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Stockland Aura South Early Release Area

ENGINEERING SERVICES REPORT



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EXECUTIVE SUMMARY

The Engineering Services Report (ESR) has been prepared by KN Group Pty Ltd (KNg) on behalf of Stockland Development Pty Ltd to support the Development Application for the Aura South Early Release Area (ERA) at Bells Creek Road, Coochin Creek. The application seeks approval for Reconfiguring a Lot, Operational Works and a Material Change of Use in accordance with a Plan of Development. The ERA represents the first stage of the broader Aura South development, which encompasses approximately 88 hectares across Lot 1 on SP332399 and Lot 2 on SP357748 (the site) within the Halls Creek Priority Development Area (PDA) (refer Figure 1). This report presents the engineering servicing and infrastructure strategy for the ERA, demonstrating that the proposed development is supported by a practical and scalable servicing framework that enables staged delivery while aligning with existing and planned infrastructure across the wider Aura and future Aura South communities.

As the first neighbourhood within Aura South, the ERA is proposed to deliver a maximum yield of 1,051 dwellings together with a neighbourhood centre, enterprise and employment land, district sports and recreation facilities, open space and supporting infrastructure. It has been determined that the ERA can be serviced immediately by efficiently extending and augmenting existing Aura infrastructure rather than requiring substantial standalone infrastructure investment prior to development.

Key engineering servicing outcomes are summarised as follows:

- **Bulk Earthworks:** A concept earthworks strategy has been developed that responds to the site's natural topography. The strategy minimises bulk earthworks and supports an overall cut and fill balance across the development, with borrow locations within the PDA but external to the ERA boundary. The ERA footprint is outside identified flood, coastal and acid sulfate hazard overlays, allowing development platforms to be established using conventional earthworks methods with limited filling requirements.

- **Transport:** Access to the ERA will be provided from the Bells Creek Arterial Road (BCA) along the north-western boundary. Primary ingress and egress will be provided via the Phase 1 interim intersection located at the north-eastern ERA boundary. A secondary emergency access connection is proposed at the north-western ERA boundary to provide network redundancy and facilitate emergency and service vehicle access when required.

- **Water Supply:** To service the ERA (3,048 EP), a staged water servicing strategy has been developed that initially utilises available capacity within the existing Aura–Caloundra South water supply network via an ID 513 mm trunk main connecting to dual ID450 crossings beneath Bells Creek Arterial Road. This interim arrangement allows Aura South to utilise available network capacity until approximately 10,778 EP is developed within Aura South, at which point a dedicated 12.6 ML reservoir and independent ID650 minimum trunk water main will be commissioned to support the ultimate development of the Halls Creek PDA.

- **Sewerage:** For the initial stages of development, a gravity sewerage system is proposed that discharges directly to the existing Aura sewerage network via the DN750 GRP trunk sewer, avoiding the need to commission the Aura South Sewer Pump Station (SPS) during the initial stages of development, which includes the ERA (3,048 EP). As Aura South expands beyond the ERA and northern gravity catchment (approximately 5,000 EP), wastewater will transition to a staged gravity and pump station network centred on a single Aura South SPS, ultimately conveying flows through the existing Aura sewerage system to the Kawana Sewage Treatment Plant.

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- **Stormwater Management:** Stormwater management will be achieved through an integrated system comprising conventional drainage infrastructure, natural drainage corridors and Water Sensitive Urban Design (WSUD) measures. The proposed strategy seeks to manage overland flow, stormwater quantity and stormwater quality outcomes while supporting the protection of downstream environmental values and Pumicestone Passage catchment hydrology.

- **Electrical and Telecommunications:** All lots within the ERA will be serviced with underground electricity and telecommunications (NBN). Consideration may be given to provision of a higher capacity electrical network to accommodate increased electric vehicle charging demand within residential and town centre areas. Additional works within the Bells Creek Arterial Road corridor, including conduit infrastructure, will support the future extension of electrical and telecommunications networks to the ERA.

The proposed infrastructure framework has been developed in accordance with the objectives of the Halls Creek PDA, supporting coordinated infrastructure delivery, environmental protection, transport connectivity and urban development. Overall, the investigations undertaken to date demonstrate that Aura South ERA can be serviced through a coordinated and staged infrastructure delivery framework that leverages existing and planned regional infrastructure while supporting the long-term development objectives for the site.

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1. INTRODUCTION

The Engineering Services Report (ESR) has been prepared to provide a high-level assessment of the infrastructure and servicing requirements associated with the proposed Aura South Early Release Area (ERA). The report outlines the proposed servicing strategy for key infrastructure networks, including transport, earthworks, stormwater, water, sewerage and utility services. Consideration has also been given to the broader future Aura South development to ensure that servicing strategies are appropriately integrated within the ultimate infrastructure framework. The assessment has been prepared having regard to the requirements of the Halls Creek Development Scheme and the broader planning, environmental and infrastructure framework applicable to the site, and adopts contemporary engineering standards and best-practice principles to inform the future design, staging and delivery of infrastructure for Aura South.

1.1 SITE DESCRIPTION

The proposed Early Release Area (ERA) represents the first stage of development within the Aura South project and the broader Halls Creek PDA. The ERA is approximately 88 hectares and located within Coochin Creek in the Sunshine Coast local government area. The site is situated across Lot 1 on SP332399 and Lot 2 on SP357748. The ERA forms part of the broader Aura South development area and is proposed to deliver the first neighbourhood within the PDA, including residential development, neighbourhood centre facilities, enterprise and employment land, open space, recreation areas and supporting infrastructure.

The broader Aura South site comprises approximately 1,242 hectares and is located immediately south of the established Aura community within the Caloundra South PDA, forming a logical extension of the wider Aura growth corridor. The site is predominantly characterised by cleared rural grazing land, together with environmental corridors, drainage features, farm infrastructure and access tracks associated with historical agricultural activities. The development area is bounded to the north-west by Bells Creek Arterial Road (BCA), which provides the primary connection to the surrounding transport network and broader Sunshine Coast region.

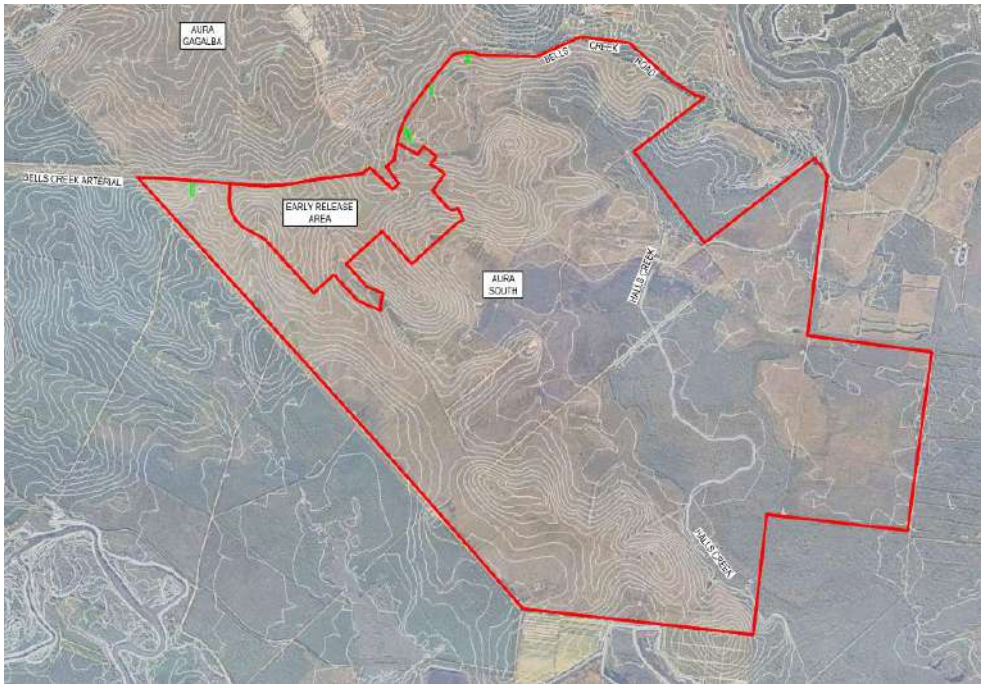


Figure 1. Proposed Development Site

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1.2 EXISTING TOPOGRAPHY

Existing ground levels within the ERA range from approximately RL 22.5 m AHD to RL 7.0 m AHD and generally fall towards the south-east, draining to the Halls Creek catchment which ultimately discharges to Pumicestone Passage via Halls Bay. The majority of the site drains through a series of well-defined gully lines that gradually converge toward the south-east, with a smaller portion of the catchment draining to the south-west towards adjoining land. The general drainage pattern is illustrated in Figure 2, with existing site contours shown on the KNg Existing Contour Layout Plan in Appendix B. The site is characterised by gently undulating terrain, with typical gradients ranging from 0% to 3% and isolated areas approaching 5%. Due to the relatively flat topography, natural drainage is conveyed through existing gully lines and historical drainage channels with limited evidence of erosion associated with high-velocity flows. Broader low-lying areas occur within the southern portions of the site, where natural ground levels generally range between RL 1 m AHD and RL 2 m AHD.

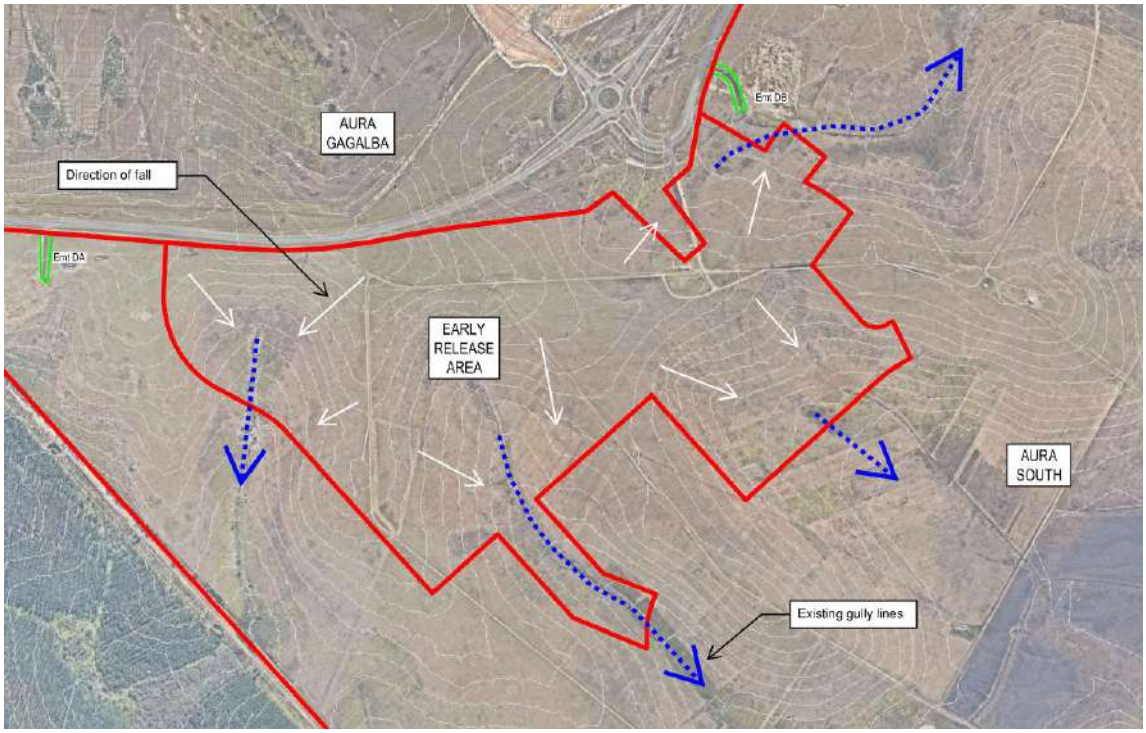


Figure 2. Existing Topography

1.3 PROPOSED DEVELOPMENT

Stockland Development Pty Limited proposes to develop Aura South as a master-planned community within the Halls Creek Priority Development Area (PDA). The proposed Early Release Area (ERA) represents the first stage of development within Aura South. The development has been planned in response to the site's natural topography and environmental characteristics, with low-lying land generally retained for open space, drainage and environmental purposes to maintain natural drainage corridors and landscape features while supporting an integrated framework for future development and infrastructure delivery.

As the first neighbourhood within the PDA, the ERA is proposed to deliver a maximum yield of 1,051 dwellings together with a neighbourhood centre, 5 enterprise and employment lots, the proposed District Sports Park, local parks, open space areas, active transport connections and supporting infrastructure. The adopted development yield and staging strategy form the basis of the engineering servicing demand assessments and infrastructure sizing outlined throughout this report for water, sewerage, stormwater,

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transport and utility services. Figure 3 illustrates the current Aura South ERA Structure Plan, while more detailed development yield breakdowns are provided in the ERA Town Planning Report prepared by Place Design Group.



Figure 3. ERA Plan of Subdivision (Prepared by Place Design Group)

2. EARTHWORKS ASSESSMENT

A bulk earthworks assessment has been undertaken to demonstrate the feasibility of delivering the Aura South Early Release area. The assessment has considered the site's natural topography, proposed land use framework, environmental constraints and servicing requirements to develop a concept grading strategy for the ERA and Balance Lot capable of supporting future development. The ERA concept earthworks and grading strategy is illustrated in Figure 4, with further detail also including the concept Balance Lot strategy provided in Appendices B and C. The earthworks approach seeks to respond to the site's natural landform by minimising disturbance where practicable, reducing overall earthworks volumes and facilitating an appropriate balance between development outcomes, environmental considerations and infrastructure delivery. Management of very flat grades will be a key design constraint in future precincts, however the ERA has suitable natural grades to allow for more conventional road and stormwater design approach.

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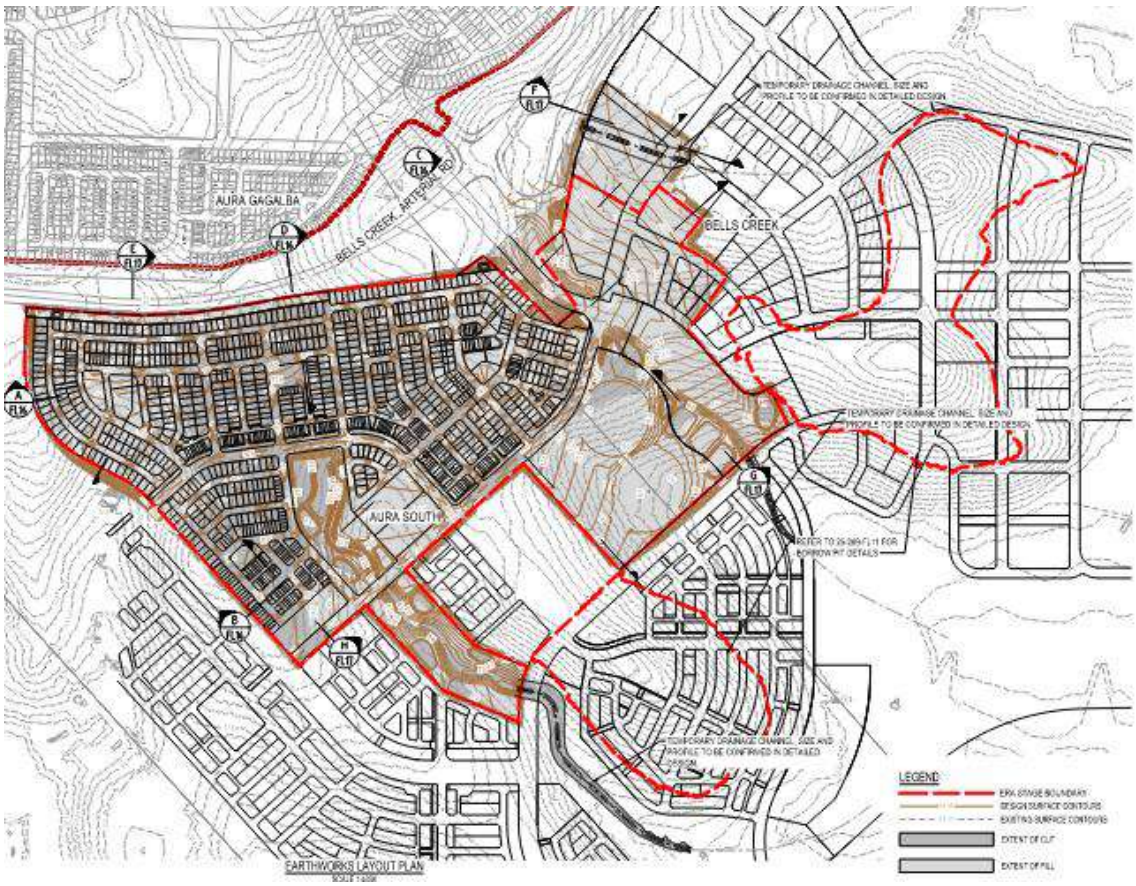


Figure 4. Concept ERA Bulk Earthworks

2.1 EARTHWORKS STRATEGY

The Aura South ERA is characterised by a gently undulating landform, with elevations generally ranging between RL 22.5 m AHD and RL 7.0 m AHD. The bulk earthworks strategy has been developed to facilitate gravity sewer drainage to the existing SPS-LMT119 within the Aura – Caloundra South PDA, while establishing suitable development platforms and maintaining efficient infrastructure servicing outcomes. Bulk earthworks will be required to establish building platforms, road corridors, drainage infrastructure and utility networks throughout the development. The preliminary grading strategy has been designed to support conventional slab-on-ground residential construction, minimise retaining wall requirements and achieve an overall balance between cut and fill volumes. Earthworks will be undertaken in accordance with AS3798-2007 Guidelines on Earthworks for Commercial and Residential Developments and relevant statutory requirements.

Preliminary grading indicates that the development can be delivered using conventional earthworks and infrastructure construction methods. Indicative cut and fill areas are shown on the Concept Bulk Earthworks Plan (Figure 4), with supporting functional plans provided in Appendices B and C. The grading strategy generally follows existing ridgelines and natural drainage patterns, with development concentrated on higher and more gently sloping land. The ERA development footprint is located outside identified flood and coastal hazard overlays, allowing development platforms to be established without the need for flood-related filling. Localised earthworks may nevertheless be required adjacent to drainage corridors and environmental areas to achieve suitable drainage and servicing outcomes.

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Indicative cut and fill volumes and the overall earthworks balance are summarised in Table 2. The current strategy maximises reuse of site-won material and minimises reliance on imported fill where practicable. The ERA is forecast to require a net fill volume, with material sourced from borrow areas within the broader Halls Creek PDA development footprint. This approach assists in achieving ultimate precinct development levels while minimising haulage demands on the external road network. Earthworks quantities will continue to be refined through detailed design and operational works stages, including confirmation of platform levels, batter treatments and road corridor grading.

Table 1. Preliminary Bulk Earthworks Volumes

BULK EARTHWORKS VOLUMES (APPROXIMATE)			
AREA	**CUT (M^3)**	**FILL (M^3)**	**TOTAL IMPORT FROM BORROW (M^3)**
Early Release Area (ERA)	**- 354,170**	**1,240,050**	**885,879**
Borrow Pit 1^	-735,818	TOTAL AVAILABLE IMPORT FROM BORROW LOCATIONS WITHIN BALANCE PDA	1,272,554
Borrow Pit 2^	-536,736		

^*Borrow Pit cut volumes shown are for information only and excluded from balance and total volumes*

2.2 RETAINING STRUCTURES & BOUNDARY INTERFACES

Earthworks will be staged to support orderly development, maintain infrastructure connectivity and provide suitable interfaces with future urban areas, open space and environmental corridors. Final batter treatments, level transitions and interface details will be confirmed during detailed design.

Acoustic treatment will likely be required along the Bells Creek Arterial Road interface along the northern boundary as shown per the Acoustic Impact Assessment prepared by Stantec, included as Attachment 11 of the Town Planning Report. Retaining structures will be provided where required to accommodate level transitions between development platforms, road corridors and adjoining land. The concept grading strategy seeks to minimise retaining wall lengths and heights through alignment with the site's natural terrain, with retaining walls within the ERA generally expected to remain below 1.5 m. Indicative retaining wall locations are shown in Appendix B, with final locations and extents to be confirmed during detailed design. All retaining structures will be designed and certified in accordance with applicable Australian Standards and geotechnical recommendations.

2.3 ACID SULFATE SOIL CONSIDERATIONS

Majority of the ERA is located above RL 5.0 m AHD, reducing the likelihood of encountering Acid Sulfate Soils (ASS). Lower-lying portions of the site may nevertheless contain ASS and will require further investigation as the detailed design progresses. Initial functional earthworks modelling shows some of the lower/downstream sections of the central drainage corridors external the ERA are below RL 5.0 m AHD which is required to support hydraulic functionality of the proposed Green Heart Lake contained within the future balance lot. Preliminary investigations undertaken by Douglas Partners Pty Ltd included as Appendix E indicate a generally low risk of ASS across the developable portions of the site, with soil conditions largely consistent with the site's mapped ASS risk profile. Additional geotechnical assessment, field sampling and laboratory testing will be undertaken as development planning progresses to confirm any treatment requirements and to inform future development staging. If ASS is encountered, management and treatment measures will be implemented in accordance with a project-specific Acid Sulfate Soil Management Plan (ASSMP) prepared for the relevant development stage and consistent with the environmental approval framework for the project and the Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines.

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2.4 EROSION AND SEDIMENT CONTROL

Given the environmental sensitivity of the receiving waterways and surrounding ecological areas, erosion and sediment control (ESC) will form a key component of the earthworks delivery strategy. Construction activities will be staged and managed to minimise erosion, sediment mobilisation and adverse water quality impacts on downstream receiving environments. Standard practice site specific Erosion and Sediment Control Plans (ESCP) will be prepared for the ERA aligning with a Precinct Construction Environment Management Plan (PCEMP) as defined in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) conditions of approval (received 22 May 2026). These plans will be developed in accordance with the *Best Practice Erosion and Sediment Control* (IECA, 2025) and the State Planning Policy (DILGP, 2017). While these documents are closely aligned, the State Planning Policy (DILGP, 2017) provides specific water quality performance criteria that must be achieved by sediment control measures.

During construction, erosion and sediment control measures will be implemented, monitored, and maintained in accordance with the approved ESCPs. A project wide ESC strategy will be established during the detailed design phase to identify project specific risks and ensure that appropriate control measures are designed to mitigate those risks. Bulk earthworks and disturbance areas will generally be staged from the Bells Creek Arterial site access point southward toward downstream protected environmental areas. As development progresses and Water Sensitive Urban Design (WSUD) infrastructure is commissioned, downstream areas will be utilised as treatment buffers to protected areas.

The Principal Contractor will be responsible for undertaking construction activities in a manner that minimises construction-related soil erosion, sediment runoff, and drainage impacts on surrounding sensitive environments and catchments as defined in the PCEMP. These plans will function as live documents, identifying the location, type, and sequencing of ESC measures necessary to manage sediment and erosion risks and maintain compliance.

Erosion control is the primary control measure to limit erosion and sediment mobilisation. Typical best-practice erosion control measures expected to be implemented across the site include:

- Limiting site clearing to areas immediately required prior to commencement of bulk earthworks;
- Stabilising temporary stockpiles, particularly topsoil, which is expected to be stockpiled for extended periods between stripping and respreading;
- Stabilising temporary drainage lines, which present a heightened risk of erosion due to concentrated flows;
- Stabilising steep batters; and
- Promptly respreading topsoil and applying hydromulch or an equivalent erosion control treatment to enable rapid stabilisation and vegetation establishment once final levels are achieved.

Monthly audits undertaken by a Certified Professional in Erosion and Sediment Control (CPESC) will be carried out, supported by a formal corrective action register and real-time monitoring of outlet water quality from all sediment basins. Where practicable, clean water diversion drains will be incorporated to minimise runoff volumes requiring treatment.

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3. TRAFFIC & TRANSPORT

A Transport Impact Assessment has been undertaken by Jalahawi Consulting to demonstrate the feasibility of servicing the ERA, included as Attachment 7 of the Town Planning Report. The transport strategy has been developed generally in accordance with the EDQ Street and Movement Network PDA Guideline to integrate with the existing and planned regional transport network, while providing a connected internal road hierarchy that supports vehicles, active transport, public transport and emergency access. The proposed transport framework responds to the anticipated development yield and staged delivery of infrastructure, while maintaining consistency with the broader Aura – Caloundra South transport network and regional planning objectives. Figure 5 below details the road network layout proposed hierarchies, with further traffic reporting by Jalahawi Consulting.

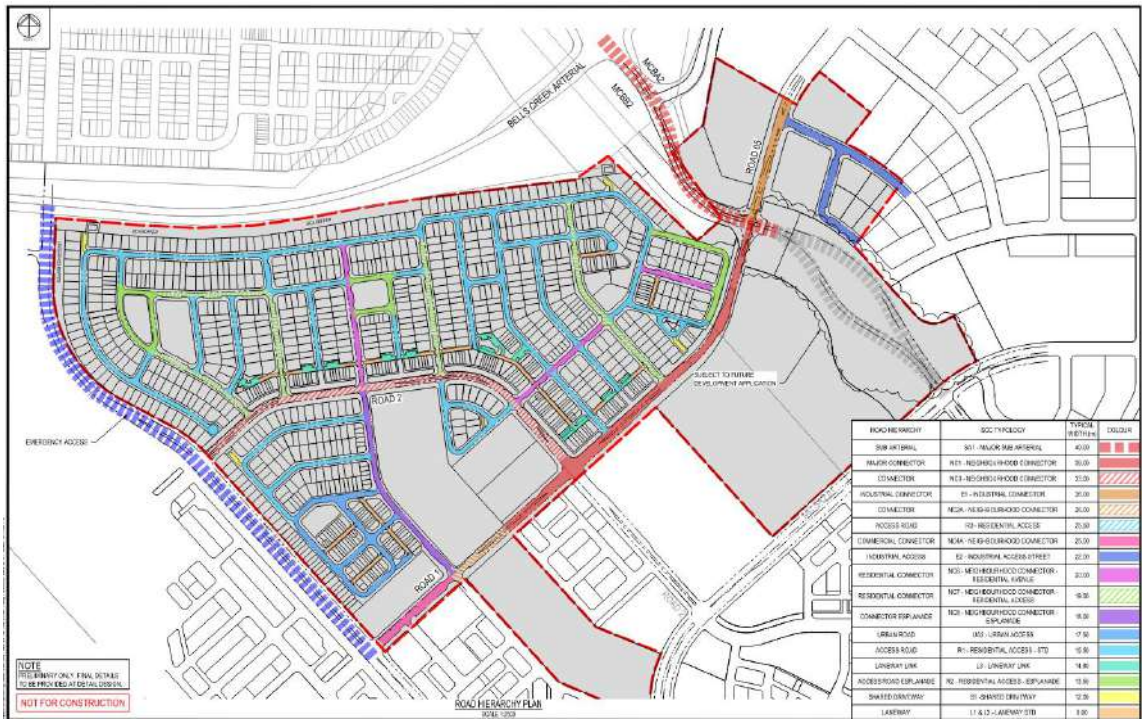


Figure 5. Concept ERA Road Hierarchy

3.1 INTERNAL ROAD HIERARCHY

The proposed ERA internal road network, as shown in Figure 5 , comprises a hierarchy of trunk connector roads, neighbourhood connector roads and local streets designed to provide efficient east-west and north-south connectivity between residential neighbourhoods, centres, community infrastructure and open space areas. The network is centred around a series of trunk connector roads that provide the primary movement corridors through the site, connecting the ERA to the proposed Bells Creek Arterial Road access points and the broader Aura – Caloundra South transport network. The road hierarchy has been developed by Place Design Group generally in accordance with the Economic Development Queensland Street and Movement Network PDA Guideline No. 06 and the IPWEA Street Design Manual: Walkable Neighbourhoods, with road classifications informed by the forecast traffic demands associated with the Aura South development.

The internal road layout has been planned to support staged development while maintaining connectivity for all transport modes. Peak trip generation, network performance, lane requirements, intersection treatments and access arrangements have been assessed by Jalahawi Consulting as part of the Traffic

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Impact Assessment. The assessment confirms that the proposed road network can be delivered using conventional urban road infrastructure, with detailed lane configurations, intersection upgrades and signalisation requirements to be refined through future design stages. Typical road cross-sections and conceptual road hierarchy plans are included in Appendix B.

3.2 EXTERNAL ROAD CONNECTIONS

The primary connection to the regional transport network is provided via Bells Creek Arterial Road (BCA), a state-controlled arterial road that forms part of the broader Sunshine Coast transport network. The proposed access to the ERA will utilise the Bells Creek Arterial Road (BCA) along the north-western boundary. The access strategy proposes two connection points to the Bells Creek Arterial Road. Primary ingress and egress will be provided via the Phase 1 interim intersection located at the north-eastern ERA boundary. A secondary emergency access connection is proposed at the north-western ERA boundary to provide network redundancy and facilitate emergency and service vehicle access when required.

The ultimate future access strategy under development for Aura South proposes staged strategic connections to the BCA, including:

1. A western connection providing regional egress movements onto the BCA and grade separated access into Aura.;
2. A central connection associated with the future Aura Boulevard via BCA roundabout;
3. An eastern ingress connection incorporating direct access to the broader Aura South development.

Preliminary concept investigations have identified the western connection as providing network benefits through improved traffic distribution, enhanced connectivity and greater permeability in the ultimate road network arrangement. The ultimate connections to the BCA will be subject to detailed traffic modelling and negotiations with the Department of Transport and Main Roads (DTMR).

The external transport framework also incorporates a future 2-Way separated cycle path connection between Aura South and the existing Aura community. In the short term, active transport movements are proposed to utilise at-grade crossing arrangements across Bells Creek Road, while opportunities for a future grade-separated crossing of Bells Creek Arterial Road will continue to be investigated as part of the broader Aura South active transport network. The form, alignment and timing of any future grade-separated crossing will be determined through future planning and design processes.

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The conceptual access arrangements are illustrated below in Figure 6.

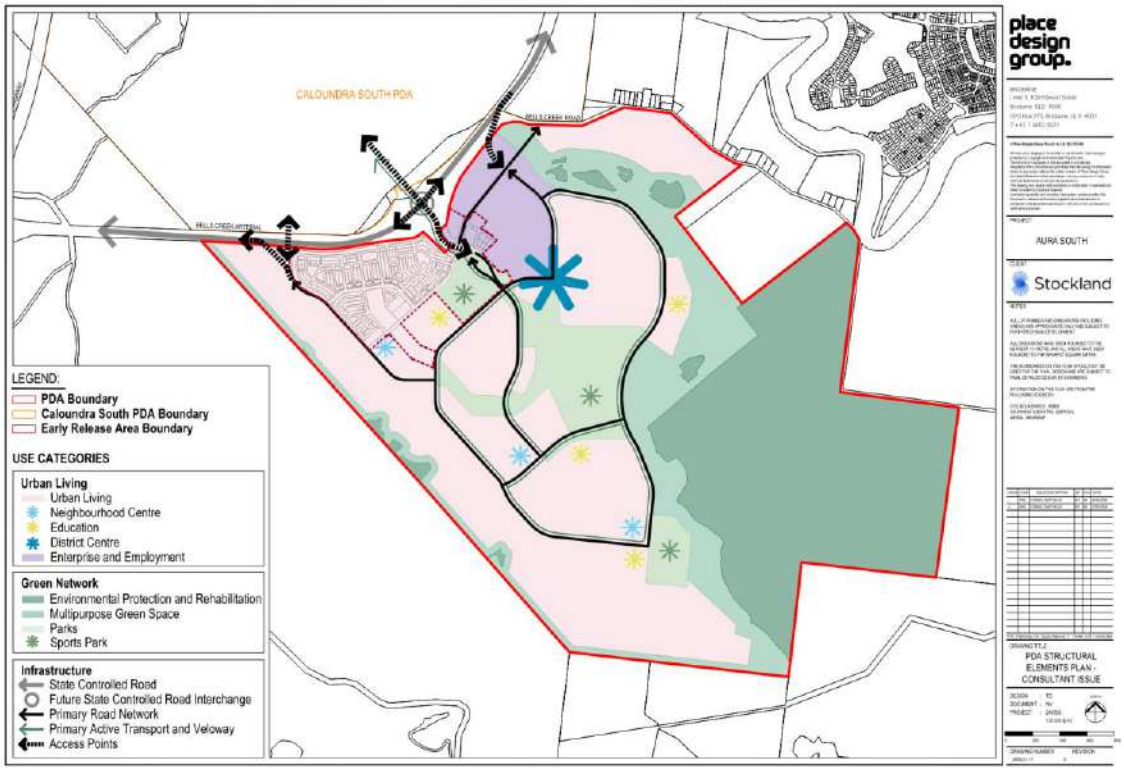


Figure 6. Concept External Road Connection Strategy

3.3 ACTIVE TRANSPORT NETWORK

Active transport forms a key component of the proposed movement network. Shared pathways, pedestrian connections and cycle infrastructure are proposed throughout the development to support access to schools, community facilities, parks, centres and public transport services. The active transport network will be integrated within road corridors, open space networks and environmental corridors to provide convenient and attractive walking and cycling routes. An active transport connection is proposed to utilise at-grade crossing arrangements across Bells Creek Road, while opportunities for a future grade-separated crossing of Bells Creek Arterial Road will continue to be investigated as part of the broader Aura South active transport network. The form, alignment and timing of any future grade-separated crossing will be determined through future planning and design processes.

3.4 PUBLIC TRANSPORT CONSIDERATIONS

The transport framework has been designed to support future public transport services through an interconnected road network capable of accommodating efficient bus operations from the early stages of development. Aura South is also strategically located to benefit from planned Sunshine Coast public transport improvements, including the proposed Bells Creek (Aura) train station associated with The Wave rail project, which may provide future regional public transport connections. Detailed public transport infrastructure requirements and service planning will be refined through ongoing consultation with government agencies and transport providers.

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3.5 EMERGENCY AND SERVICE VEHICLE ACCESS

Major roads and intersections will be designed to accommodate the swept path requirements of a 19 m Articulated Vehicle (AV) in accordance with Austroads and AS2890, confirming suitable access arrangements and road geometry while supporting future public transport operations and service accessibility. Internal roads within residential areas will be designed to accommodate a 12.5 m Heavy Rigid Vehicle (HRV) and the 10.2 m Waste Collection Vehicle (WCV) nominated by Sunshine Coast Council, facilitating waste collection, maintenance activities, service vehicle access and emergency response requirements. Road corridors, hydrant spacing and intersection layouts will be designed in accordance with applicable Australian Standards and emergency service requirements to ensure safe and efficient access throughout all stages of development. Supporting swept path assessments are included within the functional design drawings provided in Appendix B.

3.6 EARLY RELEASE AREA – STAGING REQUIREMENTS

Transport infrastructure will be delivered progressively in accordance with the development staging program. Initial access to the Early Release Area (ERA) is anticipated to utilise interim connections to the existing transport network, with subsequent upgrades and additional access points delivered in line with development demand and regional network requirements. The ultimate transport strategy includes upgrades to the BCA corridor and Aura Boulevard within the Aura – Caloundra South suburb of Gagalba providing connection between Aura South and adjoining development areas. Preliminary concept investigations indicate that these upgrades can be accommodated within the surrounding transport corridor and integrated with the broader regional network.

Further traffic modelling, functional design and consultation with DTMR will continue as development planning progresses to confirm staging triggers, infrastructure delivery requirements and ultimate network configuration.

4. STORMWATER MANAGEMENT

Stormwater Quality Management and Flooding and Storm tide Inundation Reports (included as Attachments 9 & 10 of the Town Planning Report) have been prepared by Water Technology and Designflow to demonstrate the feasibility of managing stormwater quantity, quality and flooding associated with the proposed Early Release Area. The proposed stormwater management framework responds to the site's natural catchment hydrology and environmental constraints, while supporting the staged delivery of development across the broader Aura South site. Stormwater management will be delivered through a combination of conventional drainage infrastructure, Water Sensitive Urban Design (WSUD) measures, rehabilitation of natural drainage corridors and includes consideration of stormwater harvesting opportunities.

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Figure 7 below conceptually shows the broader piped stormwater network to be delivered within the ERA.



Figure 7. ERA Concept Stormwater Layout Plan

4.1 EXISTING & PROPOSED CATCHMENTS

The Aura South site forms part of the broader Halls Creek and Coochin Creek catchments, which ultimately discharge to the Pumicestone Passage. Existing drainage patterns generally follow the site's natural topography, with the majority of runoff conveyed at an average grade of 1-2% via sheet flows, established drainage corridors and headwater creek systems draining toward the south-east. The proposed development has been planned to retain and incorporate these corridors within open space and environmental networks where practicable to maintain hydrological function, provide flood conveyance and support ecological outcomes. Figure 8 below shows the proposed catchment plans for the ERA, noting an additional 5 ha of the Bells Creek Arterial (BCA) is also considered in the stormwater strategy and catchment modelling. There a no other external catchments draining into the ERA other than what has been included from the BCA.

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Figure 8. Concept Aura South ERA Catchment Plan

4.2 FLOODING ASSESSMENT

Flood and Storm tide inundation modelling has been completed by Water Technology and Designflow for the ERA and broader Aura South development to establish flood behaviour, habitable development levels and stormwater management requirements. Preliminary investigations indicate that the ERA urban development footprint is located outside identified flood and coastal hazard overlays and above the defined flood event levels. Development adjacent to waterways and drainage corridors may require localised earthworks and stormwater infrastructure to maintain flood conveyance and flood storage functions. For detailed flood assessment outcomes, refer to the flood reporting prepared by Water Technology, which provides an assessment of the existing catchment hydrology, defines minor and major flood events, unmitigated and mitigated development impacts, proposed post-development flow management measures and potential impacts on adjoining land within the broader receiving catchment.

4.3 STORMWATER QUANTITY MANAGEMENT

Stormwater quantity management will be achieved through an integrated network of drainage corridors, constructed waterbodies, WSUD assets and engineered drainage infrastructure. Runoff volume reduction is a key objective of the broader Aura South stormwater strategy, with rainwater harvesting, infiltration-based treatment measures and water reuse initiatives incorporated to reduce runoff volumes and mitigate post-development peak discharge flows. The proposed Greenheart Lake will form a key component of the ultimate stormwater management system, providing regional storage, detention and stormwater harvesting functions within the broader drainage network.

Rainwater tanks form part of the Aura South water conservation and stormwater management strategy, reducing potable water demand while contributing to stormwater quantity and quality objectives. Consistent with the broader Aura development, tank sizing and connection requirements vary by land use and dwelling type, generally supplying toilets, laundry cold water services and external taps. The adopted

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rainwater tank requirements are included within the Stormwater Management Plan prepared by Water Technology.

Stormwater infrastructure will be delivered progressively in accordance with development staging, with the ERA initially supported by temporary sediment control measures and distributed treatment assets before transitioning to the ultimate drainage and waterway network, including naturalised waterways, permanent WSUD infrastructure and integrated storage assets. This staged approach will provide controlled stormwater conveyance, achieve lawful point of discharge requirements, attenuate peak flows and protect downstream receiving waterways from adverse hydraulic impacts. Temporary drains draining from the ERA into the broader future development site are proposed as project phasing is delivered.

4.4 STORMWATER QUALITY MANAGEMENT

The water quality management strategy prepared by Designflow has been incorporated into the development framework through the adoption of Water Sensitive Urban Design (WSUD) principles and stormwater treatment measures that respond to the sensitivity of downstream receiving environments, including the High Ecological Value (HEV) waters of Pumicestone Passage and associated Ramsar-listed wetland systems. The proposed treatment strategy adopts a distributed treatment train approach comprising bioretention systems, vegetated corridors, swales, wetlands and other WSUD measures integrated throughout the development, rather than relying solely on large end-of-line treatment systems. This approach supports the protection of downstream environmental values while achieving the required stormwater quality objectives and will be further refined through future MUSIC modelling and detailed drainage design. To achieve these outcomes, the ERA will incorporate approximately bio retention treatment area distributed throughout the catchment, with Figure 8 in Section 4.1 above, refer to the Stormwater Quality Management Plan prepared by Designflow providing a detailed breakdown of the proposed treatment devices, locations and contributing catchments.

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5. UTILITIES ASSESSMENT

Preliminary servicing demand assessments have been prepared for the ERA to inform the sizing of water supply, sewerage and supporting utility infrastructure. The assessments adopt Equivalent Population (EP) loading rates as shown in Table 5 below, consistent with the broader Aura South servicing strategy. The following sections outline the proposed water supply and sewerage servicing strategies for the ERA, including the infrastructure requirements, servicing assumptions and how the ERA will integrate into the ultimate Aura staged delivery framework. An Aura South Early Release Water and Sewer Servicing Assessment dated 28 October 2026 is included as Appendix D. Noting Stantec are currently preparing a comprehensive Infrastructure Management Plan (IMP) for Aura South that will further refine the long-term water and sewer servicing strategy, infrastructure staging and network delivery requirements for both the ERA and broader development area.

Table 2. Aura South EP Demand Assessment

Aura South Total Resi	EP/Lot
Residential Lots greater than and equal to 175m2	2.77
Residential Lots less than 175m2	1.95
Apartment	1.95
Land Lease Dwellings	1.70
Aura South Total Non-Residential	**EP/Ha (adjusted for site cover)**
Office	56
Industry/SME	24
Large Format Retail	55
Schools	30
Shops	90
Child Care	75
Community	66
Food and Drink	324
Shopping Centre	130
Medical	48
Gym	156
Service Centre	84
Police Station	36
Energex Substation	120
Sports Park	10

5.1 WATER RETICULATION

A water servicing assessment undertaken by Stantec confirms that the ERA can be serviced through a staged connection to the existing Aura water supply network. The broader Aura South servicing strategy has been developed around three infrastructure stages, allowing development to progressively transition from an initial supply arrangement through Aura to a standalone Aura South water supply network as development demand increases. The detailed assessment is documented within the Aura South Early Release Area Water Supply and Sewerage Servicing Assessment provided in Appendix D.

The ultimate Aura South water supply network has been planned for an estimated population of approximately 30,942 equivalent persons (EP) and incorporates a dedicated 12.6 ML reservoir and 650

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mm minimum internal diameter trunk supply main. Prior to delivery of this infrastructure, Aura South will utilise available capacity within the existing Aura water supply network, consistent with the broader Aura and Aura South Infrastructure Management Plans.

ERA Water Demand and Servicing

The ERA has been assessed to generate an ultimate demand of approximately 3,048 EP, including a 10% design uplift for infrastructure planning purposes. Based on the adopted design criteria, this equates to an estimated 9.2 L/s Average Day Demand (ADD), 13.2 L/s Mean Day Maximum Month Demand (MDMM), 17.3 L/s Peak Day Demand (PDD) and 32.9 L/s Peak Hour Demand (PHD). Hydraulic modelling completed by Stantec confirms that the proposed ERA reticulation network satisfies the level-of-service requirements of the SEQ Water Supply and Sewerage Design and Construction Code, including pressure and fire flow requirements.

The ERA will initially be supplied via the extended Aura western trunk main through a DN630 PE100 SDR11 (ID 513 mm) connection. Dual 450 mm diameter water mains are proposed beneath the Bells Creek Arterial Road to connect Aura South to the Aura network, providing both network resilience and compatibility with the ultimate Aura South servicing arrangement. The proposed servicing strategy is illustrated in Figure 9.

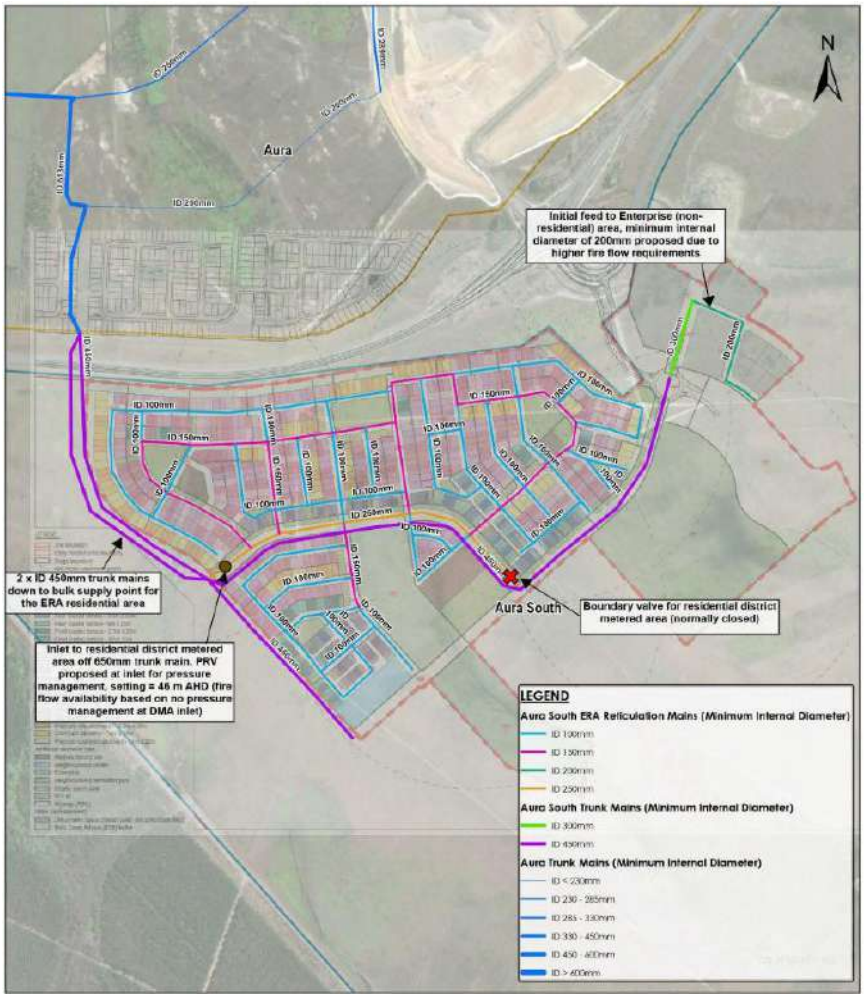


Figure 9. ERA Water Servicing Strategy

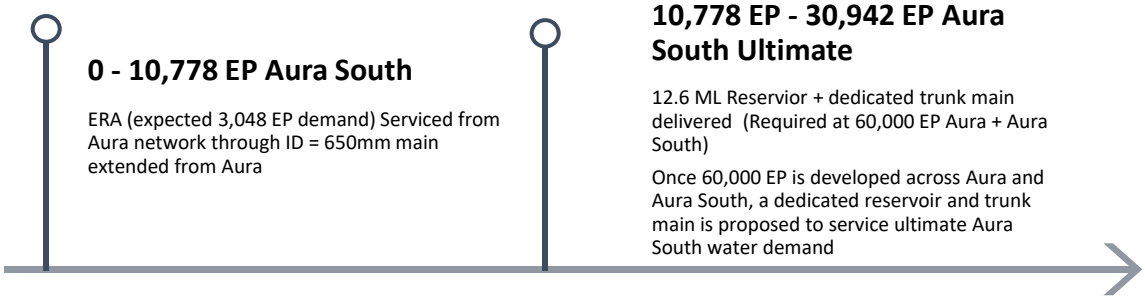
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Infrastructure Staging

The water servicing strategy has been developed to support the staged rollout of Aura South. The ERA forms part of Aura South Infrastructure Stage 1, which allows development of up to approximately 5,000 EP within Aura South using capacity available within the existing Aura network. Water supply through Aura may continue until approximately 10,778 EP is developed within Aura South, corresponding to a combined Aura and Aura South population of approximately 60,000 EP.

Beyond this threshold, the capacity of the existing Aura supply arrangement is exhausted and the dedicated Aura South water supply system is required. This infrastructure comprises a new 12.6 ML reservoir co-located at the Aura reservoir facility together with a 650 mm minimum internal diameter trunk supply main servicing Aura South. At this stage, Aura South transitions to an independent water supply system while the interim connection through Aura is retained as a contingency and operational redundancy. The key infrastructure triggers associated with this staged servicing framework are summarised in Figure 10.

Figure 10. Water Infrastructure Delivery Triggers



5.2 SEWERAGE

A sewer servicing assessment undertaken by Stantec confirms that the ERA can be serviced through a gravity connection to the existing Aura sewerage network without requiring commissioning of the proposed Aura South Sewer Pump Station (SPS). The broader Aura South servicing strategy has been developed around a staged wastewater network that progressively transitions from a northern gravity catchment to a centralised SPS arrangement as development expands across the site. The detailed assessment is documented within the Aura South Early Release Area Water Supply and Sewerage Servicing Assessment provided in Appendix H.

The ultimate Aura South sewerage network has been planned for an estimated population of approximately 30,942 equivalent persons (EP) and comprises a conventional gravity sewer network draining to a single centralised Aura South SPS. Wastewater will ultimately be conveyed through the Aura sewerage network via SPS-LMT119 and the regional SPS-LMT116 to the Kawana Sewage Treatment Plant. This arrangement minimises operational complexity, reduces the number of pump stations across the development and provides an efficient long-term servicing solution for Aura South.

ERA Sewage Flows and Servicing

The ERA has been assessed to generate an ultimate wastewater load of approximately 3,048 EP, including a 10% design uplift for infrastructure planning purposes. Based on the adopted sewerage design criteria, this equates to approximately 6.4 L/s Average Dry Weather Flow (ADWF) and 25.4 L/s Peak Wet Weather

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Flow (PWWF). These flows have been used to inform the sizing of the ERA sewer reticulation network and external trunk infrastructure.

The ERA forms part of the northern Aura South gravity sewer catchment and can discharge directly to the proposed DN750 GRP trunk gravity sewer connecting Aura South to the Aura sewerage network. Sewerage from the ERA will be collected via a conventional gravity network comprising DN180 NuSewer reticulation mains and a DN250-DN400 NuSewer collector network, which conveys flows to the Aura connection point. Hydraulic assessments undertaken by Stantec confirm that the proposed network has sufficient capacity to service the ERA while maintaining compliance with the SEQ Water Supply and Sewerage Design and Construction Code. The proposed servicing arrangement is illustrated in Figures 11, 12 & 13.

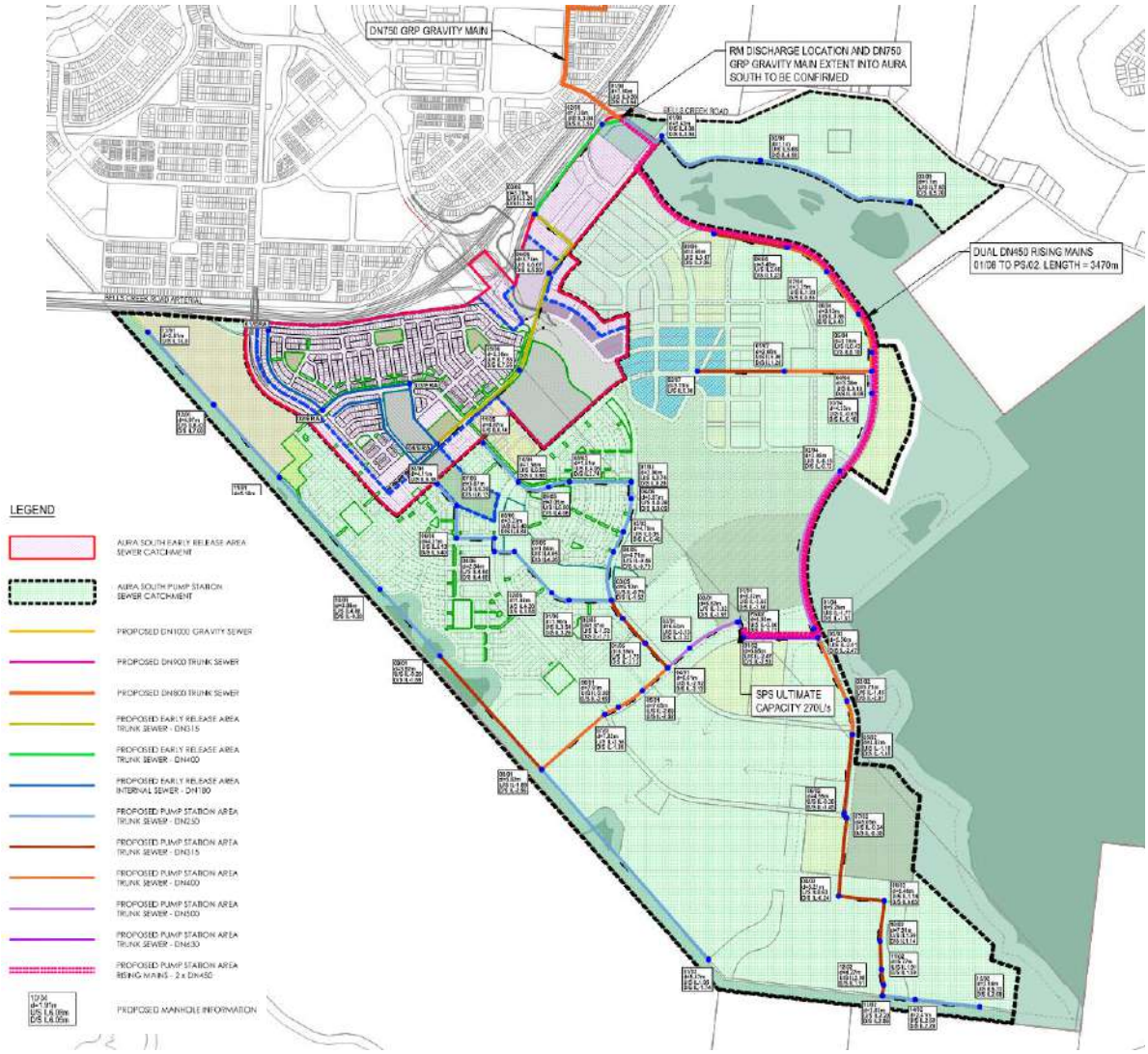


Figure 11. Concept Internal Sewer Network – Aura South ERA & Balance

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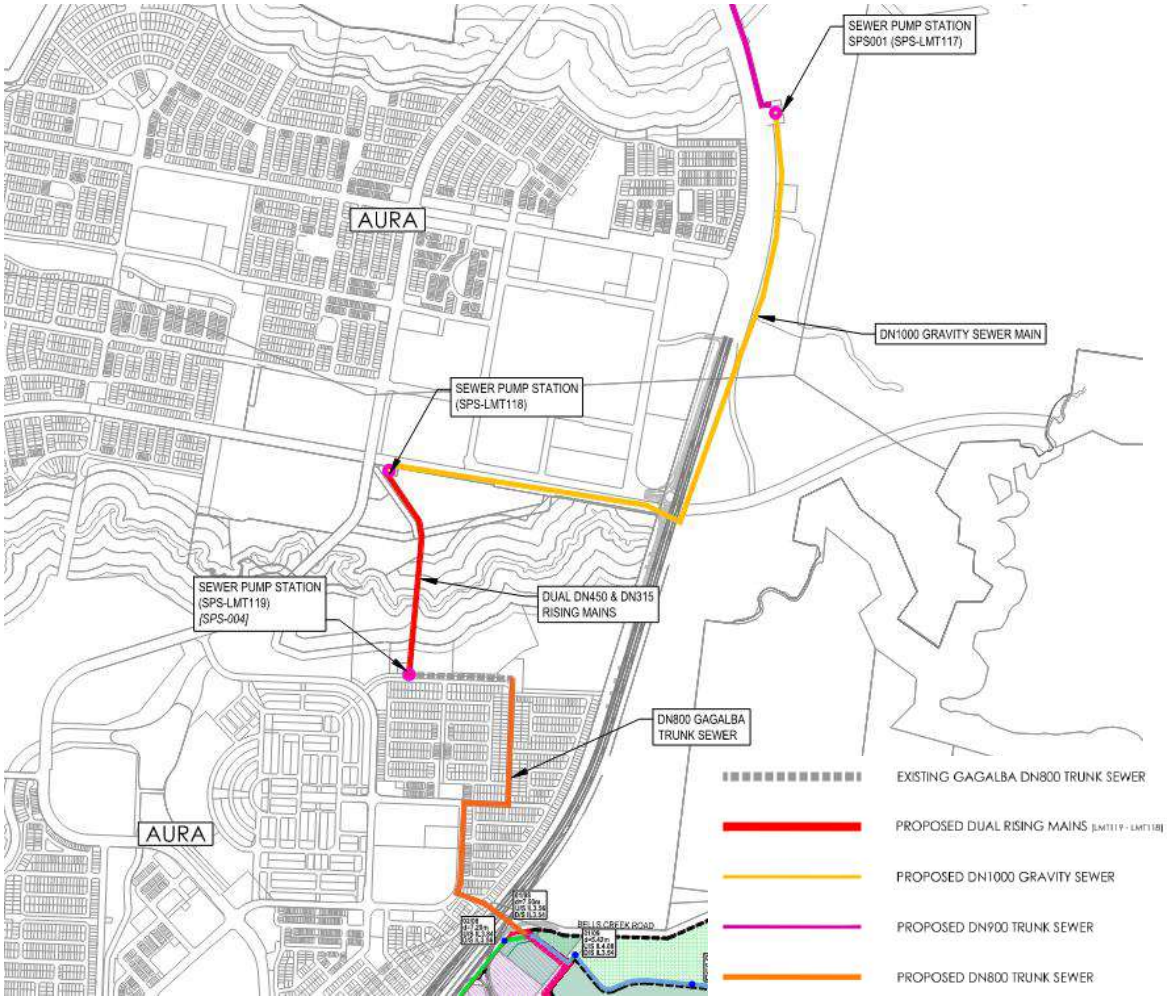


Figure 12.External Sewer Network – Aura Gagalba

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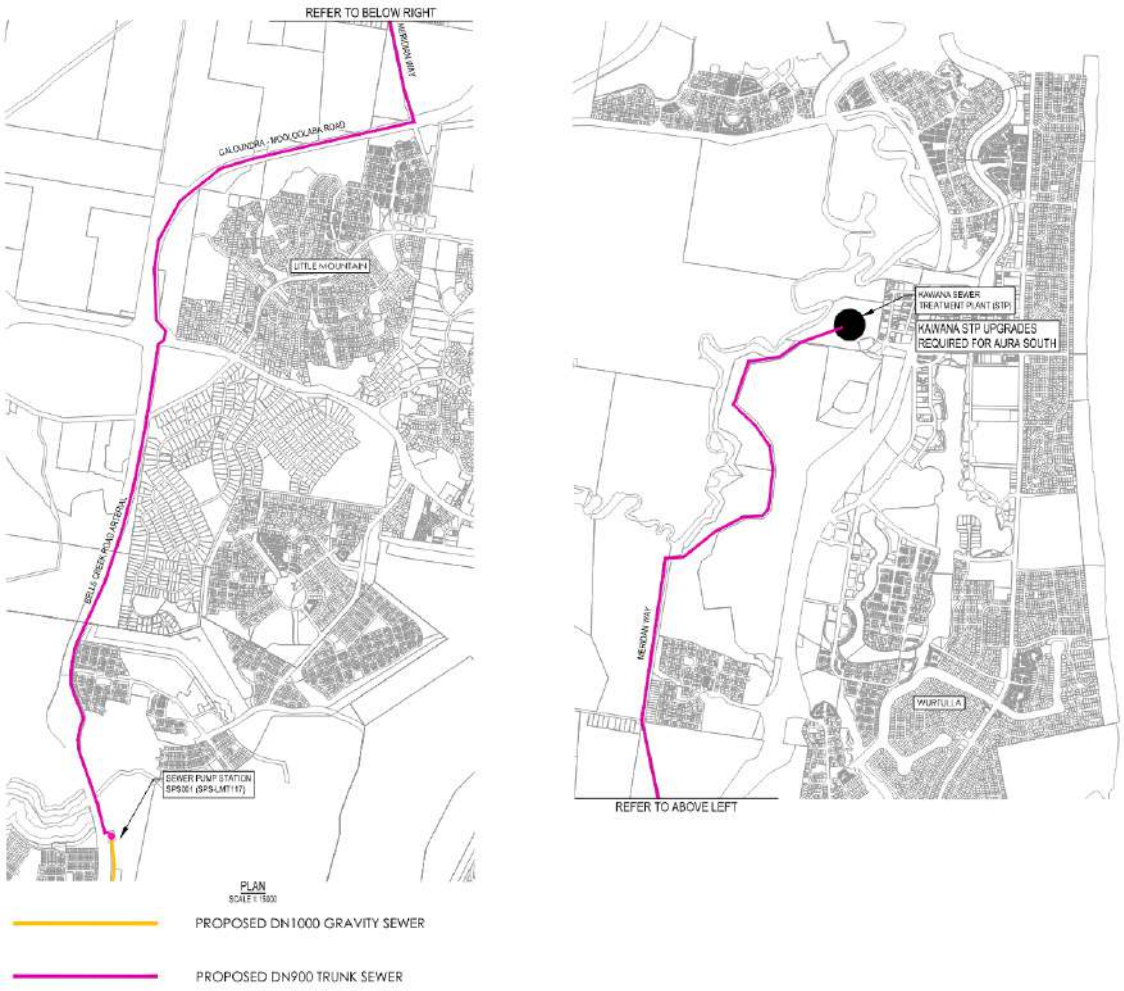


Figure 13.External Sewer Network - Kawana STP

Infrastructure Staging

The sewerage strategy has been developed to support the staged rollout of Aura South. The ERA forms part of Aura South Infrastructure Stage 1, which allows approximately 5,000 EP to be serviced by gravity before the proposed Aura South SPS is required. This approach avoids the need for interim pump stations and major mechanical infrastructure during the initial stages of development while preserving the corridors required for the ultimate sewerage network.

Beyond approximately 5,000 EP, development transitions into Aura South Infrastructure Stage 2, triggering construction of the centralised Aura South SPS and associated rising mains. Subsequent growth to the ultimate development population of 30,942 EP is accommodated through progressive upgrades to the regional sewerage network, including SPS-LMT119, SPS-LMT116 and the associated trunk mains. Dual rising mains from the Aura South SPS will ultimately be delivered to provide operational resilience and accommodate full development of Aura South. The key infrastructure delivery triggers associated with the sewerage servicing framework are summarised in Figure 14.

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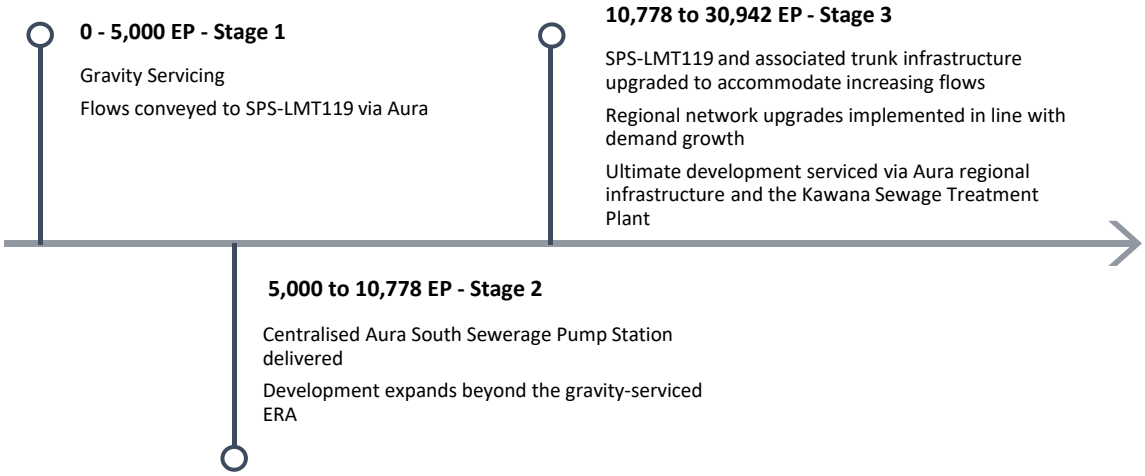


Figure 14. Sewer Infrastructure Delivery Triggers

5.3 ELECTRICAL & TELECOMMUNICATIONS

Existing electrical and telecommunications infrastructures is located within the adjacent Aura – Caloundra South development and surrounding transport corridors. The site is currently only serviced by infrastructure associated with its rural land use. Investigations undertaken by CV Services as part of the master planning process identified that both the ERA and the broader Aura South development can be serviced through staged extensions of the existing electricity and telecommunications networks servicing the Aura – Caloundra South community. Initial servicing of the ERA will be achieved through extension of existing networks, with new underground reticulation infrastructure delivered in accordance with development staging and service authority requirements. Additional works within the Bells Creek Arterial Road corridor, including conduit infrastructure, will support the future extension of electrical and telecommunications networks to Aura South. Reference should be made to the Aura South Infrastructure Management Plan – Energy & Communications prepared by CV Services included as Appendix G.

The electrical network is anticipated to comprise new distribution feeders, pad-mounted transformers and associated reticulation connected to the existing Energex network, while telecommunications services are expected to be provided through extensions of the existing fibre network. Additional reticulation, transformers and communications infrastructure will be progressively delivered as future stages of Aura South are developed, ensuring adequate network capacity and service reliability. Detailed design will also consider emerging technologies such as electric vehicle charging infrastructure, rooftop solar generation and battery storage systems to support future sustainability outcomes. Detailed network planning, infrastructure sizing and connection arrangements will be confirmed in consultation with the relevant service authorities during future operational works design phases.

6. ENVIRONMENTAL MANAGEMENT

Environmental constraints and approval requirements have been considered throughout the planning and servicing strategy development for Aura South. The site is subject to a range of environmental conditions arising from the EPBC Act approval (EPBC Ref: 2023/09548). The following sections summarise the key environmental considerations relevant to the proposed engineering services strategy and the measures proposed to support compliant and sustainable development outcomes. An Environmental Assessment Report prepared by SMEC and included as Attachment 12 of the Town Planning Report provides an

overview of the environmental overlays relevant to the ERA and highlights the key environmental constraints that have informed the proposed infrastructure servicing strategies.

6.1 ENVIRONMENTAL VALUES AND PROTECTION MEASURES

Infrastructure delivery within the ERA is generally confined to previously disturbed agricultural land, with environmental protection and rehabilitation areas largely avoided. The ERA is located outside mapped wetland and frog habitat areas; however, future stormwater infrastructure across Aura South will be planned and delivered in accordance with the approved EPBC habitat, buffer and offset framework.

The Aura South site contains significant environmental values, including sensitive receiving waters, natural drainage corridors, remnant vegetation and habitat areas associated with the Halls Creek and Coochin Creek catchments. These features have informed the development layout, with open space networks, environmental corridors and waterway buffers generally aligned to low-lying land, natural drainage pathways and ecological values. Infrastructure has been planned to integrate with these natural systems where practicable while minimising impacts on waterways, riparian corridors and habitat areas. Stormwater management measures, including WSUD infrastructure, will support water quality objectives and the long-term health of downstream ecosystems. Vegetation clearing and habitat management will be undertaken in accordance with the approved environmental management framework, including specific requirements for the Wallum Sedge Frog and associated offset areas, to protect environmental values during both construction and operation of the development.

6.2 CONSTRUCTION ENVIRONMENTAL MANAGEMENT

Construction will be undertaken in accordance with project-specific environmental management plans prepared for each stage of the project and consistent with applicable approval conditions and future operational requirements. Construction activities will incorporate erosion and sediment control, acid sulfate soil management, water quality monitoring, vegetation management, rehabilitation and environmental inspection regimes where applicable. Site-specific Erosion and Sediment Control Plans (ESCPs), Acid Sulfate Soil Management Plans (ASSMPs) and Precinct Construction Environmental Management Plans (PCEMPs) will be prepared and implemented in accordance with relevant approval conditions and industry best practice. These measures will assist in managing potential impacts on downstream waterways, environmental corridors and surrounding sensitive environments during construction.

6.3 SUSTAINABILITY INITIATIVES

The proposed development incorporates a range of sustainability initiatives intended to support long-term environmental performance, climate resilience and resource efficiency. Key initiatives include the integration of WSUD measures within the ERA which will integrate with the broader Blue-Green Framework of the Aura South Site. The development also promotes protection and rehabilitation of natural drainage corridors, biodiversity enhancement and habitat restoration, opportunities for stormwater harvesting and water reuse, urban cooling through extensive tree canopy and landscape networks, promotion of active transport connections, and the staged delivery of infrastructure aligned with development demand. Future renewable energy technologies, including electric vehicle charging infrastructure, rooftop solar generation and battery storage systems, will also be considered. Collectively, these initiatives support the delivery of a resilient and sustainable community while maintaining consistency with the environmental commitments and approval framework established for ERA and Aura South development.

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7. CONCLUSIONS

The investigations undertaken to date demonstrate that the ERA within the Aura South development, can be serviced through a coordinated and staged infrastructure delivery framework that integrates with existing and planned regional infrastructure while responding to the site's environmental and physical constraints.

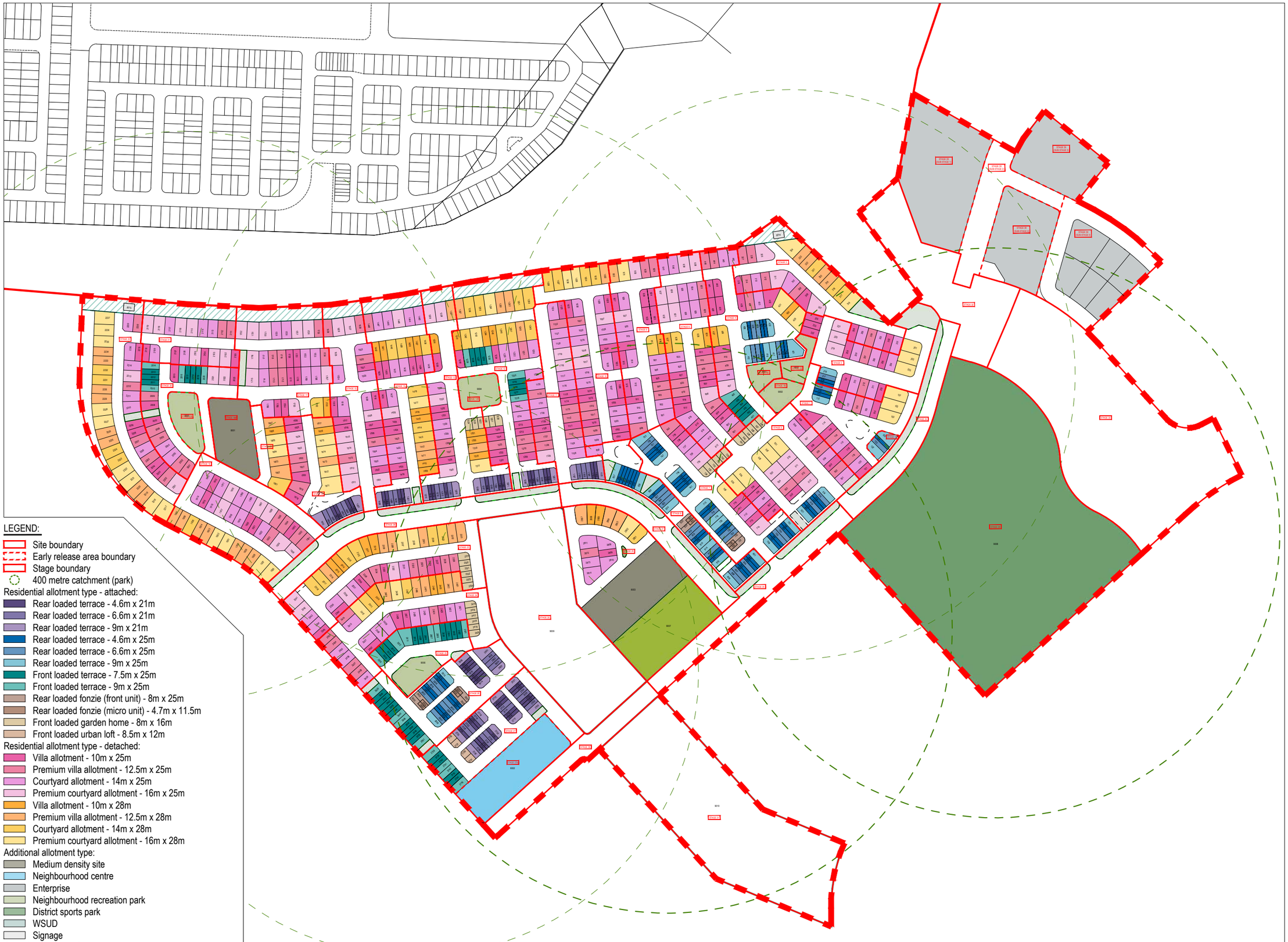
The assessments completed for transport, earthworks, stormwater, water supply, sewerage and utility infrastructure confirm that the ERA can be delivered using conventional engineering solutions supported by staged infrastructure upgrades and extensions. Access to the development can be achieved via the existing Bells Creek Arterial Road corridor, while water, sewerage, electrical and telecommunications services can be provided through a combination of existing network capacity and future trunk infrastructure identified for Aura South. Stormwater management has been developed around an integrated drainage and WSUD framework that supports water quality objectives, mitigates post-development peak discharge flows and protects downstream environmental values.

The proposed servicing strategies have been planned to support the orderly delivery of approximately 1,051 homes and associated neighbourhood, employment, recreation and community facilities within the ERA, while maintaining consistency with the ultimate Aura South development framework. The proposed infrastructure approach aligns with the objectives of the Halls Creek Development Scheme and establishes a clear pathway for the staged delivery of development and associated infrastructure across the broader Aura South community.

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APPENDIX A – EARLY RELEASE PLAN OF SUBDIVISION (PREPARED BY PLACE DESIGN GROUP)

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place design group.

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Verify all dimensions on site prior to construction.
This drawing may display with permission a combination of specialist and other consultant(s) input and linework.
Nominated specialist and consultant information contained within this document is referenced from their supplied documentation and is contained in this document as indicative only and not for construction or certification purposes.

PROJECT

AURA SOUTH

CLIENT

Stockland

NOTES

ALL LOT NUMBER AND DIMENSIONS (INCLUDING AREAS) ARE APPROXIMATE ONLY AND SUBJECT TO FURTHER DESIGN DEVELOPMENT.

ALL DIMENSIONS HAVE BEEN ROUNDED TO THE NEAREST 1.0 METRE AND ALL AREAS HAVE BEEN ROUNDED TO THE NEAREST SQUARE METRE.

THE BOUNDARIES ON THIS PLAN SHOULD NOT BE USED FOR THE FINAL DESIGN AND ARE SUBJECT TO FINAL DETAILED DESIGN BY ENGINEERS.

INFORMATION ON THIS PLAN ARE FROM THE FOLLOWING SOURCES:

SITE BOUNDARIES: URBIS
ADJOINING CADASTRE: QSPATIAL
AERIAL: NEARMAP

DRAFT

ISSUE	CODE	ISSUE DESCRIPTION	BY	CHK	DATE
.	PRE	FOR CLIENT REVIEW	NV	NV	27/08/2026
A	PRE	FOR CLIENT REVIEW	NV	NV	04/09/2026
B	PRE	EDQ ISSUE	NV	NV	25/09/2026
C	PRE	FOR COORDINATION	NV	NV	14/10/2026
D	PRE	DRAFT CLIENT ISSUE	NV	NV	23/10/2026
E	PRE	EDQ ISSUE	NV	NV	02/11/2026

PRE - Preliminary | CA - Council Approval | T - Tender | CON - Construction

DRAWING TITLE

EARLY RELEASE AREA - PLAN OF SUBDIVISION

DESIGN : TD
DOCUMENT : NV
PROJECT : 240553
1:5,0000 @ A3

NORTH

0 50 100 150 200

DRAWING NUMBER 240553 - 91

REVISION E

APPENDIX B – EARLY RELEASE AREA FUNCTIONAL PLANS (PREPARED BY KNG)

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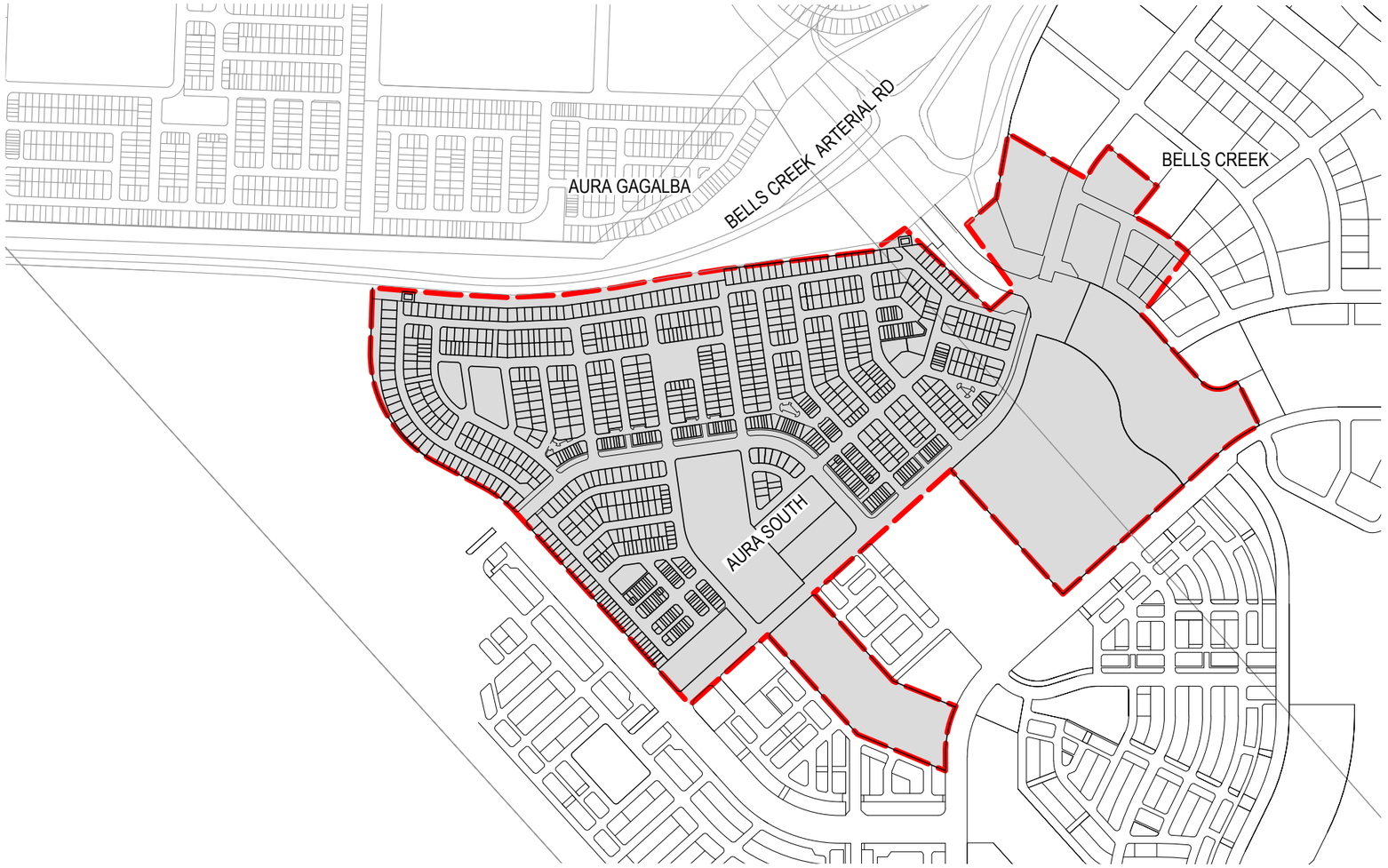
NORTH

Stockland

AURA SOUTH DA1 FUNCTIONALS

DRAWING INDEX

DRAWING NO.	DRAWING TITLE
25-269-FL01	GENERAL - LOCALITY PLAN AND DRAWING INDEX
25-269-FL10	EARTHWORKS - LAYOUT PLAN
25-269-FL11	EARTHWORKS BORROW - LAYOUT PLAN
25-269-FL12	EARTHWORKS - CUT & FILL DEPTH RANGE - LAYOUT PLAN
25-269-FL13	EARTHWORKS BORROW - CUT DEPTH RANGE - LAYOUT PLAN
25-269-FL14	EARTHWORKS - RETAINING WALLS - LAYOUT PLAN
25-269-FL15	EARTHWORKS - RETAINING WALLS - DETAILS
25-269-FL16	EARTHWORKS - SECTIONS - SHEET 1
25-269-FL17	EARTHWORKS - SECTIONS - SHEET 2
25-269-FL20	ROADWORKS - HIERARCHY PLAN
25-269-FL21	ROADWORKS - PATHWAY CONNECTIVITY PLAN
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25-269-FL23	ROADWORKS - SETOUT PLAN - SHEET 2
25-269-FL24	ROADWORKS - TYPICAL SECTIONS - SHEET 1
25-269-FL25	ROADWORKS - TYPICAL SECTIONS - SHEET 2
25-269-FL26	ROADWORKS - TYPICAL SECTIONS - SHEET 3
25-269-FL27	ROADWORKS - TYPICAL SECTIONS - SHEET 4
25-269-FL28	ROADWORKS - TYPICAL SECTIONS - SHEET 5
25-269-FL29	ROADWORKS - LONGITUDINAL SECTIONS ROAD 01 - SHEET 1
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25-269-FL35	ROADWORKS - LONGITUDINAL SECTIONS - ROAD MCBB2
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25-269-FL37	ROADWORKS - INTERSECTIONS AND LINEMARKING - SHEET 2
25-269-FL38	ROADWORKS - INTERSECTIONS AND LINEMARKING - SHEET 3
25-269-FL39	ROADWORKS - INTERSECTIONS AND LINEMARKING - SHEET 4
25-269-FL40	ROADWORKS - INTERSECTIONS AND LINEMARKING - SHEET 5
25-269-FL41	ROADWORKS - INTERSECTIONS AND LINEMARKING - SHEET 6
25-269-FL42	ROADWORKS - INTERSECTIONS AND LINEMARKING - SHEET 7
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25-269-FL44	ROADWORKS - INTERSECTIONS AND LINEMARKING - SHEET 9
25-269-FL45	ROADWORKS - INTERSECTIONS AND LINEMARKING - SHEET 10
25-269-FL46	ROADWORKS - INTERSECTIONS AND LINEMARKING - SHEET 11
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25-269-FL51	ROADWORKS - SIGHT LINES - SHEET 2
25-269-FL52	ROADWORKS - INTERIM CONNECTION
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25-269-FL61	STORMWATER - CATCHMENT PLAN
25-269-FL62	STORMWATER - EXISTING CATCHMENT PLAN
25-269-FL63	STORMWATER - DEVELOPED CATCHMENT PLAN
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25-269-FL74	SEWER RETICULATION - LONGITUDINAL SECTIONS - SHEET 3
25-269-FL80	WATER RETICULATION - LAYOUT PLAN



LOCALITY PLAN
SCALE 1:5000

NOTE
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REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: AURA SOUTH

Client: Stockland

Approved:

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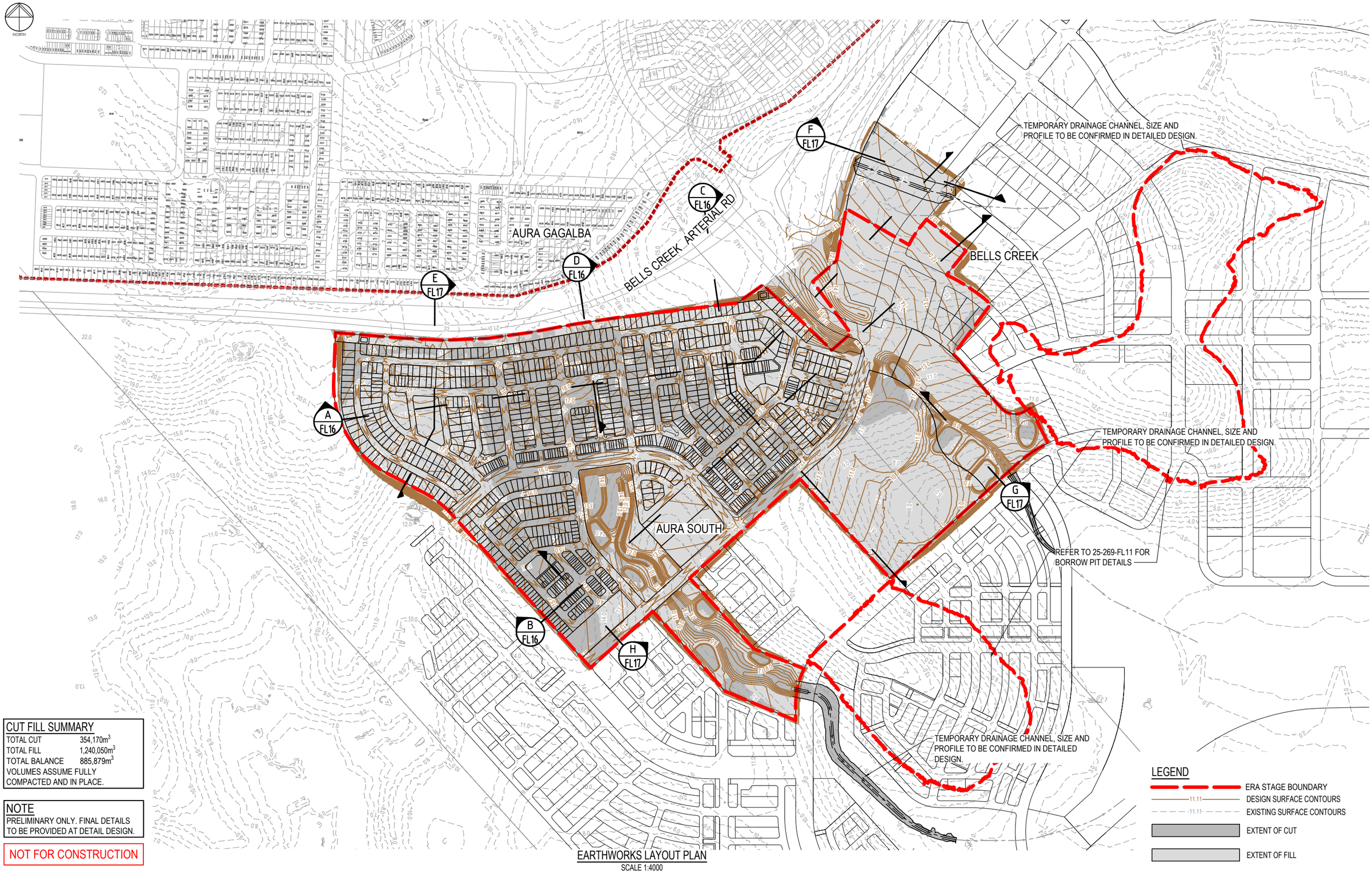
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Revision: B

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EARTHWORKS LAYOUT PLAN
SCALE 1:4000

CUT FILL SUMMARY	
TOTAL CUT	354,170m^3
TOTAL FILL	1,240,050m^3
TOTAL BALANCE	885,879m^3

VOLUMES ASSUME FULLY COMPACTED AND IN PLACE.

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B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: **AURA SOUTH**

Client: Stockland

Approved:

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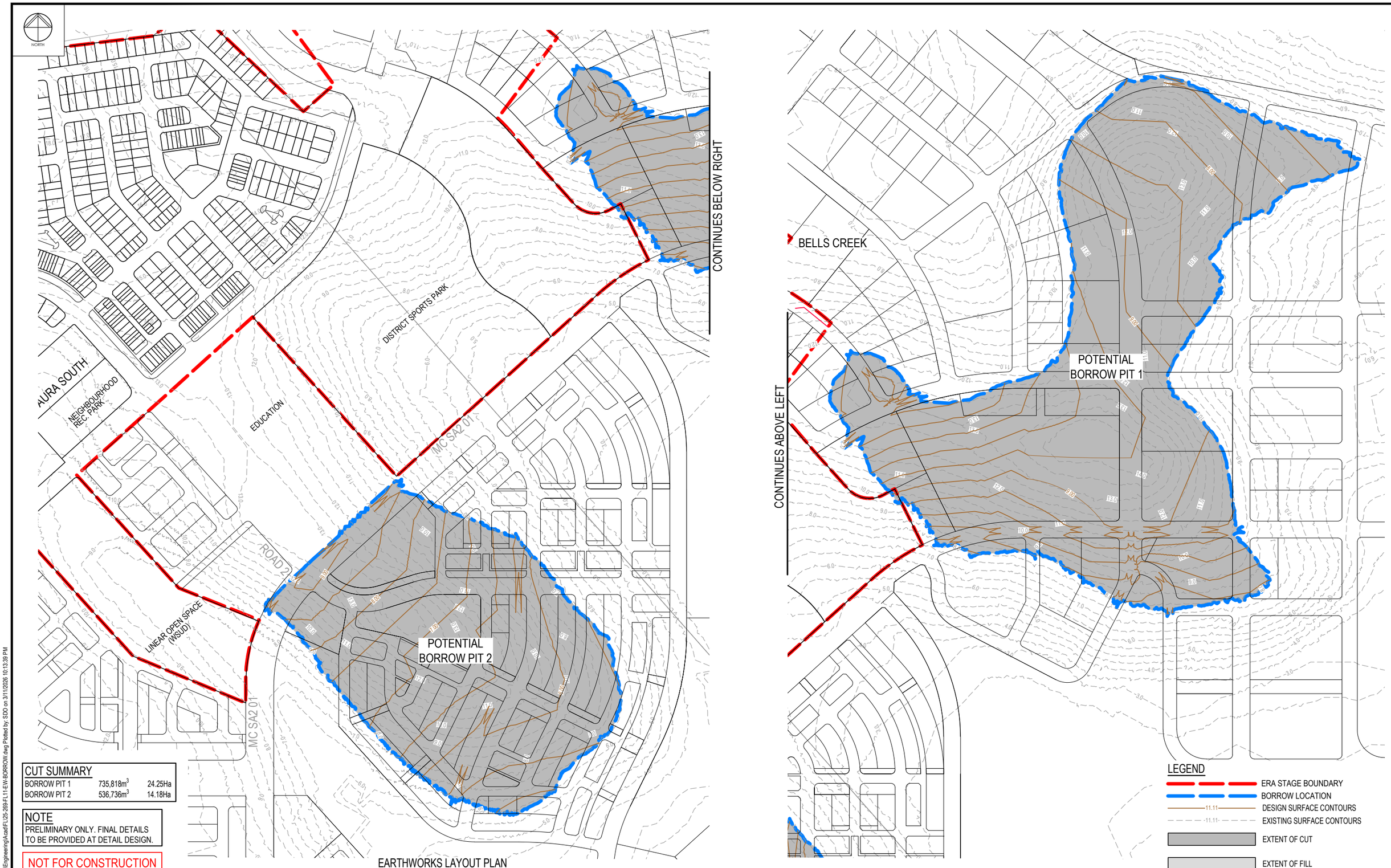
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	Revision: B

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CUT SUMMARY		
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BORROW PIT 2	536,736m^3	14.18Ha

NOTE
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EARTHWORKS LAYOUT PLAN
SCALE 1:2500

REVISIONS

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B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: **AURA SOUTH**

Client: Stockland

Approved:

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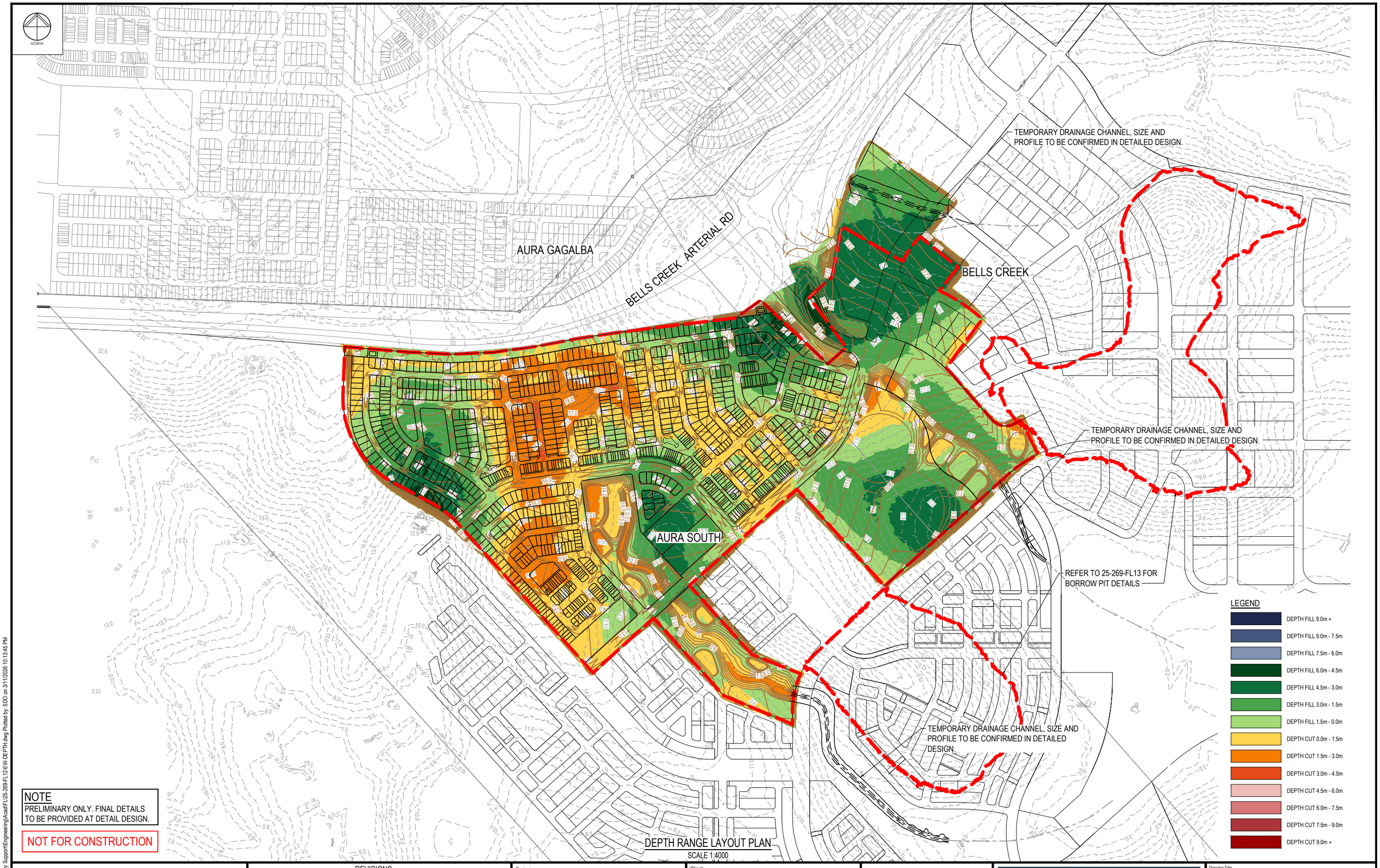
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Drawing Title: EARTHWORKS BORROW LAYOUT PLAN

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Revision: B

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DEPTH RANGE LAYOUT PLAN
SCALE 1:4000

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Project
AURA SOUTH

Client
Stockland

Approved

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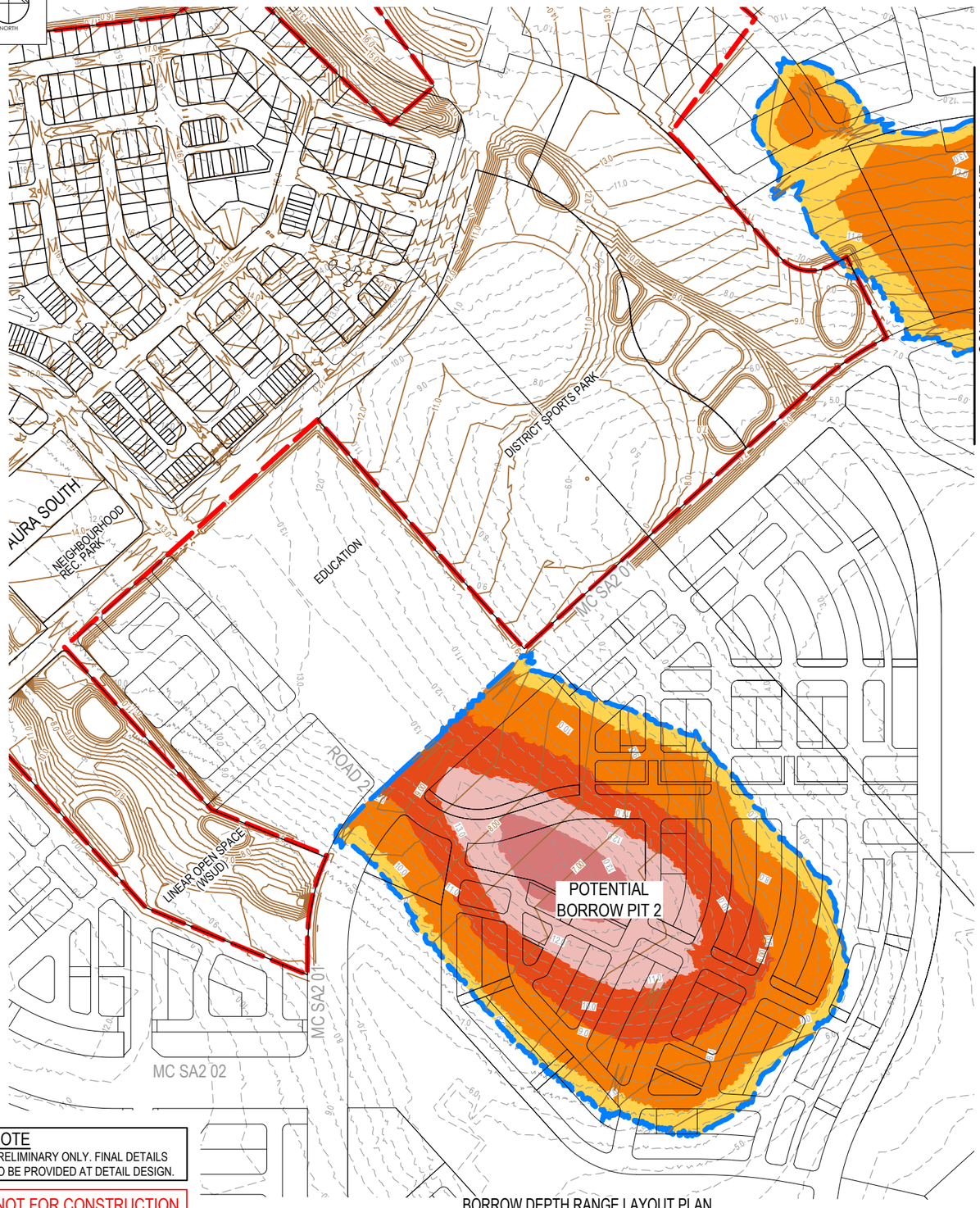
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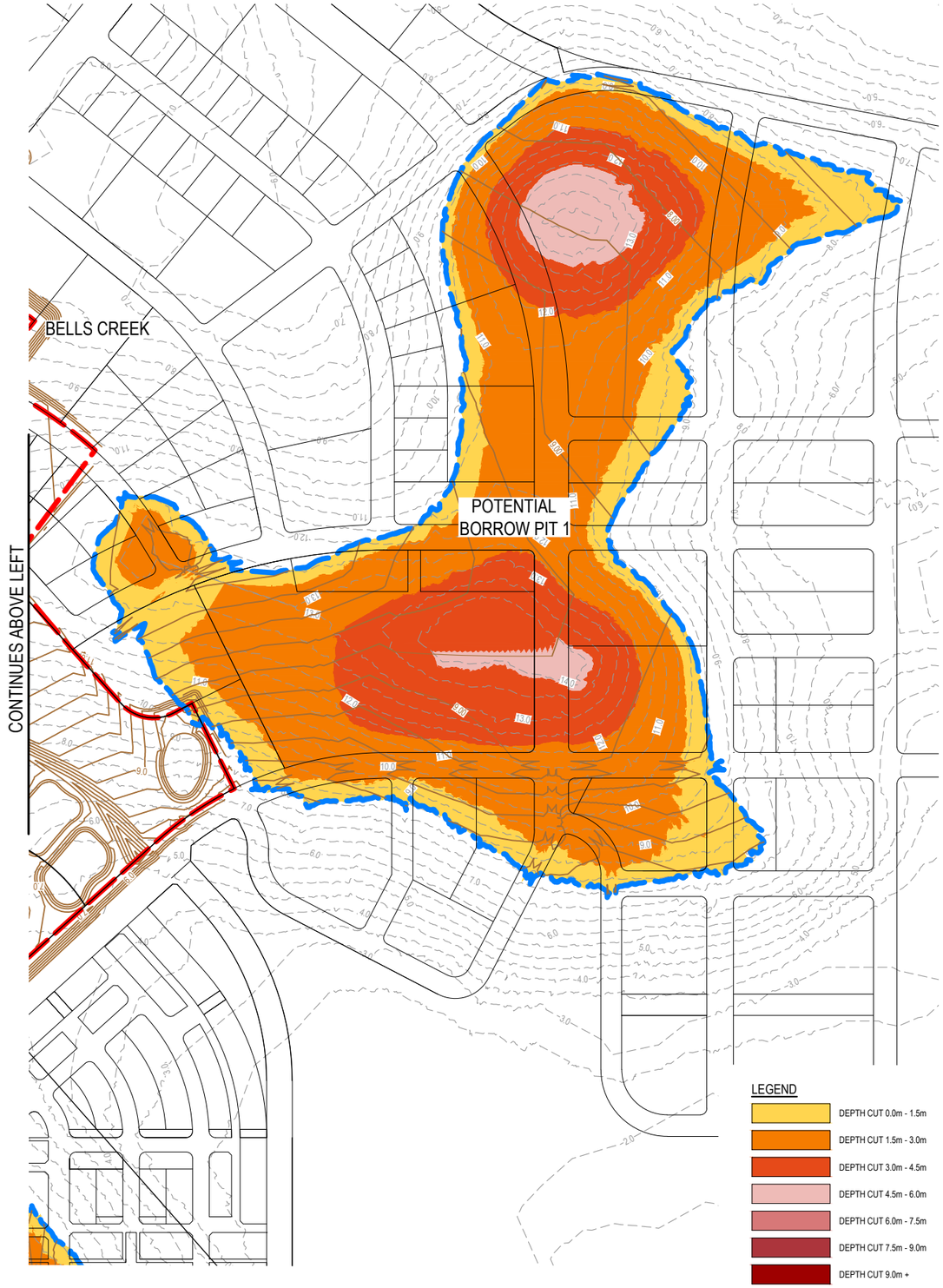
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Drawing Title
EARTHWORKS
CUT & FILL DEPTH RANGE
LAYOUT PLAN

Scale	Sheet
AS SHOWN	
A1	
Drawing No	Revision
25-269-FL12	B

M:\2025\25269 Aura South DA1 Preliminary Support\Engineering\Acad\FL\25-269-FL12-EW-DEPTH.dwg Plotted by: SDO on 3/11/2026 10:13:45 PM





NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

BORROW DEPTH RANGE LAYOUT PLAN
SCALE 1:2500

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: **AURA SOUTH**

Client: Stockland

Approved:

50 0 50 100m
1 : 2500 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

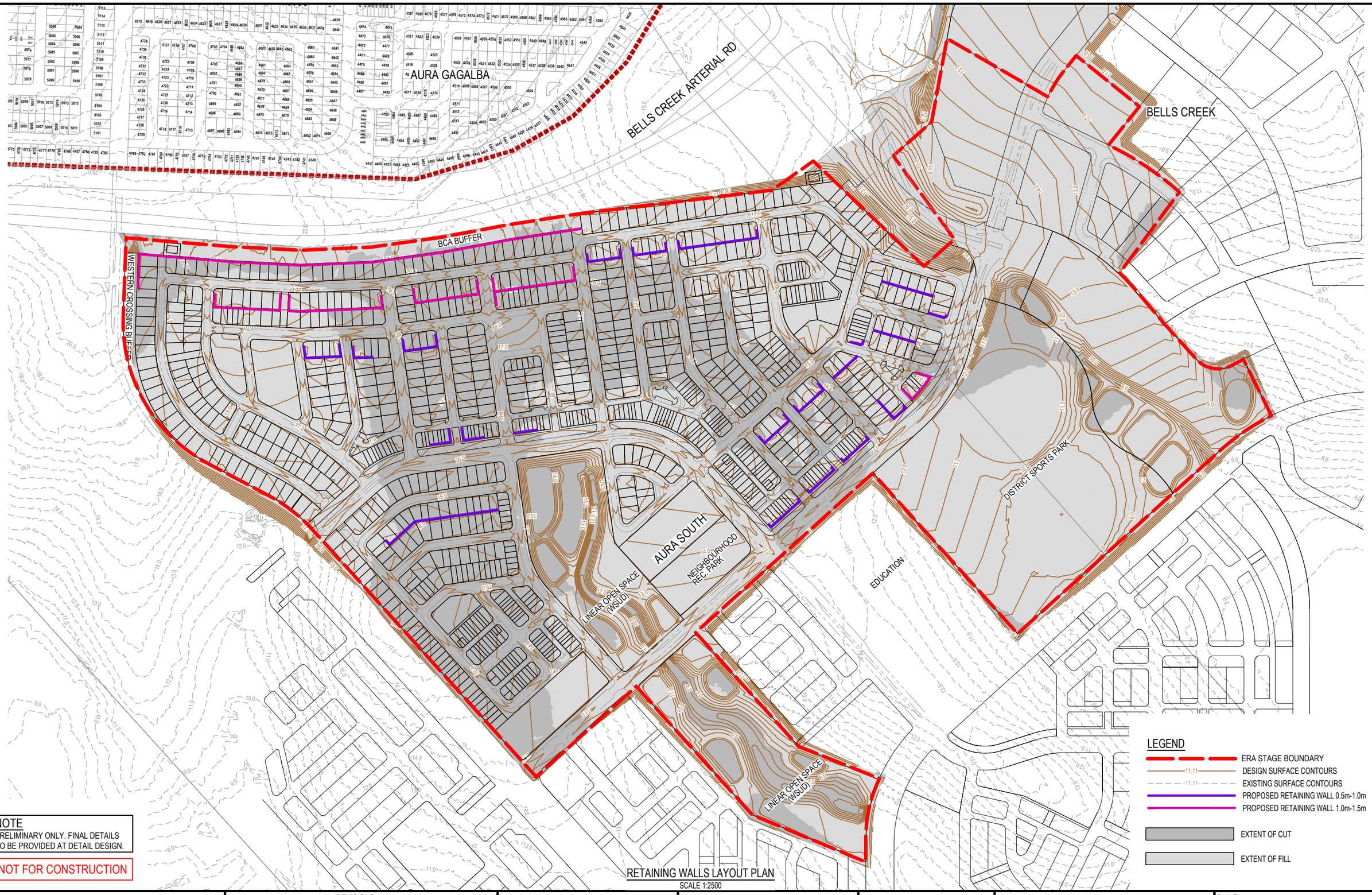
kn group
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Drawing Title: EARTHWORKS BORROW CUT DEPTH RANGE LAYOUT PLAN

Scale	Sheet
AS SHOWN	A1

Drawing No	Revision
25-269-FL13	B

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NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

RETAINING WALLS LAYOUT PLAN
SCALE 1:2500

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL				

Project
AURA SOUTH

Client
Stockland

Approved

1 : 2500 (A1 UNREDUCED)
50 0 50 100m
DO NOT SCALE THIS DRAWING

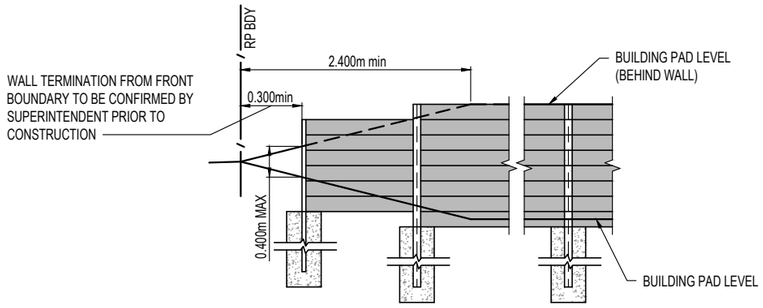
kn group
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Drawing Title
EARTHWORKS
RETAINING WALLS
LAYOUT PLAN

Scale	Sheet
AS SHOWN	
A1	Drawing No 25-269-FL14
	Revision B

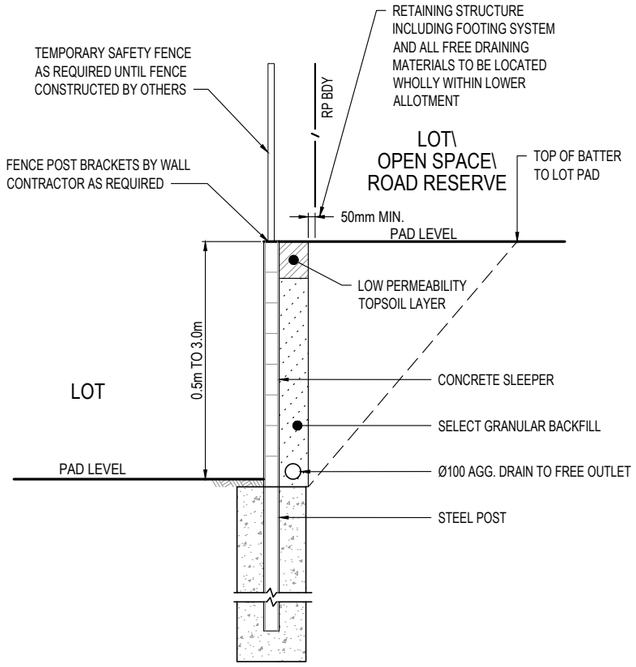
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RETAINING WALL GENERAL ARRANGEMENTS PROVIDED AS A GUIDE ONLY. CONTRACTOR TO PROVIDE ALL FORM 15 AND FORM 12 CERTIFICATIONS INCLUDING ALL GLOBAL STABILITY ASSESSMENT AND CERTIFICATION.

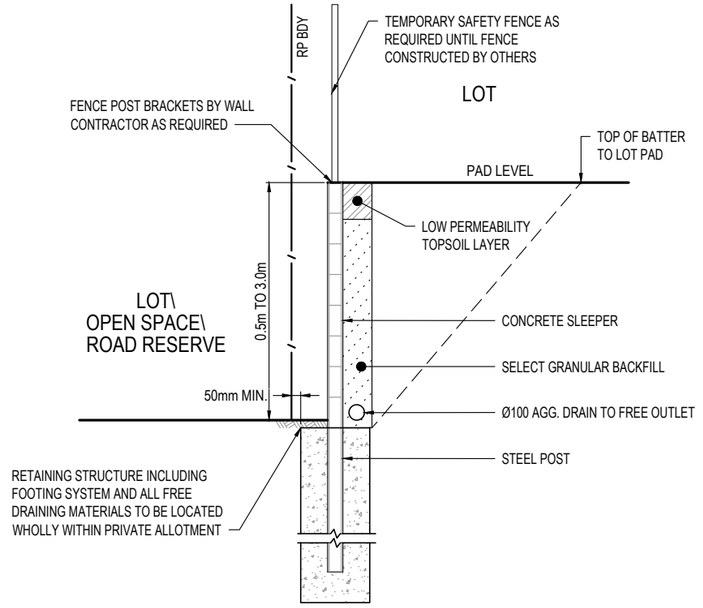


TYPICAL SIDE RETAINING WALL (DESIGNED BY OTHERS)
ELEVATION AT FRONT OF ALLOTMENTS
SCALE NTS

NOTE:
DESIGN LOAD TO BE - 5 KPA DEAD AND 5 KPA LIVE LOAD UNLESS SPECFIED OTHERWISE



CONCRETE SLEEPER WALL DETAIL 1
REAR / SIDE BOUNDARY AND
STREET FRONTAGE (LOT LOWER)
BETWEEN LOTS 0.5m TO 1.5m
SCALE 1:25



CONCRETE SLEEPER WALL DETAIL 2
STREET FRONTAGE (LOT HIGHER)
SCALE 1:25

NOTE
PRELIMINARY ONLY. FINAL DETAILS
TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

0.5 0 0.5 1.0m
1 : 25 (A1 UNREDUCED)

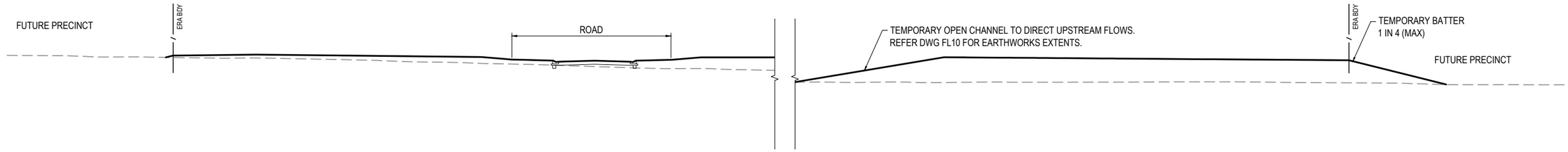
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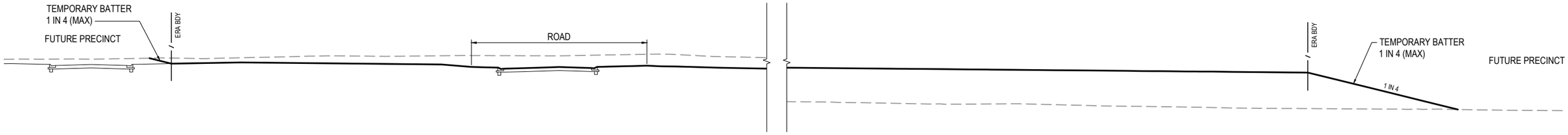
Drawing Title
EARTHWORKS
RETAINING WALLS
DETAILS

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL15
Revision: B

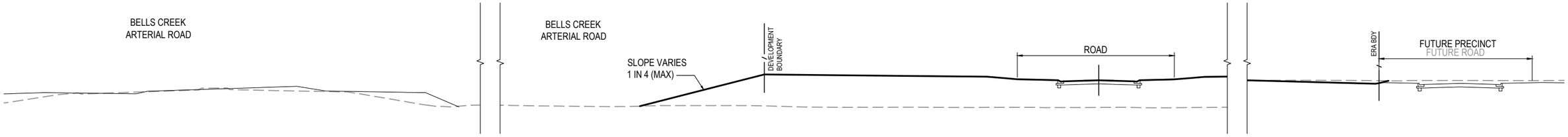
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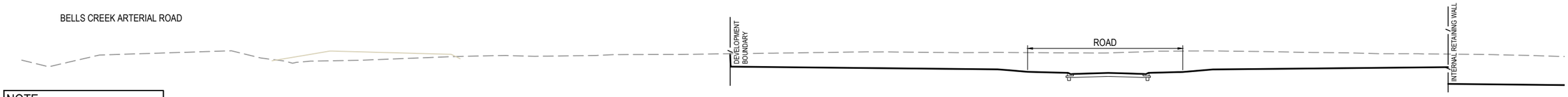
A FL10 SECTION
SCALE 1:200



B FL10 SECTION
SCALE 1:200



C FL10 SECTION
SCALE 1:200



D FL10 SECTION
SCALE 1:200

NOTE
PRELIMINARY ONLY. FINAL DETAILS
TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR
APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

2 1 0 2 4 6 8 10m
1 : 200 (A1 UNREDUCED)

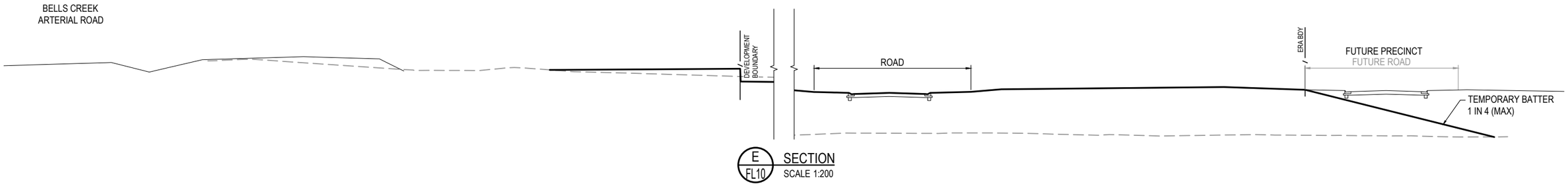
DO NOT SCALE THIS DRAWING

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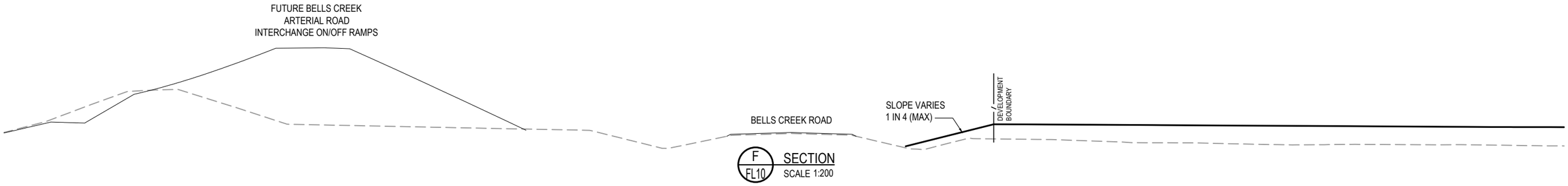
Drawing Title
EARTHWORKS
SECTIONS
SHEET 1

Scale: AS SHOWN
Sheet:
A1
Drawing No: 25-269-FL16
Revision: B

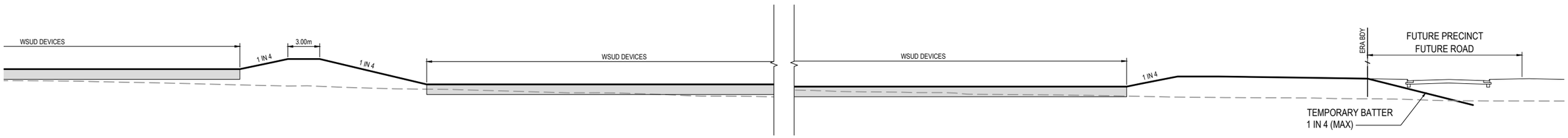
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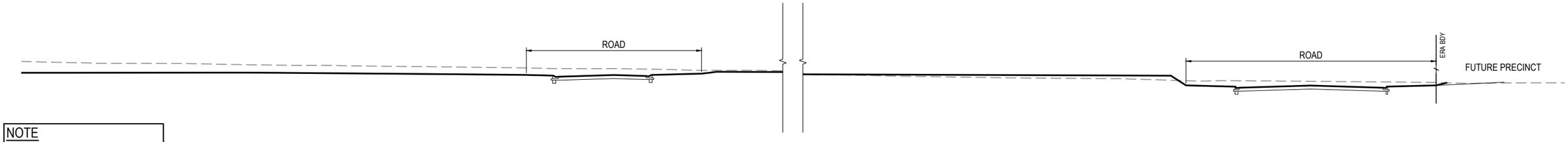
E FL10 SECTION
SCALE 1:200



F FL10 SECTION
SCALE 1:200



G FL10 SECTION
SCALE 1:200



H FL10 SECTION
SCALE 1:200

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

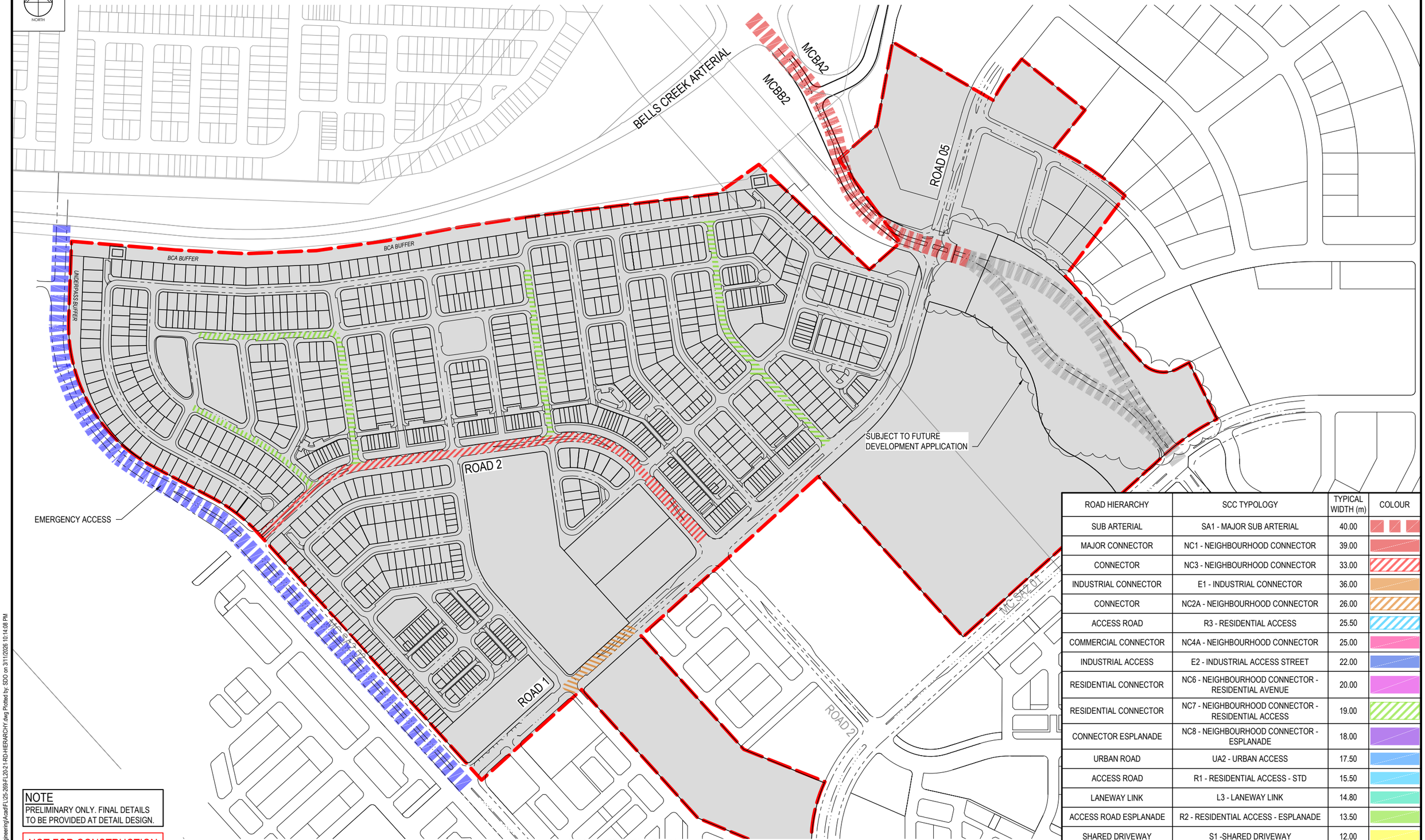
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DO NOT SCALE THIS DRAWING

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Drawing Title
EARTHWORKS SECTIONS SHEET 2

Scale: AS SHOWN
Sheet:
A1
Drawing No: 25-269-FL17
Revision: B

M:\2025\25269 Aura South DA1 Preliminary Support\Engineering\Acad\FL\25-269-FL16-17-EW-SECTIONS.dwg Plotted by: SDO on 3/11/2026 10:14:03 PM



ROAD HIERARCHY	SCC TYPOLOGY	TYPICAL WIDTH (m)	COLOUR
SUB ARTERIAL	SA1 - MAJOR SUB ARTERIAL	40.00	
MAJOR CONNECTOR	NC1 - NEIGHBOURHOOD CONNECTOR	39.00	
CONNECTOR	NC3 - NEIGHBOURHOOD CONNECTOR	33.00	
INDUSTRIAL CONNECTOR	E1 - INDUSTRIAL CONNECTOR	36.00	
CONNECTOR	NC2A - NEIGHBOURHOOD CONNECTOR	26.00	
ACCESS ROAD	R3 - RESIDENTIAL ACCESS	25.50	
COMMERCIAL CONNECTOR	NC4A - NEIGHBOURHOOD CONNECTOR	25.00	
INDUSTRIAL ACCESS	E2 - INDUSTRIAL ACCESS STREET	22.00	
RESIDENTIAL CONNECTOR	NC6 - NEIGHBOURHOOD CONNECTOR - RESIDENTIAL AVENUE	20.00	
RESIDENTIAL CONNECTOR	NC7 - NEIGHBOURHOOD CONNECTOR - RESIDENTIAL ACCESS	19.00	
CONNECTOR ESPLANADE	NC8 - NEIGHBOURHOOD CONNECTOR - ESPLANADE	18.00	
URBAN ROAD	UA2 - URBAN ACCESS	17.50	
ACCESS ROAD	R1 - RESIDENTIAL ACCESS - STD	15.50	
LANEWAY LINK	L3 - LANEWAY LINK	14.80	
ACCESS ROAD ESPLANADE	R2 - RESIDENTIAL ACCESS - ESPLANADE	13.50	
SHARED DRIVEWAY	S1 -SHARED DRIVEWAY	12.00	
LANEWAY	L1 & L2 - LANEWAY STD	8.00	

NOTE
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NOT FOR CONSTRUCTION

ROAD HIERARCHY PLAN
SCALE 1:2500

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

50 0 50 100m
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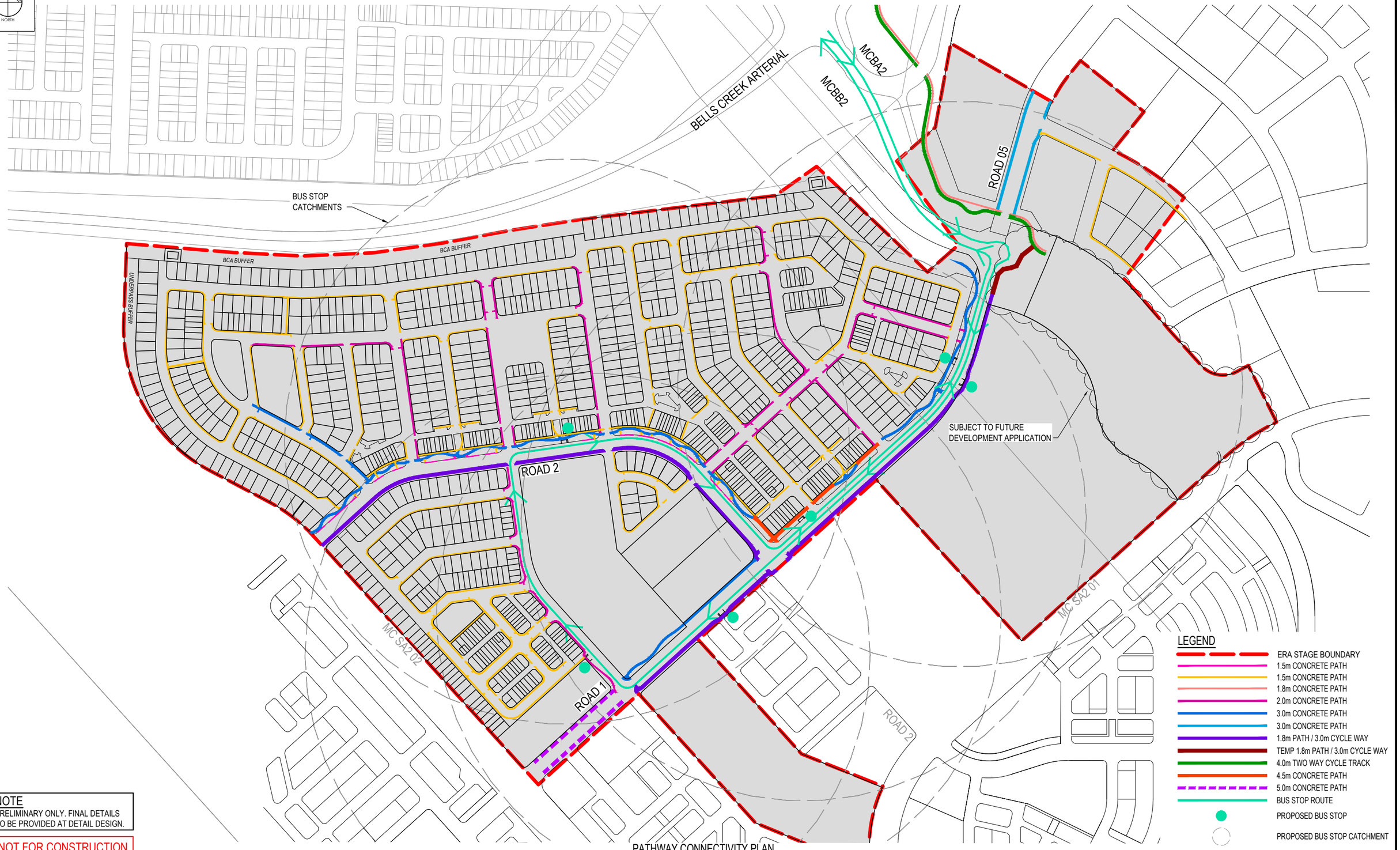
DO NOT SCALE THIS DRAWING

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Drawing Title
ROADWORKS HIERARCHY PLAN

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL20
Revision: B

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NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

PATHWAY CONNECTIVITY PLAN
SCALE 1:2500

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

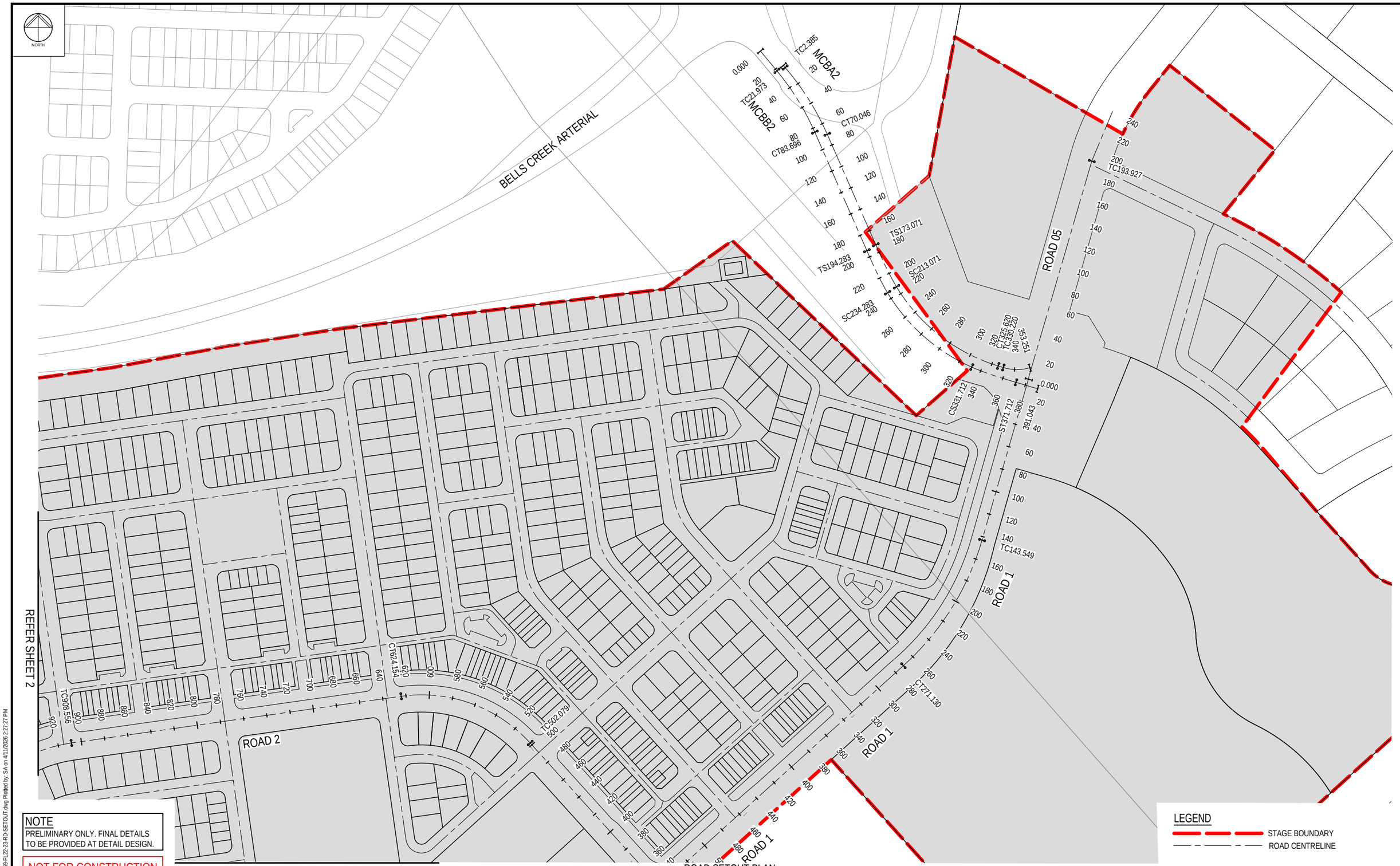
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1 : 2500 (A1 UNREDUCED)
DO NOT SCALE THIS DRAWING

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Drawing Title
ROADWORKS
PATHWAY CONNECTIVITY PLAN

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL21
Revision: B

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NOTE
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NOT FOR CONSTRUCTION

LEGEND
STAGE BOUNDARY
ROAD CENTRELINE

ROAD SETOUT PLAN
SCALE 1:1500

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR INFORMATION	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26
C	FOR APPROVAL	SA	SD	EPG	04.11.26

Project
AURA SOUTH

Client
Stockland

Approved

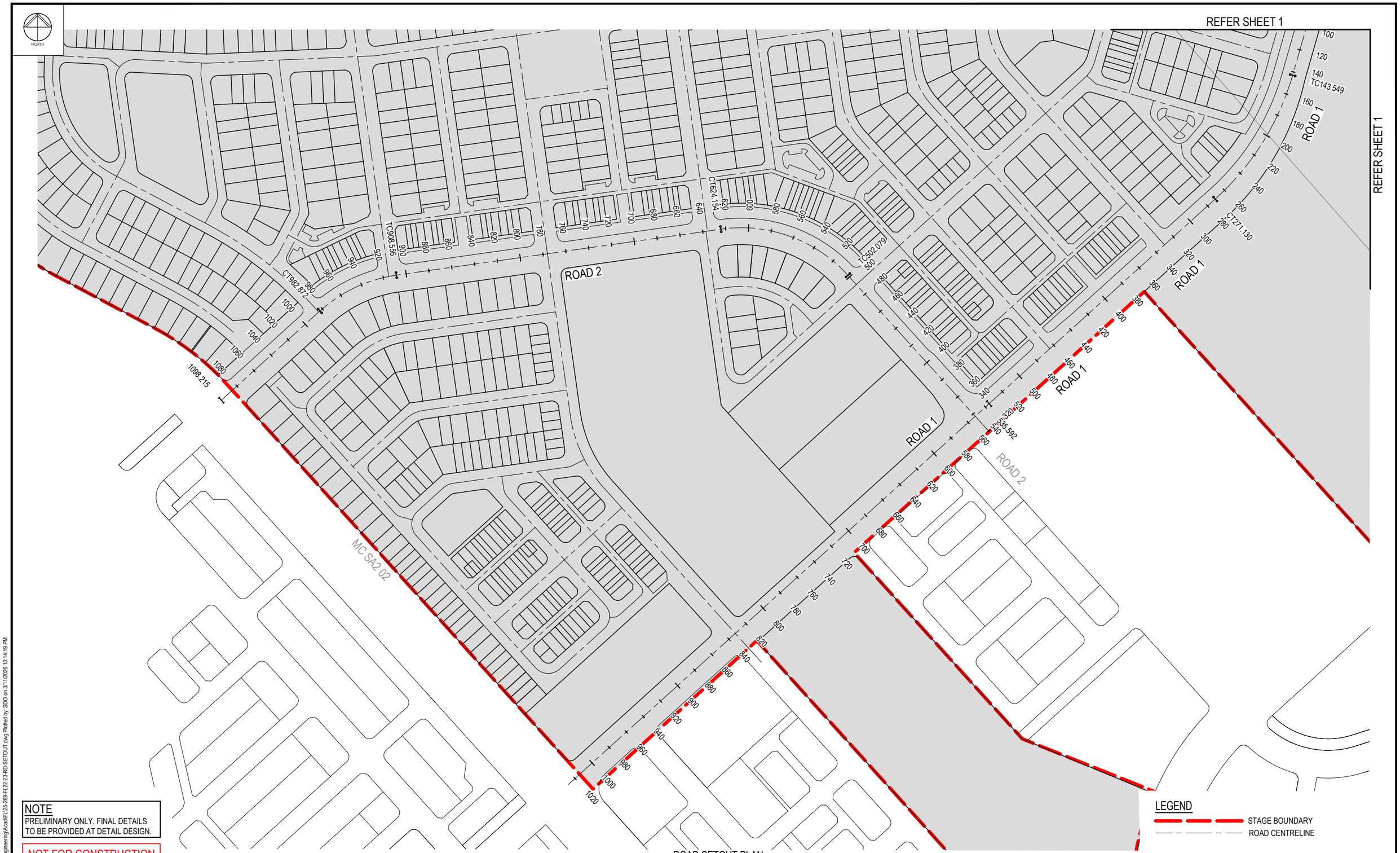
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DO NOT SCALE THIS DRAWING

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Drawing Title
ROADWORKS SETOUT PLAN SHEET 1

Scale: AS SHOWN
Sheet:
A1
Drawing No: 25-269-FL22
Revision: B

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NOTE
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NOT FOR CONSTRUCTION

ROAD SETOUT PLAN
SCALE 1:1500

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

15 0 15 30 45 60 75m
1 : 1500 (A1 UNREDUCED)

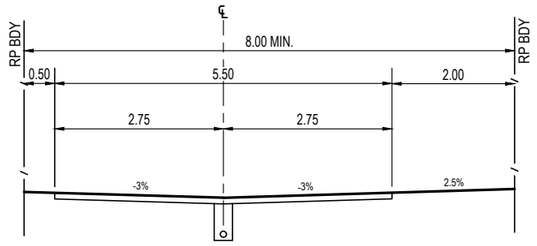
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Drawing Title
ROADWORKS
SETOUT PLAN
SHEET 2

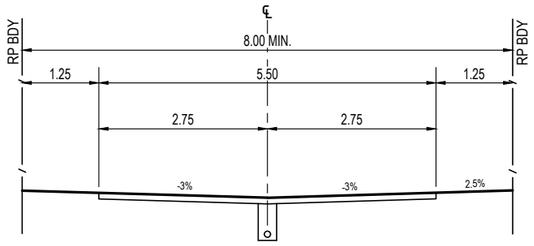
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Drawing No: 25-269-FL23
Revision: B

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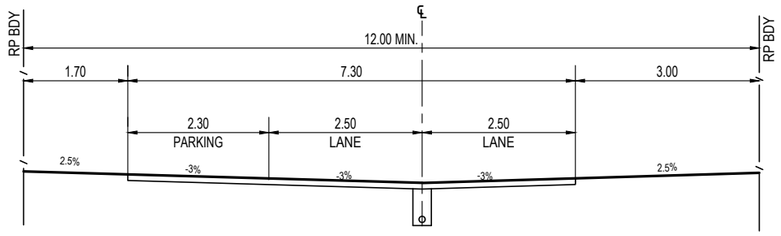
L1 - LANEWAY A

SCALE 1:50



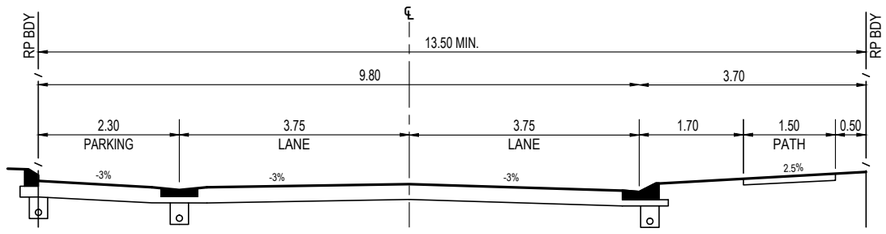
L2 - LANEWAY B

SCALE 1:50



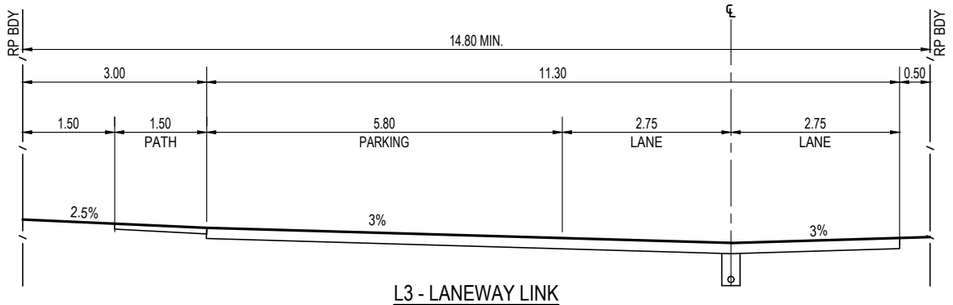
S1 - SHARED DRIVEWAY

SCALE 1:50



R2 - RESIDENTIAL ACCESS - ESPLANADE

SCALE 1:50



L3 - LANEWAY LINK

SCALE 1:50

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project

AURA SOUTH

Client

Stockland

Approved

1.0 0.5 0 1.0 2.0m
1 : 50 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

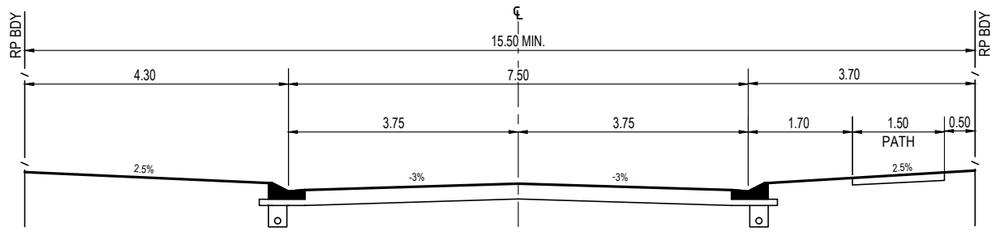
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Drawing Title

ROADWORKS
TYPICAL SECTIONS
SHEET 1

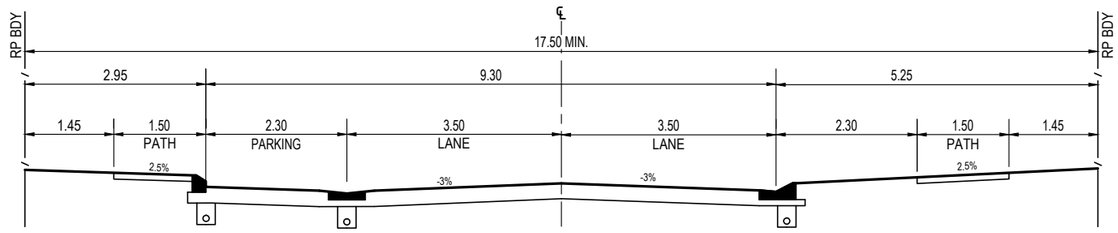
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AS SHOWN	
A1	Drawing No: 25-269-FL24
	Revision: B

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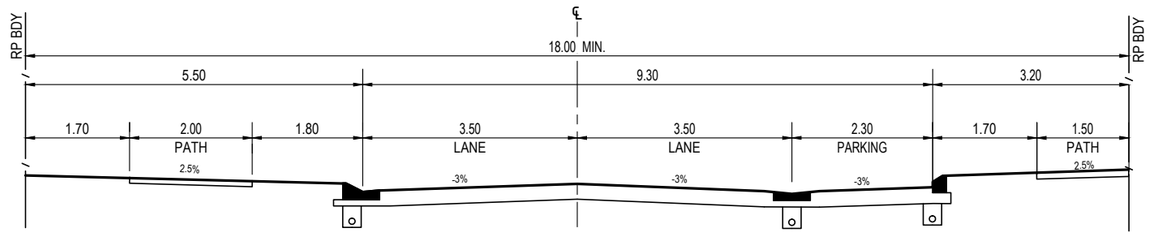
R1 - RESIDENTIAL ACCESS - STANDARD

SCALE 1:50



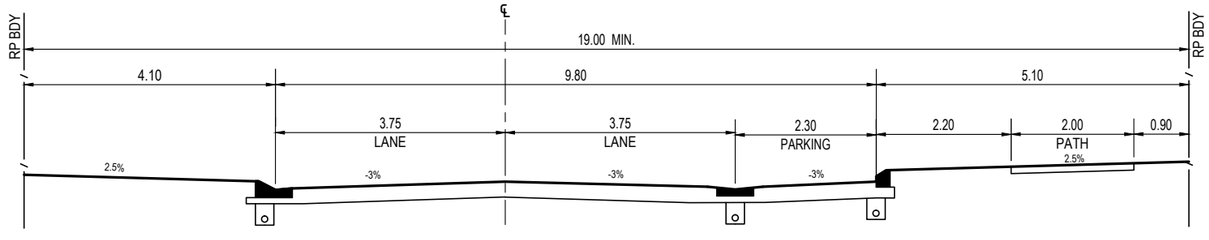
UA2 - URBAN ACCESS - URBAN VILLAGE

SCALE 1:50



NC8 - NEIGHBOURHOOD CONNECTOR - ESPLANADE

SCALE 1:50



NC7 - NEIGHBOURHOOD CONNECTOR - RESIDENTIAL ACCESS

SCALE 1:50

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project

AURA SOUTH

Client

Stockland

Approved

1.0 0.5 0 1.0 2.0m
1 : 50 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

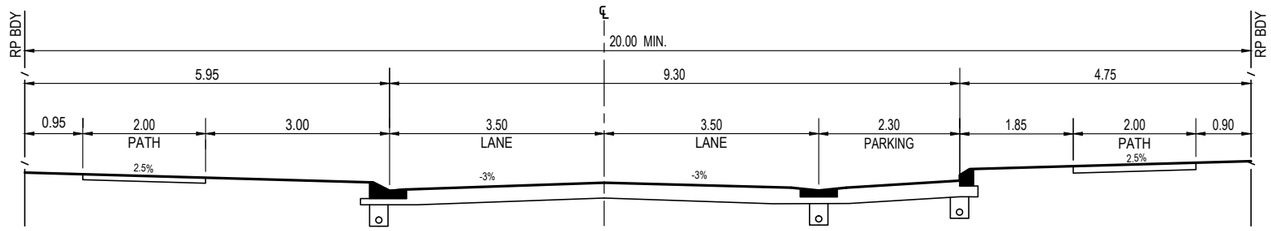
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Drawing Title

ROADWORKS
TYPICAL SECTIONS
SHEET 2

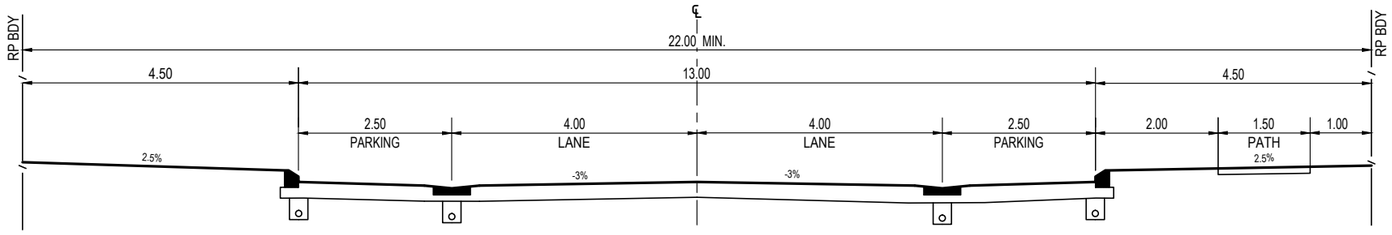
Scale	Sheet
AS SHOWN	
A1	Drawing No: 25-269-FL25
	Revision: B

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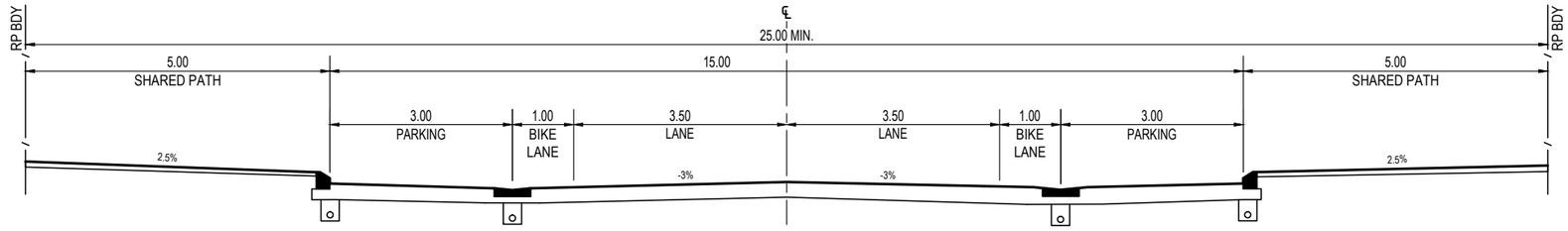
NC6 - NEIGHBOURHOOD CONNECTOR - RESIDENTIAL AVENUE

SCALE 1:50



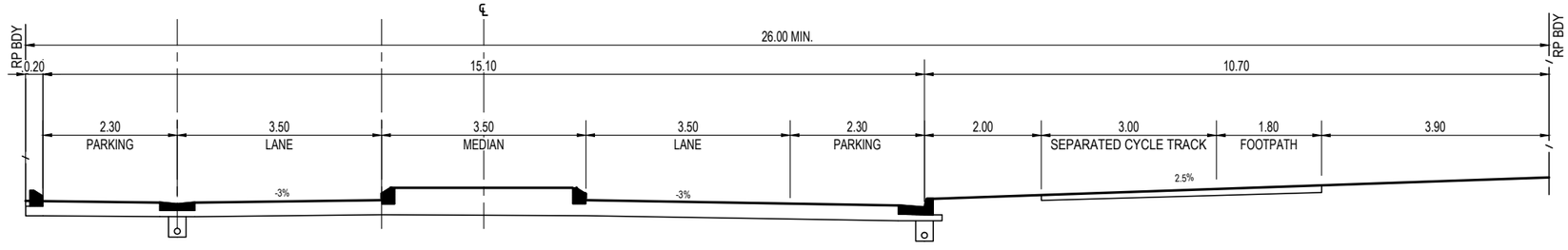
E2 - INDUSTRIAL ACCESS

SCALE 1:50



NC4A - NEIGHBOURHOOD CONNECTOR COMMERCIAL

SCALE 1:50



NC2A - NEIGHBOURHOOD CONNECTOR - LINEAR OPEN SPACE VARIATION

SCALE 1:50

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project

AURA SOUTH

Client

Stockland

Approved

1.0 0.5 0 1.0 2.0m
1 : 50 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

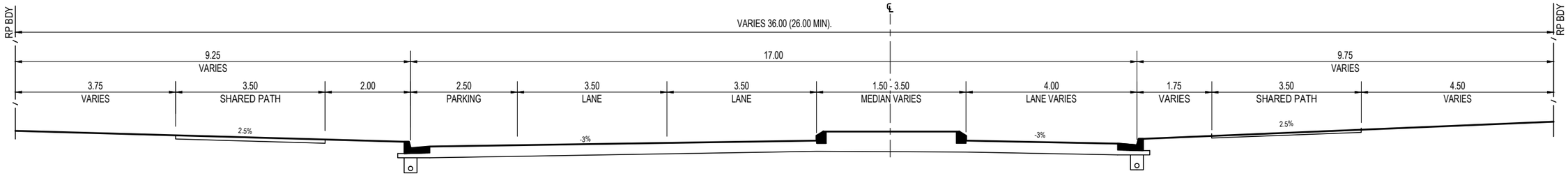
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Drawing Title

ROADWORKS
TYPICAL SECTIONS
SHEET 3

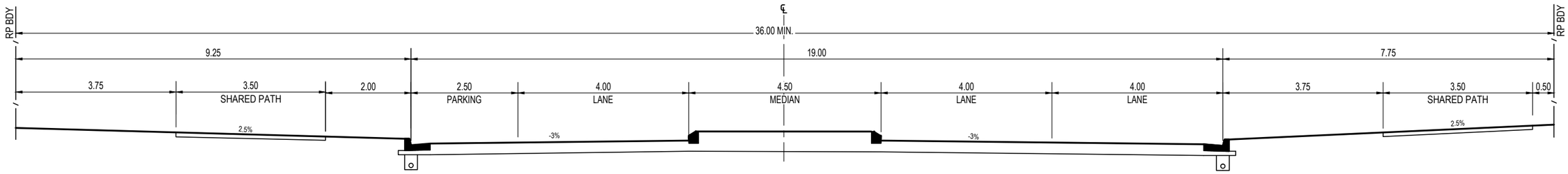
Scale	Sheet
AS SHOWN	
A1	Drawing No 25-269-FL26
	Revision B

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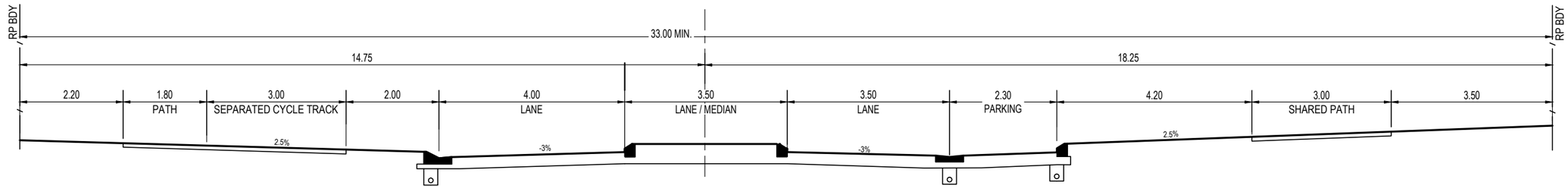
E1 - INDUSTRIAL CONNECTOR A

SCALE 1:50



E1 - INDUSTRIAL CONNECTOR B

SCALE 1:50



NC3 - NEIGHBOURHOOD CONNECTOR

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: **AURA SOUTH**

Client: Stockland

Approved

1.0 0.5 0 1.0 2.0m
1 : 50 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

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Drawing Title: ROADWORKS TYPICAL SECTIONS SHEET 4

Scale: AS SHOWN

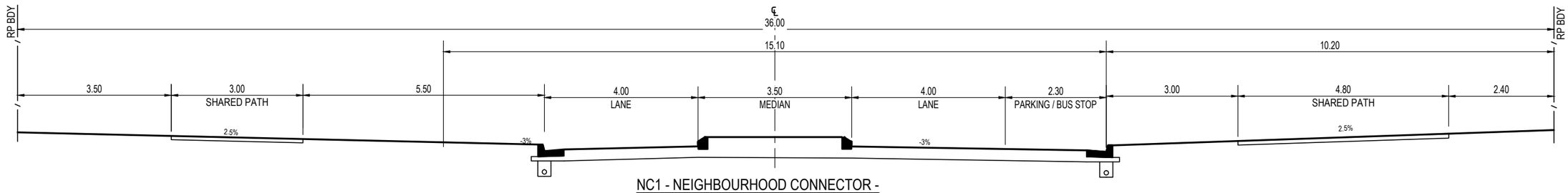
Sheet:

A1

Drawing No: 25-269-FL27

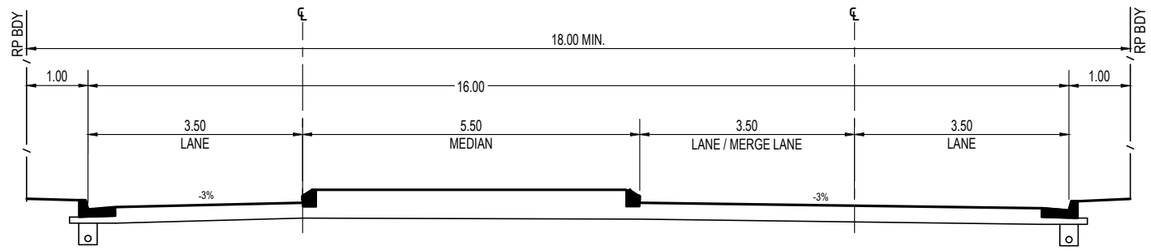
Revision: B

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NC1 - NEIGHBOURHOOD CONNECTOR - ARRIVAL BOULEVARD

SCALE 1:50



SA1 - MAJOR SUB ARTERIAL - INTERIM

SCALE 1:50

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: AURA SOUTH

Client: Stockland

Approved:

1.0 0.5 0 1.0 2.0m
1 : 50 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

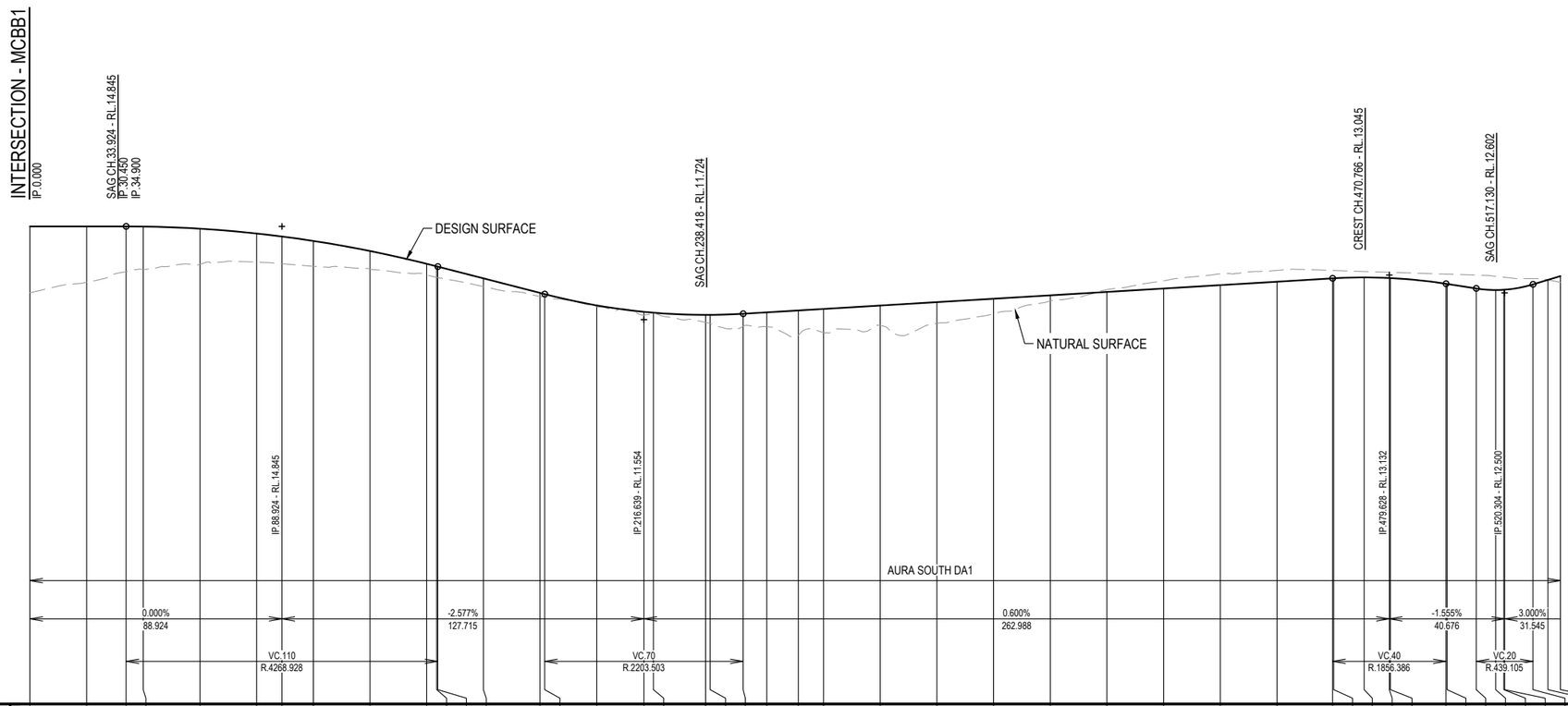
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Drawing Title: ROADWORKS TYPICAL SECTIONS SHEET 5

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL28
Revision: B

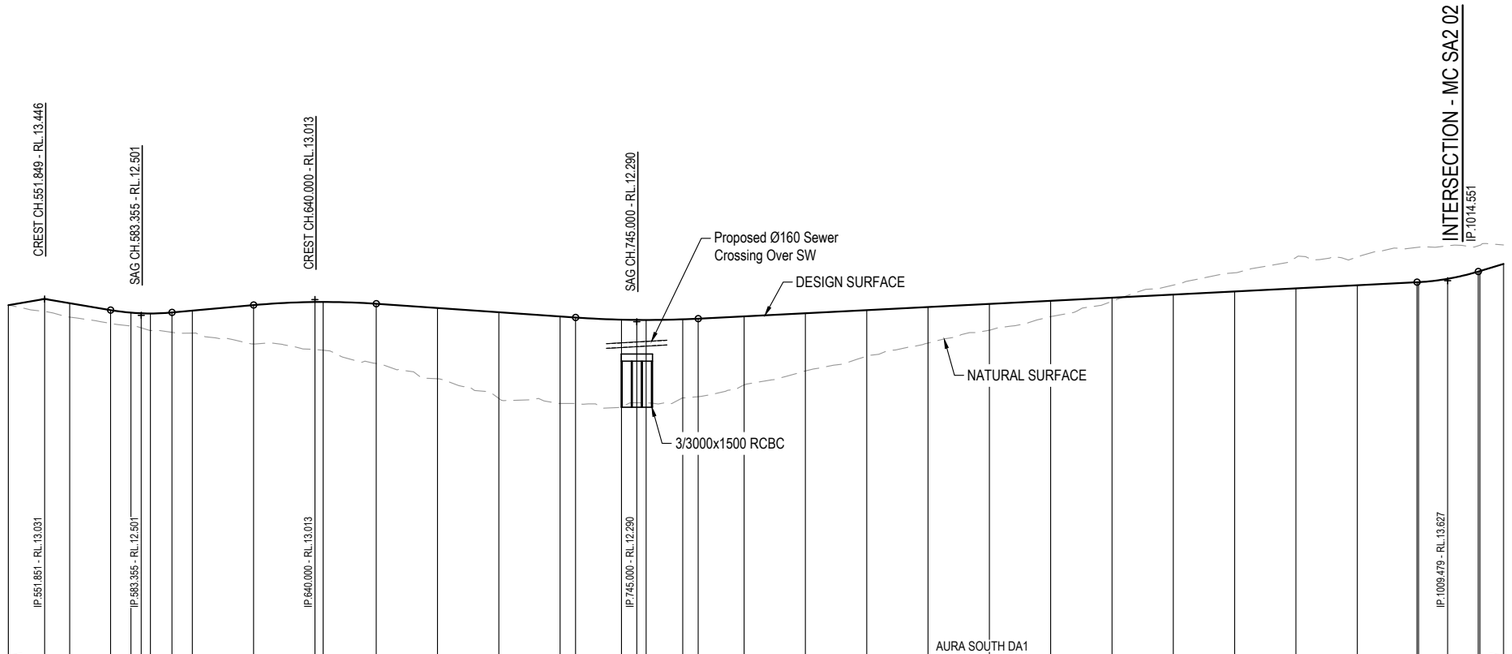
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POSTED SPEED	60 Km/hr
DESIGN SPEED	60 Km/hr



| | | |

POSTED SPEED	60 Km/hr
DESIGN SPEED	60 Km/hr



DATUM R.L.-3.000

NATURAL SURFACE	12.839	12.625	12.439	12.235	12.150	12.091	12.003	11.947	11.919	11.565	11.385	11.361	10.931	10.431	9.790	9.623	9.622	9.519	9.648	9.642	9.806	9.847	10.228	10.688	11.168	11.595	12.013	12.457	12.956	13.483	13.886	14.383	14.400	14.714	14.720	14.764	14.766	14.783	14.791
CUT/FILL DEPTH	-0.007	0.406	0.455	0.434	0.435	0.475	0.557	0.645	0.732	1.267	1.548	1.573	1.944	2.306	2.810	2.838	2.805	2.839	2.702	2.706	2.563	2.543	2.238	1.880	1.501	1.175	0.858	0.516	0.118	-0.309	-0.610	-1.006	-0.922	-1.137	-1.141	-1.074	-0.839	-0.841	-0.616
DESIGN SURFACE	12.831	13.031	12.894	12.669	12.586	12.565	12.560	12.591	12.651	12.832	12.933	12.934	12.875	12.737	12.599	12.462	12.427	12.358	12.349	12.348	12.369	12.391	12.467	12.568	12.669	12.770	12.871	12.972	13.073	13.175	13.276	13.377	13.478	13.577	13.579	13.689	13.927	13.943	14.175
PEGGED CHAINAGE	540.000	551.851	560.000	573.355	580.000	583.355	586.365	593.355	600.000	620.000	640.000	642.701	660.000	680.000	700.000	720.000	725.000	740.000	745.000	748.062	760.000	765.000	780.000	800.000	820.000	840.000	860.000	880.000	900.000	920.000	940.000	960.000	980.000	999.479	1000.000	1009.479	1019.479	1020.000	1027.740

Horiz Curve Data

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

LONGITUDINAL SECTION - ROAD 01
SCALE - 1:1000 (H)
1:100 (V)

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

1 : 1000 (A1 UNREDUCED)
1 : 100 (A1 UNREDUCED)
DO NOT SCALE THIS DRAWING

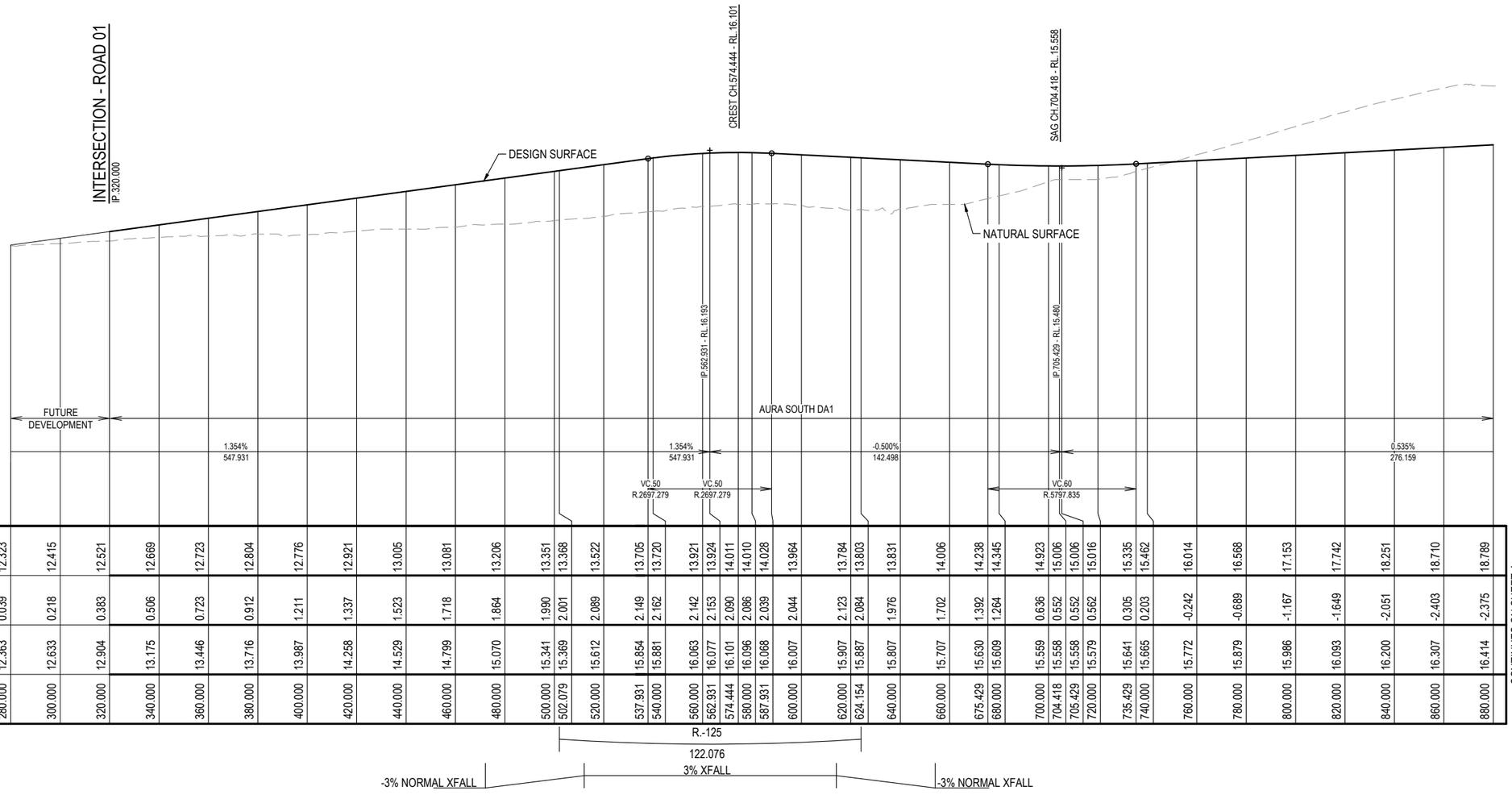
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Drawing Title
ROADWORKS
LONGITUDINAL SECTIONS
ROAD 01 - SHEET 2

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL30
Revision: B

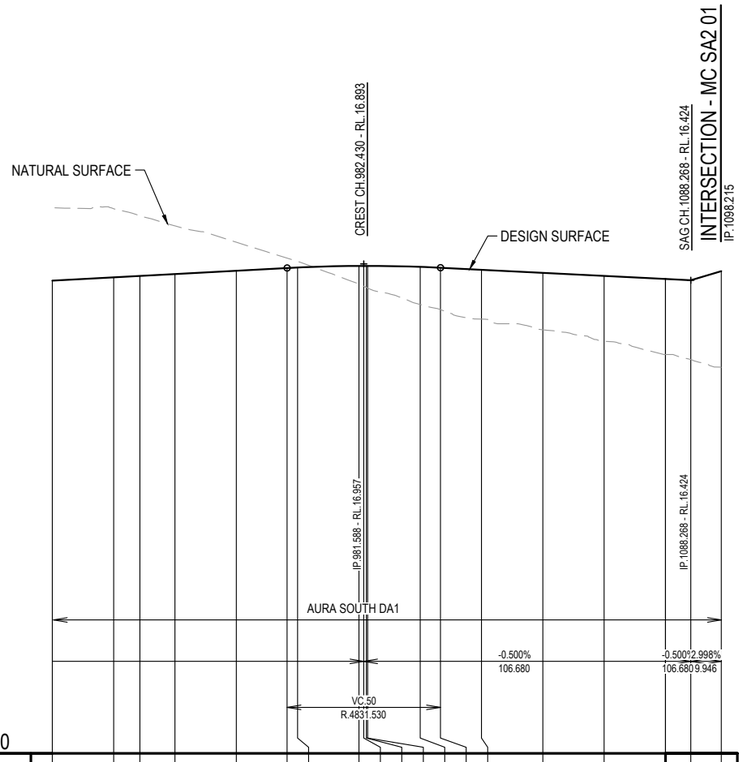
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POSTED SPEED	60 Km/hr
DESIGN SPEED	60 Km/hr



| | | |

POSTED SPEED	60 Km/hr
DESIGN SPEED	60 Km/hr



NATURAL SURFACE	18.789	18.755	18.531	18.197	17.665	17.145	17.039	16.301	16.229	16.191	16.171	15.635	15.469	15.159	14.811	14.435	14.006	13.841	13.583
CUT/FILL DEPTH	-2.375	-2.234	-1.964	-1.569	-0.930	-0.322	-0.199	0.591	0.664	0.701	0.721	1.226	1.364	1.607	1.854	2.131	2.460	2.582	3.139
DESIGN SURFACE	16.414	16.521	16.567	16.628	16.735	16.824	16.841	16.892	16.893	16.893	16.893	16.861	16.832	16.765	16.665	16.565	16.465	16.424	16.722
PEGGED CHAINAGE	880.000	900.000	908.556	920.000	940.000	956.588	960.000	980.000	981.588	982.430	982.872	1000.000	1006.588	1020.000	1040.000	1060.000	1080.000	1088.268	1098.215

Horiz Curve Data: R.-125

74.316

Superelevation: -3% NORMAL XFALL | 3% XFALL | -3% NORMAL XFALL

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

LONGITUDINAL SECTION - ROAD 02

SCALE - 1:1000 (H)
1:100 (V)

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: **AURA SOUTH**

Client: Stockland

Approved

1 : 1000 (A1 UNREDUCED) — 10 5 0 10 20 30 40 50m

1 : 100 (A1 UNREDUCED) — 1 0.5 0 1 2 3 4 5m

DO NOT SCALE THIS DRAWING

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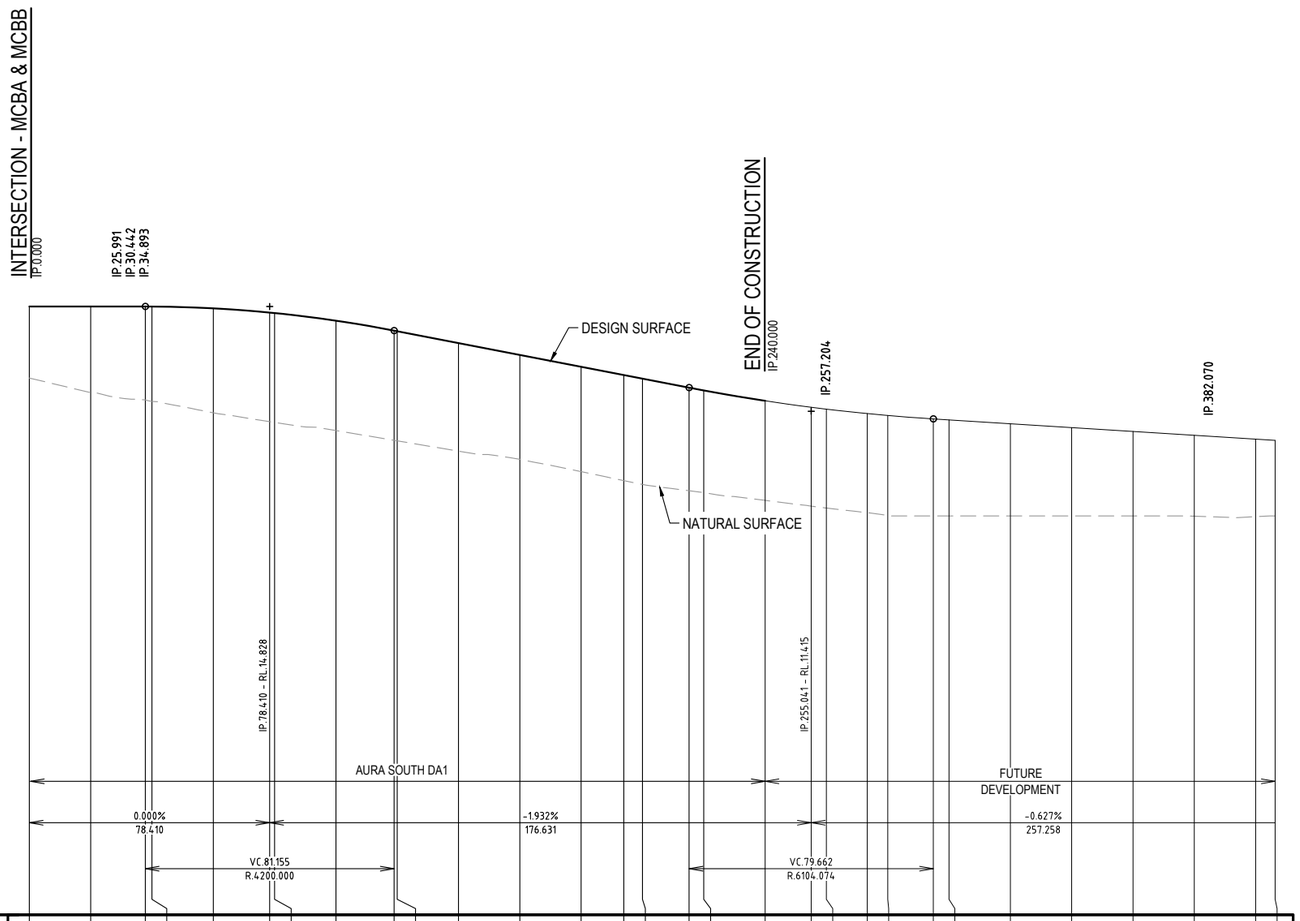
Drawing Title: ROADWORKS LONGITUDINAL SECTIONS ROAD 02 - SHEET 2

Scale	Sheet
AS SHOWN	
A1	

Drawing No	Revision
25-269-FL32	B

M:\2025\25269 Aura South DA1 Preliminary Support\Engineering\Acad\FL\25-269-FL29-35-RD-LONGS.dwg Plotted by: SDO on 3/11/2026 10:14:33 PM

POSTED SPEED	60 Km/hr
DESIGN SPEED	60 Km/hr



DATUM R.L.-5.000

NATURAL SURFACE	12.497	12.022	11.780	11.735	11.365	11.076	11.051	10.785	10.467	10.450	10.115	9.847	9.444	9.154	9.028	8.822	8.760	8.507	8.321	8.258	8.108	8.014	8.003	8.003	8.003	8.003	8.003	8.003	7.993	7.977	8.003
CUT/FILL DEPTH	2.331	2.805	3.048	3.092	3.404	3.556	3.565	3.583	3.577	3.574	3.523	3.404	3.421	3.442	3.450	3.363	3.334	3.248	3.224	3.225	3.230	3.262	3.162	3.130	3.004	2.879	2.753	2.638	2.529	2.462
DESIGN SURFACE	14.828	14.828	14.828	14.827	14.769	14.632	14.616	14.368	14.044	14.024	13.638	13.251	12.865	12.596	12.478	12.184	12.094	11.756	11.545	11.483	11.338	11.276	11.165	11.133	11.007	10.882	10.756	10.631	10.506	10.466
PEGGED CHAINAGE	0.000	20.000	37.833	40.000	60.000	78.410	80.000	100.000	118.988	120.000	140.000	160.000	180.000	193.927	200.000	215.210	220.000	240.000	255.041	260.000	273.309	280.000	294.873	300.000	320.000	340.000	360.000	380.000	400.000	406.368

Horiz Curve Data

R.200
79.382

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

LONGITUDINAL SECTION - ROAD 05

SCALE - 1:1000 (H)
1:100 (V)

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: AURA SOUTH

Client: Stockland

Approved

10 5 0 10 20 30 40 50m
1 : 1000 (A1 UNREDUCED)
1 0.5 0 1 2 3 4 5m
1 : 100 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

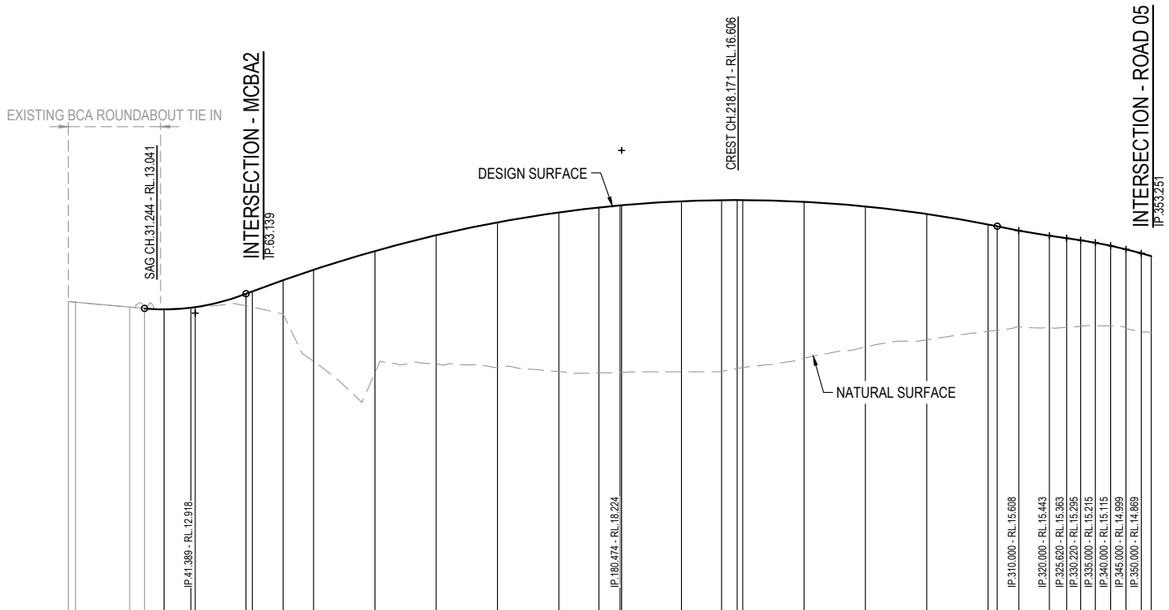
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Drawing Title: ROADWORKS LONGITUDINAL SECTIONS ROAD 5

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL33
Revision: B

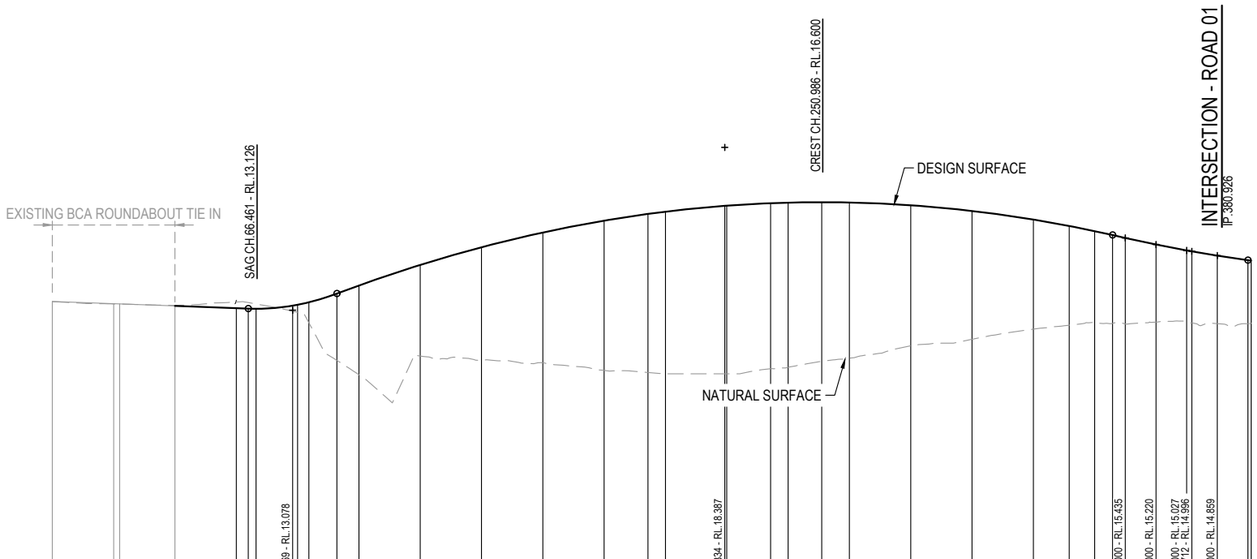
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POSTED SPEED	60 Km/hr
DESIGN SPEED	70 Km/hr

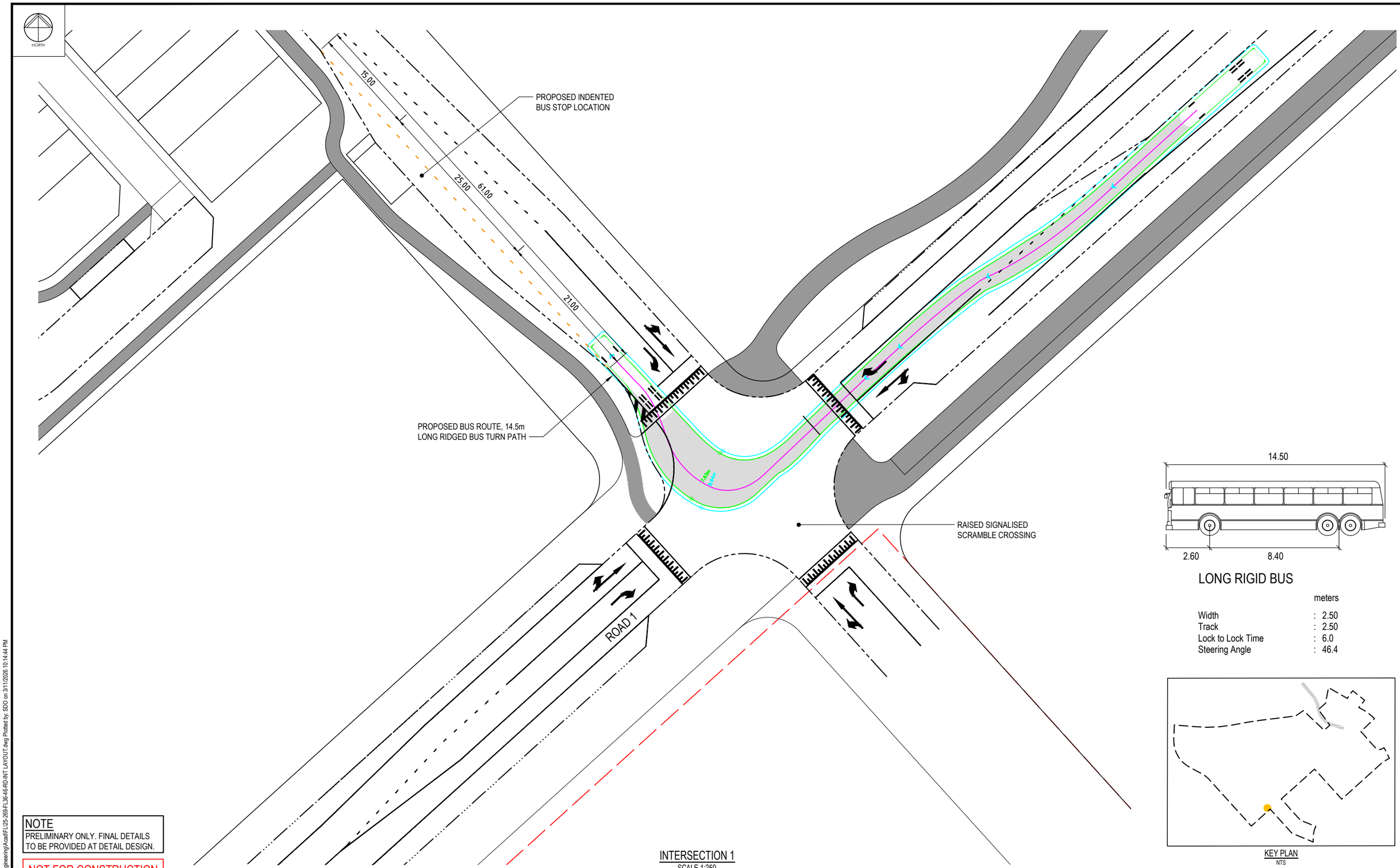


| | | |

POSTED SPEED	60 Km/hr
DESIGN SPEED	70 Km/hr



| | | |



LONG RIGID BUS

		meters
Width	:	2.50
Track	:	2.50
Lock to Lock Time	:	6.0
Steering Angle	:	46.4

KEY PLAN
NTS

INTERSECTION 1
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)

NOTE
PRELIMINARY ONLY. FINAL DETAILS
TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

5 0 5 10m
1 : 250 (A1 UNREDUCED)

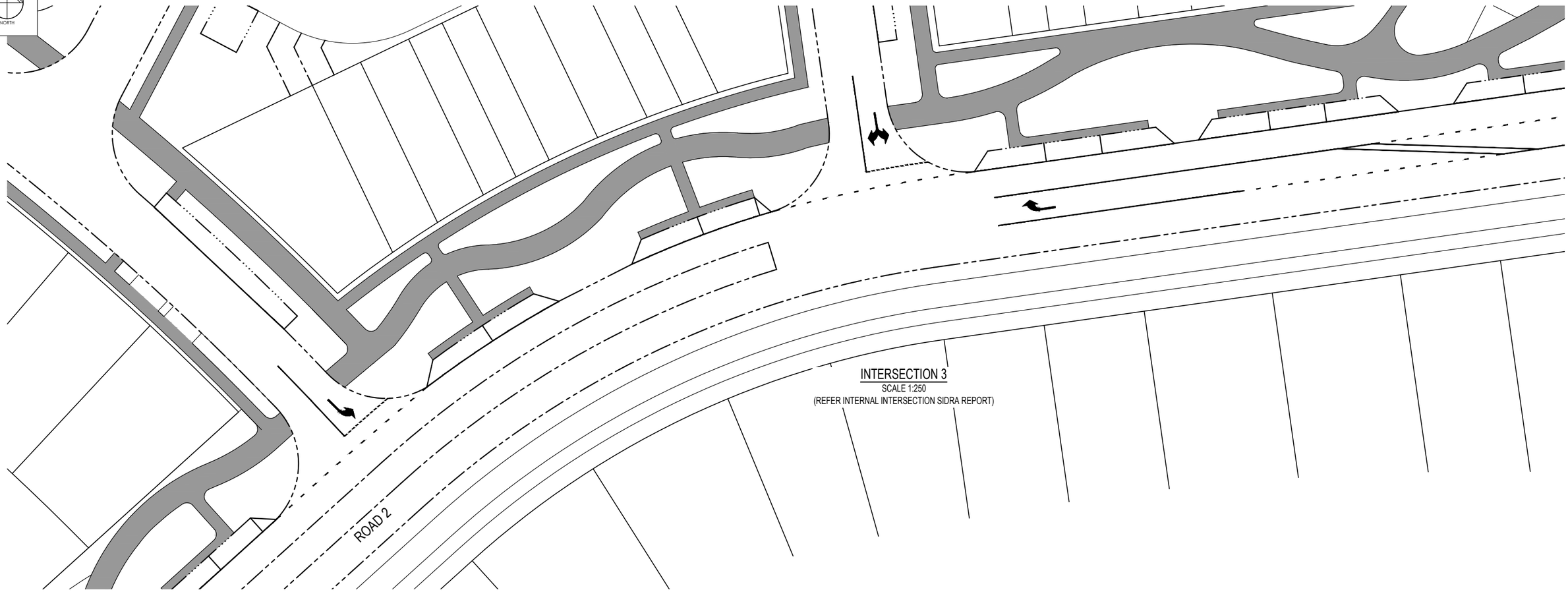
DO NOT SCALE THIS DRAWING

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Drawing Title
ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 1

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL36
Revision: B

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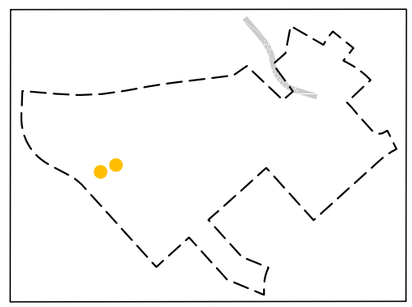


INTERSECTION 3
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)

INTERSECTION 2
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION



KEY PLAN
NTS

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

5 0 5 10m
1 : 250 (A1 UNREDUCED)

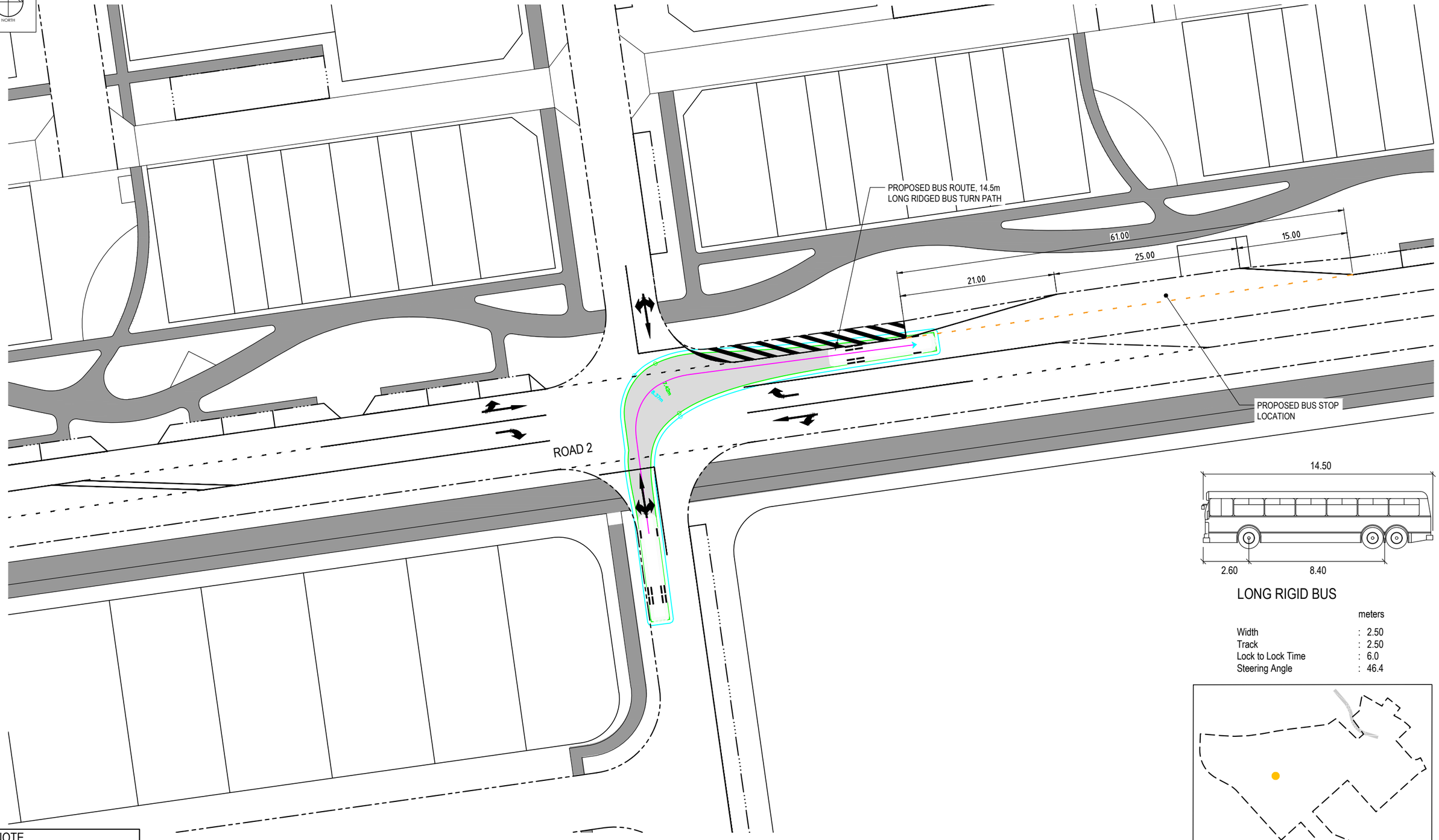
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Drawing Title
ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 2

Scale: AS SHOWN
Sheet:
A1
Drawing No: 25-269-FL37
Revision: B

M:\2025\25269 Aura South DA1 Preliminary Support\Engineering\Acad\FL\25-269-FL36-46-RD-INT LAYOUT.dwg Plotted by: SDO on 3/11/2025 10:14:47 PM



LONG RIGID BUS

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 46.4

KEY PLAN
NTS

NOTE
PRELIMINARY ONLY. FINAL DETAILS
TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

INTERSECTION 4
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

5 0 5 10m
1 : 250 (A1 UNREDUCED)

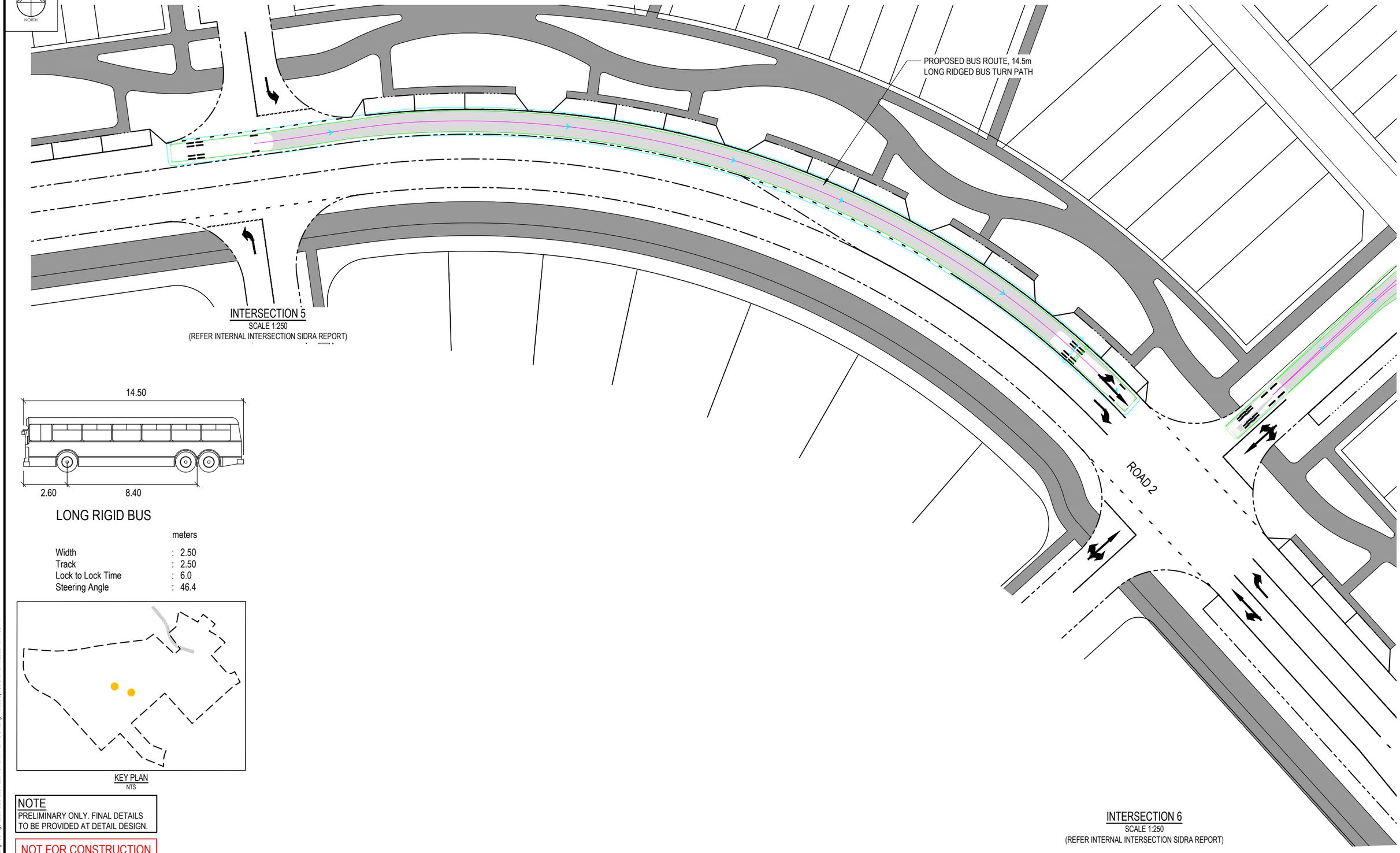
DO NOT SCALE THIS DRAWING

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Drawing Title
ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 3

Scale	Sheet
AS SHOWN	
A1	
Drawing No: 25-269-FL38	Revision: B

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INTERSECTION 5
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)

INTERSECTION 6
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)

LONG RIGID BUS

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 46.4

KEY PLAN
NTS

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

5 0 5 10m
1 : 250 (A1 UNREDUCED)

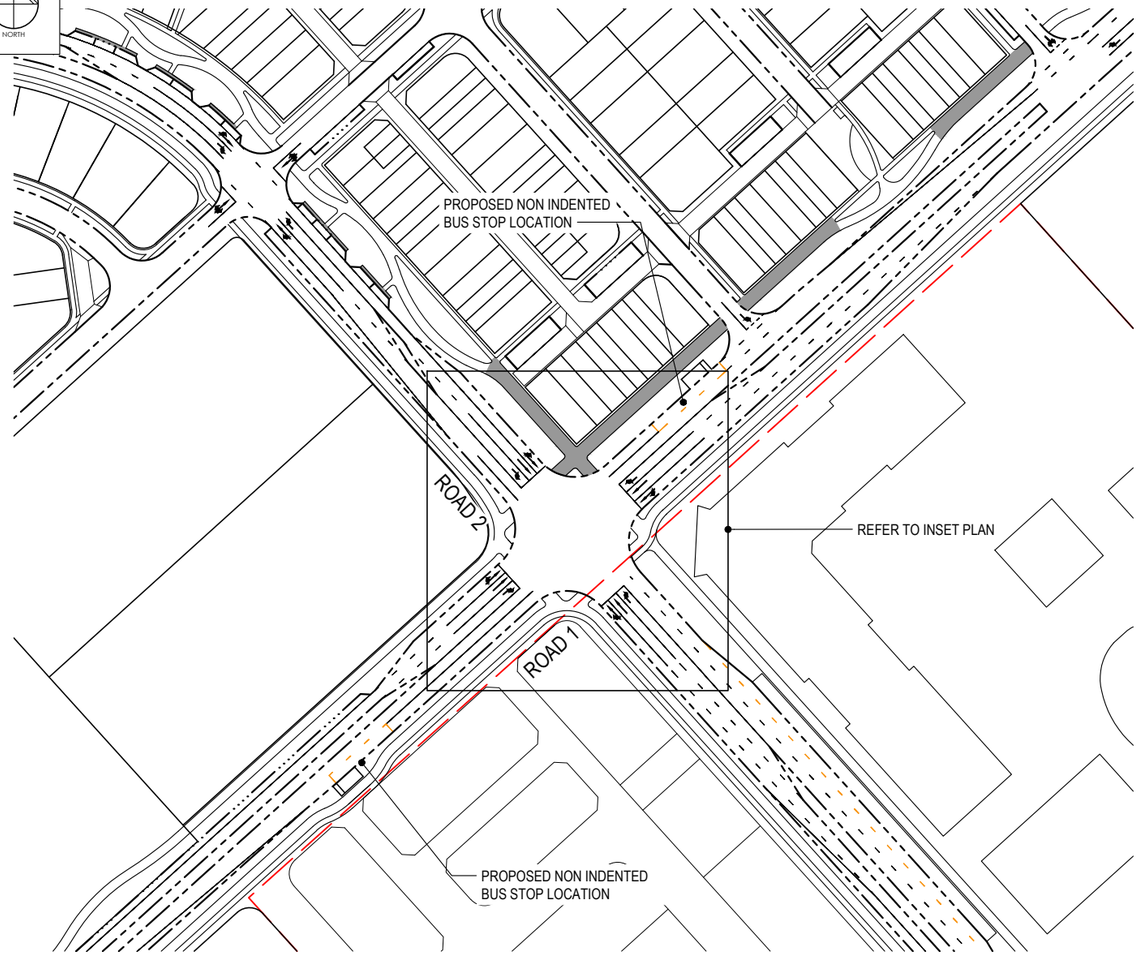
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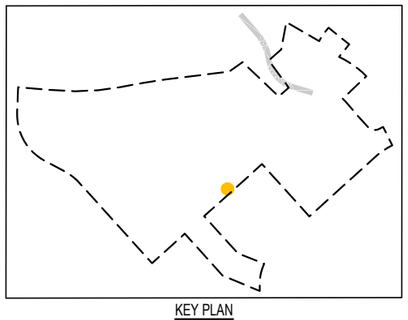
Drawing Title
ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 4

Scale	Sheet
AS SHOWN	
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	Revision: B

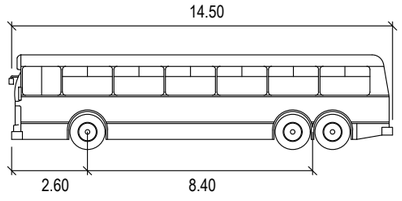
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INTERSECTION 7 OVERALL
SCALE 1:1000
(REFER INTERNAL INTERSECTION SIDRA REPORT)

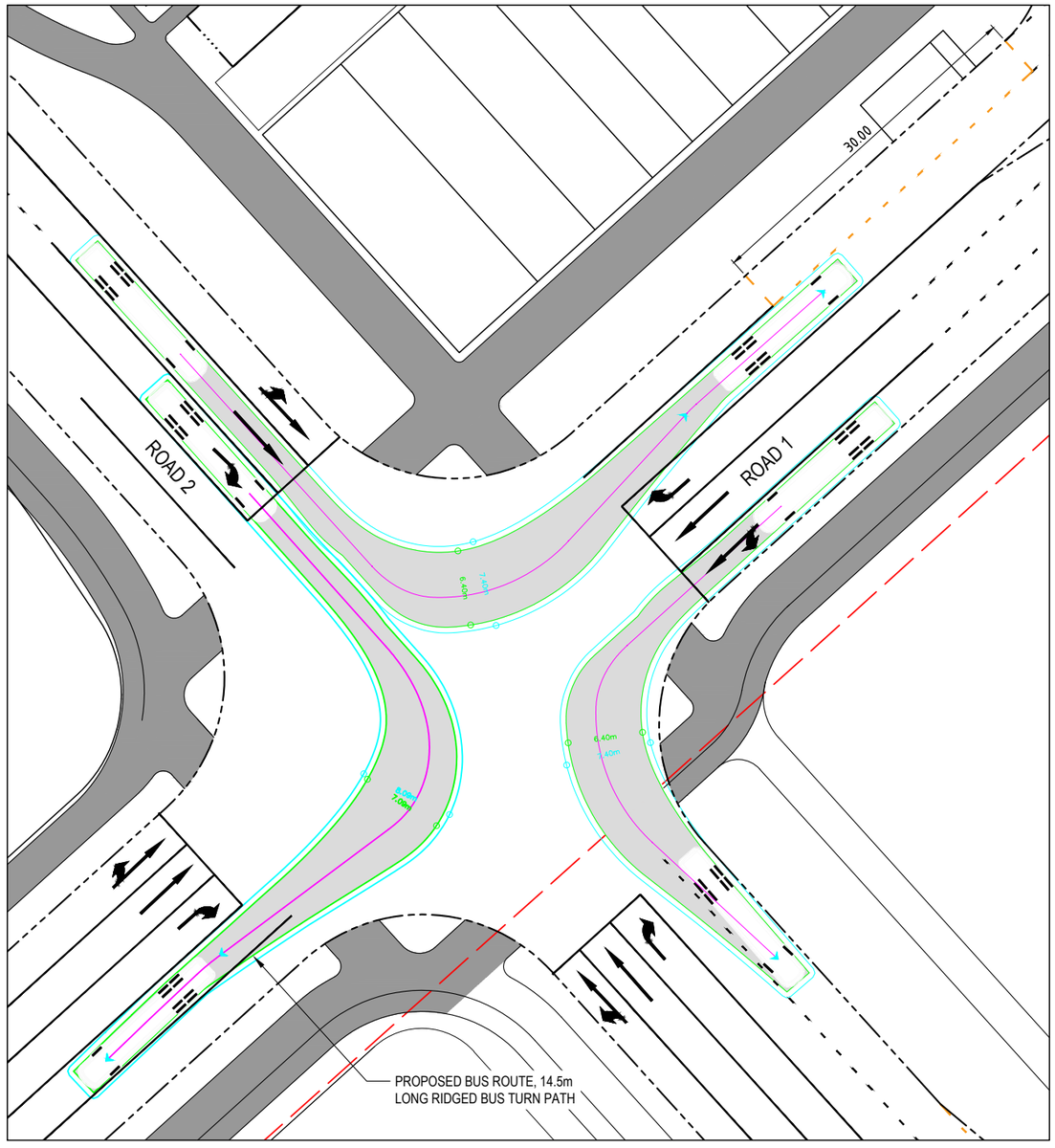


KEY PLAN
NTS



LONG RIGID BUS

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 46.4



INSET - INTERSECTION 7
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)

DESIGN STANDARDS - AUX THROUGH-LANE

- DESIGN SPEED 60km/h
- DIVERGE TAPER LENGTH = 60m
- MERGE TAPER LENGTH = 100m
- 4 SEC OF TRAVEL PARALLEL LANE LENGTH = 67m
- RUN OUT LENGTH = 30m
- APPROACH SIGHT DISTANCE TO MERGE = 73m

STANDARDS REFERENCES

- AUSTROADS GTRD PART 4A - SECTION 5.5 AND 5.6
- AUSTROADS GTRD PART 3 - SECTION 9.9.2
- AS 1742.2:2022 - SECTION 4.6.2

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA		EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

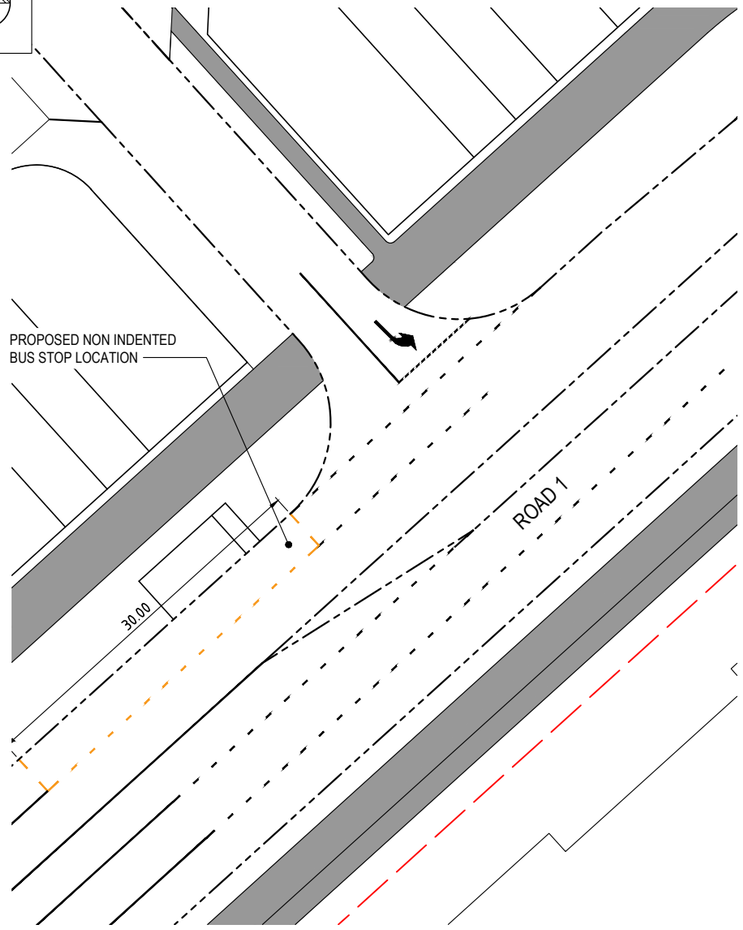
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1 : 1000 (A1 UNREDUCED)
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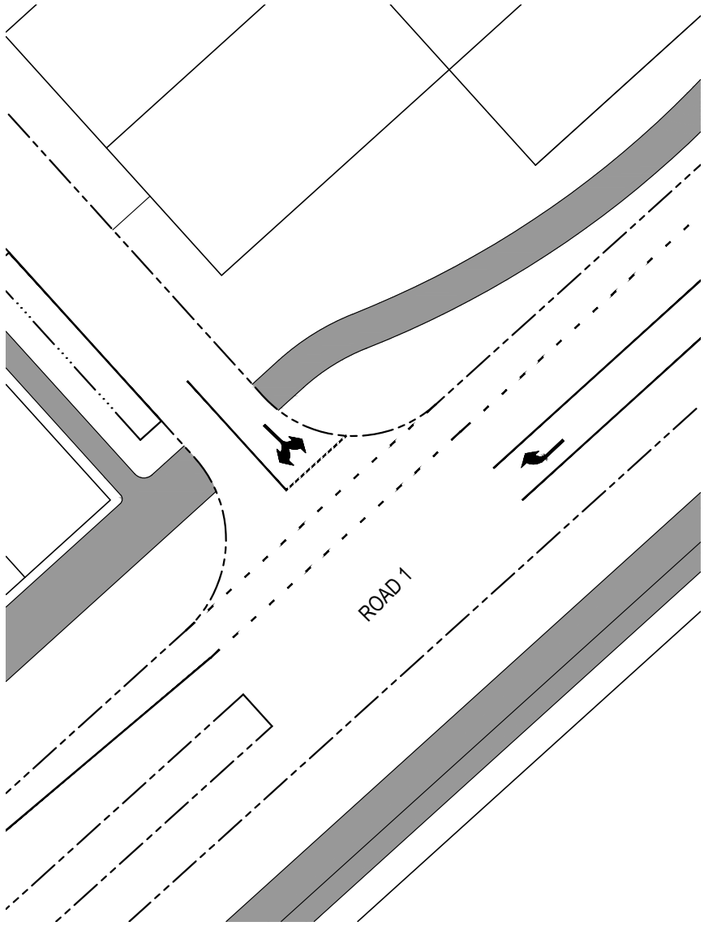
Drawing Title
ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 5

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AS SHOWN	
A1	Drawing No. 25-269-FL40
	Revision B

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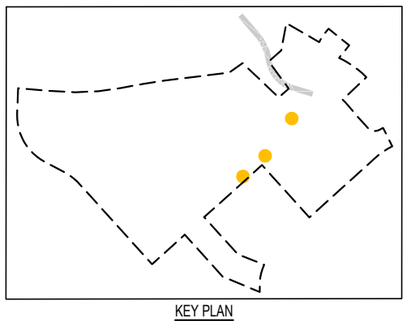
INTERSECTION 8
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)



INTERSECTION 9
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)



BUS STOP DETAIL
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)



KEY PLAN
NTS

DESIGN STANDARDS - AUX THROUGH-LANE

- DESIGN SPEED 60km/h
- DIVERGE TAPER LENGTH = 60m
- MERGE TAPER LENGTH = 100m
- 4 SEC OF TRAVEL PARALLEL LANE LENGTH = 67m
- RUN OUT LENGTH = 30m
- APPROACH SIGHT DISTANCE TO MERGE = 73m

STANDARDS REFERENCES

- AUSTROADS GTRD PART 4A - SECTION 5.5 AND 5.6
- AUSTROADS GTRD PART 3 - SECTION 9.9.2
- AS 1742.2:2022 - SECTION 4.6.2

NOTE
PRELIMINARY ONLY. FINAL DETAILS
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NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

5 0 5 10m
1 : 250 (A1 UNREDUCED)
DO NOT SCALE THIS DRAWING

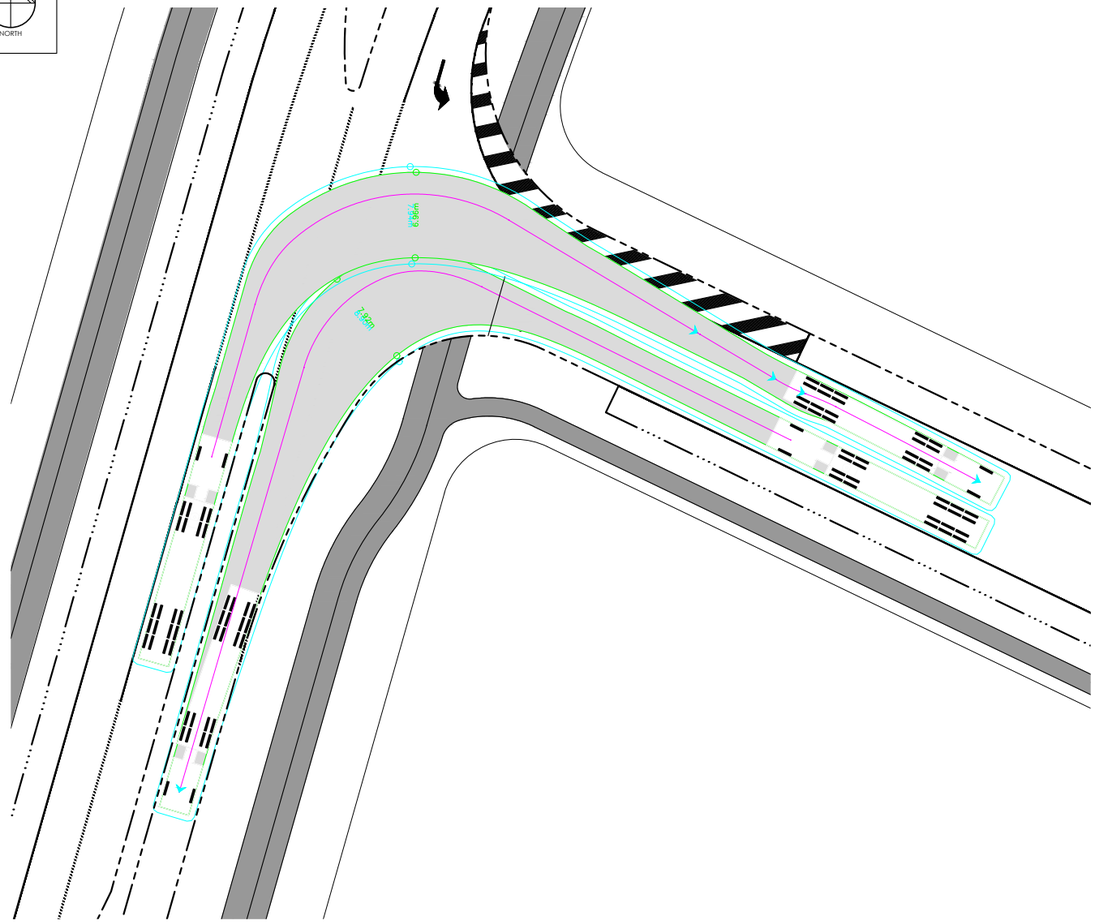
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Drawing Title
ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 6

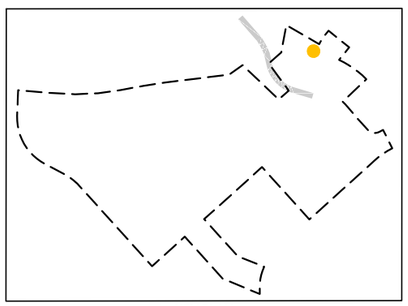
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Drawing No	Revision
25-269-FL41	B

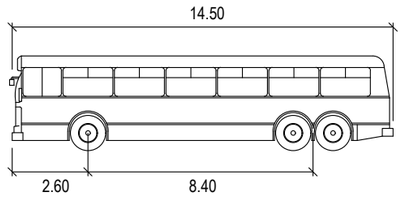
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INTERSECTION 10
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)



KEY PLAN
NTS

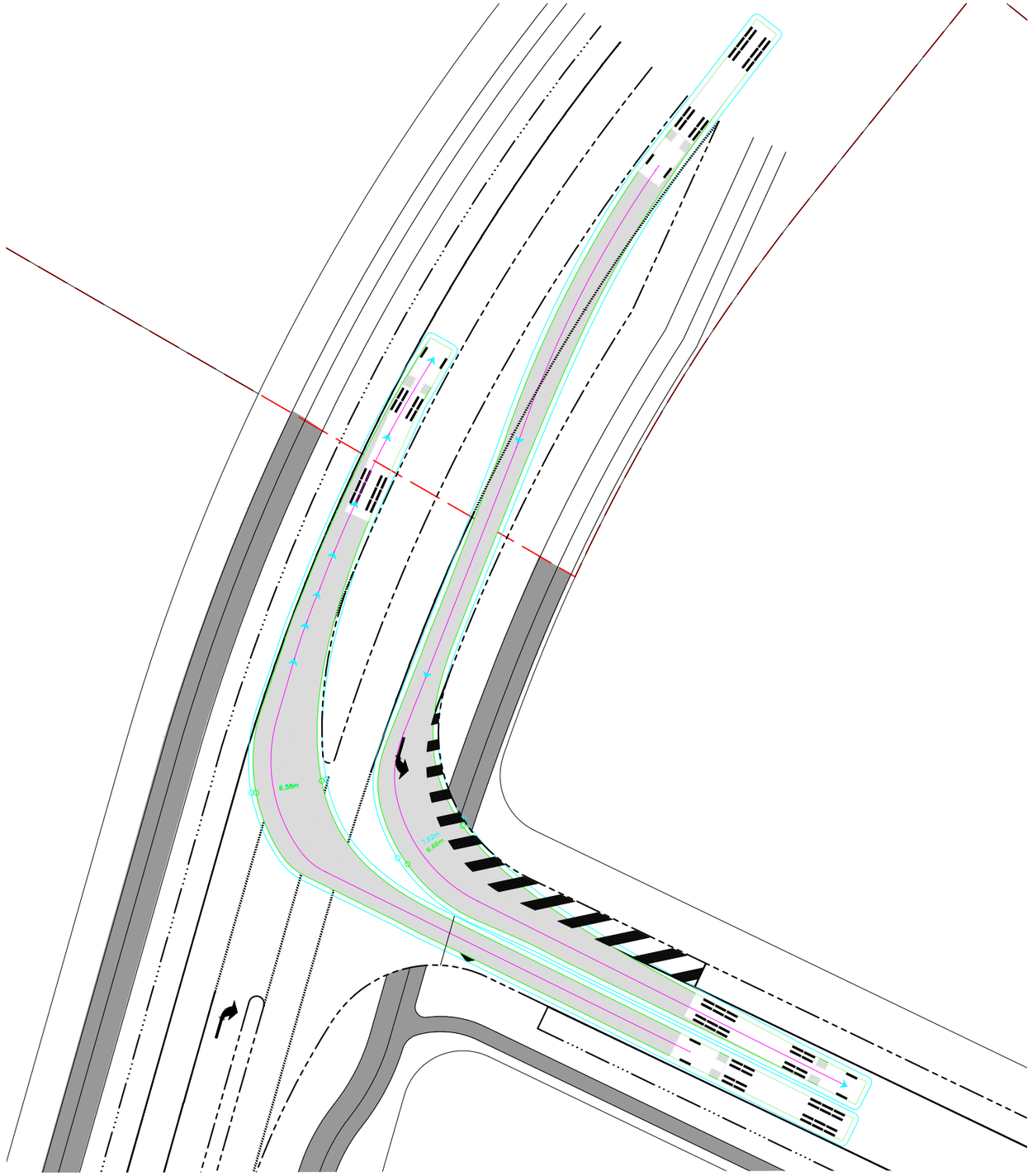


LONG RIGID BUS

		meters
Width	:	2.50
Track	:	2.50
Lock to Lock Time	:	6.0
Steering Angle	:	46.4

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

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INTERSECTION 11
SCALE 1:250
(REFER INTERNAL INTERSECTION SIDRA REPORT)

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

5 0 5 10m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

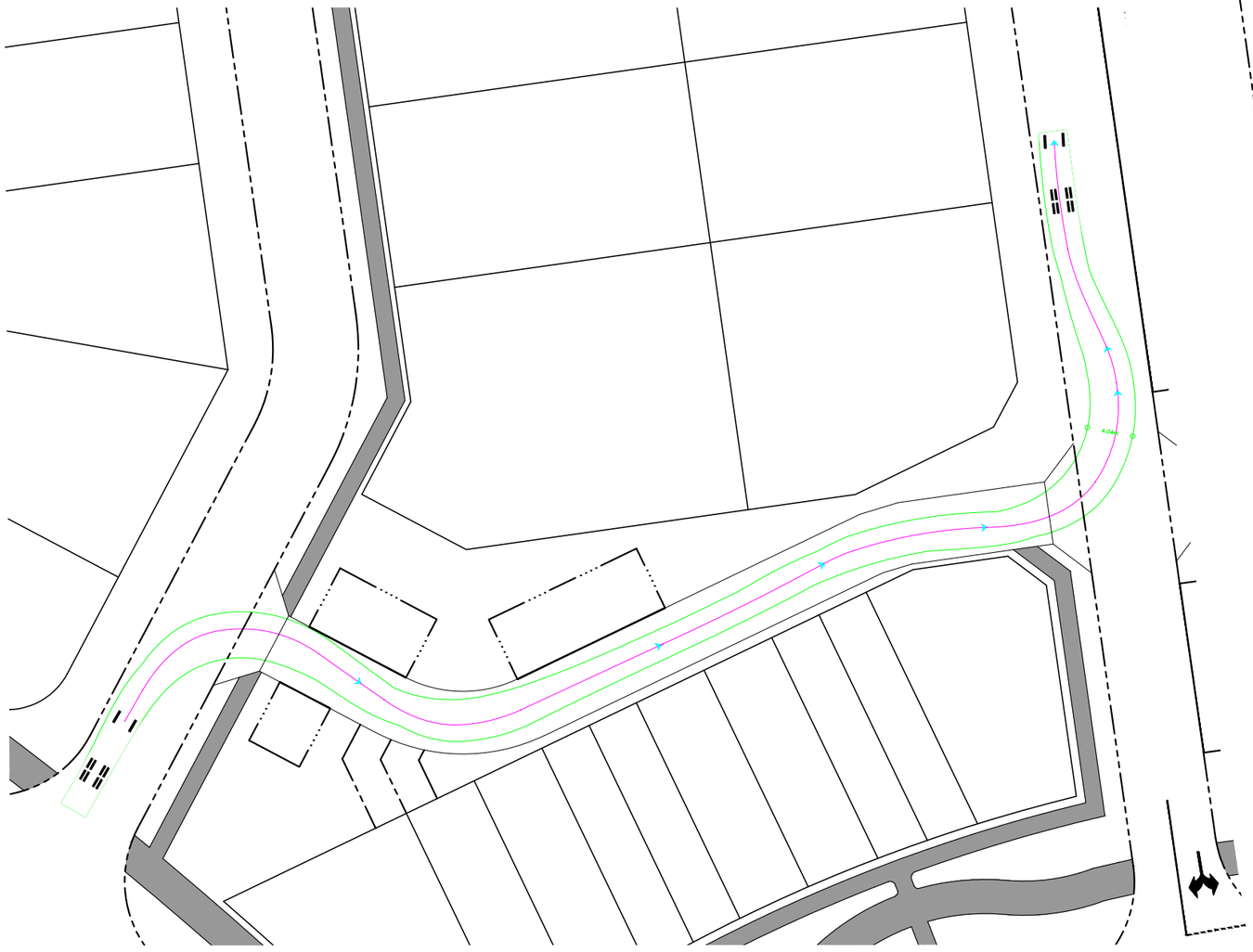
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Drawing Title
ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 7

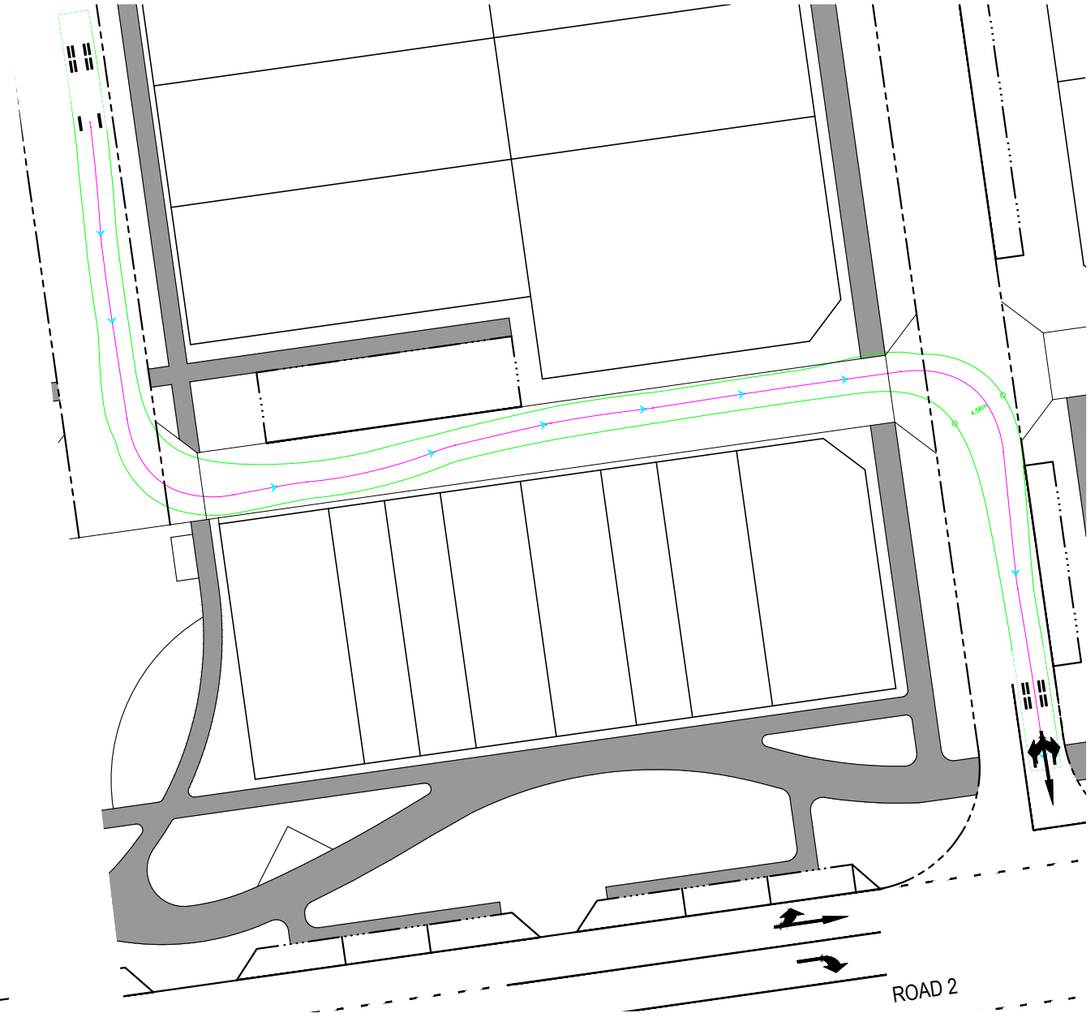
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Revision: B

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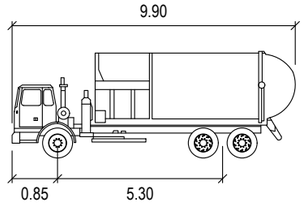
NORTH



REFUSE TRUCK SWEPT PATH
SCALE 1:250

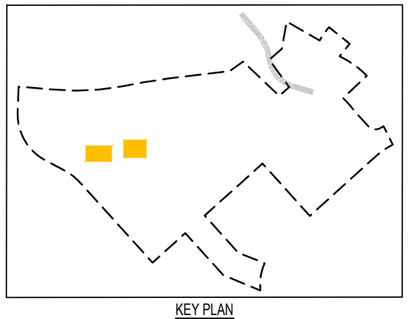


REFUSE TRUCK SWEPT PATH
SCALE 1:250



SCC SIDE LOADING RECYCLING TRUCK

	meters
Width	: 2.49
Track	: 1.91
Lock to Lock Time	: 6.0
Steering Angle	: 40.0



KEY PLAN
NTS

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

5 0 5 10m
1 : 250 (A1 UNREDUCED)

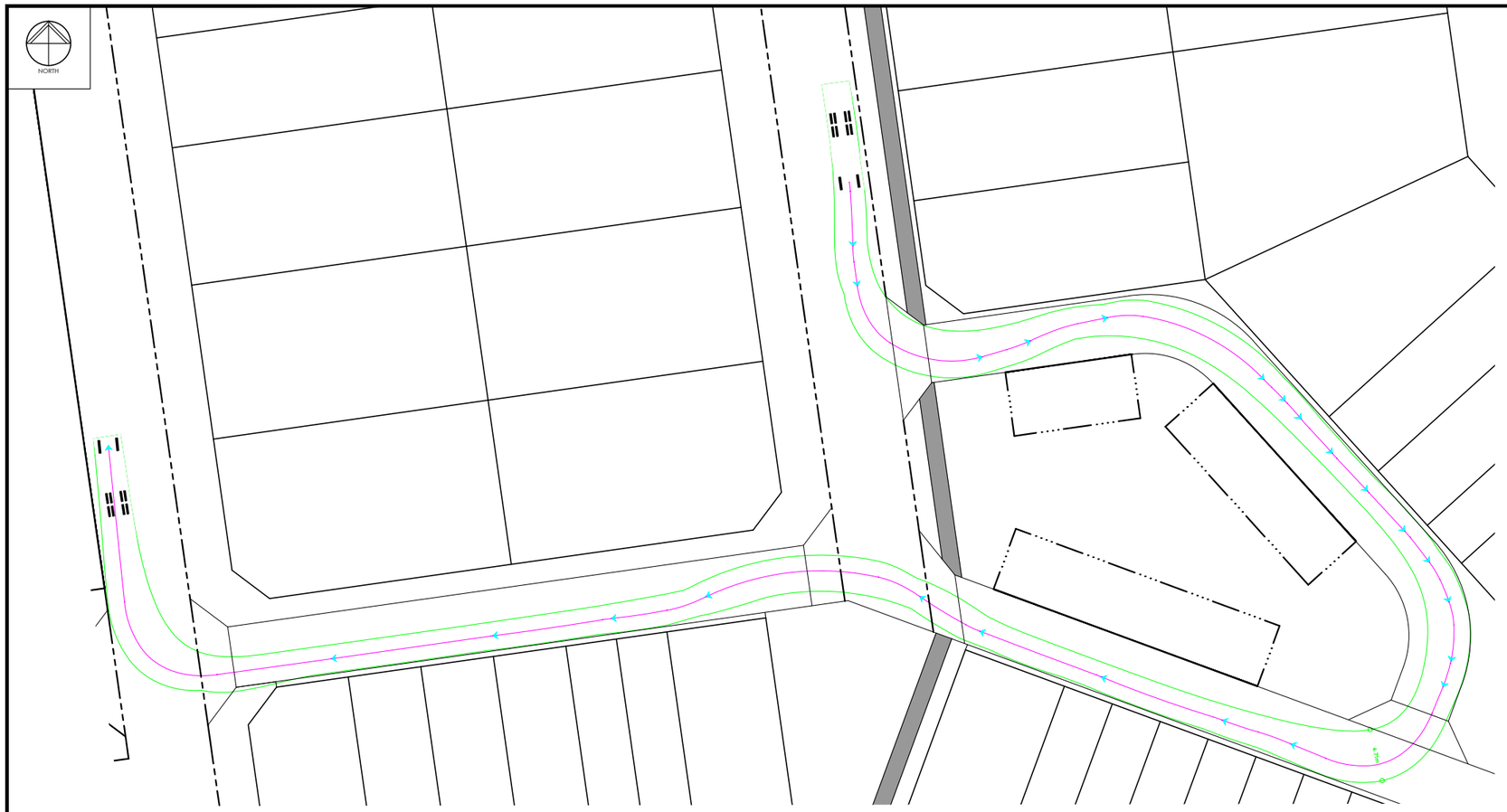
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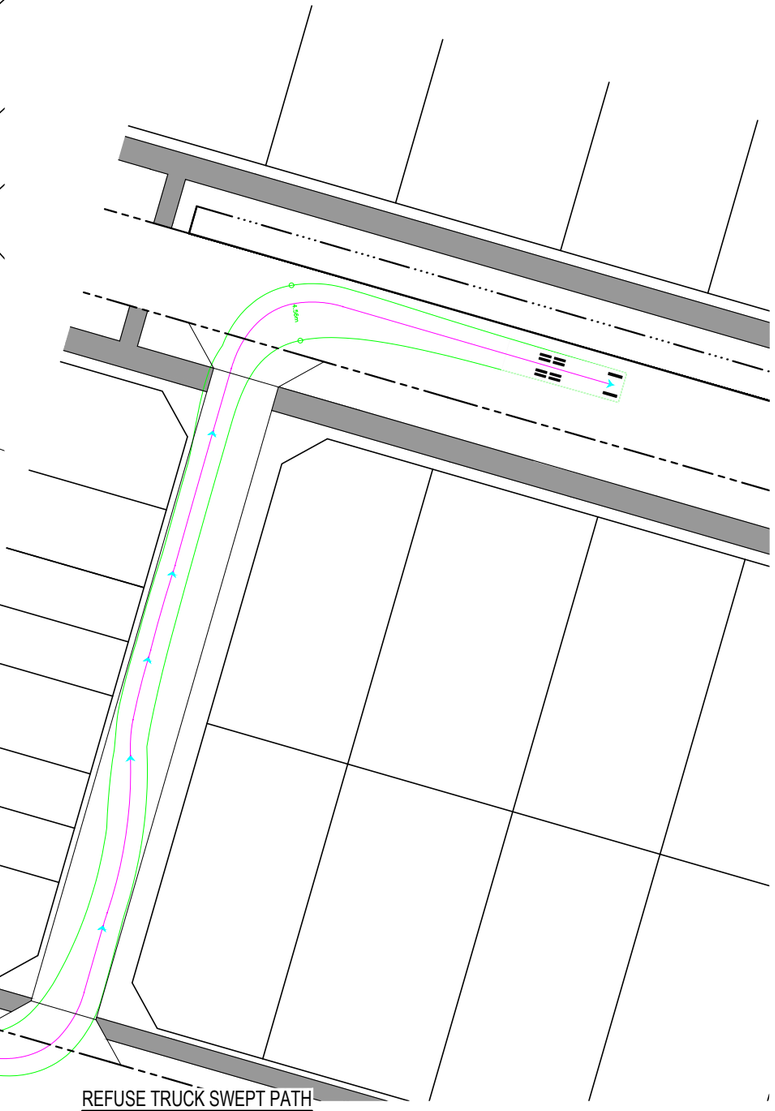
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ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 8

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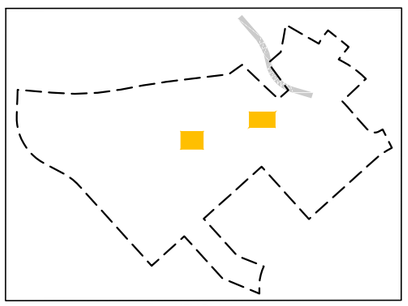
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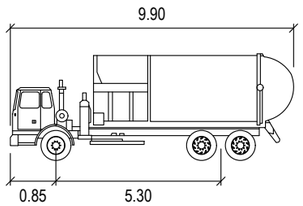
REFUSE TRUCK SWEPT PATH
SCALE 1:250



REFUSE TRUCK SWEPT PATH
SCALE 1:250



KEY PLAN
NTS



SCC SIDE LOADING RECYCLING TRUCK

		meters
Width	:	2.49
Track	:	1.91
Lock to Lock Time	:	6.0
Steering Angle	:	40.0

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
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1 : 250 (A1 UNREDUCED)

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Drawing Title
ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 9

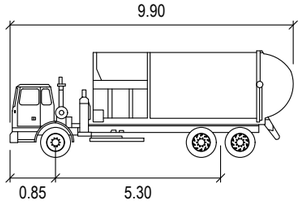
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Drawing No	Revision
25-269-FL44	B

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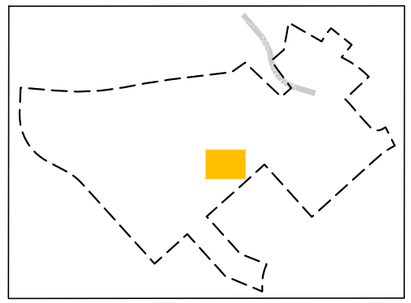


REFUSE TRUCK SWEPT PATH
SCALE 1:250



SCC SIDE LOADING RECYCLING TRUCK

	meters
Width	: 2.49
Track	: 1.91
Lock to Lock Time	: 6.0
Steering Angle	: 40.0



KEY PLAN
NTS

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
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5 0 5 10m
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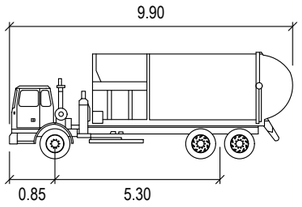
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ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 10

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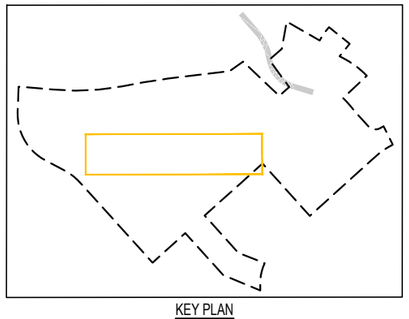


REFUSE TRUCK SWEPT PATH
SCALE 1:1000



SCC SIDE LOADING RECYCLING TRUCK

		meters
Width	:	2.49
Track	:	1.91
Lock to Lock Time	:	6.0
Steering Angle	:	40.0



KEY PLAN
NTS

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

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FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

10 5 0 10 20 30 40 50m
1 : 1000 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

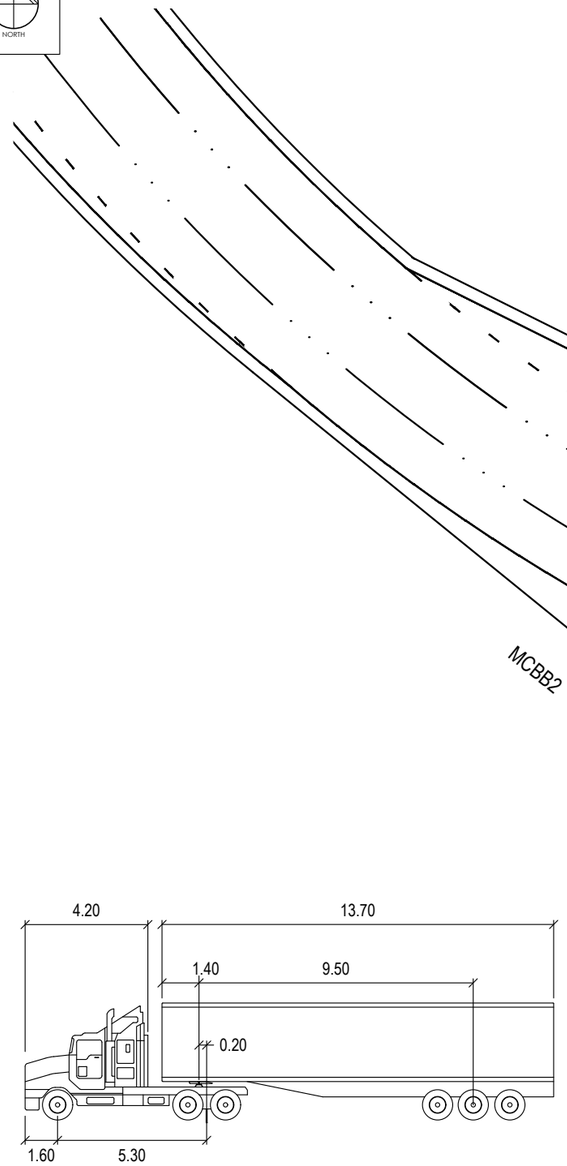
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Drawing Title
ROADWORKS
INTERSECTIONS AND LINEMARKING
SHEET 11

Scale	Sheet
AS SHOWN	
A1	

Drawing No	Revision
25-269-FL46	B

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PM S 19M

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

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PM S 19M SWEPT PATHS
SCALE 1:250

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
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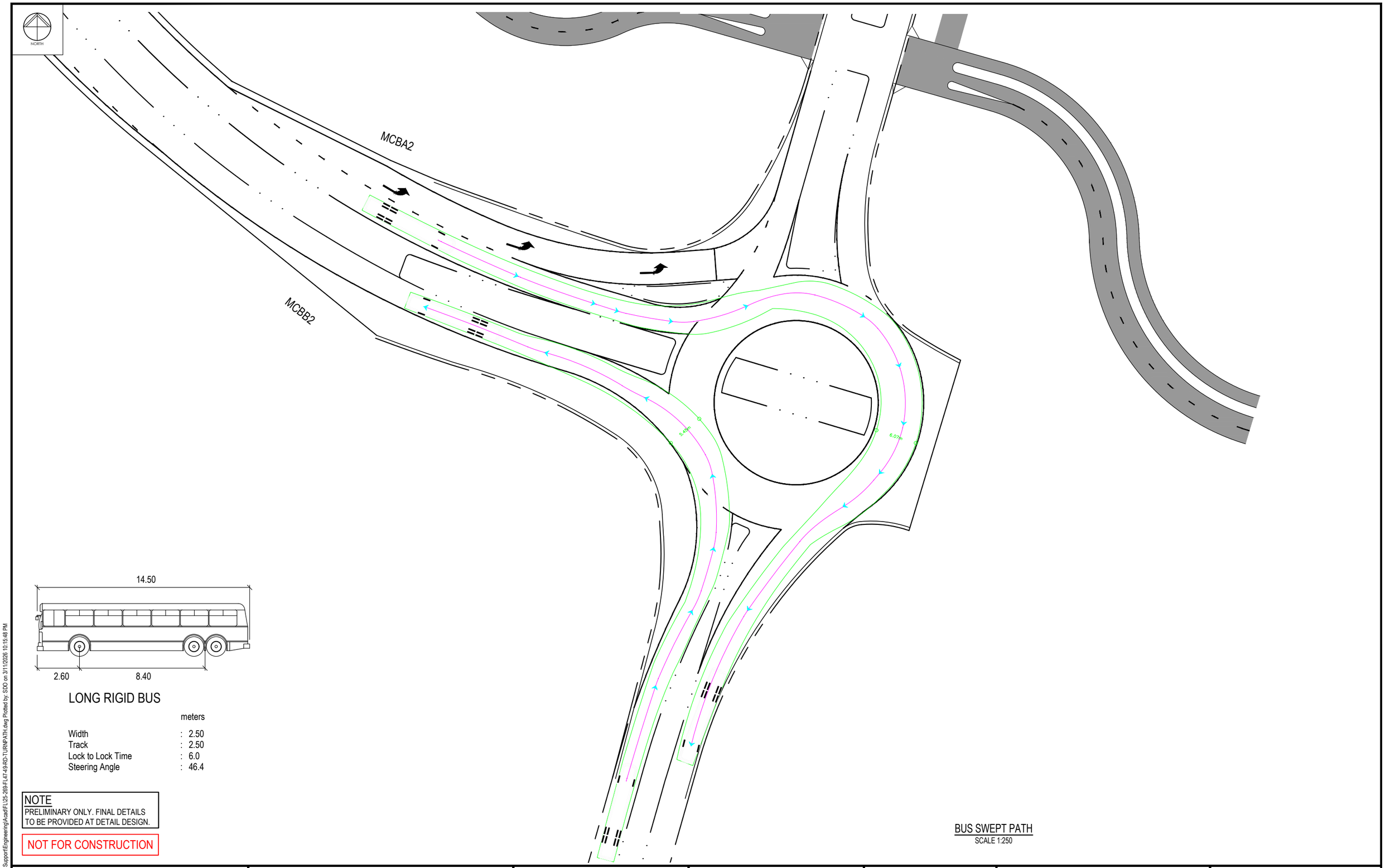
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Drawing Title
ROADWORKS
TURNPATH - PM S 19M

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Drawing No: 25-269-FL47
Revision: B

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LONG RIGID BUS

		meters
Width	:	2.50
Track	:	2.50
Lock to Lock Time	:	6.0
Steering Angle	:	46.4

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

BUS SWEPT PATH
SCALE 1:250

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

5 0 5 10m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

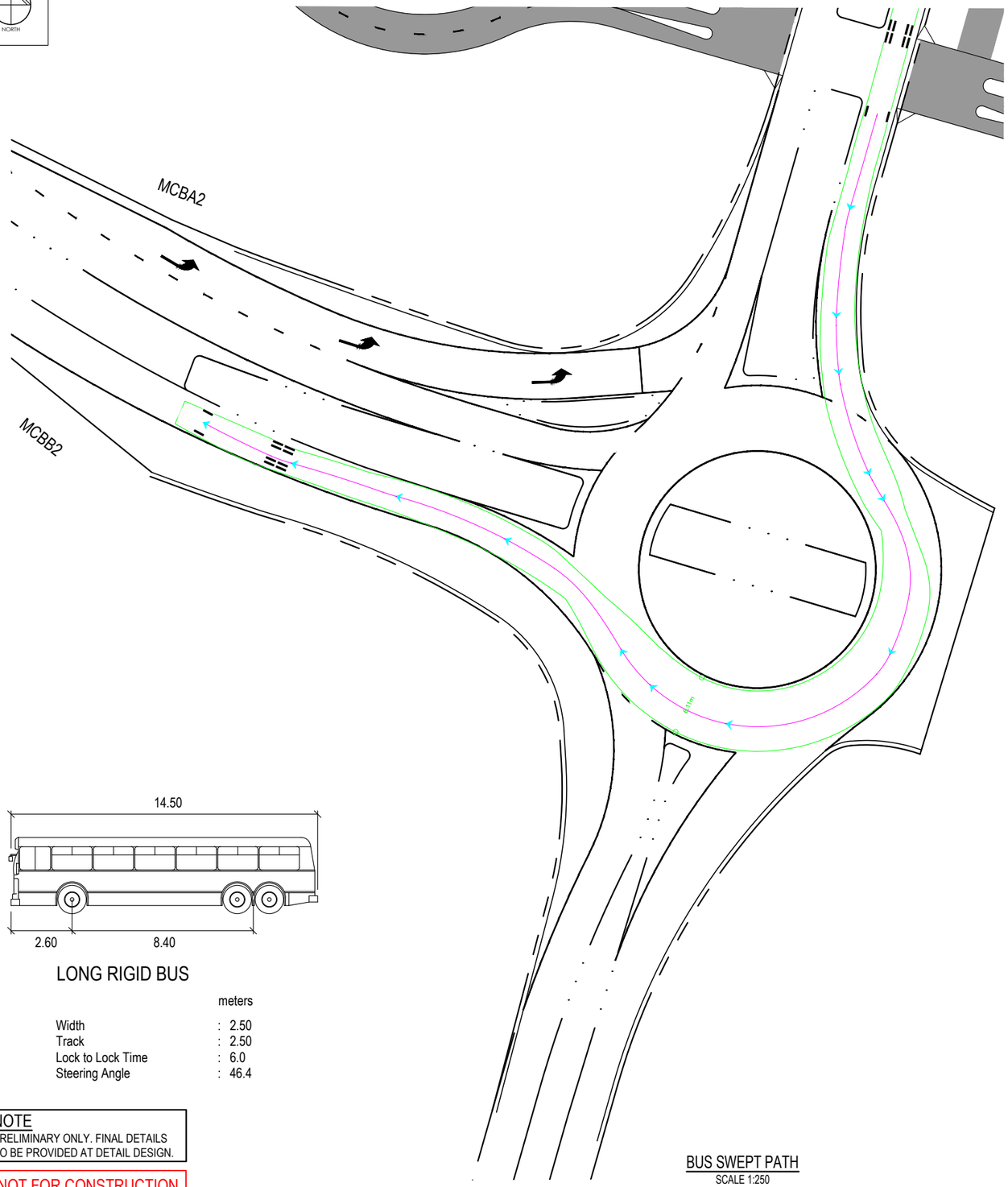
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Drawing Title
ROADWORKS
TURNPATH - BUS
SHEET 1

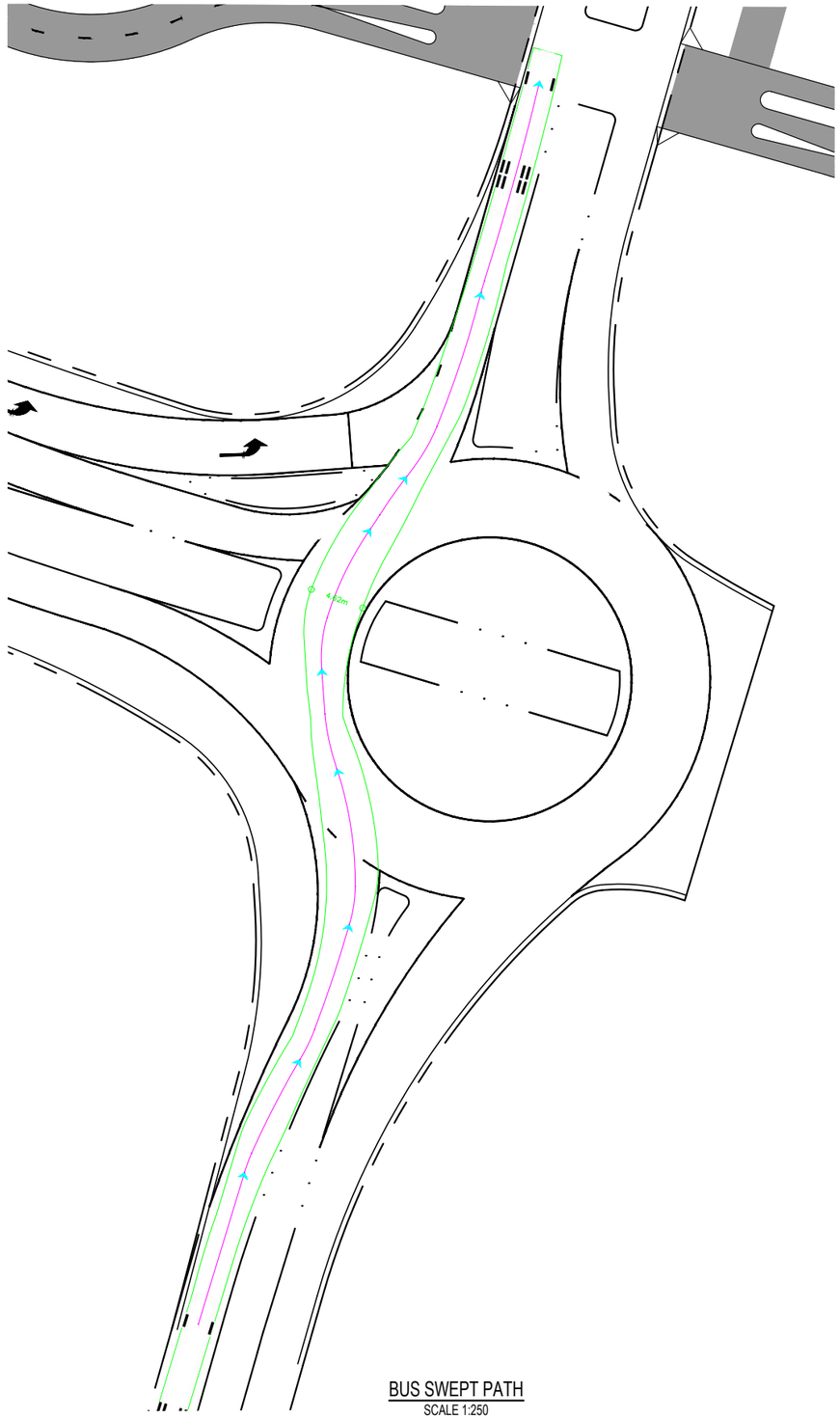
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Revision: B

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NORTH



BUS SWEPT PATH
SCALE 1:250



BUS SWEPT PATH
SCALE 1:250

LONG RIGID BUS

		meters
Width	:	2.50
Track	:	2.50
Lock to Lock Time	:	6.0
Steering Angle	:	46.4

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

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REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

5 0 5 10m
1 : 250 (A1 UNREDUCED)

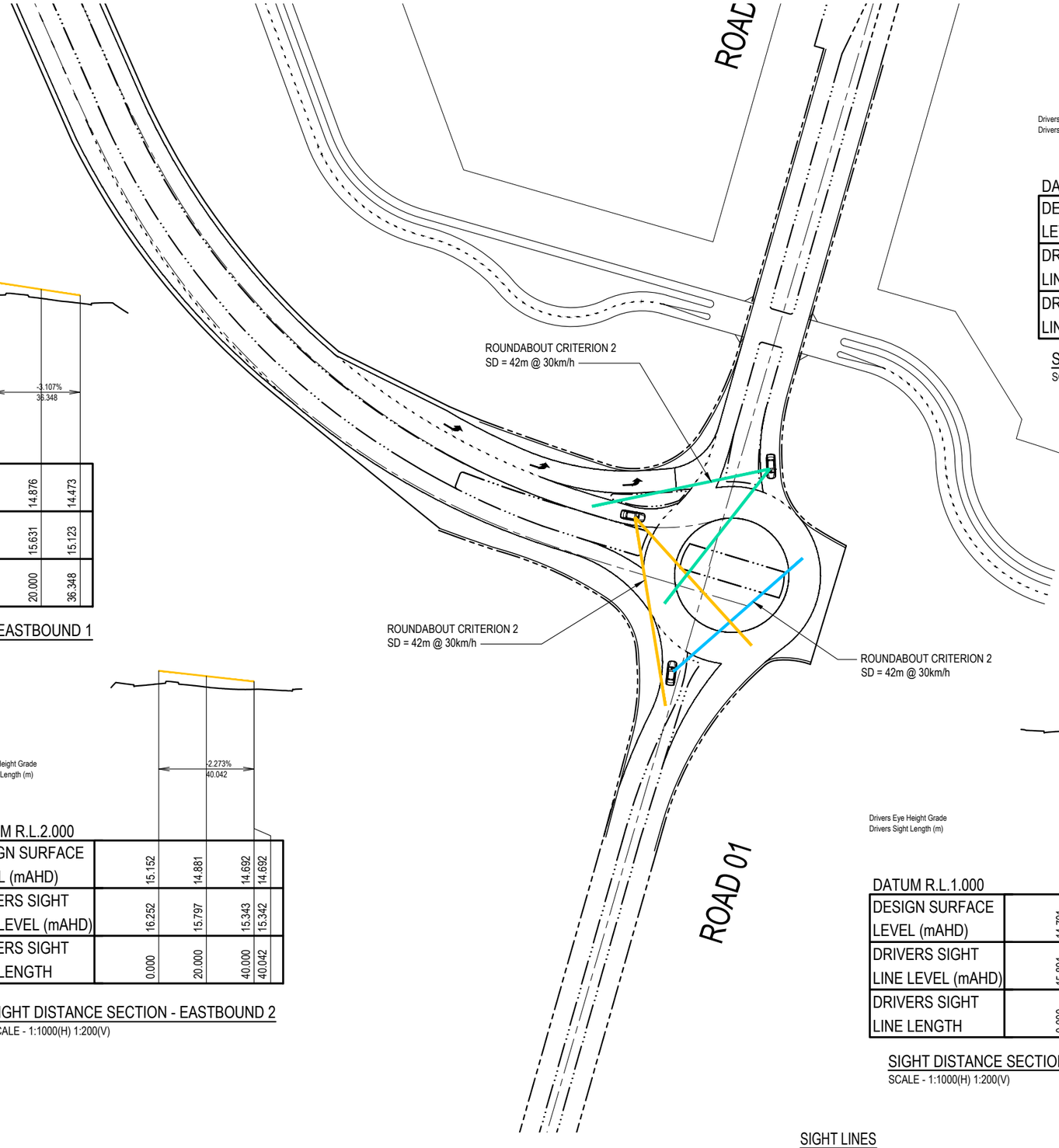
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Drawing Title
ROADWORKS
TURNPATH - BUS
SHEET 2

Scale	Sheet
AS SHOWN	
A1	Drawing No: 25-269-FL49
	Revision: B

NORTH



DATUM R.L.1.000

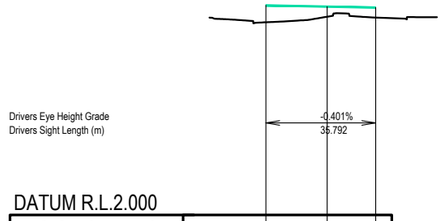
DESIGN SURFACE LEVEL (mAHD)	15.152	14.876	14.473
DRIVERS SIGHT LINE LEVEL (mAHD)	16.252	15.631	15.123
DRIVERS SIGHT LINE LENGTH	0.000	20.000	36.348

SIGHT DISTANCE SECTION - EASTBOUND 1
SCALE - 1:1000(H) 1:200(V)

DATUM R.L.2.000

DESIGN SURFACE LEVEL (mAHD)	15.152	14.881	14.692	14.692
DRIVERS SIGHT LINE LEVEL (mAHD)	16.252	15.797	15.343	15.342
DRIVERS SIGHT LINE LENGTH	0.000	20.000	40.000	40.042

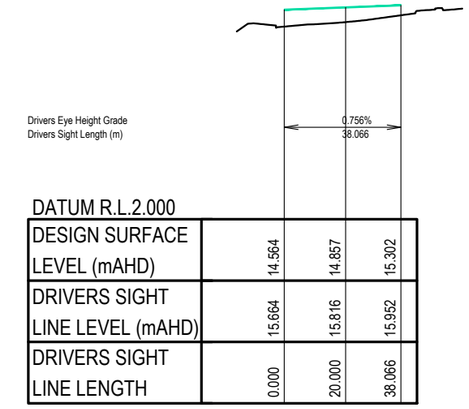
SIGHT DISTANCE SECTION - EASTBOUND 2
SCALE - 1:1000(H) 1:200(V)



DATUM R.L.2.000

DESIGN SURFACE LEVEL (mAHD)	14.564	14.925	14.871
DRIVERS SIGHT LINE LEVEL (mAHD)	15.664	15.584	15.521
DRIVERS SIGHT LINE LENGTH	0.000	20.000	35.792

SIGHT DISTANCE SECTION - SOUTHBOUND 1
SCALE - 1:1000(H) 1:200(V)



DATUM R.L.2.000

DESIGN SURFACE LEVEL (mAHD)	14.564	14.857	15.302
DRIVERS SIGHT LINE LEVEL (mAHD)	15.664	15.816	15.952
DRIVERS SIGHT LINE LENGTH	0.000	20.000	38.066

SIGHT DISTANCE SECTION - SOUTHBOUND 2
SCALE - 1:1000(H) 1:200(V)

DATUM R.L.1.000

DESIGN SURFACE LEVEL (mAHD)	14.701	14.677	14.555
DRIVERS SIGHT LINE LEVEL (mAHD)	15.801	15.471	15.205
DRIVERS SIGHT LINE LENGTH	0.000	20.000	36.073

SIGHT DISTANCE SECTION - NORTHBOUND
SCALE - 1:1000(H) 1:200(V)

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

SIGHT LINES
SCALE 1:500

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR INFORMATION	SA	SD	EPG	24.08.26
B	FOR INFORMATION	SA	SD	EPG	03.11.26

Project: AURA SOUTH

Client: Stockland

Approved

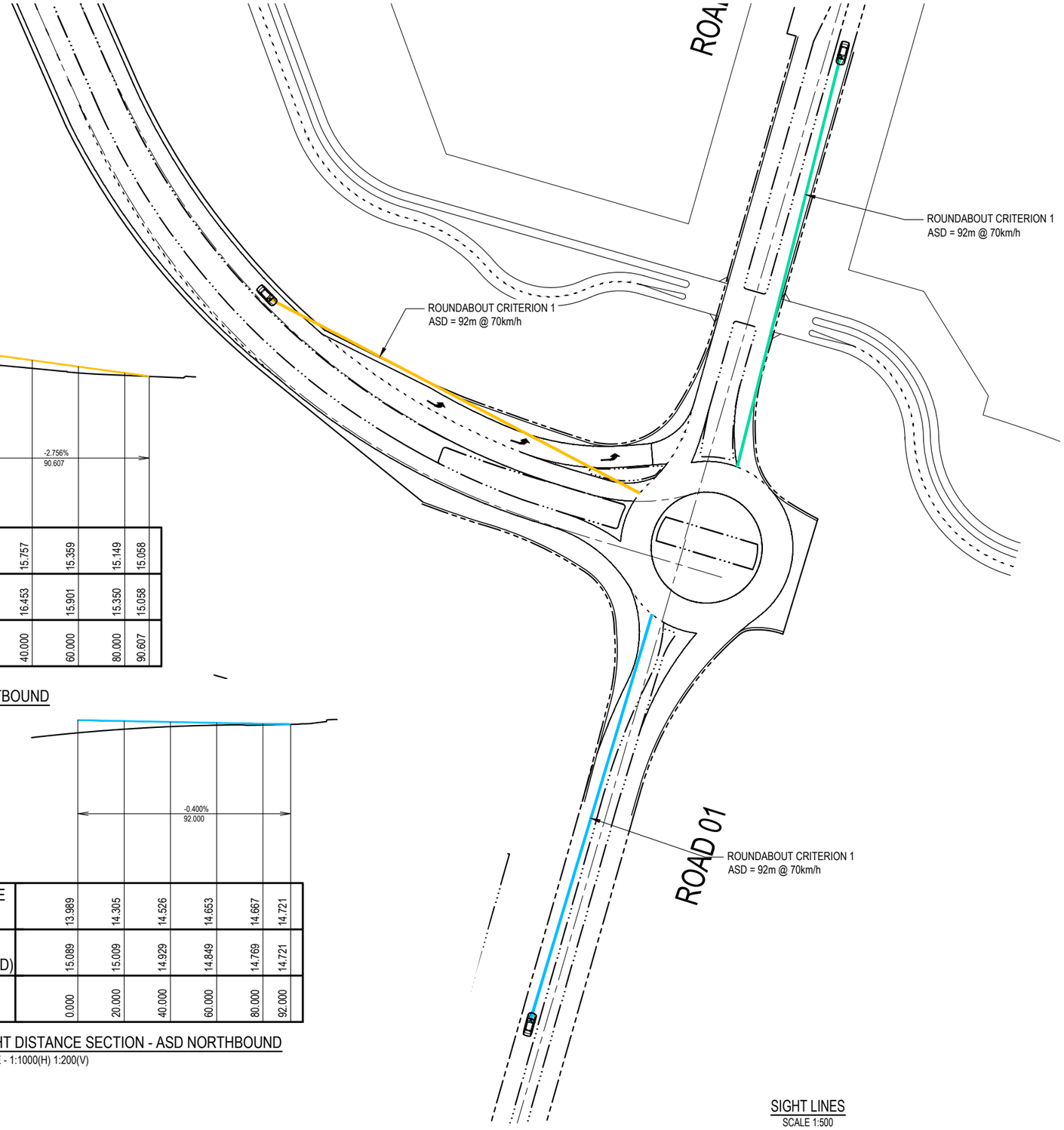
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1 : 1000 (A1 UNREDUCED)
2 1 0 2 4 6 8 10m
1 : 200 (A1 UNREDUCED)
DO NOT SCALE THIS DRAWING

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Drawing Title: ROADWORKS SIGHT LINES SHEET 1

Scale: AS SHOWN
Sheet:
A1
Drawing No. 25-269-FL50
Revision: B

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Drivers Eye Height Grade
Drivers Sight Length (m)

-2.756%
90.607

DATUM R.L.2.000

DESIGN SURFACE LEVEL (mAHD)	16.455	16.122	15.757	15.359	15.149	15.058
DRIVERS SIGHT LINE LEVEL (mAHD)	17.555	17.004	16.453	15.901	15.350	15.058
DRIVERS SIGHT LINE LENGTH	0.000	20.000	40.000	60.000	80.000	90.607

SIGHT DISTANCE SECTION - ASD EASTBOUND

SCALE - 1:1000(H) 1:200(V)

Drivers Eye Height Grade
Drivers Sight Length (m)

-0.400%
92.000

DATUM R.L.1.000

DESIGN SURFACE LEVEL (mAHD)	13.989	14.305	14.526	14.653	14.667	14.721
DRIVERS SIGHT LINE LEVEL (mAHD)	15.089	15.009	14.929	14.849	14.769	14.721
DRIVERS SIGHT LINE LENGTH	0.000	20.000	40.000	60.000	80.000	92.000

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

SIGHT DISTANCE SECTION - ASD NORTHBOUND

SCALE - 1:1000(H) 1:200(V)

Drivers Eye Height Grade
Drivers Sight Length (m)

-0.542%
91.777

DATUM R.L.1.000

DESIGN SURFACE LEVEL (mAHD)	13.970	14.261	14.453	14.562	14.559	14.572
DRIVERS SIGHT LINE LEVEL (mAHD)	15.070	14.962	14.853	14.745	14.636	14.572
DRIVERS SIGHT LINE LENGTH	0.000	20.000	40.000	60.000	80.000	91.777

SIGHT DISTANCE SECTION - ASD SOUTHBOUND

SCALE - 1:1000(H) 1:200(V)

SIGHT LINES

SCALE 1:500

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR INFORMATION	SA	SD	EPG	24.08.26
B	FOR INFORMATION	SA	SD	EPG	03.11.26

Project: AURA SOUTH

Client: Stockland

Approved

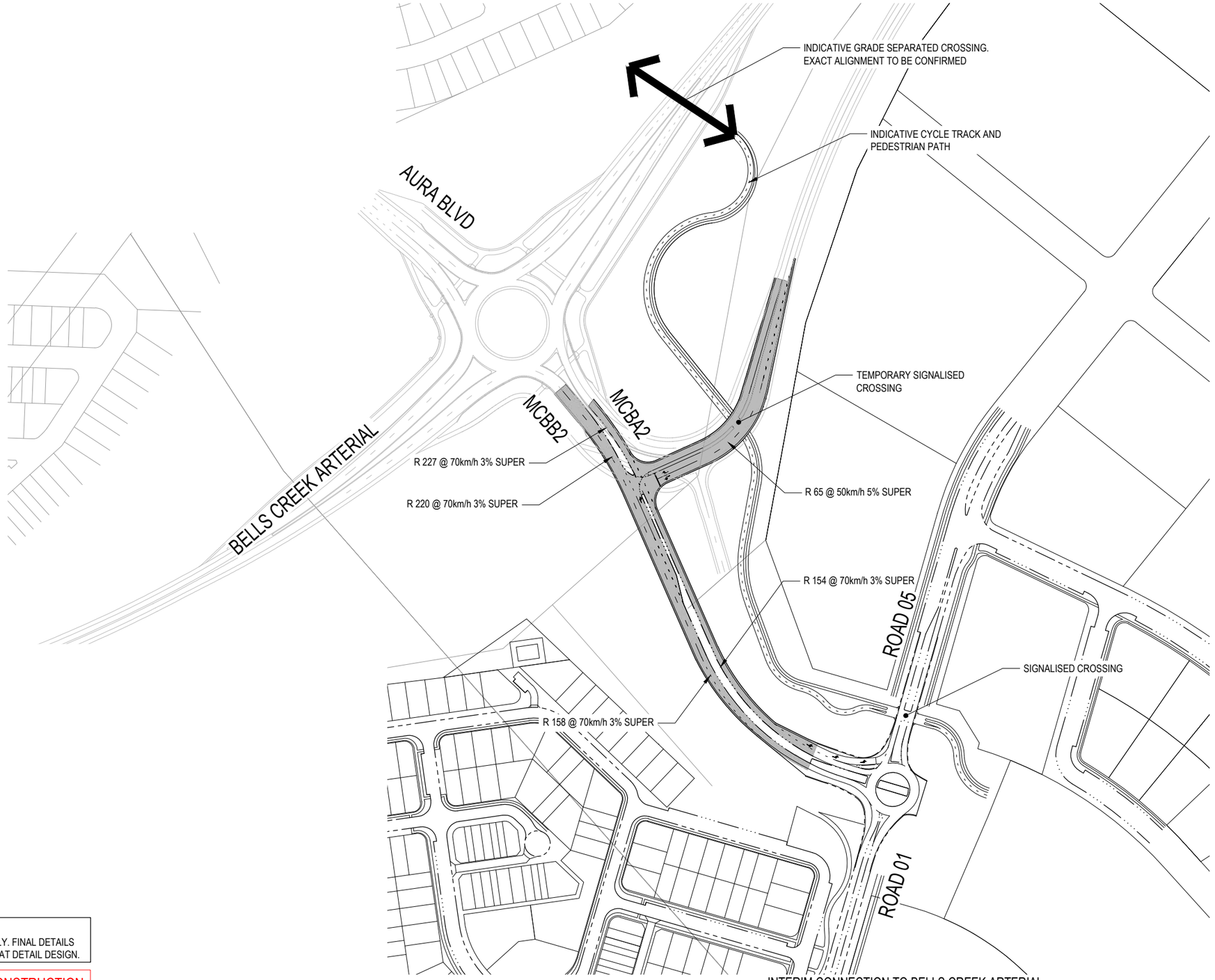
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2 1 0 2 4 6 8 10m
1 : 200 (A1 UNREDUCED)
DO NOT SCALE THIS DRAWING

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Drawing Title: ROADWORKS SIGHT LINES SHEET 2

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL51
Revision: B

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INTERIM CONNECTION TO BELLS CREEK ARTERIAL

SCALE 1:500

NOTE
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TO BE PROVIDED AT DETAIL DESIGN.

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FOR
APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR INFORMATION	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26
C	FOR APPROVAL	SA	SD	EPG	04.11.26

Project
AURA SOUTH

Client
Stockland

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15 0 15 30 45 60 75m
1 : 1500 (A1 UNREDUCED)

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Drawing Title
ROADWORKS
INTERIM CONNECTION

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL52
Revision: C

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STORMWATER LAYOUT PLAN
SCALE 1:2500

NOTE
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REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR INFORMATION	SA	SD	EPG	24.08.26
B	FOR INFORMATION	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

50 0 50 100m
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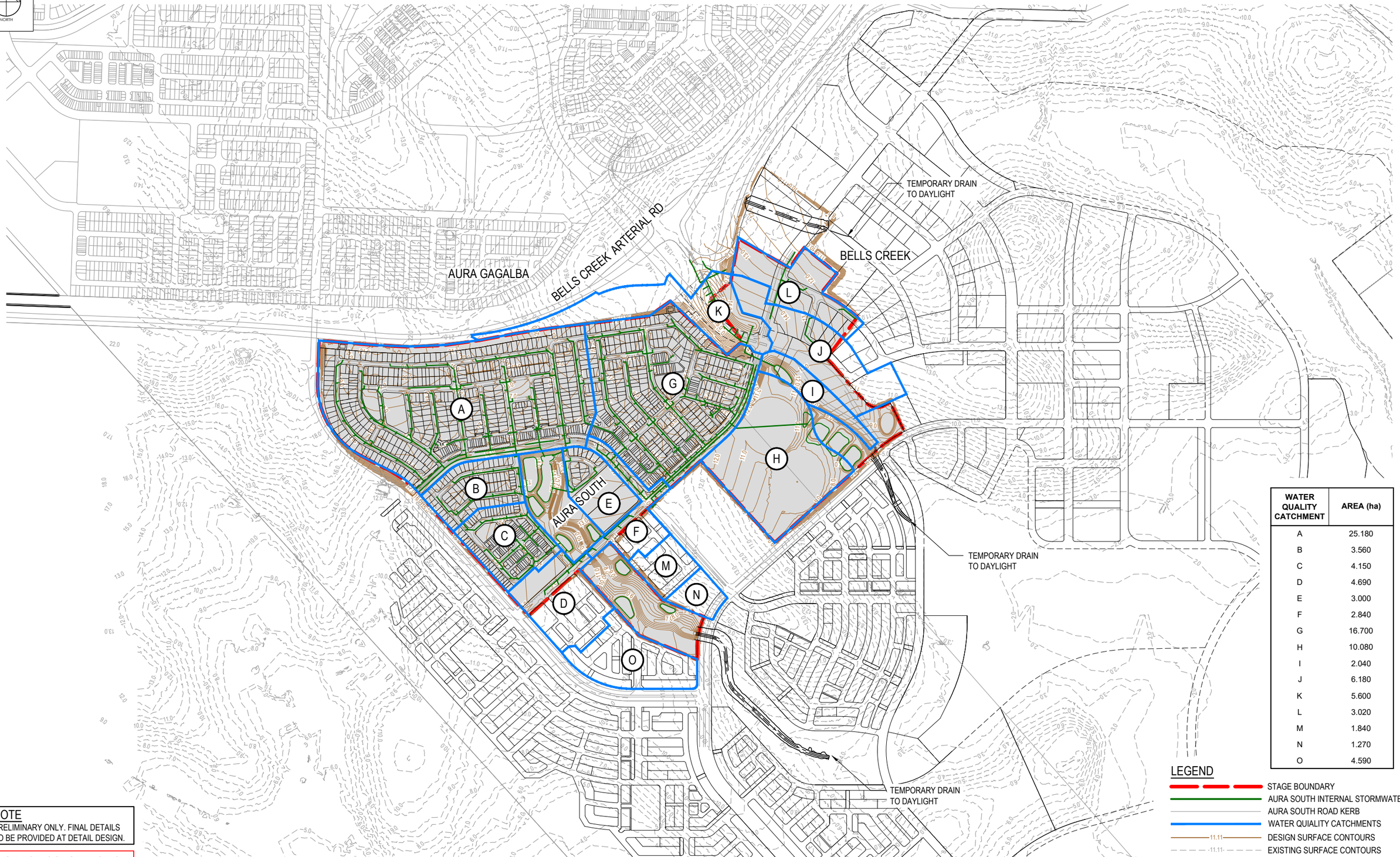
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Drawing Title
STORMWATER LAYOUT PLAN

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL60
Revision: B

M:\2025\25269 Aura South DA1 Preliminary Support\Engineering\Acad\FL\25-269-FL60-SW-LAYOUT.dwg Plotted by: SDO on 3/11/2026 10:16:12 PM



WATER QUALITY CATCHMENT	AREA (ha)
A	25.180
B	3.560
C	4.150
D	4.690
E	3.000
F	2.840
G	16.700
H	10.080
I	2.040
J	6.180
K	5.600
L	3.020
M	1.840
N	1.270
O	4.590

LEGEND

- STAGE BOUNDARY
- AURA SOUTH INTERNAL STORMWATER
- AURA SOUTH ROAD KERB
- WATER QUIALITY CATCHMENTS
- 11.11 DESIGN SURFACE CONTOURS
- 11.11 EXISTING SURFACE CONTOURS
- INTERIM DRAIN. GRADE TO DAYLIGHT

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

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STORWATER CATCHMENT PLAN
SCALE 1:5000

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR INFORMATION	SA	SD	EPG	24.08.26
B	FOR INFORMATION	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

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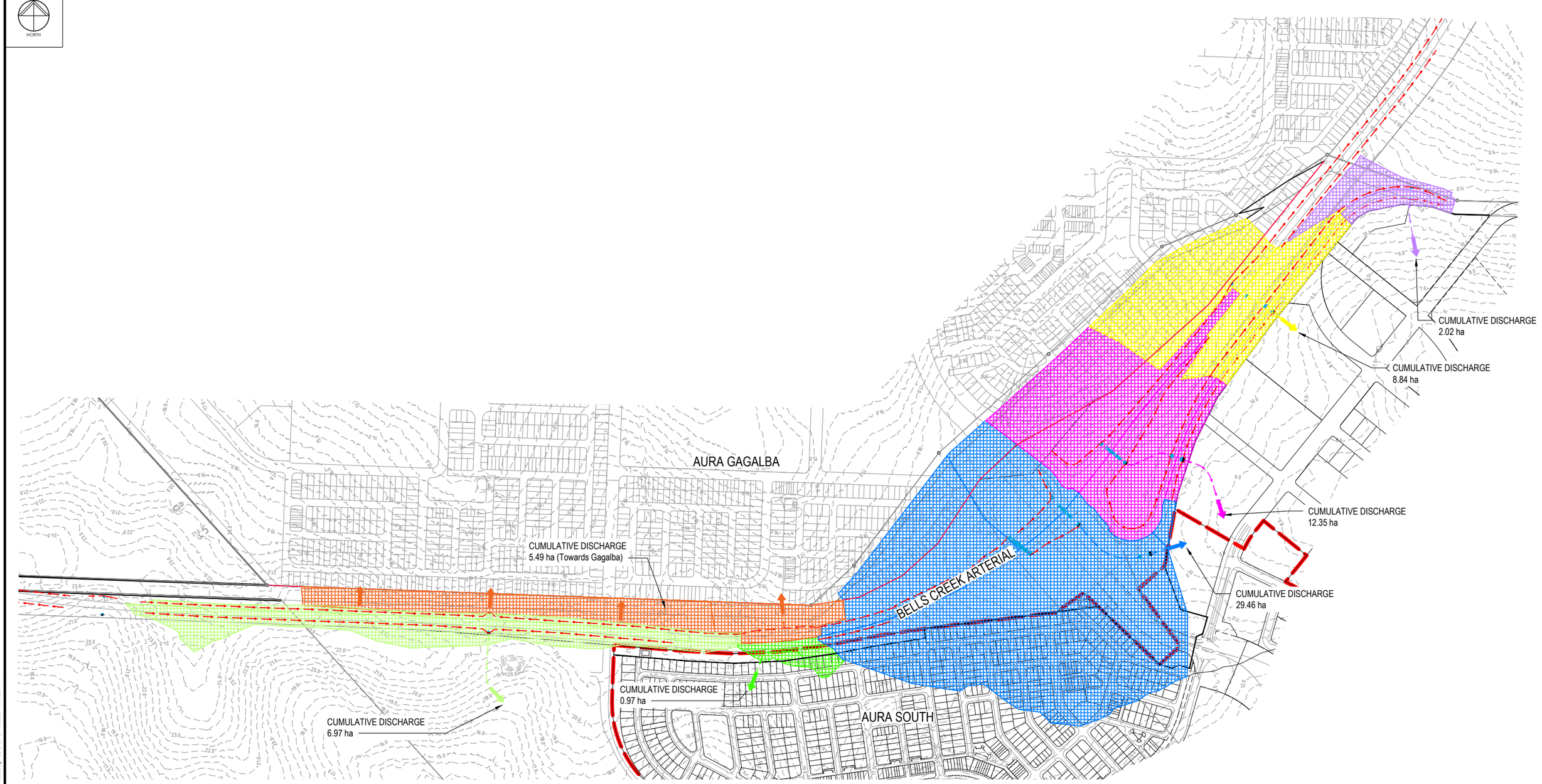
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Drawing Title
STORMWATER CATCHMENT PLAN

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL61
Revision: B

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STORMWATER - EXISTING CATCHMENT PLAN

SCALE 1:4000

LEGEND

- AURA SOUTH ERA BOUNDARY
- EXISTING BCA ROADSIDE DRAIN
- EXISTING DRAIN TO OUTLET/S
- AURA SOUTH ERA ROAD KERB
- EXISTING SURFACE CONTOURS

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

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FOR INFORMATION

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: AURA SOUTH

Client: Stockland

Approved:

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1 : 4000 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING

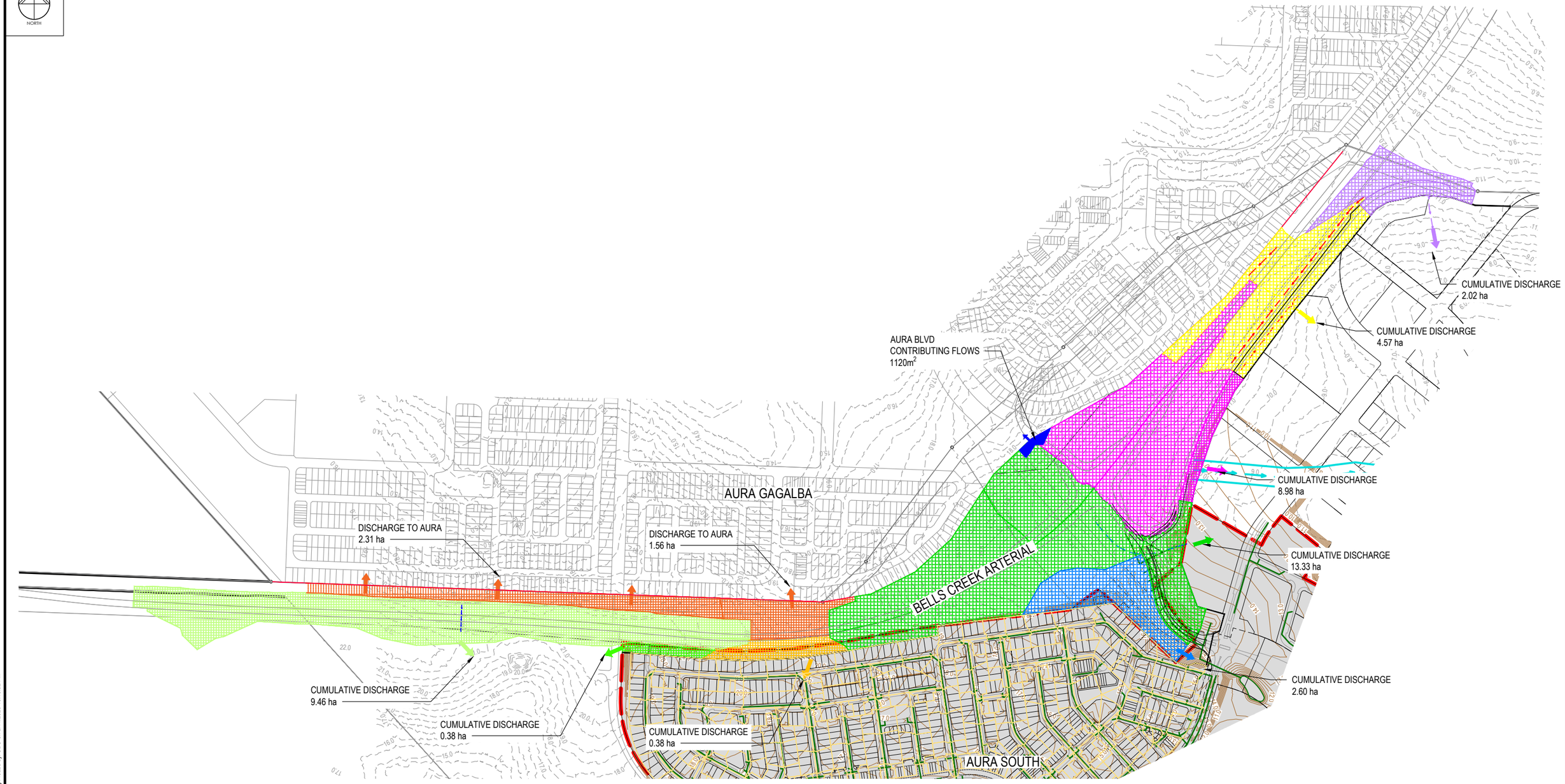
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Drawing Title: STORMWATER EXISTING CATCHMENT PLAN

Scale	Sheet
AS SHOWN	
A1	

Drawing No.	Revision
25-269-FL62	B

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STORMWATER - ULTIMATE CATCHMENT PLAN

SCALE 1:4000

LEGEND

- ERA BOUNDARY
- ULTIMATE BCA AND INTERCHANGE
- WATER CATCHMENTS
- 11.11 DESIGN SURFACE CONTOURS
- -11.11- EXISTING SURFACE CONTOURS
- INDICATIVE CATCHMENT DRAINAGE FLOW

NOTE
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FOR INFORMATION

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: **AURA SOUTH**

Client: Stockland

Approved:

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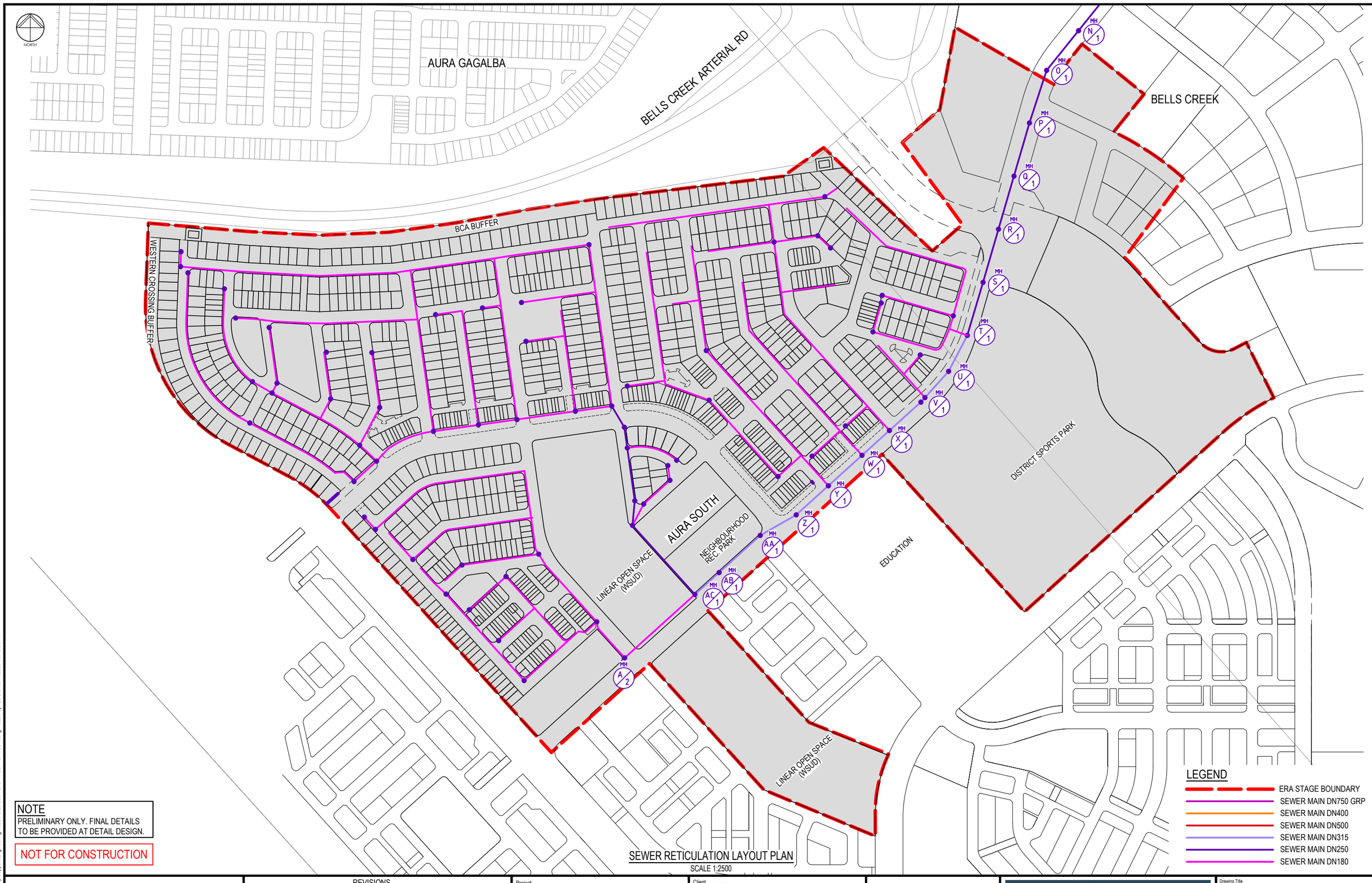
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Drawing Title: STORMWATER DEVELOPED CATCHMENT PLAN

Scale	Sheet
AS SHOWN	
A1	Drawing No. 25-269-FL63
	Revision B

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NOTE
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SEWER RETICULATION LAYOUT PLAN
SCALE 1:2500

FOR INFORMATION

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

1 : 2500 (A1 UNREDUCED)
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Drawing Title
SEWER RETICULATION LAYOUT PLAN SHEET 1

Scale	Sheet
AS SHOWN	
A1	Drawing No. 25-269-FL70
	Revision B

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NORTH

Refer Whole of Site Master Plan 26-300-SK001 – SK003 Dated 28.10.2026, prepared by KN Group & Aura South Early Release Area WS&S Servicing Report, dated 28.10.2026, prepared by Stantec for External Connection Details.

DN750 GRP TRUNK SEWER
REFER STANTEC PLANS
PROJECT NUMBER :304701877
FOR ALL DETAILS

S CREEK ARTERIAL RD

BELLS CREEK

MH A/1
MH B/1
MH C/1
MH D/1
END E/1
MH F/1
MH G/1
MH H/1
MH I/1
MH J/1
MH K/1
MH L/1
MH M/1
MH N/1
MH O/1
MH P/1
MH Q/1
MH R/1
MH S/1
MH T/1
MH U/1

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

NOT FOR CONSTRUCTION

LEGEND
- ERA STAGE BOUNDARY
- SEWER MAIN DN750 GRP
- SEWER MAIN DN400
- SEWER MAIN DN500
- SEWER MAIN DN315
- SEWER MAIN DN250
- SEWER MAIN DN180

SEWER RETICULATION LAYOUT PLAN
SCALE 1:2500

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FOR INFORMATION

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project: **AURA SOUTH**

Client: Stockland

Approved:

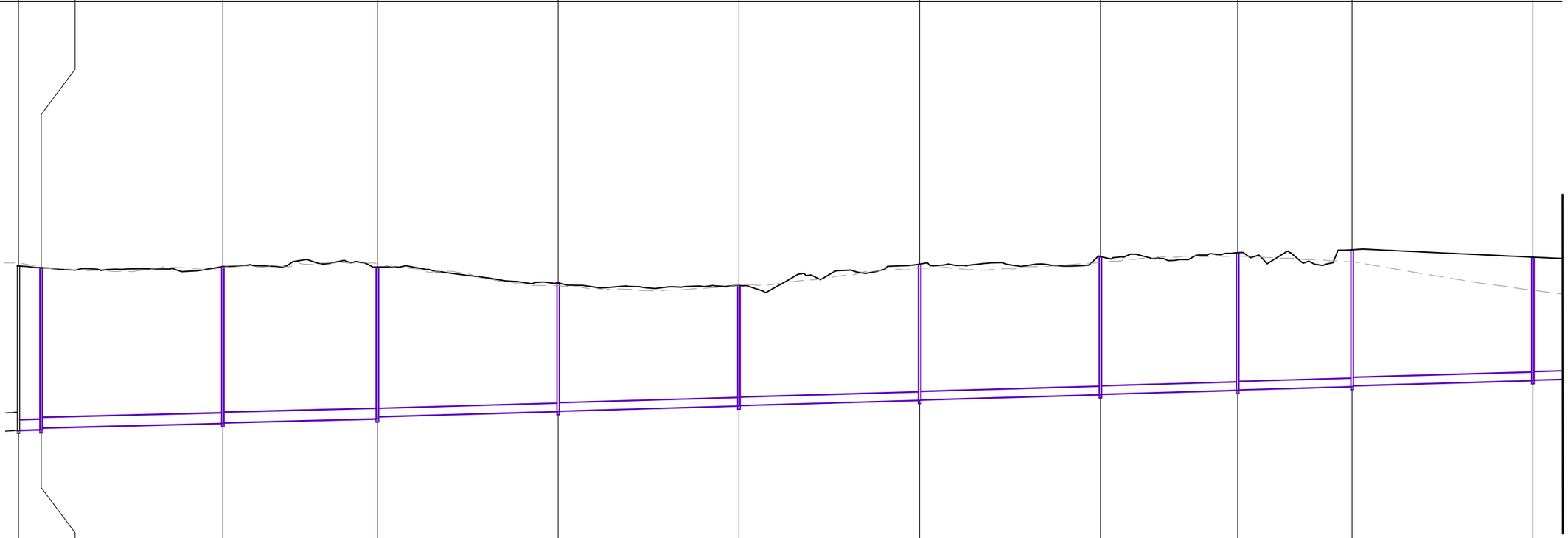
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1 : 2500 (A1 UNREDUCED)

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Drawing Title: SEWER RETICULATION LAYOUT PLAN SHEET 2

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL71
Revision: B



MAINTENANCE HOLE No.	A/1	B/1	C/1	D/1	E/1	F/1	G/1	H/1	I/1	J/1	K/1
MH/MS COVER TYPE											
MH/MS TYPE											
DATUM R.L.	-2.000										-2.000
PIPE DIAMETER	DN500PE 100 SDR21	DN500PE 100 SDR21	DN500PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	
GRADE	1 in 400	1 in 400	1 in 400	1 in 350	1 in 350	1 in 350	1 in 350	1 in 350	1 in 350	1 in 350	
LENGTH	10	80.398	68.389	80	80	80	80	60.69	50.642	80	
EMBEDMENT TYPE											
JUNCTION INVERT LEVEL											
DEPTH OF INVERT BELOW FSL	7.267	7.267 / 7.158	7.078 / 6.932	6.902 / 6.713	6.621 / 5.69	5.67 / 5.326	5.306 / 6.021	6.001 / 6.111	6.091 / 6.089	6.069 / 6.048	6.008 / 5.455	5.435
INVERT LEVEL (IL)	3.534	3.534 / 3.559	3.639 / 3.84	3.87 / 4.041	4.133 / 4.362	4.382 / 4.61	4.63 / 4.859	4.879 / 5.107	5.127 / 5.301	5.321 / 5.466	5.506 / 5.734	5.754
FINISHED SURFACE LEVEL (FSL)	10.801	10.717	10.772	10.754	10.052	9.936	10.88	11.218	11.39	11.514	11.189	
EXISTING SURFACE LEVEL (ESL)	10.988	10.786	10.812	10.969	9.992	10.002	10.766	11.035	11.316	11.065	9.792	
CHAINAGE (CH)		10	90.398	158.787	238.787	318.787	398.787	478.787	539.477	590.118	670.118	

NOT FOR CONSTRUCTION

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

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1 : 1000 (A1 UNREDUCED)

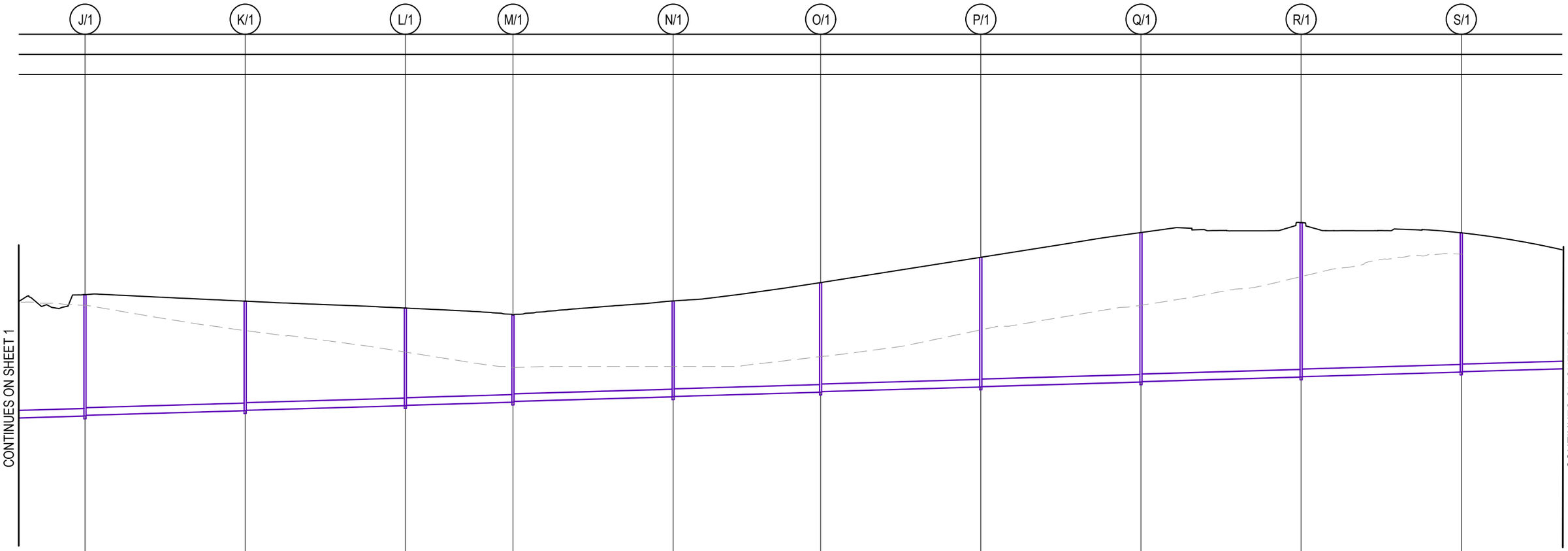
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Drawing Title
SEWER RETICULATION
LONGITUDINAL SECTIONS
SHEET 1

Scale	Sheet
AS SHOWN	
A1	Drawing No: 25-269-FL72
	Revision: B

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0PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 SDR21	DN400PE 100 S
1 in 350	1 in 350	1 in 350	1 in 350	1 in 350	1 in 350	1 in 350	1 in 350	1 in 350	1 in 350	1 in 350
50.642	80	80	53.772	80	73.673	80	79.999	80	80	80
6.048	6.008	5.435	4.843	4.309	4.756	5.429	6.445	7.43	7.678	6.919
5.466	5.506	5.754	6.003	6.197	6.445	6.686	6.934	7.183	7.431	7.68
11.514	11.189	10.846	10.506	11.201	12.115	13.379	14.613	15.109	14.599	
11.065	9.792	8.718	7.947	8.003	8.494	9.841	11.051	12.495	13.586	
	590.118	670.118	750.118	803.891	883.891	957.564	1037.564	1117.563	1197.563	1277.563
	5.455	4.863	4.349	4.776	5.459	6.465	7.45	7.698	6.939	
	5.734	5.983	6.157	6.425	6.656	6.914	7.163	7.411	7.66	

NOT FOR CONSTRUCTION

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

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REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

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1 : 1000 (A1 UNREDUCED)

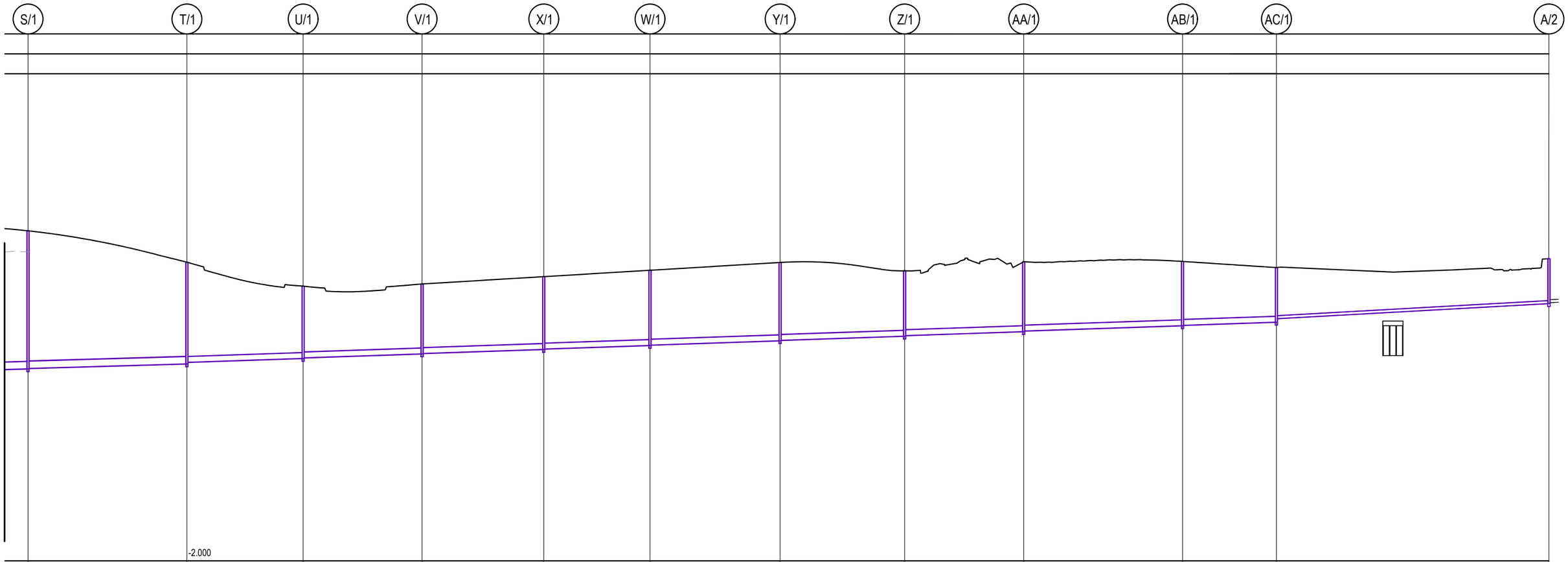
DO NOT SCALE THIS DRAWING

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Drawing Title
SEWER RETICULATION
LONGITUDINAL SECTIONS
SHEET 2

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL73
Revision: B

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	1 in 350	1 in 300	1 in 300	1 in 300	1 in 300	1 in 300	1 in 300	1 in 300	1 in 300	1 in 300	1 in 180	
	80	58.549	59.907	61.265	53.519	65.527	62.719	59.958	80	47.285	137.270	
6.939	6.919	5.033	3.603	3.494	3.636	3.759	3.913	3.254	3.481	3.21	2.602	2.218
7.66	7.68	7.987	8.212	8.431	8.656	8.854	9.093	9.332	9.561	9.848	10.147	10.976
14.599	13.02	11.815	11.925	12.292	12.613	13.006	12.586	13.042	13.058	12.749	13.194	
13.586	12.727	11.733	11.146	11.761	12.828	13.294	13.037	12.289	10.852	9.897	11.904	
1277.563	1357.563	1416.112	1476.019	1537.284	1590.803	1656.33	1719.049	1779.007	1859.007	1906.292	137.270	

NOT FOR CONSTRUCTION

NOTE
PRELIMINARY ONLY. FINAL DETAILS TO BE PROVIDED AT DETAIL DESIGN.

FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
A	FOR APPROVAL	SA	SD	EPG	24.08.26
B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project
AURA SOUTH

Client
Stockland

Approved

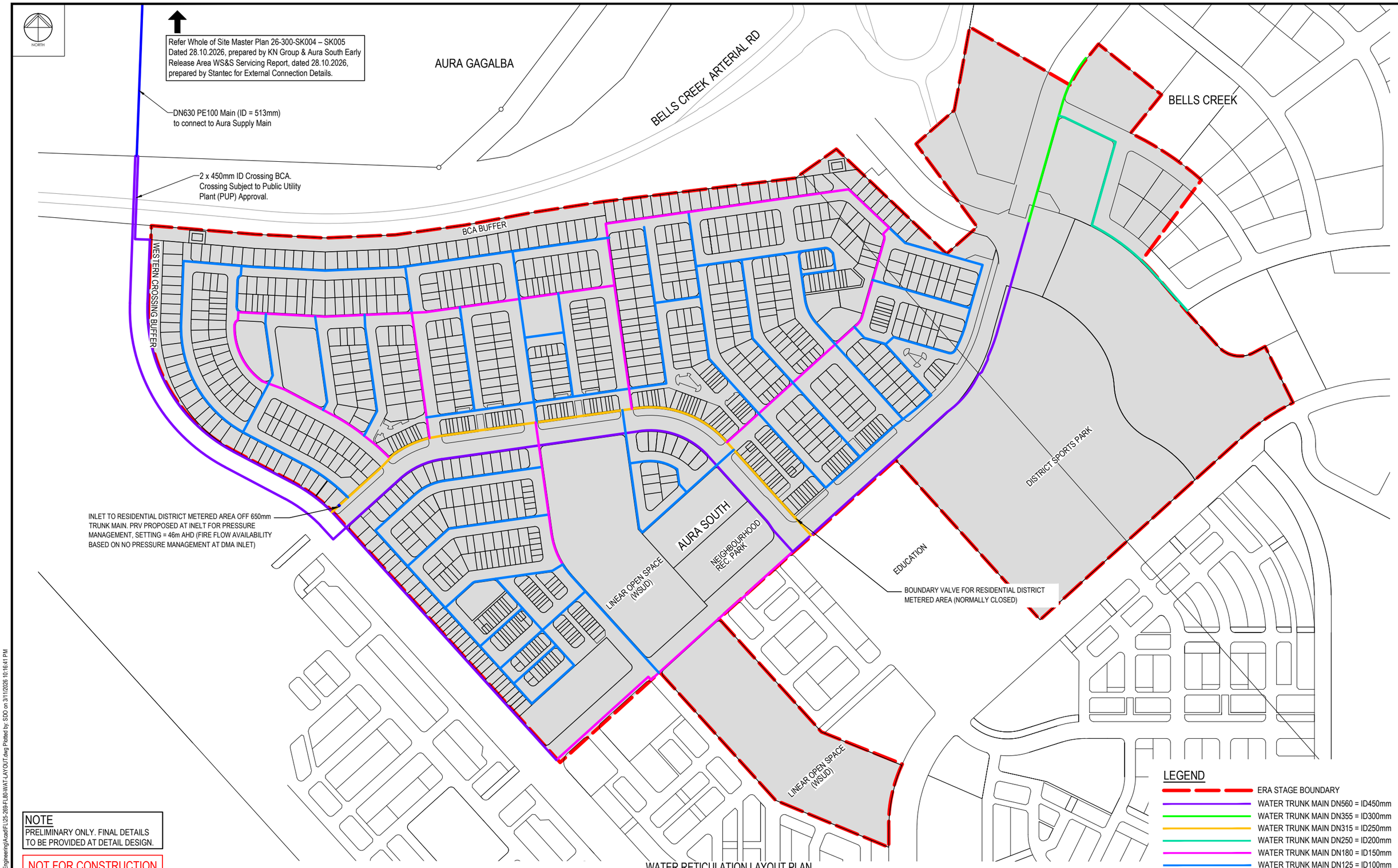
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Drawing Title
SEWER RETICULATION
LONGITUDINAL SECTIONS
SHEET 3

Scale: AS SHOWN
Sheet: A1
Drawing No: 25-269-FL74
Revision: B

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WATER RETICULATION LAYOUT PLAN

SCALE 1:2500

NOTE
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FOR APPROVAL

REVISIONS

No	Description	DR	DES	CHK	Date
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B	FOR APPROVAL	SA	SD	EPG	03.11.26

Project

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50 0 50 100m

1 : 2500 (A1 UNREDUCED)

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Drawing Title

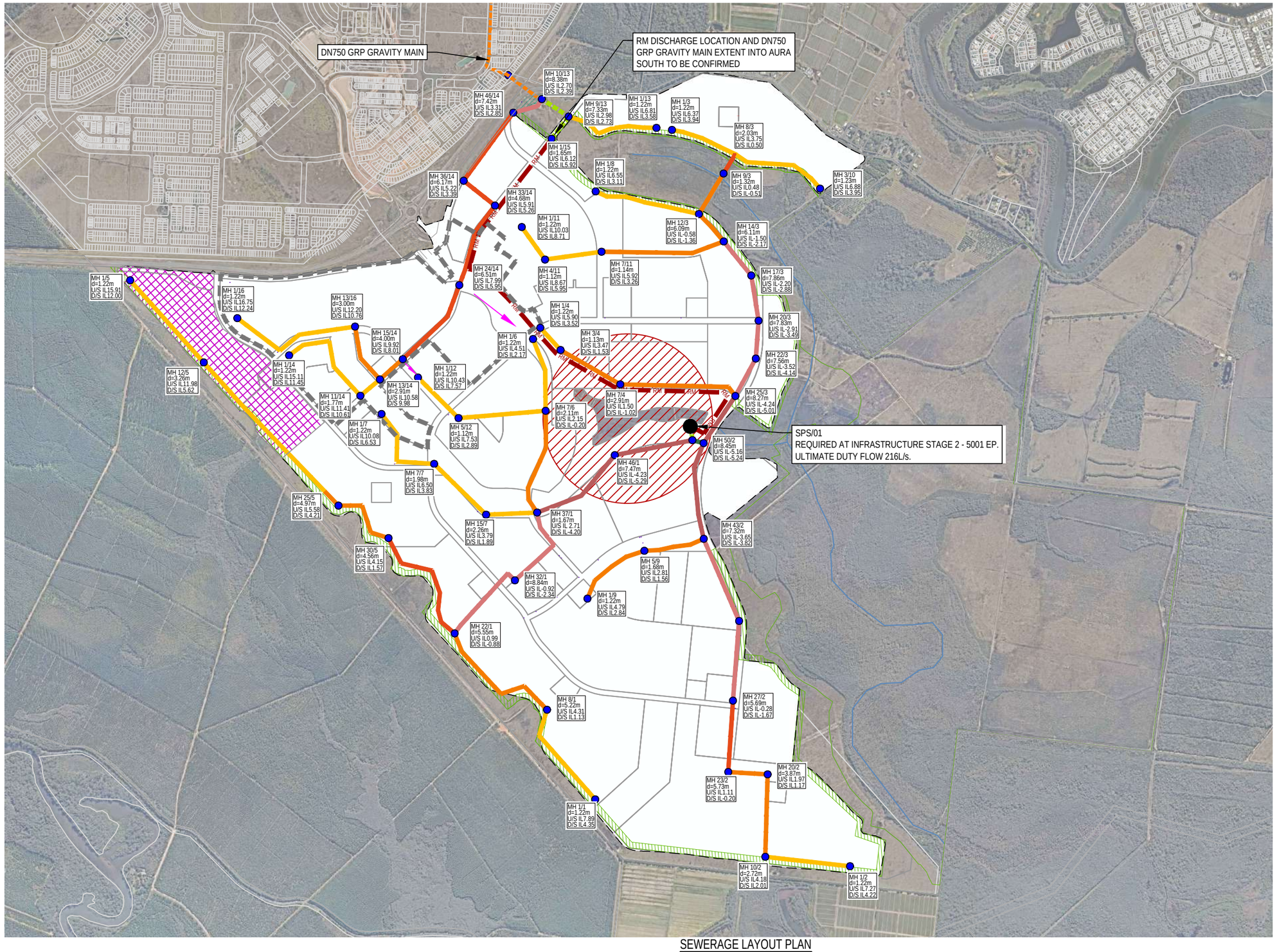
WATER RETICULATION LAYOUT PLAN

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A1	Drawing No 25-269-FL80
	Revision B

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APPENDIX C – CONCEPT WHOLE OF SITE STRATEGY PLAN (PREPARED BY KNG)

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LEGEND

- EARLY RELEASE AREA
- AURA SOUTH GRAVITY CATCHMENT TO GAGALBA SPS-LMT119
- POTENTIAL GRAVITY CATCHMENT
- AURA SOUTH PUMP STATION SEWER CATCHMENT
- POTENTIAL PUMP STATION LOCATION
- PROPOSED SEWER MAIN DN180 SDR21 ID = 163
- PROPOSED TRUNK SEWER DN250 SDR 17 ID = 220
- PROPOSED TRUNK SEWER DN315 SDR 17 ID 277
- PROPOSED TRUNK SEWER DN400 SDR 17 ID = 352
- PROPOSED TRUNK SEWER DN500 SDR 17 ID = 440
- PROPOSED TRUNK SEWER DN630 SDR 17 ID = 554
- PROPOSED TRUNK SEWER DN750 GRP ID = 783
- PROPOSED TRUNK SEWER DN800 SDR17 ID = 704
- PROPOSED TRUNK SEWER ID = 1000
- PROPOSED RISING MAIN 2 x DN450 SDR 11 ID = 366 (RM RM)
- PROPOSED MANHOLE INFORMATION (e.g. MH 27/2 d=5.69m U/S IL-0.28 D/S IL-1.67)
- POTENTIAL LOCATION FOR TEMPORARY SEWER DIVERSION FROM NORTHERN CATCHMENT TO AURA SOUTH SPS

NOTE: INDICATIVE CATCHMENT SIZING AND LEVELS TO BE CONFIRMED AT DETAILED DESIGN.

ALL ALIGNMENTS AND CATCHMENT BOUNDARIES SHOWN ARE INDICATIVE ONLY AND SUBJECT TO CONFIRMATION DURING DETAILED DESIGN

REFER AURA SOUTH INFRASTRUCTURE MASTER PLAN (IMP) DATED 21 OCTOBER 2026 PREPARED BY STANTEC.

SEWERAGE LAYOUT PLAN

SCALE 1:10000

CONCEPT NOT FOR CONSTRUCTION

100 50 0 100 200 300 400 500m

1 : 10000 (A1 UNREDUCED)

REVISIONS

No	Description	DR	DES	CHK	Date
A	ISSUED FOR INFORMATION	LC	AJ	EG	28.10.26

Project: AURA SOUTH

Client: Stockland

Approved:

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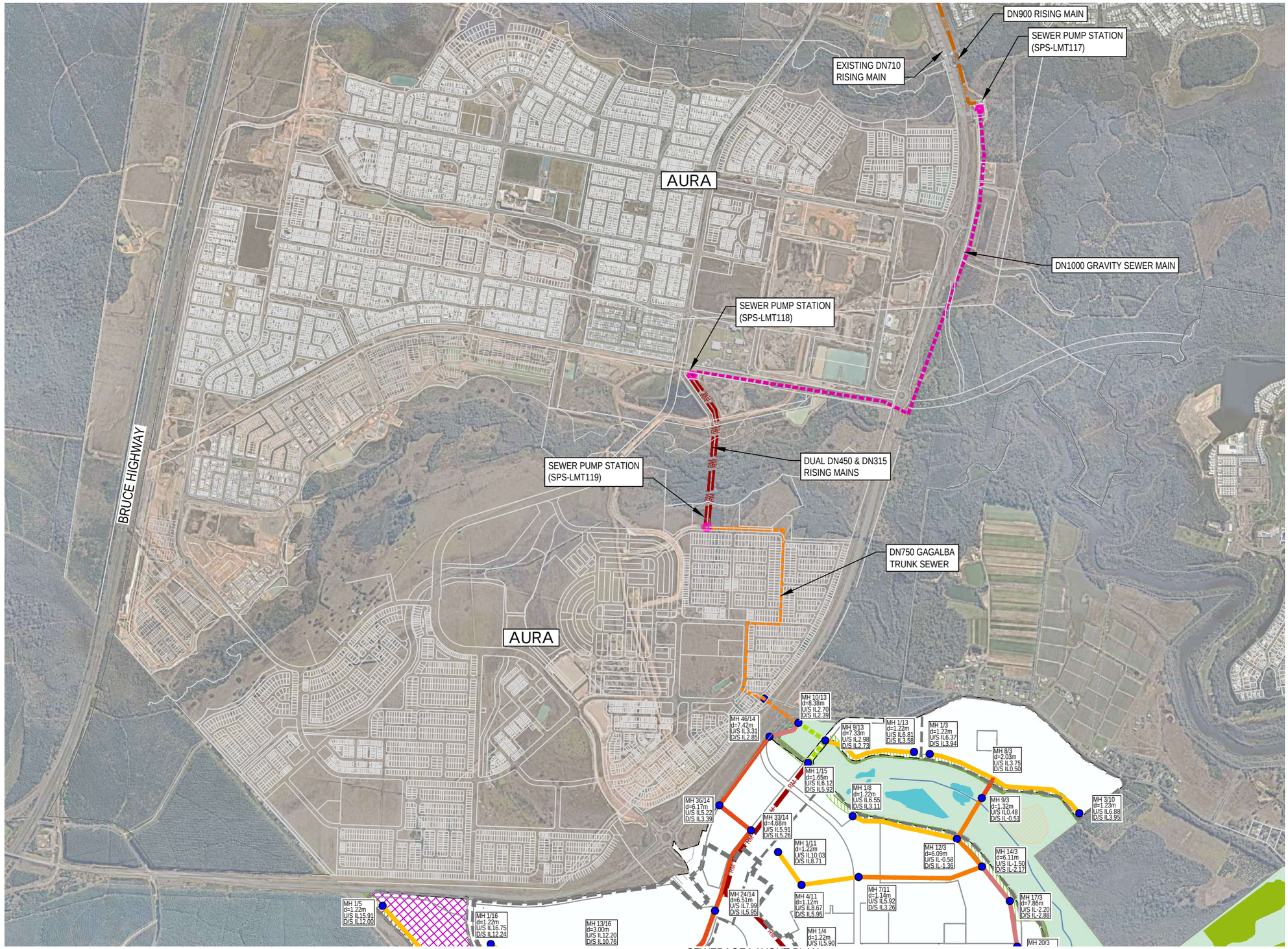
Application No.: -

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Drawing Title: CONCEPT SEWERAGE LAYOUT PLAN SHEET 1

Scale	Sheet
AS SHOWN	
A1	Drawing No 26-300-SK-001 / Revision A

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SEWERAGE LAYOUT PLAN

SCALE 1:10000

LEGEND

- EARLY RELEASE AREA
- AURA SOUTH GRAVITY CATCHMENT TO GAGALBA SPS-LMT119
- POTENTIAL GRAVITY CATCHMENT
- AURA SOUTH PUMP STATION SEWER CATCHMENT
- POTENTIAL PUMP STATION LOCATION
- PROPOSED SEWER MAIN DN180 SDR21 ID = 163
- PROPOSED TRUNK SEWER DN250 SDR 17 ID = 220
- PROPOSED TRUNK SEWER DN315 SDR 17 ID 277
- PROPOSED TRUNK SEWER DN400 SDR 17 ID = 352
- PROPOSED TRUNK SEWER DN500 SDR 17 ID = 440
- PROPOSED TRUNK SEWER DN630 SDR 17 ID = 554
- PROPOSED TRUNK SEWER DN750 GRP ID = 783
- PROPOSED TRUNK SEWER DN800 SDR17 ID = 704
- PROPOSED TRUNK SEWER ID = 1000
- PROPOSED RISING MAIN 2 x DN450 SDR 11 ID = 366
- PROPOSED RISING MAIN DN900 ID = 732
- MH 27/2 d=5.69m U/S IL-0.28 D/S IL-1.67 — PROPOSED MANHOLE INFORMATION
- POTENTIAL LOCATION FOR TEMPORARY SEWER DIVERSION FROM NORTHERN CATCHMENT TO AURA SOUTH SPS
- EXISTING RISING MAIN DN900 SDR 11 ID = 732
- EXISTING RISING MAIN DN710 SDR 11 ID = 578

NOTE: INDICATIVE CATCHMENT SIZING AND LEVELS TO BE CONFIRMED AT DETAILED DESIGN.

ALL ALIGNMENTS AND CATCHMENT BOUNDARIES SHOWN ARE INDICATIVE ONLY AND SUBJECT TO CONFIRMATION DURING DETAILED DESIGN

REFER AURA SOUTH INFRASTRUCTURE MASTER PLAN (IMP) DATED 21 OCTOBER 2026 PREPARED BY STANTEC.

CONCEPT NOT FOR CONSTRUCTION

100 50 0 100 200 300 400 500m
1 : 10000 (A1 UNREDUCED)

REVISIONS

No	Description	DR	DES	CHK	Date
A	ISSUED FOR INFORMATION	LC	AJ	EG	28.10.26

Project: AURA SOUTH

Client: Stockland

Approved:

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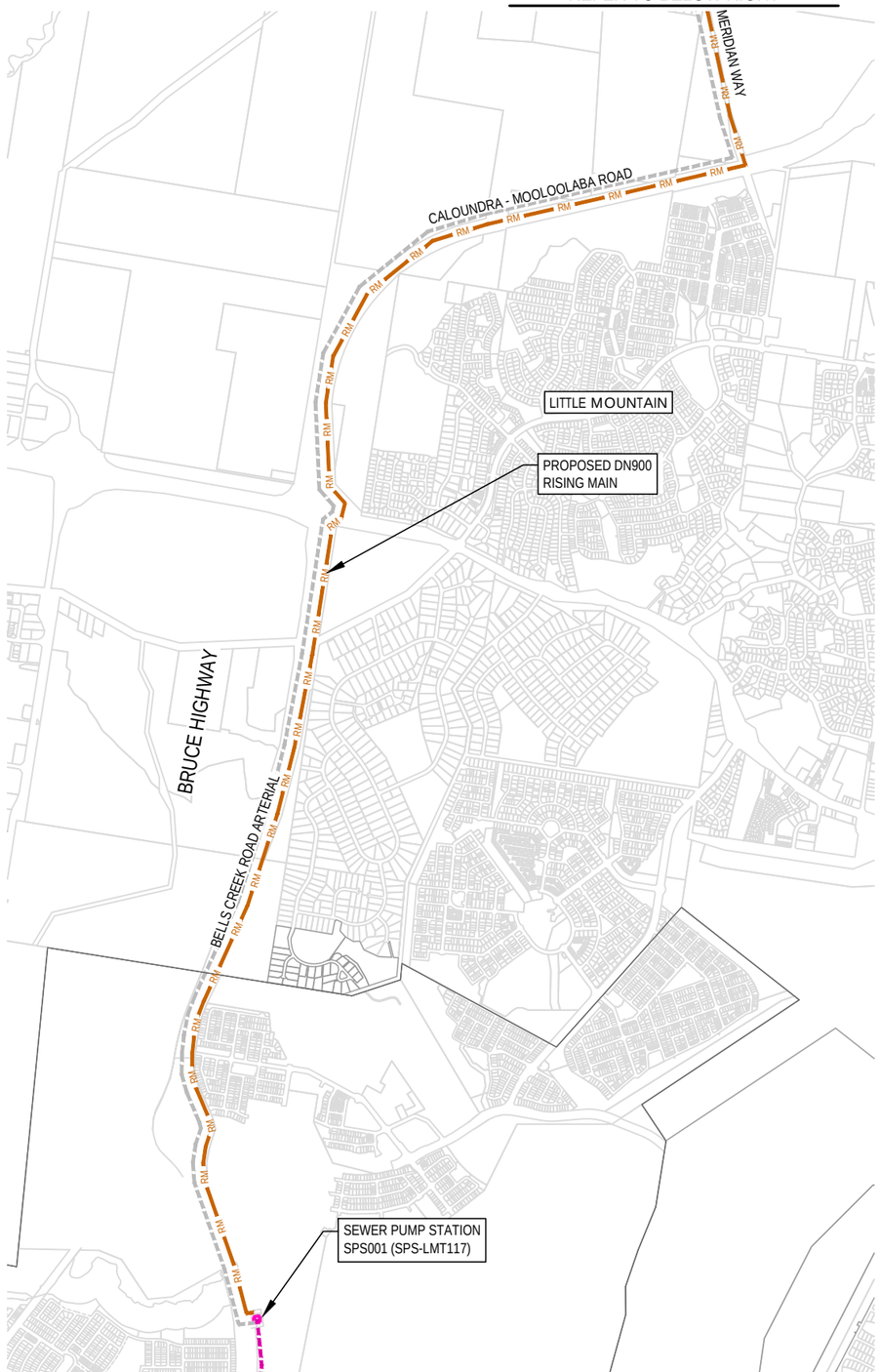
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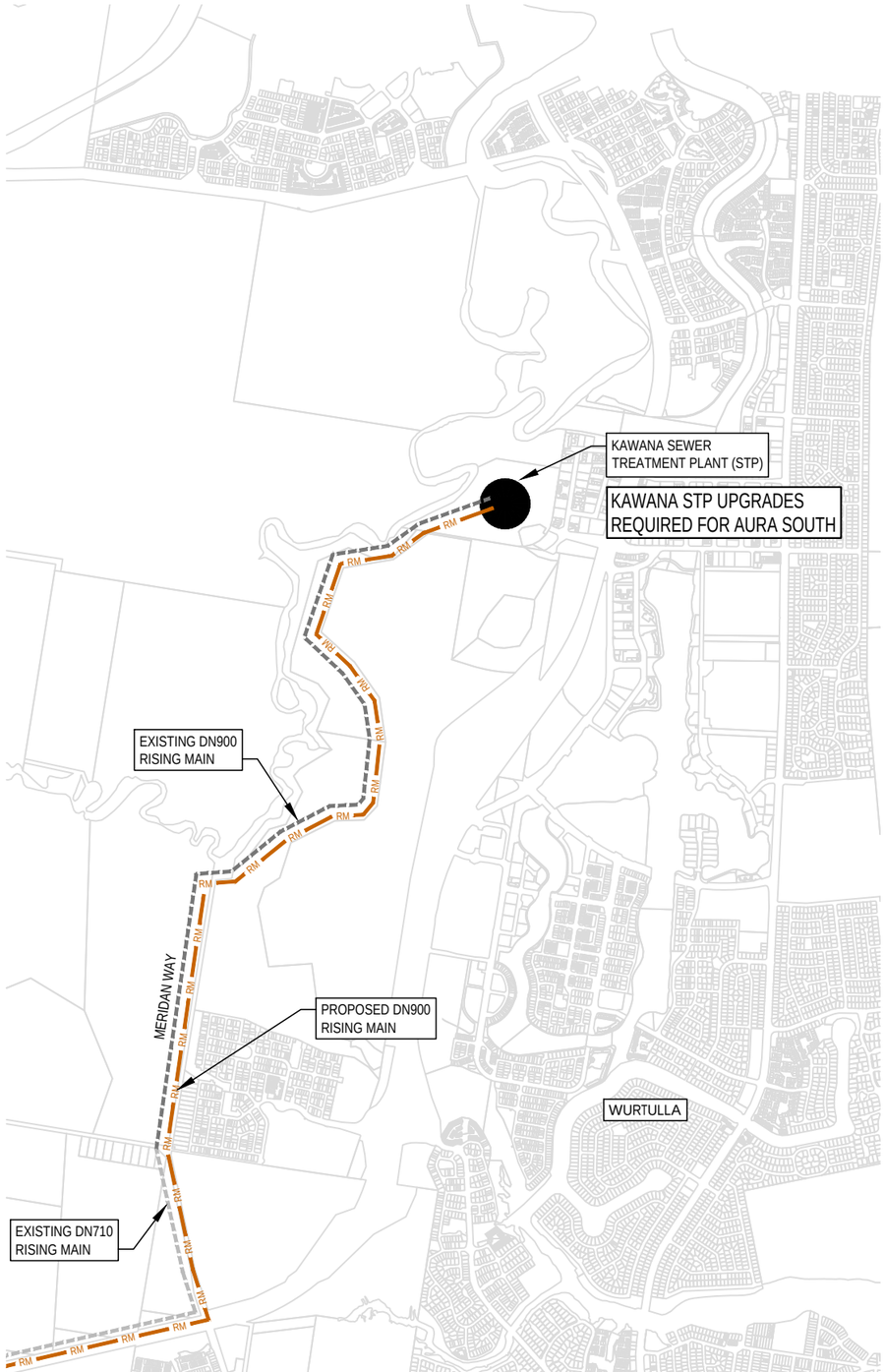
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REFER TO BELOW RIGHT



SEWERAGE LAYOUT PLAN
SCALE 1:10000



REFER TO ABOVE LEFT

LEGEND

- PROPOSED RISING MAIN DN900 ID = 732
- EXISTING RISING MAIN DN900 SDR 11 ID = 732
- EXISTING RISING MAIN DN710 SDR 11 ID = 578

NOTE: INDICATIVE CATCHMENT SIZING AND LEVELS TO BE CONFIRMED AT DETAILED DESIGN.

ALL ALIGNMENTS AND CATCHMENT BOUNDARIES SHOWN ARE INDICATIVE ONLY AND SUBJECT TO CONFIRMATION DURING DETAILED DESIGN

REFER AURA SOUTH INFRASTRUCTURE MASTER PLAN (IMP) DATED 21 OCTOBER 2026 PREPARED BY STANTEC.

CONCEPT NOT FOR CONSTRUCTION

100 50 0 100 200 300 400 500m
1 : 10000 (A1 UNREDUCED)

REVISIONS

No	Description	DR	DES	CHK	Date
A	ISSUED FOR INFORMATION	LC	AJ	EG	28.10.26

Project: AURA SOUTH

Client: Stockland

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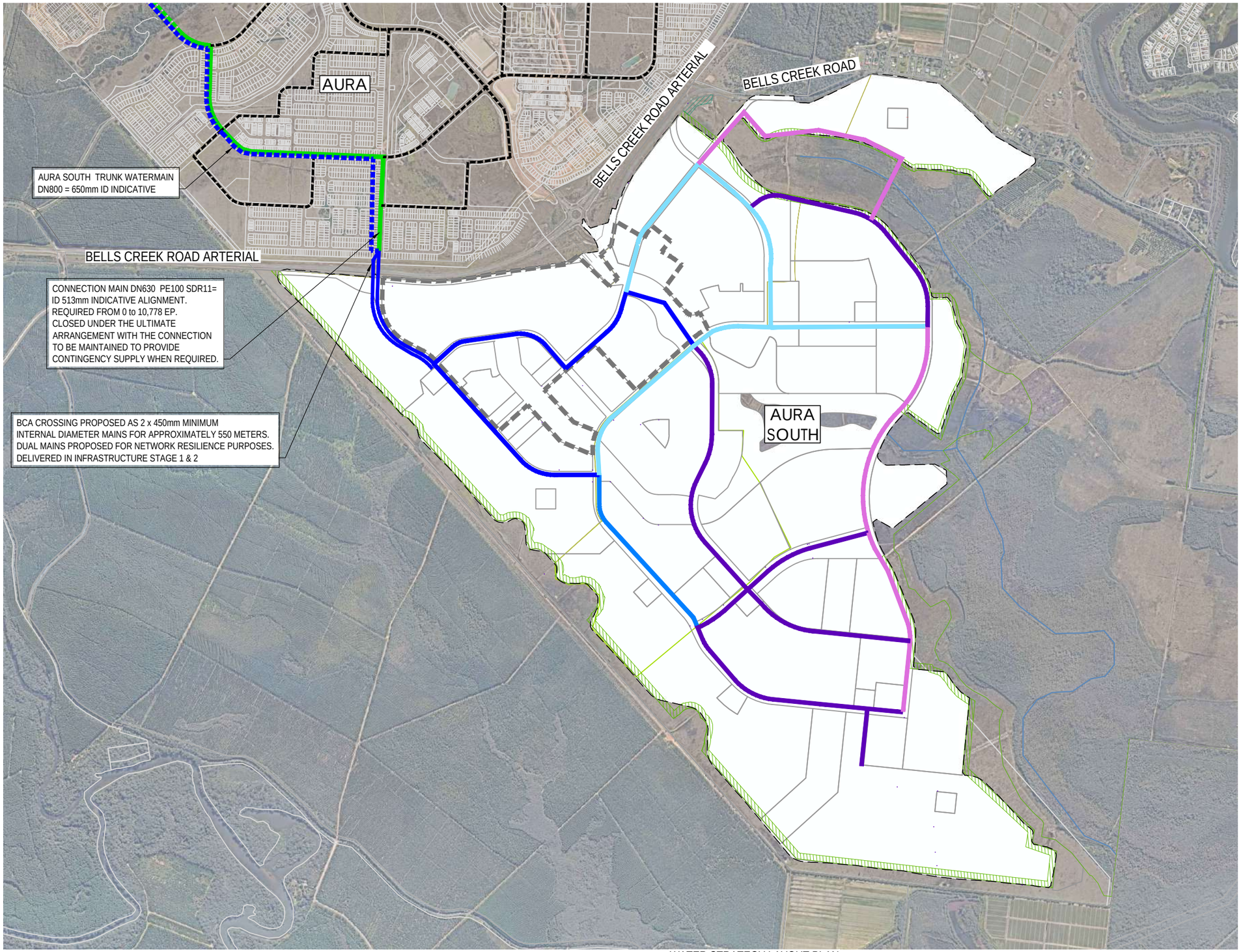
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Drawing Title: CONCEPT SEWERAGE LAYOUT PLAN SHEET 3

Scale: AS SHOWN
Sheet: A1
Drawing No: 26-300-SK-003
Revision: A

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REFER TO 26-300-SK005 FOR CONTINUATION



LEGEND

- EARLY RELEASE AREA
- INDICATIVE AURA SOUTH APPROX. 5,000 EP CATCHMENT BOUNDARY
- INDICATIVE AURA SOUTH APPROX. 5,001 - 10,778 EP CATCHMENT BOUNDARY
- INDICATIVE AURA SOUTH APPROX. 10,779 - 30,942 EP CATCHMENT BOUNDARY
- AURA SOUTH TRUNK MAIN DN800= ID 650mm
- AURA TRUNK MAIN DN800 = ID 650mm
- TRUNK MAIN CONNECTION DN630 = ID 513mm
- TRUNK MAIN DN560 = ID 450mm
- TRUNK MAIN DN500 = ID 400mm
- TRUNK MAIN DN355 = ID 300mm
- TRUNK MAIN DN315 = ID 250mm
- TRUNK MAIN DN250 = ID 200mm
- AURA GAGALBA TRUNK NETWORK INDICATIVE LAYOUT

ALL ALIGNMENTS AND CATCHMENT BOUNDARIES SHOWN ARE INDICATIVE ONLY AND SUBJECT TO CONFIRMATION DURING DETAILED DESIGN

REFER AURA SOUTH INFRASTRUCTURE MASTER PLAN, prepared BY STANTEC
Dated 21 October 2026

WATER STRATEGY LAYOUT PLAN

SCALE 1:10000

CONCEPT NOT FOR CONSTRUCTION

100 50 0 100 200 300 400 500m
1 : 10000 (A1 UNREDUCED)

REVISIONS

No	Description	DR	DES	CHK	Date
A	ISSUED FOR INFORMATION	AJ	AJ	EG	28.10.26

Project: AURA SOUTH

Client: Stockland

Approved:

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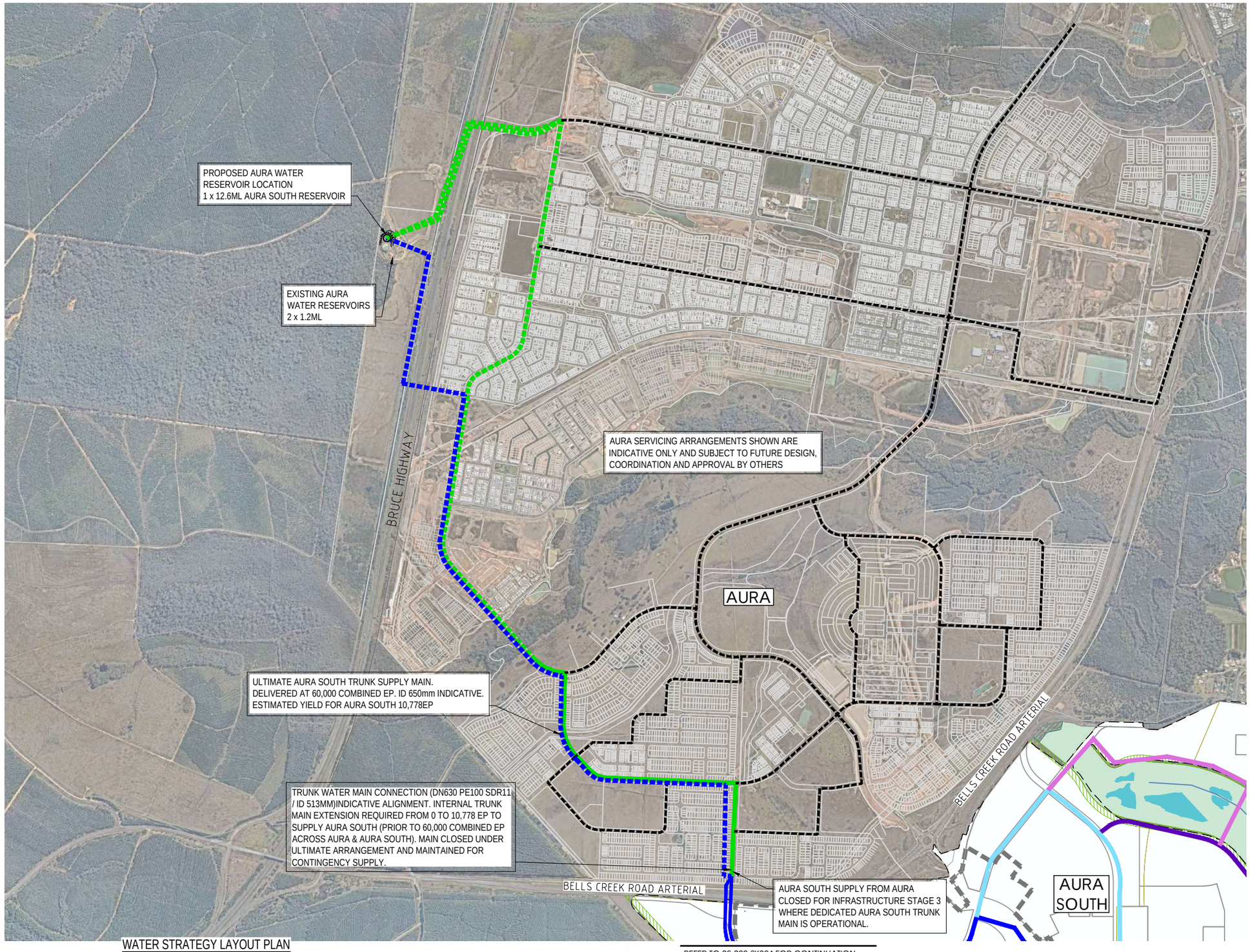
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Drawing Title: CONCEPT WATER STRATEGY LAYOUT PLAN SHEET 1

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A1	Drawing No 26-300-SK-004
	Revision A

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WATER STRATEGY LAYOUT PLAN
SCALE 1:10000

REFER TO 26-300-SK004 FOR CONTINUATION

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REFER AURA SOUTH INFRASTRUCTURE MASTER PLAN, prepared BY STANTEC *Dated 21 October 2026*

CONCEPT NOT FOR CONSTRUCTION

100 50 0 100 200 300 400 500m
1 : 10000 (A1 UNREDUCED)

REVISIONS

No	Description	DR	DES	CHK	Date
A	ISSUED FOR INFORMATION	AJ	AJ	EG	28.10.26

Project: AURA SOUTH

Client: Stockland

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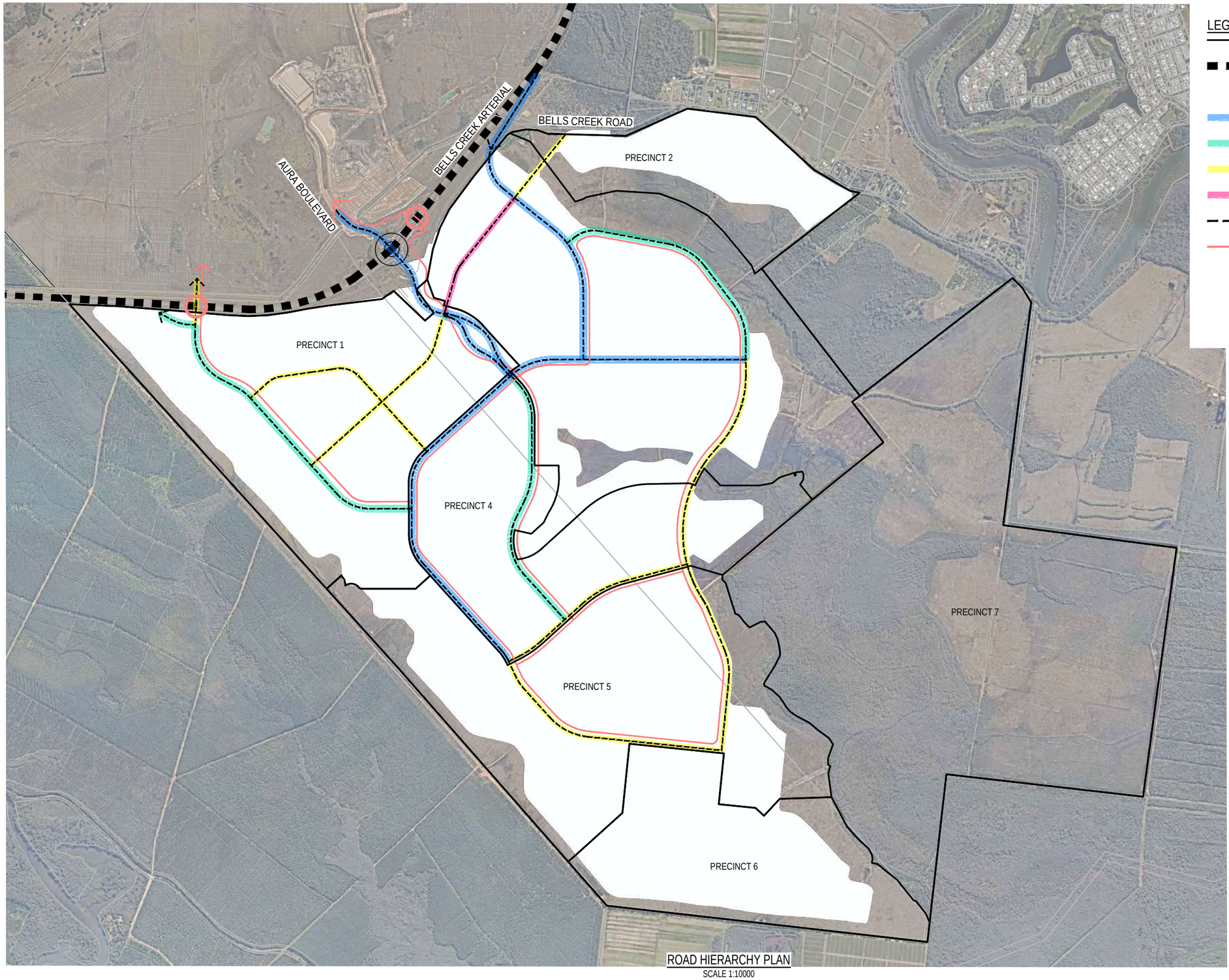
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Drawing Title: CONCEPT WATER STRATEGY LAYOUT PLAN SHEET 2

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	Revision A

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LEGEND

- PRECINT BOUNDARY
- STATE CONTROLLED ROAD
- FUTURE STATE CONTROLLED ROAD INTERSECTION
- SUB-ARTERIAL - 4 LANE AND MEDIAN
- SUB-ARTERIAL - 2 LANE AND MEDIAN
- NEIGHBOURHOOD CONNECTOR - 2 LANE
- INDUSTRIAL CONNECTOR - 2 TO 4 LANES AND MEDIAN
- PUBLIC TRANSPORT NETWORK
- PRIMARY ACTIVE TRANSPORT AND CYCLE TRACK
- CYCLE TRACK (TWO WAY) BRIDGE CONNECTION TO GABALBA

ROAD HIERARCHY PLAN
SCALE 1:10000

NOTE: REFER AURA SOUTH TRAFFIC AND TRANSPORTATION INFRASTRUCTURE MASTER PLAM, PREPARED BY JALAHAWI CONSULTING DATED 19 OCTOBER 2026

ALL ALIGNMENTS AND CATCHMENT BOUNDARIES SHOWN ARE INDICATIVE ONLY AND SUBJECT TO CONFIRMATION DURING DETAILED DESIGN

CONCEPT NOT FOR CONSTRUCTION

100 50 0 100 200 300 400 500m
1 : 10000 (A1 UNREDUCED)

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No	Description	DR	DES	CHK	Date
1	ISSUED FOR INFORMATION	SA	AJ	EG	28.10.26

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Client: Stockland

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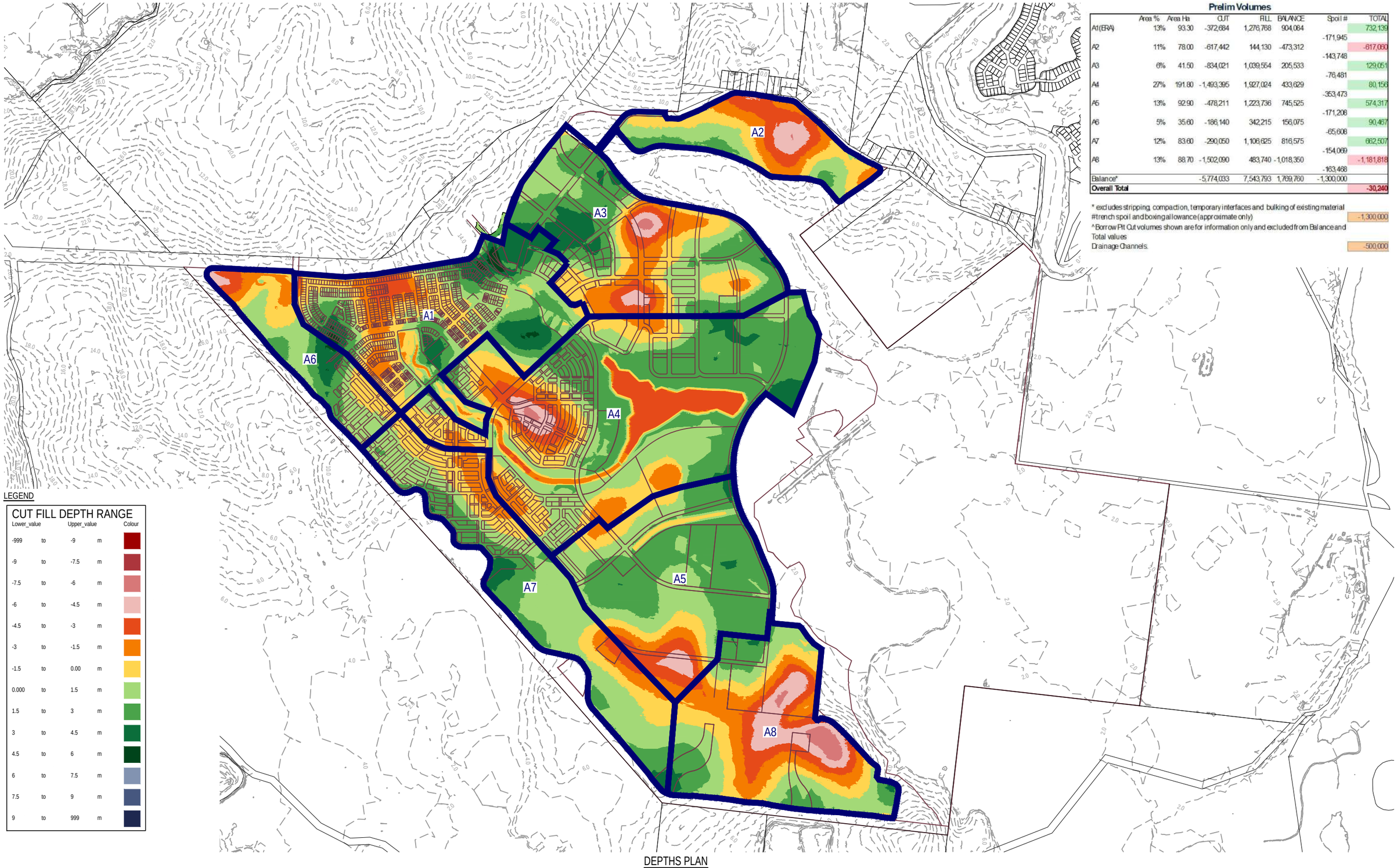
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Drawing Title: CONCEPT ROADWORKS STRATEGY ROAD HIERARCHY PLANS

Scale	Sheet
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	Revision: A

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Prelim Volumes

	Area %	Area Ha	CUT	FILL	BALANCE	Spoil #	TOTAL
A1(ERA)	13%	93.30	-372,684	1,276,768	904,084		732,139
						-171,945	
A2	11%	78.00	-617,442	144,130	-473,312		-617,060
						-143,748	
A3	6%	41.50	-834,021	1,039,554	205,533		129,051
						-76,481	
A4	27%	191.80	-1,493,395	1,927,024	433,629		80,156
						-353,473	
A5	13%	92.90	-478,211	1,223,736	745,525		574,317
						-171,208	
A6	5%	35.60	-186,140	342,215	156,075		90,467
						-65,608	
A7	12%	83.60	-290,050	1,106,625	816,575		662,507
						-154,069	
A8	13%	88.70	-1,502,090	483,740	-1,018,350		-1,181,818
						-163,468	
Balance*			-5,774,033	7,543,793	1,769,760	-1,300,000	
Overall Total							**-30,240**

* excludes stripping, compaction, temporary interfaces and bulking of existing material
#trench spoil and boxing allowance (approximate only) -1,300,000
^Borrow Pit Cut volumes shown are for information only and excluded from Balance and Total values
Drainage Channels. -500,000

LEGEND

CUT FILL DEPTH RANGE

Lower_value		Upper_value		Colour
-999	to	-9	m	
-9	to	-7.5	m	
-7.5	to	-6	m	
-6	to	-4.5	m	
-4.5	to	-3	m	
-3	to	-1.5	m	
-1.5	to	0.00	m	
0.000	to	1.5	m	
1.5	to	3	m	
3	to	4.5	m	
4.5	to	6	m	
6	to	7.5	m	
7.5	to	9	m	
9	to	999	m	

DEPTHS PLAN
SCALE 1:10000

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CONCEPT NOT FOR CONSTRUCTION

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1 : 10000 (A1 UNREDUCED)

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No	Description	DR	DES	CHK	Date
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Project
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Drawing Title
CONCEPT OVERALL BULK EARTHWORKS STRATEGY DEPTHS PLAN

Scale: AS SHOWN
Sheet: A1
Drawing No: 26-300-SK-007
Revision: A

LEGEND

- 0.00 CONCEPT DESIGN CONTOURS
- 0.00 EXISTING CONTOURS
- EARLY WORKS AREA
- EXTENT OF EARTHWORKS

DEPTHS PLAN
SCALE 1:10000

Date

Rev

CONCEPT NOT FOR CONSTRUCTION

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1 : 10000 (A1 UNREDUCED)

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Drawing Title

CONCEPT OVERALL SITE NATURAL SURFACE CONTOURS

Scale	Sheet
AS SHOWN	
A1	Drawing No 26-300-SK-008
	Revision A

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APPENDIX D – AURA SOUTH EARLY RELEASE AREA WS&S SERVICING REPORT (PREPARED BY STANTEC)

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Aura South Early Release Area Water Supply and Sewerage Servicing Assessment

Stantec

Prepared for:
Stockland

Prepared by:
Liam White / Michael Austin

Date:
28 October 2026

Project/File:
300203654

Stantec Australia Pty Ltd

Revision Schedule

Revision No.	Date	Description	Prepared by	Quality Reviewer	Independent Reviewer	Project Manager Final Approval
0	29/09/26	Draft Rev0	LW / PH	PH / MA	MM	MM / PH
1	28/10/26	Rev1	LW / PH	PH / MA	MM	MM / PH

Checked and approved by RPEQ

Name: **Phillip Hall 23017**

Signature: 

Disclaimer

The conclusions in the report are Stantec's professional opinion, as of the time of the report, and concerning the scope described in the report. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. The report relates solely to the specific project for which Stantec was retained and the stated purpose for which the report was prepared. The report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

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Prepared by: Liam White
Signature

Reviewed by: Phillip Hall
Signature

Approved by: Madeline Meagher
Signature

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1 Introduction

Aura South is a large emerging greenfield community located south of the progressing Aura development on the Sunshine Coast. Consisting of 1,233 ha of land located south of Bells Creek Arterial Road, Aura South is an important regional development that will yield between 10,000 and 12,000 residential lots. The extent of Aura South is provided in Figure 1-1.

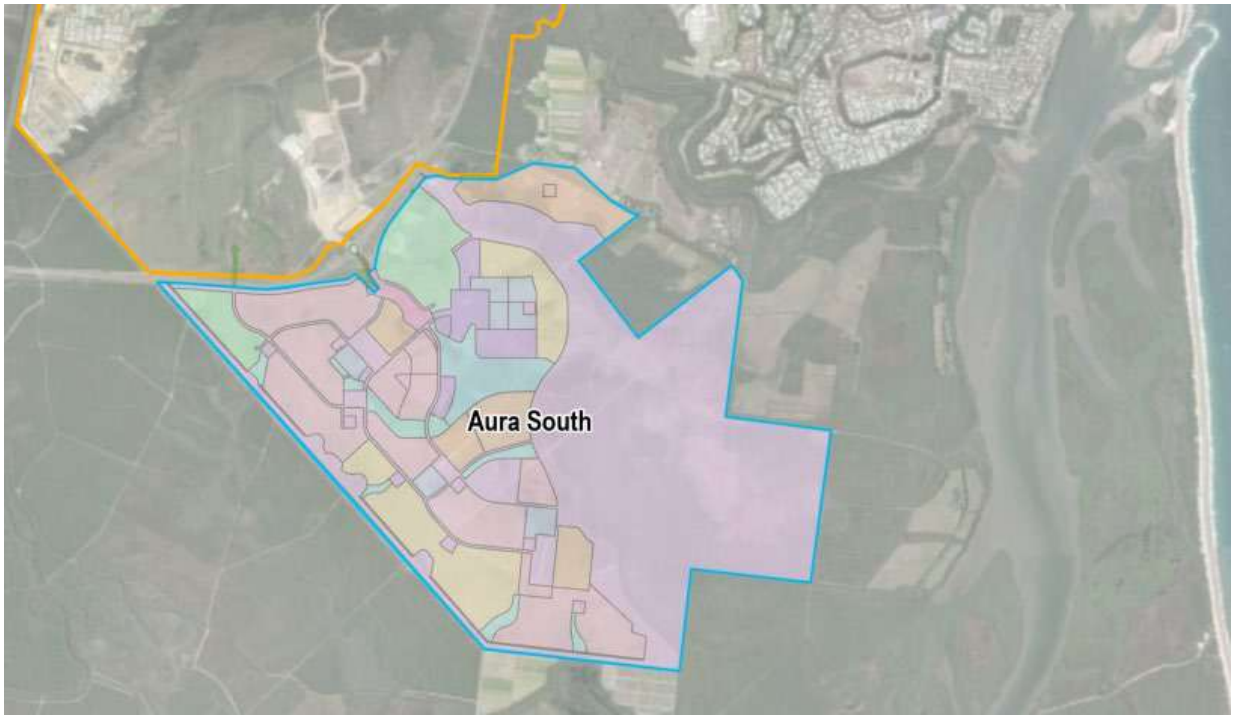


Figure 1-1: Aura South Locality and Site Boundary

The first Aura South lots will be delivered as part of an early release area (ERA) positioned at the north of Aura South. The extent of the Ara South ERA is shown in Figure 1-2. The ERA is anticipated to consist of 1,015 residential lots and 14.25 ha of non-residential land made of a mix of offices, industry/SME, large format retain, shops, service centre and a police station.

In respect to water supply and sewerage the Aura South ERA is well located to be initially serviced through available capacity in the Aura water supply and sewerage networks. Aura infrastructure planning within both the Aura 2022 and 2026 IMP, the 2026 Aura South IMP, and subsequent infrastructure design and delivery, has made provision to accommodate the Aura South ERA. The Aura and Aura South IMPs contain staged capacity upgrades to accommodate Aura South through its sewerage network through to full development build out. Water Infrastructure and sizing through the Aura water supply network have been planned so to accommodate Aura South until 60,000 combined EP across Aura and Aura South is realised.

This report documents the water supply and sewerage servicing strategies for the Aura South ERA in the context of the overall Aura South development and demonstrates compliance with standards of service both internally and externally to Aura South.

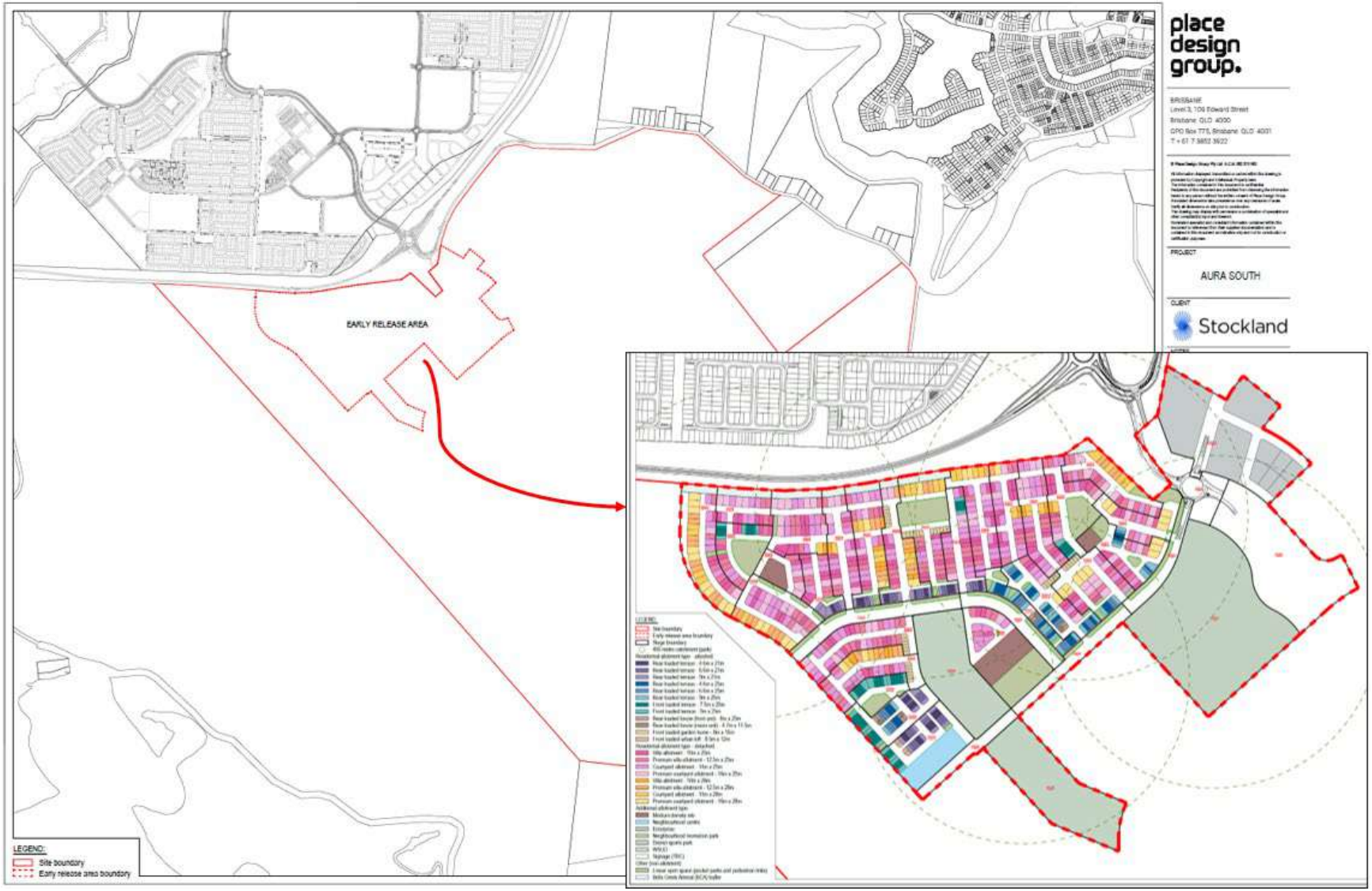


Figure 1-2: Aura South Early Release Area Locality and Subdivision Plan

2 Background

2.1 Aura South Servicing Overview

The development and planning of staged water supply and sewerage infrastructure strategies to service Aura South have been progressing for several years. These strategies have been further refined within the 2026 Aura Water supply and Sewerage IMP Update and the 2026 Aura South Water Supply and Sewerage IMP.

2.1.1 Water Supply

The Aura South water supply servicing strategy is summarised as follows:

- Aura South EP to 10,778 EP (including anticipated Aura South ERA EP of 3,048 EP) *(up to 60,000 combined Aura + Aura South EP)*

  Aura South EP to 10,778 EP is to be supplied through the Aura water supply network utilising the 2 x 12 ML Aura reservoirs (1 x existing and 1 x future) and the 2 x 660 mm diameter MSCL Aura reservoir outlet mains crossing the Bruce Highway into the Aura network. 10,778 EP is the estimated EP within Aura South at a combined Aura plus Aura South EP of 60,000 EP. Flow will be conveyed to Aura South through Aura via an upsized internal network including extension of the DN630 PE100 SDR11 (ID 513 mm) main that currently terminates after Aura Precinct 15. This internal Aura water main will be extended to the Aura South water connection point crossing the Bells Creek Arterial (BCA)Road.

  The supply to Aura South will continue to operate in this arrangement though to 10,778 EP. Full development in the Aura South ERA will initially be serviced through this arrangement.

  Twin 450 mm diameter mains will cross the BCA from Aura South and will continue to the ERA inlet point within Aura South. The twin mains are proposed to provide network resilience to Aura South and remove a single point of failure supply arrangement.

- Aura South EP > 10,778 EP *(beyond 60,000 combined Aura + Aura South EP)*

  Beyond 10,778 EP in Aura south (60,000 EP Aura + Aura South total), capacity within the Aura water supply network including the Aura reservoir capacity will be exhausted. A separate standalone supply arrangement for servicing Aura South is required. This standalone arrangement involves a new Aura South 12.6 ML reservoir storage, located at the Aura reservoir facility, and a dedicated minimum 650 mm internal diameter supply main from the reservoir to the Aura South connection point. The existing 600 mm diameter Aura reservoir inlet supply main has the required capacity to Ultimate Aura and Aura South development.

Figure 2-1 provides a summary, extracted from the Aura IMP, of the key external trunk infrastructure mentioned above for servicing Aura South.

2.1.2 Sewerage

Aura South sewerage flows will be conveyed through the Aura network to the Regional Aura SPS (SPS—LMT116) for pumping through large rising mains to the Kawana STP for treatment and release.

To accommodate this arrangement, planning and design of infrastructure through Aura has considered the capacity required to accommodate Aura South in its sizing.

Internally though Aura, a DN750 GRP gravity trunk main will receive all Aura South flows and convey these to Aura pumping station SPS-LMT119 for further conveyance through the Aura network toward the regional SPS (SP-LMT116). SPS-LMT119, the SPS-LMT119 rising mains and the proposed DN1000 gravity trunk main to the regional Aura pumping station SPS-LMT116 have all been sized within the Aura IMP to accommodate Aura South flows. This supply strategy through Aura for accommodating Aura South flows, taken from the Aura IMP, is provided in Figure 2-3.

The wastewater servicing strategy continues to rely on the regional sewerage network centred on SPS-LMT116, with flows from both Aura and Aura South ultimately conveyed to the Kawana Sewage Treatment Plant (STP) via SPS-LMT116 and its DN710/DN900 PE100 twin rising mains (one existing and one future). In line with Unitywater planning and design, the last several kilometres of the first regional rising main has been built as a DN900 PE100 trunk main with the available Unitywater planning showing the second main to follow this sizing in the future. The reason for the increase to a DN900 PE100 for the final several kilometres is to accommodate future flows from Harmony and Beerwah East developments. This existing Unitywater regional strategy for these SPS-LMT116 DN710/DN900 PE100 rising mains has been adopted.

SPS-LMT116 (Regional Aura SPS) has initially been delivered in a Stage 1 arrangement (initial pumps and single rising main) with a plan for Stage 2 upgrades at a combined 45,000 EP within Aura and Aura South. The SPS-LMT116 pump station has been designed with sufficient space to accommodate pump upgrades at this time. Stage 2 rising main duplication will also occur at 45,000 combined Aura and Aura South EP. Finalisation of the Stage 2 upgrade requirements prior to 45,000 EP will need Unitywater to consider the other key regional developments also intending to utilise this regional rising main system.

Internal Aura South Sewerage Strategy

The Aura South sewerage network will operate as two catchments:

- Gravity catchment to the Aura / Aura South connection point (including the ERA)

An area at the north of Aura South is serviceable by gravity. Sewage collected from this area can gravitate to the start of the DN750 GRP trunk gravity sewer that will bring Aura South sewage into the Aura network. It is anticipated that this gravity network will be capable of accommodating around the first 5000 EPs in Aura South. This gravity collection catchment has helped to define the Aura South early release area extent shown in Figure 2-2.

- Aura South Pump Station Catchment

Internally, the Aura South contours allow for an Ultimate sewerage network with collection of the balance of flows to a single Aura South SPS. The Aura South SPS can then lift sewerage through rising mains to the Northern Aura South boundary where connection into the Aura gravity network via the proposed DN750 GRP gravity main occurs.

A proposed location for the Aura SPS is shown in Figure 2-2. The Ultimate sewerage network consisting of a single SPS has been developed with several environmental risk management strategies to protect sensitive downstream stormwater catchment areas. The risk management strategies include:

- The consolidation of SPS into one centralised station

- Smart / Nu Sewers – HDPE pipes
- The design for emergency storage for 6 hours ADWF
- Offline basin/WSUD for EROS discharge as contingency buffer for overflows.
- Monitoring - Comprehensive analytics, real-time system monitoring, and groundwater monitoring to identify network issues, failures and leaks.

The network consisting of a single SPS does require a single section of deeper gravity sewer to collect flows from the southwest of the site to the SPS.

Dual 300 mm diameter rising mains have also been proposed from the Aura South SPS in order to facilitate online maintenance and enable the continuation of flow conveyance in the event of a rising mains outage. Although both rising mains will need be delivered together to provide this resilience and safeguard against failure, hydraulically, the first rising main is required when the extent of area able to be serviced by gravity is exhausted. The second rising main is hydraulically required at around development of half the Aura South SPS catchment ~ 13,000 EP

A concept Aura South sewerage servicing strategy showing the ERA and the gravity sub catchments is shown within Figure 2-2.

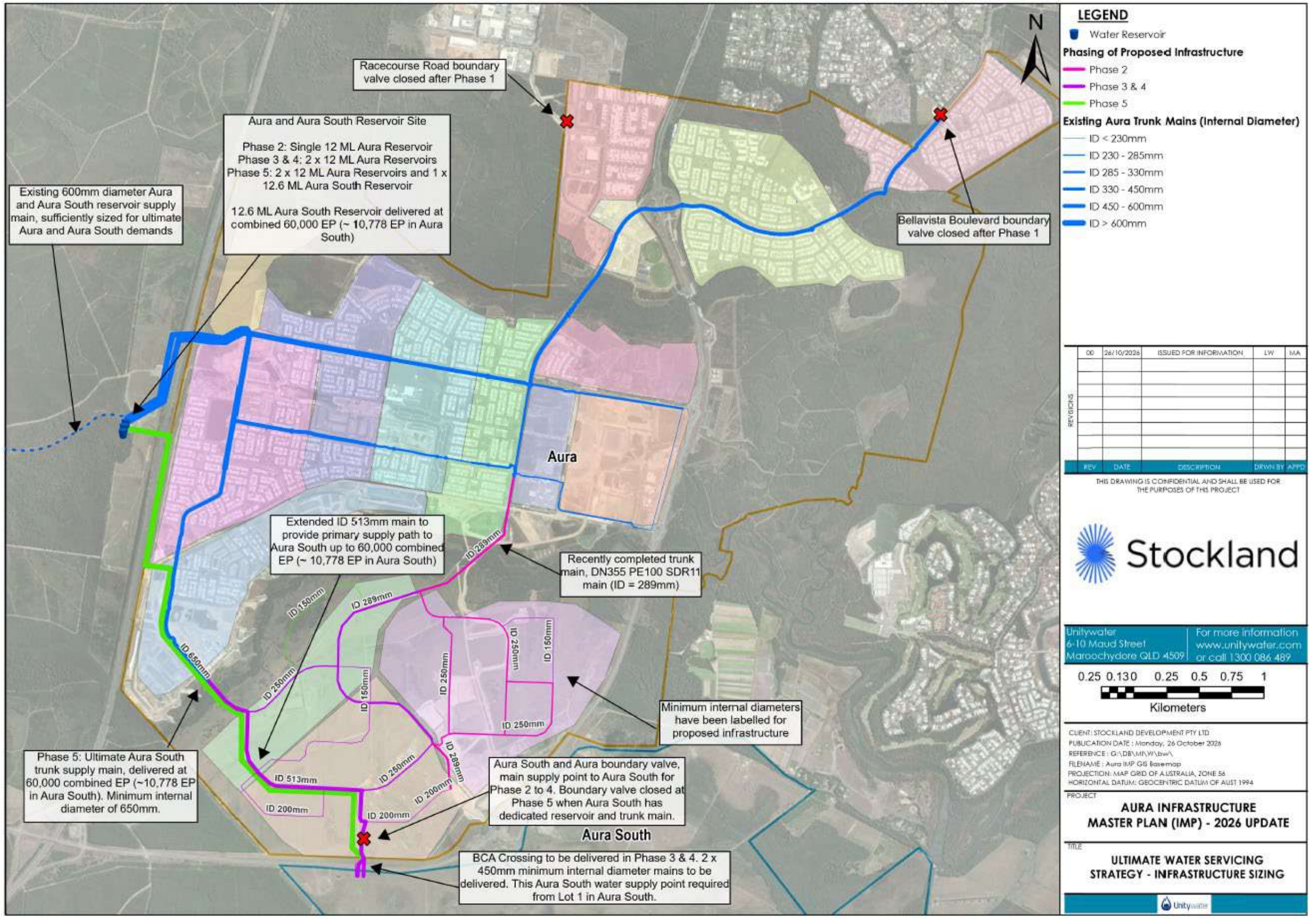


Figure 2-1: Aura South Trunk External Water Supply Strategy

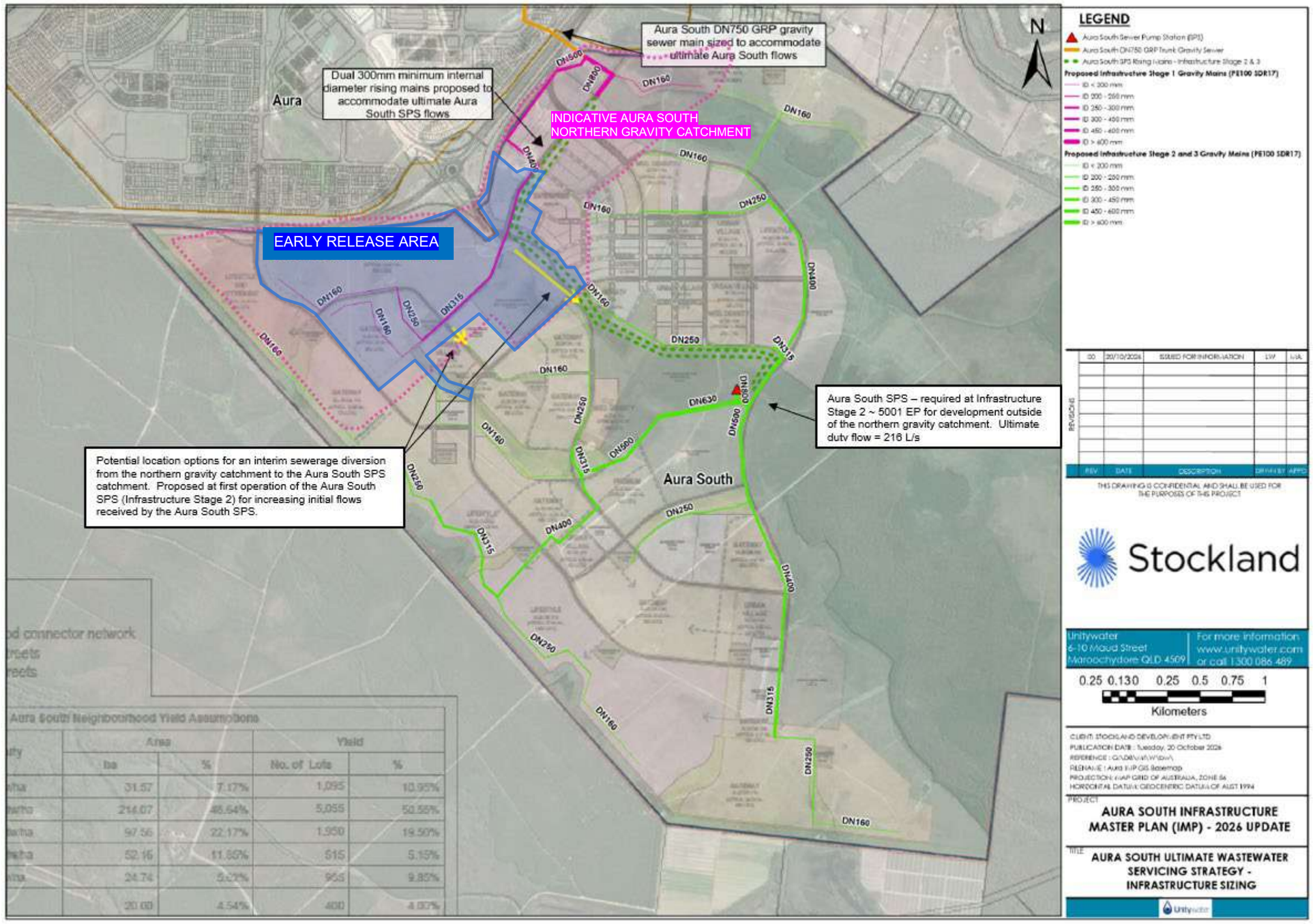


Figure 2-2: Aura South Concept Sewerage Servicing Strategy

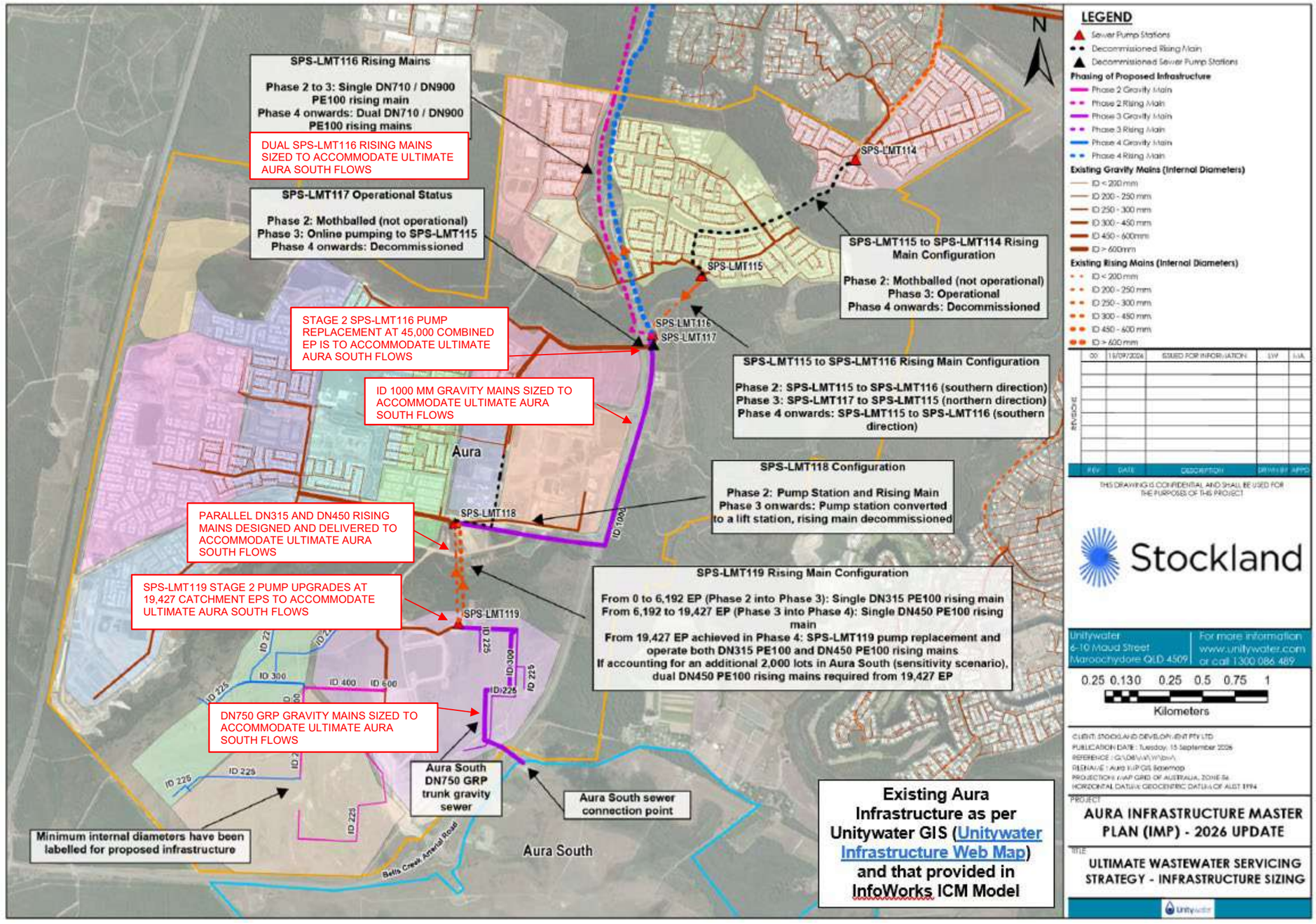


Figure 2-3: Aura South trunk sewerage servicing strategy through Aura

2.2 Related Reports

The Aura Water Supply and Sewerage Infrastructure Master Plan (Aura IMP) (Stantec; 2026) and Aura South Infrastructure Master Plan (Aura South IMP) (Stantec; 2026) provide staged capacity assessment of Aura Water supply and sewerage infrastructure whilst accommodating projected growth within Aura South. IMP outcomes include staged water supply and sewerage trunk infrastructure plans for Aura and Aura South. The Aura and Aura South IMPs contains internal and external trunk infrastructure capacity assessments and provides modelling results.

Within this Aura South ERA Water Supply and Sewerage Servicing Assessment report, some outputs for the Aura and Aura South IMPs have been directly extracted and replicated for ease of reference. However, both Aura and Aura South IMPs should be referred to for full details.

3 Assumptions and Approach

Key assumptions and the general approach adopted for this Aura South ERA servicing assessment is presented in the following sections.

The general assessment approach has involved identifying the initial servicing requirement for the Aura South ERA in its early supply arrangement whilst ensure the Ultimate servicing needs of Aura South are accommodated.

3.1 Network Models

Network models provided by Unitywater and updated for use in the recent Aura IMP Update have been expanded and used in this ERA servicing assessment. The latest Unitywater models forming the basis of assessment are as follows:

- **Water Supply:** IMF_LAN_Water_MP_Model_2026(Draft01).wspt, transportable database of the InfoWorks WS Pro model for Landers Shoot (and Image Flat).
- **Sewer:** 20251127 Kawana Master ICM Model, transportable database of InfoWorks ICM model for Kawana.

3.2 Assumptions

- Aura South Early Release Area development timing:
    - First Lot in 2030
    - ERA total development EP = 3,048 EP including a 10% design uplift (EP development detailed in Section 4)
    - As the ERA will be the first development within Aura South, based on the below EP per infrastructure phase extracted from the Aura South IMP, the Aura South ERA will be completed within Aura South Infrastrucutre Stage 1 corresponding to Aura IMP Phase 3.

Table 3-1: EP Summary per Aura Infrastructure Phase

Aura South IMP Infrastructure Stage	n/a	n/a	Stage 1 (0 to 5000 EP in Aura South)	Stage 2 (5,001 to 10,778 EP in Aura South)	Stage 3 (10,779 EP and above in Aura South)
Corresponding Aura IMP Phase with Combined EP	Existing EP (2026)	Phase 2 22,000 – 30,000 EP	Phase 3 30,000 – 45,000 EP	Phase 4 45,000 – 60,000 EP	Phase 5 Ultimate
Aura	22,000	30,000	39,693	49,222	57,927
Aura South (with 10% uplift)	0	0	5,307	10,778	30,942
Aura and Aura South Total	22,000	30,000	45,000	60,000	88,869

- Within Aura South IMP Infrastructure Stage 1 / Aura IMP Phase 3, the following trunk infrastructure will be available to service the Aura South ERA:
    - Water Supply:
        - 2 x 12 ML Aura reservoirs with capacity to service up to 60,000 combined EP across Aura and Aura South (estimated 10,778 EP attributed to Aura South). Aura South will initially borrow storage capacity from Aura until a total of 60,000 total EP is achieved. At which time a new 12.6 ML Aura South reservoir will be delivered, and the Aura and Aura South water supply networks will operate separately.
        - An extension of the DN630 PE100 SDR11 (ID 513 mm) Aura internal western trunk main to the Aura South connection point will be available in Aura South Stage 1 / Aura IMP Phase 3 to provide the main supply path through Aura to Aura South up to 60,000 combined Aura and Aura South EP. Beyond 60,000 EP, a dedicated 650 mm minimum internal diameter supply main to Aura South from the Aura South reservoir will be delivered to facilitate separate Aura and Aura South water supply zones.
        - Refer to Figure 2-1 for spatial reference to the above discussed infrastructure.
    - Sewerage:
        - The DN750 GRP trunk sewerage gravity main from the Aura South Boundary to SPS-LMT119 will be available in Aura IMP Phase 3 to received flows from the Aura South ERA. This main is sized to convey Ultimate flows.
        - The DN1000 GRP trunk sewerage gravity main from the SPS-LMT119 rising main discharge point to SPS-LMT116 will be available in Aura IMP Phase 3. This main is sized to convey Ultimate flows.
        - SPS-LMT119 will be operation in its initial operational arrangement at the start of Phase 3 using is smaller DN315 P100 rising main. Once 6,192 upstream EP is achieved, anticipated within the development of the Aura South ERA, SPS-LMT119 will switch to its second stage operational arrangement using its DN450 PE100 rising main. The Aura South ERA will be completed with SPS-LMT119 operating in this second stage. The Ultimate operational stage for SPS-LMT119 will commence at 19,427 upstream EP occurring in Aura IMP Phase 4 after the Aura South ERA has been completed.
        - Refer to Figure 2-3 for spatial reference to the above discussed infrastructure

3.3 Standards of Service

The design criteria in the Southeast Queensland Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code) has been adopted to assess the water supply and sewerage infrastructure requirements for the Aura South ERA.

3.3.1 Water Supply

The key water supply DSS, taken from the SEQ WS&S D&C Code, that has been adopted for the Aura South ERA servicing assessment are as follows:

Demand Based DSS

- Average Day (AD) Demand Rate = 230 L/EP/day.
- Estimated Non-Revenue Water (NRW) = 30 L/EP/day.
- Mean Day Maximum Month to Average Day (MDMM:AD) Factor = 1.5 for all land uses.
- Peak Day to Average Day (PD:AD) Factor = 2 for all land uses.

Performance Based DSS

- Minimum pressure under normal operating conditions = 22 metres at the property boundary.
- Maximum service pressure under normal operating conditions = 55 metres.
- Firefighting performance for detached/attached residential = 15 L/s for two hours with background demand of 2/3 peak hour demand or average demand, whichever is greater.
- Firefighting performance for commercial/industrial buildings = 30 L/s for four hours with a background demand of peak hour demand (between 10am and 4pm).
- Ground reservoir storage sizing = 3 x (PD – MDMM) + emergency storage. Emergency storage either greater of 4 hours at MDMM or 0.5 ML.
- Desirable head loss = less than 5 m/km pipeline for mains ≤ DN150 and less than 3 m/km pipeline for mains ≥ DN200.
- Maximum allowable velocity = 2.5 m/s.

3.3.2 Sewerage

The Sewerage Network Design Criteria, taken from the SEQ WS&S D&C Code, that has been adopted for the Aura South ERA servicing assessment area as follows:

Flow Based DSS

- Average Dry Weather Flow (ADWF) = 180 L/EP/day (NuSewer)
- Peak Dry Weather Flow (PDWF) = C2 x ADWF, where C2 = 4.7 x $(EP)^{-0.105}$
- Peak Wet Weather Flow (PWWF) = 4 x ADWF

Performance Based DSS

- Pump station capacity = PWWF in a duty/assist operation mode.
- Emergency storage = 6 hours at ADWF (new) + minimum of 4 hours at ADWF for existing.

- Manning's value (n) = 0.0128.
- New gravity sewers maximum depth of flow = 75% depth at PWWF.
- Maximum velocity = 3 m/s for both gravity and rising mains.

Rising main minimum velocity = 0.75 m/s (preferred velocity = 1 – 1.5 m/s).

4 Population and Demand Development

4.1 Aura South Whole Development

4.1.1 EP Conversion Factors

For the Aura South development, the SA2 Beerwah Catchment EP rates and the Non-Residential EP rates defined in Netserv Plan Part A have been adopted as follows:

- Detached / Standard residential (=>175 m2) = 2.77 EP per dwelling.
- Attached residential / Apartments = 1.95 EP per dwelling
- Small and Terrace Residential (<175 m2) = 1.95 EP per dwelling
    - 1.95 EP per dwelling has been assumed for small lots such as Urban Terrace and Medium Density dwellings (as per the Aura IMP)
- Land Lease Dwellings = 1.7 EP per dwelling.
- Adopted Non-residential Netserv factors and assumed building coverages are provided in Table 4-1.

Table 4-1: Aura South Non-Residential EP Conversion Factors

Aura Non Residential use	Netserv Allocation	EP/100m2 GFA (Netserv)	Assumed Building Coverage %	Note
Office	Office	0.8	70	
Industry / SME	Low/Service Industry	0.4	60	
Large Format Retail	Warehouse	1.1	50	
Schools	Education Establishment	0.6	50	
Shops	Shop	1.5	60	
Child Care	Child Care Centre	1.5	50	
Community	Community Use	1.1	60	
Food and Drink	Food and Drink Outlet	5.4	60	
Shopping Centre	Shopping Centre	1.3	known GFA	17,300 m2 GFA
Medical	Health Care	0.8	60	
Gym	Club	2.6	60	
Service Centre	Service Station	1.4	60	
Police Station	Emergency Services	0.6	60	
Energex Substation	Utilities Installation	2.0	60	
Sports Parks (Toilet and Junior Club House)	N/A			10 EP Allowance for each site

4.1.2 Ultimate Aura South Population Projections

Ultimate EPs for Aura South have been derived from the Aura South Structure Plan, shown below in Figure 4-1. At ultimate development, Aura South is anticipated to have a development yield of 30,942 EP which includes 10% design uplift.

The EP breakdown of the Aura South is presented below in Table 4-2, noting the following:

- Current Aura South planning anticipates 10,000 dwellings, distributed between residential lots greater than 175 m^2, residential lots less than 175 m^2, apartments and land lease dwellings as per Table 4-2 below.
- Development areas have been provided for non-residential land uses. The EP conversion factors have been applied to these areas to estimate non-residential EPs in Aura South as per Table 4-2 below.

Table 4-2: Residential and Non-Residential Ultimate EP breakdown

Land Use	Quantity	EP Conversion Rate		Population	Note
Residential	**No. Dwellings**	**EP / Dwelling**		**EP**	
Residential Lots ≥ 175m2	5,253	2.77		14,551	
Residential Lots ≤ 175m2	3,502	1.95		6,829	
Apartment	845	1.95		1,648	
Land Lease Dwellings	400	1.7		680	
Total Residential EP				**23,707**	
Total Residential EP with 10% Design Uplift				**26,078**	
Non-Residential	**Site Area (Hectares)**	**EP/100m² GFA (Netserv)**	**Assumed Building Coverage (%)**	**EP**	
Office	1.31	0.8	70	73	
Industry / SME	23.91	0.4	60	574	
Large Format Retail	7.66	1.1	50	421	
Schools	35.35	0.6	50	1061	
Shops	6.18	1.5	60	556	
Child Care	2.70	1.5	50	203	
Community	1.00	1.1	60	66	
Food and Drink	2.45	5.4	60	794	
Shopping Centre		1.3	known GFA	225	17,300 m2 GFA
Medical	0.40	0.8	60	19	
Gym	0.87	2.6	60	136	
Service Centre	0.95	1.4	60	80	
Police Station	1.80	0.6	60	65	
Energex Substation	1.00	2.0	60	120	
Sports Parks (Toilet and Junior Club House)				30	10 EP allowed for each of 3 sites
Total Non-Residential EP				**4,422**	
Total Non-Residential EP with 10% Design Uplift				**4,864**	
Total Residential and Non-Residential EP				**28,129**	
Total Residential and Non-Residential EP with 10% Design Uplift				**30,942**	

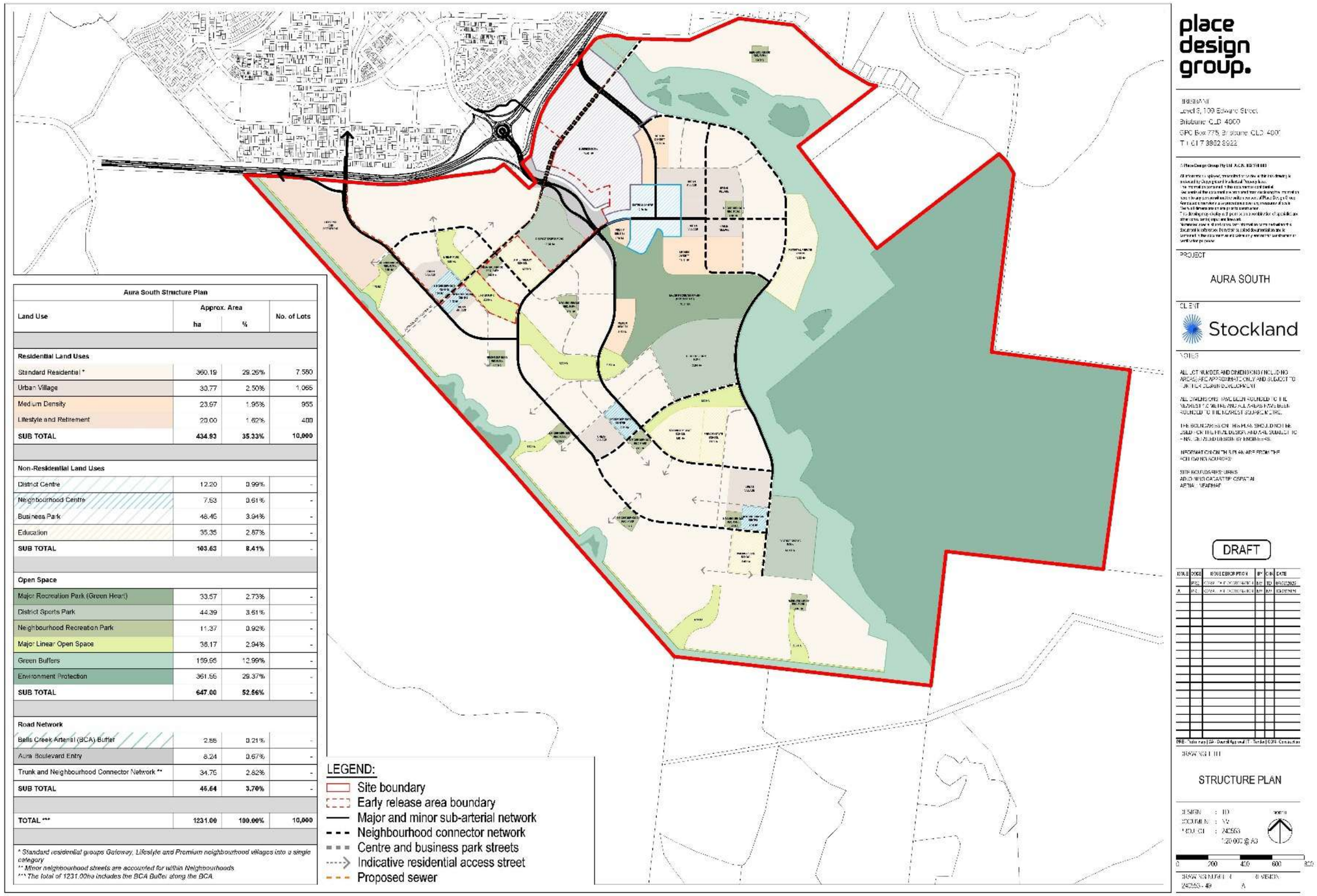


Figure 4-1: Aura South Structure Plan

4.2 Aura South Early Release Area

Place design group have recently completed a subdivision layout for the Early Release Area, refer to Figure 4-2.

Adopting the same EP conversion factors as those listed in Section 3.1 and the proposed number of residential dwellings and the non-residential developable area as per the Early Release Area subdivision layout presented in Figure 4-3, the EP of the Early Release Area has been determined as shown within Table 4-3.

Table 4-3: Aura South Early Release Area EP

Land Use	Quantity	EP Conversion Rate		Population
Residential	**No. Dwellings**	**EP / Dwelling**		**EP**
Residential Lots ≥ 175m2	747	2.77		2,069
Residential Lots ≤ 175m2	268	1.95		523
Total Residential EP				**2,592**
Total Residential EP with 10% Design Uplift				**2,851**
Non-Residential	**Site Area (Hectares)**	**EP/100m² GFA (Netserv)**	**Assumed Building Coverage (%)**	**EP**
Office	1.0	0.8	70	56
Industry / SME	1.0	0.4	60	24
Large Format Retail	1.8	1.1	50	99
Total Non-Residential EP				**179**
Total Non-Residential EP with 10% Design Uplift				**197**
Total Residential and Non-Residential EP				**2,771**
Total Residential and Non-Residential EP with 10% Design Uplift				**3,048**

Adopting a 10% design uplift for infrastructure sizing purposes, a total development yield of 3,048 EP has been derived for the Aura South Early Release Area.

4.3 Neighbouring Development to the ERA

The sewage generated by the Aura South ERA will be collected and conveyed by gravity to the Aura DN750 GRP sewerage trunk gravity main. This Aura South sewerage gravity catchment will also contain other Aura South development in addition to the ERA. Figure 2-2 and Figure 4-2 show an indicative gravity catchment extent with potential for gravity collection to the Aura connection point. The extent of this catchment is subject to further change as the design for development external to the ERA progresses.

The area within the northern Aura South gravity catchment could consist of up to an estimated 2,000 additional EP outside the ERA with varying potential to connect to the northern Aura South direct gravity catchment. Although subject to change up or down, the total potential northern Aura South direct gravity catchment EP is initially estimated at around 5,000 EP.

The northern Aura South gravity sewerage infrastructure proposed to service the ERA will be delivered to provide the potential to service up the potential 5,000 EP.

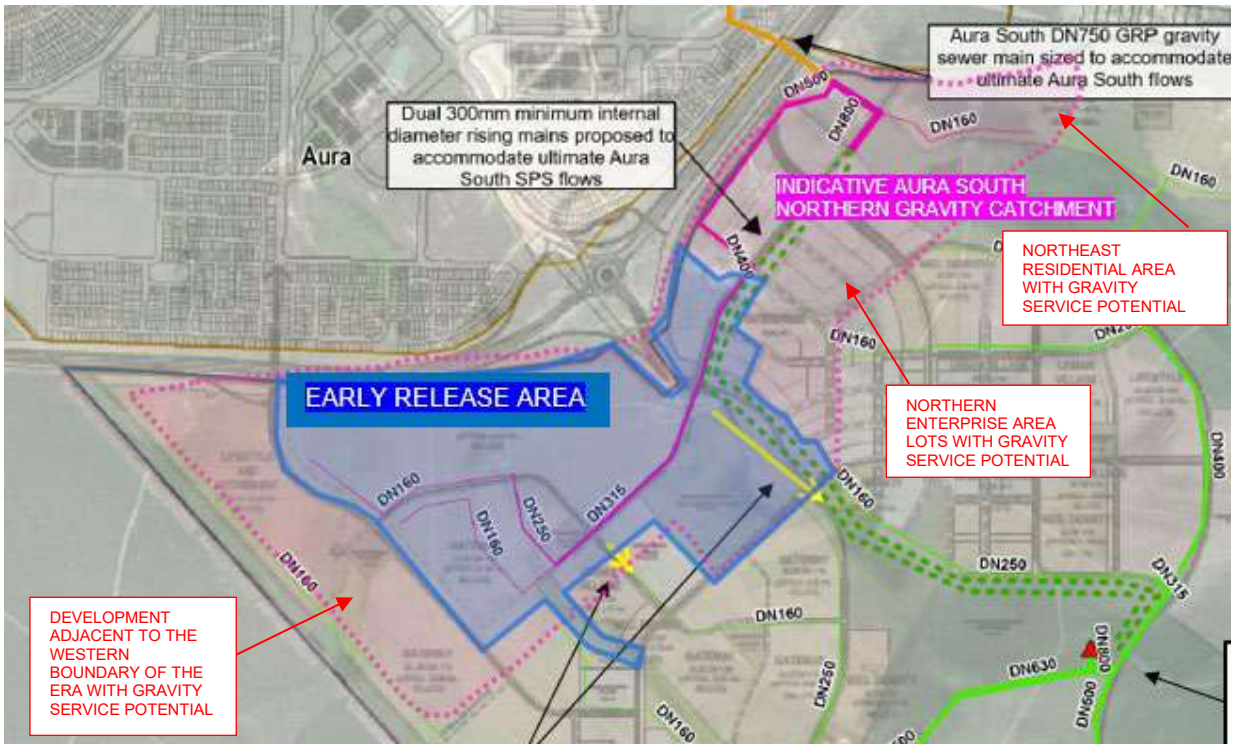


Figure 4-2: Potential Aura South Northern Sewerage Gravity Catchment



Figure 4-3: Aura South Early Release Area Subdivision Plan

5 Ultimate Aura South IMP Servicing Plan Summary

The Aura South IMP has been recently produced. The infrastructure within the Aura South IMP has been assessed at three key infrastructure phases in a similar approach to that used in the Aura IMP. The three Aura South infrastructure stages are listed as follows:

- **Aura South Infrastructure Stage 1: Up to 5,000 EP**

In Aura South Infrastructure Stage 1, development will occur within the northern part of Aura South focussed on area that has potential to be conveyed to the Aura South to Aura discharge point via gravity. The 5,000 EP under Aura South Infrastructure Stage 1 refers to the initial estimated EP with potential for direct gravity collection to the Aura DN750 GRP trunk gravity sewer, and includes the Aura South ERA EP. No Aura South sewerage pumping station is required in Aura South Infrastructure Stage 1.

Water to Aura South will be supplied via the Aura water supply network.

Aura South IMP Infrastructure Stage 1 corresponds with Aura IMP Phase 3 with respect to overall EPs.

- **Aura South Infrastructure Stage 2: 5,001 EP to 10,778 EP**

The key Stage 2 infrastructure items are the Aura South SPS and sewerage rising mains. Once development occurs outside of the northern Aura South gravity sewer catchment (initially estimated 5,000 EP), the Aura South SPS is triggered to service additional development in Aura South. The Aura South SPS rising mains will discharge into the previously delivered DN750 GRP Aura trunk gravity sewer which conveys flows through the south of Aura to SPS-LMT119. To support initial operation of the Aura SPS, temporary diversion of part of the northern gravity catchment to the SPS catchment is proposed at 5,001 EP or when the SPS is first in operation.

For water supply, the interim arrangement (continuation of Stage 1) involving water supply through Aura will continue until the end of Stage 2 when a combined 60,000 EP is developed across both Aura and Aura South. It is anticipated that Aura South will contribute 10,778 EP once a combined 60,000 EP is developed across both Aura and Aura South (18%) based on currently anticipated development rates.

Aura South IMP Infrastructure Stage 2 corresponds with Aura IMP Phase 4 with respect to overall EPs.

- **Aura South Infrastructure Stage 3: Ultimate 10,779 EP – 30,942 EP**

Once 60,000 EP is developed across Aura and Aura South (estimated 10,779 EP in Aura South), the dedicated Aura South reservoir and trunk supply main is required to service Aura South through to full development.

For sewer, no major new trunk infrastructure is required. All continuing development will gravitate to the Aura South SPS for onward pumping through to full development.

Aura South IMP Infrastructure Stage 3 corresponds with Aura IMP Phase 5 with respect to overall EPs.

Figure 5-1 presents the anticipated development extents within Aura South across each of the above discussed Aura South IMP Infrastructure Stages.

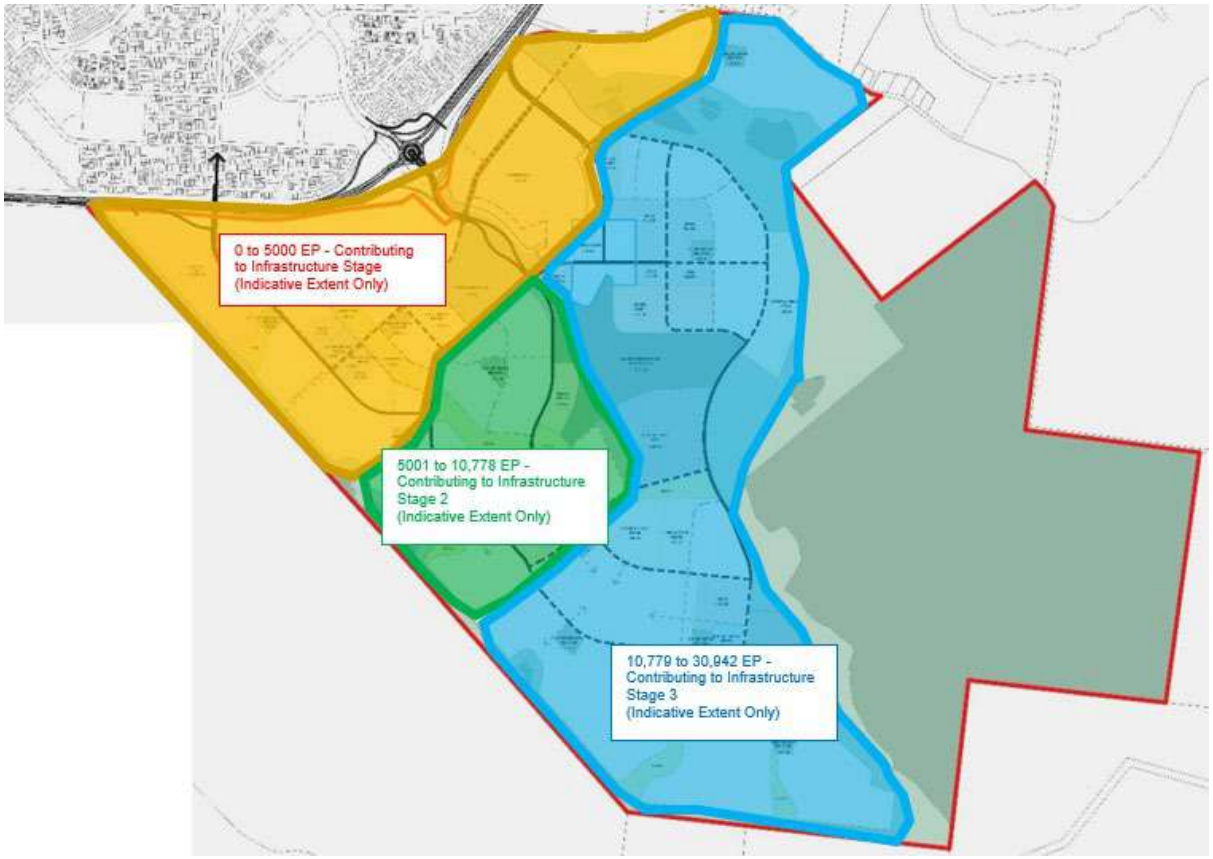


Figure 5-1: Aura South indicative development progression

5.1.1 Water Supply

The proposed Aura South trunk water supply arrangement for Aura South Infrastructure Stages 1 and 2, taken from the Aura South IMP, is shown within Figure 5-2. Figure 5-3 shows the Aura South Infrastructure related to Infrastructure Stage 3 (Ultimate). Both maps provide minimum pressure available at peak hour demand.

5.1.2 Sewerage

The proposed Aura South trunk sewerage infrastructure arrangement for Aura South Infrastructure Stage 1 taken from the Aura South IMP, is shown within Figure 5-4. Figure 5-4 also shows the Infrastructure Stages 2 and 3 (through to Ultimate) Aura South trunk sewerage infrastructure. The servicing strategy is only shown in this figure, with trunk infrastructure sizing still being developed as part of the Aura South IMP update (exact location and sizing of infrastructure will be better understood as design progresses).

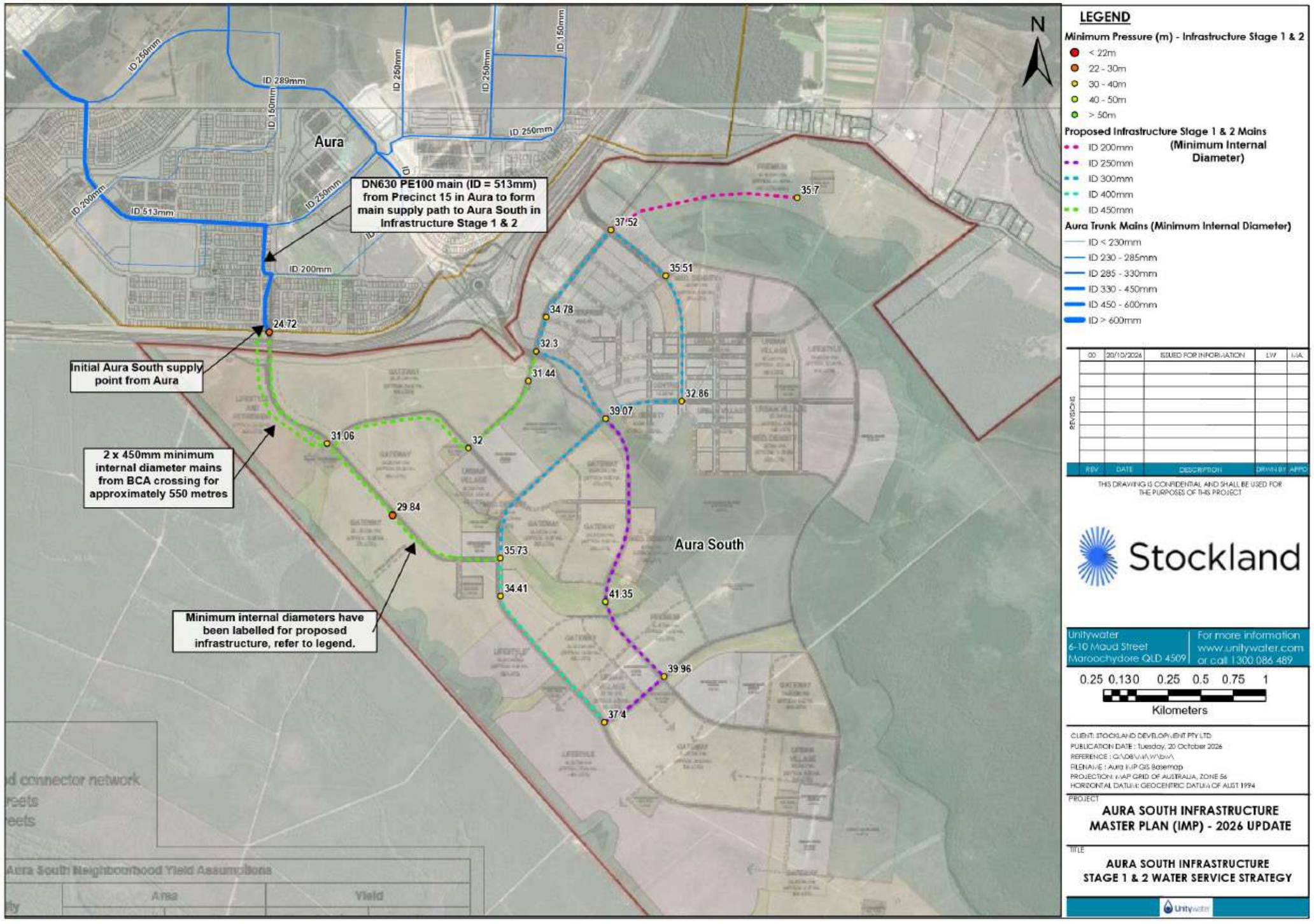


Figure 5-2: Aura South Water Infrastructure Stage 1 & 2 – water supply servicing strategy with minimum pressure

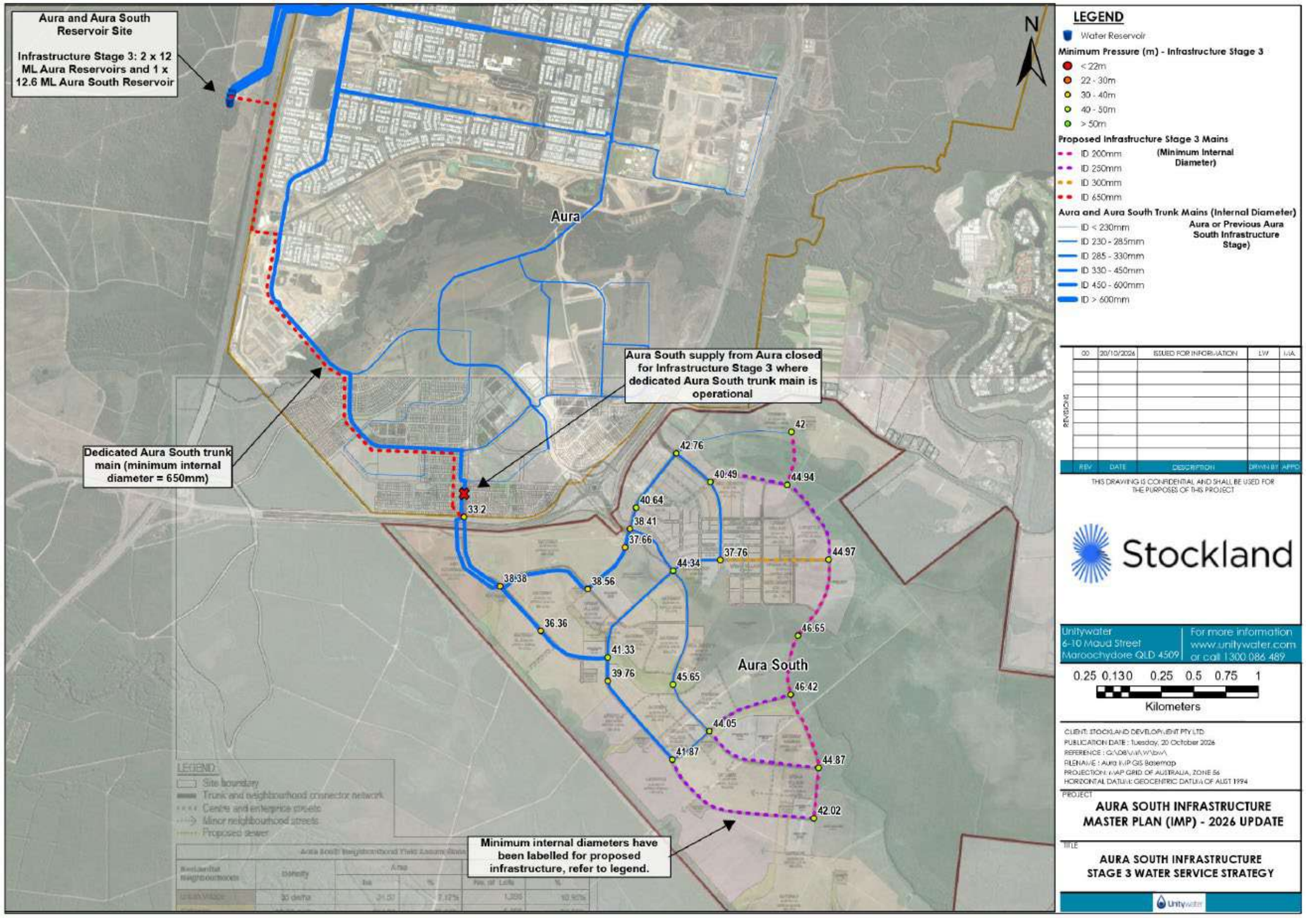


Figure 5-3: Aura South Infrastructure Stage 3 – water supply servicing strategy with minimum pressure

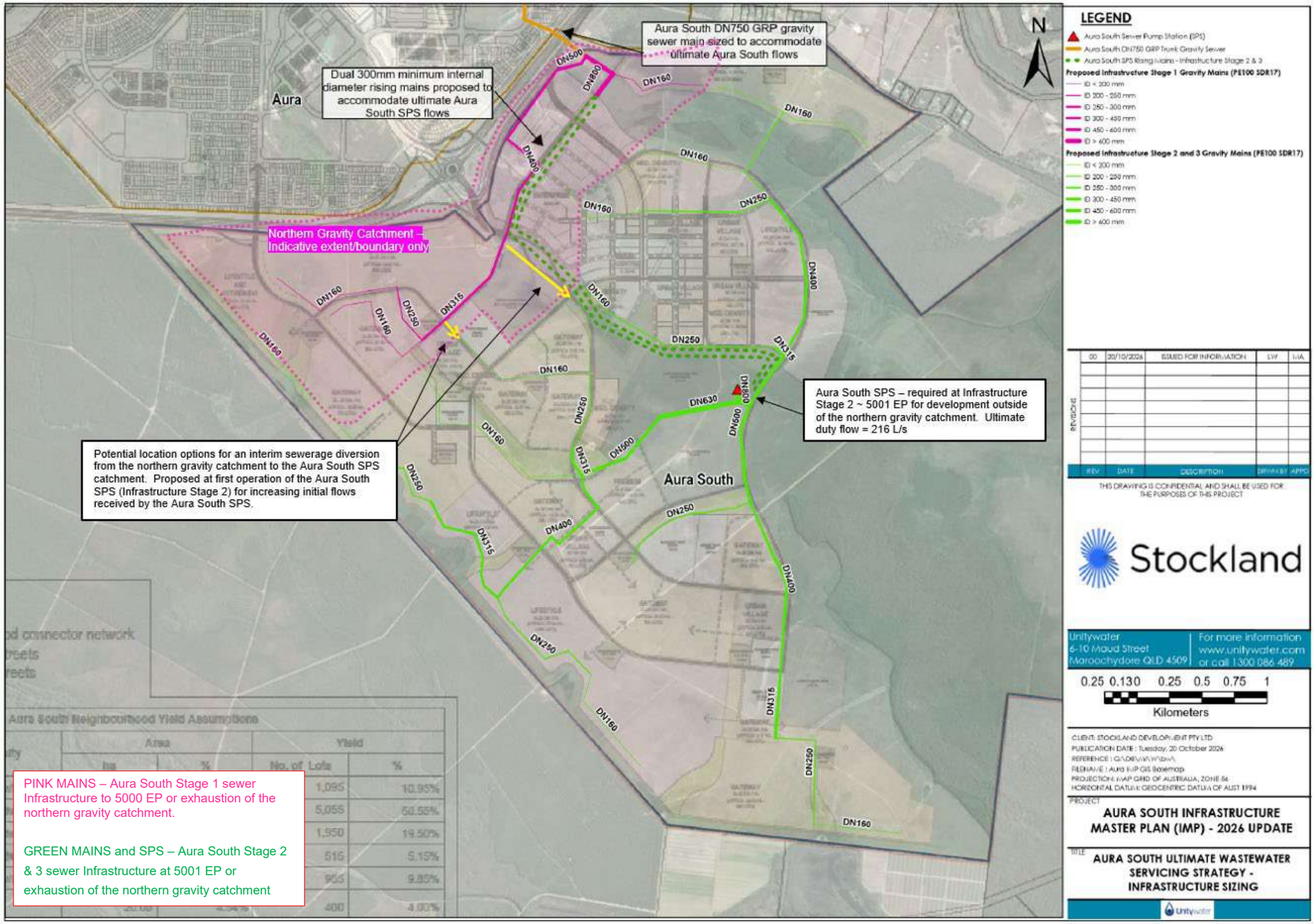


Figure 5-4: Aura South Sewerage Infrastructure Stages 1, 2 and 3 – Servicing Plan

6 Early Release Area Assessment

The water supply and sewerage infrastructure required to service the Aura South ERA is documented in this report section. Earlier report sections have documented the external water supply and sewerage trunk infrastructure through Aura that will be available to service the Aura South ERA.

6.1 Water Supply

6.1.1 Early Release Area Water Demands

The anticipated water demand projections for the Aura South Early Release Area have been estimated using the water supply demand rates and peaking factors listed in Section 3.3.1 and the development yield found in Section 4.2. A summary of the demands for the Aura South Early Release Area is presented below in Table 6-1.

Table 6-1: Aura South Early Release Area anticipated water supply demand

Water Demands	Early Release Area (Total EP = 3,048 EP)		
	Residential	Non-Residential	Total
Average Demand (L/s)	8.6	0.6	9.2
MDMM (L/s)	12.4	0.9	13.2
Peak Day (L/s)	16.2	1.1	17.3
Peak Hour (L/s)	31.3	1.5	32.9

6.1.2 Early Release Area Water Network

As discussed in earlier sections, the Aura South ERA will initially be serviced via the Aura water supply network with the main path of water supply through Aura via the Aura internal western DN630 PE100 SDR11 (ID = 513 mm) trunk main that will be extended to the Aura South boundary.

The proposed reticulation network layout for the Aura South Early Release Area is presented in Figure 6-1, described as follows:

- The feed for the Early Release Area is to connect from the dual 450 mm minimum internal diameter trunk mains running south in an alignment to the west of Aura South from the Aura South supply point to the ERA inlet. The parallel 450 mm diameter mains are sized to accommodate Ultimate Aura South water demands.
- A minimum internal diameter main of 250mm connects off this main to form the primary feed to the residential section of the Aura South Early Release Area. This main follows an alignment through the ERA of a proposed 450 mm diameter Aura South trunk main. A boundary valve is proposed at the southern end of this alignment through the ERA on a connection point back to the 450mm diameter Aura South trunk main. This closed connection provides an emergency feed to the proposed ERA, to be opened and used if there are issues with the primary supply point into the Aura South ERA.
- A pressure reducing valve (PRV) can be installed at the 250 mm diameter ERA inlet main to form a pressure managed area (PMA) for the residential region of the Aura South Early Release Area. The proposed setting for the PRV is 46 m AHD, based on a maximum customer

elevation of around 20 m AHD in the residential component of the Early Release Area and maintaining around 25 m of pressure to properties. Hydraulic modelling has identified around a 1 m internal head loss to high elevation customers in the ERA under peak demand. The PRV will reduce the fluctuation in pressure observed in the Early Release Area network as well as removing higher than required pressures. Pressure management can be effective in both reducing water losses and extending asset life.

- A 150mm internal diameter loop has been proposed off the 250 mm internal diameter supply main to the residential Early Release Area, supporting minimum pressure, head loss and fire flow performance.
- 100mm internal diameter mains have then been looped off the 150 mm internal diameter mains for connectivity and ensuring there is a water main fronting all properties.
- For the non-residential Enterprise component of the Early Release Area to the east, a separate feed from a 300 mm diameter internal Aura South trunk main has been proposed to form a basis of a non-residential district metered area (DMA). A minimum internal diameter of 200mm has been proposed for the feed to the Enterprise / Non-Residential area due to the higher fire flow requirements (30 L/s over 4 hours) and the potential for additional non-residential development (outside the Early Release Area) to be fed from this connection / supply main.

6.1.3 Reservoir Storage

Aura and Aura South will operate as a combined network up to a combined 60,000 EP. Reservoir storage up to 60,000 EP will be provide by 2 x 12 ML Aura reservoirs. The first will service up to a combined 30,000 EP and the second, delivered at 30,000 EP, will support the first reservoir to service a combined 60,000 EP. The Aura South ERA will commence after a combined 30,000 EP and be completed prior to a combined 45,000 EP across Aura and Aura South. Therefore, storage to Aura South will be initially borrowed from Aura and sufficient storage at the Aura reservoir site will be available to service the Aura South ERA.

Beyond a combined 60,000 EP (Estimated 10,778 EP in Aura South) a dedicated Aura South reservoir of 12.6 ML will be required.

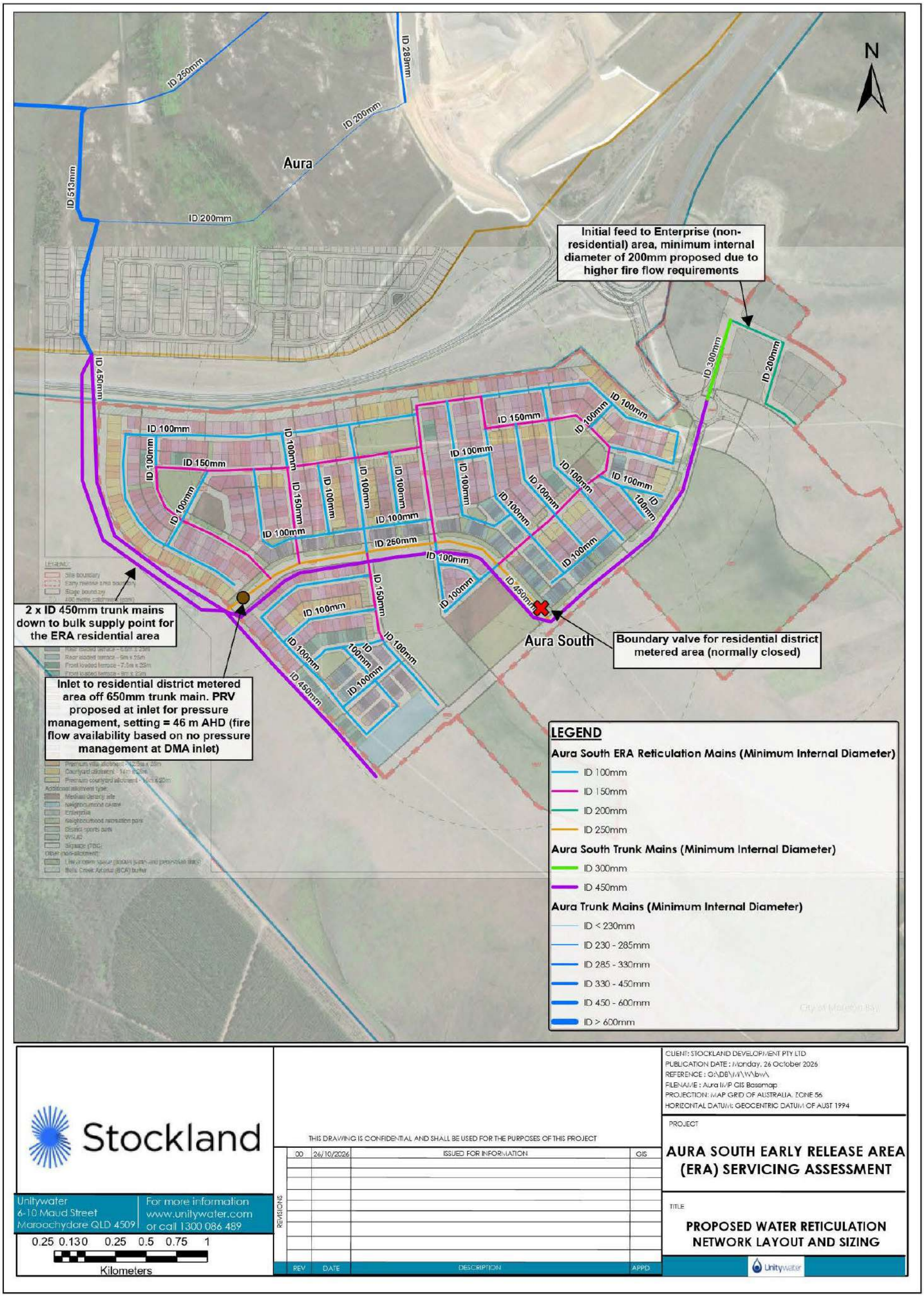


Figure 6-1: Proposed Aura South Early Release Area Water Supply Network

6.1.4 ERA Water Supply Modelling Assessment

Refer to Table 6-2 for a summary of the minimum pressure, maximum pressure and available fire flow at critical junctions within the Early Release Area water network. Results are shown for the Aura South ERA at Aura South Infrastructure Stage 1 & 2 (to 10,778 EP, supply through Aura) and Aura South Infrastructure Stage 3 (>10,778 to Ultimate EP, separate Aura and Aura South water networks). Results for Aura South Infrastructure Stage 1 & 2 (at 10,778 EP) are presented as a more conservative scenario than presenting supply to the ERA alone (to 3,054 EP).

Table 6-2: Summary of modelling results for the Aura South Early Release Area

Infrastructure Stage	Precinct	Minimum Pressure (m)	Maximum Pressure[1] (m)	Available Fire Flow (L/s)
1 & 2 (Interim Supply from Aura up to 10,778 EP)	Residential	24.2 Junction ID: AS92	46.4 Junction ID: AS3a	19.3 Junction ID: AS91
	Enterprise / Non-residential	32.7 Junction ID: AS7	48.4 Junction ID: AS94	53.0 Junction ID: AS7
3 (Ultimate Supply from Aura South Reservoir)	Residential	30.8 Junction ID: AS51	46.7 Junction ID: AS3a	21.4 Junction ID: AS91
	Enterprise / Non-residential	37.5 Junction ID: AS7	48.6 Junction ID: AS94	55.3 Junction ID: AS7

1) Maximum pressure results presented are based on no pressure management into the residential and non-residential metered areas (will reduce if pressure management is used).

Network modelling results demonstrate the proposed reticulation network arrangement for the Early Release Area can meet all SEQ WS&S D&C Code requirements for both the Aura South Infrastructure Stage 1 & 2 and Aura South Infrastructure Stage 3 network supply arrangements. This confirms that the proposed water network infrastructure and supply strategy to service the Early Release Area in Aura South is sufficiently sized.

Appendix A contains minimum pressure, head loss and available fire flow performance maps for the Early Release Area reticulation network for both two infrastructure stages assessed.

With all performance requirements satisfied for water supply, development of the water reticulation network for the Aura South Early Release Area can proceed as per the planned layout presented in this report.

6.2 Sewerage

6.2.1 Early Release Area Sewerage Flows

The anticipated sewage flow projections for the Aura South Early Release Area have been estimated using the sewerage unit flow rates and peaking factors listed in Section 3.3.2 and the development yield found in Section 4.2. A summary of the sewage flows for the Aura South Early Release Area is presented below Table 6-3.

Table 6-3: Aura South Early Release Area anticipated sewage flows

Water Demands	Early Release Area (Total EP = 3,048 EP)		
	Residential	Non-Residential	Total
Average Dry Weather Flow (L/s)	5.9	0.4	6.4
Peak Wet Weather Flow (L/s)	23.8	1.6	25.4

6.2.2 Early Release Area Sewerage Network

As discussed in previous report sections, the external infrastructure, both regionally and through Aura, required to accommodate the Aura South ERA has been identified with the 2026 Aura IMP and the Aura South IMP. This trunk sewerage infrastructure eternal to Aura South will be available at the required time to receive flows from first lots in the Aura South ERA through to full ERA development.

The Aura South ERA is located such that a gravity solution to collect and convey flows to the Aura South to Aura connection point (DN750 GRP sewerage trunk gravity main) exists. The ERA is not reliant on the delivery of the Aura South SPS for servicing sewage flows.

The initially proposed Aura South ERA sewerage network, conveying flows to the Aura connection point, is shown within Figure 6-2 and Figure 6-3 and described as follows:

- A sewerage reticulation network consisting of DN180 NuSewer mains is proposed to collect and convey sewage to a DN250 / DN315 / DN400 NuSewer collector main which will transfer ERA sewage flows to the Aura DN750 GRP trunk gravity sewer connection point at Bells Creek Arterial Road.
- The DN250 / DN315 / DN400 NuSewer collector main will be delivered at or steeper than the minimum gradient as per the SEQ WS&S D&C Code.
- The ERA and extended direct gravity sewerage network can operate independently to the balance of the Aura South sewerage network which will require the Aura South SPS for servicing sewage flows.

The ERA network shown with in Figure 6-2 and Figure 6-3 sized only to be capable of accommodating a future area beyond the ERA area alone up to around 5,000 EP in total. The northern part of the eastern residential area will be collected and conveyed directly by its own DN160 NuSewer gravity main to the DN750 GRP Aura trunk sewer, and therefore, will not impact the network sizing proposed.

A sizing review of the proposed gravity network through the ERA may be required as certainty around catchment extents develops.

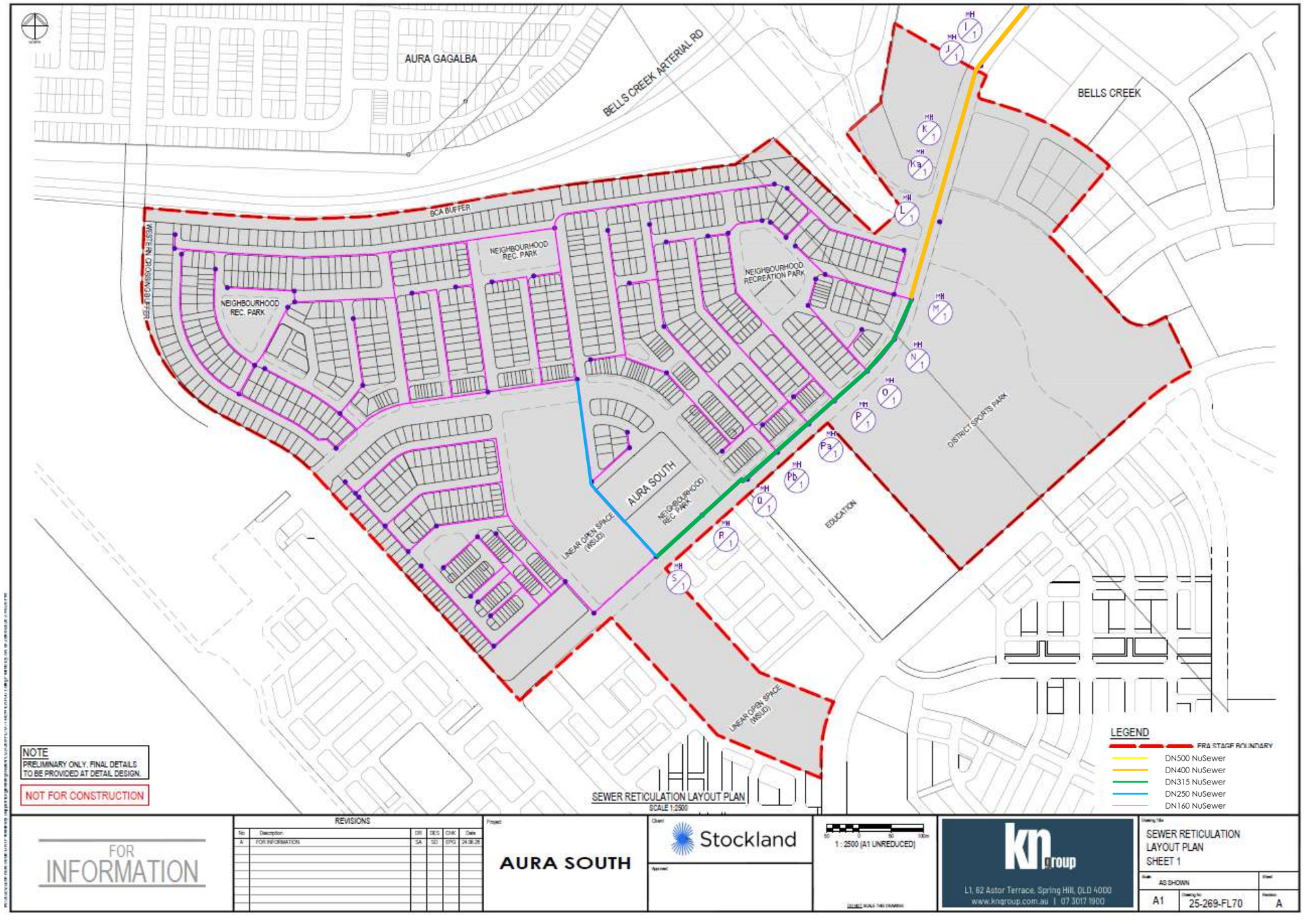


Figure 6-2: Aura South Early Release Area Sewerage Network (Part 1)

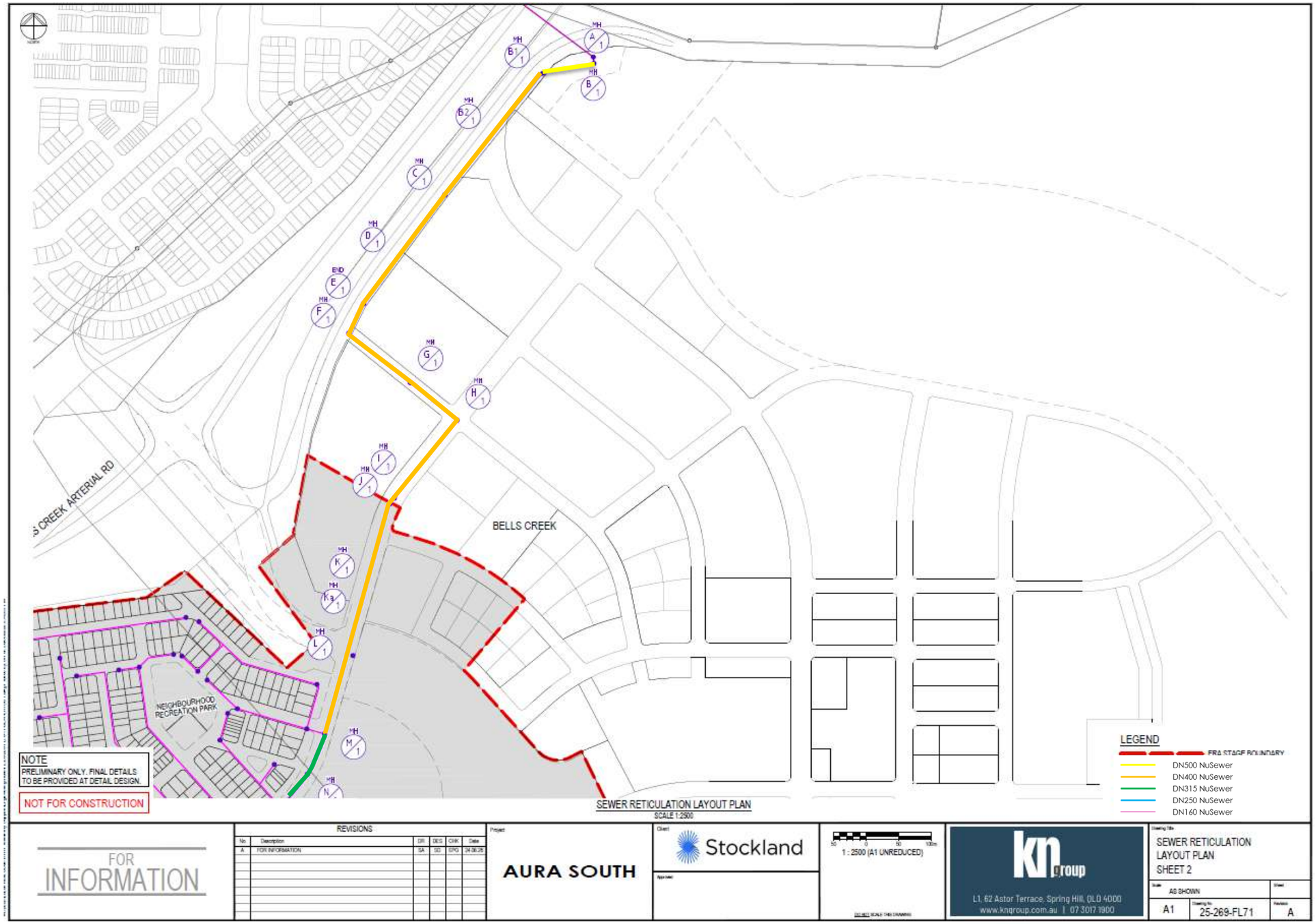


Figure 6-3: Aura South Early Release Area Sewerage Network (Part 2)

6.2.3 ERA Sewerage Capacity Assessment

The capacity of the DN250/DN315/DN400 NuSewer collector main shown within Figure 6-2 and Figure 6-3 has been assessed at PWWF with full development of the ERA. Flow depths remain below the maximum targeted depths within new pipes of 75% the pipe diameter.

6.2.4 External Trunk Network Modelling Assessment

The key external assets to service Aura South are shown below in Figure 6-4 as follows:

- Line 6 – DN750 GRP trunk gravity sewer from Aura South Boundary to SPS-LMT119
- SPS-LMT119 and dual DN315 PE100 and DN450 PE100 rising mains
- Line 4 – 1000 mm diameter trunk gravity sewer
- SPS-LMT116 and dual DN710/DN900 PE100 SDR11 rising mains

Based on the Aura South and Aura IMPs, EP and infrastructure phasing and timing, all these key assets for servicing Aura South through Aura have accounted for Aura South flows and will be available by the first lot within the Aura South ERA.

Appendix B provides the Ultimate sewerage gravity flow profiles through Line 6 (DN750 GRP trunk sewer) and Line 4 (1000 mm diameter trunk sewer), extracted from the Aura IMP, demonstrating these mains have been sized to accommodate full Aura South development. Refer to Section 2.1.2 and Section 3.2 for discussions in respect to the capacity and planning for SPS-LMT119 and SPS-LMT116 and their respective rising mains. More detailed information in respect to the capacity and upgrade staging of these two sewerage pumping stations is provided within the Aura IMP.

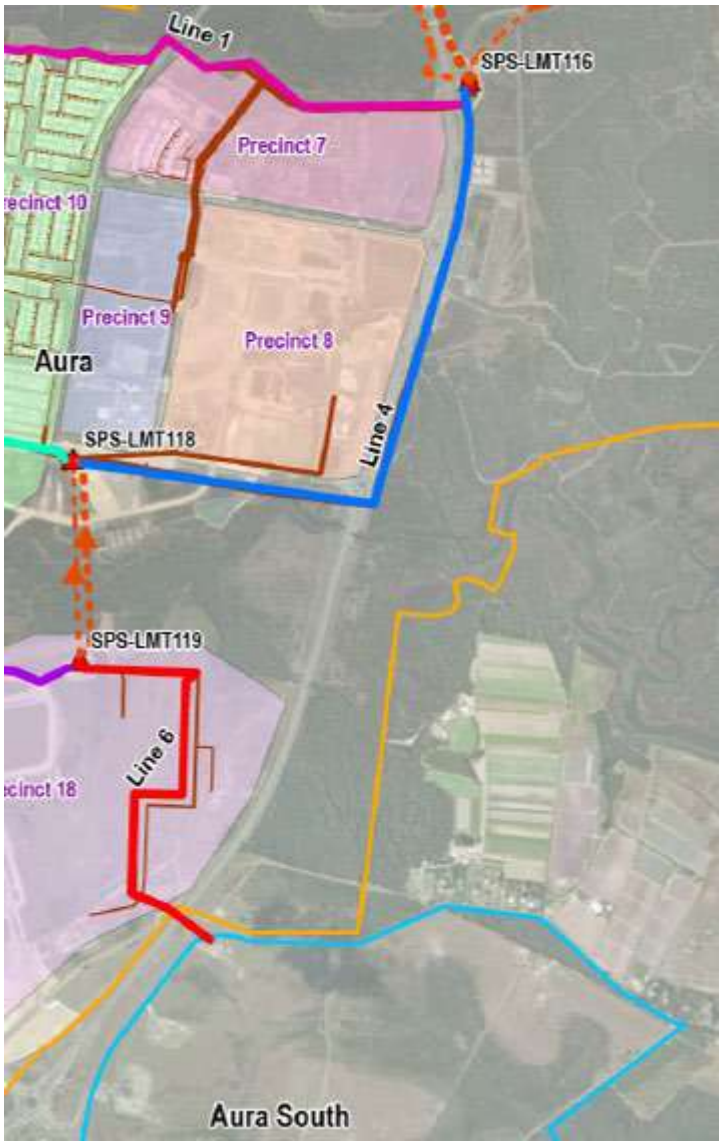


Figure 6-4: Key Infrastructure for Servicing Aura South through Aura - Modelling references

7 Conclusions

Conclusions from the Aura South water supply and sewerage servicing assessment are as follows:

1. The Aura South Early release area is located within the north of Aura South. The location has been influenced by the ability to collect and convey sewage from the ERA by gravity without need for an Aura South sewerage pumping station. The ERA will primarily consist of residential lots with some non-residential EP associated with the Aura South enterprise area. First lots in the ERA are anticipated at around 2030. The estimated ERA EP is 3,048 EP including a 10% design uplift for the purposes of infrastructure assessment.

2. Water Supply:

    a. The ERA will be supplied through a connection to the Aura water supply network, and along with the rest of Aura South, borrow capacity form the Aura network until a combined Aura and Aura South 60,000 EP is achieved. The anticipated Aura South EP is 10,778 EP when a combined 60,000 EP is reached. The 3,048 EP of the ERA is within this 10,778 EP.

    b. Water mains through Aura to the Aura South connection point have been sized within the recent Aura IMP to accommodate supply to Aura South and still maintain levels of service through Aura. Aura reservoir storage can also accommodate Aura South including the ERA through to a combined Aura plus Aura South 60,000 EP.

    c. Beyond a combined Aura plus Aura South 60,000 EP (10,778 EP in Aura South), the capacity of the Aura reservoir and network will be exhausted. Aura South will then be serviced by a new 12.6 ML reservoir and dedicated reservoir outlet main, hence returning the balance of Aura infrastructure capacity to Aura.

    d. A District Metering Area (DMA) arrangement with pressure management has been proposed for the Aura South ERA. The local ERA water supply network is proposed to consist of 250, 200, 150 and 100 mm diameter mains. Modelling has identified that standards of service under peak hour and fire flow are met within the ERA from first lot to Ultimate development in Aura South.

3. Sewerage

    a. Aura South including the Aura South ERA will utilise infrastructure through Aura to convey sewage flows to the Kawana STP. The infrastructure through Aura that will service Aura South has been sized within the Aura IMP and the Aura South IMP to accommodate Aura South flows through the life of the development. The key trunk sewerage infrastructure through Aura, and onward to the Kawana STP, that will accommodate Aura South flows are as follows:

        i. DN750 GRP trunk gravity sewer from Aura South Boundary to SPS-LMT119

        ii. SPS-LMT119 and dual DN315 PE100 and DN450 PE100 rising mains

        iii. 1000 mm diameter trunk gravity sewer from the SPS-LMT119 rising mains discharge point to SPS-LMT116

iv. SPS-LMT116 and dual DN710/DN900 PE100 SDR11 rising mains

All these assets will be constructed and operational by the time the Aura South ERA commences. Each of these assets through Aura have been sized to accommodate Ultimate flows or have a developed staged upgrade plan to accommodate increasing flows.

b. A local gravity network to accommodate the Aura ERA is proposed to consist of DN160 NuSewer reticulation mains and a DN250/DN315/DN400 NuSewer collector main which will convey flows to the DN750 GRP trunk sewer at the Aura South to Aura connection point.

Appendices

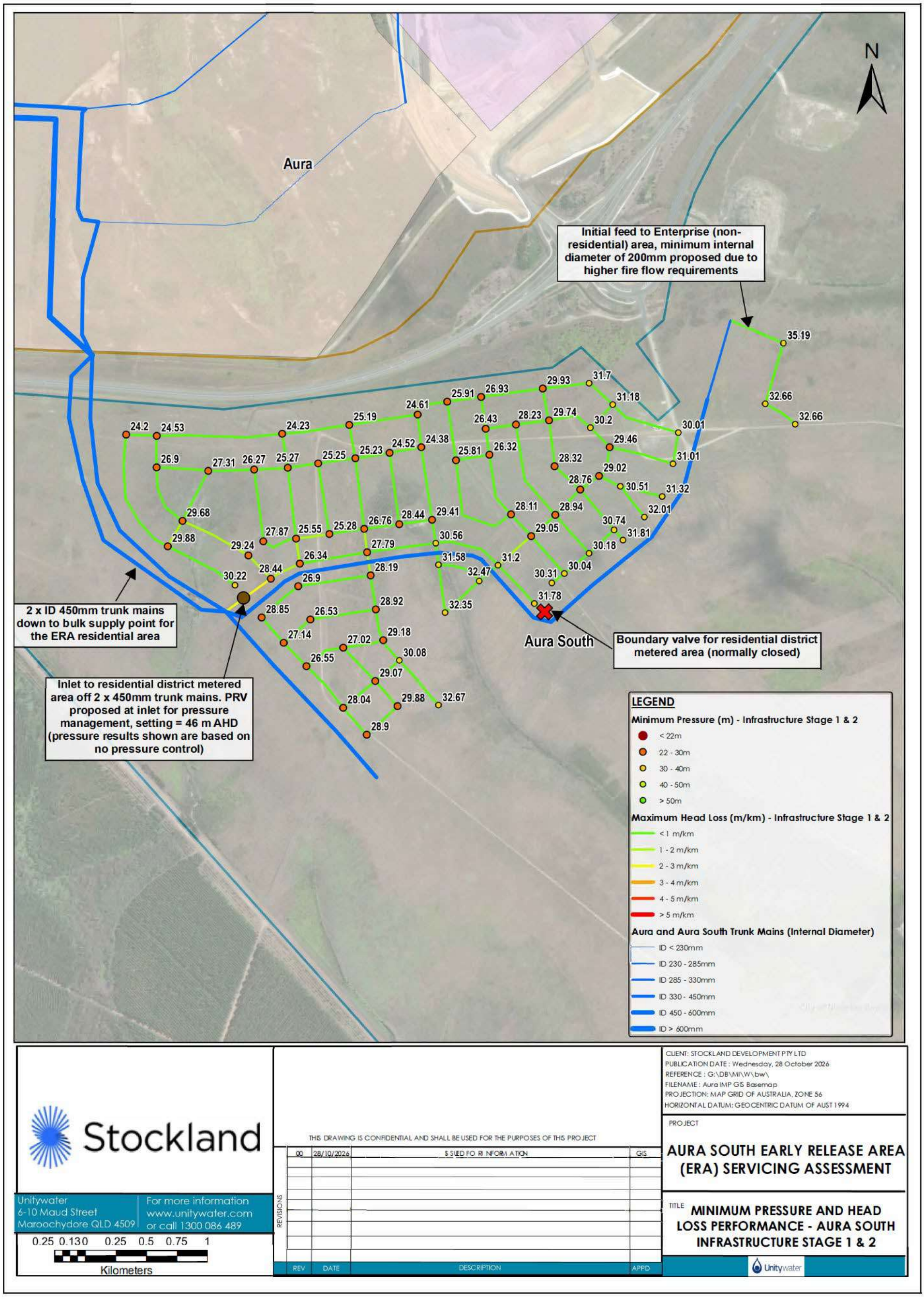
Appendix A ERA Water Network Modelling Results

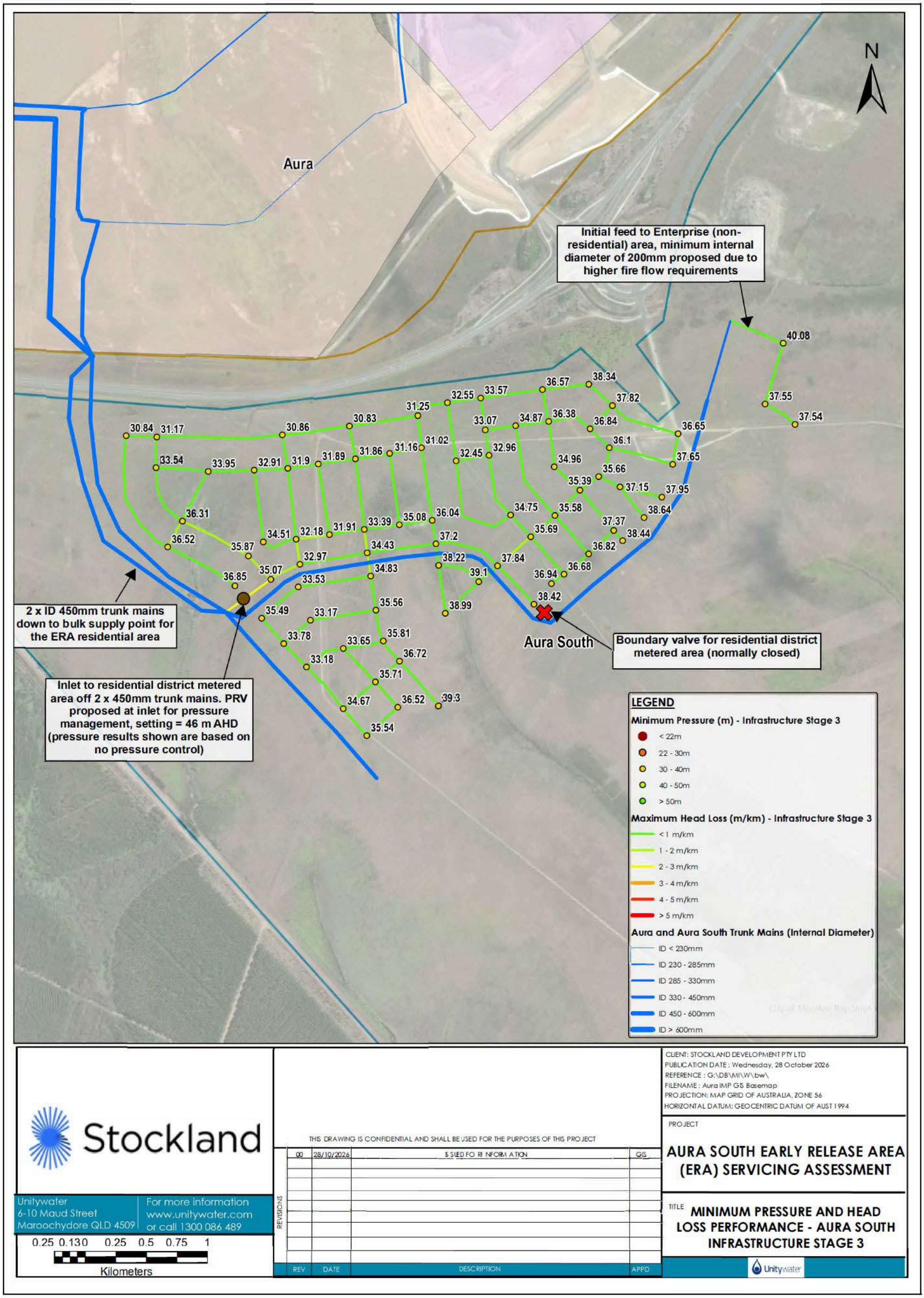
Figure A1 – Stage 1 & 2 ERA Minimum pressure and head loss performance

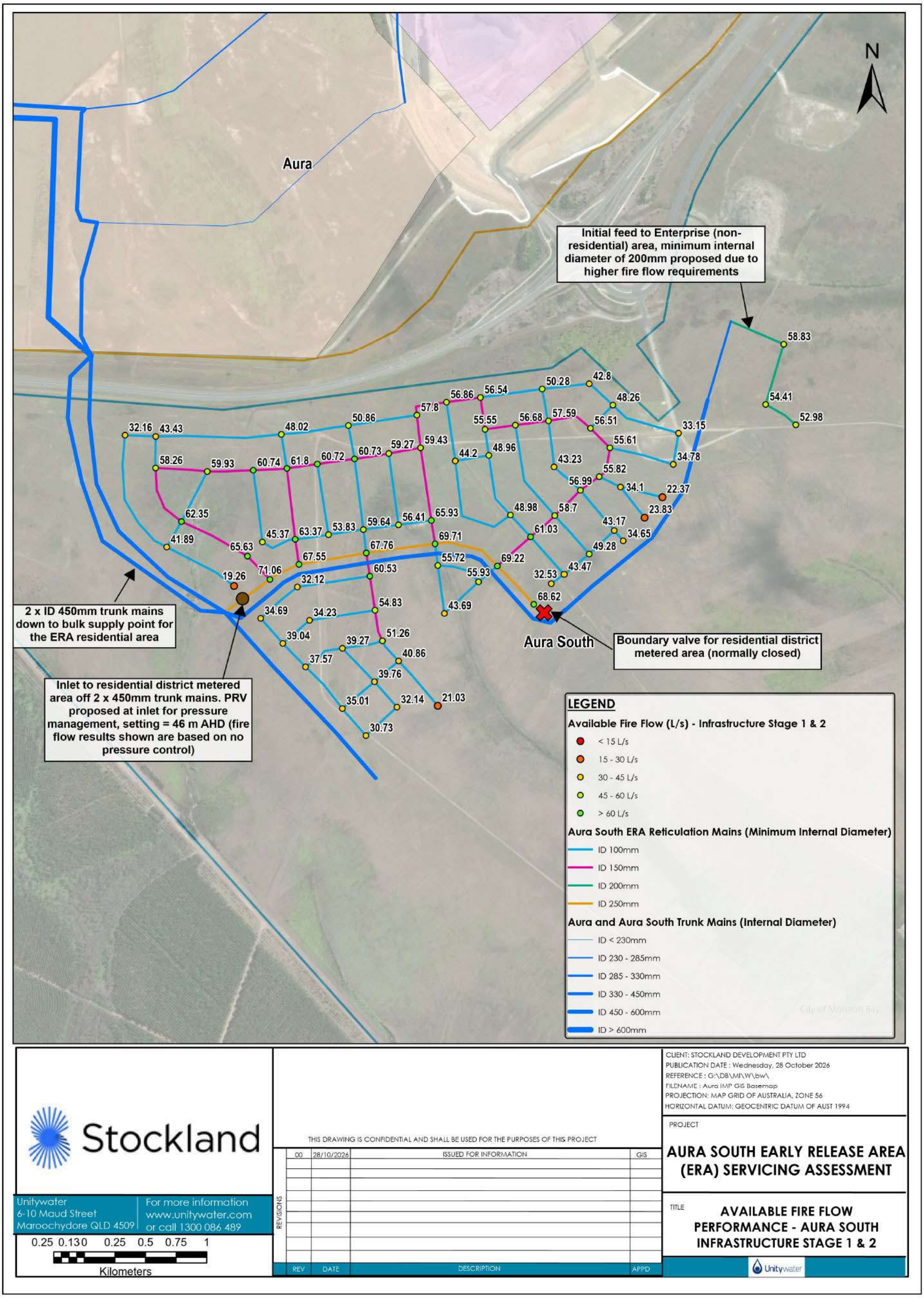
Figure A2 – Stage 3 ERA Minimum pressure and head loss performance

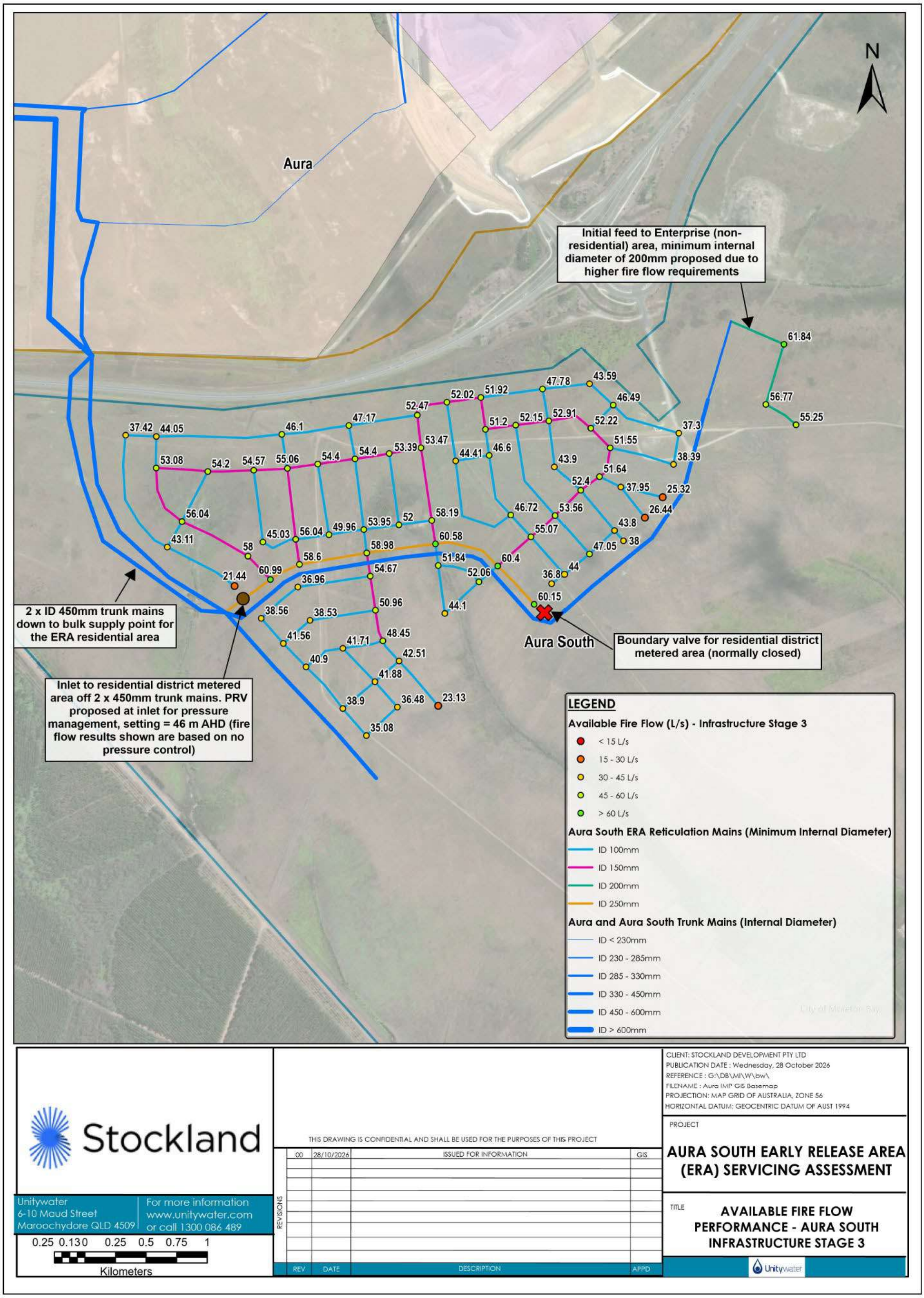
Figure A3 – Stage 1 & 2 ERA Available Fire Flow Performance

Figure A4 – Stage 3 ERA Available Fire Flow Performance


N
Aura
Initial feed to Enterprise (non-residential) area, minimum internal diameter of 200mm proposed due to higher fire flow requirements
2 x ID 450mm trunk mains down to bulk supply point for the ERA residential area
Inlet to residential district metered area off 2 x 450mm trunk mains. PRV proposed at inlet for pressure management, setting = 46 m AHD (pressure results shown are based on no pressure control)
Aura South
Boundary valve for residential district metered area (normally closed)
LEGEND
Minimum Pressure (m) - Infrastructure Stage 1 & 2
< 22m
22 - 30m
30 - 40m
40 - 50m
> 50m
Maximum Head Loss (m/km) - Infrastructure Stage 1 & 2
< 1 m/km
1 - 2 m/km
2 - 3 m/km
3 - 4 m/km
4 - 5 m/km
> 5 m/km
Aura and Aura South Trunk Mains (Internal Diameter)
ID < 230mm
ID 230 - 285mm
ID 285 - 330mm
ID 330 - 450mm
ID 450 - 600mm
ID > 600mm
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HORIZONTAL DATUM: GEOCENTRIC DATUM OF AUST 1994
PROJECT
AURA SOUTH EARLY RELEASE AREA (ERA) SERVICING ASSESSMENT
TITLE
MINIMUM PRESSURE AND HEAD LOSS PERFORMANCE - AURA SOUTH INFRASTRUCTURE STAGE 1 & 2
Unitywater


N
Aura
Initial feed to Enterprise (non-residential) area, minimum internal diameter of 200mm proposed due to higher fire flow requirements
2 x ID 450mm trunk mains down to bulk supply point for the ERA residential area
Inlet to residential district metered area off 2 x 450mm trunk mains. PRV proposed at inlet for pressure management, setting = 46 m AHD (pressure results shown are based on no pressure control)
Aura South
Boundary valve for residential district metered area (normally closed)
LEGEND
Minimum Pressure (m) - Infrastructure Stage 3
< 22m
22 - 30m
30 - 40m
40 - 50m
> 50m
Maximum Head Loss (m/km) - Infrastructure Stage 3
< 1 m/km
1 - 2 m/km
2 - 3 m/km
3 - 4 m/km
4 - 5 m/km
> 5 m/km
Aura and Aura South Trunk Mains (Internal Diameter)
ID < 230mm
ID 230 - 285mm
ID 285 - 330mm
ID 330 - 450mm
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TITLE
MINIMUM PRESSURE AND HEAD LOSS PERFORMANCE - AURA SOUTH INFRASTRUCTURE STAGE 3
Unitywater


N
Aura
Initial feed to Enterprise (non-residential) area, minimum internal diameter of 200mm proposed due to higher fire flow requirements
58.83
54.41
52.98
42.8
48.26
50.28
56.54
56.86
57.8
50.86
48.02
32.16
43.43
55.55
56.68
57.59
56.51
33.15
55.61
34.78
58.26
59.93
60.74
61.8
60.72
60.73
59.27
59.43
44.2
48.96
43.23
55.82
56.99
34.1
22.37
23.83
62.35
41.89
65.63
45.37
63.37
53.83
59.64
56.41
65.93
48.98
58.7
43.17
34.65
61.03
49.28
43.47
69.71
67.76
67.55
71.06
19.26
55.72
69.22
55.93
32.53
68.62
60.53
32.12
54.83
34.69
34.23
39.04
39.27
51.26
40.86
37.57
39.76
35.01
32.14
21.03
30.73
43.69
2 x ID 450mm trunk mains down to bulk supply point for the ERA residential area
Inlet to residential district metered area off 2 x 450mm trunk mains. PRV proposed at inlet for pressure management, setting = 46 m AHD (fire flow results shown are based on no pressure control)
Aura South
Boundary valve for residential district metered area (normally closed)
LEGEND
Available Fire Flow (L/s) - Infrastructure Stage 1 & 2
< 15 L/s
15 - 30 L/s
30 - 45 L/s
45 - 60 L/s
> 60 L/s
Aura South ERA Reticulation Mains (Minimum Internal Diameter)
ID 100mm
ID 150mm
ID 200mm
ID 250mm
Aura and Aura South Trunk Mains (Internal Diameter)
ID < 230mm
ID 230 - 285mm
ID 285 - 330mm
ID 330 - 450mm
ID 450 - 600mm
ID > 600mm
City of Moreton Bay
Stockland
Unitywater
6-10 Maud Street
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Unitywater

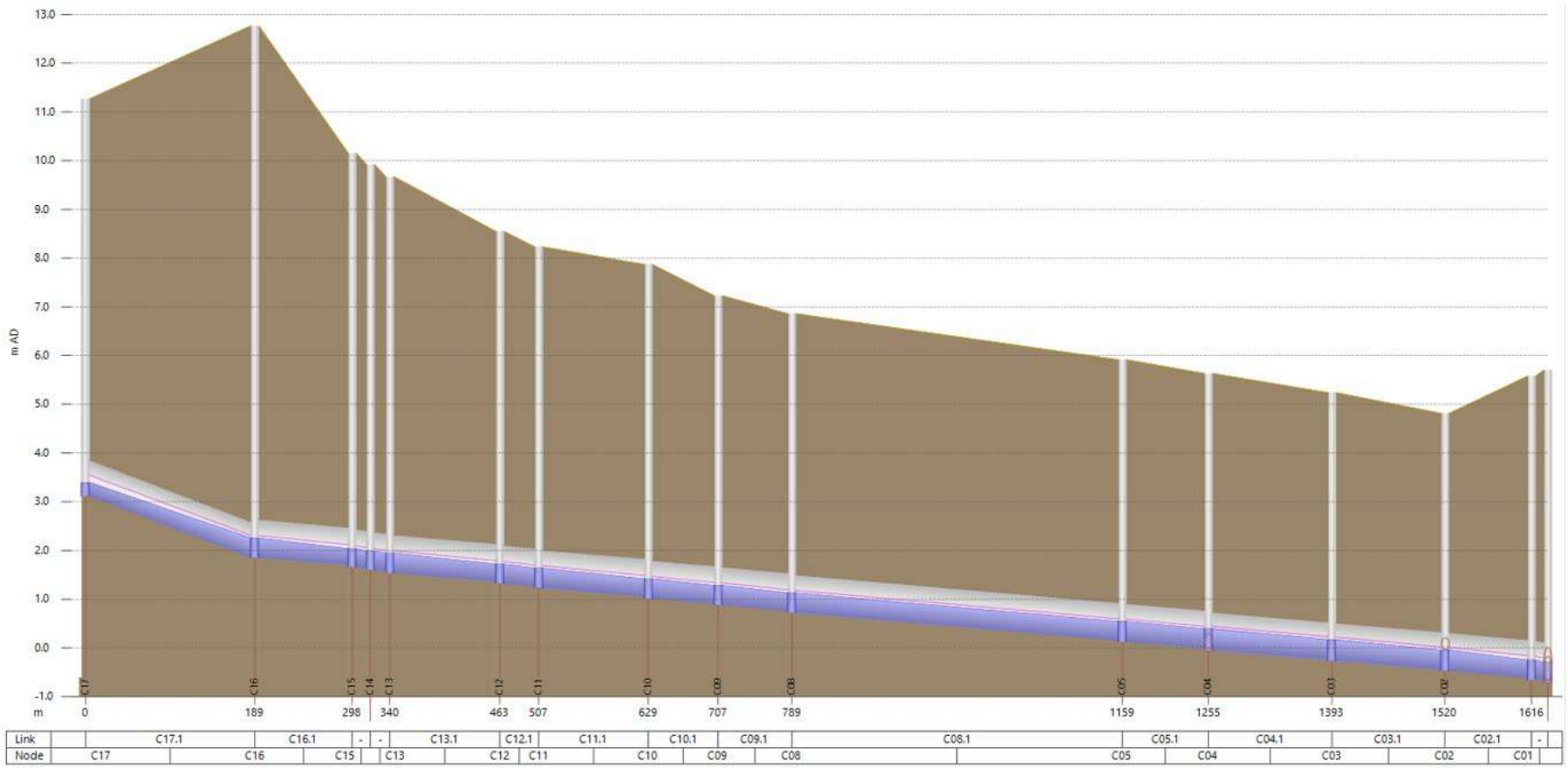

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Aura
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Inlet to residential district metered area off 2 x 450mm trunk mains. PRV proposed at inlet for pressure management, setting = 46 m AHD (fire flow results shown are based on no pressure control)
Aura South
Boundary valve for residential district metered area (normally closed)
LEGEND
Available Fire Flow (L/s) - Infrastructure Stage 3
< 15 L/s
15 - 30 L/s
30 - 45 L/s
45 - 60 L/s
> 60 L/s
Aura South ERA Reticulation Mains (Minimum Internal Diameter)
ID 100mm
ID 150mm
ID 200mm
ID 250mm
Aura and Aura South Trunk Mains (Internal Diameter)
ID < 230mm
ID 230 - 285mm
ID 285 - 330mm
ID 330 - 450mm
ID 450 - 600mm
ID > 600mm
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PUBLICATION DATE : Wednesday, 28 October 2026
REFERENCE : G:\DB\MI\W\bw\
FILENAME : Aura IMP GIS Basemap
PROJECTION: MAP GRID OF AUSTRALIA, ZONE 56
HORIZONTAL DATUM: GEOCENTRIC DATUM OF AUST 1994
PROJECT
AURA SOUTH EARLY RELEASE AREA (ERA) SERVICING ASSESSMENT
TITLE
AVAILABLE FIRE FLOW PERFORMANCE - AURA SOUTH INFRASTRUCTURE STAGE 3
Unitywater

Appendix B Sewerage Network Modelling Results

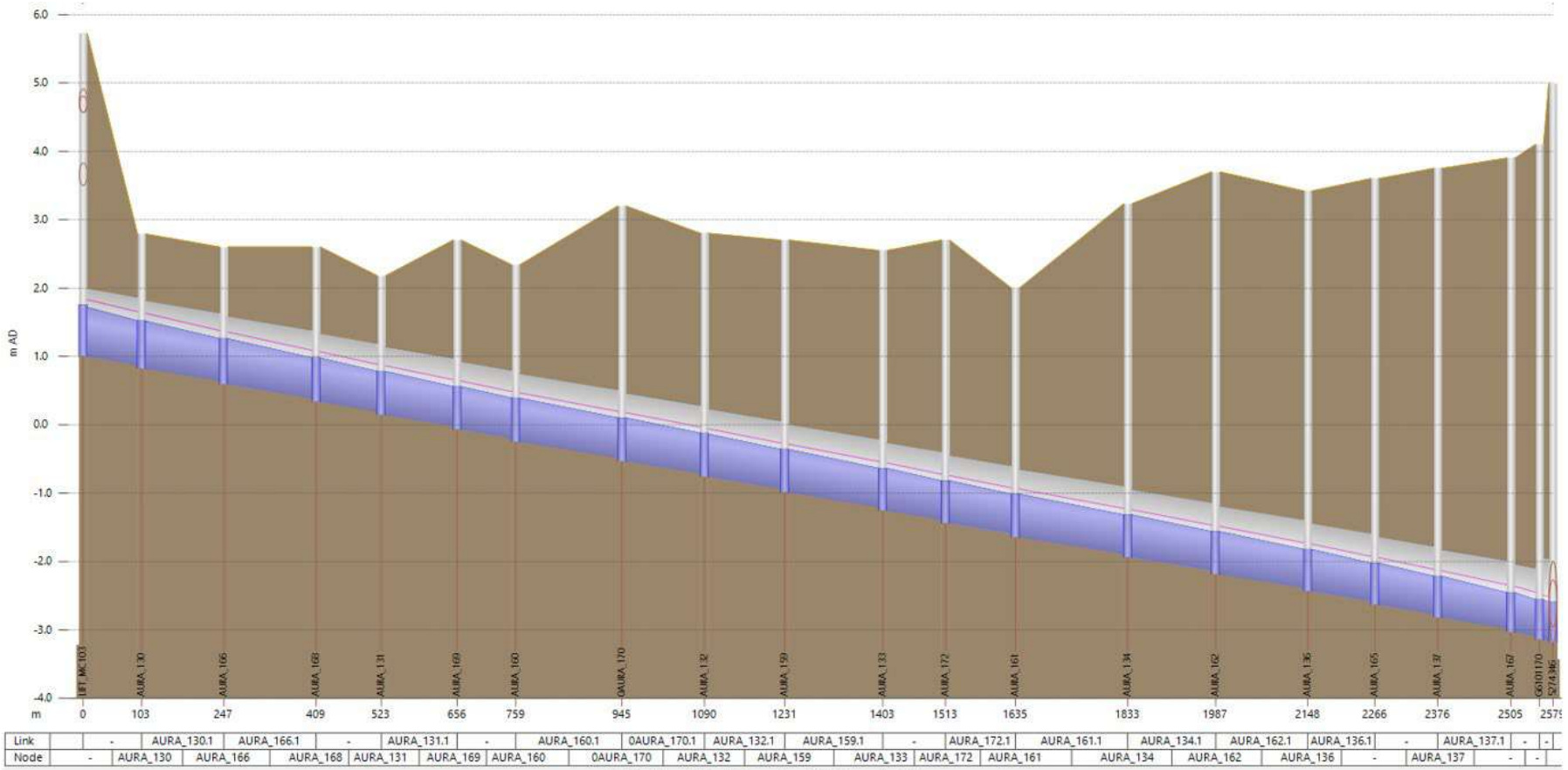
Figure B1 – Line 6 DN750 GRP Trunk Sewer – Ultimate Flow Profile

Figure B2 – Line 4 1000 mm diameter Trunk Sewer – Ultimate Flow Profile

Line references are provided in Section 6.2.4



HGL Profile Line 6 – Ultimate Flows



HGL Profile Line 4 – Ultimate Flows

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APPENDIX E – PRELIMINARY ACID SULFATE SOILS INVESTIGATION (PREPARED BY DOUGLAS PARTNERS)

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Douglas PARTNERS

GROUNDED EXPERTISE

Factual Report on Preliminary Acid Sulfate Soils Investigation

Proposed Subdivision

Bells Creek Road, Coochin Creek

Prepared for KN Group Pty Ltd

Project 229035.00

25 July 2025

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Document History

Details

Project No.	229035.00
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Site Address	Bells Creek Road, Coochin Creek
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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature	Date
Author	
Reviewer	25 July 2025

Douglas PARTNERS | GROUNDED EXPERTISE

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Factual Report on Preliminary Acid Sulfate Soils Investigation
Proposed Subdivision
Bells Creek Road, Coochin Creek

1. Introduction

This report presents the factual results of a preliminary acid sulfate soils (ASS) investigation undertaken by Douglas Partners Pty Ltd (Douglas) for the proposed subdivision on Bells Creek Road, Coochin Creek.

The investigation was undertaken at the request of KN Group Pty Ltd on behalf of Stockland Development Pty Limited in general accordance with Douglas' proposal 229035.00.P.001.Rev0 dated 9 April 2024.

The investigation comprised the drilling of eight bores followed by laboratory testing of selected samples. Details of the field work and laboratory testing are presented in this report.

This report must be read in conjunction with the notes entitled *"About This Report"* in Appendix A along with any other explanatory notes and should be kept in its entirety without separation of individual pages or sections.

2. Site Description

The site for the proposed subdivision is located on the southern side of Bells Creek Road, Coochin Creek and encompasses two allotments described as Lot 1 on SP332399 and Lot 2 on SP334580 (refer to Drawing 1, Appendix B).

The site is gently undulating, with ground surface levels falling below RL 5 AHD towards Halls Creek which runs in a north-south direction through the south-eastern part of the site.

At the time of the investigation, the site was mostly covered with grasses, small shrubbery and regrowth, with dense vegetation around Halls Creek. Following rainfall and due to vegetation, access at the time of investigation was limited to existing access tracks. Typical site conditions are shown in the photographs in Figure 1.



Figure 1: Typical access along existing tracks

3. Regional Geology and Acid Sulfate Soils

The Geological Survey of Queensland's detailed surface geology mapping (refer to Figure 2) indicates the low lying areas of the site to be underlain Quaternary aged flood plain alluvium described as typically comprising *"clay, silt, sand and gravel"*. Local experience suggests the alluvium to be underlain by Late Triassic to Early Jurassic aged Landsborough Sandstone described as typically comprising *"Lithofeldspathic labile and quartzose sandstone, siltstone, shale, minor coal, ferruginous oolite marker"*.

Reference to the Department of Natural Resources and Mines – Acid Sulfate Soils Map 2 Redcliffe to Teewah (refer to Figure 3), indicates that the investigation area is predominately located within an area described as *"land <5m AHD with a low probability of ASS occurrence"* . The area to the south-west along the site boundary is described as *"Reasonable probability of ASS occurrence"* To the south-east, outside of the current investigation area, areas of "land where ASS occurs within 5 m of the surface" including *"areas associated Melaleuca sp. wetlands and occasionally Casuarina glauca communities"* are identified on the mapping.



Figure 2: Geology map with bore locations

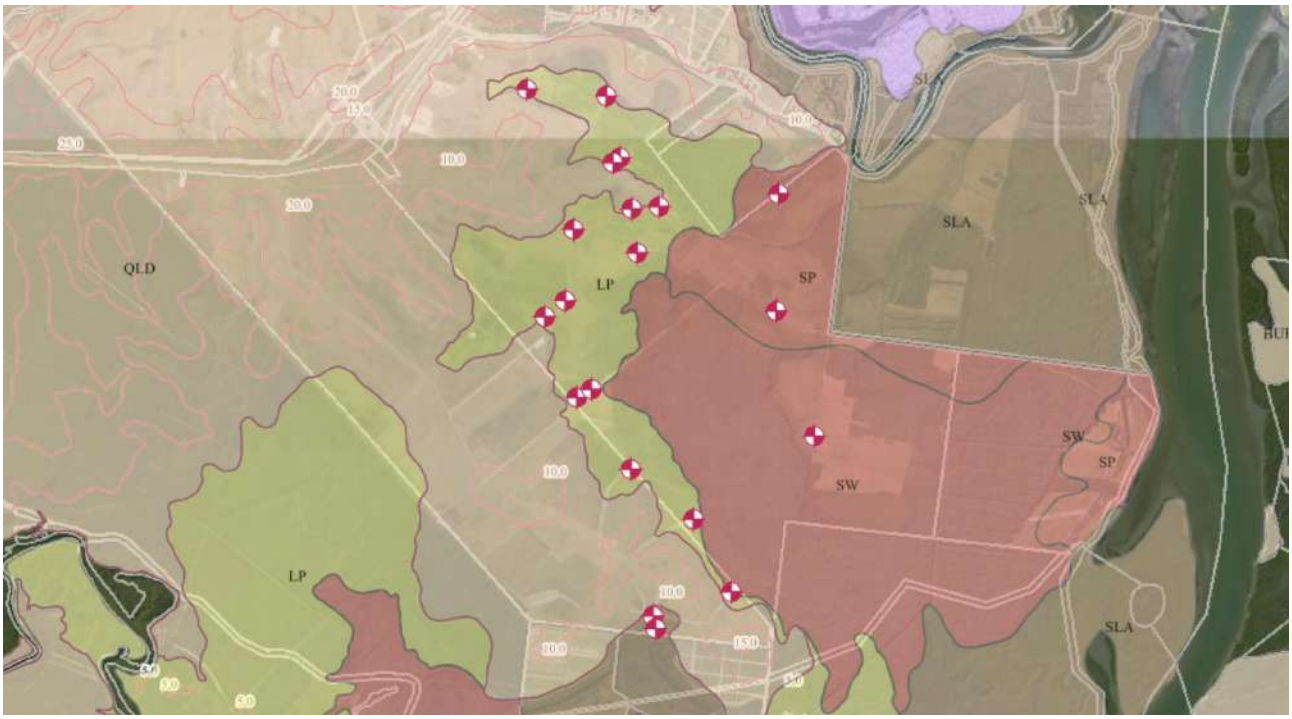


Figure 3: Acid sulfate soils map with bore locations

4. Previous Investigations

Douglas have previously undertaken geotechnical drilling and the installation of groundwater monitoring wells across the site, the results of which are presented in the following reports:

- *"Report on Groundwater Well Installation – Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek"* Douglas report 219363.00.R.001.Rev dated 17 April 2023;
- *"Investigation Summary Report, Groundwater Monitoring Wells – Bells Creek Road, Coochin Creek"* Douglas report 219363.01.R.001.Rev0 dated 25 June 2024.

The field work as part of these previous investigations comprised the drilling and installation of 12 groundwater monitoring wells to 10 m depth. ASS laboratory testing was also carried out on selected samples recovered from these previous bores.

Where appropriate, the results from the previous investigations have been included in Appendix E for completeness and to supplement the results of this preliminary investigation.

5. Field Work

5.1 Field Work Methods

The field work for this investigation was undertaken between 27 May 2024 and 22 July 2024. The field work comprised the drilling of eight bores (designated as Bores 1, 3, 4, 5, 11, 15, 27 and 28).

Site access was limited to existing access tracks following rainfall and due to vegetation, preventing access to a number of proposed bore locations across the site. The bores were located in areas were the existing ground surface level is below RL 5 AHD, or where the proposed level of disturbance is anticipated to extend to below RL 5 AHD. The approximate bore locations are indicated on Drawing 1 in Appendix B.

The bores were drilled to either 3.0 m or 6.0 m depth with 4WD ute mounted drilling rigs using continuous flight augers fitted with a tungsten carbide (TC) bit. Sampling was carried out at regular 0.25 m intervals and stored in zip-lock bags. Sample integrity was maintained by keeping all samples in ice-cooled, insulated containers immediately after sampling. Samples were placed on ice and sent to the laboratory within relevant laboratory holding times.

The field work was undertaken by experienced geotechnical personnel who logged the bores, collected samples for visual and tactile assessment and for subsequent laboratory testing. Strata identification was undertaken through observation of cutting returns and recovered samples.

5.2 Field Work Results

The subsurface conditions encountered in the bores are given in detail on the borehole logs in Appendix C, together with notes defining the classification methods and descriptive terms used. The depths were measured below the existing surface levels at the time of investigation.

In summary, the subsurface conditions encountered in the bores comprised localised fill overlying alluvial and residual sands and clays which are further described below:

- **Fill:** Relatively 'stiff' sandy clay fill was encountered to 0.35 m depth locally in Bore 3.
- **Alluvial Sands and Clays:** Underlying the fill in Bore 3, and from the surface in Bores 4, 5, 27 and 28, inferred alluvial silty sand was encountered to between 0.3 m and 1.65 m depth. The relative density of the alluvial silty sand was typically very loose to loose, grading medium dense and very dense locally in Bores 3 and 4. A lower sequence of medium dense to very dense silty sand was encountered below 1.8 m depth in Bore 3. Loose to medium dense clayey sand was encountered in Bore 3, and firm to stiff sandy clay was encountered in Bores 1 and 3.
- **Residual Sands and Clays:** Underlying the alluvial sands and clays in Bores 1, 4, 5, 27 and 28, and from the surface in Bores 11 and 15; typically stiff to very stiff silty and sandy clays inferred to be residual were encountered. Medium dense clayey sand was encountered in Bore 15. The residual soils continued to termination of the bores at 3.0 m and 6.0 m depth.

Groundwater seepage was observed at between 0.25 m and 0.7 m depth perched within the upper alluvial sands above the residual clays. Groundwater seepage was also observed at 1.8 m depth within the lower silty sand in Bore 3. Seepage through the alluvial sands and along the sand/clay interface should be expected during and following periods of prolonged wet weather. It should be noted however, that groundwater depths and ground moisture conditions are affected by climatic conditions, soil permeability, drainage conditions and human influence; and will therefore vary with time.

6. Laboratory Testing

Samples were recovered from the bores at regular 0.25 m depth intervals and were screened by measurement of pH after the addition of distilled water (pH_f) and peroxide (pH_{fox}). Based on the results of the screening tests and visual inspection of the samples, selected samples were subjected to more rigorous Chromium Suite analytical testing. The results of this testing are summarised in the table in Appendix D along with detailed test reports.

7. Further Investigation

This investigation is considered to be preliminary in nature due to access constraints at the time of investigation, limiting the number of sample locations and subsequent laboratory testing. The current investigation is considered suitable for the current broadscale planning, however further investigation works will be necessary once suitable site access is available to comply with the latest Queensland ASS Sampling Guideline minimum recommended sampling frequency and if necessary the development of an acid sulfate soils management plan (ASSMP).

8. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for the proposed subdivision on Bells Creek Road, Coochin Creek. This report is provided for the exclusive use of KN Group Pty Ltd and Stockland Development Pty Limited for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own

risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the subsurface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Subsurface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

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Appendix A

About this Report

About this Report

October 2024

Introduction

These notes have been provided to amplify Douglas' report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

Douglas' reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Engagement Terms for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, Douglas will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, Douglas cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, Douglas will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, Douglas requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. Douglas would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Appendix B

Test Location Plan

Acid Sulfate Soil Mapping





Location Plan

LEGEND:-

- Bore Location and Number
- Previous Bore Locations (219363.01)
- Previous Bore Locations (219363.00)
- **GW** Groundwater Well
- RL 5.0 Contour (AHD)

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0		17/07/2025	JST

: ZONE 56
COORDINATE REFERENCE SYSTEM: MGA2020

N

Douglas PARTNERS

OFFICE: SUNSHINE COAST
2 Mallet Street, Kunda Park, QLD 4556

CLIENT: **Stockland Development Pty Limited**

SCALE: 0 200 400 600 800 m
SCALE 1: 20,000 (A3)

NOTE:
- Base image from MetroMap (Dated 07.11.2024)
- Site locality image from OpenStreetMap. Not to scale.

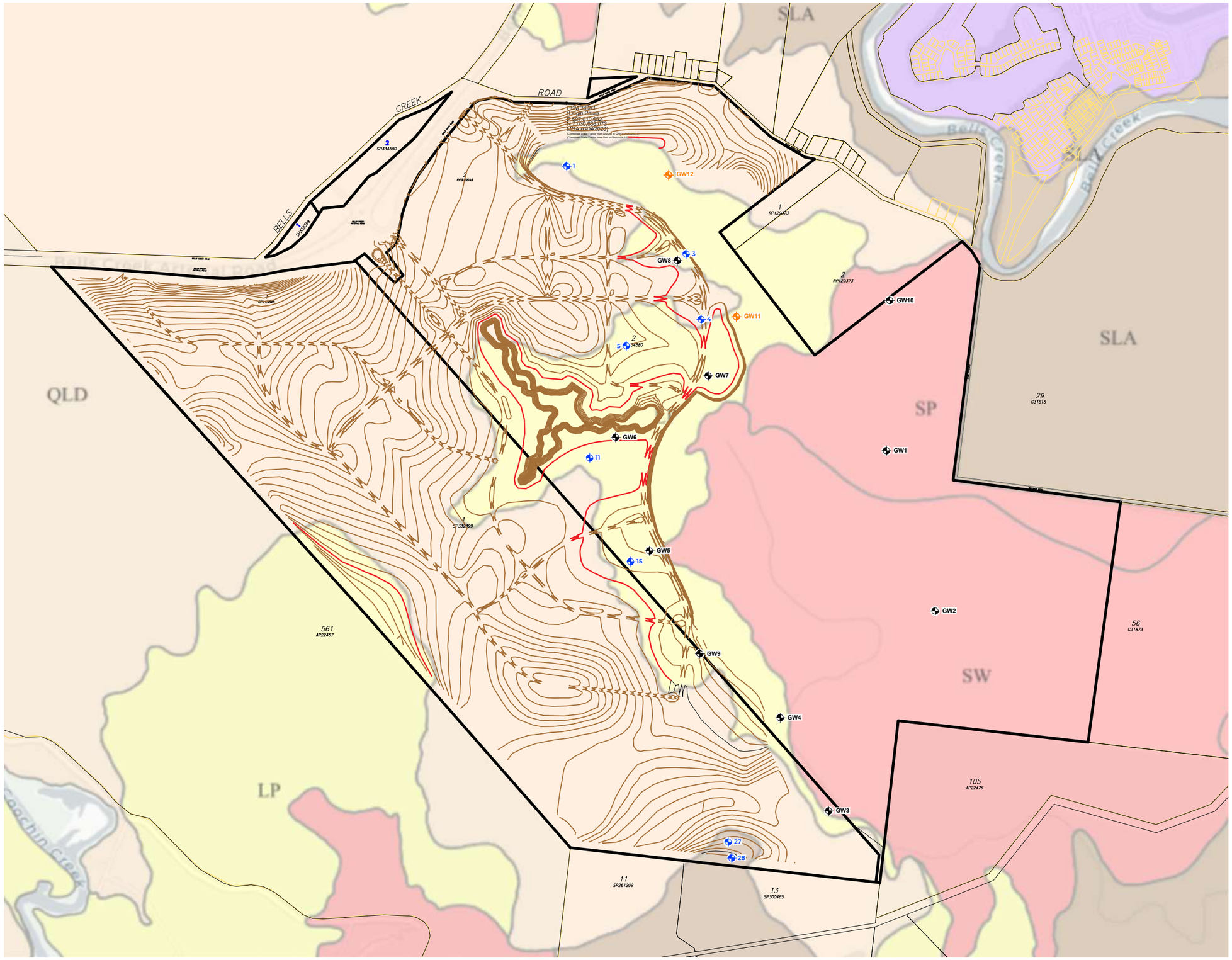
PROJECT NAME: **Proposed Subdivision**

PROJECT ADDRESS: **Bells Creek Road, Coochin Creek**

DRAWING TITLE: **TEST LOCATION PLAN**

PROJECT No: **229035.00**
DRAWING No: **1**
REVISION: **0**

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Location Plan

LEGEND:-

- Bore location and number
- Previous bore locations (219363.01)
- Previous bore locations (219363.00)
- **LP** Low probability of ASS occurrence; land <5m AHD with a low probability of ASS occurrence
- **SP** ASS probably occur - Potential or actual ASS occur within 5m of the surface
- **SW** ASS probably occur - ASS typically occur at depth, areas associated Melaleuca sp. wetlands and occasionally Casuarina glauca communities
- **SLA** ASS may occur - Reasonable probability of ASS occurrence
- RL 5.0 Contour (AHD)

REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0		10/07/2025	JST

: ZONE 56
COORDINATE REFERENCE SYSTEM: MGA2020

Douglas PARTNERS
OFFICE: SUNSHINE COAST
2 Mallet Street, Kunda Park, QLD 4556

CLIENT: **Stockland Development Pty Limited**

SCALE: 0 200 400 600 800 m
SCALE 1: 20,000 (A3)

NOTE:
- Base image from MetroMap (Dated 07.11.2024)
- Site locality image from OpenStreetMap. Not to scale.

PROJECT NAME: **Proposed Subdivision**

PROJECT ADDRESS: **Bells Creek Road, Coochin Creek**

DRAWING TITLE: **Acid Sulfate Soils Mapping**

PROJECT No: **229035.00**
DRAWING No: **2**
REVISION: **0**

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Appendix C

Sampling, Testing and Excavation Methodology

Soil Descriptions

Borehole Logs

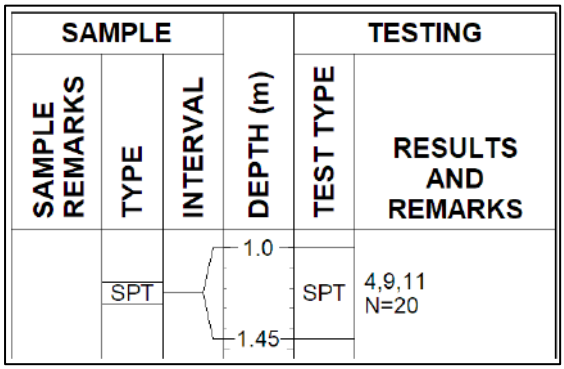
Sampling, Testing and Excavation Methodology

Terminology
Symbols
Abbreviations

March 2024

Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:



Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid Sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Environmental sample	ES
Gas sample	G
Piston sample	P
Sample from SPT test	SPT
Undisturbed tube sample	U[1]
Water sample	W
Material Sample	MT
Core sample for unconfined compressive strength testing	UCS

[1] – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y =x blows for y mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS

Field and laboratory testing (continued)

Test Type	Code
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(_)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

Groundwater Observations

▷	seepage/inflow
▽	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD[1]
Air Track	AT
Diatube	DT[1]
Hand auger	HA[1]
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA[1]
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT[1]
Ripping tyne/ripper	R
Rock roller	RR[1]
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON[1]
Mud/blade bucket	MB[1]
Toothed bucket	TB[1]
Vibrocore	VC[1]
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB[1]

[1] – numeric suffixes indicate tool diameter/width in mm

Douglas PARTNERS

Soil Descriptions

Terminology
Symbols
Abbreviations

March 2024

Introduction

All materials which are not considered to be "in-situ rock" are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:



The "classification" comprises a two character "group symbol" providing a general summary of dominant soil characteristics. The "name" summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either "fine grained" (also known as "cohesive" behaviour) or "coarse grained" ("non cohesive" behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as "oversize"	
Cobble	63 - 200		
Gravel[1]	2.36 - 63	Coarse	>65%
Sand[1]	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

[1] – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer "component proportions" below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a "Sandy CLAY", this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a "primary", "secondary", or "minor" component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition[1]	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor[2]	Present in the soil, but not significant to its engineering properties	All other components	All other components

[1] As defined in AS1726-2017 6.1.4.4

[2] In the detailed material description, minor components are split into two further sub-categories. Refer "identification of minor components" below.

Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, "INTERBEDDED Silty CLAY AND SAND".

Soil Descriptions

Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component [1]	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

[1] – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

Type		Particle size (mm)
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 – 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code NDF, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example (VS).

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as "extremely weathered material" in reports and by the abbreviation code XWM on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than 'very low' as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be "oversize" may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with "MIXTURE OF".

intentionally blank

BOREHOLE LOG

CLIENT: KN Group Pty Ltd
PROJECT: Proposed Subdivision
LOCATION: Bells Creek Road, Coochin Creek, QLD

SURFACE LEVEL:
COORDINATE: E:507010.0, N:7030344.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 01
PROJECT No: 229035.00
DATE: 27/05/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^]	DENSITY.[^]	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
		0.20	TOPSOIL / Sandy CLAY (CL): grey brown; low plasticity; fine to medium sand; with organics.		TOP	F		M	0.00m - 3.00m: ASS samples taken every 0.25m interval	D		0.20	PP	90kPa
			Sandy CLAY (CL-CI): dark brown; low to medium plasticity; fine to medium sand.		possibly ALV	F		M				0.50		
		0.60	Clayey SAND (SC): light brown; fine to medium.		possibly ALV	L		W		D		0.60		
		1	1.20m: palegrey				MD					0.90		
										D		1		
		1.50	Silty Sandy CLAY (CI): pale grey; medium plasticity; fine to medium sand.									1.20		
		2	1.90m: grey streaked orange		possibly RS	VSt		M				1.50	DCP9/100	
			2.40m: orange pale grey							D		2.40	PP	470kPa
		3	Borehole discontinued at 3.00m depth. Limit of Investigation.									2.70	PP	410kPa
													PP	160kPa
		4												
		5												
		6												

20/80

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Drillman GT10-KD
METHOD: AD/T to 3m
REMARKS: Groundwater seepage observed at 0.6m depth.

OPERATOR: DK

LOGGED: DK
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

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BOREHOLE LOG

CLIENT: KN Group Pty Ltd
PROJECT: Proposed Subdivision
LOCATION: Bells Creek Road, Coochin Creek, QLD

SURFACE LEVEL:
COORDINATE: E:507629.0, N:7029889.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 03
PROJECT No: 229035.00
DATE: 21/06/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
		0.00	FILL / Sandy CLAY (CH): grey mottled orange brown; high plasticity; fine to medium sand.		FILL	St	M	0.00m - 3.00m: ASS samples taken every 0.25m interval			0.00
		0.35	Silty SAND (SM): dark grey; fine to medium.		ALV	MD	M				
		0.50	Silty CLAY (CH): grey mottled orange brown; high plasticity; with fine to medium sand.		possibly ALV	St	M				
		1.10	Sandy CLAY (CH): grey mottled orange brown; high plasticity; fine to medium sand.		possibly ALV	VSt	M		D		1.20
▷		1.80	Silty SAND (SM): grey; fine to coarse.		possibly ALV	MD / MD - D / MD	W				1.50
		3.00	Borehole discontinued at 3.00m depth. Limit of Investigation.								2.00

TESTING AND REMARKS	
TEST TYPE	RESULTS AND REMARKS
DCP9/100	PP 140kPa; PP 140kPa; PP 150kPa; PP 270kPa; 21

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Jacro 200
METHOD: AD/T to 3m
REMARKS: Groundwater seepage observed at 1.8m depth.

OPERATOR: Battisson & Sons

LOGGED: JB
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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BOREHOLE LOG

CLIENT: KN Group Pty Ltd
PROJECT: Proposed Subdivision
LOCATION: Bells Creek Road, Coochin Creek, QLD

SURFACE LEVEL:
COORDINATE: E:507707.0, N:7029550.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 04
PROJECT No: 229035.00
DATE: 21/06/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0	Silty SAND (SM): dark grey; fine to medium.			L	M	0.00m - 3.00m: ASS samples taken every 0.25m interval				DCP9/100	5 10 15
		0.25m: grey			VL	W		D		0.60		
		0.55m: grey brown; fine to coarse		ALV						0.90		20/60
	1				MD					1		
		1.30m: orange brown streaked dark grey, with fine gravel			D	M						
	1.65	Sandy CLAY (CH): grey mottled red brown; high plasticity; fine to coarse sand; with fine gravel.			St						PP	180kPa
	2			RS		M				2	PP	200kPa
		2.60m: with ironstone gravel lensing			VSt						PP	220kPa
	3	Borehole discontinued at 3.00m depth. Limit of Investigation.									PP	380kPa
	4											
	5											
	6											

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Jacro 200
METHOD: AD/T to 3m
REMARKS: Groundwater seepage observed at 0.25m depth.

OPERATOR: Battisson & Sons

LOGGED: JB
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

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BOREHOLE LOG

CLIENT: KN Group Pty Ltd
PROJECT: Proposed Subdivision
LOCATION: Bells Creek Road, Coochin Creek, QLD

SURFACE LEVEL:
COORDINATE: E:507319.0, N:7029413.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 05
PROJECT No: 229035.00
DATE: 21/06/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
		0.30	Silty SAND (SM): dark grey; fine to coarse.		ALV	VL	M	0.00m - 3.00m: ASS samples taken every 0.25m interval	D	0.50 - 0.75	0.50	PP	70kPa
			Sandy CLAY (CH): grey mottled orange brown; high plasticity; fine to coarse sand; with fine gravel. 0.50m: grey mottled red brown			F					0.75	PP	90kPa
			0.75m: grey		possibly RS	St	M					PP	160kPa
		1	1.25m: fine to medium sand; no gravel			VSt					1	PP	220kPa
		1.70	Silty CLAY (CH): grey mottled red brown; high plasticity; with ironstone gravel lensing; trace of fine to medium sand.		RS	VSt	M					PP	220kPa
		2									2	PP	250kPa
		3	Borehole discontinued at 3.00m depth. Limit of Investigation.									PP	270kPa
		4											
		5											
		6											

DCP 9/100: 5, 10, 15; 20/90

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Jacro 200
METHOD: AD/T to 3m
REMARKS: No groundwater seepage observed at time of drilling

OPERATOR: Battisson & Sons

LOGGED: JB
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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BOREHOLE LOG

CLIENT: KN Group Pty Ltd
PROJECT: Proposed Subdivision
LOCATION: Bells Creek Road, Coochin Creek, QLD

SURFACE LEVEL:
COORDINATE: E:507129.0, N:7028833.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 11
PROJECT No: 229035.00
DATE: 27/05/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
		0.20	TOPSOIL / Silty Sandy CLAY (CL): grey brown; low plasticity; fine to medium sand; with organics.		TOP	St	M	0.00m - 6.00m: ASS samples taken every 0.25m interval					
			Sandy CLAY (CI): grey mottled orange brown; medium plasticity; fine to medium sand.						D		0.40	PP	110kPa
			0.50m: pale brown grey			St					0.70	PP	120kPa
		1	0.90m: orange mottled grey red; trace of fine to medium gravel						D		1.00	PP	210kPa
											1.30	PP	20/80
			1.80m: grey white mottled orange									PP	200kPa
		2	2.30m: orange mottled grey red								2	DCP 9/100 PP	310kPa
			2.80m: pale grey mottled red									PP	250kPa
		3	3.10m: red mottled pale grey		possibly RS		M				3	PP	20/70
												PP	220kPa
						VSt			D		3.20	PP	220kPa
			3.70m-4.10m: red mottled grey orange								3.50	PP	20/80
		4									4	PP	290kPa
												PP	200kPa
		5	5.40m-5.80m: red orange								5	PP	280kPa
											5.50	PP	250kPa
									D		5.80	PP	210kPa
		6	Borehole discontinued at 6.00m depth. Limit of Investigation.										

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Drillman GT10-KD
METHOD: AD/T to 6m
REMARKS: No groundwater seepage observed at time of drilling

OPERATOR: DK

LOGGED: DK
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

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BOREHOLE LOG

CLIENT: KN Group Pty Ltd
PROJECT: Proposed Subdivision
LOCATION: Bells Creek Road, Coochin Creek, QLD

SURFACE LEVEL:
COORDINATE: E:507341.0, N:7028296.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 15
PROJECT No: 229035.00
DATE: 27/05/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)
		0.00	Clayey SAND (SC): brown grey; fine to medium.		possibly RS	MD	M	0.00m - 6.00m: ASS samples taken every 0.25m interval			
		0.50	Silty Sandy CLAY (CI): orange brown streaked grey; medium plasticity; fine to medium sand.		possibly RS	F - St	M				
		0.90	Clayey SAND (SC): grey; fine to medium.		possibly RS	MD	M				1
		1.10	Silty Sandy CLAY (CI): grey pale brown; medium plasticity; fine to medium sand.						D		1.10
											1.40
		2	2.00m: orange pale grey								2
		3	3.10m: pale grey streaked orange								3.20
			3.50m: pale grey		possibly RS	VSt	M		D		3.50
		4	4.50m: grey								4
		5									5
		6	Borehole discontinued at 6.00m depth. Limit of Investigation.								

TESTING AND REMARKS

TEST TYPE	RESULTS AND REMARKS
	5 10 15 20/80
PP	90kPa
PP	140kPa
DCP9/100	
PP	340kPa
	20/70
PP	310kPa
PP	350kPa
	20/80
PP	320kPa
PP	320kPa
PP	270kPa
PP	250kPa
PP	250kPa
PP	200kPa

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Drillman GT10-KD
METHOD: AD/T to 6m
REMARKS: No groundwater seepage observed at time of drilling

OPERATOR: DK

LOGGED: DK
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

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BOREHOLE LOG

CLIENT: KN Group Pty Ltd
PROJECT: Proposed Subdivision
LOCATION: Bells Creek Road, Coochin Creek, QLD

SURFACE LEVEL:
COORDINATE: E:507847.0, N:7026844.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 27
PROJECT No: 229035.00
DATE: 22/07/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE		REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
▽	0	Silty SAND (SM): dark grey; fine to medium.		ALV	L	M		0.00m - 3.00m: ASS samples taken every 0.25m interval					
		0.50m: grey brown				W							
	0.70	Sandy CLAY (CH): grey; high plasticity; fine to medium sand.		possibly RS	VSt	M			D		1.00	PP	480kPa
	1											PP	530kPa
	1.80	Sandy CLAY (CI): grey; medium plasticity; fine to medium sand.		possibly RS	H	M					1.70	PP	600kPa
	2										2	PP	>600kPa
	3	Borehole discontinued at 3.00m depth. Limit of Investigation.										PP	>600kPa
	4												
	5												
	6												

DCP9/100: 5, 10, 15; 20/70

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Jacro 200
METHOD: AD/T to 3m
REMARKS: Groundwater seepage observed at 0.5m depth.

OPERATOR: Battisson & Sons

LOGGED: JB
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

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BOREHOLE LOG

CLIENT: KN Group Pty Ltd
PROJECT: Proposed Subdivision
LOCATION: Bells Creek Road, Coochin Creek, QLD

SURFACE LEVEL:
COORDINATE: E:507865.0, N:7026761.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 28
PROJECT No: 229035.00
DATE: 22/07/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE		REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0	Silty SAND (SM): dark grey; fine to medium.		ALV	L	M		0.00m - 3.00m: ASS samples taken every 0.25m interval					
		0.70m: grey brown				W							
	0.95	Sandy CLAY (CH): grey; high plasticity; fine to coarse sand.		possibly RS	VSt	M					1	PP	420kPa
	2	2.10m: fine to medium sand									2	PP	430kPa
												PP	530kPa
												PP	430kPa
	3	Borehole discontinued at 3.00m depth. Limit of Investigation.										PP	390kPa
	4												
	5												
	6												

DCP9/100: 5, 10, 15; 20/90

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Jacro 200
METHOD: AD/T to 3m
REMARKS: Groundwater seepage observed at 0.7m depth.

OPERATOR: Battisson & Sons

LOGGED: JB
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions

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Appendix D

Laboratory Results

Acid Sulfate Soil Test Results v1.2

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Summary of results - acid sulfate soils

Project No: 229035.00

Project Name: Proposed Subdivision

Location: Bells Creek Road, Coochin Creek

Sample Information					Screening Test Results				Laboratory Analysis Results (Acid Base Accounting)								
Location ID	Depth from (m)	Depth to (m)	Sample Description	Adopted Texture	pH_F (pH units)	pH_{FOX} (pH units)	Reaction Strength	pH change (pH units)	pH_{KCl} (pH units)	S_{KCl} (%S)	S_{HCl} (%S)	Scr (%S)	TAA (%S)	S_{NAS} (%S)	ANC_{BT} (%S)	ANC Corroborated (Y/N)	Net Acidity (%S)
											Coarse texture: sands to loamy sands and peats						0.03
			Assessment Criteria (pH units)		**<4**	**<3**	-	**1.0**	Action Criteria (%S)		Medium texture: clayey sand to light clays						0.06[a]/0.03[b]
											Fine texture: light medium to heavy clays						0.1[a]/0.03[b]
Location ID	Depth from (m)	Depth to (m)	Sample Description	Adopted Texture	pH_F (pH units)	pH_{FOX} (pH units)	Reaction Strength	pH change (pH units)	pH_{KCl} (pH units)	S_{KCl} (%S)	S_{HCl} (%S)	Scr (%S)	TAA (%S)	S_{NAS} (%S)	ANC_{BT} (%S)	ANC Corroborated (Y/N)	Net Acidity (%S)
1	0.00	0.25	Sandy CLAY - grey brown	F	5.3	**2.5**	4	**2.8**									
1	0.25	0.50	Sandy CLAY - dark brown	F	5.4	**2.6**	3	**2.8**	4.8	<0.005		<0.005	0.046				0.050
1	0.50	0.75	Sandy CLAY - dark brown	F	5.5	**2.7**	3	**2.8**									
1	0.75	1.00	Clayey SAND - light brown	M	5.6	3.2	3	**2.4**	5.0	<0.005		<0.005	0.030				0.030
1	1.00	1.25	Clayey SAND - light brown	M	5.3	4.1	4	**1.2**									
1	1.25	1.50	Clayey SAND - pale grey	M	5.6	4.1	2	**1.5**									
1	1.50	1.75	Silty Sandy CLAY - pale grey	F	5.5	3.8	2	**1.7**									
1	1.75	2.00	Silty Sandy CLAY - pale grey	F	5.4	3.7	2	**1.7**	4.7	<0.005		<0.005	0.076				0.080
1	2.00	2.25	Silty Sandy CLAY - grey streaked orange	F	5.6	3.8	2	**1.8**									
1	2.25	2.50	Silty Sandy CLAY - grey streaked orange	F	5.7	4.0	3	**1.7**									
1	2.50	2.75	Silty Sandy CLAY - orange ale grey	F	5.6	4.4	4	**1.2**									
1	2.75	3.00	Silty Sandy CLAY - orange ale grey	F	5.5	4.1	2	**1.4**	5.0	<0.005		<0.005	0.032				0.030
3	0.00	0.25	FILL/Sandy CLAY - grey mottled orange brown	F	4.9	3.6	3	**1.3**									
3	0.25	0.50	Silty SAND - dark grey	C	5.0	3.6	3	**1.4**									
3	0.50	0.75	Silty CLAY - grey mottled orange brown	F	5.3	3.3	3	**2.0**	4.5	0.008		0.030	0.230				0.260
3	0.75	1.00	Silty CLAY - grey mottled orange brown														
3	1.00	1.25	Silty CLAY - grey mottled orange brown	F	5.1	3.4	3	**1.7**	4.3	0.007	0.010	0.007	0.210	<0.005			0.220
3	1.25	1.50	Sandy CLAY - grey mottled orange brown	F	5.1	3.5	3	**1.6**									
3	1.50	1.75	Sandy CLAY - grey mottled orange brown	F	5.1	3.5	2	**1.6**									
3	1.75	2.00	Sandy CLAY - grey mottled orange brown	F	5.0	4.1	2	0.9									
3	2.00	2.25	Silty SAND - grey	C	5.0	3.6	2	**1.4**	4.6	<0.005		<0.005	0.038				0.040
3	2.25	2.50	Silty SAND - grey	C	4.8	4.0	2	0.8									
3	2.50	2.75	Silty SAND - grey	C	5.1	3.7	3	**1.4**									
3	2.75	3.00	Silty SAND - grey	C	5.1	3.6	3	**1.5**									
4	0.00	0.25	Silty SAND - dark grey	C	5.1	**2.7**	3	**2.4**	4.8	<0.005		<0.005	0.036				0.040
4	0.25	0.50	Silty SAND - grey	C	5.2	3.1	3	**2.1**									
4	0.50	0.75	Silty SAND - grey brown	C	5.2	3.1	3	**2.1**									
4	0.75	1.00	Silty SAND - grey brown	C	5.0	3.2	3	**1.8**									
4	1.00	1.25	Silty SAND - grey brown	C	5.6	3.1	3	**2.5**	5.3	<0.005		<0.005	0.012				<0.02
4	1.25	1.50	Silty SAND - orange brown streaked dark grey	C	5.3	3.7	3	**1.6**									
4	1.50	1.75	Silty SAND - orange brown streaked dark grey	C	4.9	3.6	3	**1.3**									

Acid Sulfate Soil Test Results v1.2

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Sample Information					Screening Test Results				Laboratory Analysis Results (Acid Base Accounting)								
Location ID	Depth from (m)	Depth to (m)	Sample Description	Adopted Texture	pH_F (pH units)	pH_{FOX} (pH units)	Reaction Strength	pH change (pH units)	pH_{KCl} (pH units)	S_{KCl} (%S)	S_{HCl} (%S)	Scr (%S)	TAA (%S)	S_{NAS} (%S)	ANC_{BT} (%S)	ANC Corroborated (Y/N)	Net Acidity (%S)
											Coarse texture: sands to loamy sands and peats						0.03
			Assessment Criteria (pH units)		**<4**	**<3**	-	**1.0**	Action Criteria (%S)		Medium texture: clayey sand to light clays						0.06[a]/0.03[b]
											Fine texture: light medium to heavy clays						0.1[a]/0.03[b]
Location ID	Depth from (m)	Depth to (m)	Sample Description	Adopted Texture	pH_F (pH units)	pH_{FOX} (pH units)	Reaction Strength	pH change (pH units)	pH_{KCl} (pH units)	S_{KCl} (%S)	S_{HCl} (%S)	Scr (%S)	TAA (%S)	S_{NAS} (%S)	ANC_{BT} (%S)	ANC Corroborated (Y/N)	Net Acidity (%S)
4	1.75	2.00	Sandy CLAY - grey mottled red brown	F	5.1	3.6	3	**1.5**									
4	2.00	2.25	Sandy CLAY - grey mottled red brown	F	4.8	3.2	4	**1.6**	4.2	<0.005	<0.005	<0.005	0.098	<0.005			0.100
4	2.25	2.50	Sandy CLAY - grey mottled red brown	F	4.8	3.3	4	**1.5**									
4	2.50	2.75	Sandy CLAY - grey mottled red brown	F	4.8	3.4	4	**1.4**									
4	2.75	3.00	Sandy CLAY - grey mottled red brown	F	5.2	3.4	4	**1.8**									
5	0.00	0.25	Silty SAND - dark grey	C	5.4	**2.8**	3	**2.6**	4.7	<0.005		<0.005	0.042				0.040
5	0.25	0.50	Sandy CLAY - grey mottled orange brown	F	5.4	3.8	2	**1.6**									
5	0.50	0.75	Sandy CLAY - grey mottled red brown	F	5.3	3.9	2	**1.4**									
5	0.75	1.00	Sandy CLAY - grey mottled red brown	F	5.4	3.6	3	**1.8**	4.6	0.016		<0.005	0.038				0.040
5	1.00	1.25	Sandy CLAY - grey mottled red brown	F	5.3	4.2	3	**1.1**									
5	1.25	1.50	Sandy CLAY - grey mottled red brown	F	5.7	4.6	3	**1.1**									
5	1.50	1.75	Sandy CLAY - grey mottled red brown	F	5.6	4.6	3	**1.0**	4.8	0.012		<0.005	0.025				0.030
5	1.75	2.00	Silty CLAY - grey mottled red brown	F	5.4	4.7	2	0.7									
5	2.00	2.25	Silty CLAY - grey mottled red brown	F	5.4	4.8	2	0.6									
5	2.25	2.50	Silty CLAY - grey mottled red brown	F	5.4	4.8	2	0.6									
5	2.50	2.75	Silty CLAY - grey mottled red brown	F	5.5	4.6	2	0.9									
5	2.75	3.00	Silty CLAY - grey mottled red brown	F	5.6	4.4	2	**1.2**	4.6	0.007		<0.005	0.044				0.040
11	0.00	0.25	Silty Sandy CLAY - grey brown	F	4.8	**2.7**	4	**2.1**									
11	0.25	0.50	Sandy CLAY - grey mottled orange brown	F	6.0	**2.8**	3	**3.2**	5.0	<0.005		<0.005	0.029				0.030
11	0.50	0.75	Sandy CLAY - pale brown grey	F	5.9	4.1	2	**1.8**									
11	0.75	1.00	Sandy CLAY - pale brown grey	F	5.7	4.3	2	**1.4**									
11	1.00	1.25	Sandy CLAY - orange mottled grey red	F	6.1	4.1	3	**2.0**	4.7	0.028		<0.005	0.065				0.070
11	1.25	1.50	Sandy CLAY - orange mottled grey red	F	5.6	4.4	2	**1.2**									
11	1.50	1.75	Sandy CLAY - orange mottled grey red	F	5.6	4.4	3	**1.2**									
11	1.75	2.00	Sandy CLAY - grey white mottled orange	F	5.7	4.4	3	**1.3**	5.1	0.007		<0.005	0.023				0.030
11	2.00	2.25	Sandy CLAY - grey white mottled orange	F	6.2	5.1	3	**1.1**									
11	2.25	2.50	Sandy CLAY - orange mottled grey red	F	6.1	4.9	2	**1.2**									
11	2.50	2.75	Sandy CLAY - orange mottled grey red	F	6.0	5.4	3	0.6									
11	2.75	3.00	Sandy CLAY - pale grey mottled red	F	5.9	4.8	2	**1.1**	5.1			0.011	0.023				0.030
11	3.00	3.25	Sandy CLAY - red mottled pale grey	F	6.1	4.8	2	**1.3**									
11	3.25	3.50	Sandy CLAY - red mottled pale grey	F	6.1	4.5	2	**1.6**	5.2			0.006	0.021				0.030
11	3.50	3.75	Sandy CLAY - red mottled pale grey	F	6.3	5.6	3	0.7									
11	3.75	4.00	Sandy CLAY - red mottled grey orange	F	6.3	5.3	2	**1.0**									
11	4.00	4.25	Sandy CLAY - red mottled grey orange	F	6.8	5.9	3	0.9									
11	4.25	4.50	Sandy CLAY - red mottled pale grey	F	6.7	5.9	3	0.8									
11	4.50	4.75	Sandy CLAY - red mottled pale grey	F	6.6	6.6	3	0.0									
11	4.75	5.00	Sandy CLAY - red mottled pale grey	F	6.9	5.6	2	**1.3**	5.6			<0.005	0.009				<0.02
11	5.00	5.25	Sandy CLAY - red mottled pale grey	F	7.1	6.7	4	0.4									
11	5.25	5.50	Sandy CLAY - red mottled pale grey	F	7.2	6.7	3	0.5									

Acid Sulfate Soil Test Results v1.2

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Sample Information					Screening Test Results				Laboratory Analysis Results (Acid Base Accounting)									
Location ID	Depth from (m)	Depth to (m)	Sample Description	Adopted Texture	pH_F (pH units)	pH_{FOX} (pH units)	Reaction Strength	pH change (pH units)	pH_{KCl} (pH units)	S_{KCl} (%S)	S_{HCl} (%S)	Scr (%S)	TAA (%S)	S_{NAS} (%S)	ANC_{BT} (%S)	ANC Corroborated (Y/N)	Net Acidity (%S)
											Coarse texture: sands to loamy sands and peats						0.03
			Assessment Criteria (pH units)		**<4**	**<3**	-	**1.0**	Action Criteria (%S)		Medium texture: clayey sand to light clays						0.06[a]/0.03[b]
											Fine texture: light medium to heavy clays						0.1[a]/0.03[b]
Location ID	Depth from (m)	Depth to (m)	Sample Description	Adopted Texture	pH_F (pH units)	pH_{FOX} (pH units)	Reaction Strength	pH change (pH units)	pH_{KCl} (pH units)	S_{KCl} (%S)	S_{HCl} (%S)	Scr (%S)	TAA (%S)	S_{NAS} (%S)	ANC_{BT} (%S)	ANC Corroborated (Y/N)	Net Acidity (%S)
11	5.50	5.75	Sandy CLAY - red orange	F	6.1	6.6	3	-									
11	5.75	6.00	Sandy CLAY - red mottled pale grey	F	7.8	6.7	3	**1.1**									
15	0.00	0.25	Clayey SAND - brown grey	M	5.7	3.1	4	**2.6**	5.2			<0.005	0.021				0.020
15	0.25	0.50	Clayey SAND - brown grey	M	5.6	3.2	3	**2.4**									
15	0.50	0.75	Silty Sandy CLAY - orange brown streaked grey	F	5.5	3.7	3	**1.8**									
15	0.75	1.00	Silty Sandy CLAY - orange brown streaked grey	F	5.4	3.1	2	**2.3**	5.1			0.005	0.018				0.020
15	1.00	1.25	Clayey SAND - grey	M	5.6	3.8	2	**1.8**									
15	1.25	1.50	Silty Sandy CLAY - pale grey brown	F	5.6	4.0	2	**1.6**									
15	1.50	1.75	Silty Sandy CLAY - pale grey brown	F	5.6	3.8	4	**1.8**	4.9			0.006	0.031				0.040
15	1.75	2.00	Silty Sandy CLAY - pale grey brown	F	5.5	4.1	3	**1.4**									
15	2.00	2.25	Silty Sandy CLAY - orange pale grey	F	5.2	4.1	4	**1.1**									
15	2.25	2.50	Silty Sandy CLAY - orange pale grey	F	5.3	4.4	3	0.9									
15	2.50	2.75	Silty Sandy CLAY - orange pale grey	F	5.5	4.5	3	**1.0**	4.6			<0.005	0.083				0.080
15	2.75	3.00	Silty Sandy CLAY - orange pale grey	F	5.7	4.7	4	**1.0**									
15	3.00	3.25	Silty Sandy CLAY - orange pale grey	F	5.7	4.7	4	**1.0**									
15	3.25	3.50	Silty Sandy CLAY - pale grey streaked orange	F	5.6	4.8	4	0.8									
15	3.50	3.75	Silty Sandy CLAY - pale grey	F	5.8	5.1	4	0.7									
15	3.75	4.00	Silty Sandy CLAY - pale grey	F	5.8	4.9	4	0.9									
15	4.00	4.25	Silty Sandy CLAY - pale grey	F	5.7	4.6	4	**1.1**									
15	4.25	4.50	Silty Sandy CLAY - pale grey	F	5.9	5.0	4	0.9									
15	4.50	4.75	Silty Sandy CLAY - grey	F	5.9	5.1	4	0.8									
15	4.75	5.00	Silty Sandy CLAY - grey	F	5.9	5.1	4	0.8									
15	5.00	5.25	Silty Sandy CLAY - grey	F	6.0	4.7	4	**1.3**	4.6			<0.005	0.091				0.090
15	5.25	5.50	Silty Sandy CLAY - grey	F	6.1	4.9	4	**1.2**									
15	5.50	5.75	Silty Sandy CLAY - grey	F	6.1	5.0	4	**1.1**									
15	5.75	6.00	Silty Sandy CLAY - grey	F	6.1	5.0	4	**1.1**									
27	0.00	0.25	Silty SAND - dark grey	C	5.8	**2.7**	4	**3.1**	4.7	<0.005		<0.005	0.036				0.040
27	0.25	0.50	Silty SAND - dark grey	C	5.7	3.7	4	**2.0**									
27	0.50	0.75	Silty SAND - grey brown	C	6.0	**2.7**	4	**3.3**	4.9	<0.005		<0.005	0.023				0.020
27	0.75	1.00	Sandy CLAY - grey	F	6.1	4.1	2	**2.0**									
27	1.00	1.25	Sandy CLAY - grey	F	5.9	4.3	2	**1.6**	4.6	<0.005		<0.005	0.044				0.040
27	1.25	1.50	Sandy CLAY - grey	F	5.7	4.5	2	**1.2**									
27	1.50	1.75	Sandy CLAY - grey	F	5.6	4.8	2	0.8									
27	1.75	2.00	Sandy CLAY - grey	F	5.8	4.5	3	**1.3**	4.4	<0.005	<0.005	<0.005	0.093	0.007			0.100
27	2.00	2.25	Sandy CLAY - grey	F	5.8	4.6	3	**1.2**									
27	2.25	2.50	Sandy CLAY - grey	F	5.6	5.0	3	0.6									
27	2.50	2.75	Sandy CLAY - grey	F	5.9	4.9	3	**1.0**									
27	2.75	3.00	Sandy CLAY - grey	F	5.6	4.8	3	0.8									
28	0.00	0.25	Silty SAND - dark grey	C	5.4	**2.5**	3	**2.9**	4.7	<0.005		<0.005	0.045				0.050
28	0.25	0.50	Silty SAND - dark grey	C	5.6	3.7	3	**1.9**									
28	0.50	0.75	Silty SAND - dark grey	C	5.3	3.5	3	**1.8**									
28	0.75	1.00	Silty SAND - grey brown	C	5.0	4.1	2	0.9									

Acid Sulfate Soil Test Results v1.2

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Sample Information					Screening Test Results				Laboratory Analysis Results (Acid Base Accounting)								
Location ID	Depth from (m)	Depth to (m)	Sample Description	Adopted Texture	pH_F (pH units)	pH_{FOX} (pH units)	Reaction Strength	pH change (pH units)	pH_{KCl} (pH units)	S_{KCl} (%S)	S_{HCl} (%S)	Scr (%S)	TAA (%S)	S_{NAS} (%S)	ANC_{BT} (%S)	ANC Corroborated (Y/N)	Net Acidity (%S)
											Coarse texture: sands to loamy sands and peats						0.03
			Assessment Criteria (pH units)		**<4**	**<3**	-	**1.0**	Action Criteria (%S)		Medium texture: clayey sand to light clays						0.06[a]/0.03[b]
											Fine texture: light medium to heavy clays						0.1[a]/0.03[b]
Location ID	Depth from (m)	Depth to (m)	Sample Description	Adopted Texture	pH_F (pH units)	pH_{FOX} (pH units)	Reaction Strength	pH change (pH units)	pH_{KCl} (pH units)	S_{KCl} (%S)	S_{HCl} (%S)	Scr (%S)	TAA (%S)	S_{NAS} (%S)	ANC_{BT} (%S)	ANC Corroborated (Y/N)	Net Acidity (%S)
28	1.00	1.25	Sandy CLAY - grey	F	5.0	3.8	2	**1.2**									
28	1.25	1.50	Sandy CLAY - grey	F	5.2	4.0	2	**1.2**									
28	1.50	1.75	Sandy CLAY - grey	F	5.3	3.8	2	**1.5**	4.5	0.005	0.010	<0.005	0.078	0.007			0.090
28	1.75	2.00	Sandy CLAY - grey	F	5.6	4.4	3	**1.2**									
28	2.00	2.25	Sandy CLAY - grey	F	5.7	4.4	2	**1.3**									
28	2.25	2.50	Sandy CLAY - grey	F	5.5	4.5	2	**1.0**									
28	2.50	2.75	Sandy CLAY - grey	F	5.4	4.2	2	**1.2**	4.3	<0.005	0.005	<0.005	0.170	0.008			0.180
28	2.75	3.00	Sandy CLAY - grey	F	5.7	4.5	2	**1.2**									

Notes:

Adopted texutre - C = coarse, M = medium, F = fine

pH_F - Soil pH in water

pH_{FOX} - Soil pH in peroxide

Reaction strength: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

pH change = pH_F - pH_{FOX}

pH_{KCL} - KCl extractable pH

S_{KCl} - KCl extractable sulfur

S_{HCl} - HCl extractable sulfur

S_{cr} - potential sulfidic acidity

TAA - titratable actual acidity (reported if pH_{KCL}<6.5)

S_{NAS} – retained acidity (reported if pHkCl < 4.5)

ANC_{BT} – acid neutralising capacity (reported if $pH_{KCl} \geq 6.5$)

NT - Not tested

Bold results are indicators of ASS conditions, noting:

- Assessment criteria are considered a reasonable initial screening for AASS or PASS
- pH_F<4 is indicative of the presence of Actual ASS (AASS), although it is not conclusive of ASS on its own as naturally occurring non ASS soils can have pH_F<5
- pH_{FOX}<3 or pH Change ≥1 may indicate potential ASS (PASS), although exception apply. Laboratory testing required to confirm presence of Reduced Inorganic Sulfur (RIS)
- Refer to Table 5.1, A2, A3 of Sullivan,L. et al (2018) for further details

Shaded results trigger action (i.e. equal to or exceed the action criteria). Criteria is specific for soil texture and anticpated tonnage of soil disturbed.

Net Acidity can only include the measured ANC where the ANC has been corroborated by other data (for example slab incubation data) that demonstrates the soil material does not experience acidification during complete oxidation under field conditions.

a - Action criterion for disturbance of 1-1000 tonnes of material

Douglas Partners Pty Ltd
439 Montague Road
West End
QLD 4101

NATA Accredited
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Attention: **Brett Egen**

Report **1104926-S**
Project name BELLS CREEK ROAD COOCHIN CREEK
Project ID 229035
Received Date Jun 04, 2024

Client Sample ID			**BORE 1 - 0.0M**	**BORE 1-0.25M**	**BORE 1-0.5M**	**BORE 1-0.75M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0011724**	**B24-Jn0011725**	**B24-Jn0011726**	**B24-Jn0011727**
Date Sampled			**May 27, 2024**	**May 27, 2024**	**May 27, 2024**	**May 27, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.4	5.5	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.5	2.6	2.7	3.2
Reaction Ratings*[S05]	0	comment	4.0	3.0	3.0	3.0

Client Sample ID			**BORE 1-1.0M**	**BORE 1-1.25M**	**BORE 1-1.5M**	**BORE 1-1.75M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0011728**	**B24-Jn0011729**	**B24-Jn0011730**	**B24-Jn0011731**
Date Sampled			**May 27, 2024**	**May 27, 2024**	**May 27, 2024**	**May 27, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.6	5.5	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	4.1	3.8	3.7
Reaction Ratings*[S05]	0	comment	4.0	2.0	2.0	2.0

Client Sample ID			**BORE 1-2.0M**	**BORE 1-2.25M**	**BORE 1-2.5M**	**BORE 1-2.75M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0011732**	**B24-Jn0011733**	**B24-Jn0011734**	**B24-Jn0011735**
Date Sampled			**May 27, 2024**	**May 27, 2024**	**May 27, 2024**	**May 27, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	5.7	5.6	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.8	4.0	4.4	4.1
Reaction Ratings*[S05]	0	comment	2.0	3.0	4.0	2.0

Client Sample ID			BORE 11-0.0M	BORE 11-0.25M	BORE 11-0.5M	BORE 11-0.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0011810	B24-Jn0011811	B24-Jn0011812	B24-Jn0011813
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	6.0	5.9	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	2.7	2.8	4.1	4.3
Reaction Ratings*[S05]	0	comment	4.0	3.0	2.0	2.0

Client Sample ID			BORE 11-1.0M	BORE 11-1.25M	BORE 11-1.5M	BORE 11-1.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0011814	B24-Jn0011815	B24-Jn0011816	B24-Jn0011817
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.1	5.6	5.6	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	4.4	4.4	4.4
Reaction Ratings*[S05]	0	comment	3.0	2.0	3.0	3.0

Client Sample ID			BORE 11-2.0M	BORE 11-2.25M	BORE 11-2.5M	BORE 11-2.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0011818	B24-Jn0011819	B24-Jn0011820	B24-Jn0011821
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.2	6.1	6.0	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.1	4.9	5.4	4.8
Reaction Ratings*[S05]	0	comment	3.0	2.0	3.0	2.0

Client Sample ID			BORE 11-3.0M	BORE 11-3.25M	BORE 11-3.50M	BORE 11-3.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0011822	B24-Jn0011823	B24-Jn0011824	B24-Jn0011825
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.1	6.1	6.3	6.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.8	4.5	5.6	5.3
Reaction Ratings*[S05]	0	comment	2.0	2.0	3.0	2.0

Client Sample ID			BORE 11-4.0M	BORE 11-4.25M	BORE 11-4.50M	BORE 11-4.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0011826	B24-Jn0011827	B24-Jn0011828	B24-Jn0011829
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.8	6.7	6.6	6.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.9	5.9	6.6	5.6
Reaction Ratings*[S05]	0	comment	3.0	3.0	3.0	2.0

Client Sample ID			BORE 11-5.0M	BORE 11-5.25M	BORE 11-5.50M	BORE 11-5.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0011830	B24-Jn0011831	B24-Jn0011832	B24-Jn0011833
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	7.1	7.2	6.1	7.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	6.7	6.7	6.6	6.7
Reaction Ratings*[S05]	0	comment	4.0	3.0	3.0	3.0

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Attention: **Brett Egen**

Report **1105040-S**
Project name BELLS CREEK ROAD COOCHIN CREEK
Project ID 229035
Received Date Jun 04, 2024

Client Sample ID			**BORE 15-0.0M**	**BORE 15-0.25M**	**BORE 15-0.5M**	**BORE 15-0.75M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0012508**	**B24-Jn0012509**	**B24-Jn0012510**	**B24-Jn0012511**
Date Sampled			**May 27, 2024**	**May 27, 2024**	**May 27, 2024**	**May 27, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.6	5.5	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.2	3.7	3.1
Reaction Ratings*[S05]	0	comment	4.0	3.0	3.0	2.0

Client Sample ID			**BORE 15-1.0M**	**BORE 15-1.25M**	**BORE 15-1.5M**	**BORE 15-1.75M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0012512**	**B24-Jn0012513**	**B24-Jn0012514**	**B24-Jn0012515**
Date Sampled			**May 27, 2024**	**May 27, 2024**	**May 27, 2024**	**May 27, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	5.6	5.6	5.5
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.8	4.0	3.8	4.1
Reaction Ratings*[S05]	0	comment	2.0	2.0	4.0	3.0

Client Sample ID			**BORE 15-2.0M**	**BORE 15-2.25M**	**BORE 15-2.5M**	**BORE 15-2.75M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0012516**	**B24-Jn0012517**	**B24-Jn0012518**	**B24-Jn0012519**
Date Sampled			**May 27, 2024**	**May 27, 2024**	**May 27, 2024**	**May 27, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.3	5.5	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	4.4	4.5	4.7
Reaction Ratings*[S05]	0	comment	4.0	3.0	3.0	4.0

Client Sample ID			BORE 15-3.0M	BORE 15-3.25M	BORE 15-3.50M	BORE 15-3.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0012520	B24-Jn0012521	B24-Jn0012522	B24-Jn0012523
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.6	5.8	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.7	4.8	5.1	4.9
Reaction Ratings*[S05]	0	comment	4.0	4.0	4.0	4.0

Client Sample ID			BORE 15-4.0M	BORE 15-4.25M	BORE 15-4.50M	BORE 15-4.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0012524	B24-Jn0012525	B24-Jn0012526	B24-Jn0012527
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.9	5.9	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.6	5.0	5.1	5.1
Reaction Ratings*[S05]	0	comment	4.0	4.0	4.0	4.0

Client Sample ID			BORE 15-5.0M	BORE 15-5.25M	BORE 15-5.50M	BORE 15-5.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0012528	B24-Jn0012529	B24-Jn0012530	B24-Jn0012531
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	6.0	6.1	6.1	6.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.7	4.9	5.0	5.0
Reaction Ratings*[S05]	0	comment	4.0	4.0	4.0	4.0

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Attention: **Brett Egen**

Report **1112664-S**
Project name BELLS CREEK ROAD COOCHIN CREEK
Project ID 229035
Received Date Jun 26, 2024

Client Sample ID			**BORE 3_0.0-0.25M**	**BORE 3_0.25-0.5M**	**BORE 3_0.5-0.75M**	**BORE 3_1.0-1.25M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0073788**	**B24-Jn0073789**	**B24-Jn0073790**	**B24-Jn0073792**
Date Sampled			**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	5.0	5.3	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	3.6	3.3	3.4
Reaction Ratings*[S05]	0	comment	3.0	3.0	3.0	3.0

Client Sample ID			**BORE 3_1.25-1.5M**	**BORE 3_1.5-1.75M**	**BORE 3_1.75-2.0M**	**BORE 3_2.0-2.25M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0073793**	**B24-Jn0073794**	**B24-Jn0073795**	**B24-Jn0073796**
Date Sampled			**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	5.1	5.0	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.5	3.5	4.1	3.6
Reaction Ratings*[S05]	0	comment	3.0	2.0	2.0	2.0

Client Sample ID			**BORE 3_2.25-2.5M**	**BORE 3_2.5-2.75M**	**BORE 3_2.75-3.0M**	**BORE 4_0.0-0.25M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0073797**	**B24-Jn0073798**	**B24-Jn0073799**	**B24-Jn0073800**
Date Sampled			**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	5.1	5.1	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.0	3.7	3.6	2.7
Reaction Ratings*[S05]	0	comment	2.0	3.0	3.0	3.0

Client Sample ID			BORE 4_0.25-0.5M	BORE 4_0.5-0.75M	BORE 4_0.75-1.0M	BORE 4_1.0-1.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073801	B24-Jn0073802	B24-Jn0073803	B24-Jn0073804
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.2	5.0	5.6
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.1	3.1	3.2	3.1
Reaction Ratings*[S05]	0	comment	3.0	3.0	3.0	3.0

Client Sample ID			BORE 4_1.25-1.5M	BORE 4_1.5-1.75M	BORE 4_1.75-2.0M	BORE 4_2.0-2.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073805	B24-Jn0073806	B24-Jn0073807	B24-Jn0073808
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	4.9	5.1	4.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.6	3.6	3.2
Reaction Ratings*[S05]	0	comment	3.0	3.0	3.0	4.0

Client Sample ID			BORE 4_2.25-2.5M	BORE 4_2.5-2.75M	BORE 4_2.75-3.0M	BORE 5_0.0-0.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073809	B24-Jn0073810	B24-Jn0073811	B24-Jn0073812
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.8	4.8	5.2	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.3	3.4	3.4	2.8
Reaction Ratings*[S05]	0	comment	4.0	4.0	4.0	3.0

Client Sample ID			BORE 5_0.25-0.5M	BORE 5_0.5-0.75M	BORE 5_0.75-1.0M	BORE 5_1.0-1.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073813	B24-Jn0073814	B24-Jn0073815	B24-Jn0073816
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	5.3	5.4	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.8	3.9	3.6	4.2
Reaction Ratings*[S05]	0	comment	2.0	2.0	3.0	3.0

Client Sample ID			BORE 5_1.25-1.5M	BORE 5_1.5-1.75M	BORE 5_1.75-2.0M	BORE 5_2.0-2.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073817	B24-Jn0073818	B24-Jn0073819	B24-Jn0073820
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.6	5.4	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.6	4.6	4.7	4.8
Reaction Ratings*[S05]	0	comment	3.0	3.0	2.0	2.0

Client Sample ID			BORE 5_2.25-2.5M	BORE 5_2.5-2.75M	BORE 5_2.75-3.0M	BORE 27_0.0-0.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073821	B24-Jn0073822	B24-Jn0073823	B24-Jn0073824
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.4	5.5	5.6	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.8	4.6	4.4	2.7
Reaction Ratings*[S05]	0	comment	2.0	2.0	2.0	4.0

Client Sample ID			BORE 27_0.25-0.5M	BORE 27_0.5-0.75M	BORE 27_0.75-1.0M	BORE 27_1.0-1.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073825	B24-Jn0073826	B24-Jn0073827	B24-Jn0073828
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	6.0	6.1	5.9
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	2.7	4.1	4.3
Reaction Ratings*[S05]	0	comment	4.0	4.0	2.0	2.0

Client Sample ID			BORE 27_1.25-1.5M	BORE 27_1.5-1.75M	BORE 27_1.75-2.0M	BORE 27_2.0-2.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073829	B24-Jn0073830	B24-Jn0073831	B24-Jn0073832
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.7	5.6	5.8	5.8
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.5	4.8	4.5	4.6
Reaction Ratings*[S05]	0	comment	2.0	2.0	3.0	3.0

Client Sample ID			BORE 27_2.25-2.5M	BORE 27_2.5-2.75M	BORE 27_2.75-3.0M	BORE 28_0.0-0.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073833	B24-Jn0073834	B24-Jn0073835	B24-Jn0073836
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	5.9	5.6	5.4
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.0	4.9	4.8	2.5
Reaction Ratings*[S05]	0	comment	3.0	3.0	3.0	3.0

Client Sample ID			BORE 28_0.25-0.5M	BORE 28_0.5-0.75M	BORE 28_0.75-1.0M	BORE 28_1.0-1.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073837	B24-Jn0073838	B24-Jn0073839	B24-Jn0073840
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.6	5.3	5.0	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.7	3.5	4.1	3.8
Reaction Ratings*[S05]	0	comment	3.0	3.0	2.0	2.0

Client Sample ID			BORE 28_1.25-1.5M	BORE 28_1.5-1.75M	BORE 28_1.75-2.0M	BORE 28_2.0-2.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073841	B24-Jn0073842	B24-Jn0073843	B24-Jn0073844
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.3	5.6	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.0	3.8	4.4	4.4
Reaction Ratings*[S05]	0	comment	2.0	2.0	3.0	2.0

Client Sample ID			BORE 28_2.25-2.5M	BORE 28_2.5-2.75M	BORE 28_2.75-3.0M
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0073845	B24-Jn0073846	B24-Jn0073847
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit			
Acid Sulfate Soils Field pH Test					
pH-F (Field pH test)*	0.1	pH Units	5.5	5.4	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.5	4.2	4.5
Reaction Ratings*[S05]	0	comment	2.0	2.0	2.0

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Attention: **Brett Egen**

Report **1109011-S**
Project name BELLS CREEK ROAD COOCHIN CREEK
Project ID 229035
Received Date Jun 17, 2024

Client Sample ID			**BORE 15-0.0M**	**BORE 15-0.75M**	**BORE 15-1.5M**	**BORE 15-2.5M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0044714**	**B24-Jn0044715**	**B24-Jn0044716**	**B24-Jn0044717**
Date Sampled			**May 27, 2024**	**May 27, 2024**	**May 27, 2024**	**May 27, 2024**
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	5.2	5.1	4.9	4.6
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	13	11	19	52
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.021	0.018	0.031	0.083
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	0.005	0.006	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	3.2	3.5	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	N/A	N/A	N/A	N/A
HCl Extractable Sulfur	0.005	% S	N/A	N/A	N/A	N/A
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.02	0.02	0.04	0.08
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	13	15	23	52
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	1.0	1.1	1.7	3.9
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	74	120	97	98
>2mm Fraction	0.005	g	6.0	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	92	100	100	100
Extraneous Material	0.1	%	7.5	< 0.1	< 0.1	< 0.1

Client Sample ID			BORE 15-5.0M	BORE 1-0.25M	BORE 1-0.75M	BORE 1-1.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0044719	B24-Jn0044902	B24-Jn0044903	B24-Jn0044904
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	4.6	4.8	5.0	4.7
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	56	29	19	47
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.091	0.046	0.030	0.076
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3	< 3	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	N/A	< 0.005	< 0.005	< 0.005
HCl Extractable Sulfur	0.005	% S	N/A	N/A	N/A	N/A
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.09	0.05	0.03	0.08
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	56	29	19	47
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	4.2	2.2	1.4	3.6
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	86	70	77	66
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	5.7
Analysed Material	0.1	%	100	100	100	92
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	8.0
Sample Properties						
% Moisture	1	%	-	14	12	15

Client Sample ID			BORE 1-2.75M	BORE 11-0.25M	BORE 11-1.0M	BORE 11-1.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0044905	B24-Jn0044906	B24-Jn0044907	B24-Jn0044908
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	5.0	5.0	4.7	5.1
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	20	18	41	14
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.032	0.029	0.065	0.023
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3	< 3	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	< 0.005	< 0.005	0.028	0.007
HCl Extractable Sulfur	0.005	% S	N/A	N/A	N/A	N/A

Client Sample ID			BORE 1-2.75M	BORE 11-0.25M	BORE 11-1.0M	BORE 11-1.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0044905	B24-Jn0044906	B24-Jn0044907	B24-Jn0044908
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit				
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.03	0.03	0.07	0.02
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	20	18	41	14
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	1.5	1.4	3.0	1.1
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	64	59	32	55
>2mm Fraction	0.005	g	< 0.005	< 0.005	20	2.8
Analysed Material	0.1	%	100	100	61	95
Extraneous Material	0.1	%	< 0.1	< 0.1	39	4.9
Sample Properties						
% Moisture	1	%	17	9.3	11	22

Client Sample ID			BORE 11-2.75M	BORE 11-3.25M	BORE 11-4.75M
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0044909	B24-Jn0044910	B24-Jn0044911
Date Sampled			May 27, 2024	May 27, 2024	May 27, 2024
Test/Reference	LOR	Unit			
Actual Acidity (NLM-3.2)					
pH-KCL (NLM-3.1)	0.1	pH Units	5.1	5.2	5.6
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	14	13	5.5
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.023	0.021	0.009
Potential Acidity - Chromium Reducible Sulfur					
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	0.011	0.006	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	6.9	3.8	< 3
Extractable Sulfur					
Sulfur - KCl Extractable	0.005	% S	N/A	N/A	N/A
HCl Extractable Sulfur	0.005	% S	N/A	N/A	N/A
Retained Acidity (S-NAS)					
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)					
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5

Client Sample ID			BORE 11-2.75M	BORE 11-3.25M	BORE 11-4.75M
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0044909**	**B24-Jn0044910**	**B24-Jn0044911**
Date Sampled			**May 27, 2024**	**May 27, 2024**	**May 27, 2024**
Test/Reference	LOR	Unit			
Net Acidity (Including ANC)					
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.03	0.03	< 0.02
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	21	17	< 10
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	1.6	1.3	< 1
Chromium Suite (SKCl) - NASSG (Excluding ANC)					
<2mm Fraction	0.005	g	57	65	69
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1
Sample Properties					
% Moisture	1	%	15	14	19

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Attention: **Brett Egen**

Report **1117715-S**
Project name BELLS CREEK ROAD COOCHIN CREEK
Project ID 229035
Received Date Jul 08, 2024

Client Sample ID			**BORE 4_0.0-0.25M**	**BORE 4_1.0-1.25M**	**BORE 4_2.0-2.25M**	**BORE 5_0.0-0.25M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-JI0035292**	**B24-JI0035293**	**B24-JI0035294**	**B24-JI0035295**
Date Sampled			**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	4.8	5.3	4.2	4.7
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	23	7.7	61	26
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.036	0.012	0.098	0.042
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3	< 3	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
HCl Extractable Sulfur	0.005	% S	N/A	N/A	< 0.005	N/A
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	N/A	< 0.005	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	N/A	< 0.005	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	2.3	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.04	< 0.02	0.10	0.04
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	23	< 10	63	26
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	1.7	< 1	4.7	2.0
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	60	91	64	88
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1
Sample Properties						
% Moisture	1	%	10	15	22	17

Client Sample ID			BORE 5_0.75-1.0M	BORE 5_1.5-1.75M	BORE 5_2.75-3.0M	BORE 27_0.5-0.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-JI0035296	B24-JI0035297	B24-JI0035298	B24-JI0035299
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	4.6	4.8	4.6	4.9
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	24	16	27	14
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.038	0.025	0.044	0.023
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3	< 3	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	0.016	0.012	0.007	< 0.005
HCl Extractable Sulfur	0.005	% S	N/A	N/A	N/A	N/A
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.04	0.03	0.04	0.02
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	24	16	27	14
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	1.8	1.2	2.1	1.1
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	48	48	36	150
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1
Sample Properties						
% Moisture	1	%	16	18	19	12

Client Sample ID			BORE 27_1.0-1.25M	BORE 27_1.75-2.0M	BORE 27_0.0-0.25M	BORE 28_0.0-0.25M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-JI0035300	B24-JI0035301	B24-JI0035302	B24-JI0035303
Date Sampled			Jun 21, 2024	Jun 21, 2024	Jun 21, 2024	Jun 21, 2024
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	4.6	4.4	4.7	4.7
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	27	58	22	28
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.044	0.093	0.036	0.045
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3	< 3	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
HCl Extractable Sulfur	0.005	% S	N/A	< 0.005	N/A	N/A

Client Sample ID			BORE 27_1.0-1.25M	BORE 27_1.75-2.0M	BORE 27_0.0-0.25M	BORE 28_0.0-0.25M
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-JI0035300**	**B24-JI0035301**	**B24-JI0035302**	**B24-JI0035303**
Date Sampled			**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**
Test/Reference	LOR	Unit				
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	0.009	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	0.007	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	4.3	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.04	0.10	0.04	0.05
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	27	62	22	28
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	2.0	4.7	1.7	2.1
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	42	43	51	75
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1
Sample Properties						
% Moisture	1	%	10	17	17	20

Client Sample ID			BORE 28_1.5-1.75M	BORE 28_2.5-2.75M	BORE 3_0.5-0.75M	BORE 3_1.0-1.25M
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-JI0035304**	**B24-JI0035305**	**B24-JI0035306**	**B24-JI0035307**
Date Sampled			**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	4.5	4.3	4.5	4.3
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	49	110	140	130
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.078	0.17	0.23	0.21
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005	0.030	0.007
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3	18	4.2
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	0.005	< 0.005	0.008	0.007
HCl Extractable Sulfur	0.005	% S	0.010	0.005	N/A	0.010
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	0.010	0.010	N/A	0.006
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	0.007	0.008	N/A	< 0.005
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	4.5	4.8	N/A	2.9
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5

Client Sample ID			BORE 28_1.5-1.75M	BORE 28_2.5-2.75M	BORE 3_0.5-0.75M	BORE 3_1.0-1.25M
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-JI0035304**	**B24-JI0035305**	**B24-JI0035306**	**B24-JI0035307**
Date Sampled			**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**	**Jun 21, 2024**
Test/Reference	LOR	Unit				
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.09	0.18	0.26	0.22
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	53	110	160	140
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	4.0	8.3	12	10
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	42	34	28	23
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1
Sample Properties						
% Moisture	1	%	13	[G03]N/A	34	26

Client Sample ID			BORE 3_2.0-2.25M
Sample Matrix			**Soil**
Eurofins Sample No.			**B24-JI0035308**
Date Sampled			**Jun 21, 2024**
Test/Reference	LOR	Unit	
Actual Acidity (NLM-3.2)			
pH-KCL (NLM-3.1)	0.1	pH Units	4.6
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	24
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.038
Potential Acidity - Chromium Reducible Sulfur			
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3
Extractable Sulfur			
Sulfur - KCl Extractable	0.005	% S	< 0.005
HCl Extractable Sulfur	0.005	% S	N/A
Retained Acidity (S-NAS)			
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0
Acid Neutralising Capacity (ANCbt)			
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A
ANC Fineness Factor		factor	1.5
Net Acidity (Including ANC)			
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.04
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	24
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	1.8
Chromium Suite (SKCl) - NASSG (Excluding ANC)			
<2mm Fraction	0.005	g	82
>2mm Fraction	0.005	g	< 0.005
Analysed Material	0.1	%	100
Extraneous Material	0.1	%	< 0.1
Sample Properties			
% Moisture	1	%	13

Appendix E

Previous Investigation Results

BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek

SURFACE LEVEL: 1.4 AHD
EASTING: 508667
NORTHING: 7028870.3
DIP/AZIMUTH: 90°/--

BORE No: GW1
PROJECT No: 219363.00
DATE: 16/2/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	SAND SP: fine to medium grained, pale grey, moist			0.25		ASS samples taken every 0.25m to 2m depth, then every 0.5m to 10m		Cement Grout Backfill 0m to 1m
		- brown							
	1.0	- wet						▽	Bentonite Backfill 1m to 1.2m
	1.2	Sandy CLAY CH: high plasticity, dark grey and grey, fine to medium grained sand, wet							
	2.4	Silty CLAY CH: high plasticity, dark grey, with fine grained sand, wet							
	3.0	Sandy CLAY CI: medium plasticity, grey, fine to medium grained sand, moist							
		- pale grey streaked orange							Sand Backfill 1.2m to 10.2m Slotted PVC 1.2m to 10.2m
	10.2	Bore discontinued at 10.2m Limit of Investigation							

RIG: Mobile B80 **DRILLER:** MK Drilling **LOGGED:** MDH **CASING:**

TYPE OF BORING: Auger to 10.2m

WATER OBSERVATIONS: Groundwater seepage observed at 1.0 m depth at time of drilling.

REMARKS: Location coordinates are in MGA94 Zone 56J.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▽	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek

SURFACE LEVEL: 2.3 AHD
EASTING: 508683.3
NORTHING: 7029648.2
DIP/AZIMUTH: 90°/--

BORE No: GW10
PROJECT No: 219363.00
DATE: 16/2/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.2	Clayey SAND SC: fine to medium grained, yellow-orange mottled grey, moist			0.25		ASS samples taken every 0.25m to 2m depth, then every 0.5m to 10m	▽	Cement Grout Backfill 0m to 1m
		Sandy CLAY CI: medium plasticity, yellow-orange mottled pale grey, fine to medium grained sand, moist							
		- wet							Bentonite Backfill 1m to 1.2m
		- brown-grey							Sand Backfill 1.2m to 10.2m Slotted PVC 1.2m to 10.2m
		- grey streaked pale grey							
	10.2	Bore discontinued at 10.2m Limit of Investigation							

RIG: Mobile B80 **DRILLER:** MK Drilling **LOGGED:** MDH **CASING:**

TYPE OF BORING: Auger to 10.2m

WATER OBSERVATIONS: Groundwater seepage observed at 0.8 m depth at time of drilling.

REMARKS: Location coordinates are in MGA94 Zone 56J.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek

SURFACE LEVEL: 2.0 AHD
EASTING: 508919.3
NORTHING: 7028039.9
DIP/AZIMUTH: 90°/--

BORE No: GW2
PROJECT No: 219363.00
DATE: 15/2/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.0	SAND SP: fine to medium grained, pale grey, moist - brown and orange - dark grey-brown			0.25		ASS samples taken every 0.25m to 2m depth, then every 0.5m to 10m	▽	Cement Grout Backfill 0m to 1m Bentonite Backfill 1m to 1.2m
	1.0	- wet							
	2.0	- orange-brown							
	3.1	Silty CLAY CH: high plasticity, dark grey, with fine grained sand, wet							
	4.6	Silty CLAY CH: high plasticity, grey, moist							Sand Backfill 1.2m to 10.2m Slotted PVC 1.2m to 10.2m
	6.4	Sandy CLAY CI-CH: medium to high plasticity, grey streaked orange, fine to medium grained sand, moist							
	8.0	- orange mottled grey							
	10.2	Bore discontinued at 10.2m Limit of Investigation							

RIG: Mobile B80 **DRILLER:** MK Drilling **LOGGED:** MDH **CASING:**

TYPE OF BORING: Auger to 10.2m

WATER OBSERVATIONS: Groundwater seepage observed at 1.2 m depth at time of drilling.

REMARKS: Location coordinates are in MGA94 Zone 56J.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek

SURFACE LEVEL: 2.2 AHD
EASTING: 508367.5
NORTHING: 7027004.4
DIP/AZIMUTH: 90°/--

BORE No: GW3
PROJECT No: 219363.00
DATE: 15/2/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.15	TOPSOIL/Silty SAND SM: fine to medium grained, dark grey-brown, with organics, moist			0.25		ASS samples taken every 0.25m to 2m depth, then every 0.5m to 10m		Cement Grout Backfill 0m to 1m
	0.7	Sandy CLAY CI: medium plasticity, white-pale grey, fine to medium grained sand, moist							
	1	Silty CLAY CH: high plasticity, pale grey mottled orange, with fine to medium grained sand, moist							Bentonite Backfill 1m to 1.2m
	1.7	Sandy CLAY CI: medium plasticity, red-brown mottled grey, fine to medium grained sand, moist							
	2.8	Silty Sandy CLAY CI-CH: medium to high plasticity, pale grey mottled brown and orange, moist							
		- orange mottled grey, wet						▽	
	7.3								Sand Backfill 1.2m to 10.2m Slotted PVC 1.2m to 10.2m
	7.5	Silty Sandy CLAY CI: medium plasticity, dark grey streaked grey and brown, with fine to medium grained sand, moist							
		Silty Sandy CLAY CI-CH: medium to high plasticity, orange mottled grey, moist							
		- dark grey mottled brown and grey							
	10.2	Bore discontinued at 10.2m Limit of Investigation							

RIG: Mobile B80 **DRILLER:** MK Drilling **LOGGED:** MDH **CASING:**

TYPE OF BORING: Auger to 10.2m

WATER OBSERVATIONS: Groundwater seepage observed at 4.8 m depth at time of drilling.

REMARKS: Location coordinates are in MGA94 Zone 56J.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▽	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek

SURFACE LEVEL: 2.1 AHD
EASTING: 508116.7
NORTHING: 7027487.6
DIP/AZIMUTH: 90°/--

BORE No: GW4
PROJECT No: 219363.00
DATE: 14/2/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.4	TOPSOIL/Silty SAND SM: fine to medium grained, grey, moist - pale grey-brown - pale brown			0.25		ASS samples taken every 0.25m to 2m depth, then every 0.5m to 10m		Cement Grout Backfill 0m to 1m
	1	Sandy CLAY CI: medium plasticity, grey-blue, fine to medium grained sand, moist							Bentonite Backfill 1m to 1.2m
	4	- red mottled grey							
	5	- grey-blue mottled orange							
	6	- red mottled grey							Sand Backfill 1.2m to 10.2m Slotted PVC 1.2m to 10.2m
	8.0	Sandy CLAY CL-CI: low to medium plasticity, grey mottled orange, fine to medium grained sand, moist							
	10.2	Bore discontinued at 10.2m Limit of Investigation							

RIG: Mobile B80 **DRILLER:** MK Drilling **LOGGED:** MDH **CASING:**

TYPE OF BORING: Auger to 10.2m

WATER OBSERVATIONS: No groundwater seepage observed during drilling

REMARKS: Location coordinates are in MGA94 Zone 56J.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek

SURFACE LEVEL: 2.0 AHD
EASTING: 507438.9
NORTHING: 7028351.5
DIP/AZIMUTH: 90°/--

BORE No: GW5
PROJECT No: 219363.00
DATE: 14/2/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.1	TOPSOIL/Silty SAND SM: fine to medium grained, grey, with organics, moist			0.25		ASS samples taken every 0.25m to 2m depth, then every 0.5m to 10m		Cement Grout Backfill 0m to 1m
	0.8	Clayey SAND SC: fine to medium grained, grey-brown, moist - orange-brown							
	1.7	Sandy CLAY CI: medium plasticity, grey mottled orange-brown, moist							Bentonite Backfill 1m to 1.2m
	3.1	Silty CLAY CI-CH: medium to high plasticity, grey mottled blue-grey orange brown, with fine to medium grained sand, moist							
		Sandy Silty CLAY CI: medium plasticity, blue-grey mottled orange, fine to medium grained sand, moist							Sand Backfill 1.2m to 10.2m Slotted PVC 1.2m to 10.2m
		- wet						▽	
	7.8	Sandy CLAY CL: low plasticity, brown-orange, fine to medium grained sand, wet							
	10.1 10.2	SANDSTONE HW: fine to medium grained, brown-orange, highly weathered							
		Bore discontinued at 10.2m Limit of Investigation							

RIG: Mobile B80 **DRILLER:** MK Drilling **LOGGED:** MDH **CASING:**

TYPE OF BORING: Auger to 10.2m

WATER OBSERVATIONS: Groundwater seepage observed at 7.0 m depth at time of drilling.

REMARKS: Location coordinates are in MGA94 Zone 56J.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek

SURFACE LEVEL: 1.0 AHD
EASTING: 507264.1
NORTHING: 7028940.1
DIP/AZIMUTH: 90°/--

BORE No: GW6
PROJECT No: 219363.00
DATE: 14/2/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.1	TOPSOIL/Silty SAND SM: fine to medium grained, dark grey-brown, with fine rounded gravel, moist			0.25		ASS samples taken every 0.25m to 2m depth, then every 0.5m to 10m	▽	Cement Grout Backfill 0m to 1m
	0.4	Sandy CLAY CI: medium plasticity, dark brown-grey mottled orange, fine to medium grained sand, moist							
	0.55	Silty CLAY CH: high plasticity, grey mottled orange, moist							
	1	Clayey SAND SC/Sandy CLAY CI: fine to medium grained, medium plasticity, grey, wet							Bentonite Backfill 1m to 1.2m
	1.6	Silty CLAY CH: high plasticity, grey mottled orange, with fine grained sand, moist							
	4.2	Sandy CLAY CI: medium plasticity, fine to coarse grained sand, pale grey mottled grey, with fine gravel, moist							
	4.8	Sandy Silty CLAY CH: high plasticity, grey, fine grained sand, moist							
	5.2	Sandy CLAY CI-CH: medium to high plasticity, grey, fine to medium grained sand, moist							Sand Backfill 1.2m to 10.2m Slotted PVC 1.2m to 10.2m
	6.2								
	6.3	SAND SP: fine to medium grained, brown, wet							
		Sandy CLAY CI: medium plasticity, orange mottled grey and brown, fine to medium grained sand, wet							
	7.2	Sandy CLAY CL: low plasticity, pale grey, fine to medium grained sand, moist							
		- wet							
	10.2	Bore discontinued at 10.2m Limit of Investigation							

RIG: Mobile B80 **DRILLER:** MK Drilling **LOGGED:** MDH **CASING:**

TYPE OF BORING: Auger to 10.2m

WATER OBSERVATIONS: Groundwater seepage observed at 0.55 m depth at time of drilling.

REMARKS: Location coordinates are in MGA94 Zone 56J.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek

SURFACE LEVEL: 1.3 AHD
EASTING: 507743.1
NORTHING: 7029257.9
DIP/AZIMUTH: 90°/--

BORE No: GW7
PROJECT No: 219363.00
DATE: 16/2/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.2	TOPSOIL/Silty SAND SM: fine to medium grained, dark grey, with fine rounded gravel, moist			0.25		ASS samples taken every 0.25m to 2m depth, then every 0.5m to 10m		Cement Grout Backfill 0m to 1m
		Clayey SAND SC: fine to medium grained, brown, moist							Bentonite Backfill 1m to 1.2m
		- wet						▽	
		- grey							
	3.0	Sandy CLAY CI-CH: medium to high plasticity, grey mottled orange and pale brown, fine to medium grained sand, moist to wet							
	5.0	SAND SP: fine to medium grained, pale grey, wet							Sand Backfill 1.2m to 10.2m Slotted PVC 1.2m to 10.2m
	7.5	Sandy CLAY CI: medium plasticity, pale grey, fine to medium grained sand, moist							
	10.2	Bore discontinued at 10.2m Limit of Investigation							

RIG: Mobile B80 **DRILLER:** MK Drilling **LOGGED:** MDH **CASING:**

TYPE OF BORING: Auger to 10.2m

WATER OBSERVATIONS: Groundwater seepage observed at 1.7 m depth at time of drilling.

REMARKS: Location coordinates are in MGA94 Zone 56J.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▽	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek

SURFACE LEVEL: 1.8 AHD
EASTING: 507583.7
NORTHING: 7029855.2
DIP/AZIMUTH: 90°/--

BORE No: GW8
PROJECT No: 219363.00
DATE: 17/2/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.2	TOPSOIL/Silty SAND SM: fine to medium grained, dark grey, with organics, moist			0.25		ASS samples taken every 0.25m to 2m depth, then every 0.5m to 2.5m	▽	Cement Grout Backfill 0m to 1m
	0.6	Clayey SAND SC: fine to medium grained, grey streaked dark grey, moist							
	0.8	Sandy CLAY CI-CH: medium to high plasticity, grey, fine to medium grained sand, moist							Bentonite Backfill 1m to 1.2m
	1	Clayey SAND SC: fine to medium grained, grey, moist - wet							
	1.8	Sandy CLAY CI: medium plasticity, pale grey mottled orange, fine to medium grained sand, wet							Sand Backfill 1.2m to 10.2m Slotted PVC 1.2m to 10.2m
	10.2	Bore discontinued at 10.2m Limit of Investigation							

RIG: Mobile B80 **DRILLER:** MK Drilling **LOGGED:** MDH **CASING:** HWT to 2.5m

TYPE OF BORING: Auger to 2.5m, Washbore to 10.2m

WATER OBSERVATIONS: Groundwater seepage observed at 1.5 m depth at time of drilling.

REMARKS: Location coordinates are in MGA94 Zone 56J.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Lots 1 & 2 RP910848 Bells Creek Road, Coochin Creek

SURFACE LEVEL: 2.2 AHD
EASTING: 507699.6
NORTHING: 7027819.2
DIP/AZIMUTH: 90°/--

BORE No: GW9
PROJECT No: 219363.00
DATE: 17/2/2023
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.15	TOPSOIL/Clayey SAND SM: fine to medium grained, dark brown-grey streaked orange, moist - pale grey			0.25		ASS samples taken every 0.25m to 2m depth, then every 0.5m to 4m		Cement Grout Backfill 0m to 1m
		Sandy CLAY CI: medium plasticity, brown mottled orange, fine to medium grained, moist							Bentonite Backfill 1m to 1.2m
		- grey, wet						▽	
		- grey mottled brown and orange							Sand Backfill 1.2m to 10.2m Slotted PVC 1.2m to 10.2m
	7.0	Silty CLAY CI: medium plasticity, grey mottled orange and pale grey, with fine to medium grained sand							
	10.2	Bore discontinued at 10.2m Limit of Investigation							

RIG: Mobile B80 **DRILLER:** MK Drilling **LOGGED:** MDH **CASING:** HWT to 4.0m

TYPE OF BORING: Auger to 4.0m, Washbore to 10.2m

WATER OBSERVATIONS: Groundwater seepage observed at 3.5 m depth at time of drilling.

REMARKS: Location coordinates are in MGA94 Zone 56J.

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Test Code/Name	[1] FIELD SCREEN SUITE		
Lab Reference (LR)	**240223.430**	Client Name	Douglas Partners Pty Ltd (Sunshine Coast)
SampleID	**(As Listed)**	Client Contact	Brett Egen
		Project Name	Coochin Creek
Report Date	28/02/2023	Job Number	219363
Sample Received Date	23/02/2023	Order Number	
Sample Disposal Date	25/04/2023	Chain of Custody	
Sample Packaging	Plastic Bag	Client Email	brett.egen@douglaspartners.com.au
Temperature	Ambient	Client Address	28 Kessling Avenue Kunda Park Queensland 4556

Analytical Method: Test Methodology for pH_f and pH_fox as per QASSIT 2004 Laboratory Methods. Indications based on pH data only.
RATE: 0=No Reaction 1=Low 2=Moderate 3=High 4=Very High (steam evolved).
TEMP: Surface temperature rise (°C) oxidised sample at 5 minutes - cooling may occur for fast reaction.

S#	SampleID	pH_f	pH_Fox	Change	Rate	Indication
1	GW1 0.25	4.2	2.2	-2.0	2	high TPA
2	GW1 0.5	4.2	2.1	-2.1	2	high TPA & sulphide possible
3	GW1 0.75	4.3	2.1	-2.2	2	high TPA & sulphide possible
4	GW1 1	5.3	2.0	-3.3	2	low TAA & high TPA & high sulphide/low buffer
5	GW1 1.25	4.6	2.0	-2.6	2	low TAA & high TPA & sulphide possible
6	GW1 1.5	5.3	2.0	-3.3	2	low TAA & high TPA & high sulphide/low buffer
7	GW1 1.75	5.4	2.0	-3.4	3	low TAA & high TPA & high sulphide/low buffer
8	GW1 2	5.0	2.0	-3.0	3	low TAA & high TPA & sulphide possible
9	GW1 2.5	6.4	2.3	-4.1	4	low TAA & high TPA & high sulphide/low buffer
10	GW1 3	6.4	2.3	-4.1	4	low TAA & high TPA & high sulphide/low buffer
11	GW1 3.5	6.2	2.1	-4.1	3	low TAA & high TPA & high sulphide/low buffer
12	GW1 4	6.0	1.9	-4.1	4	low TAA & high TPA & high sulphide/low buffer
13	GW1 4.5	5.7	2.9	-2.8	3	low TAA & moderate TPA & sulphide possible
14	GW1 5	5.7	2.7	-3.0	4	low TAA & moderate TPA & sulphide possible
15	GW1 5.5	5.8	2.8	-3.0	4	low TAA & moderate TPA & sulphide possible
16	GW1 6	5.6	3.0	-2.6	4	low TAA & moderate TPA & sulphide possible
17	GW1 6.5	5.8	3.2	-2.6	4	low TAA & moderate TPA & sulphide possible
18	GW1 7	5.9	3.0	-2.9	4	low TAA & moderate TPA & sulphide possible
19	GW1 7.5	6.0	3.0	-3.0	4	low TAA & moderate TPA & sulphide possible
20	GW1 8	5.9	3.0	-2.9	3	low TAA & moderate TPA & sulphide possible
21	GW1 8.5	5.9	2.6	-3.3	2	low TAA & moderate TPA & high sulphide/low buffer
22	GW1 9	6.2	3.0	-3.2	2	low TAA & moderate TPA & high sulphide/low buffer
23	GW1 9.5	5.9	2.7	-3.2	2	low TAA & moderate TPA & high sulphide/low buffer
24	GW1 10	6.1	2.7	-3.4	4	low TAA & moderate TPA & high sulphide/low buffer
25	GW2 0.25	6.0	4.2	-1.8	2	low TAA
26	GW2 0.5	5.8	2.0	-3.8	2	low TAA & high TPA & high sulphide/low buffer
27	GW2 0.75	5.6	2.3	-3.3	2	low TAA & high TPA & high sulphide/low buffer
28	GW2 1	5.9	2.6	-3.3	2	low TAA & moderate TPA & high sulphide/low buffer
29	GW2 1.25	5.8	2.8	-3.0	2	low TAA & moderate TPA & sulphide possible
30	GW2 1.5	5.8	3.0	-2.8	2	low TAA & moderate TPA & sulphide possible
31	GW2 1.75	5.5	3.2	-2.3	2	low TAA & moderate TPA & sulphide possible
32	GW2 2	4.6	2.4	-2.2	2	low TAA & high TPA & sulphide possible
33	GW2 2.5	4.8	2.4	-2.4	1	low TAA & high TPA & sulphide possible
34	GW2 3	4.6	2.1	-2.5	4	low TAA & high TPA & sulphide possible
35	GW2 3.5	4.5	2.2	-2.3	4	low TAA & high TPA & sulphide possible
36	GW2 4	5.8	1.8	-4.0	4	low TAA & high TPA & high sulphide/low buffer
37	GW2 4.5	5.9	2.8	-3.1	4	low TAA & moderate TPA & high sulphide/low buffer
38	GW2 5	6.0	3.1	-2.9	4	low TAA & moderate TPA & sulphide possible
39	GW2 5.5	6.3	3.0	-3.3	4	low TAA & moderate TPA & high sulphide/low buffer
40	GW2 6	5.7	3.5	-2.2	3	low TAA & sulphide possible
41	GW2 6.5	6.2	3.2	-3.0	2	low TAA & moderate TPA & sulphide possible
42	GW2 7	6.2	3.0	-3.2	2	low TAA & moderate TPA & high sulphide/low buffer
43	GW2 7.5	5.8	2.9	-2.9	4	low TAA & moderate TPA & sulphide possible

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Test Code/Name	**[1] FIELD SCREEN SUITE**		
Lab Reference (LR)	**240223.430**	Client Name	Douglas Partners Pty Ltd (Sunshine Coast)
SampleID	**(As Listed)**	Client Contact	Brett Egen
		Project Name	Coochin Creek
Report Date	28/02/2023	Job Number	219363
Sample Received Date	23/02/2023	Order Number	
Sample Disposal Date	25/04/2023	Chain of Custody	
Sample Packaging	Plastic Bag	Client Email	brett.egen@douglaspartners.com.au
Temperature	Ambient	Client Address	28 Kessling Avenue Kunda Park Queensland 4556

Analytical Method: Test Methodology for pH_f and pH_fox as per QASSIT 2004 Laboratory Methods. Indications based on pH data only.
RATE: 0=No Reaction 1=Low 2=Moderate 3=High 4=Very High (steam evolved).
TEMP: Surface temperature rise (°C) oxidised sample at 5 minutes - cooling may occur for fast reaction.

S#	SampleID	pH_f	pH_Fox	Change	Rate	Indication
44	GW2 8	5.9	2.8	-3.1	4	low TAA & moderate TPA & high sulphide/low buffer
45	GW2 8.5	5.9	3.1	-2.8	4	low TAA & moderate TPA & sulphide possible
46	GW2 9	5.6	2.9	-2.7	2	low TAA & moderate TPA & sulphide possible
47	GW2 9.5	6.0	3.2	-2.8	2	low TAA & moderate TPA & sulphide possible
48	GW2 10	6.2	5.4	-0.8	2	low TAA & low TPA & low sulphide

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Test Code/Name	[1] FIELD SCREEN SUITE		
Lab Reference (LR)	**240223.434**	Client Name	Douglas Partners Pty Ltd (Sunshine Coast)
SampleID	**(As Listed)**	Client Contact	Brett Egen
		Project Name	Coochin Creek
Report Date	28/02/2023	Job Number	219363
Sample Received Date	23/02/2023	Order Number	
Sample Disposal Date	25/04/2023	Chain of Custody	
Sample Packaging	Plastic Bag	Client Email	brett.egen@douglaspartners.com.au
Temperature	Ambient	Client Address	28 Kessling Avenue Kunda Park Queensland 4556

Analytical Method: Test Methodology for pH_f and pH_fox as per QASSIT 2004 Laboratory Methods. Indications based on pH data only.
RATE: 0=No Reaction 1=Low 2=Moderate 3=High 4=Very High (steam evolved).
TEMP: Surface temperature rise (°C) oxidised sample at 5 minutes - cooling may occur for fast reaction.

S#	SampleID	pH_f	pH_Fox	Change	Rate	Indication
1	GW3 0.25	5.6	4.0	-1.6	0	low TAA
2	GW3 0.5	5.8	4.3	-1.5	2	low TAA
3	GW3 0.75	5.8	4.3	-1.5	2	low TAA
4	GW3 1	5.6	4.2	-1.4	0	low TAA
5	GW3 1.25	5.3	4.1	-1.2	0	low TAA
6	GW3 1.5	5.3	4.3	-1.0	1	low TAA
7	GW3 1.75	5.0	4.2	-0.8	1	low TAA & low sulphide
8	GW3 2	5.4	4.1	-1.3	1	low TAA
9	GW3 2.5	5.2	3.8	-1.4	1	low TAA
10	GW3 3	5.6	4.4	-1.2	1	low TAA
11	GW3 3.5	5.6	4.3	-1.3	1	low TAA
12	GW3 4	6.1	4.6	-1.5	2	low TAA & low TPA
13	GW3 4.5	5.9	4.9	-1.0	2	low TAA & low TPA
14	GW3 5	5.8	4.8	-1.0	2	low TAA & low TPA
15	GW3 5.5	5.7	4.8	-0.9	2	low TAA & low TPA & low sulphide
16	GW3 6	6.1	4.6	-1.5	1	low TAA & low TPA
17	GW3 6.5	6.2	4.5	-1.7	1	low TAA
18	GW3 7	6.2	4.5	-1.7	2	low TAA
19	GW3 7.5	6.1	4.2	-1.9	1	low TAA
20	GW3 8	5.9	4.3	-1.6	1	low TAA
21	GW3 8.5	5.6	4.3	-1.3	1	low TAA
22	GW3 9	6.0	3.2	-2.8	1	low TAA & moderate TPA & sulphide possible
23	GW3 9.5	5.8	3.0	-2.8	1	low TAA & moderate TPA & sulphide possible
24	GW3 10	6.1	3.1	-3.0	1	low TAA & moderate TPA & sulphide possible
25	GW4 0.25	5.9	3.5	-2.4	1	low TAA & sulphide possible
26	GW4 0.5	5.3	3.9	-1.4	0	low TAA
27	GW4 0.75	5.2	3.8	-1.4	0	low TAA
28	GW4 1	5.3	3.8	-1.5	0	low TAA
29	GW4 1.25	5.4	4.0	-1.4	0	low TAA
30	GW4 1.5	5.5	4.0	-1.5	0	low TAA
31	GW4 1.75	5.4	4.6	-0.8	2	low TAA & low TPA & low sulphide
32	GW4 2	5.5	4.7	-0.8	2	low TAA & low TPA & low sulphide
33	GW4 2.5	5.5	4.8	-0.7	2	low TAA & low TPA & low sulphide
34	GW4 3	5.5	4.3	-1.2	2	low TAA
35	GW4 3.5	5.1	4.1	-1.0	2	low TAA
36	GW4 4	5.6	4.3	-1.3	2	low TAA
37	GW4 4.5	5.6	4.3	-1.3	0	low TAA
38	GW4 5.5	5.7	4.9	-0.8	2	low TAA & low TPA & low sulphide
39	GW4 6	5.7	3.3	-2.4	0	low TAA & moderate TPA & sulphide possible
40	GW4 6.5	5.9	3.2	-2.7	0	low TAA & moderate TPA & sulphide possible
41	GW4 7	5.6	3.2	-2.4	1	low TAA & moderate TPA & sulphide possible
42	GW4 7.5	6.0	3.1	-2.9	1	low TAA & moderate TPA & sulphide possible
43	GW4 8	5.7	2.8	-2.9	1	low TAA & moderate TPA & sulphide possible

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Test Code/Name	[1] FIELD SCREEN SUITE		
Lab Reference (LR)	**240223.434**	Client Name	Douglas Partners Pty Ltd (Sunshine Coast)
SampleID	**(As Listed)**	Client Contact	Brett Egen
		Project Name	Coochin Creek
Report Date	28/02/2023	Job Number	219363
Sample Received Date	23/02/2023	Order Number	
Sample Disposal Date	25/04/2023	Chain of Custody	
Sample Packaging	Plastic Bag	Client Email	brett.egen@douglaspartners.com.au
Temperature	Ambient	Client Address	28 Kessling Avenue Kunda Park Queensland 4556

Analytical Method: Test Methodology for pH_f and pH_fox as per QASSIT 2004 Laboratory Methods. Indications based on pH data only.
RATE: 0=No Reaction 1=Low 2=Moderate 3=High 4=Very High (steam evolved).
TEMP: Surface temperature rise (°C) oxidised sample at 5 minutes - cooling may occur for fast reaction.

S#	SampleID	pH_f	pH_Fox	Change	Rate	Indication
44	GW4 8.5	5.8	3.0	-2.8	1	low TAA & moderate TPA & sulphide possible
45	GW4 9	5.9	2.5	-3.4	1	low TAA & moderate TPA & high sulphide/low buffer
46	GW4 9.5	6.0	2.4	-3.6	1	low TAA & high TPA & high sulphide/low buffer
47	GW4 10	5.9	2.6	-3.3	1	low TAA & moderate TPA & high sulphide/low buffer

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Test Code/Name	[1] FIELD SCREEN SUITE		
Lab Reference (LR)	**240223.436**	Client Name	Douglas Partners Pty Ltd (Sunshine Coast)
SampleID	**(As Listed)**	Client Contact	Brett Egen
		Project Name	Coochin Creek
Report Date	3/03/2023	Job Number	219363
Sample Received Date	23/02/2023	Order Number	
Sample Disposal Date	25/04/2023	Chain of Custody	
Sample Packaging	Plastic Bag	Client Email	brett.egen@douglaspartners.com.au
Temperature	Ambient	Client Address	28 Kessling Avenue Kunda Park Queensland 4556

Analytical Method: Test Methodology for pH_f and pH_fox as per QASSIT 2004 Laboratory Methods. Indications based on pH data only.
RATE: 0=No Reaction 1=Low 2=Moderate 3=High 4=Very High (steam evolved).
TEMP: Surface temperature rise (°C) oxidised sample at 5 minutes - cooling may occur for fast reaction.

S#	SampleID	pH_f	pH_Fox	Change	Rate	Indication
1	GW5 0.25	5.5	3.7	-1.8	1	low TAA
2	GW5 0.5	5.3	4.2	-1.1	0	low TAA
3	GW5 0.75	5.3	4.0	-1.3	0	low TAA
4	GW5 1	5.3	4.1	-1.2	0	low TAA
5	GW5 1.25	5.4	4.4	-1.0	0	low TAA
6	GW5 1.5	5.3	4.3	-1.0	0	low TAA
7	GW5 1.75	5.8	5.1	-0.7	2	low TAA & low TPA & low sulphide
8	GW5 2	5.6	5.0	-0.6	2	low TAA & low TPA & low sulphide
9	GW5 2.25	5.3	4.6	-0.7	2	low TAA & low TPA & low sulphide
10	GW5 2.5	5.1	3.8	-1.3	0	low TAA
11	GW5 3	5.9	4.7	-1.2	2	low TAA & low TPA
12	GW5 3.5	6.0	5.2	-0.8	2	low TAA & low TPA & low sulphide
13	GW5 4	6.0	4.9	-1.1	2	low TAA & low TPA
14	GW5 4.5	6.1	5.0	-1.1	2	low TAA & low TPA
15	GW5 5	6.2	5.1	-1.1	2	low TAA & low TPA
16	GW5 5.5	6.1	4.8	-1.3	2	low TAA & low TPA
17	GW5 6	6.4	6.4	0.0	2	low TAA & low TPA & low sulphide
18	GW5 6.5	7.2	7.0	-0.2	2	no TAA & no TPA & low sulphide
19	GW5 7	7.4	7.0	-0.4	2	no TAA & no TPA & low sulphide
20	GW5 7.5	7.1	6.6	-0.5	2	no TAA & no TPA & low sulphide
21	GW5 8	7.6	7.1	-0.5	1	no TAA & no TPA & low sulphide
22	GW5 8.5	7.2	6.7	-0.5	1	no TAA & no TPA & low sulphide
23	GW5 9	7.8	6.0	-1.8	1	no TAA & low TPA
24	GW5 9.5	7.6	7.0	-0.6	3	no TAA & no TPA & low sulphide
25	GW5 10	8.0	6.7	-1.3	3	no TAA & no TPA
26	GW6 0.5	5.2	3.0	-2.2	0	low TAA & moderate TPA & sulphide possible
27	GW6 1	5.6	3.4	-2.2	0	low TAA & moderate TPA & sulphide possible
28	GW6 1.5	5.2	3.4	-1.8	0	low TAA & moderate TPA
29	GW6 2	5.4	3.1	-2.3	2	low TAA & moderate TPA & sulphide possible
30	GW6 2.5	5.1	3.1	-2.0	1	low TAA & moderate TPA
31	GW6 3	5.2	4.5	-0.7	2	low TAA & low sulphide
32	GW6 3.5	5.6	4.7	-0.9	2	low TAA & low TPA & low sulphide
33	GW6 4	5.4	2.4	-3.0	2	low TAA & high TPA & sulphide possible
34	GW6 4.5	5.6	4.1	-1.5	2	low TAA
35	GW6 5	5.5	4.3	-1.2	2	low TAA
36	GW6 5.5	5.9	4.7	-1.2	2	low TAA & low TPA
37	GW6 6	5.5	4.3	-1.2	2	low TAA
38	GW6 6.5	5.3	4.6	-0.7	2	low TAA & low TPA & low sulphide
39	GW6 7	5.6	3.9	-1.7	2	low TAA
40	GW6 7.5	5.6	4.6	-1.0	2	low TAA & low TPA
41	GW6 8	5.5	3.3	-2.2	2	low TAA & moderate TPA & sulphide possible
42	GW6 8.5	6.4	4.0	-2.4	1	low TAA & sulphide possible
43	GW6 9	6.3	3.9	-2.4	1	low TAA & sulphide possible

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Test Code/Name	[1] FIELD SCREEN SUITE		
Lab Reference (LR)	**240223.436**	Client Name	Douglas Partners Pty Ltd (Sunshine Coast)
SampleID	**(As Listed)**	Client Contact	Brett Egen
		Project Name	Coochin Creek
Report Date	3/03/2023	Job Number	219363
Sample Received Date	23/02/2023	Order Number	
Sample Disposal Date	25/04/2023	Chain of Custody	
Sample Packaging	Plastic Bag	Client Email	brett.egen@douglaspartners.com.au
Temperature	Ambient	Client Address	28 Kessling Avenue Kunda Park Queensland 4556

Analytical Method: Test Methodology for pH_f and pH_fox as per QASSIT 2004 Laboratory Methods. Indications based on pH data only.
RATE: 0=No Reaction 1=Low 2=Moderate 3=High 4=Very High (steam evolved).
TEMP: Surface temperature rise (°C) oxidised sample at 5 minutes - cooling may occur for fast reaction.

S#	SampleID	pH_f	pH_Fox	Change	Rate	Indication
44	GW6 9.5	6.4	3.8	-2.6	0	low TAA & sulphide possible
45	GW6 10	6.6	3.8	-2.8	0	no TAA & sulphide possible

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Signatory: Ph:+617 3289 7179 ABN 91 056 237 275

Test Code/Name	**[1] FIELD SCREEN SUITE**		
Lab Reference (LR)	**240223.439**	Client Name	Douglas Partners Pty Ltd (Sunshine Coast)
SampleID	**(As Listed)**	Client Contact	Brett Egen
		Project Name	Coochin Creek
Report Date	3/03/2023	Job Number	219363
Sample Received Date	23/02/2023	Order Number	
Sample Disposal Date	25/04/2023	Chain of Custody	
Sample Packaging	Plastic Bag	Client Email	brett.egen@douglaspartners.com.au
Temperature	Ambient	Client Address	28 Kessling Avenue Kunda Park Queensland 4556

Analytical Method: Test Methodology for pH_f and pH_fox as per QASSIT 2004 Laboratory Methods. Indications based on pH data only.
RATE: 0=No Reaction 1=Low 2=Moderate 3=High 4=Very High (steam evolved).
TEMP: Surface temperature rise (°C) oxidised sample at 5 minutes - cooling may occur for fast reaction.

S#	SampleID	pH_f	pH_Fox	Change	Rate	Indication
1	GW7 0.25	5.8	3.3	-2.5	4	low TAA & moderate TPA & sulphide possible
2	GW7 0.5	5.3	3.3	-2.0	1	low TAA & moderate TPA
3	GW7 0.75	5.6	4.3	-1.3	0	low TAA
4	GW7 1	5.4	3.9	-1.5	0	low TAA
5	GW7 1.25	5.4	3.8	-1.6	0	low TAA
6	GW7 1.5	5.3	3.3	-2.0	0	low TAA & moderate TPA
7	GW7 1.75	5.5	3.3	-2.2	1	low TAA & moderate TPA & sulphide possible
8	GW7 2	5.8	4.1	-1.7	2	low TAA
9	GW7 2.5	5.6	3.4	-2.2	2	low TAA & moderate TPA & sulphide possible
10	GW7 3	5.6	3.7	-1.9	2	low TAA
11	GW7 3.5	5.5	4.5	-1.0	2	low TAA
12	GW7 4	5.5	4.4	-1.1	1	low TAA
13	GW7 4.5	5.5	4.7	-0.8	2	low TAA & low TPA & low sulphide
14	GW7 5	6.1	5.6	-0.5	2	low TAA & low TPA & low sulphide
15	GW7 5.5	5.7	4.9	-0.8	2	low TAA & low TPA & low sulphide
16	GW7 6	5.5	5.1	-0.4	2	low TAA & low TPA & low sulphide
17	GW7 6.5	5.6	4.2	-1.4	1	low TAA
18	GW7 7	5.2	4.7	-0.5	1	low TAA & low TPA & low sulphide
19	GW7 7.5	5.2	4.1	-1.1	1	low TAA
20	GW7 8	5.6	4.6	-1.0	2	low TAA & low TPA
21	GW7 8.5	5.6	4.6	-1.0	2	low TAA & low TPA
22	GW7 9	5.3	4.1	-1.2	1	low TAA
23	GW7 9.5	5.5	4.5	-1.0	2	low TAA
24	GW7 10	5.2	4.6	-0.6	2	low TAA & low TPA & low sulphide
25	GW8 0.25	5.4	3.5	-1.9	1	low TAA
26	GW8 0.5	5.0	3.0	-2.0	1	low TAA & moderate TPA
27	GW8 0.75	5.2	3.2	-2.0	1	low TAA & moderate TPA
28	GW8 1	5.4	3.7	-1.7	0	low TAA
29	GW8 1.25	5.3	3.6	-1.7	0	low TAA
30	GW8 1.5	4.6	2.4	-2.2	0	low TAA & high TPA & sulphide possible
31	GW8 1.75	5.0	3.7	-1.3	0	low TAA
32	GW8 2	5.3	4.6	-0.7	0	low TAA & low TPA & low sulphide
33	GW8 2.5	5.4	4.2	-1.2	1	low TAA

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781 Mt Glorious Rd Highvale 4520

Biotrack Certificate of Analysis

Signatory: Ph:+617 3289 7179 ABN 91 056 237 275

Test Code/Name	[1] FIELD SCREEN SUITE		
Lab Reference (LR)	**240223.441**	Client Name	Douglas Partners Pty Ltd (Sunshine Coast)
SampleID	**(As Listed)**	Client Contact	Brett Egen
		Project Name	Coochin Creek
Report Date	3/03/2023	Job Number	219363
Sample Received Date	23/02/2023	Order Number	
Sample Disposal Date	25/04/2023	Chain of Custody	
Sample Packaging	Plastic Bag	Client Email	brett.egen@douglaspartners.com.au
Temperature	Ambient	Client Address	28 Kessling Avenue Kunda Park Queensland 4556

Analytical Method: Test Methodology for pH_f and pH_fox as per QASSIT 2004 Laboratory Methods. Indications based on pH data only.
RATE: 0=No Reaction 1=Low 2=Moderate 3=High 4=Very High (steam evolved).
TEMP: Surface temperature rise (°C) oxidised sample at 5 minutes - cooling may occur for fast reaction.

S#	SampleID	pH_f	pH_Fox	Change	Rate	Indication
1	GW9 0.25	5.6	2.0	-3.6	2	low TAA & high TPA & high sulphide/low buffer
2	GW9 0.5	5.4	4.0	-1.4	2	low TAA
3	GW9 0.75	5.9	4.3	-1.6	1	low TAA
4	GW9 1	5.5	3.8	-1.7	2	low TAA
5	GW9 1.25	5.4	4.4	-1.0	1	low TAA
6	GW9 1.5	5.3	4.1	-1.2	1	low TAA
7	GW9 1.75	5.2	4.1	-1.1	2	low TAA
8	GW9 2	5.2	4.0	-1.2	1	low TAA
9	GW9 2.5	5.1	4.0	-1.1	1	low TAA
10	GW9 3	5.4	4.1	-1.3	1	low TAA
11	GW9 3.5	5.4	4.0	-1.4	1	low TAA
12	GW9 4	5.2	3.9	-1.3	1	low TAA
13	GW10 0.25	5.3	2.6	-2.7	2	low TAA & moderate TPA & sulphide possible
14	GW10 0.5	5.3	4.0	-1.3	2	low TAA
15	GW10 0.75	5.3	4.3	-1.0	2	low TAA
16	GW10 1	5.2	4.3	-0.9	2	low TAA & low sulphide
17	GW10 1.25	5.1	4.3	-0.8	2	low TAA & low sulphide
18	GW10 1.5	5.2	4.5	-0.7	2	low TAA & low sulphide
19	GW10 1.75	5.2	4.3	-0.9	2	low TAA & low sulphide
20	GW10 2	5.1	4.1	-1.0	2	low TAA
21	GW10 2.5	5.3	4.3	-1.0	0	low TAA
22	GW10 3	5.5	4.4	-1.1	1	low TAA
23	GW10 3.5	5.6	4.3	-1.3	0	low TAA
24	GW10 4	5.4	3.9	-1.5	0	low TAA
25	GW10 4.5	5.7	3.9	-1.8	0	low TAA
26	GW10 5	5.4	4.1	-1.3	1	low TAA
27	GW10 5.5	5.7	4.8	-0.9	1	low TAA & low TPA & low sulphide
28	GW10 6.5	5.8	4.7	-1.1	1	low TAA & low TPA
29	GW10 7	5.9	3.2	-2.7	1	low TAA & moderate TPA & sulphide possible
30	GW10 7.5	5.8	4.3	-1.5	1	low TAA
31	GW10 8	5.7	4.6	-1.1	1	low TAA & low TPA
32	GW10 8.5	5.8	4.3	-1.5	1	low TAA
33	GW10 9	5.6	3.4	-2.2	2	low TAA & moderate TPA & sulphide possible
34	GW10 9.5	6.1	4.7	-1.4	1	low TAA & low TPA
35	GW10 10	6.4	5.2	-1.2	1	low TAA & low TPA

DETERMINATION OF ACID SULFATE SOIL PROPERTIES

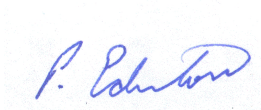
CERTIFICATE OF ANALYSIS

Analysis By: Bio-Track Pty Ltd ABN 91 056 237 275 781 Mt. Glorious Road Highvale, Brisbane, Australia, 4520 Ph. 07 3289 7179 Fx. 07 3289 7155

LAB REFERENCE	LR140223.589 Page 1 of 1 Report Pages.
CLIENT NAME	Douglas Partners Pty Ltd (Sunshine Coast)
PROJECT NAME	Coochin Creek JN219363
SAMPLING DATE	14/2/2023
DATE RECEIVED	23/3/2023

Sample ID as received. METHODOLOGY: As per (DNR QASSIT May 2004), oven dried (85'C), >1000 um shell removed, fine grind. All reported values gravimetric, dry mass.
%sEQ (equivalent sulphur) calculated as moles TAA/624 + %S Cr + %sNAS - sANC/ 1.5 (sNAS included irrespective of pH).
LIME1 rates calculated to neutralise TPA (or TAA if >TPA)+ aS_RAS -ANC_E/1.5 LIME2 rates calculated to neutralise TAA + aS_POS or S_Cr + aS_RAS -ANC_BT/1.5
NB. Lime rates assume 97% lime neutralisation but DO NOT include any safety factors. Suggested factor=1.5-2. Rates are kg/ton. Multiply by bulk density to convert to kg/m3.
Fineness Factor (FF)=1.5

ID	Depth	pH KCl	TAA	pH ox	TPA	TSA	s ANC BT	S KCl	S P	S POS	S eq	Lime	Ca NAS
	m		m/t		m/t	m/t	%	%	%	%	%	kg/t	mg/kg
		23A	23F	23B	23G	23H	s19A2	23Ce	23De	23Ee	s		20E
GW1	1	4.93	3	5.3	10	7	0.00%	0.02%	0.03%	<0.01%	0.01%	0	188
GW1	2	4.66	17	4.5	2	0	0.00%	0.01%	0.06%	0.05%	0.08%	2	120
GW1	3	4.61	17	3.4	34	17	0.00%	0.03%	0.23%	0.20%	0.23%	7	272
GW1	4	4.08	27	2.9	142	115	0.00%	0.07%	0.56%	0.49%	0.53%	17	328
GW1	5	4.65	10	3.1	125	115	0.00%	0.07%	0.53%	0.46%	0.47%	15	292
GW1	6	4.60	5	4.1	29	24	0.00%	0.06%	0.26%	0.20%	0.21%	6	352
GW1	7	4.60	5	3.9	50	46	0.00%	0.05%	0.23%	0.18%	0.18%	6	324
GW1	8.5	4.71	17	3.8	46	29	0.00%	0.04%	0.23%	0.18%	0.21%	6	296
GW1	9.5	6.27	10	4.6	12	2	0.00%	0.03%	0.11%	0.08%	0.10%	3	232
GW2	0.75	4.36	13	4.2	61	48	0.00%	<0.01%	0.02%	<0.01%	0.02%	1	104
GW2	2	4.64	11	4.6	50	40	0.00%	0.02%	0.09%	0.07%	0.09%	3	72
GW2	3	4.41	29	3.5	48	19	0.00%	0.04%	0.20%	0.16%	0.20%	6	72
GW2	4	4.06	26	2.2	415	389	0.00%	0.10%	1.62%	1.52%	1.56%	49	440
GW2	5.5	4.88	5	4.1	28	22	0.00%	0.04%	0.17%	0.13%	0.13%	4	560
GW2	6	6.13	12	5.4	8	0	0.00%	0.02%	0.06%	0.04%	0.06%	2	284
GW2	7	6.50	0	6.5	0	0	0.00%	0.02%	0.06%	0.04%	0.04%	1	236
GW2	8	3.99	34	3.4	118	84	0.00%	0.08%	0.45%	0.38%	0.43%	14	328
GW2	9	7.10	0	7.1	0	0	0.18%	0.02%	0.04%	0.01%	-0.17%	-5	520
GW3	0.5	3.83	46	4.1	7	0	0.00%	<0.01%	0.02%	<0.01%	0.07%	2	248
GW3	1.5	3.99	34	4.7	13	0	0.00%	<0.01%	<0.01%	<0.01%	0.05%	2	188
GW3	2.5	3.85	96	4.1	39	0	0.00%	<0.01%	<0.01%	<0.01%	0.15%	5	240
GW3	3.5	3.98	92	4.3	23	0	0.00%	<0.01%	<0.01%	<0.01%	0.15%	5	116
GW3	5	4.16	75	4.3	15	0	0.00%	<0.01%	<0.01%	<0.01%	0.12%	4	76
GW3	7	4.15	43	4.5	4	0	0.00%	<0.01%	<0.01%	<0.01%	0.07%	2	136
GW3	9.5	4.28	17	4.7	5	0	0.00%	<0.01%	<0.01%	<0.01%	0.03%	1	252
GW4	0.75	4.05	29	4.9	8	0	0.00%	0.01%	0.02%	<0.01%	0.05%	2	60
GW4	2	4.35	7	5.5	10	2	0.00%	0.01%	0.01%	<0.01%	0.01%	0	28
GW4	3.5	3.91	19	4.7	11	0	0.00%	0.02%	0.04%	0.02%	0.05%	1	120
GW4	5.5	3.90	60	4.4	31	0	0.00%	<0.01%	0.01%	<0.01%	0.10%	3	244
GW4	7	3.90	43	4.2	28	0	0.00%	<0.01%	0.02%	<0.01%	0.07%	2	192
GW4	8	3.90	54	4.3	30	0	0.00%	0.01%	<0.01%	<0.01%	0.09%	3	332
GW4	9.5	4.01	39	4.2	23	0	0.00%	<0.01%	<0.01%	<0.01%	0.06%	2	680



Signatory For and on behalf of Bio-Track Pty Ltd

DETERMINATION OF ACID SULFATE SOIL PROPERTIES

CERTIFICATE OF ANALYSIS

Analysis By: Bio-Track Pty Ltd ABN 91 056 237 275 781 Mt. Glorious Road Highvale, Brisbane, Australia, 4520 Ph. 07 3289 7179 Fx. 07 3289 7155

LAB REFERENCE	LR140223.593 Page 1 of 1 Report Pages.
CLIENT NAME	Douglas Partners Pty Ltd (Sunshine Coast)
PROJECT NAME	Coochin Creek JN219363
SAMPLING DATE	14/2/2023
DATE RECEIVED	23/3/2023

Sample ID as received. METHODOLOGY: As per (DNR QASSIT May 2004), oven dried (85'C), >1000 um shell removed, fine grind. All reported values gravimetric, dry mass.
%sEQ (equivalent sulphur) calculated as moles TAA/624 + %S Cr + %sNAS - sANC/ 1.5 (sNAS included irrespective of pH).
LIME1 rates calculated to neutralise TPA (or TAA if >TPA)+ aS_RAS -ANC_E/1.5 LIME2 rates calculated to neutralise TAA + aS_POS or S_Cr + aS_RAS -ANC_BT/1.5
NB. Lime rates assume 97% lime neutralisation but DO NOT include any safety factors. Suggested factor=1.5-2. Rates are kg/ton. Multiply by bulk density to convert to kg/m3.
Fineness Factor (FF)=1.5

ID	Depth	pH KCl	TAA	pH ox	TPA	TSA	s ANC BT	S KCl	S P	S POS	S eq	Lime	Ca NAS
	m		m/t		m/t	m/t	%	%	%	%	%	kg/t	mg/kg
		23A	23F	23B	23G	23H	s19A2	23Ce	23De	23Ee	s		20E
GW5	0.25	4.80	22	6.3	7	0	0.00%	<0.01%	<0.01%	<0.01%	0.03%	1	152
GW5	0.75	4.19	24	5.1	10	0	0.00%	<0.01%	<0.01%	<0.01%	0.04%	1	0
GW5	2.5	4.42	14	4.1	8	0	0.00%	<0.01%	<0.01%	<0.01%	0.02%	1	0
GW5	4	5.06	12	6.7	0	0	0.00%	0.01%	<0.01%	<0.01%	0.02%	1	64
GW5	5.5	5.54	12	6.7	0	0	0.00%	<0.01%	<0.01%	<0.01%	0.02%	1	132
GW5	7	6.81	0	6.8	0	0	0.00%	<0.01%	<0.01%	<0.01%	0.00%	0	336
GW5	9	6.02	17	6.8	0	0	0.00%	<0.01%	<0.01%	<0.01%	0.03%	1	1120
GW5	10	6.95	0	7.0	0	0	0.00%	<0.01%	<0.01%	<0.01%	0.00%	0	760
GW6	1	4.29	17	4.7	11	0	0.00%	<0.01%	<0.01%	<0.01%	0.03%	1	0
GW6	2	4.01	32	4.1	14	0	0.00%	0.01%	<0.01%	<0.01%	0.05%	2	0
GW6	4	4.15	19	4.8	8	0	0.00%	0.03%	<0.01%	<0.01%	0.03%	1	36
GW6	5	4.18	24	4.8	6	0	0.00%	0.02%	<0.01%	<0.01%	0.04%	1	80
GW6	7	4.17	15	4.6	4	0	0.00%	0.02%	<0.01%	<0.01%	0.02%	1	128
GW6	8	4.22	13	5.7	7	0	0.00%	0.01%	<0.01%	<0.01%	0.02%	1	148
GW6	9.5	5.70	12	6.7	0	0	0.00%	<0.01%	<0.01%	<0.01%	0.02%	1	440
GW7	0.25	4.27	28	4.2	49	21	0.00%	<0.01%	<0.01%	<0.01%	0.05%	1	196
GW7	1.5	4.69	5	6.4	4	0	0.00%	<0.01%	<0.01%	<0.01%	0.01%	0	0
GW7	2.5	4.90	17	6.4	4	0	0.00%	<0.01%	<0.01%	<0.01%	0.03%	1	0
GW7	4	5.38	12	6.8	0	0	0.00%	<0.01%	<0.01%	<0.01%	0.02%	1	56
GW7	6.5	6.02	10	6.1	11	1	0.00%	<0.01%	<0.01%	<0.01%	0.02%	0	80
GW7	7.5	6.08	12	7.2	0	0	0.00%	0.02%	<0.01%	<0.01%	0.02%	1	84
GW7	9	6.00	12	6.6	0	0	0.00%	<0.01%	<0.01%	<0.01%	0.02%	1	160
GW8	0.5	4.44	17	3.7	48	31	0.00%	<0.01%	<0.01%	<0.01%	0.03%	1	0
GW8	1.5	4.42	8	4.7	1	0	0.00%	<0.01%	<0.01%	<0.01%	0.01%	0	0
GW9	0.25	4.73	14	3.6	81	66	0.00%	<0.01%	<0.01%	<0.01%	0.02%	1	76
GW9	1	3.86	92	4.4	63	0	0.00%	<0.01%	<0.01%	<0.01%	0.15%	5	0
GW9	1.75	3.77	109	4.0	50	0	0.00%	<0.01%	<0.01%	<0.01%	0.17%	5	48
GW9	2.5	3.76	106	4.1	47	0	0.00%	<0.01%	<0.01%	<0.01%	0.17%	5	11
GW10	0.25	4.54	17	5.3	7	0	0.00%	<0.01%	<0.01%	<0.01%	0.03%	1	0
GW10	1	4.27	3	5.6	5	2	0.00%	<0.01%	<0.01%	<0.01%	0.00%	0	0
GW10	2	4.31	0	5.8	5	4	0.00%	<0.01%	<0.01%	<0.01%	0.00%	0	0
GW10	4	4.19	24	5.4	6	0	0.00%	<0.01%	<0.01%	<0.01%	0.04%	1	0
GW10	7	4.41	3	5.5	0	0	0.00%	<0.01%	<0.01%	<0.01%	0.00%	0	56
GW10	9	4.65	17	5.4	0	0	0.00%	<0.01%	<0.01%	<0.01%	0.03%	1	180

Signatory For and on behalf of Bio-Track Pty Ltd

BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Bells Creek Road, Coochin Creek, QLD

SURFACE LEVEL: 2.8 AHD
COORDINATE: E:507889.1, N:7029563.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: GW11
PROJECT No: 219363.01
DATE: 21/05/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	2.8	0.25	TOPSOIL / Silty Sandy CLAY (CI): grey brown; medium plasticity; fine sand; with organics.	TS	TOP	S	M - W	0.25m - 2.00m: ASS samples taken every 0.25m interval			1	SPT	1,3,3 N=6	Grout	50mm
			Clayey SAND (SC): brown; fine to medium; low plasticity clay.		ALV	L	M - W								
	1.10	1.75	Silty Sandy CLAY (CL): grey mottled orange brown; low plasticity; fine sand.		RS	St	W				2	SPT	4,6,6 N=12		
		2	Silty CLAY (CI): grey mottled brown grey; medium plasticity. 2.30m: pale grey mottled red orange		RS	St	W								
		2.80									3	SPT	3,10,12 N=22		
		3	Silty CLAY (CH): red brown orange brown mottled grey; high plasticity; with gravel. 3.50m: grey streaked orange red brown		RS	St									
		4.30									4	SPT	6,12,10 N=22		
		5	Silty CLAY (CI): pale grey ; medium plasticity. 4.90m: grey streaked red brown, with fine gravel		RS	VSt									
		5.50									5	SPT	3,4,7 N=11		
		6	Silty CLAY (CI-CH): red brown orange brown mottled grey; medium to high plasticity; with gravel. 6.00m: pale grey mottled orange brown, no gravel		RS	VSt								Sand	50mm
		6.50					NDF				6	SPT	6,12,10 N=22		
		7	Silty CLAY (CI): pale grey streaked dark red brown; medium plasticity. 7.20m: pale grey		RS	St									
		8	8.00m: pale grey streaked brown, trace of medium gravel								7	SPT	3,4,7 N=11		
		8.70									8	SPT	4,5,6 N=11		
		9	Silty CLAY (CI-CH): red brown streaked brown; medium to high plasticity.		RS	St									
		9.60									9	SPT	4,6,10 N=16		
		10	Silty CLAY (CI): orange brown mottled pale grey; medium plasticity.		RS	VSt					10				
			Borehole discontinued at 10.45m depth. Limit of Investigation.												

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hanjin D&B 8D
METHOD: AD/T to 2.5m, then WB to 10.45m
REMARKS: Groundwater observed at 1.0 m

OPERATOR: MK Drilling

LOGGED: SAW
CASING: HWT to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Water Technology Pty Ltd
PROJECT: Groundwater Monitoring Wells
LOCATION: Bells Creek Road, Coochin Creek, QLD

SURFACE LEVEL: 3.3 AHD
COORDINATE: E:507538.1, N:7030298.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: GW12
PROJECT No: 219363.01
DATE: 20/05/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	3	0.25	TOPSOIL / Silty SAND (SM): dark brown grey; fine to medium; with organics.	TS TC T	TOP	VL	M - W	0.25m - 2.00m: ASS samples taken every 0.25m interval							
			Silty SAND (SM): dark brown grey; fine to medium.		ALV	L	M - W								
		1.00	Silty Sandy CLAY (CI): pale grey; medium plasticity; fine to medium sand.		possibly RS	S - F	W				1	SPT	3,1,2 N=3	Gravel	50mm
	2	2									2				
	1	2.30	Silty CLAY (CH): pale grey mottled orange brown; high plasticity; trace of fine sand.		RS	St						SPT	3,3,10 N=13		
		2.80	Silty CLAY (CI): pale grey streaked red orange brown; medium plasticity.		RS	St					3				
	0	3	3.80m: pale grey												
	-1	4	4.20m: pale grey streaked red orange brown								4	SPT	4,5,9 N=14		
		4.50	Silty CLAY (CH): red brown streaked orange brown; high plasticity.		RS	St									
	-2	5	5.00m: red brown								5				
		5.70	Silty CLAY (CI-CH): grey mottled red brown; medium to high plasticity.		RS	St - VSt	NDF					SPT	3,5,10 N=15		
	-3	6	6.10m: grey								6				
		6.50	Silty Sandy CLAY (CI): grey orange brown; medium plasticity; fine to medium sand.		RS	St								Sand	50mm
		7.00	Silty CLAY (CI): red brown streaked grey orange brown; medium plasticity; trace of fine sand.		RS	St					7	SPT	2,4,5 N=9		
	-4		7.40m: grey mottled orange brown												
	-5	8									8				
		8.30	Silty CLAY (CL): grey mottled orange brown; low plasticity.		RS	VSt									
		8.80	Silty CLAY (CI): orange brown; medium plasticity.		RS	H						SPT	3,6,10 N=16		
	-6	9									9				
		10									10	SPT	30/80 (HB)		
	-7		Borehole discontinued at 10.08m depth. Limit of Investigation.												

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hanjin D&B 8D
METHOD: AD/T to 2.5m, then WB to 10.08m
REMARKS: Groundwater observed at 1.3 m

OPERATOR: MK Drilling

LOGGED: SAW
CASING: HWT to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

Acid Sulfate Soil Test Results v1.2

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Summary of results - acid sulfate soils

Project No: 219363.01

Project Name: Groundwater Monitoring Wells

Location: Bells Creek Road, Coochin Creek

Sample Information						Screening Test Results				Laboratory Analysis Results (Acid Base Accounting)								
Location ID	Depth from (m)	Depth to (m)	Reduced level (AHD)	Sample Description	Adopted Texture	pH_F (pH units)	pH_{FOX} (pH units)	Reaction Strength	pH change (pH units)	pH_{KCl} (pH units)	S_{KCl} (%S)	S_{HCl} (%S)	Scr (%S)	TAA (%S)	S_{NAS} (%S)	ANC_{BT} (%S)	ANC Corroborated (Y/N)	Net Acidity (%S)
				Assessment Criteria (pH units)		**<4**	**<3**	-	**1.0**	Action Criteria (%S)		Coarse texture: sands to loamy sands and peats						0.03
												Medium texture: clayey sand to light clays						0.06[a]/0.03[b]
												Fine texture: light medium to heavy clays						0.1[a]/0.03[b]
GW11	0.00	0.25	2.80 to 2.55	Silty sandy CLAY - grey brown	F	5.5	3.6	4	-1.9	5.5	<0.005		<0.005	0.017				<0.02
GW11	0.25	0.50	2.55 to 2.30	Clayey SAND - brown	M	5.3	4.0	4	-1.3									
GW11	0.50	0.75	2.30 to 2.05	Clayey SAND - brown	M	5.2	3.9	2	-1.3	8.0	0.008		<0.005	<0.003		0.610	N	<0.02
GW11	0.75	**1.00**	2.05 to 1.80	Clayey SAND - brown	M	5.1	4.2	2	-0.9									
GW11	**1.00**	**1.25**	1.80 to 1.55	Clayey SAND - brown	M	5.2	4.1	2	-1.1									
GW11	**1.25**	**1.50**	1.55 to 1.30	Silty Sandy CLAY - grey mottled orange brown	F	5.2	4.1	2	-1.1	5.2	0.006		<0.005	0.017				<0.02
GW11	**1.50**	**1.75**	1.30 to 1.05	Silty Sandy CLAY - grey mottled orange brown	F	5.3	4.3	2	-1.0									
GW11	**1.75**	**2.00**	1.05 to 0.80	Silty CLAY - grey mottled brown grey	F	5.2	4.5	2	-0.7	5.4	0.005		<0.005	0.014				<0.02
GW11	**2.50**	**2.95**	0.30 to -0.15	Silty CLAY - pale grey mottled red orange	F	5.2	4.6	2	-0.6	4.9	0.012		<0.005	0.032				0.03
GW11	**4.00**	**4.45**	-1.20 to -1.65	Silty CLAY - grey streaked orange red brown	F	5.2	4.7	2	-0.5	4.7	0.008		<0.005	0.063				0.06
GW11	**5.50**	**5.95**	-2.70 to -3.15	Silty CLAY - red brown orange brown mottled grey	F	5.2	4.3	4	-0.9	4.5	0.007		<0.005	0.072				0.07
GW11	**7.00**	**7.45**	-4.20 to -4.65	Silty CLAY - pale grey streaked dark red brown	F	5.3	5.2	4	-0.1	4.8	0.010		<0.005	0.061				0.06
GW11	**8.50**	**8.95**	-5.70 to -6.15	Silty CLAY - pale grey streaked brown	F	5.5	5.3	4	-0.2	4.9	0.006		<0.005	0.058				0.06
GW11	**10.00**	**10.45**	-7.20 to -7.65	Silty CLAY - orange brown	F	5.5	5.1	4	-0.4	4.9	0.007		<0.005	0.059				0.06
GW12	0.00	0.25	3.30 to 3.05	Silty SAND - dark brown grey	C	5.2	3.7	3	-1.5	4.8	<0.005		<0.005	0.066				0.07
GW12	0.25	0.50	3.05 to 2.80	Silty SAND - dark brown grey	C	5.2	3.7	3	-1.5									
GW12	0.50	0.75	2.80 to 2.55	Silty SAND - dark brown grey	C	5.3	3.9	3	-1.4	4.9	<0.005		<0.005	0.061				0.06
GW12	0.75	1.00	2.55 to 2.30	Silty SAND - dark brown grey	C	5.2	3.9	3	-1.3									
GW12	1.00	1.25	2.30 to 2.05	Silty Sandy CLAY - pale grey	F	5.0	4.0	3	-1.0									
GW12	1.25	**1.50**	2.05 to 1.80	Silty Sandy CLAY - pale grey	F	5.0	4.0	2	-1.0									
GW12	**1.50**	**1.75**	1.80 to 1.55	Silty Sandy CLAY - pale grey	F	5.1	4.0	2	-1.1	5.0	<0.005		<0.005	0.056				0.06
GW12	**1.75**	**2.00**	1.55 to 1.30	Silty Sandy CLAY - pale grey	F	5.0	4.2	3	-0.8									
GW12	**2.50**	**2.95**	0.80 to 0.35	Silty CLAY - pale grey streaked red orange	F	5.1	4.1	4	-1.0	4.3	0.011	0.012	<0.005	0.120	0.014			0.13
GW12	**4.00**	**4.45**	-0.70 to -1.15	Silty CLAY - pale grey	F	5.0	4.3	4	-0.7	4.4	0.013	0.014	<0.005	0.100	0.016			0.11
GW12	**5.50**	**5.95**	-2.20 to -2.65	Silty CLAY - red brown orange brown mottled grey	F	4.9	4.3	3	-0.6	4.4	0.007	0.008	<0.005	0.140	0.009			0.14
GW12	**7.00**	**7.45**	-3.70 to -4.15	Silty CLAY - red brown streaked grey orange brown	F	4.9	4.4	2	-0.5	4.6	0.008		<0.005	0.089				0.09
GW12	**8.50**	**8.95**	-5.20 to -5.65	Silty CLAY - grey mottled orange brown	F	5.1	4.3	2	-0.8	4.6	<0.005		<0.005	0.080				0.08
GW12	**10.00**	**10.08**	-6.70 to -6.78	Silty CLAY - orange brown	F	5.7	5.2	2	-0.5									

Notes:

Adopted texutre - C = coarse, M = medium, F = fine

pH_F - Soil pH in water

pH_{FOX} - Soil pH in peroxide

Reaction strength: 1 - No reaction to slight , 2 - Moderate reaction, 3 - Strong reaction with persistenth froth, 4 - Extreme reaction

pH change = pH_F - pH_{FOX}

pH_{KCL} - KCl extractable pH

S_{KCl} - KCl extractable sulfur

S_{HCl} - HCl extractable sulfur

S_{Cr} - potential sulfidic acidity

TAA - titratable actual acidity (reported if pH_{KCL}<6.5)

S_{NAS} – retained acidity (reported if pHKCl < 4.5)

ANC_{BT} – acid neutralising capacity (reported if pH_{KCl} ≥ 6.5)

NT - Not tested

Blue depths indicate where samples have been collected at or below the groundwater table

Bold results are indicators of ASS conditions, noting:

- Assessment criteria are considered a reasonable initial screening for AASS or PASS
- pH_F<4 is indicative of the presence of Actual ASS (AASS), although it is not conclusive of ASS on its own as naturally occurring non ASS soils can have pH_F<5
- pH_{FOX}<3 or pH Change ≥1 may indicate potential ASS (PASS), although exception apply. Laboratory testing required to confirm presence of Reduced Inorganic Sulfur (RIS)
- Refer to Table 5.1, A2, A3 of Sullivan,L. et al (2018) for further details

Shaded results trigger action (i.e. equal to or exceed the action criteria). Criteria is specific for soil texture and anticpated tonnage of soil disturbed.

Net Acidity can only include the measured ANC where the ANC has been corroborated by other data (for example slab incubation data) that demonstrates the soil material does not experience acidification during complete oxidation under field conditions.

a - Action criterion for disturbance of 1-1000 tonnes of material

b - Action criterion for disturbance of more than 1000 tonnes of material

The action criteria apply only to ASS materials and not to other acidic soils such as acidic peatlands and coastal heaths.

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West End
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Attention: **Brett Egen**

Report **1100289-S**
Project name BELLS CREEK ROAD COOCHIN CREEK
Project ID 219363.01
Received Date May 22, 2024

Client Sample ID			**GW1_0.25M**	**GW1_0.5M**	**GW1-0.75M**	**GW1-1.0M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-My0065005**	**B24-My0065006**	**B24-My0065007**	**B24-My0065008**
Date Sampled			**May 21, 2024**	**May 21, 2024**	**May 21, 2024**	**May 21, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.5	5.3	5.2	5.1
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.6	4.0	3.9	4.2
Reaction Ratings*[S05]	0	comment	4.0	4.0	2.0	2.0

Client Sample ID			**GW1-1.25M**	**GW1-1.5M**	**GW-1.75M**	**GW1-2.0M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-My0065009**	**B24-My0065010**	**B24-My0065011**	**B24-My0065012**
Date Sampled			**May 21, 2024**	**May 21, 2024**	**May 21, 2024**	**May 21, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.2	5.3	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.1	4.1	4.3	4.5
Reaction Ratings*[S05]	0	comment	2.0	2.0	2.0	2.0

Client Sample ID			**GW1-2.5M**	**GW1-4.0M**	**GW1-5.5M**	**GW1-7.0M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-My0065013**	**B24-My0065014**	**B24-My0065015**	**B24-My0065016**
Date Sampled			**May 21, 2024**	**May 21, 2024**	**May 21, 2024**	**May 21, 2024**
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.2	5.2	5.2	5.3
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.6	4.7	4.3	5.2
Reaction Ratings*[S05]	0	comment	2.0	2.0	4.0	4.0

Client Sample ID			GW1-8.5M	GW1-10.0M	GW2-0.25M	GW2-0.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-My0065017	B24-My0065018	B24-My0065019	B24-My0065020
Date Sampled			May 21, 2024	May 21, 2024	May 21, 2024	May 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.5	5.5	5.2	5.2
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.3	5.1	3.7	3.7
Reaction Ratings*[S05]	0	comment	4.0	4.0	3.0	3.0

Client Sample ID			GW2-0.75M	GW2-1.0M	GW2-1.25M	GW2-1.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-My0065021	B24-My0065022	B24-My0065023	B24-My0065024
Date Sampled			May 21, 2024	May 21, 2024	May 21, 2024	May 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.3	5.2	5.0	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	3.9	3.9	4.0	4.0
Reaction Ratings*[S05]	0	comment	3.0	3.0	3.0	2.0

Client Sample ID			GW2-1.75M	GW2-2.0M	GW2-2.5M	GW2-4.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-My0065025	B24-My0065026	B24-My0065027	B24-My0065028
Date Sampled			May 21, 2024	May 21, 2024	May 21, 2024	May 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	5.1	5.0	5.1	5.0
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.0	4.2	4.1	4.3
Reaction Ratings*[S05]	0	comment	2.0	3.0	4.0	4.0

Client Sample ID			GW2-5.5M	GW2-7.0M	GW2-8.5M	GW2-10.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-My0065029	B24-My0065030	B24-My0065031	B24-My0065032
Date Sampled			May 21, 2024	May 21, 2024	May 21, 2024	May 21, 2024
Test/Reference	LOR	Unit				
Acid Sulfate Soils Field pH Test						
pH-F (Field pH test)*	0.1	pH Units	4.9	4.9	5.1	5.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	4.3	4.4	4.3	5.2
Reaction Ratings*[S05]	0	comment	3.0	2.0	2.0	2.0

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Attention: **Brett Egen**

Report **1105998-S**
Project name BELLS CREEK ROAD COOCHIN CREEK
Project ID 219363.01
Received Date Jun 05, 2024

Client Sample ID			**GW1_0.25M**	**GW1-0.75M**	**GW1-1.5M**	**GW1-2.0M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**B24-Jn0020119**	**B24-Jn0020120**	**B24-Jn0020121**	**B24-Jn0020122**
Date Sampled			**May 21, 2024**	**May 21, 2024**	**May 21, 2024**	**May 21, 2024**
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	5.5	8.0	5.2	5.4
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	11	< 2	10	8.5
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.017	< 0.003	0.017	0.014
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3	< 3	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	< 0.005	0.008	0.006	0.005
HCl Extractable Sulfur	0.005	% S	N/A	N/A	N/A	N/A
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	0.61	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	0.20	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	120	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	< 0.02	< 0.02	< 0.02	< 0.02
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	11	< 10	10	< 10
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	< 1	< 1	< 1	< 1
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	84	79	89	89
>2mm Fraction	0.005	g	< 0.005	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	100	100	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1	< 0.1	< 0.1
Sample Properties						
% Moisture	1	%	18	15	17	16

Client Sample ID			GW1-2.5M	GW1-4.0M	GW1-5.5M	GW1-7.0M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0020123	B24-Jn0020124	B24-Jn0020125	B24-Jn0020126
Date Sampled			May 21, 2024	May 21, 2024	May 21, 2024	May 21, 2024
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	4.9	4.7	4.5	4.8
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	20	39	45	38
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.032	0.063	0.072	0.061
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3	< 3	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	0.012	0.008	0.007	0.010
HCl Extractable Sulfur	0.005	% S	N/A	N/A	N/A	N/A
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.03	0.06	0.07	0.06
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	20	39	45	38
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	1.5	3.0	3.4	2.8
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	54	57	65	46
>2mm Fraction	0.005	g	< 0.005	3.6	< 0.005	< 0.005
Analysed Material	0.1	%	100	94	100	100
Extraneous Material	0.1	%	< 0.1	6.0	< 0.1	< 0.1
Sample Properties						
% Moisture	1	%	19	15	20	23

Client Sample ID			GW1-8.5M	GW1-10.0M	GW2-0.25M	GW2-0.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0020127	B24-Jn0020128	B24-Jn0020129	B24-Jn0020130
Date Sampled			May 21, 2024	May 21, 2024	May 21, 2024	May 21, 2024
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	4.9	4.9	4.8	4.9
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	36	37	41	38
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.058	0.059	0.066	0.061
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3	< 3	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	0.006	0.007	< 0.005	< 0.005
HCl Extractable Sulfur	0.005	% S	N/A	N/A	N/A	N/A

Client Sample ID			GW1-8.5M	GW1-10.0M	GW2-0.25M	GW2-0.75M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0020127	B24-Jn0020128	B24-Jn0020129	B24-Jn0020130
Date Sampled			May 21, 2024	May 21, 2024	May 21, 2024	May 21, 2024
Test/Reference	LOR	Unit				
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	N/A	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.06	0.06	0.07	0.06
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	36	37	41	38
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	2.7	2.8	3.1	2.8
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	48	55	86	86
>2mm Fraction	0.005	g	7.6	< 0.005	< 0.005	< 0.005
Analysed Material	0.1	%	86	100	100	100
Extraneous Material	0.1	%	14	< 0.1	< 0.1	< 0.1
Sample Properties						
% Moisture	1	%	22	25	17	16

Client Sample ID			GW2-1.75M	GW2-2.5M	GW2-4.0M	GW2-5.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0020131	B24-Jn0020132	B24-Jn0020133	B24-Jn0020134
Date Sampled			May 21, 2024	May 21, 2024	May 21, 2024	May 21, 2024
Test/Reference	LOR	Unit				
Actual Acidity (NLM-3.2)						
pH-KCL (NLM-3.1)	0.1	pH Units	5.0	4.3	4.4	4.4
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	35	75	64	85
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.056	0.12	0.10	0.14
Potential Acidity - Chromium Reducible Sulfur						
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005	< 0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3	< 3	< 3
Extractable Sulfur						
Sulfur - KCl Extractable	0.005	% S	< 0.005	0.011	0.013	0.007
HCl Extractable Sulfur	0.005	% S	N/A	0.012	0.014	0.008
Retained Acidity (S-NAS)						
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	0.014	0.016	0.009
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	0.010	0.012	0.006
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	6.3	7.6	4.0
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0	2.0	2.0
Acid Neutralising Capacity (ANCbt)						
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5	1.5	1.5

Client Sample ID			GW2-1.75M	GW2-2.5M	GW2-4.0M	GW2-5.5M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			B24-Jn0020131	B24-Jn0020132	B24-Jn0020133	B24-Jn0020134
Date Sampled			May 21, 2024	May 21, 2024	May 21, 2024	May 21, 2024
Test/Reference	LOR	Unit				
Net Acidity (Including ANC)						
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.06	0.13	0.11	0.14
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	35	82	72	89
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	2.6	6.1	5.4	6.7
Chromium Suite (SKCl) - NASSG (Excluding ANC)						
<2mm Fraction	0.005	g	56	42	44	30
>2mm Fraction	0.005	g	< 0.005	6.5	< 0.005	< 0.005
Analysed Material	0.1	%	100	87	100	100
Extraneous Material	0.1	%	< 0.1	13	< 0.1	< 0.1
Sample Properties						
% Moisture	1	%	15	21	23	26

Client Sample ID			GW2-7.0M	GW2-8.5M
Sample Matrix			Soil	Soil
Eurofins Sample No.			B24-Jn0020135	B24-Jn0020136
Date Sampled			May 21, 2024	May 21, 2024
Test/Reference	LOR	Unit		
Actual Acidity (NLM-3.2)				
pH-KCL (NLM-3.1)	0.1	pH Units	4.6	4.6
Titratable Actual Acidity (NLM-3.2)	2	mol H+/t	55	50
Titratable Actual Acidity (NLM-3.2)	0.003	% pyrite S	0.089	0.080
Potential Acidity - Chromium Reducible Sulfur				
Chromium Reducible Sulfur (s-SCr) (NLM-2.1)[S04]	0.005	% S	< 0.005	< 0.005
Chromium Reducible Sulfur (a-SCr) (NLM-2.1)	3	mol H+/t	< 3	< 3
Extractable Sulfur				
Sulfur - KCl Extractable	0.005	% S	0.008	< 0.005
HCl Extractable Sulfur	0.005	% S	N/A	N/A
Retained Acidity (S-NAS)				
Net Acid soluble sulfur (SNAS) NLM-4.1	0.005	% S	N/A	N/A
Net Acid soluble sulfur (s-SNAS) NLM-4.1[S02]	0.005	% S	N/A	N/A
Net Acid soluble sulfur (a-SNAS) NLM-4.1	2	mol H+/t	N/A	N/A
HCl Extractable Sulfur Correction Factor	1	factor	2.0	2.0
Acid Neutralising Capacity (ANCbt)				
Acid Neutralising Capacity - (ANCbt) (NLM-5.2)	0.01	% CaCO3	N/A	N/A
Acid Neutralising Capacity - (s-ANCbt) (NLM-5.2)[S03]	0.02	% S	N/A	N/A
Acid Neutralising Capacity - (a-ANCbt) (NLM-5.2)	2	mol H+/t	N/A	N/A
ANC Fineness Factor		factor	1.5	1.5
Net Acidity (Including ANC)				
s-CRS Suite - Net Acidity - NASSG (including ANC)	0.02	% S	0.09	0.08
CRS Suite - Net Acidity - NASSG (Including ANC)	10	mol H+/t	55	50
CRS Suite - Liming Rate - NASSG (Including ANC)[S01]	1	kg CaCO3/t	4.1	3.7
Chromium Suite (SKCl) - NASSG (Excluding ANC)				
<2mm Fraction	0.005	g	39	38
>2mm Fraction	0.005	g	< 0.005	< 0.005
Analysed Material	0.1	%	100	100
Extraneous Material	0.1	%	< 0.1	< 0.1
Sample Properties				
% Moisture	1	%	27	27

APPENDIX F – PRELIMINARY EROSION & SEDIMENT CONTROL TECHNICAL MEMORANDUM (PREPARED BY TOPO)

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TOPO.

TECHNICAL MEMORANDUM

TO:	ERIC GRYWACHESKI
COMPANY:	KN GROUP
FROM:	KYLE ROBSON
SUBJECT:	AURA SOUTH – WATER QUALITY DURING THE CONSTRUCTION PHASE
OUR REF:	T4535
DATE:	16/02/2026

1 INTRODUCTION

This Technical Memorandum has been prepared to provide guidance on potential erosion and sediment control measures to be implemented on the Aura South project to manage water quality during the construction phase .

2 EROSION AND SEDIMENT CONTROL MANAGEMENT MEASURES

Construction Phase Erosion and Sediment control is typically defined by three management areas:

1. Erosion Control
2. Drainage Control
3. Sediment Control

2.1. EROSION CONTROL

Erosion control is the primary control measure to limit erosion and sediment mobilisation. The following typical practices would be expected to demonstrate best practice erosion control on a residential development site.

- Limit site clearing until immediately prior to commencing bulk earthworks
- Stabilise any temporary stockpiles, particularly topsoil noting this is likely to be stockpiled for the longest duration (i.e. from site clearing/stripping to respreading following completion of earthworks)
- Stabilise temporary drainage lines as these are at the highest risk of eroding due to concentrated flow
- Stabilise any steep batters
- Respread topsoil and apply hydromulch or other suitable erosion control measure to provide rapid stabilization and establishment of vegetation to completed lots as soon as final levels are achieved.

2.2. DRAINAGE CONTROL

Drainage controls during construction should include (1) clean water diversion drains to prevent external flow entering the site, and (2) internal dirty water drains to direct site runoff from exposed areas to appropriate sediment control measures. All temporary drains, both clean and dirty are to be sized to convey flows from the contributing catchment in a non-erosive manner.

2.3. SEDIMENT CONTROL

The minimum sediment control requirements per best practice are dictated by either (1) the calculated soil loss and associated erosion risk, or (2) the ability to achieve prescribed water quality release limits for site runoff. The

soil loss estimation takes into account key factors including topography, soil types (including allowance for dispersion potential), rainfall erosivity and site management (including surface condition). *Best Practice Erosion and Sediment Control* (IECA, 2025) provides three levels of sediment control:

- Type 1 – sediment basins (management of fine sediment)
- Type 2 – rock filter dams, excavated sediment traps (limited management of fine sediment)
- Type 3 – sediment fence, inlet protection (coarse sediment management only)

3 OBJECTIVES AND THE STATE PLANNING POLICY

Best Practice Erosion and Sediment Control (IECA, 2025) and the *State Planning Policy* (DILGP, 2017) are closely aligned, however, the *State Planning Policy* (DILGP, 2017) defines a water quality criteria for sediment control measures which dictates the use of Type 1 sediment controls (sediment basins) for all sites exceeding 2,500m^2.

Appendix A, Table A of the *State Planning Policy* (DILGP, 2017) is provided below as Figure 1. Part 2 and 3 of Table A provides design events for temporary drainage structures and emergency spillways form sediment basins. These align with *Best Practice Erosion and Sediment Control* (IECA, 2025). A sediment control measure in accordance with the *State Planning Policy* (DILGP, 2017) is required to manage 80% of annual runoff volume to a Total Suspended Solids (TSS) concentration of 50mg/L or below. This approach is different to *Best Practice Erosion and Sediment Control* (IECA, 2025), however, a technical note *Sediment Management on Construction Sites – Complying with the SPP* (Water by Design, 2018) provides guidance on how to achieve the SPP requirement for Sediment Control. This includes five options:

1. High Efficiency Sediment Basin – Type A or Type B basin in accordance with *Best Practice Erosion and Sediment Control* (IECA, 2025)
2. Large Traditional Sediment Basin – 1200m^3 per hectare of Catchment for Caloundra
3. Total Capture – e.g. basement works or fully bunded works where no runoff can discharge from site
4. Alternative Innovative Measures
5. Erosion Control – typically used on small sites which cannot drain to a basin

Issue	Desired outcomes
Drainage control	1. Manage stormwater flows around or through areas of exposed soil to avoid contamination. 2. Manage sheet flows in order to avoid or minimise the generation of rill or gully erosion. 3. Provide stable concentrated flow paths to achieve the construction phase stormwater management design objectives for temporary drainage works (part 2). 4. Provide emergency spillways for sediment basins to achieve the construction phase stormwater management design objectives for emergency spillways on temporary sediment basins (part 3).
Erosion control	1. Stage clearing and construction works to minimise the area of exposed soil at any one time. 2. Effectively cover or stabilise exposed soils prior to predicted rainfall. 3. Prior to completion of works for the development, and prior to removal of sediment controls, all site surfaces must be effectively stabilised[13] using methods which will achieve effective short-term stabilisation.
Sediment control	1. Direct runoff from exposed site soils to sediment controls that are appropriate to the extent of disturbance and level of erosion risk. 2. All exposed areas greater than 2500 metres^2 must be provided with sediment controls which are designed, implemented and maintained to a standard which would achieve at least 80% of the average annual runoff volume of the contributing catchment treated (i.e. 80% hydrological effectiveness) to 50mg/L Total Suspended Solids (TSS) or less, and pH in the range (6.5–8.5).

Figure 1 – Table A *State Planning Policy* (DILGP, 2017)

4 PROPOSED MEASURES

Erosion , drainage and sediment control measures to be used on the Aura South development site will adhere to the *State Planning Policy* (DILGP, 2017) and the principles of *Best Practice Erosion and Sediment Control* (IECA, 2025). This will include drainage and erosion control measures defined in Section 2 and the use of either High Efficiency Sediment basins or Traditional Sediment basins sized and operated in accordance with Section 3.

Management Plans to be prepared in conjunction with the development are to adhere to the requirement of the *State Planning Policy* (DILGP, 2017) and the principles of *Best Practice Erosion and Sediment Control* (IECA, 2025). In addition, the following is to be undertaken:

- All Erosion and Sediment Control plans (ESCPs) to be certified by a Certified Professional in Erosion and Sediment Control (CPESC)
- Auditing of the site to be undertaken monthly by a CPESC including a corrective action register
- Real-time monitoring of outlet water quality for all High-Effficiency Sediment Basins

APPENDIX G – INFRASTRUCTURE MANAGEMENT PLAN – ENERGY & COMMUNICATIONS (CV SERVICES)

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08/08/2025

Revision – A

Aura South

Bells Creek Arterial, Coochin Creek

Infrastructure Management Plan – Energy & Communications

Quality ISO 9001 Environment ISO 14001 OHS ISO 45001

CV Infrastructure Services Pty Ltd ABN 87 135 850 985
148 Hedley Avenue, Hendra QLD 4011 | PO Box 3260, Hendra QLD 4011
Ph: (07) 3622 4333 | Fax: (07) 3622 4334 | **www.cvsg.com.au**

1. Electricity Network

Electricity will be supplied to the site from the existing Energex network being developed in the Gagalba precinct via the installation of a cross-road conduit bank within Bells Creek Arterial. CV Services have been in contact with Energex regarding their requirements for supplying the site, and confirmation has been made that the existing Energex network is able to supply the site, with the Bells Creek substation currently under construction, able to supply the required load for the ultimate subdivision.

A full Energex electrical master plan will be completed in due course to assist Energex with planning their greater network capacity to ensure sufficient capacity remains available or new 11kv feeders installed in line with demand requirements through existing pathways in the Aura development or new pathway via Bells Creek Arterial.

The site has the ability to connect to either the existing 11kv feeder CLD1A (Feeder being extended as a part of and servicing Gagalba or CLD28A in initial phases of the development.

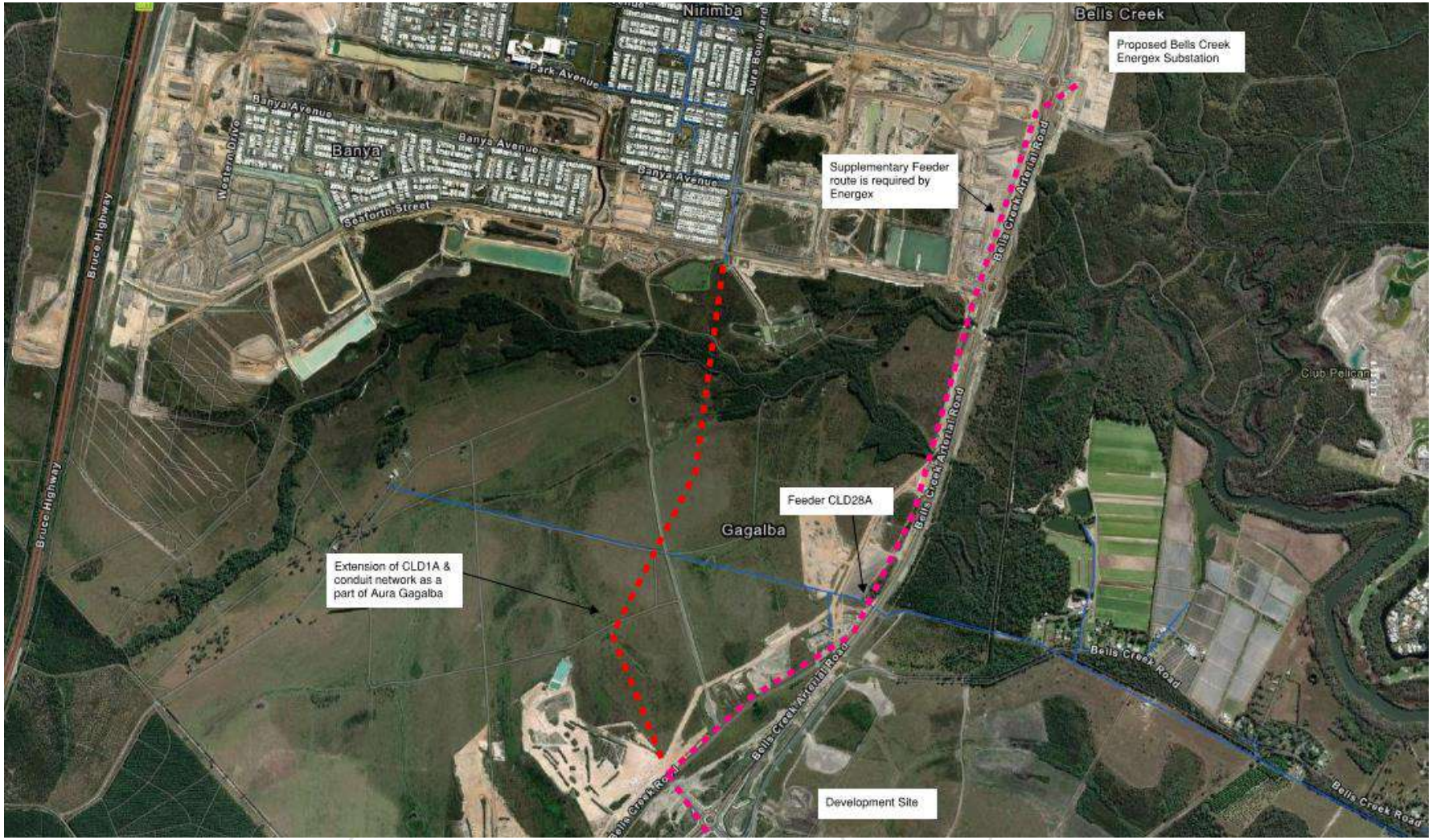
The proposed extension of the 11kV network will feed a series of 500kva Padmount Transformers (PMT's). The developer will be responsible for installing and dedicating the land that PMT's are located on as road reserve. 11kV Ring Main Units (RMU's) will also need to be installed to facilitate flexible switching of the Energex 11kV network.

Energy Usage and Supply

Energex specify the load requirements for residential properties (Currently 4.5kVA), which must be used when calculating the required electrical infrastructure. This allowance is based on many years of collected data and market trends and allows for peak energy usage. We have identified that approximately 80 PMTs will be required throughout the Site to supply the residential lots with low-voltage, three-phase electricity. The load on any high-density residential, commercial and retail areas will need to be considered on a case-by-case basis, and any additional infrastructure required for these will be designed and installed by Energex when required to meet the final electrical demands of these sites.

Conduits

The Developer will be responsible for providing underground conduits throughout the proposed road network for servicing the development and Energex's use. The configuration of the 11kV conduit banks will be generally in accordance with Energex's supply and planning manual. Low-voltage and street lighting conduits will be installed as required.



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Quality ISO 9001 Environment ISO 14001 OHS ISO 45001

2. Communications

The telecommunications network is proposed to be supplied by NBN Co, with the development located within NBN's development footprint.

NBN's fibre-ready pit and pipe network will be provided by the developer, with design and construction to be provided by the electrical designer when appointed in accordance with the staged delivery of the development.

In accordance with standard procedure, NBN will provide a fibre to the premise network at a fixed per lot. NBN has yet to fully investigate if any backhaul charges would apply to this development but has indicated that a backhaul charge will not be applicable for this precinct.

The NBN pit and pipe network will be installed in a joint-use trench arrangement with the Energex network where possible.

There will be an existing NBN pit and pipe network within Bells Creek Arterial Road, which is being installed as part of the Gagalba phase of the Aura development. This infrastructure can be utilised to facilitate the connection of this development.

