Rail Noise Assessment

Logan Estate Residential Subdivision
Fairydale Lane
Mudgee, NSW

Prepared for: Maas Group Properties Logan Pty Limited
September 2022
MAC221675-01RP1

Muller Acoustic Consulting

Document Information

Rail Noise Assessment

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Fairydale Lane

Mudgee, NSW

Prepared for: Maas Group Properties Logan Pty Limited

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Maas Group Properties Logan Pty Limited (Maas Group) to prepare a Rail Noise Assessment (RNA) for the residential allotments Lots 93 - 107 within the Logan Estate, Mudgee, NSW.

This report presents the results, findings and recommendations of the RNVA and has been prepared to accompany the project's Development Application (DA).

The assessment has been undertaken in general accordance with the following policies and guidelines:

- Department of Planning (DPI) 2008, Development near Rail Corridors and Busy Roads – Interim Guideline; and
- Standards Australia AS 2107:2000 — Acoustics — Recommended design sound levels and reverberation times for building interiors.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A.**

1.1 Project Background

MAC understands that Maas Group has received development approval for the establishment of the Logan Estate residential subdivision off Fairydale Lane, Mudgee, NSW (the 'estate'). The estate is located on the north-western fringe of Mudgee and is bordered by the Gwabegar railway line to the west (refer **Figure 1**). The subdivision plan is provided in **Appendix B**.

Under the Plan of Subdivision for the estate, a Section 88B restriction applies to residential allotments Lot 93 - 107, as summarised below:

a) *No dwelling or habitable room shall be constructed unless the dwelling or habitable room is constructed in accordance with noise mitigation measures consistent with Category 2 Acoustic Treatment of Residences, Appendix C of the Department of Planning's publication, Development near Rail Corridors and Busy Roads – Interim Guidelines.*

The Gwabegar railway line is a railway line in the central west of NSW that travels from Wallerawang to Gwabegar, passing through Mudgee. The section from Mudgee to Gulgong was opened in 1909 and operated until 1992 when the line was closed. Following repairs in 2000, the line was reopened between Kandos and Gulgong with heritage trains operating around once per month under heavy speed restrictions. In 2007 the line was suspended from use indefinitely, however, the line legally remains open.

It is understood that reopening the line would require a significant capital investment to redevelop the line, which would require re-laying significant sections of track. It is noted that where a disused heavy rail line is brought back into use, operational noise levels would be assessed as a redevelopment under the NSW EPA's Rail Infrastructure Noise Guideline (RING) (2013), including requirements for noise attenuation. Notwithstanding, in consideration of the Section 88B Restriction, assessment is undertaken to predict potential internal noise levels of future dwellings within the Logan Estate from rail movements and provide recommendations for proactive noise control measures.

MAC understands that there are no current plans to reopen the railway line, and hence, there are no projected rail traffic volumes. It is understood however, that Moolarben Coal previously proposed to transport coal to the Mount Piper Power Station northwest of Lithgow. Therefore, rail movements for the assessment were assumed with reference to the transport of coal from Moolarben Coal Mine.

Under the Moolarben Stage 2 project, coal is currently transported to the Port of Newcastle at a rate of up to five trains per day (10 movements). Theoretically assuming that up to half of the trains from Moolarben Coal would use the Gwabegar railway line to transport coal through Mudgee to Mount Piper, and allowing for incidental freight services, the assessment has conservatively allowed for up to six rail movements occurring during the day period (7am to 10pm) or the night period (10pm to 7am). It is also noted that the assessed rail movements are consistent with the current enhanced train frequency on the Narrabri line of up to six train paths per day to transport the record grain and cotton harvests. It is therefore considered that the assessed rail movements are a representative worst-case scenario for potential future rail movements past the estate.

FIGURE 1

PROJECT SITE

MAC221675-01

LOGAN ESTATE

KEY

Project Site

Logan Estate

Lot 93 - 107

Rail Corridor

Railway Line

0 30 60 90 120 m

N

MAC
Muller Acoustic Consulting

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2 Noise Policy and Guidelines

2.1 Development Near Rail Corridors and Busy Roads – Interim Guidelines

Guidance for the specification of internal noise levels of habitable rooms is prescribed in Department of Planning's (DoP) Development near Rail Corridors and Busy Roads – Interim Guidelines (2008) ('the guideline').

The guideline outlines internal criterion levels for Clause 87 (Rail) of the State Environmental Planning Policy (SEPP) for Infrastructure (Infrastructure SEPP):

"If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:

- *in any bedroom in the building : 35 dBA at any time 10pm–7am; and*
- *anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dBA at any time."*

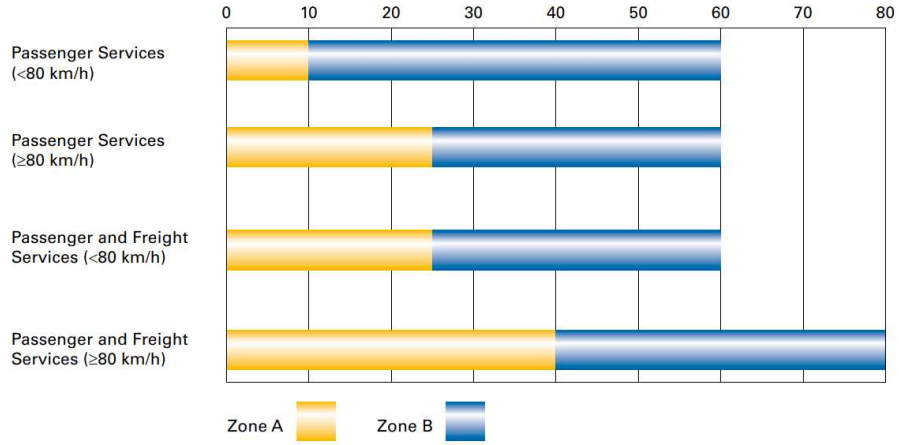
Table 3.1 of the guideline clarifies that the above noise criteria are to be determined as an $LA_{eq(15hr)}$ for the day and $LA_{eq(9hr)}$ for the night period. Ground borne noise is calculated as LA_{max} for 95% of rail pass-by events. It is noted that ground borne noise is generally associated with rail operations where buildings are constructed over or adjacent to land over tunnels. As the project is not built over, or adjacent to land over tunnels, the assessment of ground borne noise is excluded from this assessment.

2.1.1 Rail Noise Screening Tests

Section 3.5.1 of the guideline provides a screening test to determine the level of assessment required when noise sensitive receivers are located close to existing rail lines. **Figure 2** identifies indicative acoustic assessment zones based on distance (in metres) for developments from an operational rail track.

For developments located within Zone A, a detailed noise impact assessment is required. For single dwellings in Zone B, standard mitigation measures consistent with Road Nosie Control Treatment Category 2 (Appendix C or the guideline), for development will normally provide adequate attenuation to achieve the acceptable internal noise levels.

Figure 2 Acoustic Assessment Zones.



2.2 Human Comfort – Assessment Vibration: A Technical Guideline

Humans are far more sensitive to vibration than is commonly realised and may detect vibration levels which are well below levels that may cause damage to buildings or structures. Assessing vibration: a technical guideline was published in February of 2006 by the DECC and is based on guidelines contained in BS 6472 – 1992, Evaluation of human exposure to vibration in buildings (1-80Hz) and provides guidance on assessing vibration against human comfort.

The technical guideline presents preferred and maximum vibration values for use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques.

At vibration values below the preferred values, there is a low probability of adverse comment or disturbance to building occupants. Where all feasible and reasonable mitigation measures have been applied and vibration values are still beyond the maximum value, it is recommended the operator negotiate directly with the affected community.

The technical guideline defines three vibration types and provides direction for assessing and evaluating the applicable criteria and include continuous vibration, impulsive vibration and intermittent vibration. The technical guideline states that intermittent train passbys should be classed as intermittent sources of vibration.

2.2.1 Intermittent Vibration

Intermittent vibration (as defined in Section 2.1 of the technical guideline) is assessed using the vibration dose concept which relates to vibration magnitude and exposure time.

Section 2.4 of the technical guideline provides acceptable values for intermittent vibration in terms of vibration dose values (VDV) which requires the measurement of the overall weighted rms (root mean square) acceleration levels over the frequency range 1 Hz to 80 Hz. To calculate VDV the following formula (refer section 2.4.1 of the technical guideline) was used:

$$VDV = \left[\int_0^T a^4(t)dt \right]^{0.25}$$

Where VDV is the vibration dose value in $m/s^{1.75}$, a (t) is the frequency-weighted rms of acceleration in m/s^2 and T is the total period of the day (in seconds) during which vibration may occur.

The Acceptable Vibration Dose Values (VDV) for Intermittent Vibration is reproduced in **Table 1**.

Table 1 Acceptable Vibration Dose Values (VDV) for Intermittent Vibration ($m/s^{1.75}$)

Receiver	Daytime		Night-time	
	Preferred Value, $m/s^{1.75}$	Maximum Value, $m/s^{1.75}$	Preferred Value, $m/s^{1.75}$	Maximum Value, $m/s^{1.75}$
Residences	0.20	0.4	0.13	0.26

Note: Daytime is 7am to 10pm and Night-time is 10pm to 7am

There is a low probability of adverse comment or disturbance to building occupants at vibration values below the preferred values. Adverse comment or complaints may be expected if vibration values approach the maximum values. The technical guideline states that activities should be designed to meet the preferred values where an area is not already exposed to vibration.

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3 Noise and Vibration Assessment Methodology

3.1 Rail Noise Screening Analysis

A review of the subdivision layout superimposed over aerial imagery was undertaken to identify proposed residential lots located within the 25m Zone A and 60m Zone B offset distances from the Gwabegar railway line, for freight and passenger services less than 80km/h.

The review identified that the rear boundary fence line of each of the residential allotments Lots 93 - 107 are located within 25m of the railway line, with the minimum offset distance approximately 17m.

3.2 Rail Noise Calculation

Bruel & Kjaer (Predictor, V11.10) noise modelling software was used to predict rail noise levels at the location of the project. The model incorporated three-dimensional ground contours within the project site and the surrounding locality. The calculation method used to predict rail noise levels was in general accordance with the Dutch Standard RMR/SRM2 (2012).

Train movements (block braked freight trains) were modelled along the existing railway alignment with a maximum speed of 40km/hr. MAC has conservatively assumed that if the railway line is recommissioned, there would be up to six (6) rail movements per day, which may occur during the day period or the night period.

It is noted that the modelled noise levels include a façade correction factor of +2.5dBA, in accordance with the NSW EPA (2013) Rail Infrastructure Noise Guideline.

3.3 Indicative Attenuation Levels

The Environmental Noise Management Manual (ENMM) (2001) provides a summary of indicative attenuation from standard building types. The indicative attenuation levels are summarised in **Table 2**, which provides typical performance of buildings with respect to noise reduction. A light framed residence with single 3mm glazing would be expected to provide a reduction of approximately 20dBA from external to internal with windows closed. Where windows are closed, the fresh air requirements outlined in the Building Code of Australia are to be satisfied.

Table 2 Indicative Building Noise Attenuation		
Building Type	Windows	Internal noise reduction, dBA
All	Open	10
Light frame	Single glazed (closed)	20
Masonry	Single glazed (closed)	25
	Double glazed (closed)	30

Note: Sourced from ENMM, 2001.

3.4 Rail Vibration Assessment

The assessment of potential vibration from the passage of trains past the development site was based on historic vibration emission data measured from the passage of coal trains in the Hunter Region of NSW. Historic results identify received VDV (vibration dose) levels of 0.11m/s$^{1.75}$ and 0.08 m/s$^{1.75}$ for day and night train passbys respectively, measured 5m from operational rail tracks.

These levels are significantly below preferred dose values (see **Table 1**). Therefore, as the residential lots are set back a minimum of 17m from the track, rail vibration are expected to be below the levels that would generate disturbance to building occupants.

4 Noise Assessment Results and Discussion

Rail noise modelling was undertaken for the day period (7am to 10pm) and the night period (10pm to 7am) assuming up to six rail movements per period. A +2.5dB façade correction factor was applied to the modelled results to account for façade reflection.

To achieve the internal design sound levels of 35dB $LA_{eq(period)}$ for sleeping areas and 40dB $LA_{eq(period)}$ for other habitable spaces, rail noise contours (external) were generated for the 45dBA noise contour (sleeping areas) and 50dBA noise contour (other habitable spaces), allowing for a conservative 10dB reduction across the building façade with windows partially open for ventilation. It is noted that the predictive modelling assumed that there were no additional noise attenuation measures beyond the building façade (e.g. boundary fences).

The results of the assessment for the night period (10pm to 7am), which represents the most conservative assessment period, are presented in **Figure 3**. The assessment demonstrates that where no additional noise attenuation measures are implemented, and windows remain partially open for ventilation, internal noise levels would potentially exceed the design sound level for sleeping areas at each of the residential allotments.

Further modelling was undertaken with the inclusion of a noise barrier to approximately 1.8m in height (comprising materials with a surface density of at least 10kg/m^2, and not contain any gaps) along the boundary of the allotments fronting the railway line, and along the side boundary (south) of Lot 93. The noise affected areas, with the inclusion of the barrier are presented in **Figure 4** for the more sensitive night period (10pm to 7am). The results of the analysis indicate that where a barrier is constructed along the rail corridor boundary, the internal design sound levels are anticipated to be achieved with standard construction materials at all locations across each of the residential allotments (Lots 93 - 107). It is noted that the noise affected areas apply to single storey dwellings, or the ground floor of multi storey dwellings only.

Figure 3: Rail Noise Affected Areas

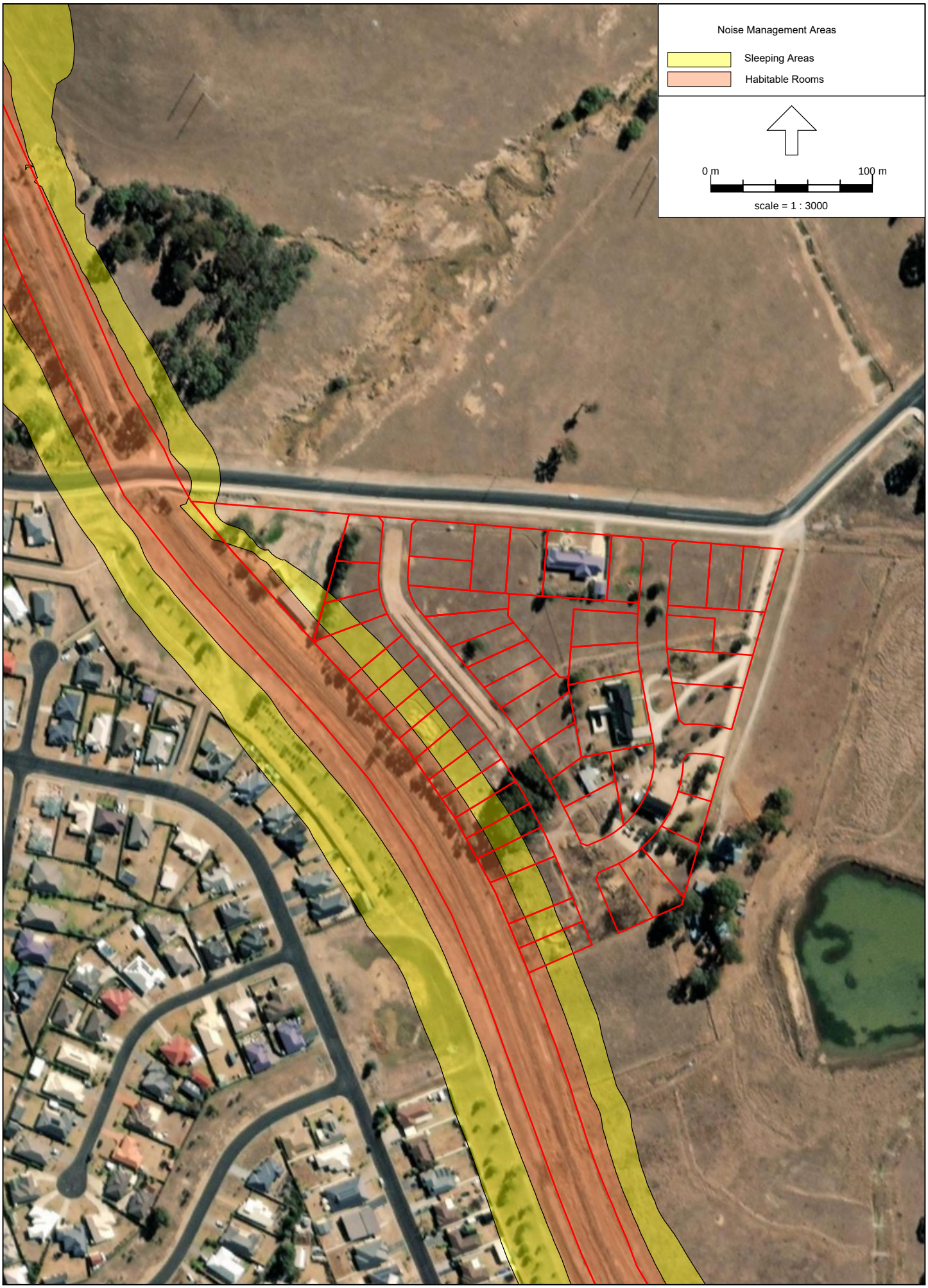
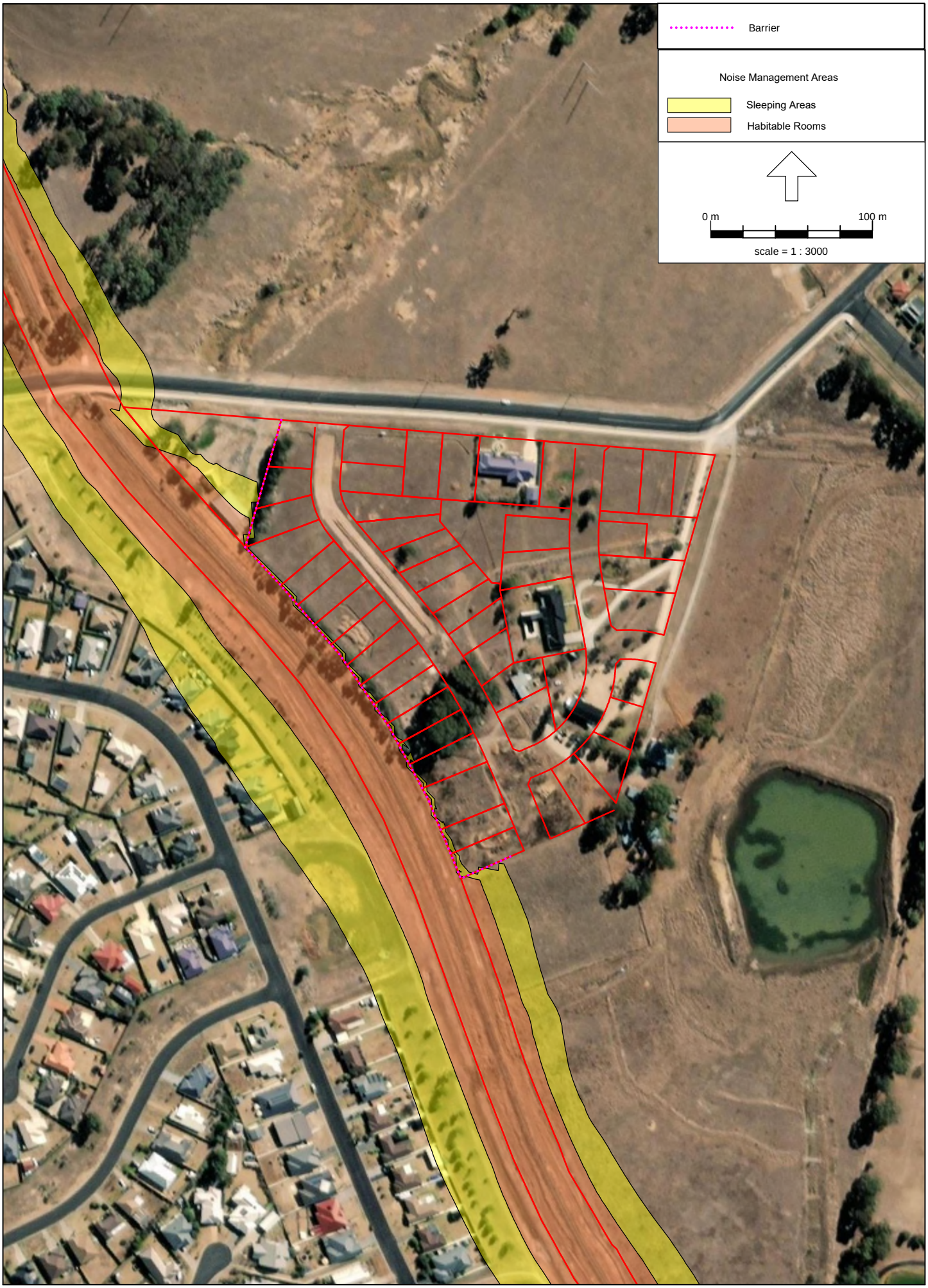


Figure 4: Rail Noise Affected Areas (with Barrier)



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5 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed an assessment of potential rail noise and vibration impacts at Lots 93 – 107 within the Logan Estate residential subdivision, Mudgee, NSW.

The assessment has propagated noise levels from the passage of trains along the adjacent railway line to the proposal site to identify potentially noise affected areas, within which, future residential dwellings may require upgraded building elements to satisfy internal design sounds levels.

The results of the assessment identified that where a barrier fence to 1.8m in height and comprising materials with a surface density of at least 10kg/m^2 is constructed along the rail corridor boundary and on the southern side of Lot 93, the recommended internal design levels would be achieved at all residential allotments for dwellings constructed of standard building elements, with windows partially open for ventilation.

Additionally, vibration emissions from rail traffic are demonstrated to satisfy recommended levels that may generate a low probability of adverse comment or disturbance to building occupants.

Following the findings of the assessment, it is recommended that the Section 88B restriction requiring Category 2 treatments to be implemented for all residential dwellings within Lots 93 – 107 be removed.

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Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

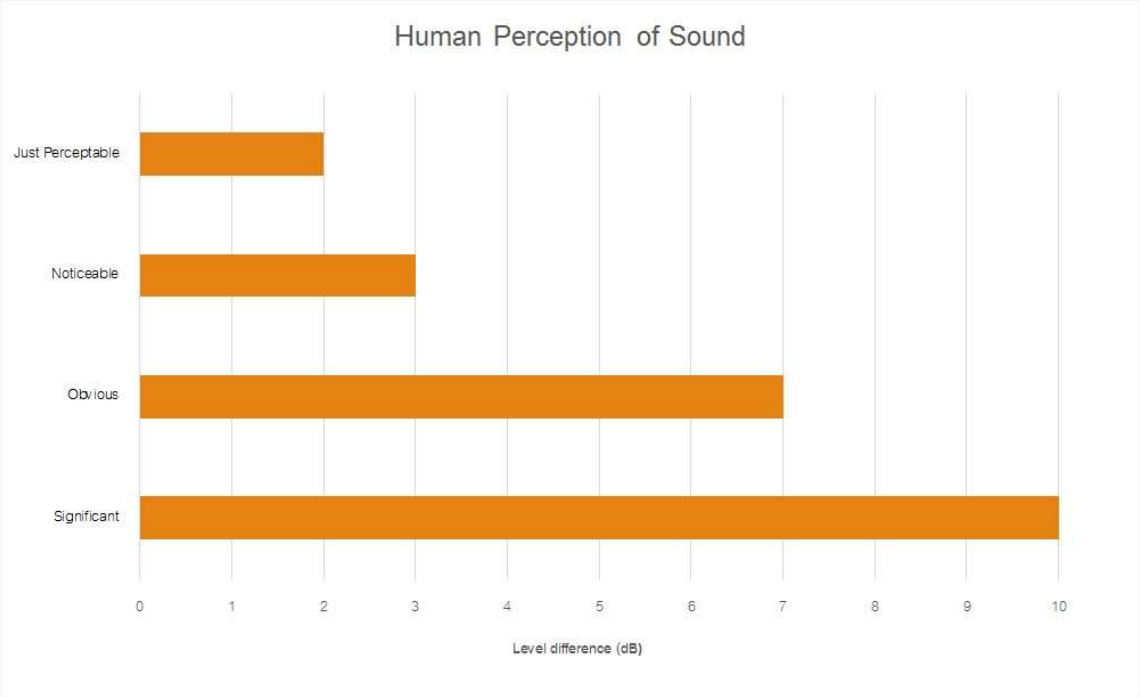
Table A1 Glossary of Acoustical Terms

Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAmax	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (Lw or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by 10.log10 (W/Wo). Where W is the sound power in watts to the reference level of 10^{-12} watts.
Sound pressure level (Lp or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from Lw in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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Appendix B – Subdivision Plans

RESIDENTIAL SUBDIVISION

LOT 2 / DP 538790

17-29 FAIRYDALE LANE, MUDGEE, NSW, 2850

STAGE 2 - ISSUE FOR CONSTRUCTION CERTIFICATE

LIST OF DRAWINGS

LOCALITY PLAN
N.T.S

ARCHITECT

ISSUED FOR CONSTRUCTION	27.08.21	1
ISSUED FOR CONSTRUCTION CERTIFICATE	03.05.21	0

STATUS
CONSTRUCTION CERTIFICATE

CLIENT
MAAS GROUP

PROJECT
PROPOSED SUBDIVISION
17-29 FAIRYDALE LANE
MUDGEE, NSW, 2850

DESIGNED	DRAWN	DATE	SIZE	CAD REF
J.D.	J.M.	16.12.20	A1	TX15091.00

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DRAWING TITLE
COVER PAGE

DRAWING No
TX-15091.00 - C1.0

ISSUE
1

GENERAL NOTES

CONSTRUCTION NOTES

1. ALL WORK TO BE CARRIED OUT GENERALLY IN ACCORDANCE WITH MA0020/21 PARTICULARLY AS REGARDS ENVIRONMENTAL MANAGEMENT, CONSTRUCTION STANDARDS, INSPECTION REQUIREMENTS AND ANY SPECIFIC CONDITIONS IN THE CONSTRUCTION CERTIFICATE APPROVAL.
2. ALL WORK TO BE CARRIED OUT IN A WORKMANLIKE MANNER AND IN ACCORDANCE WITH TECHNICAL AND PERFORMANCE REQUIREMENTS OF RELEVANT AND APPLICABLE CODES, STANDARDS, COUNCILS DEVELOPMENT CONTROL PLAN AND AUS SPEC # 1.
3. WHERE DISCREPANCIES BETWEEN THE DRAWING SAND, COUNICLS DEVELOPMENT CONTROL PLAN OCCUR, THE WORKS MUST COMPLY WITH THE WRITTEN REQUIREMENTS OF THE DEVELOPMENT CONTROL PLAN.
4. FOR THE DURATION OF THE WORKS ONE TRAFFICABLE LANE MUST REMAIN OPEN ON FAIRYDALE LANE FOR PUBLIC ACCESS AND TRAFFIC AT ALL TIMES.
5. CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES AND DEBRIS, ETC. TO THE EXTENT SPECIFIED. CLEARING AND GRUBBING - ATTENTION IS DRAWN TO COUNCIL'S TREE PRESERVATION ORDER.
6. ALL NEW WORKS SHALL MAKE SMOOTH JUNCTION WITH EXISTING WORKS.
7. THE CONTRACTOR SHALL CARRY OUT A SERVICES SEARCH AND SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND PROTECT AND MAKE ARRANGEMENT WITH THE RELEVANT AUTHORITY TO RELOCATE AND/OR ADJUST IF NECESSARY. INFORMATION GIVEN ON THE DRAWINGS IN RESPECT TO SERVICES IS FOR GUIDANCE ONLY AND IS NOT GUARANTEED COMPLETE NOR CORRECT.
8. SERVICE CONDUITS TO BE LAID AS DIRECTED BY THE RELEVANT AUTHORITY CLEAR OF ALL VEHICULAR CROSSINGS.
9. PROVISION TO BE MADE FOR SUITABLE PROTECTION OF ROAD PAVEMENT KERB AND GUTTER AND FOOTPATH FORMATION.
10. VEHICULAR ACCESS AND ALL SERVICES TO BE MAINTAINED AT ALL TIMES TO ADJOINING PROPERTIES AFFECTED BY CONSTRUCTION WORKS. THE CONTRACTOR IS NOT TO ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE PERMISSION OF THE OWNER AND SUPERINTENDENT.
11. WHERE KERB & GUTTER IS LAID BY USE OF A KERB & GUTTER MACHINE THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONCRETE QUALITY. THE REMOVAL OF ALL KERB & GUTTER AT HIS OWN EXPENSE WHERE THE MINIMUM STRENGTH IS NOT ACHIEVED AT 28 DAYS IN ACCORDANCE WITH COUNCIL'S STANDARD SPECIFICATIONS.
12. ALL TEMPORARY ROAD CONSTRUCTION TO BE REMOVED AND SURFACE TO BE REINSTATED TO NATURAL CONDITION WHERE PERMANENT ACCESS IS AVAILABLE.
13. TOPSOIL TO BE REMOVED AND STOCKPILED WHERE SHOWN.
14. EARTHWORKS TO BE CARRIED OUT TO THE SATISFACTION OF THE SUPERVISING ENGINEER. UNSOUND MATERIAL IS TO BE REMOVED FROM ROADS AND LOTS PRIOR TO FILLING. ALL SITE REGRADING AREAS SHALL BE FINALLY GRADED TO THE SATISFACTION OF THE SUPERINTENDENT.
15. WHERE LOT FILLING IN EXCESS OF 500mm IN DEPTH IS PROPOSED, LEVELS ARE TO BE TAKEN ON THE STRIPPED SURFACE PRIOR TO THE COMMENCEMENT OF FILLING AND ON THE FINISHED SURFACE. SUCH LEVELS ARE TO BE SHOWN ON THE WORK AS EXECUTED PLANS. FILLING TO BE CARRIED OUT TO COUNCIL'S STANDARDS.
16. PROVIDE 150mm TOPSOIL TO ALL FOOTPATHS AND FILLED AREAS.
17. DRAINAGE STUBS TO BE EXTENDED INTO EACH LOT.
18. CONDUIT TRENCHES AND STORMWATER DRAINAGE LINES TO BE BACKFILLED WITH APPROVED WASHED RIVER SAND AND VIBRATED. CONDUIT TRENCHES TO BE GRADED AT A MINIMUM OF 1% TO EITHER SUBSOIL OR STORMWATER DRAINAGE LINES.
19. SUBSOIL DRAINS TO BE CONSTRUCTED AS REQUIRED BY SUPERVISING ENGINEER.
20. SERVICE CONDUIT LOCATIONS TO BE PERMANENTLY MARKED ON KERB FACE.
21. PRIOR TO COMMENCEMENT OF WORK, THE CONTRACTOR SHALL PROVIDE A TRAFFIC MANAGEMENT PLAN PREPARED BY AN ACCREDITED PERSON IN ACCORDANCE WITH RTA REQUIREMENTS, FOR ANY WORK ON OR ADJACENT TO PUBLIC ROADS. PLAN TO BE SUBMITTED TO COUNCIL AND RTA.
22. LAND FILL MATERIALS MUST SATISFY THE FOLLOWING REQUIREMENTS:
    - BE NON-PUTRESCIBLE SOLID WASTE
    - BE FREE OF SLAG, HAZARDOUS, CONTAMINATED, TOXIC OR RADIO-ACTIVE MATTER
    - BE FREE OF INDUSTRIAL WASTE AND BUILDING DEBRIS
    - MUST NOT ORIGINATE FROM A SITE THAT HAS BEEN USED AT ANY TIME FOR ACTIVITIES LISTED IN APPENDIX B OF DIRCULAR NO.20 FROM NSW DEPARTMENT OF PLANNING, UNLESS THE MATERIALS HAVE BEEN CHEMICALLY TESTED AND THE MATERIALS APPROVED FOR DISPOSAL AS CLEAN FILL, OR THE SITE FROM WHICH THE MATERIAL ORIGINATES HAS BEEN DEMONSTRATED BY SUITABLE INVESTIGATION AND WHERE APPROPRIATE CHEMICAL TESTING, TO BE FREE OF CONTAMINATION TO THE SATISFACTION OF THE SUPERINTENDENT.
23. EACH INCOMING LOAD OF MATERIAL FOR DISPOSAL AT THE PROPERTY MUST BE INSPECTED ON ARRIVAL AT THE PROPERTY AND SORTED TO REMOVE ANY UNACCEPTABLE MATERIALS BEFORE PLACEMENT INTO THE EXCAVATION. ANY SUSPECT MATERIAL MUST EITHER BE REJECTED FOR DISPOSAL ELSEWHERE, OR BE CHEMICALLY TESTED TO CONFIRM THAT IT IS NOT CONTAMINATED. RECORDS OF THE SOURCE (INCLUDING THE ADDRESS AND OWNER OF SOURCE SITE), NATURE AND QUANTITY OF ALL INCOMING LOADS INCLUDING THE DATE, THE NAME OF CARRIER, AND VEHICLE REGISTRATION MUST BE MAINTAINED BY THE APPLICANT/OPERATOR AND SUPPLIED IF REQUESTED BY SUPERINTENDENT ALONG WITH ANY RESULTS OF CHEMICAL TESTING OF MATERIALS ACCEPTED FOR PLACEMENT IN THE EXCAVATION.
24. NO FIRES ARE TO BE LIT OR WASTE MATERIALS BURNT ON THE SITE.
25. ALL OUTBUILDINGS, RUBBISH & FENCES ARE TO BE DEMOLISHED AND THE MATERIALS DISPOSED OF WITHOUT NUISANCE. (N.B. INCINERATION OF THE MATERIALS IS STRICTLY PROHIBITED UNDER THE PROVISIONS OF THE CLEAN AIR ACT AND ANY BREACHES WILL RESULT IN LEGAL ACTION BEING RECOMMENDED.)
26. WHERE THE LAND IS TO BE FILLED, GRADED OR ROADWORKS CONSTRUCTED, IT WILL BE NECESSARY THAT REGULAR WATERING DOWN OF OPERATIONS BE CARRIED OUT WHERE THE CREATION OF DUST DURING EARTHWORKS IS A PROBLEM.
27. MATERIALS MUST NOT BE BURNT OR BURIED ON THE SITE ALL TRUCK TRANSPORTING DEBRIS FROM THE SITE MUST BE COVERED
28. ALL NOXIOUS PLANTS TO BE REMOVED FROM THE PROPERTY.
29. LAND FILLED IN EXCESS OF 500mm TO BE COMPACTED TO 95% STANDARD DRY DENSITY RATIO (AS1289 E4.1). EACH LOT, WHETHER FILLED OR NOT, TO BE CLASSIFIED IN TERMS OF THE AUSTRALIAN STANDARD FOR RESIDENTIAL SLABS AND FOOTINGS (AS2870) PREPARED BY A NATA REGISTERED SOIL TESTING CONSULTANT. WHERE THE LOT CLASSIFICATION IS H, A RESTRICTION WILL BE REQUIRED ON THE TITLE OF THAT LOT THAT SPECIAL FOOTINGS FOR ANY BUILDING MAY BE REQUIRED. A CLASSIFICATION OF E OR P IS UNACCEPTABLE.
30. THE FOLLOWING MEASURES ARE TO BE UNDERTAKEN TO TREES TO BE RETAINED.
31. AREA AROUND TREES TO BE TAPED OFF.
32. NO MACHINERY TO BE USED ADJACENT TO TREES.
33. ALL WORKS WITHIN 3m OF THE TREES TO BE CARRIED OUT BY MANUAL METHODS AND NOT COMPACTED BY MACHINERY.
34. STONE PITCHING TO BE USED AROUND TREES WHERE FILLING IS TO BE UNDERTAKEN THAT IS GREATER THAN 0.3m.
35. WHERE DESIGN LEVELS ARE LOWER THAN THE LEVELS OF A TREE, EXCAVATION WILL ONLY BE CARRIED OUT BY HAND AND THE TREES BEING LEFT ON A SUITABLE MOUND.
36. ALL MACHINERY TO BE LOADED/UNLOADED WITHIN WORKSITE.
37. ALL MATERIALS TO BE LOADED/UNLOADED WITHIN WORKSITE.
38. ALL CONSTRUCTION MATERIALS AND MACHINERY MUST BE KEPT WITHIN WORKSITE.
39. THE CONTRACTOR SHALL ENSURE THAT SOIL/EXCAVATED MATERIAL IS NOT DEPOSITED ON SURROUNDING ROADS. ANY SOIL DROPPED ON THE SURROUNDING ROADS SHALL BE IMMEDIATELY REMOVED.

EARTHWORKS NOTES

1. OVER FULL AREA OF EARTHWORKS, CLEAR VEGETATION, RUBBISH, SLABS ETC. AND STRIP TOPSOIL, AVERAGE 150mm THICK. REMOVE FROM SITE, EXCEPT TOP SOIL FOR RE-USE.
2. CUT AND FILL OVER THE SITE TO LEVELS REQUIRED.
3. PRIOR TO ANY FILLING IN AREAS OF CUT OR IN EXISTING GROUND, PROOF ROLL THE EXPOSED SURFACE WITH A ROLLER OF MINIMUM WEIGHT OF 8 TONNES WITH A MINIMUM OF 6 PASSES.
4. EXCAVATE AND REMOVE ANY SOFT SPOTS ENCOUNTERED DURING PROOF ROLLING AND REPLACE WITH APPROVED FILL COMPACTED IN LAYERS. THE WHOLE OF THE EXPOSED SUBGRADE AND FILL SHALL BE COMPACTED TO 100% STANDARD MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT ± 2%. THE COST OF ANY RE-TESTING IS TO BE THE RESPONSIBILITY OF THE CONTRACTOR.
5. FOR ON SITE FILLING AREAS, THE PROJECT SURVEYOR SHALL BE NOTIFIED AND TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
6. ROCK: WHERE ROCK IS ENCOUNTERED AT SUBGRADE, IT SHALL BE OVER RIPPED A MINIMUM OF 300mm DEEP AND RECOMPACTED TO SPECIFICATION TO BREAK UP DRAINAGE PATHS.
7. FILL IN 150mm MAXIMUM (LOOSE THICKNESS) LAYERS TO UNDERSIDE OF BASECOURSE USING THE EXCAVATED MATERIAL AND COMPACTED TO 100% STANDARD (AS1289.5.1.1), MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT ± 2%. SHOULD THERE BE INSUFFICIENT MATERIAL FROM SITE EXCAVATIONS, IMPORT AS NECESSARY CLEAN GRANULAR FILL TO APPROVAL.
8. BATTERS TO BE AS SHOWN, OR MAXIMUM 1 VERT : 4 HORIZ.
9. ALL CONDUITS AND MAINS SHALL BE LAID PRIOR TO LAYING FINAL PAVEMENT.
10. ALL BATTERS AND FOOTPATHS ADJACENT TO ROADS SHALL BE TOPSOILED WITH 150mm APPROVED LOAM AND SEEDED UNLESS OTHERWISE SPECIFIED.

GEOTECHNICAL NOTES

1. ALL FILL SHALL BE COMPACTED TO NOT LESS THAN 95% OF STANDARD MAXIMUM DRY DENSITY. ALL AREAS WHICH HAVE TEST RESULTS LESS THAN 95 % STANDARD SHOULD BE REWORKED AND RETESTED TO ENSURE COMPLIANCE IN ACCORDANCE WITH AS1289 TESTS 12 & 13.
2. ALL FILL AREAS TO BE SURVEYED AT STRIPPING AND FINAL STAGES AND LEVELS SHOWN ON PLAN SHADED. (TOGETHER WITH CROSS SECTIONS AT MAX. 20m C/C) AT WORK AS EXECUTED STAGE AND CONTROLLED BY REGISTERED SURVEYOR.
3. ALL TESTING WORKS SHALL BE CONTROLLED AND CERTIFIED BY A N.A.T.A. REGISTERED LABORATORY. A COLLATED COPY OF ALL TESTS CERTIFICATES, ACCOMPANIED BY AN OVERALL SITE PLAN, CLEARLY INDICATING THE LOCATION OF EACH TEST AND FILL AREAS ETC. AND THE LABORATORY CERTIFICATE COVERING THE WHOLE OF THE AREA TO BE FORWARDED TO THE SUPERINTENDENT UPON COMPLETION.

SURVEY NOTES

ALL SURVEY INFORMATION PROVIDED FOR THIS PROJECT IS OBTAINED FROM JABEK PTY LTD.

1. ALL LEVELS ARE TO A.H.D.
2. ALL CHAINAGES AND LEVELS ARE IN METRES. DIMENSIONS FOR DETAILS AS SHOWN.
3. CONTRACTORS SHALL ARRANGE FOR THE WORKS TO BE SET OUT BY A REGISTERED SURVEYOR.
4. EXISTING SERVICES SHOWN SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.
5. CO-ORDINATES ARE MGA ZONE 55 GROUND.

INSPECTION HOLD POINTS

MID WESTERN REGIONAL COUNCIL (MWRC) IS TO BE NOTIFIED 24 HOURS PRIOR TO EACH INSPECTION. UPON SATISFACTORY COMPLETION OF THE WORK MWRC WILL RELEASE EACH HOLD POINT BY PROVIDING WRITTEN NOTICE TO THE SUPERINTENDENT. WORK SHALL ONLY RECOMMENCE AFTER THE HOLD POINT HAS BEEN RELEASED.

INSPECTION HOLD POINTS ARE TO BE AS FOLLOWS:

1. INSTALLATION OF ALL EROSION AND SEDIMENTATION CONTROL MEASURES
2. ROAD CONSTRUCTION
   - 2.1. PREPARATION AND PROOF ROLL OF SUB-GRADE.
   - 2.2. PREPARATION AND PROOF ROLL OF SUB-BASE.
   - 2.3. PREPARATION AND PROOF ROLL OF BASE.
   - 2.4. PREPARATION OF BASE PRIOR TO SEAL
3. INSTALLATION OF ALL WATER SUPPLY INFRASTRUCTURE PRIOR TO BACKFILLING
4. INSTALLATION OF ALL SEWERAGE INFRASTRUCTURE PRIOR TO BACKFILLING
5. CCTV INSPECTION OF ALL SEWER MAINS IS TO BE UNDERTAKEN AFTER COMPLETION OF ALL SITE WORKS BUT **PRIOR** TO INSPECTION FOR THE PURPOSES OF PRACTICAL COMPLETION.
6. AN ADDITIONAL CCTV INSPECTION OF ALL SEWER MAINS IS TO BE UNDERTAKEN NO LESS THAN ONE MONTH PRIOR TO THE COMPLETION OF THE DEFECTS LIABILITY PERIOD.
7. INSTALLATION OF ALL DRAINAGE INFRASTRUCTURE PRIOR TO BACKFILLING
8. TEST RESULTS OF SUB-BASE AND BASE COURSE MATERIAL PROPOSED PRIOR TO PLACING
9. PROOF ROLLING WITH MINIMUM 15T ROLLER OF SUBGRADE WITH MAXIMUM DEFLECTION OF DRUM THICKNESS.
10. ESTABLISHMENT OF LINE AND LEVEL FOR KERB AND GUTTER PLACEMENT
11. ROAD PAVEMENT CONSTRUCTION INCLUDING SUBMISSION OF ALL SATISFACTORY COMPACTION TEST REPORTS IN ACCORDANCE WITH AUS-SPEC ACCEPTANCE OF COMPACTED LAYERS C242.17 AND C242.18 FOR SUB-BASE AND BASE LAYERS MAXIMUM 150mm DEPTH USING RANDOM TEST LOCATIONS AS PER RTA G4
12. VISUAL INSPECTION OF ROAD PAVEMENT TO CONFIRM CONSISTENCY OF PAVEMENT PRIOR TO BITUMEN SEALING
13. VISUAL INSPECTION OF BITUMEN SEAL PRIOR TO ASPHALTING
14. ALL RECORDS FOLLOWING PAVEMENT SURFACING INCLUDING PRIMER SEAL AND ASPHALT DETAILS AS SPECIFIED IN AUS-SPEC
15. FINAL VISUAL INSPECTION OF ROAD PAVEMENT SURFACING ON COMPLETION
16. ACCEPTANCE TESTING OF WATER SUPPLY AND SEWERAGE INFRASTRUCTURE IN ACCORDANCE WITH WSA02 AND WSA03 (INCLUDING CCTV INSPECTION)
17. INSTALLATION OF FORM WORK AND STEEL PRIOR TO POURING CONCRETE
18. PRACTICAL COMPLETION
19. FINAL COMPLETION INSPECTION (AT END OF DEFECTS LIABILITY PERIOD)

ARCHITECT

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STATUS
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PROJECT
PROPOSED SUBDIVISION
17-29 FAIRYDALE LANE
MUDGEE, NSW, 2850

DESIGNED	DRAWN	DATE	SIZE	CAD REF
J.D.	J.M.	16.12.20	A1	TX15091.00

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COVER PAGE

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ISSUE
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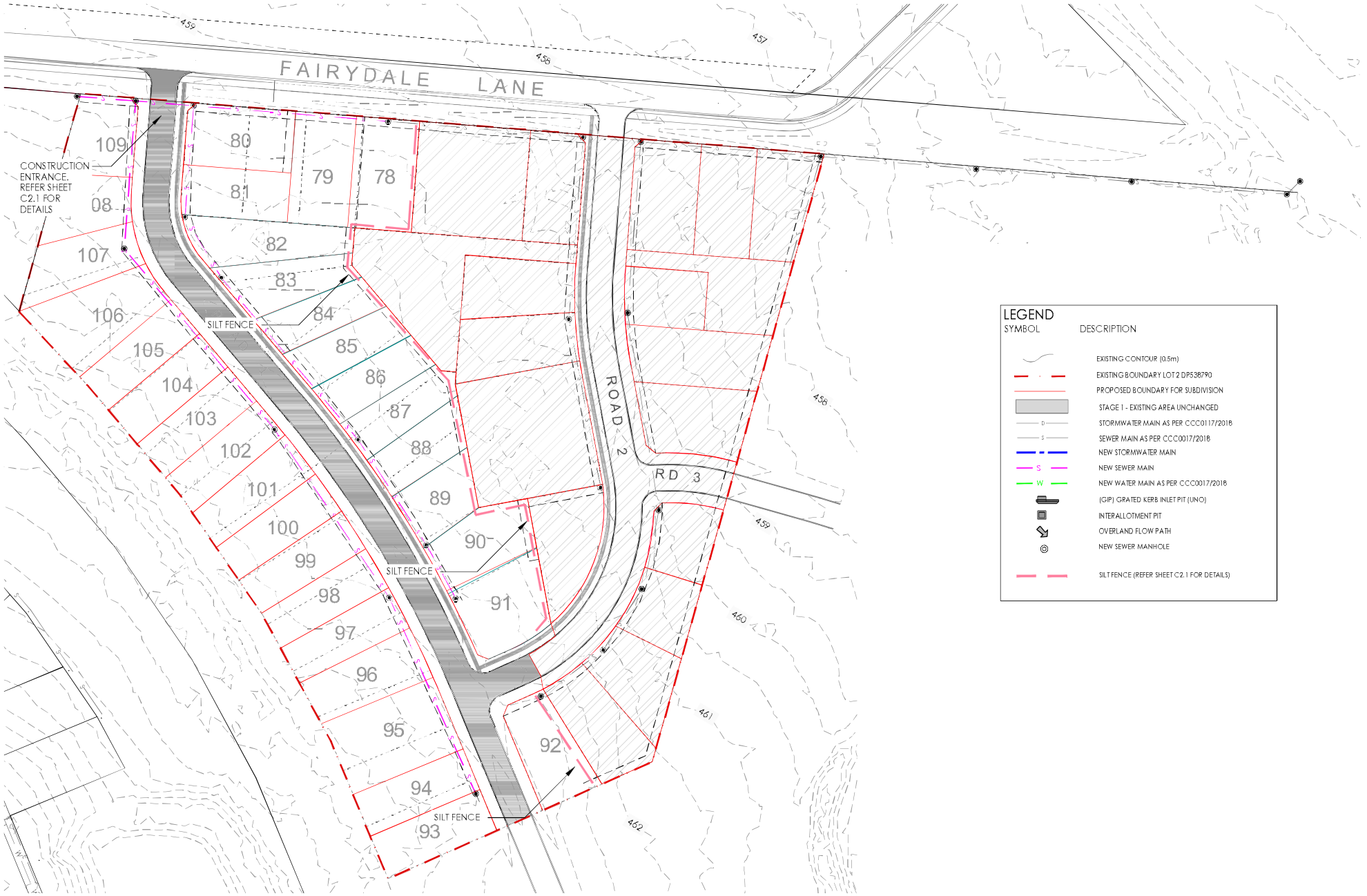

EROSION & SEDIMENT CONTROL PLAN

SCALE 1:1250 @ A3

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EROSION AND SEDIMENT CONTROL PLAN

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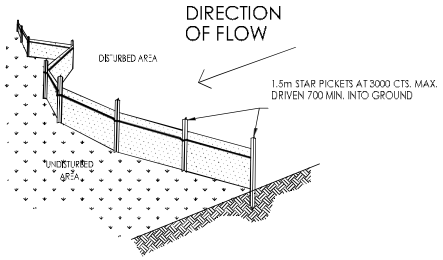
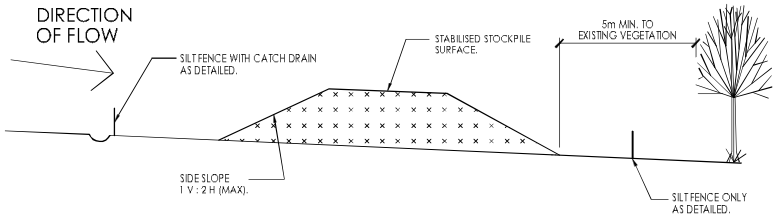


TYPICAL SILT FENCE DETAIL

N.T.S.

PROVIDE 1m RETURNS AT 30m INTERVALS TYPICAL.



TYPICAL STOCKPILE DETAIL

N.T.S.

STOCKPILE NOTES

1. PLACE ALL STOCKPILES IN LOCATIONS MORE THAN 5m FROM EXISTING VEGETATION, ROADS & HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT ELONGATED MOUNDS. SIDE SLOPE TO BE 1 V: 2 H MAX.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE STOCKPILES ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE USING WOOD CHIP MULCH - 16 TONNE/Ha.
5. CONSTRUCT SILT FENCE WITH CATCH DRAIN ON UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES & SILT FENCE ONLY 1 TO 2m DOWNSLOPE AS SHOWN.

NOTES:

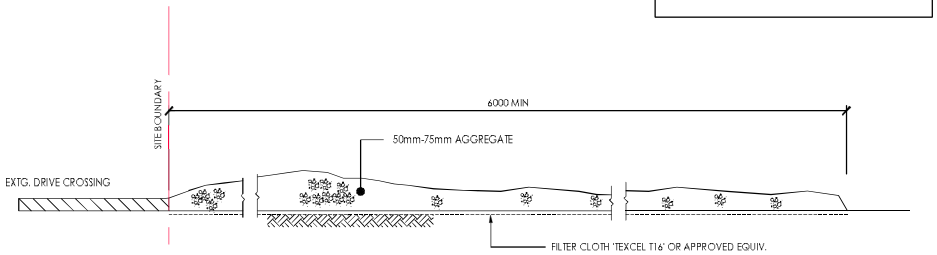
ALL EROSION & SEDIMENT CONTROL MEASURES TO BE INSPECTED & MAINTAINED DAILY BY SITE MANAGER.

MINIMISE DISTURBED AREAS.

ROADS & FOOTPATHS TO BE SWEPT DAILY.

1.2m TURF TO BE PLACED BEHIND KERBS.

DUST MINIMISATION CONTROL BY WATERING TO BE IMPLEMENTED BY SITE MANAGER AS REQUIRED OR AS DIRECTED BY MWRC COUNCIL.



CONSTRUCTION ENTRANCE

NOTE:
TO BE CONSTRUCTED PRIOR TO COMMENCEMENT OF ANY WORKS.

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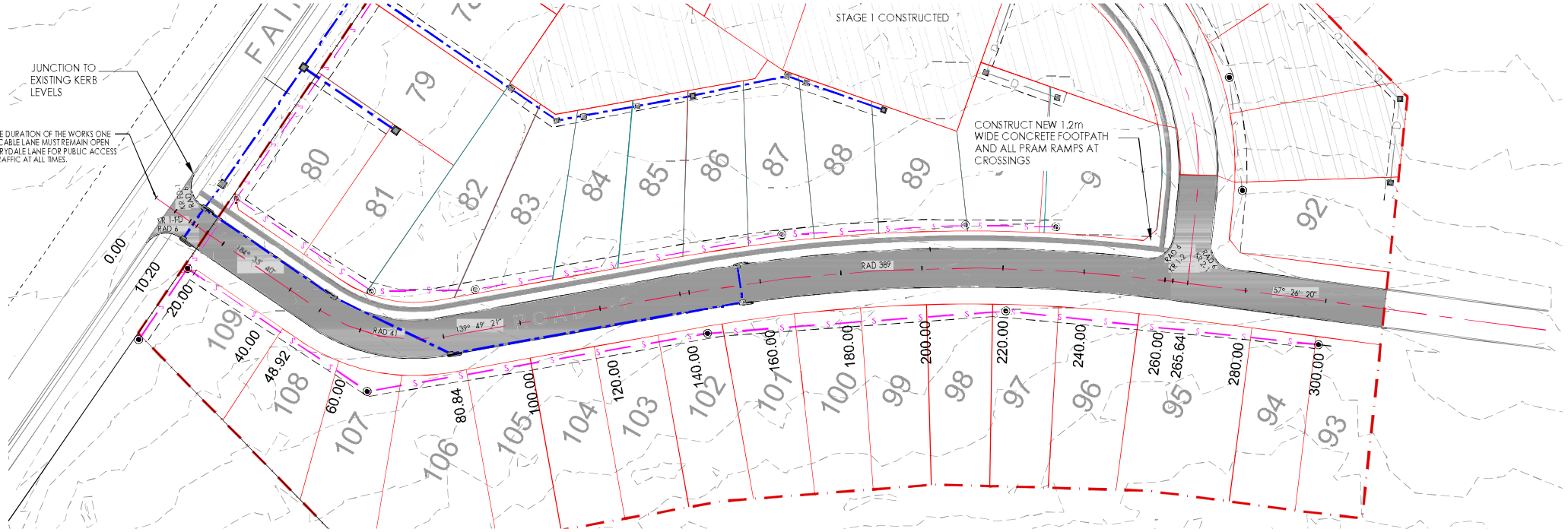
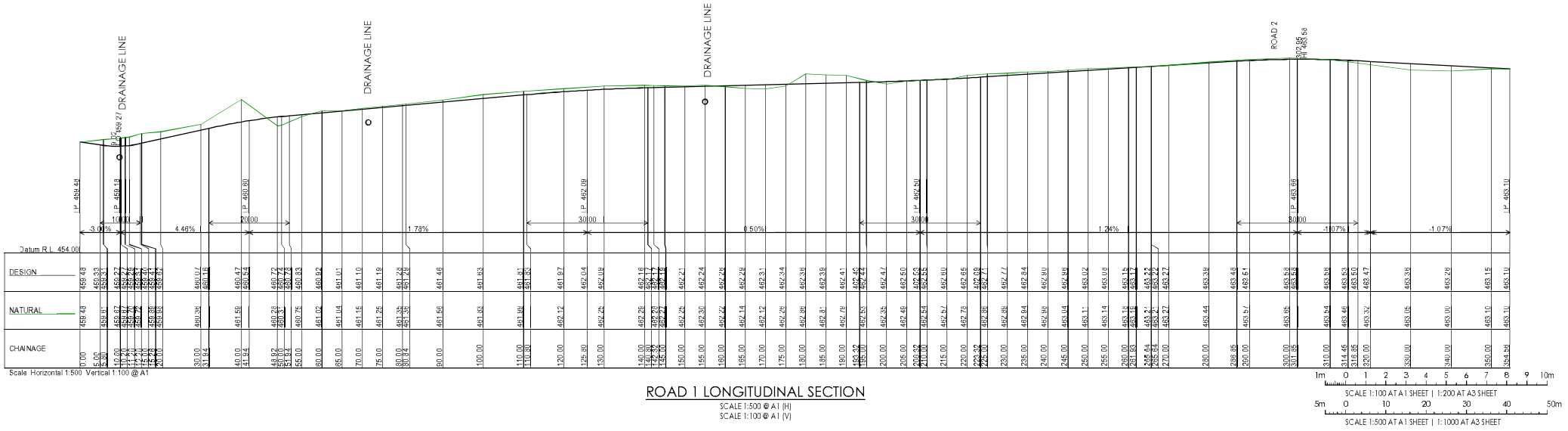


ROAD 1 PLAN
SCALE 1:500 @ A1



ROAD 1 LONGITUDINAL SECTION
SCALE 1:500 @ A1 (H)
SCALE 1:100 @ A1 (V)

SCALE 1:100 AT A1 SHEET | 1:200 AT A3 SHEET

SCALE 1:500 AT A1 SHEET | 1:1000 AT A3 SHEET

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ROAD 1 LONG SECTION
SHEET 1

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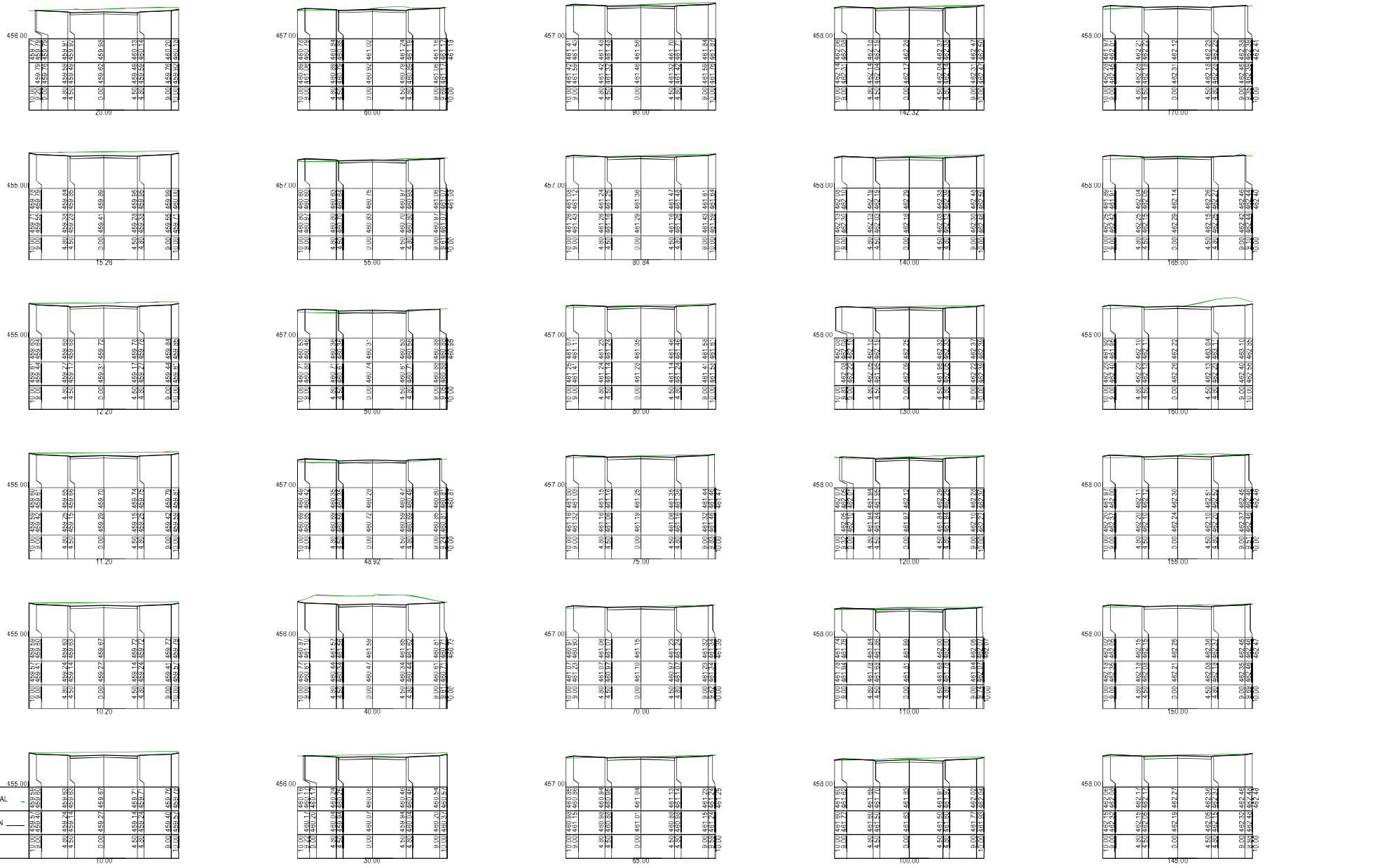

2m 0 5 10 15 20 25m

SCALE 1:250 AT A1 SHEET | 1:500 AT A3 SHEET

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PROPOSED SUBDIVISION
17-29 FAIRYDALE LANE
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ROAD 1 CROSS SECTIONS
SHEET 1

DRAWING No
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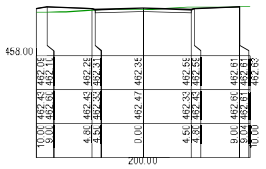

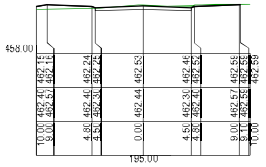

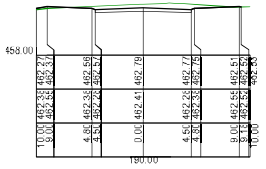

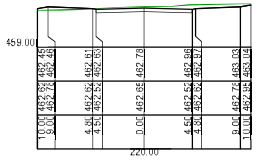

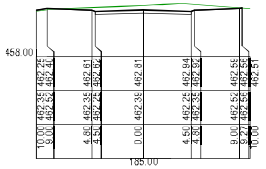

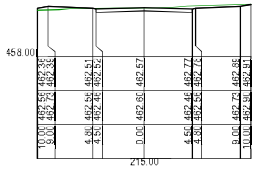

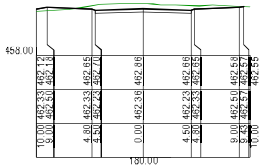

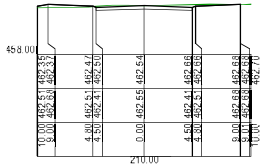

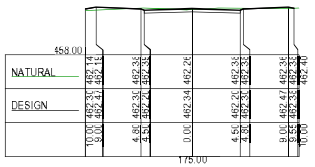

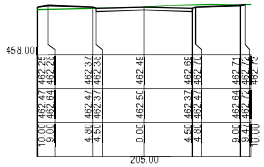

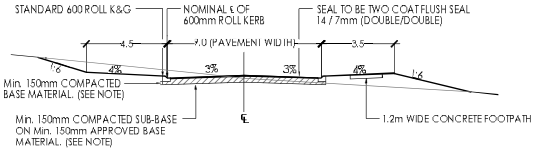

TYPICAL CROSS-SECTION
FULL ROAD CONSTRUCTION

NOT TO SCALE

NOTE:

- MINIMUM ACCEPTABLE BASE MATERIAL EITHER DGB 20, GMB 20.
- MINIMUM SUB-BASE MATERIAL EITHER DGS 20, DGS 40, GMS 40.
- MATERIAL DEPTH TO BE DETERMINED BY CBR TESTING.

2m 0 5 10 15 20 25m

SCALE 1:250 AT A1 SHEET | 1:500 AT A3 SHEET

ARCHITECT

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MAAS GROUP

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17-29 FAIRYDALE LANE
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DRAWING TITLE
ROAD 1 CROSS SECTIONS
SHEET 2

DRAWING No
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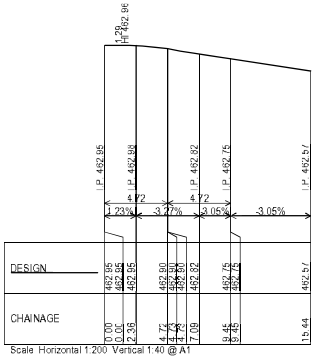
1



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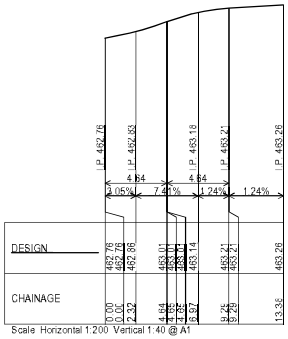

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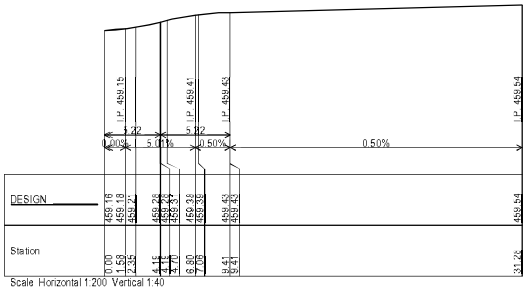

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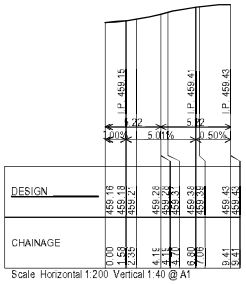

KR 1 - FD

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SCALE 1:200 AT A1 SHEET | 1:400 AT A3 SHEET

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TX-15091.00 - C3.3

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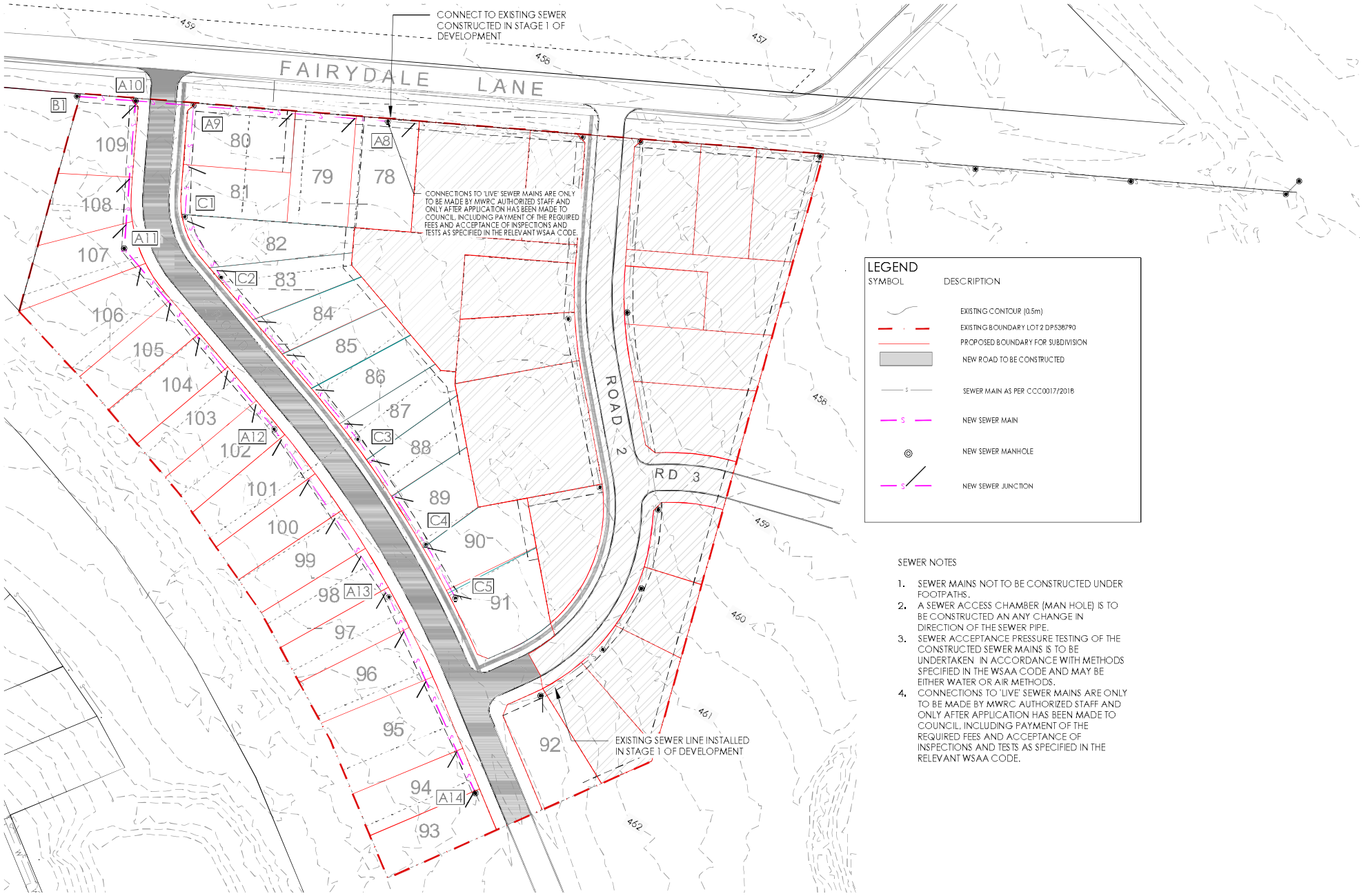

SEWER NOTES

1. SEWER MAINS NOT TO BE CONSTRUCTED UNDER FOOTPATHS.
2. A SEWER ACCESS CHAMBER (MAN HOLE) IS TO BE CONSTRUCTED AN ANY CHANGE IN DIRECTION OF THE SEWER PIPE.
3. SEWER ACCEPTANCE PRESSURE TESTING OF THE CONSTRUCTED SEWER MAINS IS TO BE UNDERTAKEN IN ACCORDANCE WITH METHODS SPECIFIED IN THE WSAA CODE AND MAY BE EITHER WATER OR AIR METHODS.
4. CONNECTIONS TO 'LIVE' SEWER MAINS ARE ONLY TO BE MADE BY MWRC AUTHORIZED STAFF AND ONLY AFTER APPLICATION HAS BEEN MADE TO COUNCIL, INCLUDING PAYMENT OF THE REQUIRED FEES AND ACCEPTANCE OF INSPECTIONS AND TESTS AS SPECIFIED IN THE RELEVANT WSAA CODE.

SEWER PLAN
SCALE A

0 5 10 15 20m
SCALE A

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SEWER PLAN

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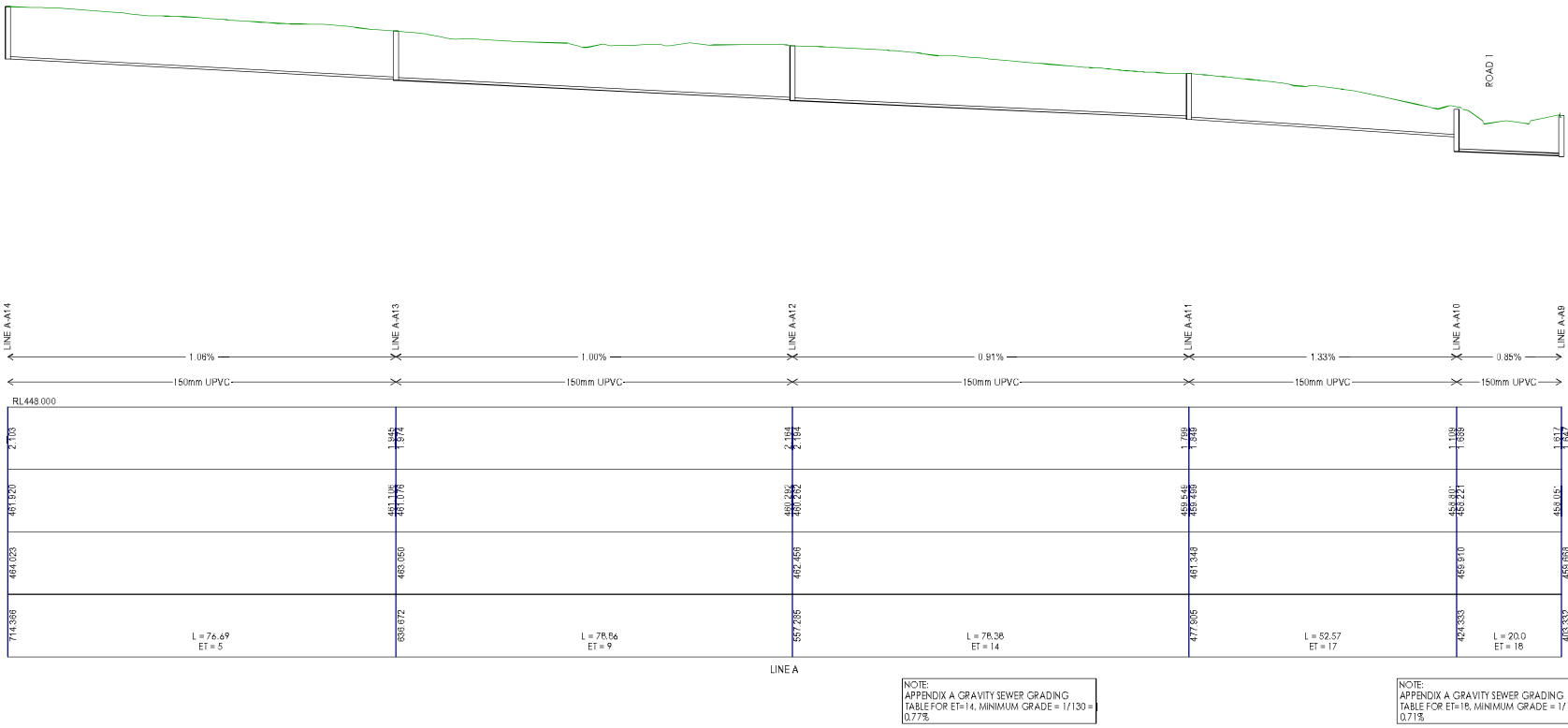

SEWER LONGITUDINAL SECTION LINE A

SCALE 1:1000 @ A3

ARCHITECT

ISSUED FOR CONSTRUCTION	27.08.21	1
ISSUED FOR CONSTRUCTION CERTIFICATE	03.05.21	0

STATUS
CONSTRUCTION CERTIFICATE

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MAAS GROUP

PROJECT
PROPOSED SUBDIVISION
17-29 FAIRYDALE LANE
MUDGEE, NSW, 2850

DESIGNED	DRAWN	DATE	SIZE	CAD REF
J.D.	J.M.	16.12.20	A1	TX15091.00

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DRAWING TITLE
SEWER LONG SECTION
SHEET 1

DRAWING No
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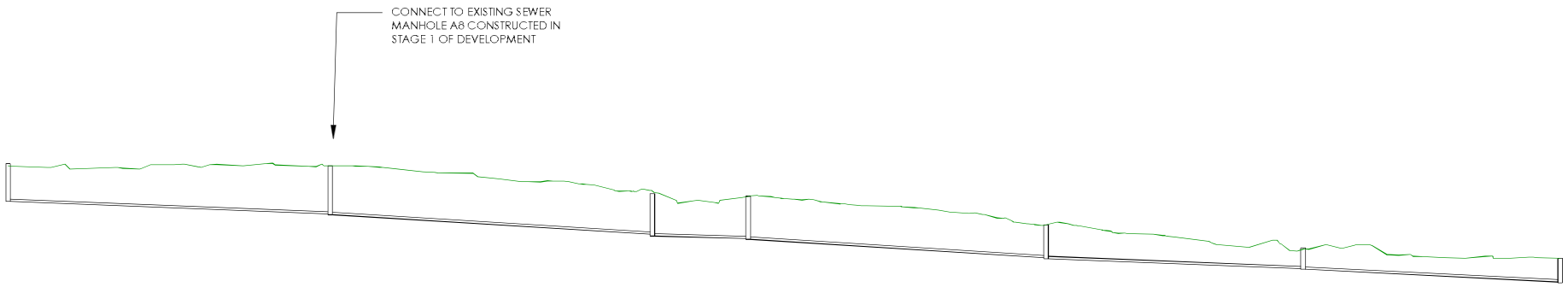

	LINE A-A9		LINE A-A8		LINE A-A7		LINE A-A6		LINE A-A5		LINE A-A4		LINE A-A3
GRADE		0.80%		1.22%		0.58%		1.25%		0.80%		1.00%	
PIPE SIZE		150mm UPVC		150mm UPVC		150mm UPVC		150mm UPVC		150mm UPVC		150mm UPVC	
DATUM R.L	RL448.000												
DEPTH TO INVERT	1.617 1.647		2.110 2.140		1.780 1.800		1.881 1.881		1.443 1.434		0.912 0.942		1.040 1.010
INVERT LEVEL	466.051 466.021		467.494 467.464		466.581 466.561		466.385 466.385		465.551 465.561		465.068 465.039		464.486
SURFACE LEVEL	469.668		469.674		468.361		468.266		466.994		466.981		465.526
CHAINAGE	403.332		332.877		262.021		241.021		175.881		119.314		82.837
		L = 69.66 ET = 30											

NOTE:
APPENDIX A GRAVITY SEWER GRADING
TABLE FOR ET=30, MINIMUM GRADE = 1/150 = 0.67%

EXISTING SEWER LINE

LINE A

SEWER LONGITUDINAL SECTION LINE A

SCALE 1:1000 @ A3

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SEWER LONG SECTION
SHEET 2

DRAWING No
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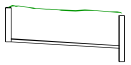
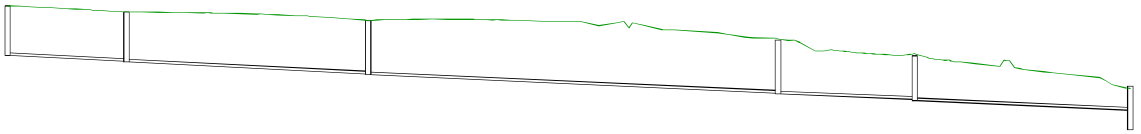
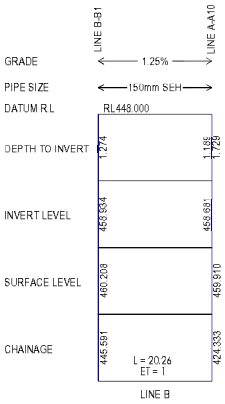
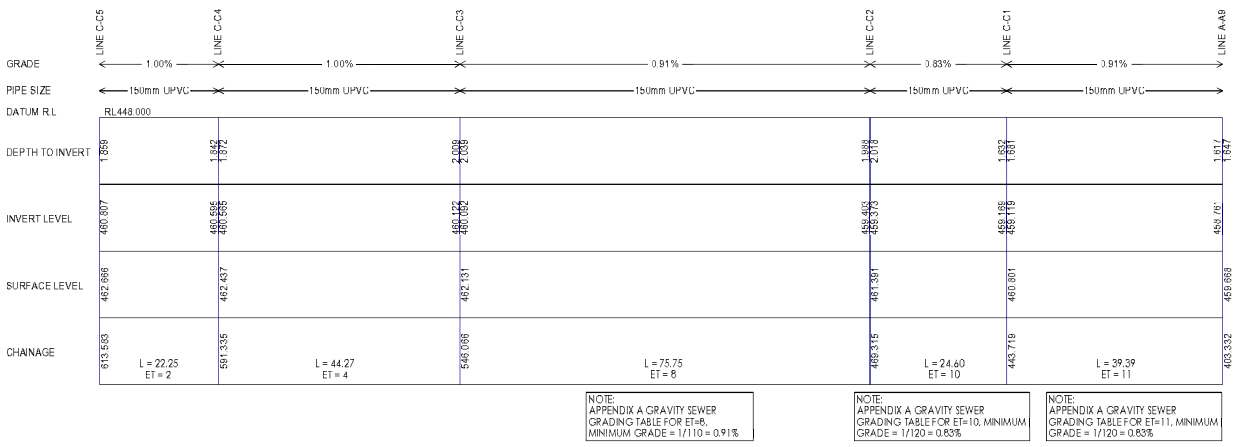






SEWER LONGITUDINAL SECTION LINE B

SCALE 1:1000 @ A3



SEWER LONGITUDINAL SECTION LINE C

SCALE 1:1000 @ A3

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SEWER LONG SECTION
SHEET 3

DRAWING No
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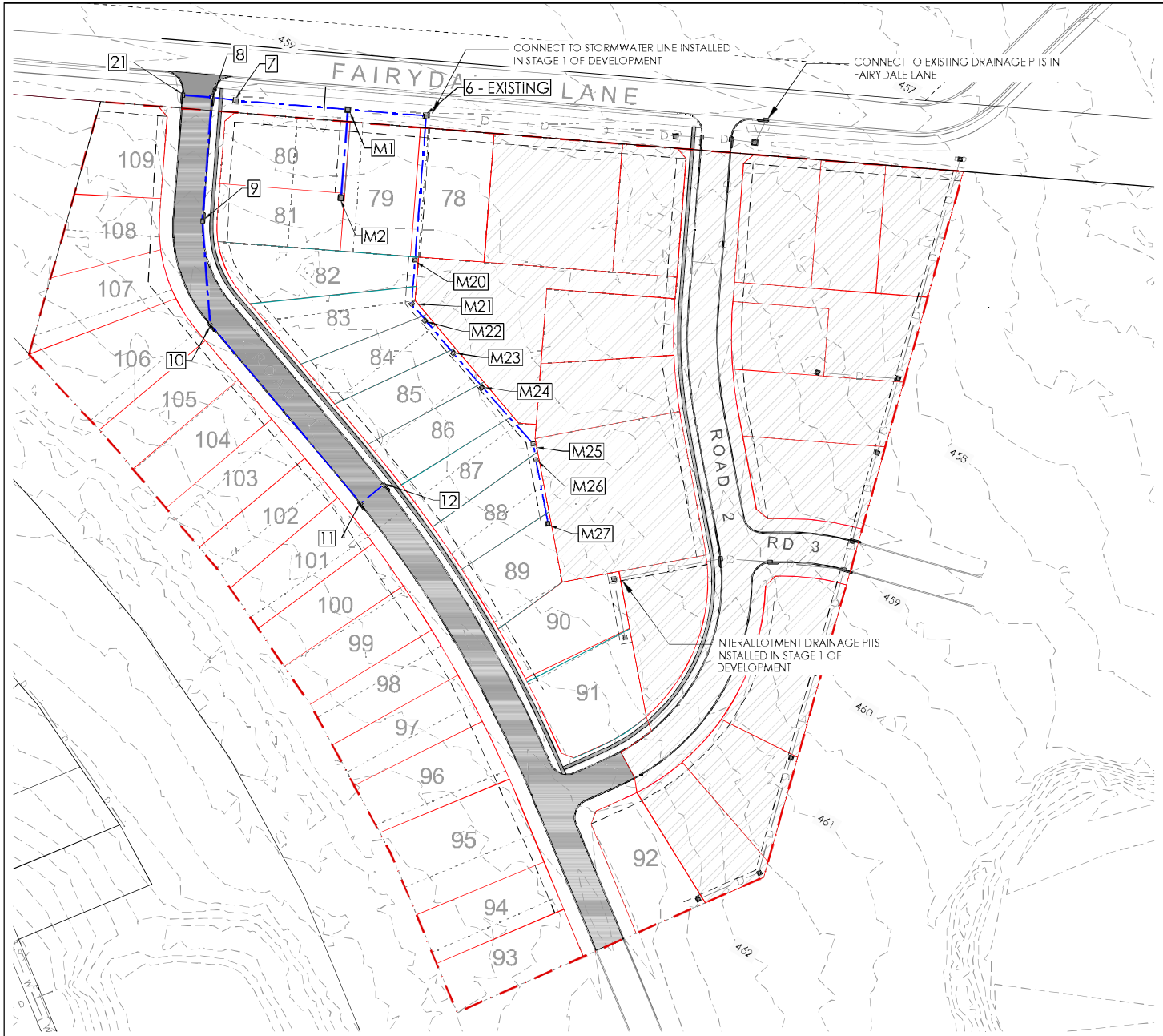

LEGEND

SYMBOL	DESCRIPTION
	EXISTING CONTOUR (0.5m)
	EXISTING BOUNDARY LOT 2 DP538790
	PROPOSED BOUNDARY FOR SUBDIVISION
	STAGE 1 - EXISTING AREA UNCHANGED
D	STORMWATER MAIN AS PER CCC0117/2018
S	SEWER MAIN AS PER CCC0017/2018
	NEW STORMWATER MAIN
S	NEW SEWER MAIN
W	NEW WATER MAIN AS PER CCC0017/2018
	(GIP) GRATED KERB INLET PIT (UNO)
	INTERALLOTMENT PIT
	OVERLAND FLOW PATH
	NEW SEWER MANHOLE

DRAINAGE PLAN
SCALE A

0 5 10 15 20m
SCALE A

ARCHITECT

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DRAWING TITLE
DRAINAGE PLAN

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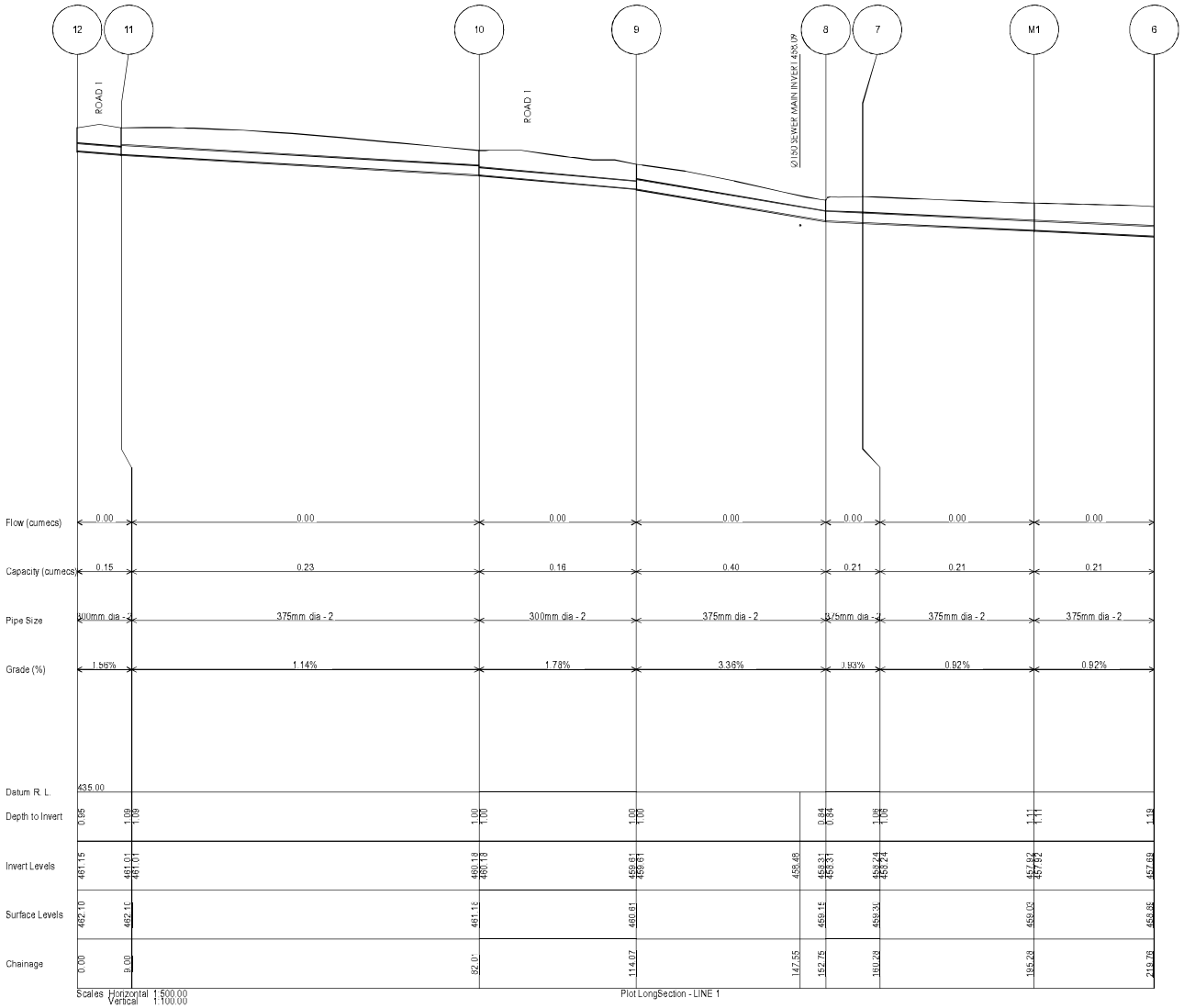
1



DRAINAGE LONGITUDINAL SECTION LINE 1

SCALE 1:500 @ A1 (H)
SCALE 1:100 @ A1 (V)

1m 0 1 2 3 4 5 6 7 8 9 10m
SCALE 1:100 AT A1 SHEET | 1:200 AT A3 SHEET
5m 0 10 20 30 40 50m
SCALE 1:500 AT A1 SHEET | 1:1000 AT A3 SHEET

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DRAINAGE LONG SECTION
SHEET 1

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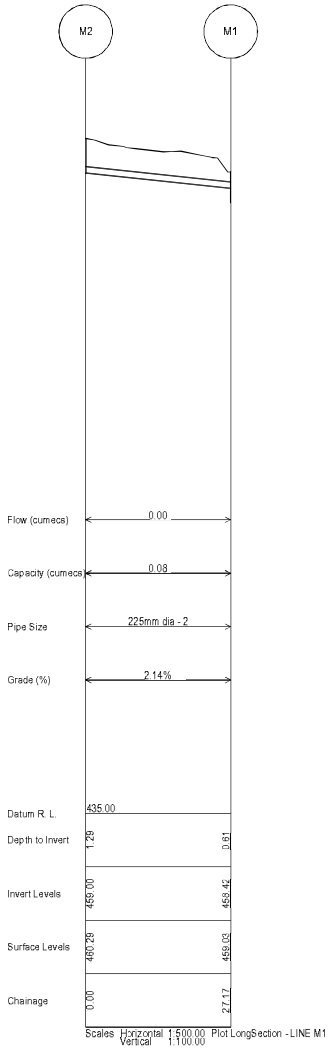

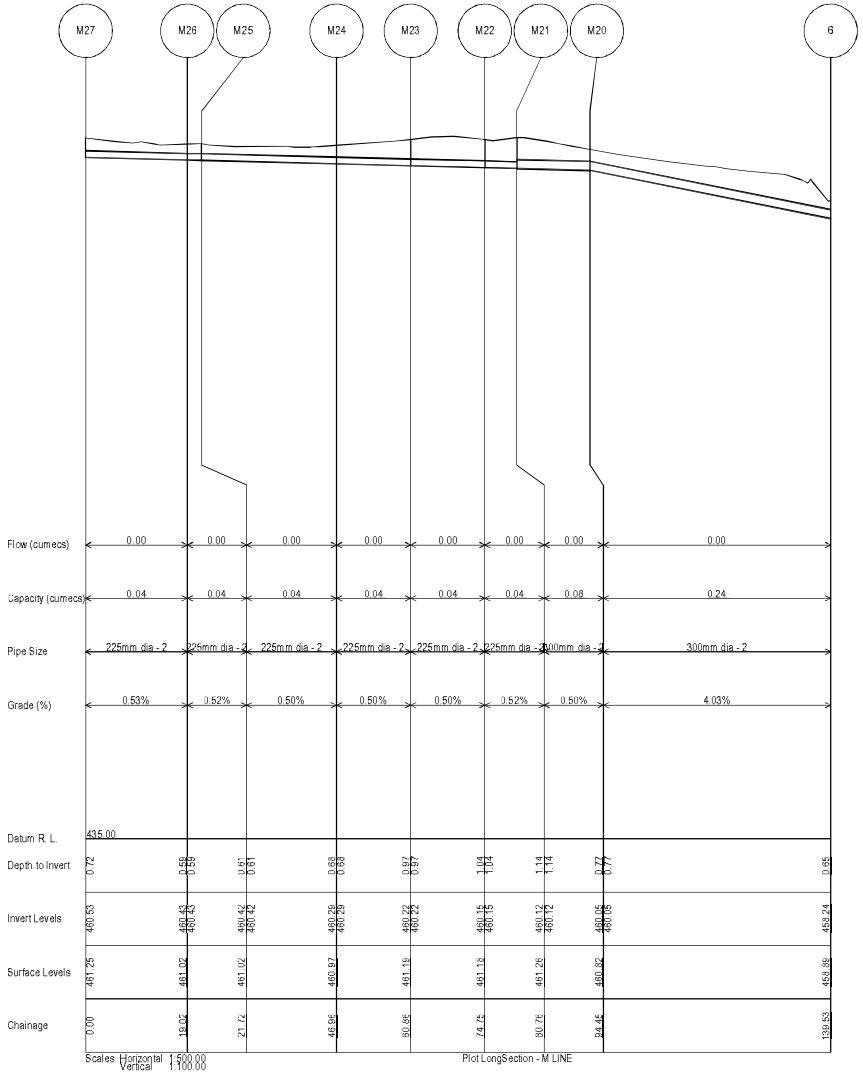

DRAINAGE LONGITUDINAL SECTION LINE M1

SCALE 1:500 @ A1 (H)
SCALE 1:100 @ A1 (V)

DRAINAGE LONGITUDINAL SECTION LINE M2

SCALE 1:500 @ A1 (H)
SCALE 1:100 @ A1 (V)

1m 0 1 2 3 4 5 6 7 8 9 10m
SCALE 1:100 AT A1 SHEET | 1:200 AT A3 SHEET
5m 0 10 20 30 40 50m
SCALE 1:500 AT A1 SHEET | 1:1000 AT A3 SHEET

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DRAINAGE LONG SECTION
SHEET 2

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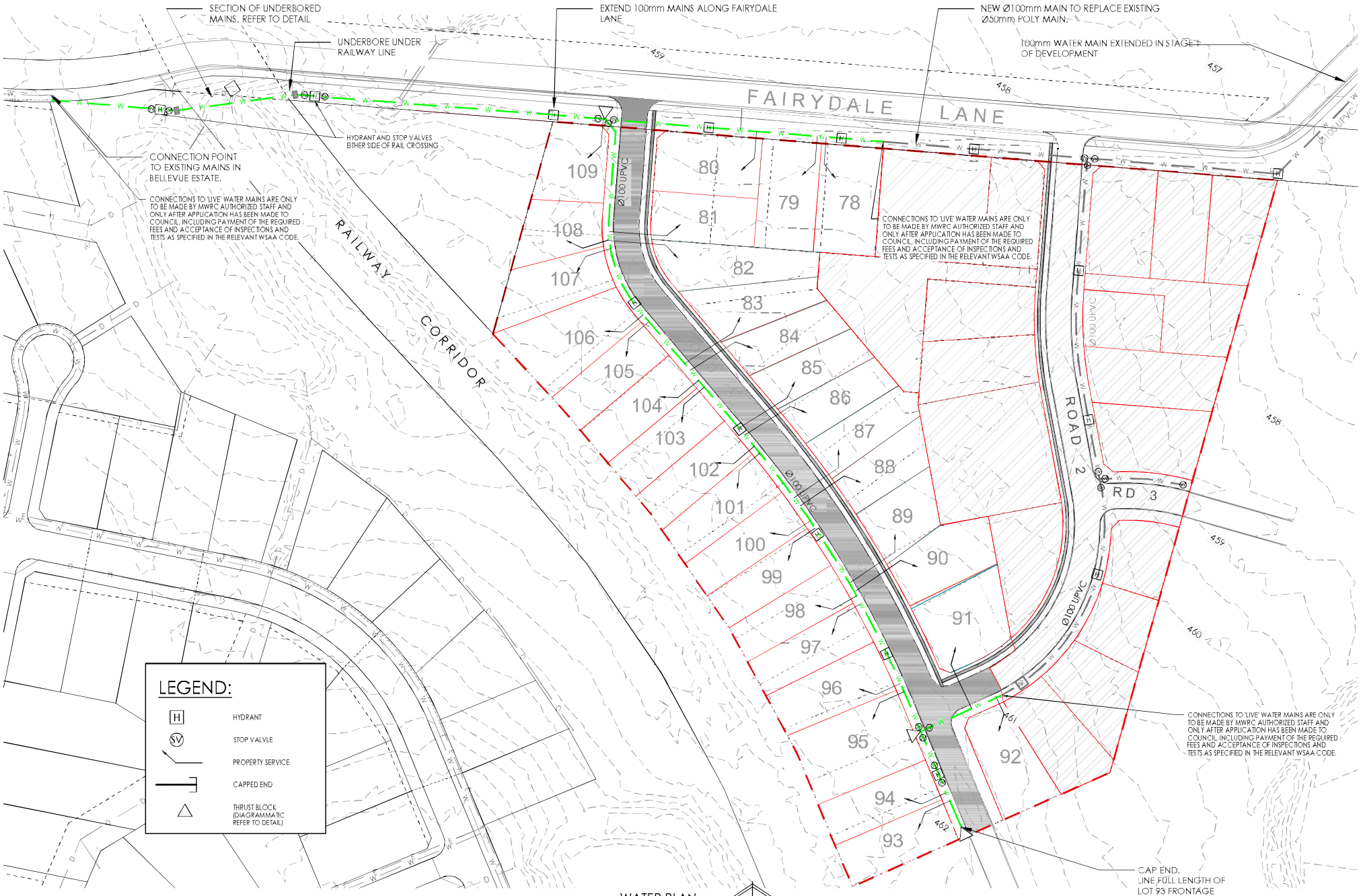

WATER PLAN
SCALE 1:1250 @ A3

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DRAWING TITLE
WATER PLAN

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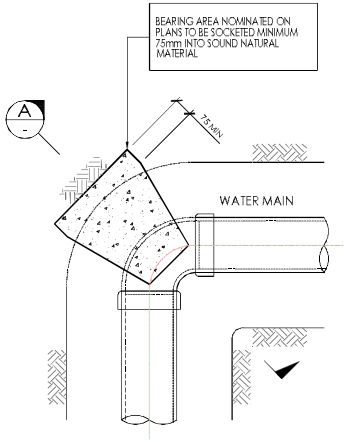
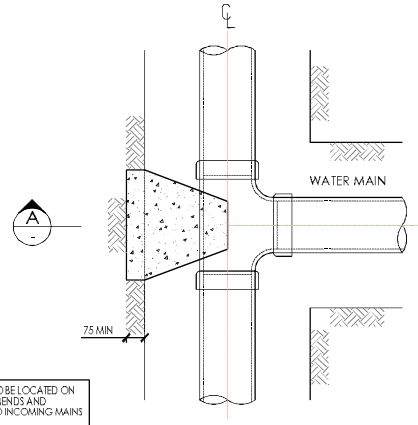
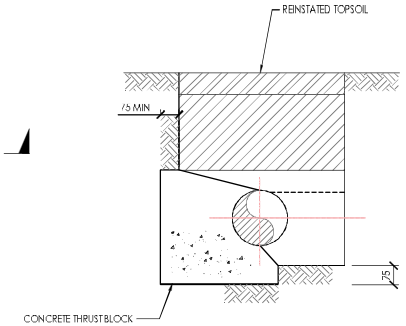


THRUST BLOCK DETAIL
TYPICAL BEND
N.T.S.



THRUST BLOCK TO BE LOCATED ON OUTSIDE OF ALL BENDS AND OPPOSITE SIDE TO INCOMING MAINS AT TEES

THRUST BLOCK DETAIL
TYPICAL TEE
N.T.S.



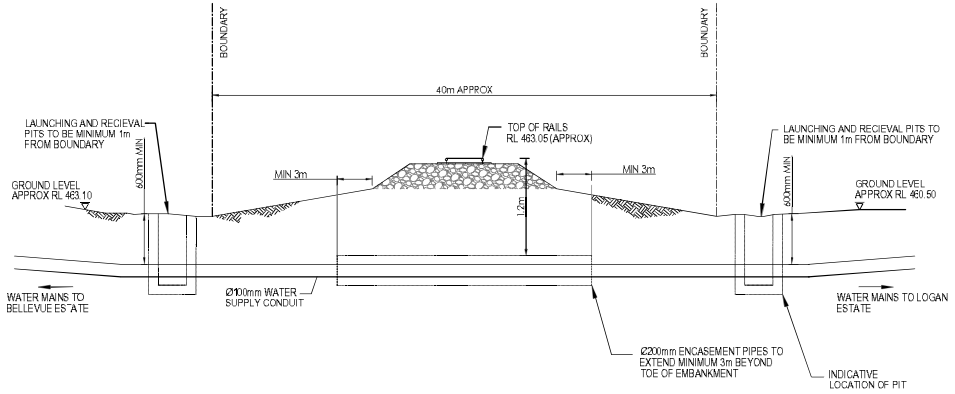
SECTION N.T.S. A

MINIMUM THRUST AREA FOR CONCRETE BLOCKS					
WATER MAIN SIZE (mm)	90° & 60° BENDS	45° & 30° BENDS	22.5° BENDS	11.25° BENDS	TEES AND DEAD ENDS
100	N	N	N	N	N
150	0.34	N	N	N	0.34

THRUST BLOCK TYPICAL SIZES
TABLE 7.3 WSA 03-2011-3.1 FOR AHBP 100kPa

NOTES: 'N' DENOTES NOMINAL THRUST BLOCK AREA OF BELOW FITTING TO ABOVE FITTING FOR FULL TRENCH WIDTH

MINIMUM VERTICAL CLEARANCES	
WATER MAIN	150mm
TELECOMMUNICATIONS	150mm
ELECTRICITY CABLES/CONDUIT	225mm
STORMWATER DRAINS	150mm
SEWER LINES	500mm



RAILWAY UNDERBORE SECTION
N.T.S.

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APPURTENANCE NOTES:

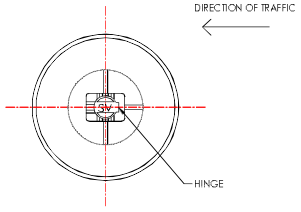
1. HYDRANTS TO BE SPRING LOADED TYPE OF 80mm NOMINAL SIZE FBE-RISLAN COATED COMPLETE WITH HYDRANT TEE OF CAST OR DUCTILE IRON.
2. APPROVED CEMENT LINED CAST IRON BOXES SHALL BE FIXED OVER ALL VALVES AND HYDRANTS.
3. RISERS TO HYDRANTS AND VALVES TO BE PROVIDED AS REQUIRED TO HAVE HYDRANTS NOMINALLY 75-225 BETWEEN TOP OF BOX AND TOP OF SPINDLE.
4. PLACE PROTECTION SLEEVE (90mm STORMWATER) OVER SERVICE ISOLATION VALVE.
5. IN AREAS PAVED WITH BITUMEN SEALING, ASPHALT, CONCRETE OR PAVING BLOCKS THE SURFACE VALVE AND HYDRANT COVERS SHALL BE FLUSH WITH THE PAVED SURFACE.
6. BI-DIRECTIONAL BLUE FIRE HYDRANT RAISED REFLECTIVE PAVEMENT MARKERS LOCATED ON ROAD CENTRELINE TO BE 50mm CLEAR OF ANY LINEMARKING. RAISED BLUE FIRE HYDRANT MARKERS SHALL BE IN ACCORDANCE WITH AS1906.3.
7. ALL WATER STOP VALVES ARE TO BE 'CLOCKWISE CLOSING' VALVES.

CONDUITS NOTE:

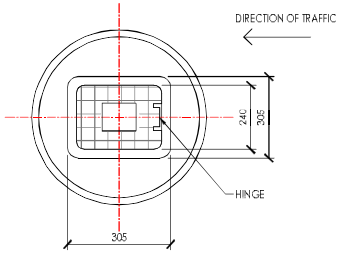
1. CONDUITS TO BE LAID UNDER ROADWAY WITH MINIMUM 600mm COVER COMMENCING 600mm FROM THE MAIN AND LAID AT RIGHT ANGLES TO THE MAIN AND TERMINATING 2.5m FROM THE PROPERTY BOUNDARY UNLESS SHOWN OTHERWISE.
2. CONDUITS TO BE 100mm UPVC CLASS 6 SEWER PIPE (WATER ONLY).
3. THE LETTER "W" TO BE MARKED INTO KERB ABOVE THE CONDUITS PLACED FOR WATER AND PAINTED TO A STANDARD APPROVED BY THE MID WESTERN REGIONAL COUNCIL.
4. FOR CONDUITS FOR ELECTRICAL RETICULATION SEE DRAWING BY ESSENTIAL ENERGY.
5. THE LETTER "C" TO BE MARKED INTO KERB ABOVE THE CONDUITS PLACED FOR POSSIBLE FUTURE USE.
6. SEPARATE CONDUITS ARE TO BE PROVIDED FOR EACH LOT.

WATER NOTES:

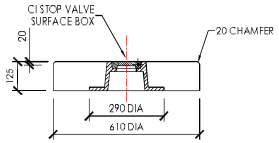
1. WATER MAINS TO BE LAID GENERALLY IN ACCORDANCE WITH REQUIREMENTS OF WSA03-2011 AND PIPE MANUFACTURER.
2. MINIMUM COVER OVER PIPELINES (ALL TYPES) SHALL BE 750mm IN AREAS SUBJECT TO VEHICULAR LOADING SUCH AS ROADS AND 600mm ELSEWHERE. MINIMUM DEPTH OF COVER UNDER SEALED CARRIAGEWAY SHALL BE TAKEN FROM THE INVERT OF THE KERB.
3. WATER MAINS TO BE 100mm UPVC CLASS 12 RUBBER RING JOINTED AS PER AS2977 DUCTILE IRON COMPATIBLE WITH WATER MAIN ROAD CROSSINGS IN DUCTILE IRON. DUCTILE IRON PIPE AND FITTINGS AND ANY NON RISLAN COATED FITTINGS TO BE SLEEVED.
   - 3.1. ALTERNATIVELY PVC-M AS/NZS4765, SERIES 1 OR 2 MINIMUM PN 12 RUBBER RING JOINT.
4. DICL AS/NZS2280 PN35 RUBBER RING JOINT, PE WRAPPED AS3680. IF DICL FLANGED PIPE IS USED THE CLASS SHALL BE THE FLANGE CLASS PIPE.
5. DICL TO EXTEND 1m BEYOND BACK OF KERB OR INTO FITTINGS, WHERE PROVIDED.
6. MAX DEFLECTION ON BENDS PER JOINT AS PER MANUFACTURERS SPECIFICATION.
7. THRUST BLOCKS TO BE PROVIDED AT ALL BENDS, TEE, TAPERS, VALVES AND DEAD ENDS TO THE SATISFACTION OF COUNCIL AND DESIGN IN ACCORDANCE WITH THE REQUIREMENTS OF PIPELINE MANUFACTURER/DESIGNER.
8. TRENCH STOPS AND BULKHEADS (TS) ARE TO BE PLACED IN WATER TRENCHES ON LINES AT THE FOLLOWING SPACING IN ACCORDANCE WITH TABLE 7.5 OF WSA03-2011:
   - 8.1. GRADE > 5% BUT <= 14% = 100/GRADE% m (TRENCH STOP)
   - 8.2. GRADE >15% BUT <=29% = (80xPIPE LENGTH)/GRADE% m (CONCRETE BULKHEAD)
9. ACCEPTANCE TESTING TO BE CARRIED OUT IN ACCORDANCE WITH WSA03-2011, INCLUDING PRESSURE TESTING AND DISINFECTION TESTING. DETAILS OF THE CONTRACTOR ENGAGED FOR DISINFECTION AND THEIR PROPOSED DISINFECTION METHOD MUST BE PROVIDED TO COUNCIL PRIOR TO DISINFECTION BEING UNDERTAKEN.
10. PRODUCTS IN CONTACT WITH POTABLE WATER SHALL BE TESTED AND COMPLY WITH REQUIREMENTS OF AS/NZS4020 FOR PRODUCTS IN CONTACT WITH DRINKING WATER.
11. PROVISION OF TEMPORARY CAP AT COMPLETION OF EACH STAGE TO ALLOW SMOOTH TRANSITION TO FUTURE STAGES.
12. LAY DETECTABLE MARKING TAPE ON TOP OF THE PIPE EMBEDMENT MATERIAL BEFORE TRENCH FILLING. LAY THE TAPE OVER THE EMBEDMENT TO FORM A CONTINUOUS CONNECTION BETWEEN VALVES AND/OR HYDRANTS. STRIP THE ENDS OF THE TAPE TO EXPOSE ITS CONDUCTING WIRES. CONNECT BARE WIRES TO A NUT OR BOLT OF A VALVE OR HYDRANT TO FORM AN ELECTRICAL CONNECTION OF THE WIRE TO THE VALVE OR HYDRANT.
13. ALL SERVICES Ø20 CLASS A ANNEALED COPPER WITH LOCKABLE BALL VALVE AND TURNED OFF AT MAIN COCKS AFTER TESTING AND COMMISSIONING. TAPPING BANDS FOR SERVICES TO BE INSTALLED IN ACCORDANCE WITH CLEARANCES AS RECOMMENDED BY MANUFACTURER. LAY MARKING TAPE ON TOP OF THE CONNECTION PIPEWORK. TO BE INSTALLED PERPENDICULAR TO THE WATER MAIN. TO HAVE A HORIZONTAL CLEARANCE NO LESS THAN 600mm. MAIN COCKS ARE TO HAVE TWO POINTS OF ISOLATION AND ARE TO BE OF A "CAP AND COVER" TYPE.
14. WATER MAINS ARE NOT TO BE CONSTRUCTED UNDER FOOTPATHS.
15. TREES ARE NOT TO BE PLANTED ABOVE WATER MAINS.



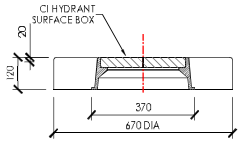
STOP VALVE COVER - PLAN
N.T.S.



HYDRANT COVER - PLAN
N.T.S.



STOP VALVE COVER - SECTION
N.T.S.



HYDRANT COVER - SECTION
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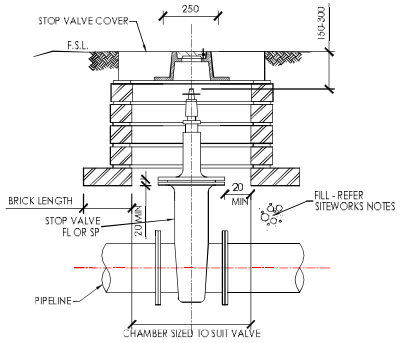
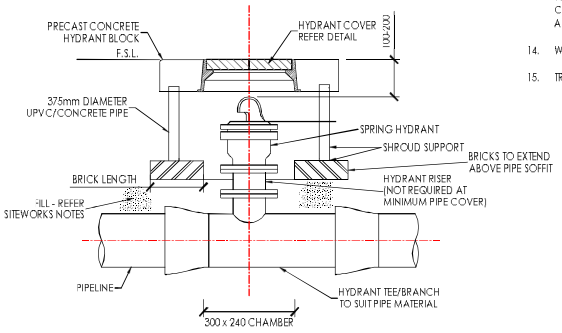


STOP VALVE INSTALLATION
N.T.S.



HYDRANT INSTALLATION WITH UPVC AND CONCRETE PIPE CHAMBER
N.T.S.

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17-29 FAIRYDALE LANE
MUDGEE, NSW, 2850

DESIGNED	DRAWN	DATE	SIZE	CAD REF
J.D.	J.M.	16.12.20	A1	TX15091.00

ISSUED FOR CONSTRUCTION	27.08.21	1
ISSUED FOR CONSTRUCTION CERTIFICATE	03.05.21	0

STATUS
CONSTRUCTION CERTIFICATE

TRIAXIAL CONSULTING
COMPLEX PROBLEMS RESOLVED SIMPLY

1300 874 294 | TRIAXIAL.COM.AU

46 MARKET STREET, MUDGEE, NSW 2850
PO BOX 1075, MUDGEE, NSW 2850

SYDNEY | ADELAIDE | BAROSSA | DARWIN | MUDGEE

DRAWING TITLE
WATER DETAILS
SHEET 2

DRAWING No
TX-15091.00 - C6.2

ISSUE
1

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