

Mod 1 Supplementary Integrated Water Cycle Management Strategy

661 Culburra Road, Culburra Beach, NSW 2540

Final Report

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1 Introduction

1.1 Overview and Scope

Martens & Associates Pty Ltd (**MA**) have prepared this Supplementary Integrated Water Cycle Management Strategy to support a modification to the development consent for State Significant Development (**SSD**) (application SSD 3846) (the **Consent**) for the proposed mixed use development at Lot 1 in DP1305809 and Lots 1 and 3 in DP 1279350, 661 Culburra Road, Culburra Beach NSW (the **site**).

This report should be read in conjunction with the following reports and plans:

1. Concept plan layout provided by Allen Price Ltd (**AP**), Revision M dated June 2025, refer to Appendix A.
2. Preliminary engineering plans prepared by AP, dated May 2025, refer to Appendix B.
3. MA Integrated Water Cycle Management Strategy, Mixed Use Urban Development at West Culburra, NSW (**IWCMS**) (Ref: P1203365JR07V06, November 2020).
4. Addendum to Integrated Water Cycle Management Strategy, Mixed Use Urban Development at West Culburra, NSW (**Addendum IWCMS**) (Ref: P1203365JR10V01, July 2021).

The report addresses changes in the subdivision layout, primarily focusing on the stormwater management strategy. Information in this report supersedes all previously provided in the IWCMS and the Addendum IWCMS. Where matters are not included in this document, the information in the IWCMS and Addendum IWCMS is to be relied on. For ease of reference the IWCMS and Addendum IWCMS are referred to as the '**Approved Water Strategy**' in this document.

Changes to the development layout and the stormwater management solution as documented and assessed in this modification application, do not include any changes to the town centre precinct. Design modifications are limited to the industrial precinct (south of the sewage treatment plant) and the adjoining residential precinct to the west. Design and assessment of the town centre precinct remains as documented in the Approved Water Strategy.

1.2 The Concept Plan

The Concept Plan was approved by the NSW Land and Environment Court in 2019. This Report accompanies the proposed modification application to amend the Concept Plan. The amended site concept plan is provided in Appendix A. The primary objective of these modifications is to realign the development footprint to correspond with a recent survey of the Mean High Water Mark (**MHWM**) and to adjust the approved stormwater basin layouts in accordance with the conditions of consent. Additionally, minor changes have been proposed in response to the Council's previous feedback on the staging plan and

subdivision layout and to remove the individual allotment boundaries. Minor changes include:

1. For the low density residential area:
 - a) Realignment of cul-de-sac access from the perimeter road to an interior road.
 - b) Removal of the pedestrian walking path between the cul-de-sac head and the road.
 - c) Removal of Bioretention basins (**Biobasins**) labelled B1, B2, and B3, and inclusion of a biobasin labelled as Bio E.
 - d) Decrease in area for Pond 1 serving the residential area.
 - e) Increase in road pavement widths to improve bushfire access.
 - f) Change of development footprint for the residential component from 24.93ha to 23.87ha.
2. For the industrial precinct:
 - a) Removal of bushfire egress from the northern boundary of Park 2 and industrial area and realignment through Park 2.
 - b) Extension of Park 2 along the northern boundary adjoining Culburra STP.
 - c) Realignment of lots while retaining the total area of Industrial lots.
 - d) Introduction of a new wetland and decrease in surface area for Pond 3 serving the industrial area.
 - e) Increase in road pavement widths to improve bushfire access.
 - f) Change of development footprint area from 5.34ha to 4.05ha.
 - g) Removal of detailed lot layout to industrial development and plan for 13 lots.
3. For the open space / foreshore areas:
 - a) Park 1: The area has been increased from 1.0ha in the approved concept proposal to 1.69ha.
 - b) Park 2: The area has been increased from 1.79ha in the approved concept proposal to 2.51ha.
 - c) Foreshore Reserve (Residential): Due to the redefinition of MHWM, the area has decreased to 9.89ha from 11.88ha.
 - d) Woodland Reserve: This area has been increased to 2.85ha from 2.81ha.

- e) Other Parks and Reserves: The Park within Town Centre Precinct adjoining Lot 313, Park (Sporting Field), and Foreshore Reserve (Town Centre) have all remained unchanged in their respective areas as per the approved concept proposal.

1.3 Report Reviewer

This report has been reviewed by Dr Daniel Martens. Dr Martens maintains over 30 years of experience in both civil engineering and environmental science, which has included authoring, undertaking and supervising numerous surface water and groundwater management plans. Dr Martens undertook the supervision and technical lead of the Approved Water Strategy.

2 Stormwater Quality Management Plan

2.1 Overview

This supplementary stormwater quality assessment has been prepared to assess the performance of an amended stormwater basin design. The assessment considers the updated development layout and amended stormwater treatment train. Design iterations have been undertaken to ensure that the amended treatment solution achieves the stormwater quality objectives adopted in the Approved Water Strategy.

The updated site stormwater solution remains consistent with the performance standards established in the Approved Water Strategy. The stormwater management proposal for the concept plan uses a combination of 'at source' and 'end of line' controls to ensure the adopted objectives are satisfied. The industry standard water quality modelling software, MUSIC, was used to assess the effectiveness of the stormwater treatment system. An amended version of the calibration Model for Urban Stormwater Improvement Conceptualisation (**MUSIC**, Version 6.3 as developed by the CRC for Catchment Hydrology) model developed in the preparation of the Approved Water Strategy was used of this assessment, with modifications made only to respond to the changes in the development layout and in the specification of the water quality treatment devices.

Key elements of the amended site proposal are:

1. Integration of at source Water Sensitive Urban Design (**WSUD**) devices like rainwater tanks and gross pollutant traps across the development to mitigate runoff volumes, provide for stormwater reuse and to mitigate development water quality impacts.
2. Inclusion of gross pollutant trap (**GPTs**) for the capture of gross pollutants from urban areas.
3. Construction of primary and secondary end of line bioretention basins to treat stormwater runoff through processes of filtration, evapotranspiration, and detention.
4. Diversion of stormwater to ponds for use in park and sports field irrigation. This aids in managing and reducing stormwater releases to the Crookhaven River estuary buffer area, and, through reuse and retention, aids in the removal of pollutant load and assists in pathogen deactivation and control.
5. Implementation of a downstream stormwater dispersal system to spread flows from bioretention basins as broad overland flows, avoiding concentrated flows through the estuary buffer area.

2.2 Discharge Locations

The concept plan area generally drains northward into the Crookhaven River estuary (**the Estuary**), with a smaller section directing water south toward Lake Wollumboola. The

Approved Water Strategy adopted differing assessment criteria for the two catchment to align with their distinct characteristics.

2.3 Stormwater Quality Objectives

The performance targets adopted by the Approved Water Strategy, and also adopted for this study, are outlined:

1. **Pollutant Load Reductions:** Achieve the minimum pollutant removal targets required under Shoalhaven Council's Development Control Plan (**DCP**) 2014 Chapter G2 for stormwater released into Shoalhaven River and Lake Wollumboola. The pollutant reduction targets are summarised in Table 1 below.
2. **NorBE:** Achieve a neutral or beneficial impact on the Estuary and Lake Wollumboola.

Table 1: Summary of pollutant load reduction targets.

Pollutant	Post Development Average Annual Load Reduction (%)
Total suspended solids (TSS)	85
Total phosphorus (TP)	45 – the Estuary 65 - Lake Wollumboola
Total nitrogen (TN)	45
Gross pollutants (GP)	90

2.4 Water Quality Modelling Methodology

2.4.1 Overview

A modified version of the MUSIC model developed for the Approved Water Strategy, was used to evaluate treatment train effectiveness (**TTE**) and post development pollutant generation from the site. Refer to Map 1 - Map 6 in Appendix C for the MUSIC model layout.

The MUSIC model used in this amended assessment has been updated from the Approved Water Strategy to accurately reflect the changes described in this modification application for assessment. These changes include:

1. Refinement of pre and post development catchments to align with the updated concept layout and drainage design.
2. Adjustments to impervious percentages to account for added footpaths, access roads, and road widening.
3. Exclusion of primary basins from residential and industrial development areas.
4. Addition of a new wetland treatment device for treatment of industrial area runoff.

5. Increase in exfiltration rates applied to treatment devices.
6. Resizing of treatment devices to achieve adopted water quality objectives.

2.4.2 Approach

The following modelling scenarios were considered as part of the modelling:

1. **Pre development:** Existing site condition modelled to determine baseline pollutant generation rates for TSS, TP, TN and GP.
2. **Post development (untreated):** Developed site condition modelled without any water quality treatment devices.
3. **Post development (treated):** Developed site condition modelled with water quality treatment devices to achieve adopted objectives for nutrients and gross pollutants.

An iterative approach was used for post development modelling to determine appropriate types, sizes and locations of stormwater treatment devices for modelling scenarios to achieve water quality objectives.

2.4.3 Setup and Calibration

Input parameters for source and treatment nodes are consistent with those detailed in Section 4.4 of IWCMS except as described in the following section.

2.4.3.1 Exfiltration Rate

The exfiltration rate has been revised from 0.25 mm/hr to 0.5 mm/hr as a result of detailed groundwater modelling undertaken during the Stage 1 development application works. This modelling incorporated additional monitoring data and aquifer testing, resulting in a modified understanding of the site's hydrogeological conditions. The further developed groundwater modelling conclude that the soils have a greater infiltration capacity than previously assumed, supporting the adoption of the higher exfiltration rate.

The adopted exfiltration rate of 0.5 mm/hr remains conservative relative to the measured average K_{sat} of 21.3 mm/hr¹ and is considered suitable for use in the MUSIC model. This rate is consistent with the approach outlined in Section 4.4.3.8 of the IWCMS. Treatment devices within the Lake Wollumboola catchment remain as fully impermeable lined structures.

¹ As reported in Table 20 of the IWCMS.

2.4.3.2 Catchments

The current land cover (model PD-LC1 on Map 14 of IWCMS) was adopted to define surface conditions for the assessment of runoff quality to the Estuary and Lake Wollumboola for the pre development case. MUSIC model catchment plans were updated for this update stormwater quality assessment as follows:

1. Pre development catchments based on existing conditions, refer to Map 7 in Appendix C.
2. Post development catchments based on developed conditions, refer to Map 8 Appendix C).

Generally, MUSIC model catchments have been adjusted to exclude area that is not part of the development. However, all land that is proposed to be altered by the development, undergo a change of land use, or which drains towards a water quality device, has been included in the MUSIC model.

2.4.4 Concept Treatment Train

The stormwater treatment strategy for the site is a combination of 'at source' and 'end of line' controls to ensure objectives are satisfied. Individual stormwater quality improvement devices (**SQIDs**) for the proposed development are outlined in the following sections. The treatment devices and sizes may be subject to change at the detailed design stage. Refer to Map 9 for locations of the proposed treatment devices.

2.4.4.1 Rainwater Tanks

The concept plan proposal includes rainwater capture and reuse from roof runoff. The assumptions used for modelling are consistent with those outlined in Section 4.2.1 of the IWCMS. The number of rainwater tanks has been updated based on the planned lots for each development according to the updated concept plan. The sizing of the tanks remains the same for residential and industrial development areas (5kL and 15kL / lot respectively).

2.4.4.2 Gross Pollutant Traps

Six gross pollutant traps (**GPT**) have been included in the stormwater treatment train, to be located upstream of stormwater treatment structures. System specification, sizing, and removal efficiency of the GPTs are provided by the manufacturer (Holcim Australia). Refer to Table 2 for updated locations and Appendix D for further details.

Table 2: GPT treatment measures included in MUSIC modelling.

GPT ID	Location
1	Upstream of Secondary Biobasin E
2	Upstream of Pond 1
3	Upstream of Wetland 1
4	Upstream of Pond 2

GPT ID	Location
5	Upstream of Primary Biobasin 6
6	Upstream of Primary Biobasin 7

2.4.4.3 Bioretention Basin

Bioretention basins provide a key water quality management element in the stormwater management strategy. Several primary and secondary biobasins have been proposed at various locations within the concept plan area.

- Primary biobasins have been proposed within road reserves to treat stormwater runoff from the development. This runoff will be conveyed to the primary biobasins via a pit and pipe network, where it will undergo initial treatment through media filtration and detention.
- Secondary biobasins have been incorporated into parkland areas to provide supplementary treatment prior to dispersal. Biobasins offer significant stormwater treatment through media filtration, detention, and some biological uptake of nutrients. Secondary biobasins are to be semi permeable (with a nominal exfiltration rate of 0.5 mm/hr) to enable groundwater recharge of stormwater within the concept plan area. The adequacy of this design was demonstrated in the Approved Water Strategy through groundwater impact assessment.

The biobasin located within the Lake Wollumboola catchment is proposed to maintain a fully impermeable liner. A summary of proposed biobasins is provided in Table 3 with full details provided in Appendix D.

Table 3: Biobasin treatment measures included in MUSIC modelling.

Biobasin ID	Primary or Secondary	Base Area (m ²)	Area Serviced
6	Primary	500	Residential, commercial, industrial
7	Primary	507	Access road and roundabout that drains into Lake Wollumboola
A	Secondary	2,028	Residential
B	Secondary	3,000	Residential, commercial, industrial, park, carpark
C	Secondary	1,071	Industrial, park
D	Secondary	251	Industrial
E	Secondary	1,652	Residential

2.4.4.4 Stormwater Ponds

Three offline stormwater ponds (**Ponds**) have been integrated into the stormwater management strategy. In sub catchments serviced by ponds, stormwater generated by

the development within the Crookhaven River catchment portion of the concept plan (with exception of Lot 301 and 302) will be conveyed to flow control structures upslope the ponds. Flow control will divert high flows to the pond and low flows to a bioretention basin. Preliminary specifications for ponds are provided in Table 4 with full details provided in Appendix D.

Table 4: Preliminary specification of ponds.

Pond ID	Minimum Inflow Threshold (L/s)	Minimum Surface Area (m ²)	Extended Detention Depth (m)	Permanent Pool Volume (m ³)
1	20	4,379	0.5	11,013
2	10	2,500	0.5	7,500
3	10	2,204	0.5	3,196

2.4.4.5 Wetland

A wetland is proposed as an end of line treatment in the modelling collecting and treating the proposed industrial development. The wetland provides treatment through sedimentation, infiltration and absorption by vegetation to remove fine sediments, nutrients, and other pollutants. Refer to Table 5 for locations and Appendix D for further details.

Table 5: Preliminary specification of Wetland.

Wetland ID	Minimum Surface Area (m ²)	Extended Detention Depth (m)	Permanent Pool Volume (m ³)
1	1,429	0.30	846

2.5 Water Quality Results

2.5.1 Pollutant Load Reductions

2.5.1.1 Crookhaven River Estuary

Table 6 summarises pollutant loads and reductions for catchments flowing into the Estuary. The results demonstrates that all pollutant load reduction target, including gross pollutants, TSS, TP, and TN, are achieved, with reductions surpassing Shoalhaven DCP Chapter G2 requirements.

Table 6: MUSIC TTE assessment results for the Estuary.

Parameter	Source Load (kg/year)	Residual Load (kg/year)	Reduction (%)	Complies (Y/N)
Total Suspended Solids	33100	1290	96	Y
Total Phosphorus	68.4	9.3	87	Y
Total Nitrogen	488.0	84.1	83	Y
Gross Pollutants	5130	16	100	Y

2.5.1.2 Lake Wollumboola

Table 7 provides the modelled pollutant loads and load reductions for catchments draining into Lake Wollumboola. The results show that the proposed stormwater management system achieves pollutant load reduction targets for all pollutants, including gross pollutants, TSS, TP, and TN.

Table 7: MUSIC TTE assessment results for Lake Wollumboola.

Parameter	Source Load (kg/year)	Residual Load (kg/year)	Reduction (%)	Complies (Y/N)
Total Suspended Solids	3040	249	92	Y
Total Phosphorus	5.1	0.9	82	Y
Total Nitrogen	22.4	8.2	64	Y
Gross Pollutants	235	21	91	Y

2.5.2 NorBE

2.5.2.1 Crookhaven River Estuary

For catchments draining to the Crookhaven River, Table 8 shows MUSIC modelling results comparing developed treated and pre development conditions. The following observations are made:

1. Gross pollutant and suspended sediment load generation rates in the developed scenario are lower than pre development conditions.
2. Nutrient load generation rates in the developed scenario are lower than pre development conditions.

Completed assessment demonstrates that there shall be no increased in priority pollutants (TN, TP and TSS) to the Estuary and therefore no deleterious impacts as a result of the design modifications proposed.

Table 8: MUSIC NorBE assessment results for the Estuary.

Parameter	Pre development Source Load (kg/year)	Post development Residual Load (kg/year)	Reduction (kg/year)	Complies (Y/N)
Total Suspended Solids	6310	1290	-5020	Y
Total Phosphorus	11.20	9.26	-1.94	Y
Total Nitrogen	93.80	84.10	-9.70	Y
Gross Pollutants	43	16	-26	Y

2.5.2.2 Lake Wollumboola

For catchments draining to Lake Wollumboola, Table 9 provides MUSIC modelling results comparing developed treated and pre development conditions:

1. The developed scenario for Lake Wollumboola shows reduced rates of gross pollutant and suspended sediment generation.
2. Nutrient load generation rates are lower in the developed scenario compared to pre development conditions.

Completed assessment demonstrates that there shall be no increased in priority pollutants (TN, TP and TSS) to the Lake Wollumboola and therefore no deleterious impacts as a result of the design modifications proposed.

Table 9: MUSIC NorBE assessment results for Lake Wollumboola.

Parameter	Pre development Source Load (kg/year)	Post development Residual Load (kg/year)	Reduction (kg/year)	Complies (Y/N)
Total Suspended Solids	1750	249	-1501	Y
Total Phosphorus	2.90	0.94	-1.96	Y
Total Nitrogen	14.00	8.18	-5.82	Y
Gross Pollutants	124	21	-104	Y

2.6 Consistency with SSD 3846 Conditions

Further to a request for further information from the Department of Planning Housing and Infrastructure, an assessment of the compliance of the amended water stormwater management strategy with condition B1 – B6 of SSD 3846 development consent is provided.

In considering the compliance of the modification to that consent it is noteworthy that this document is to be read in conjunction with the Approved Water Strategy and that this document does not replace those documents. Demonstration of compliance of each stage of the development shall be required, as a condition of SSD 3846, and nothing in this current modification seeks to alter those conditions or the need for compliance of future designs to those conditions.

2.6.1 Condition B1

The Applicant must ensure that the Concept Proposal complies with the criteria of Neutral or Beneficial Effect (NorBE) for water quality in the Crookhaven River adjacent to the site and for water quality in Lake Wollumboola by implementation of the IWCMS.

The criteria for NorBE is detailed in the IWCMS at section 2.4. That criteria for the assessment of water quality impacts has been adopted for the subsequent design assessment completed in this supplementary IWCMS and the associated MUSIC water

quality modelling. Modifications to the site stormwater management solution have been designed to comply with the NorBE criteria.

2.6.2 Condition B2

The Applicant must ensure the Concept Proposal complies with the following requirements as per the IWCMS:

- a) SEPP 62;
- b) NSW Oyster Industry Sustainable Aquaculture Strategy (OISAS);
- c) Healthy Estuaries for Healthy Oysters Guideline; and
- d) Shoalhaven Council Development Control Plan, in particular Chapter G2 and the Supporting Document 1–“Sustainable Stormwater Technical Guidelines”.

System performance criteria established in the IWCMS have been similarly considered by the modified site stormwater management solution. The subsequent stages of the development shall be designed with reference to those system performance criteria to ensure continued compliance with the listed requirements.

2.6.3 Condition B3

The Applicant must ensure that stormwater infrastructure is located outside the Foreshore Reserve as shown in the Concept Plan in Appendix 1.

The modified development layout has been developed to respond to updated survey of the ‘Foreshore Reserve’ based on, we understand, a corrected mean high water line for the site. In this way, the modified development layout, including the stormwater infrastructure, continues to remain outside of the Foreshore Reserve area.

2.6.4 Condition B4

The Applicant must ensure that the Concept Proposal includes stormwater treatment measures sufficient to:

- a) comply with the criteria in condition B1;
- b) satisfy the criteria of Neutral or Beneficial Effect (NorBE) for the runoff discharged to the Crookhaven River and Lake Wollumboola relative to a pre-development case that considers current land cover (model PD-LC1 on Map 14 of IWCMS).
- c) result in flow volumes, frequencies and runoff hydrographs that largely mimic pre-development hydrologic conditions (generally in accordance with the developed case rates nominated in Section 4.1 and Section 4.2 of the Addendum IWCMS).
- d) produce pathogen levels lower than the pre-development case (generally in accordance with Section 5 of the Addendum IWCMS).

- e) *maintain groundwater flow regimes and groundwater quality and to provide no material change to material levels in any SEPP 14 wetland (generally in accordance with Section 5 of the IWCMS with any revision necessary to incorporate the findings of the HGEO 2020 West Culburra Groundwater Assessment).*

The modified development:

- a) Provides a design solution which complies with approvals condition B1;
- b) Is consistent with section 2.4 of the approved IWCMS by complying with NorBE against the predevelopment case noted in the condition, with only adjustments as necessitated by the change in the overall development footprint to accommodate the updated land surveys.
- c) The minor changes to the design configuration of the stormwater infrastructure shall not materially impact the flow volumes, frequency and runoff hydrographs compared to those documented in Section 4.1 and 4.2 of the Addendum IWCMS. Ongoing compliance, at subsequent Stages of the development's approval, with these conditions shall be assessed at Stage 1 and subsequent stages.
- d) The treatment train proposed is not significantly different from that documented in the approved site stormwater management solution. The performance of that system shall be commensurate with regards to not only TSS, TN and TP removal (as verified by MUSIC modelling undertaken in this assessment, but also for the removal of pathogens. Ongoing compliance with these conditions shall be assessed at Stage 1 and subsequent stages
- e) The general configuration of the stormwater management solution remains consistent with that previously approved. The exfiltration rate for stormwater treatment devices, which supports the maintenance of groundwater regimes, has been revised from 0.25 mm/hr to 0.5 mm/hr as part of this modification. This updated rate reflects detailed groundwater modelling undertaken during the staging phase of the development, informed by additional monitoring and aquifer testing. While a detailed groundwater impact assessment has not been included as part of this modification application, the maintenance of groundwater flow regimes to receiving environments (including downslope wetlands) shall be achieved. Detailed assessment and ongoing compliance with these conditions will be addressed at Stage 1 and subsequent stages of the development approval.

2.6.5 Condition B5

The Applicant shall demonstrate compliance with the above criteria for:

- a) *surface water quality based on the use of the MUSIC software in accordance with the latest version of the NSW MUSIC Modelling Guidelines by NSW Local Land Services;*
- b) *groundwater by the use of MODFLOW and MT3DMS or similar.*

The modified development:

- a) demonstrated compliance with the latest version of the NSW MUSIC modelling Guidelines referenced.
- b) The modification to the development layout shall not materially impact the input parameters adopted for the competed MODFLOW modelling which demonstrated, as part of the application for SSD 3846, to the above criteria.

Ongoing compliance, at subsequent Stages of the development's approval, with these conditions shall be assessed at Stage 1 and subsequent stages.

2.6.6 Condition B6

Unless a superior water quality outcome can be achieved by the use of alternate stormwater treatment devices, the Applicant shall ensure that the Concept Proposal includes stormwater treatment elements generally in accordance with those nominated in Section 4 of the IWCMS, including:

- a) *rainwater tanks (minimum 5kL tank per residential/ commercial lot and 15kL tank per industrial lot);*
- b) *gross pollutant traps upstream of stormwater treatment structures;*
- c) *biobasins, designed to ensure sufficient baseflow is maintained for the long-term viability of vegetation in the biobasins. The Applicant must ensure that each bioretention system includes a backup irrigation system that enables water stored in the stormwater ponds to be used for irrigation over the bioretention system. The Applicant must ensure that basins include a suitably designed sump within the outlet flow path that will permanently hold water sufficient to enable water quality sampling or will otherwise enable water to be sampled as flow occurs to the outlet;*
- d) *stormwater ponds;*
- e) *irrigation of sporting fields (25,600 m²) and open parkland (10,000 m², 1,300 m², 16,850 m² and 7,700 m² areas). Any parkland and sports field irrigation by the Applicant must be undertaken from stormwater ponds in accordance with the recommendations and principles outlined in the IWCMS. The Applicant must ensure that ponds are sized to maximise the retention and re-use of stormwater, within minimum pond volumes and parkland / sports field areas in accordance with those specified in the IWCMS.*

The modified development:

- a) includes rainwater tanks (minimum 5kL tank per residential/ commercial lot and 15kL tank per industrial lot) consistent with the IWCMS previously approved;

- b) includes gross pollutant traps upstream of stormwater treatment structures consistent with the IWCMS previously approved;
- c) includes biobasins, designed to ensure sufficient baseflow is maintained for the long-term viability of vegetation in the biobasins. The Stage 1 (and subsequent stages') design detail shall ensure that each bioretention system includes a backup irrigation system that enables water stored in the stormwater ponds to be used for irrigation over the bioretention system. The Stage 1 (and subsequent stages') designs shall ensure that basins include a suitably designed sump within the outlet flow path that will permanently hold water sufficient to enable water quality sampling or will otherwise enable water to be sampled as flow occurs to the outlet;
- d) includes stormwater ponds of a commensurate scale to those in the approved development layout.
- e) Minor changes to the total area of irrigated landscaping etc has been implemented in the modification design. The effect of those changes on the overall water quality management outcomes for the site are negligible, with the overall integrated stormwater management solution achieving the desired NorBE water quality outcome for the site. The modified design solution maintained the design principle of irrigation of sports fields (unchanged) and parklands in accordance with the approved IWCMS.

Ongoing compliance, at subsequent Stages of the development's approval, with these conditions shall be assessed at Stage 1 and subsequent stages.

2.7 Conclusions

Modification to the site layout and stormwater treatment train have been made to accommodate detailed site survey and design refinement. MUSIC modelling has been undertaken to assess the impacts of this redesign. That modelling concludes that the water quality objectives, as described in the Approved Water Strategy, are satisfied for the amended site and treatment train design. The conceptual stormwater treatment train mitigates the development's impacts, achieving Neutral or Beneficial Effect on water quality in downstream receiving environments.

Further refinement of the model, at the detailed design stage of each development stage, may alter the size and location of treatment devices. However, performance outcomes of the final design are to achieve the water quality objectives documented in this report and in the Approved Water Strategy.

3 References

BMT WBM (2015), *NSW MUSIC Modelling Guidelines*.

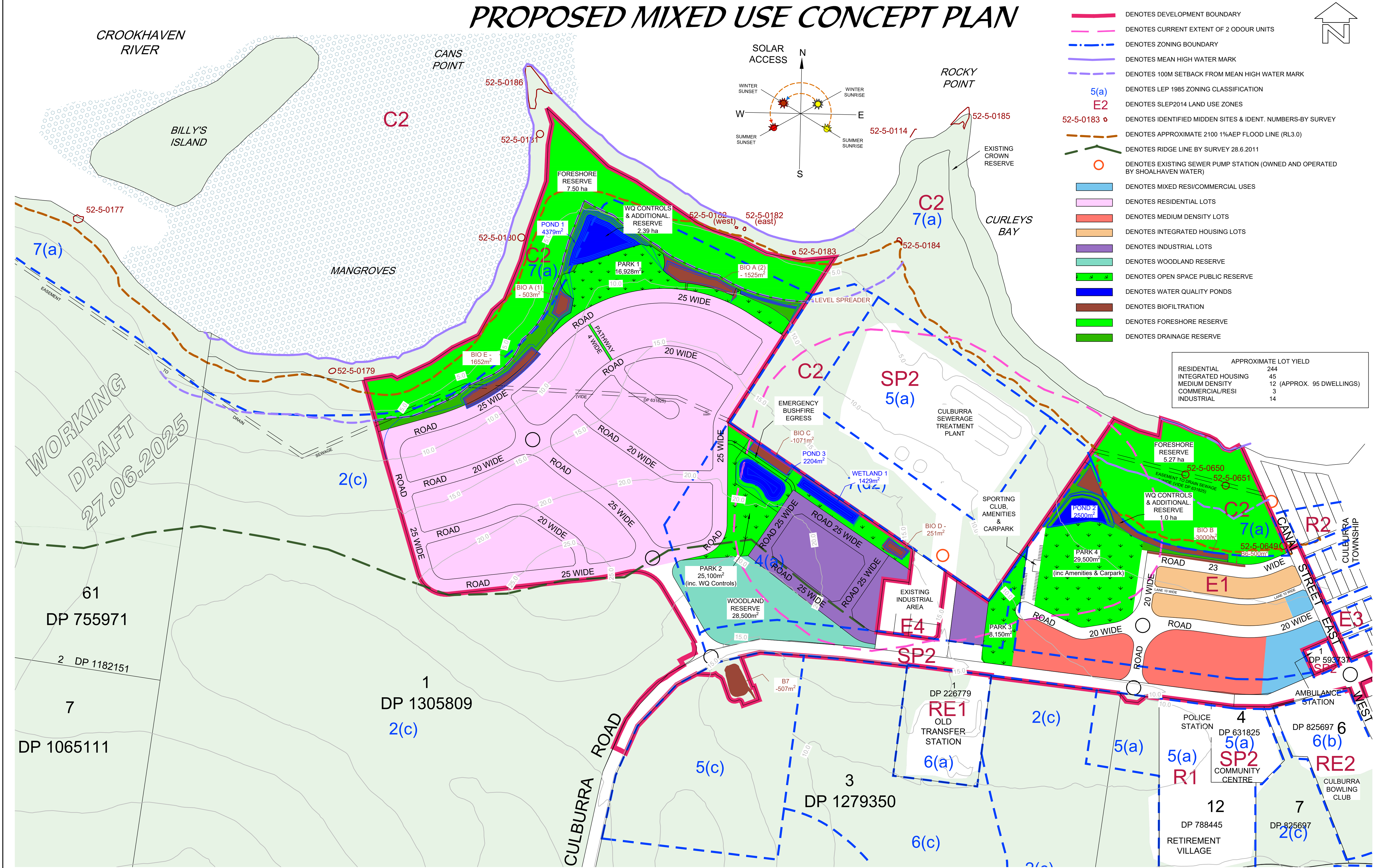
Martens and Associates (November 2020), *Integrated Water Cycle Management Strategy, Mixed Use Urban Development at West Culburra, NSW (P1203365JR07V06)*.

Martens and Associates (June 2021), *Addendum to Integrated Water Cycle Management Strategy, Mixed Use Urban Development at West Culburra, NSW (P1203365JR10V01)*.

Shoalhaven City Council (2014), *Development Control Plan*.

Appendix A Concept Plan Layout

PROPOSED MIXED USE CONCEPT PLAN



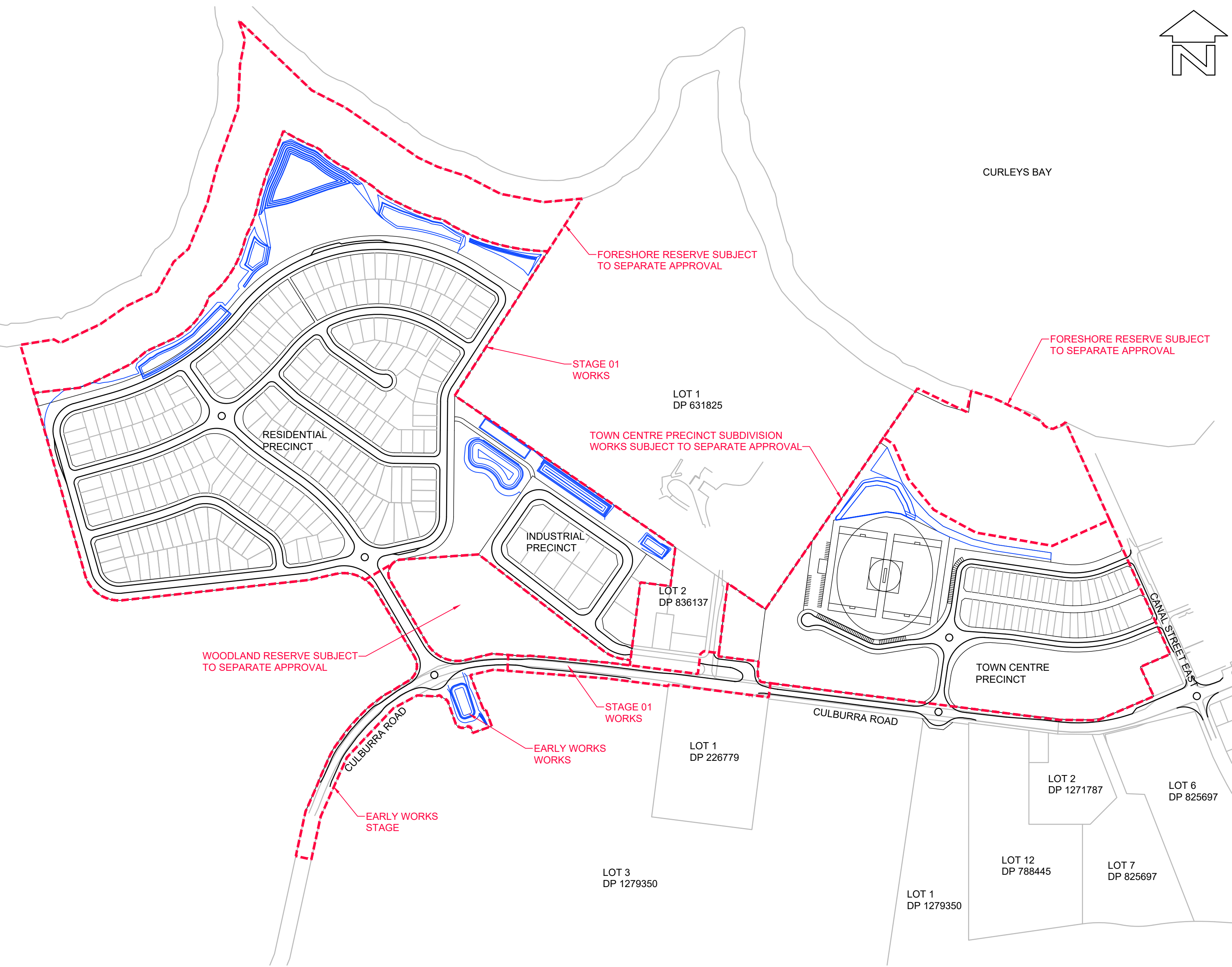
BEWARE!
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NOTE:
CONTOURS AS SHOWN OBTAINED FROM ELVIS
VIA NSW SPATIAL SERVICES D.E.M.
CONTOUR INTERVAL 5.0 METRES

AllenPrice Development Consultants	PLAN SHOWING	ISSUE	DESCRIPTION	BY	DATE	050100150 SCALE: 1:3000 (AT A1 ORIGINAL) PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES	<table><tr><td>SURVEY</td><td>DESIGN</td><td>DRAWN</td><td>CHECK'D</td></tr><tr><td>AP</td><td>DS / AE</td><td>DS / AE</td><td>RL</td></tr></table>				SURVEY	DESIGN	DRAWN	CHECK'D	AP	DS / AE	DS / AE	RL	DATUM	ORIGIN	PROFESSIONAL STANDARDS SCHEME Liability limited by a scheme approved under Professional Standards Legislation																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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Appendix B Civil Engineering Plans

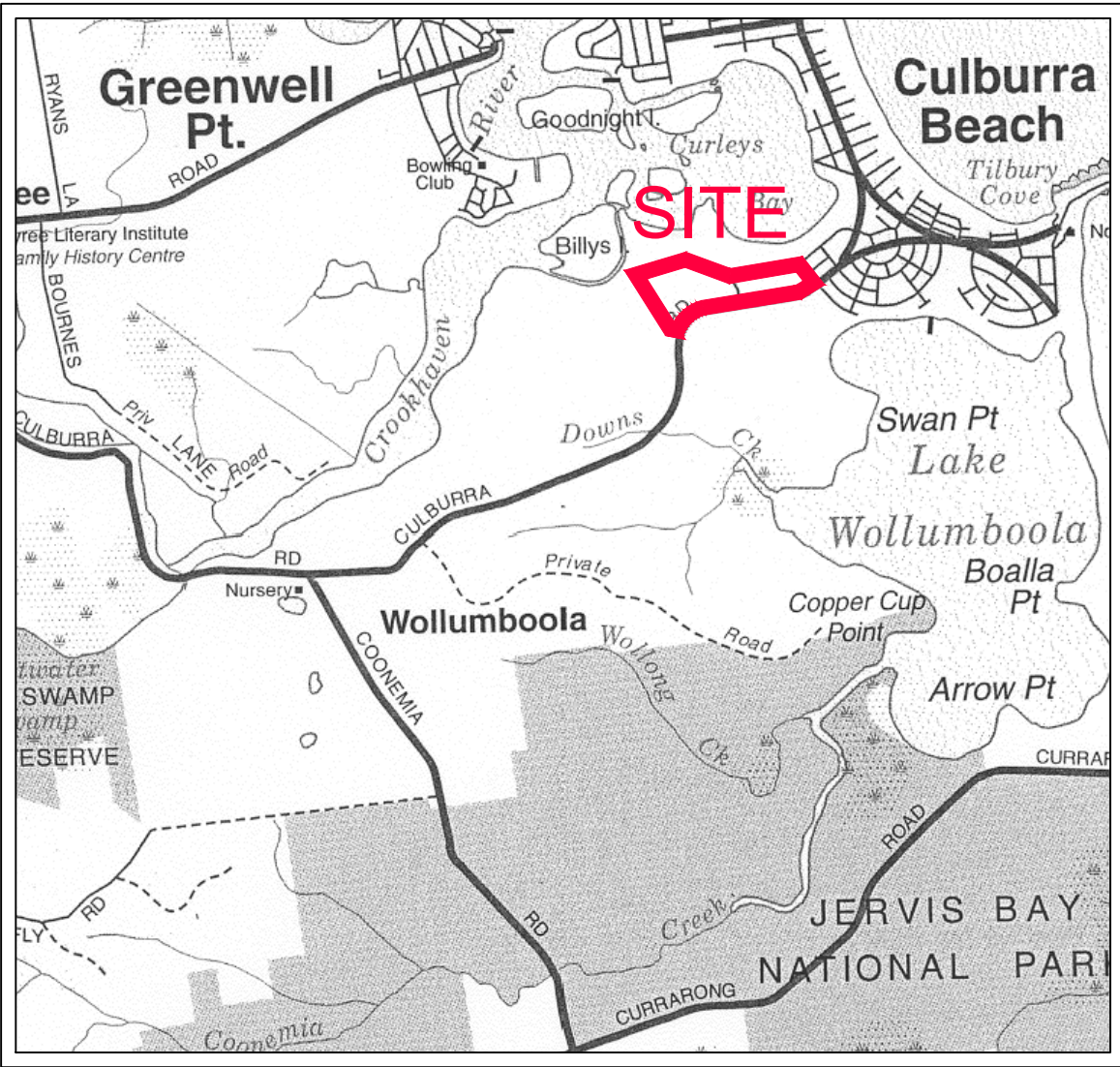
PRELIMINARY ENGINEERING DRAWINGS FOR PROPOSED MIXED-USE SUBDIVISION AT WEST CULBURRA



SITE LAYOUT PLAN
SCALE 1:4000

DRAWING SCHEDULE

25405-100	COVER SHEET AND INDEX PLAN
25405-101	PRELIMINARY RESIDENTIAL PRECINCT LAYOUT PLAN
25405-102	PRELIMINARY INDUSTRIAL PRECINCT LAYOUT PLAN
25405-103	PRELIMINARY TOWN CENTRE PRECINCT LAYOUT PLAN
25405-104	PRELIMINARY OVERALL CONCEPT ROUNDABOUT 01 DESIGN
25405-105	PRELIMINARY CONCEPT ROUNDABOUT 01 DESIGN
25405-106	ROUNDABOUT 01 VEHICLE MOVEMENT LAYOUT PLAN SHEET 01
25405-107	ROUNDABOUT 01 VEHICLE MOVEMENT LAYOUT PLAN SHEET 02
25405-108	PRELIMINARY ROUNDABOUT 01 SIGHT LINE LAYOUT PLAN
25405-109	PRELIMINARY CONCEPT INDUSTRIAL ENTRY & EXIT LAYOUT PLAN
25405-110	PRELIMINARY CONCEPT INDUSTRIAL ENTRY & EXIT VEHICLE MOVEMENTS & SIGHT DISTANCE LAYOUT PLAN
25405-111	PRELIMINARY CONCEPT ROUNDABOUT 02 LAYOUT PLAN
25405-112	PRELIMINARY CONCEPT ROUNDABOUT 02 DESIGN
25405-113	ROUNDABOUT 02 VEHICLE MOVEMENT LAYOUT PLAN
25405-114	PRELIMINARY ROUNDABOUT 02 SIGHT LINE LAYOUT PLAN
25405-115	PRELIMINARY CONCEPT ROUNDABOUT 03 LAYOUT PLAN
25405-116	PRELIMINARY CONCEPT ROUNDABOUT 03 DESIGN
25405-117	ROUNDABOUT 03 VEHICLE MOVEMENT LAYOUT PLAN SHEET 01
25405-118	ROUNDABOUT 03 VEHICLE MOVEMENT LAYOUT PLAN SHEET 02
25405-119	PRELIMINARY ROUNDABOUT 03 SIGHT LINE LAYOUT PLAN
25405-120	PRELIMINARY TYPICAL ROAD CROSS SECTIONS PLAN SHEET 01
25405-121	PRELIMINARY TYPICAL ROAD CROSS SECTIONS PLAN SHEET 02
25405-122	PRELIMINARY TYPICAL ROAD CROSS SECTIONS PLAN SHEET 03
25405-123	PRELIMINARY TYPICAL ROAD CROSS SECTIONS PLAN SHEET 04
25405-124	PRELIMINARY TYPICAL ROAD CROSS SECTIONS PLAN SHEET 05
25405-125	EASTERN POND CONCEPT LAYOUT PLAN
25405-126	PRELIMINARY BASIN LAYOUT PLAN SHEET 01
25405-127	PRELIMINARY BASIN LAYOUT PLAN SHEET 02
25405-128	PRELIMINARY BASIN LAYOUT PLAN SHEET 03
25405-129	PRELIMINARY BASIN LAYOUT PLAN SHEET 04
25405-130	PRELIMINARY BASIN LAYOUT PLAN SHEET 05
25405-131	PRELIMINARY OVERALL LAYOUT PLAN
25405-132	PRELIMINARY CROSS SECTIONS PLAN SHEET 01
25405-133	PRELIMINARY CROSS SECTIONS PLAN SHEET 02
25405-134	PRELIMINARY CROSS SECTIONS PLAN SHEET 03
25405-135	PRELIMINARY CROSS SECTIONS PLAN SHEET 04



LOCALITY PLAN
MAP DRAWN & PUBLISHED BY
CARTODRAFT AUST P/L

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COVER SHEET AND INDEX PLAN
WEST CULBURRA MIXED USE DEVELOPMENT
Over Lot 1 DP 1305809
At CULBURRA ROAD, CALBURRA BEACH
For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P7	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024
P8	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025

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SCALE:- 1:4000
(AT A1 ORIGINAL)

PRELIMINARY
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AP	CJG	CJG	RMH	AUSTRALIAN HEIGHT DATUM
ALLEN PRICE PTY LTD				DATE OF SURVEY
Nowra Office • 75 Plunkett St, Nowra NSW 2541				MAY 2025
Kilgore Office • 1/28 Bong Bong St, Kilgore NSW 2533				DRAWING NUMBER
Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500				25405-100
(02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au				

ORIGIN	SSM
RL	
SHEET	ISSUE
1	P8

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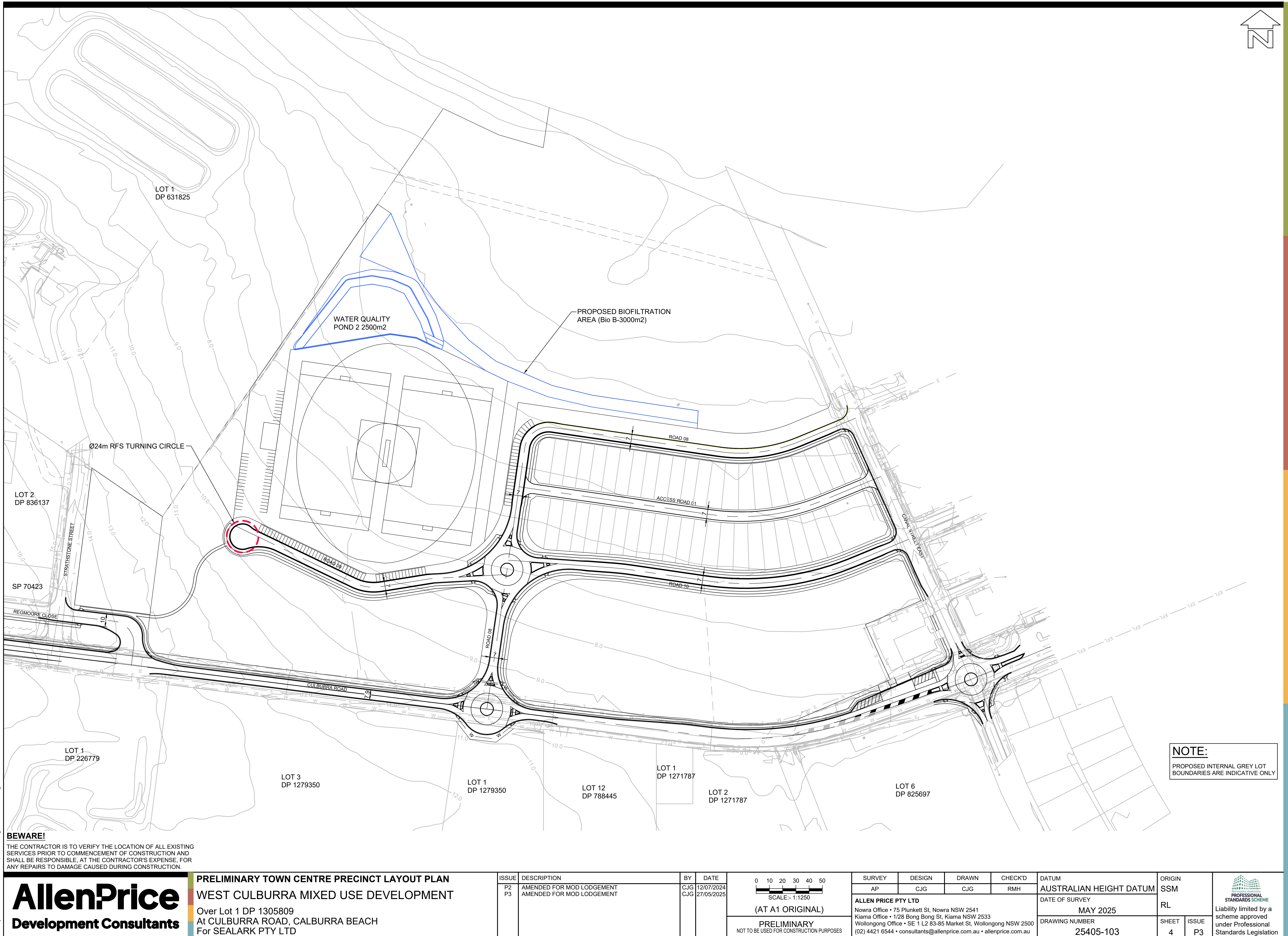
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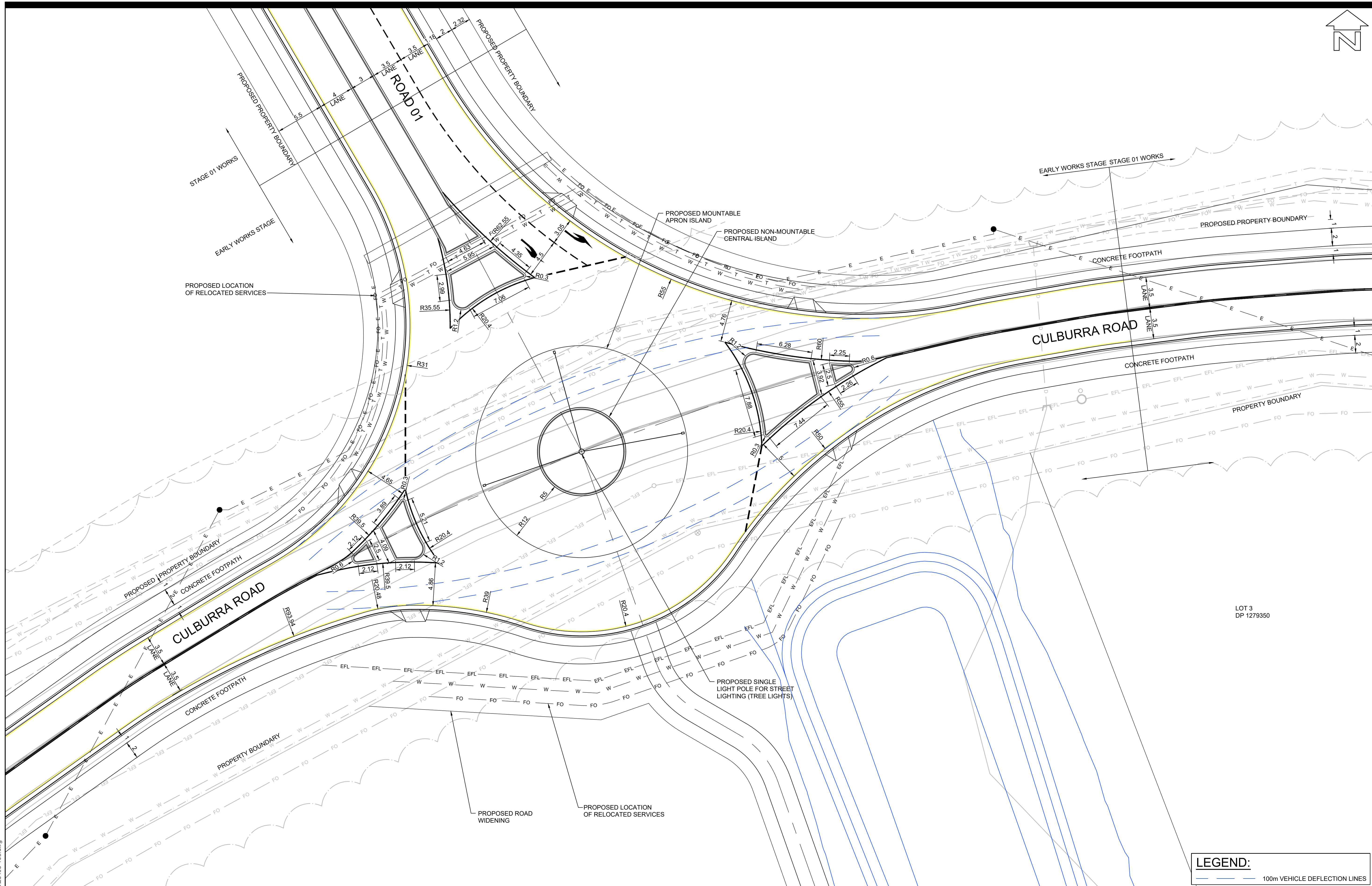
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WEST CULBURRA MIXED USE DEVELOPMENT
 Over Lot 1 DP 1305809
 At CULBURRA ROAD, CALBURRA BEACH
 For SEALARK PTY LTD

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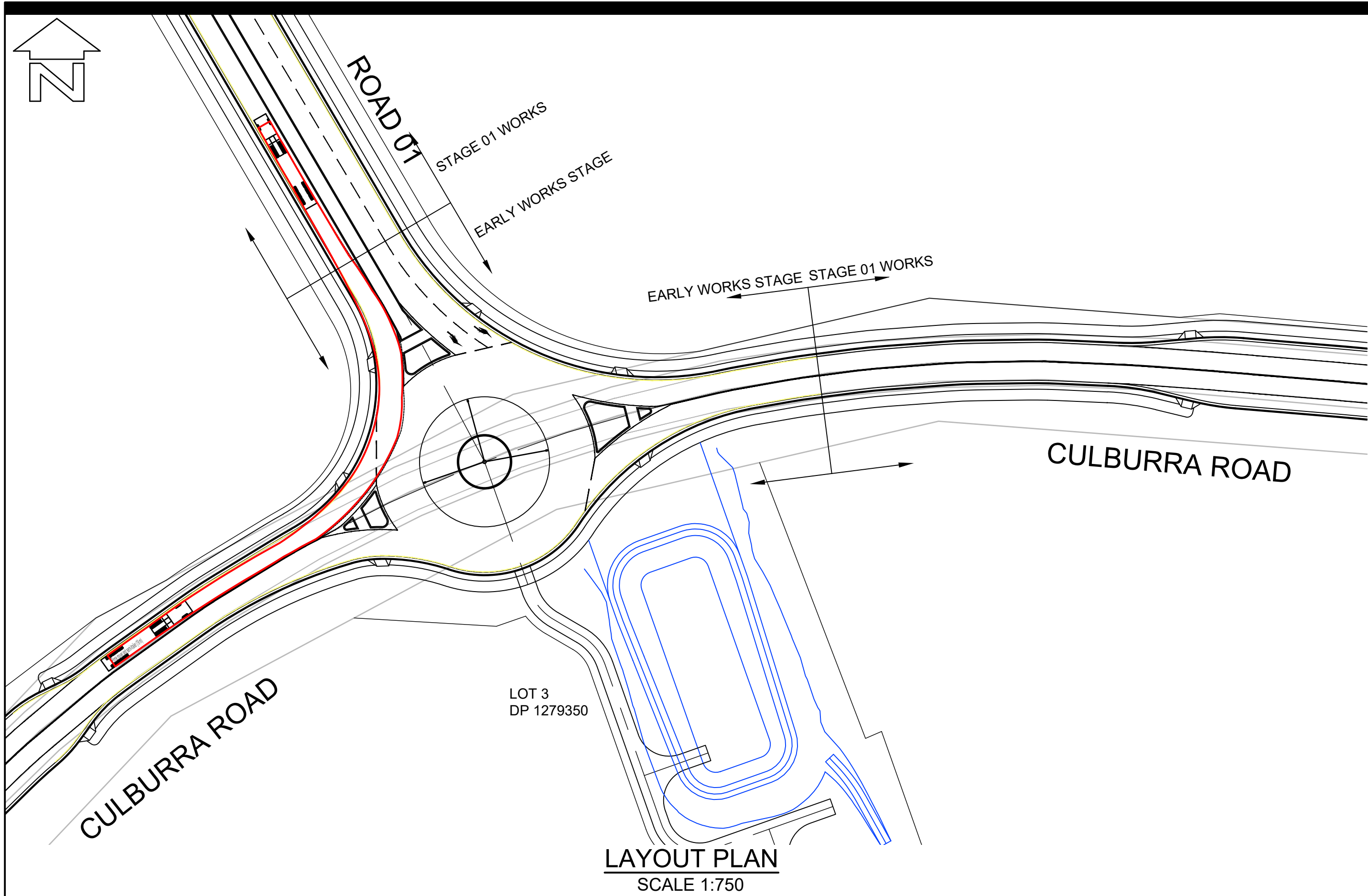
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P8	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025



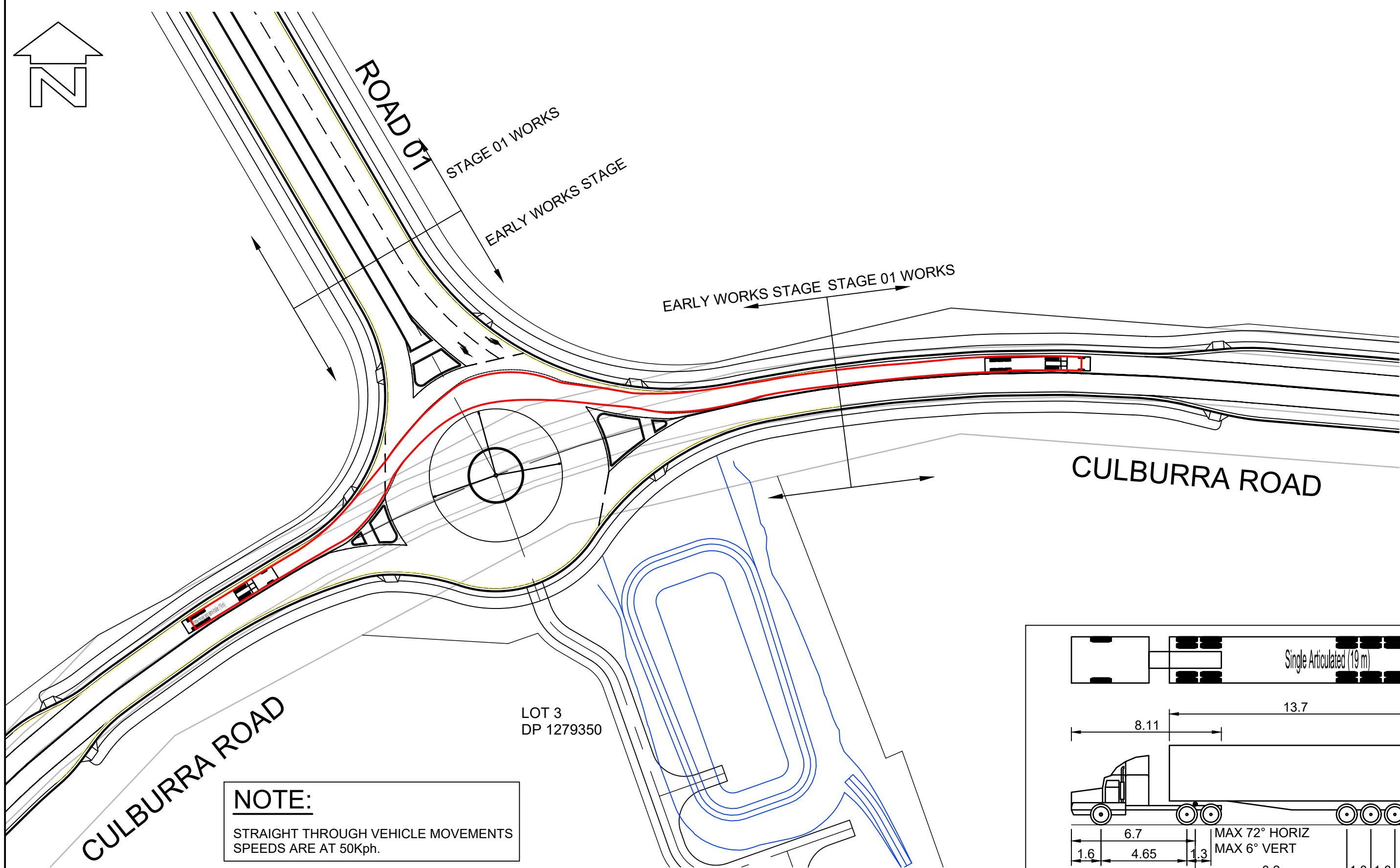
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DATE OF SURVEY	MAY 2025
DRAWING NUMBER	25405-105

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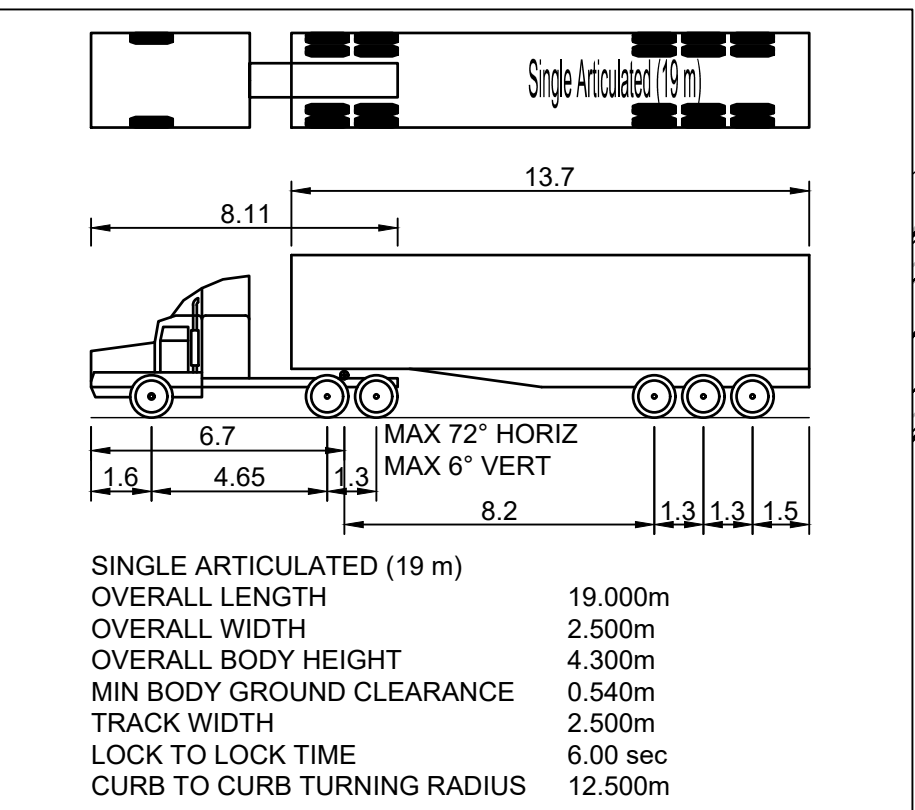


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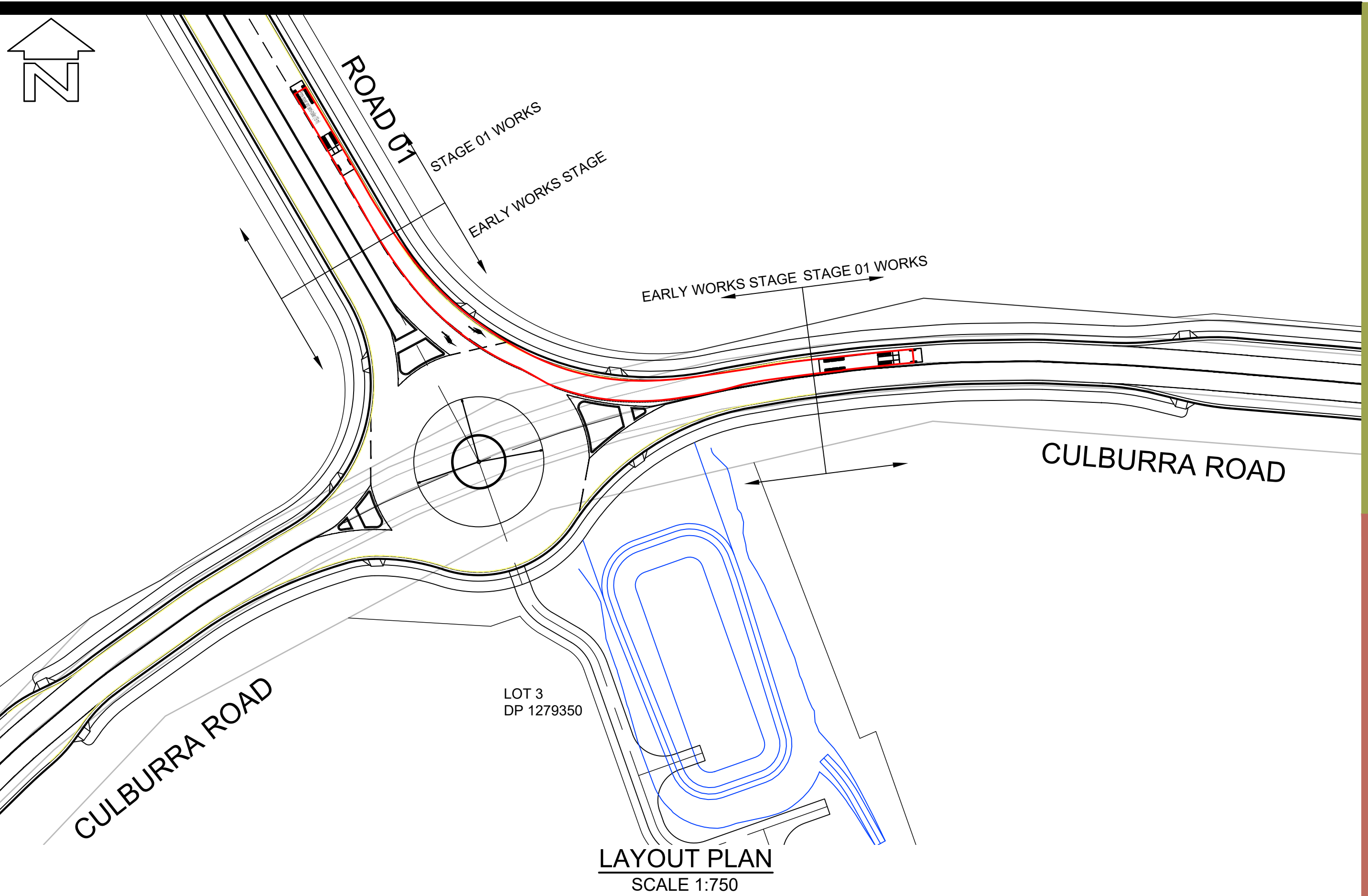


NOTE:
STRAIGHT THROUGH VEHICLE MOVEMENTS
SPEEDS ARE AT 50Kph.

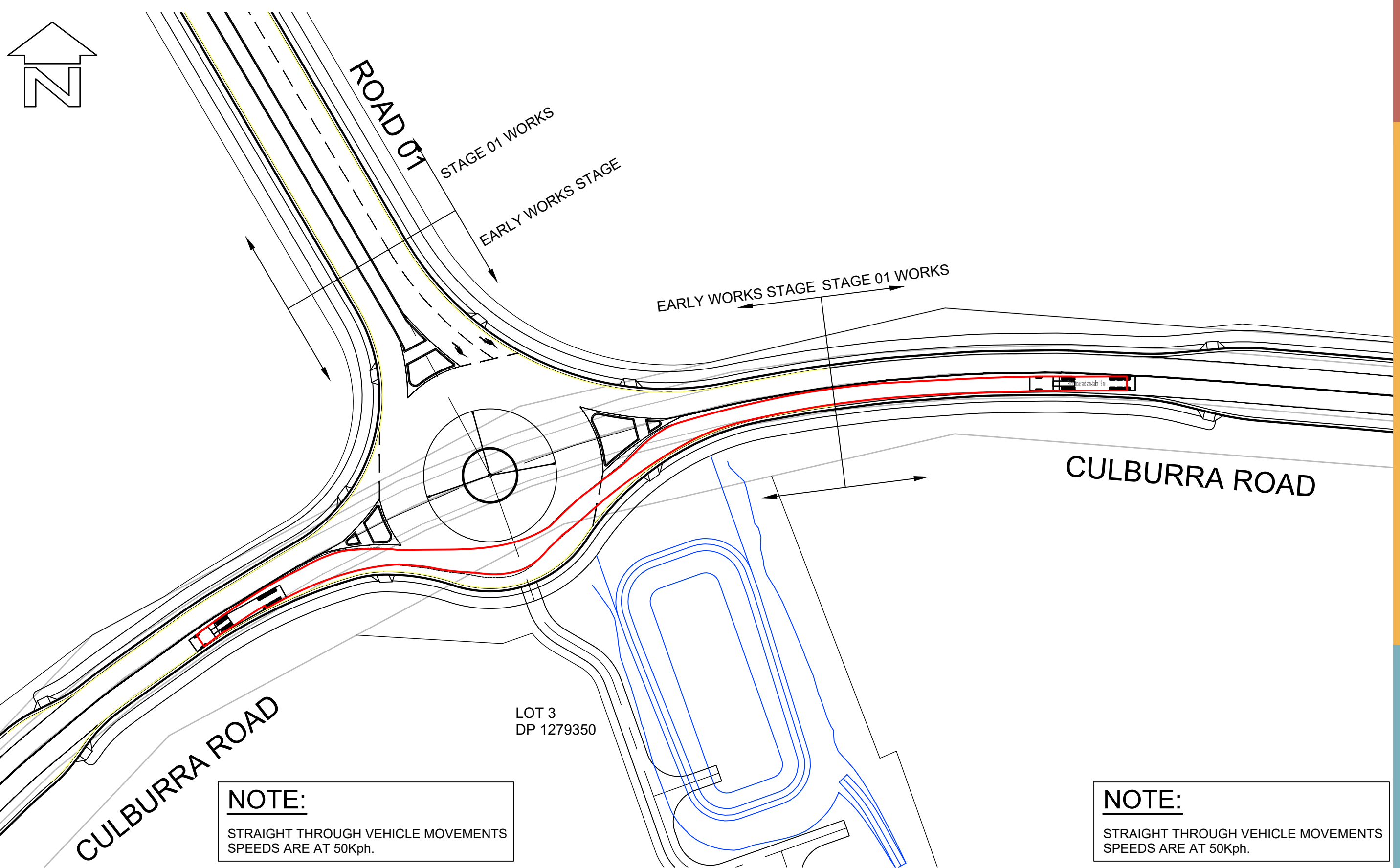
LAYOUT PLAN
SCALE 1:750



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LAYOUT PLAN
SCALE 1:750

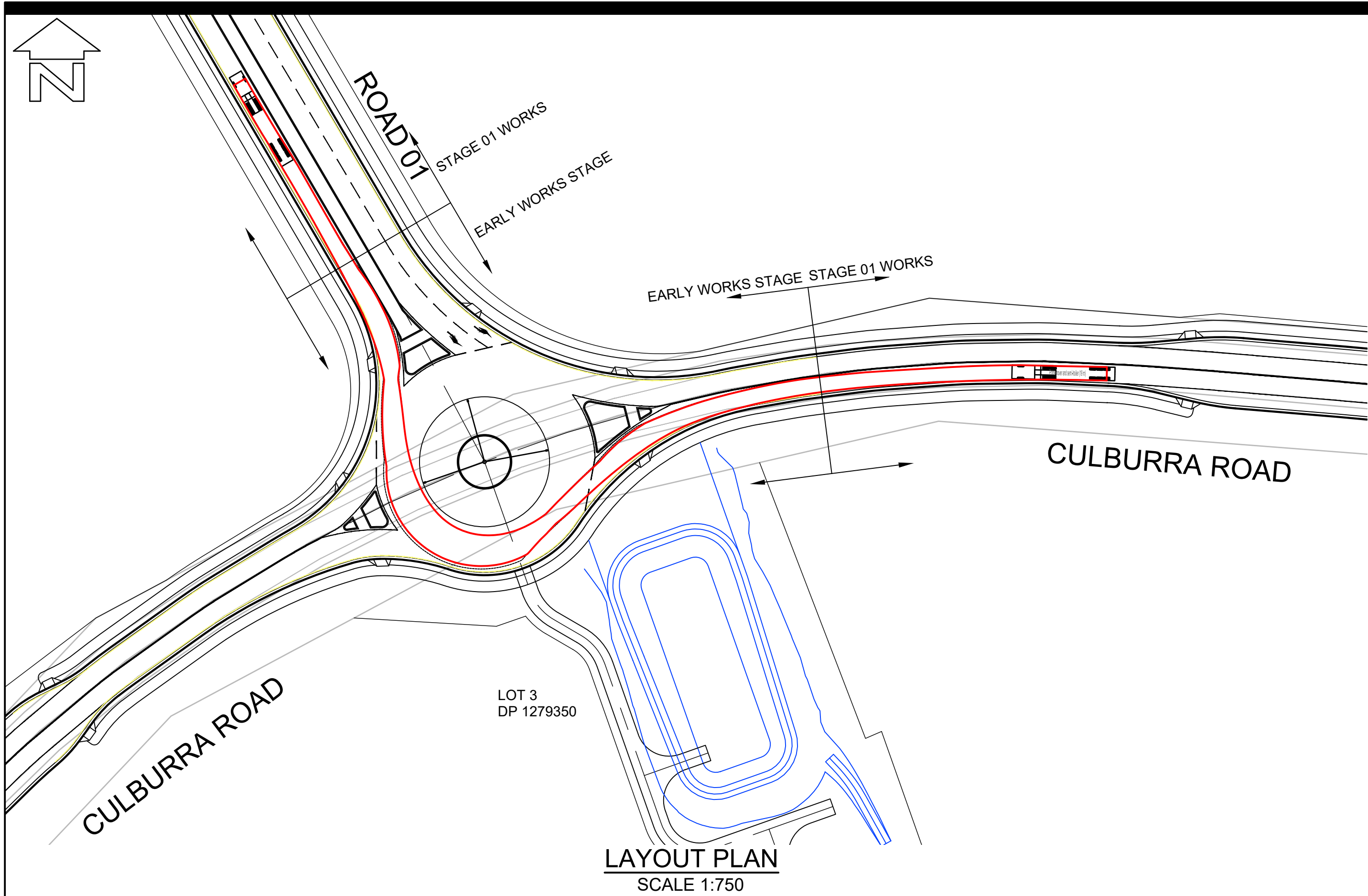


NOTE:
STRAIGHT THROUGH VEHICLE MOVEMENTS
SPEEDS ARE AT 50Kph.

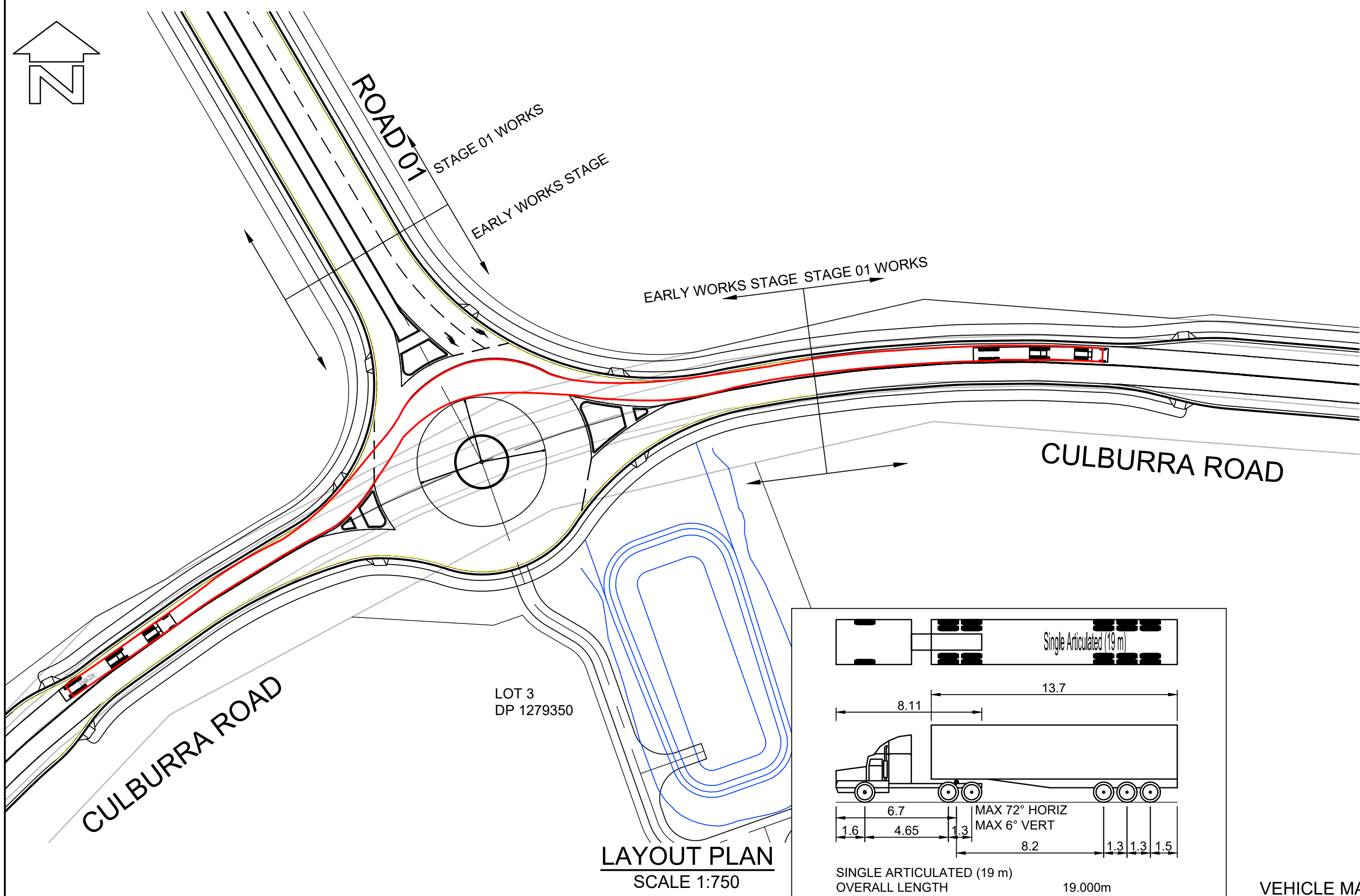
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NOTE:
STRAIGHT THROUGH VEHICLE MOVEMENTS
SPEEDS ARE AT 50Kph.

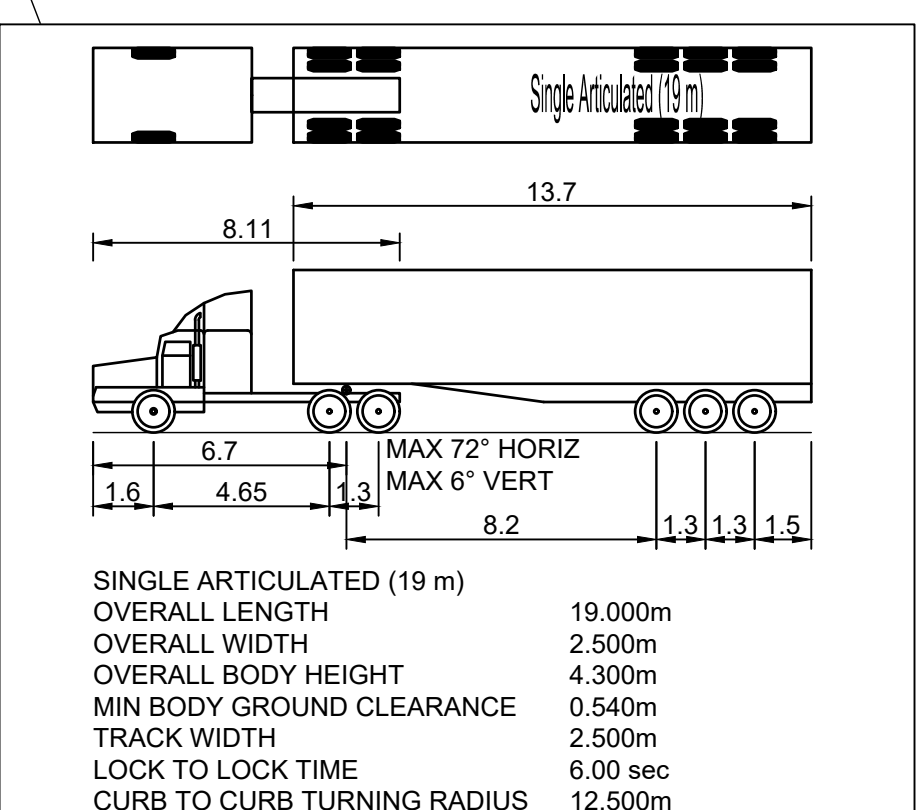
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----- PATH OF OUTER FRONT WHEEL (FORWARD MOVEMENT)
----- SWEEP PATH OF VEHICLE BODY (FORWARD MOVEMENT)
THIS DRAWING HAS BEEN PREPARED USING MODELING COMPUTER SOFTWARE AUTODESK VEHICLE TRACKING 2016. THE VEHICLE USED IS BASED UPON DATA PROVIDED BY AUSTRROADS 2013 FOR A SINGLE ARTICULATED (19.0m) TRAVELING AT 20km/hr AND INCORPORATES A REASONABLE DEGREE OF TOLERANCE. HOWEVER IT IS NOT POSSIBLE TO ACCOUNT FOR ALL VEHICLE TYPES/ CHARACTERISTICS AND/OR DRIVER ABILITY.



LAYOUT PLAN
SCALE 1:750

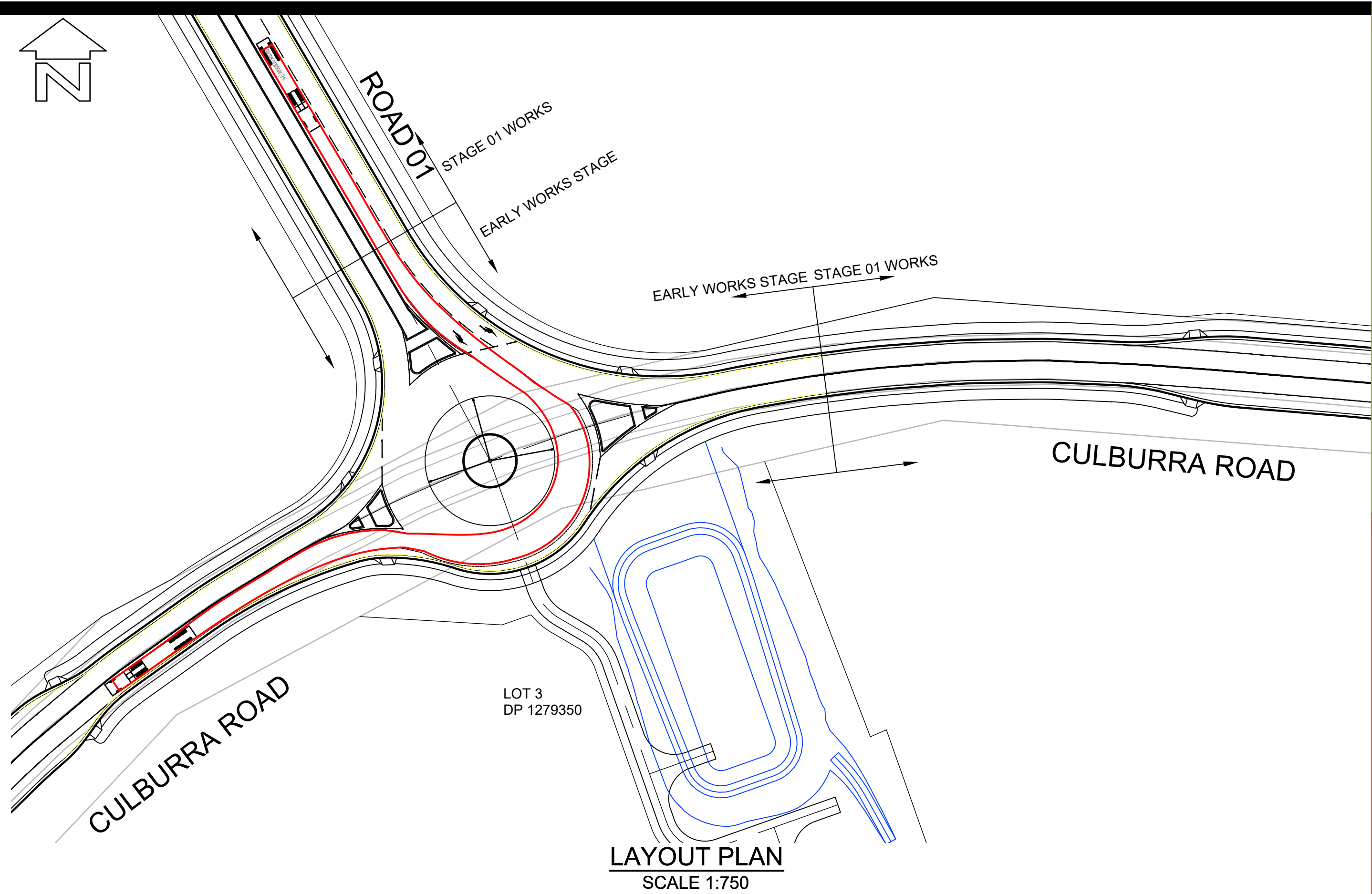


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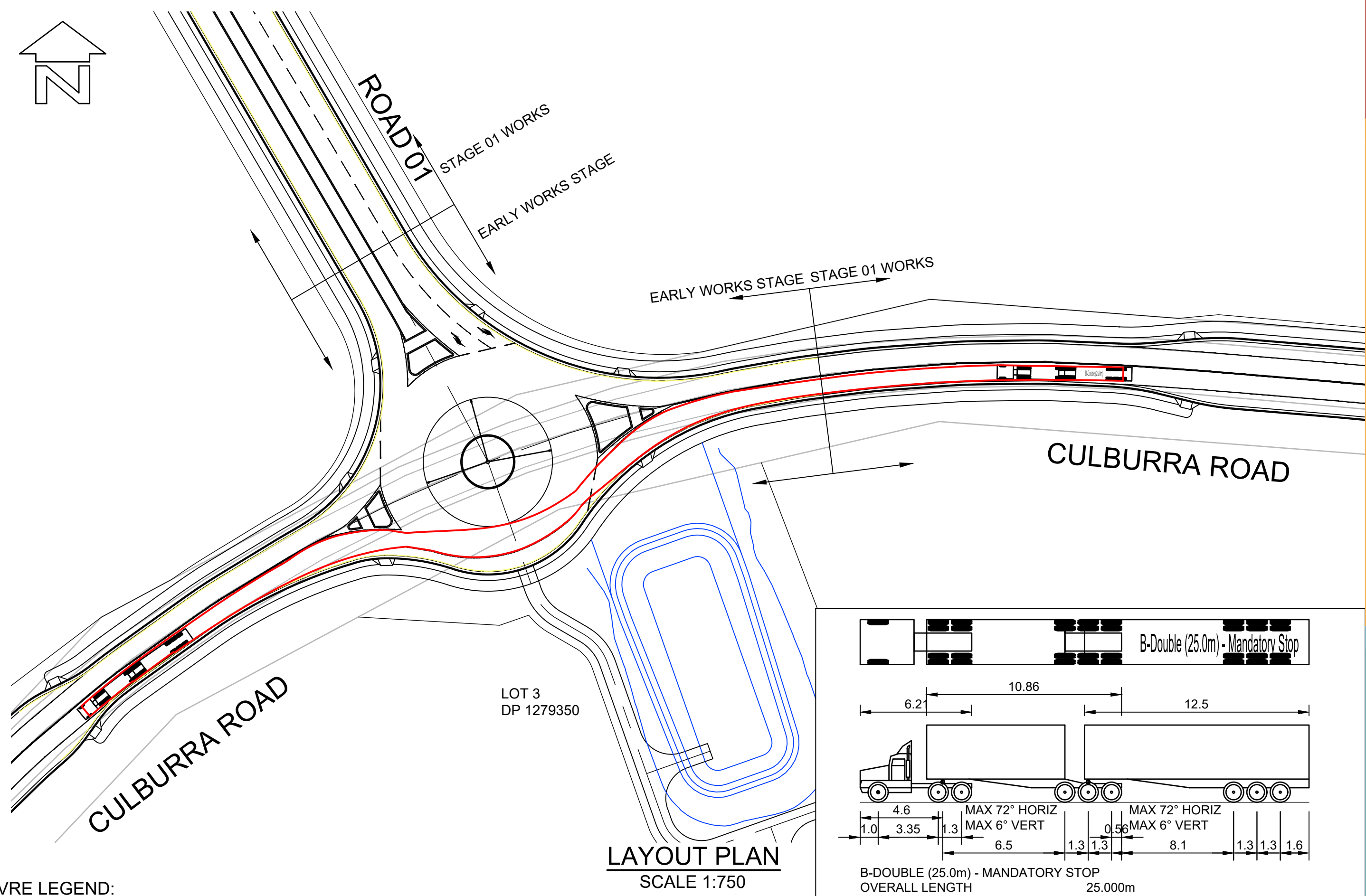


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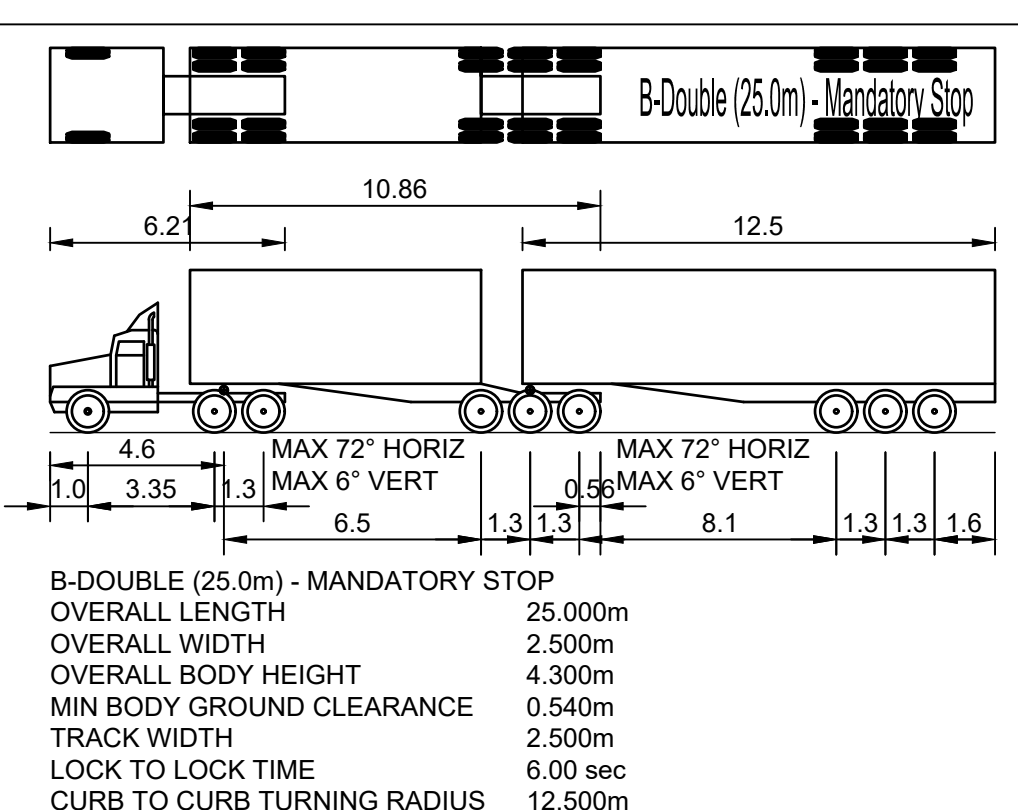
----- PATH OF OUTER FRONT WHEEL (FORWARD MOVEMENT)
----- SWEEP PATH OF VEHICLE BODY (FORWARD MOVEMENT)
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LAYOUT PLAN
SCALE 1:750



LAYOUT PLAN
SCALE 1:750

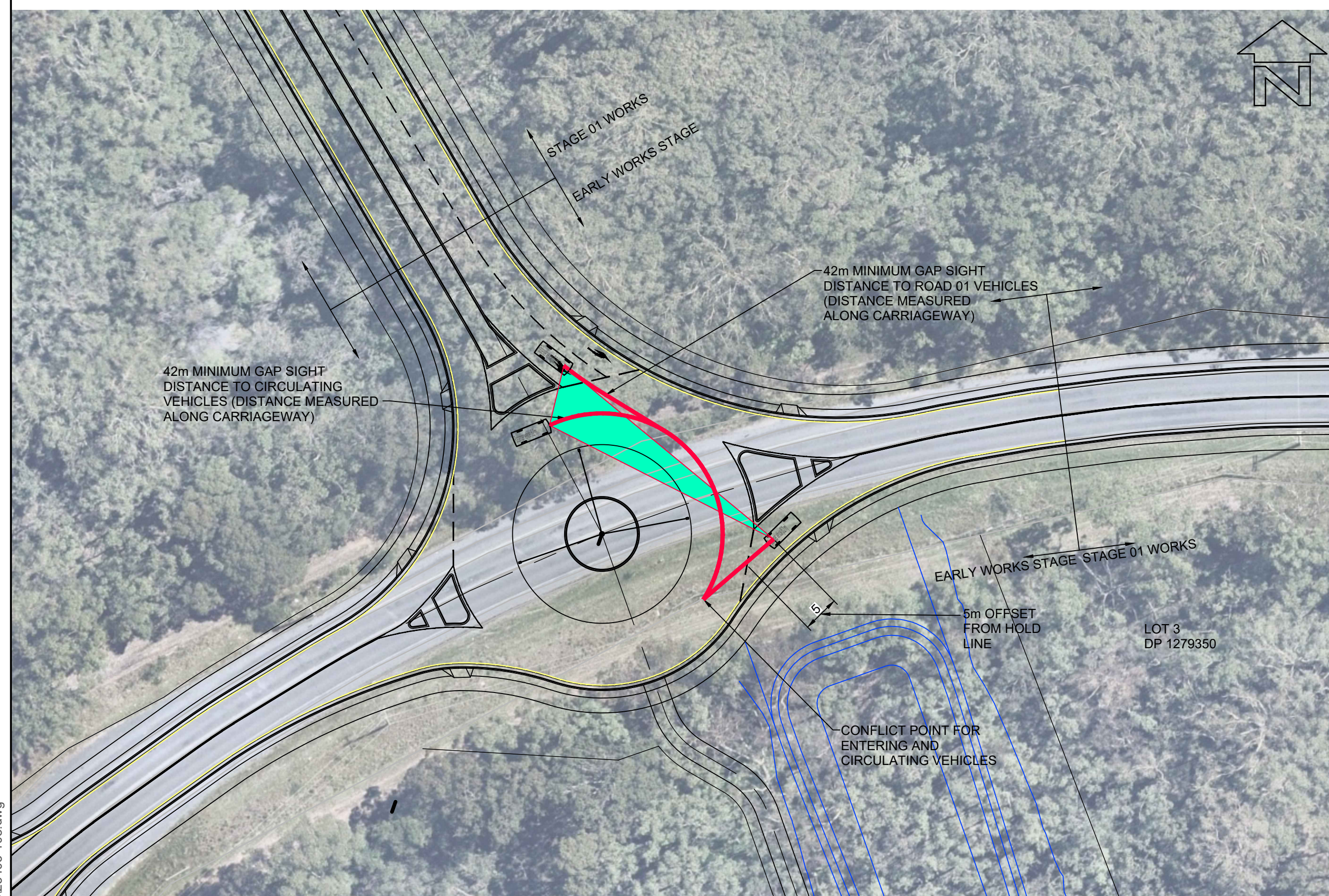
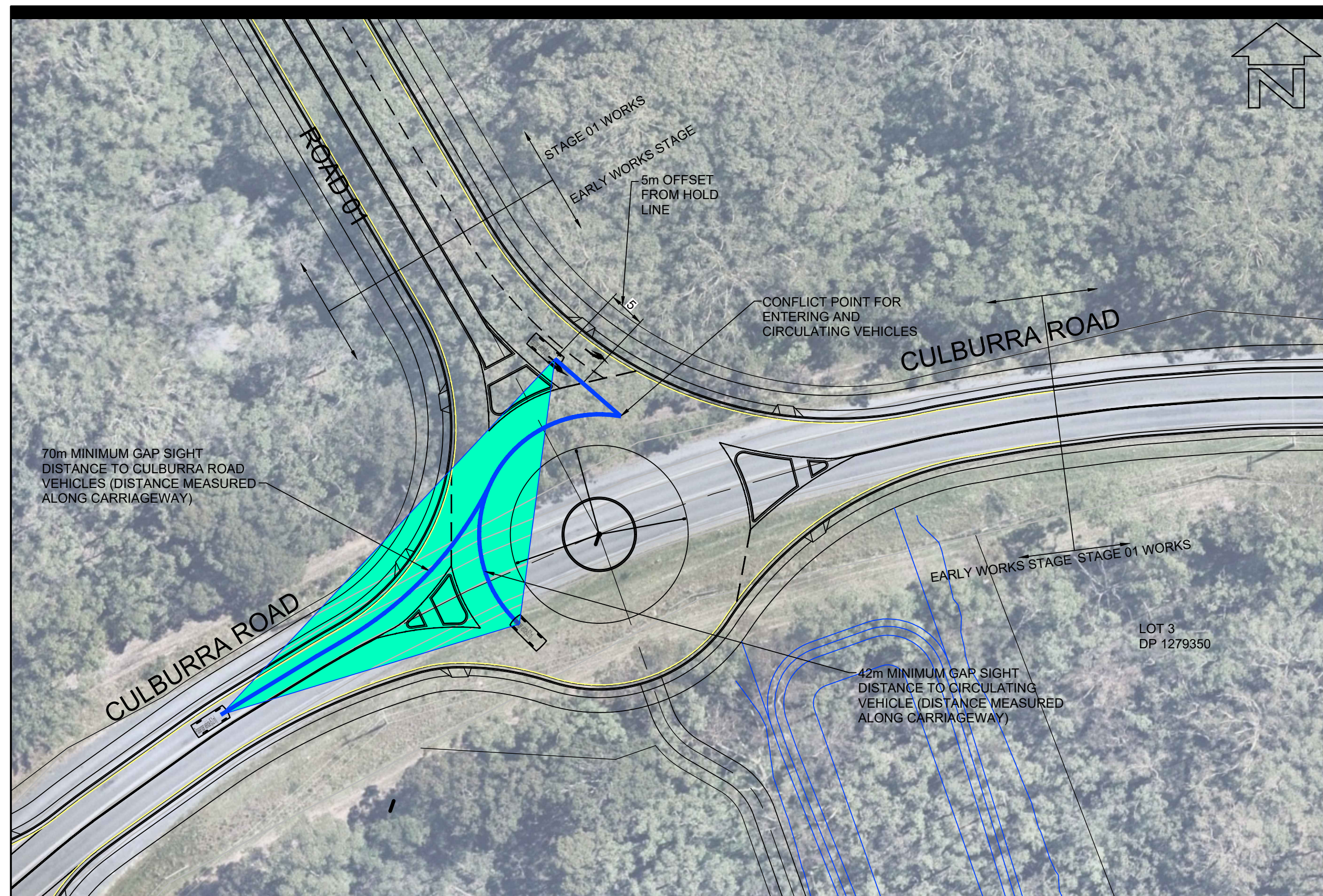


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P7	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024
P8	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025

SURVEY	DESIGN	DRAWN	CHECK'D
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DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
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DRAWING NUMBER	SHEET
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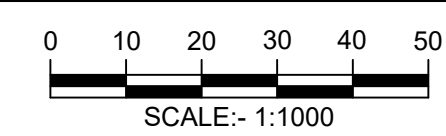
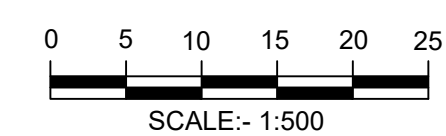


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LAYOUT PLAN

SCALE 1:500



LAYOUT PLAN
SCALE 1:1000

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PRELIMINARY ROUNDABOUT 01 SIGHT LINE LAYOUT PLAN

WEST CULBURRA MIXED USE DEVELOPMENT

Over Lot 1 DP 1305809

At CULBURRA ROAD, CALBURRA BEACH

For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
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P8	AMENDED FOR MOD LODGEMENT	CJG	27/05/2021

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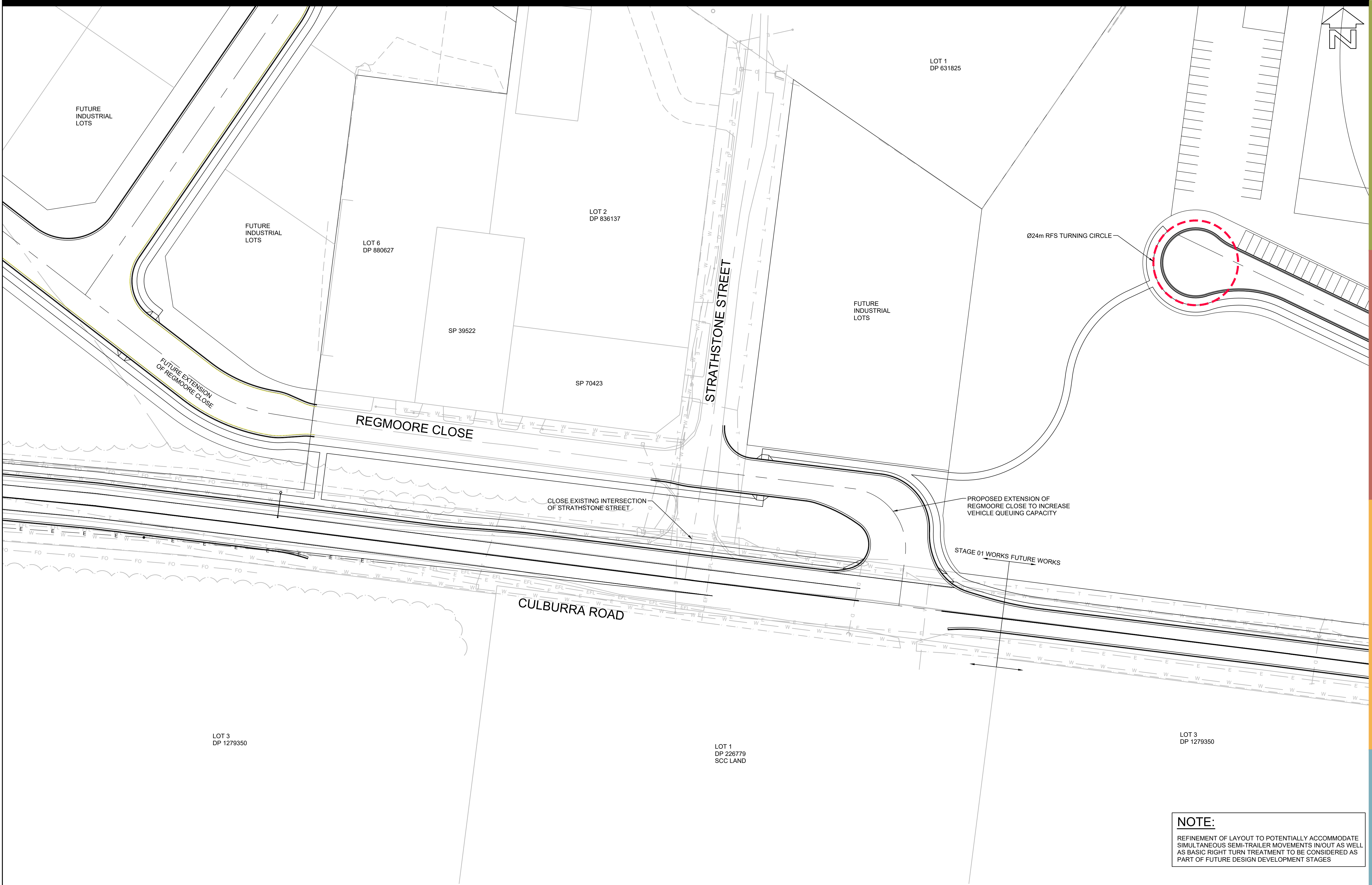
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AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD			
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Kiama Office • 1/28 Gong Bong St, Kiama NSW 2533			
Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500			
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DATUM	AUSTRALIAN HEIGHT DATUM
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DRAWING NUMBER	25405-108

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LAYOUT PLAN
SCALE 1:500

NOTE:
REFINEMENT OF LAYOUT TO POTENTIALLY ACCOMMODATE SIMULTANEOUS SEMI-TRAILER MOVEMENTS IN/OUT AS WELL AS BASIC RIGHT TURN TREATMENT TO BE CONSIDERED AS PART OF FUTURE DESIGN DEVELOPMENT STAGES

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PRELIMINARY CONCEPT INDUSTRIAL ENTRY & EXIT LAYOUT PLAN

WEST CULBURRA MIXED USE DEVELOPMENT

Over Lot 1 DP 1305809

At CULBURRA ROAD, CALBURRA BEACH

For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
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(AT A1 ORIGINAL)

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AP	CJG	CJG	RMH

ALLEN PRICE PTY LTD

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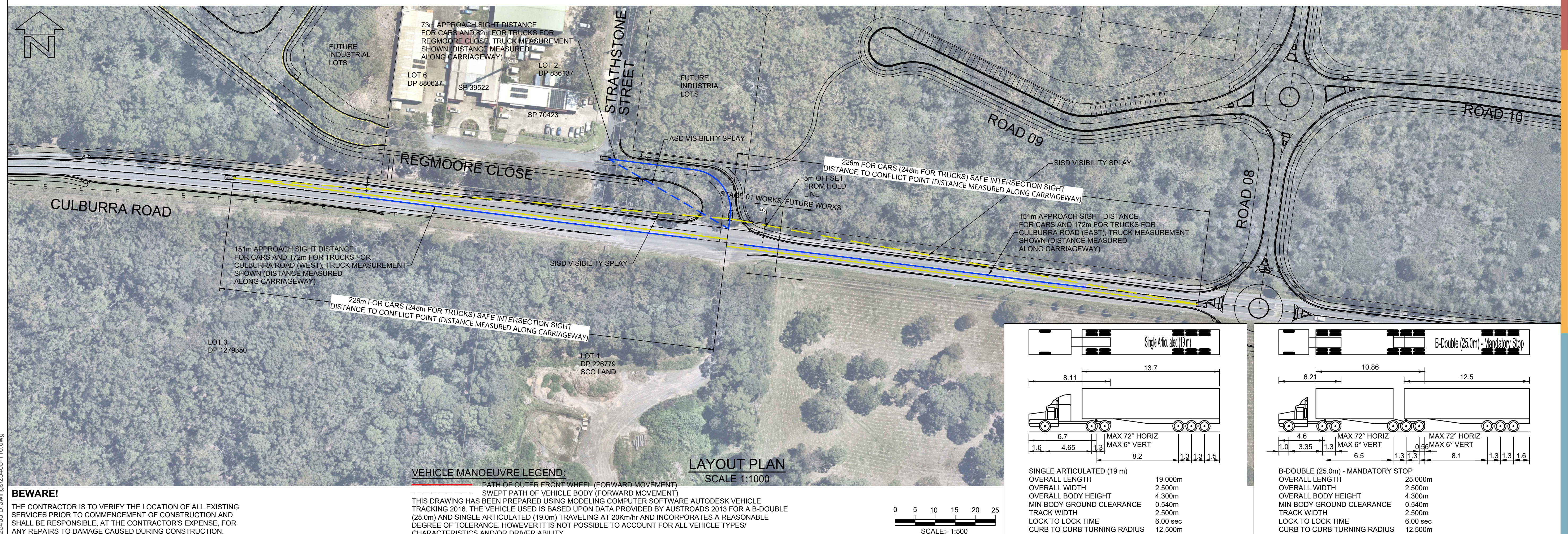
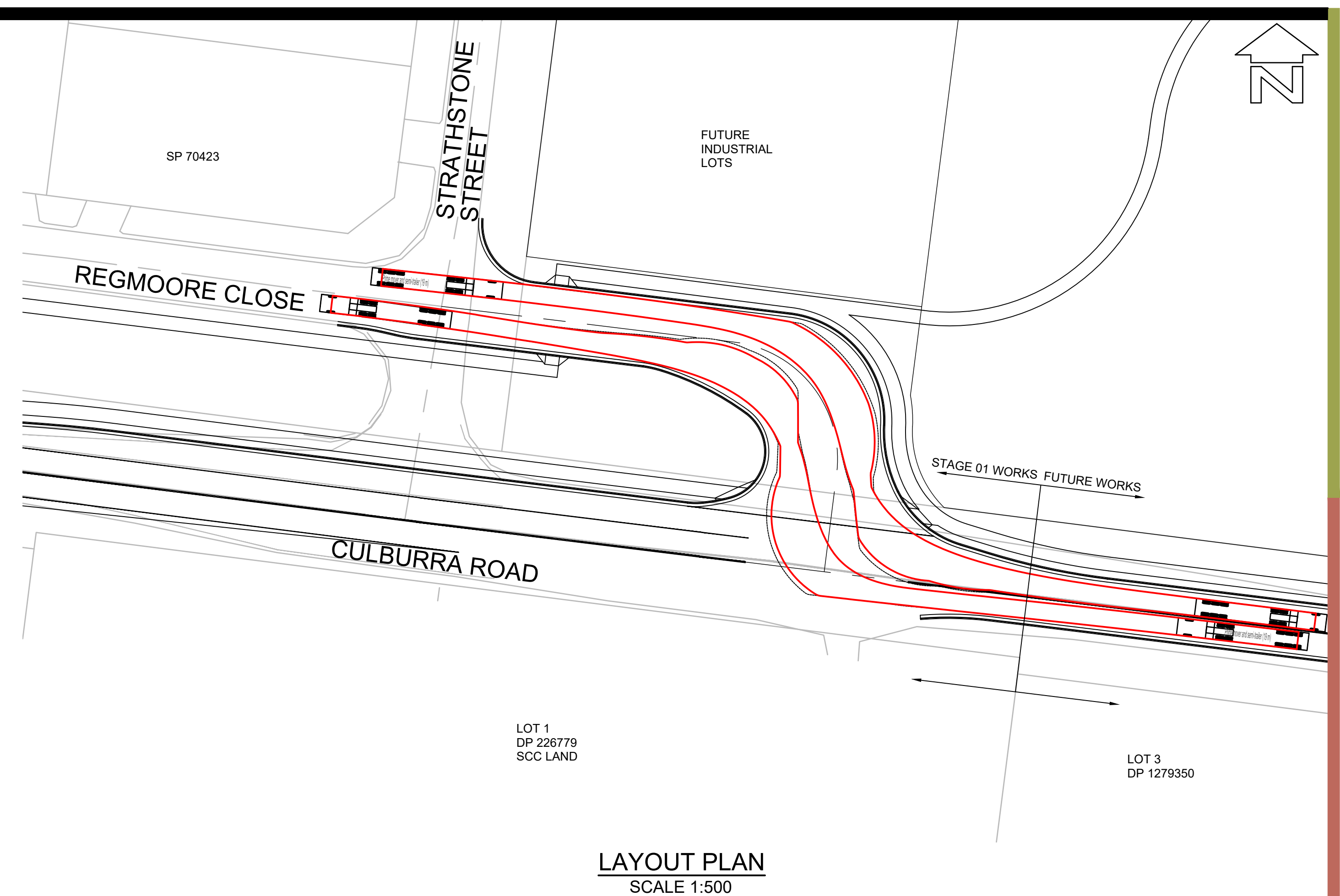
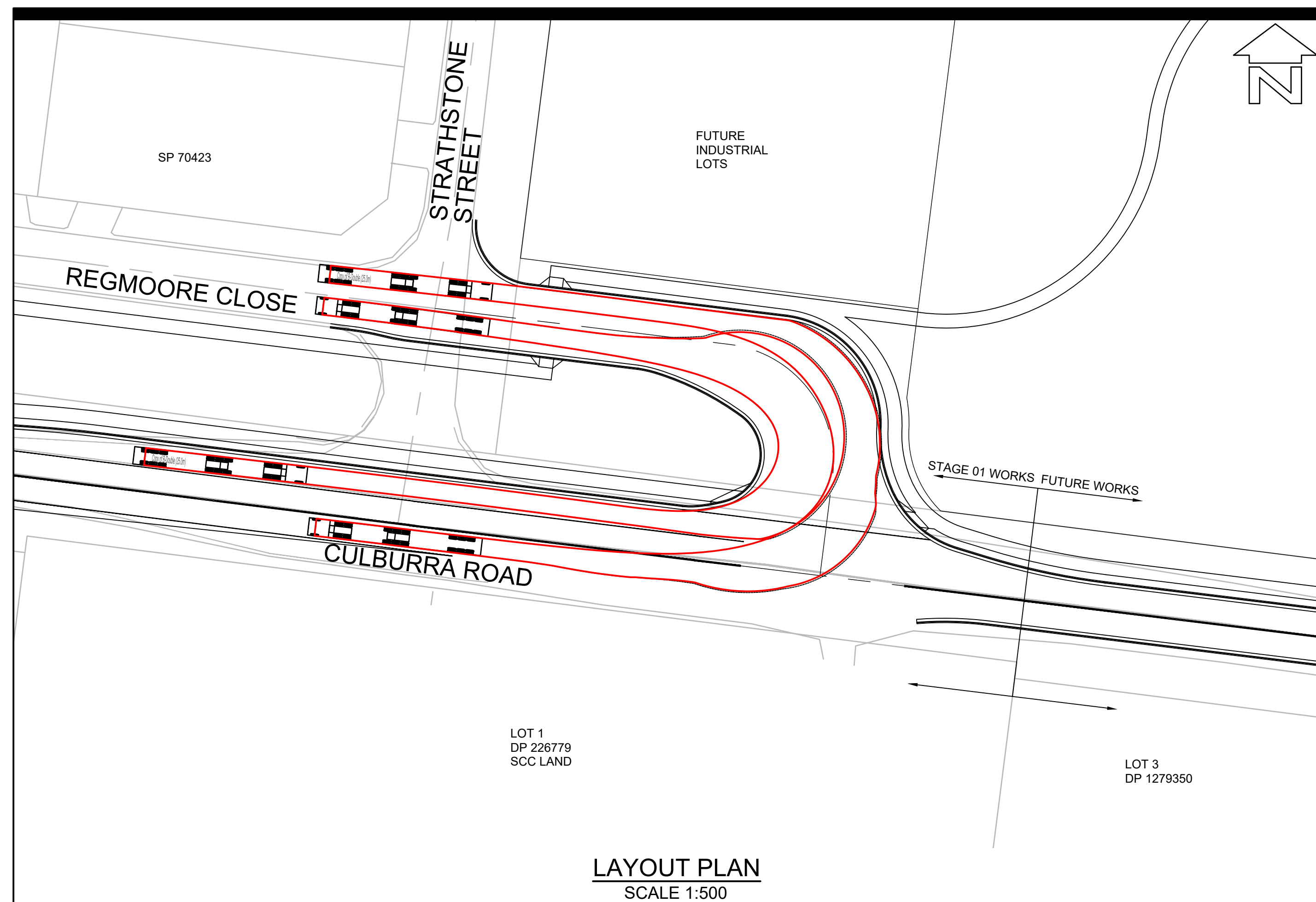
Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500

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DATUM	ORIGIN
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DATE OF SURVEY	RL
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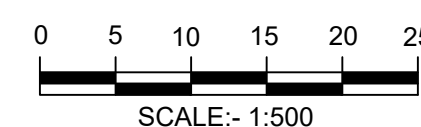


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VEHICLE MANOEUVRE LEGEND:

----- PATH OF OUTER FRONT WHEEL (FORWARD MOVEMENT)
----- SWEEP PATH OF VEHICLE BODY (FORWARD MOVEMENT)
THIS DRAWING HAS BEEN PREPARED USING MODELING COMPUTER SOFTWARE AUTODESK VEHICLE TRACKING 2016. THE VEHICLE USED IS BASED UPON DATA PROVIDED BY AUSTRORoads 2013 FOR A B-DOUBLE (25.0m) AND SINGLE ARTICULATED (19.0m) TRAVELING AT 20km/hr AND INCORPORATES A REASONABLE DEGREE OF TOLERANCE, HOWEVER IT IS NOT POSSIBLE TO ACCOUNT FOR ALL VEHICLE TYPES/ CHARACTERISTICS AND/OR DRIVER ABILITY.



Single Articulated (19 m)

8.11 13.7

6.7

1.6 4.65 1.3

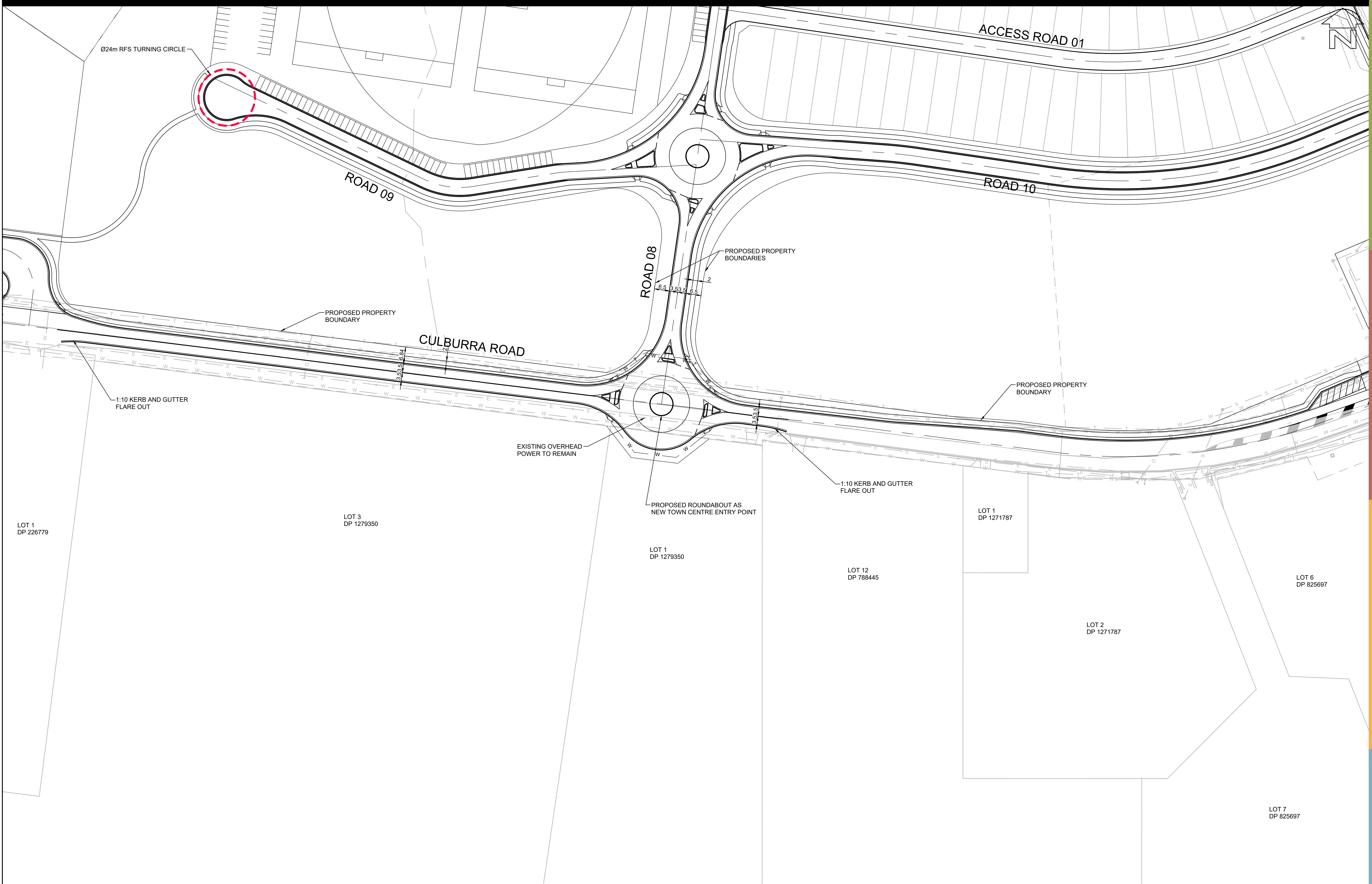
MAX 72° HORIZ
MAX 6° VERT

8.2 1.3 1.3 1.1

SINGLE ARTICULATED (19 m)

OVERALL LENGTH	19.000m
OVERALL WIDTH	2.500m
OVERALL BODY HEIGHT	4.300m
MINA BODY GROUND CLEARANCE	0.540m
TRACK WIDTH	2.500m
LOCK TO LOCK TIME	6.00 sec
CURB TO CURB TURNING RADIUS	12.500m

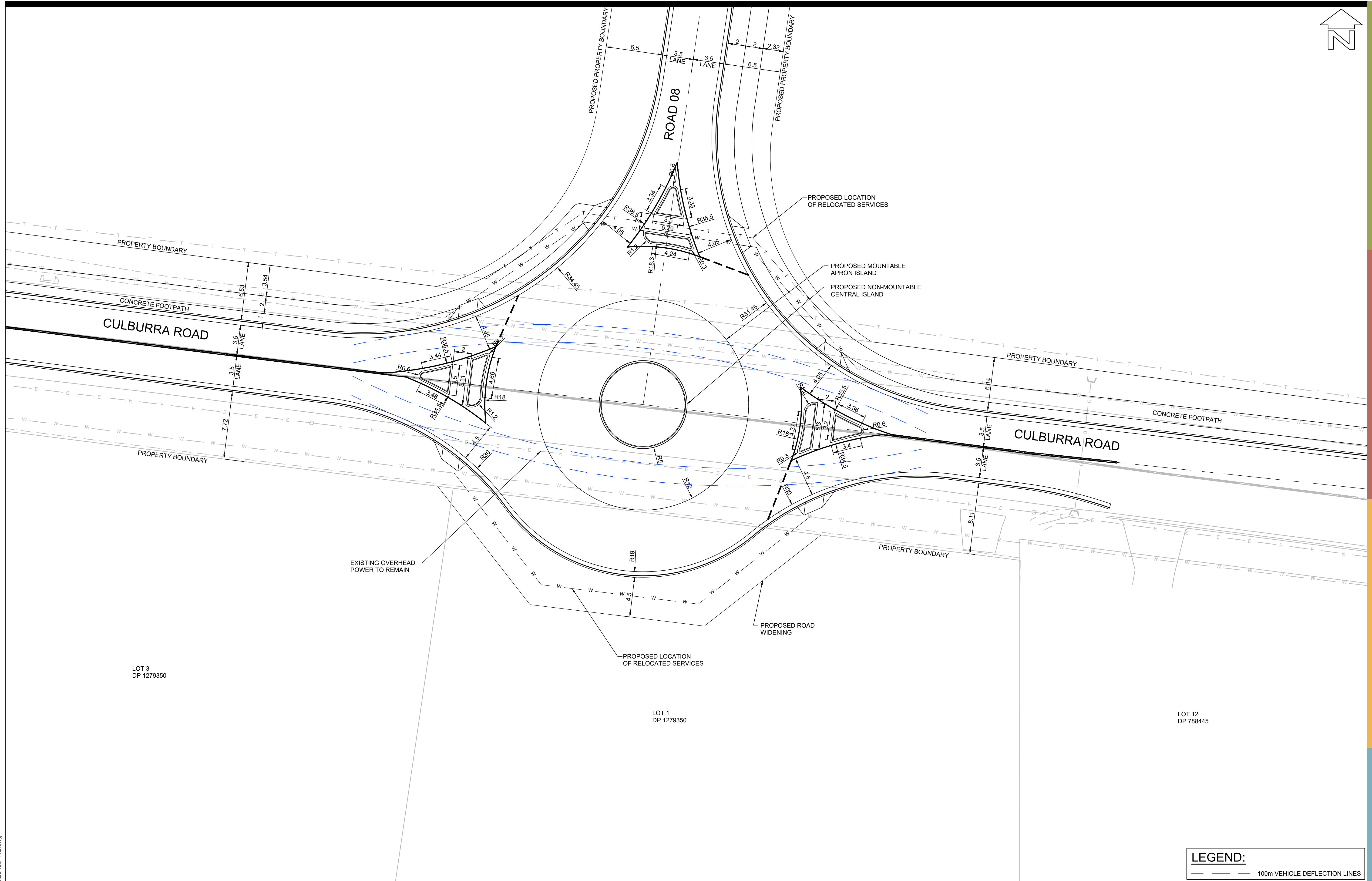
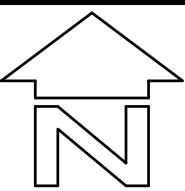
[illegible]



LAYOUT PLAN
SCALE 1:750

BEWARE!
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

AllenPrice Development Consultants	PRELIMINARY CONCEPT ROUNDABOUT 02 LAYOUT PLAN		ISSUE	DESCRIPTION	BY	DATE	0510152025 SCALE:- 1:750 (AT A1 ORIGINAL) PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES				SURVEY		DESIGN	DRAWN	CHECK'D	DATUM		ORIGIN		 PROFESSIONAL STANDARDS SCHEME Liability limited by a scheme approved under Professional Standards Legislation
	WEST CULBURRA MIXED USE DEVELOPMENT		P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024					AP		CJG	CJG	RMH	AUSTRALIAN HEIGHT DATUM		SSM		
	Over Lot 1 DP 1305809		P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025					ALLEN PRICE PTY LTD		DATE OF SURVEY		MAY 2025		RL			
	At CULBURRA ROAD, CALBURRA BEACH						Nowra Office • 75 Plunkett St, Nowra NSW 2541						DRAWING NUMBER		SHEET		ISSUE			
	For SEALARK PTY LTD						Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533						25405-111		12		P3			
						Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500														
						(02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au														

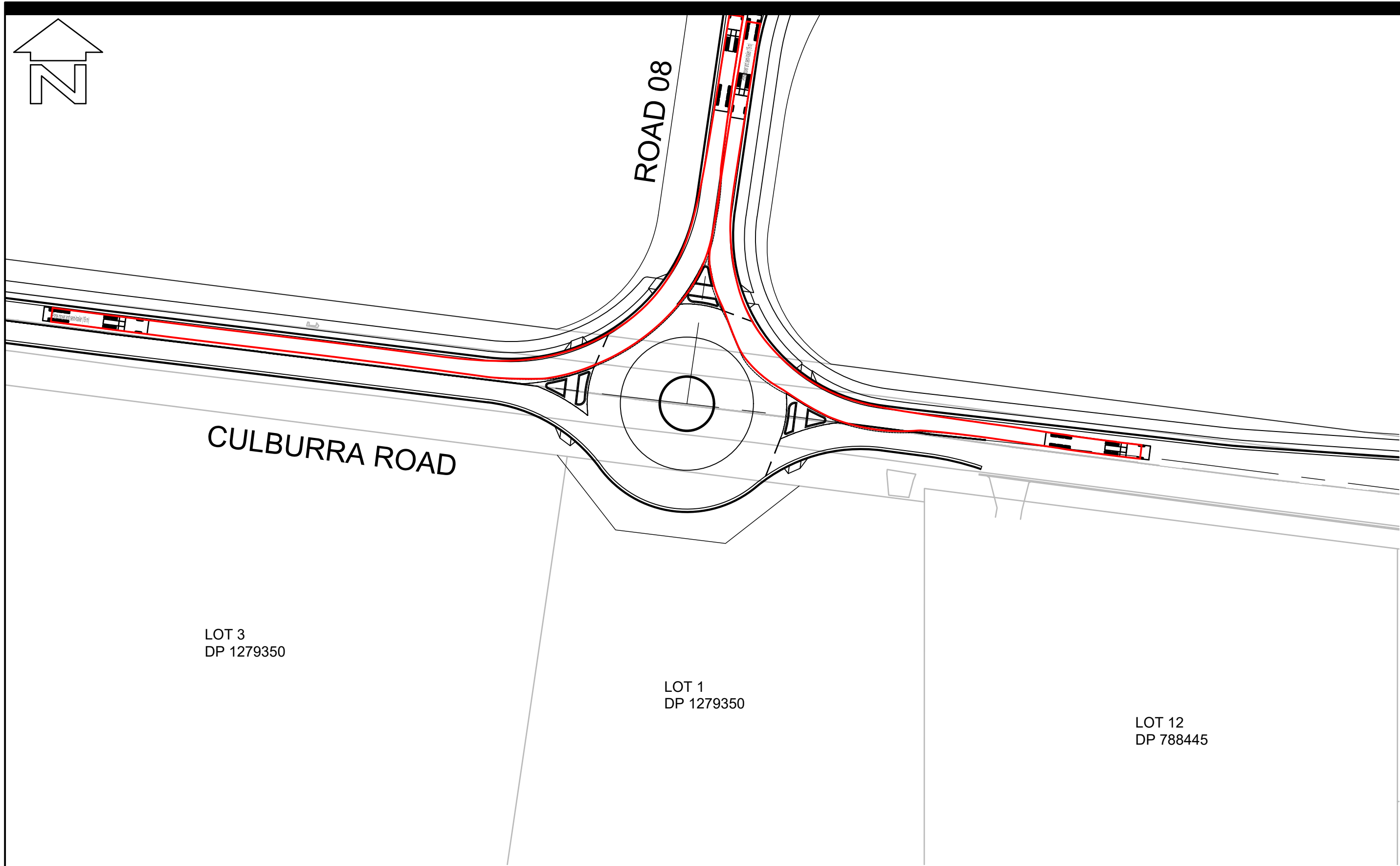


LAYOUT PLAN
SCALE 1:200

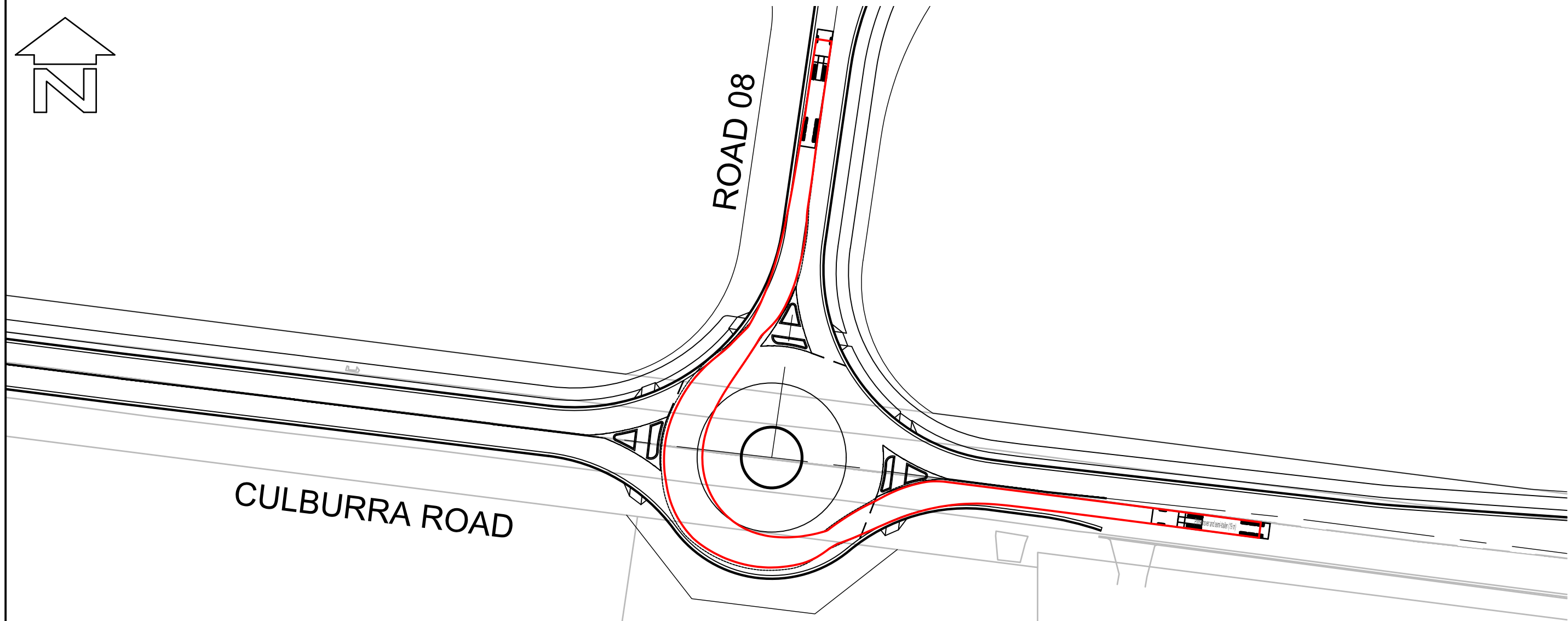
LEGEND:	
	100m VEHICLE DEFLECTION LINES

BEWARE!
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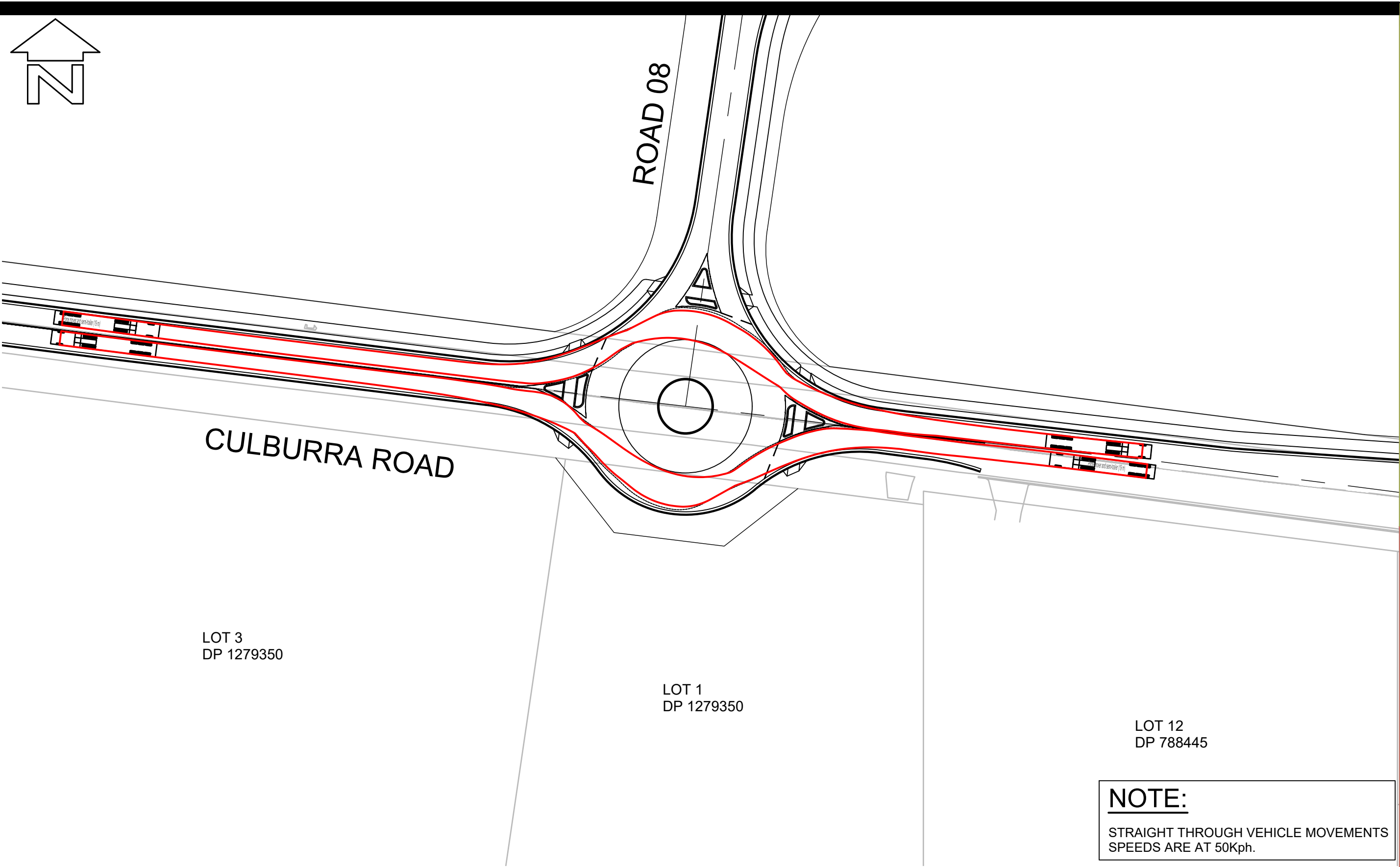
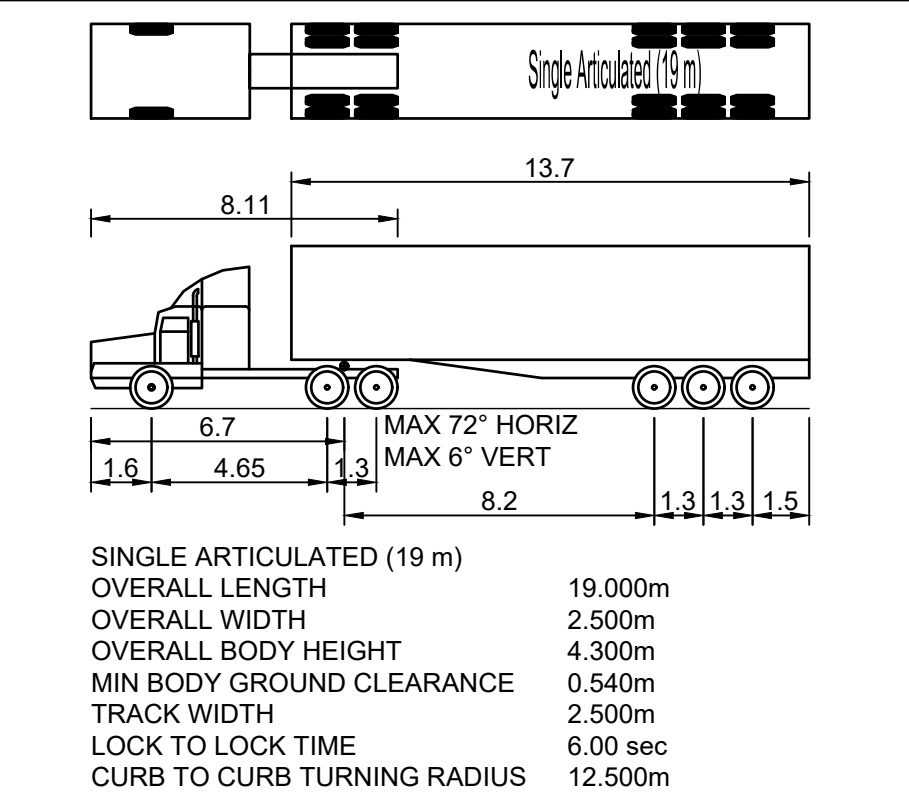
	PRELIMINARY CONCEPT ROUNDABOUT 02 DESIGN		ISSUE	DESCRIPTION	BY	DATE		SURVEY	DESIGN	DRAWN	CHECK'D	DATUM	ORIGIN	 Liability limited by a scheme approved under Professional Standards Legislation
	WEST CULBURRA MIXED USE DEVELOPMENT		P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024		AP	CJG	CJG	RMH	AUSTRALIAN HEIGHT DATUM	SSM	
	Over Lot 1 DP 1305809		P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025		ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kilamba Office • 1/28 Bong Bong St, Kilamba NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au				DATE OF SURVEY	RL	
	At CULBURRA ROAD, CALBURRA BEACH							MAY 2025				DRAWING NUMBER	SHEET	
	For SEALARK PTY LTD							25405-112					13	ISSUE
													P3	



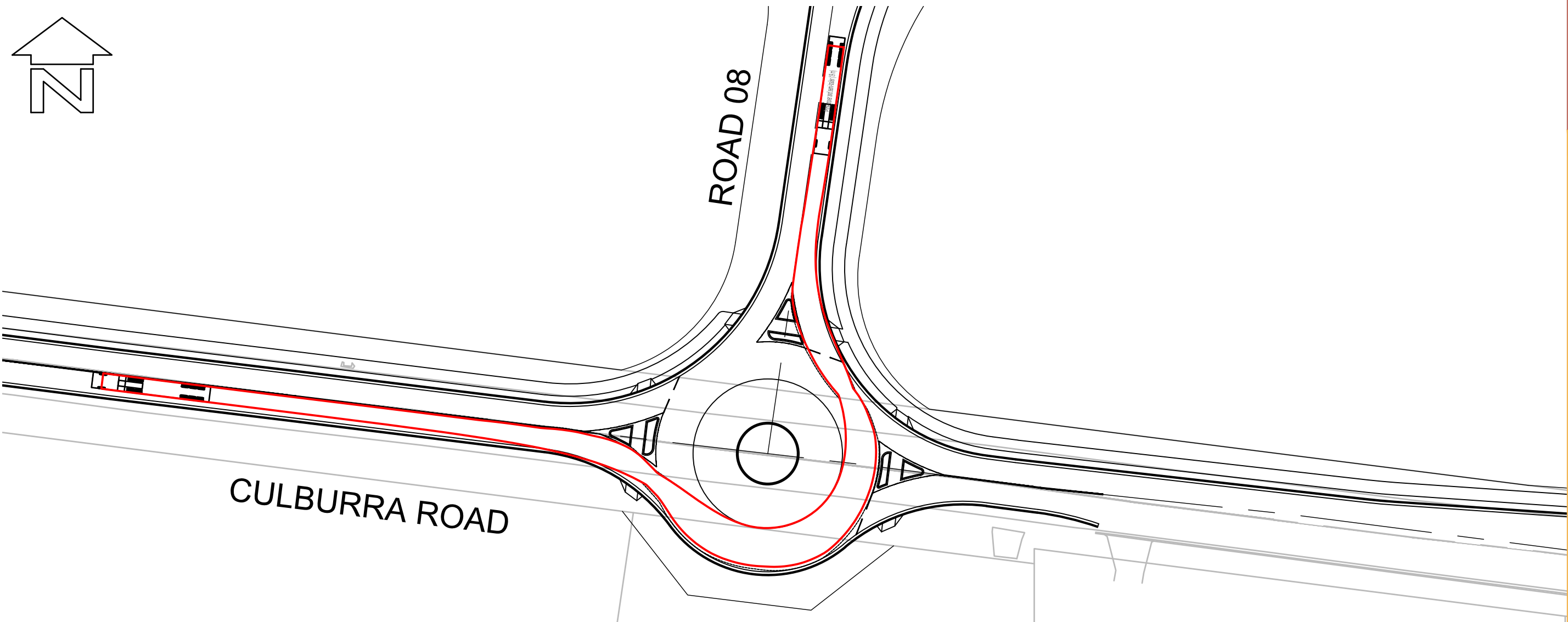
LAYOUT PLAN
SCALE 1:750



LAYOUT PLAN
SCALE 1:750



LAYOUT PLAN
SCALE 1:750

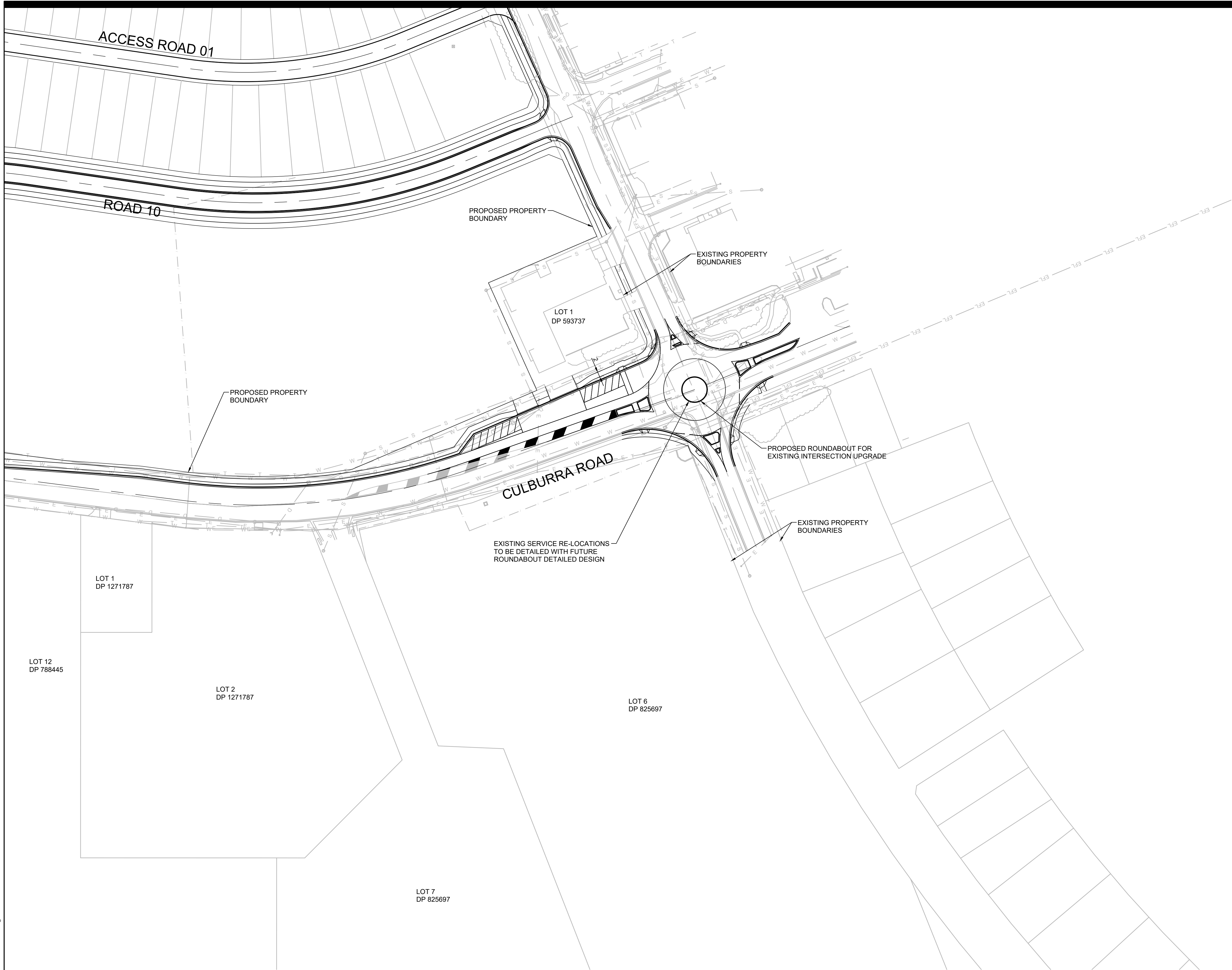
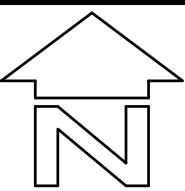


LAYOUT PLAN
SCALE 1:750

NOTE:
STRAIGHT THROUGH VEHICLE MOVEMENTS
SPEEDS ARE AT 50Kph.

BEWARE!
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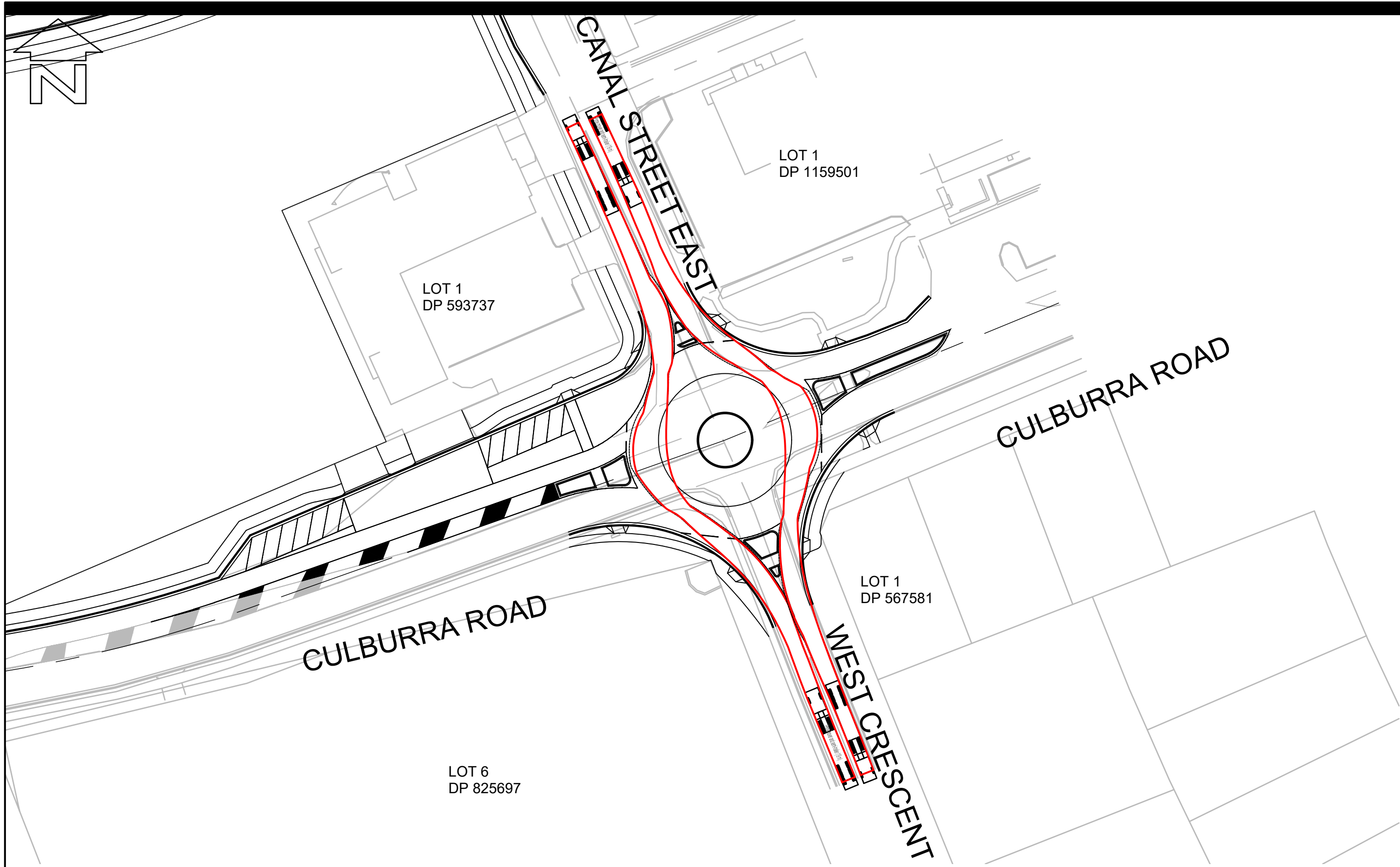
VEHICLE MANOEUVRE LEGEND:
- - - - - PATH OF OUTER FRONT WHEEL (FORWARD MOVEMENT)
- - - - - SWEEP PATH OF VEHICLE BODY (FORWARD MOVEMENT)
THIS DRAWING HAS BEEN PREPARED USING MODELING COMPUTER SOFTWARE AUTODESK VEHICLE TRACKING 2016. THE VEHICLE USED IS BASED UPON DATA PROVIDED BY AUSTRROADS 2013 FOR A SINGLE ARTICULATED (19.0m) TRAVELING AT 20km/hr AND INCORPORATES A REASONABLE DEGREE OF TOLERANCE. HOWEVER IT IS NOT POSSIBLE TO ACCOUNT FOR ALL VEHICLE TYPES/ CHARACTERISTICS AND/OR DRIVER ABILITY.



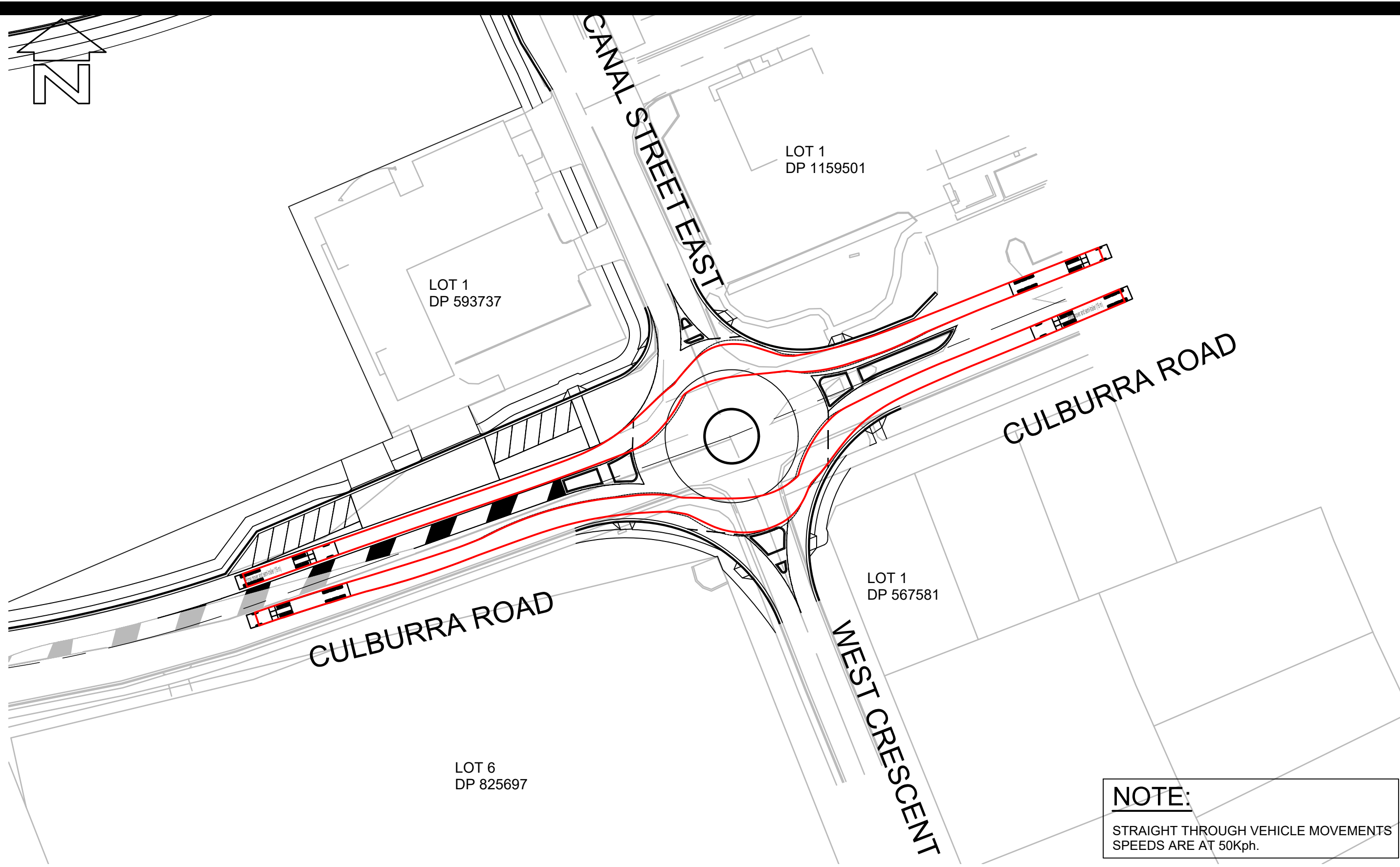
LAYOUT PLAN
SCALE 1:750

BEWARE!
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AllenPrice Development Consultants	PRELIMINARY CONCEPT ROUNDABOUT 03 LAYOUT PLAN		ISSUE	DESCRIPTION	BY	DATE	0510152025 SCALE:- 1:750 (AT A1 ORIGINAL) PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES	SURVEY	DESIGN	DRAWN	CHECK'D	DATUM	ORIGIN	PROFESSIONAL STANDARDS SCHEME Liability limited by a scheme approved under Professional Standards Legislation	
	WEST CULBURRA MIXED USE DEVELOPMENT		P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024		AP	CJG			AUSTRALIAN HEIGHT DATUM	SSM		
	Over Lot 1 DP 1305809 At CULBURRA ROAD, CALBURRA BEACH For SEALARK PTY LTD		P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025		ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiamra Office • 1/28 Bong Bong St, Kiamra NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au				DATE OF SURVEY	RL		
									MAY 2025		DRAWING NUMBER	SHEET	ISSUE		
												25405-115	16	P3	

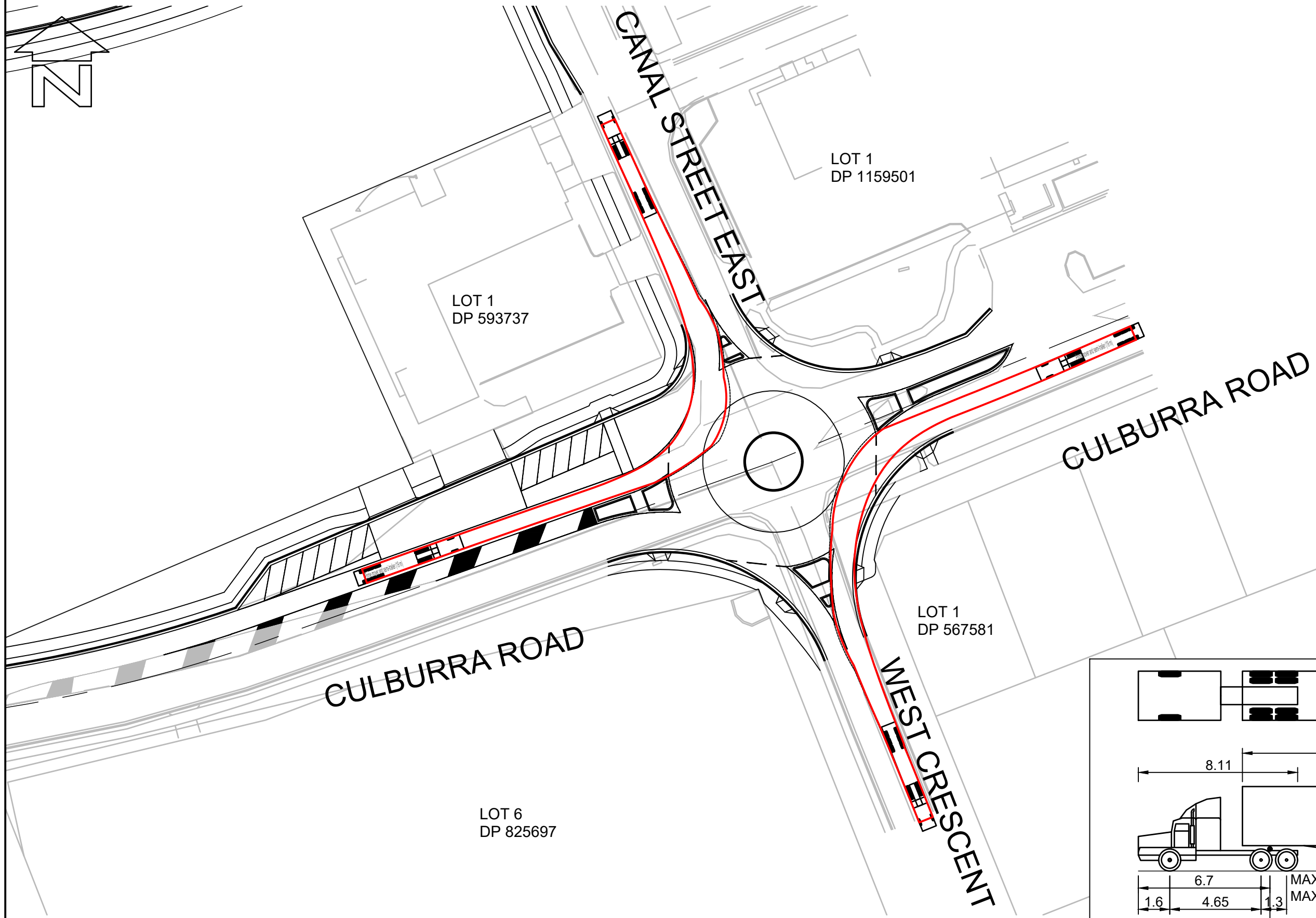


LAYOUT PLAN
SCALE 1:750

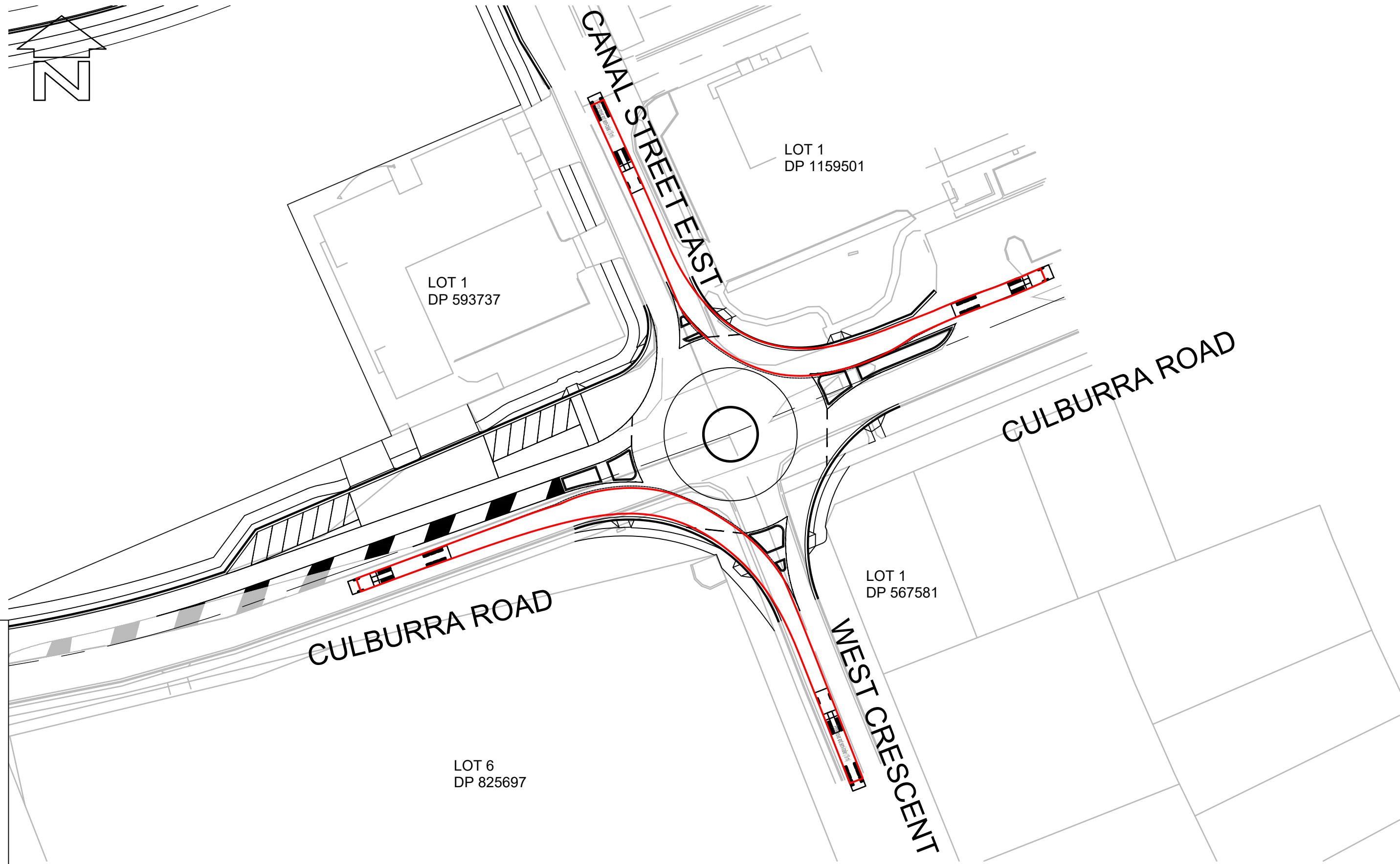


NOTE:
STRAIGHT THROUGH VEHICLE MOVEMENTS
SPEEDS ARE AT 50Kph.

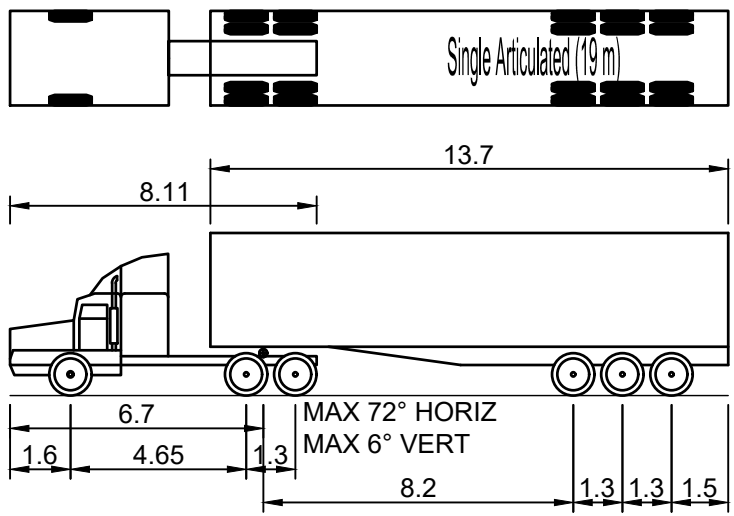
LAYOUT PLAN
SCALE 1:750



LAYOUT PLAN
SCALE 1:750



LAYOUT PLAN
SCALE 1:750



SINGLE ARTICULATED (19 m)
OVERALL LENGTH 19.000m
OVERALL WIDTH 2.500m
OVERALL BODY HEIGHT 4.300m
MIN BODY GROUND CLEARANCE 0.540m
TRACK WIDTH 2.500m
LOCK TO LOCK TIME 6.00 sec
CURB TO CURB TURNING RADIUS 12.500m

VEHICLE MANOEUVRE LEGEND:

----- PATH OF OUTER FRONT WHEEL (FORWARD MOVEMENT)
----- SWEEP PATH OF VEHICLE BODY (FORWARD MOVEMENT)
THIS DRAWING HAS BEEN PREPARED USING MODELING COMPUTER SOFTWARE AUTODESK VEHICLE TRACKING 2016. THE VEHICLE USED IS BASED UPON DATA PROVIDED BY AUSTRROADS 2013 FOR A SINGLE ARTICULATED (19.0m) TRAVELING AT 20km/hr AND INCORPORATES A REASONABLE DEGREE OF TOLERANCE. HOWEVER IT IS NOT POSSIBLE TO ACCOUNT FOR ALL VEHICLE TYPES/ CHARACTERISTICS AND/OR DRIVER ABILITY.

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AllenPrice
Development Consultants

ROUNDAABOUT 03 VEHICLE MOVEMENT LAYOUT PLAN
WEST CULBURRA MIXED USE DEVELOPMENT
Over Lot 1 DP 1305809
At CULBURRA ROAD, CALBURRA BEACH
For SEALARK PTY LTD

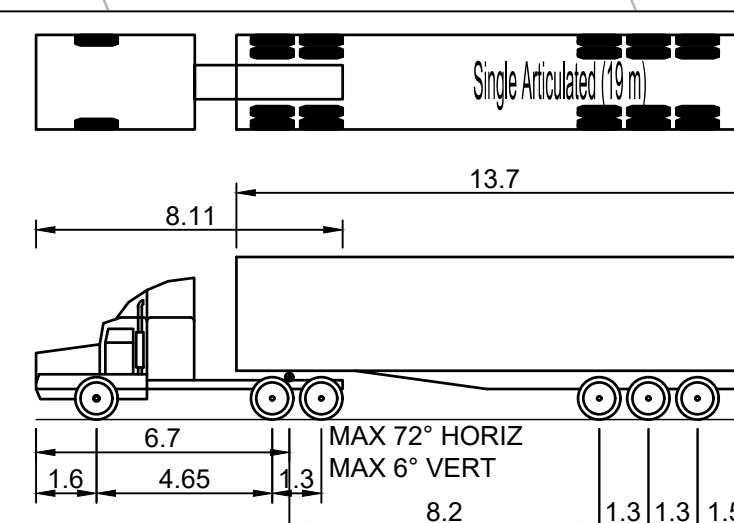
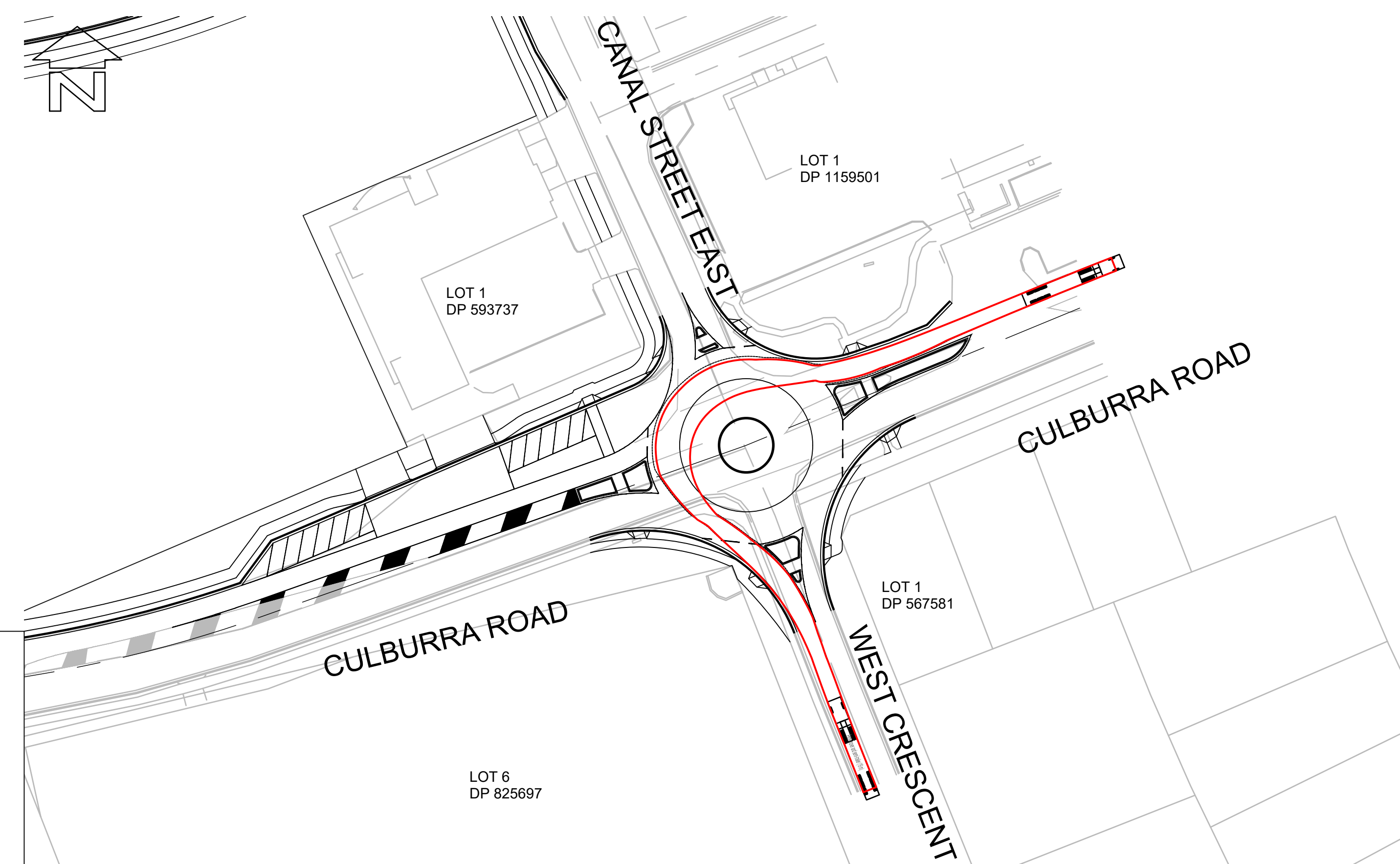
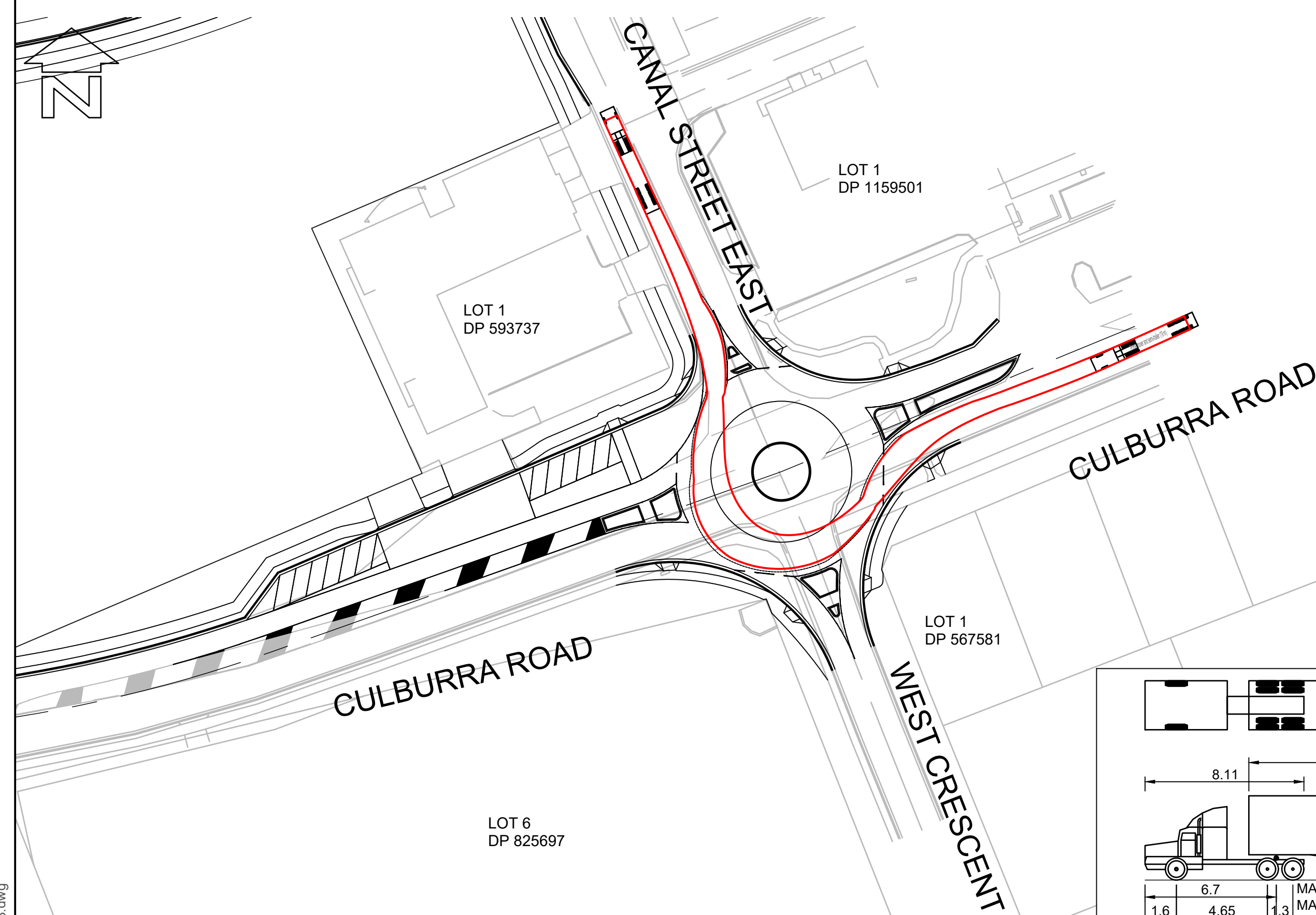
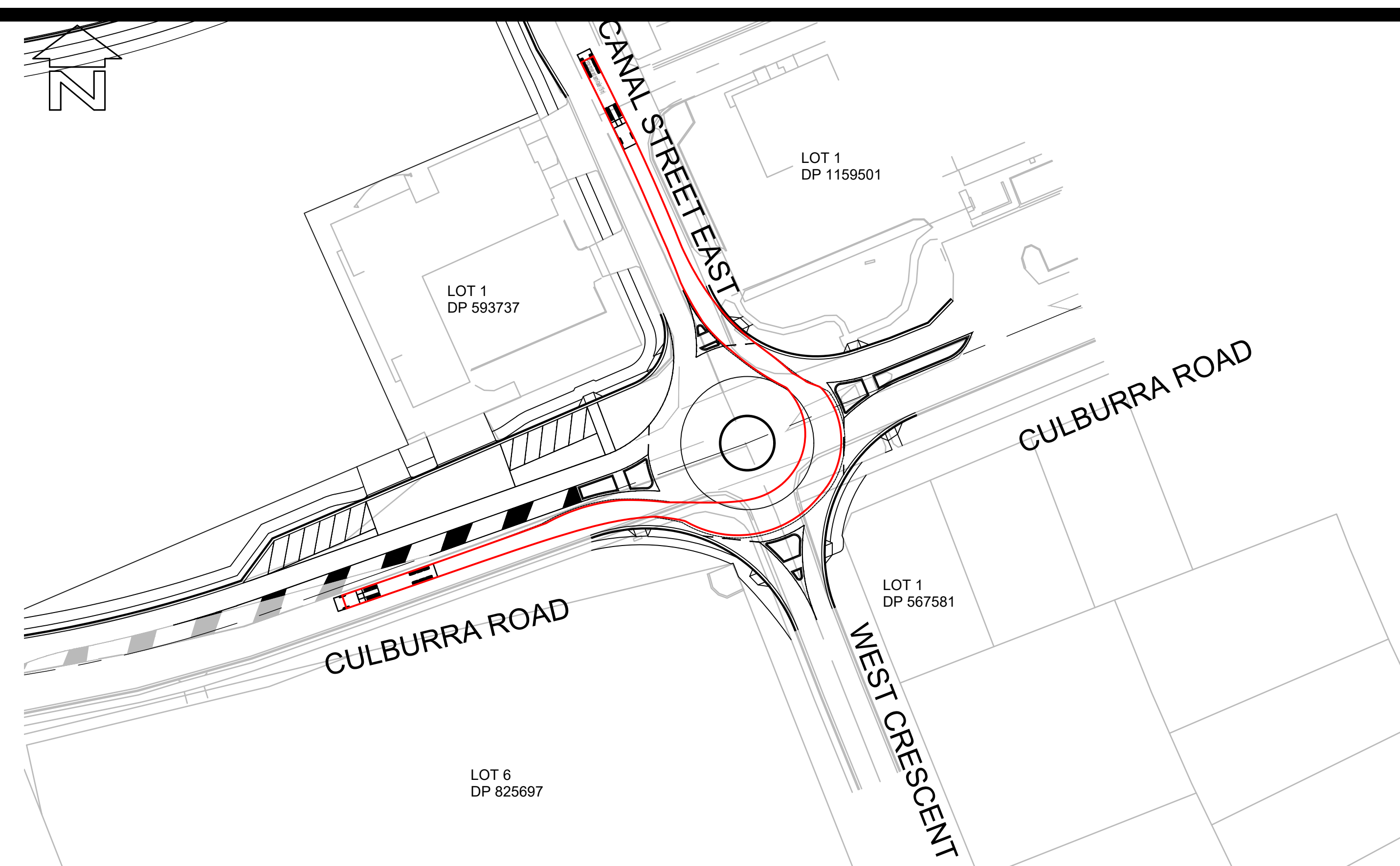
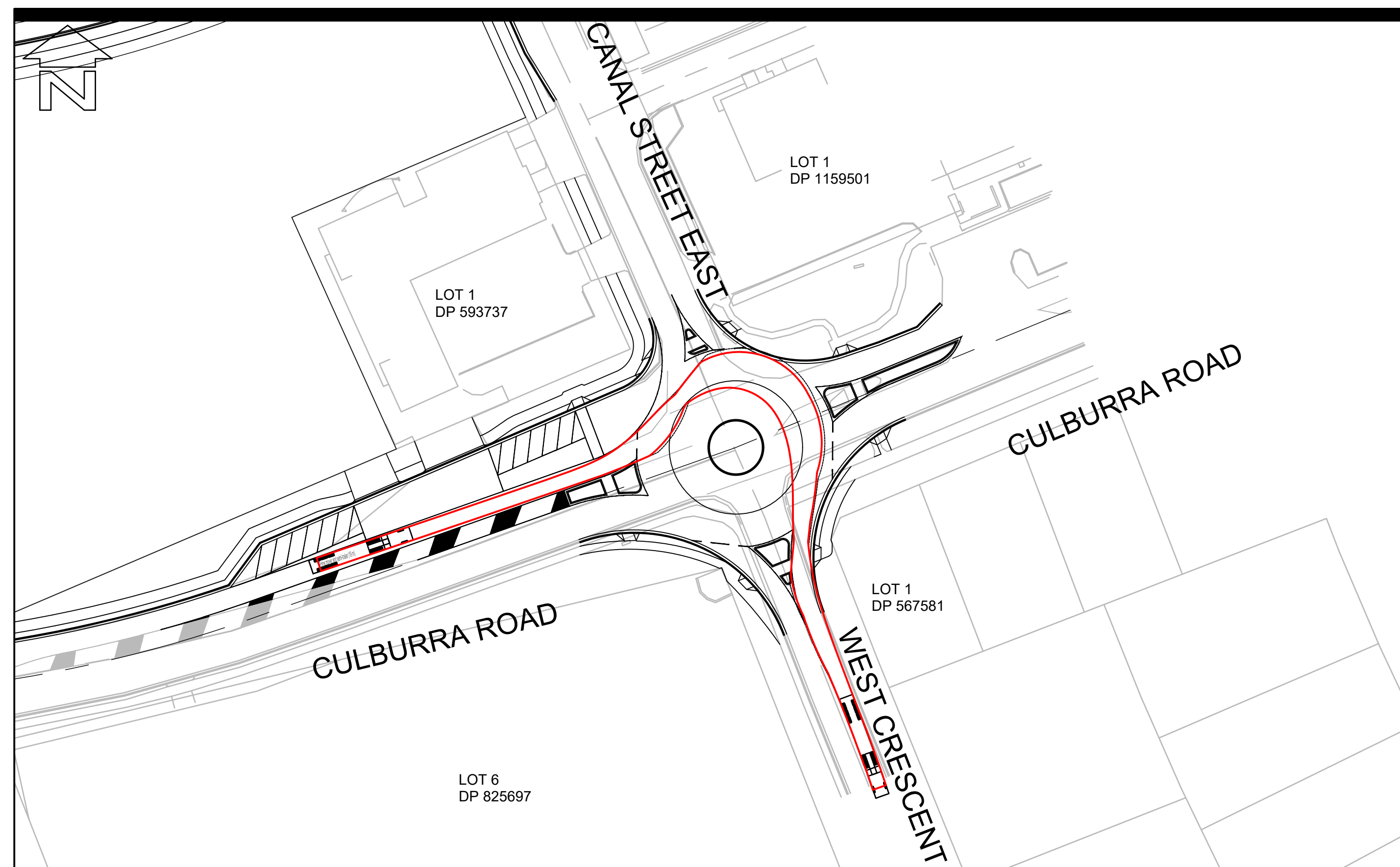
ISSUE	DESCRIPTION	BY	DATE
P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024
P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025

0 5 10 15 20 25
SCALE:- 1:750
(AT A1 ORIGINAL)
PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES

SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD			
Nowra Office • 75 Plunkett St, Nowra NSW 2541			
Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533			
Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500			
(02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	SHEET
25405-117	18
	ISSUE
	P3

Liability limited by a
scheme approved
under Professional
Standards Legislation



SINGLE ARTICULATED (19 m)	
OVERALL LENGTH	19.000m
OVERALL WIDTH	2.500m
OVERALL BODY HEIGHT	4.300m
MIN BODY GROUND CLEARANCE	0.540m
TRACK WIDTH	2.500m
LOCK TO LOCK TIME	6.00 sec
CURB TO CURB TURNING RADIUS	12.500m

VEHICLE MANOEUVRE LEGEND:

----- PATH OF OUTER FRONT WHEEL (FORWARD MOVEMENT)
----- SWEEP PATH OF VEHICLE BODY (FORWARD MOVEMENT)
THIS DRAWING HAS BEEN PREPARED USING MODELING SOFTWARE. THERE ARE AUTODESK VEHICLE TRACKING
2016. THE VEHICLE USED IS BASED ON DATA PROVIDED BY AUSTRORoads 2013 FOR A SINGLE ARTICULATED
(19.0m) TRAVELLING AT 20km/hr AND INCORPORATES A REASONABLE DEGREE OF TOLERANCE HOWEVER
IT IS NOT POSSIBLE TO ACCIDENT FOR ALL VEHICLE TYPES/CHARACTERISTICS AND/OR DRIVER ABILITY

BEWARE!

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AllenPrice

Development Consultants

ROUNDBABOUT 03 VEHICLE MOVEMENT LAYOUT PLAN WEST CULBURRA MIXED USE DEVELOPMENT

Over Lot 1 DP 1305809
At CULBURRA ROAD, CALBURRA BEACH
For SEALARK PTY LTD

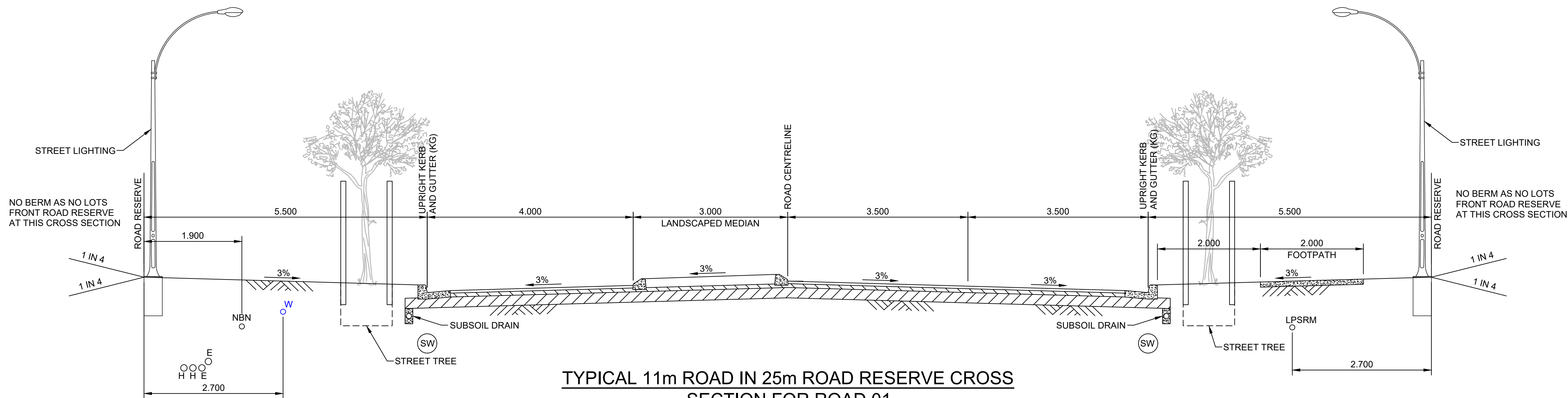
ISSUE	DESCRIPTION	BY	DATE
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P3	AMENDED FOR MOD LODGEMENT	C/JG	27/05/2025



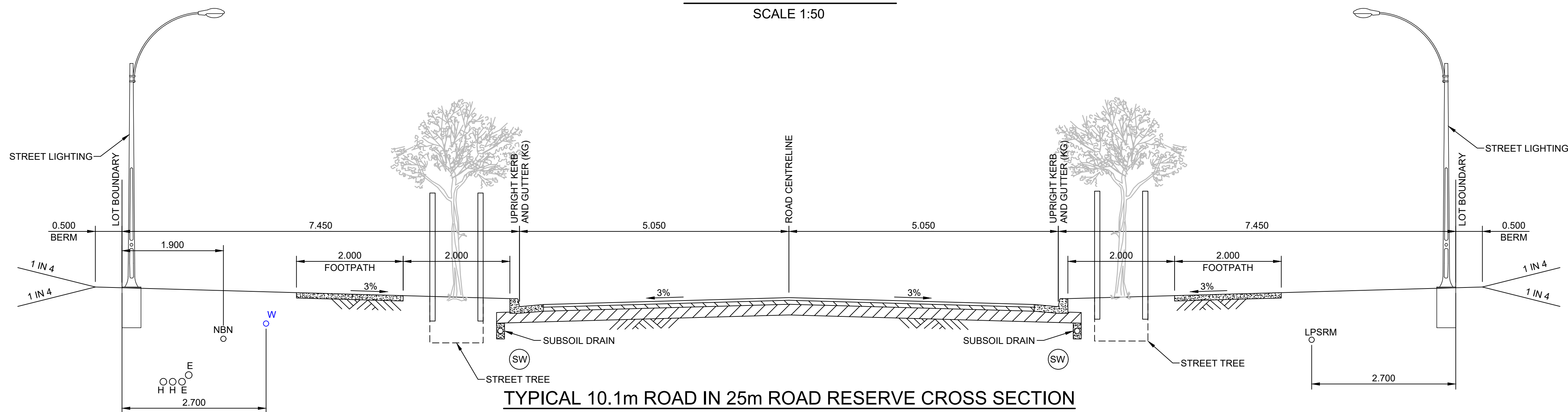
(AT A1 ORIGINAL)

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

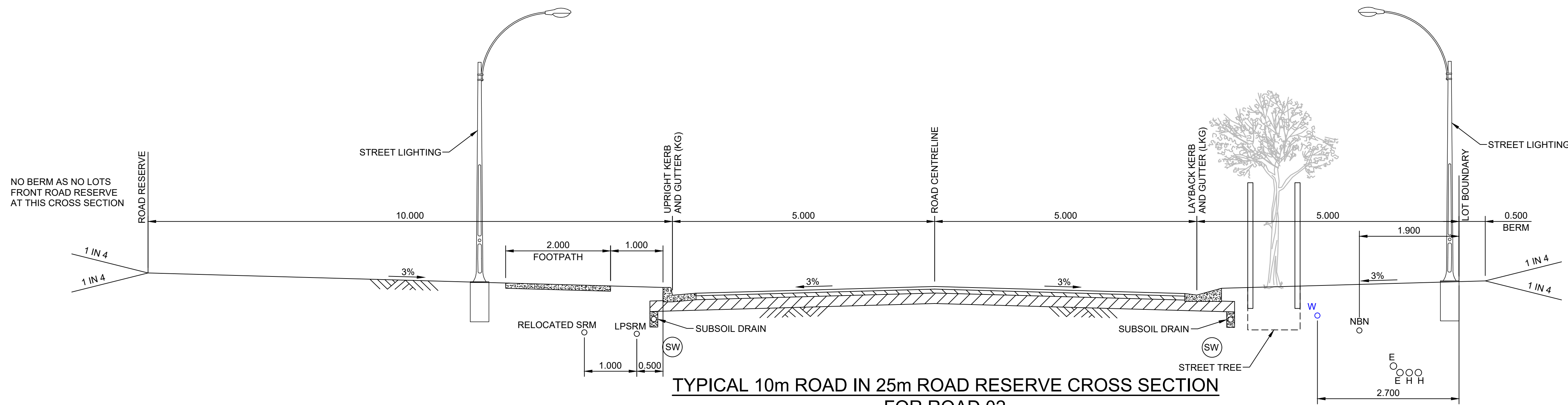
SURVEY				DESIGN		DRAWN		CHECK'D		DATUM		ORIGIN		 PROFESSIONAL STANDARDS SCHEME	
AP				CJG		CJG		RMH		AUSTRALIAN HEIGHT DATUM		SSM			
ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au										DATE OF SURVEY		RL		Liability limited by a scheme approved by under Professional Standards Legislation	
										MAY 2025					
										DRAWING NUMBER		SHEET		ISSUE	
										25405-118		19		P3	



TYPICAL 11m ROAD IN 25m ROAD RESERVE CROSS SECTION FOR ROAD 01
SCALE 1:50



TYPICAL 10.1m ROAD IN 25m ROAD RESERVE CROSS SECTION FOR ROAD 01
SCALE 1:50

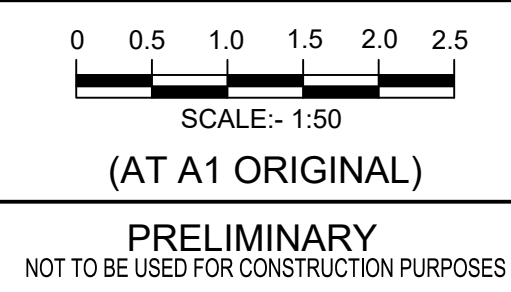


TYPICAL 10m ROAD IN 25m ROAD RESERVE CROSS SECTION FOR ROAD 02
SCALE 1:50

NOTE:
FOOTPATHS SHOWN ON CROSS SECTIONS ARE FOR INFORMATION ONLY. SEE LAYOUT PLANS FOR CLARIFICATION OF FOOTPATH LOCATION THROUGH SUBDIVISION.

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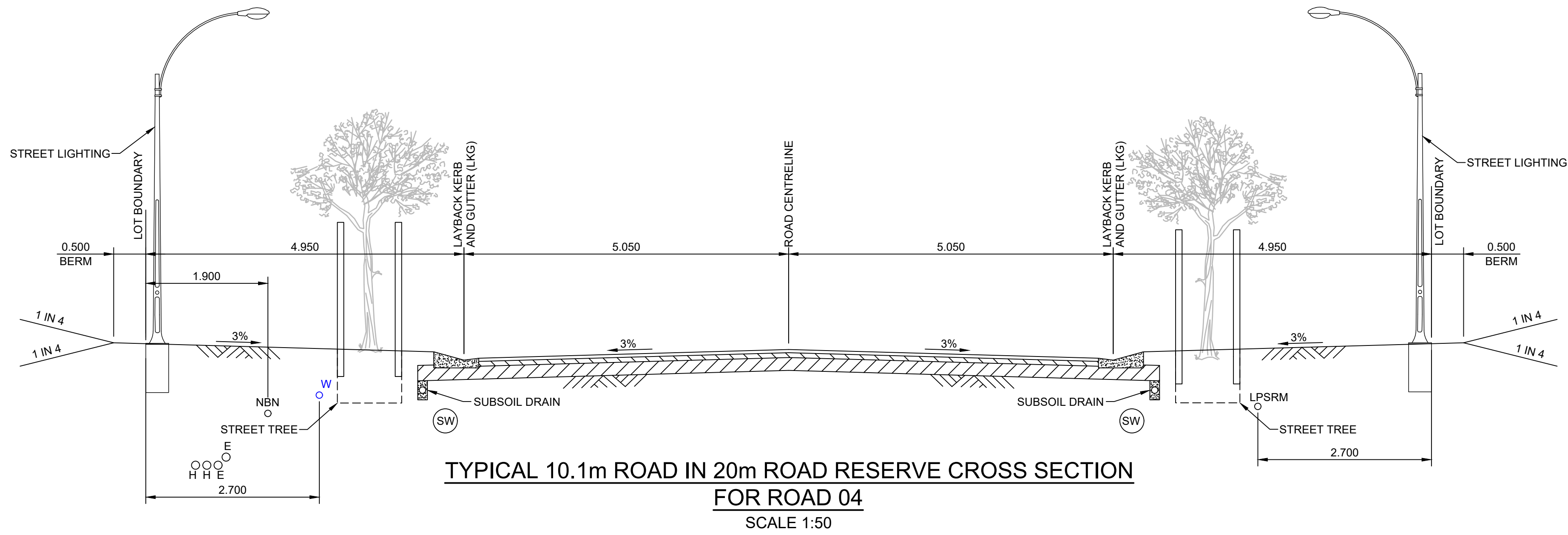
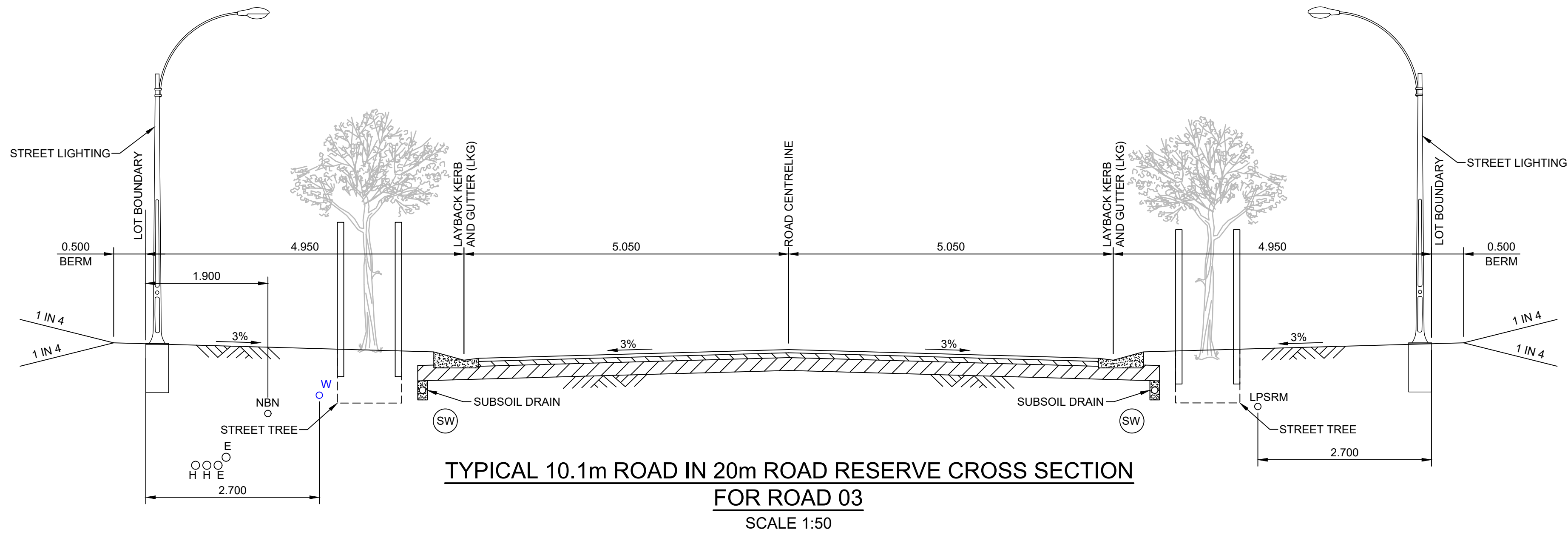
ISSUE	DESCRIPTION	BY	DATE
P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024
P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025



SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	
25405-120	

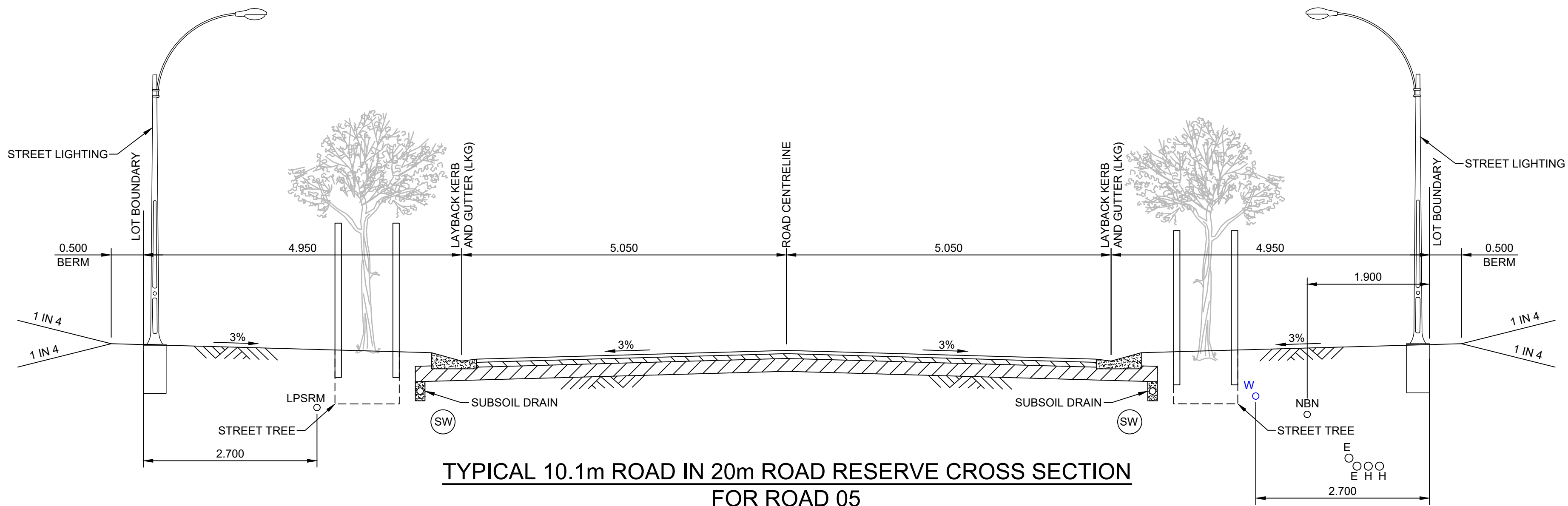
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21	P3



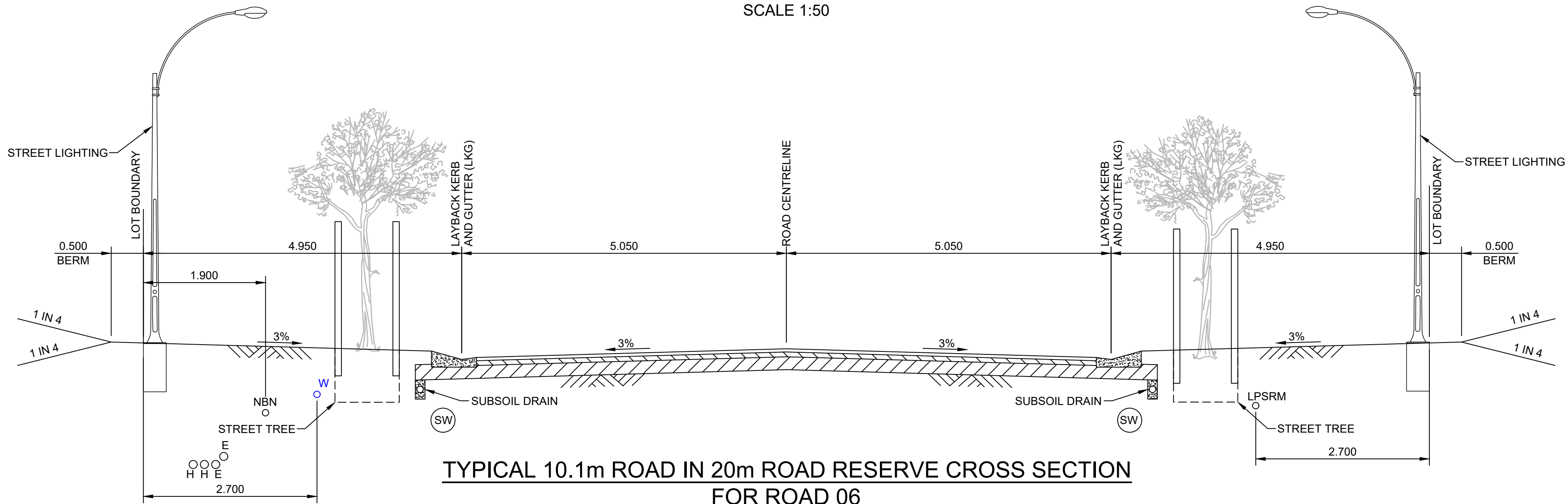
NOTE:
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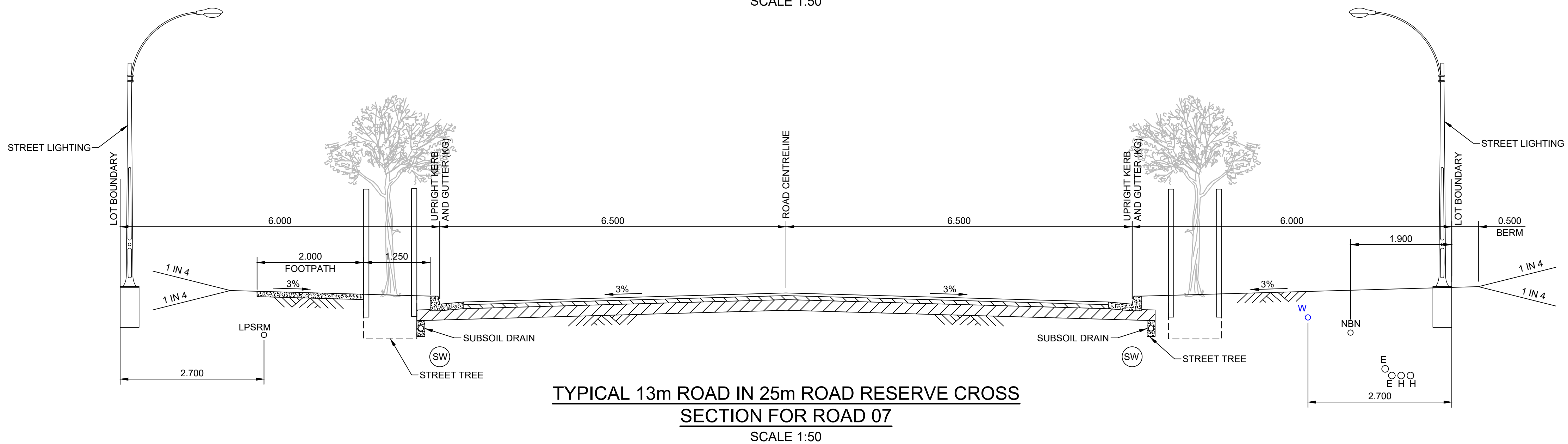
AllenPrice Development Consultants	PRELIMINARY TYPICAL ROAD CROSS SECTIONS PLAN SHEET 02 WEST CULBURRA MIXED USE DEVELOPMENT Over Lot 1 DP 1305809 At CULBURRA ROAD, CALBURRA BEACH For SEALARK PTY LTD				<table><tr><th>ISSUE</th><th>DESCRIPTION</th><th>BY</th><th>DATE</th></tr><tr><td>P2</td><td>AMENDED FOR MOD LODGEMENT</td><td>CJG</td><td>12/07/2024</td></tr><tr><td>P3</td><td>AMENDED FOR MOD LODGEMENT</td><td>CJG</td><td>27/05/2025</td></tr></table>		ISSUE	DESCRIPTION	BY	DATE	P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024	P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025	00.51.01.52.02.5 SCALE:- 1:50 (AT A1 ORIGINAL) PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES		<table><tr><th>SURVEY</th><th>DESIGN</th><th>DRAWN</th><th>CHECK'D</th></tr><tr><td>AP</td><td>CJG</td><td>CJG</td><td>RMH</td></tr></table> ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au		SURVEY	DESIGN	DRAWN	CHECK'D	AP	CJG	CJG	RMH	<table><tr><th>DATUM</th><th>ORIGIN</th></tr><tr><td>AUSTRALIAN HEIGHT DATUM</td><td>SSM</td></tr></table>		DATUM	ORIGIN	AUSTRALIAN HEIGHT DATUM	SSM	PROFESSIONAL STANDARDS SCHEME Liability limited by a scheme approved under Professional Standards Legislation
	ISSUE	DESCRIPTION	BY	DATE																																	
	P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024																																	
	P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025																																	
	SURVEY	DESIGN	DRAWN	CHECK'D																																	
AP	CJG	CJG	RMH																																		
DATUM	ORIGIN																																				
AUSTRALIAN HEIGHT DATUM	SSM																																				
		<table><tr><th>DATE OF SURVEY</th><th>RL</th></tr><tr><td>MAY 2025</td><td></td></tr></table>		DATE OF SURVEY	RL	MAY 2025																															
DATE OF SURVEY	RL																																				
MAY 2025																																					
		<table><tr><th>DRAWING NUMBER</th><th>SHEET</th><th>ISSUE</th></tr><tr><td>25405-121</td><td>22</td><td>P3</td></tr></table>		DRAWING NUMBER	SHEET	ISSUE	25405-121	22	P3																												
DRAWING NUMBER	SHEET	ISSUE																																			
25405-121	22	P3																																			



TYPICAL 10.1m ROAD IN 20m ROAD RESERVE CROSS SECTION
FOR ROAD 05
SCALE 1:50



TYPICAL 10.1m ROAD IN 20m ROAD RESERVE CROSS SECTION
FOR ROAD 06
SCALE 1:50

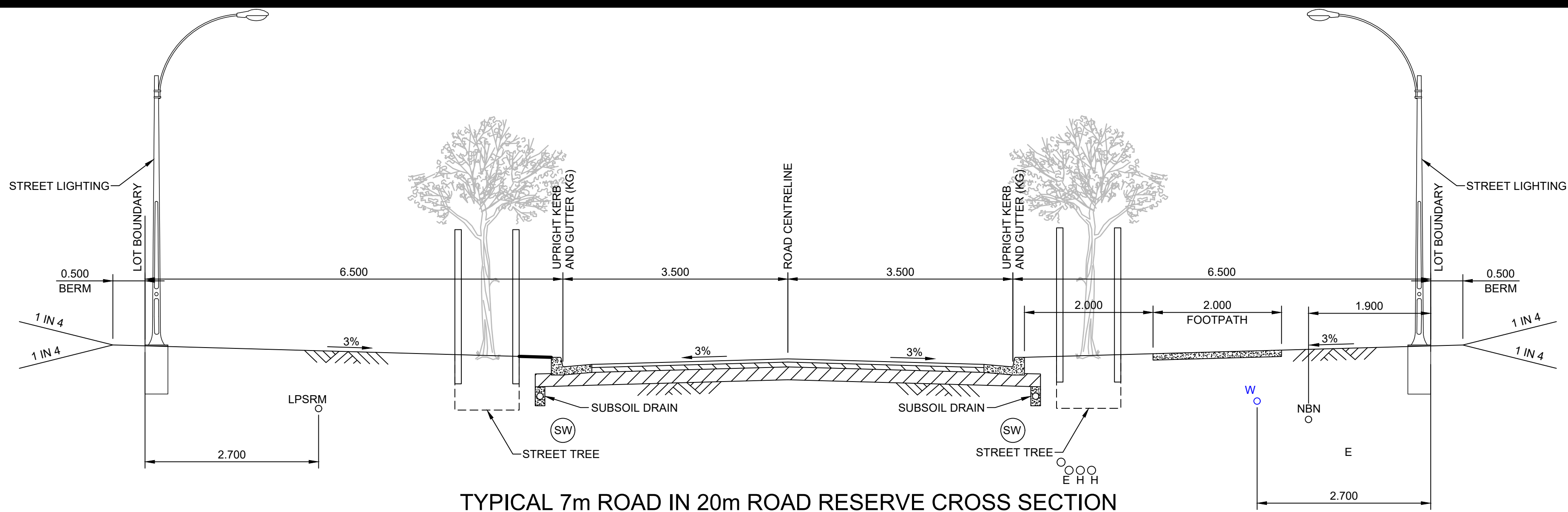


TYPICAL 13m ROAD IN 25m ROAD RESERVE CROSS SECTION
FOR ROAD 07
SCALE 1:50

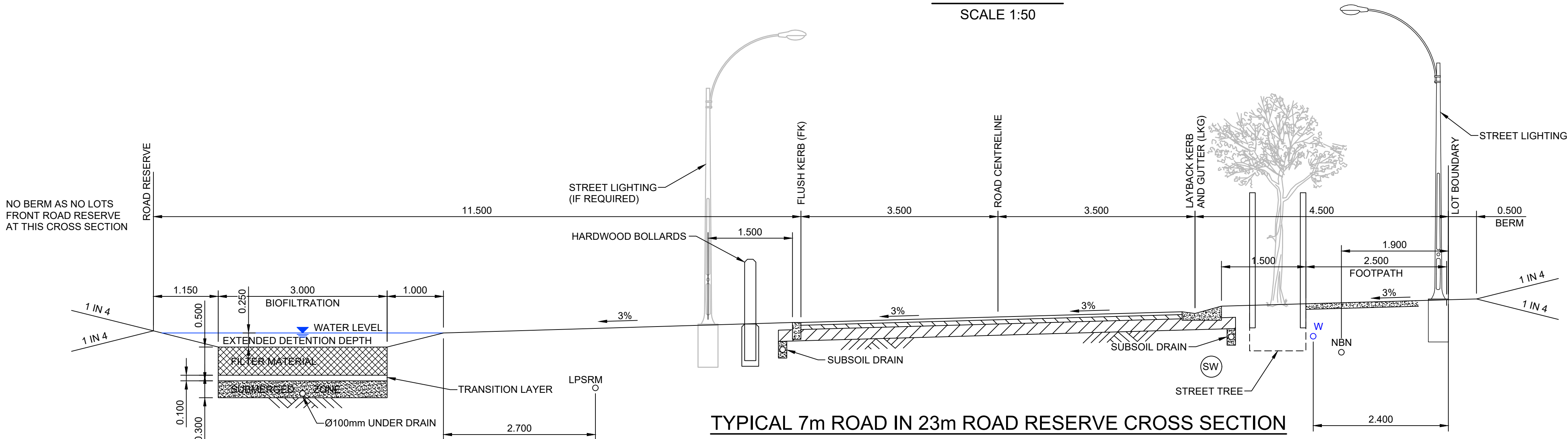
NOTE:
FOOTPATHS SHOWN ON CROSS SECTIONS ARE FOR INFORMATION ONLY. SEE LAYOUT PLANS FOR CLARIFICATION OF FOOTPATH LOCATION THROUGH SUBDIVISION.

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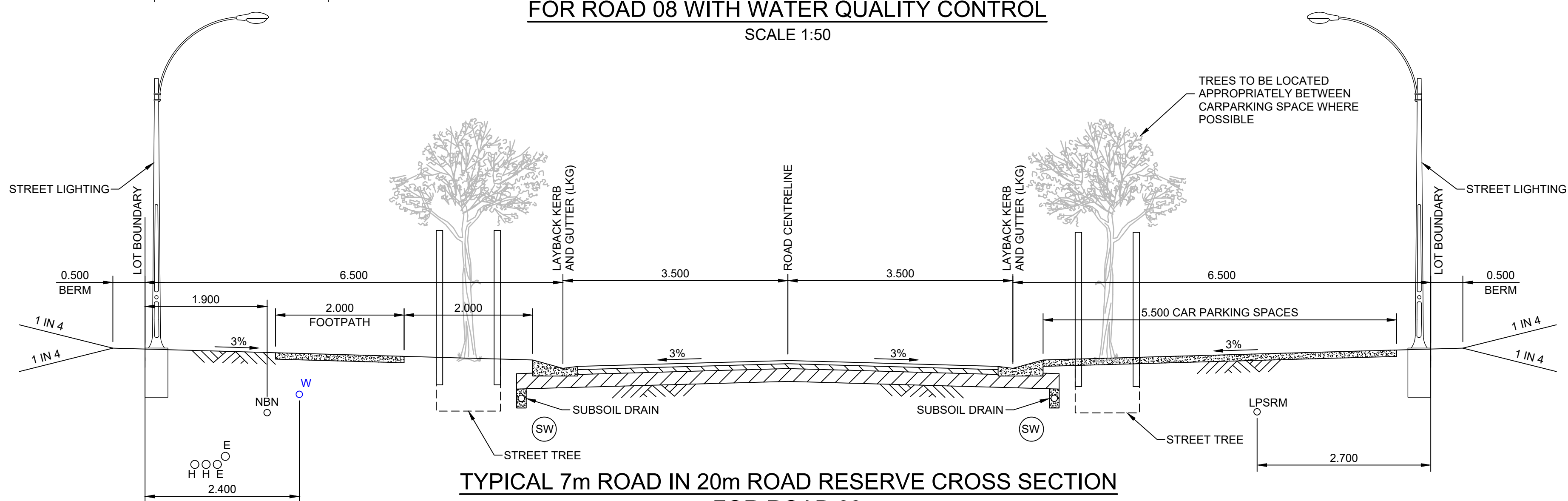
AllenPrice Development Consultants	PRELIMINARY TYPICAL ROAD CROSS SECTIONS PLAN SHEET 03				ISSUE	DESCRIPTION	BY	DATE	0 0.5 1.0 1.5 2.0 2.5 SCALE:- 1:50 (AT A1 ORIGINAL) PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES				SURVEY		DESIGN	DRAWN	CHECK'D	DATUM		ORIGIN		 PROFESSIONAL STANDARDS SCHEME Liability limited by a scheme approved under Professional Standards Legislation
	WEST CULBURRA MIXED USE DEVELOPMENT				P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024					AP		CJG	CJG	RMH	AUSTRALIAN HEIGHT DATUM		SSM		
	Over Lot 1 DP 1305809 At CULBURRA ROAD, CALBURRA BEACH For SEALARK PTY LTD				P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025									DATE OF SURVEY		RL			
													ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au				MAY 2025					
																DRAWING NUMBER		SHEET		ISSUE		
																25405-122		23		P3		



TYPICAL 7m ROAD IN 20m ROAD RESERVE CROSS SECTION
FOR ROAD 08
SCALE 1:50



TYPICAL 7m ROAD IN 23m ROAD RESERVE CROSS SECTION
FOR ROAD 08 WITH WATER QUALITY CONTROL
SCALE 1:50

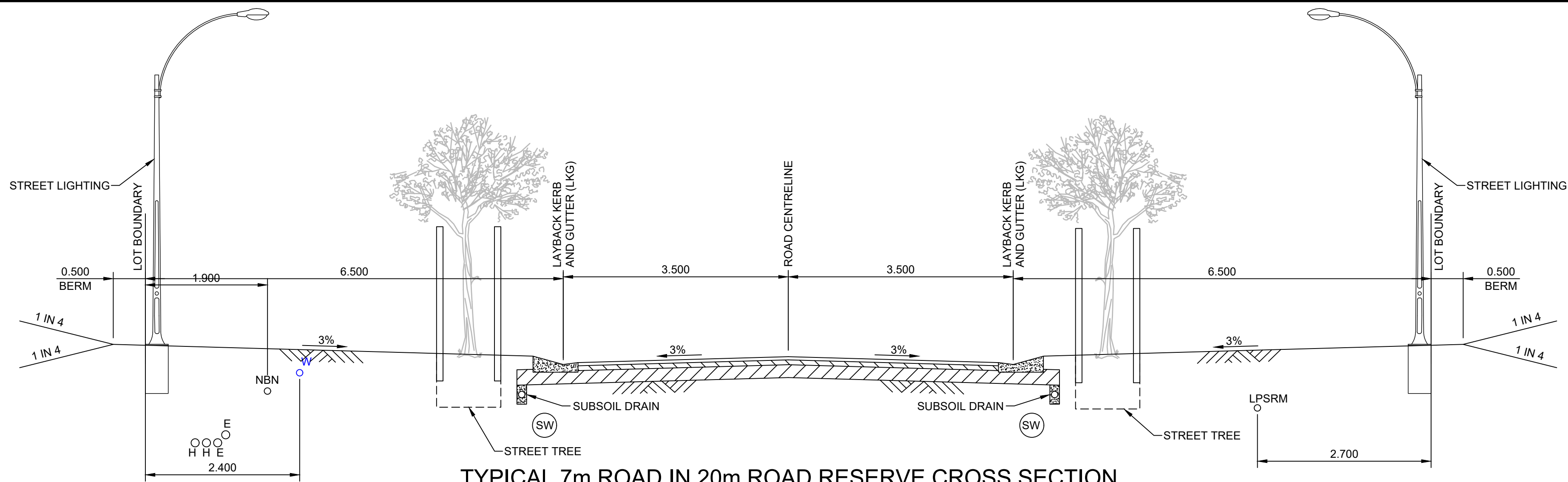


TYPICAL 7m ROAD IN 20m ROAD RESERVE CROSS SECTION
FOR ROAD 09
SCALE 1:50

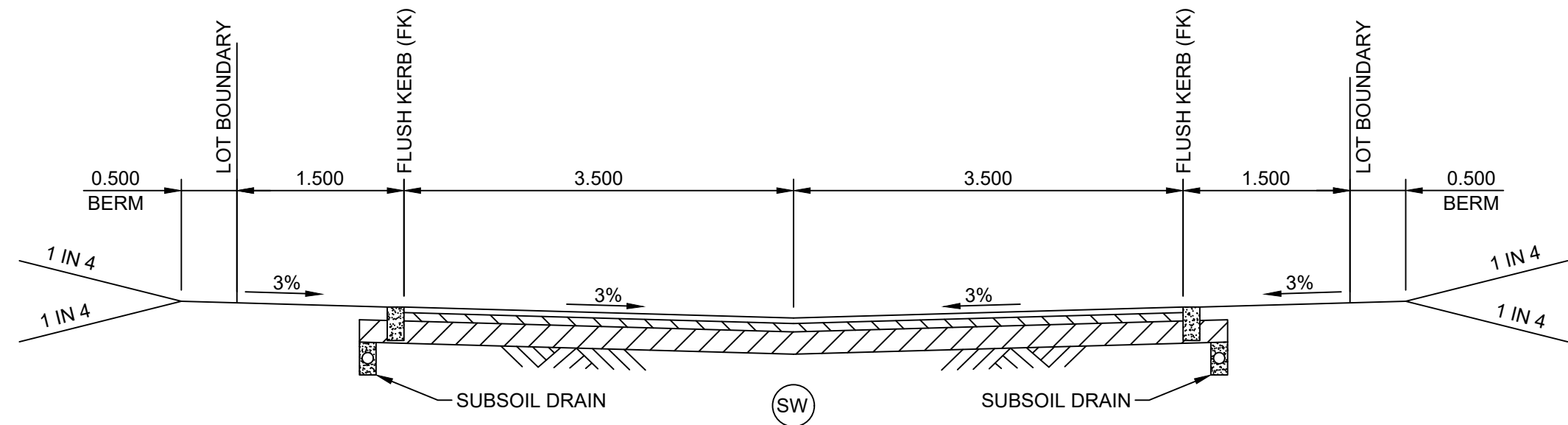
NOTE:
FOOTPATHS SHOWN ON CROSS SECTIONS ARE FOR INFORMATION ONLY. SEE LAYOUT PLANS FOR CLARIFICATION OF FOOTPATH LOCATION THROUGH SUBDIVISION.

BEWARE!
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

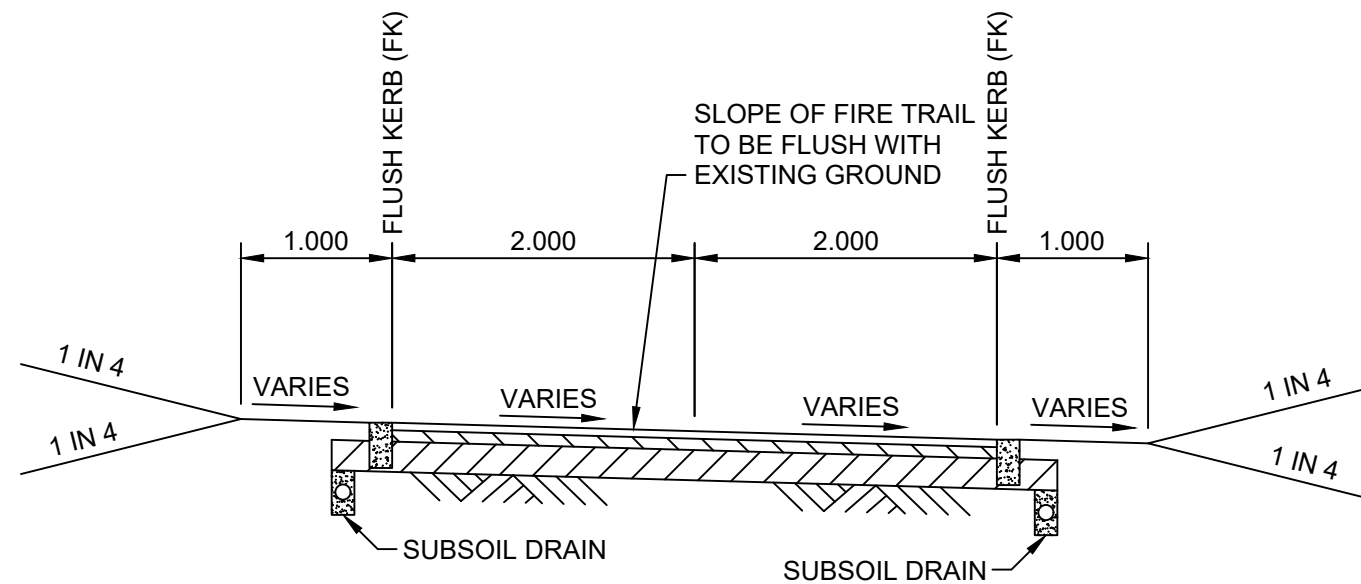
AllenPrice Development Consultants	PRELIMINARY TYPICAL ROAD CROSS SECTIONS PLAN SHEET 04		ISSUE	DESCRIPTION	BY	DATE	0 0.5 1.0 1.5 2.0 2.5 SCALE:- 1:50 (AT A1 ORIGINAL) PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES	SURVEY	DESIGN	DRAWN	CHECK'D	DATUM	ORIGIN	Liability limited by a scheme approved under Professional Standards Legislation
	WEST CULBURRA MIXED USE DEVELOPMENT		P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024		AP	CJG	CJG	RMH	AUSTRALIAN HEIGHT DATUM	SSM	
	Over Lot 1 DP 1305809		P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025		ALLEN PRICE PTY LTD				DATE OF SURVEY	RL	
	At CULBURRA ROAD, CALBURRA BEACH							Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au				MAY 2025		
	For SEALARK PTY LTD							DRAWING NUMBER				25405-123	SHEET	ISSUE
													24	P3



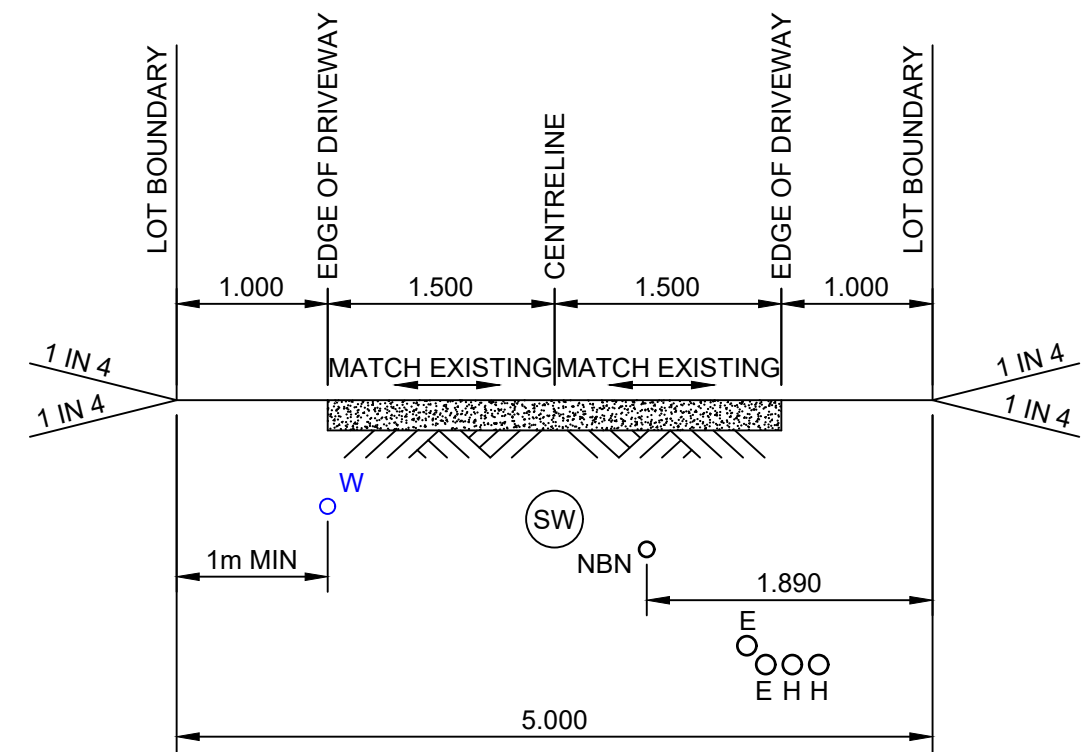
TYPICAL 7m ROAD IN 20m ROAD RESERVE CROSS SECTION
FOR ROAD 10
SCALE 1:50



TYPICAL 7m ROAD IN 10m ROAD RESERVE CROSS SECTION
FOR ACCESS ROAD 01
SCALE 1:50



TYPICAL 4m FIRE TRAIL PRIVATE PROPERTY/PUBLIC RESERVE CROSS SECTION
FOR EMERGENCY EGRESS ROUTE 01
SCALE 1:50

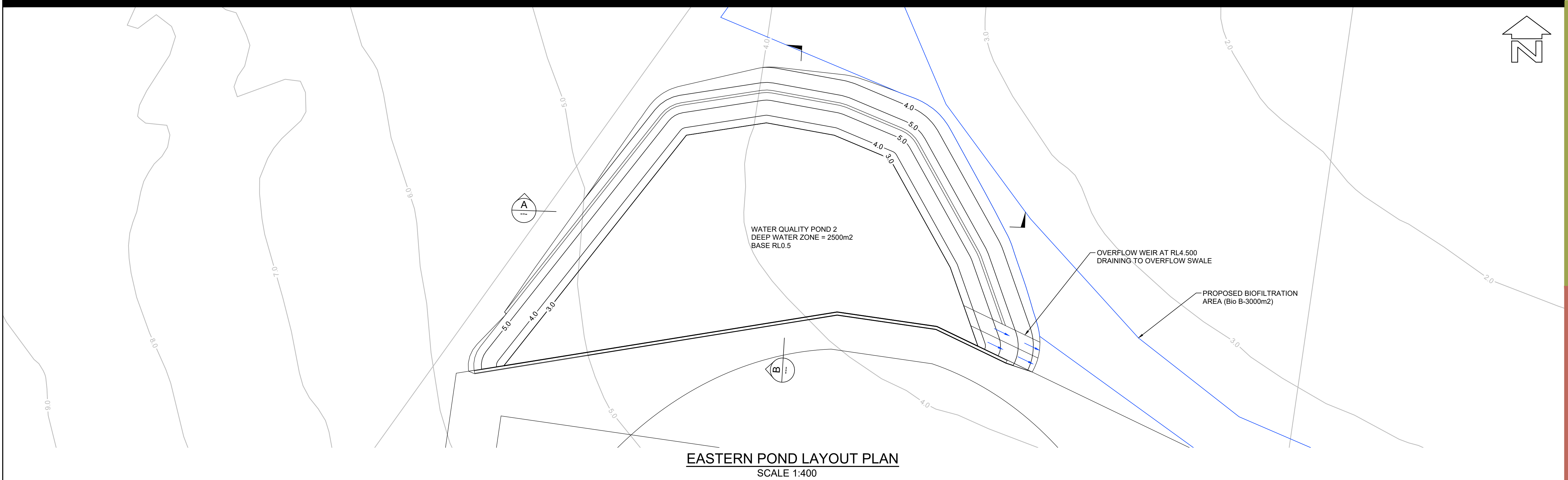


TYPICAL DRIVEWAY CROSS SECTION - 3m WIDTH
SCALE 1:50

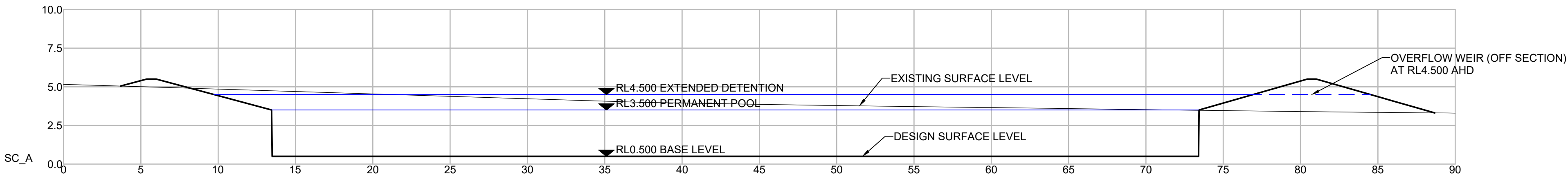
NOTE:
FOOTPATHS SHOWN ON CROSS SECTIONS ARE FOR INFORMATION ONLY. SEE LAYOUT PLANS FOR CLARIFICATION OF FOOTPATH LOCATION THROUGH SUBDIVISION.

BEWARE!
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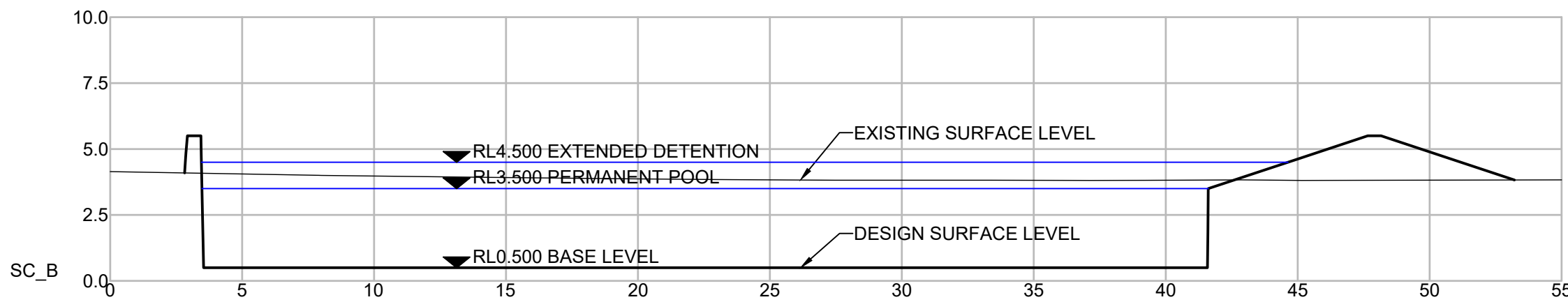
AllenPrice Development Consultants	PRELIMINARY TYPICAL ROAD CROSS SECTIONS PLAN SHEET 05		ISSUE	DESCRIPTION	BY	DATE	0 0.5 1.0 1.5 2.0 2.5 SCALE:- 1:50 (AT A1 ORIGINAL) PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES	SURVEY	DESIGN	DRAWN	CHECK'D	DATUM	ORIGIN	 Liability limited by a scheme approved under Professional Standards Legislation
	WEST CULBURRA MIXED USE DEVELOPMENT		P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024		AP	CJG	CJG	RMH	AUSTRALIAN HEIGHT DATUM	SSM	
	Over Lot 1 DP 1305809		P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025		ALLEN PRICE PTY LTD				DATE OF SURVEY	RL	
	At CULBURRA ROAD, CALBURRA BEACH							Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au				MAY 2025		
	For SEALARK PTY LTD											DRAWING NUMBER	SHEET	ISSUE
												25405-124	25	P3



EASTERN POND LAYOUT PLAN
SCALE 1:400



SECTION A
SCALE 1:200



SECTION B
SCALE 1:200

BEWARE!
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

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Development Consultants

EASTERN POND CONCEPT LAYOUT PLAN

WEST CULBURRA MIXED USE DEVELOPMENT

Over Lot 1 DP 1305809

At CULBURRA ROAD, CALBURRA BEACH

For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P2	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024
P3	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025

0 5 10 15 20

SCALE:- 1:400

(AT A1 ORIGINAL)

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION PURPOSES

0 2.5 5.0 7.5 10

SCALE:- 1:200

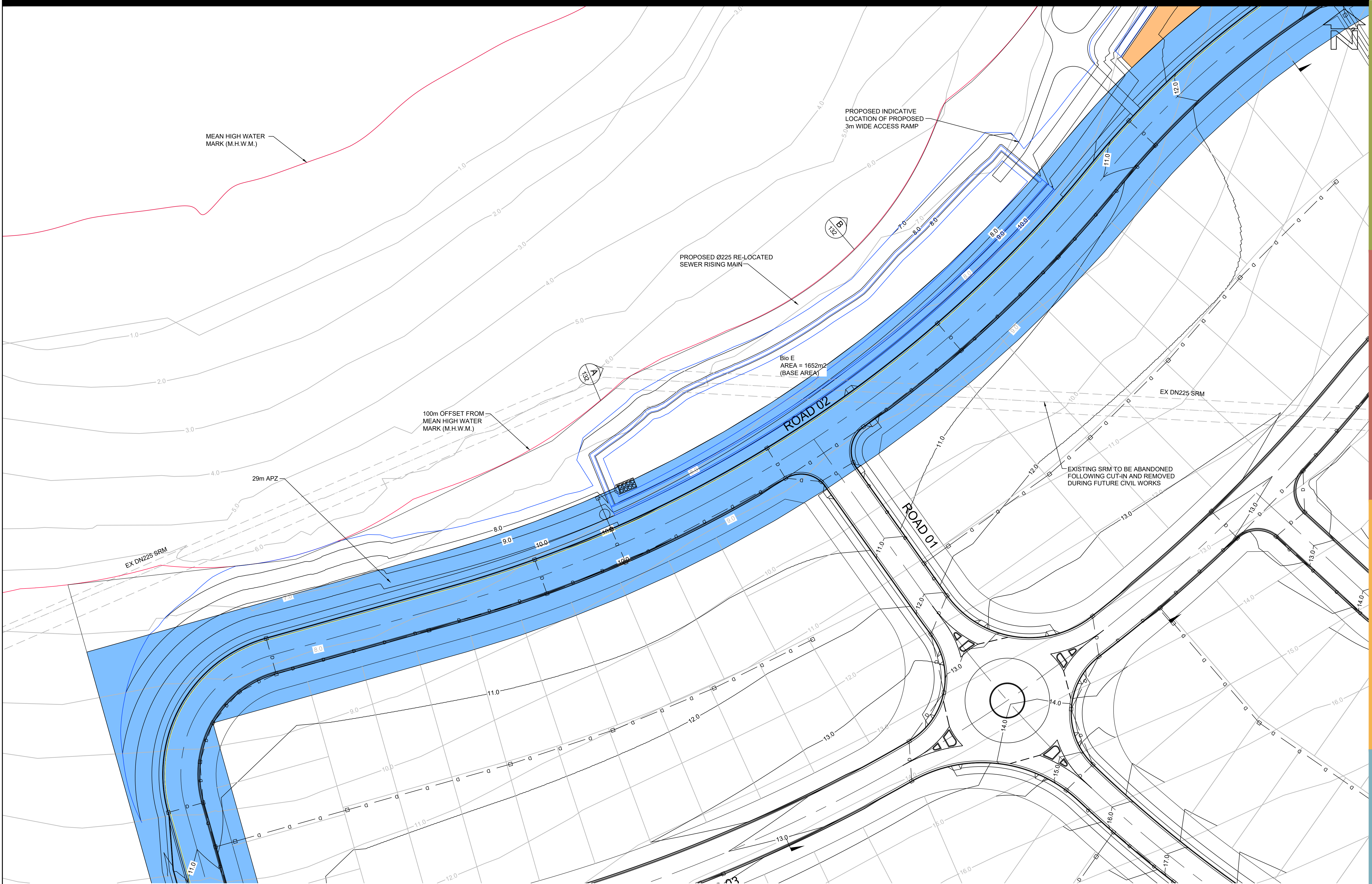
SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH

ALLEN PRICE PTY LTD
Nowra Office • 75 Plunkett St, Nowra NSW 2541
Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533
Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500
(02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au

DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	SHEET
25405-125	26
	ISSUE
	P3

PROFESSIONAL
STANDARDS SCHEME

Liability limited by a
scheme approved
under Professional
Standards Legislation



BEWARE!
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

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Development Consultants

PRELIMINARY BASIN LAYOUT PLAN SHEET 01

WEST CULBURRA MIXED USE DEVELOPMENT

Over Lot 1 DP 1305809

At CULBURRA ROAD, CALBURRA BEACH

For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P4	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024
P5	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025

05102025

SCALE:- 1:500

(AT A1 ORIGINAL)

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION PURPOSES

SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD			
Nowra Office • 75 Plunkett St, Nowra NSW 2541			
Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533			
Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500			
(02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	SHEET
25405-126	27
	ISSUE
	P5

PROFESSIONAL

STANDARDS

SCHEME

Liability limited by a scheme approved under Professional Standards Legislation

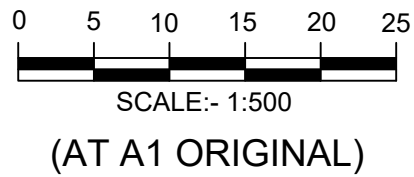
M:\Projects\20000\25000s\25405 Drawings\25405-126-135.dwg

BEWARE!
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

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Development Consultants

PRELIMINARY BASIN LAYOUT PLAN SHEET 02
WEST CULBURRA MIXED USE DEVELOPMENT
Over Lot 1 DP 1305809
At CULBURRA ROAD, CALBURRA BEACH
For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P4 P5	AMENDED FOR MOD LODGEMENT AMENDED FOR MOD LODGEMENT	CJG CJG	12/07/2024 27/05/2025

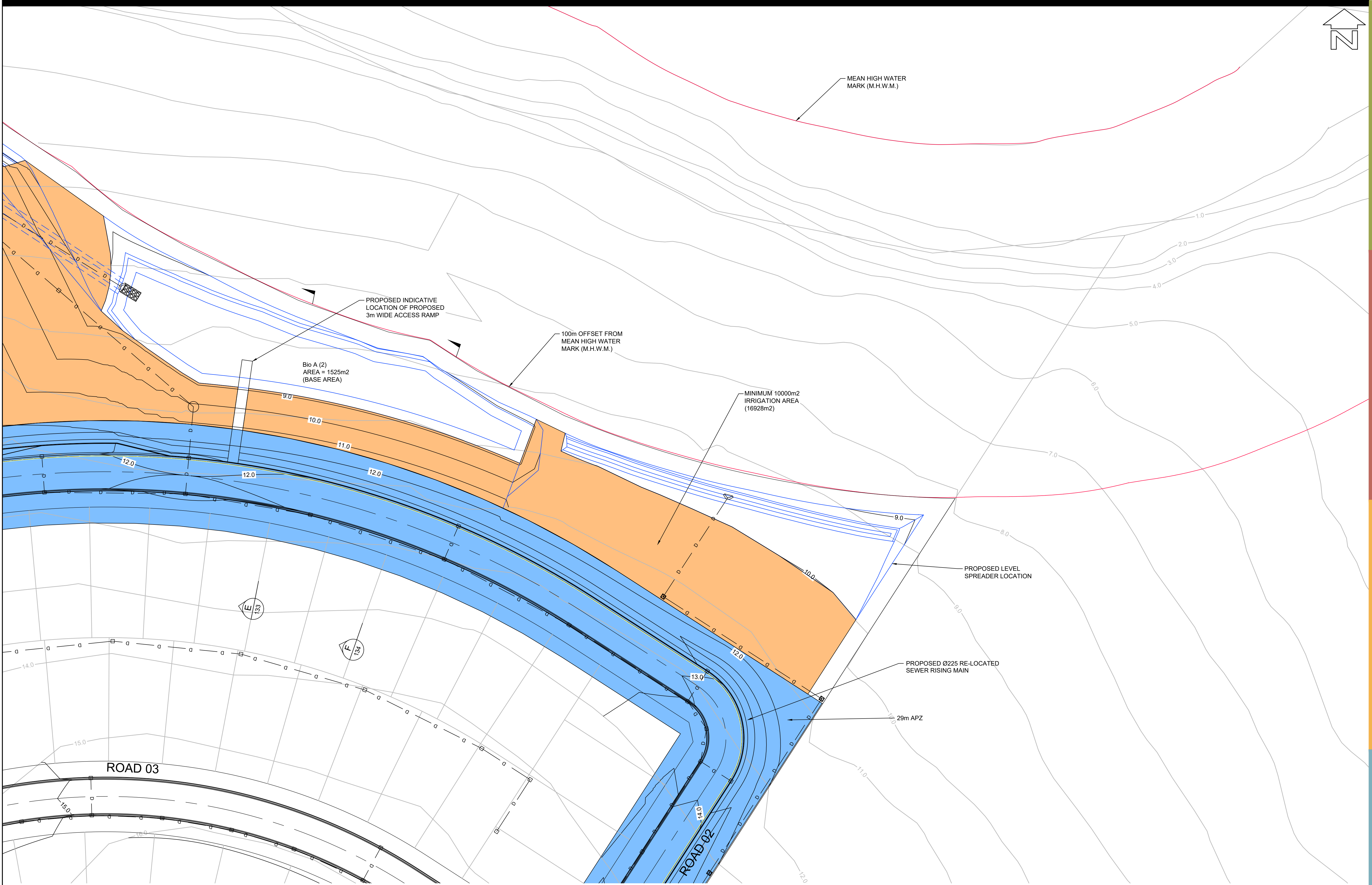


PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kilgarnie Office • 1/28 Bong Bong St, Kilgarnie NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	SHEET
25405-127	28
	ISSUE
	P5

Liability limited by a
scheme approved
under Professional
Standards Legislation



BEWARE!
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

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Development Consultants

PRELIMINARY BASIN LAYOUT PLAN SHEET 03

WEST CULBURRA MIXED USE DEVELOPMENT

Over Lot 1 DP 1305809

At CULBURRA ROAD, CALBURRA BEACH

For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P4 P5	AMENDED FOR MOD LODGEMENT AMENDED FOR MOD LODGEMENT	CJG CJG	12/07/2024 27/05/2025

05102025

SCALE:- 1:500

(AT A1 ORIGINAL)

PRELIMINARY

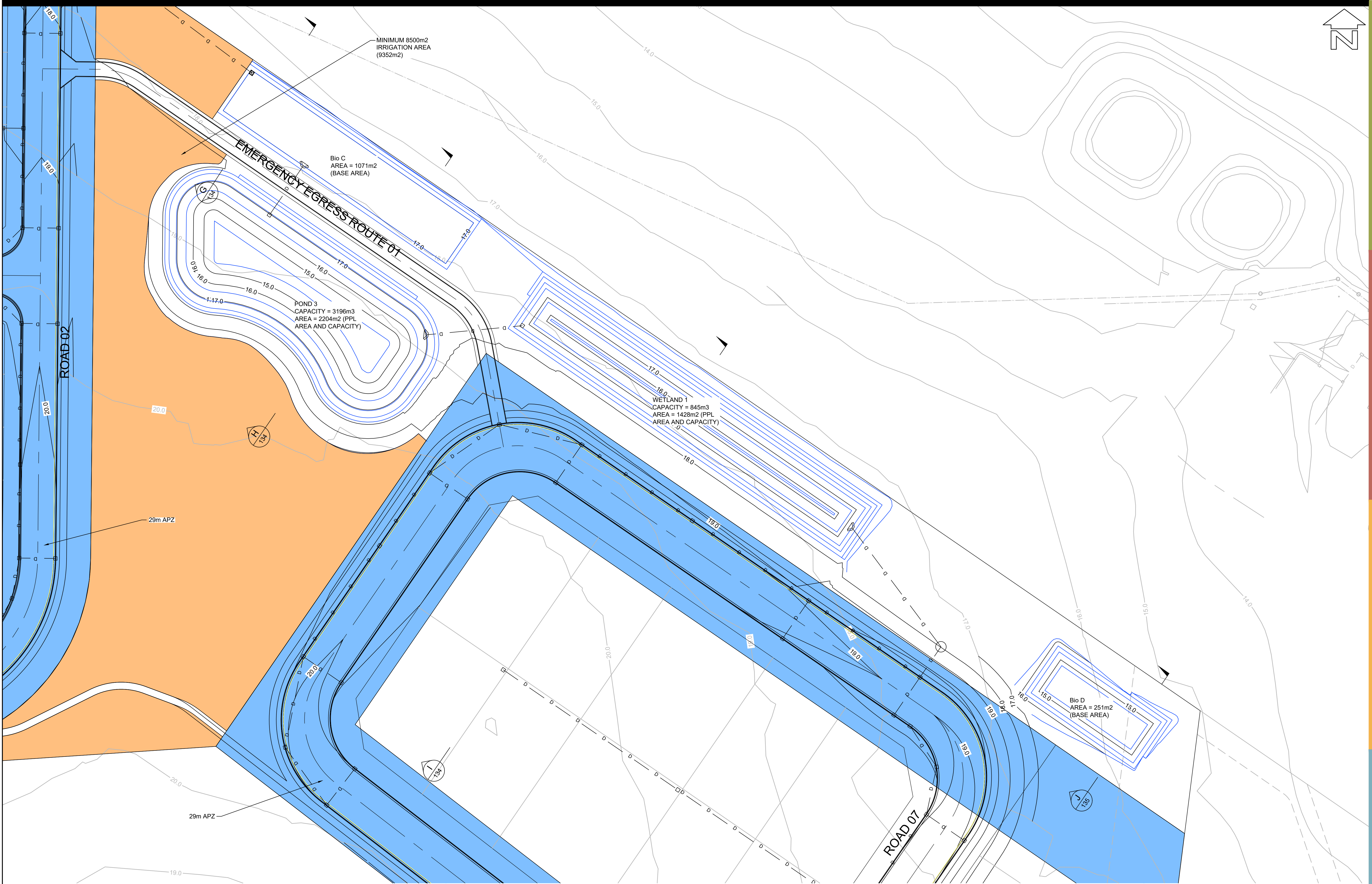
NOT TO BE USED FOR CONSTRUCTION PURPOSES

SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kilnara Office • 1/28 Bong Bong St, Kilnara NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	SHEET
25405-128	29
	ISSUE
	P5

PROFESSIONAL
STANDARDS SCHEME

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under Professional
Standards Legislation



BEWARE!
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

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PRELIMINARY BASIN LAYOUT PLAN SHEET 04

WEST CULBURRA MIXED USE DEVELOPMENT

Over Lot 1 DP 1305809

At CULBURRA ROAD, CALBURRA BEACH

For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P4	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024
P5	AMENDED FOR MOD LODGEMENT	CJG	27/05/2025

0525

0

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25

SCALE:- 1:500

(AT A1 ORIGINAL)

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION PURPOSES

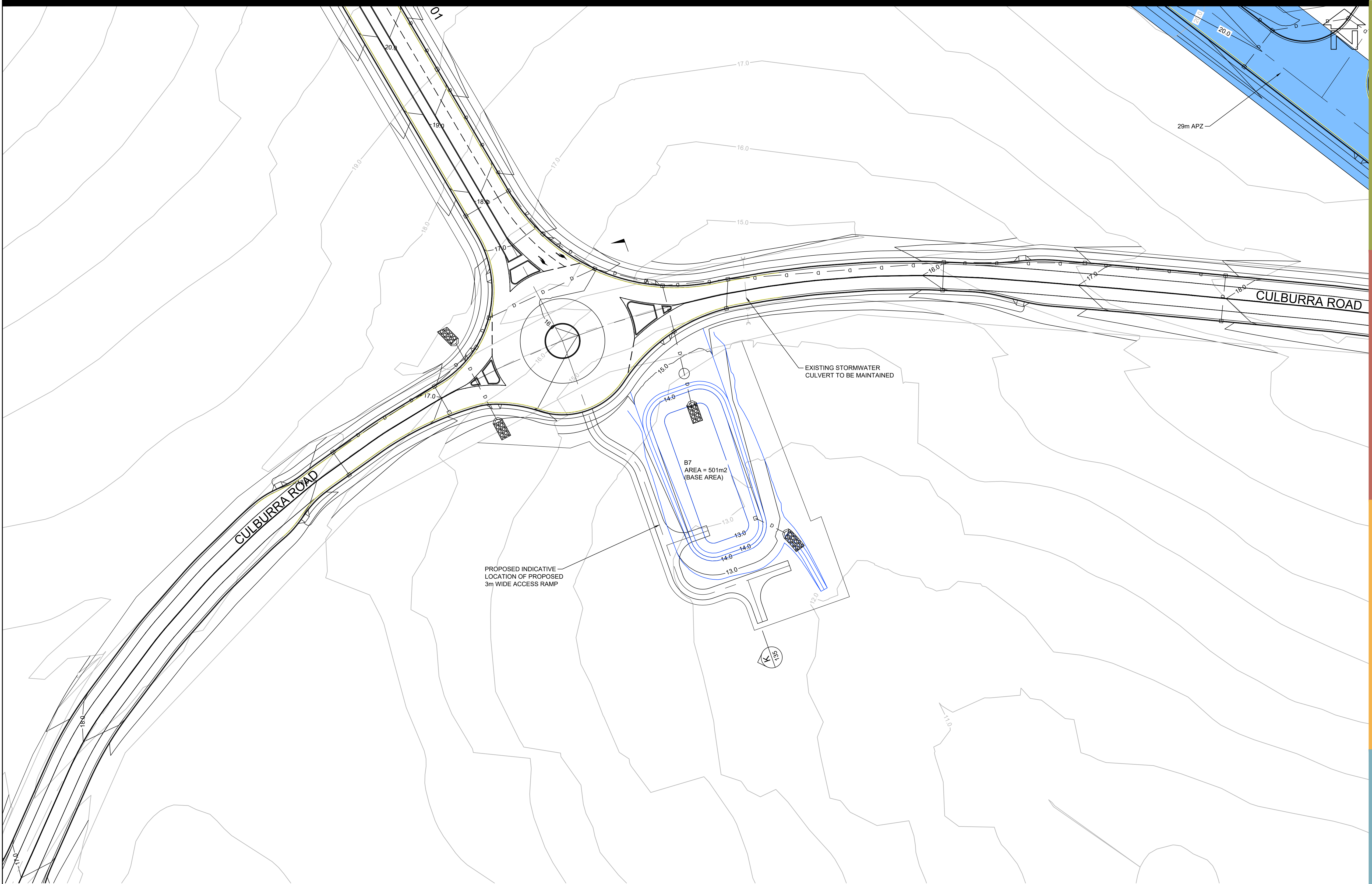
SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD			
Nowra Office • 75 Plunkett St, Nowra NSW 2541			
Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533			
Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500			
(02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	SHEET
25405-129	30
	ISSUE
	P5

PROFESSIONAL

STANDARDS SCHEME

Liability limited by a scheme approved under Professional Standards Legislation



BEWARE!
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

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PRELIMINARY BASIN LAYOUT PLAN SHEET 05

WEST CULBURRA MIXED USE DEVELOPMENT

Over Lot 1 DP 1305809

At CULBURRA ROAD, CALBURRA BEACH

For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P4	AMENDED FOR MOD LODGEMENT	CJG	12/07/2024
P5	AMENDED FOR MOD LODGEMENT	CJG	26/05/2025

05

0

5

10

15

20

25

SCALE:- 1:500

(AT A1 ORIGINAL)

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION PURPOSES

SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH

ALLEN PRICE PTY LTD
Nowra Office • 75 Plunkett St, Nowra NSW 2541
Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533
Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500
(02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au

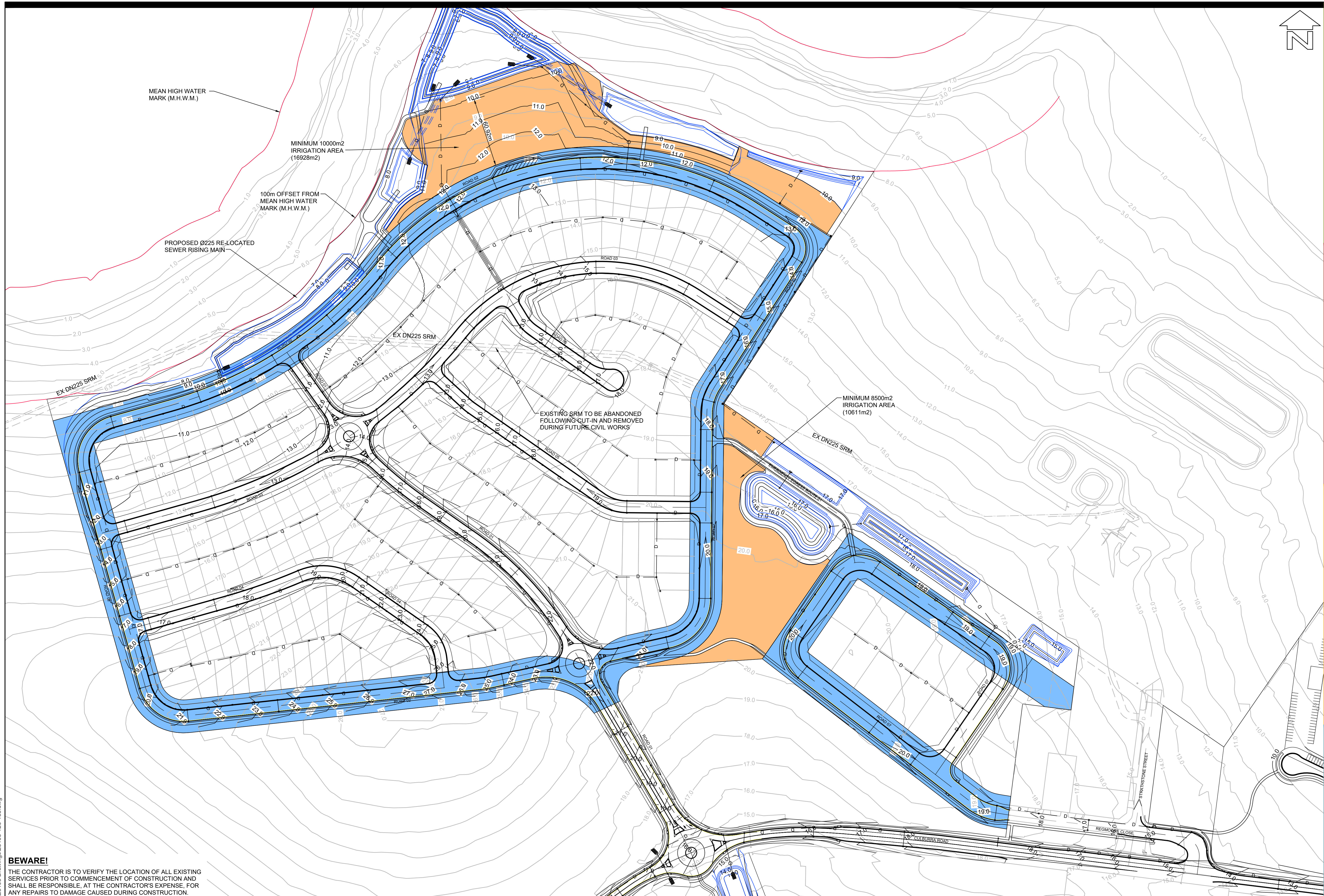
DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM

DATE OF SURVEY
MAY 2025

DRAWING NUMBER
25405-130

SHEET	ISSUE
31	P5

Liability limited by a scheme approved under Professional Standards Legislation



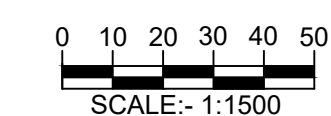
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

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PRELIMINARY OVERALL LAYOUT PLAN
WEST CULBURRA MIXED USE DEVELOPMENT
 Over Lot 1 DP 1305809
 At CULBURRA ROAD, CALBURRA BEACH
 For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P4	AMENDED FOR MOD LODGEMENT	CJG	12/07/2021
P5	AMENDED FOR MOD LODGEMENT	CJG	27/05/2021



(AT A1 ORIGINAL)

PRELIMINARY
TO BE USED FOR CONSTRUCTION PURPOSES

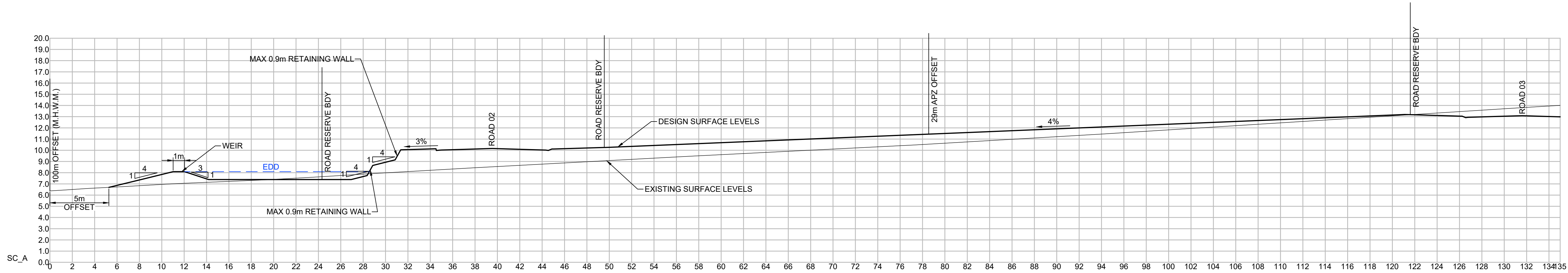
SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD			
Nowra Office • 75 Plunkett St, Nowra NSW 2541			
Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533			
Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500			
(02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

DATUM	AUSTRALIAN HEIGHT DATUM
DATE OF SURVEY	MAY 2025
DRAWING NUMBER	25405-131

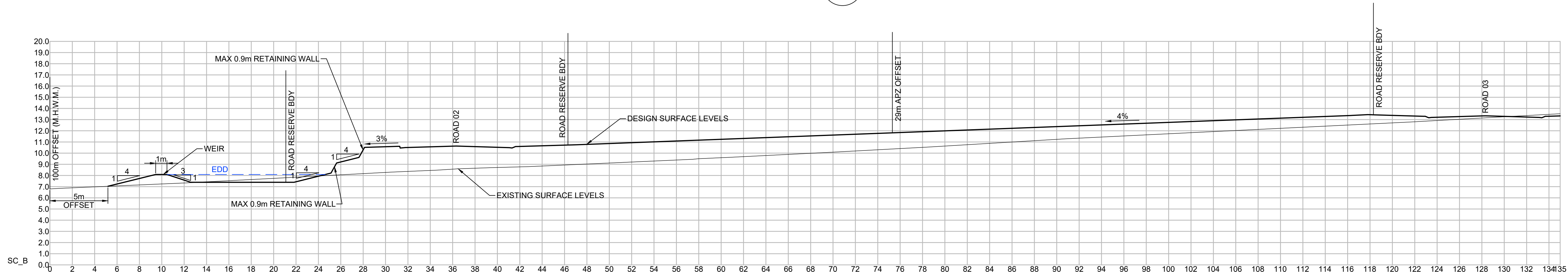
ORIGIN		
SSM		
RL		
SHEET	ISSUE	
32	P5	



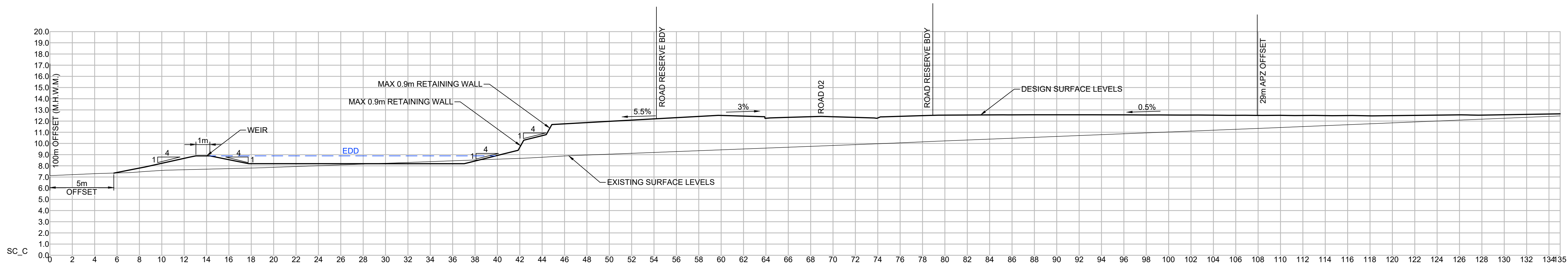
ability limited by a
scheme approved
under Professional
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SECTION A
SCALE 1:200



SECTION B
SCALE 1:200



SECTION C
SCALE 1:200

BEWARE!
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PRELIMINARY CROSS SECTIONS PLAN SHEET 01
WEST CULBURRA MIXED USE DEVELOPMENT
Over Lot 1 DP 1305809
At CULBURRA ROAD, CALBURRA BEACH
For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P4 P5	AMENDED FOR MOD LODGEMENT AMENDED FOR MOD LODGEMENT	CJG CJG	12/07/2024 27/05/2025



PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kilma Office • 1/28 Bong Bong St, Kilma NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	SHEET
25405-132	33
	ISSUE
	P5



M:\Projects\20000\25000s\25405 Drawings\25405-126-135.dwg

BEWARE!

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PRELIMINARY CROSS SECTIONS PLAN SHEET 02
WEST CULBURRA MIXED USE DEVELOPMENT
Over Lot 1 DP 1305809
At CULBURRA ROAD, CALBURRA BEACH
For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P4 P5	AMENDED FOR MOD LODGEMENT AMENDED FOR MOD LODGEMENT	CJG CJG	12/07/2024 27/05/2025



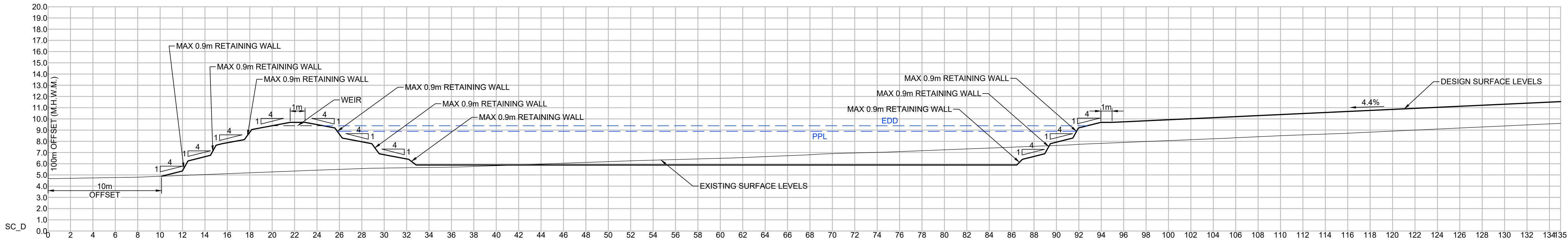
PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiamra Office • 1/28 Bong Bong St, Kiamra NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

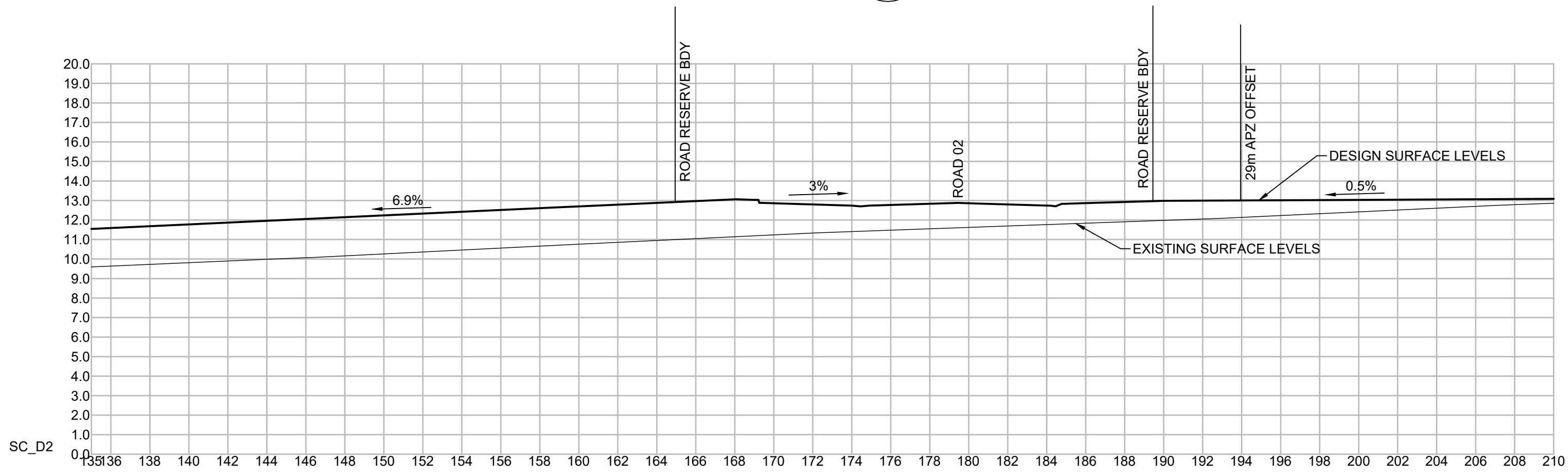
DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	SHEET
25405-133	34
ISSUE	P5



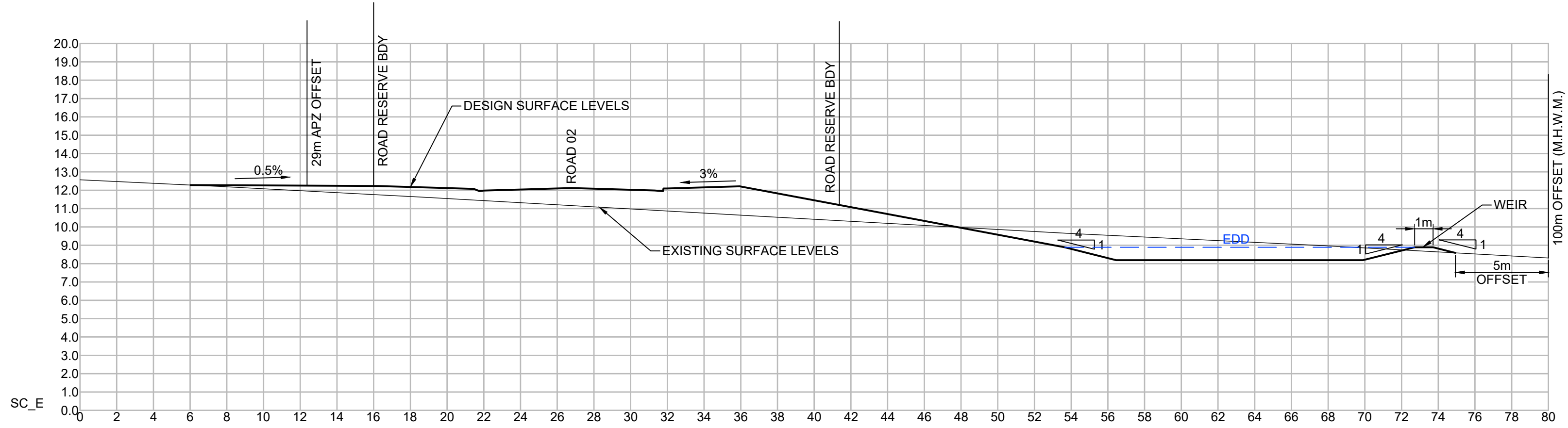
Liability limited by a
scheme approved
under Professional
Standards Legislation



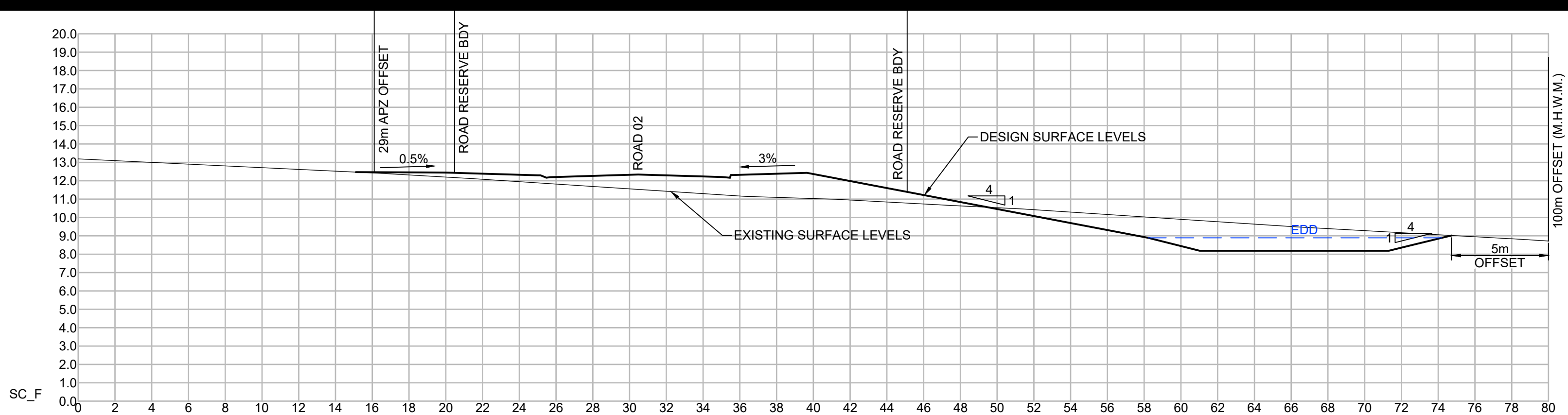
SECTION D
SCALE 1:200
127



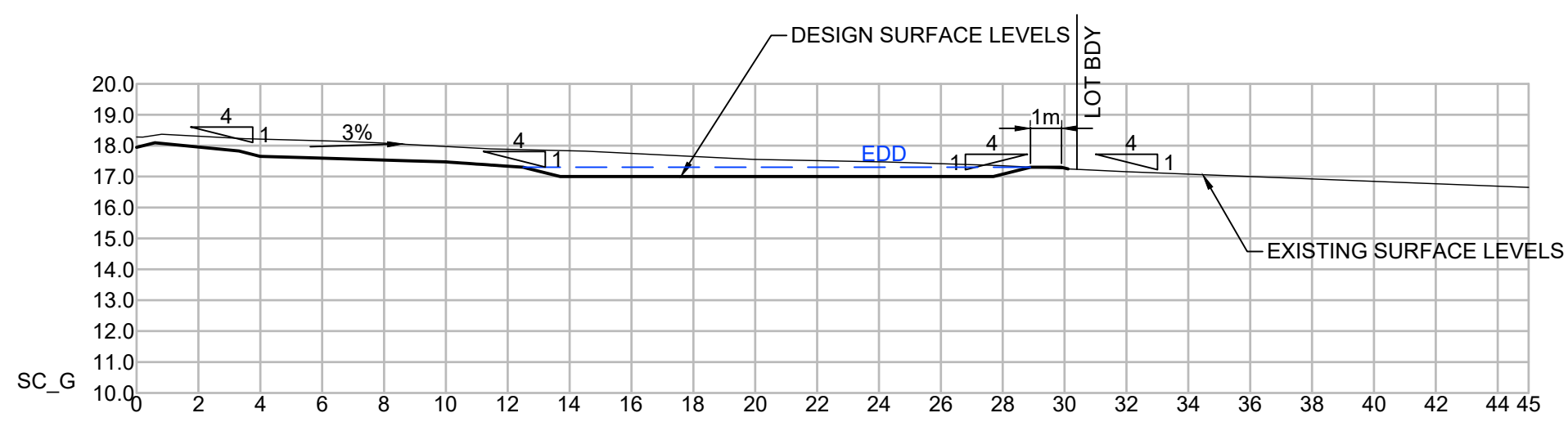
SECTION D
SCALE 1:200
127



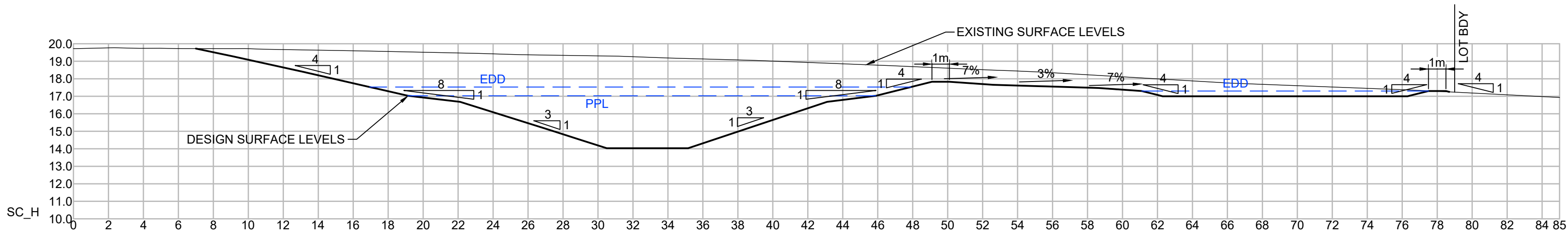
SECTION E
SCALE 1:200
128



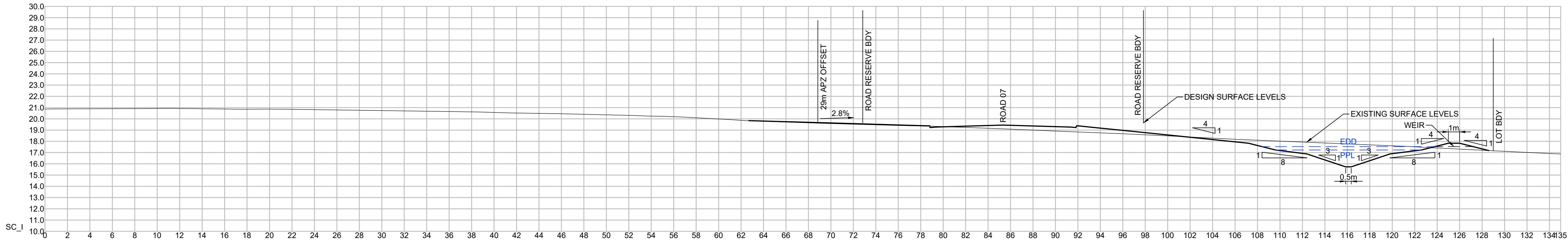
SECTION F
SCALE 1:200



SECTION G
SCALE 1:200



SECTION H
SCALE 1:200



SECTION I
SCALE 1:200

BEWARE!
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PRELIMINARY CROSS SECTIONS PLAN SHEET 03
WEST CULBURRA MIXED USE DEVELOPMENT
Over Lot 1 DP 1305809
At CULBURRA ROAD, CALBURRA BEACH
For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P4 P5	AMENDED FOR MOD LODGEMENT AMENDED FOR MOD LODGEMENT	CJG CJG	12/07/2024 27/05/2025

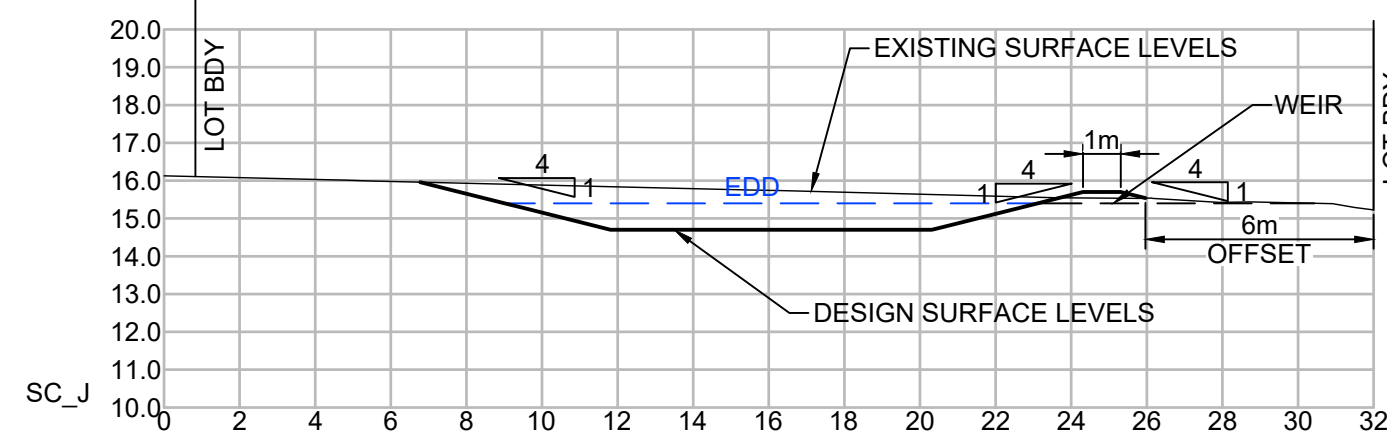


PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

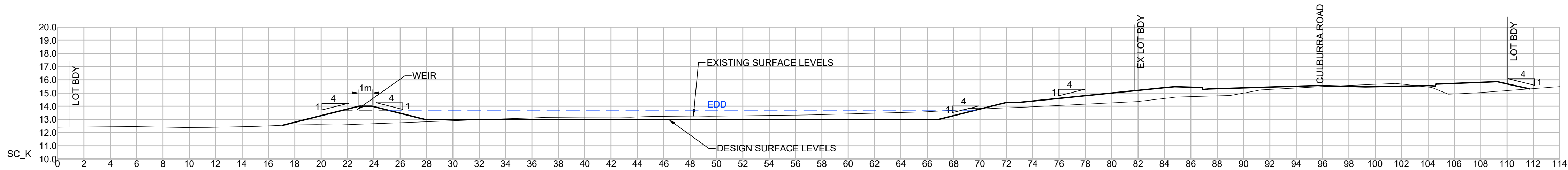
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AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	SHEET
25405-134	35
	ISSUE
	P5

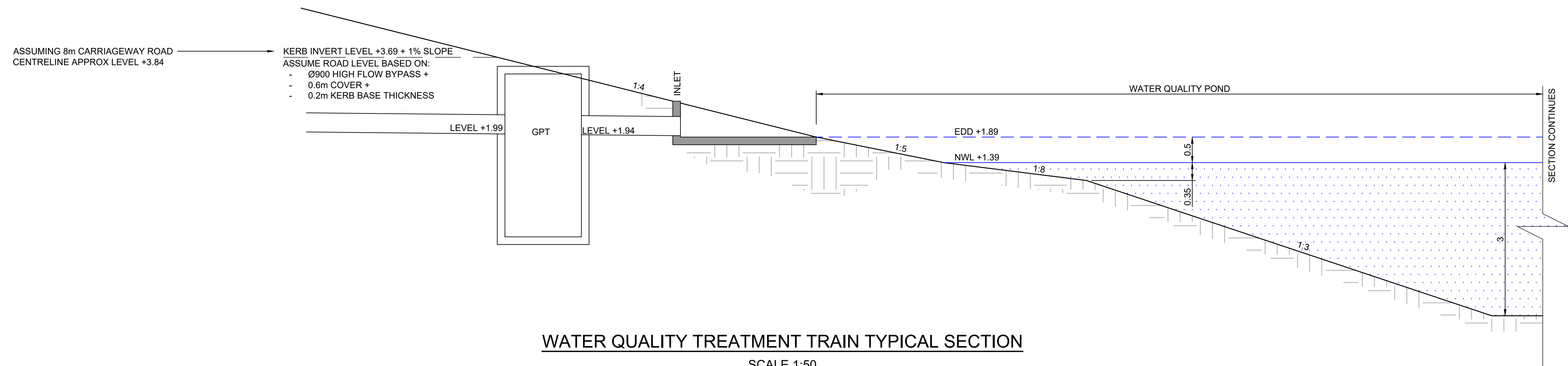




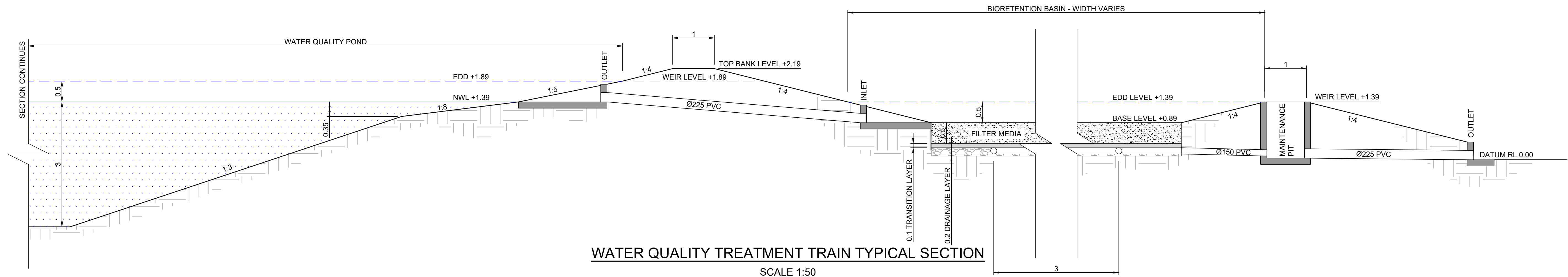
SECTION J
SCALE 1:200 129



SECTION K
SCALE 1:200 130



WATER QUALITY TREATMENT TRAIN TYPICAL SECTION
SCALE 1:50



WATER QUALITY TREATMENT TRAIN TYPICAL SECTION
SCALE 1:50

BEWARE!
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

AllenPrice
Development Consultants

PRELIMINARY CROSS SECTIONS PLAN SHEET 04
WEST CULBURRA MIXED USE DEVELOPMENT
Over Lot 1 DP 1305809
At CULBURRA ROAD, CALBURRA BEACH
For SEALARK PTY LTD

ISSUE	DESCRIPTION	BY	DATE
P4 P5	AMENDED FOR MOD LODGEMENT AMENDED FOR MOD LODGEMENT	CJG CJG	12/07/2024 27/05/2025



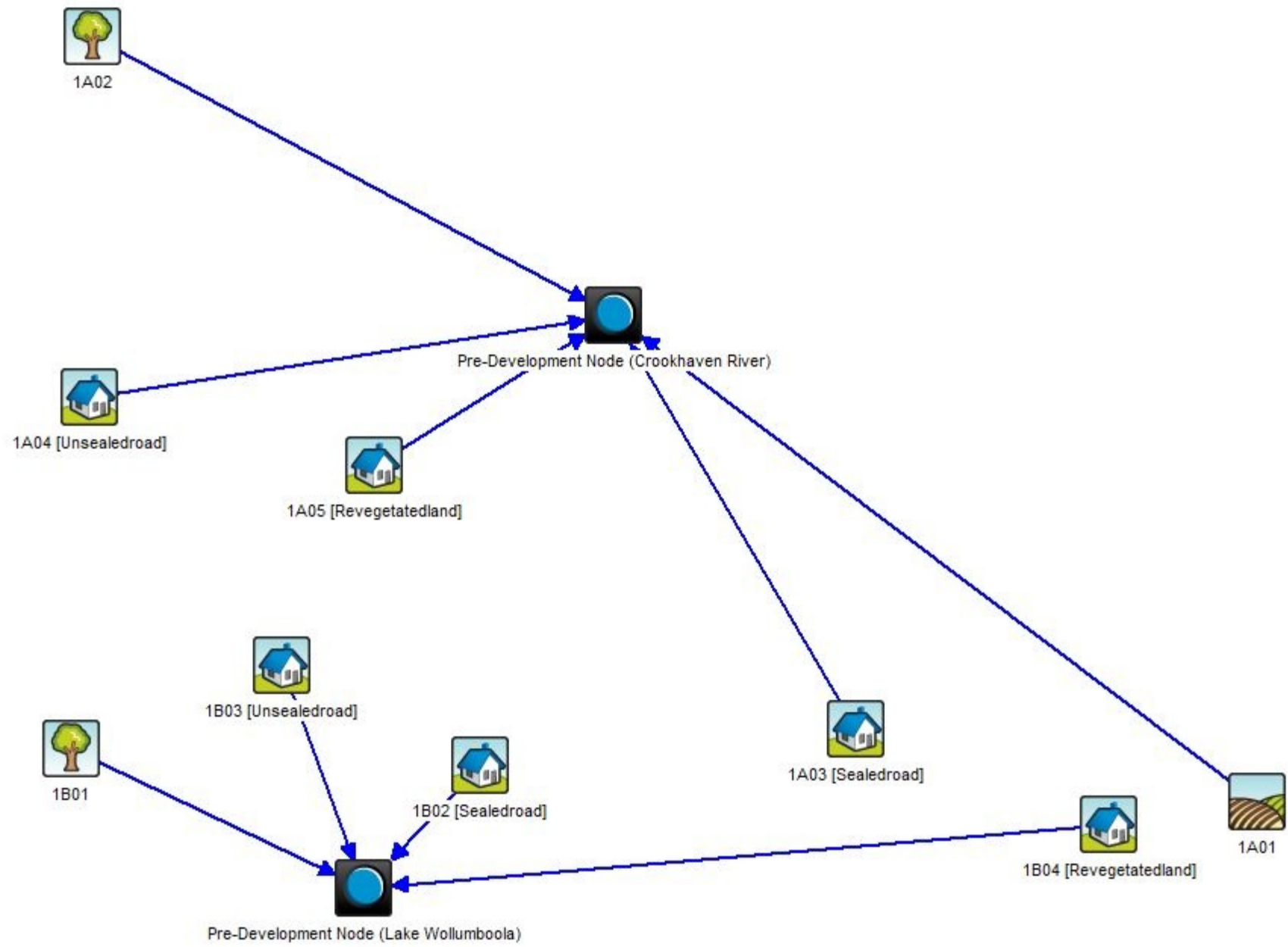
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NOT TO BE USED FOR CONSTRUCTION PURPOSES

SURVEY	DESIGN	DRAWN	CHECK'D
AP	CJG	CJG	RMH
ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au			

DATUM	ORIGIN
AUSTRALIAN HEIGHT DATUM	SSM
DATE OF SURVEY	RL
MAY 2025	
DRAWING NUMBER	SHEET
25405-135	36
	ISSUE
	P5

Liability limited by a
scheme approved
under Professional
Standards Legislation

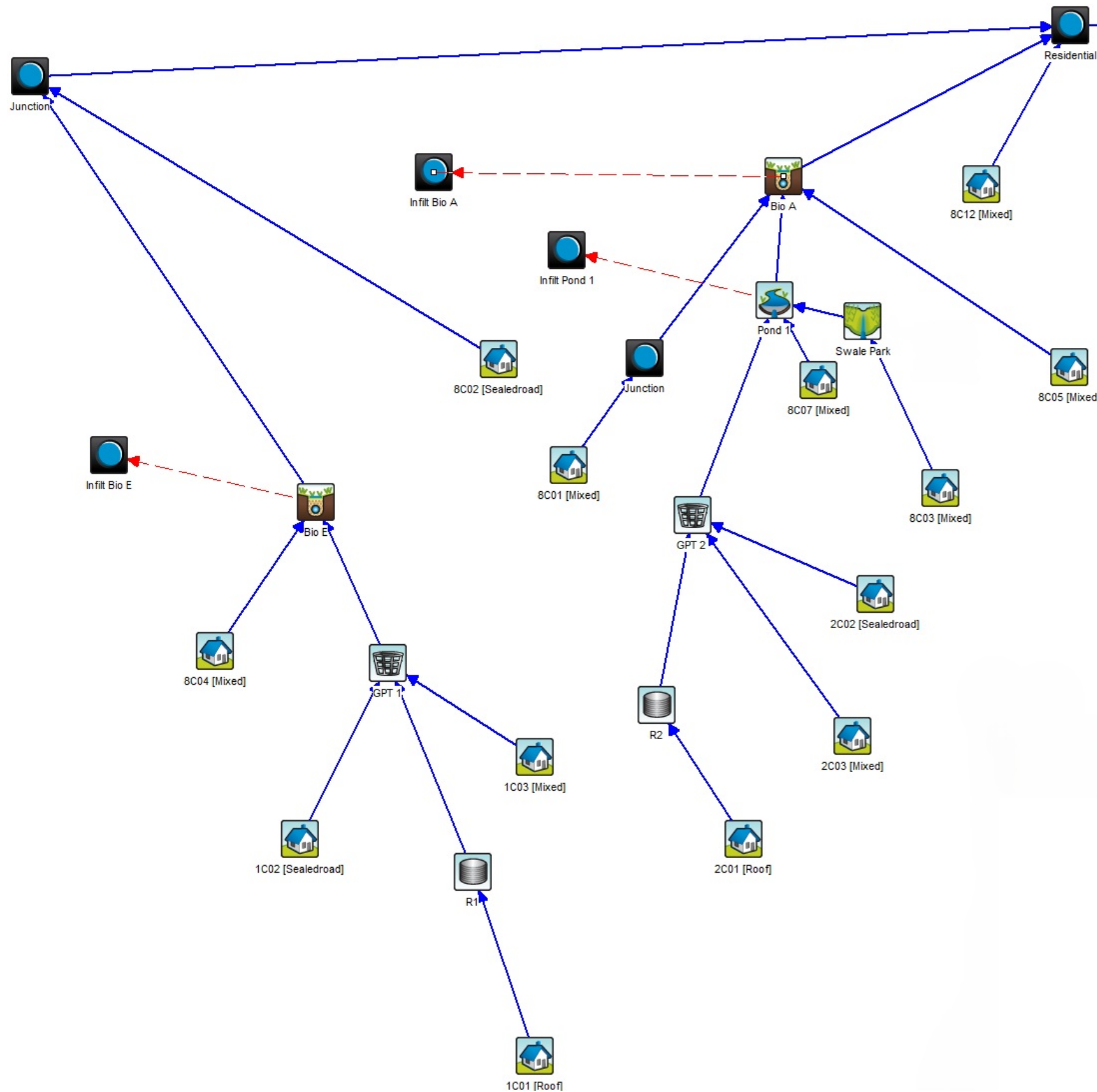
Appendix C Maps



Notes:
- Music Model Reference: P2209097MUS04V32.

Map Title / Figure:
Pre Development MUSIC Model Layout

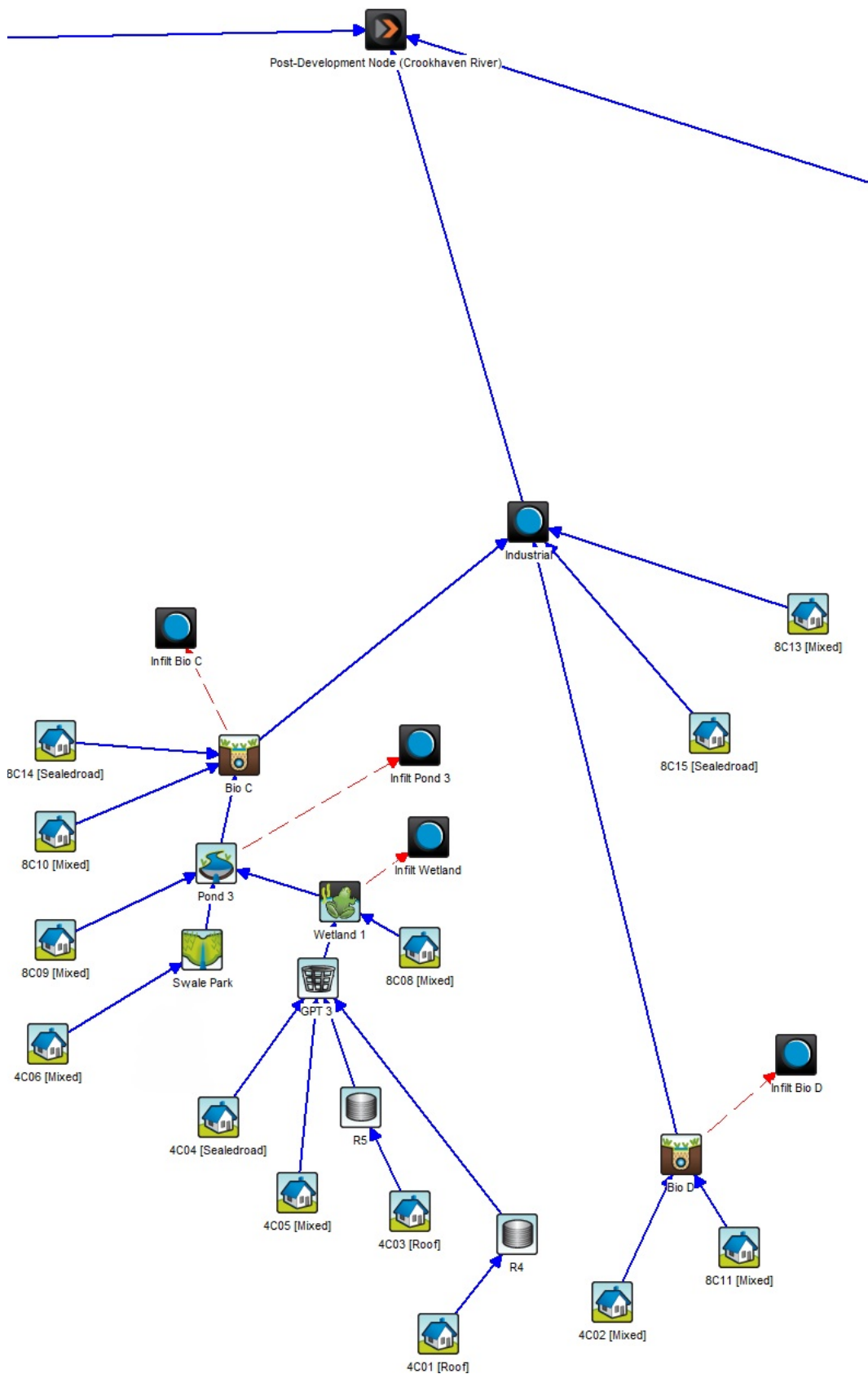
Viewport



Notes:
- Music Model Reference: P2209097MUS04V32.

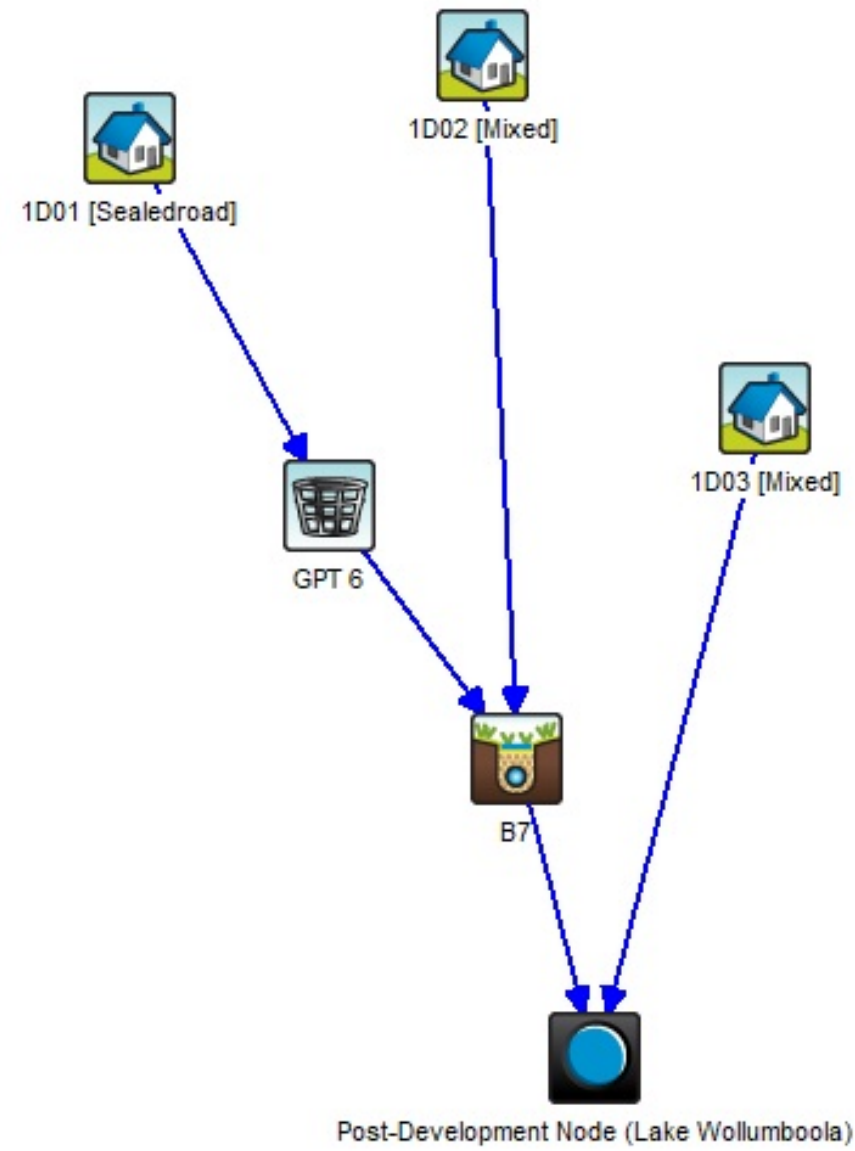
Post Development MUSIC Model Layout (Residential Precinct to Crookhaven River)

Viewport



Notes:
- Music Model Reference: P2209097MUS04V32.

Post Development MUSIC Model Layout
(Industrial Precinct to Crookhaven River)



Notes:
- Music Model Reference: P2209097MUS04V32.

Map Title / Figure:
**Post Development MUSIC Model Layout
(Road Catchment to Lake Wollumboola)**

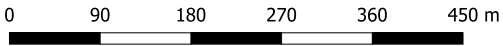
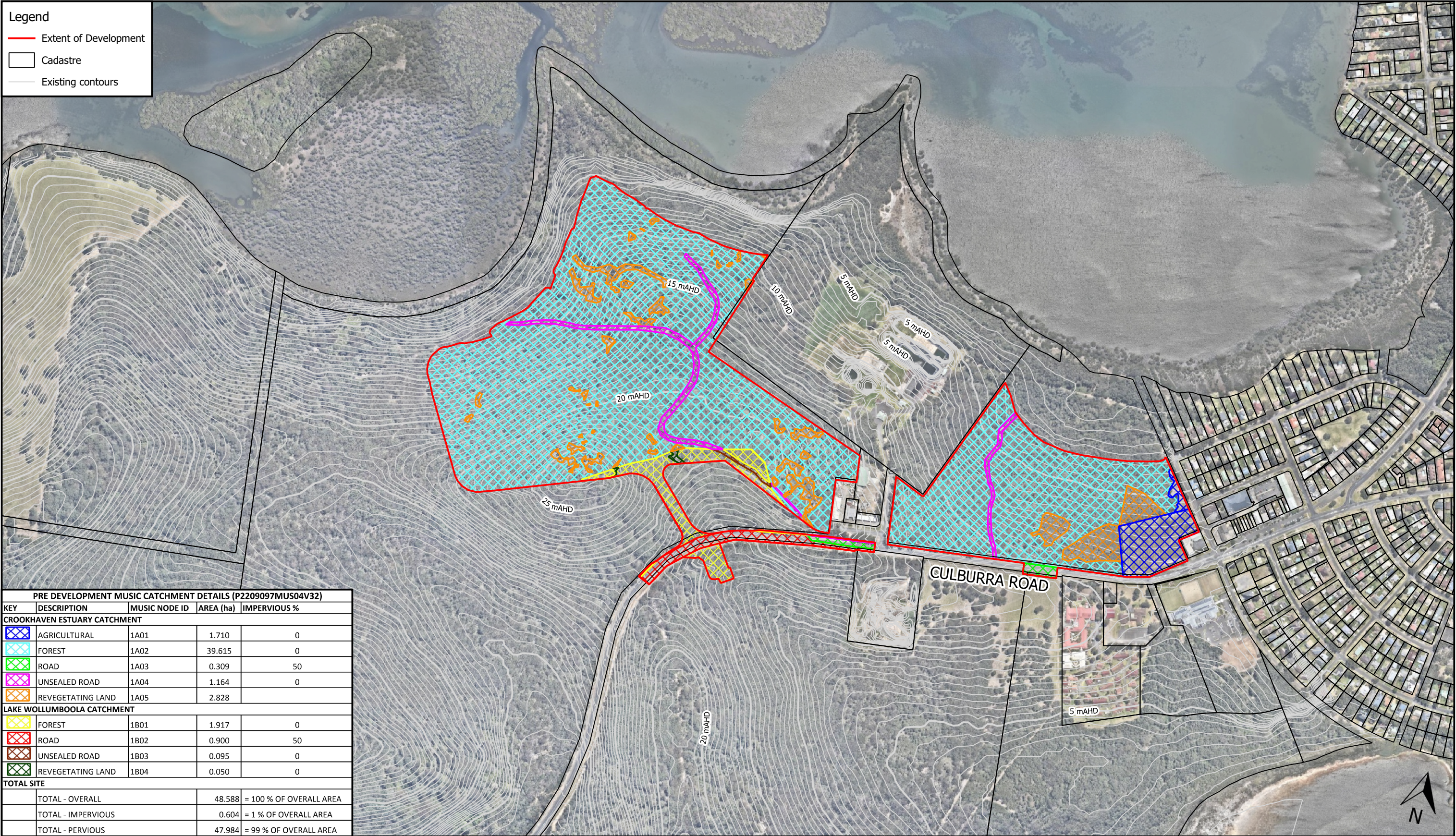
Viewport

Legend

Extent of Development

Cadastre

Existing contours



1:7500 @ A3
Viewport

Notes:
- Aerial from Nearmap (2019).
- Cadastre from NSW Clip and Ship (2023).
- Existing contours from Allen Price & Scarrats Pty Ltd.
- Pre development catchments were delineated based on existing landuse.

MUSIC Pre Development Catchments

Legend

Extent of Development

Proposed Layout

Cadastre

Proposed contours

Proposed Drainage

POST DEVELOPMENT MUSIC CATCHMENT DETAILS (P2209097MUS04V32)				
KEY	DESCRIPTION	MUSIC NODE ID	AREA (ha)	IMPERVIOUS %
CROOKHAVEN ESTUARY CATCHMENT				
	C1 ROOF TO BIO E	1C01	2.595	100
	C1 ROAD TO BIO E	1C02	3.260	64
	C1 REMAINING TO BIO E	1C03	3.172	5
	C2 ROOF TO POND 1	2C01	3.979	100
	C2 ROAD TO POND 1	2C02	4.540	65
	C2 REMAINING TO POND 1	2C03	4.864	5
	C4 ROOF TO POND 3	4C01	0.232	100
	C4 REMAINING TO BIO D	4C02	0.232	44
	C4 ROOF TO POND 3	4C03	0.650	100
	C4 ROAD TO POND 3	4C04	1.387	51
	C4 REMAINING TO POND 3	4C05	0.650	44
	C4 PARK TO POND 3	4C06	0.835	0
	C5 ROOF TO POND 2	5C01	0.288	100
	C5 ROAD TO POND 2	5C02	0.170	39
	C5 REMAINING TO POND 2	5C03	0.288	44
	C5 PARK UPPER TO POND 2	5C04	0.530	0
	C5 PARK MIDDLE TO POND 2	5C05	0.240	0
	C5 CARPARK TO POND 2	5C06	0.267	100
	C5 SPORT CLUB TO POND 2	5C07	0.024	100
	C5 PARK LOWER TO POND 2	5C08	2.771	0
	C6 ROOF TO B6	6C01	1.933	100
	C6 REMAINING TO B6	6C02	1.459	16
	C6 ROOF TO B6	6C03	0.584	100
	C6 REMAINING TO B6	6C04	0.389	16
	C6 ROOF TO B6	6C05	0.967	100
	C6 ROAD TO B6	6C06	2.533	39
	C6 REMAINING TO B6	6C07	0.730	20
	C8 BIO A1 FOOTPRINT	8C01	0.218	0
	C8 ACCESS ROAD	8C02	0.060	100
	C8 PARK A	8C03	0.825	0
	C8 BIO E FOOTPRINT	8C04	0.312	0
	C8 BIO A2 FOOTPRINT	8C05	0.474	0
	C8 POND 2 & BIO B FOOTPRINT	8C06	1.049	0
	C8 POND 1 FOOTPRINT	8C07	0.684	0
	C8 WETLAND FOOTPRINT	8C08	0.371	0
	C8 POND 3 FOOTPRINT	8C09	0.432	0
	C8 BIO C FOOTPRINT	8C10	0.216	0
	C8 BIO D FOOTPRINT	8C11	0.150	0
	C8 BYPASS RESIDENTIAL	8C12	1.396	0
	C8 BYPASS INDUSTRIAL	8C13	0.427	0
	C8 EMERGENCY ROAD TO BIO C	8C14	0.100	70
	C8 EMERGENCY ROAD BYPASS	8C15	0.021	100
	C8 ROAD TO POND 2	8C16	0.412	67
LAKE WOLLUMBOOLA CATCHMENT				
	D1 ROAD	1D01	1.176	82
	D1 BIO	1D02	0.142	0
	D1 BYPASS	1D03	0.557	10
TOTAL SITE				
TOTAL - OVERALL			48.589	= 100 % OF OVERALL AREA
TOTAL - IMPERVIOUS			21.120	= 43 % OF OVERALL AREA
TOTAL - PERVIOUS			27.470	= 57 % OF OVERALL AREA

090180270360450 m

1:7500 @ A3

Viewport

- Notes:
- Cadastre from NSW Clip and Ship (2023).

- Proposed contours from Allen Price & Scarrats Pty Ltd.

- Post development catchments delineated based on proposed land uses and proposed concept layout.

- Proposed concept layout and drainage network provided by Allen Price & Scarrats Pty Ltd.

- Post development catchments delineated based on proposed land uses and proposed concept layout.

- All lots have been split into 'roof', 'road' and 'remaining'.

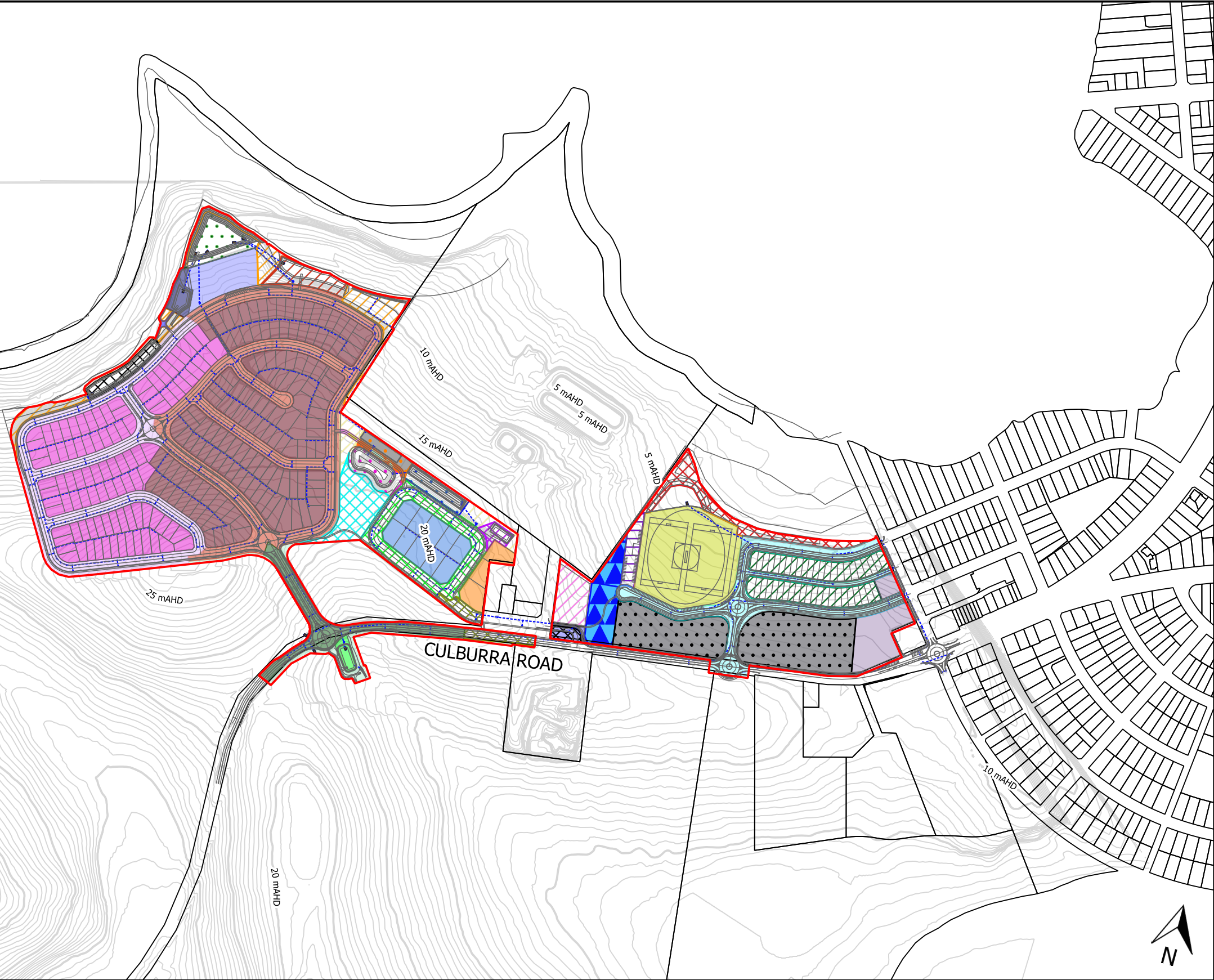
- Assumed roof area for residential lots = 45% of the lot area.

- Assumed roof area for medium density lot/integrated housing lot = 57% of the lot area.

- Assumed roof area for mixed use residential/commercial lot = 60% of the lot area.

- Assumed roof area for industrial lot = 50% of the lot area.

- Assumed each lot has a driveway of 3 x 6 = 18 m²



Map Title / Figure:

MUSIC Post Development Catchments

Map 08

Culburra Road, West Culburra, NSW

Proposed Mixed Use Subdivision

Integrated Water Cycle Management Strategy (MOD 1)

Sealark Pty Ltd

30/06/2025

Map

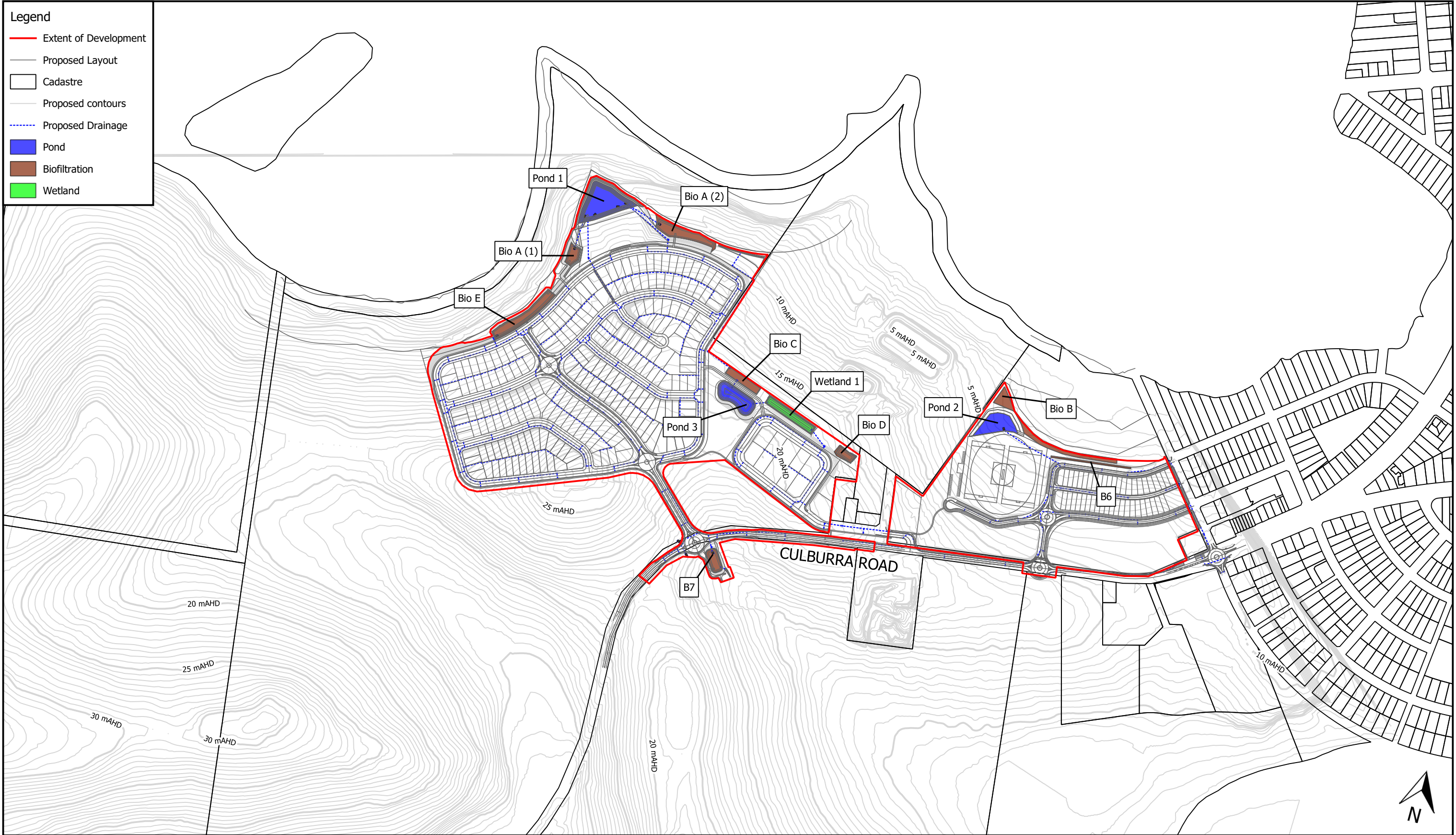
Site

Project

Sub-Project

Client

Date



0 90 180 270 360 450 m

1:7500 @ A3

Viewport

Notes:

- Cadastral from NSW Clip and Ship (2023).
- Proposed contours from Allen Price & Scarratts Pty Ltd.
- Proposed concept layout and drainage network provided by Allen Price & Scarratts Pty Ltd.

Map Title / Figure:

Proposed Water Quality Treatments

Appendix D MUSIC Model Data

Parameter	Description	Input	Reference
Setup	Climate File	Nowra RAN AWS	eWater
Source Nodes	Rainfall Threshold	Based on surface type specified in Table 5-4 of NSW MUSIC Modelling Guidelines	BMT WBM MUSIC Modelling Guidelines (2015)
	Base & Storm flow Parameter	As per Table 5-6 & 5-7 of NSW MUSIC Modelling Guidelines	BMT WBM MUSIC Modelling Guidelines (2015)
	Estimation Method	Stochastically generated	BMT WBM MUSIC Modelling Guidelines (2015)
Rainwater Tanks	Low Flow Bypass	0 m ³ /s	BMT WBM MUSIC Modelling Guidelines (2015)
	High Flow Bypass	0.010 m ³ /s per dwelling	By design
	Volume Below Overflow	5.0 kL per residential lot 15.0 kL per industrial lot	By design
	Surface Area	2.5 m ² per tank for residential lots 7.5 m ² per tank for industrial lots	By design
	Overflow Pipe Diameter	90 mm pipes for each tank	By design
	Internal Reuse	1 ET = 0.265 kL/day/dwelling 1ET for dwellings and units 15 ET/ha for industrial	NSW DWE (2008) Shoalhaven Water (2012)
	External Reuse	55.115 kL/yr/single dwelling and industrial 32.12 kL/yr/multi residential dwelling	BMT WBM MUSIC Modelling Guidelines (2015)
Gross Pollutant Traps	Low Flow Bypass	0 m ³ /s	By design
	High Flow Bypass	1.05 m ³ /s HumeGard (HG24) for GPT 3, 4 and 6 1.91 m ³ /s HumeGard (HG40) for GPT 1, 2 and 5	Designed and specified by Holcim Australia
	Treatment Efficiency	As per manufacturer's specification	Holcim Australia
Biobasins	Low Flow Bypass	0 m ³ /s	BMT WBM MUSIC Modelling Guidelines (2015)
	High Flow Bypass	100 m ³ /s	By design
	Extended Detention Depth	0.30 m for primary, 0.70 m for secondary	By design
	Surface Area	Varies (see Table 10)	By design
	Filter Area	Varies (see Table 10)	By design

Parameter	Description	Input	Reference
	Unlined Filter Media Perimeter	0.01 m	By design
	Saturated Hydraulic Conductivity	100 mm/hr	BMT WBM MUSIC Modelling Guidelines (2015)
	Filter Depth	0.5 m	By design
	TN content of Filter Media	400 mg/kg	BMT WBM MUSIC Modelling Guidelines (2015)
	Orthophosphate Content of Filter Media	40 mg/kg	BMT WBM MUSIC Modelling Guidelines (2015)
	Exfiltration Rate	0.5 mm/hr	By design
	Lined Base	Yes for primary, No for secondary	By design
	Vegetation Properties	Vegetated with effective nutrient removal plants	By design
	Overflow Weir Width	Varies (see Table 10)	By design
	Underdrain Present	Varies (see Table 10)	By design
	Submerged Zone with Carbon Present	Varies (see Table 10)	By design
Ponds	Low Flow Bypass	0 m ³ /s	BMT WBM MUSIC Modelling Guidelines (2015)
	High Flow Bypass	100 m ³ /s	Set to ensure all flows drain to ponds
	Surface Area	Varies (see Table 11)	By design
	Extended Detention Depth	0.50 m	By design
	Permanent Pool Volume	Varies (see Table 11)	By design
	Initial Volume	0 m ³	By design
	Exfiltration Rate	0.5 mm/hr	Infiltration testing
	Evaporation Loss	75%	By design
	Equivalent Pipe Diameter	Varies (see Table 11)	By design
	Overflow Weir width	3 m	By design
Wetlands	Low Flow Bypass	0 m ³ /s	By design
	High Flow Bypass	100 m ³ /s	By design
	Inlet Pond Volume	0 m ³	By design
	Surface Area	1429 m ²	By design

Parameter	Description	Input	Reference
	Extended Detention Depth	0.30 m	By design
	Permanent Pool Volume	846 m ³	By design
	Initial Volume	846 m ³	By design
	Exfiltration Rate	0.5 mm/hr	By design
	Evaporative Loss as % PET	125	By design
	Equivalent Pipe Diameter	36 mm	By design
	Overflow Weir Width	5.0 m	By design

Table 10: Individual bioretention basin inputs.

Biobasin ID	Surface/Filter Area (m ²)	Overflow Weir Width (m)	Under Drain	Submerged Zone Depth (m)
6	500	5	Yes	0.05
7	507	5	Yes	0
A	2,028	300	Yes	0
B	3,000	300	Yes	0.1
C	1,071	5	Yes	0.05
D	251	5	No	0.05
E	1,652	150	Yes	0

Table 11: Individual Pond inputs.

Pond ID	Surface Area (m ²)	Equivalent Pipe Diameter (mm)	Permanent Pool Volume (m ³)
1	4,379	225	11,013
2	2,500	180	7,500
3	2,204	120	3,196