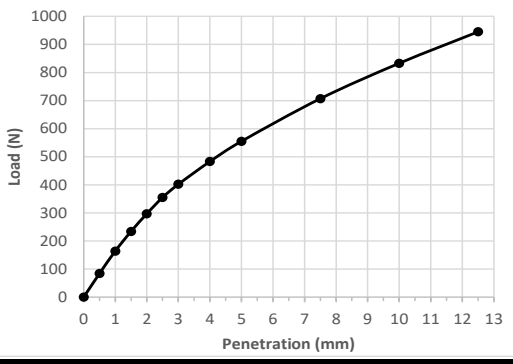
Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12423	**22/04/2024**	**TP09-P**	**-**	**-**	**1.10-1.50**

Parameters	Units	Test Results		Information
Pretreatment Regime	--	No Pretreatment		
Portion Retained on AS Sieve	%	0% on 19mm		Retained material excluded from CBR
Material Plasticity (Liquid Limit)	--	High (More than 50%)		By Technician's Assessment
Sample Curing Time	hrs	MDD = 96 hrs	CBR = 163 hrs	
Soil Particle Density	t/m3	2.67		Estimated value only**
Maximum Dry Density (MDD)	t/m3	1.54		Standard compactive effort
Optimum Moisture Content (OMC)	%	26.5		
Field Moisture Content	%	Field 26.3 %		Passing 19.0mm portion
Compaction Moisture Content	%	Achieved 26.8 %	LMR = 101.5%	Specified LMR = 100%
Compaction Dry Density	t/m3	Achieved 1.53 t/m3	LDR = 99.5%	Specified LDR = 100%
Surcharge Load	kg	4.5		
Period of Soaking	Days	Soaked - 4 Days		Dry Density (after soaking) = 1.50 t/m3.
Specimen Swell	%	2.0		
Moisture Content - Top 30mm	%	32.0		After Penetration
Moisture Content - Remaining	%	28.0		After Penetration

Dry Density Vs Moisture Content



Load-Penetration Curve



Material CBR Value (%)

3.0

California Bearing Ratios

CBR $_{2.5}$ = 2.5

CBR $_{5.0}$ = 3.0

Including an Applied Correction of 0.0 mm

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS1289.2.1.1: (2005) Moisture Content of a Soil (Oven Drying)
AS1289.5.1.1: (2017)Dry Density/Moisture content relation of a soil (Standard)
AS1289.6.1.1: (2014)California Bearing Ratio of a soil (remoulded specimen)

**** NATA accreditation does not cover the performance of this service**

Report Remarks & Endorsement

Issued By: J.Edmunds
Approved Signatory

Accredited for compliance with ISO/IEC 17025 - Testing.
Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

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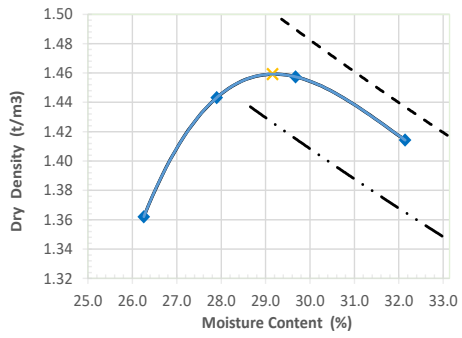
Report on AS CBR and MDD

Client:	EP Risk	Report No:	**17-27-CBR**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	15/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used(Source):	-	Test Request/Order:	**EP3627**
Material Description:	Refer to logs	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 29/04/2024 to 15/05/2024	Control Line:	-

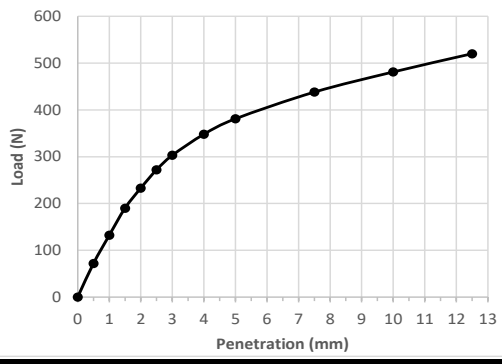
Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12424	**22/04/2024**	**TP15-P**	**-**	**-**	**0.20-0.60**

Parameters	Units	Test Results		Information
Pretreatment Regime	--	No Pretreatment		
Portion Retained on AS Sieve	%	0% on 19mm		Retained material excluded from CBR
Material Plasticity (Liquid Limit)	--	High (More than 50%)		By Technician's Assessment
Sample Curing Time	hrs	MDD = 97 hrs	CBR = 164 hrs	
Soil Particle Density	t/m3	2.67		Estimated value only**
Maximum Dry Density (MDD)	t/m3	1.46		Standard compactive effort
Optimum Moisture Content (OMC)	%	29.0		
Field Moisture Content	%	Field 33.2 %		Passing 19.0mm portion
Compaction Moisture Content	%	Achieved 29.5 %	LMR = 101.0%	Specified LMR = 100%
Compaction Dry Density	t/m3	Achieved 1.45 t/m3	LDR = 99.5%	Specified LDR = 100%
Surcharge Load	kg	4.5		
Period of Soaking	Days	Soaked - 4 Days		Dry Density (after soaking) = 1.41 t/m3.
Specimen Swell	%	3.0		
Moisture Content - Top 30mm	%	36.4		After Penetration
Moisture Content - Remaining	%	31.4		After Penetration

Dry Density Vs Moisture Content



Load-Penetration Curve



Material CBR Value (%)

2.0

California Bearing Ratios

CBR $_{2.5}$ = 2.0

CBR $_{5.0}$ = 2.0

Including an Applied Correction of 0.0 mm

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS1289.2.1.1: (2005) Moisture Content of a Soil (Oven Drying)
AS1289.5.1.1: (2017)Dry Density/Moisture content relation of a soil (Standard)
AS1289.6.1.1: (2014)California Bearing Ratio of a soil (remoulded specimen)

** **NATA accreditation does not cover the performance of this service**

Report Remarks & Endorsement

Accredited for compliance with ISO/IEC 17025 - Testing.
Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

Issued By: J.Edmunds
Approved Signatory

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Report on Material Quality

Client:	EP Risk	Report No:	**17-28-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 1 of 2
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 06/05/2024	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12425	**22/04/2024**	**TP18-L**	**-**	**-**	**0.20-0.50**

Sampling & Test Methods (Results relate only to the items sampled/tested) **(** NATA accreditation does not cover the performance of this service)**

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS 1289.3.6.1 Coarse: (2009)Particle size distribution of a soil
AS 1289.3.6.1 Fine: (2009)Particle size distribution of a soil
AS 1289.3.1.1: (2009)Determination of Liquid Limit (4 point Casagrande)
AS 1289.3.2.1: (2009) Determination of the Plastic Limit
AS 1289.3.3.1: (2009)Calculation of the Plastic Index of a soil
AS 1289.3.4.1: (2008)Determination of the Linear Shrinkage of a soil

Report Remarks & Endorsement

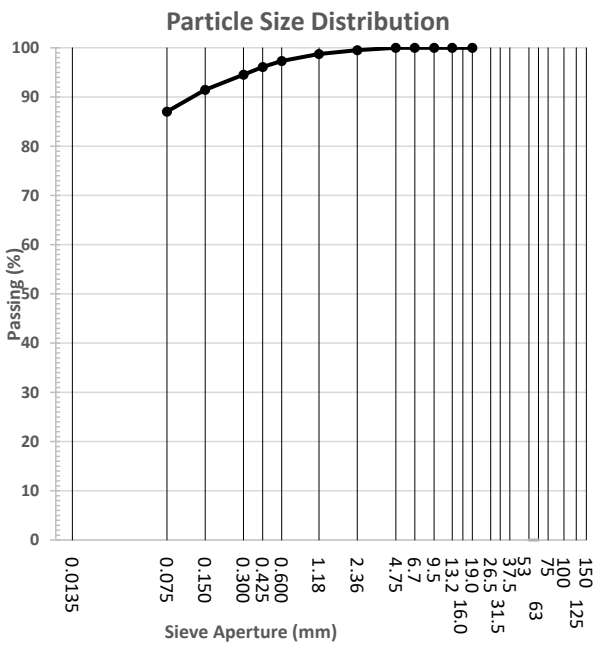
NATA

Accredited for compliance with ISO/IEC 17025 - Testing.

Issued By: J.Edmunds
Approved Signatory

Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

Specification Name				**Graphical Representation**
Particle Size Distribution (WASHED)	Units	**Result**	**Specification Limits**	
Passing 150mm Sieve	%			
Passing 125mm Sieve	%			
Passing 100mm Sieve	%			
Passing 75.0mm Sieve	%			
Passing 63.0mm Sieve	%			
Passing 53.0mm Sieve	%			
Passing 37.5mm Sieve	%			
Passing 31.5mm Sieve	%			
Passing 26.5mm Sieve	%			
Passing 19.0mm Sieve	%	**100**		
Passing 16.0mm Sieve	%			
Passing 13.2mm Sieve	%	**100**		
Passing 9.5mm Sieve	%	**100**		
Passing 6.7mm Sieve	%	**100**		
Passing 4.75mm Sieve	%	**100**		
Passing 2.36mm Sieve	%	**100**		
Passing 1.18mm Sieve	%	**99**		
Passing 0.600mm Sieve	%	**97**		
Passing 0.425mm Sieve	%	**96**		
Passing 0.300mm Sieve	%	**95**		
Passing 0.150mm Sieve	%	**91**		
Passing 0.075mm Sieve	%	**87**		
Passing 0.0135mm Sieve	%			



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WB080 - Rev 32, 28/11/2023

Report on Material Quality

Client:	EP Risk	Report No:	**17-28-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 2 of 2
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 06/05/2024	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12425	**22/04/2024**	**TP18-L**	**-**	**-**	**0.20-0.50**

Plasticity	Units	Result	Specification Limits	Remarks
Liquid Limit	%	**64**		Oven Dried & Dry Sieved
Plastic Limit	%	**17**		Oven Dried & Dry Sieved
Plastic Index	%	**47**		Oven Dried & Dry Sieved
Linear Shrinkage	%	**16.0**		

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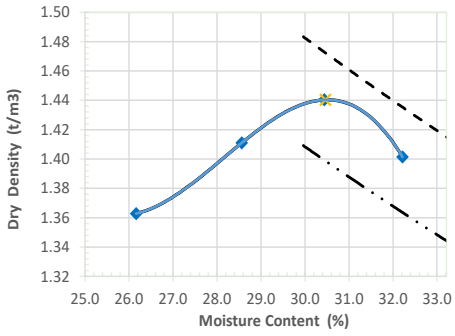
Report on AS CBR and MDD

Client:	EP Risk	Report No:	**17-30-CBR**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	15/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used(Source):	-	Test Request/Order:	**EP3627**
Material Description:	Refer to logs	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 29/04/2024 to 15/05/2024	Control Line:	-

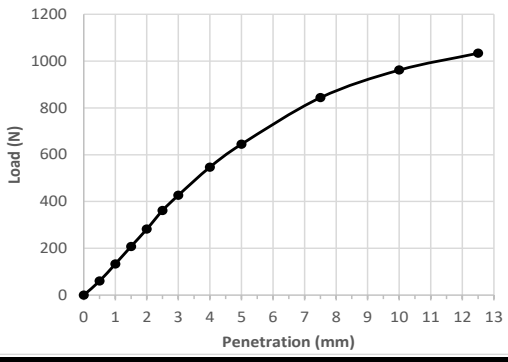
Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12427	**22/04/2024**	**TP20-P**	**-**	**-**	**0.30-0.80**

Parameters	Units	Test Results		Information
Pretreatment Regime	--	No Pretreatment		
Portion Retained on AS Sieve	%	0% on 19mm		Retained material excluded from CBR
Material Plasticity (Liquid Limit)	--	High (More than 50%)		By Technician's Assessment
Sample Curing Time	hrs	MDD = 96 hrs	CBR = 111 hrs	
Soil Particle Density	t/m3	2.67		Estimated value only**
Maximum Dry Density (MDD)	t/m3	1.44		Standard compactive effort
Optimum Moisture Content (OMC)	%	30.5		
Field Moisture Content	%	Field 30.1 %		Passing 19.0mm portion
Compaction Moisture Content	%	Achieved 30.1 %	LMR = 98.5%	Specified LMR = 100%
Compaction Dry Density	t/m3	Achieved 1.45 t/m3	LDR = 100.5%	Specified LDR = 100%
Surcharge Load	kg	4.5		
Period of Soaking	Days	Soaked - 4 Days		Dry Density (after soaking) = 1.42 t/m3.
Specimen Swell	%	1.5		
Moisture Content - Top 30mm	%	34.7		After Penetration
Moisture Content - Remaining	%	31.0		After Penetration

Dry Density Vs Moisture Content



Load-Penetration Curve



Material CBR Value (%)

3.5

California Bearing Ratios

CBR $_{2.5}$ = 2.5

CBR $_{5.0}$ = 3.5

Including an Applied Correction of 0.0 mm

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS1289.2.1.1: (2005) Moisture Content of a Soil (Oven Drying)
AS1289.5.1.1: (2017)Dry Density/Moisture content relation of a soil (Standard)
AS1289.6.1.1: (2014)California Bearing Ratio of a soil (remoulded specimen)

** **NATA accreditation does not cover the performance of this service**

Report Remarks & Endorsement

NATA

Accredited for compliance with ISO/IEC 17025 - Testing.
Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

Issued By: J.Edmunds
Approved Signatory

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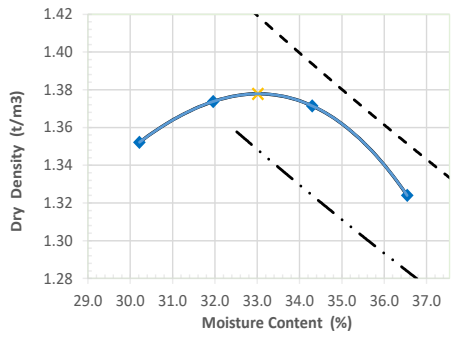
Report on AS CBR and MDD

Client:	EP Risk	Report No:	**17-32-CBR**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	15/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used(Source):	-	Test Request/Order:	**EP3627**
Material Description:	Refer to logs	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 29/04/2024 to 15/05/2024	Control Line:	-

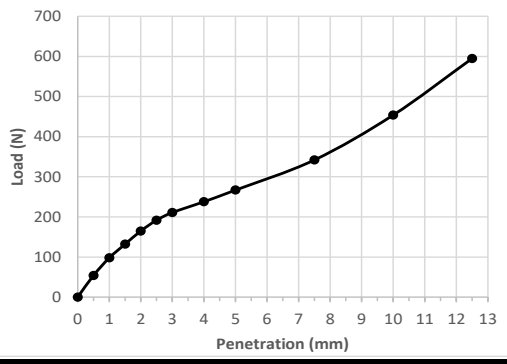
Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12429	**22/04/2024**	**TP24-P**	**-**	**-**	**0.50-1.00**

Parameters	Units	Test Results		Information
Pretreatment Regime	--	No Pretreatment		
Portion Retained on AS Sieve	%	0% on 19mm		Retained material excluded from CBR
Material Plasticity (Liquid Limit)	--	High (More than 50%)		By Technician's Assessment
Sample Curing Time	hrs	MDD = 96 hrs	CBR = 163 hrs	
Soil Particle Density	t/m3	2.67		Estimated value only**
Maximum Dry Density (MDD)	t/m3	1.38		Standard compactive effort
Optimum Moisture Content (OMC)	%	33.0		
Field Moisture Content	%	Field 33.2 %		Passing 19.0mm portion
Compaction Moisture Content	%	Achieved 33.4 %	LMR = 101.0%	Specified LMR = 100%
Compaction Dry Density	t/m3	Achieved 1.37 t/m3	LDR = 99.5%	Specified LDR = 100%
Surcharge Load	kg	4.5		
Period of Soaking	Days	Soaked - 4 Days		Dry Density (after soaking) = 1.33 t/m3.
Specimen Swell	%	3.0		
Moisture Content - Top 30mm	%	39.3		After Penetration
Moisture Content - Remaining	%	35.4		After Penetration

Dry Density Vs Moisture Content



Load-Penetration Curve



Material CBR Value (%)

1.5

California Bearing Ratios

CBR $_{2.5}$ = 1.5

CBR $_{5.0}$ = 1.5

Including an Applied Correction of 0.0 mm

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS1289.2.1.1: (2005) Moisture Content of a Soil (Oven Drying)
AS1289.5.1.1: (2017)Dry Density/Moisture content relation of a soil (Standard)
AS1289.6.1.1: (2014)California Bearing Ratio of a soil (remoulded specimen)

**** NATA accreditation does not cover the performance of this service**

Report Remarks & Endorsement

Accredited for compliance with ISO/IEC 17025 - Testing.
Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

Issued By: J.Edmunds
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WB080 - Rev 32, 28/11/2023

Report on Material Quality

Client:	EP Risk	Report No:	**17-33-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 1 of 2
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 07/05/2024	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12430	**22/04/2024**	**TP25-P**	**-**	**-**	**1.50-2.50**

Sampling & Test Methods (Results relate only to the items sampled/tested) **(** NATA accreditation does not cover the performance of this service)**

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS 1289.3.6.1 Coarse: (2009)Particle size distribution of a soil
AS 1289.3.6.1 Fine: (2009)Particle size distribution of a soil
AS 1289.3.1.1: (2009)Determination of Liquid Limit (4 point Casagrande)
AS 1289.3.2.1: (2009) Determination of the Plastic Limit

Report Remarks & Endorsement

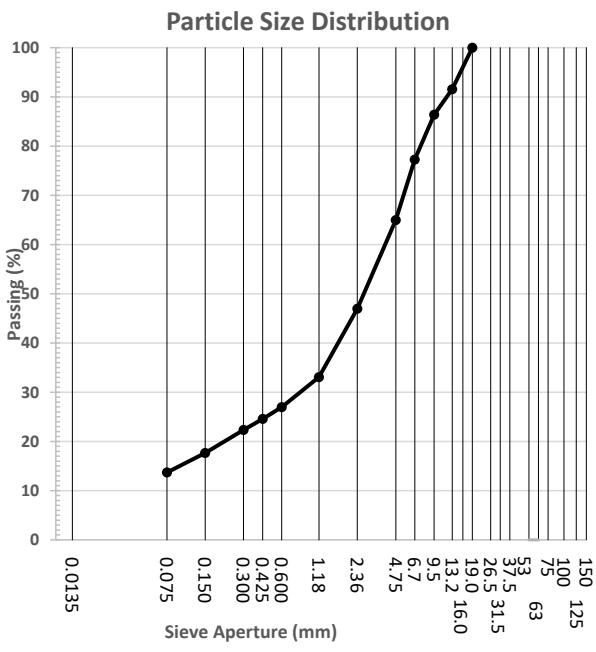
NATA

Accredited for compliance with ISO/IEC 17025 - Testing.

Issued By: J.Edmunds
Approved Signatory

Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

Specification Name				
Particle Size Distribution (WASHED)	Units	**Result**	**Specification Limits**	**Graphical Representation**
Passing 150mm Sieve	%			
Passing 125mm Sieve	%			
Passing 100mm Sieve	%			
Passing 75.0mm Sieve	%			
Passing 63.0mm Sieve	%			
Passing 53.0mm Sieve	%			
Passing 37.5mm Sieve	%			
Passing 31.5mm Sieve	%			
Passing 26.5mm Sieve	%			
Passing 19.0mm Sieve	%	**100**		
Passing 16.0mm Sieve	%			
Passing 13.2mm Sieve	%	**92**		
Passing 9.5mm Sieve	%	**86**		
Passing 6.7mm Sieve	%	**77**		
Passing 4.75mm Sieve	%	**65**		
Passing 2.36mm Sieve	%	**47**		
Passing 1.18mm Sieve	%	**33**		
Passing 0.600mm Sieve	%	**27**		
Passing 0.425mm Sieve	%	**25**		
Passing 0.300mm Sieve	%	**22**		
Passing 0.150mm Sieve	%	**18**		
Passing 0.075mm Sieve	%	**14**		
Passing 0.0135mm Sieve	%			



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WB080 - Rev 32, 28/11/2023

Report on Material Quality

Client:	EP Risk	Report No:	**17-33-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 2 of 2
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 07/05/2024	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12430	**22/04/2024**	**TP25-P**	**-**	**-**	**1.50-2.50**

Plasticity	Units	Result	Specification Limits	Remarks
Liquid Limit	%	**42**		Oven Dried & Dry Sieved
Plastic Limit	%	**17**		Oven Dried & Dry Sieved
Plastic Index	%	**25**		Oven Dried & Dry Sieved

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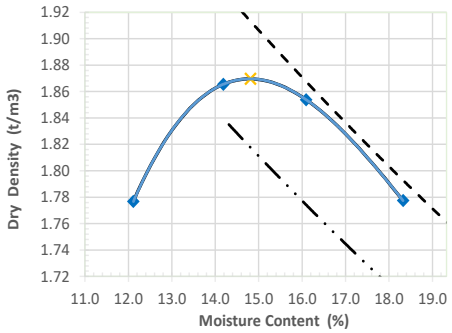
Report on AS CBR and MDD

Client:	EP Risk	Report No:	**17-35-CBR**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	15/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used(Source):	-	Test Request/Order:	**EP3627**
Material Description:	Refer to logs	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 15/05/2024	Control Line:	-

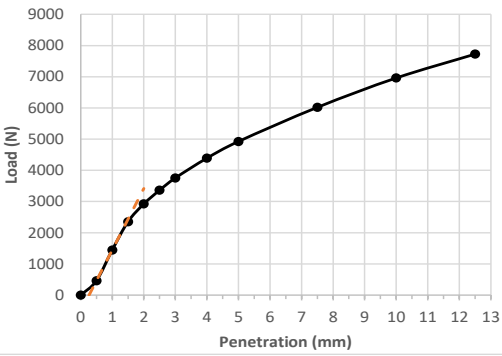
Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12432	**22/04/2024**	**TP29-P**	**-**	**-**	**1.50-2.00**

Parameters	Units	Test Results		Information
Pretreatment Regime	--	No Pretreatment		
Portion Retained on AS Sieve	%	1% on 19mm		Retained material excluded from CBR
Material Plasticity (Liquid Limit)	--	Low (Less than 35%)		By Technician's Assessment
Sample Curing Time	hrs	MDD = 26 hrs	CBR = 89 hrs	
Soil Particle Density	t/m3	2.67		Estimated value only**
Maximum Dry Density (MDD)	t/m3	1.87		Standard compactive effort
Optimum Moisture Content (OMC)	%	15.0		
Field Moisture Content	%	Field 12.5 %		Passing 19.0mm portion
Compaction Moisture Content	%	Achieved 14.6 %	LMR = 99.0%	Specified LMR = 100%
Compaction Dry Density	t/m3	Achieved 1.87 t/m3	LDR = 100.0%	Specified LDR = 100%
Surcharge Load	kg	4.5		
Period of Soaking	Days	Soaked - 4 Days		Dry Density (after soaking) = 1.87 t/m3.
Specimen Swell	%	0.5		
Moisture Content - Top 30mm	%	16.4		After Penetration
Moisture Content - Remaining	%	15.1		After Penetration

Dry Density Vs Moisture Content



Load-Penetration Curve



Material CBR Value (%)

25

California Bearing Ratios

CBR $_{2.5}$ = 25

CBR $_{5.0}$ = 25

Including an Applied Correction of 0.3 mm

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS1289.2.1.1: (2005) Moisture Content of a Soil (Oven Drying)
AS1289.5.1.1: (2017)Dry Density/Moisture content relation of a soil (Standard)
AS1289.6.1.1: (2014)California Bearing Ratio of a soil (remoulded specimen)

** **NATA accreditation does not cover the performance of this service**

Report Remarks & Endorsement

Accredited for compliance with ISO/IEC 17025 - Testing.
Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

Issued By: J.Edmunds
Approved Signatory

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WB080 - Rev 32, 28/11/2023

Report on Material Quality

Client:	EP Risk	Report No:	**17-38-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 1 of 2
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 06/05/2024	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12435	**22/04/2024**	**TP35-P**	**-**	**-**	**1.50-2.00**

Sampling & Test Methods (Results relate only to the items sampled/tested) **(** NATA accreditation does not cover the performance of this service)**

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.3.6.1 Coarse: (2009)Particle size distribution of a soil
AS 1289.3.1.1: (2009)Determination of Liquid Limit (4 point Casagrande)
AS 1289.3.3.1: (2009)Calculation of the Plastic Index of a soil
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS 1289.3.6.1 Fine: (2009)Particle size distribution of a soil
AS 1289.3.2.1: (2009) Determination of the Plastic Limit
AS 1289.3.4.1: (2008)Determination of the Linear Shrinkage of a soil

Report Remarks & Endorsement

NATA
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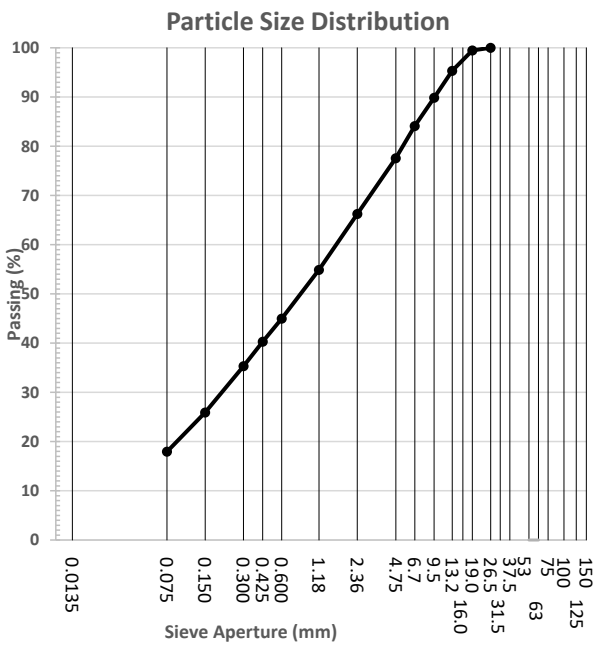
Issued By: J.Edmunds
Approved Signatory

Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

Specification Name				**Graphical Representation**
Particle Size Distribution (WASHED)	Units	**Result**	**Specification Limits**	
Passing 150mm Sieve	%			
Passing 125mm Sieve	%			
Passing 100mm Sieve	%			
Passing 75.0mm Sieve	%			
Passing 63.0mm Sieve	%			
Passing 53.0mm Sieve	%			
Passing 37.5mm Sieve	%			
Passing 31.5mm Sieve	%			
Passing 26.5mm Sieve	%	**100**		
Passing 19.0mm Sieve	%	**99**		
Passing 16.0mm Sieve	%			
Passing 13.2mm Sieve	%	**95**		
Passing 9.5mm Sieve	%	**90**		
Passing 6.7mm Sieve	%	**84**		
Passing 4.75mm Sieve	%	**78**		
Passing 2.36mm Sieve	%	**66**		
Passing 1.18mm Sieve	%	**55**		
Passing 0.600mm Sieve	%	**45**		
Passing 0.425mm Sieve	%	**40**		
Passing 0.300mm Sieve	%	**35**		
Passing 0.150mm Sieve	%	**26**		
Passing 0.075mm Sieve	%	**18**		
Passing 0.0135mm Sieve	%			



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WB080 - Rev 32, 28/11/2023

Report on Material Quality

Client:	EP Risk	Report No:	**17-38-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 2 of 2
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	
Lot Comments:		ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 06/05/2024	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12435	**22/04/2024**	**TP35-P**	**-**	**-**	**1.50-2.00**

Plasticity	Units	Result	Specification Limits	Remarks
Liquid Limit	%	**38**		Oven Dried & Dry Sieved
Plastic Limit	%	**20**		Oven Dried & Dry Sieved
Plastic Index	%	**18**		Oven Dried & Dry Sieved
Linear Shrinkage	%	**6.5**		

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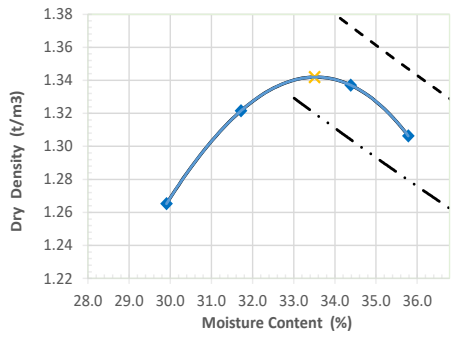
Report on AS CBR and MDD

Client:	EP Risk	Report No:	**17-39-CBR**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	15/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used(Source):	-	Test Request/Order:	**EP3627**
Material Description:	Refer to logs	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 30/04/2024 to 15/05/2024	Control Line:	-

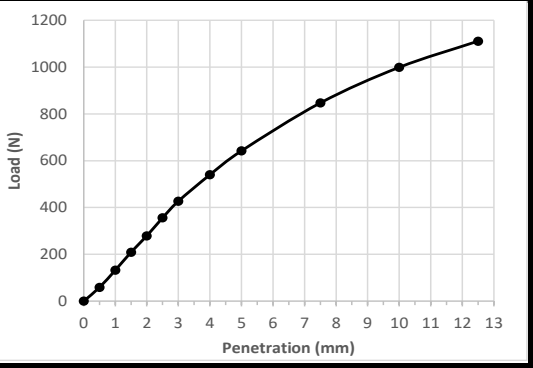
Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12436	**22/04/2024**	**TP37-P**	**-**	**-**	**1.70-2.50**

Parameters	Units	Test Results		Information
Pretreatment Regime	--	No Pretreatment		
Portion Retained on AS Sieve	%	8% on 19mm		Retained material excluded from CBR
Material Plasticity (Liquid Limit)	--	High (More than 50%)		By Technician's Assessment
Sample Curing Time	hrs	MDD = 96 hrs	CBR = 140 hrs	
Soil Particle Density	t/m3	2.60		Estimated value only**
Maximum Dry Density (MDD)	t/m3	1.34		Standard compactive effort
Optimum Moisture Content (OMC)	%	33.5		
Field Moisture Content	%	Field 31.8 %		Passing 19.0mm portion
Compaction Moisture Content	%	Achieved 33.3 %	LMR = 99.5%	Specified LMR = 100%
Compaction Dry Density	t/m3	Achieved 1.34 t/m3	LDR = 100.0%	Specified LDR = 100%
Surcharge Load	kg	4.5		
Period of Soaking	Days	Soaked - 4 Days		Dry Density (after soaking) = 1.32 t/m3.
Specimen Swell	%	1.5		
Moisture Content - Top 30mm	%	38.5		After Penetration
Moisture Content - Remaining	%	34.8		After Penetration

Dry Density Vs Moisture Content



Load-Penetration Curve



Material CBR Value (%)

3.0

California Bearing Ratios

CBR $_{2.5}$ = 2.5

CBR $_{5.0}$ = 3.0

Including an Applied Correction of 0.0 mm

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS1289.2.1.1: (2005) Moisture Content of a Soil (Oven Drying)
AS1289.5.1.1: (2017)Dry Density/Moisture content relation of a soil (Standard)
AS1289.6.1.1: (2014)California Bearing Ratio of a soil (remoulded specimen)

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Report Remarks & Endorsement

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Lab Site Number: 25677
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Base Lab Name: ASCT Illawarra

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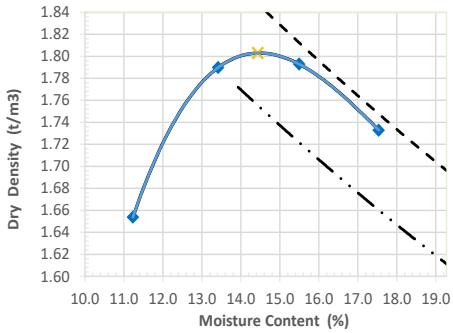
Report on AS CBR and MDD

Client:	EP Risk	Report No:	**17-40-CBR**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used(Source):	-	Test Request/Order:	**EP3627**
Material Description:	Refer to logs	Lot Number:	-
Lot Boundaries:	-	ITP/PCP Number:	-
Lab Test Date/s:	Laboratory testing 02/05/2024 to 14/05/2024	Control Line:	-

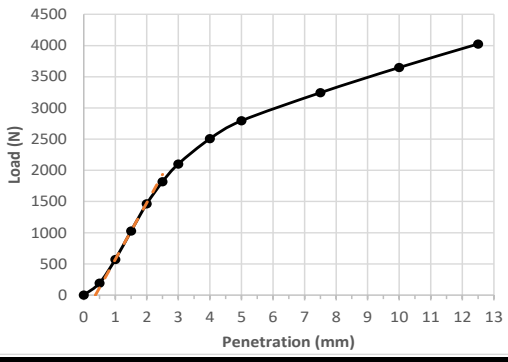
Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12437	**22/04/2024**	**TP38-P**	**-**	**-**	**1.00-1.75**

Parameters	Units	Test Results		Information
Pretreatment Regime	--	No Pretreatment		
Portion Retained on AS Sieve	%	12% on 19mm		Retained material excluded from CBR
Material Plasticity (Liquid Limit)	--	Low (Less than 35%)		By Technician's Assessment
Sample Curing Time	hrs	MDD = 24 hrs	CBR = 39 hrs	
Soil Particle Density	t/m3	2.52		Estimated value only**
Maximum Dry Density (MDD)	t/m3	1.80		Standard compactive effort
Optimum Moisture Content (OMC)	%	14.5		
Field Moisture Content	%	Field 12.5 %		Passing 19.0mm portion
Compaction Moisture Content	%	Achieved 14.4 %	LMR = 99.5%	Specified LMR = 100%
Compaction Dry Density	t/m3	Achieved 1.81 t/m3	LDR = 100.5%	Specified LDR = 100%
Surcharge Load	kg	4.5		
Period of Soaking	Days	Soaked - 4 Days		Dry Density (after soaking) = 1.80 t/m3.
Specimen Swell	%	0.5		
Moisture Content - Top 30mm	%	16.9		After Penetration
Moisture Content - Remaining	%	15.7		After Penetration

Dry Density Vs Moisture Content



Load-Penetration Curve



Material CBR Value (%)

15

California Bearing Ratios

CBR $_{2.5}$ = 15

CBR $_{5.0}$ = 14

Including an Applied Correction of 0.4 mm

Sampling & Test Methods (Results relate only to the items sampled/tested)

Sampled by Customer: Results apply to the sample/s as received. **
AS 1289.1.1: (2001)Preparation of disturbed soil samples
AS1289.2.1.1: (2005) Moisture Content of a Soil (Oven Drying)
AS1289.5.1.1: (2017)Dry Density/Moisture content relation of a soil (Standard)
AS1289.6.1.1: (2014)California Bearing Ratio of a soil (remoulded specimen)

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Report Remarks & Endorsement

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Base Lab Name: ASCT Illawarra

Issued By: J.Edmunds
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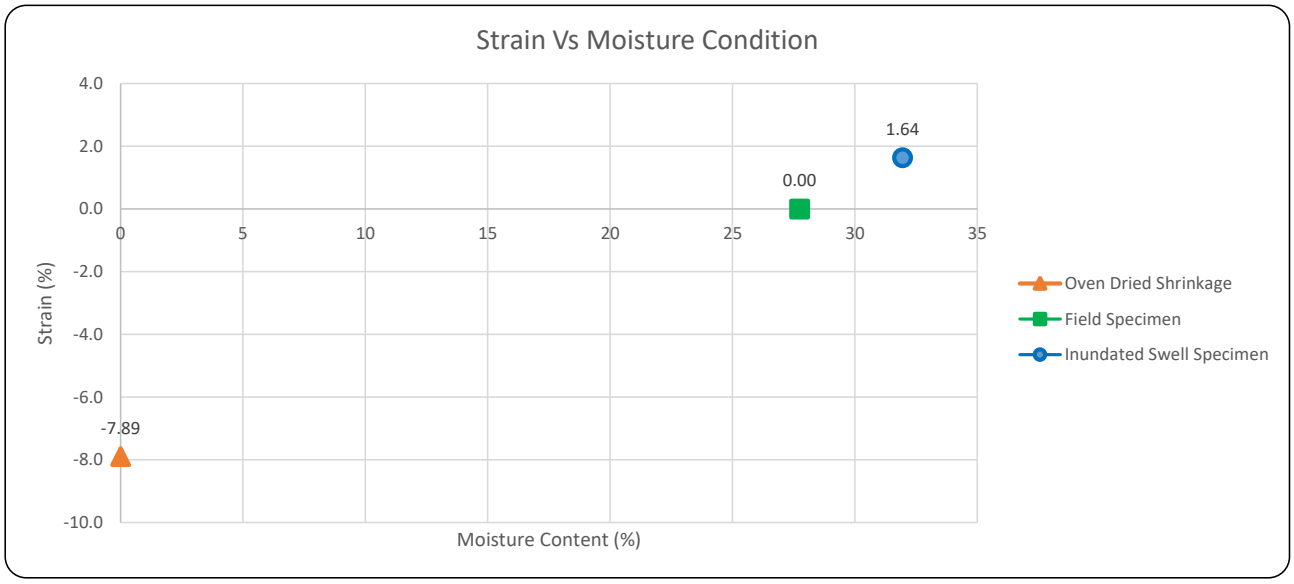
Report on Shrink / Swell Index of a Soil

Client:	EP Risk	Report No:	**17-21-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Test Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	-
Lab Test Date/s:	Testing commenced 03/05/2024 and was completed 09/05/2024.	ITP/PCP Number:	-
Lot Comments:	-	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12418	**22/04/2024**	**TP01-L**	**-**	**-**	**0.70-1.20**

Parameters	Units	Test Results	Soil Description
Shrinkage - Field Moisture Content	%	26.0	CLAY
Swell - Field Moisture Content	%	29.5	
Swell - Inundated Moisture Content	%	31.9	
Inert Inclusions in the soil	%	0	
Extent of Soil Crumbling	-	None	
Extent of Soil Cracking	-	Minor	
Shrink-Swell Index	**%**	**4.8**	



Sampling & Test Methods (Results relate only to the items sampled/tested)	Report Remarks & Endorsement
Sampled by Customer: Results apply to the sample/s as received. ** AS 1289.7.1.1: (2003) Shrink Swell Index of a Soil	

Accredited for compliance with ISO/IEC 17025 - Testing.

Issued By: J.Edmunds
Approved Signatory

Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

(NATA accreditation does not cover the performance of this service)**

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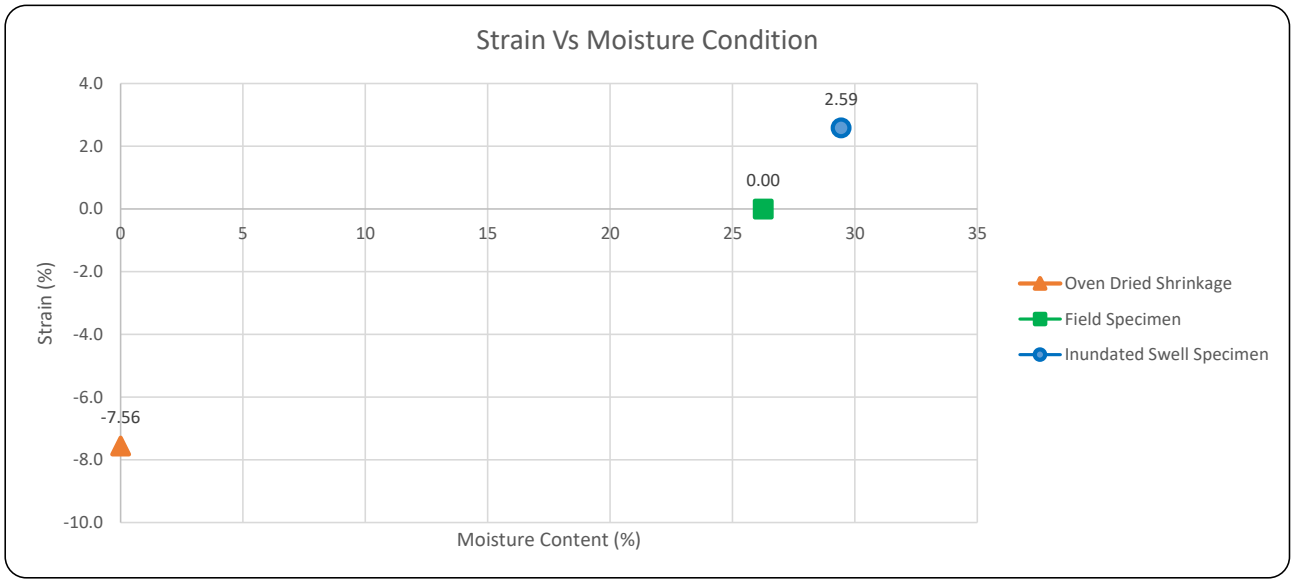
Report on Shrink / Swell Index of a Soil

Client:	EP Risk	Report No:	**17-29-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Test Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	-
Lab Test Date/s:	Testing commenced 03/05/2024 and was completed 09/05/2024.	ITP/PCP Number:	-
Lot Comments:	-	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12426	**22/04/2024**	**TP19-L**	**-**	**-**	**0.30-0.80**

Parameters	Units	Test Results	Soil Description
Shrinkage - Field Moisture Content	%	27.1	CLAY
Swell - Field Moisture Content	%	25.4	
Swell - Inundated Moisture Content	%	29.4	
Inert Inclusions in the soil	%	0	
Extent of Soil Crumbling	-	None	
Extent of Soil Cracking	-	Minor	
Shrink-Swell Index	**%**	**4.9**	



Sampling & Test Methods (Results relate only to the items sampled/tested)	Report Remarks & Endorsement
Sampled by Customer: Results apply to the sample/s as received. ** AS 1289.7.1.1: (2003) Shrink Swell Index of a Soil	

Accredited for compliance with ISO/IEC 17025 - Testing.

Issued By: J.Edmunds
Approved Signatory

Lab Site Number: 25677
Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

(NATA accreditation does not cover the performance of this service)**

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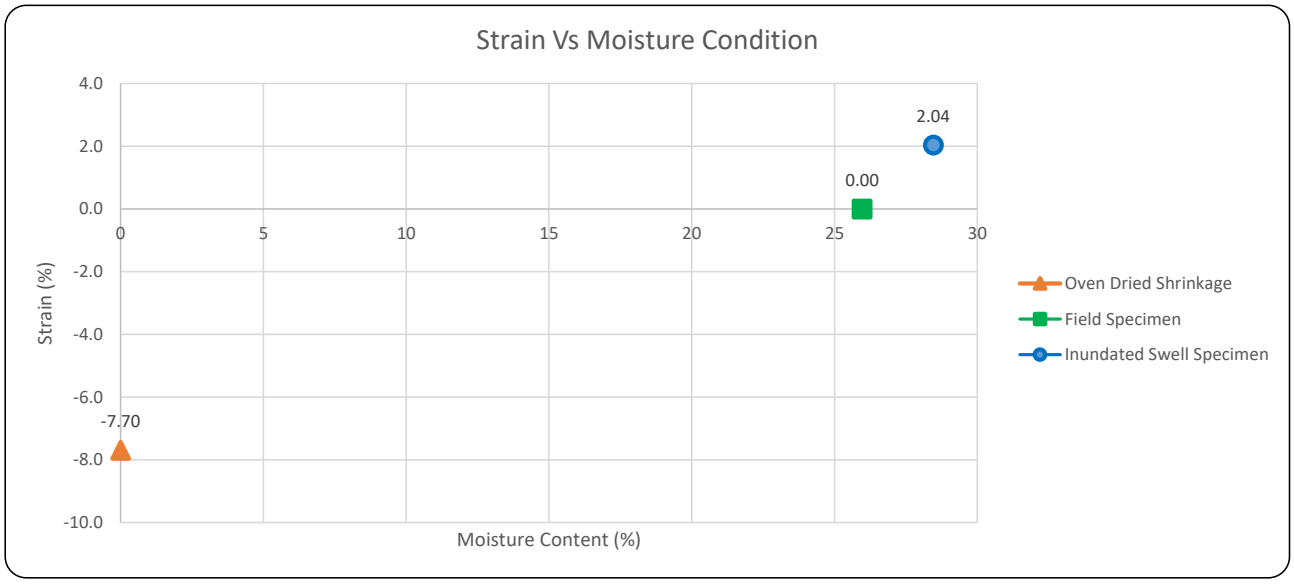
Report on Shrink / Swell Index of a Soil

Client:	EP Risk	Report No:	**17-31-MQ**
Client Address:	3/19 Bolton Street, Newcastle NSW 2300	Report Date:	14/05/2024
Project:	Material Testing	Report Page:	Page 1 of 1
Works Component:	Thirdi Gorforth Anambah Road	Project No:	17
Material Used:	-	Test Request/Order:	EP3627
Material Description:	Refer to logs	Lot Number:	-
Lab Test Date/s:	Testing commenced 03/05/2024 and was completed 09/05/2024.	ITP/PCP Number:	-
Lot Comments:	-	Control Line:	-

Sample Number	Sample Date	Chainage/Location	Offset	Level of Test	Test Depth
12428	**22/04/2024**	**TP23-L**	**-**	**-**	**0.3-0.80**

Parameters	Units	Test Results	Soil Description
Shrinkage - Field Moisture Content	%	26.8	CLAY
Swell - Field Moisture Content	%	25.1	
Swell - Inundated Moisture Content	%	28.5	
Inert Inclusions in the soil	%	0	
Extent of Soil Crumbling	-	None	
Extent of Soil Cracking	-	Minor	
Shrink-Swell Index	**%**	**4.8**	



Sampling & Test Methods (Results relate only to the items sampled/tested)	Report Remarks & Endorsement
Sampled by Customer: Results apply to the sample/s as received. ** AS 1289.7.1.1: (2003) Shrink Swell Index of a Soil	

Accredited for compliance with ISO/IEC 17025 - Testing.

Issued By: J.Edmunds
Approved Signatory

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Base Lab Accreditation: 20656
Base Lab Name: ASCT Illawarra

(NATA accreditation does not cover the performance of this service)**

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Report on the Point Load Strength of Rock

Client:	ASCT Newcastle	Sample No:	**23581**
Client Address:	13/31 Riverside Drive, Mayfield West, NSW 2304	Report No:	**160A-PL**
Project:	Geotechnical Testing	Report Date:	9/05/2024
Component:	EP Risk - Thirdi Gorforth Anambah Road	Project No:	344
Material Type:	TP05-P - 2.50-3.00	Test Request:	EP3627
Material Origin (Source):	Unknown	ITP/PCP:	-
Rock Body Sampled:	A sample of rock was submitted to this laboratory, by others.	Lot Number:	TP05-P - 2.50-3.00
		Date Tested:	7/05/2024
Sampling Method:	Sampled By Client	Test Method Used:	AS 4133.4.1
	The NATA endorsement does not include the performance of sampling.	Report Page:	1 of 1

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**1**	**2**	**3**	**4**	**5**
Lithological Description:			Sedimentary	Sedimentary	Sedimentary	Sedimentary	Sedimentary
Moisture Condition at Test:			Moist	Moist	Moist	Moist	Moist
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	Lump	Lump	Lump	Lump
Anisotropic Direction (Note 1):							
Depth / Diameter:	D	(mm)	63.0	58.5	68.5	81.5	64.0
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	93.5	83.5	88.0	87.0	80.0
Uncorrected Point Load Strength:	I_S	(MPa)	0.22	0.19	0.19	0.15	0.25
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.28**	**0.23**	**0.24**	**0.2**	**0.31**
Failure Mode (Note 2):			3	3	3	3	3
Descriptive Strength (Note 3):			Low	Low	Low	Low	Medium

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**6**	**-**	**-**	**-**	**-**
Lithological Description:			Sedimentary	-	-	-	-
Moisture Condition at Test:			Moist	-	-	-	-
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	-	-	-	-
Anisotropic Direction (Note 1):				**-**	**-**	**-**	**-**
Depth / Diameter:	D	(mm)	59.5	-	-	-	-
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	88.0	-	-	-	-
Uncorrected Point Load Strength:	I_S	(MPa)	0.26	-	-	-	-
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.32**	**-**	**-**	**-**	**-**
Failure Mode (Note 2):			3	-	-	-	-
Descriptive Strength (Note 3):			Medium	-	-	-	-

Mean Point Load Strength Index (MPa)

0.3

Mean value calculated in accordance with AS 4133.4.1, Clause 3.2 (a).The value is provided as information only, and is not included in the NATA endorsement.

Note 1 - Anisotropic Direction

--	Anisotropic testing not required/requested.
Parallel	Load applied parallel to banding/foliation.
Normal	Load applied at 90° to the banding/foliation.

Note 3 - Descriptive Strength

The strength descriptors used are drawn from T223 (section 6).They are provided as information only, and are not included in the NATA endorsement.

Note 2 - Failure Mode

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by **J**oint Plane.
4M	Fracture influenced by **M**icro-fracture.
4F	Fracture influenced by **F**oliation.
4V	Fracture influenced by **V**ein.
5	Invalid Result (Partial fracture, or chip).

Report Remarks / Comments:

Laboratory testing commenced on the 07/05/2024

Accredited for compliance with ISO/IEC 17025 - Testing. The results relate only to the items

NATA Accreditation number: 20656

Approved By: P.Baltoski
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Report on the Point Load Strength of Rock

Client:	ASCT Newcastle	Sample No:	**23581**
Client Address:	13/31 Riverside Drive, Mayfield West, NSW 2304	Report No:	**160PL**
Project:	Geotechnical Testing	Report Date:	9/05/2024
Component:	EP Risk - Thirdi Gorforth Anambah Road	Project No:	344
Material Type:	TP05-P - 2.50-3.00	Test Request:	EP3627
Material Origin (Source):	Unknown	ITP/PCP:	-
Rock Body Sampled:	A sample of rock was submitted to this laboratory, by others.	Lot Number:	TP05-P - 2.50-3.00
		Date Tested:	7/05/2024
Sampling Method:	Sampled By Client	Test Method Used:	AS 4133.4.1
	The NATA endorsement does not include the performance of sampling.	Report Page:	1 of 1

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**1**	**2**	**3**	**4**	**5**
Lithological Description:			Sedimentary	Sedimentary	Sedimentary	Sedimentary	Sedimentary
Moisture Condition at Test:			Moist	Moist	Moist	Moist	Moist
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	Lump	Lump	Lump	Lump
Anisotropic Direction (Note 1):							
Depth / Diameter:	D	(mm)	51.0	68.0	47.5	37.5	61.0
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	55.0	111.0	78.5	64.5	85.0
Uncorrected Point Load Strength:	I_S	(MPa)	0.29	0.24	0.23	0.42	0.24
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.32**	**0.32**	**0.26**	**0.44**	**0.3**
Failure Mode (Note 2):			3	3	3	3	3
Descriptive Strength (Note 3):			Medium	Medium	Low	Medium	Low

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**6**	**-**	**-**	**-**	**-**
Lithological Description:			Sedimentary	-	-	-	-
Moisture Condition at Test:			Moist	-	-	-	-
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	-	-	-	-
Anisotropic Direction (Note 1):				**-**	**-**	**-**	**-**
Depth / Diameter:	D	(mm)	61.5	-	-	-	-
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	77.5	-	-	-	-
Uncorrected Point Load Strength:	I_S	(MPa)	0.23	-	-	-	-
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.28**	**-**	**-**	**-**	**-**
Failure Mode (Note 2):			3	-	-	-	-
Descriptive Strength (Note 3):			Low	-	-	-	-

Mean Point Load Strength Index (MPa)

0.3

Mean value calculated in accordance with AS 4133.4.1, Clause 3.2 (a).The value is provided as information only, and is not included in the NATA endorsement.

Note 1 - Anisotropic Direction

--	Anisotropic testing not required/requested.
Parallel	Load applied parallel to banding/foliation.
Normal	Load applied at 90° to the banding/foliation.

Note 3 - Descriptive Strength

The strength descriptors used are drawn from T223 (section 6).They are provided as information only, and are not included in the NATA endorsement.

Note 2 - Failure Mode

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by **J**oint Plane.
4M	Fracture influenced by **M**icro-fracture.
4F	Fracture influenced by **F**oliation.
4V	Fracture influenced by **V**ein.
5	Invalid Result (Partial fracture, or chip).

Report Remarks / Comments:

Laboratory testing commenced on the 07/05/2024

Accredited for compliance with ISO/IEC 17025 - Testing. The results relate only to the items

NATA Accreditation number: 20656

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Report on the Point Load Strength of Rock

Client:	ASCT Newcastle	Sample No:	**23582**
Client Address:	13/31 Riverside Drive, Mayfield West, NSW 2304	Report No:	**161A-PL**
Project:	Geotechnical Testing	Report Date:	9/05/2024
Component:	EP Risk - Thirdi Gorforth Anambah Road	Project No:	344
Material Type:	TP28-P - 1.00-1.30	Test Request:	EP3627
Material Origin (Source):	Unknown	ITP/PCP:	-
Rock Body Sampled:	A sample of rock was submitted to this laboratory, by others.	Lot Number:	TP28-P - 1.00-1.30
		Date Tested:	8/05/2024
Sampling Method:	Sampled By Client	Test Method Used:	AS 4133.4.1
	The NATA endorsement does not include the performance of sampling.	Report Page:	1 of 1

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**1**	**2**	**3**	**4**	**5**
Lithological Description:			Sedimentary	Sedimentary	Sedimentary	Sedimentary	Sedimentary
Moisture Condition at Test:			Moist	Moist	Moist	Moist	Moist
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	Lump	Lump	Lump	Lump
Anisotropic Direction (Note 1):							
Depth / Diameter:	D	(mm)	49.0	84.0	58.5	57.0	48.0
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	70.0	84.5	91.0	86.5	70.5
Uncorrected Point Load Strength:	I_S	(MPa)	0.066	0.2	0.38	0.16	0.61
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.075**	**0.27**	**0.48**	**0.2**	**0.69**
Failure Mode (Note 2):			3	3	3	3	3
Descriptive Strength (Note 3):			Very Low	Low	Medium	Low	Medium

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**6**	**-**	**-**	**-**	**-**
Lithological Description:			Sedimentary	-	-	-	-
Moisture Condition at Test:			Moist	-	-	-	-
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	-	-	-	-
Anisotropic Direction (Note 1):				**-**	**-**	**-**	**-**
Depth / Diameter:	D	(mm)	48.5	-	-	-	-
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	70.0	-	-	-	-
Uncorrected Point Load Strength:	I_S	(MPa)	0.51	-	-	-	-
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.58**	**-**	**-**	**-**	**-**
Failure Mode (Note 2):			3	-	-	-	-
Descriptive Strength (Note 3):			Medium	-	-	-	-

Mean Point Load Strength Index (MPa)

0.4

Mean value calculated in accordance with AS 4133.4.1, Clause 3.2 (a).The value is provided as information only, and is not included in the NATA endorsement.

Note 1 - Anisotropic Direction

--	Anisotropic testing not required/requested.
Parallel	Load applied parallel to banding/foliation.
Normal	Load applied at 90° to the banding/foliation.

Note 3 - Descriptive Strength

The strength descriptors used are drawn from T223 (section 6).They are provided as information only, and are not included in the NATA endorsement.

Note 2 - Failure Mode

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by **J**oint Plane.
4M	Fracture influenced by **M**icro-fracture.
4F	Fracture influenced by **F**oliation.
4V	Fracture influenced by **V**ein.
5	Invalid Result (Partial fracture, or chip).

Report Remarks / Comments:

Laboratory testing commenced on the 08/05/2024

Accredited for compliance with ISO/IEC 17025 - Testing. The results relate only to the items

NATA Accreditation number: 20656

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Report on the Point Load Strength of Rock

Client:	ASCT Newcastle	Sample No:	**23582**
Client Address:	13/31 Riverside Drive, Mayfield West, NSW 2304	Report No:	**161PL**
Project:	Geotechnical Testing	Report Date:	9/05/2024
Component:	EP Risk - Thirdi Gorforth Anambah Road	Project No:	344
Material Type:	TP28-P - 1.00-1.30	Test Request:	EP3627
Material Origin (Source):	Unknown	ITP/PCP:	-
Rock Body Sampled:	A sample of rock was submitted to this laboratory, by others.	Lot Number:	TP28-P - 1.00-1.30
		Date Tested:	8/05/2024
Sampling Method:	Sampled By Client	Test Method Used:	AS 4133.4.1
	The NATA endorsement does not include the performance of sampling.	Report Page:	1 of 1

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**1**	**2**	**3**	**4**	**5**
Lithological Description:			Sedimentary	Sedimentary	Sedimentary	Sedimentary	Sedimentary
Moisture Condition at Test:			Moist	Moist	Moist	Moist	Moist
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	Lump	Lump	Lump	Lump
Anisotropic Direction (Note 1):							
Depth / Diameter:	D	(mm)	52.5	61.5	72.5	80.0	65.0
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	92.5	67.0	80.5	87.0	77.5
Uncorrected Point Load Strength:	I_S	(MPa)	0.61	0.88	0.67	0.63	0.24
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.75**	**1**	**0.86**	**0.83**	**0.3**
Failure Mode (Note 2):			3	3	3	3	3
Descriptive Strength (Note 3):			Medium	High	Medium	Medium	Medium

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**6**	**-**	**-**	**-**	**-**
Lithological Description:			Sedimentary	-	-	-	-
Moisture Condition at Test:			Moist	-	-	-	-
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	-	-	-	-
Anisotropic Direction (Note 1):				**-**	**-**	**-**	**-**
Depth / Diameter:	D	(mm)	64.0	-	-	-	-
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	102.0	-	-	-	-
Uncorrected Point Load Strength:	I_S	(MPa)	0.64	-	-	-	-
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.84**	**-**	**-**	**-**	**-**
Failure Mode (Note 2):			3	-	-	-	-
Descriptive Strength (Note 3):			Medium	-	-	-	-

Mean Point Load Strength Index (MPa)

0.8

Mean value calculated in accordance with AS 4133.4.1, Clause 3.2 (a).The value is provided as information only, and is not included in the NATA endorsement.

Note 1 - Anisotropic Direction

--	Anisotropic testing not required/requested.
Parallel	Load applied parallel to banding/foliation.
Normal	Load applied at 90° to the banding/foliation.

Note 3 - Descriptive Strength

The strength descriptors used are drawn from T223 (section 6).They are provided as information only, and are not included in the NATA endorsement.

Note 2 - Failure Mode

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by **J**oint Plane.
4M	Fracture influenced by **M**icro-fracture.
4F	Fracture influenced by **F**oliation.
4V	Fracture influenced by **V**ein.
5	Invalid Result (Partial fracture, or chip).

Report Remarks / Comments:

Laboratory testing commenced on the 08/05/2024

Accredited for compliance with ISO/IEC 17025 - Testing. The results relate only to the items

NATA Accreditation number: 20656

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Report on the Point Load Strength of Rock

Client:	ASCT Newcastle	Sample No:	**23583**
Client Address:	13/31 Riverside Drive, Mayfield West, NSW 2304	Report No:	**162A-PL**
Project:	Geotechnical Testing	Report Date:	9/05/2024
Component:	EP Risk - Thirdi Gorforth Anambah Road	Project No:	344
Material Type:	TP32-P - 0.50-1.20	Test Request:	EP3627
Material Origin (Source):	Unknown	ITP/PCP:	-
Rock Body Sampled:	A sample of rock was submitted to this laboratory, by others.	Lot Number:	TP32-P - 0.50-1.20
		Date Tested:	8/05/2024
Sampling Method:	Sampled By Client	Test Method Used:	AS 4133.4.1
	The NATA endorsement does not include the performance of sampling.	Report Page:	1 of 1

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**1**	**2**	**3**	**4**	**5**
Lithological Description:			Sedimentary	Sedimentary	Sedimentary	Sedimentary	Sedimentary
Moisture Condition at Test:			Moist	Moist	Moist	Moist	Moist
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	Lump	Lump	Lump	Lump
Anisotropic Direction (Note 1):							
Depth / Diameter:	D	(mm)	61.5	46.5	68.0	66.0	39.0
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	84.5	83.5	75.0	90.5	69.0
Uncorrected Point Load Strength:	I_S	(MPa)	0.42	0.24	0.14	0.17	0.74
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.52**	**0.28**	**0.17**	**0.22**	**0.8**
Failure Mode (Note 2):			3	3	3	3	3
Descriptive Strength (Note 3):			Medium	Low	Low	Low	Medium

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**6**	**-**	**-**	**-**	**-**
Lithological Description:			Sedimentary	-	-	-	-
Moisture Condition at Test:			Moist	-	-	-	-
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	-	-	-	-
Anisotropic Direction (Note 1):				**-**	**-**	**-**	**-**
Depth / Diameter:	D	(mm)	68.5	-	-	-	-
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	66.5	-	-	-	-
Uncorrected Point Load Strength:	I_S	(MPa)	0.3	-	-	-	-
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.36**	**-**	**-**	**-**	**-**
Failure Mode (Note 2):			3	-	-	-	-
Descriptive Strength (Note 3):			Medium	-	-	-	-

Mean Point Load Strength Index (MPa)

0.3

Mean value calculated in accordance with AS 4133.4.1, Clause 3.2 (a).The value is provided as information only, and is not included in the NATA endorsement.

Note 1 - Anisotropic Direction

--	Anisotropic testing not required/requested.
Parallel	Load applied parallel to banding/foliation.
Normal	Load applied at 90° to the banding/foliation.

Note 3 - Descriptive Strength

The strength descriptors used are drawn from T223 (section 6).They are provided as information only, and are not included in the NATA endorsement.

Note 2 - Failure Mode

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by **J**oint Plane.
4M	Fracture influenced by **M**icro-fracture.
4F	Fracture influenced by **F**oliation.
4V	Fracture influenced by **V**ein.
5	Invalid Result (Partial fracture, or chip).

Report Remarks / Comments:

Laboratory testing commenced on the 08/05/2024

Accredited for compliance with ISO/IEC 17025 - Testing. The results relate only to the items

NATA Accreditation number: 20656

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Report on the Point Load Strength of Rock

Client:	ASCT Newcastle	Sample No:	**23583**
Client Address:	13/31 Riverside Drive, Mayfield West, NSW 2304	Report No:	**162PL**
Project:	Geotechnical Testing	Report Date:	9/05/2024
Component:	EP Risk - Thirdi Gorforth Anambah Road	Project No:	344
Material Type:	TP32-P - 0.50-1.20	Test Request:	EP3627
Material Origin (Source):	Unknown	ITP/PCP:	-
Rock Body Sampled:	A sample of rock was submitted to this laboratory, by others.	Lot Number:	TP32-P - 0.50-1.20
		Date Tested:	8/05/2024
Sampling Method:	Sampled By Client	Test Method Used:	AS 4133.4.1
	The NATA endorsement does not include the performance of sampling.	Report Page:	1 of 1

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**1**	**2**	**3**	**4**	**5**
Lithological Description:			Sedimentary	Sedimentary	Sedimentary	Sedimentary	Sedimentary
Moisture Condition at Test:			Moist	Moist	Moist	Moist	Moist
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	Lump	Lump	Lump	Lump
Anisotropic Direction (Note 1):							
Depth / Diameter:	D	(mm)	53.0	61.5	62.0	65.5	67.0
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	78.0	84.0	88.5	85.0	85.0
Uncorrected Point Load Strength:	I_S	(MPa)	0.22	0.28	0.34	0.29	0.47
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.26**	**0.35**	**0.43**	**0.37**	**0.6**
Failure Mode (Note 2):			3	3	3	3	3
Descriptive Strength (Note 3):			Low	Medium	Medium	Medium	Medium

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**6**	**-**	**-**	**-**	**-**
Lithological Description:			Sedimentary	-	-	-	-
Moisture Condition at Test:			Moist	-	-	-	-
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	-	-	-	-
Anisotropic Direction (Note 1):				**-**	**-**	**-**	**-**
Depth / Diameter:	D	(mm)	59.0	-	-	-	-
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	76.5	-	-	-	-
Uncorrected Point Load Strength:	I_S	(MPa)	1.2	-	-	-	-
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**1.5**	**-**	**-**	**-**	**-**
Failure Mode (Note 2):			3	-	-	-	-
Descriptive Strength (Note 3):			High	-	-	-	-

Mean Point Load Strength Index (MPa)

0.4

Mean value calculated in accordance with AS 4133.4.1, Clause 3.2 (a).The value is provided as information only, and is not included in the NATA endorsement.

Note 1 - Anisotropic Direction

--	Anisotropic testing not required/requested.
Parallel	Load applied parallel to banding/foliation.
Normal	Load applied at 90° to the banding/foliation.

Note 3 - Descriptive Strength

The strength descriptors used are drawn from T223 (section 6).They are provided as information only, and are not included in the NATA endorsement.

Note 2 - Failure Mode

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by **J**oint Plane.
4M	Fracture influenced by **M**icro-fracture.
4F	Fracture influenced by **F**oliation.
4V	Fracture influenced by **V**ein.
5	Invalid Result (Partial fracture, or chip).

Report Remarks / Comments:

Laboratory testing commenced on the 08/05/2024

Accredited for compliance with ISO/IEC 17025 - Testing. The results relate only to the items

NATA Accreditation number: 20656

Approved By: P.Baltoski
Approved Signatory

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Report on the Point Load Strength of Rock

Client:	ASCT Newcastle	Sample No:	**23584**
Client Address:	13/31 Riverside Drive, Mayfield West, NSW 2304	Report No:	**163A-PL**
Project:	Geotechnical Testing	Report Date:	9/05/2024
Component:	EP Risk - Thirdi Gorforth Anambah Road	Project No:	344
Material Type:	TP33-P - 1.00-1.80	Test Request:	EP3627
Material Origin (Source):	Unknown	ITP/PCP:	-
Rock Body Sampled:	A sample of rock was submitted to this laboratory, by others.	Lot Number:	TP33-P - 1.00-1.80
		Date Tested:	9/05/2024
Sampling Method:	Sampled By Client	Test Method Used:	AS 4133.4.1
	The NATA endorsement does not include the performance of sampling.	Report Page:	1 of 1

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**1**	**2**	**3**	**4**	**5**
Lithological Description:			Sedimentary	Sedimentary	Sedimentary	Sedimentary	Sedimentary
Moisture Condition at Test:			Moist	Moist	Moist	Moist	Moist
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	Lump	Lump	Lump	Lump
Anisotropic Direction (Note 1):							
Depth / Diameter:	D	(mm)	81.0	62.0	44.0	53.0	50.5
Length:	L	(mm)	82.0	100.5	68.0	87.0	89.0
Width:	W	(mm)	53.5	70.0	49.5	77.0	90.0
Uncorrected Point Load Strength:	I_S	(MPa)	0.033	0.48	0.29	0.085	0.019
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.039**	**0.57**	**0.29**	**0.1**	**0.023**
Failure Mode (Note 2):			3	3	3	3	3
Descriptive Strength (Note 3):			Very Low	Medium	Low	Very Low	Extremeley Low

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**6**	-	-	-	-
Lithological Description:			Sedimentary	-	-	-	-
Moisture Condition at Test:			Moist	-	-	-	-
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	-	-	-	-
Anisotropic Direction (Note 1):				-	-	-	-
Depth / Diameter:	D	(mm)	54.0	-	-	-	-
Length:	L	(mm)	97.0	-	-	-	-
Width:	W	(mm)	69.5	-	-	-	-
Uncorrected Point Load Strength:	I_S	(MPa)	0.2	-	-	-	-
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.24**	-	-	-	-
Failure Mode (Note 2):			3	-	-	-	-
Descriptive Strength (Note 3):			Low	-	-	-	-

Mean Point Load Strength Index (MPa)

0.2

Mean value calculated in accordance with AS 4133.4.1, Clause 3.2 (a).The value is provided as information only, and is not included in the NATA endorsement.

Note 1 - Anisotropic Direction

--	Anisotropic testing not required/requested.
Parallel	Load applied parallel to banding/foliation.
Normal	Load applied at 90° to the banding/foliation.

Note 3 - Descriptive Strength

The strength descriptors used are drawn from T223 (section 6).They are provided as information only, and are not included in the NATA endorsement.

Note 2 - Failure Mode

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by **J**oint Plane.
4M	Fracture influenced by **M**icro-fracture.
4F	Fracture influenced by **F**oliation.
4V	Fracture influenced by **V**ein.
5	Invalid Result (Partial fracture, or chip).

Report Remarks / Comments:

Laboratory testing commenced on the 09/05/2024

Accredited for compliance with ISO/IEC 17025 - Testing. The results relate only to the items

NATA Accreditation number: 20656

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Report on the Point Load Strength of Rock

Client:	ASCT Newcastle	Sample No:	**23584**
Client Address:	13/31 Riverside Drive, Mayfield West, NSW 2304	Report No:	**163PL**
Project:	Geotechnical Testing	Report Date:	9/05/2024
Component:	EP Risk - Thirdi Gorforth Anambah Road	Project No:	344
Material Type:	TP33-P - 1.00-1.80	Test Request:	EP3627
Material Origin (Source):	Unknown	ITP/PCP:	-
Rock Body Sampled:	A sample of rock was submitted to this laboratory, by others.	Lot Number:	TP33-P - 1.00-1.80
		Date Tested:	9/05/2024
Sampling Method:	Sampled By Client	Test Method Used:	AS 4133.4.1
	The NATA endorsement does not include the performance of sampling.	Report Page:	1 of 1

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**1**	**2**	**3**	**4**	**5**
Lithological Description:			Sedimentary	Sedimentary	Sedimentary	Sedimentary	Sedimentary
Moisture Condition at Test:			Dry	Dry	Dry	Dry	Dry
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	Lump	Lump	Lump	Lump
Anisotropic Direction (Note 1):							
Depth / Diameter:	D	(mm)	50.5	50.5	63.0	48.5	47.5
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	69.0	73.0	73.5	68.5	60.0
Uncorrected Point Load Strength:	I_S	(MPa)	0.31	0.25	0.3	0.8	0.21
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.35**	**0.29**	**0.36**	**0.9**	**0.22**
Failure Mode (Note 2):			1	1	1	1	1
Descriptive Strength (Note 3):			Medium	Low	Medium	Medium	Low

Parameter	Symbol	Unit	Sample Information & Test Results				
Individual Rock Piece:			**6**	**-**	**-**	**-**	**-**
Lithological Description:			Sedimentary	-	-	-	-
Moisture Condition at Test:			Dry	-	-	-	-
Moisture Storage History:			Specimens were kept in a sealed air-tight container from the point of sampling (or receipt), until tested.				
Test Type:			Lump	-	-	-	-
Anisotropic Direction (Note 1):				**-**	**-**	**-**	**-**
Depth / Diameter:	D	(mm)	64.5	-	-	-	-
Length:	L	(mm)	-	-	-	-	-
Width:	W	(mm)	91.0	-	-	-	-
Uncorrected Point Load Strength:	I_S	(MPa)	0.13	-	-	-	-
Point Load Strength Index:	$I_{S(50)}$	**(MPa)**	**0.17**	**-**	**-**	**-**	**-**
Failure Mode (Note 2):			1	-	-	-	-
Descriptive Strength (Note 3):			Low	-	-	-	-

Mean Point Load Strength Index (MPa)

0.3

Mean value calculated in accordance with AS 4133.4.1, Clause 3.2 (a).The value is provided as information only, and is not included in the NATA endorsement.

Note 1 - Anisotropic Direction

--	Anisotropic testing not required/requested.
Parallel	Load applied parallel to banding/foliation.
Normal	Load applied at 90° to the banding/foliation.

Note 3 - Descriptive Strength

The strength descriptors used are drawn from T223 (section 6).They are provided as information only, and are not included in the NATA endorsement.

Note 2 - Failure Mode

1	Fracture through fabric, oblique to banding.
2	Fracture along banding.
3	Fracture through rock mass.
4J	Fracture influenced by **J**oint Plane.
4M	Fracture influenced by **M**icro-fracture.
4F	Fracture influenced by **F**oliation.
4V	Fracture influenced by **V**ein.
5	Invalid Result (Partial fracture, or chip).

Report Remarks / Comments:

Laboratory testing commenced on the 09/05/2024

Accredited for compliance with ISO/IEC 17025 - Testing. The results relate only to the items

NATA Accreditation number: 20656

Approved By: P.Baltoski
Approved Signatory

eurofins | Environment Testing

EP Risk Management (NSW)
80 Mount Street,
North Sydney
NSW 2060

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Ovidiu Pruteanu**

Report **1090775-S**
Project name GOSFORTH
Project ID EP3627
Received Date Apr 24, 2024

Client Sample ID			**TP11-L-2.8-3.0**	**TP36-L-2.8-3.0**	**TP40-P-2.8-3.0**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**N24-Ap0063563**	**N24-Ap0063564**	**N24-Ap0063565**
Date Sampled			**Apr 22, 2024**	**Apr 23, 2024**	**Apr 24, 2024**
Test/Reference	LOR	Unit			
Chloride	10	mg/kg	100	100	220
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	130	150	310
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	9.0	8.7	9.5
Resistivity*	0.5	ohm.m	75	68	32
Sulphate (as SO4)	10	mg/kg	< 25	< 25	< 25
Sample Properties					
% Moisture	1	%	7.4	8.6	10.0

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	Apr 30, 2024	28 Days
- Method: In-house method LTM-INO-4090 Chloride by Discrete Analyser			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Sydney	Apr 30, 2024	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25 °C as rec.)	Sydney	Apr 30, 2024	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Sulphate (as SO4)	Sydney	Apr 30, 2024	28 Days
- Method: In-house method LTM-INO-4110 Sulphate by Discrete Analyser			
% Moisture	Sydney	Apr 24, 2024	14 Days
- Method: LTM-GEN-7080 Moisture			

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Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	Site# 25079 & 25289

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Company Name: EP Risk Management (Newcastle)
Address: 80 Mount Street,
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NSW 2060

Project Name: GOSFORTH
Project ID: EP3627

Order No.: EP3627
Report #: 1090775
Phone: 02 99225021
Fax:

Received: Apr 24, 2024 2:05 PM
Due: May 2, 2024
Priority: 5 Day
Contact Name: Ovidiu Pruteanu

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	TP11-L-2.8-3.0	Apr 22, 2024		Soil	N24-Ap0063563	X	X
2	TP36-L-2.8-3.0	Apr 23, 2024		Soil	N24-Ap0063564	X	X
3	TP40-L-2.8-3.0	Apr 24, 2024		Soil	N24-Ap0063565	X	X
Test Counts						3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony Forming Unit	**Colour:** Pt-Co Units (CU)	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	uS/cm	< 10			10	Pass	
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
LCS - % Recovery							
Conductivity (1:5 aqueous extract at 25 °C as rec.)	%	98			70-130	Pass	
Resistivity*	%	98			70-130	Pass	
LCS - % Recovery							
Chloride	%	101			70-130	Pass	
Sulphate (as SO4)	%	102			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Chloride	R24-Ap0063424	NCP	%	103			70-130	Pass	
Sulphate (as SO4)	R24-Ap0063424	NCP	%	107			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	R24-Ap0063424	NCP	uS/cm	< 10	< 10	<1	30%	Pass	
pH (1:5 Aqueous extract at 25 °C as rec.)	S24-My0000098	NCP	pH Units	5.5	5.6	<1	30%	Pass	
Resistivity*	R24-Ap0063424	NCP	ohm.m	2000	2400	20	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	N24-Ap0063565	CP	mg/kg	220	230	1.8	30%	Pass	
Sulphate (as SO4)	N24-Ap0063565	CP	mg/kg	< 25	< 25	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Nileshni Goundar	Analytical Services Manager
Ryan Phillips	Senior Analyst-Inorganic

Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Company Name: EP Risk Management (Newcastle)
Address: 80 Mount Street,
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Project Name: GOSFORTH
Project ID: EP3627

Order No.: EP3627
Report #: 1090775
Phone: 02 99225021
Fax:

Received: Apr 24, 2024 2:05 PM
Due: May 2, 2024
Priority: 5 Day
Contact Name: Ovidiu Pruteanu

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	TP11-L-2.8-3.0	Apr 22, 2024		Soil	N24-Ap0063563	X	X
2	TP36-L-2.8-3.0	Apr 23, 2024		Soil	N24-Ap0063564	X	X
3	TP40-L-2.8-3.0	Apr 24, 2024		Soil	N24-Ap0063565	X	X
Test Counts						3	3

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

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Purchase Order	EP 3627
Quote ID №	

Project №	EP3627
Project Name	Gosforth
Project Manager	OVIDIU PRUTEANU
EDD Format (Excel, EQuIS etc)	
Sampler(s)	3
Handed over by	OVIDIU PRUTEANU
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Analyses — Where metals are required, please specify 'Total' or 'Filtered'. SUITE codes must be listed to ensure the correct analyses are performed.

Containers — Change container type & size if necessary

Required Turnaround Time (TAT) — Default will be 5 days if not ticked

♦Surcharge will apply
- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦
- ☐ 1 day♦
- ☐ 2 days♦
- ☐ 3 days♦
- ☐ 5 days (Standard)
- ☐ Other( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix Soil (S) Water (W)	AGGRESSIVITY	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	TP11-L-2.8-3.0	22/04		X									
2	TP36-L 2.8-3.0	23/04		X									
3	TP40-L 2.8-3.0	24/04		X									
4													
5													
6													
7													
8													
9													
10													
	Total Counts												

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal

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Received By	JRandam	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	24/4	Time	2:10
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Name / Signature / Date / Time / Temperature: 26.2 / Report №: 1090775

Appendix F

FOUNDATION MAINTENANCE AND FOOTING PERFOMANCE

Foundation Maintenance and Footing Performance:
A Homeowner's Guide

CSIRO

BTF 18
replaces
Information
Sheet 10/91

Buildings can and often do move. This movement can be up, down, lateral or rotational. The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil. It is important for the homeowner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented, thus protecting against building movement.

This Building Technology File is designed to identify causes of soil-related building movement, and to suggest methods of prevention of resultant cracking in buildings.

Soil Types

The types of soils usually present under the topsoil in land zoned for residential buildings can be split into two approximate groups – granular and clay. Quite often, foundation soil is a mixture of both types. The general problems associated with soils having granular content are usually caused by erosion. Clay soils are subject to saturation and swell/shrink problems.

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. The table below is Table 2.1 from AS 2870, the Residential Slab and Footing Code.

Causes of Movement

Settlement due to construction
There are two types of settlement that occur as a result of construction:

- Immediate settlement occurs when a building is first placed on its foundation soil, as a result of compaction of the soil under the weight of the structure. The cohesive quality of clay soil mitigates against this, but granular (particularly sandy) soil is susceptible.
- Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soil's lack of resistance to local compressive or shear stresses. This will usually take place during the first few months after construction, but has been known to take many years in exceptional cases.

These problems are the province of the builder and should be taken into consideration as part of the preparation of the site for construction. Building Technology File 19 (BTF 19) deals with these problems.

Erosion
All soils are prone to erosion, but sandy soil is particularly susceptible to being washed away. Even clay with a sand component of say 10% or more can suffer from erosion.

Saturation
This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume – particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

Seasonal swelling and shrinkage of soil
All clays react to the presence of water by slowly absorbing it, making the soil increase in volume (see table below). The degree of increase varies considerably between different clays, as does the degree of decrease during the subsequent drying out caused by fair weather periods. Because of the low absorption and expulsion rate, this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods, usually of weeks or months, depending on the land and soil characteristics.

The swelling of soil creates an upward force on the footings of the building, and shrinkage creates subsidence that takes away the support needed by the footing to retain equilibrium.

Shear failure
This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing. There are two major post-construction causes:

- Significant load increase.
- Reduction of lateral support of the soil under the footing due to erosion or excavation.
- In clay soil, shear failure can be caused by saturation of the soil adjacent to or under the footing.

GENERAL DEFINITIONS OF SITE CLASSES

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites with only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes
H	Highly reactive clay sites, which can experience high ground movement from moisture changes
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes
A to P	Filled sites
P	Sites which include soft soils, such as soft clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise

Tree root growth
Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways:

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.
- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

Unevenness of Movement

The types of ground movement described above usually occur unevenly throughout the building's foundation soil. Settlement due to construction tends to be uneven because of:

- Differing compaction of foundation soil prior to construction.
- Differing moisture content of foundation soil prior to construction.

Movement due to non-construction causes is usually more uneven still. Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow.

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond. It can also occur wherever there is a source of water near footings in clay soil. This leads to a severe reduction in the strength of the soil which may create local shear failure.

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building first, then gradually spreads to the interior. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Swelling gradually reaches the interior soil as absorption continues. Shrinkage usually begins where the sun's heat is greatest.

Effects of Uneven Soil Movement on Structures

Erosion and saturation
Erosion removes the support from under footings, tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail. Older masonry has little resistance. Evidence of failure varies according to circumstances and symptoms may include:

- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows.
- Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends).

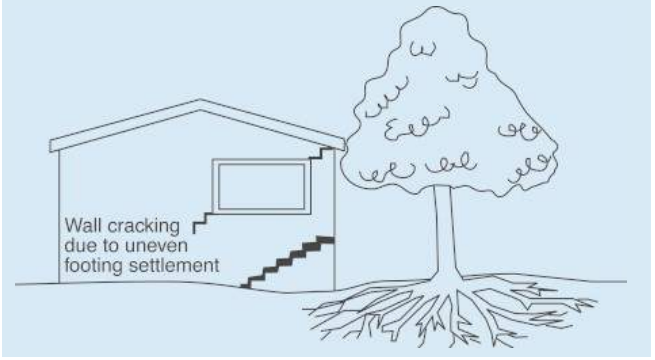
Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

Seasonal swelling/shrinkage in clay
Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system, then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings. This swelling first tends to create a dish effect, because the external footings are pushed higher than the internal ones.

The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

As the moisture absorption process completes its journey to the innermost areas of the building, the internal footings will rise. If the spread of moisture is roughly even, it may be that the symptoms will temporarily disappear, but it is more likely that swelling will be uneven, creating a difference rather than a disappearance in symptoms. In buildings with timber flooring supported by bearers and joists, the isolated piers will rise more easily than the strip footings or piers under walls, creating noticeable doming of flooring.

Trees can cause shrinkage and damage



As the weather pattern changes and the soil begins to dry out, the external footings will be first affected, beginning with the locations where the sun's effect is strongest. This has the effect of lowering the external footings. The doming is accentuated and cracking reduces or disappears where it occurred because of dishing, but other cracks open up. The roof lines may become convex.

Doming and dishing are also affected by weather in other ways. In areas where warm, wet summers and cooler dry winters prevail, water migration tends to be toward the interior and doming will be accentuated, whereas where summers are dry and winters are cold and wet, migration tends to be toward the exterior and the underlying propensity is toward dishing.

Movement caused by tree roots
In general, growing roots will exert an upward pressure on footings, whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage.

Complications caused by the structure itself
Most forces that the soil causes to be exerted on structures are vertical – i.e. either up or down. However, because these forces are seldom spread evenly around the footings, and because the building resists uneven movement because of its rigidity, forces are exerted from one part of the building to another. The net result of all these forces is usually rotational. This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause. A common symptom is binding of doors on the vertical member of the frame.

Effects on full masonry structures
Brickwork will resist cracking where it can. It will attempt to span areas that lose support because of subsided foundations or raised points. It is therefore usual to see cracking at weak points, such as openings for windows or doors.

In the event of construction settlement, cracking will usually remain unchanged after the process of settlement has ceased.

With local shear or erosion, cracking will usually continue to develop until the original cause has been remedied, or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective.

In the case of swell/shrink effects, the brickwork will in some cases return to its original position after completion of a cycle, however it is more likely that the rotational effect will not be exactly reversed, and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position. This means that in a case where swelling takes place after construction and cracking occurs, the cracking is likely to at least partly remain after the shrink segment of the cycle is complete. Thus, each time the cycle is repeated, the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent.

With repeated cycles, once the cracking is established, if there is no other complication, it is normal for the incidence of cracking to stabilise, as the building has the articulation it needs to cope with the problem. This is by no means always the case, however, and monitoring of cracks in walls and floors should always be treated seriously.

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

The normal structural arrangement is that the inner leaf of brickwork in the external walls and at least some of the internal walls (depending on the roof type) comprise the load-bearing structure on which any upper floors, ceilings and the roof are supported. In these cases, it is internally visible cracking that should be the main focus of attention, however there are a few examples of dwellings whose external leaf of masonry plays some supporting role, so this should be checked if there is any doubt. In any case, externally visible cracking is important as a guide to stresses on the structure generally, and it should also be remembered that the external walls must be capable of supporting themselves.

Effects on framed structures
Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility. Also, the doming/dishing effects tend to be lower because of the lighter weight of walls. The main risks to framed buildings are encountered because of the isolated pier footings used under walls. Where erosion or saturation cause a footing to fall away, this can double the span which a wall must bridge. This additional stress can create cracking in wall linings, particularly where there is a weak point in the structure caused by a door or window opening. It is, however, unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period. The same warning period should apply in the case of upheaval. It should be noted, however, that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building. In this case, the subfloor masonry walls can be expected to behave as full brickwork walls.

Effects on brick veneer structures
Because the load-bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls, depending on the type of roof, the building can be expected to behave as a framed structure, except that the external masonry will behave in a similar way to the external leaf of a full masonry structure.

Water Service and Drainage

Where a water service pipe, a sewer or stormwater drainage pipe is in the vicinity of a building, a water leak can cause erosion, swelling or saturation of susceptible soil. Even a minuscule leak can be enough to saturate a clay foundation. A leaking tap near a building can have the same effect. In addition, trenches containing pipes can become watercourses even though backfilled, particularly where broken rubble is used as fill. Water that runs along these trenches can be responsible for serious erosion, interstrata seepage into subfloor areas and saturation.

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water, complicating and exacerbating the problem.
Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves etc.
- Corroded guttering or downpipes can spill water to ground.
- Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings, sometimes causing large-scale problems such as erosion, saturation and migration of water under the building.

Seriousness of Cracking

In general, most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored. The table below is a reproduction of Table C1 of AS 2870.

AS 2870 also publishes figures relating to cracking in concrete floors, however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs, this table is not reproduced here.

Prevention/Cure

Plumbing
Where building movement is caused by water service, roof plumbing, sewer or stormwater failure, the remedy is to repair the problem. It is prudent, however, to consider also rerouting pipes away from the building where possible, and relocating taps to positions where any leakage will not direct water to the building vicinity. Even where gully traps are present, there is sometimes sufficient spill to create erosion or saturation, particularly in modern installations using smaller diameter PVC fixtures. Indeed, some gully traps are not situated directly under the taps that are installed to charge them, with the result that water from the tap may enter the backfilled trench that houses the sewer piping. If the trench has been poorly backfilled, the water will either pond or flow along the bottom of the trench. As these trenches usually run alongside the footings and can be at a similar depth, it is not hard to see how any water that is thus directed into a trench can easily affect the foundation's ability to support footings or even gain entry to the subfloor area.

Ground drainage
In all soils there is the capacity for water to travel on the surface and below it. Surface water flows can be established by inspection during and after heavy or prolonged rain. If necessary, a grated drain system connected to the stormwater collection system is usually an easy solution.

It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

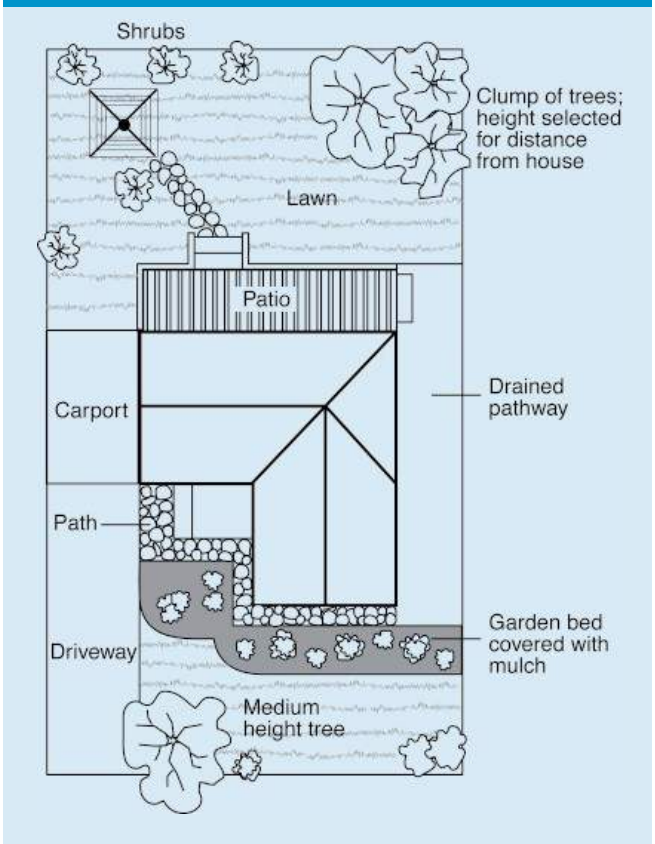
Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0.1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly	<5 mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weathertightness often impaired	5–15 mm (or a number of cracks 3 mm or more in one group)	3
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted	15–25 mm but also depend on number of cracks	4

Gardens for a reactive site



should extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1:60. The finished paving should be no less than 100 mm below brick vent bases.

It is prudent to relocate drainage pipes away from this paving, if possible, to avoid complications from future leakage. If this is not practical, earthenware pipes should be replaced by PVC and backfilling should be of the same soil type as the surrounding soil and compacted to the same density.

Except in areas where freezing of water is an issue, it is wise to remove taps in the building area and relocate them well away from the building – preferably not uphill from it (see BTF 19).

It may be desirable to install a grated drain at the outside edge of the paving on the uphill side of the building. If subsoil drainage is needed this can be installed under the surface drain.

Condensation
In buildings with a subfloor void such as where bearers and joists support flooring, insufficient ventilation creates ideal conditions for condensation, particularly where there is little clearance between the floor and the ground. Condensation adds to the moisture already present in the subfloor and significantly slows the process of drying out. Installation of an adequate subfloor ventilation system, either natural or mechanical, is desirable.

Warning: Although this Building Technology File deals with cracking in buildings, it should be said that subfloor moisture can result in the development of other problems, notably:

- Water that is transmitted into masonry, metal or timber building elements causes damage and/or decay to those elements.
- High subfloor humidity and moisture content create an ideal environment for various pests, including termites and spiders.
- Where high moisture levels are transmitted to the flooring and walls, an increase in the dust mite count can ensue within the living areas. Dust mites, as well as dampness in general, can be a health hazard to inhabitants, particularly those who are abnormally susceptible to respiratory ailments.

The garden
The ideal vegetation layout is to have lawn or plants that require only light watering immediately adjacent to the drainage or paving edge, then more demanding plants, shrubs and trees spread out in that order.

Overwatering due to misuse of automatic watering systems is a common cause of saturation and water migration under footings. If it is necessary to use these systems, it is important to remove garden beds to a completely safe distance from buildings.

Existing trees
Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings, if the offending roots are subsidiary and their removal will not significantly damage the tree, they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building. If it is not possible to remove the relevant roots without damage to the tree, an application to remove the tree should be made to the local authority. A prudent plan is to transplant likely offenders before they become a problem.

Information on trees, plants and shrubs
State departments overseeing agriculture can give information regarding root patterns, volume of water needed and safe distance from buildings of most species. Botanic gardens are also sources of information. For information on plant roots and drains, see Building Technology File 17.

Excavation
Excavation around footings must be properly engineered. Soil supporting footings can only be safely excavated at an angle that allows the soil under the footing to remain stable. This angle is called the angle of repose (or friction) and varies significantly between soil types and conditions. Removal of soil within the angle of repose will cause subsidence.

Remediation

Where erosion has occurred that has washed away soil adjacent to footings, soil of the same classification should be introduced and compacted to the same density. Where footings have been undermined, augmentation or other specialist work may be required. Remediation of footings and foundations is generally the realm of a specialist consultant.

Where isolated footings rise and fall because of swell/shrink effect, the homeowner may be tempted to alleviate floor bounce by filling the gap that has appeared between the bearer and the pier with blocking. The danger here is that when the next swell segment of the cycle occurs, the extra blocking will push the floor up into an accentuated dome and may also cause local shear failure in the soil. If it is necessary to use blocking, it should be by a pair of fine wedges and monitoring should be carried out fortnightly.

This BTF was prepared by John Lewer FAIB, MIAMA, Partner, Construction Diagnosis.

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