OFFER OF PROFESSIONAL SERVICES

CONCEPT DESIGN REPORT

Project No: MKR00959

FEBRUARY 2025

Prepared For:

HIRINGA

MAKER ENG

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Reviewed By: James Agustin Date: 13/03/2025

Approved By: James Agustin Date: 13/03/2025

External Issue

Revision Control Register			
Version	Issue Date:	Issued To:	Name:
Rev 1	13/03/2025	Hiringa Energy	James Agustin

1 INTRODUCTION

Hiringa Energy have engaged MakerENG Pty Ltd (Maker) to prepare the concept design drawing package for the site entrance to the proposed Green Hydrogen and Ammonia Project (GEGHA), located at 2910 Gwydir Highway, Moree. The proposed entrance location is shown below in **Figure 1.**

Figure 1 – Proposed Site Access Location (Google Maps, August 2022)

This report predominantly seeks to provide clarification to Transport for NSW on the design rationale for the concept design.

2 EXISTING INFORMATION

Currently, the road adjacent to the proposed GEGHA site (Gwydir Highway) maintains a speed limit of 100km/h, and there are no existing plans to reduce this speed. The primary goal of this project is to improve the safety measures for individuals entering and exiting the proposed GEGHA site.

Considering the current speed limit, and the variety of vehicles that will be entering and exiting the site, a BAR/BAL entry is required for vehicles to safely pull off Gwydir Highway before entering the site.

2.1 DETAILED SURVEY

SMK consultants completed the detailed survey prior to the commencement of the concept design package. The survey was completed in MGA55 GDA 2020.

3 CONCEPT DESIGN PHASE

The following section outlines the design rationale for the concept design.

3.1 TREATMENT SELECTION

3.1.1 Basic Turn Treatments – Rural Basic Left-Turn Treatment (BAL)

Basic Turn Treatments are a simpler intersection layout compared to auxiliary lanes and are designed to be compact and are typically more cost-effective. They are ideal for areas where the proportion of turning traffic is low when compared to through traffic. The BAL consists of an intersection where the swept path of the design vehicle is used to determine an appropriate kerb return radius. From this point, the length of the BAL and the taper can be determined. BAL's may be used with any type of wearing surface and must be installed with adequate line marking and signage delineation. Additionally, such intersections/turning treatments should be located only where there is sufficient sight distance available.

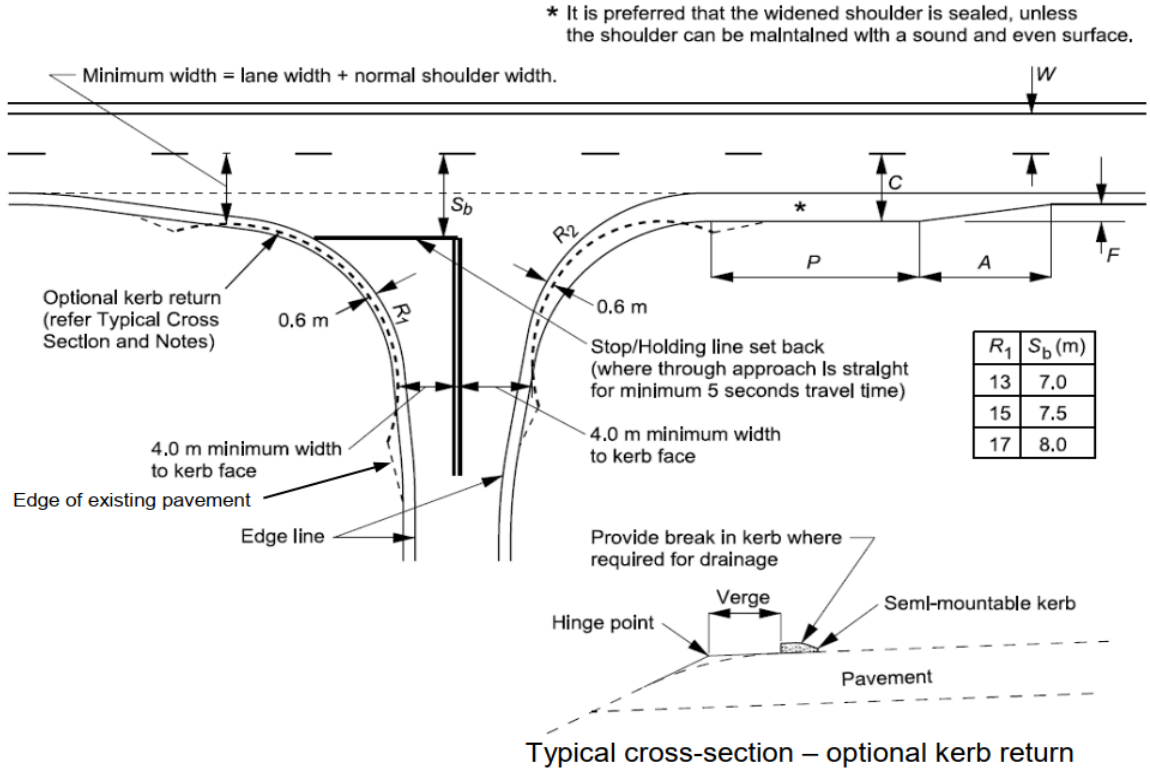
3.1.2 Basic Turn Treatments – Rural Basic Right-Turn Treatment (BAR)

This treatment provides sufficient trafficable width for the design through vehicle to pass on the left of a stationary turning vehicle. This is achieved by widening the shoulder to provide a minimum width sufficient to allow the vehicles to pass. Where adequate through sight distance exists, BAR turn treatments will generally be marked with a broken centreline to allow overtaking on the major road through the intersection. This will not restrict overtaking opportunities, thereby minimising delays.

3.1.3 Rural Basic Left-Turn (BAL) Geometric Design

Austroads Guide to Road Design Part 4A: Unsignalized and Signalized Intersections, outlines the various dimensions that make up the geometry of a Rural Basic Left-Turn

Figure 8.2: Rural basic left-turn treatment (BAL)



R_1	S_b (m)
13	7.0
15	7.5
17	8.0

treatment and the calculations (if any) required to obtain such values. The below **Figure 2** illustrates the BAL parameters.

Figure 2 - BAL Parameters

BAL Parameters

- R_1 *and* R_2 *are determined by the swept path of the design vehicle.*
  - $R1 = 21.0m$
  - $R2 = 21.0m$
- $W = Nominal\ Through\ Lane\ Width\ (m) = 3.5m$
- $C = Distance\ From\ Shoulder\ Widening\ to\ CL = 7.5m$
- $V = Design\ speed\ of\ Major\ Road\ Approach\ \left(\frac{km}{h}\right) = 120\left(\frac{km}{h}\right)$
- $F = Formation\ Widening\ = 3.0m$
- $A = \frac{(0.5)VF}{3.6} = \frac{(0.5)(120)(3.0)}{3.6} = 50.0m$
- $P = Minimum\ Length\ of\ Parallel\ Widened\ Shoulder\ (From\ Table\ 8.1) = 45.0m$
- $S_b = Setback\ distance\ from\ stop\ \&\ giveway\ line\ to\ major\ road\ CL = 10.0m$

The above assumptions and dimensions have been provided within the Concept Design documentation package, as they stipulate the geometry of the required turning treatment.

3.1.4 Rural Basic Right-Turn (BAR) Geometric Design

Austroads Guide to Road Design Part 4A: Unsignalized and Signalized Intersections, outlines the various dimensions that make up the geometry of a Rural Basic Right-Turn treatment and the calculations (if any) required to obtain such values. The below **Figure 3** illustrates the BAR parameters,

Figure 7.1: Basic right (BAR) turn treatment on a two-lane rural road

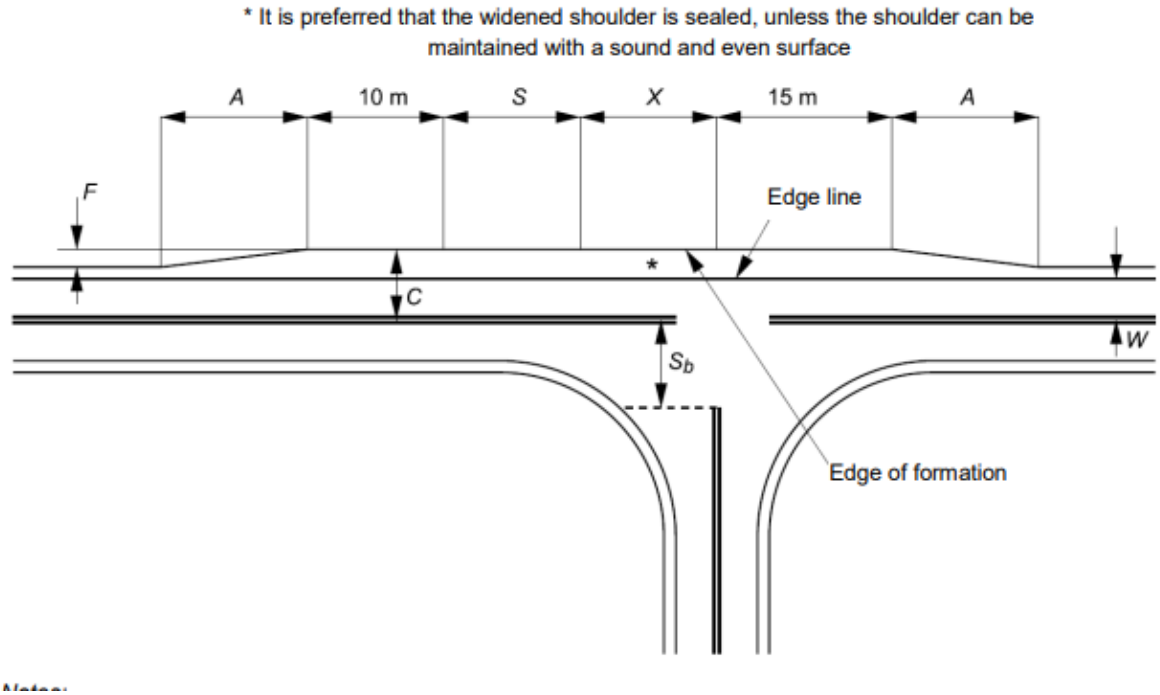


Figure 3 - BAR Parameters

BAR Parameters

- $W = Nominal\ Through\ Lane\ Width\ (m) = 3.5m$
- $C = Distance\ From\ Shoulder\ Widening\ to\ CL = 7.5m$
- $V = Design\ speed\ of\ Major\ Road\ Approach\ \left(\frac{km}{h}\right) = 120\left(\frac{km}{h}\right)$

        - $Where\ the\ 85th\ Percentile\ for\ the\ road\ has\ been\ adopted.$
    - $F = Formation\ Widening\ = 3.0m)$
    - $A = \frac{(0.5)VF}{3.6} = \frac{(0.5)(110)(3.0)}{3.6} = 46.0m.$
    - $A\ value\ of\ 55.0m\ has\ been\ adopted\ to\ allow\ for\ a\ passing\ 26.0m\ B\ double\ vehicle$
    - $S = Storage\ length\ to\ cater\ for\ one\ design\ tunring\ vehcile\ (m) = 26.0m$
    - $X = Distance\ based\ on\ design\ vehicle\ turning\ path\ = 15.0m$

The above assumptions and dimensions have been provided within the Concept Design documentation package, as they stipulate the geometry of the required turning treatment.

3.2 FINAL CONCEPT DESIGN

- The Final Concept Design Phase encompasses the detailed 3D Design and Drafting for a Rural Basic Left-Turn Treatment (BAL) and a Rural Basic Right-Turn Treatment (BAR) to facilitate access to the proposed Green Hydrogen and Ammonia Project off the Gwydir Highway. Key aspects of the design are summarized as follows:
- **Turn Treatments**: A BAL and BAR configuration have been selected to enable safe access to the BESS while maintaining traffic flow on Gwydir Highway.
- **Widening**: The BAL includes widening of approximately 3.0m to achieve a minimum offset 'C' distance of 6.5m from the Gwydir Highway centerline. The BAR includes widening of 4.0m to achieve a minimum offset 'C' distance of 7.5m from the Gwydir Highway centerline.
- **Access Configuration**: Kerb returns of 21.0m and 21.0m radii are provided at the entry and exit.
- **Batter Slopes**: Maximum roadside fill and cut batters of 1:6 are applied to ensure slope stability and maintain safe roadside conditions.
- **Drainage Swale Adjustments**: The open drain along the northern side of Gwydir Highway will also be realigned to integrate with the modified intersection drainage network.
- **Vehicle Accommodation**: Sufficient space is provided to allow vehicles on Gwydir Highway to pass a Design Vehicle (26.0m B-Double) turning into the site without hindrance, with additional stopping space provided for vehicles at the site access gate
- **Traffic Control and Signage**: New signage and line marking are specified for the BAL, BAR, and site entry, including:
    - Dividing Lines (S1)
    - Barrier Linemarking (BB)
    - Stop Linemarking (TB)
    - Giveway Sign (R1-2B)

Refer to **Appendix A** for the final concept design plans.

4 CONCLUSION AND RECOMMENDATIONS FOR DETAILED DESIGN

The concept design for the site access to the proposed Green Hydrogen and Ammonia Project has incorporated relevant investigations and existing data, concluding that a Rural Basic Left-Turn (BAL) and Basic Right-Turn (BAR) treatment are suitable for safe and efficient access. The final concept design addresses the turning movements of both design and check vehicles, confirming the required layout for the site entrance.

For the transition to detailed design and preparation for construction, several additional steps are recommended:

- **Geotechnical Investigations**: Conduct further geotechnical studies to refine pavement design and address any subsurface considerations.
- **Civil Detailing:** Enhance detailing in the civil design to provide clarity and ensure compliance with relevant standards.
- **Service Coordination**: Identify and locate existing services and assess any necessary relocations as part of the design process.
- **Road Safety Audit**: A road safety audit should be undertaken on both the existing conditions and the detailed design. Any recommendations should be incorporated into the final design package.
- **Independent Verification**: Independent verification of the detailed design and drawing package is required. Upon approval, the finalised design and associated documentation can be submitted to TfNSW for approval, enabling the project to proceed to construction.

This report, intended to complement the submitted Concept Design plans, provides insight into the design rationale and considerations. If Transport for NSW (TfNSW) anticipates further road improvements in this area in the foreseeable future, it is recommended that the site entrance design be revisited with these potential changes in mind to ensure future adaptability.

APPENDIX A

CONCEPT DESIGN

MAKER ENG

GWYDIR HIGHWAY INTERSECTION UPGRADE
WATHAGAR NEW SOUTH WALES

CONCEPT DESIGN

PLAN NUMBER	DRAWING TITLE
MKR00959-201-C0000	COVER SHEET AND INDEX
MKR00959-201-C0010	NOTES
MKR00959-201-C0040	KEY PLAN
MKR00959-201-C0100	CIVIL WORKS LAYOUT PLAN
MKR00959-201-C0310	TYPICAL SECTIONS PLAN
MKR00959-201-C0350	CIVIL DETAILS
MKR00959-201-C0400	PAVEMENT PLAN
MKR00959-201-C0500	LONGITUDINAL SECTIONS - ROAD 01 & 02
MKR00959-201-C0600	ROAD CROSS SECTIONS PLAN - ROAD 01 - 1 OF 4
MKR00959-201-C0601	ROAD CROSS SECTIONS PLAN - ROAD 01 - 2 OF 4
MKR00959-201-C0602	ROAD CROSS SECTIONS PLAN - ROAD 01 - 3 OF 4
MKR00959-201-C0603	ROAD CROSS SECTIONS PLAN - ROAD 01 - 4 OF 4
MKR00959-201-C0700	KERB RETURN LAYOUT AND SECTIONS
MKR00959-201-C1700	SWEPT PATH ANALYSIS LAYOUT PLAN - DESIGN VEHICLE
MKR00959-201-C1800	SIGHT LINE LAYOUT PLAN
MKR00959-201-C1801	SIGHT LINE LONGITUDINAL SECTIONS
MKR00959-201-C1900	LOCAL AREA TRAFFIC MANAGEMENT LAYOUT PLAN

LOCALITY DIAGRAM

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

0 25 50 75 100 125m
SCALE 1:2500 AT ORIGINAL SIZE

HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
COVER SHEET AND INDEX

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0000		A1	2

NOTE: ALL CIVIL ENGINEERING CONSTRUCTION WORKS MUST BE CARRIED OUT IN ACCORDANCE WITH TfNSW GUIDELINES AND TECHNICAL SPECIFICATIONS, ALONG WITH THE REQUIREMENTS OF ALL RELEVANT CODES OF PRACTICE REFERENCED THEREIN. COMPLIANCE WITH THE REQUIREMENTS OF ALL APPLICABLE STATUTORY AUTHORITIES IS ALSO MANDATORY. THIS NOTE MUST BE READ IN CONJUNCTION WITH ALL OTHER NOTES PROVIDED IN THE DRAWING PACKAGE.

GENERAL

1. READ THESE NOTES IN CONJUNCTION WITH ENGINEERING DRAWINGS, SPECIFICATIONS AND WRITTEN INSTRUCTIONS. ALWAYS REFER TO TfNSW TECHNICAL SPECIFICATION FOR CLASSIFICATION AND DETAILS
2. ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT TfNSW PROJECT SPECIFICATIONS FOR THE WORKS TOGETHER WITH THE REQUIREMENTS OF ALL RELEVANT CODES OF PRACTICE REFERRED TO THEREIN AND THE REQUIREMENTS OF ALL STATUTORY AUTHORITIES WHERE APPLICABLE.
3. THE CONTRACTOR SHALL CHECK AND BE RESPONSIBLE FOR THE CORRECTNESS OF ALL DIMENSIONS. ANY DISCREPANCY SHALL BE REPORTED IMMEDIATELY TO THE SUPERINTENDENT. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING OFF THE PLANS.
4. NO CHANGES SHALL BE MADE BY THE CONTRACTOR WITHOUT THE WRITTEN CONSENT OF THE SUPERINTENDENT. THE SUPERINTENDENT IS TO CONFIRM THE EXACT EXTENTS ON SITE PRIOR TO COMMENCEMENT OF WORKS.
5. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT SAFE WORK PRACTICES ARE FOLLOWED AT ALL TIMES DURING THE COURSE OF THE CONTRACT. OH&S REGULATIONS AND WORK COVER REQUIREMENTS ARE TO BE COMPLIED WITH. REFER TO THE SPECIFICATION AND CONTRACT DOCUMENTS.
6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL SURVEY MARKS ARE MAINTAINED. IF THE CONTROL MARKS ARE DESTROYED OR MOVED DURING CONSTRUCTION THE CONTRACTOR MUST SUPPLY ADEQUATE MARKS FOR RE-ESTABLISHMENT AND INFORM THE SUPERINTENDENT.
7. LIAISE WITH THE APPOINTED SITE SUPERINTENDENT PRIOR TO COMMENCEMENT OF CONSTRUCTION.
8. LEVELS ARE TO AUSTRALIAN HEIGHT DATUMN (AHD).
9. CO-ORDINATES ARE TO MAP GRID AUSTRALIA (MGA) CO-ORDINATE SYSTEM (ZONE 55).
10. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE (U.N.O), ALL LEVELS, CHAINAGES, STATIONS AND -CO-ORDINATE ARE EXPRESSED IN METRES.
11. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED BY THE SUPERINTENDENT.
12. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS.
13. THE CONTRACTOR SHALL NOT ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE OWNERS.
14. SITE FILL AREAS - THE CONTRACTORS REGISTERED SURVEYOR SHALL TAKE LEVELS OF EXISTING SURFACE AFTER STRIPPING TOPSOIL AND PRIOR TO COMMENCING FILL OPERATIONS.
15. DRAINAGE LINES UNDER ROADS SHALL BE BACKFILLED WITH NON-COHESIVE SAND. AND THE SUBSOIL DRAIN WRAPPED IN APPROVED FILTER SOCK, DISCHARGING INTO DOWN STREAM PITS.
16. ALL CONDUITS AND MAINS SHALL BE LAID PRIOR TO LAYING FINAL ASPHALTIC CONCRETE SEAL.
17. WHERE REFERENCE IS MADE TO PROPRIETARY COMPONENT NAMES ON THE DRAWINGS THE CONTRACTOR MAY PROPOSE AN ALTERNATIVE PRODUCT PROVIDED THE ALTERNATIVE IS EQUIVALENT AND SATISFIES THE REQUIREMENTS OF THE SPECIFICATION AND IS APPROVED BY TfNSW.
18. HYDROMULCH TO BE APPLIED TO ALL DISTURBED AREAS NOT COVERED BY TURF, JUTEMESH OR OTHER STABILISATION.
19. TREES NOT SHOWN TO BE REMOVED AND WHICH ARE CLOSE TO THE CONSTRUCTION WORKS (WORKS ENCROACH INTO THE TREE PROTECTION ZONE (TPZ)) ARE TO BE MAINTAINED SUBJECT TO CONFIRMATION FROM AN ARBORIST IN ACCORDANCE WITH AS 4970.
20. THE CONTRACTOR SHALL MAINTAIN DUST CONTROL THROUGHOUT THE DURATION OF THE PROJECT.
21. THE CONTRACTOR MUST ENSURE THAT NO MATERIAL IS DRAGGED FROM THE CONSTRUCTION SITE ONTO GWYDIR HIGHWAY AND SHALL MAKE APPROPRIATE PROVISIONS WITH IN THE CONSTRUCTION SITE TO FACILITATE THIS REQUIREMENT.
22. ALL REDUNDANT CONSTRUCTION ACCESSES SHALL BE REMOVED ONCE THE MAIN INTERSECTION IS OPERATIONAL.

EARTHWORKS

1. ALL EARTHWORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH TfNSW SPECIFICATION TS 02158.1.
2. THE CONTRACTOR'S GEOTECHNICAL ENGINEER IS TO INSPECT ALL PROPOSED PAVEMENT FOUNDATION TREATMENTS. THE DETAILS OF THESE FOUNDATION TREATMENTS SHALL BE PROVIDED TO THE PRINCIPAL FOR REVIEW PRIOR TO CONSTRUCTION TO VERIFY THEIR SUITABILITY.
3. REFER TO GEOTECH REPORT FOR FURTHER INFORMATION.

SURVEY NOTES

1. ALL SITE SET OUT POINTS ARE TO BE CERTIFIED BY A REGISTERED SURVEYOR.
2. THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN INVESTIGATED BY THE REGISTERED SURVEYOR. THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. MAKERENG DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.
3. CONTACT SUPERINTENDENT IF DISCREPANCIES ARE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND FIELD DATA.
4. PROJECT COORDINATE SYSTEM USED: MGA-55 (GDA2020). ALL SETOUT INFORMATION AND DATUM SHALL BE CONFIRMED BY A REGISTERED SURVEYOR PRIOR TO CONSTRUCTION.
5. DIGITAL DATA PROVIDED FOR INFORMATION ONLY AND IS NOT TO BE FOR SETOUT UNLESS NOTED OTHERWISE
6. PLANS TAKE PRECEDENCE OVER DIGITAL DATA UNLESS NOTED OTHERWISE
7. ANY APPROVAL TO REMOVE A SURVEY MARK MUST COMPLY WITH THE SURVEYOR GENERAL'S DIRECTIONS NO. 11: PRESERVATION OF SURVEY INFRASTRUCTURE (POSI), AS ISSUED BY SPATIAL SERVICES AND TFNSW
8. ALL DEVELOPMENT AND CONSTRUCTION ACTIVITIES THAT MAY IMPACT SURVEY MARK INFRASTRUCTURE MUST CONSIDER POSI AND INCLUDE APPROPRIATE PRESERVATION AND REPLACEMENT STRATEGIES TO MITIGATE ANY ADVERSE OUTCOMES.

ASPHALT PAVING

1. HAND PLACEMENT OF ASPHALT IS ONLY PERMITTED FOR MINOR CORRECTIONS OF THE EXISTING SURFACE AND IN AREAS WHERE PLACEMENT WITH A PAVING MACHINE IS IMPRACTICAL.
2. THE MINIMUM PAVING WIDTH IS 1.2 m.
3. ALL LOOSE, CRACKED AND /OR BONEY MATERIAL AT THE EDGE OF A PAVED MAT MUST BE REMOVED PRIOR TO PLACING THE ADJACENT MAT.
4. EACH JOINT MUST BE FINISHED WITH A SMOOTH, PLANAR SURFACE COINCIDING WITH THE SURFACE OF THE REST OF THE MAT AND SATISFYING THE SURFACE SHAPE REQUIREMENTS SPECIFIED IN TfNSW SPECIFICATIONS TS 03283.1.
5. JOINT LOCATIONS ARE TO COMPLY WITH TfNSW SPECIFICATION R116 AND/OR TfNSW STANDARD DRAWINGS DS2012/001329 UNLESS OTHERWISE APPROVED BY PRINCIPAL.
6. CONTRACTOR TO INSTALL HIGH FRICTION AGGREGATE FOR 50m ON APPROACH AND 20m ON DEPARTURE TO/FROM THE INTERSECTION.
7. REFER TO GEOTECH REPORT FOR FURTHER INFORMATION.

PAVEMENT

1. ANY TOPSOIL AND SUBSOIL CONTAINING ORGANIC MATTERS IS TO BE REMOVED.
2. THE EXPOSED FORMATION SUBGRADE LEVEL SHOULD BE SCARIFIED AND MOISTURE CONDITIONED WITHIN +/- 2% OF STANDARD OPTIMUM MOISTURE CONTENT (SOMC) AND THEN RE-COMPACTED TO A DRY DENSITY RATIO NOT LESS THAN 100% STANDARD. IN ACCORDANCE WITH AS1289 5.1.1, 5.4.1 OR 5.7.1.
3. SUBGRADE SHOULD BE COMPACTED USING A (MINIMUM) 15 TONNE SHEET-FOOT ROLLER TO 100% SMDD UNDER ROADS. ANY EXCESSIVELY WET, SOFT OR WEAK AREAS IDENTIFIED DURING THE SUBGRADE COMPACTION PROCESS THAT DO NOT RESPOND TO FURTHER COMPACTION SHOULD BE ALLOWED TO DRY OUT AND THEN BE RE-COMPACTED OR REMOVED AND REPLACED WITH SELECT FILL.
4. WHERE CBR ≥ 3% IS NOT ACHIEVED, SUBGRADE REMEDIATION AS PER THE DIRECTION OF THE ON SITE GEOTECHNICAL ENGINEER.
5. PAVEMENT SUBGRADE SHOULD BE UNDERGO A GEOTECHNICAL INSPECTION PRIOR TO PAVEMENT WORKS. LEVEL 1 SUPERVISION SHOULD BE UNDERTAKEN BY AN ACCREDITED GEOTECHNICAL CONSULTANT DURING PAVEMENT CONSTRUCTION IN ACCORDANCE WITH AS3798-2007.
6. CONSTRUCT THE ROAD BASE AND SUBBASE MATERIALS USING 'CLEAN', FREE OF ORGANIC MATTER. UNBOUND PAVEMENT MATERIAL OR MATERIAL TO BE MODIFIED FOR USE IN SUBBASE AND/OR BASE COARSES TO BE IN ACCORDANCE WITH TfNSW 3051.
7. ONE PAVEMENT TEST SHOULD BE CARRIED OUT PER 500m2 OR ONE TEST PER 100m3, WITH A MINIMUM TESTING FREQUENCY IN ACCORDANCE WITH TS01572.1 AND RELEVANT PAVEMENT SPECIFICATION.

TACKCOAT

1. THE TACKCOAT MUST BE APPLIED AT AN APPLICATION RATE OF BETWEEN 0.15 L/m² AND 0.30 L/m² OF RESIDUAL BITUMEN. FOR JOINTS, THE APPLICATION RATE MUST BE DOUBLED ON VERTICAL FACES.
2. BITUMEN EMULSION FOR USE AS A TACKCOAT MUST BE CRS/170-60 AND COMPLYING WITH AS 1160.

PRIMESEALS AND SEALS

1. ALL PRIMERSEALS AND SEALS MUST BE APPLIED IN ACCORDANCE WITH TfNSW SPECIFICATIONS TS03283.1 OR TS03290.1
2. SEALS MUST NOT BE PLACED OVER THE TOP OF SUBSURFACE DRAINS.

UTILITIES

1. ALL SERVICES SHOWN ON THIS PLAN ARE APPROXIMATE ONLY AND HAVE BEEN LOCATED FROM SITE INVESTIGATION AND RELEVANT AUTHORITIES' PLANS. THESE SERVICES ARE NOT GUARANTEED CORRECT OR COMPLETE.
2. UTILITY LOCATIONS SHOWN ARE NOT CONSIDERED TO BE EXACT OR COMPREHENSIVE. PRIOR TO COMMENCING WORK THE CONTRACTOR SHALL VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES AND ADVISE THE PRINCIPAL OF ANY CLASHES.
3. THE CONTRACTOR MUST OBTAIN UP-TO-DATE PLANS FROM 'BEFORE YOU DIG AUSTRALIA' BEFORE COMMENCEMENT OF WORKS. THE EXACT LOCATION OF ALL SERVICES ARE TO BE VERIFIED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS.
4. EXISTING SERVICES ARE TO BE MAINTAINED OR ADJUSTED AS DETAILED IN THE PLANS. ANY ADJUSTMENT OR PROTECTION MEASURES ARE TO BE CARRIED OUT BY ACCREDITED SERVICE PROVIDERS. REFER ANY CONFLICTS OR UNIDENTIFIED EXISTING SERVICES TO THE SUPERINTENDENT IMMEDIATELY.
5. INSTALL ALL TEMPORARY SUPPORT REQUIRED TO PROTECT UTILITIES.
6. ALL EXCAVATION WORKS MUST BE CARRIED OUT IN ACCORDANCE WITH THE REGULATIONS SET BY THE RESPECTIVE UTILITY SERVICE PROVIDER. CONTRACTOR TO EXECUTE UTILITY STAGING STRATEGY TO COMPLY WITH THE OVERALL WORKS PROGRAM.
7. THE CONTRACTOR IS RESPONSIBLE FOR GAINING APPROVALS OF ALL TEMPORARY DESIGNS REQUIRED TO COMPLETE THE RELOCATION WORKS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORKS ADJACENT TO ANY SERVICE WITH
9. THE RELEVANT AUTHORITY IN ACCORDANCE WITH AUTHORITY REQUIREMENTS. REFER TO THE SPECIFICATION. 7. THE CONTRACTOR SHALL COORDINATE WITH THE RELEVANT UTILITY AUTHORITIES AND THE PRINCIPAL WITH RESPECT TO ANY TEMPORARY DIVERSIONS NECESSARY FOR CONSTRUCTION STAGING WORKS.
10. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL EXISTING UTILITIES ARE ACCURATELY LOCATED, IDENTIFIED, CHECKED AGAINST ALL DESIGN DRAWINGS AND PROTECTED OR RELOCATED AS REQUIRED PRIOR TO CONSTRUCTION WORKS.
11. REQUIRED CONDITIONS ARE TO BE OBTAINED FROM RELEVANT AUTHORITIES WHILE WORKING IN THE VICINITY OF UTILITIES PRIOR TO CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN SUCH CONDITIONS.
12. ALL SERVICES COVERS TO BE PLACED AT FINISHED SURFACE LEVELS, ENSURE LONGITUDINAL AND CROSS FALL GRADES MATCH PROPOSED GRADES.

KERBS AND ROAD SAFETY BARRIERS

1. SAFETY BARRIERS MUST BE ACCEPTED SAFETY BARRIER PRODUCT, REFER TO TfNSW ACCEPTANCE DOCUMENTS FOR SAFETY BARRIER PRODUCT ACCEPTED FOR USE ON CLASSIFIED ROADS IN NSW.
2. FOR SAFETY BARRIER COMPONENTS TO SCALE AND INSTALLATION DETAILS, REFER TO MANUFACTURERS DETAILS AND TfNSW STANDARD DRAWINGS.
3. START AND END POINTS OF SAFETY BARRIERS IN THE SCHEDULE INCLUDE ALL LENGTHS OF TERMINALS AND TRANSITIONS.
4. DIMENSIONS ARE SUBJECT TO MANUFACTURER'S TOLERANCES EXCEPT WHERE ALLOWABLE TOLERANCE ARE NOMINATED.
5. ALL KERB AND GUTTER SHAPES ARE IN ACCORDANCE WITH TfNSW STANDARD DRAWING R0300-01 UNLESS NOTED OTHERWISE.
6. ALL CHANGES IN KERB TYPES ALONG A CONTINUOUS RUN OF KERBING SHALL BE IN ACCORDANCE WITH TfNSW STANDARD DRAWINGS R0300-05 TO R0300-10.
7. KERBS MUST BE THE STRENGTH GRADE SPECIFIED IN TfNSW SPECIFICATION TS 03264.1.
8. REFER DRAWING 30012890-RF-0051 FOR KERB AND GUTTER SCHEDULES.
9. TERMINALS AND CRASH CUSHIONS MUST BE APPROVED FOR USE ON TfNSW NETWORK. REFER TO TfNSW ACCEPTANCE DOCUMENTATION FOR APPROVED TERMINALS AND CRASH CUSHIONS.
10. SAFETY BARRIER TERMINALS MUST BE APPROVED FOR THE SAFETY BARRIER SYSTEM INSTALLED. REFER TO TfNSW ACCEPTANCE DOCUMENTS FOR TERMINALS THAT ARE APPROVED FOR SPECIFIC SAFETY BARRIER SYSTEMS.

SIGNAGE AND DELINEATION

1. TO ELIMINATE EXCESSIVE GLARE FROM THE SURFACE OF A SIGN IT MUST BE TURNED APPROXIMATELY 5° AWAY FROM THE NORMAL TO THE HEADLIGHT BEAM/LINE OF SIGHT.
2. ALL SIGNAGE TO BE CLEAR OF ALL VEGETATION AND OBSTRUCTIONS.
3. CONDITION ASSESSMENT TO BE UNDERTAKEN ON ALL EXISTING SIGN FACES, BOTH THOSE TO REMAIN AND THOSE TO BE RELOCATED, PRIOR TO BEING RE-USED, AS DIRECTED BY THE PRINCIPAL.
4. NEW AND RELOCATED SIGN STRUCTURES MUST AVOID ALL UTILITIES.
5. LATERAL OFFSET DIMENSION FOR SIGNAGE LOCATED BEHIND SAFETY BARRIER SYSTEM HAS BEEN DEFINED BY TfNSW ACCEPTANCE DOCUMENT FOR SAFETY BARRIER PRODUCTS.
6. FOR MESSAGES ON PAVEMENTS REFER TO TfNSW DELINEATION GUIDELINES SECTION 9.
7. EXISTING SIGN LOCATIONS ARE INDICATIVE ONLY. RELEVANT SIGNAGE MAY BE RETAINED DURING CONSTRUCTION.
8. FOR THE DETAILED REQUIREMENTS FOR THE SIGNS, DEVICES AND MARKINGS SPECIFIED REFER TO AS 1743, AS1742, AS/NZS 1906.1, AS/NZ S1906.2, AS/NZS1906.3, AS/NZS 2009A AND AS 4049 SERIES AND TfNSW SUPPLEMENTS.
9. ALL REGULATORY SIGNPOSTING AND LINE MARKING SHOWN ON THESE DRAWINGS WILL REQUIRE APPROVAL BY WRITTEN AUTHORISATION FROM AN OFFICER AUTHORISED UNDER SECTION 5.9 OF THE TfNSW DELEGATIONS MANUAL.
10. PAVEMENT ARROWS TO BE INSTALL IN ACCORDANCE WITH AUSTRALIAN STANDARDS 1742.2 AS PER TfNSW SPECIFICATION TS TS 03292.1
11. CHEVRON LAYOUT INCLUDING SIZE, ANGLE AND SPACING TO BE IN ACCORDANCE WITH THE RTA DELINEATION GUIDELINES AND AS 1742.2.
12. RETROREFLECTIVE RAISED PAVEMENT MARKERS (RRPM'S) SHALL BE PLACED ON ALL LANE, EDGE, BARRIER LINES UNLESS NOTED OTHERWISE.

FENCING

1. ALL FENCING TO BE INSTALLED IN ACCORDANCE WITH TfNSW SERVICE STANDARD DRAWINGS R0800 AND TfNSW SPECIFICATION TS 03300.1.

GEOTEXTILES

1. GEOTEXTILES TO BE SUPPLIED IN ACCORDANCE WITH TfNSW SPECIFICATION TS 02167.1.

GUIDEPOSTS

1. GUIDEPOSTS TO BE PLACED IN ACCORDANCE WITH TfNSW SPECIFICATION TS 03290.1 AND TfNSW DELINEATION GUIDELINES.
2. DELINEATORS TO BE AFFIXED TO ALL GUIDEPOSTS.
3. DELINEATORS TO BE PLACED CENTRALLY ON POSTS BETWEEN 50mm AND 100mm FROM THE TOP OF THE POST. 4. ALL GUIDEPOSTS TO BE PROVIDED AT SPACING TO COMPLY WITH FOG PRONE AREA.
4. REFER TO TfNSW STANDARD (ROAD) DRAWING R0710-18 FOR SAFETY BARRIER DELINEATION UNIT.

TREES

ALL TREES SHALL BE PROTECTED BY THE FOLLOWING MEASURES:

1. PROTECTIVE FENCING CONSTRUCTED OF 1.8m HIGH CHAIN WIRE MESH SUPPORTED BY ROBUST POSTS SHALL BE INSTALLED AT A MINIMUM RADIUS OF 3m FROM THE TRUNK OF EACH TREE.THIS FENCING SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY WORKS AND REMAIN IN PLACE UNTIL ALL WORKS ARE COMPLETED.SIGNAGE SHALL BE ERECTED ON THE FENCE IN ACCORDANCE WITH THE ARBORICULTURE REPORT.
2. THE TREE PROTECTION ZONE WITHIN THE PROTECTIVE FENCING SHALL BE MULCHED WITH SUITABLE ORGANIC MULCH (WOOD CHIPS OR COMPOST LEAF CHIP MULCH) AT THE DISCRETION OF THE PROJECT ARBORIST.
3. NO DEVELOPMENT OR ASSOCIATED ACTIVITY IS PERMITTED WITHIN THE FENCED TREE PROTECTION ZONE FOR THE DURATION OF THE WORKS.
4. ANY APPROVED WORKS WITHIN THIS TREE PROTECTION ZONE SHALL BE UNDER THE DIRECTION OF AND TO THE SATISFACTION OF A SUITABLY QUALIFIED AND EXPERIENCED ARBORIST.

SUBSURFACE DRAINAGE

1. ANY REFERENCE TO SUBSURFACE DRAINS INCLUDES ALL TRENCH DRAINS, INTERFACE DRAINS, AND PARALLEL DRAIN/CARRIER PIPE.
2. SUBSURFACE DRAINS TO BE CONSTRUCTED IN ACCORDANCE WITH TfNSW SPECIFICATION TS 03260.1 AND TfNSW STANDARD DRAWINGS SERIES MD.R33 WITH NO FINES CONCRETE BACKFILL
3. CARRIER PIPES TO BE DN100 UNPERFORATED TYPE 1 CLASS SN20 CORRUGATED PVC PIPE.
4. DEPTH OF SUBSURFACE DRAINS TO BE CONFIRMED ON SITE BY THE CONTRACTOR WITH AGREEMENT FROM THE PRINCIPAL AND TO BE MEASURED FROM THE LOWEST POINT OF THE EXISTING OR NEW PAVEMENT SMZ.
5. SUBSURFACE DRAINAGE OUTLETS TO BE CONSTRUCTED IN ACCORDANCE WITH TfNSW STANDARD DRAWING MD.R33.A04
6. ALL UPSTREAM ENDS OF SUBSURFACE DRAINS ARE TO BE CAPPED EXCEPT WHERE CONNECTED TO A DIFFERENT SUBSURFACE PIPE.

DRAINAGE

1. THE DOCUMENTED DRAINAGE SYSTEM IS DETAILED ONLY FOR THE PERMANENT ROAD CONFIGURATION UNLESS NOTED OTHERWISE. CONSTRUCTION REQUIREMENTS SHALL BE THE CONTRACTOR'S RESPONSIBILITY, SEDIMENT CONTROL REQUIREMENTS INCLUSIVE.
2. DRAINAGE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATIONS, STANDARDS, TfNSW SUPPLEMENTARY DRAWINGS.
3. TRANSVERSE DRAINAGE PIPES HAVE BEEN DESIGNED FOR EMBANKMENT POSITIVE PROJECTION CONDITIONS WITH TYPE HS3 SUPPORT UNLESS NOTED OTHERWISE. LONGITUDINAL PAVEMENT DRAINAGE HAS BEEN
4. DESIGNED FOR TRENCH CONDITIONS WITH TYPE HS3 SUPPORT IN ACCORDANCE WITH TfNSW STANDARD DRAWING R0240-01, UNLESS NOTED OTHERWISE.
5. PIPE CLASS SHOWN ON THE LONGITUDINAL SECTIONS ARE BASED ON FINAL LOADS OF SM1600 AT FINAL LEVEL.
6. ALL LOCATIONS, ORIENTATION AND LEVELS SHALL BE VERIFIED ONSITE BEFORE COMMENCING ANY WORK. ANY DISCREPANCIES IN THE DRAWINGS AND/OR SPECIFICATIONS SHALL BE REFERRED TO THE PRINCIPAL FOR CLARIFICATION BEFORE PROCEEDING. NATURAL SURFACE LEVELS ARE INDICATIVE ONLY.
7. THE CONTRACTOR IS RESPONSIBLE FOR EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED.
8. ANY PERMITS REQUIRED FOR DIVERSION WORKS SHALL BE OBTAINED BY THE CONTRACTOR.
9. THE LOCATION OF ALL SERVICES/UTILITIES SHALL BE CONFIRMED PRIOR TO CONSTRUCTION AND CHECKED FOR CONFLICT WITH THE STORMWATER DRAINAGE SYSTEM.
10. COMBINED STORMWATER AND SUBSURFACE TRENCH TO BE ADOPTED BELOW KERBS WITH STORMWATER PIPES. WHERE STORMWATER DRAINAGE IS NOT PRESENT, SUBSURFACE TO OUTLET AT MAX. 80m SPACING, VIA A SUBSURFACE OUTLET STRUCTURE.
11. TAILOUT WORKS TO EXTEND AT MIN. 0.5%, U.N.O.

DRAINAGE STRUCTURES

1. EQUIVALENT PRECAST HEADWALLS / PITS MAY BE USED. PRECAST HEADWALLS/PITS MUST COMPLY WITH TfNSW SPECIFICATION B115, WITH CONCRETE REINFORCEMENT USED COMPLYING WITH TfNSW SPECIFICATION TS 03264.1.
2. DRAINAGE STRUCTURES OTHER THAN PIPES MUST BE UNIFORMLY SUPPORTED BY PROVIDING AN UNREINFORCED CONCRETE FOUNDATION NOT LESS THAN 50mm THICK COMPLYING WITH TfNSW SPECIFICATION TS 03264.1.
3. UNSUITABLE FOUNDING MATERIAL FOR PIPES AND STRUCTURES SHALL BE REMOVED OR IMPROVED IN ACCORDANCE WITH TfNSW SPECIFICATION TS 03254.1.
4. FOR LOCATION AND LEVEL OF PITS AND HEADWALLS REFER TO DRAINAGE DRAWING LONG SECTIONS AND SCHEDULES.
5. ALL WELDS TO BE IN ACCORDANCE WITH TfNSW SPECIFICATION B203.
6. ALL GALVANISING TO BE IN ACCORDANCE WITH TfNSW SPECIFICATION TS 03264.1.
7. PIPE TRENCH SUBSOIL DRAINAGE TO BE IN ACCORDANCE WITH MD.R33.A08.
8. ALL DRAINAGE PIPES SHALL BE REINFORCED CONCRETE PIPES (RCP) CLASS 4. UNLESS NOTED OTHERWISE. CONCRETE PIPES ARE TO BE RUBBER RING JOINTED SPIGOT AND SOCKET TYPES UNLESS NOTED OTHERWISE. MANUFACTURE AND INSTALLATION TO BE IN ACCORDANCE WITH TfNSW SPECIFICATION R11.
9. DRAINAGE STRUCTURES SHALL BE BACKFILLED IN ACCORDANCE WITH TfNSW SPECIFICATION TS 02162.1. DIFFERENTIAL LOADING OF DRAINAGE STRUCTURES DURING BACKFILL OPERATION SHALL BE AVOIDED.
10. THE CONTRACTOR SHALL ENSURE THAT ALL TEMPORARY EXCAVATIONS ARE SAFE AND CARRIED OUT TO AN APPROVED SAFE WORK METHOD STATEMENT.
11. FOR DRAINAGE STRUCTURE COVER DETAILS REFER TfNSW MODEL DRAWINGS AS SPECIFIED IN DRAINAGE SCHEDULE.
12. CONNECTION BETWEEN PIPES AND STRUCTURES TO BE UNDERTAKEN IN ACCORDANCE WITH TfNSW SPECIFICATIONS AND MODEL DRAWINGS UNLESS NOTED OTHERWISE.
13. UNLESS STATED ELSEWHERE ON DRAWINGS, CONCRETE EXPOSURE CLASSIFICATION FOR HEADWALLS,WINGWALLS, AND DRAINAGE PITS MUST BE B2.
14. UNLESS STATED ELSEWHERE ON DRAWINGS, MINIMUM 28 DAY CHARACTERISTIC COMPRESSIVE STRENGTH OF CAST IN-SITU CONCRETE MUST BE 40MPa.
15. UNLESS STATED ELSEWHERE ON DRAWINGS, NOMINAL COVER TO REINFORCEMENT NEAREST TO THE CONCRETE FACE OF HEADWALLS, WINGWALLS, AND DRAINAGE PITS MUST BE 55mm.
16. UNLESS NOTED OTHERWISE, INSTALL A 3m LENGTH OF SUBSOIL DRAINAGE PIPE AT THE DISCHARGE END OF PIPES IN ACCORDANCE WITH TS 3254.1

DRAINAGE SETOUT

1. SETTING OUT DIMENSIONS AND SIZES OF DRAINAGE STRUCTURES SHALL NOT BE OBTAINED BY SCALING FROM THE DRAWINGS. ANY SETOUT AND/OR DIMENSIONS SHOWN FOR DRAINAGE STRUCTURES SHALL BE CHECKED BY THE CONTRACTOR BEFORE CONSTRUCTION COMMENCES.
2. FOR CHANNEL SETOUT DETAILS REFER TO THE RELEVANT ELECTRONIC MODEL AS INDICATED IN THE DESIGN MODEL FILE BOX ON EACH DRAINAGE PLAN. THE LOCATIONS ON THE PLAN ARE INDICATIVE AND THE ACTUAL ALIGNMENT AND LOCATION IS TO BE DETERMINED ON SITE TO SUIT PURPOSE.
3. THE LOCATION OF DRAINAGE STRUCTURES AND OPEN DRAINS SHALL BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION AND ADJUSTED WHERE REQUIRED TO CLEAR EXISTING UTILITIES SUBJECT TO APPROVAL BY THE PRINCIPAL.
4. PIPE LENGTHS SHOWN ON THE DRAINAGE SCHEDULES ARE BASED ON THE HORIZONTAL DISTANCE BETWEEN PIT CENTRES. PIPE LENGTHS FOR PROCUREMENT AND SET OUT TO BE CONFIRMED BY CONTRACTOR.
5. ALL SETOUT POINTS QUOTED ARE AS PER TfNSW STANDARD DRAWINGS.
6. WHERE A CONNECTION IS MADE TO AN EXISTING DRAINAGE PIPE OR PIT, THEN THE LEVEL OF THAT ELEMENT MUST BE SURVEYED PRIOR TO CONSTRUCTION AND ANY DISCREPANCIES FOUND ARE TO BE REFERRED TO THE DESIGNER FOR CLARIFICATION.

SCOUR PROTECTION

1. ALL ROCK FILLED MATTRESSES TO BE IN ACCORDANCE WITH TfNSW SPECIFICATION TS 02162.1.
2. THE ROCK SHALL BE WELL GRADED THROUGHOUT THE SCOUR PROTECTION LAYER. STONE SIZES SHALL BE DEPENDENT ON THE D_{50} VALUE SPECIFIED ON THE DRAWINGS.
3. ROCK IS TO BE HARD, DENSE, DURABLE, RESISTANT TO WEATHERING AND ANGULAR IN SHAPE. IT SHALL BE FREE FROM OVERBURDEN, SPOIL, SHALE AND ORGANIC MATTER. ROCK THAT IS LAMINATED, FRACTURED, POROUS OR OTHERWISE PHYSICALLY WEAK WILL BE UNACCEPTABLE.
4. GEOFABRIC BENEATH RIP-RAP SCOUR PROTECTION TO BE IN ACCORDANCE WITH TfNSW SPECIFICATION TS 02167.1.
5. RIP-RAP SCOUR PROTECTION MATERIAL TO BE IN ACCORDANCE WITH TfNSW MODEL SPECIFICATION TS 02162.1.

SAFETY IN DESIGN

1. THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH TfNSW SPECIFICATION G22. THIS DOCUMENT LISTS SOME DESIGN RELATED WORK HEALTH AND SAFETY HAZARDS ASSOCIATED WITH THE PROJECT DESIGN, CONSTRUCTION AND OPERATION THERE MAY BE OTHER HAZARDS AND RISKS NOT STATED IN THIS DOCUMENT. THIS DOCUMENT DOES NOT RELIEVE THE CONTRACTOR OF ITS OBLIGATIONS UNDER THE CONTRACT AND RELEVANT LEGISLATION.

CODE	TITLE	PREVIOUS REFERENCE
TS01566.2	GENERAL REQUIREMENTS (MAJOR CONTRACTS) – QA: CLAUSES 34,35,36,37 & 41 ONLY	G2
TS 03401.1	TRAFFIC MANAGEMENT - QA	G10
TS 02338.1	WORK HEALTH AND SAFETY (CONSTRUCTION WORK)	G22
TS 01456.1	CONSTRUCTION SURVEYS - QA	G71
TS 01572.1	QUALITY MANAGEMENT (MAJOR WORKS) - QA	Q6
TS01733.1	CONCRETE WORK FOR BRIDGES - QA	B80
TS 03254.1	STORMWATER DRAINAGE - QA	R11
TS 03255.1	KERBS AND CHANNELS (GUTTERS) - QA	R15
TS 03256.1	PRECAST REINFORCED CONCRETE BOX CULVERTS - QA	R16
TS 03257.1	PLASTIC FLEXIBLE PIPES - QA	R23
TS 03259.1	VERTICAL WICK DRAINS - QA	R31
TS 03260.1	TRENCH DRAINS - QA	R33
TS 03261.1	INTRA-PAVEMENT DRAINS - QA	R37
TS 03262.1	EDGE DRAINS - QA	R38
TS 02158.1	EARTHWORKS - QA	R44
TS 03263	CONSTRUCTION OF VERGES - QA	R49
TS 02161.1	STABILISATION OF EARTHWORKS - QA	R50
TS 03264.1	GENERAL CONCRETE	R53
TS 02162.1	ROCK FILLED GABIONS AND MATTRESSES - QA	R55
TS 02167.1	GEOTEXTILES (SEPARATION AND FILTRATION) - QA	R63
TS 03266.1	CONSTRUCTION OF UNBOUND AND MODIFIED PAVEMENT COURSE - QA	R71
TS03267.1	PLANT MIXED HEAVILY BOUND PAVEMENT COURSE - QA	R73
TS 03276.1	SPRAYED BITUMINOUS SURFACING (WITH CUTBACK BITUMEN) - QA	R106
TS 03277.1	SPRAYED BITUMINOUS SURFACING (WITH POLYMER MODIFIED BINDER) - QA	R107
TS03283.1	HEAVY DUTY DENSE GRADED ASPHALT - QA	R116
TS 03290.1	INSTALLATION OF GUIDEPOSTS - QA	R131
TS 03291.1	SAFETY BARRIER SYSTEMS - QA	R132
TS 03292.1	RETROREFLECTIVE RAISED PAVEMENT MARKERS - QA	R142
TS 03293.1	SIGNPOSTING - QA	R143
TS 03294.1	PAVEMENT MARKING (PERFORMANCE-BASED) - QA	R145
TS 03298.1	VEGETATION - QA	R178
TS 03299.1	LANDSCAPE PLANTING - QA	R179
TS 03300.1	FENCING - QA	R201
TS 03301.1	PROPERTY ADJUSTMENTS - QA	R204
TS 03316.1	SELECT MATERIAL EARTHWORKS - QA	3071
TS 03357.1	AGGREGATE FILTER MATERIALS FOR SUBSURFACE DRAINAGE - QA	3580
TS 00127	STORMWATER DRAINAGE SERIES	R0200
TS 02418	CONCRETE HEADWALLS SINGLE CELL 300MM TO 900MM DIA WITH CONCRETE APRON (2 TO 1 BATTER OR STEEPER)	R0210-01
TS 02447	GULLY PIT TYPE SA FOR PIPE DIA. UP TO 450 MM (SHEET 1 AND 2)	R0220-01
TS 02450	PRECAST CONCRETE LINTELS FOR TYPE SA KERB GULLY PITS	R0220-03
TS 02456	GULLY PIT TYPE SF	R0220-09
TS 02482	GULLY PITS INSPECTION PIT WIT SINGLE OR DOUBLE CAST IRON FRAME AND COVER	R0220-35
TS 02511	INSTALLATION OF BURIED CONCRETE PIPES TYPE HS3 SUPPORT	R0240-01
TS 00128	KERB & CHANNEL SERIES	R0300
TS 02512	STANDARD KERB AND CHANNEL SHAPES (S381)	R0300-01
TS 02521	KERB RAMPS (SHEETS 1-3)	R0300-11
TS 00130	CLEARING AND GRUBBING SERIES	R0500
TS 02528	TREE PROTECTION (S105)	R0500-01
TS 00133	FENCING SERIES	R0800
TS 02588	RURAL ROAD BOUNDARY FENCING - TYPICAL FENCE PANEL DETAIL	R0800-02

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

HIRINGA

MAKER ENG

DRAWN: J.NEWELL | DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH | DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN

NOT FOR CONSTRUCTION

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
NOTES

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0010		A1	2

SHEET 1 @ 1:1000

LOT 2
DP773266

LOT 55
DP751793

SHEET 1 @ 1:375

GWYDIR HIGHWAY

ROAD 01

ROAD 02

GWYDIR HIGHWAY

LOT 7300
DP1161855

LEGEND

PROPOSED

- CIVIL WORKS BOUNDARY
- SHEET LAYOUT (1:375 SCALE)
- SHEET LAYOUT (1:1000 SCALE)

EXISTING

- LOT BOUNDARY
- 180.0 CONTOURS (0.5m)
- WATER COURSE
- LINEMARKING
- EDGE OF BITUMEN
- ROAD CENTRELINE

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

0 10 20 30 40 50m
SCALE 1:1000 AT ORIGINAL SIZE

HIRINGA

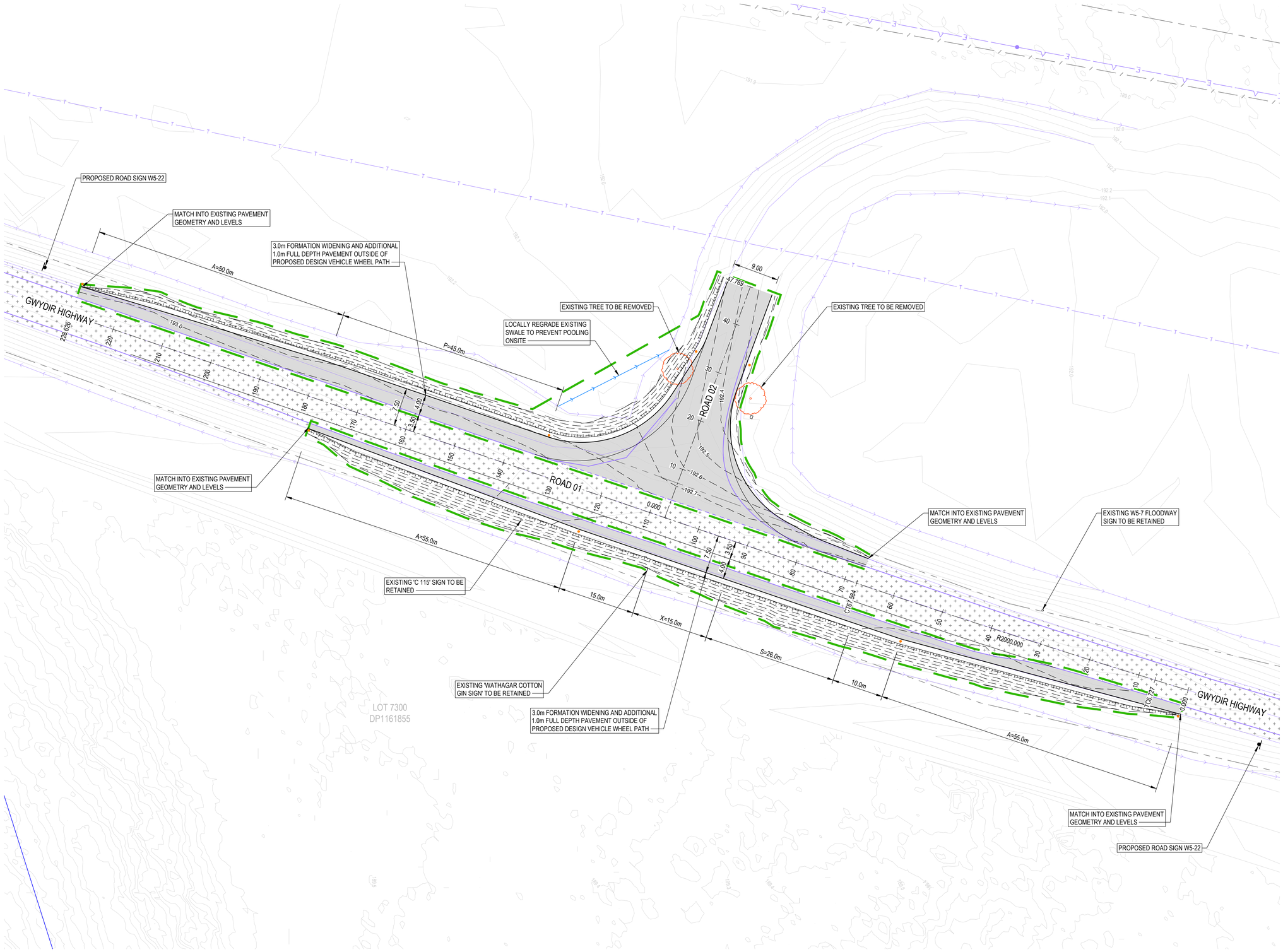
MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	

NOT FOR CONSTRUCTION

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
KEY PLAN

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0040		A1	2



LEGEND

PROPOSED

- CIVIL WORKS BOUNDARY
- LOT BOUNDARY
- ROAD CENTERLINE AND CHAINAGE
- CONTOURS (0.1m)
- PAVEMENT
- SWALE INVERT
- SIGN
- GUIDE POST

EXISTING

- LOT BOUNDARY
- CONTOURS (0.1m)
- PAVEMENT
- ELECTRICAL ABOVE GROUND
- COMMUNICATIONS
- ROAD CENTRELINE
- LINEMARKING
- EDGE OF BITUMEN
- SWALE INVERT
- FENCE
- TREE (TO BE REMOVED)

NOTES:

1. ALL PROPOSED WORKS WILL BE CONSTRUCTED TO MATCH THE EXISTING PAVEMENT AND IN ACCORDANCE WITH AUSTROADS GUIDE TO PAVEMENT TECHNOLOGY PART 2 STRUCTURAL DESIGN 2024 AND TFNSW QA SPECIFICATIONS
2. PROPOSED LINE MARKING TO BE AUDIO TACTILE LINE MARKING AND MATCH INTO EXISTING

BEFORE YOU DIG www.byda.com.au

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF WORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING PH 1100 (BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	14.01.25	ISSUED FOR APPROVAL	JMN	JMA

0 3.75 7.5 11.25 15 18.75m
SCALE 1:375 AT ORIGINAL SIZE

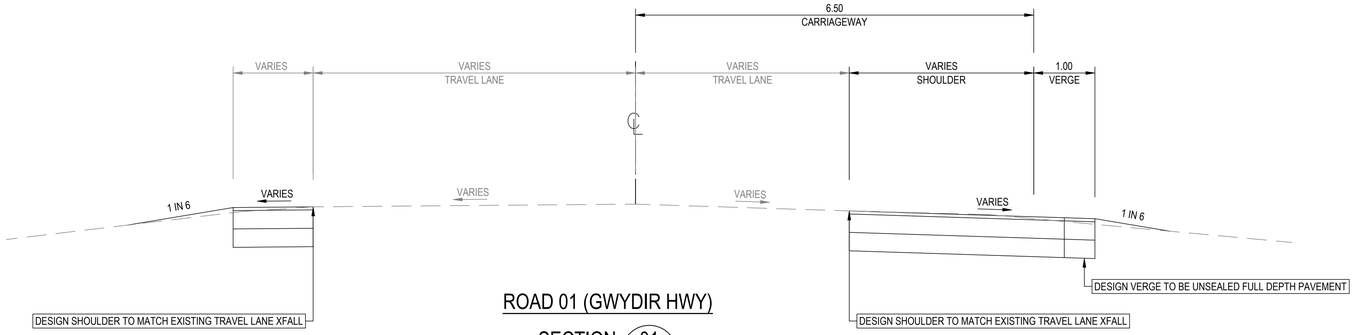
HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
CIVIL WORKS LAYOUT PLAN

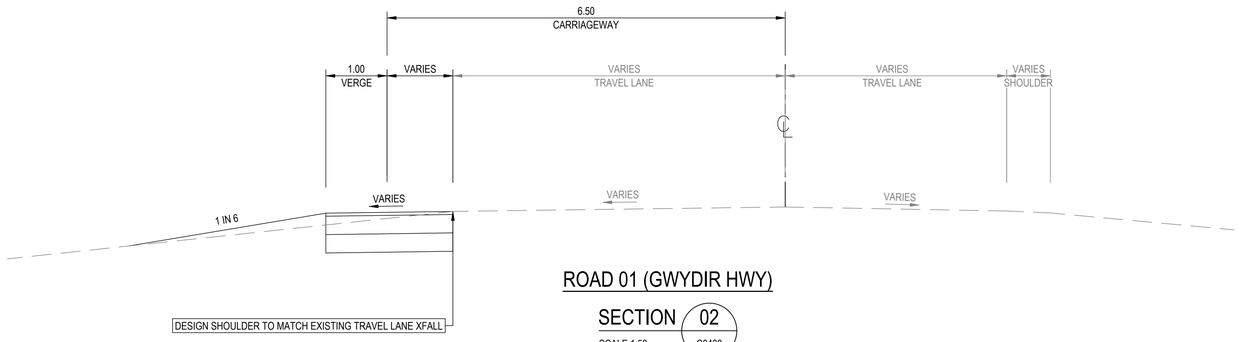
DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0100		A1	2



ROAD 01 (GWYDIR HWY)

SECTION 01

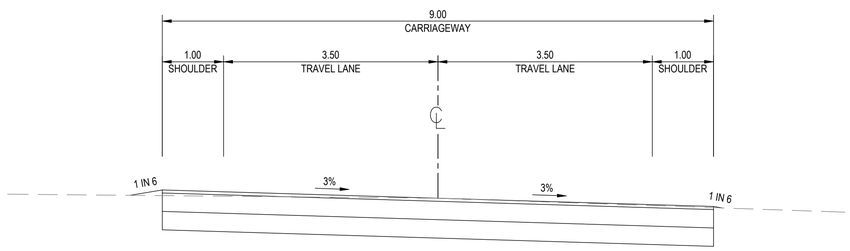
SCALE 1:50 C0400



ROAD 01 (GWYDIR HWY)

SECTION 02

SCALE 1:50 C0400



ROAD 02 (9m WIDE)

SECTION 03

SCALE 1:50 C0400

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

0 0.5 1.0 1.5 2.0 2.5m

SCALE 1:50 AT ORIGINAL SIZE

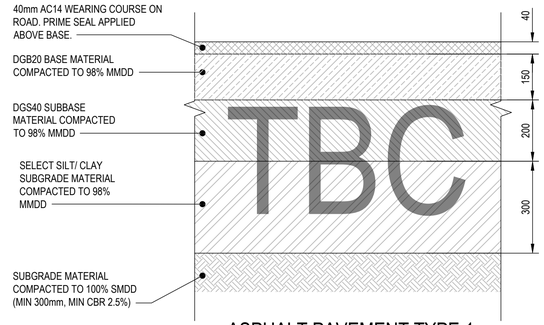
HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
TYPICAL SECTIONS PLAN

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0310		A1	2



ASPHALT PAVEMENT TYPE 1

SCALE: 1:10

NOTES

1. SELECT FILL MATERIAL SHOULD HAVE A CBR>33% AND A PLASTICITY INDEX (PI)<15% IN ITS ORIGINAL STATE BEFORE ADDITION OF ADDITIVE.
2. SELECT FILL MATERIAL SHOULD BE MODIFIED WITH APPROPRIATE ADDITIVE IF CBR<33% AND/OR PI>15%.
3. SELECT FILL SPECIFICATION TAKEN FROM TfNSW QA SPECIFICATION 3071.
4. FINAL PAVEMENT DETAIL TO BE CONFIRMED BY GEOTECHNICAL ENGINEER.

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

0 0.1 0.2 0.3 0.4 0.5m

SCALE 1:10 AT ORIGINAL SIZE

HIRINGA

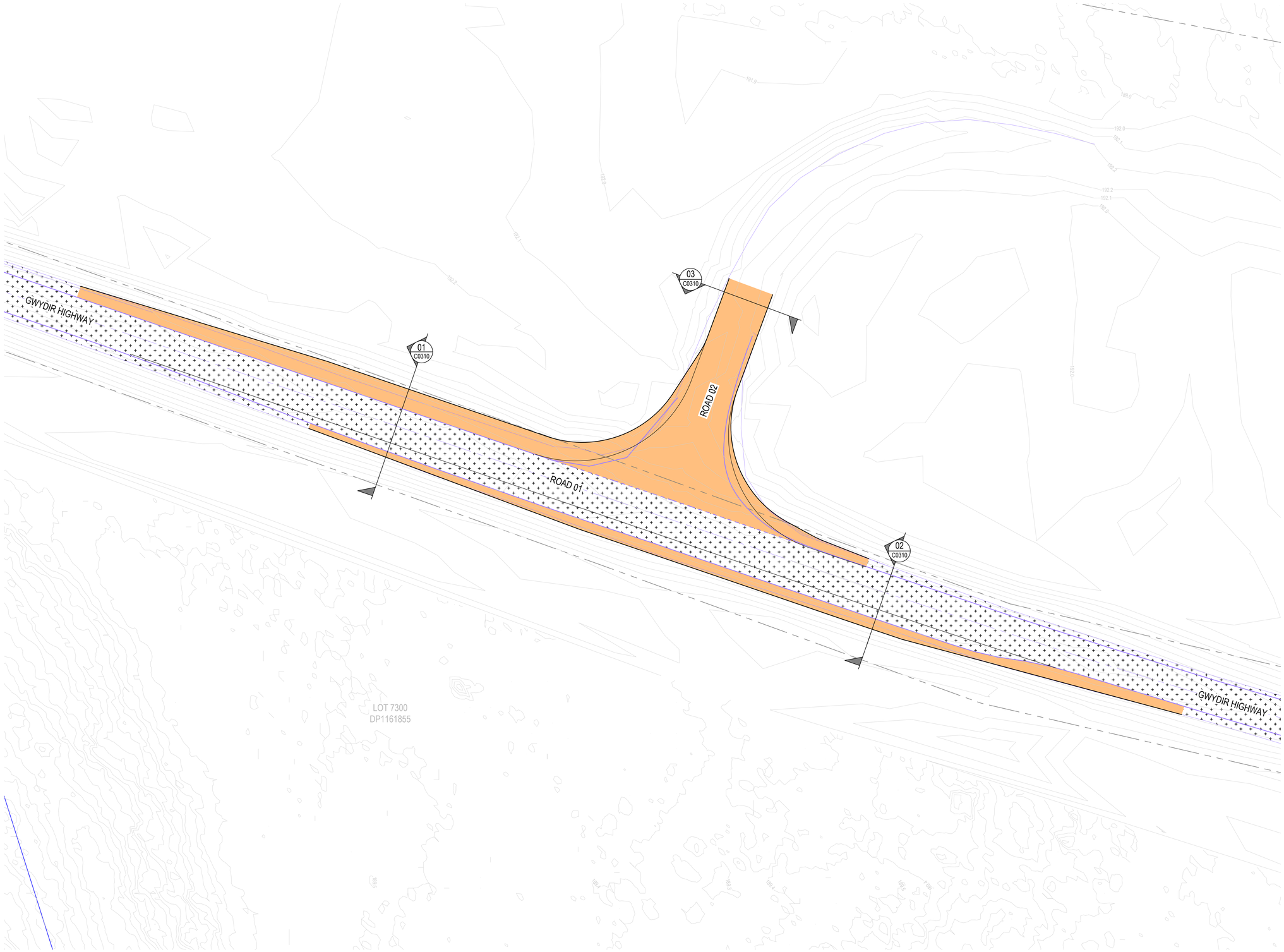
MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	

NOT FOR CONSTRUCTION

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
CIVIL DETAILS

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0350		A1	2



LEGEND

PROPOSED

P1 — PAVEMENT TYPE 1

EXISTING

- LOT BOUNDARY
- CONTOURS (0.1m)
- PAVEMENT
- LINEMARKING
- EDGE OF BITUMEN
- ROAD CENTRELINE

NOTES:

1. REFER MKR00959-201-C0350 FOR PAVEMENT DETAIL

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

0 3.75 7.5 11.25 15 18.75m

SCALE 1:375 AT ORIGINAL SIZE

HIRINGA

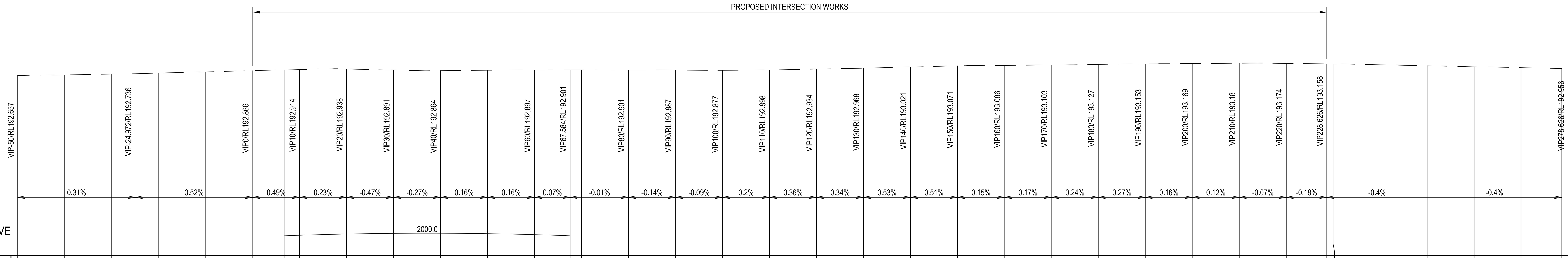
MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	

NOT FOR CONSTRUCTION

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
PAVEMENT PLAN

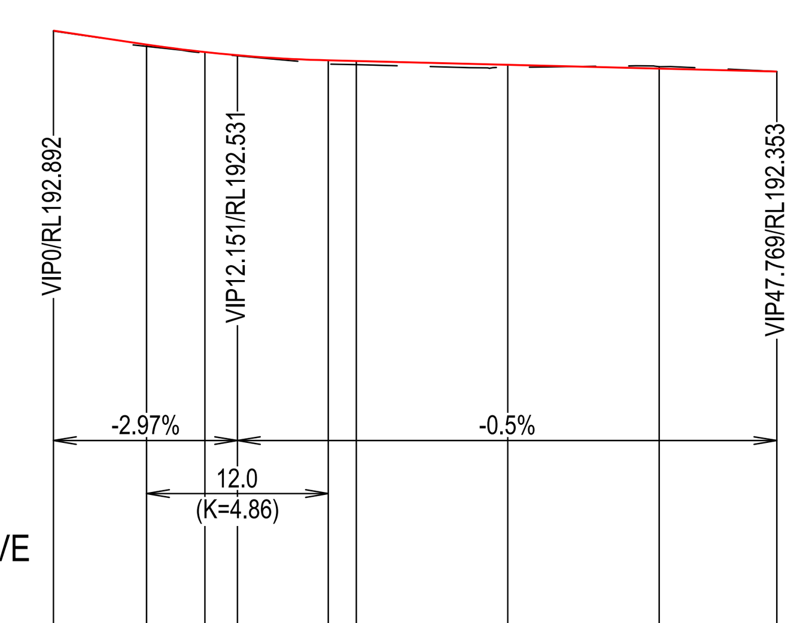
DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0400		A1	2



PEGGED CHAINAGE	DESIGN SURFACE LEVEL	EXISTING SURFACE LEVEL	CUT/FILL DEPTHS
-50.000		192.657	0.000
-40.000		192.688	0.000
-30.000		192.720	0.000
-20.000		192.761	0.000
-10.000		192.814	0.000
0.000		192.866	0.000
6.727		192.898	0.000
10.000		192.914	0.000
20.000		192.938	0.000
30.000		192.891	0.000
40.000		192.864	0.000
50.000		192.880	0.000
60.000		192.897	0.000
67.584		192.901	0.000
70.000		192.901	0.000
80.000		192.901	0.000
90.000		192.887	0.000
100.000		192.877	0.000
110.000		192.898	0.000
120.000		192.934	0.000
130.000		192.968	0.000
140.000		193.021	0.000
150.000		193.071	0.000
160.000		193.086	0.000
170.000		193.103	0.000
180.000		193.127	0.000
190.000		193.153	0.000
200.000		193.169	0.000
210.000		193.180	0.000
220.000		193.174	0.000
228.626		193.158	0.000
230.000		193.153	0.000
240.000		193.112	0.000
250.000		193.072	0.000
260.000		193.031	0.000
270.000		192.991	0.000
278.626		192.956	0.000

HOR : 1 IN 500
VERT: 1 IN 100

LONGITUDINAL SECTION - ROAD 01



PEGGED CHAINAGE	DESIGN SURFACE LEVEL	EXISTING SURFACE LEVEL	CUT/FILL DEPTHS
0.000	192.892	192.887	0.005
6.151	192.710	192.686	0.023
10.000	192.611	192.599	0.011
12.151	192.569	192.560	0.008
18.151	192.501	192.451	0.050
20.000	192.492	192.443	0.049
30.000	192.442	192.408	0.035
40.000	192.392	192.418	-0.025
47.769	192.353	192.354	-0.000

HOR : 1 IN 500
VERT: 1 IN 100

LONGITUDINAL SECTION - ROAD 02

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

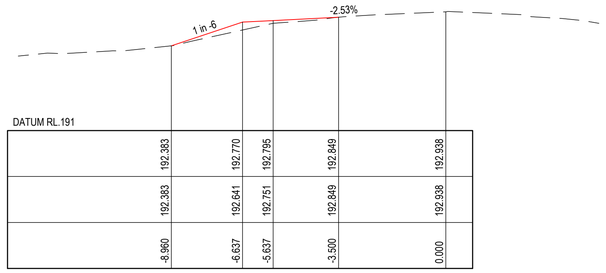
HORIZONTAL 1:500 AT ORIGINAL SIZE — 0 5 10 15 20 25m
VERTICAL 1:100 AT ORIGINAL SIZE — 0 1 2 3 4 5m

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	

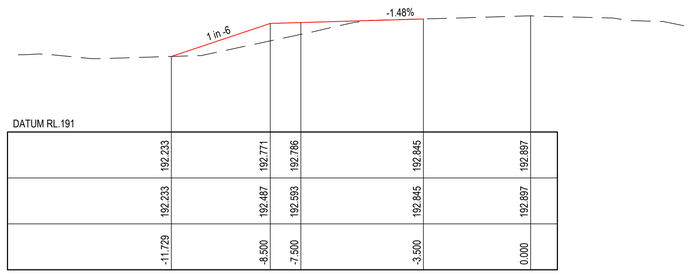
NOT FOR CONSTRUCTION

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
LONGITUDINAL SECTIONS
ROAD 01 & 02

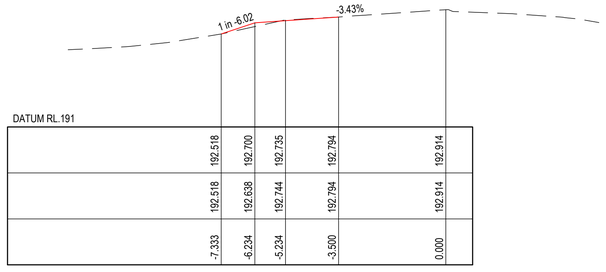
DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0500		A1	2



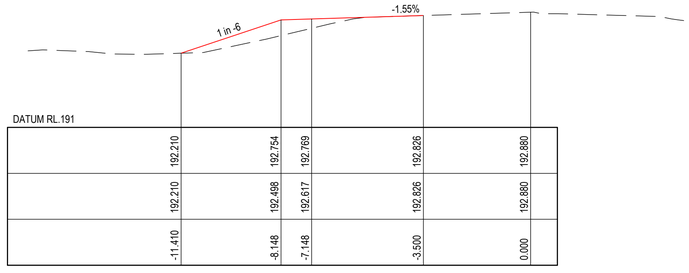
CH 20.000



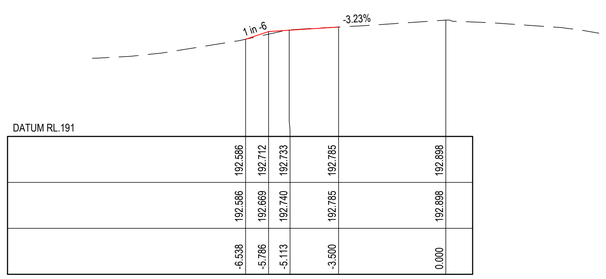
CH 60.000



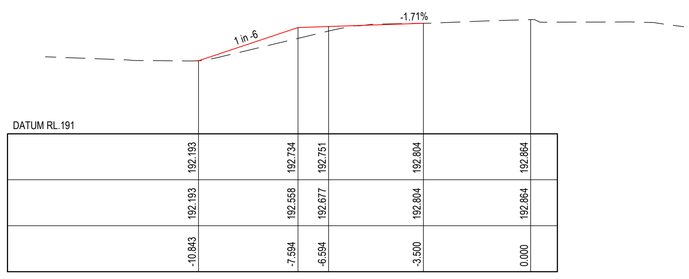
CH 10.000



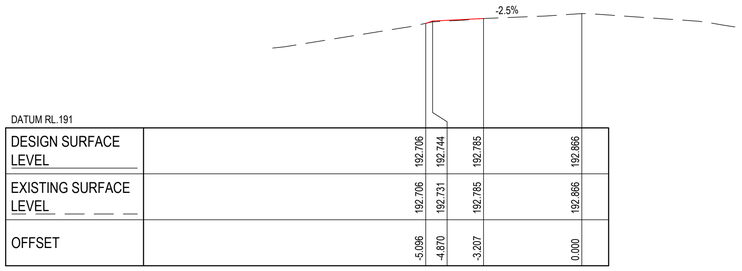
CH 50.000



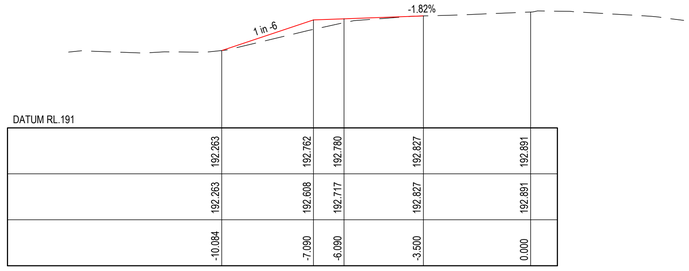
CH 6.727



CH 40.000



CH 0.000



CH 30.000

ROAD 01

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

HORIZONTAL 1:100 AT ORIGINAL SIZE 0 1 2 3 4 5m
VERTICAL 1:50 AT ORIGINAL SIZE 0 0.5 1 1.5 2 2.5m

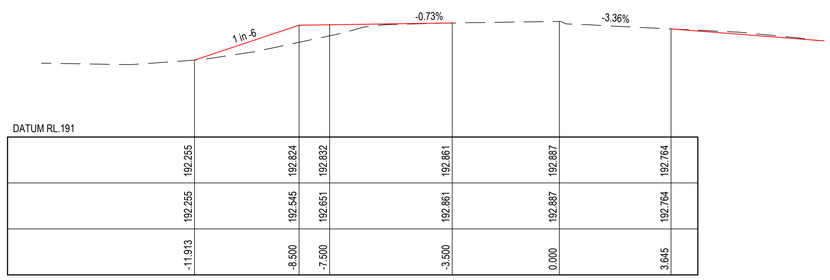
HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

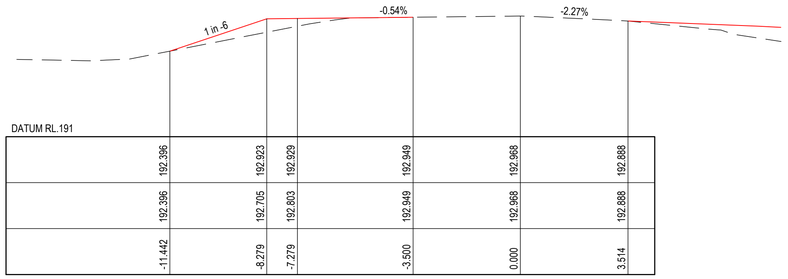
GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
ROAD CROSS SECTIONS PLAN
ROAD 01

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0600	1 OF 4	A1	2



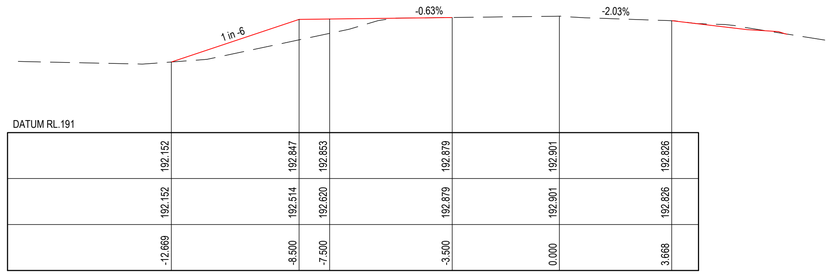
DATUM RL.191						
	192.255	192.824	192.832	192.861	192.887	192.764
	192.255	192.545	192.651	192.861	192.887	192.764
	-11.913	-8.500	-7.500	-3.500	0.000	3.645

CH 90.000



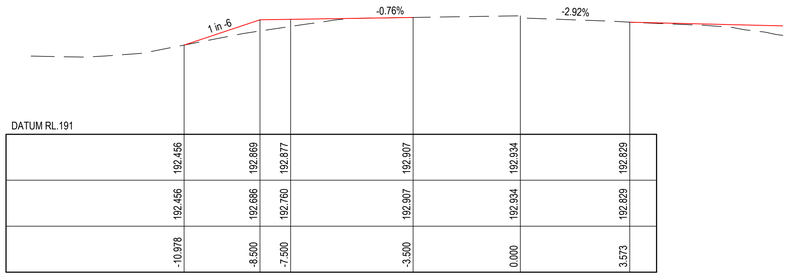
DATUM RL.191						
	192.396	192.923	192.929	192.949	192.968	192.888
	192.396	192.705	192.803	192.949	192.968	192.888
	-11.442	-8.279	-7.279	-3.500	0.000	3.514

CH 130.000



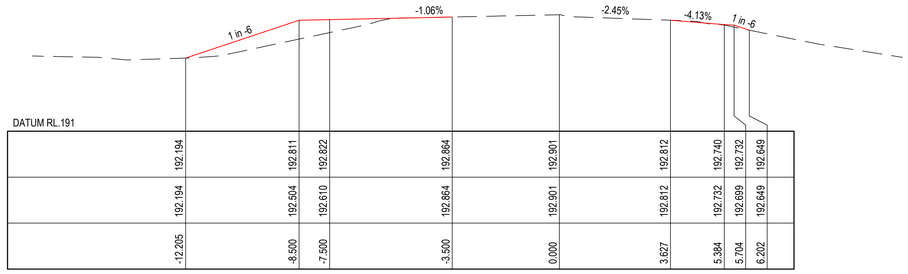
DATUM RL.191						
	192.152	192.847	192.853	192.879	192.901	192.826
	192.152	192.514	192.620	192.879	192.901	192.826
	-12.669	-8.500	-7.500	-3.500	0.000	3.668

CH 80.000



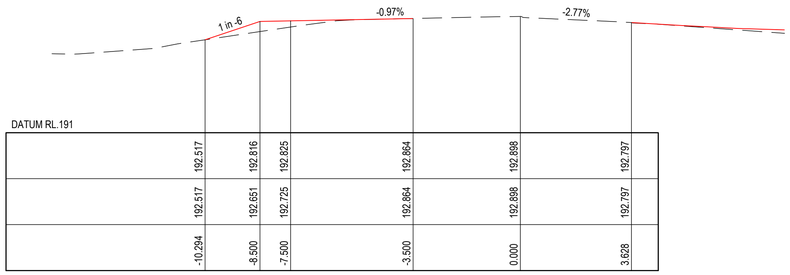
DATUM RL.191						
	192.456	192.869	192.877	192.907	192.934	192.829
	192.456	192.686	192.760	192.907	192.934	192.829
	-10.978	-8.500	-7.500	-3.500	0.000	3.573

CH 120.000



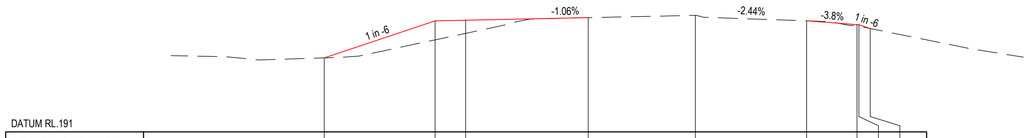
DATUM RL.191								
	192.194	192.811	192.822	192.864	192.901	192.812	192.740	192.732	192.649
	192.194	192.504	192.610	192.864	192.901	192.812	192.732	192.699	192.649
	-12.205	-8.500	-7.500	-3.500	0.000	3.627	5.384	5.704	6.202

CH 70.000



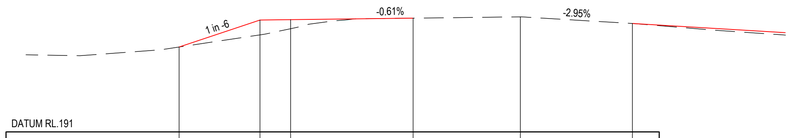
DATUM RL.191						
	192.517	192.816	192.825	192.864	192.898	192.797
	192.517	192.651	192.725	192.864	192.898	192.797
	-10.294	-8.500	-7.500	-3.500	0.000	3.628

CH 110.000



DATUM RL.191								
DESIGN SURFACE LEVEL	192.208	192.811	192.822	192.864	192.901	192.813	192.750	192.749	192.687
EXISTING SURFACE LEVEL	192.208	192.502	192.608	192.864	192.901	192.813	192.731	192.724	192.687
OFFSET	-12.120	-8.500	-7.500	-3.500	0.000	3.631	5.276	5.338	5.708

CH 67.584



DATUM RL.191						
	192.385	192.825	192.832	192.856	192.877	192.769
	192.385	192.583	192.684	192.856	192.877	192.769
	-11.142	-8.500	-7.500	-3.500	0.000	3.659

CH 100.000

ROAD 01

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

HORIZONTAL 1:100 AT ORIGINAL SIZE 0 1 2 3 4 5m

VERTICAL 1:50 AT ORIGINAL SIZE 0 0.5 1 1.5 2 2.5m

HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
ROAD CROSS SECTIONS PLAN
ROAD 01

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0601	2 OF 4	A1	2

DATUM RL.191

	192.686	193.034	193.042	193.068	193.103	193.006	192.897	192.870	192.500
	192.686	192.896	192.990	193.068	193.103	193.002	192.760	192.679	192.500
-9.068		-6.980	-6.188	-3.500	0.000	3.518	7.500	8.500	10.720

CH 170.000

DATUM RL.191

	193.180	193.053	192.949	192.914	192.661
	193.180	193.048	192.901	192.821	192.661
0.000		3.549	6.448	7.448	8.964

CH 210.000

DATUM RL.191

	192.485	193.022	193.031	193.056	193.086	192.977	192.851	192.820	192.512
	192.485	192.845	192.962	193.056	193.086	192.972	192.744	192.662	192.512
-10.684		-7.461	-6.461	-3.500	0.000	3.493	7.500	8.500	10.345

CH 160.000

DATUM RL.191

	193.169	193.032	192.905	192.867	192.614
	193.169	193.029	192.815	192.724	192.614
0.000		3.534	6.783	7.783	9.298

CH 200.000

DATUM RL.191

	192.364	193.013	193.020	193.045	193.071	192.966	192.845	192.815	192.484
	192.364	192.811	192.928	193.045	193.071	192.965	192.728	192.646	192.484
-11.626		-7.733	-6.733	-3.500	0.000	3.472	7.500	8.500	10.487

CH 150.000

DATUM RL.191

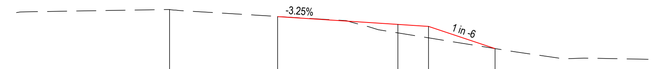
	193.153	193.013	192.870	192.830	192.511
	193.153	193.050	192.749	192.651	192.511
0.000		3.525	7.119	8.119	10.034

CH 190.000

DATUM RL.191

DESIGN SURFACE LEVEL	192.330	193.001	193.003	193.012	193.021	192.932	192.830	192.805	192.387
EXISTING SURFACE LEVEL	192.330	192.742	192.861	193.012	193.021	192.927	192.711	192.608	192.387
OFFSET	-12.032	-8.006	-7.006	-3.500	0.000	3.461	7.500	8.500	11.008

CH 140.000



DATUM RL.191

	193.127	193.012	192.884	192.852	192.490
	193.127	193.014	192.746	192.665	192.490
0.000		3.527	7.454	8.454	10.625

CH 180.000

ROAD 01

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

HORIZONTAL 1:100 AT ORIGINAL SIZE 0 1 2 3 4 5m

VERTICAL 1:50 AT ORIGINAL SIZE 0 0.5 1 1.5 2 2.5m

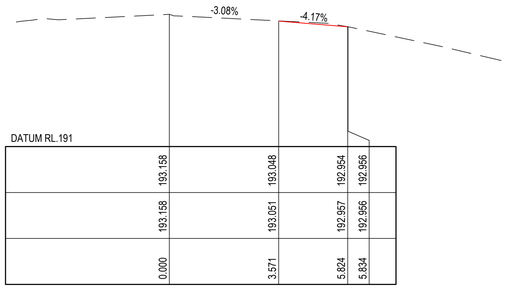
HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

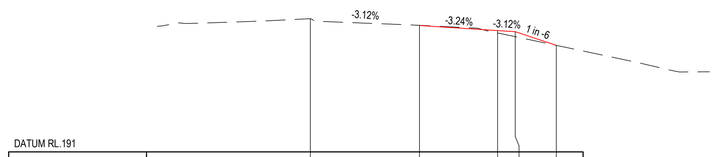
GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
ROAD CROSS SECTIONS PLAN
ROAD 01

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0602	3 OF 4	A1	2



DATUM RL.191				
	193.158	193.048	192.954	192.956
	193.158	193.051	192.957	192.956
	0.000	3.571	5.824	5.834

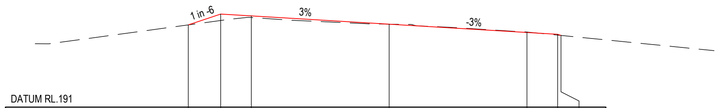
CH 228.626



DATUM RL.191					
DESIGN SURFACE LEVEL	193.174	193.063	192.980	192.962	192.739
EXISTING SURFACE LEVEL	193.174	193.066	192.941	192.881	192.739
OFFSET	0.000	3.561	6.113	6.688	8.030

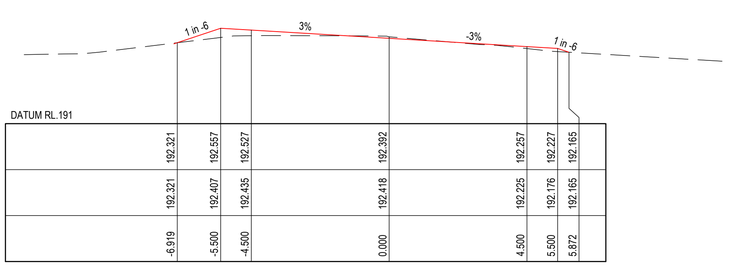
CH 220.000

ROAD 01



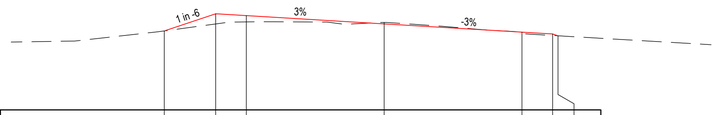
DATUM RL.191							
	192.342	192.518	192.488	192.353	192.218	192.188	192.170
	192.342	192.414	192.463	192.354	192.225	192.175	192.170
	-6.558	-5.500	-4.500	0.000	4.500	5.500	5.611

CH 47.769



DATUM RL.191							
	192.321	192.557	192.527	192.392	192.257	192.227	192.165
	192.321	192.407	192.435	192.418	192.225	192.176	192.165
	-6.919	-5.500	-4.500	0.000	4.500	5.500	5.872

CH 40.000



DATUM RL.191							
DESIGN SURFACE LEVEL	192.289	192.569	192.539	192.404	192.269	192.239	192.209
EXISTING SURFACE LEVEL	192.289	192.402	192.436	192.427	192.243	192.214	192.209
OFFSET	-7.179	-5.500	-4.500	0.000	4.500	5.500	5.677

CH 37.746

ROAD 02

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

HORIZONTAL 1:100 AT ORIGINAL SIZE
0 1 2 3 4 5m

VERTICAL 1:50 AT ORIGINAL SIZE
0 0.5 1 1.5 2 2.5m

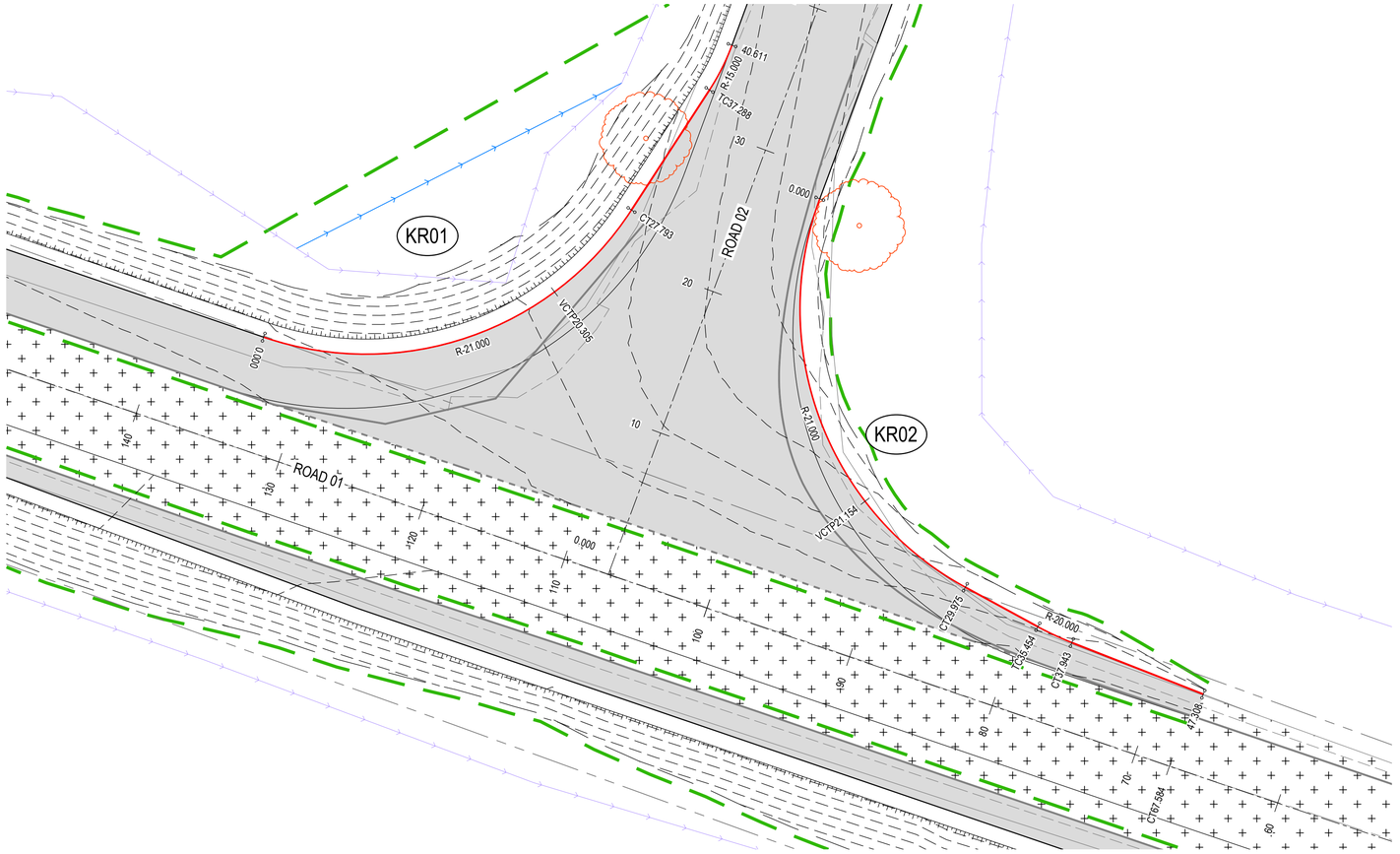
HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
ROAD CROSS SECTIONS PLAN
ROAD 01

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0603	4 OF 4	A1	2



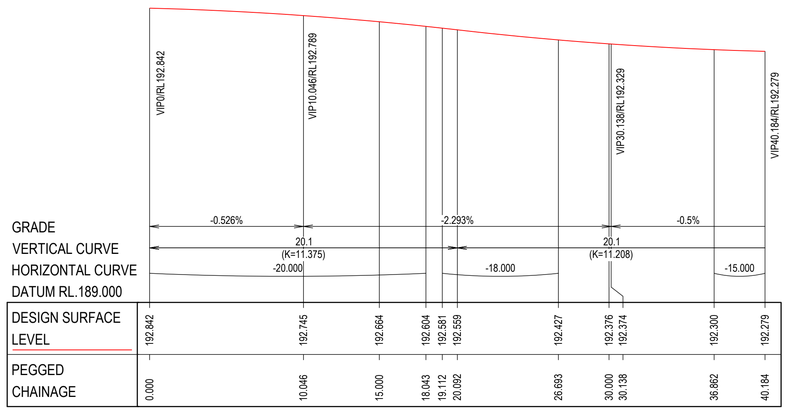
LEGEND

PROPOSED

- CIVIL WORKS BOUNDARY
- KERB RETURN ALIGNMENT (LIP OF KERB)
- 192.0 CONTOURS (0.2m)
- 15 / 30 ROAD CENTERLINE AND CHAINAGE
- KR01 KERB RETURN LABELS
- PAVEMENT
- SWALE INVERT

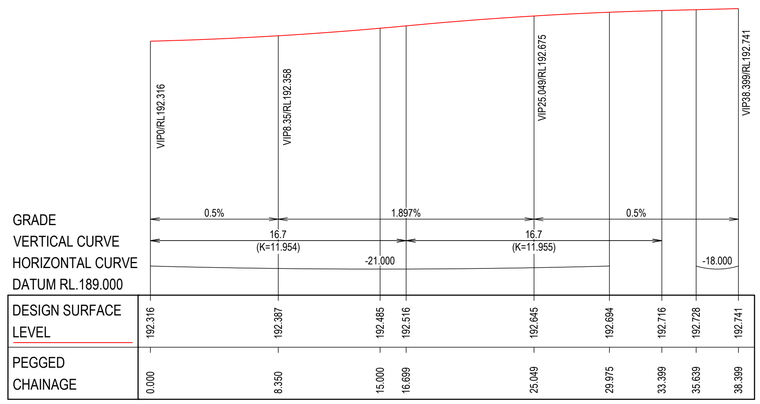
EXISTING

- LOT BOUNDARY
- 192.0 CONTOURS (0.5m)
- PAVEMENT
- SWALE INVERT
- TREE (TO BE REMOVED)



HOR : 1 IN 200
VERT: 1 IN 40

LONGITUDINAL SECTION - KR 01



HOR : 1 IN 200
VERT: 1 IN 40

LONGITUDINAL SECTION - KR 02

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE

HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

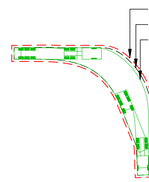
GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
KERB RETURN LAYOUT AND SECTIONS

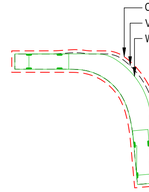
DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C0700		A1	2

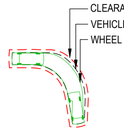
LOT 7300
DP1161855

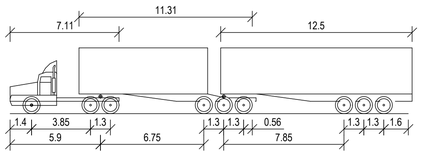
LOT 7300
DP1161855

LEGEND









B-DOUBLE	
OVERALL LENGTH	26.000m
OVERALL WIDTH	2.500m
OVERALL BODY HEIGHT	4.300m
MIN BODY GROUND CLEARANCE	0.540m
TRACK WIDTH	2.500m
LOCK-TO-LOCK TIME	6.00s
KERB TO KERB TURNING RADIUS	15.000m

DESIGN VEHICLE

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	21.01.25	ISSUED FOR APPROVAL	JMN	JMA

0 3.75 7.5 11.25 15 18.75m
SCALE 1:375 AT ORIGINAL SIZE

HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
SWEPT PATH ANALYSIS LAYOUT PLAN
DESIGN VEHICLE

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C1700		A1	2

LOT 2
DP773266

LOT 55
DP751793

LOT 7300
DP1161855

SIGHT DISTANCE 01 - (S.I.S.D)
- SISD (SAFE INTERSECTION SIGHT DISTANCE) = 319.9m
- DT (DECISION TIME) = 5.0 sec
- V (DESIGN SPEED) = 110km/h (SIGN POSTED SPEED +10km/h)
- D (COEFFICIENT OF DECELERATION) = 0.29
- A (LONGITUDINAL GRADE) = -0.5%

SIGHT LINE 01

CONFLICT POINTS

SIGHT DISTANCE 02 - (S.I.S.D)
- SISD (SAFE INTERSECTION SIGHT DISTANCE) = 314.3m
- DT (DECISION TIME) = 5.0 sec
- V (DESIGN SPEED) = 110km/h (SIGN POSTED SPEED +10km/h)
- D (COEFFICIENT OF DECELERATION) = 0.29
- A (LONGITUDINAL GRADE) = +0.5%

SIGHT LINE 02

PROPOSED

LEGEND

- SSID (SAFE INTERSECTION SIGHT DISTANCE)
- LINE OF SIGHT
- VEHICLE

EXISTING

- LOT BOUNDARY
- ROAD CENTRELINE
- LINEMARKING
- EDGE OF BITUMEN

SIGHT DISTANCE 01 (SISD)	
D_T (DECISION TIME)	5.0s
d (COEFFICIENT OF DELECERATION)	0.29
a (LONGITUDINAL GRADE IN %)	-0.5%
V (OPERATING SPEED)	110km/h
SISD	319.9m

SIGHT DISTANCE 02 (SISD)	
D_T (DECISION TIME)	5.0s
d (COEFFICIENT OF DELECERATION)	0.29
a (LONGITUDINAL GRADE IN %)	0.5%
V (OPERATING SPEED)	110km/h
SISD	314.3m

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

0 10 20 30 40 50m
SCALE 1:1000 AT ORIGINAL SIZE

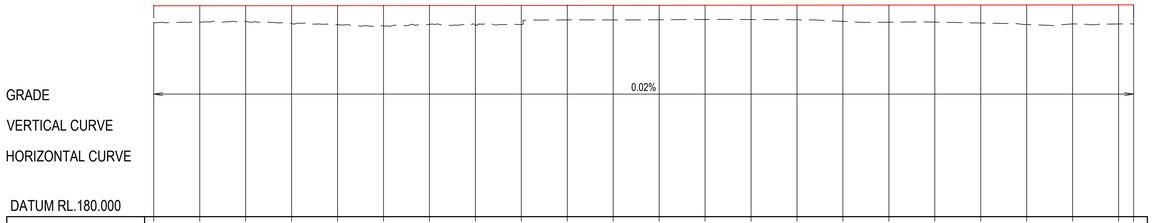
HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
SIGHT LINE LAYOUT PLAN

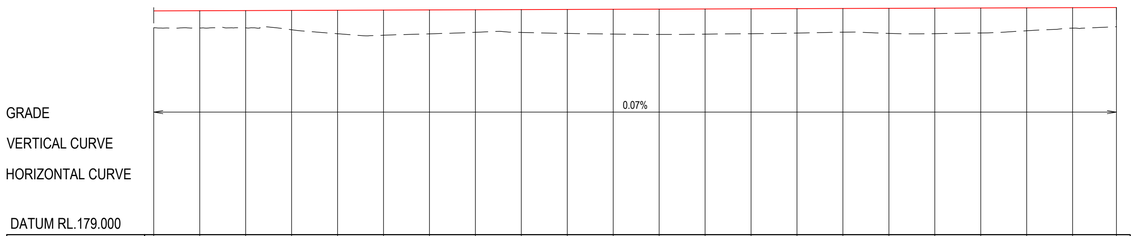
DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C1800		A1	2



SIGHT LINE LEVEL	193.769	193.772	193.774	193.777	193.780	193.782	193.785	193.788	193.791	193.793	193.796	193.799	193.802	193.804	193.807	193.810	193.812	193.815	193.818	193.821	193.823	193.826	193.827
FINAL SURFACE LEVEL	192.669	192.686	192.760	192.611	192.527	192.448	192.551	192.516	192.536	192.844	192.846	192.853	192.874	192.868	192.851	192.749	192.693	192.699	192.641	192.539	192.584	192.578	192.577
CLEARANCE	1.100	1.085	1.014	1.166	1.252	1.334	1.235	1.272	1.254	0.949	0.951	0.946	0.928	0.936	0.956	1.061	1.119	1.116	1.177	1.281	1.240	1.248	1.250
PEGGED CHAINAGE	0.000	15.000	30.000	45.000	60.000	75.000	90.000	105.000	120.000	135.000	150.000	165.000	180.000	195.000	210.000	225.000	240.000	255.000	270.000	285.000	300.000	315.000	319.900

HOR : 1 IN 1000
VERT: 1 IN 200

LONGITUDINAL SECTION - SIGHT LINE 01



SIGHT LINE LEVEL	193.610	193.620	193.630	193.641	193.651	193.661	193.672	193.682	193.693	193.703	193.713	193.724	193.734	193.744	193.755	193.765	193.776	193.786	193.796	193.807	193.817	193.827
FINAL SURFACE LEVEL	192.510	192.494	192.503	192.377	192.117	192.020	192.109	192.211	192.202	192.138	192.097	192.072	192.090	192.121	192.160	192.218	192.135	192.123	192.166	192.311	192.483	192.577
CLEARANCE	1.100	1.126	1.127	1.264	1.534	1.642	1.563	1.471	1.491	1.565	1.617	1.651	1.644	1.623	1.595	1.547	1.640	1.663	1.631	1.495	1.334	1.250
PEGGED CHAINAGE	0.000	15.000	30.000	45.000	60.000	75.000	90.000	105.000	120.000	135.000	150.000	165.000	180.000	195.000	210.000	225.000	240.000	255.000	270.000	285.000	300.000	314.300

HOR : 1 IN 1000
VERT: 1 IN 200

LONGITUDINAL SECTION - SIGHT LINE 02

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

HORIZONTAL 1:1000 AT ORIGINAL SIZE — 0 10 20 30 40 50m
VERTICAL 1:200 AT ORIGINAL SIZE — 0 2 4 6 8 10m

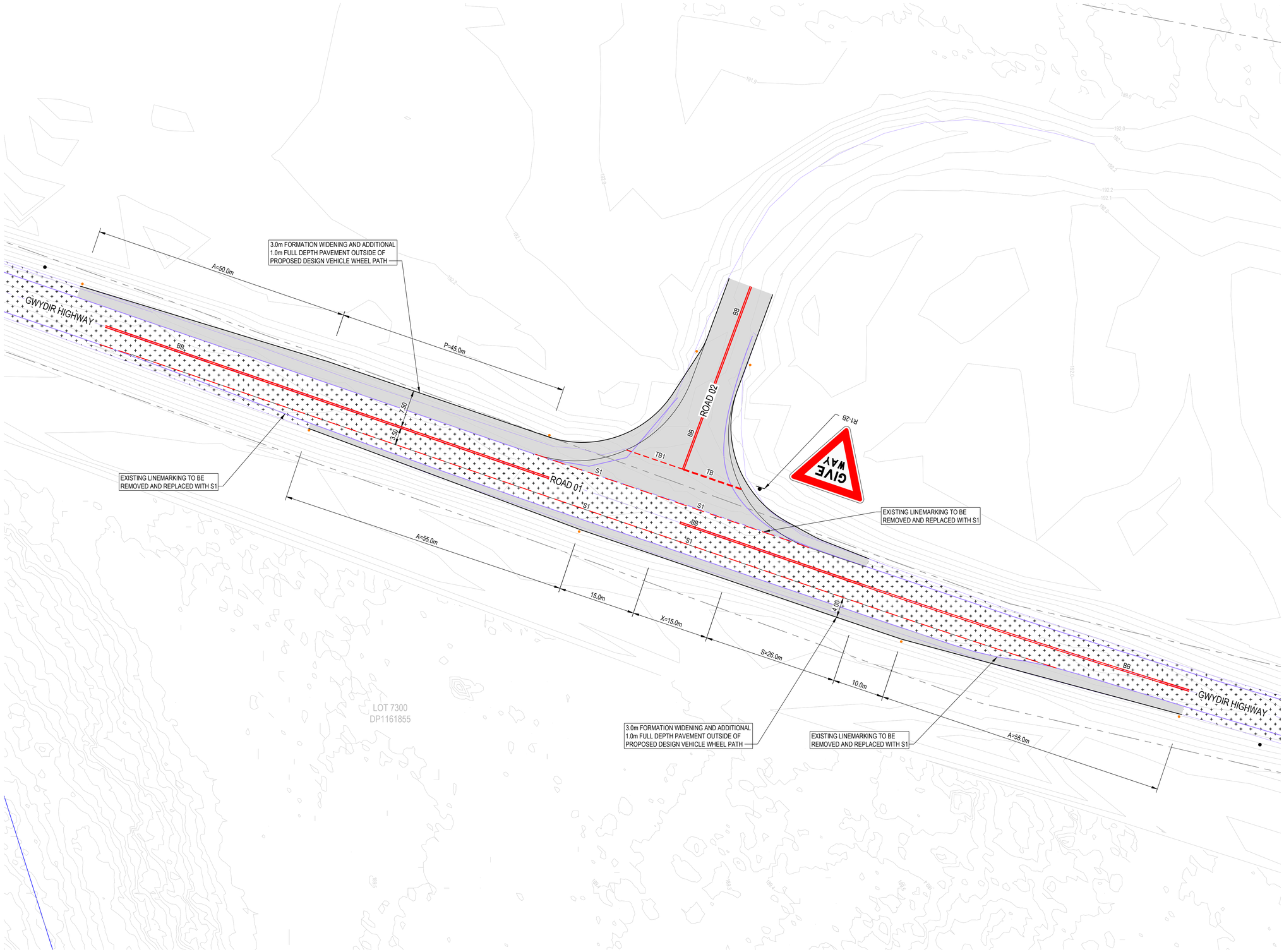
HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	
NOT FOR CONSTRUCTION	

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
SIGHT LINE LONGITUDINAL SECTIONS

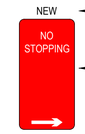
DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C1801		A1	2



LEGEND

PROPOSED

- BB — LINEMARKING - BB
- E1 — LINEMARKING - E1
- S1 — LINEMARKING - S1
- TB — LINEMARKING - TB
- TB1 — LINEMARKING - TB1
- NEW SIGN POST
- GUIDE POST



NEW, RELOCATE EXISTING, OR EXISTING SIGN

COLOUR GREY = NEW = EXISTING

RMS TRAFFIC SIGN CODE AND ARROW DIRECTION
(R) - RIGHT
(L) - LEFT
(BW) - BOTH WAYS

NOTES:

1. REFER TO RMS DELINEATION MANUAL FOR FURTHER DETAILS:
   - 1.1. SECTION 4 - LONGITUDINAL MARKINGS
   - 1.2. SECTION 6 - TRANSVERSE MARKINGS
   - 1.3. SECTION 11 - PAVEMENT MARKINGS AT ROUNDABOUTS
2. ALL TRAFFIC SIGN CODES REFER TO STANDARD RMS SIGNAGE

REV	DATE	DESCRIPTION	AMD BY	APP BY
2	13.03.25	ISSUED FOR APPROVAL	JLR	JMA
1	13.02.25	ISSUED FOR APPROVAL	JMN	JMA

0 3.75 7.5 11.25 15 18.75m
SCALE 1:375 AT ORIGINAL SIZE

HIRINGA

MAKER ENG

DRAWN: J.NEWELL	DESIGNED: J.NEWELL
DRAFT CHECK: H.SMITH	DESIGN CHECK: H.SMITH
APPROVED: J.AGUSTIN	

NOT FOR CONSTRUCTION

GWYDIR HIGHWAY INTERSECTION UPGRADE
CONCEPT DESIGN
LOCAL AREA TRAFFIC MANAGEMENT LAYOUT PLAN

DRAWING NUMBER	SHEET No.	ORIG. SIZE	REVISION
MKR00959-201-C1900		A1	2

Office Locations

Wollongong Office
Suite 3, Level 2
280 Keira Street
Wollongong NSW 2500
P: 02 4288 4401

Geelong Office
Suite 2, 2-6 Rutland Street
Newtown VIC 3220
P: 03 4245 1171

www.makereng.com.au

Management Systems

Quality and safety are extremely important to Maker ENG and as such we are certified to the following Australian Standards:

- ISO 9001:2015 Quality Management Systems
- ISO 45001:2018 Occupational Health and Safety Management Systems
- ISO 14001:2015 Environmental Management Systems

MAKER ENG

Urban Development Institute of Australia VICTORIA

Urban Development Institute of Australia NEW SOUTH WALES