CM13.6. Australia Park - Car Park & Levee Construction - Contract 25/01164

DATE	10 September 2025	**FIL REFERENCE**	FIL25/01164
CONFIDENTIAL	No		
FURTHER ENQUIRIES	Andrew Lawson (City Projects) David Costello (City Landscapes)	**PHONE**	6023 8111
AUTHOR	Clenisa Canafe		

Purpose of Report

To recommend to Council a preferred contractor for Contract No. 25/01164 - Australia Park Car Park and Levee Construction through a qualitative and quantitative assessment.

Background

Australia Park is located on the southern side of Ebden Street and west of Wodonga Place, adjacent to Oddies Creek Park and the historic Turks Head Building. It is the second riverside park approaching Albury from the NSW/Victorian border and is an important gateway to the public parkland areas adjoining the Murray River.

At present, access to the Oddies Creek Park gravel car park is via a one-way vehicle bridge with no pedestrian access. With the proposed construction of the splash park in Oddies Creek Park, visitation is expected to significantly increase during peak periods, therefore formalising car parking and improving pedestrian connections is required to meet the expected visitation demands. This project will also address the car park demands for the adjacent facilities within the wider riverside park's precinct.

The levee element of the project will provide increased flood protection to the city, with overall amenity improved for visitors through the provision of connecting pathways, linking the pedestrian bridge from Australia Park to Oddies Creek Park, a new picnic shelter, an upgraded section of Ebden Street, extensive landscaping and tree planting, lighting and associated upgrades to the water and wastewater network.

The Australia Park Car Park and Levee Construction project is being delivered by AlburyCity in partnership with the NSW Government, under the Regional Growth Environment and Tourism Fund. The project is part of a wider range of projects identified within the Murray River Experience Master Plan that seek to improve our connection with the Murray River.

Since the initial endorsement (2017), this project, which included 80 car spaces, had progressed through detailed design and completion of relevant due diligence and approvals and subsequently was released for tenders in October 2023. A report was presented to Council on 27 November 2023 seeking to award the contract. At this Council meeting, Council resolved not to accept any of the tender submissions and to place the Australia Park Car Park and Levee Construction concept on public exhibition prior to recommencing the tender process for construction.

Following the above Council resolution, the public exhibition of the Australia Park proposed improvements commenced on 20 June 2024 and concluded on 22 July 2024. The feedback received through the public exhibition process was presented to Council at the Council meeting held on 9 December 2024. At this meeting, the Council resolution outlined the following design amendments prior to recommencing the tender process with a view to awarding a contract for the Australia Park Car Park, Pedestrian Bridge and Levee Bank Upgrade project:

- include a maximum of 65 car spaces with four disabled spaces in Australia Park; and
- include a lighter coloured coating to the car park to reduce the heat sink effect.

The resolution also stated that following the construction phase, to identify and progress additional tree planting opportunities that would not encroach or impact the integrity of the levee bank.

Consequently, the design set and Review of Environmental Factors (REF) were amended to satisfy the above resolution of Council, prior to releasing a new tender for the project.

Procurement Objectives

The objectives of this procurement activity are strategic in nature. The planned outcomes seek to address the following considerations that align to the themes within AlburyCity's Community Strategic Plan – *Towards Albury 2050*;

- **Social Impact**

  Towards Albury 2050, A Growing Sustainable Economy, Outcome 1.1 Albury is a vibrant city, providing high-quality sustainable infrastructure, industry–leading services and amenities.

  Strategic Actions:
  1.2.1 Effectively plan, upgrade, and maintain our network of roads, bridges, cycleways, footpaths, walkways, and street lighting.
  1.3.1 Create and support authentic and engaging visitor experience.
  1.3.3 Build and maintain partnerships to attract visitation to our region and increase the diversity in attractions, events and facilities for our community and visitors.'

  Towards Albury 2050, A Caring Community, Outcome 3.4 Albury is inclusive, and accessible for all ages and abilities.

  Strategic Action:
  3.4.1 Plan and develop infrastructure that is accessible for all.

  The project will increase flood protection to the city, improve car parking capacity and accessibility, and overall amenity for visitors to the riverside parks.

- **Economic Impact**

  The improved amenity to the riverside parks will enhance the regional attractions for families and tourist in Albury. Additionally, the construction has the potential to generate employment and training opportunities, resulting in positive economic benefits for the local businesses.

- **Environmental Impact**

  Towards Albury 2050, An Enhanced Natural Environment, Outcome 2.4 Albury responsibly protects, conserves and enhances our natural assets.

  Strategic Action:
  2.4.3 Provide open spaces, parklands and improve access to our natural surroundings.

  A detailed Arboriculture Impact Assessment Report (Appendix D contained within Attachment 3 – Review of Environmental Factors (REF) Report) has been prepared outlining tree impacts anticipated by the project including the direct removal of 21 trees, which includes 17 planted exotic trees and 4 young River Red Gum trees. Under Part 5 of the Environmental Planning & Assessment Act 1979, it has been concluded that the environmental impact of the project is not likely to be significant, with Tests of Significance indicating that the project is unlikely to significantly affect threatened species or their habitats. The landscaping of the new car park and levee bank will include 18 mature trees (Lemon Scented Gums and Illawarra Flame Trees), and 2,126 understorey plantings. This will be complemented by additional revegetation of Oddies Creek that will include the planting of 70 native trees and 120 native shrubs, which exceeds the Albury Development Control Plan 2010 (Albury DCP 2010) compensatory planting requirement of 20 trees. The reestablishment of the existing gravel car park area will also increase the availability of green open space in the area. Additionally, the surface of the new carpark will be painted with heat reduction coating designed to lower surface temperature, therefore, reducing the heat sink effect associated with conventional asphalt surface.

- **Civic leadership Impact**

  Towards Albury 2050, A Leading Community

  Strategic Actions:
  4.2 Our communities voice is considered in decision making.
  4.2.1 Effectively engage the community on decisions that affect them.

  A Stakeholder Engagement Plan, which was been prepared to provide the community the opportunity to comment on the Australia Park improvements was endorsed by Council at the Council meeting held on 26 February 2024. Following Council endorsement, the project was placed on public exhibition, which commenced on 20 June 2024 and concluded on 22 July 2024. The feedback to the proposed improvements received through the public exhibition process was presented to Council at the Council meeting held on 9 December 2024 and was endorsed to progress to open tender for construction.

  This project is also supported by Council and the community through the provision of funding within the Four-Year Delivery Program 2025-2029.

Scope

The scope of the works and/or specification included in this contract is summarised below:

- realignment and upgrade of the South Albury levee bank;
- construction of a 65 - space car park (inclusive of four accessible parking), painted with heat reduction coating;
- reconstruction of Ebden Street, between Wodonga Place and the western turning area;
- landscaping, picnic shelter, tree planting and linking pathways;
- pedestrian bridge linking Oddies Creek Park and Australia Park;
- decommissioning and rehabilitation of old gravel car park;
- new service vehicle creek crossing; and
- associated water, sewer, and electrical works.

Invitation to Tender

Tenders were invited by Council for Contract No. 25/01164 Australia Park Car Park and Levee Construction and advertised in the Border Mail, Sydney Morning Herald and on Tenderlink. Tenders closed at 12 noon on 31 July 2025.

The contract duration was initially estimated at between 40-44 weeks, with scheduled completion in the 2026/27 financial year.

Relevant documentation provided is attached for information (see Attachments 1, 2 and 3).

Tender Close

At the close of tenders, submissions were received from the following companies in alphabetical order:

- Excell Gray Bruni Pty Ltd (Wodonga, VIC); and
- Naubro Kerb Pty Ltd (Albury, NSW).

All tenders were received and evaluated in accordance with the local government legislation of NSW, and Council's Social and Sustainable Procurement Policy and Guidelines.

The assessment panel for the tender comprised of Team Leader Project Delivery - Miguel de Oliveira, Project Officer - Ben Hooper, Sourcing Coordinator - Matt de Freitas, Senior Design Engineer - Alan Rodgers and Senior Project Engineer - Clenisa Canafe.

Conformity Check

A conformity assessment was undertaken to ensure all submissions received were in accordance with the contract documentation and specification.

Company	Schedules returned with supporting information	WHS & Insurance Documentation accepted	Conformity Status
Excell Gray Bruni Pty Ltd	Yes	Yes	Conforming
Naubro Kerb Pty Ltd	Yes	Yes	Conforming

As indicated above, all submissions were assessed as conforming tenders, and all companies are WHS registered with AlburyCity.

Qualitative Assessment (Non-price aspects)

A qualitative assessment considered a range of criterion including:

- **Experience** – relevant experience in performing same or similar projects; developing experience including research and innovation.
- **Methodology/program of work** – work methods, project/scope understanding, proposed product, program and timeline.
- **Capacity** – availability of resources, current and future commitments and workload.
- **Capability** – skills, specialisation, certification, business systems to deliver required goods/services/works, contract management capabilities; and
- **Benefit to the region and Australian manufacturing** – local impact on social, economic and community outcomes to benefit the Albury/Wodonga region and Australian producers.

Company	Experience (30%)	Methodology/ Program (30%)	Capacity (20%)	Capability (10%)	Local Benefit (10%)	Total (100%)
Excell Gray Bruni Pty Ltd	29	26	19	10	8	92
Naubro Kerb Pty Ltd	20	23	12	6	8	69

Excell Gray Bruni Pty Ltd is a locally based company (Wodonga, VIC) and has extensive experience across a wide range of civil infrastructure projects for public and private sector clients.

Their current work commitments include WPS05 Pipework and Valve Upgrade for AlburyCity (anticipated completion September 2025), Murray Park Estate for EDM Group (anticipated completion December 2025) and projects for Albury Race Club (anticipated completion September 2025) and Wilson Transformer Company (anticipated completion January 2025).

Notable projects the company have completed for AlburyCity include the Albury Riverside Precinct, Ernest Grant Park, the Thurgoona Drive and Evesham Place Intersection Upgrade and the Centaur Road Reconstruction. Excell Gray Bruni Pty Ltd demonstrated exceptional performance in the delivery of these projects.

Excell Gray Bruni Pty Ltd submitted a program with the shortest works duration of only 21 weeks for on-site activities, with completion due by mid-March 2026. This timeframe is considered optimistic with no allowance for standard delivery program risks such as inclement weather or weather-related

events and latent conditions. Their submitted construction methodology demonstrated a solid understanding of the scope of work. A draft Construction Environmental Management Plan, which will be revised relevant to the specific tasks if their tender is successful was included within their submission as well as the company's Environmental Policy Statement and Environmental Management System Procedure.

The company's submission addresses AlburyCity's procurement objectives, specifically *"Towards Albury 2050, A Growing Sustainable Economy",* through their provision for project planning, sequencing and coordination, by utilising their experienced resources and equipment necessary to build high-quality infrastructure. Additionally, they have indicated that they understand the importance of constructing the levee bank in a timely manner and the implication of inclement weather during construction of this element.

Excell Gray Bruni Pty Ltd nominated that 100% of materials, specialist plant and equipment, labour and subcontractors will be sourced in the region with the majority of project activities to be completed utilising the company's direct employees. The company also listed several community groups, sporting groups and events which they sponsor. They have also indicated that this procurement activity will provide them the opportunity for skill and technology transfer to local individuals through ongoing training of their recently engaged Cadet Engineer who will be involved in this project.

Referee information suggests that Excell Gray Bruni Pty Ltd has demonstrated excellent time management, achieved key project milestones, is well resourced, and delivered quality outcomes.

Additionally, the external financial capacity assessment indicated that Excell Gray Bruni Pty Ltd has a strong financial capacity to undertake this contract.

Naubro Kerb Pty Ltd is a locally owned company (Albury, NSW), specialising in kerb and gutter construction and general concreting works. They have extensive history completing concrete based works for private and public sectors, including AlburyCity and Transport for NSW (TfNSW).

Their current commitments include Supply & Installation of Kerb & Channels (Gutters), Larras Lee Rehabilitation & Safety Works on the Mitchell Highway (anticipated completion September 2025), and Concrete Supply & Placement of No-Fines Pads and Kerb on the Oxley Highway at Mount Seaview (anticipated completion November 2025) for TfNSW and Construction of MR319 Culverts Widening for Hay Shire Council (anticipated completion September 2025). Additionally, Naubro Kerb Pty Ltd have recently been awarded by AlburyCity the contract for the Lavington Drainage Reconstruction - Boronia Street to Railway Line (anticipated completion December 2025).

AlburyCity's experience with Naubro Kerb Pty Ltd relates to the delivery of various footpath and concrete projects, including the Urana Road Footpath project, Union Road (east) Pedestrian Facilities Project, and Wagirra Trail concrete works. Outcomes were highly regarded, however, having not completed a contract of this scale, the extent of their experience, capacity and capability in delivering a project of this type could not be demonstrated and they were scored lower for these reasons.

Naubro Kerb Pty Ltd submitted a program of 24 weeks for on-site activities with anticipated completion in early April 2026, however, minor inconsistency with project activity sequencing was

noted in their submission. The methodology demonstrated understanding of the project requirements. They have also included in their submission the company's Environmental Management Plan and ISO Certification for Management System.

Naubro Kerb Pty Ltd submission addresses AlburyCity's procurement objectives, specifically "*Towards Albury 2050, A Growing Sustainable Economy*", through their management systems, which are aligned with international standards, ensuring compliance with customer and regulatory requirements, necessary to deliver high-quality infrastructure.

The submission provided by Naubro Kerb Pty Ltd indicated that, should they be awarded this contract, 70-90% materials, plant, and equipment and 80-100% labour would be sourced locally. The company also indicated that they provide sponsorships to a diverse range of sporting groups and community organisations.

Referee information suggests that Naubro Kerb Pty Ltd has demonstrated superior project management and cooperation level. Specific referee information relating to a project of this scale is limited.

The value of this contract is comparative to Naubro Kerb Pty Ltd's average annual revenue for the two years ended June 2024. An external financial capacity assessment indicated a marginal financial capacity to undertake the scope of works, given the contract value is a significant percentage of their recent annual revenue.

From the information provided, all companies demonstrate they have the required management systems, plant and equipment, and availability to provide AlburyCity with a quality product and the meet project objectives. The submission from Naubro Kerb Pty Ltd, however, presents a higher risk regarding demonstrated financial capacity and lower demonstrated experience to undertake a project of this type and scale.

Quantitative Assessment (Pricing)

The contract was issued seeking a project lump sum tendered by suppliers to complete the project.

The tendered prices and ratings relative to the lowest price are tabulated below.

Company	**Contract Value (incl GST)**	**Rating (100)**
Excell Gray Bruni Pty Ltd	$3,755,316.47	100
Naubro Kerb Pty Ltd	$4,049,909.27	93

The budget allocation for the project is $4.4M (including GST), which is phased between FY2025-26 and FY2026-27, with all submissions being within the allocated budget.

As detailed above, the submission from Excell Gray Bruni Pty Ltd was the most favourable from a cost perspective, being $295K (8%) more favourable than that from Naubro Kerb Pty Ltd.

Risk

- **Business Risk** – Financial risks are possible, most likely associated with scope creep or latent conditions as a result of subsurface conditions differing from those anticipated. However, these risks have been minimised through a clearly defined scope of works and extensive investigations during the design phase of this project.

  Additionally, the budget for this project is phased between FY2025-26 and FY2026-27 with cashflow initially based on a 40-44 week contract period. Submissions indicated a construction period of between 21-24 weeks, therefore, the estimated completion of on ground works could be completed by mid-March to early-April 2026 (subject to commencement date and favorable weather conditions). If the project progresses in accordance with the tender submissions, the FY2025-26 allocation would not align with the cash flow to complete this project and will require ~$900K to be brought forward from FY2026-27. Once the construction contract is awarded and timelines/cashflow are known, it is proposed that the FY2025/26 allocation shortfall be accommodated through adjustment in a future Quarterly Budget Review, using underspend from other capital projects that are not anticipated to meet project milestones in this financial year as planned.

- **Corporate Risk** – Corporate risks are possible, primarily associated with disruptions to the surrounding facilities and closure of access to Noreuil Parade via Ebden Street, however access will remain via Hovell Street. Parking in the precinct will be impacted due to the removal of car parking spaces during construction; however, parking will be maintained on Noreuil Parade and on-street adjacent to the precinct to support visitation. Any delays during construction will prolong the inevitable impact to parking and facilities in the precinct, potentially impacting the AlburyCity brand. Information will be provided to the public by our normal channels regarding the construction impacts to raise awareness and minimise corporate risk.

- **WHS and Public Risk** – WHS risks due to construction works will be controlled in accordance with AlburyCity procedures. The contractor will be WHS registered by AlburyCity and will be required to implement relevant Safe Work Method Statements and safety inspections.

- **Environmental Risk** – A Review of Environmental Factors (REF) and associated investigations have been undertaken and approved to identify any environmental risks and suitable measures to mitigate them (Attachment 3). The contractor will be required to implement extensive mitigation requirements to reduce the environmental risks inclusive of environmental control plans addressing environmental controls to be implemented. In addition, the contractor will be required to engage a qualified ecologist to supervise sensitive components of the works, and a qualified arborist to manage the removal of required vegetation.

- **Delivery Program Risk** – Standard delivery program risks are possible, such as delays due to inclement weather or weather-related events (ie. high river levels), delays due to latent conditions and contractor-caused delays. The construction of the levee bank should be in a timely manner considering the impact of inclement weather on the site, which is adjacent to, over, in, or would be potentially under, varying water levels.

Engagement

Community consultation relating to this project was initially undertaken in 2017 with many respondents supportive of plans to further improve facilities, parking and pedestrian connectivity between Australia Park, Oddies Creek Park and the other riverside park areas. The community response was presented to Council and was subsequently endorsed in August 2017.

Since the initial endorsement, the project has progressed with detailed design and completion of relevant due diligence and approvals, and subsequently was released for tenders in October 2023, with a report presented to Council on 27 November 2023 seeking to award the contract. At this Council meeting, Council resolved not to accept any of the tender submissions and to place the Australia Park Car Park and Levee Construction concept on public exhibition prior to recommencing the tender process for construction.

Following Council's resolution, a Stakeholder Engagement Plan was prepared to provide the community the opportunity to comment on the Australia Park improvements which was subsequently presented and endorsed by Council at the Council meeting held on 26 February 2024. The project was then placed on public exhibition for 33 days which commenced on 20 June 2024 and concluded on 22 July 2024.

The feedback received through the public exhibition process was presented to Council at the Council meeting held on 9 December 2024. In summary, there was significant support for several of the proposed improvements such as increasing the amount of native vegetation along Oddies Creek, installation of a new pedestrian bridge and upgrade of the levee bank. Additionally, there were slightly more respondents that were 'supportive' as opposed to 'not supportive' to the proposed construction of car park within Australia Park. It was identified that the additional spaces will address the need for more car parking, that is anticipated with the proposed construction of the Oddies Creek Park Splash Park and increasing visitation to the area. Key public concerns raised by the community such as environmental impact, heat sink effect, and loss of open space were also identified and were addressed through modifications to the initial concept design and revegetation plan. Considering the extensive community consultation and a range of design refinements to minimise environmental impacts and address community concerns, it was recommended to recommence the tender process for the project. At the same meeting, Council resolved to recommence the tender process with a view to awarding a contract for the Australia Park Car Park, Pedestrian Bridge and Levee Bank Upgrade project.

Additionally, this project is supported by Council and the community through the provision of funding within the Four-Year Delivery Program 2025-2029.

Summary

The scoring for the qualitative and quantitative assessment is summarised in the following table:

Company	Qualitative (Non-price Score)	Quantitative (Price Score)
Excell Gray Bruni Pty Ltd	92	100
Naubro Kerb Pty Ltd	69	93

From the qualitative assessment, all companies have the required management systems, experience, resources and availability to successfully undertake this project.

From a quantitative perspective the submission from Excell Gray Bruni Pty Ltd was assessed as being the most advantageous. Their submission was $295K (8%) more favourable than that of Naubro Kerb Pty Ltd.

Therefore, based on the qualitative and quantitative assessments, it is deemed that the submission from Excell Gray Bruni Pty Ltd provides the best value for Council to deliver this project.

The submission from Excell Gray Bruni Pty Ltd addresses Council's procurement objectives, specifically *"A Growing Sustainable Economy, Towards Albury 2050"*, through their provision for project planning, sequencing and coordination, by utilising their experienced resources and equipment necessary to build high-quality infrastructure.

Conclusion

Council invited tenders for the Australia Park Car Park and Levee Construction Contract and received two submissions.

The Australia Park Car Park and Levee Construction project is being delivered by AlburyCity, in partnership with the NSW Government, under the Regional Growth Environment and Tourism Fund. The project is part of a wider range of projects identified within the Murray River Experience Master Plan that seek to improve our connection with the Murray River.

This project will address the current and future demand for car park for the riverside parks, with visitation anticipated to increase with the proposed construction of the Oddies Creek Park Splash Park. Additionally, it will provide overall improved amenity for visitors through the provision of connecting pathways, a new picnic shelter, upgraded road, extensive landscaping and tree planting, street lighting and associated water and sewer network and increased flood protection to the city.

Having now undertaken extensive community consultation and incorporated a range of design refinements to reduce environmental impacts and address community concerns, it is now considered appropriate to award the contract and commence the construction phase for the proposed improvements at Australia Park.

A quantitative and qualitative assessment indicated that Excell Gray Bruni Pty Ltd was the most favourable submission. Their tendered price of $3,755,316.47 (including GST) is within the budget allocation of $4.4M (including GST), which is phased between FY2025/26 and FY2026/27.

To ensure adequate funding is available to complete the construction contract within FY2025-26 as indicated in the tender submissions, the split budget component identified within FY2026/27 may need to be brought forward, with adjustments to be accommodated as part of the future Quarterly Budget Review.

Recommendation

That Council:

a. pursuant to section 178 (1)(a) of the *Local Government (General) Regulation 2021* NSW, resolves to accept the tender from Excell Gray Bruni Pty Ltd and awards the contract for 24/01164 Australia Park Car Park and Levee Construction, for the tendered lump sum price of $3,755,316.47 (including GST).

b. endorse a budget allocation to be brought forward from the FY2026/27 allocation to cover the ~$900K shortfall, should the project progress in accordance with the tender submissions and be completed this FY2025/26, an adjustment being accommodated at the future Quarterly Budget Review, considering other project timing/scheduling as required.

Attachments

1. Australia Park Car Park and Levee Construction Locality Plan (DOC23/418545).
2. Australia Park Car Park and Levee Construction General Arrangement Plan (DOC25/213737).
3. Australia Park Car Park and Levee Construction Review of Environmental Factors Report (REF) with Appendices – Amended May 2025 (DOC25/137360).

Australia Park Car Park & Levee Construction - Locality Plan



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Metres 50 100 150 200

MAP GRID AUSTRALIA, ZONE 55
TRANSVERSE MERCATOR PROJECTION
HORIZONTAL DATUM: GEODETIC DATUM AUSTRALIA 1994
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM 1972

SCALE:	1:2500 @ A4P
GENERATED BY:	Kyal.Sharpe
DATE:	Nov 14, 2023, 12:10 PM

AlburyCity

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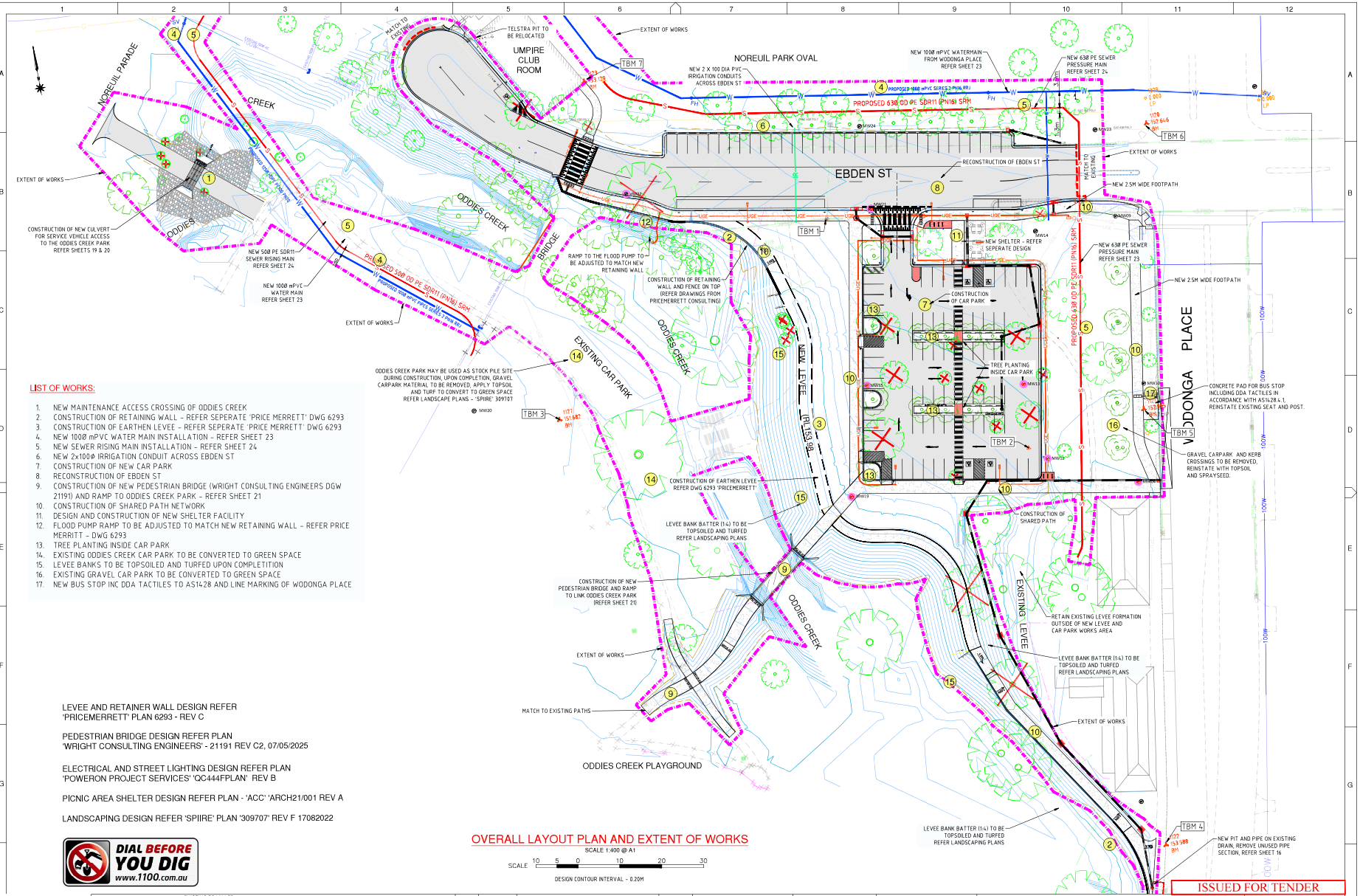

LIST OF WORKS:

1. NEW MAINTENANCE ACCESS CROSSING OF ODDIES CREEK
2. CONSTRUCTION OF RETAINING WALL - REFER SEPERATE 'PRICE MERRETT' DWG 6293
3. CONSTRUCTION OF EARTHEN LEVEE - REFER SEPERATE 'PRICE MERRETT' DWG 6293
4. NEW 1000 mPVC WATER MAIN INSTALLATION - REFER SHEET 23
5. NEW SEWER RISING MAIN INSTALLATION - REFER SHEET 24
6. NEW 2x100ø IRRIGATION CONDUIT ACROSS EBDEN ST
7. CONSTRUCTION OF NEW CAR PARK
8. RECONSTRUCTION OF EBDEN ST
9. CONSTRUCTION OF NEW PEDESTRIAN BRIDGE (WRIGHT CONSULTING ENGINEERS DGW 21191) AND RAMP TO ODDIES CREEK PARK - REFER SHEET 21
10. CONSTRUCTION OF SHARED PATH NETWORK
11. DESIGN AND CONSTRUCTION OF NEW SHELTER FACILITY
12. FLOOD PUMP RAMP TO BE ADJUSTED TO MATCH NEW RETAINING WALL - REFER PRICE MERRITT - DWG 6293
13. TREE PLANTING INSIDE CAR PARK
14. EXISTING ODDIES CREEK CAR PARK TO BE CONVERTED TO GREEN SPACE
15. LEVEE BANKS TO BE TOPSOILED AND TURFED UPON COMPLETITION
16. EXISTING GRAVEL CAR PARK TO BE CONVERTED TO GREEN SPACE
17. NEW BUS STOP INC DDA TACTILES TO AS1428 AND LINE MARKING OF WODONGA PLACE

LEVEE AND RETAINER WALL DESIGN REFER 'PRICEMERRETT' PLAN 6293 - REV C

PEDESTRIAN BRIDGE DESIGN REFER PLAN 'WRIGHT CONSULTING ENGINEERS' - 21191 REV C2, 07/05/2025

ELECTRICAL AND STREET LIGHTING DESIGN REFER PLAN 'POWERON PROJECT SERVICES' 'QC444FPLAN' REV B

PICNIC AREA SHELTER DESIGN REFER PLAN - 'ACC' 'ARCH21/001 REV A

LANDSCAPING DESIGN REFER 'SPIIRE' PLAN '309707' REV F 17082022

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OVERALL LAYOUT PLAN AND EXTENT OF WORKS

SCALE 1:400 @ A1

SCALE 10 5 0 10 20 30

DESIGN CONTOUR INTERVAL - 0.20M

ISSUED FOR TENDER

AlburyCity

LEGEND					
TOP OF BANK	EXISTING DRAINAGE	EXISTING TREES	EXISTING JUNCTION PIT		
BANK BOTTOM	PROPOSED DRAINAGE	TREES TO REMOVE	EXISTING SAG PIT		
EXISTING KERB	PROPOSED KERB & GUTTER	NEW TREES TO PLANT	EXISTING SIDE ENTRY PIT		
CONCRETE EDGE	PROP LEVEE ALIGNMENT	LIGHT POLE	EXISTING GRATED PIT		
BITUMEN - EDGE	CONCRETE EDGE	LIGHT TO REMOVE	PROPOSED DGGP		
EDGE OF PATH	EXISTING WATER MAIN	HYDRANT/SV	PROPOSED JUNCTION PIT		
FENCE	PROP IRRIGATION COND	BP MONITORING WELL - REMAIN	REMOVE		
	PROPOSED WATER MAIN				

REV	DATE	AMENDMENTS	INT.
H	20/05/2025	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	30/04/2025	REVISED - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1: 400
SHEET	A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN
APPROVED ... / ... / ... TEAM LEADER - DESIGN
APPROVED ... / ... / ... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
PROPOSED WORKS

LEDGER No. 3764.5015

REV.	No. of Sheets	Sheet No.
H	28	03

DRAWING NUMBER ENG21/357

Project:

Australia Park car park, pedestrian bridge and levee bank reconstruction

Review of Environmental Factors (REF)

Date: 07 August 2023

This format is the AlburyCity standard template for preparing a Review of Environmental Factors (REF) for activities undertaken in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979 (*EP&A Act). AlburyCity staff preparing the REF template should refer to the *Guidelines for preparing a Review of Environmental Factors* and discuss project requirements with the Environmental Planner.

This document was adapted from the REF template developed by Eco Logical Australia for local councils in NSW as part of the Local Government NSW (LGNSW) Council Roadside Reserve Project (CRR). The CRR project is funded by the NSW Environmental Trust to build the capacity of councils and to improve the management of roadside environmental values in NSW.

Summary Note
Australia Park car park, pedestrian bridge and levee bank reconstruction
Review of Environmental Factors (REF)

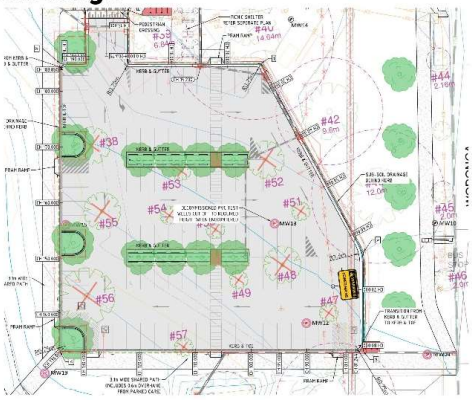
This Review of Environmental Factors (REF) was determined based on designs (Civil designs REV G) for an 80 space carpark along with other elements identified in the proposed work (pages 3-4) of the REF and associated attachments. Following, a community engagement process Council resolved to reduce the number of car spaces from 80 to 65 and include lighter coloured coating to the car park to reduce the heat sink effect.

A redesign process has been undertaken (Civil designs REV H) which has resulted in a reduction of car park area and an overall net increase in green space. The redesign enables one additional tree to be retained (tree no. 43- Tree protection zone (TPZ) encroachment from 15% to 0%) however there has been a minor increase in TPZ encroachment of tree no 42 (11% to 17%) and tree no. 40 (23% to 28%).

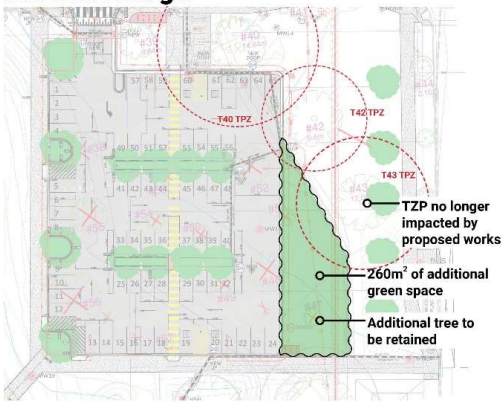
A summary of the changes to the civil designs are listed below

Australia Park Carpark Design changes: Environmental impact overview

Initial Design



Revised Design



ACC Arborist advice to minimise disturbance of affected trees:

- Pre-start meeting to take place to discuss the items below with the relevant personnel
- Hydro excavation for the outer edge of the car park excavation from the southern drip line of the lemon scented gum to the further most drip line on the Elm tree -hold point to inspect
- AQF level 5 arborist to be engaged to be on site whilst the hyrdo works are undertaken (at others cost). Should any roots larger than 50mm be located AlburyCity Arborist to be contacted
- Under boring to be undertaken for the electrical conduit from the southernmost edge of the lemon scented drip line to the further most drip line on the Elm tree
- Celtis to be retained, any roots located larger than 50mm located I am to be contacted
- Temporary fencing to be erected and maintained around all trees to be retained according to AS4970.2009- Protection of trees on development sites - hold point to inspect

Changes to TPZ incursion with revised design

Tree	New m2	%	Old m2	%
#40	188	28%	152	23%
#42	48	17%	31	11%
#43	0	0	68	15%
Total	236m2		251m2	

Following project completion, other opportunities for tree planting will be considered in this area

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In addition, the landscape plan has been amended to reflect the reduced carpark area while the pedestrian bridge designs have been updated from revision C1 to C2 to address some anomalies between the engineering civil designs and pedestrian bridge designs.

Discussion with the Environment Team was undertaken with agreement that the environmental impacts of the revised carpark design were less than identified in the determined REF therefore the content of the REF were not updated except for the following:

- This Summary Note added to the front of the determined REF;
- Inclusion of note 2 on the cover of the Arboricultural impact Assessment Report indicating the changes to the status of trees due to the redesign; and
- The addition of Appendix I with Environmental Team approval that the project can proceed without further assessment in accordance with s.5.4 of the EP&A Act.

REF prepared by: Name: David Armstrong Title: Team Leader Parks & Recreation Phone: 02 6023 8706	Signature: Date: 28/5/2025

Determiner Declaration & Approval

I certify that I have reviewed and endorsed the contents of this REF document and, to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under Clause 170 of the EP&A Regulation, and the information it contains is neither false nor misleading. The project can proceed, subject to the controls outlined in this REF and the conditions listed in Section 8 and Appendix I.

Name: David Costello Title: Service Leader City Landscapes Phone: 02 6023 8133	Signature: Date: 29/05/2025

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Abbreviations

Abbreviation	Description
ACHA	Aboriginal Cultural Heritage Assessment
AHIMS	Aboriginal Heritage Information Management System
AoS	Assessment of Significance (FM Act)
BC Act	*Biodiversity Conservation Act 2016*
CEMP	Construction Environmental Management Plan
DPIE	Department of Planning, Industry and Environment
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPBC	*Environment Protection and Biodiversity Conservation Act 1999*
ESCP	Erosion and sediment control plan
FM Act	*Fisheries Management Act 1994*
FFMP	Grey-headed Flying-fox Management Plan
GHFF	Grey-headed Flying-fox
LEP	Local Environmental Plan
MNES	Matters of National Environmental Significance
MREP	*Murray Regional Environmental Plan No. 2*
NPW Act	*National Parks and Wildlife Act 1974*
OEH	Office of Environment and Heritage
POEO	*Protection of the Environment Operations Act 1997*
PCT	Plant Community Type
REF	Review of Environmental Factors
SEPP	State Environmental Planning Policy
SoHI	Statement of Heritage Impact
ToS	Test of Significance (BC Act)
TPZ	Tree Protection Zone

Section 1

1 Introduction

This environmental assessment and determination of the project has been undertaken in accordance with Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). For this project, Albury City Council (AlburyCity) is both a public authority proponent (EP&A Act s.4) and the determining authority (EP&A Act s.5.1). This REF has been prepared in accordance with Clause 228 of the EP&A Regulation (2000).

1.1 Project Description and Background

Table 1: Project Details

Project Name	**Australia Park car park, pedestrian bridge and levee bank reconstruction**
Project Manager *(include contact details)*	David Armstrong - Project Lead David Costello – Project Sponsor Alan Rodgers - Design Engineer Kyal Sharpe – Project Engineer
Description of work to be undertaken including construction methods and ancillary works *(Include pre-construction activities, site set up, construction works, new access tracks, stockpiles, lay-down areas, and post-construction activities or operational phase)*	Australia Park is located to the southern side of Ebden Street and west of Wodonga Place, approximately 900 metres south west of the Albury central business district (CBD). Australia Park is the first riverside park accessed after the northbound crossing of the NSW/Victoria border, and is an important gateway to the public parkland areas adjoining the Murray River. AlburyCity proposes to relocate and upgrade the existing levee bank and develop additional and formalised car parking facilities in conjunction with a new pedestrian bridge across Oddies Creek to connect to the Oddies Creek play space. These three individual projects are proposed to be constructed within the same area, and consequently they have been planned concurrently to ensure alignment and design consistency. The project objectives include: • Improve car parking capacity in the area to give effect to a 2017 Council resolution that sought to create additional permanent car parking spaces (100) and identify additional overflow parking spaces (77) in the precinct. • Improve pedestrian safety in the area by separating motor vehicles from pedestrians and the Oddies Creek Park children's playground. • Improve the visitor experience through the replacement of public BBQ, overhead shelter, picnic and seating facilities. • Tree planting and landscaping of car park and levee bank. • Reconstruct the existing levee bank to meet the 1% AEP flood and freeboard requirements to provide flood protection to the city and to optimise the use of space in conjunction with the proposed car park and surrounding parkland.

- Revegetate and rehabilitate the riparian areas along Oddies Creek, subject to the development of an approved revegetation plan that has been included as a condition of this REF.
- Removing the gravel car park from the flood plain and managing vehicle access to limit erosion into the river.
- Landscaping and rehabilitation of two existing carparks that will revert back to open space.
- Deliver on the direction of a number of AlburyCity Strategic Plans including the Murray River Experience Master Plan, Albury Riverside Precinct Stage 2 Refined Concept Design, and the Floodplain Risk Management Strategy and Plan.

The projects are consistent with a number themes and actions in Towards Albury 2050 including:

A Growing Sustainable Economy

- 1.2 Albury has an accessible, integrated transport network that connects our city through safe and efficient travel options.
- 1.3 Albury will offer diverse and innovative experiences to attract new and repeat visitation

An Enhanced Natural Environment

- 2.4 Albury is a recognised leader in the conservation and management of our natural resources
- 2.4.3 Acknowledge our connection to the natural environment by providing opportunities for the community to connect and respectfully enjoy our natural environment.

The proposed works include:

- Construction of a new sealed 80 space (77 car space with three Disability Discrimination Act (DDA) compliant spaces) carpark to the south of Ebden Street in Australia Park. (2716 sq.m)
- Reconstruction and resealing of Ebden Street and adjoining car parks between the intersection with Wodonga Place and the Noreuil Park Oval Community room building.
- Demolition of existing BBQ facilities, seating, overhead shelter, and pathways within Australia Park.
- Direct removal of 22 trees including 18 planted exotic trees and four young River Red Gums (non hollow-bearing).
- Major encroachment (greater than 10%) upon the tree protection zones (TPZ's) of 51 trees including
    - Non-viable encroachment on 12 trees including two River Red Gum trees assumed to be a 'loss' (Note works around TPZs is to be monitored by a qualified arborist with trees to be retained where possible)
    - Viable encroachment on 39 trees including 18 River Red Gum trees and two non-endemic Eucalypts.

- Minor (viable) encroachment upon 10 TPZs including 6 River Red Gum trees.
- Construction of a new earthen levee bank on a new alignment closer to Oddies Creek, as well as a section of concrete retaining wall on the southern side of Ebden Street and north side of Wodonga Place, adjacent to the Turks Head Building.
- Construction of a new pedestrian bridge across Oddies Creek, linking the new Australia Park car park and the Oddies Creek Play Space.
- Installation of a new service vehicle culvert across Oddies Creek approximately 130 metres west of the site (service vehicle access via Noreuil Parade).
- Decommissioning of the existing vehicle bridge (195 sq.m), gravel service access road (302 sq.m) and Oddies Creek gravel carpark (1810 sq.m), which will be converted to additional green space adjacent Oddies Creek.
- Decommissioning of small gravel carpark (340 sq.m) adjacent to existing buildings on Wodonga Place, which will be converted to additional green space
- The installation of a new car park will be offset by the rehabilitation of two existing gravel car parks and associated hard stand areas. This would result in a minimal net loss of open space of approximately 67 sq.m. However, with the two landscaped areas in the car park (35.8 sq.m and 49.2 sq.m) there will be no effective net loss of open space.
- Landscaping of car park and levee bank, including 18 mature lemon scented gums and Illawarra Flame Trees and 2126 understorey plantings of various species.
- Installation of new BBQ and seating facilities, lighting and pedestrian pathways.
- Revegetation of grassed areas and the Oddies Creek riparian area with suitable locally native species, subject to preparation of an approved revegetation plan that is a condition of this REF.
- Installation of a new irrigation system for grassed areas.

The proposed works would be undertaken across an area of approximately 3 hectares (the project area). The project area is presented in Figure 1. Design drawings are presented in Appendix A.

- Car park designs
- Pedestrian bridge designs
- Levee bank designs
- Electrical Lighting Design

Construction of the project would involve the following:

- Establishment of temporary erosion and sediment control measures, as well as security fencing.
- Identification, marking and fencing of vegetation to be protected (Tree Protection Zones) and the boundary of the works area (No-Go Zones).

	• Installation of a new culvert, and lockable bollards on Oddies Creek to maintain service and emergency vehicle access to Oddies Creek Park from Noreuil Parade. • Site establishment and temporary site compound set up. • Exotic and native tree removal. • Earthworks to modify the existing levee bank and provide a flat site for the carpark. This will include the import of clay material for the core and 'key' of the levee bank. • Levee bank reconstruction, including retaining wall construction adjacent Ebden Street and the Turks Head Building. • Earthworks and reconstruction of Ebden Street. • Construction of hardstand areas. • Asphalt placement on Ebden Street and the new carpark. • Construction of a pedestrian bridge across Oddies Creek to provide access to the Oddies Creek Park from Australia Park. • Backfilling, shaping and topsoiling of disturbed areas. • Vegetation establishment and site restoration including grassed areas and planting of local native species in the riparian area (Plan to be finalised). • Landscaping of car park and levee bank, including 18 mature lemon scented gums and Illawarra Flame Trees and 2126 under plantings of various species. • Demobilisation of all site resources. Ground disturbing works in the vicinity of existing trees would be undertaken in conjunction with arborist advice and supervision. Ancillary temporary facilities such as the site compound, construction vehicle parking areas, and stockpile and equipment lay down areas would be established prior to construction commencing and would be removed following construction. Ancillary permanent works would include new underground water and sewer mains, irrigation system, lighting and power supply, stormwater collection and drainage, and reconstruction of the existing ramp servicing the flood pump adjacent Ebden Street.
Plant / vehicles to be used	Equipment anticipated to be required for the construction of the project includes: • Trucks • Excavators • Grader • Front end loader • Water cart • Concrete trucks • Concrete pump truck and/or line pump equipment • Light low loader semi-trailer for machinery transport • Rollers • Asphalt paver and associated plant • Light vehicles

	• Skid Steer / Positrack • Crane(s) • Franner • Hand tools Between two and five light vehicles would be required on a routine basis for the movement of site personnel, including contractors and AlburyCity staff. Between four and eight heavy vehicles would be present on-site at any point during the construction duration.
Construction commencement	It is anticipated that construction would commence in early 2024. The timing and implementation of construction works would be influenced by ground conditions and flood risk.
Work duration	Approximately 10 months (weather and river levels permitting).
Work hours	Work hours are to be in accordance with the *Interim Construction Noise Guidelines* (DECC 2009): • Monday to Friday 7.00 am to 6.00 pm • Saturday 8.00 am to 1.00 pm No work is proposed to be undertaken on Sunday or Public Holidays.

1.2 Project Location and Context

Table 2: Location details

Address	317 Wodonga Place, South Albury
Lot / DP	• Lot 1, DP 1094181 • Lot 2, DP1182825 • Lot 4111, DP 1087080 • Lot 4112, DP 1087080 • Lot 4120, DP 1087043 • Lot 1, DP 1087117 • Lot 2, DP 1087117 • Lot 3, DP 1087117 • Lot 4, DP 1087117 • Lot 5, DP 1087117 • Lot 6, DP 1087117 • Lot 7, DP 1087117 • Lot 8, DP 1087117 • Lot 9, DP 1087117 The location of these lots is shown in the image below. 
Land tenure	AlburyCity owned land
Zoning	RE1: Public Recreation

What is the surrounding land use? **(E.g. bushland, housing, farmland)**	The project area is situated within South Albury, NSW, and is located entirely on public land owned and managed by AlburyCity. Australia Park is bounded by Ebden Street and Noreuil Park to the north; Wodonga Place to the east and Oddies Creek to the south and west. Australia Park is a recreational area located within the riverside parklands of Albury. Carparking within Australia Park is limited to the areas adjoining Ebden Street. Australia Park also includes commercial businesses (health spa and a former art gallery / commercial building) fronting Wodonga Place. Australia Park is located adjacent to Oddies Creek Park, which contains a large children's playground, public amenities, barbeque and seating area, and an off-leash dog area. The surrounding area is primarily open space utilised for public recreation. The Murray River, of which Oddies Creek is a tributary, is located approximately 200 metres south west of the project area. There are numerous businesses to the east of the project on the eastern side of Wodonga Place. Business activities include a motel, caravan sales, a service station, furniture / joinery, and event hire. The Albury CBD is located approximately 900 metres north east of the project area. Photographs of the project area and existing conditions are presented in Figure 2.

1.2.1 Project Justification and Consideration of Alternatives

Table 3: Need for the project

Project objective/s	The project has tourism, amenity, public safety and environmental objectives. Australia Park is a gateway to the Albury riverside parkland precinct and forms a key component of the Murray River Experience Master Plan that was adopted by Council in 2007. This master plan seeks to strengthen the relationship between the community and the Murray River, provide greater access to the river, and improved amenities and diversity of experiences. Oddies Creek Playground currently attracts more than 120,000 visits per year, which is forecast to increase significantly in the future in response to further developments that are currently either underway (ie Riverside Precinct), and subject to future feasibility and design (ie Oddies Creek Park Splash Park). In early 2017, a proposal and a breakdown on proposed car parking spaces across the entire riverside precinct was presented to council (DOC17/35942), which the proposal including 100 additional spaces in Australia Park. This was subsequently presented to Council in June 2017 (DOC17/95200) and adopted. Community consultation was then initiated to gain community feedback in relation to the Draft Riverside Precinct Concept Plans through a 'Have your Say' process, with 562 residents participating. The community response was overwhelmingly positive with 91% of respondents supportive of plans to 'further improve facilities, parking and pedestrian connectivity

between Australia Park, Oddies Creek play space and the other riverside park areas'. This information was presented to Council in August 2017 (DOC17/168918) with project endorsement.

Australia Park has limited connectivity to Oddies Creek Play Space which is currently serviced by a gravel carpark and a single lane vehicle bridge with a five tonne limit. Businesses and facilities currently occupying the public parkland fronting Wodonga Place have limited access and parking adjacent to the road. To access the gravel car park adjacent to the buildings, vehicles are required to travel to Victoria, U-turn at the next break in the median strip and return back to NSW before they are able to turn into the carpark. Additional parking at the rear (to the west) of these buildings would provide opportunities for enhanced visitation and use. The existing gravel car park adjacent to Wodonga Place would be converted back to open space parkland.

The new car park would provide increased capacity for visitation not only to Oddies Creek Play space but also to Noreuil Park Oval which has limited available parking, particularly on weekends and during school holidays when the play space is at its busiest. Further to this the car park would cater for the large number of major events within the riverside parklands, and also service nearby facilities such as the Albury Pool, Tennis Centre, Flying Fruit Fly Circus, South Albury Playing fields and Gateway Island. The car park will also be of a capacity to ensure that any further tourist attraction facilities developed within the river precinct will be catered for. The new car park would improve safety for users through the separation of vehicles and pedestrians at Oddies Creek Park. Currently a single lane five tonne limited bridge provides vehicle access to the Oddies Creek Park Play Space from Ebden Street. This bridge is also used by pedestrians including children, particularly when the existing gravel car park in Oddies Creek Park has reached capacity and overflow parking is required in Ebden Street or beyond.

The existing BBQ and picnic facilities are aging. New facilities and landscaping would improve the amenity and functionality of the area.

To improve the broader environmental values of the area, it is proposed to undertake further revegetation of the riparian areas adjoining Oddies Creek with endemic flora, which would create habitat for a variety of fauna species, improve the ecological value of the area, and build on environmental weed removal activities previously undertaken.

Realignment and reconstruction of the flood levee is being undertaken as part of a larger design review and upgrade in South Albury. The new levee and retaining wall would be engineered and constructed to modern standards, to meet the 1% AEP flood requirements and improve the flood protection in this part of the city.

Alternatives considered	**Options considered** **1. 'Do nothing':** The 'Do nothing' option would involve no works within Australia Park, which is contrary to the feedback received from the community who are supportive of further activation, enhancement and beautification of the Central Riverside Park areas. The consequences of implementing this option could potentially include: • Lost opportunity to upgrade aging visitor facilities and improve amenity within Australia Park which is the gateway to the Murray River parkland area. • Lost opportunity to maximise the visitor experience in Australia Park and the wider Murray River parkland area, and to accommodate additional car parking spaces. • Ongoing risk of unsafe interactions between pedestrians and vehicles at the Oddies Creek Park. • Levee bank remains at current standard and elevation (with current risk of overtopping) **2. Upgrade Levee in existing location and not construct car park** The levee bank could be upgraded generally in its current location, which would involve raising the levee between approximately 0.6-0.8m. The works associated with increasing the levee height would impact the TPZ of ten trees (two native) which all are likely to be removed as they would pose a risk to the levee integrity. The upgrade of the levee alone will still impact on the parkland environment with just less than half the number of trees required to be removed compared to the preferred proposal. The consequences of this option could include: • Lost opportunity to upgrade aging visitor facilities and improve amenity within Australia Park which is the gateway to the Murray River parkland area. • Lost opportunity to maximise the visitor experience in Australia Park and the wider Murray River parkland area, and to accommodate additional car parking spaces. • Ongoing risk of unsafe interactions between pedestrians and vehicles at the Oddies Creek Park. **3. Upgrade Levee in existing location and construct modified car park** This alternative would see the upgrade of the levee in the existing location, as per the previous alternative and impacts, with the addition of a reduced car park (identified within initial concept plans) between the levee and Wodonga Place. In addition to the levee impacts this alternative has the potential to require the removal of a similar number of trees as the preferred alternative with reduced benefits and outcomes for the precinct and the community. During design investigations, this alternative demonstrated it would encroach on the TPZ's of a number of significant trees in the north-east corner of the

site, which have subsequently been retained in the preferred option due to their significant value and amenity.

The consequences of this option could include:

- Lost opportunity to provide greater value infrastructure with potentially similar impacts to the preferred option.
- Reduced benefit to the precinct and the community.
- Potentially require the retention of the existing car park in Oddies Creek to ensure sufficient car parking availability
- Lost opportunity to consolidate three separate car parking areas and return two existing car parks to green space with improved landscaping.
- Ongoing risk of unsafe interactions between pedestrians and vehicles at the Oddies Creek Park.

4. Various other alternative designs through an iterative design process with similar outcomes as per above

AlburyCity has progressively developed a range of alternative designs and potential layouts for the site with varying numbers of car parking spaces and BBQ / visitor facilities. These designs had a variable range of impacts on existing trees and green space depending on the specific layout and revision. On-site inspections, internal design and planning discussions assisted in design development, and included a decision to minimise impacts on native vegetation by modifying areas occupied by exotic vegetation.

There was a major realignment of the car park to accommodate mature Lemon-scented Gums *Eucalyptus citriodora* at the Corner of Ebden Street and Wodonga Place.

The levee bank which passes through the site introduces a range of constraints in terms of layout, elevation, flood protection and site accessibility.

5. Relocate Levee Bank and construct 80 space car park to the east of the levee

The proposed design is considered optimal in minimising environmental impact whilst still delivering the outcomes sought by the community to 'further improve facilities, parking and pedestrian connectivity between Australia Park, Oddies Creek play space and the other riverside park areas'. More specifically the benefits of this option provides for:

- Improved amenity and visitor experience
- Increased car parking capacity to give effect to the 2017 Council resolution and create an additional 100 car parking spaces.
- Levee upgrades to achieve greater levels of flood protection
- Reduction of impacts on native trees through design siting and construction techniques
- Consolidate three car parking areas into one, and return two existing gravel car parking areas to green space with additional tree planting and re-vegetation

	• Improves safety through the removal of unsafe interactions between pedestrians and vehicles at the Oddies Creek Park • Provide parking to meet the current and future needs of the riverside precinct, with an additional benefit to service various other closely located facilities, and will help meet parking demand on weekends, school holidays and during major events held within the riverside precinct. An options assessment is presented in the table below. It should be noted that there would be considerable impact on existing trees, mainly exotics, resulting from any works associated with upgrades to the levee bank even if the existing alignment was retained.

Option	Advantages	Challenges
Option 1 **Do nothing**	• No environmental impacts would occur as a result of construction	• Aging visitor facilities and suboptimal visitor experience • Inability to cater for peak car parking demand during weekends, school holidays and major events • Ongoing risk of pedestrian safety issues • Levee flood protection levels unchanged • Limited carparking to service the buildings fronting Wodonga Place. • Would not provide the outcomes sought by the community who are seeking to improve facilities, parking and pedestrian connectivity between Australia Park, Oddies Creek play space
Option 2 **Upgrade Levee in existing location and not construct car park**	• Improved Flood Protection	• No improvement to parking availability in the precinct • Existing ad hoc gravel car park to be retained • Requires removal of vegetation due to impacts on Tree Protection Zones • Requires construction adjacent existing businesses and heritage listed building • Would not provide the outcomes sought by the community who are seeking to improve facilities,

			parking and pedestrian connectivity between Australia Park, Oddies Creek play space
	Option 3 **Upgrade Levee in existing location and construct modified car park**	• Improved amenity and visitor experience • Increased car parking capacity to service adjoining facilities and businesses • Levee upgraded to achieve greater levels of flood protection	• Minor reduction in area of green space within public parkland • Impacts on Tree Protection Zones (TPZ) of native vegetation • Requires construction adjacent waterway • Requires removal / relocation of existing levee bank • Requires construction adjacent existing businesses and heritage listed building • Limited improvement to parking within the precinct
	Option 4 Various other designs **Original concept design – based on:** • Stage 1 car park construction - 25 car spaces (with two disabled car spaces). Note stage 2 car parking and levee bank upgrade was not considered in this option. • Construction of landscaped entry parkland, adjacent to Wodonga Place,	• No impact on the existing levee bank • Minimal environmental impacts	• Retention of the levee bank resulted in fewer additional car spaces • Retention of levee bank restricted accessibility throughout the site, based on site levels. • Levee flood protection levels unchanged • Aging visitor facilities and suboptimal visitor experience • Ongoing risk of pedestrian safety issues at entrance to Oddies Creek Park • Existing ad hoc gravel car park to be retained

	including tree planting		
	Option 5: - Relocate Levee Bank and construct 80 space Car Park to the east of the levee	• Levee upgrades to achieve greater levels of flood protection • Consolidation of three car park areas into one • Increased car parking capacity to meet the current and future needs of riverside precinct • Elimination of pedestrian safety issues at current entrance to Oddies Creek Park • Provide the outcomes sought by the community who are seeking to improve facilities, parking and pedestrian connectivity between Australia Park and Oddies Creek play space • Landscaping of car park and levee bank including 18 mature trees and 2126 under storey • Revegetation of the riparian areas adjoining Oddies Creek with native species. • Independently assessed as having no significant impact on any threatened species, population or	• No effective net loss of green space within public parkland • Direct removal of 22 trees (18 exotic, 4 young river red gums) • Encroachment on Tree Protection Zones (TPZ) of 51 trees (Non-viable encroachment - 12 trees (Including two River Red Gum trees) & Viable encroachment – 39 trees) • Requires construction adjacent waterway • Requires removal / relocation of existing levee bank • Requires construction adjacent existing businesses and heritage listed building • Temporary disruption to traffic and park users during construction

		ecological community.	

Summary of preferred option (5): - Relocate Levee Bank and construct 80 space Car Park to the east of the levee

The preferred option has been developed using an iterative design process to minimise environmental impact whilst still delivering the outcomes sought by the community to improve facilities, parking and pedestrian connectivity between Australia Park, Oddies Creek play space and the other riverside park areas. Where possible, environmental impacts have been reduced through design (for example by retaining endemic native tree species and avoiding/minimising TPZ impacts where possible).

The preferred option includes revegetation of the riparian areas adjoining Oddies Creek with native species (included as a condition as part of the determination of this REF), as well as the planting of 18 new trees and over 2,000 shrubs and grasses adjacent to the carpark and landscaped areas. A landscape plan incorporating proposed revegetation activities is presented in Appendix F.

In developing the preferred design option it was noted that there may be some short term environmental impacts during construction, but that the objectives of the project (improved car parking capacity, visitor experience, upgraded facilities in Australia Park and the adjoining Murray River parkland areas) could be delivered without significant or unacceptable long term environmental impacts.



Figure 1: Project area

	
View south east along new levee bank alignment. Non endemic eucalypts to be removed. Turks Head heritage listed building and existing levee bank at left.	View north west from northern bank of Oddies Creek. Gravel track and culverts to be replaced with pedestrian bridge. Oddies Creek Park gravel carpark to be decommissioned.
	
View north west from Oddies Creek Park car park. Single lane five tonne limited bridge used for vehicle and pedestrian access to be decommissioned.	View south from Ebden Street. BBQ facilities and shelter to be demolished and replaced.
	
View north west from Oddies Creek. Four redgum saplings to be removed to accommodate new levee bank.	View south east from Ebden Street. Future carpark area. Levee bank to be removed and relocated to the right.

Figure 2 Photographs of the project area

Section 2

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2 Statutory and Planning Context

Indicate whether the proposed works are permissible under the relevant legislation. Include an explanation where necessary.

Environmental Planning and Assessment Act 1979 **(EP&A Act)**

Consider objectives of the relevant environmental planning instruments (e.g. State Environmental Planning Policies (SEPPs), Albury Local Environmental Plan 2010 (LEP), zoning and permissible uses, development controls etc.

State Environmental Planning Policy (Transport and Infrastructure) 2021

Are the proposed works exempt development? ☐ Yes ☒ No

(If yes, no statutory consultation required)

Are the proposed works complying development? ☐ Yes ☒ No

(If yes, no statutory consultation required)

Are the proposed works permitted with consent? ☐ Yes ☒ No

Are the proposed works permitted without consent? ☒ Yes ☐ No

Relevant SEPP clause/s:

Clause 2.73 (3a) of the SEPP provides for the development of:

(i) Roads, pedestrian pathways, cycleways, single storey car parks, ticketing facilities, viewing platforms and pedestrian bridges,

(ii) recreation areas and recreation facilities (outdoor), but not including grandstands

(iv) lighting, if light spill and artificial sky glow is minimised in accordance with the Lighting for Roads and Public Spaces Standard,

(v) landscaping, including landscape structures or features (such as art work) and irrigation systems,

(vi) amenities for people using the reserve, including toilets and change rooms,

(vii) food preparation and related facilities for people using the reserve

Clause 2.56 (1) provides for environmental management works.

As the works are to be undertaken by AlburyCity (a public authority) the works are permissible without development consent and can be assessed under Part 5 of the EP&A Act. Development consent under Part 4 is not required.

As the project includes development on flood liable land, consultation with the State Emergency Service (SES) is required under Section 2.13 of the State Environmental Planning Policy (Transport & Infrastructure 2021 (formerly Clause 15AA of SEPP (Infrastructure) 2007 (ISEPP)). Consultation with the SES was undertaken in September 2021, under the ISEPP. Correspondence is provided in Appendix B.

State Environmental Planning Policy (Biodiversity and Conservation) 2021

The Biodiversity and Conservation SEPP consolidates and repeals 11 SEPPs, including *Murray Regional Environmental Plan No 2—Riverine Land*.

The project would be expected to generate additional quantities of stormwater due to the increased areas of hardstand. Stormwater from the site would be collected and discharged via an existing stormwater collection and discharge system. The decommissioning of the existing Oddies Creek Park gravel car park adjoining Oddies Creek, and its revegetation with grass would be expected to reduce runoff and sediment discharge directly adjacent to the waterway.

The relocation of the levee bank to the west of the existing site is anticipated to result in minor changes to the topography of the site and a small reduction in floodplain water storage capacity. This change in floodplain storage capacity is not considered likely to affect the hydrology of the River Murray system. No consultation under Part 5.3 (10 Flood Control Works) is considered necessary.

The project is considered unlikely to adversely affect the riverine environment of the River Murray.

Biodiversity Certification of the Albury Local Environmental Plan 2010

Are the proposed works located in a Biodiversity Certification Exclusion area? ☒ Yes ☐ No

Works are within the RE1 Zone (exclusion area).

Biodiversity Conservation Act 2016 **(BC Act)**

The BC Act provides for the protection and conservation of threatened species, ecological communities and their habitats and lists key threatening processes to biodiversity in NSW. Impacts to threatened species, communities and their habitat are assessed under s7.3 of the BC Act and in accordance with s1.7 of the EP&A Act.

Are any threatened species, ecological communities or their habitats located in the area? ☒ Yes ☐ No

Are the proposed works likely to impact on any threatened species, ecological communities or their habitats? ☒ Yes ☐ No

If yes, undertake a Test of Significance for any threatened species or ecological communities that may be impacted.

An assessment of the likelihood of occurrence and the potential for impact to BC Act listed threatened species and communities has been undertaken in the Biodiversity Assessment for the project, presented in Appendix C. The Biodiversity Assessment indicates that there is potential habitat for six BC Act listed species within the project area. Tests of Significance indicate that a significant effect is not likely to result from the project. A Species Impact Statement or opting into the Biodiversity Offset Scheme is not required.

Fisheries Management Act 1994 **(FM Act)**

The FM provides for the protection and conservation of aquatic species and their habitat throughout NSW.

Are the proposed works located in or adjacent to a water course? ☒ Yes ☐ No

Are the proposed works located in key fish habitat? ☒ Yes ☐ No

If yes, a Part 7 Permit may be required.

Are the proposed works likely to impact on any threatened species, populations or ecological communities? ☐ Yes ☒ No

If yes, undertake an Assessment of Significance for any threatened species, populations or ecological communities that may be impacted.

Threatened species, populations and communities listed under the FM Act have been assessed in the Biodiversity Assessment for the project, presented in Appendix C. These assessments determined that five aquatic species have a medium likelihood of occurring within the study area. Seven-part tests have been prepared for the threatened species that may potentially be subject to negative impacts. Significant impacts to these species are considered unlikely.

Oddies Creek is considered TYPE 1, CLASS 1 key fish habitat and may provide habitat for threatened aquatic species.

A permit may be required under Section 200 of the FM Act for dredging or reclamation work. Clarification has been sought from NSW DPI regarding the crossover and Fisheries confirmed a permit is not required

If temporary blockages to fish passage (not currently proposed) (for example coffer dams spanning width of a waterway) are required during the works, a permit may also be required by NSW DPI under Part 7 of the FM Act to temporarily obstruct fish passage.

Biosecurity Act 2015

The Biosecurity Act outlines biosecurity risks and impacts and introduces the concept of priority weeds. A priority weed is any weed that is or should be prevented, managed, controlled or eradicated in the region.

Are any priority weeds for Murray Local Land Services region located in or adjacent to the works area? ☒ Yes ☐ No ☐ Unknown

Two Priority Weeds for the Murray LLS region have been recorded within the broader study area:

- *Asparagus asparagoides* (Bridal Creeper)
- *Genista monspessulana* (Cape Broom)

These species have a General Biosecurity Duty of *Mandatory Measure: A person must not import into the State or sell.*

No priority weeds are known within the project area, and AlburyCity have a long term management program in place to remove the extensive number of exotic woody weeds from the river bank. All practical steps should be taken to control and eradicate the weeds from the study area prior to vegetation removal, in accordance with mitigation measures outlined in Table 6.

Water Management Act 2000

Controlled activity approval is generally required for work within 40 metres of a water course. Under section 37 of the *Water Management (General) Regulation 2011*, public authorities are exempt from obtaining a controlled activity approval. The objectives of protecting water sources are still relevant and must be met.

Are the proposed works located in or adjacent to a water course? ☒ Yes ☐ No

Works associated with the project would be undertaken adjacent to and over Oddies Creek in a number of locations. As AlburyCity are the proponent, no controlled activity approval is required. Works would be conducted in accordance with the *Guidelines for instream works on waterfront land* (DPI Office of Water 2012).

Impacts to Oddies Creek and the Murray River would be mitigated by measures outlined in Table 6.

National Parks and Wildlife Act 1974 (NPW Act)

The NPW Act aims to conserve the natural and cultural heritage of NSW. It is an offence to knowingly destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage or desecration of an Aboriginal object or Aboriginal place without prior written consent.

Will the proposed works disturb the ground surface or any culturally modified trees? ☒ Yes ☐ No

Will the proposed works affect known Aboriginal objects or Aboriginal places? ☐ Yes ☒ No

Are the proposed works located within, or will it affect areas within 200 metres of a water course, within a sand dune system, on a ridge top, within 20 metres of a rock shelter? ☒ Yes ☐ No

An Aboriginal Cultural Heritage Due Diligence Assessment (ACHDDA) has been undertaken for the project area and is presented in Appendix E. The field investigations noted extensive historical site disturbance. Intact archaeological deposits were considered unlikely to remain in the project area and the area is considered to have low archaeological potential.

No project impacts to Aboriginal Cultural Heritage are anticipated. Mitigated measures associated with potential impacts to Aboriginal Cultural Heritage are outlined in Table 6.

Heritage Act 1977

The Heritage Act makes provisions to conserve the environmental heritage of NSW.

Will any historical cultural heritage items listed on the following registers be impacted by the proposed works?

☒ Schedule 5 of the Albury LEP

☐ NSW State Heritage Inventory

☐ NSW State Heritage Register

☐ Register of the National Estate

☐ Commonwealth Heritage List

☐ National Heritage List

If yes, additional approvals may be required.

The Turks Head [former] Museum (I195) is listed as a 'Heritage item' under Schedule 5 of the Albury LEP (local significance) and is located immediately adjacent to the levee bank works (refer Figure 3). No modifications to the building or its curtilage are proposed. Impacts would be avoided by the implementation of mitigation measures outlined in Table 6.

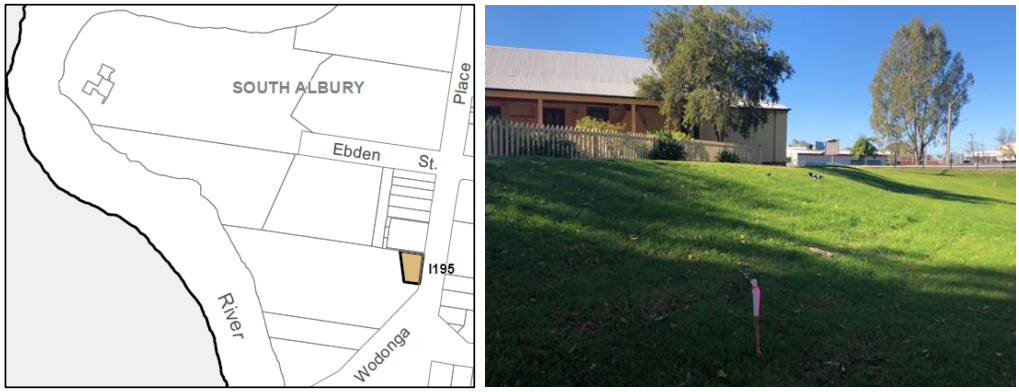

Figure 3 Location of Turks Head building (I195) and view looking south-east on levee bank alignment

***Protection of the Environment Operations Act 1997* (POEO Act)**

The POEO Act is the key environmental protection and pollution statute in NSW. Through the EPA, the POEO Act establishes a licencing regime for waste, air, water and pollution.

Will the proposed works involve generation of waste? ☒ Yes ☐ No

Construction and demolition waste (for example felled trees, soil, gravel, BBQ shelter materials, bitumen and concrete, general waste) would be generated during construction, and would be managed in accordance with the EPA's Waste Classification Guideline (EPA, 2014). Proposed waste avoidance and minimisation measures are proposed in Table 6.

Will the proposed works involve discharge of water to any water courses? ☐ Yes ☒ No

The existing stormwater collection and discharge system would be utilised following minor reconstruction works. No new discharges to watercourses are proposed.

Discharges to watercourses during construction are to be treated prior to discharge via implementation of mitigation measures described in Table 6 and as detailed in the Erosion and Sediment Control Plan (Appendix G).

During operation the discharge of runoff from the project site would be via the existing stormwater collection system.

***Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)**

The EPBC Act protects matters of National Environmental Significance (NES), such as threatened species and ecological communities, migratory species (protected under international agreements), and National Heritage places (among others).

Any actions that will, or are likely to have a significant impact on the matters of NES require referral and approval from the Australian Government Environment Minister.

Are there any matters of NES located in the area? ☒ Yes ☐ No

Will any matters of NES be potentially impacted by the proposed works? ☒ Yes ☐ No

If yes, undertake a Significant Impact Criteria assessment.

An assessment of the likelihood of occurrence and the potential for significant impacts to EPBC Act listed threatened species and communities has been undertaken and is presented in the Biodiversity Assessment for the project (refer Appendix C). Four species are considered to have a medium or greater likelihood of occurring within the project area:

- Grey-headed Flying-fox
- Flat-headed Galaxias
- Trout Cod
- Murray Cod

Assessments against the Significant Impact Criteria (CoA 2013) have been prepared for these species and it has been concluded that a significant impact is not likely to result from the project due to the size of the proposed works, dispersal ability of the species and the quantity of similar vegetation and aquatic habitats that would be retained within the study area and surrounding areas.

No impacts on listed flora species or migratory species are anticipated. No EPBC listed threatened ecological communities or Ramsar wetlands occur within the project area.

Section 3

3 Environmental Assessment

Under Part 5 of the EP&A Act, a determining authority has a duty to consider environmental impacts of activities in relation to threatened species, threatened species habitat and threatened ecological communities.

3.1 Consideration of Environmental Factors

Clause 228 of the EP&A Regulation describes the factors that should be considered for environmental assessment under Part 5 of the EP&A Act. For the purposes of Part 5 of the Act, the factors to be taken into account when consideration is being given to the likely impact of an activity on the environment are listed in Table 4.

Table 4: Consideration of environmental factors

Is the project likely to cause:	Yes/No	Comment
a) Any environmental impact on a community	Yes	Construction of the project would temporarily restrict access and use of Australia Park, which would have a minor and short-term negative impact on the community. Construction related impacts to noise amenity, air quality and visual amenity would be short-term, localised and minor. The scheduling of levee removal/reconstruction works would be considerate of flood risk. In operation, the project would have a positive impact on the community of South Albury by improving the standard of the flood protection levee. The project would require the direct removal of 22 trees (18 exotic, 4 young river red gums), as well as encroachment on Tree Protection Zones (TPZ) of 51 trees that will be retained where possible however 12 have been considered non-viable including two River Red Gum trees (Note works around TPZs is to be monitored by a qualified arborist with trees to be retained where possible). A landscaping plan reintroduces 18 advanced tree species and 2126 under storey plants. It is also proposed to revegetate local native species along the Oddies Creek riparian zone as a condition of this REF. The design has been considerate of a number of significant trees where possible with the design being altered to mitigate impact on such.

Is the project likely to cause:	Yes/No	Comment
		Construction close to the creek is required, however necessary sediment controls will be installed to protect these areas. The project would also create additional/new car parking and barbeque facilities near popular recreational areas such as Oddies Creek Park and the Murray River. The project would increase car parking availability including disabled access to recreational facilities, public amenities and businesses adjoining Wodonga Place.
b) A transformation of a locality	No	The project would alter the local appearance and amenity of the immediate area through the creation of a new car park and visitor facilities within Australia Park. The removal of some large trees would temporarily change the 'leafy' and 'shady' appearance of the site, until replacement trees become established. The project would not transform the locality but would alter the appearance of the project area. The existing land uses within and adjoining the project area would not change. Some areas currently used for carparking will be upgraded to green space. Upon completion of the project construction, all plant, equipment and construction material would be removed from site and parts of the site would be rehabilitated and revegetated.
c) Any environmental impact on the ecosystem of the locality	Yes	The project has been independently assessed and determined as having no significant impact on any threatened species, population or ecological community. The proposed works would have short term and minor ecological impacts during construction including ground disturbance, grass and tree removal (including removal of 18 exotic trees, and four young River Red Gum trees) and major TPZ impacts on two additional hollow bearing River Red Gum trees within the project area, however with the implementation of mitigation measures outlined in Table 6, it is considered unlikely that the works would significantly impact the ecosystem of the locality. Revegetation of the

Is the project likely to cause:	Yes/No	Comment
		Oddies Creek riparian area with locally native vegetation is expected to have a positive environmental and ecosystem impact through the provision of additional habitat. Refer to the assessment of impacts to biodiversity in Table 5, the Biodiversity Assessment (Appendix C), and the Arboricultural Impact Assessment (Appendix D).
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality	Yes	Views to the project area from Wodonga Place are interrupted and screened by existing buildings and vegetation to be retained. The construction of a new car park will see no effective net loss of open space with the rehabilitation of identified areas and in short term localised impacts to visual amenity within Australia Park. The installation of a new levee bank would alter the current views to and from the site, however the landscaped levee bank would soften and screen the presence of the car park from north- bound motorists entering the city. Landscaping and revegetation measures including reclamation of the existing gravel carpark for greenspace would assist in the mitigation of adverse impacts over the long term. The project will result in positive impacts for those seeking recreational opportunities through the Oddies Creek Play Space. It will also provide improved benefits for disabled and all abilities access, as well as eliminate the current safety risk where pedestrians and motorists utilise the same bridge crossing to access Oddies Creek Park. Refer to the environmental assessment in Table 5.
e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or	No	The implementation of the mitigation measures outlined in Table 6 would protect the Turks Head heritage item. The proposed works are not expected to have a significant impact on any locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social

Is the project likely to cause:	Yes/No	Comment
other special value for present or future generations		significance. Refer to the environmental assessment in Table 5.
f) Any impact on the habitat of protected fauna (within the meaning of the NPW Act)	Yes	The project has been independently assessed and determined as having no significant impact on any threatened species, population or ecological community. The project would have a direct impact on a small amount of potential habitat for protected fauna through vegetation removal, noting that the project would require the direct removal of 22 trees (18 exotic, 4 young river red gums), as well as encroachment on Tree Protection Zones (TPZ) of 51 trees that will be retained where possible however 12 have been considered non-viable. However, these short-term impacts would be offset by longer term outcomes anticipated with the proposed tree planting, levee landscaping, and broader revegetation program along Oddies Creek. Indirect impacts through TPZ encroachment (including TPZ encroachment on two hollow bearing trees) would also occur, however these trees will be retained to ensure the ongoing availability of hollows and foraging habitat. Construction related impacts to noise amenity, air quality and visual amenity would be short-term, localised and minor. Lighting is to be installed in the carpark to ensure security of the site. Where necessary the design will be sympathetic to the surrounding environment through the use of shielding and/or movement sensors to prevent unnecessary light spill/pollution. This REF has assessed the impacts of the project to native fauna in the assessment of biodiversity in Table 5 and the Biodiversity Assessment in Appendix C.
g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air	No	The project is not anticipated to endanger any species of animal, plant or other form of life, whether living on land, in water or in the air.

Is the project likely to cause:	Yes/No	Comment
		Refer to the biodiversity assessment in Table 5 and the Biodiversity Assessment in Appendix C.
h) Any long-term effects on the environment	No	The project is not expected to have any significant long-term adverse impacts on the environment. The majority of trees to be removed are exotic and are considered to offer less fauna habitat value in comparison to native trees. There will be no effective net loss of open space through construction of a new carpark with the offset through the reclamation of the existing gravel carpark as green space, and the extensive landscaping and revegetation along Oddies Creek. Revegetation and landscaping activities are proposed to maintain the open parkland setting, whilst improving the appearance and function of the riparian areas adjoining Oddies Park. The existing recreational facilities (barbeques and seating areas) would be upgraded. Whilst formalising car parking arrangements and providing for some additional spaces in this part of the riverside parklands, the project in itself is not anticipated to generate traffic or significantly alter traffic flows in the area. Removing the gravel car park from the flood plain and managing vehicle access will limit erosion into Oddies Creek and the Murray River. The new sealed car park will result in a small increase in stormwater, which will be integrated into the broader stormwater network. The replacement of an existing gravel path and culvert structure with an architect designed and purpose-built pedestrian bridge is expected to provide additional visual interest Lighting is to be installed in the carpark to ensure security of the site. The design will adopt best practice which includes using the lowest lighting intensity required for the illumination task. Light sources would be kept low in intensity and close to the ground, and lighting would be timed to minimise operating

Is the project likely to cause:	Yes/No	Comment
		hours. Shielding could be utilised where necessary to prevent unnecessary light spill/pollution. Refer to the environmental assessment in Table 5.
i) Any degradation of the quality of the environment	No	The project would have a short-term impact on the potential habitat available to fauna of the area through the direct removal of 22 trees (18 exotic 4 young river red gums). However, this would have an overall low impact due to the presence of suitable flora and habitat elsewhere in Albury's riverside parklands and adjoining riparian land. In addition, this removal would be offset by longer term outcomes anticipated with the proposed tree planting, levee landscaping, and broader revegetation program along Oddies Creek. The project would not have a significant, long term adverse impact on the quality of the environment. Refer to the environmental assessment in Table 5.
j) Any risk to the safety of the environment	No	The project is not anticipated to impact the safety of the environment. The use of plant and vehicles poses a potential contamination risk during construction, which would be mitigated by measures in Table 6. Table 6: Mitigation measures
k) Any reduction in the range of beneficial uses of the environment	No	The proposed works would not significantly reduce the range of beneficial uses of the environment. The creation of a new carpark would slightly reduce the area available for passive recreation in Australia Park. This will be offset by the reclamation of green space in the existing gravel car parks and roadways, which will result in no effective net loss of open space in the area.
l) Any pollution of the environment	No	The project would not pollute the environment. Construction measures are to be undertaken in accordance with an Erosion and Sediment Control Plan (Appendix G).

Is the project likely to cause:	Yes/No	Comment
m) Any environmental problems associated with the disposal of waste	No	There are no anticipated problems associated with the disposal of waste. The project may include the excavation and disposal of asbestos piping. Any contaminated waste material would be managed via measures listed in Table 6.
n) Any increased demands on resources (natural or otherwise) that are, or are likely to become in short supply	No	The project would not increase the demand on resources that are likely to become in short supply.
o) Any cumulative environmental effect with other existing or likely future activities	No	Native vegetation removal (including TPZ impacts on two large hollow-bearing trees) is planned as part of levee reconstruction along Oddies Creek to the south of Australia Park, however it should be noted that these TPZ impacted trees will be retained where possible to ensure the ongoing availability of hollows and foraging habitat. Removal of vegetation (mainly exotic species) associated with the construction of other Council projects was undertaken in the vicinity of this area in March 2022 (Riverside Precinct), although this was offset by additional tree and understorey planting/landscaping throughout the adjacent area along Hovell Tree Drive. Additional vegetation removal may result in a reduction of low-quality habitat for some common native fauna (birds and possums). The cumulative impacts of incremental habitat loss is a key concern for native species, however given the quality and quantity of similar habitat immediately adjacent to the works site, cumulative environmental impacts are considered to be minor and non-significant.
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	No	The project is not located within a coastal area and would not impact coastal processes.
q) Any applicable local strategic planning statement, regional strategic plan or district strategic plan made under Division 3.1 of the Act	No	No local planning statements, regional strategic plans or district strategic plans are directly associated with the project. The project is consistent with the objectives and actions contained within the Murray River

Is the project likely to cause:	Yes/No	Comment
		Experience Master Plan (Urban Initiatives, 2007). These include to: • Strengthen the relationship between the community and the Murray River • Provide greater access to the Murray River • Provide quality amenities in all open spaces • Promote and develop a diversity of experiences • Significantly improve the health and wellbeing of the Murray River The project supports a number of actions within the master plan including the upgrade the Oddies Creek Park, Ebden Street entry and stopping point, and the Turks Head building redevelopment.
r) Any other environmental factors	No	No impacts to any other environmental factors have been identified.

4 Environmental Impacts and Mitigation Measures

This section identifies the potential impacts of proposed works on the ecological values of the project area and includes recommendations to avoid, minimise and mitigate these impacts.

The proposed works present various risks to, and potential impacts on environmental components such as soils, hydrology, ecology, noise and air quality, Aboriginal and historic cultural heritage. The main risks are described in Table 5. To reduce potential impacts associated with these risks (as well as other minor risks), the mitigation measures presented in Table 6 would be implemented.

Table 5: Environmental impact assessment

Environmental component	Summary of potential impacts
Biodiversity	**Existing environment** Biosis Pty Ltd undertook a Biodiversity Assessment for the project area (Appendix C). This assessment built on a previous Biodiversity Constraints Assessment (Biosis, 2020a) for the project area. The biodiversity impacts assessed were calculated based on the extent of works provided by Albury City Council and the arborist assessment undertaken by Homewood Consulting Pty Ltd (Homewood, 2022). Terrestrial flora and fauna surveys were undertaken on 28 September 2021 in addition to a desktop study to determine the biodiversity values within and around the project area. The results of the Biodiversity Assessment are as follows: *Ecological communities* No threatened ecological communities are present within the study area. *Flora* Vegetation within the project area has been modified with disturbances associated with services infrastructure, recreational developments and weed invasion. The project area contains one Plant Community Type (PCT): *PCT 5 – River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion* (refer Figure 4). This PCT is associated with Oddies Creek and contains species such as River Red Gum (*Eucalyptus camaldulensis*), as well as planted and predominantly introduced vegetation. PCT 5 within the project area is regarded as being in a poor condition, with mid and ground layers being composed of planted and introduced vegetation. The cleared areas of the project area are made up of predominantly introduced grasses, such as Kikuyu (*Pennisetum clandestinum*), Paspalum

Environmental component	Summary of potential impacts
	(*Paspalum dilatatum*) and Toowoomba Canary Grass (*Phalaris aquatica*). Other introduced understorey vegetation includes Catsear (*Hypochaeris radicata*) and St John's Wort (*Hypericum perforatum subsp. veronense*). The cleared areas contain several scattered large River Red Gums (*Eucalyptus camaldulensis*), many of which are hollow bearing. No threatened flora species were identified in the field survey or were considered to have a medium or greater chance of occurring in the study area. *Fauna* The project area provides habitat for a range of locally common avian, marsupial, reptile, microbat and aquatic species. Eleven threatened fauna species were considered to have a medium or greater likelihood of occurrence within the study area. There is a known camp of Grey Headed-Flying-foxes (GHFF) adjacent to the Murray River, approximately two kilometres north west of the project area in Padman Park. The Murray River, located west of the project and which Oddies Creek is an anabranch / tributary of, contains high quality instream habitat including large woody debris, complex stream hydraulics and stable base flows. Threatened species known to occur within the Murray River near the project area are Trout Cod (*Maccullochella macquariensis)*; Silver Perch (*Bidyanus bidyanus)*; Murray Cod (*Maccullochella peelii*) and Murray Spiny Crayfish (*Euastacus armatus*). Oddies Creek is considered TYPE 1, CLASS 1 key fish habitat and may provide habitat for threatened aquatic species. **Potential impacts** *Vegetation removal* The Arboricultural impact assessment for the project (Appendix D) (Homewood, 2022) assessed 137 trees within Australia Park. The level of impacts was assessed as: (1) removal, (2) major TPZ (non-viable) (>10% TPZ and/or structural root zone) (3) major (viable) (>10% TPZ and/or structural root zone with mitigating factors), (4) minor (<10% of TPZ) or (5) no impacts. The Tree Assessment Plan (Appendix H) illustrates the impacted trees on the site and their level of impact. It should be noted that trees 67 and 68 will now be retained. A redesign of the section of levee bank in the vicinity of these trees has resulted in significantly less encroachment of the TPZ of these trees so they can be retained. As indicated in Section 1.2.1 in order to achieve the required project area and facilitate the levee bank reconstruction, the preferred project design sought to minimise impacts on native trees at the expense of exotic trees. This is reflected in the statistics presented in Appendix D, with exotic and non-indigenous eucalypts occupying 83% of the combined impact category (removal (category 1) and major non-viable (category 2)).

Environmental component	Summary of potential impacts

The project would result in the removal of 0.18 hectares of low quality native vegetation consistent with PCT 5, including the direct removal of four non-hollow-bearing River Red Gum trees (diameter at breast height (DBH) <40cm) and encroachment of two hollow-bearing River Red Gum trees that are considered non-viable post construction.

A summary of native indigenous trees to be removed or subject to major impacts (non viable) due to TPZ encroachment is presented below.

Tree ID	Species	DBH	Hollow bearing Y/N	Level of Impact
19	River Red Gum (*Eucalyptus camaldulensis*)	103	**Y**	TPZ encroachment 37%
34	River Red Gum (*Eucalyptus camaldulensis*)	25	**N**	Removal
35	River Red Gum (*Eucalyptus camaldulensis*)	36	**N**	Removal
36	River Red Gum (*Eucalyptus camaldulensis*)	13	**N**	Removal
37	River Red Gum (*Eucalyptus camaldulensis*)	20	**N**	Removal
69	River Red Gum (*Eucalyptus camaldulensis*)	110	**Y**	TPZ encroachment 15%

An additional two native planted and 28 exotic planted trees would be removed or be considered non-viable post construction due to the extent of encroachment of their TPZ.

Removal of these indigenous trees would not significantly impact the remnant PCT 5 within the wider area, given it is previously disturbed and in poor condition, however the potential loss of two hollow bearing trees and impacts on the TPZs of other trees may reduce the potential habitat available to some fauna species. However, it should be noted that these TPZ impacted trees will be retained where possible to ensure the ongoing availability of hollows and foraging habitat.

Death or injury may occur to fauna present during clearing of vegetation. If birds are present but not nesting during construction, they would generally move away from the proposal site to escape the disturbance. Mitigation measures would include pre-clearance survey and advice from an ecologist.

Removal (22 Trees) or major TPZ - non viable impacts (12 Trees) on introduced flora (including 28 exotic trees with a range of heights, diameters and retention value (refer Appendices 4 and 5 of the Arboricultural impact

Environmental component	Summary of potential impacts
	assessment (Appendix D)) would reduce the potential habitat available to fauna of the area, however this would have an overall low impact due to the presence of suitable flora and habitat elsewhere in Albury's riverside parklands and adjoining riparian land. No communities or flora listed under the BC Act or the EPBC Act would be impacted by the project. The Biodiversity Assessment recorded one threatened terrestrial species (Dusky Woodswallow) within the project area. Six of the eleven threatened species considered to have a medium or greater likelihood of occurrence within the project area were mobile mammals or bird species that may forage within the area on occasion. The remainder are aquatic species. The removal of flora during construction of the project is not expected to have a significant impact on these species given their high level of mobility and the presence of foraging resources in surrounding parkland. *Noise* The GHFF camp within Padman Park would not be directly impacted during construction of the project. Some construction noise may travel to the camp, though the impact would be negligible given the distance between the project area and the camp. GHFF may occur within the project area periodically, however, are expected to avoid the area during construction given the presence of mobile plant and construction activities, and the nocturnal activity levels of GHFF. *Lighting* It is noted that street lighting is currently operating on Wodonga Place and Ebden Street. Security lighting is associated with the Turks Head Building, public amenities, Wodonga Place businesses and Noreuil Park Community Rooms. Sports ground lights operate periodically to illuminate training and sporting activities on the Noreuil Park Oval. Where afterhours artificial lighting is required, lighting design would adopt best practice which includes using the lowest lighting intensity required for the illumination task. Light sources would be kept low in intensity and close to the ground, and lighting would be timed to minimise operating hours. Shielding could be utilised where necessary. *Waterways* Significant impacts to listed aquatic species are unlikely to occur during construction of the project due to the small area of works, high degree of existing waterway modification and the implementation of mitigation measures to protect riparian areas and water quality. The waterway crossings would be

Environmental component	Summary of potential impacts
	designed and constructed consistent with the recommendations in *Guidelines for watercourse crossings on waterfront land* (NSW Office of Water, 2012). Safeguards specific to the protection / removal of native vegetation and threatened and general fauna habitat, have been included in Table 6 of this REF. No ongoing significant impacts to native flora and fauna are considered likely following completion of the project. It is anticipated that the proposed works would contribute to an overall improvement in Oddies Creek riparian conditions through revegetation works.
Soil and groundwater *(including contaminated land, acid sulfate soils, salinity etc.)*	**Existing environment** The project area is located within the Murray River floodplain, which is subject to seasonal flooding. The site is underlain by quaternary alluvium. Soils are generally composed of cracking grey clays and brown clays, with some locally occurring grey earths and alluvial soils occurring along drainage lines. Soil limitations in the area (DECCW, 2010) are associated with localised non-cohesive soils; widespread seasonal flooding and waterlogging; thin topsoil and widespread land salinity discharge (although no salinity hazard is considered likely at this site). A search of the Australian Groundwater Database on 15 April 2021 (BoM, 2021a) identified three bores around the project site. • GW 505641 – AlburyCity monitoring bore located in Australia Park, installed in 2012 to a depth of 5m. No standing water level (SWL) data is available for this bore. • GW 504462 – private monitoring bore located at the BP Border Service Station, installed in 2009 to a depth of 6 metres. SWL was measured at 3.5 metres below ground level. • GW 505139 – private monitoring bore located in Noreuil Park, installed in 2007 to a depth of 23 metres. SWL was measured at 2.27 metres below ground level. A search of the Australian Soil Resource Information System (ASRIS, 2014) found that the project area has a low probability (low confidence) of acid sulphate soil formation. The topography of the project area is varied. Oddies Creek has moderately steep banks. Australia Park slopes gently down to Oddies Creek but is undulating due to the levee bank which passes through the centre of the park and elevates the ground surface by approximately 1 metre. A review of the NSW Contaminated Land record (NSW EPA, 2021a) and list of notified contaminated sites (NSW EPA, 2021b), indicated that there was no listed contaminated site within the project area. The closest contaminated site

Environmental component	Summary of potential impacts
	was the BP Border Service Station, located 60 metres east of the project area on the corner of Ebden Street and Wodonga Place. AlburyCity have also noted that pipes underneath Ebden Street may contain asbestos (refer pavement details plan in Appendix A). **Potential impacts** The project would require bulk earthworks to be completed. The rearrangement of Ebden Street and construction of the car park would require the area to be cut and filled. Excavations associated with the cut and fill process would be generally shallow and would only be to depths required to achieve a flat surface across the area. Shallow earthworks would also be required during the construction of new culverts and the pedestrian bridge. The construction of the new earthen levee would require deeper excavations for the core, to a depth of 1.5 metres, as well as placement and compaction of suitable material for the levee bank. The installation of some services such as lighting and power would require trenching. Groundwater may be encountered at excavation depths below 2 metres based on data from surrounding bores. During earthworks, soils would be exposed to wind and rain creating potential for erosion. Other activities such as vehicle movement would impact on soil stability. Unprotected soils have potential to generate excess dust, changed landforms and water quality impacts (particularly as the project is located close to Oddies Creek). An erosion and sediment control plan has been prepared (Appendix G) as per the *Blue Book - Managing Urban Stormwater: Soils and Construction* (the Blue Book) (Landcom, 2004) to manage the anticipated impacts. Following construction, exposed surfaces would be rehabilitated to pre-existing condition. Stockpiling of construction materials is expected to have a negligible impact on soil stability due to placement within the existing Ebden Street carpark and roadway. The project would have a minor impact on soils following implementation of the erosion and sediment control plan in conjunction with the measures outlined in Table 6. The results of the contaminated land searches provide no indication that soils within the project area are contaminated or present a significant risk to workers or the public during construction. However, there is potential for contaminated groundwater to migrate from the BP Border Service Station site, impacting soils and groundwater in the project area. Impacted soils may occur at depths greater than 2 metres below ground level given to proximity to groundwater. A stop work procedure in the event of the discovery of contamination soils or groundwater is included in Table 6. Construction of the project may also pose a contamination risk to soils and groundwater through leaks and spills of fuel and chemicals. The project may also require the removal of asbestos pipes located beneath Ebden Street. These pipes would be removed prior to any roadworks commencing.

Environmental component	Summary of potential impacts
	Contamination risks would be managed by the implementation of measures outlined in Table 6. Following completion of the project and restoration of surface cover vegetation, ongoing impacts to soils and groundwater are not anticipated. Bank protection and revegetation along the northern and eastern side of Oddies Creek may have a minor positive impact on soil stability.
Water	**Existing environment** The project is located adjacent to Oddies Creek, which is a tributary and highly modified former anabranch of the Murray River. Oddies Creek intersects with the Murray River south east of Willowbank Road, passes through South Albury, and reconnects to the Murray River adjacent to Noreuil Park. Oddies Creek is shallow and vegetated, with patchy groundcover vegetation along its banks in the project area. Stormwater runoff from South Albury, Australia Park, Noreuil Park and Oddies Park enter the waterway. The South Albury flood levee is predominately an earthen embankment that is approximately 3.8 kilometres long extending from Doctors Point Road in East Albury to Smollett Street Bridge just north of the Albury Football ground. The levee was commissioned in the mid 1970's in response to several flood events during the early 1970's. The levee was designed to provide a 1% AEP level of protection to residential and commercial properties in South Albury. Investigations undertaken in 2018 found that there was insufficient freeboard in parts of the levee in the project area (Water Technology, 2018). Other flood mitigation facilities near Oddies Creek include the flood pump adjacent Ebden Street. The project area is located in a "Sensitive Area" as defined by Schedule 7.2 of the Albury LEP. The objective of a Sensitive Area is to maintain the hydrogeological functions of the riparian land waterways and aquifers. **Potential impacts** During construction there is a potential that sediment and erosion runoff would lead to impacts to water quality within Oddies Creek and the Murray River. Impacts in the construction phase are expected to be minimal following the implementation of the mitigation measures described in Table 6 and the development of an erosion and sediment control plan (Appendix G). Instream works with Oddies Creek are limited to culvert removal and installation. Construction of the new carpark would require the demolition of a section of the existing levee, leading to an increase in flood risk during the construction period. Construction of the new earthen levee and retaining wall at Ebden Street would mitigate this flood risk. Construction activities have the potential to impact surface water quality due to the leakage or spills of chemicals or fuels from vehicles associated with

Environmental component	Summary of potential impacts
	construction. While this has the potential to impact on the water quality of receiving waters, the likelihood of this occurring is considered low provided that appropriate spill containment and clean-up measures are put in place. The project would generate additional surface water runoff due to the increase in the area of sealed surface in Australia Park. Surface water runoff has the potential for contamination from leaks of fuels or oils as it us used by motor vehicles. Drainage from the carpark would tie into existing stormwater drainage infrastructure, which would direct stormwater into Oddies Creek at the levee pump station site. In the event of a significant spill the discharge pipe can be closed using a valve to prevent discharge to the waterway (similar to the prevention of ingress of floodwater during a flood). The revegetation of the existing Oddies Creek gravel carpark and the adjoining waterway banks would provide a minor positive water quality impact to the Oddies Creek due to a reduction in exposed surfaces / filtering of sediment and runoff. The project would have a positive impact to the residents and commercial businesses of South Albury by creating a higher level of flood protection than current conditions. No impact on the flood behaviour or flood levels of Oddies Creek or the Murray River is anticipated, despite a minor reduction in floodplain storage capacity due to the relocation of the levee (towards the Murray River).
Aboriginal cultural heritage	**Existing environment** Biosis Pty Ltd undertook an Aboriginal Due Diligence Assessment (ADDA) for the project area (Appendix E), consistent with the recommendations of Jacobs (2020). This involved a desktop assessment and site survey. The desktop assessment found that no Aboriginal cultural heritage sites are registered within the project area on the Aboriginal Heritage Information Management System (AHIMS). There are two Aboriginal cultural heritage sites registered within 200 metres of the project area. Biosis undertook an archaeological survey of the project area on 14 October 2021 in conjunction with a representative from the Albury and District Local Aboriginal Land Council (LALC) and a Wiradjuri Elder. The site assessment did not identify any previously unrecorded Aboriginal cultural heritage sites, or any areas of (archaeological) sensitivity within the project area and surrounds. Post European settlement activities have resulted in substantial modifications to the natural landscape within the study area. Past land use practices such as vegetation removal, agriculture and installation of the levee bank and recreational facilities have caused extensive ground disturbances within the project area.

Environmental component	Summary of potential impacts
	Potential impacts Works would involve impacts to the ground surface in the form of soil excavation during construction. No Aboriginal sites or areas of archaeological potential were identified during the site assessment, and the ADDA concluded that that it is unlikely that any unidentified Aboriginal sites are present within the project area. There are no predicted impacts to Aboriginal sites/objects as a result of the project, and therefore no predicted impacts to Aboriginal cultural heritage. No further archaeological investigation or works are required to be undertaken for the study area. In the event that unexpected finds, including human remains, are unearthed during any phase of the project, refer to the mitigation measures listed in Table 6.
Historic heritage	**Existing environment** Albury was settled by Europeans during the 1830's, with the project area being used as pastoral lands up until the mid 1880's when it was cultivated as a market garden by the Chinese settlers (Biosis, 2020b). The creek running through the project area was named after James and Elizabeth Oddie, who kept the Turks Head Hotel between 1886 and 1890. The site continued to be used as a market garden by Chinese settlers until the 1950's, when the land was purchased by Albury City Council and converted into riverside parkland. The riverside parkland at Oddies Creek Park was the construction site of the modern-day paddle-steamer Cumberoona, and where it was launched in 1986 (Albury and District Historical Society, 2011). A search of the NSW State Heritage Register was undertaken on 12 April 2021. It identified the closest heritage item to be the Turks Head Museum, which is listed as a place of local significance (I195) in Schedule 5 of the LEP. The Turk's Head building has existed on the site from 1860's as a hotel until 1921 when it was delicensed. The site then operated as a boarding house and later as a milk bar, and was bought by Albury City Council in 1961. The building was renovated for use as a museum space. The regional museum at the Turk's Head closed in 2007 when the Albury Library Museum opened in the new building in Kiewa Street (Albury and District Historical Society, 2011). The site was recently used as an art gallery and photography studio. Turks Head Museum is described in the Schedule 5 of the LEP as being located on Lot 1 DP 542181. It is currently located on Lot 4120 DP 1087043. **Potential impacts** The demolition and relocation of the levee bank would bring works in close proximity (5 to 10 metres) to the Turks Head building. The works area would not encroach directly on the curtilage of the heritage item and no direct impacts to the Turks Head Museum are anticipated. Vibration from the

Environmental component	Summary of potential impacts
	operation of plant may indirectly impact the heritage item and needs to be considered as part of planning and implementation of the levee reconstruction. The likelihood of impact on the item would be low following the implementation of mitigation measures are outlined in Table 6. Given the site's history as a market garden, there is some potential for uncovering historical remains during earthworks. This potential is considered low, given the disturbed nature of the site. The mitigation measures outlined in Table 6 would cater for the possibility of an unexpected find during the construction phase.
Noise and vibration	**Existing environment** The existing noise and vibration environment around the project area is dominated by light vehicle and truck movement along Wodonga Place. Noise from the commercial premises east and south east of the project area also contribute to the ambient noise environment. Users of the parkland (including the adjoining Oddies Creek Park children's playground) and fauna in the area generate low levels of noise. The nearest sensitive receiver is motel accommodation on Wodonga Place, approximately 60 metres south east of the project site. The nearest residence is located on Ebden Street approximately 90 metres to the east of the project. The noise environment at the residential properties is expected to be dominated by road noise from Wodonga Place and surrounding roads. There are also several community buildings and businesses that are close to the project area including the: • Noreuil Pak Oval Community Room on the northern (opposite) side of Ebden Street. • Former NSW Tourism Centre (now a health spa business) and the heritage listed Turks Head building – both located immediately east of the project area. **Potential impacts** Construction of the project is expected to generate noise and vibration that are uncharacteristic of the existing environment, particularly when earthworks are being undertaken. Noise is expected to be audible to moderately intrusive at the motel accommodation at Wodonga Place and residences along Ebden Street. Undertaking construction activities during the standard construction hours outlined in the Interim Construction Noise Guidelines (DECC, 2009) would allow noise impacts to motel patrons / residents to be minimised. Noise generated by the project would be moderately to highly intrusive at the Noreuil Pak Oval Community Room, the health spa, and the Turks Head

<table>
<tr><th>Environmental component</th><th>Summary of potential impacts</th></tr>
<tr><td></td><td>
building. Impact to users of these buildings would be managed by measures outlined in Table 6.

The British Standard 7385-2:1993 is used as a guide to assess the likelihood of building damage from ground vibration such as that caused by piling, compaction, construction equipment and road traffic. The standard recommends levels at which ‘cosmetic’, ‘minor’ and ‘major’ categories of damage might occur based on the type of structure affected, using the peak particle velocity (PPV) parameter. As a guide, the following minimum working distances have been adapted from this standard for various pieces of plant that may be used in constructing the project. These minimum working distances must be complied with at all times and are presented below (RMS, 2016)
<table>
<tr><th>Plant item</th><th>Rating / Description</th><th>Minimum working distance to avoid Cosmetic damage (BS 7385)</th></tr>
<tr><td rowspan="6">Vibratory Roller</td><td>< 50 kN (Typically 1-2 tonnes)</td><td>5 metres</td></tr>
<tr><td>< 100 kN (Typically 2-4 tonnes</td><td>6 metres</td></tr>
<tr><td>< 200 kN (Typically 4-6 tonnes)</td><td>12 metres</td></tr>
<tr><td>< 300 kN (Typically 7-13 tonnes)</td><td>15 metres</td></tr>
<tr><td>> 300 kN (Typically 13-18 tonnes)</td><td>20 metres</td></tr>
<tr><td>> 300 kN (> 18 tonnes)</td><td>25 metres</td></tr>
<tr><td>Small hydraulic hammer</td><td>(300 kg - 5 to 12t excavator)</td><td>2 metres</td></tr>
<tr><td>Medium Hydraulic Hammer</td><td>(900 kg – 12 to 18t excavator)</td><td>7 metres</td></tr>
<tr><td>Large Hydraulic Hammer</td><td>(1600 kg – 18 to 34t excavator)</td><td>22 metres</td></tr>
<tr><td>Vibratory Pile Driver</td><td>Sheet piles</td><td>2 to 20 metres</td></tr>
<tr><td>Pile Boring</td><td>≤ 800 mm</td><td>2 metres (nominal)</td></tr>
</table>
</td></tr>
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<table>
<tr><th>Environmental component</th><th>Summary of potential impacts</th></tr>
<tr><td></td><td>
<table>
<tr><td>Jackhammer</td><td>Hand held</td><td>1 metre (nominal)</td></tr>
</table>
Whilst all receivers and surrounding structures are sensitive to vibration impacts, heritage buildings and precision industries are typically more susceptible and are subject to more stringent criteria. The Turks Head building is a listed heritage building and is located close to proposed works.

Guidance for more sensitive structures such as the Turks Head building is presented in DIN (2016).

Vibration criteria for the Turks Head building is listed below.

<table>
<tr><td rowspan="2">Type of structure</td><td colspan="3">Guideline values for velocity in mm/s</td></tr>
<tr><td colspan="3">Vibration at the foundation at a frequency of</td><td rowspan="2">Vibration at horizontal plane of highest floor at all frequencies</td></tr>
<tr><td>1 Hz to 10 Hz</td><td>10 Hz to 50 Hz</td><td>50 Hz to 100 Hz</td></tr>
<tr><td>Heritage building</td><td>3</td><td>3-8</td><td>8-10</td><td>8</td></tr>
</table>
Vibration levels generated by construction machinery must not exceed those listed above at the Turks Head building to avoid building impacts.

The project would not generate significant noise or vibration during operation. Noise generated from users of the carpark and amenities would be similar to the current background noise levels and characteristics experienced in Oddies Park and Ebden Street.</td></tr>
<tr><td>Air quality</td><td><u>Existing environment</u>

The project area is located in Albury’s riverside parklands and adjacent to Wodonga Place, an arterial road which connects Albury to Wodonga in Victoria. The nearest sensitive receiver is motel accommodation on Wodonga Place, approximately 60 metres south east of the project site. The nearest residence is located on Ebden Street approximately 90 metres to east of the project.

Existing air quality within the area is likely to be influenced by fugitive emissions from local traffic. Wood heater smoke is likely to influence the local air quality during the winter months. Unsealed roads and car parks within Albury’s riverside parkland contribute to ambient dust levels, particularly on windy days. Smoke from burning off within agricultural and forested areas, as well as bushfires within the air catchment may periodically affect air quality at the site. Data for the South-West Slopes area showed that in 2020 there were</td></tr>
</table>

Environmental component	Summary of potential impacts
	30 days where the maximum NEPM standard for PM10 was exceeded and 21 days where the maximum standard for PM2.5 was exceeded (DPIE, 2021). Climate data for Albury obtained from the Bureau of Meteorology (BoM) Albury Airport AWS (072160), approximately 4.5 kilometres north-east of the project area indicates summers are typically hot and dry, where January is the hottest and driest month, with an average maximum temperature of 32.5 degrees. Winters are generally cool and damp, with the coolest month of the year being July, which has a mean maximum temperature of 13.2 degrees. August is the wettest month of the year, with an average monthly rainfall of 65.9 mm. 9 am winds are typically from the south-east at an average speed of 8 km/h and 3 pm winds are typically from the west the at an average speed of 14.3 km/h (BoM, 2021b). **Potential impacts** The project would require earthworks and stockpiling of soil, which may generate dust. Dust may also be generated from vehicle movement over exposed surfaces. Construction of the carpark and resealing of Ebden Street would require asphalt, which would generate odour and release emissions as it is being laid. Fugitive emissions from plant would also impact the local air quality. These factors may have an impact on the residential and commercial receivers, particularly during the afternoon period where the prevailing winds are generally from the west. Dust generated from the construction of the project may also impact the air quality in adjoining parkland areas, which would reduce user amenity. Air quality impacts in the wider parkland areas are not expected to be significant and would cease following completion of the project. Mitigation measures described in Table 6 would be implemented to reduce the impact of the project. During operation, the project would have a minor positive impact on dust generation, as the existing unsealed carpark at Oddies Creek would be converted to grassland.
Waste	**Existing environment** The primary land use surrounding the project is parkland which does not generate significant volumes of waste material. The main waste stream generated at the project site is green waste from routine parkland maintenance by AlburyCity. Domestic waste is also generated by users of the parkland. **Potential impacts** Potential waste streams generated during construction of the project would include: • Road surface and roadside materials (eg gravel, bitumen, bollards and guide posts, etc)

Environmental component	Summary of potential impacts
	• Asbestos pipe material (as per pavement detail plan) • Surplus construction materials (eg geotextile fabric, excess spoil from earthworks, surplus asphalt, surplus and redundant erosion and sediment control materials, etc) • Demolition waste from removal of existing infrastructure in Australia park • Green waste • Concrete • General waste and packaging from construction activities • Wastewater from amenities Any waste generated during construction would be managed in accordance with the waste management hierarchy. This provides that waste avoidance is a priority, followed by reuse and recycling/reprocessing, with disposal as a last resort. All waste would be managed in accordance with the EPA's Waste Classification Guideline (EPA, 2014). The project is expected to generate asbestos pipe waste, which is classified as special waste under the waste classification guidelines. Asbestos waste would be segregated from other waste streams and disposed of appropriately in accordance with SafeWork NSW and the POEO Act. Excavated soil suitable for reuse would be to used to fill low lying parts of the project area or in the levee bank construction. If, in the unlikely event that re-use opportunities are unable to be identified, or the spoil is unsuitable for re-use due to its geotechnical or contamination characteristics, spoil would be tested and classified according to the EPA Guidelines (2014) and disposed of at an appropriately licensed facility. Vegetation removed as part of the project is anticipated to be mulched and reused as part of site restoration (providing it has been confirmed to be free from weeds). Domestic waste generated by construction personnel would be collected in separate waste bins for collection and appropriate recycling or disposal. The adjoining AlburyCity owned and managed toilet facilities would be used for the project. During operation, the project would produce green waste and small amounts of domestic waste. These wastes would be managed in accordance with existing AlburyCity policies and processes.
Visual amenity/ landscape	**Existing environment** Australia Park and Oddies Park are open green spaces that make up part of the Albury riverside parkland area. This area is characterised by open grassed areas and playing fields, large trees (both native and introduced), the Murray River and its associated tributaries. Built features of these parks include roads (sealed and unsealed), a levee bank, carparks, paths, sportsgrounds, community buildings, playgrounds and recreational facilities (such as toilets, picnic tables and barbecues).

Environmental component	Summary of potential impacts
	Key visual features of the project area are the Oddies Creek, native and planted trees, a levee bank and stormwater pump, a picnic area, the Turks Head building, the health spa building and the public toilets building. The project area is located adjacent to Wodonga Place and has a relatively high degree of visibility from the road and adjacent motel accommodation premises. Project areas to the immediate west of the existing buildings would have intermittent visibility from Wodonga Place due to these buildings and vegetation to be retained. **Potential impacts** Construction activities would have a temporary, moderate impact on visual amenity within the project area from stockpiled materials, earthworks and construction machinery / compounds. The project would permanently change the appearance of Australia Park with the levee bank being clearly visible from Wodonga Place. The installation of a new car park will be offset by the rehabilitation of two existing gravel car parks and associated hard stand areas. This would result in a minimal net loss of open space of approximately 67 sq.m. However, with the two landscaped areas in the car park (35.8 sq.m and 49.2 sq.m) there will be no effective net loss of open space. The potential removal of 34 trees (22 identified for removal and 12 Major TPZ encroachment – non-viable) of varying sizes would also change the 'leafy' and 'shady' appearance of the site until replacement trees become established. The levee bank reconstruction would permanently alter the currently undulating / meandering levee bank by providing a more structured and uniform slope, as well as an engineered wall adjacent to Ebden Street. The creation of a new area of greenspace on the existing Oddies Creek gravel carpark and the installation of new barbecue and picnic facilities would positively offset the visual impact of the carpark. The revegetation of the riparian areas of Oddies Creek would improve the visual amenity of the waterway and its transition with adjoining parkland areas. A landscape plan is presented in Appendix F. The replacement of an existing gravel path and culvert structure with an architect designed and purpose-built pedestrian bridge is expected to provide additional visual interest. The creation of a new carpark would permanently reduce the green space currently available in the project area and immediate surrounds. The decommissioning and rehabilitation of the Oddies Creek Park carpark would compensate for the loss of greenspace.

Environmental component	Summary of potential impacts
	Once disturbed and adjoining areas (including rehabilitation of Oddies Park carpark) have been revegetated, the project is expected to have a minor adverse impact on visual amenity of Australia Park.
Traffic	**Existing environment** The project is located adjacent Ebden Street west of Wodonga Place, which is a sealed two-lane road providing public access to the riverside parklands. Existing parking facilities in the project area include parking bays on Ebden Street and a car park adjacent to the health and beauty spa (former NSW Tourism Centre). Oddies Creek Park is serviced by an unsealed carpark accessed via a single lane concrete bridge. In the wider area, there are sealed and unsealed car parks in Noreuil Park and Hovell Tree Park to the north of the project. Australia Park and Oddies Creek park are popular recreational spaces and are frequently accessed via foot and bicycle traffic. The Wagirra Trail, which is a two metre wide, sealed shared pathway runs adjacent the Murray River and starts/terminates adjacent Oddies Park. **Potential impacts** The project would require the temporary closure of public access to Ebden Street west of the intersection with Wodonga Place, and the permanent closure of the existing gravel carpark areas in Oddies Creek Park and Australia Park. Between two and five light vehicles would be required on a daily basis for the movement of site personnel, including contractors and AlburyCity staff to and from the construction site. Between two and four heavy vehicles would be required on a daily basis for the duration of the construction. Construction activities would access the project site via Wodonga Place (C319), which is a sealed, four lane road. The project site could also be accessed from the north via Noreuil Parade, though this access would be only for light vehicles. Access to Australia Park would be restricted during construction and the works area would be fenced. Oddies Creek Park would continue to be accessible from Ebden Street for part of the works period but may not be accessible for short periods while the levee bank (concrete retaining wall) is under construction. Access to community facilities such as the Noreuil Pak Oval Community Room, and adjoining businesses fronting Wodonga Place would be maintained during the construction period.

Environmental component	Summary of potential impacts
	There may be some minor interruptions to traffic flow in the surrounding road network generated by heavy vehicle movements. Light vehicle movements are not expected to impact traffic flow. The project would create 80 new parking spaces within Australia Park which would offset the removal of parking from the Oddies Creek Park and Australia Park gravel car parks. The positioning of the new carpark adjacent to the reconstructed Ebden Street would provide for improved safety and traffic flow arrangements compared to the existing Oddies Creek park access arrangements (single lane bridge). The development is not traffic generating (car park users would generally be visiting facilities or events nearby) but would formalise parking arrangements in this part of the Murray River parklands. The construction of the shared pathway and pedestrian bridge across Oddies Creek would formalise the connection between Australia Park and Oddies Creek Park.
Socio-economic	**Existing environment** The AlburyCity LGA extends from Splitters Creek to the west, Table Top to the north, Lake Hume to the east and the Murray River to the south. The area contains 51,076 residents, of which 48.3% are male and 51.7% are female. Children under 14 make up 18.8% of the population and people over 65 make up 17.9% of the population. The most popular sectors of employment are hospitals, supermarket and grocery stores and hospitality. Unemployment in the area (2016) was 6.8% (ABS, 2016). The parklands along the Murray River are an important recreational resource for residents and a significant part of the tourism offering for Albury-Wodonga. The Murray River is a key component of the AlburyCity tourism offering, where research has indicated that 35% of visitors ranked going to the Murray River as a top activity (Tourism Research Australia, 2013). Oddies Creek Park is located to the south west of the proposed car park and new levee. The playground is considered Albury's premier children's playground, and attracts more than 100,000 visitors per year (AlburyCity, 2021). There are a number of buildings in the area that provide socio-economic benefits to the Albury community. The Noreuil Park Oval Community Room was opened in 1978. There are licence agreements in place with user groups for the building. The Turks Head building and the former NSW Tourism Centre are leased by private businesses and accessed via Wodonga Place. The Turks Head building was recently used as an art gallery and photography centre, providing the community with the opportunity to use a photography studio and display local photography (leased recently extinguished).

Environmental component	Summary of potential impacts
	Potential impacts Socio economic impacts during construction, are associated with access and amenity impacts. Construction would result in short term access restrictions and a reduction in available carparking around Australia Park and Oddies Park. Alternative temporary access arrangements would be determined by AlburyCity and the public would be notified. Access to the previously listed community buildings and businesses would be maintained throughout construction. Amenity impacts (primarily air and noise) would be short term and localised during construction. Consultation with affected lessees and the identification of specific impact avoidance and mitigation actions would be undertaken prior to works commencing. The project is likely to have a minor positive impact during construction, as it would provide employment for the AlburyCity and contractor / supplier workforce. The project would have a positive socio-economic impact during operation, as it would create additional parking spaces and improve access to the parkland and adjoining businesses.



Figure 4: Ecological features and native vegetation to be removed within the project area (Source: Biosis, 2022)

Table 6: Mitigation measures

Environmental component	Potential impact	Mitigation Measures	Likely impact level after mitigation
General	Noncompliance with mitigation measures below	• Prior to any works commencing, prepare a Construction Environmental Management Plan (CEMP) that includes mitigation measures described in this REF. • As part of the 'site induction' all workers are to be provided access to the CEMP and made aware of the potential environmental and heritage impacts and mitigation measures identified in this REF.	Minor
Biodiversity	Removal of native vegetation Removal of / damage to habitat Damage to mature trees Weed and pathogen spread Disturbance of Grey Headed Flying Fox colony Impacts to waterways and aquatic habitat	• Design has been refined and amended to retain all significant native trees, and all hollow-bearing trees are being retained. • Install appropriate exclusion fencing to the boundary of the construction area and existing tracks. Include appropriate signage such as 'No Go Zone' or 'Environmental Protection Area'. • Implement the Sediment and Erosion Control Plan (Appendix G) and ensure appropriate sediment control measures are put in place to ensure run-off during construction does not result in indirect impacts to surrounding habitats. • Implement all tree protection measures as per the Executive Summary and Appendix 3 of the Arboricultural impact assessment (Appendix D). This includes the appointment of an arborist and ongoing supervision of works in order to avoid and minimise impacts to retained trees where feasible. • Trees that are to be removed must be clearly marked. Exclusion fencing must be placed at or beyond the drip lines of the retained vegetation to prevent damage to root systems and to clearly identify the Tree Protection Zone. • Pre-clearance surveys of all vegetation to be removed should occur to identify any active nests and roost sites. • Only remove required vegetation and minimise disturbance to retained vegetation. • Locate stockpiles and/or construction material storages on existing disturbed areas where possible, and away from vegetation and drainage lines. • Construction machinery should be cleaned prior to entering and leaving site to ensure weed propagules are not transported.	Minor

Environmental component	Potential impact	Mitigation Measures	Likely impact level after mitigation
		• All practical steps should be taken to control and eradicate the weeds from the study area prior to vegetation removal. • Implement weed control and monitoring at the conclusion of construction. • The site shall be reinstated with local native vegetation as close as practicable to its original condition. • The existing car park will be reinstated to parkland. • Where artificial lighting is required, lighting design is to adopt best practice which includes using the lowest lighting intensity required for the illumination task. Light sources would be kept low in intensity and close to the ground, and lighting would be timed to minimise operating hours. • If necessary, apply recommendations from the Grey-Headed Flying Fox Management Plan to minimise impacts to existing colony in Padman Park (over 1 kilometre away). • It is unlikely that noise will affect the colony however noise reduction techniques should be considered to minimise disturbance to GHFF population. • Any woody debris encountered in the instream works zone should be relocated and reinstated within Oddies Creek. • Waterway crossings will be designed to maintain the required waterway area and existing nominal flow velocities • The design considerations and recommendations detailed in the *Guidelines for watercourse crossings on waterfront land* (NSW Office of Water, 2012) should be adhered to.	

Soil	Erosion of soils Accidental pollution of soil Incidental discovery of soil contamination Asbestos pipe removal	• Implement the Erosion and Sediment Control Plan (ESCP) (Appendix G) as part of the Construction Environmental Management Plan (CEMP) that includes soil and erosion protection measures in accordance with AlburyCity's Good Practice in Erosion and Sediment Control Guidelines. The plan is to include culvert installation and removal within Oddies Creek. • A spill management plan would be included as part of the CEMP • Spill kits would be provided onsite at all times and workers would be trained in their use during site inductions. • Locate stockpiles and construction materials away from vegetation, waterways and drainage lines, implement bunding practices where appropriate. • Minimise exposure of soils and retain vegetation where practicable. • Do not undertake works during heavy rain periods or flooding. • Manage and dispose of spoil effectively. If fill material is required to be imported, confirm its suitability before it is used in construction works. • Linear silt stop fencing to be installed within the works area and down slope of all affected areas and stockpiles. Silt fencing would be installed before excavation begins. Additional silt control measures to be installed as per the Erosion and Sediment Control Plan (Appendix G). • Sandbags, straw bales wrapped in geotextile fabric etc. would be used to slow water flow and trap sediment. No hay bales are to be used. • All erosion and silt control devices would be visually inspected weekly to ensure effectiveness as well as after each rainfall event. • Store all chemicals (e.g. fuel, oil) offsite or away from sensitive areas such as waterways or native vegetation. • Ensure all equipment is in good working order. • Stop works and notify AlburyCity supervisor if any contamination (e.g. asbestos, discoloured soil, chemical or petrol odours, refuse or leachate) is discovered. • If asbestos pipes appear to be damaged or fragmented, validation of surrounding soils will be undertaken by a suitable qualified AlburyCity staff member or environmental consultant prior to excavation and disposal.	Minor

Environmental component	Potential impact	Mitigation Measures	Likely impact level after mitigation
		• Asbestos would be removed in accordance with the *Work Health and Safety Act 2011* (WHS Act) and *Work Health and Safety Regulation 2017* and Safe Work Australia's Codes of Practice. • Asbestos containing waste would be disposed of at a licensed facility and in accordance with the POEO Act.	

Environmental component	Potential impact	Mitigation Measures	Likely impact level after mitigation
Water	Flooding Groundwater contamination Sedimentation and increased turbidity of nearby watercourses Pollution events	• A flood management plan would form part of the CEMP. The plan would evaluate potential flood risks during construction and identify suitable mitigation measures, including maintenance of levee bank integrity. • The weather forecast would be monitored daily. If a heavy or prolonged rainfall event is predicted or flood warning issued, the following measures would be implemented: o Levee bank integrity works to be prioritised o All erosion and sediment control measures would be inspected and cleared prior to forecast rainfall event o Stockpiles and trenches must be covered o Plant, vehicles and chemicals must be moved away to areas behind the existing levee o Concrete barriers are to be moved to position them parallel to slope to minimise the impedance of water along the most likely flow path if practicable. o The site would be declared closed until the rain event has passed. • Prior to works being undertaken - sample groundwater depth and quality in existing bores (including the sample bore adjoining Turks Head building) to confirm quality of groundwater and the potential for contamination / dewatering impacts. • Measures to control sedimentation and pollutants outlined in Council's Good Practice in Erosion and Sediment Control Guidelines are to be implemented. • Visual monitoring of local water quality (i.e. turbidity, hydrocarbon spills/slicks) is to be undertaken on a daily basis to identify any potential spills or deficient erosion and sediment controls. • Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets. • Reduce water velocity and capture sediment on site. • Minimise the amount of material transported from site to surrounding pavement surfaces. • Ensure new drainage works are tied into existing infrastructure prior to completion of the project.	Minor

Environmental component	Potential impact	Mitigation Measures	Likely impact level after mitigation

Aboriginal heritage	Accidental discovery of heritage items	• If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the AlburyCity Environmental Planner contacted immediately.
		• The find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object, the archaeologist would provide further instruction.
		• If any suspected ancestral human remains are discovered during works:
		  o Immediately cease all work at that location.
		  o Notify NSW Police and Department of Planning and Environment on 131 555.
		  o Do not recommence work at that location unless authorised in writing by Department of Planning and Environment.
		• Works to be carried out in accordance with the attached Aboriginal Due Diligence Assessment (Appendix E).
			None

Historic heritage	Impacts on Turks Head Museum (listed Heritage Item) Accidental discovery of heritage items	• Should the design of the project change with the potential to impact the curtilage of the Turks Head building, a Statement of Heritage Impact must be prepared prior to works commencing. • Fencing between the construction area and the Turks Head building curtilage would be established prior to construction commencing. • Construction staff would be informed of the location and heritage significance of the Turks Head building during the induction. • Measures to reduce vibration described in the noise and vibration section would be implemented during construction to reduce the risk of vibration damage on the Turks Head building. • Should any unexpected historical heritage items be uncovered during works, works should cease, and the AlburyCity Environmental Planner should be contacted immediately. An archaeologist should be contacted, and the Heritage NSW may also be notified.	None

Environmental component	Potential impact	Mitigation Measures	Likely impact level after mitigation
Noise and vibration	Excess noise and vibrations resulting from excavation and construction works Vibration impacts on buildings	• Consult with adjoining/relevant sensitive receivers (including businesses, residents, community) as part of construction planning. Confirm works and proposed mitigation measures. • Where feasible, schedule noisy works to avoid / minimise impacts on adjoining businesses. • Works are to be carried out during normal work hours (i.e. 7 am to 6 pm Monday to Friday; 8 am to 1 pm Saturdays). • Any work that is performed outside normal work hours or on Sundays or public holidays may not be permitted and, if permitted, works are to minimise noise impacts. • Maintain all machinery in good working order to reduce noise emissions. • Avoid idling machinery unless in use. • Conduct noise monitoring in the event of complaints regarding construction noise and implement findings into work practices. • Where possible, implement work practices that produce less noise. • Adhere to standard setback distances outlined in the noise and vibration section. • Dilapidation surveys would be undertaken at the Turks Head Museum prior to work commencing • If the setback distances nominated in Table 5 (noise and vibration) are unable to be adhered to, vibration monitoring must be undertaken to ensure that structural damage criteria presented in *BS 7385-2:1993* is not encroached. • Vibration monitoring would be undertaken if works are anticipated to meet or exceed the Turks Head building vibration criteria from *DIN 4150-3:2016* (Table 5).	Minor

Environmental component	Potential impact	Mitigation Measures	Likely impact level after mitigation
Air quality	Emissions from machinery Excessive dust emissions due to earthworks Fumes from asphalt placement	• Consult with adjoining/relevant sensitive receivers (including businesses, residents, community) as part of construction planning. Confirm works and proposed mitigation measures. • Where feasible, schedule dusty or odorous works to avoid / minimise impacts on adjoining businesses. • Public access to be prevented. • Limit areas of disturbance where possible • Stockpile size to be limited. Where possible import materials as required. • Stockpiles would be covered during periods of high wind or over weekends when work is not occurring. • Measures to minimise or prevent air pollution or dust are to be used including watering or covering exposed areas and stockpiles. • Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely. • Vegetation or other materials are not to be burnt on site. • Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation. • Maintain all machinery in good working order to reduce emissions. • Avoid idling machinery unless in use.	Minor

Environmental component	Potential impact	Mitigation Measures	Likely impact level after mitigation
Waste	Waste generation such as excess fill Asbestos pipe waste	• Waste generation should be minimised. • Waste material, other than vegetation and tree mulch, is not to be left on site once the works have been completed. • All surplus material and other debris resulting from the work shall be removed from site and disposed of by Council or a licensed contractor to a licensed waste management facility. Recycle / reuse waste where appropriate (e.g. mulch, fill). • Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day. • Domestic waste generated by construction personnel would be collected in separate waste bins for collection and appropriate recycling or disposal. • SafeWork NSW would be notified prior to any asbestos removal works (where required) • Asbestos would be removed in accordance with the *Work Health and Safety Act 2011* (WHS Act) and Work Health and Safety Regulation 2017 and Safe Work Australia's Codes of Practice. • Asbestos containing waste would be disposed of at a licensed facility and in accordance with the POEO Act.	Negligible
Visual amenity / landscape	Temporary construction site activities	• Prior to the works commencing - engage with neighbouring lessees / landholders and wider community where appropriate. • Reinstate disturbed areas as soon as possible. Use local native tree and shrub species to reinstate vegetated areas.	Minor
Traffic	Temporary road closure and access restrictions Changes to the flow of local traffic and car parking arrangements	• Prior to the works commencing – notify the community and engage with neighbouring and affected lessees / landholders. Identify and communicate alternative parking and access arrangements. • Erect warning signage and barriers as appropriate for the period of the works. • Schedule works in order to minimise the length of time that Ebden Street is closed. • Use traffic controllers for temporary access restrictions as required	Minor

Environmental component	Potential impact	Mitigation Measures	Likely impact level after mitigation
Socio economic	Access restrictions to recreational facilities	• Prior to the works commencing – notify the community and engage with neighbouring and affected lessees / landholders. • Local goods and services would be used where possible • Erection of signage at the site providing contact details and notifications so that the community can seek information or make complaints during construction. • Complaints would be recorded and responded to in a reasonable timeframe.	Minor

5 Conclusion

The proposed works (Australia Park car park, pedestrian bridge and levee bank reconstruction) have a range of tourism, amenity, public safety and environmental objectives. The project involves a number of demolition and construction activities including:

- Installation of a new service vehicle culvert across Oddies Creek approximately 130 metres west of the site (service vehicle access via Noreuil Parade).
- Construction of a new sealed carpark (80 spaces) to the south of Ebden Street in Australia Park, including the planting of 18 advanced trees and 2126 understorey species.
- Reconstruction and resealing of Ebden Street and adjoining car parks between the intersection with Wodonga Place and the Noreuil Pak Oval Community Room.
- Demolition of existing BBQ facilities, seating, overhead shelter, and pathways within Australia Park.
- Removal of eighteen planted exotic trees, two non-endemic eucalypts and four River Red Gum trees (non-hollow bearing).
- Major non-viable impacts to the TPZ of an additional ten exotic trees and two (hollow bearing) River Red Gum trees, noting the trees will be retained where possible as habitat trees.
- Construction of a new earthen levee bank on a new alignment closer to Oddies Creek, as well as a section of concrete retaining wall on the southern side of Ebden Street.
- Construction of a new pedestrian bridge across Oddies Creek, linking the new carpark and the Oddies Creek Play Space.
- Decommissioning of the existing vehicle bridge and Oddies Creek gravel carpark and conversion to additional green space adjacent Oddies Creek.
- Installation of new BBQ and seating facilities, lighting and pedestrian pathways.
- Revegetation of grassed areas and understorey planting along the Oddies Creek riparian area
- Installation of a new irrigation system for grassed areas.
- Realignment of water and sewer mains.

Australia Park is a gateway to the Albury riverside parkland precinct and forms a key component of the Murray River Experience Master Plan that was adopted by Council in 2007. In 2017, AlburyCity completed community consultation to gain community feedback in relation to the Riverside Precinct Concept Plans, with an overwhelmingly positive response on the plans to ‘further improve facilities, parking and pedestrian connectivity between Australia Park, Oddies Creek play space and the other riverside park areas’. Council also resolved to create additional permanent car parking spaces (100) and identify additional overflow parking spaces (77) in the precinct.

Currently, Australia Park has limited connectivity to Oddies Play Space which is serviced by a gravel carpark and a single lane vehicle bridge. The new car park would provide increased capacity for visitation and would improve the separation between vehicles and pedestrians. The existing BBQ and picnic facilities are aging. New facilities and landscaping would improve the amenity and functionality of the area. Revegetation of the riparian areas adjoining Oddies Creek with endemic flora would create habitat for a variety of fauna species and improve the ecological value of the area. Realignment and reconstruction of the flood levee would assist in maintaining flood protection for the city.

The project has been assessed under Part 5 of the EP&A Act and this Review of Environmental Factors has been prepared in accordance with relevant legislation, including but not limited to Section 5.5 of the EP&A Act, Clause 228 of the EP&A Regulation, and the Commonwealth EPBC Act.

Key environmental factors to be considered and managed during design and construction of the project include:

- Impacts to native vegetation, including hollow bearing trees and encroachment into Tree Protection Zones
- Protection of waterway quality from runoff containing sediment or other contaminants.
- Management of visual amenity associated with the introduction of new 'hard' surfaces and the removal of native and exotic vegetation
- Management of amenity impacts (air, noise, visual) on adjoining sensitive receivers and businesses.
- Protection of the heritage listed Turks Head building from vibration impact
- Avoidance of potential soil or water quality impacts in the event that asbestos and/or contaminated groundwater is encountered
- Public access to adjoining parkland areas.

It is considered that the environmental impact of the project is not likely to be significant. Minor short-term impacts would be managed through the development of a Construction Environment Management Plan (including an Erosion and Sediment Control Plan) and implementation of mitigation measures outlined in Table 6.

Medium term impacts associated with the removal of a number of (primarily exotic) trees would be mitigated through establishment of new trees, revegetation of the banks of Oddies Creek, and the conversion of the existing gravel Oddies Creek Park carpark to public greenspace.

Tests of Significance indicate that a significant effect is not likely to result from the project, and the project is considered unlikely to significantly affect threatened species, threatened ecological communities or their habitats and therefore a Species Impact Statement and a Commonwealth EPBC referral are not required.

Section 6

6 Review and Determination

Author Declaration

This REF provides a true and fair review of the activity in relation to its likely effects on the environment in accordance with the *Guidelines for Division 5.1 assessments* (DPE 2022). It addresses, to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the project and provides sufficient information to determine whether there is likely to be a significant impact on the environment as a result of the project.

I have considered all environmental impacts and safeguards to the best of my knowledge and have sought advice where required.

REF prepared by: Name: David Armstrong Title: Team Leader Parks & Recreation Phone: 02 6023 8706	Signature:  Date: 07/08/2023

Environment Team Review

AlburyCity's Environment Team has reviewed the revised Australia Park car park, pedestrian bridge and levee bank reconstruction REF (dated 07/08/2023) and associated documentation. Comments are provided below:

After assessing the Review of Environmental Factors for the proposed works relating to Australia Park car park, pedestrian bridge and levee bank reconstruction REF (dated 7/8/2023), I am satisfied that adequate steps have been taken to avoid and minimise the adverse environmental impacts associated with these works.

There is impact through the removal of exotic trees in the project that will alter the amenity of the area until replacement trees have attained sufficient maturity. The project would remove 18 exotic trees, and four non-hollow bearing River Red Gum trees. In addition, there are major Tree Protection Zone (TPZ) impacts on two additional hollow bearing River Red Gum trees within the project area. A further 20 trees have TPZ impacts that are considered non-viable. Revegetation of locally native species along Oddies Creek riparian zone is a condition of the REF. The implementation of mitigation measures including replanting 18 advanced tree species and 2126 understorey plants with the reclamation of the existing gravel carpark for greenspace would significantly lessen the impact on amenity for the locality.

The impact of replacing green spaces with hard surfaces is permanent despite mitigation measures proposed. A large car park will contribute a heat island effect and may reduce opportunities for passive recreation. The selection of advanced trees will be important because any trees planted will take 20-80 years to achieve the same maturity as the trees that would be removed. The REF lists community engagement that was undertaken in 2017 and done in relation to the *Draft Riverside Precinct and Parks Public Infrastructure Concept Plans*. Of the 562 respondents, 91% were supportive of plans to further improve facilities, parking and pedestrian connectivity between Australia Park, Oddies Creek play space and other riverside park areas".

Considering the avoidance measures and anticipated remediation works, the environmental impact of the project is not likely to be significant.

The project is recommended for approval, however, to satisfy environmental legislative obligations and mitigate environmental impacts, the conditions identified in Section 8 of the REF must be adhered to.

REF reviewed by: Name: Anthony Dufty Title: Team Leader Environment Phone: 02 6023 8284	Signature:  Date: 30/08/2023

ALTERNATE DETERMINATION & CONDITIONS

7 Review and Determination

Author Declaration

This REF provides a true and fair review of the activity in relation to its likely effects on the environment in accordance with the *Guidelines for Division 5.1 assessments* (DPE 2022). It addresses, to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the project and provides sufficient information to determine whether there is likely to be a significant impact on the environment as a result of the project.

I have considered all environmental impacts and safeguards to the best of my knowledge and have sought advice where required.

REF prepared by: Name: David Armstrong Title: Team Leader Parks & Recreation Phone: 02 6023 8706	Signature:  Date: 31/08/2023

Determiner Declaration & Approval

I certify that I have reviewed and endorsed the contents of this REF document and, to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under Clause 170 of the EP&A Regulation, and the information it contains is neither false nor misleading. The project can proceed, subject to the controls outlined in this REF and the conditions listed in Section 8.

Name: David Costello Title: Service Leader City Landscapes Phone: 02 6023 8133	Signature:  Date: 31/08/2023

8 Conditions

In addition to the mitigation measures described in this REF, the following conditions must be adhered to:

General

1. All works to be carried out as indicated in this Review of Environmental Factors (REF) with no vegetation to be removed other than that identified. Any changes to the alignment or works required outside of the works area identified in this REF will require further approval.

2. All mitigation measures outlined in this REF are to be implemented.

3. Prior to commencement of any works, a Construction Environmental Management Plan (CEMP) must be prepared and approved by the Environment Team. Work is not to commence until written notification of approval of the CEMP is provided. The CEMP must address all mitigation measures identified in the REF and all attached conditions. As a minimum, the CEMP is to include:
    a. Soil and Water Management Plan, including measures to protect watercourses
    b. Flood management plan
    c. Traffic & Access
    d. Tree Management Plan
    e. Biodiversity and tree protection
    f. Noise and vibration
    g. Unanticipated find protocol for Aboriginal cultural heritage items and human remains

4. A detailed revegetation plan for Oddies Creek is to be developed and approved by the Environment Team prior to any works commencing. The plan must include a list of appropriate native tree, shrub and understorey species as well as approximate numbers of plants and locations for planting. Planting is to reflect the vegetation community being removed or modified (i.e. PCT 5 *River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion*) in accordance with the General Native Profiles for the Albury District or the Bowna-Jindera District in the South West Slopes Revegetation Guide

5. The REF must be published in accordance with Section 171(4) of the EPA Regulation as it is in the public interest. It must be published:
    a. Before the activity commences, or
    b. If publishing the review before the activity commences is not practicable – as soon as practicable, and no later than 1 month, after the activity commences.

Pre-construction

6. No stockpiles will be established under native vegetation or near waterways in any area onsite. The existing car park and current Oddies Creek Park will be used as a stockpile yard during construction to avoid further impacts to native vegetation.

7. Pre-clearing surveys are to be undertaken by a suitably qualified ecologist immediately prior to clearing to
    a. Check for presence of flora and fauna species
    b. Identify any hollow-bearing trees or other habitat that may contain threatened fauna;
    c. Locate nearby suitable habitat for release of any fauna that may be encountered;
    d. Identify appropriate exclusion zones;
    e. Advise on any staged habitat removal that may be required

8. Any fauna that is encountered during the works shall be protected and relocated by a qualified and licenced ecologist or wildlife handler to a suitable habitat nearby. In the event that any threatened species are discovered during construction, work will stop immediately, and CEMP protocols will be followed.

9. Prior to works commencing all controls are to be installed, including Tree Protection Zones (TPZ) and exclusion zones.

10. All trees for retention (including any hollow-bearing trees) shall be clearly identified and protected in accordance with AS 4790-2009 and Appendix 3 of the Arboriculture report (Appendix D of the REF) prior to the commencement of any works. Works are only permitted in TPZs where identified in the Arboriculture report and in line with mitigation measures. TPZs are to be maintained for the entire duration of works.

Construction

11. The contractor must engage a suitably qualified Project Arborist to directly supervise excavation and other works to be undertaken within the TPZs of trees to be retained. The arborist shall possess suitable qualifications to meet the minimum requirement of AQF Level 5 set out in the Arboriculture Impact Assessment (AIA):
    a. A Tree Management Plan, including a Tree Protection Plan, shall be prepared by the project arborist, and submitted to the Council for review and approval prior to the commencement of works on-site.

12. Trees listed for removal in the Contract Documents are to be clearly marked by the project arborist prior to the commencement of works and inspected by an AlburyCity Arborist.
    a. The Contractor shall establish tree protection zones (TPZs) for all retained trees for approval by the project arborist, prior to the commencement of works.
    b. Installation of utilities within TPZs of retained trees should be installed via non-destructive or trenchless methods under supervision of the Project Arborist.
    c. Excavation, demolition, and other nominated works within areas nominated in Section 3 of the AIA shall be completed under direct supervision of the Project Arborist.
13. All root pruning shall be undertaken by and at the discretion of the Project Arborist, in consultation with an AlburyCity Arborist.

14. The retention of hollow-bearing trees and other high value trees must be prioritised. Every effort is to be made to retain tree nos. 69 and 19 due to significant amenity and environmental values (Hollow Bearing Trees). Mitigation measures to include hydro excavation under the supervision of the Project Arborist and an AlburyCity arborist.

15. Hydro excavation around all trees proposed for retention must be undertaken under the supervision of the Project Arborist and an AlburyCity arborist.

16. Kerb and guttering is not proposed for the northern edge of Ebden Street. The installation of an edge strip is not expected to result in the removal of or loss of viability of an avenue of mature established Plane Trees. Any excavation within the TPZ of these trees must be undertaken using sensitive techniques (e.g.hydro excavation) under the supervision of the Project Arborist and an AlburyCity Arborist.

17. Construction of the carpark poses a risk of damage to the locally heritage listed Turks Head building constructed in the 1860s. Protection of the building from vibration impacts associated with levee construction is detailed in the mitigation measures and the flood levee design technical specification. In addition:

    a. Vibratory rolling is prohibited within 35 m of the Turks Head building,
    b. Vibration monitoring shall be implemented and undertaken during the works in accordance with the flood levee design technical specification, and
    c. Council shall be notified immediately if the recorded vibration exceeds the permitted level.

18. Works undertaken around waterways will:

    a. be limited to low flow periods wherever possible.
    b. relocate and reinstate woody debris encountered in the instream works zone within Oddies Creek.
    c. require any temporary crossing structures to be designed, constructed and maintained so that low flow conditions and fish passage are maintained and any material used does not result in fine sediment entering the waterway.

Post-construction

19. As Australia Park is within a Biodiversity Certification Exclusion area, compensatory planting is required in accordance with Section 5.3.2 of the DCP Part 5. A Vegetation Management Plan/s is to be prepared to scale that clearly illustrates the following information: buffer zones around existing native vegetation, waterways and wetlands;

    a. rate of compensatory plantings in accordance Tables 2,3 and 4; and
    b. the proposed location of compensatory plantings, suitable species selection, separation distance between plantings, minimum container size and soil volume or required soil remediation and 2-year maintenance plan.
    c. Provide compensatory planting in accordance with the Vegetation Planting Rate in Table 2.

Table 2: Vegetation Planting Rate Ecological Value Ratio

Trees Medium/Low	1.5
Trees High	1:10
Understorey/shrubs	1:7
Groundcover	1:10

20. In accordance with Table 2, the removal of 4 River Red Gums (low/medium ecological value) species will require a minimum compensatory planting rate of 20 trees. The loss of any additional trees (i.e. due to loss of viability from TPZ encroachment) and any other shrub or understorey species is to be compensated accordingly.

21. Ecological compensatory plantings are to:

    a. be outside any known Asset Protection Zones (APZ) in accordance with NSW RFS Standards for Asset Protection Zones;
    b. provide vegetation buffer zones;
    c. be located on the subject site and connect to existing patches of native vegetation or strengthen corridors that link environmental land on two or more nearby sites;
    d. provide block shaped links, to reduce edge effects created by linear perimeters; and
    e. trees are to be planted in proximity, in accordance with Table 4.

Table 4 – Vegetation Planting Density

Vegetation Type	Density
Tree	1 per $5m^2$ with a maximum of 20 metre spacing
Shrubs	3 per $5m^2$ planted in clumps
Grasses and groundcovers	4 per $1m^2$ planted in clumps

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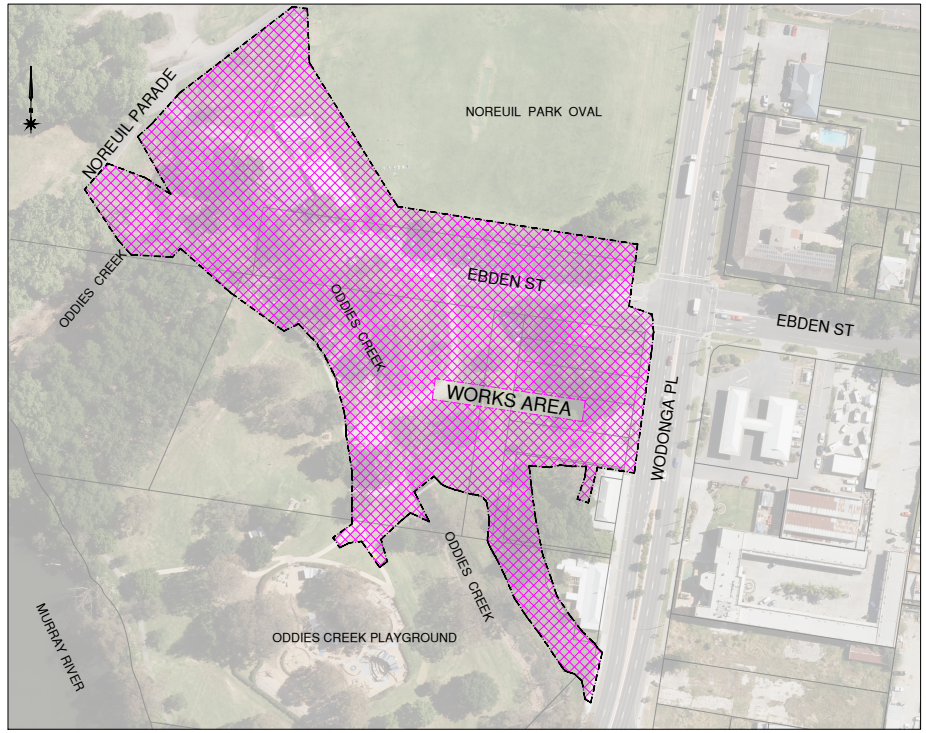
Appendix A: Engineering design drawings

AUSTRALIA PARK - CAR PARK AND LEVEE BANK CONSTRUCTION



LOCALITY PLAN

Scale 1:1000 @ A1

HORIZONTAL 1:1000 20 10 0 20 40 60

WARNING STORMWATER PIPES | WARNING SEWER MAINS | WARNING WATER MAINS | DANGER UNDERGROUND POWER | DANGER UNDERGROUND COMMUNICATIONS | DANGER UNDERGROUND GAS | DANGER OVERHEAD POWER | DANGER PETROLEUM TESTING PITS | DIAL BEFORE YOU DIG www.1100.com.au

ALBURY CITY STANDARD DRAWINGS

NUMBER	DRAWING TITLE
STD-D-10	GRATED GULLY PITS
STD-D-80	STANDARD SUB-SOIL DRAINAGE
STD-D-90	STANDARD TRENCH DETAILS STORM WATER DRAINAGE
STD-R-10	ALBURYCITY STANDARD KERB PROFILES
STD-R-20	STANDARD PERAMBULATOR RAMP ON NEW CONSTRUCTION
STD-R-21	CONCRETE FOOTPATH DETAILS
STD-S-90	STANDARD TRENCH DETAILS SEWER MAINS AND WATER MAINS
STD-W-10	WATER SERVICE CONNECTION
STD-W-20	CONCRETE THRUST BLOCK DETAILS
STD-W-30	HYDRANT AND STOP VALVE COVER AND SURROUND DETAIL

DRAWING SCHEDULE

SHEET NUMBER	SHEET TITLE
01	TITLE PAGE
02	EXISTING CONDITIONS
03	PROPOSED WORKS
04	TREE PROTECTION PLAN
05	SEDIMENT AND EROSION CONTROL PLAN
06	EARTHWORKS PLAN
07	EBDEN STREET - PLAN AND LONGITUDINAL SECTION
08	EBDEN STREET - CROSS SECTIONS CH 0.00 - CH 60.00
09	EBDEN STREET - CROSS SECTIONS CH 70.00 - CH 121.250
10	EBDEN STREET - CROSS SECTIONS CH 130.00 - CH 155 & CUL-DE-SAC
11	CAR PARK PLAN AND LONGITUDINAL SECTION
12	CAR PARK / EBDEN ST INTERSECTION - KERB RETURNS
13	PAVEMENT DETAILS
14	CARPARK TREE BAY DETAILS
15	TREE PLANTING IN CARPARK DETAILS
16	LINEMARKING AND SIGNAGE PLAN
17	DRAINAGE PLAN
18	DRAINAGE LONGITUDINAL SECTIONS
19	DRAINAGE PIT AND PIPE SCHEDULES
20	NEW ACCESS TRACK CROSSING OF ODDIES CREEK
21	DRAINAGE LONGITUDINAL SECTION - ODDIES CREEK CROSSING
22	PEDESTRIAN BRIDGE PLAN AND SECTIONS
23	SHARED PATH - RAMPS
24	WATERMAIN RELOCATION PLAN
25	SEWER RISING MAIN RELOCATION PLAN
26	BP MONITORING WELL PLAN
27	ELECTRICAL LAYOUT PLAN
28	FENCING PLAN

TABLE 4 VERTICAL CLEARANCES

EXISTING OR PROPOSED SERVICE	MINIMUM VERTICAL CLEARANCE (mm)
WATER MAINS <DN375	150
WATER MAINS >DN375	300
GAS MAINS	150
TELECOMMUNICATIONS & CABLES	150

EXISTING OR PROPOSED SERVICE	MINIMUM VERTICAL CLEARANCE (mm)
ELECTRICITY CONDUITS & CABLES	225
STORMWATER DRAINS & PITS	150
SEWERS - GRAVITY	500
SEWERS - PRESSURE & VACUUM	300

GENERAL NOTES:

1. ONLY CONTRACTORS ACCREDITED BY ALBURY CITY COUNCIL SHALL BE ELIGIBLE TO CONSTRUCT THESE WORKS.
2. THE CONTRACTOR SHALL OBTAIN A ROAD OPENING PERMIT FOR ANY WORKS WITHIN THE ROAD RESERVE AND COMPLY WITH ALL REQUIREMENTS OF THE ROAD OWNER.
3. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL'S ENGINEERING STANDARDS AND SPECIFICATIONS AS DIRECTED BY THE ALBURY CITY PROJECT ENGINEER.
4. THE CONTRACTOR IS NOT TO ENTER UPON OR DO ANY WORKS WITHIN ADJACENT LANDS WITHOUT THE WRITTEN PERMISSION OF THE PROPERTY OWNER.
5. LOCATION OF SERVICES ARE APPROXIMATE ONLY AND ALL SERVICES MUST BE LOCATED IN LINE AND LEVEL BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION.
6. ALL FILLING TO BE COMPACTED TO A MINIMUM 95% OF THE STANDARD MAXIMUM DRY DENSITY AS TESTED IN ACCORDANCE WITH E1.1 OF AS1289 UNLESS OTHERWISE NOTED.
7. FILL MATERIAL TO BE APPROVED BY THE ALBURY CITY PROJECT ENGINEER
8. SURPLUS EXCAVATED MATERIAL TO BE REMOMVED FROM SITE TO ALBURY WASTE MANAGEMENT CENTRE (AWMC) OR AS DIRECTED BY THE ALBURY CITY PROJECT ENGINEER. ENVIRONMENTAL IMPACTS TO BE ALLOWED FOR.
9. ALL NEW WORKS TO MAKE SMOOTH JUNCTION WITH EXISTING CONDITIONS.
10. NO STEP IRONS ARE TO BE INSTALLED IN PITS.
11. CHANNEL WORKS TO BE TOPSOILED & TURFED REFER LANDSCAPE PLAN.
12. ALL CONCRETE TO HAVE A MINIMUM STRESS GRADE OF N32 UNLESS OTHERWISE NOTED.
13. A MINIMUM 50mm APPROVED GRANULAR BEDDING TO BE PROVIDED UNDER ALL CONCRETE.
14. ALL SITE REGRADING AREAS ARE TO BE GRADED TO THE SATISFACTION OF THE ALBURY CITY PROJECT ENGINEER, TOPSOILED AND TURFED.
15. CONTRACTOR IS TO CLEAR SITE BY REMOVING ALL RUBBISH, FENCES, OUTHOUSES, CAR BODIES AND DEBRIS ETC.
16. COUNCIL'S TREE PRESERVATION ORDER MUST BE OBSERVED AND NO TREE IS TO BE FELLED, LOPPED OR REMOVED WITHOUT PRIOR APPROVAL OF ALBURY CITY PROJECT ENGINEER.
17. ALL DISTURBED AREAS AND BATTERS TO BE TOPSOILED AND TURFED REFER LANDSCAPE PLAN.
18. ALL MEASUREMENTS IN mm UNLESS OTHERWISE NOTED.
19. MEASUREMENTS SHALL BE TAKEN FROM THE FIGURED DIMENSIONS AND ARE NOT TO BE SCALED FROM THE DRAWINGS.

SURVEY, SET OUT AND ASSET RECORDING

20. TEMPORARY BENCH MARKS (TBM) FOR THE SET OUT OF WORKS TO THE AUSTRALIAN HEIGHT DATUM (AHD) ARE PROVIDED IN THE DESIGN DRAWINGS.
21. ALL LEVELS ARE IN METRES TO AHD.
22. ALL CO-ORDINATES ARE IN METRES TO THE MAP GRID OF AUSTRALIA (MGA 55- 94).
23. THE CONTRACTOR IS DIRECTLY RESPONSIBLE FOR ENSURING THE PROJECT SET OUT IS CONSISTENT WITH THE DESIGN. SHOULD ACTUAL SITE CONDITIONS CONFLICT IN ANY WAY WITH THAT DOCUMENTED, THE CONTRACTOR SHALL CONTACT THE ALBURY CITY PROJECT ENGINEER FOR CLARIFICATION BEFORE PROCEEDING.
24. THE CONTRACTOR IS TO ENGAGE A SUITABLY QUALIFIED AND EXPERIENCED SURVEYOR TO UNDERTAKE ASSET RECORDING OF THE WORKS. ALL SPECIFIC PIPE MATERIALS (EG: PVC-M) SHALL BE INDICATED IN THE 'AS CONSTRUCTED' INFORMATION

EMBEDMENT

25. EMBEDMENT IN TRENCH TO BE PLACED AS PER ALBURY CITY COUNCIL STANDARD DRAWINGS.

BACKFILL

26. THE CONTRACTOR IS TO MEET BACKFILL MATERIAL AND COMPACTION REQUIREMENTS (IE: ALBURY CITY COUNCIL STANDARD SPECIFICATION FOR ROAD RESERVE BACKFILL).

OTHER SERVICES

27. TO RECEIVE THE MOST UP TO DATE INFORMATION PRIOR TO CONSTRUCTION, "DIAL BEFORE YOU DIG" SHALL BE UNDERTAKEN TO AID IN THE LOCATION OF OTHER SERVICES. OTHER SERVICES SHALL BE CAREFULLY LOCATED PRIOR TO FULL EXCAVATION AT THE CONTRACTOR'S COST. ANY CLASHES OF PROPOSED NEW WORKS WITH OTHER ASSETS SHALL BE REPORTED TO THE SUPERINTENDENT IMMEDIATELY FOR CLARIFICATION.

SEDIMENT CONTROL

28. ALL SEDIMENT CONTROL MEASURES TO BE INSTALLED PRIOR TO COMMENCEMENT OF WORKS.
29. SEDIMENT CONTROL STRUCTURES TO BE INSPECTED AFTER EACH RAIN EVENT FOR DAMAGE AND ALL TRAPPED SEDIMENT TO BE REMOVED TO A NOMINATED STOCKPILE SITE.
30. THE PROJECT MANAGER TO INFORM ALL CONTRACTORS AND SUB-CONTRACTORS OF THEIR OBLIGATIONS UNDER THE EROSION AND SEDIMENT CONTROL PLAN.

TOPSOIL

31. TOPSOIL STRIPPED FROM ALL DISTURBED AREAS TO BE STOCKPILED SEPERATELY FOR REPLACEMENT UPON COMPLETION OF WORKS, STOCKPILES NOT TO EXCEED 2.0M IN HEIGHT.
32. IMPORTED SOILS BROUGHT TO SITE TO BE CLEAR OF ANY CONTAMINATES, SITE SUPERINTENDANT TO CONFIRM ACCEPTENCE OF IMPORTED MATERIALS.
33. REINSTATE ANY DISTURBED SURFACE TO AT LEAST THE STANDARD OF SURFACE BEFORE CONSTRUCTION BEGAN.

VEGETATION

34. EXISTING VEGETATION AREAS TO BE EXCLUSION ZONES FOR MACHINERY AND MATERIALS DURING CONSTRUCTION.
35. VEHICLE AND MATERIAL STORAGE TO BE IN DESIGNATED FENCED AREAS AS MARKED ON PLANS.
36. PARKING OF EQUIPMENT/PLANT/MACHINERY/VEHICLES IS NOT PERMITTED WITHIN THE TREE DRIP LINES.
37. NO EXISTING VEGETATION TO BE REMOVED WITHOUT FIRST BEING MARKED BY SUPERINTENDANT AND COUNCIL VEGETATION OFFICER.
38. NO VEGETATION WORKS TO BE CARRIED OUT WITHOUT REFERRING TO COUNCIL VEGETATION OFFICER.

BP PETROLEUM MONITORING WELL

39. GROUNDWATER MONITORING WELLS OCCUR WITHIN THE WORKS SITE - REFER SHEET 24. DECOMMISSIONED WELLS MAY BE CUT OFF AT REQUIRED HEIGHT WHEN ENCOUNTERED. RETAINED MONITORING WELLS ARE TO BE REINSTATED WITH EXISTING LID TO NEW FINISHED HEIGHT TO ENABLE ONGOING MONITORING.

ISSUED FOR TENDER

AlburyCity

N.B: All underground services information provided here are indicative, depths to be confirmed before construction.

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE 1:1000
SHEET A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

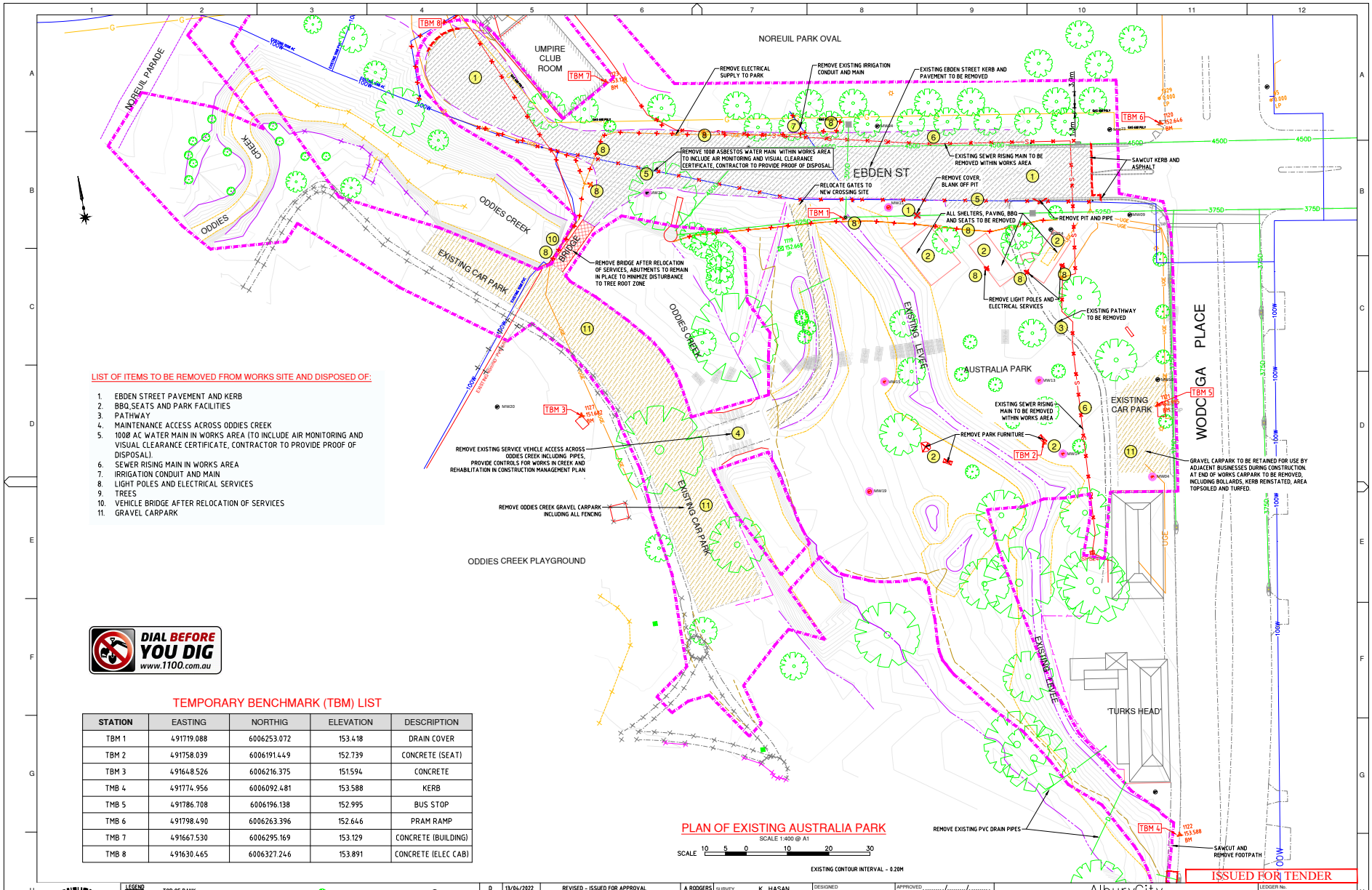
AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
SITE LOCALITY PLAN AND GENERAL NOTES

LEDGER No. 3764.5015

REV.	No. of Sheets	Sheet No.
G	28	01

DRAWING NUMBER ENG21/357



LIST OF ITEMS TO BE REMOVED FROM WORKS SITE AND DISPOSED OF:

1. EBDEN STREET PAVEMENT AND KERB
2. BBQ,SEATS AND PARK FACILITIES
3. PATHWAY
4. MAINTENANCE ACCESS ACROSS ODDIES CREEK
5. 100Ø AC WATER MAIN IN WORKS AREA (TO INCLUDE AIR MONITORING AND VISUAL CLEARANCE CERTIFICATE, CONTRACTOR TO PROVIDE PROOF OF DISPOSAL).
6. SEWER RISING MAIN IN WORKS AREA
7. IRRIGATION CONDUIT AND MAIN
8. LIGHT POLES AND ELECTRICAL SERVICES
9. TREES
10. VEHICLE BRIDGE AFTER RELOCATION OF SERVICES
11. GRAVEL CARPARK

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TEMPORARY BENCHMARK (TBM) LIST

STATION	EASTING	NORTHIG	ELEVATION	DESCRIPTION
TBM 1	491719.088	6006253.072	153.418	DRAIN COVER
TBM 2	491758.039	6006191.449	152.739	CONCRETE (SEAT)
TBM 3	491648.526	6006216.375	151.594	CONCRETE
TMB 4	491774.956	6006092.481	153.588	KERB
TMB 5	491786.708	6006196.138	152.995	BUS STOP
TMB 6	491798.490	6006263.396	152.646	PRAM RAMP
TMB 7	491667.530	6006295.169	153.129	CONCRETE (BUILDING)
TMB 8	491630.465	6006327.246	153.891	CONCRETE (ELEC CAB)

PLAN OF EXISTING AUSTRALIA PARK

SCALE 1:400 @ A1

SCALE 10 5 0 10 20 30

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LEGEND

TOP OF BANK, BANK BOTTOM, KERB, CONCRETE EDGE, BITUMEN - EDGE, EDGE OF PATH, FENCE, TREE, TREE TO REMOVE, LIGHT POLE, LIGHT TO REMOVE, BENCHMARK (TBM), EXISTING JUNCTION PIT, EXISTING SAG PIT, EXISTING SIDE ENTRY PIT, BP PETROLEUM MONITORING WELL, CONSTRUCTION FOOTPRINT

REV	DATE	AMENDMENTS	INIT.
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F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE 1:400
SHEET A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

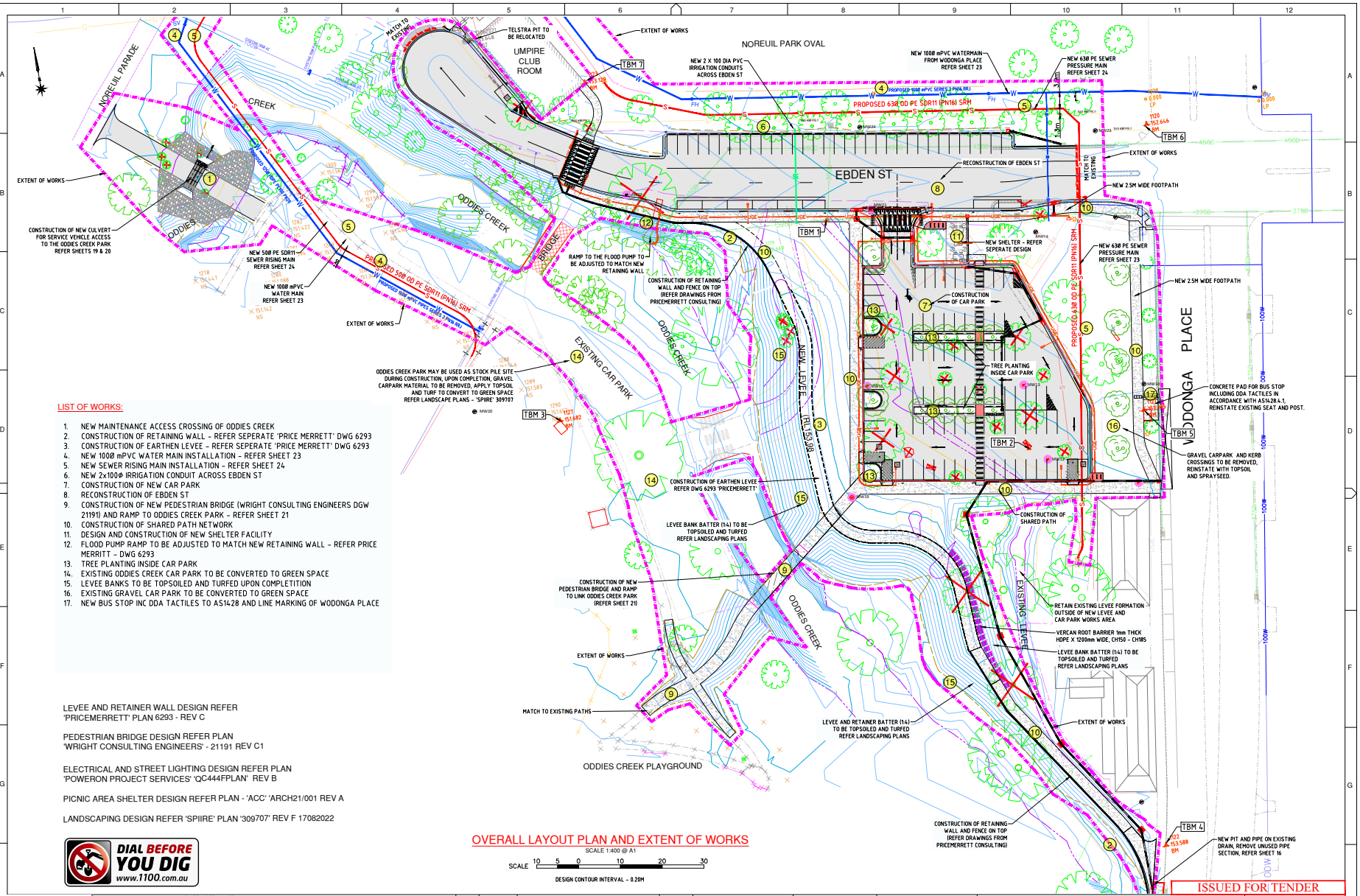
AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
EXISTING SITE CONDITION

LEDGER No. 3764.5015

REV.	No. of Sheets	Sheet No.
G	28	02

DRAWING NUMBER ENG21/357



LIST OF WORKS:

1. NEW MAINTENANCE ACCESS CROSSING OF ODDIES CREEK
2. CONSTRUCTION OF RETAINING WALL - REFER SEPERATE 'PRICE MERRETT' DWG 6293
3. CONSTRUCTION OF EARTHEN LEVEE - REFER SEPERATE 'PRICE MERRETT' DWG 6293
4. NEW 100Ø mPVC WATER MAIN INSTALLATION - REFER SHEET 23
5. NEW SEWER RISING MAIN INSTALLATION - REFER SHEET 24
6. NEW 2x100Φ IRRIGATION CONDUIT ACROSS EBDEN ST
7. CONSTRUCTION OF NEW CAR PARK
8. RECONSTRUCTION OF EBDEN ST
9. CONSTRUCTION OF NEW PEDESTRIAN BRIDGE (WRIGHT CONSULTING ENGINEERS DGW 21191) AND RAMP TO ODDIES CREEK PARK - REFER SHEET 21
10. CONSTRUCTION OF SHARED PATH NETWORK
11. DESIGN AND CONSTRUCTION OF NEW SHELTER FACILITY
12. FLOOD PUMP RAMP TO BE ADJUSTED TO MATCH NEW RETAINING WALL - REFER PRICE MERRITT - DWG 6293
13. TREE PLANTING INSIDE CAR PARK
14. EXISTING ODDIES CREEK CAR PARK TO BE CONVERTED TO GREEN SPACE
15. LEVEE BANKS TO BE TOPSOILED AND TURFED UPON COMPLETITION
16. EXISTING GRAVEL CAR PARK TO BE CONVERTED TO GREEN SPACE
17. NEW BUS STOP INC DDA TACTILES TO AS1428 AND LINE MARKING OF WODONGA PLACE

LEVEE AND RETAINER WALL DESIGN REFER 'PRICEMERRETT' PLAN 6293 - REV C

PEDESTRIAN BRIDGE DESIGN REFER PLAN 'WRIGHT CONSULTING ENGINEERS' - 21191 REV C1

ELECTRICAL AND STREET LIGHTING DESIGN REFER PLAN 'POWERON PROJECT SERVICES' 'QC444FPLAN' REV B

PICNIC AREA SHELTER DESIGN REFER PLAN - 'ACC' 'ARCH21/001 REV A

LANDSCAPING DESIGN REFER 'SPIIRE' PLAN '309707' REV F 17082022

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OVERALL LAYOUT PLAN AND EXTENT OF WORKS

SCALE 1:400 @ A1

SCALE 10 5 0 10 20 30

DESIGN CONTOUR INTERVAL - 0.20M

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LEGEND

TOP OF BANK	EXISTING DRAINAGE	EXISTING TREES	EXISTING JUNCTION PIT		
BANK BOTTOM	PROPOSED DRAINAGE	TREES TO REMOVE	EXISTING SAG PIT		
EXISTING KERB	PROPOSED KERB & GUTTER	NEW TREES TO PLANT	EXISTING SIDE ENTRY PIT		
CONCRETE EDGE	PROP LEVEE ALIGNMENT	LIGHT POLE	EXISTING GRATED PIT		
BITUMEN - EDGE	CONCRETE EDGE	LIGHT TO REMOVE	PROPOSED DGGP		
EDGE OF PATH	EXISTING WATER MAIN	HYDRANT/SV	PROPOSED JUNCTION PIT		
FENCE	PROP IRRIGATION COND	BP MONITORING WELL - REMAIN	REMOVE		
	PROPOSED WATER MAIN				

REV	DATE	AMENDMENTS	INIT.
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G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
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REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1:400
SHEET	A1

DESIGNED	K. HASAN
DRAWN	K. HASAN
CHECKED	A. RODGERS
APPROVED	J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION

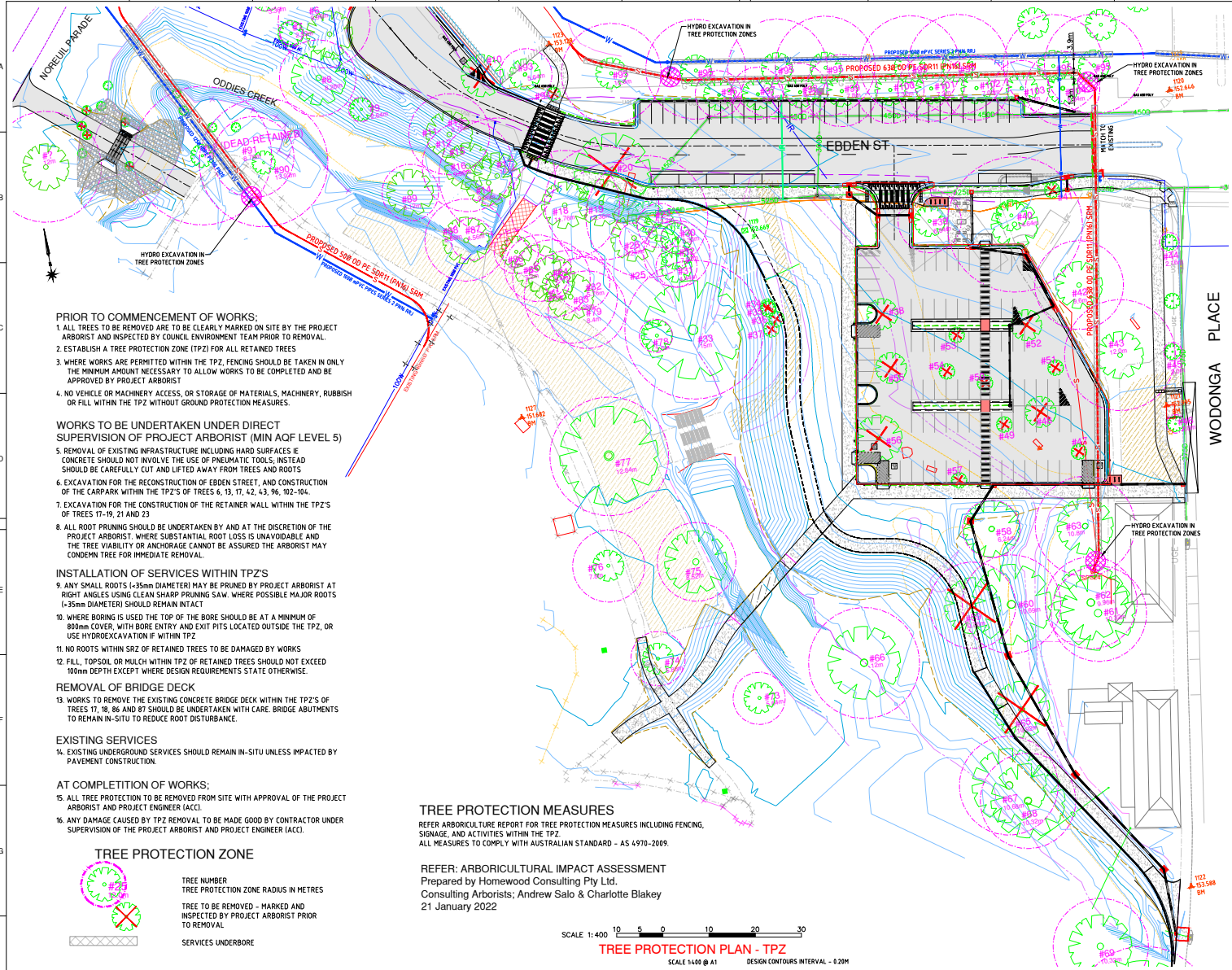
CORNER OF EBDEN ST AND WODONGA PL

PROPOSED WORKS

LEDGER No.	
3764.5015	
REV.	No. of Sheets	Sheet No.
G	28	03

DRAWING NUMBER

ENG21/357



PRIOR TO COMMENCEMENT OF WORKS;

1. ALL TREES TO BE REMOVED ARE TO BE CLEARLY MARKED ON SITE BY THE PROJECT ARBORIST AND INSPECTED BY COUNCIL ENVIRONMENT TEAM PRIOR TO REMOVAL.
2. ESTABLISH A TREE PROTECTION ZONE (TPZ) FOR ALL RETAINED TREES
3. WHERE WORKS ARE PERMITTED WITHIN THE TPZ, FENCING SHOULD BE TAKEN IN ONLY THE MINIMUM AMOUNT NECESSARY TO ALLOW WORKS TO BE COMPLETED AND BE APPROVED BY PROJECT ARBORIST
4. NO VEHICLE OR MACHINERY ACCESS, OR STORAGE OF MATERIALS, MACHINERY, RUBBISH OR FILL WITHIN THE TPZ WITHOUT GROUND PROTECTION MEASURES.

WORKS TO BE UNDERTAKEN UNDER DIRECT SUPERVISION OF PROJECT ARBORIST (MIN AQF LEVEL 5)

5. REMOVAL OF EXISTING INFRASTRUCTURE INCLUDING HARD SURFACES IE CONCRETE SHOULD NOT INVOLVE THE USE OF PNEUMATIC TOOLS, INSTEAD SHOULD BE CAREFULLY CUT AND LIFTED AWAY FROM TREES AND ROOTS
6. EXCAVATION FOR THE RECONSTRUCTION OF EBDEN STREET, AND CONSTRUCTION OF THE CARPARK WITHIN THE TPZ'S OF TREES 6, 13, 17, 42, 43, 96, 102-104.
7. EXCAVATION FOR THE CONSTRUCTION OF THE RETAINER WALL WITHIN THE TPZ'S OF TREES 17-19, 21 AND 23
8. ALL ROOT PRUNING SHOULD BE UNDERTAKEN BY AND AT THE DISCRETION OF THE PROJECT ARBORIST. WHERE SUBSTANTIAL ROOT LOSS IS UNAVOIDABLE AND THE TREE VIABILITY OR ANCHORAGE CANNOT BE ASSURED THE ARBORIST MAY CONDEMN TREE FOR IMMEDIATE REMOVAL.

INSTALLATION OF SERVICES WITHIN TPZ'S

9. ANY SMALL ROOTS (<35mm DIAMETER) MAY BE PRUNED BY PROJECT ARBORIST AT RIGHT ANGLES USING CLEAN SHARP PRUNING SAW. WHERE POSSIBLE MAJOR ROOTS (>35mm DIAMETER) SHOULD REMAIN INTACT
10. WHERE BORING IS USED THE TOP OF THE BORE SHOULD BE AT A MINIMUM OF 800mm COVER, WITH BORE ENTRY AND EXIT PITS LOCATED OUTSIDE THE TPZ, OR USE HYDROEXCAVATION IF WITHIN TPZ
11. NO ROOTS WITHIN SRZ OF RETAINED TREES TO BE DAMAGED BY WORKS
12. FILL, TOPSOIL OR MULCH WITHIN TPZ OF RETAINED TREES SHOULD NOT EXCEED 100mm DEPTH EXCEPT WHERE DESIGN REQUIREMENTS STATE OTHERWISE.

REMOVAL OF BRIDGE DECK

13. WORKS TO REMOVE THE EXISTING CONCRETE BRIDGE DECK WITHIN THE TPZ'S OF TREES 17, 18, 86 AND 87 SHOULD BE UNDERTAKEN WITH CARE. BRIDGE ABUTMENTS TO REMAIN IN-SITU TO REDUCE ROOT DISTURBANCE.

EXISTING SERVICES

14. EXISTING UNDERGROUND SERVICES SHOULD REMAIN IN-SITU UNLESS IMPACTED BY PAVEMENT CONSTRUCTION.

AT COMPLETITION OF WORKS;

15. ALL TREE PROTECTION TO BE REMOVED FROM SITE WITH APPROVAL OF THE PROJECT ARBORIST AND PROJECT ENGINEER (ACC).
16. ANY DAMAGE CAUSED BY TPZ REMOVAL TO BE MADE GOOD BY CONTRACTOR UNDER SUPERVISION OF THE PROJECT ARBORIST AND PROJECT ENGINEER (ACC).

TREE PROTECTION ZONE

TREE NUMBER
TREE PROTECTION ZONE RADIUS IN METRES

TREE TO BE REMOVED - MARKED AND INSPECTED BY PROJECT ARBORIST PRIOR TO REMOVAL

SERVICES UNDERBORE

TREE PROTECTION MEASURES

REFER ARBORICULTURE REPORT FOR TREE PROTECTION MEASURES INCLUDING FENCING, SIGNAGE, AND ACTIVITIES WITHIN THE TPZ.
ALL MEASURES TO COMPLY WITH AUSTRALIAN STANDARD - AS 4970-2009.

REFER: ARBORICULTURAL IMPACT ASSESSMENT
Prepared by Homewood Consulting Pty Ltd.
Consulting Arborists; Andrew Salo & Charlotte Blakey
21 January 2022

SCALE 1: 400 10 5 0 10 20 30

TREE PROTECTION PLAN - TPZ

SCALE 1:400 @ A1 DESIGN CONTOURS INTERVAL - 0.20M

INDIVIDUAL TREE ASSESSMENTS

ID	DBH (cm)	TPZ RADIUS (m)	TPZ IMPACT	COMMENT
1	51	6.12	NO IMPACT	
2	78	9.36	NO IMPACT	
3	18	2.16	NO IMPACT	GROUP OF 12
4	34	4.08	NO IMPACT	
5	28	3.36	NO IMPACT	
6	83	9.96	MAJOR	
7	21	2.52	NO IMPACT	GROUP OF 6
8	69	8.28	MINOR	
9	22	2.64	NO IMPACT	GROUP OF 6
10	61	7.32	REMOVE	
11	57	6.84	MINOR	
12	65	7.8	MINOR	TRUNK LEANING
13	73	8.76	MAJOR	
14	83	9.96	MINOR	3 STEMMED
15	23	2.76	NO IMPACT	
16	82	9.84	MINOR	3 STEMMED
17	105	12.6	MAJOR	CREEK SIDE
18	98	11.76	MAJOR	
19	103	12.36	MAJOR	
20	110	13.2	REMOVE	
21	63	7.56	MAJOR	
22	46	5.52	NO IMPACT	
23	110	13.2	MAJOR	3 STEMMED
24	43	5.16	NO IMPACT	
25	18	2.16	NO IMPACT	
26	27	3.24	NO IMPACT	
27	22	2.64	NO IMPACT	
28	33	3.96	NO IMPACT	
29	41	4.92	NO IMPACT	
30	28	3.36	NO IMPACT	
31	37	4.44	NO IMPACT	
32	66	7.92	MINOR	
33	131	15.0	MAJOR	
34	25	3.0	REMOVE	
35	36	4.32	REMOVE	
36	13	2.0	REMOVE	
37	20	2.4	REMOVE	
38	28	3.36	REMOVE	
39	57	6.84	MAJOR	
40	122	14.64	MAJOR	3 STEMMED
41	17	2.04	REMOVE	
42	80	9.6	MAJOR	
43	100	3.47	MAJOR	
44	18	2.16	NO IMPACT	
45	14	2.0	NO IMPACT	
46	7	2.0	NO IMPACT	
47	17	2.04	REMOVE	
48	30	3.6	REMOVE	
49	9	2.0	REMOVE	
50	23	2.76	REMOVE	
51	15	2.0	REMOVE	
52	38	4.56	REMOVE	
53	13	2.0	REMOVE	
54	6	2.0	REMOVE	
55	54	6.48	REMOVE	
56	93	11.16	REMOVE	
57	18	2.16	REMOVE	
58	52	6.24	MAJOR	
59	78	9.36	REMOVE	
60	89	10.68	MAJOR	
61	86	10.32	MINOR	
62	83	9.96	MINOR	
63	90	10.80	MAJOR	
64	147	3.89	MAJOR	
65	91	10.92	REMOVE	
66	100	12.0	MINOR	
67	89	10.68	MAJOR	
68	86	10.32	MAJOR	
69	110	13.20	MAJOR	
70	130	15.0	MINOR	DECAY IN STEM
71	42	5.04	NO IMPACT	
72	103	12.36	NO IMPACT	
73	47	5.64	NO IMPACT	
74	49	5.88	MAJOR	
75	71	8.52	MAJOR	
76	65	7.8	MAJOR	
77	107	12.84	MAJOR	
78	30	3.6	NO IMPACT	
79	70	8.4	MAJOR	
80	60	7.2	MAJOR	
81	21	2.52	NO IMPACT	
82	48	5.76	MINOR	
83	84	10.08	MAJOR	
84	70	8.4	MAJOR	
85	60	7.2	MAJOR	
86	40	4.8	MAJOR	
87	38	4.45	MAJOR	
88	74	8.88	MAJOR	
89	51	6.12	NO IMPACT	
90	116	13.92	MAJOR	
91	73	8.76	MAJOR	
92	163	15	MAJOR	INSTALL HOLLOWS
93	47	5.64	MINOR	
94	14	7	REMOVE	
95	90	10.8	MAJOR	GROUP OF 8
96	42	5.04	MAJOR	
97	47	5.64	MAJOR	
98	51	6.12	MAJOR	
99	65	7.32	MAJOR	
100	61	7.32	MAJOR	
101	60	7.2	MAJOR	
102	59	7.08	MAJOR	
103	50	6	MAJOR	
104	67	8.04	MAJOR	

ISSED FOR TENDER

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1: 400
SHEET	A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

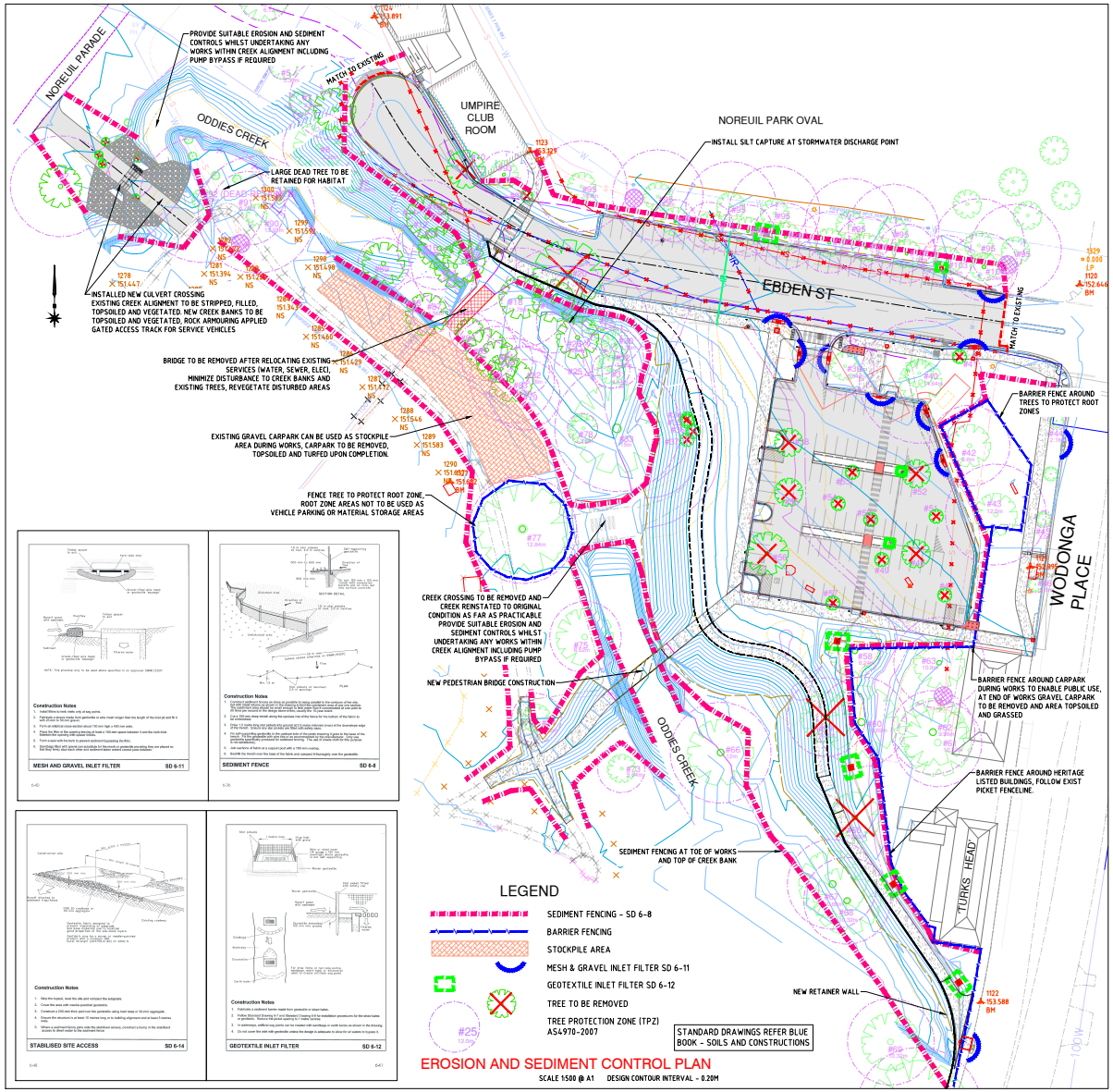
AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
TREE PROTECTION PLAN (TPZ)

LEDGER No. 3764.5015

REV.	No. of Sheets	Sheet No.
G	28	04

DRAWING NUMBER ENG21/357



EROSION AND SEDIMENT CONTROL PLAN

SCALE 1:500 @ A1 DESIGN CONTOUR INTERVAL - 0.20M

HOR 1:500 10 5 0 10 20 30 40 50

REVIEW OF ENVIRONMENTAL FACTORS - MITIGATION MEASURES

GENERAL
PRIOR TO ANY WORKS COMMENCING PREPARE A CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP) THAT INCLUDES MITIGATION MEASURES FROM THIS 'REF'.

AS PART OF THE 'SITE INDUCTION' ALL WORKERS ARE TO BE PROVIDED ACCESS TO THE CEMP AND MADE AWARE OF THE SITE SENSITIVITIES IDENTIFIED IN THIS 'REF'.

BIODIVERSITY
CLEARLY DEFINE WORK AREAS WITH NO DISTURBANCE BEYOND THE EDGE OF THESE ZONES. BARRIER FENCING TO BE INSTALLED TO PROTECT EXISTING VEGETATION PRIOR TO COMMENCEMENT OF EARTHWORKS, AND MAINTAIN FENCING IN GOOD CONDITION FOR DURATION OF WORKS PERIOD.

TREES THAT ARE TO BE TRIMMED OR REMOVED TO BE BE CLEARLY MARKED BY ARBORIST. PRIOR TO REMOVAL TREES TO BE INSPECTED BY ALBURYCITY REPRESENTATIVE AND PROJECT ARBORIST. ONLY REMOVE MINIMUM REQUIRED VEGETATION AND MINIMISE DISTURBANCE TO RETAINED VEGETATION.

DO NOT REMOVE TREES THAT CONTAIN HOLLOWS UNLESS SPECIFIC APPROVAL HAS BEEN GRANTED. TREES AND SHRUBS ARE TO BE CHECKED BY A SUITABLY QUALIFIED ECOLOGIST FOR NESTING/ROOSTING NATIVE FAUNA BEFORE REMOVAL.

IF ANY DAMAGE OCCURS TO VEGETATION IN NO-GO ZONES AS A RESULT OF WORKS; THE PROJECT ARBORIST IS TO BE NOTIFIED AND WILL ESTABLISH STRATEGIES FOR MITIGATION OF IMPACTS AND SITE RESTORATION.

CONSTRUCTION MACHINERY SHOULD BE WASHED PRIOR TO ENTERING AND LEAVING THE SITE TO ENSURE WEED PROPAGULES ARE NOT TRANSPORTED.

SOIL
MINIMISE DISTURBED AREAS, RETAIN VEGETATION WHERE POSSIBLE, STRIP TOPSOIL ONLY AS REQUIRED AS WORKS PROGRESS. DISTURBED AREAS TO HAVE TOPSOIL REPLACED AS SOON AS PRACTICABLE, AND ACHIEVE MIN 60% GRASS COVER WITHIN 20 DAYS.

SEDIMENT FENCING TO BE INSTALLED TO COUNCIL SATISFACTION PRIOR TO COMMENCEMENT OF EARTHWORKS, MAINTAIN IN GOOD CONDITION FOR DURATION OF WORKS PERIOD, INSPECT WEEKLY TO ENSURE EFFECTIVENESS, DO NOT REMOVE WITHOUT COUNCIL PERMISSION.

DO NOT UNDERTAKE WORKS DURING HEAVY RAIN PERIODS OR FLOODING.

ALL BATTERS (MAX 1 IN 3) TO BE TOPSOILED AND TURFED AS SOON AS EARTHWORKS COMPLETE TO MAINTAIN SHAPE, PREVENT SCOURING AND CONTROL DUST. GRASS COVER TO ACHIEVE MIN 60% COVER WITHIN 20 DAYS. REFER LANDSCAPE PLAN FOR FINAL FINISH SURFACE.

LOCATE STOCKPILES AND CONSTRUCTION MATERIALS AWAY FROM VEGETATION, WATERWAYS AND DRAINAGE LINES. TOPSOIL STOCKPILES MUST NOT EXCEED 2.0 METRES IN HEIGHT.

STORE ALL CHEMICALS (FUEL, OILS) OFFSITE OR AWAY FROM SENSITIVE AREAS OR NATIVE VEGETATION. ENSURE APPROPRIATE SPILL KITS ARE ONSITE.

STOP WORK AND NOTIFY COUNCIL IF ANY CONTAMINATES (EG ASBESTOS, DISCOLOURED SOIL, CHEMICAL OR PETROL ODOURS, REFUSE OR LEACHATE) IS DISCOVERED.

NO WATER MAY BE DISCHARGED INTO DRAINAGE LINES OR WATERWAYS

ABORIGINAL HERITAGE
IF ABORIGINAL HERITAGE ITEMS ARE UNCOVERED DURING WORKS, ALL WORKS WITHIN THE VICINITY OF THE FIND MUST CEASE AND THE ENVIRONMENTAL PLANNER CONTACTED IMMEDIATELY.

THE FIND SHOULD NOT BE MOVED UNTIL ASSESSMENT BY A QUALIFIED ARCHAEOLOGIST.

IF ANY SUSPECTED ANCESTRAL HUMAN REMAINS ARE DISCOVERED DURING WORKS:
- IMMEDIATELY CEASE ALL WORK AT THAT LOCATION
- NOTIFY NSW POLICE OR OEH ENVIRONMENTAL LINE 131 555
- DO NO RECOMMENCE WORK AT THAT LOCATION UNLESS AUTHORIZED IN WRITING BY OEH

HERITAGE
SHOULD ANY UNEXPECTED HISTORICAL HERITAGE ITEMS BE UNCOVERED DURING WORKS, WORKS SHOULD CEASE IMMEDIATELY AND AN ARCHAEOLOGIST CONTACTED.

NOISE AND VIBRATION
WORKS TO BE CARRIED OUT DURING NORMAL HOURS (7AM TO 6PM MONDAY TO FRIDAY, 8AM TO 1PM SATURDAY).

ANY WORK PERFORMED OUTSIDE NORMAL HOURS MAY NOT BE PERMITTED, IF PERMITTED WORKS TO MINIMISE NOISE IMPACTS.

WORKS ADJACENT TO HERITAGE LISTED BUILDING 'TURKS HEAD' SUBJECT TO VIBRATION CONTROLS AND TESTING - REFER 'PRICE MERRETT.

AIR QUALITY
EFFECTIVE DUST CONTROL MEASURES TO BE INTRODUCED AND MAINTAINED AT ALL TIMES. LOADS TO BE COVERED, WATERCART TO BE USED DURING STRIPPING AND PLACING OF MATERIAL, MOUNDS TO BE WATERED TO PROMOTE GRASS GROWTH OR COVERED TO PREVENT WINDBLOWN DUST.

WORKS NOT TO BE CARRIED OUT DURING STRONG WIND OR IN WEATHER CONDITIONS WHERE HIGH LEVELS OF DUST OR AIRBORNE PARTICLES ARE LIKELY.

VEGETATION OR OTHER MATERIALS ARE NOT TO BE BURNT ONSITE.

VEHICLES TRANSPORTING WASTE OR OTHER MATERIALS THAT MAY PRODUCE ODOURS OR DUST ARE TO BE COVERED DURING TRANSPORTATION.

MAINTAIN ALL MACHINES IN GOOD WORKING ORDER TO REDUCE EMISSIONS. AVOID IDLING MACHINES UNLESS IN USE.

WASTE
WASTE GENERATION SHOULD BE MINIMISED, ALL SURPLUS MATERIALS, OFFCUTS AND OTHER DEBRIS SHALL BE REMOVED FROM SITE AND DISPOSED OF BY A LICENSED CONTRACTOR TO A LICENSED WASTE MANAGEMENT FACILITY.

WORKING AREAS TO BE MAINTAINED IN GOOD ORDER, KEPT FREE OF RUBBISH AND CLEANED UP AT THE END OF EACH WORKING DAY.

ACCESS TO SITE FROM EBDEN STREET, WODONGA PLACE, NOREUIL PARADE ONLY. ENSURE ROADS ARE KEPT CLEAN FROM SITE MATERIAL TO ACC REQUIREMENTS.

APPLY 'TRAFFIC CONTROL MEASURES' ON ACCESS ROADS IN ACCORDANCE WITH AS 1742, TO COMPLY WITH 'RMS TRAFFIC CONTROL AT WORK SITES' GUIDELINES AND ACC REQUIREMENTS. PREPARE AND IMPLEMENT APPROVED TRAFFIC MANAGEMENT PLAN.

NOTES:

1. ALL WATER LEAVING THE SITE MUST PASS THROUGH A SEDIMENT FILTER AND BE SPREAD EVENLY ON A GRASSED AREA TO THE REQUIREMENTS LISTED ON THIS SHEET.
2. ALL SEDIMENT FENCES AND STRAW BALE SEDIMENT FILTERS UNLESS RELEASING WATER EVENLY ONTO GRASSED PASTURES ARE TO HAVE FILTER TUBES INSTALLED EVERY 20 METERS AND THE WATER CHANNELED INTO THESE FILTER TUBES.
3. ALL BARE EARTH, TABLE DRAINS AND BATTERS ARE TO BE RE-ESTABLISHED TO THE RE VEGETATION SPECIFICATION ON THIS SHEET. TABLE DRAINS ARE TO HAVE CHECK DAM SEDIMENT TRAPS CONSTRUCTED WITH OUT DAMAGING THE RE-ESTABLISHED VEGETATION MEASURES. ALLOW DEPRESSION IN CENTER OF BANK FOR SPILLWAY.
4. ALL TEMPORARY EARTH STRUCTURES INCLUDING SOIL STOCKPILES, TO BE TRACK ROLLED AND SEEDED WITHIN 14 DAYS OF THEIR CONSTRUCTION, WITH A SEED FERTILIZER MIX APPROVED BY ALBURY CITY'S COMMUNITY & RECREATION SECTION.
5. ALL DISTURBED AREAS TO BE STABILIZED AND/OR RE-VEGETATED WITHIN 14 DAYS OF EARTHWORKS COMPLETION.
6. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSTALLED PRIOR TO SITE DISTURBANCE.
7. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE CHECKED DAILY
8. ALL SEDIMENT CONTROL STRUCTURES TO BE INSPECTED AFTER EACH RAINFALL EVENT FOR STRUCTURAL DAMAGE AND ALL TRAPPED SEDIMENT TO BE REMOVED TO A NOMINATED SOIL STOCKPILE SITE
9. THE PROJECT MANAGER TO INFORM ALL CONTRACTORS AND SUB-CONTRACTORS OF THEIR OBLIGATIONS UNDER THE EROSION AND SEDIMENT CONTROL PLAN
10. REGULAR SITE INSPECTIONS ARE TO BE CONDUCTED BY THE SITE ENVIRONMENT MANAGER AND RECORDS OF ALL SUCH INSPECTIONS ARE TO BE MADE AVAILABLE UPON INSPECTION. INSPECTIONS ARE TO BE UNDERTAKEN:
- AT LEAST WEEKLY DURING NORMAL CONSTRUCTION HOURS- AND
- PRIOR TO FORECAST RAINFALL (>50% CHANCE OF 5MM OR MORE IN 24 HOURS); AND
- DURING RAIN EVENTS (IF SAFE TO DO SO); AND
- WITHIN 24 HOURS OF THE CESSATION OF A RAIN EVENT THAT CAUSES RUNOFF (IF SAFE TO DO SO)

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REVISIONS

SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE 1:500
SHEET A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
EROSION AND SEDIMENT CONTROL PLAN

LEDGER No. 3764.5015
REV. G | No. of Sheets 28 | Sheet No. 05
DRAWING NUMBER ENG21/357

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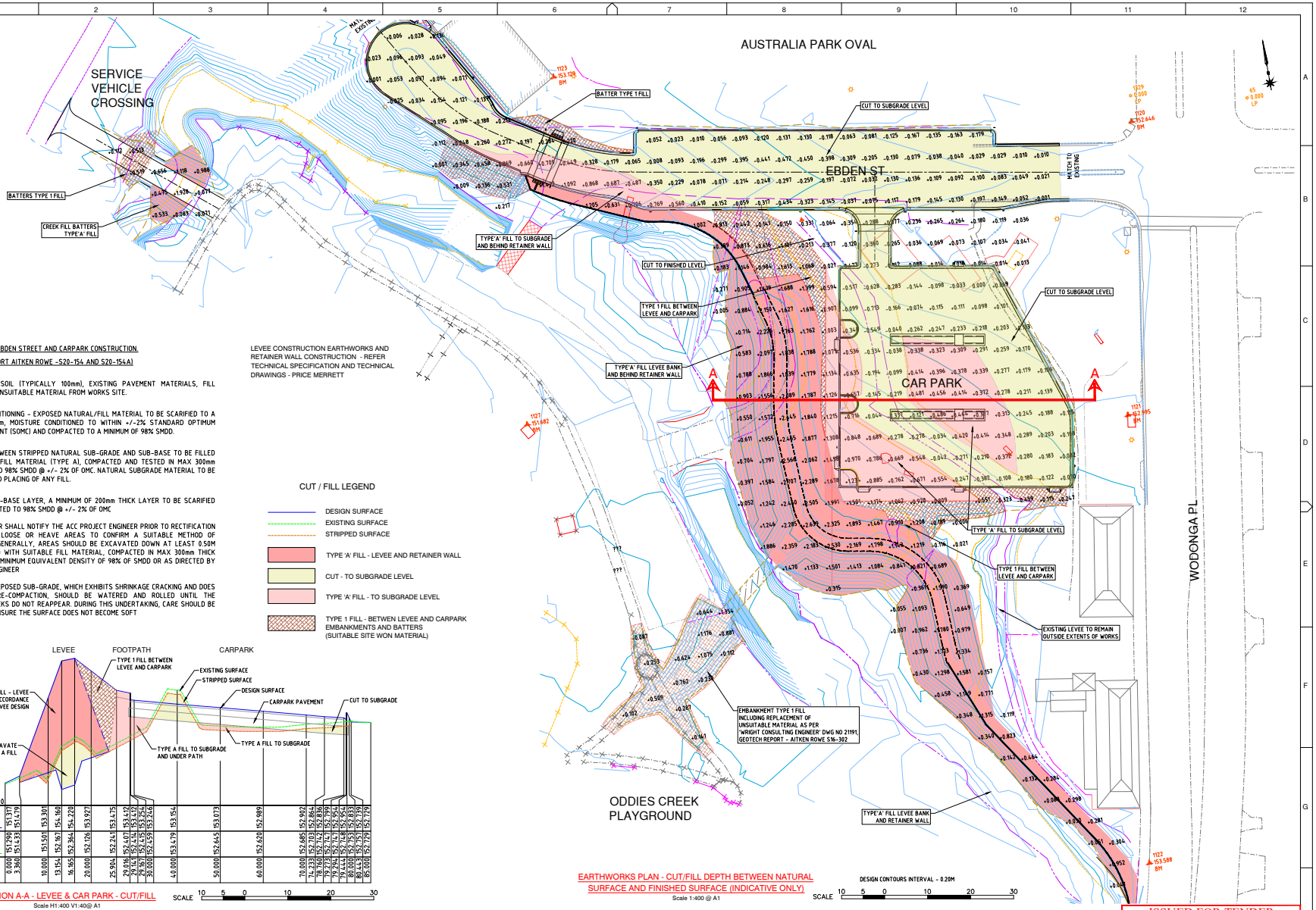

EARTHWORK NOTES: EBDEN STREET AND CARPARK CONSTRUCTION.

(REFER GEOTECH REPORT AITKEN ROWE -S20-154 AND S20-154A)

1. STRIP ALL TOPSOIL (TYPICALLY 100mm), EXISTING PAVEMENT MATERIALS, FILL MATERIAL AND UNSUITABLE MATERIAL FROM WORKS SITE.
2. SUBGRADE CONDITIONING - EXPOSED NATURAL/FILL MATERIAL TO BE SCARIFIED TO A DEPTH OF 200mm, MOISTURE CONDITIONED TO WITHIN +/-2% STANDARD OPTIMUM MOISTURE CONTENT (SOMC) AND COMPACTED TO A MINIMUM OF 98% SMDD.
3. FILL: SPACE BETWEEN STRIPPED NATURAL SUB-GRADE AND SUB-BASE TO BE FILLED WITH SUITABLE FILL MATERIAL (TYPE A), COMPACTED AND TESTED IN MAX 300mm THICK LAYERS TO 98% SMDD @ +/- 2% OF OMC. NATURAL SUBGRADE MATERIAL TO BE TESTED PRIOR TO PLACING OF ANY FILL.
4. CUT: UNDER SUB-BASE LAYER, A MINIMUM OF 200mm THICK LAYER TO BE SCARIFIED AND RE-COMPACTED TO 98% SMDD @ +/- 2% OF OMC
5. THE CONTRACTOR SHALL NOTIFY THE ACC PROJECT ENGINEER PRIOR TO RECTIFICATION OF ANY SOFT, LOOSE OR HEAVE AREAS TO CONFIRM A SUITABLE METHOD OF RECTIFICATION. GENERALLY, AREAS SHOULD BE EXCAVATED DOWN AT LEAST 0.50M AND BACKFILLED WITH SUITABLE FILL MATERIAL, COMPACTED IN MAX 300mm THICK LAYERS TO THE MINIMUM EQUIVALENT DENSITY OF 98% OF SMDD OR AS DIRECTED BY THE PROJECT ENGINEER
6. ANY AREA OF EXPOSED SUB-GRADE, WHICH EXHIBITS SHRINKAGE CRACKING AND DOES NOT REQUIRE RE-COMPACTION, SHOULD BE WATERED AND ROLLED UNTIL THE SHRINKAGE CRACKS DO NOT REAPPEAR. DURING THIS UNDERTAKING, CARE SHOULD BE EXERCISED TO ENSURE THE SURFACE DOES NOT BECOME SOFT

LEVEE CONSTRUCTION EARTHWORKS AND RETAINER WALL CONSTRUCTION - REFER TECHNICAL SPECIFICATION AND TECHNICAL DRAWINGS - PRICE MERRETT

CUT / FILL LEGEND

- DESIGN SURFACE
- EXISTING SURFACE
- STRIPPED SURFACE
- TYPE 'A' FILL - LEVEE AND RETAINER WALL
- CUT - TO SUBGRADE LEVEL
- TYPE 'A' FILL - TO SUBGRADE LEVEL
- TYPE 1 FILL - BETWEN LEVEE AND CARPARK EMBANKMENTS AND BATTERS (SUITABLE SITE WON MATERIAL)

Chainage	Existing Levels	Design Levels
0.000	151.290	151.371
3.360	151.433	151.479
10.000	151.501	153.301
13.154	152.167	154.160
16.365	152.364	154.220
20.000	152.126	153.927
25.904	152.241	153.475
29.016	152.607	153.412
29.141	152.616	153.412
29.954	152.745	153.246
30.000	152.599	153.246
40.000	153.479	153.154
50.000	152.645	153.073
60.000	152.620	152.989
70.000	152.685	152.902
74.233	152.893	152.862
78.760	152.742	152.836
79.273	152.747	152.799
79.444	152.747	152.794
80.000	152.753	152.833
80.443	152.757	152.757
85.000	152.799	152.799

SECTION A-A - LEVEE & CAR PARK - CUT/FILL

Scale H1:400 V1:40@ A1

SCALE 10 5 0 10 20 30

EARTHWORKS PLAN - CUT/FILL DEPTH BETWEEN NATURAL SURFACE AND FINISHED SURFACE (INDICATIVE ONLY)

Scale 1:400 @ A1

DESIGN CONTOURS INTERVAL - 0.20M

SCALE 10 5 0 10 20 30

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F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	AS SHOWN
SHEET	A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
EARTHWORKS PLAN

LEDGER No. 3764.5015

REV.	No. of Sheets	Sheet No.
G	28	6

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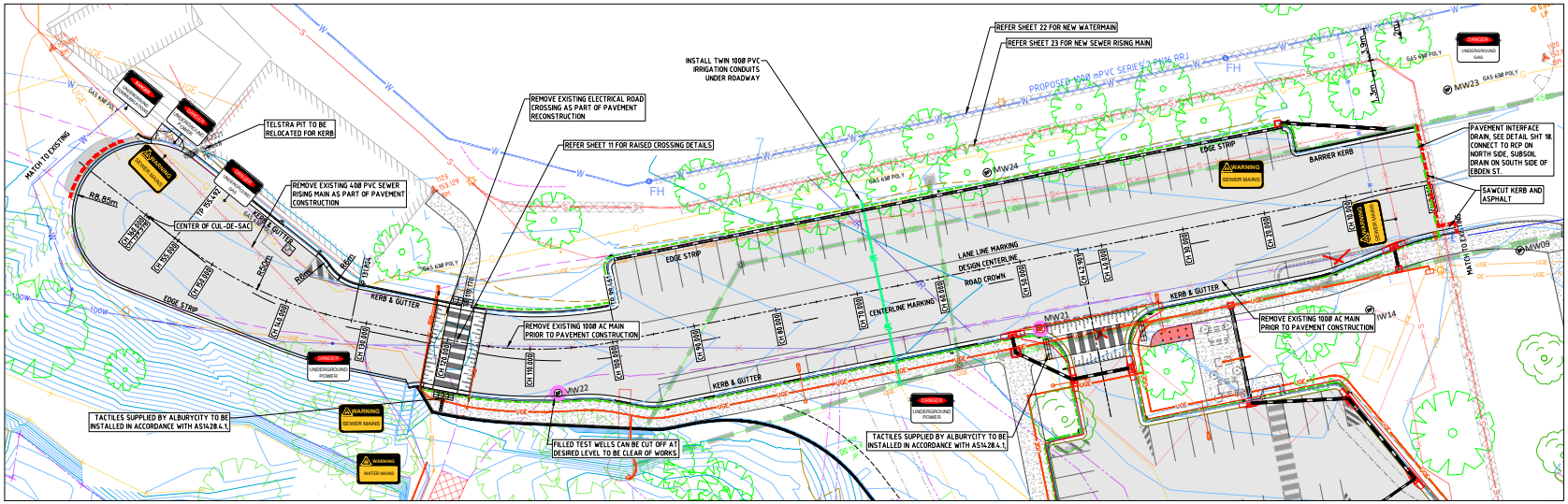
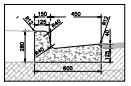
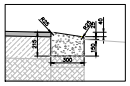


PLAN OF EBDEN ST

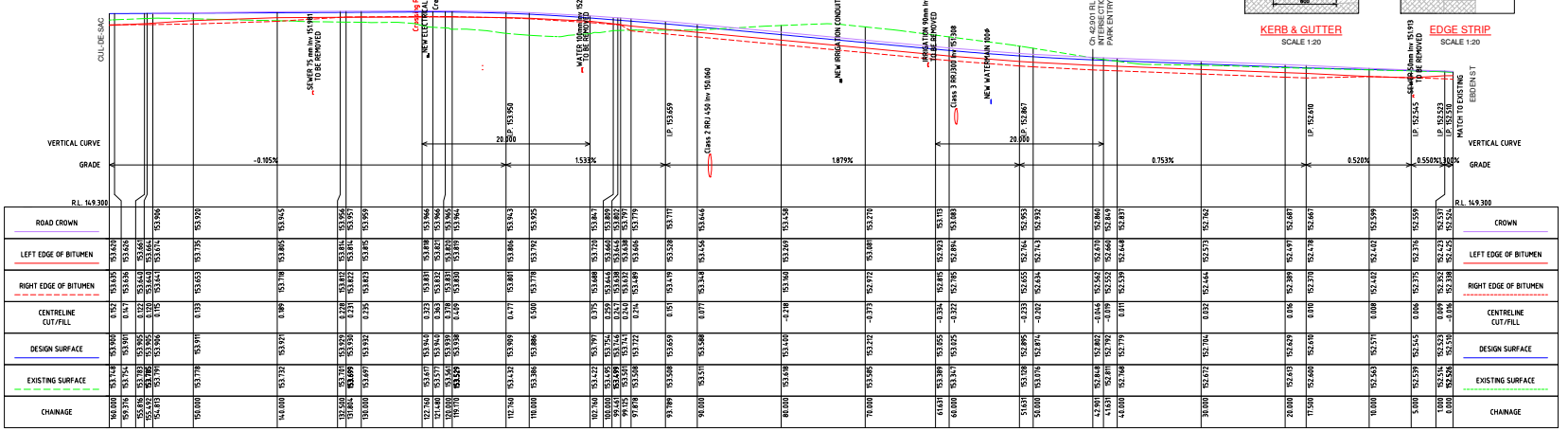
Scale 1:250 @ A1 — HOR 1:250 — DESIGN CONTOURS INTERVAL - 0.20M



KERB & GUTTER
SCALE 1:20



EDGE STRIP
SCALE 1:20



LONGITUDINAL SECTION OF EBDEN ST

HORIZONTAL 1:250 VERTICAL 1:50

HOR 1:250 — VERT 1:50

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LEGEND					
TOP OF BANK	EXISTING DRAINAGE	EXISTING TREES	EXISTING JUNCTION PIT		
BANK BOTTOM	PROPOSED DRAINAGE	TREES TO REMOVE	EXISTING SAG PIT		
EXISTING KERB	PROPOSED KERB & GUTTER	NEW TREES TO PLANT	EXISTING SIDE ENTRY PIT		
CONCRETE EDGE	PROP LEVEE ALIGNMENT	LIGHT POLE	EXISTING GRATED PIT		
BITUMEN - EDGE	CONCRETE EDGE	LIGHT TO REMOVE	PROPOSED DGGP		
EDGE OF PATH	EXISTING WATER MAIN	HYDRANT/SV	PROPOSED JUNCTION PIT		
FENCE	PROP IRRIGATION COND	BP MONITORING WELL - REMAIN	REMOVE		
	PROPOSED WATER MAIN				

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SCALE	1:250
SHEET	A1

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DRAWN	K. HASAN
CHECKED	A. RODGERS
APPROVED	J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
EBDEN ST – PLAN AND PROFILE

LEDGER No.	
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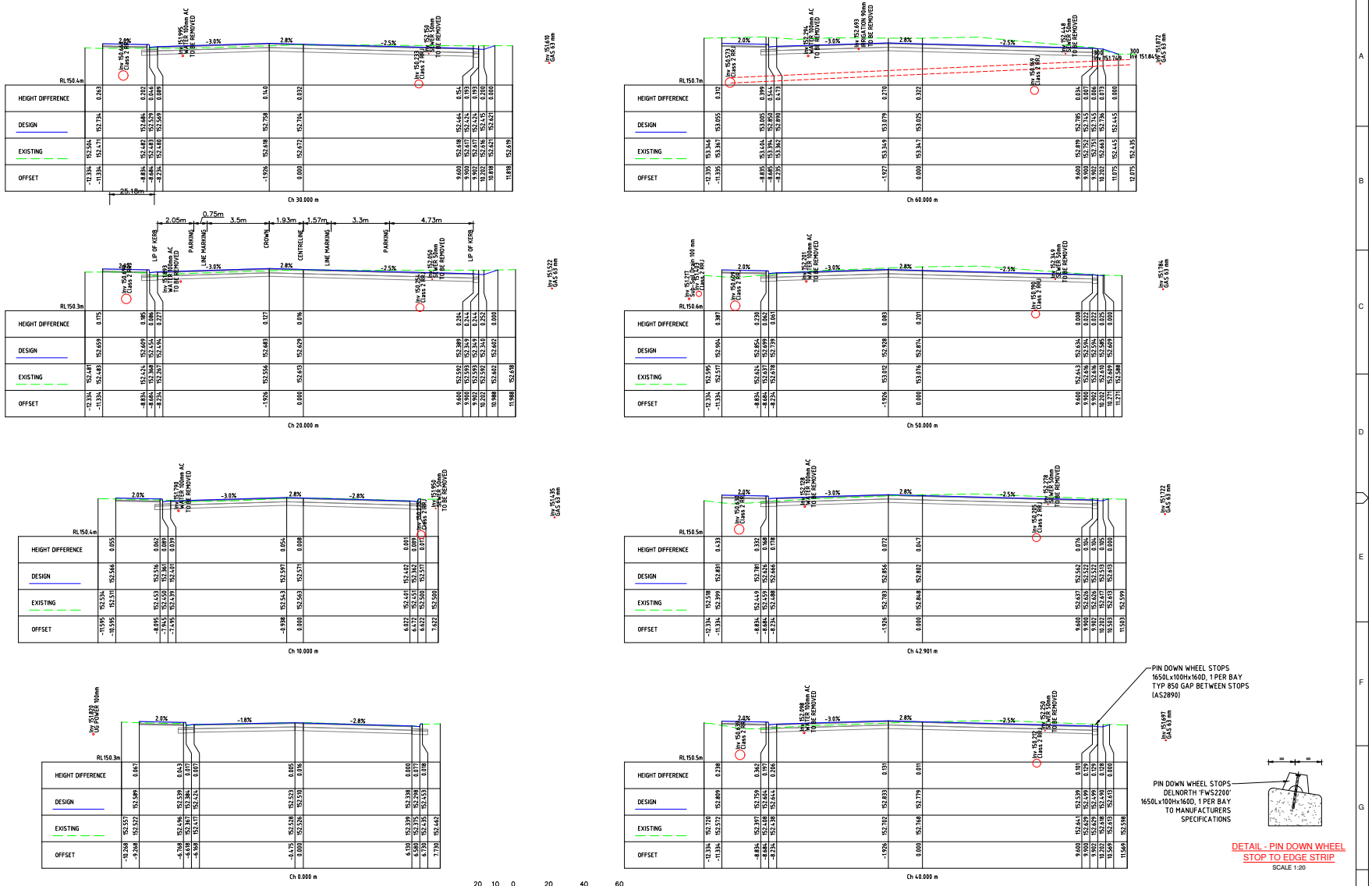

EBDEN ST CROSS SECTIONS

HORIZONTAL 1:100 VERTICAL 1:10

HORIZONTAL 20 10 0 20 40 60

VERTICAL 2 1 0 1 2 3 4 5 6

DETAIL - PIN DOWN WHEEL STOP TO EDGE STRIP

SCALE 1:20

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SCALE	H 1:100, V 1:10
SHEET	A1

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APPROVED J McLINDEN

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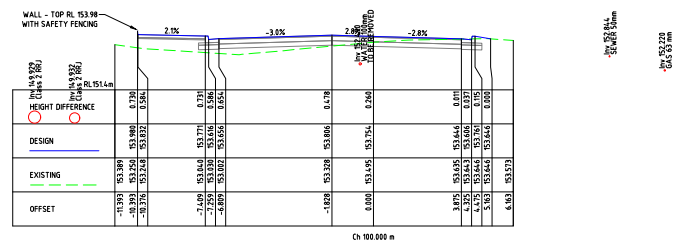
AlburyCity

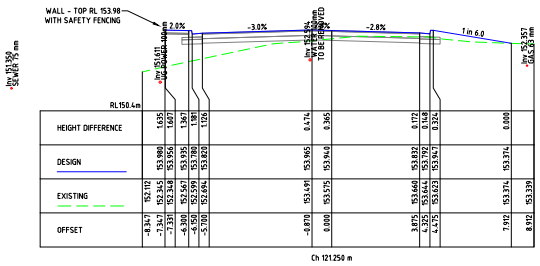
AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
EBDEN ST – CROSS SECTION CH 0.00 – CH 60.00

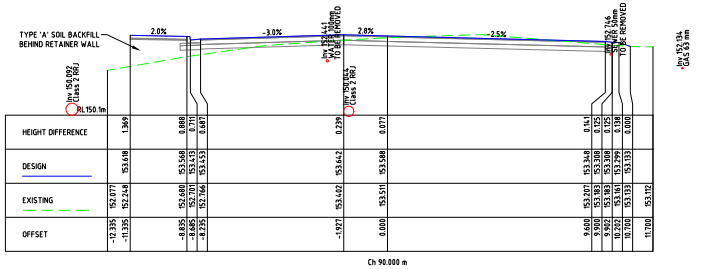
LEDGER No. 3764.5015

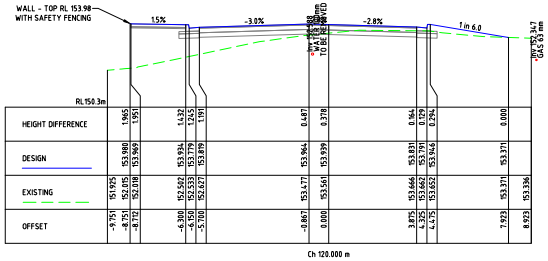
REV.	No. of Sheets	Sheet No.
G	28	08

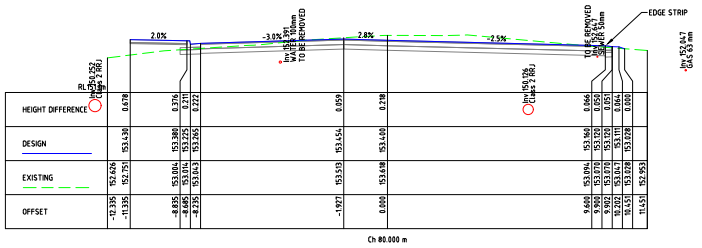
DRAWING NUMBER ENG21/357

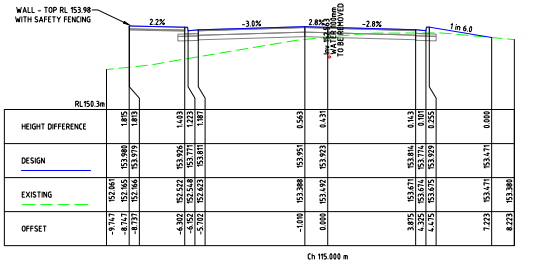


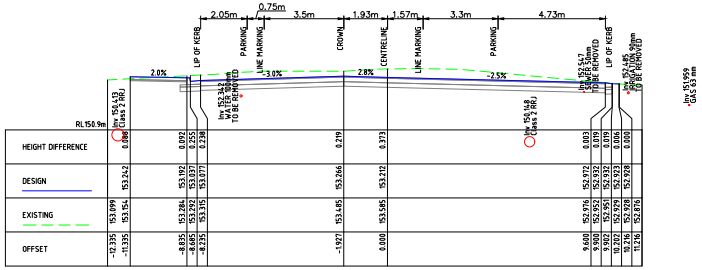


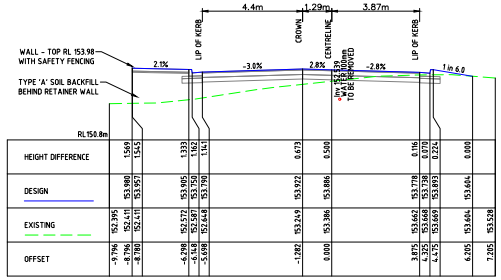












HORIZONTAL 20 10 0 20 40 60
VERTICAL 2 1 0 1 2 3 4 5 6

EBDEN ST CROSS SECTIONS

HORIZONTAL 1:100 VERTICAL 1:10

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G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
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E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	H 1:100, V 1:10
SHEET	A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

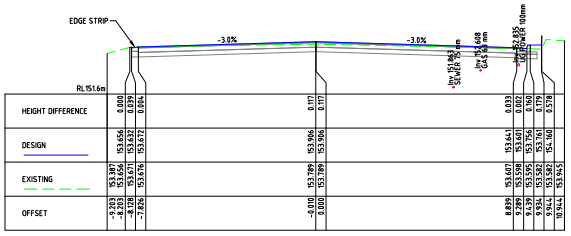
AlburyCity

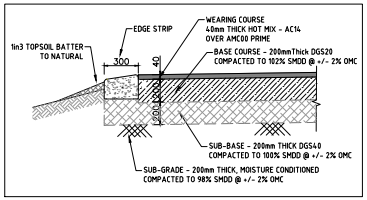
AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
EBDEN ST – CROSS SECTION CH 70.00 – CH 121.250

LEDGER No. 3764.5015

REV.	No. of Sheets	Sheet No.
G	28	09

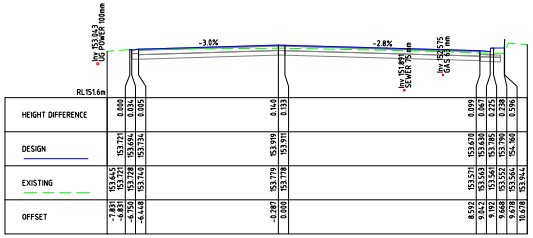
DRAWING NUMBER ENG21/357



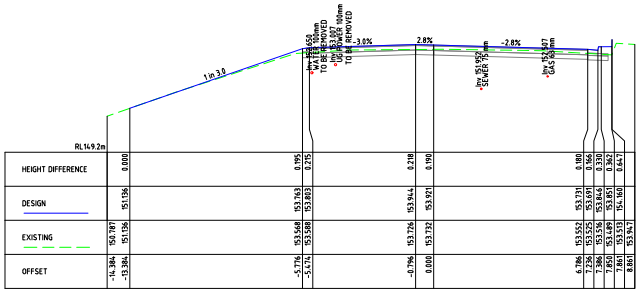


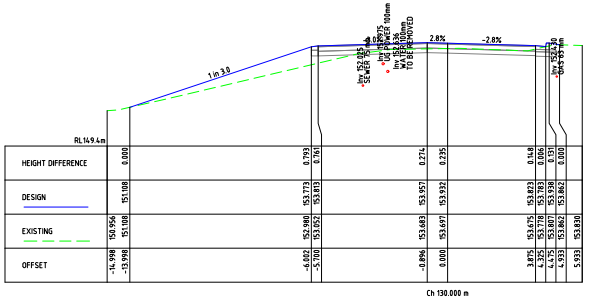
TYPICAL SECTION - EDGE STRIP

Scale 1:20 @ A1



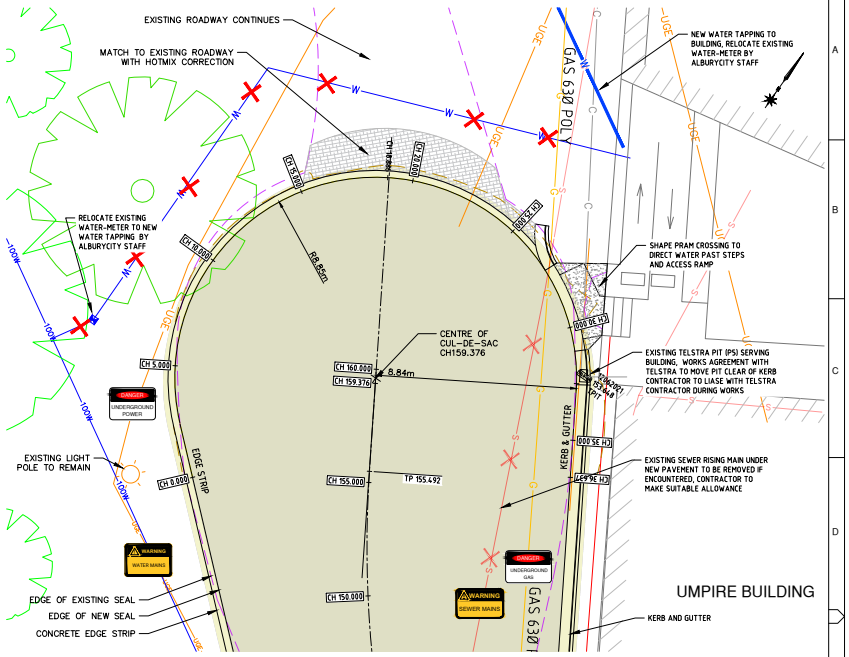
CUL-DE-SAC EDGE OF ASPHALT - SET OUT TABLE			
CHAINAGE	EASTING	NORTHING	DESIGN LEVEL
0.000	491630.038	6006295.936	153.706
5.000	491626.598	6006299.534	153.665
10.000	491625.310	6006304.296	153.645
15.000	491626.772	6006309.008	153.628
20.000	491630.530	6006312.205	153.624
25.000	491635.416	6006312.894	153.634
30.000	491639.910	6006310.860	153.654
35.000	491642.849	6006306.849	153.673
36.637	491643.691	6006305.445	153.681





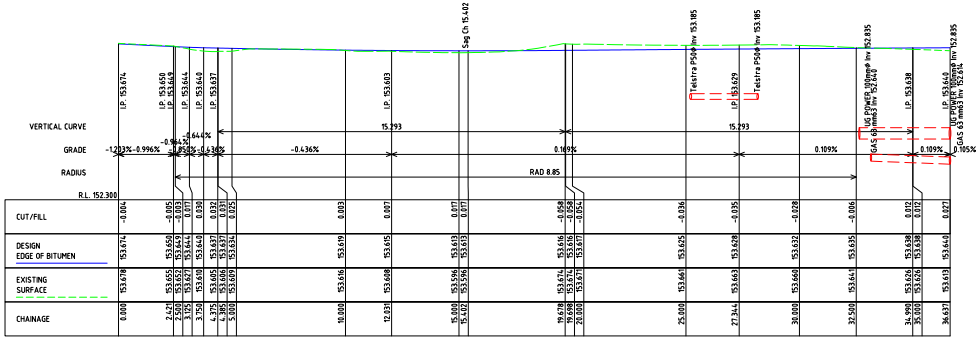
EBDEN ST CROSS SECTIONS

HORIZONTAL 1:100 VERTICAL 1:10



PLAN OF CUL-DE-SAC

Scale 1:100 @ A1



LONGITUDINAL SECTION OF CUL-DE-SAC

HORIZONTAL 1:100 VERTICAL 1:20

ISSUED FOR TENDER

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
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E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1:100
SHEET	A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION

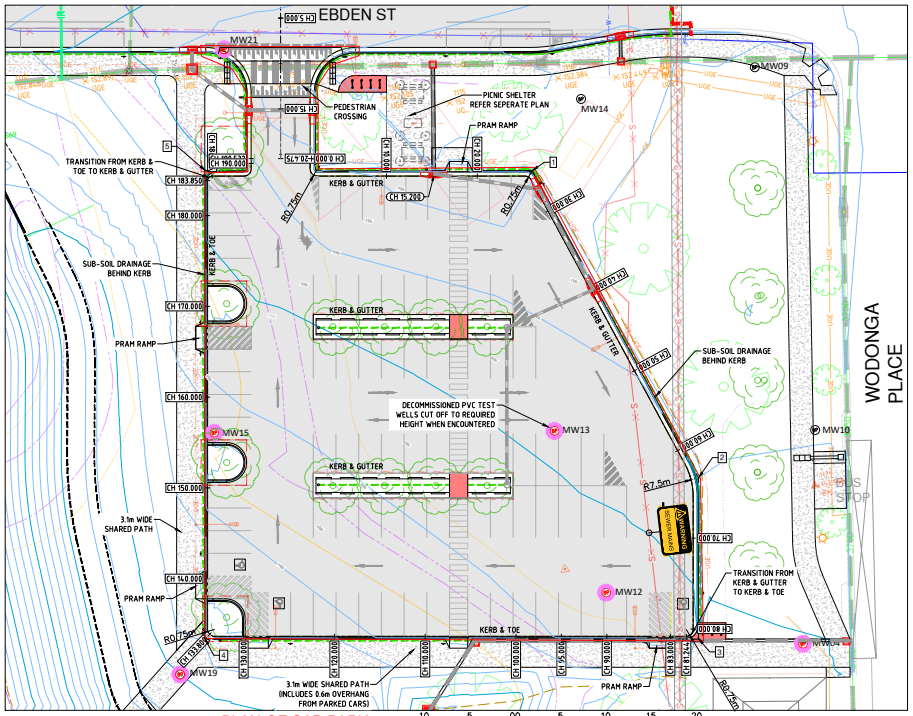
CORNER OF EBDEN ST AND WODONGA PL

EBDEN ST – SECTION CH 130.00–155.00 & CUL–DE–SAC

LEDGER No. 3764.5015

REV.	No. of Sheets	Sheet No.
G	28	10

DRAWING NUMBER ENG21/357

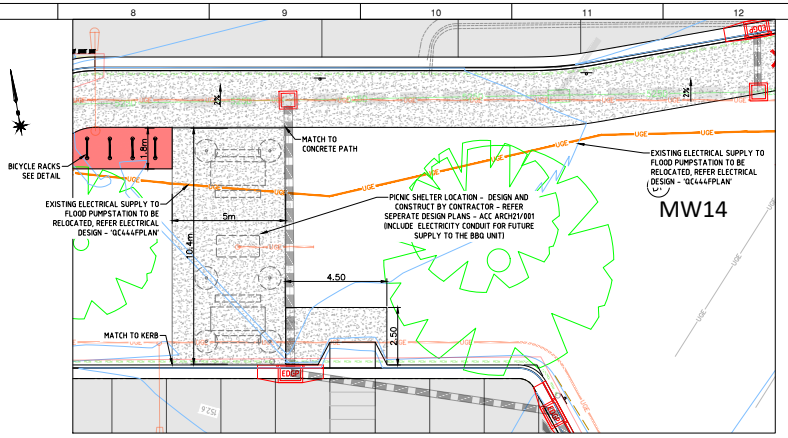


PLAN OF CAR PARK

Scale 1:250 @ A1

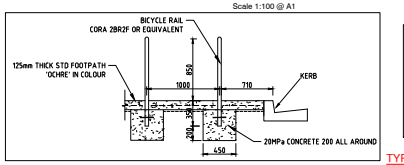
SCALE

DESIGN CONTOURS INTERVAL - 0.20M



DETAILS OF SHELTER PLATFORM

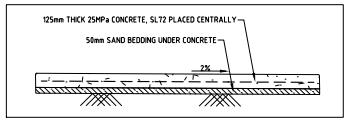
Scale 1:100 @ A1



DETAIL - BICYCLE RACK (TYPICAL) - AS2890.3

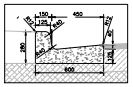
SCALE 1:125

HOR 1:100



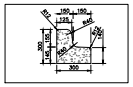
TYPICAL SECTION OF CONCRETE SHARED PATH AND BBQ PLATFORM

SCALE 1:20



KERB & GUTTER
CH 0.00 AND CH 80.066

SCALE 1:20

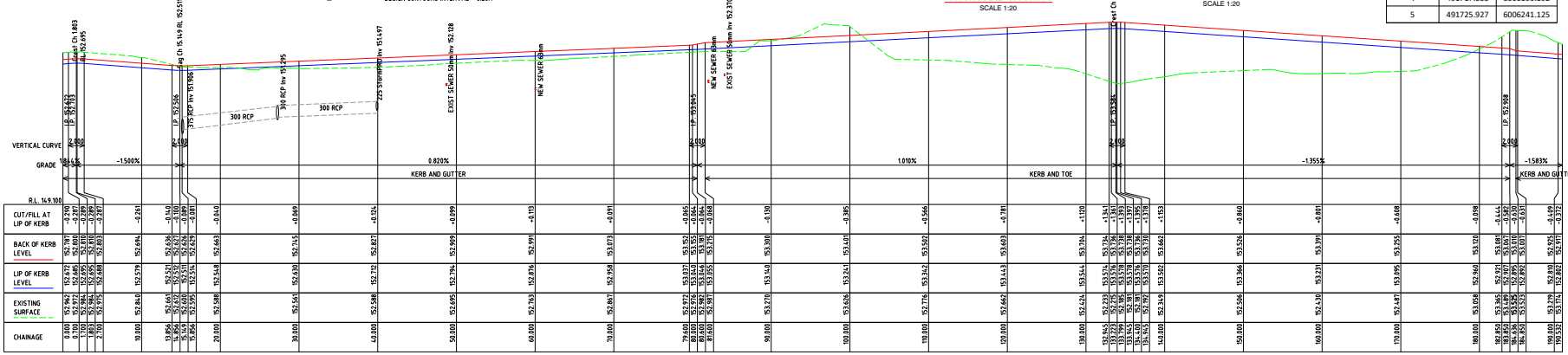


KERB & TOE
CH 81.244 AND CH 183.850

SCALE 1:20

CAR PARK CORNERS - SET OUT TABLE
BACK OF KERB - TANGENT POINT

POINT	EASTING	NORTHING
1	491761.532	6006235.344
2	491774.180	6006199.010
3	491771.333	6006181.478
4	491717.658	6006190.192
5	491725.927	6006241.125



HOR 1:250

VERT 1:50

LONGITUDINAL SECTION OF KERB LINE

HORIZONTAL 1:250 VERTICAL 1:50

ISSUED FOR TENDER

AlburyCity

LEGEND

TOP OF BANK
BANK BOTTOM
KERB
CONCRETE EDGE
BITUMEN - EDGE
EDGE OF PATH
FENCE

EXISTING DRAINAGE
PROPOSED DRAINAGE
PROPOSED KERB & GUTTER
PROPOSED LEVEE TOP
PROPOSED LEVEE BOTTOM
EXISTING WATER MAIN
PROPOSED WATER MAIN

EXISTING TREES
TREES TO REMOVE
NEW TREES TO PLANT
LIGHT POLE
LIGHT TO REMOVE
BP MONITORING WELL

EXISTING JUNCTION PIT
EXISTING SAG PIT
EXISTING SIDE ENTRY PIT
EXISTING GRATED PIT
PROPOSED DGGP

REV	DATE	AMENDMENTS	INIT.
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G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
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E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE AS SHOWN
SHEET A1

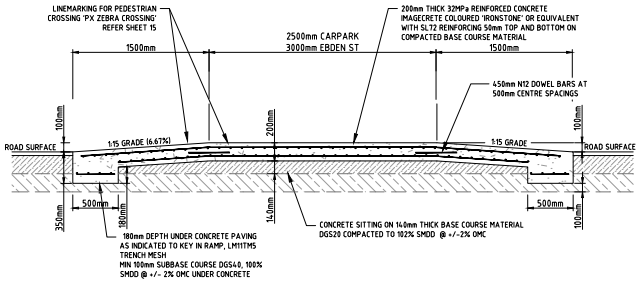
DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

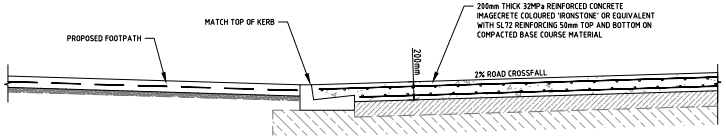
AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
CAR PARK – PLAN AND PROFILE & BBQ

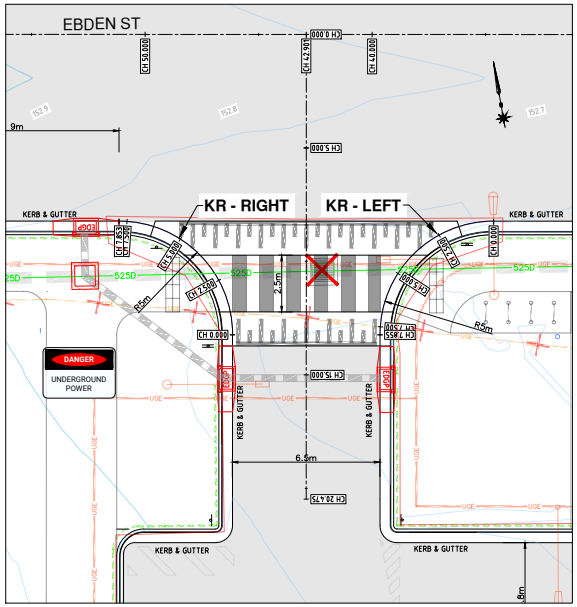
LEDGER No. 3764.5015
REV. G | No. of Sheets 28 | Sheet No. 11
DRAWING NUMBER ENG21/357



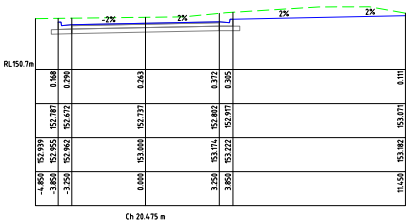
RAISED PEDESTRIAN TRAFFIC ISLAND PROFILE - AS1742.10 & AS1742.13
SECTION VIEW NTS

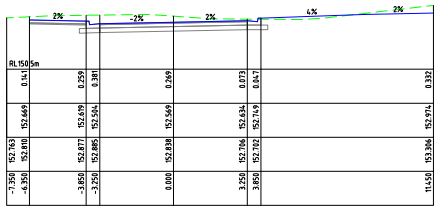


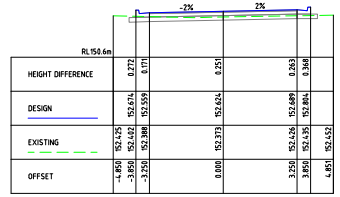
RAISED PEDESTRIAN CROSSING - CONNECTION TO KERB - AS1742.13
SECTION VIEW
SCALE H 1:50 V 1:50



PLAN OF CAR PARK ENTRANCE AND KERB RETURN WITH EBDEN ST
Scale 1:100 @ A1
HOR 1:100
DESIGN CONTOURS INTERVAL - 0.20M







CROSS SECTIONS AT CAR PARK ENTRANCE
HORIZONTAL 1:100 VERTICAL 1:100
HOR 1:100

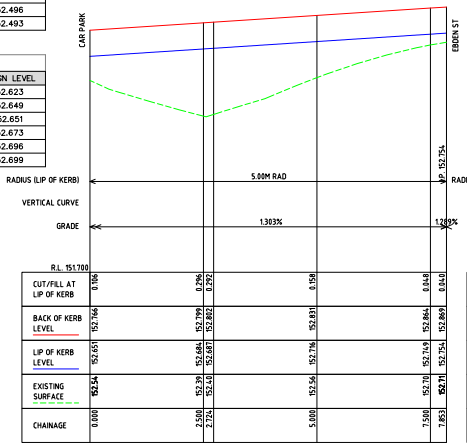
KERB RETURN - LEFT - LIP OF KERB

CHAINAGE	EASTING	NORTHING	DESIGN LEVEL
0.000	491744.487	6006251.855	152.547
2.500	491742.023	6006251.636	152.558
5.000	491739.965	6006250.262	152.519
5.130	491739.880	6006250.164	152.518
7.500	491738.819	6006248.069	152.496
7.855	491738.749	6006247.721	152.493

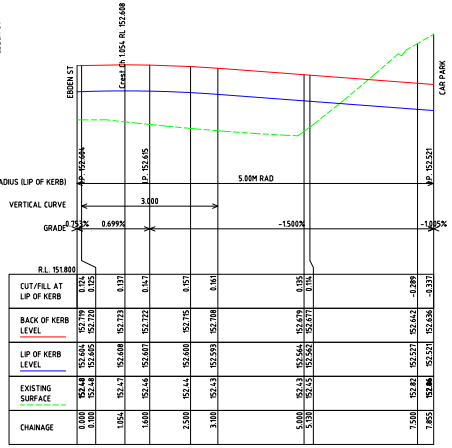
KERB RETURN - RIGHT - LIP OF KERB

CHAINAGE	EASTING	NORTHING	DESIGN LEVEL
0.000	491732.334	6006248.766	152.623
2.500	491732.114	6006251.230	152.649
2.724	491732.035	6006251.440	152.651
5.000	491730.739	6006253.288	152.673
7.500	491728.547	6006254.434	152.696
7.853	491728.201	6006254.503	152.699

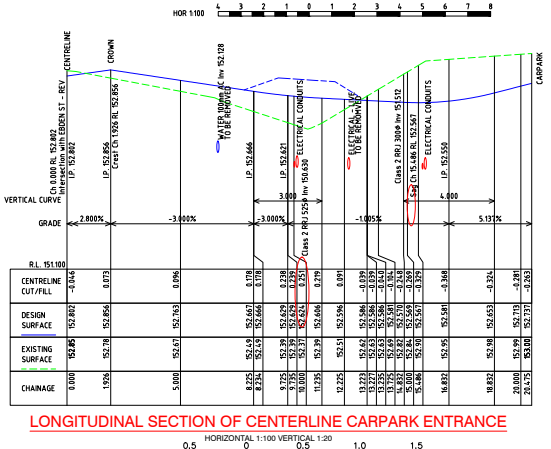
SET OUT TABLE - KERB RETURNS



LONGITUDINAL SECTION OF KR - RIGHT
HORIZONTAL 1:50 VERTICAL 1:10



LONGITUDINAL SECTION OF KR - LEFT
HORIZONTAL 1:50 VERTICAL 1:10



LONGITUDINAL SECTION OF CENTERLINE CARPARK ENTRANCE
HORIZONTAL 1:100 VERTICAL 1:20
HOR 1:50 VERTICAL 1:10
SCALE 1:100

ISSUED FOR TENDER

LEGEND

TOP OF BANK	EXISTING DRAINAGE	EXISTING TREES	EXISTING JUNCTION PIT
BANK BOTTOM	PROPOSED DRAINAGE	TREES TO REMOVE	EXISTING SAG PIT
EXISTING KERB	PROPOSED KERB & GUTTER	NEW TREES TO PLANT	EXISTING SIDE ENTRY PIT
CONCRETE EDGE	PROP LEVEE ALIGNMENT	LIGHT POLE	EXISTING GRATED PIT
BITUMEN - EDGE	CONCRETE EDGE	LIGHT TO REMOVE	PROPOSED DGGP
EDGE OF PATH	EXISTING WATER MAIN	HYDRANT/SV	PROPOSED JUNCTION PIT
FENCE	PROP IRRIGATION COND	BP MONITORING WELL - REMAIN	REMOVE
	PROPOSED WATER MAIN		

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
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F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE AS SHOWN
SHEET A1

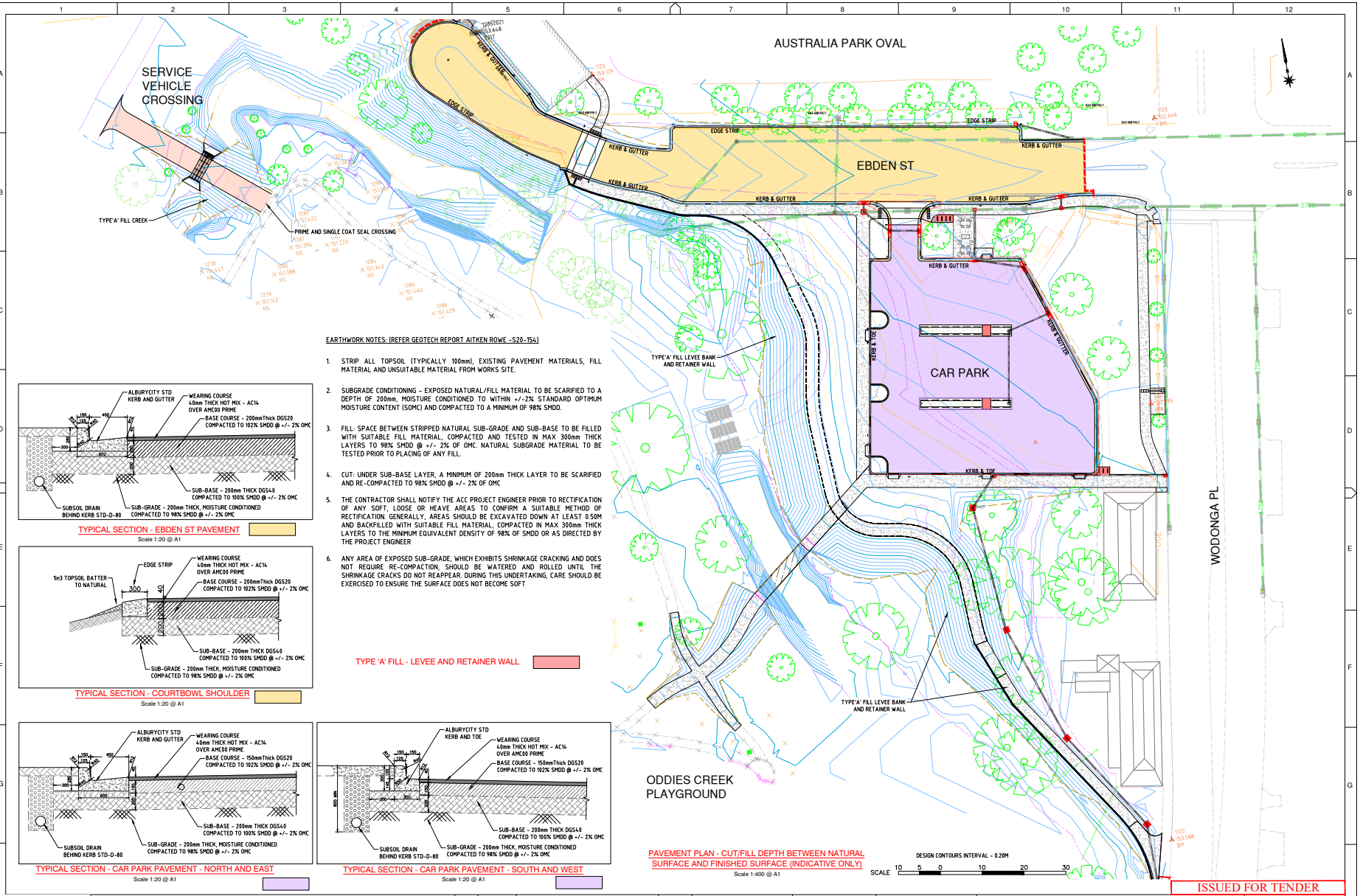
DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
CAR PARK – INTERSECTION WITH EBDEN ST

LEDGER No. 3764.5015
REV. G | No. of Sheets 28 | Sheet No. 12
DRAWING NUMBER ENG21/357



EARTHWORK NOTES: (REFER GEOTECH REPORT AITKEN ROWE -S20-154)

1. STRIP ALL TOPSOIL (TYPICALLY 100mm), EXISTING PAVEMENT MATERIALS, FILL MATERIAL AND UNSUITABLE MATERIAL FROM WORKS SITE.
2. SUBGRADE CONDITIONING - EXPOSED NATURAL/FILL MATERIAL TO BE SCARIFIED TO A DEPTH OF 200mm, MOISTURE CONDITIONED TO WITHIN +/-2% STANDARD OPTIMUM MOISTURE CONTENT (SOMC) AND COMPACTED TO A MINIMUM OF 98% SMDD.
3. FILL: SPACE BETWEEN STRIPPED NATURAL SUB-GRADE AND SUB-BASE TO BE FILLED WITH SUITABLE FILL MATERIAL, COMPACTED AND TESTED IN MAX 300mm THICK LAYERS TO 98% SMDD @ +/- 2% OF OMC. NATURAL SUBGRADE MATERIAL TO BE TESTED PRIOR TO PLACING OF ANY FILL.
4. CUT: UNDER SUB-BASE LAYER, A MINIMUM OF 200mm THICK LAYER TO BE SCARIFIED AND RE-COMPACTED TO 98% SMDD @ +/- 2% OF OMC
5. THE CONTRACTOR SHALL NOTIFY THE ACC PROJECT ENGINEER PRIOR TO RECTIFICATION OF ANY SOFT, LOOSE OR HEAVE AREAS TO CONFIRM A SUITABLE METHOD OF RECTIFICATION. GENERALLY, AREAS SHOULD BE EXCAVATED DOWN AT LEAST 0.50M AND BACKFILLED WITH SUITABLE FILL MATERIAL, COMPACTED IN MAX 300mm THICK LAYERS TO THE MINIMUM EQUIVALENT DENSITY OF 98% OF SMDD OR AS DIRECTED BY THE PROJECT ENGINEER
6. ANY AREA OF EXPOSED SUB-GRADE, WHICH EXHIBITS SHRINKAGE CRACKING AND DOES NOT REQUIRE RE-COMPACTION, SHOULD BE WATERED AND ROLLED UNTIL THE SHRINKAGE CRACKS DO NOT REAPPEAR. DURING THIS UNDERTAKING, CARE SHOULD BE EXERCISED TO ENSURE THE SURFACE DOES NOT BECOME SOFT

TYPICAL SECTION - EBDEN ST PAVEMENT

Scale 1:20 @ A1

TYPICAL SECTION - COURTBOWL SHOULDER

Scale 1:20 @ A1

TYPE 'A' FILL - LEVEE AND RETAINER WALL

TYPICAL SECTION - CAR PARK PAVEMENT - NORTH AND EAST

Scale 1:20 @ A1

TYPICAL SECTION - CAR PARK PAVEMENT - SOUTH AND WEST

Scale 1:20 @ A1

PAVEMENT PLAN - CUT/FILL DEPTH BETWEEN NATURAL SURFACE AND FINISHED SURFACE (INDICATIVE ONLY)

Scale 1:400 @ A1

ISSUED FOR TENDER

SCALE 0.5 0 0.5 1.0 1.5

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AlburyCity

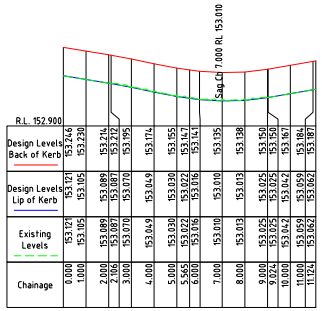
AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
PAVEMENT DETAILS

LEDGER No. 3764.5015

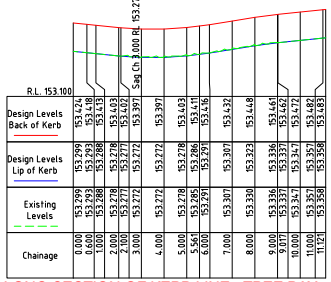
REV.	No. of Sheets	Sheet No.
G	28	13

DRAWING NUMBER ENG21/357



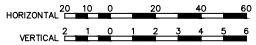
LONG SECTION OF KERB LINE - TREE BAY - TB1

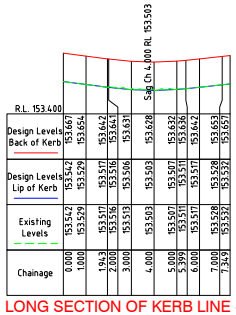
HORIZONTAL 1:100 VERTICAL 1:10



LONG SECTION OF KERB LINE - TREE BAY - TB2

HORIZONTAL 1:100 VERTICAL 1:10





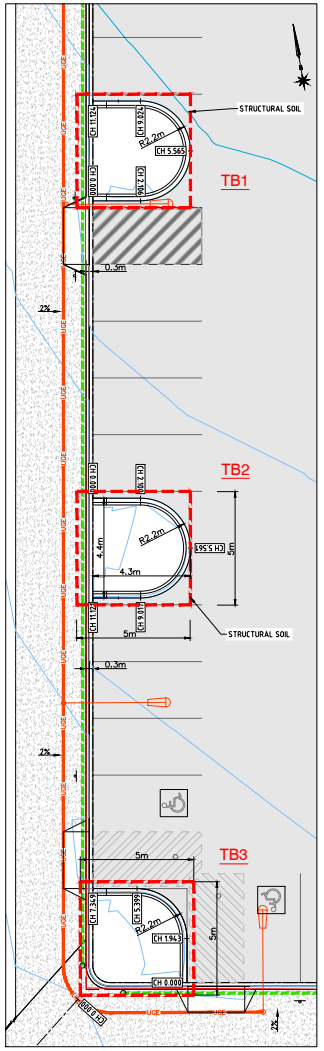
LONG SECTION OF KERB LINE - TREE BAY - TB3

HORIZONTAL 1:100 VERTICAL 1:10



SEMI MOUNTABLE KERB TREE BAYS

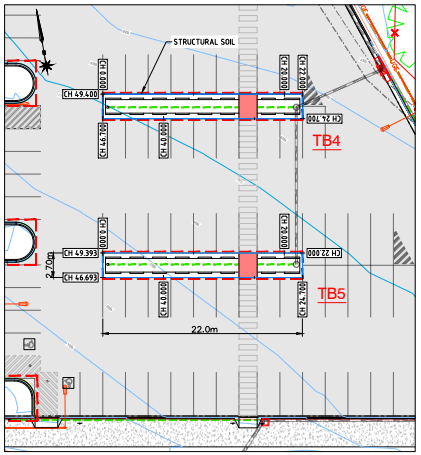
SCALE 1:20



PLAN OF CAR PARK - TREE BAYS TB1 - TB3

Scale 1:100 @ A1

HORIZONTAL 1:1000

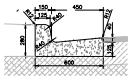


PLAN OF CAR PARK TREE BAYS TB4 & TB5

Scale 1:250 @ A1

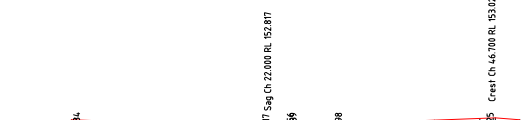
SCALE

DESIGN CONTOURS INTERVAL - 0.20M



KERB & GUTTER - CENTRAL TREE BAYS

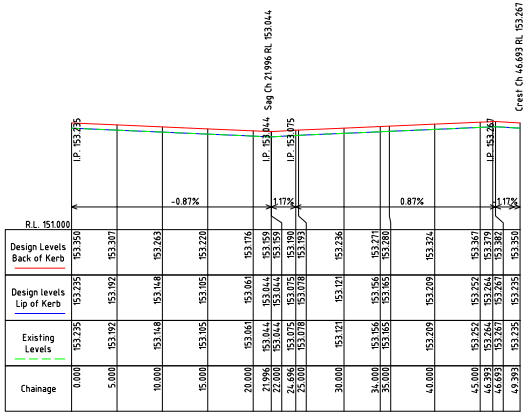
SCALE 1:20



LONG SECTION OF TREE BAY KERB LINE -TB4

HORIZONTAL 1:250 VERTICAL 1:50





LONG SECTION OF TREE BAY KERB LINE - TB5

HORIZONTAL 1:250 VERTICAL 1:50

ISSUED FOR TENDER

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	AS SHOWN
SHEET	A1

DESIGNED	K. HASAN
DRAWN	K. HASAN
CHECKED	A. RODGERS
APPROVED	J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

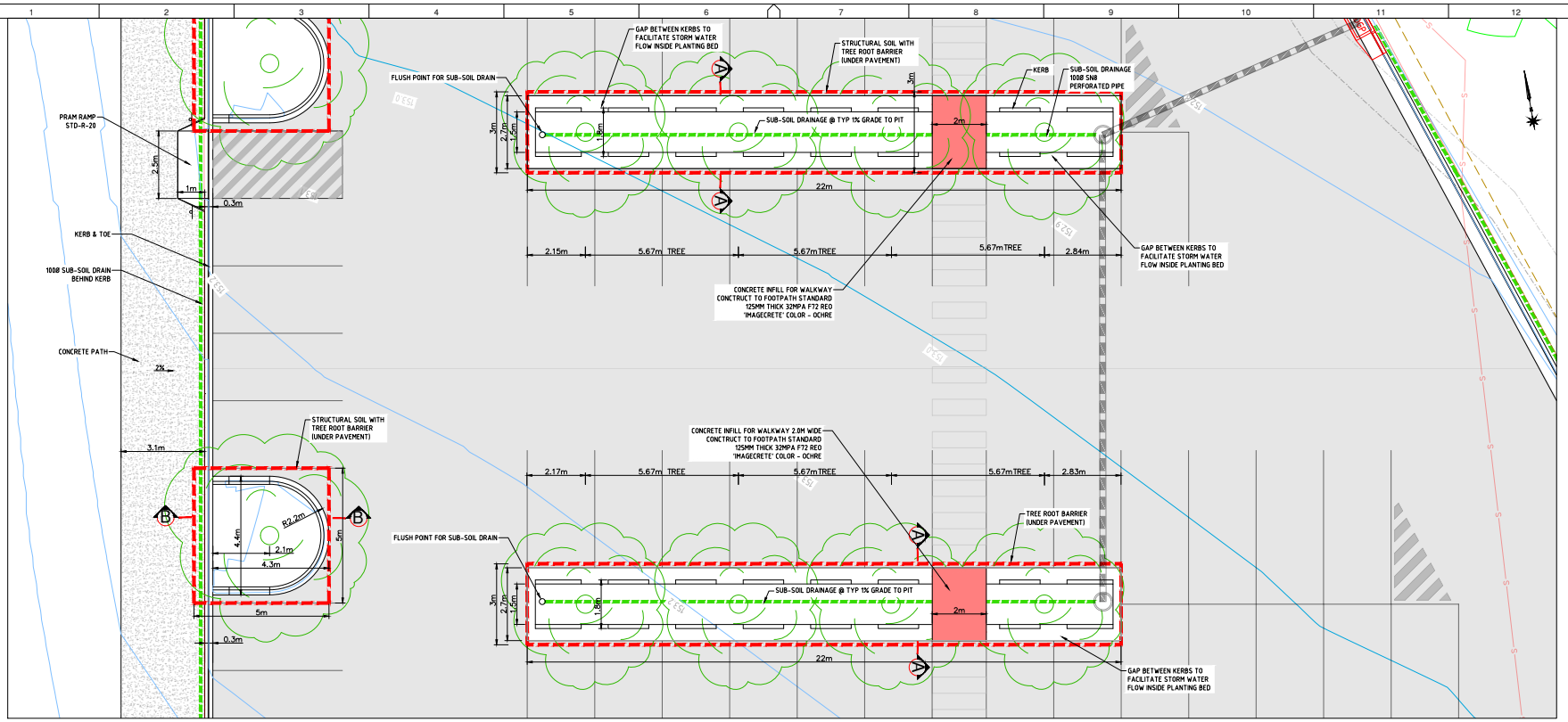
AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
CARPARK TREE BAYS PLAN AND SECTIONS

LEDGER No.	
3764.5015	
REV.	No. of Sheets
G	28
Sheet No.	
14	

DRAWING NUMBER

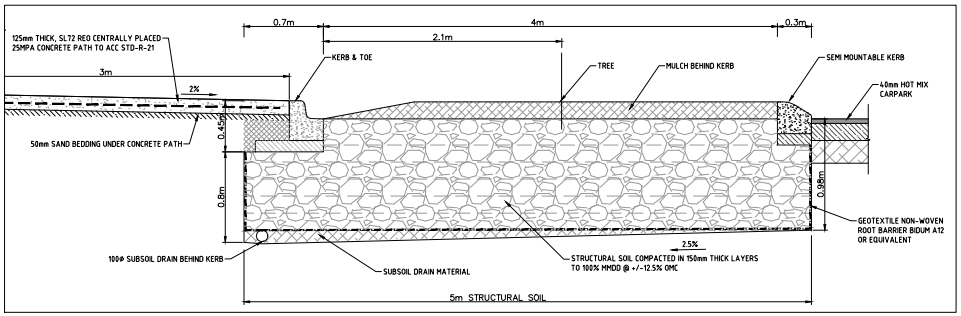
ENG21/357



PLAN OF PLANTATION INSIDE CAR PARK

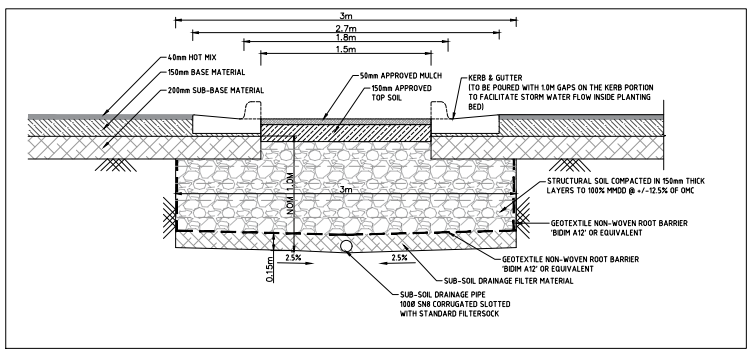
SCALE 1:75 @ A1

DESIGN CONTOURS INTERVAL - 0.20M



SECTION B-B

Scale 1:20 @ A1



SECTION A-A

Scale 1:20 @ A1

SCALE 0.5 0 0.5 1.0 1.5

ISSUED FOR TENDER

LEGEND

TOP OF BANK, BANK BOTTOM, KERB, CONCRETE EDGE, BITUMEN - EDGE, EDGE OF PATH, FENCE

EXISTING DRAINAGE, PROPOSED DRAINAGE, PROPOSED KERB & GUTTER, PROPOSED LEVEE TOP, PROPOSED LEVEE BOTTOM, EXISTING WATER MAIN, PROPOSED WATER MAIN

EXISTING TREES, TREES TO REMOVE, NEW TREES TO PLANT, LIGHT POLE, LIGHT TO REMOVE, REINSTATE BP WELL

TREE ROOT BARRIER, SUBSOIL DRAINAGE, IRRIGATION CONDUIT

REV	DATE	AMENDMENTS	INIT.
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G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	AS SHOWN
SHEET	A1

DESIGNED	K. HASAN
DRAWN	K. HASAN
CHECKED	A. RODGERS
APPROVED	J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK

27

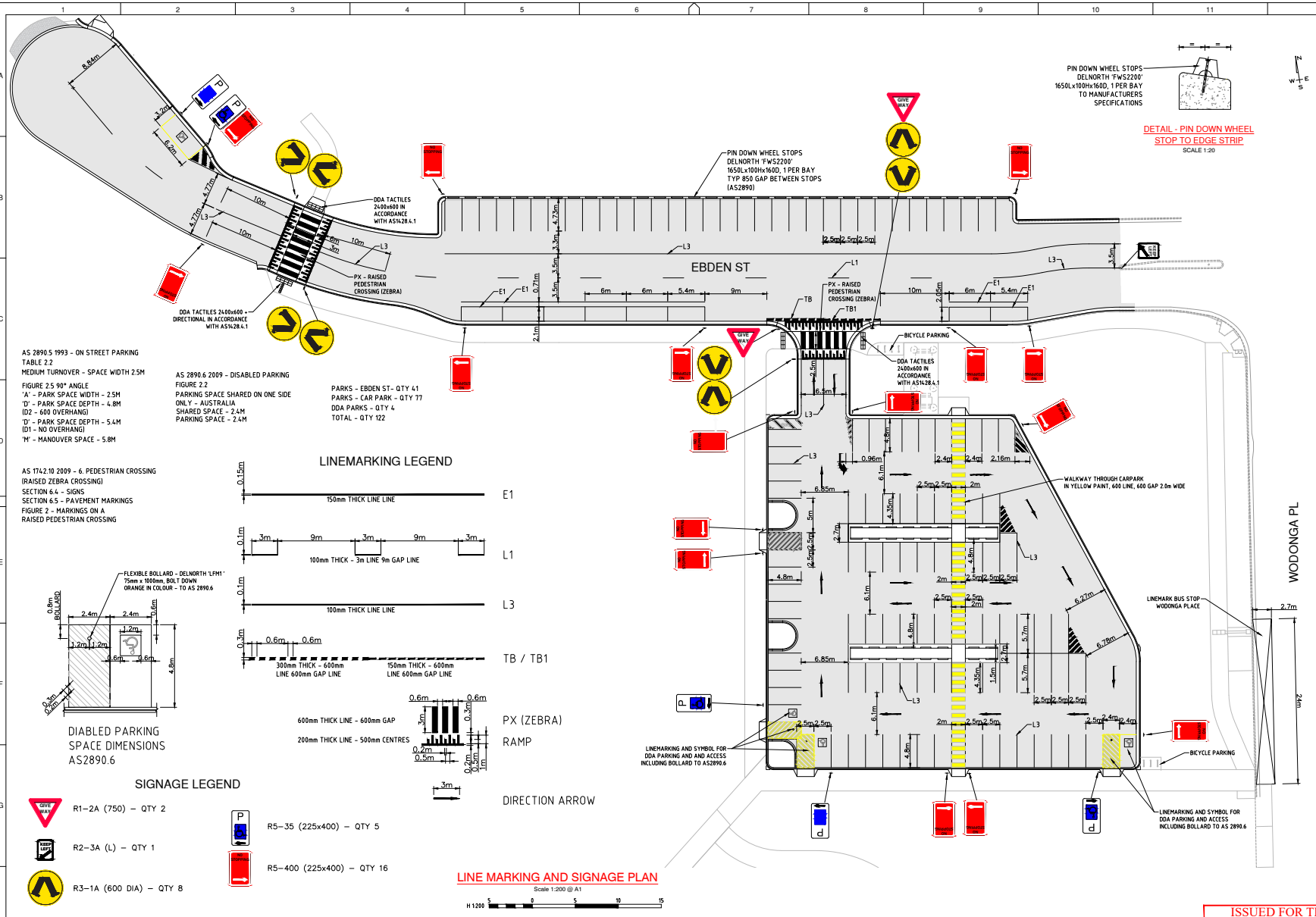
CORNER OF EBDEN ST AND WODONGA PL

TREE PLANTING INSIDE CAR PARK

LEDGER No.		
3764.5015		
REV.	No. of Sheets	Sheet No.
G	28	15

DRAWING NUMBER

ENG21/357



DETAIL - PIN DOWN WHEEL STOP TO EDGE STRIP
SCALE 1:20

AS 2890.5 1993 - ON STREET PARKING
TABLE 2.2
MEDIUM TURNOVER - SPACE WIDTH 2.5M

FIGURE 2.5 90° ANGLE
'A' - PARK SPACE WIDTH - 2.5M
'D' - PARK SPACE DEPTH - 4.8M
(D2 - 600 OVERHANG)
'D' - PARK SPACE DEPTH - 5.4M
(D1 - NO OVERHANG)
'M' - MANOUVER SPACE - 5.8M

AS 2890.6 2009 - DISABLED PARKING
FIGURE 2.2
PARKING SPACE SHARED ON ONE SIDE
ONLY - AUSTRALIA
SHARED SPACE - 2.4M
PARKING SPACE - 2.4M

PARKS - EBDEN ST- QTY 41
PARKS - CAR PARK - QTY 77
DDA PARKS - QTY 4
TOTAL - QTY 122

AS 1742.10 2009 - 6. PEDESTRIAN CROSSING
(RAISED ZEBRA CROSSING)
SECTION 6.4 - SIGNS
SECTION 6.5 - PAVEMENT MARKINGS
FIGURE 2 - MARKINGS ON A
RAISED PEDESTRIAN CROSSING

LINEMARKING LEGEND

DIABLED PARKING
SPACE DIMENSIONS
AS2890.6

SIGNAGE LEGEND

R1-2A (750) - QTY 2
R2-3A (L) - QTY 1
R3-1A (600 DIA) - QTY 8
R5-35 (225x400) - QTY 5
R5-400 (225x400) - QTY 16

LINE MARKING AND SIGNAGE PLAN

Scale 1:200 @ A1

ISSUED FOR TENDER

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

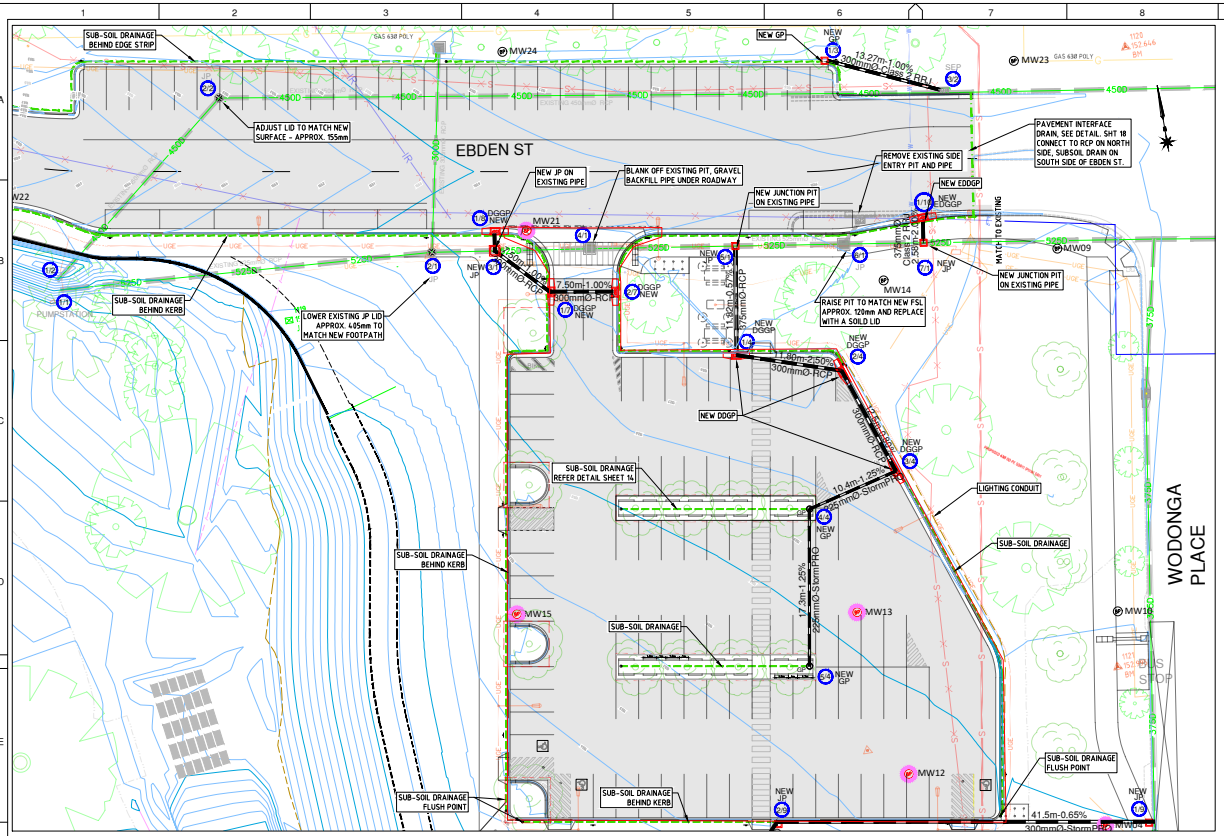
SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1:200
SHEET	A1

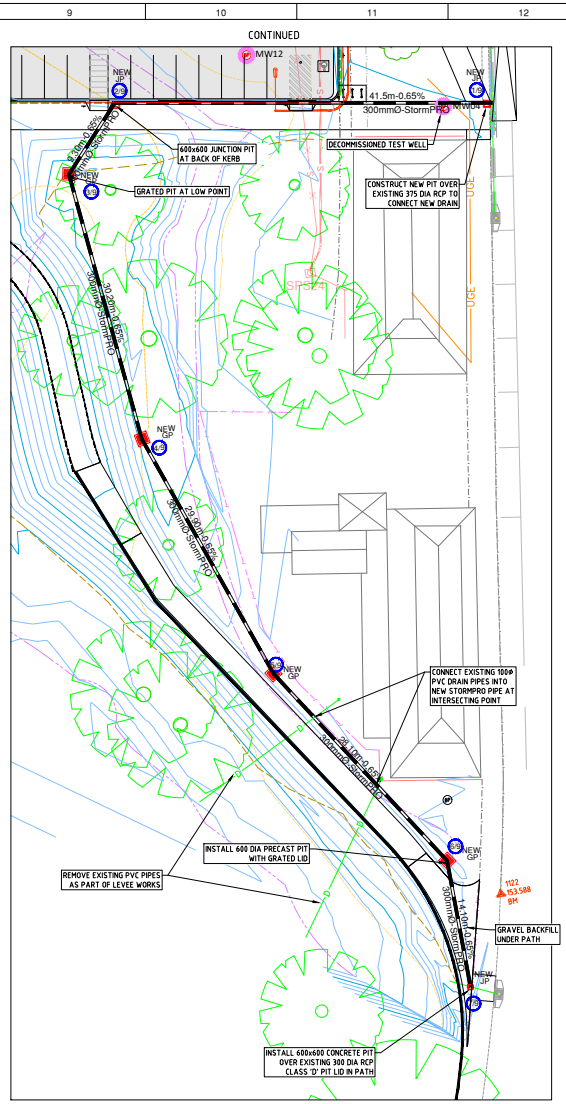
DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN
APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
LINE MARKING AND SIGNAGE PLAN

LEDGER No. 3746.5015
REV. G | No. of Sheets 28 | Sheet No. 16
DRAWING NUMBER ENG21/357





Pit Setout - Line 3

Pit No.	Easting	Northing	Lid Level
(m)	(m)	(m)	
3/2	491765.08	6006263.535	152.452
1/3	491765.52	6006266.309	152.357

Pit Setout - Line 4

(m)	(m)	(m)	
5/1	491752.58	6006248.619	152.622
1/4	491750.79	6006236.938	152.471
2/4	491761.90	6006233.163	152.589
3/4	491766.04	6006221.392	152.688
4/4	491756.00	6006218.716	152.844
5/4	491753.21	6006201.639	153.064

Pit Setout - Line 7

Pit No.	Easting	Northing	Lid Level
(m)	(m)	(m)	
3/1	491726.34	6006252.335	152.929
1/7	491731.55	6006246.932	152.749
2/7	491738.91	6006245.719	152.619

Pit Setout - Line 8

(m)	(m)	(m)	
3/1	491726.34	6006252.335	152.929
1/8	491726.65	6006254.280	152.798

Setout - Line 9

Pit No.	Easting	Northing	Lid Level
(m)	(m)	(m)	
1/9	491787.96	6006178.491	152.770
2/9	491746.94	6006185.260	153.447
3/9	491740.70	6006178.340	152.776
4/9	491743.94	6006148.273	152.930
5/9	491753.41	6006119.957	153.604
6/9	491769.69	6006097.023	153.393
7/9	491770.01	6006082.884	153.537

Pit Setout - Line 10

Pit No.	Easting	Northing	Lid Level
(m)	(m)	(m)	
7-1	491773.06	6006245.662	152.539
1-10	491773.46	6006248.215	152.491

ISSUED FOR TENDER

AlburyCity

LEGEND

TOP OF BANK	EXISTING DRAINAGE	EXISTING TREES	EXISTING JUNCTION PIT
BANK BOTTOM	PROPOSED DRAINAGE	TREES TO REMOVE	EXISTING SAG PIT
EXISTING KERB	PROPOSED KERB & GUTTER	NEW TREES TO PLANT	EXISTING SIDE ENTRY PIT
CONCRETE EDGE	PROP LEVEE ALIGNMENT	LIGHT POLE	EXISTING GRATED PIT
BITUMEN - EDGE	CONCRETE EDGE	LIGHT TO REMOVE	PROPOSED DGGP
EDGE OF PATH	EXISTING WATER MAIN	HYDRANT/SV	PROPOSED JUNCTION PIT
FENCE	PROP IRRIGATION COND	BP MONITORING WELL - REMAIN	REMOVE
	PROPOSED WATER MAIN		

REV	DATE	AMENDMENTS	INIT.
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F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1:250
SHEET	A1

DESIGNED	K. HASAN
DRAWN	K. HASAN
CHECKED	A. RODGERS
APPROVED	J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

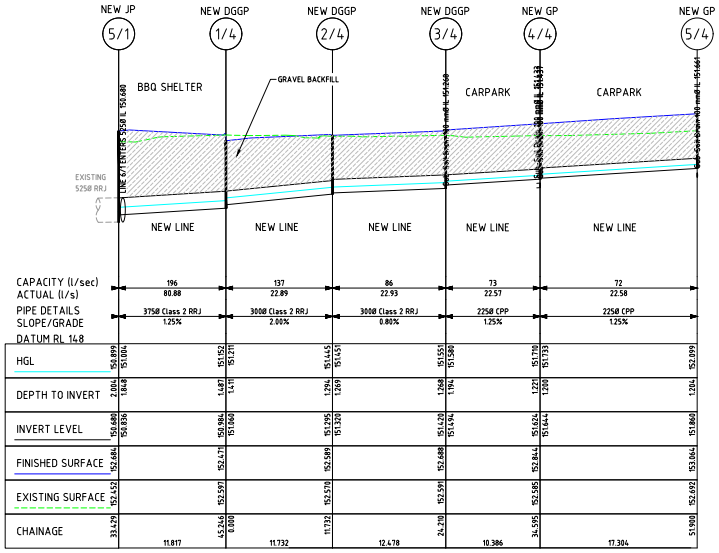
AlburyCity

AUSTRALIA PARK

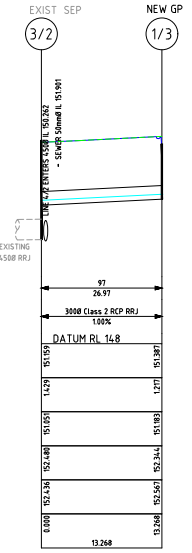
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
DRAINAGE PLAN

LEDGER No.			
3764.5015			
REV.	No. of Sheets	Sheet No.	
G	28	17	

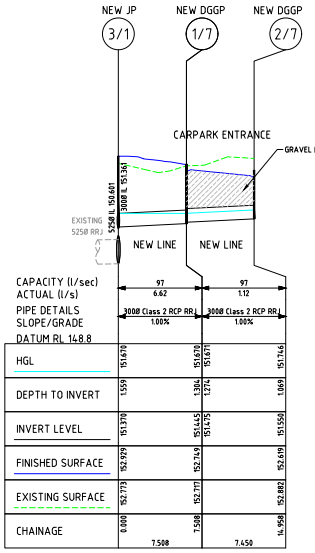
DRAWING NUMBER
ENG21/357



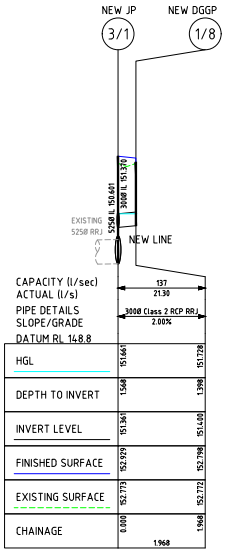
DRAINAGE LONGITUNDINAL SECTION FOR LINE 4
SCALES: HORIZONTAL 1:250 VERTICAL 1:50



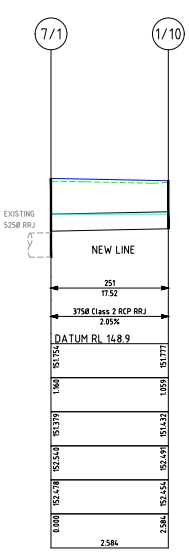
DRAINAGE LONGITUNDINAL SECTION FOR LINE 3
SCALES: HORIZONTAL 1:250 VERTICAL 1:50



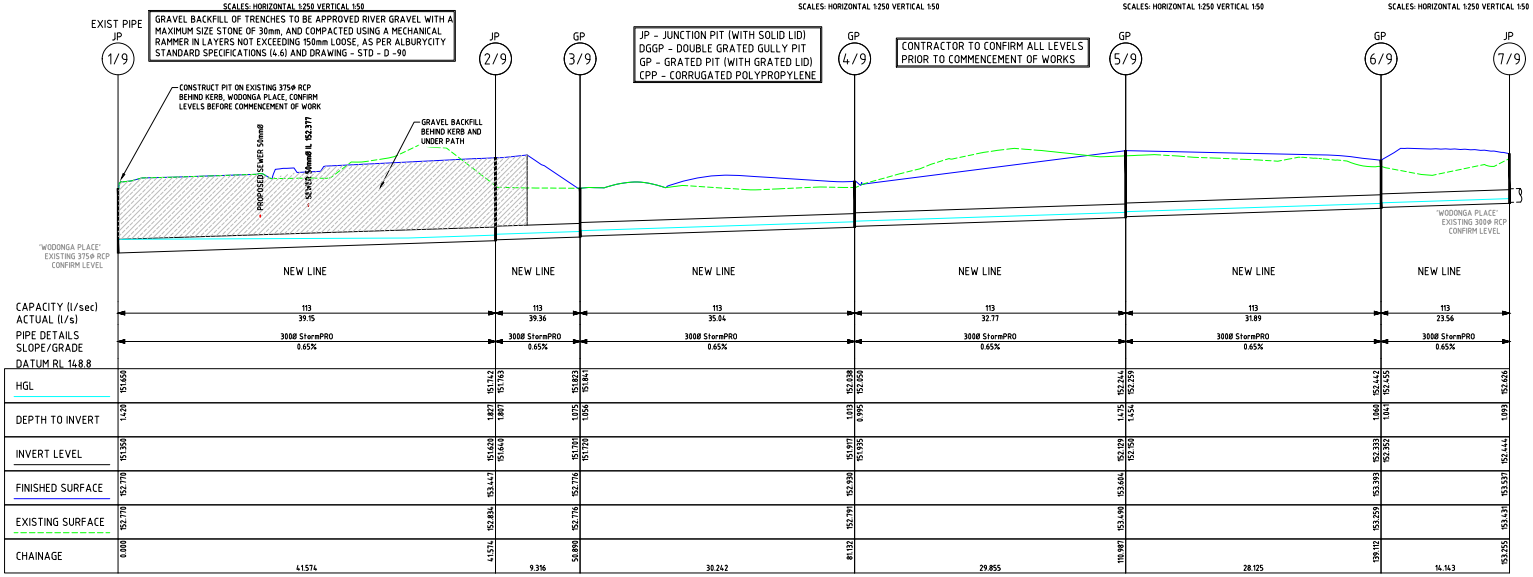
DRAINAGE LONGITUNDINAL SECTION FOR LINE 7
SCALES: HORIZONTAL 1:250 VERTICAL 1:50



DRAINAGE LONGITUNDINAL SECTION FOR LINE 8
SCALES: HORIZONTAL 1:250 VERTICAL 1:50



LONGITUNDINAL SECTION LINE 10
SCALES: HORIZONTAL 1:50 VERTICAL 1:50



GRAVEL BACKFILL OF TRENCHES TO BE APPROVED RIVER GRAVEL WITH A MAXIMUM SIZE STONE OF 30mm, AND COMPACTED USING A MECHANICAL RAMMER IN LAYERS NOT EXCEEDING 150mm LOOSE, AS PER ALBURYCITY STANDARD SPECIFICATIONS (4.6) AND DRAWING - STD - D -90

JP - JUNCTION PIT (WITH SOLID LID)
DGGP - DOUBLE GRATED GULLY PIT
GP - GRATED PIT (WITH GRATED LID)
CPP - CORRUGATED POLYPROPYLENE

CONTRACTOR TO CONFIRM ALL LEVELS PRIOR TO COMMENCEMENT OF WORKS

DRAINAGE LONGITUNDINAL SECTION FOR LINE 9
SCALES: HORIZONTAL 1:250 VERTICAL 1:50

ISSUED FOR TENDER

AlburyCity

HOR 1:250 10 0 5 10 15 20
VERT 1:50 2 1.5 1 0.5 0 1 2 3 4

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE H 1:250, V 1:50
SHEET A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity
AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
DRAINAGE LONG SECTIONS

LEDGER No. 3764.5015
REV. G | No. of Sheets 28 | Sheet No. 18
DRAWING NUMBER ENG21/357

Pit Schedule - Ebden South - Line 4

Pit No.	Pit Type	Pit Width	Pit Length	Outlet Diameter	Outlet Invert RL	Inlet Diameter	Inlet Invert RL	Pit Depth	Pit Lid Level	Easting	Northing	Comment
		(mm)	(mm)	(mm)	(m)	(mm)	(m)	(m)	(m)	(m)	(m)	
5/1	Junction Pit 600 x 600	600	600	525	150.680	525	150.680	2.004	152.684	491752.58	6006248.619	New pit on existing pipe
						375	150.839					
1/4	SAG SEP & Grate 1.20m	900	1000	375	150.906	300	151.001	1.565	152.471	491750.79	6006236.938	
2/4	1m SEP 10%			300	151.295	300	151.320	1.294	152.589	491761.90	6006233.163	
3/4	1m SEP 10%			300	151.420	225	151.494	1.268	152.688	491766.04	6006221.392	
4/4	Grated Pit 600 x 600			225	151.624	225	151.644	1.221	152.844	491756.00	6006218.716	
5/4	Grated Pit 600 x 600			225	151.860			1.204	153.064	491753.21	6006201.639	

Pit Schedule - Ebden North - Line 3

		(mm)	(mm)	(mm)	(m)	(mm)	(m)	(m)	(m)	(m)	(m)	
3/2	SEP	900	1000	450	150.292	450	150.262	2.188	152.480	491777.87	6006261.544	Existing
						300	151.051					
1/3-	Grated Pit 600 x 600	600	600	300	151.183			1.217	152.400	491765.84	6006267.147	

Pit Schedule - Entrance 1 - Line 7

		(mm)	(mm)	(mm)	(m)	(mm)	(m)	(m)	(m)	(m)	(m)	
3/1	Junction Pit 900 x 900	900	900			300	151.370	2.328	152.929	491726.34	6006252.335	New pit on existing pipe
1/7	SAG SEP & Grate 1.0m	900	1000	300	151.445	300	151.475	1.304	152.749	491731.55	6006246.932	
2/7	SAG SEP & Grate 1.0m	900	1000	300	151.550			1.069	152.619	491738.91	6006245.719	

Pit Schedule - Entrance 2 - Line 8

		(mm)	(mm)	(mm)	(m)	(mm)	(m)	(m)	(m)	(m)	(m)	
3/1	Junction Pit 900 x 900	900	900			300	151.361	1.568	152.929	491726.34	6006252.335	New pit on existing pipe
1/8	SEP & Grate 1.0% Longitudinal Grade	900	1000	300	151.400			1.398	152.798	491726.65	6006254.280	

Pit Schedule - tree 2 - Line 9

		(mm)	(mm)	(mm)	(m)	(mm)	(m)	(m)	(m)	(m)	(m)	
1/9	Junction Pit 600 x 600	600	600			300	151.350	1.420	152.770	491787.96	6006178.491	New pit on existing pipe
2/9	Junction Pit 600 x 600	600	600	300	151.620	300	151.640	1.827	153.447	491746.94	6006185.260	
3/9	Grated Pit 600 x 600	600	600	300	151.701	300	151.720	1.075	152.776	491740.70	6006178.340	
4/9	Grated Pit 600 x 600	600	600	300	151.917	300	151.935	1.013	152.930	491743.94	6006148.273	
5/9	Grated Pit 600 x 600	600	600	300	152.129	300	152.150	1.475	153.604	491753.41	6006119.957	
6/9	Grated Pit 600 x 600	600	600	300	152.333	300	152.352	1.060	153.393	491769.69	6006097.023	
7/9	Grated Pit 600 x 600	600	600	300	152.444			1.093	153.537	491770.01	6006082.884	New pit on existing pipe

Pit Schedule - Ebden New - Line 10

		(mm)	(mm)	(mm)	(m)	(mm)	(m)	(m)	(m)	(m)	(m)	
7-1	Junction Pit 900 x 600	600	900			375	151.379	1.160	152.539	491773.06	6006245.662	New pit on existing pipe
1-10	SAG SEP & Grate 1.20m	900	1000	375	151.432			1.059	152.491	491773.46	6006248.215	

Pit Schedule - Culvert

Pit No.	Pit Type	Pit Width	Pit Length	Outlet Diameter	Outlet Invert RL	Inlet Diameter	Inlet Invert RL	Pit Depth	Pit Lid Level	Easting	Northing	Comment
		(mm)	(mm)	(mm)	(m)	(mm)	(m)	(m)	(m)	(m)	(m)	
00	HEADWALL TWIN 1050	3415	1620			1050	149.502	1.380	150.882	491569.67	6006285.528	
11	HEADWALL TWIN 1050	3415	1620	1050	149.557			1.380	150.937	491574.25	6006291.236	

Pipe Schedule - Ebden South - Line 4

Pipe Label	Pipe Class	Pipe Diameter Ø	Pipe Upstream Invert	Pipe Slope 1:	Pipe Grade	Pipe Downstream Invert	Pipe Length (Pit To Pit Centre)	Remarks
		(mm)	(m)	(1 in X)	(%)	(m)	(m)	
5/1 -1/4	Class 2 RRJ	375	150.906	176.4	0.6	150.839	11.8	
1/4 -2/4	Class 2 RRJ	300	151.295	39.9	2.5	151.001	11.7	
2/4 -3/4	Class 2 RRJ	300	151.420	125.0	0.8	151.320	12.5	
3/4 -4/4	STORMPRO	225	151.624	80.0	1.3	151.494	10.4	
4/4 -4/5	STORMPRO	225	151.860	80.1	1.2	151.644	17.3	

Pipe Schedule - Ebden North - Line 3

		(mm)	(m)	(1 in X)	(%)	(m)	(m)	
3/2 -1/3	Class 2 RRJ	300	151.183	100.3	1.0	151.051	13.3	

Pipe Schedule - Entrance 1 - Line 7

		(mm)	(m)	(1 in X)	(%)	(m)	(m)	
3/1 -1/7	Class 2 RRJ	300	151.445	100.0	1.0	151.370	7.5	
1/7 -2/7	Class 2 RRJ	300	151.550	100.0	1.0	151.475	7.5	

Pipe Schedule - Entrance 2 - line 8

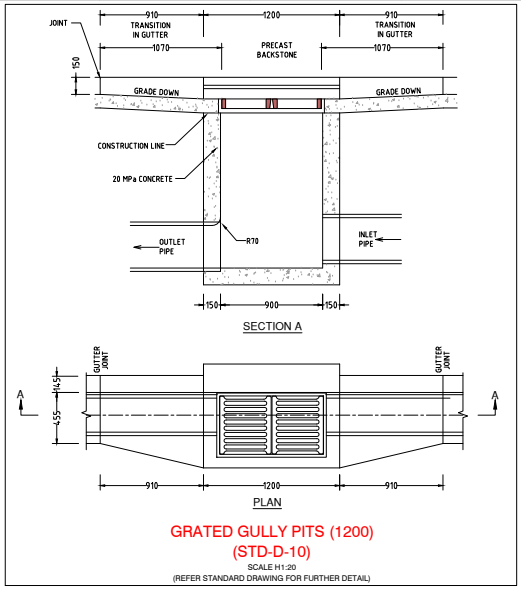
		(mm)	(m)	(1 in X)	(%)	(m)	(m)	
3/1 -1/8	Class 2 RRJ	300	151.400	50.0	2.0	151.361	2.0	

Pipe Schedule - tree 2 - Line 9

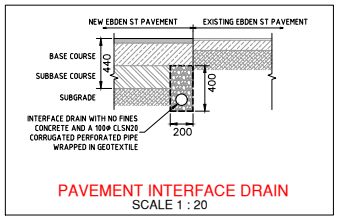
		(mm)	(m)	(1 in X)	(%)	(m)	(m)	
1/9 -2/9	STORMPRO	300	151.620	153.8	0.7	151.350	41.6	
2/9 -3/9	STORMPRO	300	151.701	153.8	0.7	151.640	9.3	
3/9 -4/9	STORMPRO	300	151.917	153.8	0.6	151.720	30.2	
4/9 -5/9	STORMPRO	300	152.129	153.8	0.7	151.935	29.6	
5/9 -6/9	STORMPRO	300	152.333	153.8	0.6	152.150	28.1	
6/9 -7/9	STORMPRO	300	152.444	153.8	0.7	152.352	14.1	

Pipe Schedule - Ebden New - Line 10

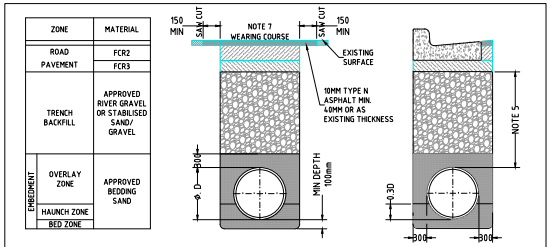
		(mm)	(m)	(1 in X)	(%)	(m)	(m)	
7/1 -1/10	Class 2 RRJ	375	151.432	48.8	2.1	151.379	2.6	



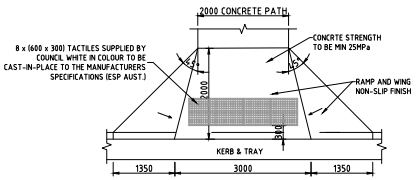
GRATED GULLY PITS (1200)
(STD-D-10)
SCALE H1:20
(REFER STANDARD DRAWING FOR FURTHER DETAIL)



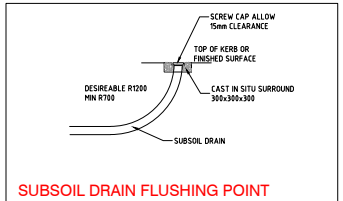
PAVEMENT INTERFACE DRAIN
SCALE 1 : 20



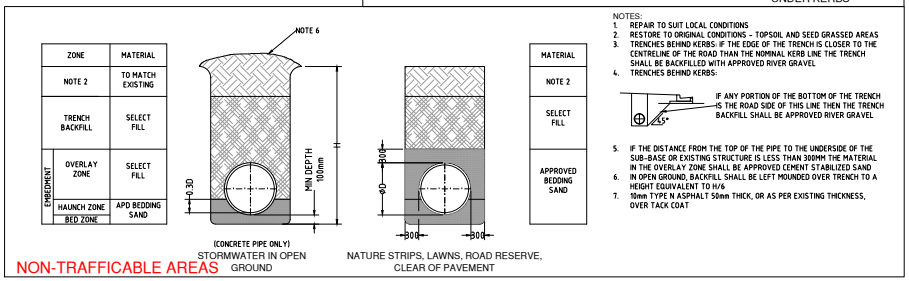
TRAFFICABLE AREAS
ROAD PAVEMENTS
ROAD PAVEMENTS UNDER KERBS



PERAMBULATOR RAMP DETAILS - CROSSING
SCALE 1 : 50



SUBSOIL DRAIN FLUSHING POINT
(STD-D-80)
SCALE H1:50
(REFER STANDARD DRAWING FOR FURTHER DETAIL)



NON-TRAFFICABLE AREAS
GROUND

ISSUED FOR TENDER

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	AS SHOWN
SHEET	A1

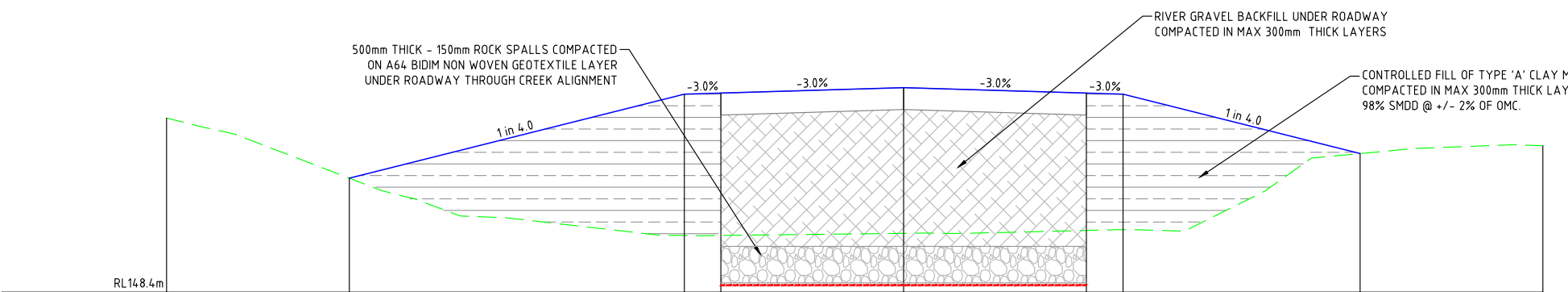
DESIGNED	K. HASAN
DRAWN	K. HASAN
CHECKED	A. RODGERS
APPROVED	J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

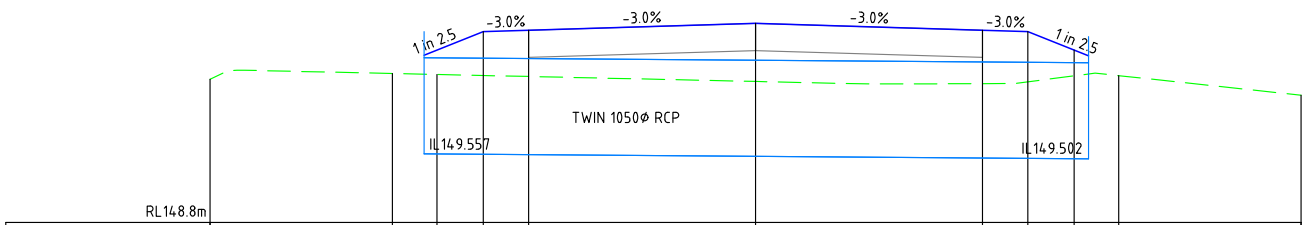
AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
DRAINAGE PIT AND PIPE SCHEDULES

LEDGER No. 3764.5015
REV. G | No. of Sheets 28 | Sheet No. 19
DRAWING NUMBER ENG21/357



HEIGHT DIFFERENCE		0.000	1.930	1.944	1.990	1.876	1.850	0.000	
DESIGN		149.957	151.103	151.118	151.193	151.118	151.103	150.292	
EXISTING	150.777	149.957	149.173	149.174	149.203	149.242	149.253	150.292	150.397
OFFSET	-10.08	-7.58	-3.00	-2.50	0.00	2.50	3.00	6.24	8.74

Ch 25.00 m

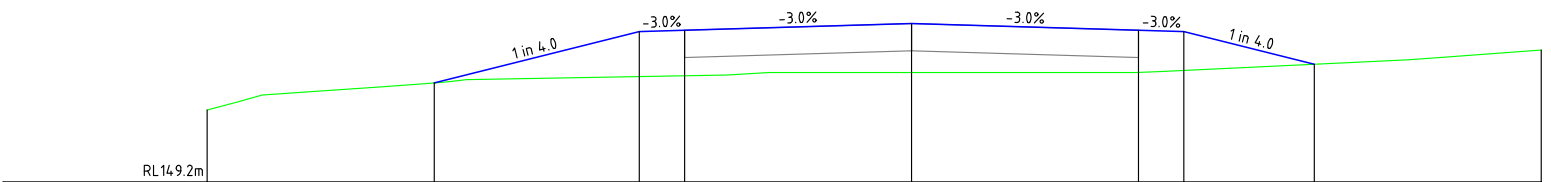


HEIGHT DIFFERENCE		0.062	0.000	0.484	0.510	0.640	0.589	0.554	0.000	0.085	
DESIGN			150.430	150.903	150.918	150.993	150.918	150.903	150.699		
EXISTING	150.377	150.441	150.430	150.419	150.408	150.353	150.329	150.349	150.415	150.417	150.202
OFFSET	-6.01	-4.00	-3.51	-3.00	-2.50	0.00	2.50	3.00	3.51	4.00	6.01

Ch 15.00 m

CONTRACTOR TO MAKE PROVISION FOR COFFER DAMS, DEWATERING AND SEDIMENT CONTROL FOR WORKS CARRIED OUT WITHIN 'ODDIES CREEK ZONE'.

REFER GEOTECH REPORT - AS22-14 AITKEN ROWE - 18 MARCH 2022 SEEPAGE WAS ENCOUNTERED DURING THE COURSE OF DRILLING FOR SAMPLES AND SHOULD BE CONSIDERED WHILST UNDERTAKING WORKS.

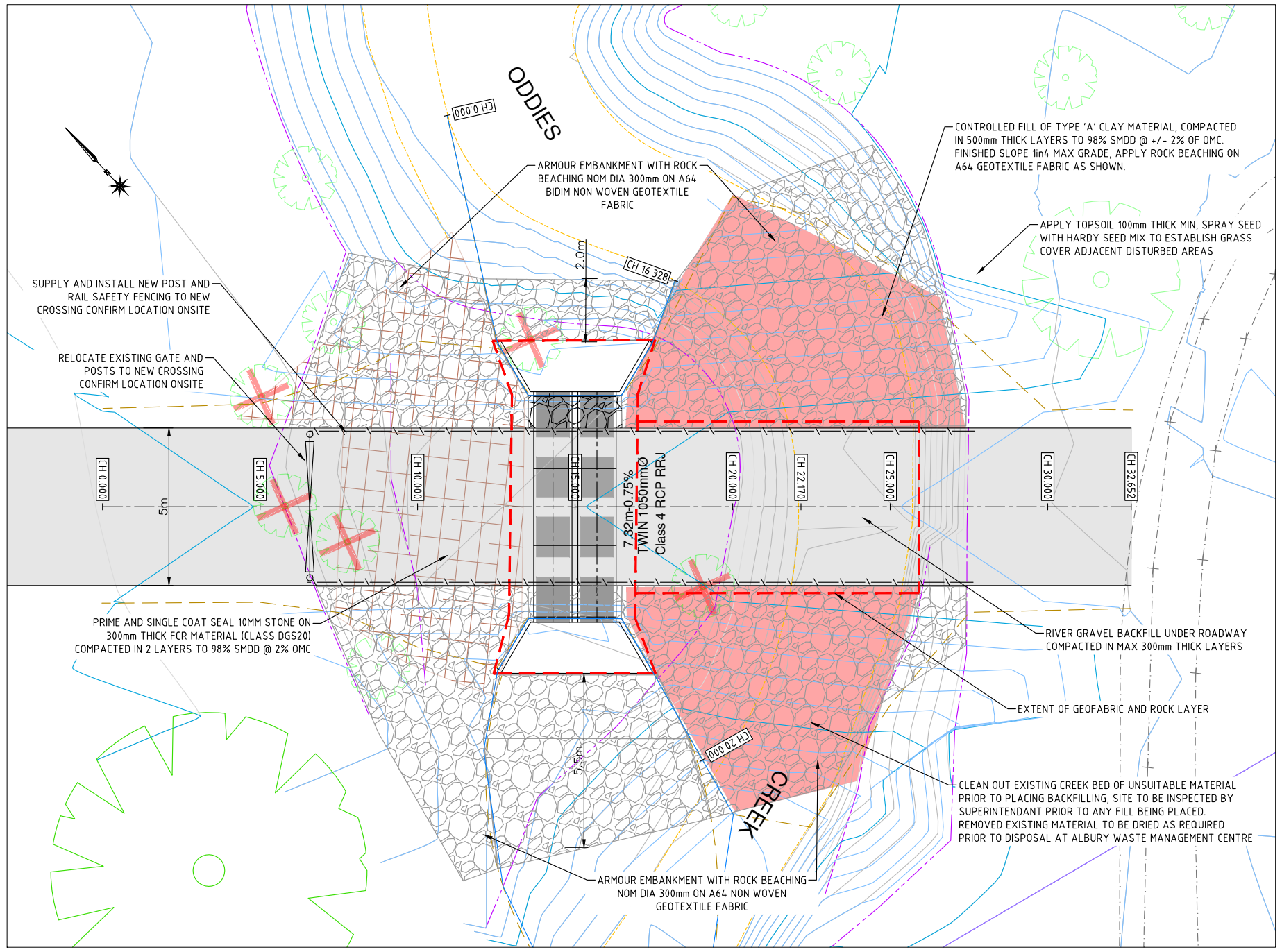


HEIGHT DIFFERENCE		0.000	0.494	0.500	0.539	0.464	0.427	0.000	
DESIGN		150.289	150.854	150.869	150.944	150.869	150.854	150.494	
EXISTING	149.990	150.289	150.360	150.369	150.404	150.404	150.426	150.494	150.652
OFFSET	-7.76	-5.26	-3.00	-2.50	0.00	2.50	3.00	4.44	6.94

Ch 10.00 m

ACCESS TRACK CROSS SECTIONS

HORIZONTAL 1:50 VERTICAL 1:50



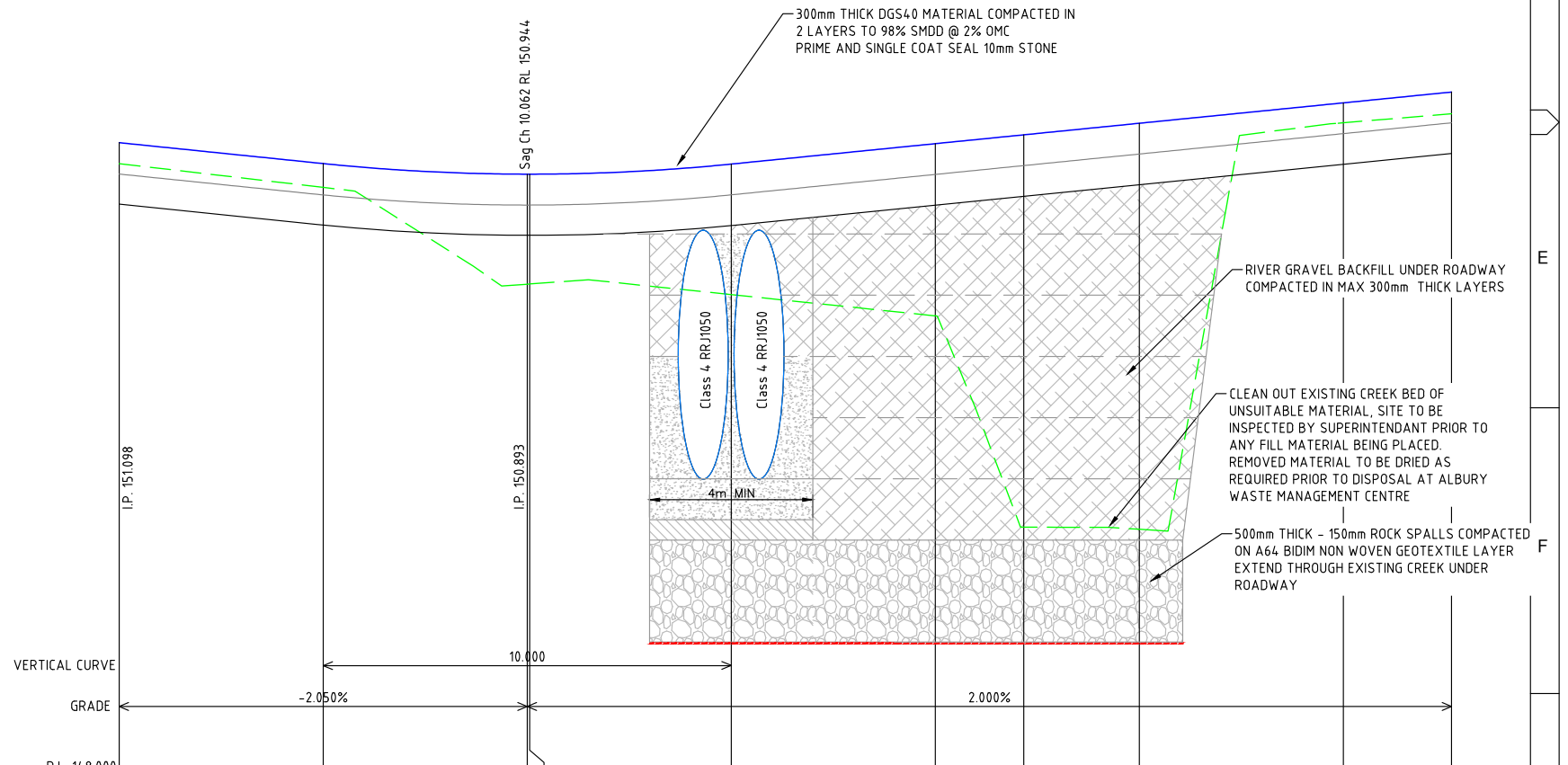
PLAN OF PROPOSED MAINTENANCE VEHICLE ACCESS TRACK AND PIPE

Scale 1:100 @ A1

DESIGN CONTOURS INTERVAL - 0.20M

VER 1: 20 0.5 0 0.5 1.0 1.5

HOR 1:100 4 3 2 1 0 1 2 3 4 5 6 7 8



VERTICAL CURVE			10.000							
GRADE	-2.050%				2.000%					
R.L. 148.000										
Centreline Cut/Fill	0.103	0.116	0.540	0.539	0.640	0.843	1.923	1.990	0.098	0.106
DESIGN SURFACE	151.098	150.995	150.944	150.944	150.993	151.093	151.136	151.193	151.293	151.346
EXISTING SURFACE	151.00	150.88	150.40	150.41	150.35	150.25	149.21	149.20	151.20	151.24
CHAINAGE	0.000	5.000	10.000	10.062	15.000	20.000	22.170	25.000	30.000	32.652

LONGITUDINAL SECTION OF ACCESS TRACK

HORIZONTAL 1:100 VERTICAL 1:20

ISSUED FOR TENDER

AlburyCity

LEGEND			
TOP OF BANK	EXISTING DRAINAGE	EXISTING TREES	EXISTING JUNCTION PIT
BANK BOTTOM	PROPOSED DRAINAGE	TREES TO REMOVE	EXISTING SAG PIT
EXISTING KERB	PROPOSED KERB & GUTTER	NEW TREES TO PLANT	EXISTING SIDE ENTRY PIT
CONCRETE EDGE	PROP LEVEE ALIGNMENT	LIGHT POLE	EXISTING GRATED PIT
BITUMEN - EDGE	CONCRETE EDGE	LIGHT TO REMOVE	PROPOSED DGGP
EDGE OF PATH	EXISTING WATER MAIN	HYDRANT/SV	PROPOSED JUNCTION PIT
FENCE	PROP IRRIGATION COND	BP MONITORING WELL - REMAIN	REMOVE
	PROPOSED WATER MAIN		

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1:100
SHEET	A1

DESIGNED	K. HASAN
DRAWN	A. RODGERS
CHECKED	A. RODGERS
APPROVED	J McLINDEN

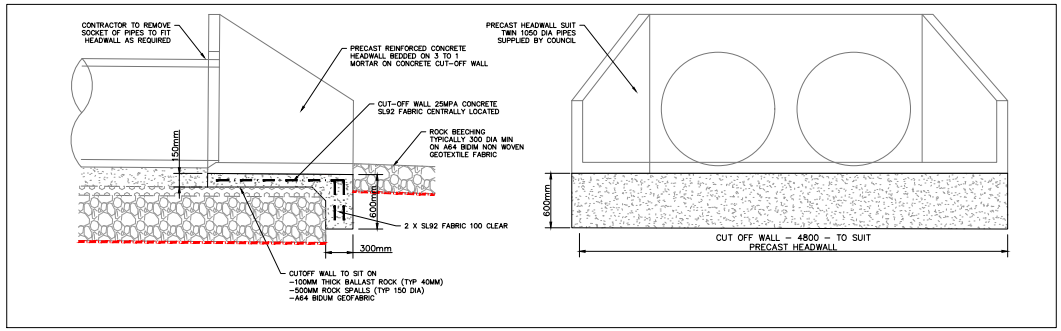
APPROVED ..../........./.........
TEAM LEADER - DESIGN
APPROVED ..../........./.........
GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK

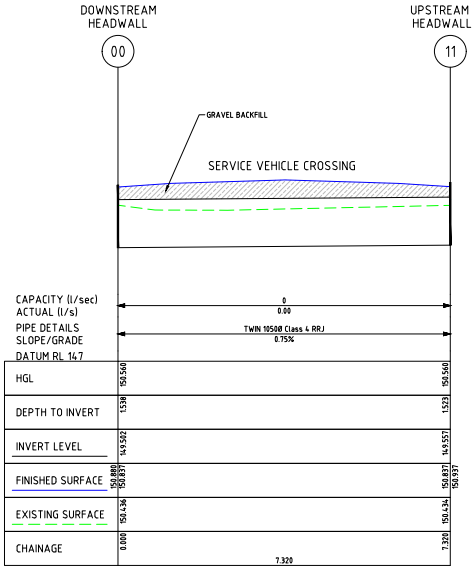
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
ACCESS TRACK CROSSING OF ODDIES CREEK

LEDGER No.	3764.5015	
REV. G	No. of Sheets 28	Sheet No. 20
DRAWING NUMBER	ENG21/357	



HEADWALL CUT-OFF WALL DETAIL

SCALE 1:25



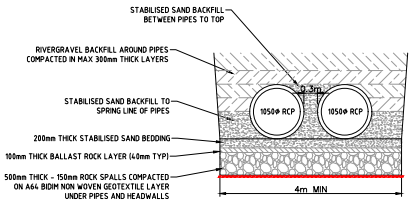
LONGITUDINAL SECTION OF TWIN PIPES

HORIZONTAL 1:50 VERTICAL 1:50

HOR 1:50 2 1.5 1 0.5 0 1 2 3 4

VERT 1:50 2 1.5 1 0.5 0 1 2 3 4

Pipe Schedule - Culvert								
		(mm)	(m)	(1 in X)	(%)	(m)	(m)	
00-11	Class 4 RRJ	1050	149.502	133.3	0.75	149.557	7.3	TWIN PIPES



PIPE BEDDING AND BACKFILL DETAIL

SCALE 1:50

ISSUED FOR TENDER

AlburyCity

REV	DATE	AMENDMENTS	INIT.
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE AS SHOWN
SHEET A1

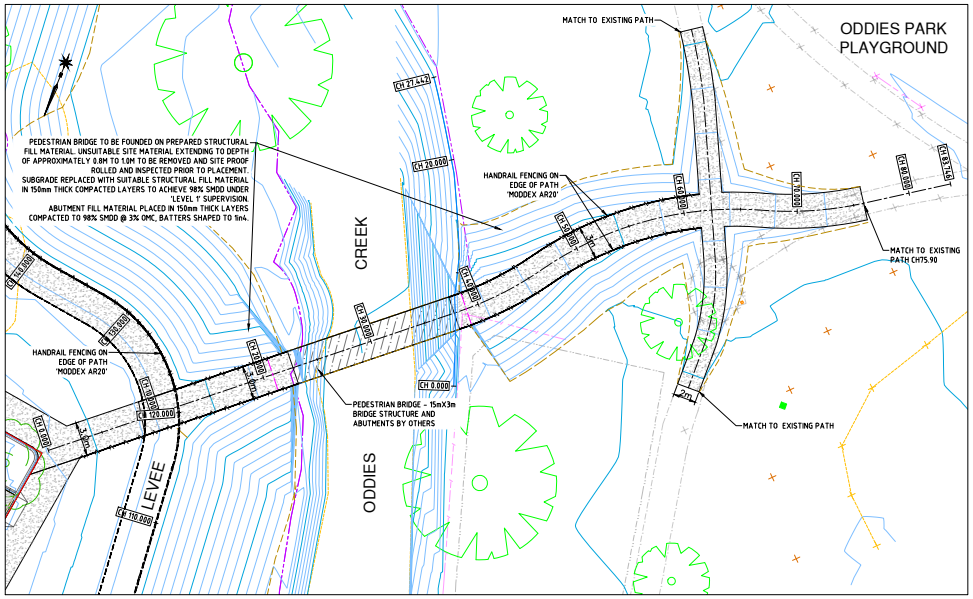
DESIGNED K. HASAN
DRAWN A. RODGERS
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
DRAINAGE LONGITUDINAL SECTION – ACCESS TRACK

LEDGER No. 3764.5015
REV. G
No. of Sheets 28
Sheet No. 21
DRAWING NUMBER ENG21/357

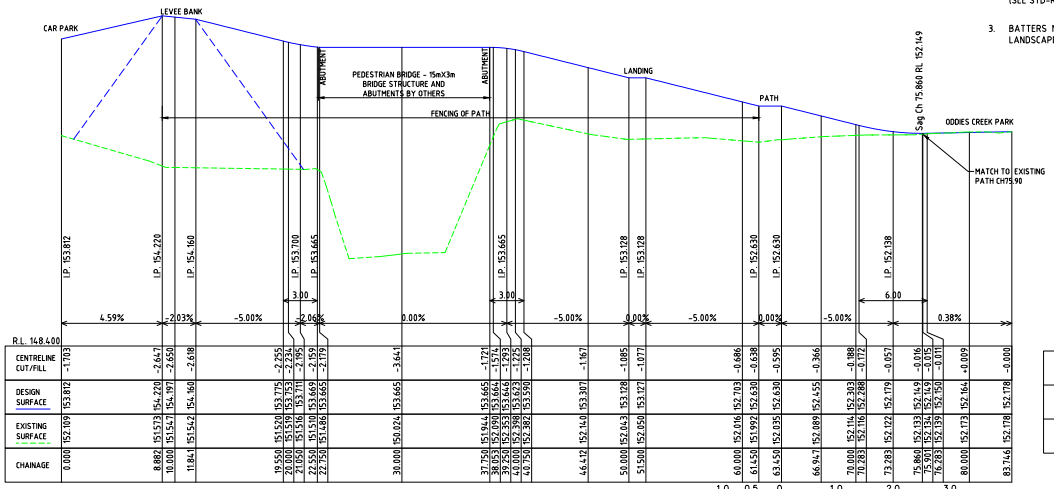


DESIGN CONTOURS INTERVAL - 0.20M

PLAN OF PEDESTRIAN BRIDGE

SCALE 1:200 @A1

H 1:200 5 0 5 10 15



R.L. 148.8.400																									
CENTRELINE CUT/FILL	-1.703	-2.647	-2.650	-2.698	-2.255	-2.234	-2.495	-2.659	-2.719	-3.641	-1.721	-1.574	-1.293	-1.225	-1.208	-1.187	-1.085	-1.077	-0.686	-0.638	-0.595	-0.366	-0.188	-0.172	-0.057	-0.016	-0.015	-0.013	+0.009	-0.000
DESIGN SURFACE	153.812	154.220	154.197	154.160	153.775	153.753	153.711	153.665	153.665	153.665	153.665	153.664	153.666	153.623	153.590	153.307	153.128	153.127	152.703	152.630	152.630	152.455	152.303	152.288	152.179	152.122	152.133	152.149	152.164	152.178
EXISTING SURFACE	152.109	151.573	151.547	151.542	151.520	151.519	151.516	151.580	151.666	152.024	151.944	152.090	152.366	152.398	152.382	152.140	152.043	152.050	152.016	151.992	152.035	152.089	152.114	152.116	152.122	152.139	152.139	152.150	152.173	152.178
CHAINAGE	0.000	8.882	10.000	11.841	19.550	20.000	21.050	22.550	22.750	30.000	37.750	38.050	39.250	40.000	40.750	46.417	50.000	51.500	69.000	61.450	63.450	66.941	70.000	70.283	73.283	75.860	76.283	76.283	80.000	83.746

LONGITUDINAL SECTION OF PEDESTRIAN BRIDGE

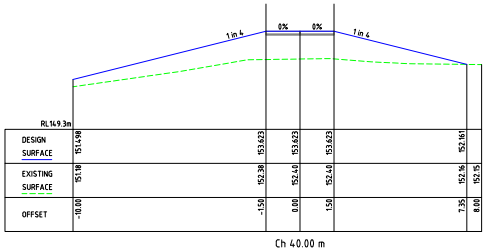
HORIZONTAL 1:200 VERTICAL 1:40

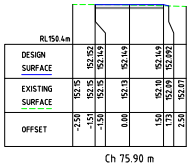
V 1:40 1.0 0.5 0 1.0 2.0 3.0

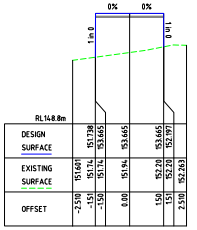
H 1:200 5 0 5 10 15

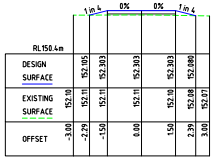
RAMP CONSTRUCTION:

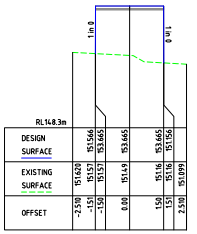
1. STRIP TOPSOIL AND STOCK PILE FOR REUSE, REMOVE UNSUITABLE NATURAL MATERIAL, PROOFROLL AND INSPECT. REPLACE WITH SUITABLE STRUCTURAL FILL IN 150mm LAYERS @ 98% SMDD UNDER LEVEL1 SUPERVISION. ABUTMENT FILL MATERIAL, PLACED AND COMPACTED IN 150mm THICK LAYERS TO 98% SMDD @ +/- 3% OF OMC, SHAPE TO 1in4 BATTERS.
2. CONCRETE PATH: 125mm THICK 25 MPa CONCRETE TO BE POURED ON 50mm THICK APPROVED SAND BEDDING, WITH SL72 MESH PLACED CENTRALLY (SEE STD-R-21 FOR DETAILS)
3. BATTERS MAX 1 in 4 TO BE TOP SOILED AND LANDSCAPED - REFER LANDSCAPING PLAN

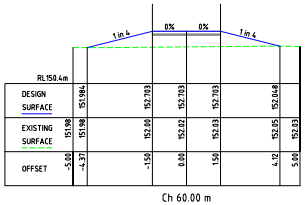


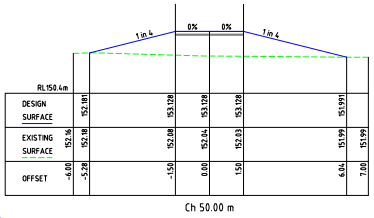


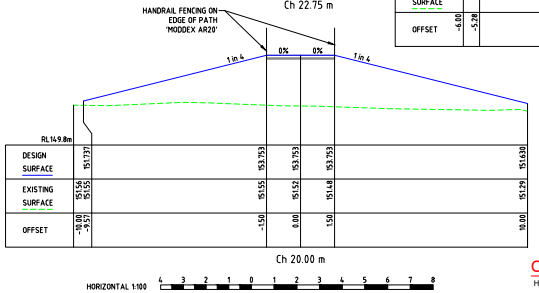












HORIZONTAL 1:100 4 3 2 1 0 1 2 3 4 5 6 7 8

VERTICAL 1:100 4 3 2 1 0 1 2 3 4 5 6 7 8

CROSS SECTIONS

HORIZONTAL 1:100 VERTICAL 1:100

ALL WORKS TO CONFORM TO AS1428.1 SEC 7

ISSUED FOR TENDER

LEGEND					
TOP OF BANK	EXISTING DRAINAGE	EXISTING TREES	EXISTING JUNCTION PIT		
BANK BOTTOM	PROPOSED DRAINAGE	TREES TO REMOVE	EXISTING SAG PIT		
EXISTING KERB	PROPOSED KERB & GUTTER	NEW TREES TO PLANT	EXISTING SIDE ENTRY PIT		
CONCRETE EDGE	PROP LEVEE ALIGNMENT	LIGHT POLE	EXISTING GRATED PIT		
BITUMEN - EDGE	CONCRETE EDGE	LIGHT TO REMOVE	PROPOSED DGGP		
EDGE OF PATH	EXISTING WATER MAIN	HYDRANT/SV	PROPOSED JUNCTION PIT		
FENCE	PROP IRRIGATION COND	BP MONITORING WELL - REMAIN	REMOVE		
	PROPOSED WATER MAIN				

REV	DATE	AMENDMENTS	INIT.
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E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1:200
SHEET	A1

DESIGNED	K. HASAN
DRAWN	K. HASAN
CHECKED	A. RODGERS
APPROVED	J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION

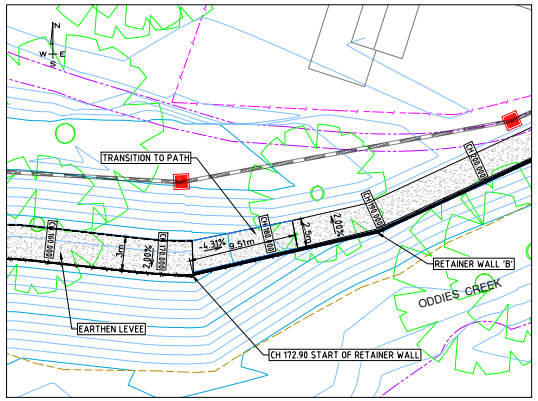
CORNER OF EBDEN ST AND WODONGA PL

PEDESTRIAN BRIDGE PLAN AND SECTIONS

LEDGER No.	
3764.5015	
REV.	No. of Sheets	Sheet No.
G	28	22

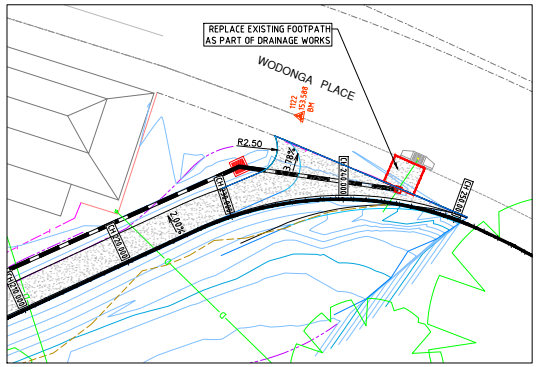
DRAWING NUMBER

ENG21/357



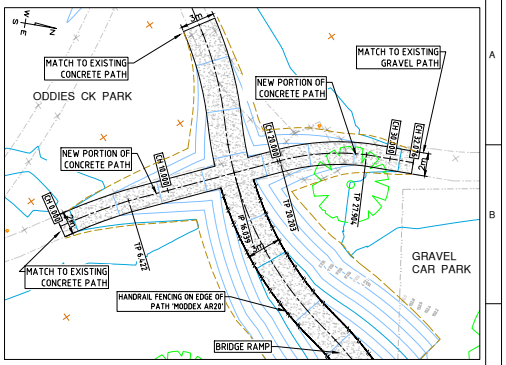
PLAN OF PATH BEHIND LEVEE B

Scale 1:200 @ A1



PLAN OF PATH WODONGA PL

Scale 1:200 @ A1



PLAN OF ODDIES CREEK PATH RECONSTRUCTION

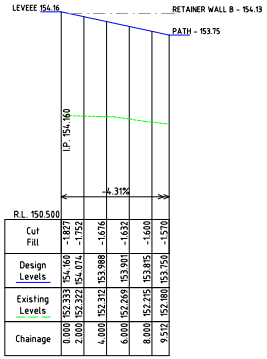
DESIGN CONTOURS INTERVAL - 0.20M

Scale 1:200 @ A1

H 1:200 5 0 5 10 15

V 1:40 1.0 0.5 0 1.0 2.0 3.0

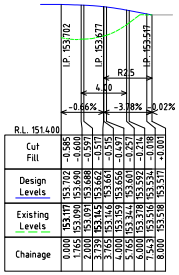
H 1:200 5 0 5 10 15



R.L. 150.500									
Cut Fill	-1.827	-1.752	-1.676	-1.632	-1.600	-1.570			
Design Levels	154.461	154.074	153.988	153.901	153.875	153.750			
Existing Levels	152.333	152.322	152.312	152.269	152.275	152.180			
Chainage	0.000	2.000	4.000	6.000	8.000	9.570			

LONG SECTION OF GRADE PATH - LEVEE-RETAINER 'B'

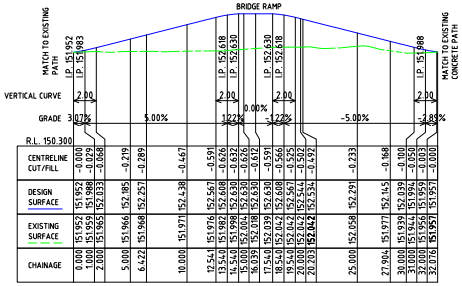
HORIZONTAL 1:200 VERTICAL 1:40



R.L. 151.400									
Cut Fill	-0.586	-0.600	-0.597	-0.577	-0.515	-0.497	-0.427	-0.278	-0.198
Design Levels	153.702	153.690	153.688	153.677	153.661	153.656	153.601	153.522	153.519
Existing Levels	153.117	153.090	153.090	153.080	153.146	153.159	153.344	153.244	153.321
Chainage	0.000	1.965	2.000	3.765	4.000	5.765	6.000	7.643	8.000

LONG SECTION OF TRANSITION TO PATH - WODONGA PL

HORIZONTAL 1:200 VERTICAL 1:40

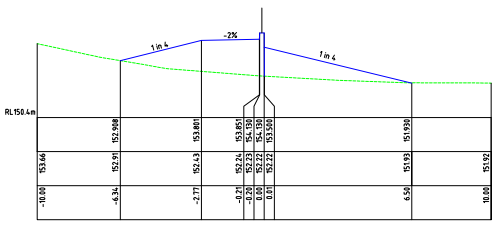


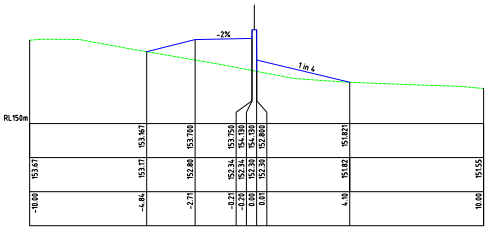
R.L. 150.300																															
CENTRELINE CUT/FILL	0.000	-0.029	-0.068	-0.219	-0.289	-0.467	-0.591	-0.626	-0.632	-0.626	-0.566	-0.525	-0.492	-0.233	-0.188	-0.100	-0.053	-0.000													
DESIGN SURFACE	151.952	151.983	152.033	152.985	152.257	152.438	152.567	152.608	152.630	152.630	152.608	152.567	152.542	152.291	151.977	151.939	151.944	151.951													
EXISTING SURFACE	151.952	151.983	152.033	151.966	151.968	151.971	151.976	151.982	151.998	152.004	152.042	152.042	152.042	152.058	151.977	151.939	151.944	151.951													
CHAINAGE	0.000	1.000	2.000	5.000	6.422	10.000	12.541	13.541	14.541	15.000	17.541	18.541	19.541	20.000	25.000	27.904	30.000	31.000	32.076												

LONGITUDINAL SECTION OF ODDIES CREEK PATH

HORIZONTAL 1:200 VERTICAL 1:40

ALL WORKS TO CONFORM TO AS1428.1 SEC 7



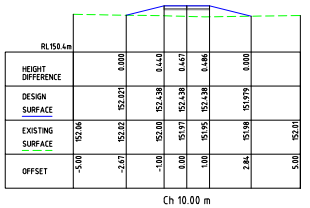


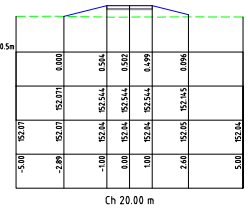
CROSS SECTIONS OF TRANSITION TO PATH

HORIZONTAL 1:100 VERTICAL 1:100

HORIZONTAL 1:100 4 3 2 1 0 1 2 3 4 5 6 7 8

VERTICAL 1:100 4 3 2 1 0 1 2 3 4 5 6 7 8





CROSS SECTIONS OF ODDIES CREEK PATH

HORIZONTAL 1:100 VERTICAL 1:100

ISSUED FOR TENDER

AlburyCity

LEGEND

TOP OF BANK
BANK BOTTOM
EXISTING KERB
CONCRETE EDGE
BITUMEN - EDGE
EDGE OF PATH
FENCE
EXISTING DRAINAGE
PROPOSED DRAINAGE
PROPOSED KERB & GUTTER
PROP LEVEE ALIGNMENT
CONCRETE EDGE
EXISTING WATER MAIN
PROP IRRIGATION COND
PROPOSED WATER MAIN
EXISTING TREES
TREES TO REMOVE
NEW TREES TO PLANT
LIGHT POLE
LIGHT TO REMOVE
HYDRANT/SV
BP MONITORING WELL - REMAIN
REMOVE
EXISTING JUNCTION PIT
EXISTING SAG PIT
EXISTING SIDE ENTRY PIT
EXISTING GRATED PIT
PROPOSED DGGP
PROPOSED JUNCTION PIT

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE 1:200
SHEET A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J. McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
SHARED PATH – RAMPS

LEDGER No. 3764.5015

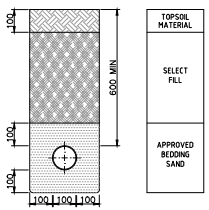
REV.	No. of Sheets	Sheet No.
G	28	23

DRAWING NUMBER ENG21/357

VERTICAL CLEARANCES FOR WATER MAIN CONSTRUCTION

WATERMAIN DESIGN AND CONSTRUCT ALL WATERMAIN WORKS TO COMPLY WITH ALBURY CITY COUNCIL STANDARD SPECIFICATIONS AND DRAWINGS

EXISTING OR PROPOSED SERVICE	MINIMUM VERTICAL CLEARANCE (mm)
WATER MAINS ≤DN375	150
WATER MAINS >DN375	300
GAS MAINS	150
TELECOMMUNICATIONS & CABLES	150
ELECTRICITY CONDUITS & CABLES	225
STORMWATER DRAINS & PITS	150
SEWERS - GRAVITY	500
SEWERS - PRESSURE & VACUUM	300



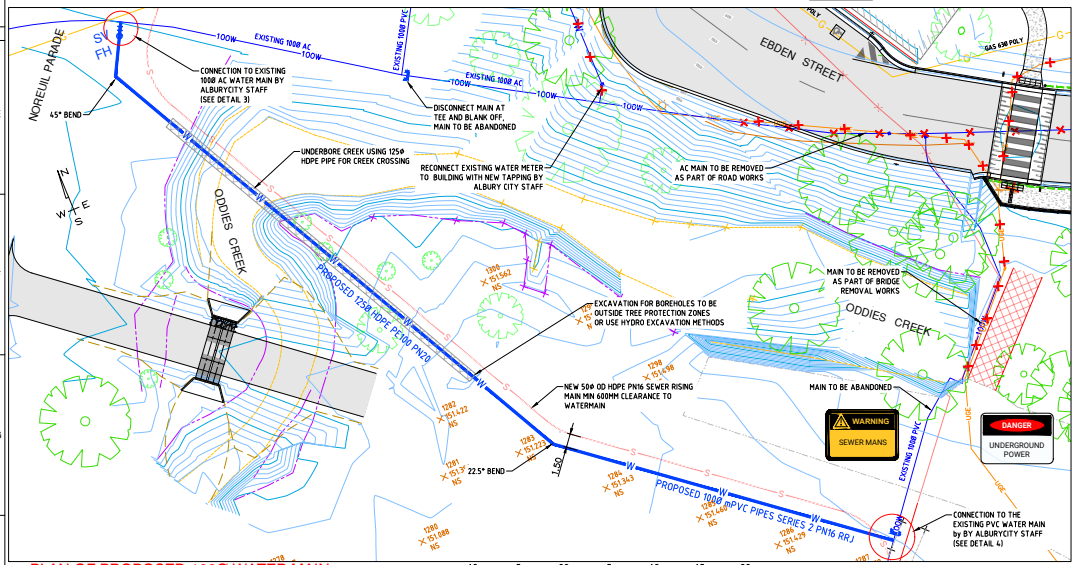
STANDARD TRENCH DETAILS
WATERMAIN - STD-S-90
NATURE STRIPS, LAWNS, ROAD RESERVE, CLEAR OF PAVEMENT

DIAL BEFORE YOU DIG www.1100.com.au

PLAN OF PROPOSED 100Ø WATER MAIN

SCALE 1:250 10 5 00 5 10 15 20 Scale 1:250 @ A1

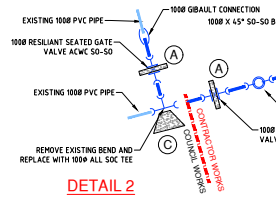
DESIGN CONTOURS INTERVAL - 0.20M



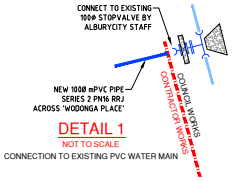
PLAN OF PROPOSED 100Ø WATER MAIN

Scale 1:250 @ A1 SCALE 1:250 10 5 00 5 10 15 20

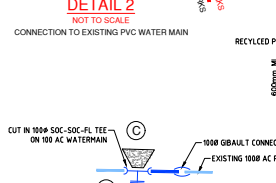
DESIGN CONTOURS INTERVAL - 0.20M



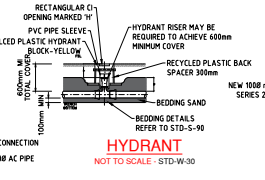
DETAIL 2
NOT TO SCALE
CONNECTION TO EXISTING PVC WATER MAIN



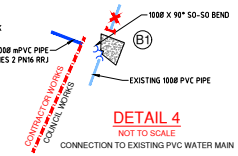
DETAIL 1
NOT TO SCALE
CONNECTION TO EXISTING PVC WATER MAIN



DETAIL 3
NOT TO SCALE
CONNECTION TO EXISTING AC WATER MAIN



HYDRANT
NOT TO SCALE - STD-W-30



DETAIL 4
NOT TO SCALE
CONNECTION TO EXISTING PVC WATER MAIN

THRUST RESTRAINT SCHEDULE

LOCATION	TYPE	THRUST	AHBP (kPa) USED	Area (m²), or W(m) x Y (m)	NO. LOCATIONS
A	GATE VALVE	DN100	50	1.30	3
B1	BEND	DN100x90 BEND	50	1.50	1
B2	BEND	DN100x45 BEND	50	0.90	2
B3	BEND	DN100x22.5 BEND	50	0.45	3
C	TEE	DN100 TEE	50	1.20	2
D	HYDRANT	DN80	50	N	4

'AHBP' - ALLOWABLE HORIZONTAL BEARING PRESSURE
'N' - NOMINAL THRUST AREA - TO BE ACHIEVED BY POURING CONCRETE FULL LENGTH OF FITTING AND EXTENDING FROM FLOOR OF TRENCH TO 100mm ABOVE FITTING.

REFER WSA03 2011 PART1.3.1, SECTION 7, TABLE 7.3
REFER ACC STANDARD DRAWING STD-W-20

ISSUED FOR TENDER

AlburyCity

LEGEND

TOP OF BANK	EXISTING DRAINAGE	EXISTING TREES	EXISTING JUNCTION PIT
BANK BOTTOM	PROPOSED DRAINAGE	TREES TO REMOVE	EXISTING SAG PIT
EXISTING KERB	PROPOSED KERB & GUTTER	NEW TREES TO PLANT	EXISTING SIDE ENTRY PIT
CONCRETE EDGE	PROP LEVEE ALIGNMENT	LIGHT POLE	EXISTING GRATED PIT
BITUMEN - EDGE	CONCRETE EDGE	LIGHT TO REMOVE	PROPOSED DGGP
EDGE OF PATH	EXISTING WATER MAIN	HYDRANT/SV	PROPOSED JUNCTION PIT
FENCE	PROP IRRIGATION COND	BP MONITORING WELL - REMAIN	REMOVE
	PROPOSED WATER MAIN		

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1:250
SHEET	A1

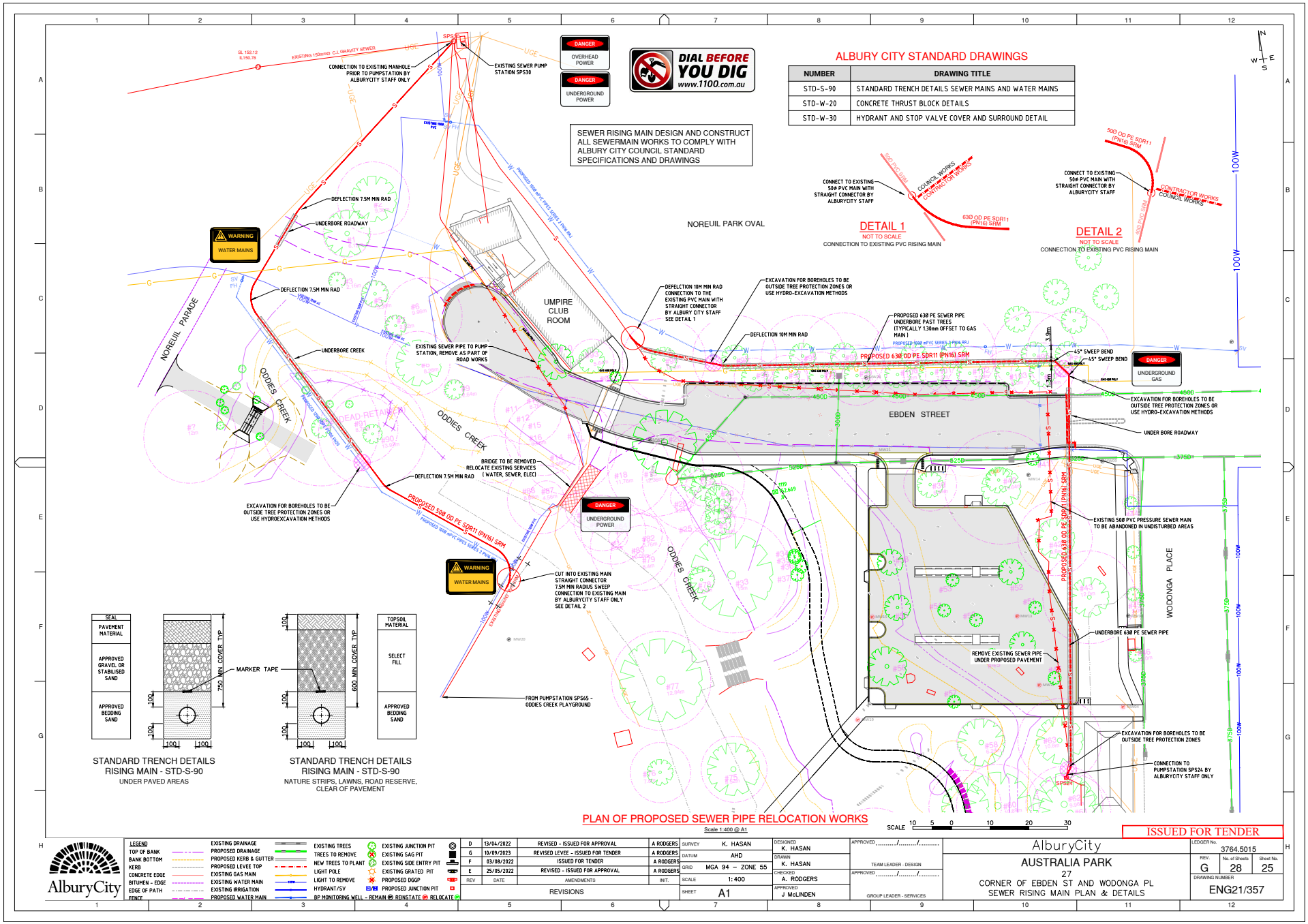
DESIGNED	K. HASAN
DRAWN	K. HASAN
CHECKED	A. RODGERS
APPROVED	J McLINDEN

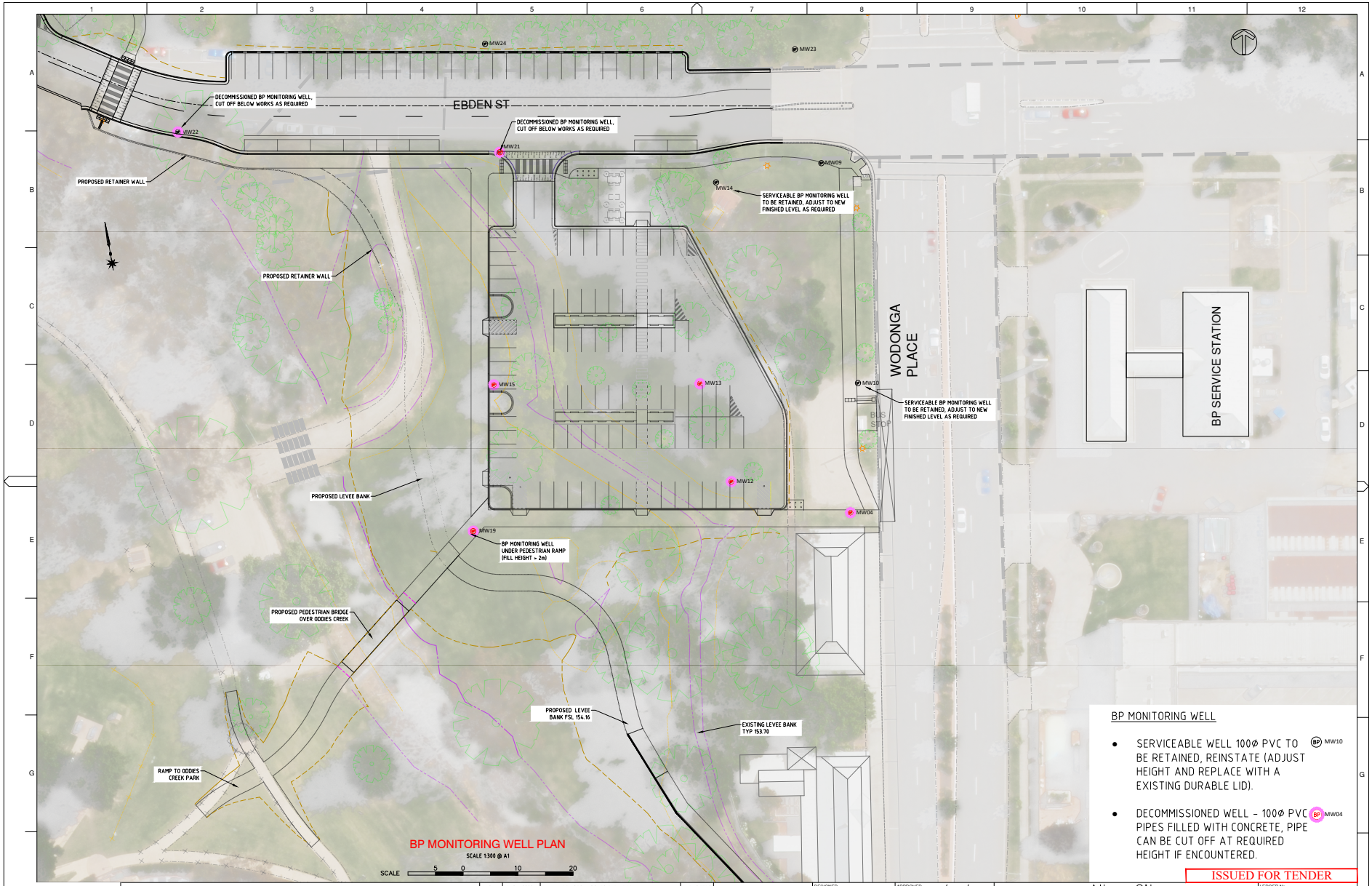
APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
WATER MAIN RELOCATION

LEDGER No. 3764.5015
REV. G | No. of Sheets 28 | Sheet No. 24
DRAWING NUMBER ENG21/357


ALBURY CITY STANDARD DRAWINGS
NUMBER | DRAWING TITLE
STD-S-90 | STANDARD TRENCH DETAILS SEWER MAINS AND WATER MAINS
STD-W-20 | CONCRETE THRUST BLOCK DETAILS
STD-W-30 | HYDRANT AND STOP VALVE COVER AND SURROUND DETAIL
SEWER RISING MAIN DESIGN AND CONSTRUCT ALL SEWERMAIN WORKS TO COMPLY WITH ALBURY CITY COUNCIL STANDARD SPECIFICATIONS AND DRAWINGS
DIAL BEFORE YOU DIG www.1100.com.au
DANGER OVERHEAD POWER
DANGER UNDERGROUND POWER
WARNING WATER MAINS
NOREUIL PARADE
NOREUIL PARK OVAL
UMPIRE CLUB ROOM
EBDEN STREET
WODONGA PLACE
ODDIES CREEK
EXISTING SEWER PUMP STATION SPS30
CONNECTION TO EXISTING MANHOLE PRIOR TO PUMPSTATION BY ALBURYCITY STAFF ONLY
DEFLECTION 7.5M MIN RAD
UNDERBORE ROADWAY
UNDERBORE CREEK
EXISTING SEWER PIPE TO PUMP STATION, REMOVE AS PART OF ROAD WORKS
DEFLECTION 10M MIN RAD
CONNECTION TO THE EXISTING PVC MAIN WITH STRAIGHT CONNECTOR BY ALBURY CITY STAFF SEE DETAIL 1
EXCAVATION FOR BOREHOLES TO BE OUTSIDE TREE PROTECTION ZONES OR USE HYDRO-EXCAVATION METHODS
PROPOSED 630 PE SEWER PIPE UNDERBORE PAST TREES (TYPICALLY 130mm OFFSET TO GAS MAIN)
PROPOSED 630 OD PE SDR11 (PN16) SRM
45° SWEEP BEND
UNDERGROUND GAS
UNDER BORE ROADWAY
BRIDGE TO BE REMOVED-RELOCATE EXISTING SERVICES (WATER, SEWER, ELEC)
EXCAVATION FOR BOREHOLES TO BE OUTSIDE TREE PROTECTION ZONES OR USE HYDROEXCAVATION METHODS
PROPOSED 500 OD PE SDR11 (PN16) SRM
CUT INTO EXISTING MAIN STRAIGHT CONNECTOR 7.5M MIN RADIUS SWEEP CONNECTION TO EXISTING MAIN BY ALBURYCITY STAFF ONLY SEE DETAL 2
FROM PUMPSTATION SPS65 - ODDIES CREEK PLAYGROUND
EXISTING 500 PVC PRESSURE SEWER MAIN TO BE ABANDONED IN UNDISTURBED AREAS
PROPOSED 630 OD PE SDR11 (PN16) SRM
UNDERBORE 630 PE SEWER PIPE
REMOVE EXISTING SEWER PIPE UNDER PROPOSED PAVEMENT
EXCAVATION FOR BOREHOLES TO BE OUTSIDE TREE PROTECTION ZONES
CONNECTION TO PUMPSTATION SPS24 BY ALBURYCITY STAFF ONLY
DETAIL 1
NOT TO SCALE
CONNECTION TO EXISTING PVC RISING MAIN
CONNECT TO EXISTING 500 PVC MAIN WITH STRAIGHT CONNECTOR BY ALBURYCITY STAFF
COUNCIL WORKS
CONTRACTOR WORKS
630 OD PE SDR11 (PN16) SRM
DETAIL 2
NOT TO SCALE
CONNECTION TO EXISTING PVC RISING MAIN
CONNECT TO EXISTING 500 PVC MAIN WITH STRAIGHT CONNECTOR BY ALBURYCITY STAFF
500 OD PE SDR11 (PN16) SRM
CONTRACTOR WORKS
COUNCIL WORKS
SEAL
PAVEMENT MATERIAL
APPROVED GRAVEL OR STABILISED SAND
APPROVED BEDDING SAND
750 MIN COVER TYP
MARKER TAPE
STANDARD TRENCH DETAILS RISING MAIN - STD-S-90
UNDER PAVED AREAS
TOPSOIL MATERIAL
SELECT FILL
APPROVED BEDDING SAND
600 MIN COVER TYP
STANDARD TRENCH DETAILS RISING MAIN - STD-S-90
NATURE STRIPS, LAWNS, ROAD RESERVE, CLEAR OF PAVEMENT
PLAN OF PROPOSED SEWER PIPE RELOCATION WORKS
Scale 1:400 @ A1
SCALE 10 5 0 10 20 30
ISSUED FOR TENDER
LEGEND
TOP OF BANK
BANK BOTTOM
KERB
CONCRETE EDGE
BITUMEN - EDGE
EDGE OF PATH
FENCE
EXISTING DRAINAGE
PROPOSED DRAINAGE
PROPOSED KERB & GUTTER
PROPOSED LEVEE TOP
EXISTING GAS MAIN
EXISTING WATER MAIN
EXISTING IRRIGATION
PROPOSED WATER MAIN
EXISTING TREES
TREES TO REMOVE
NEW TREES TO PLANT
LIGHT POLE
LIGHT TO REMOVE
HYDRANT/SV
BP MONITORING WELL - REMAIN REINSTATE RELOCATE
EXISTING JUNCTION PIT
EXISTING SAG PIT
EXISTING SIDE ENTRY PIT
EXISTING GRATED PIT
PROPOSED DGGP
PROPOSED JUNCTION PIT
D | 13/04/2022 | REVISED - ISSUED FOR APPROVAL | A RODGERS
G | 10/09/2023 | REVISED LEVEE - ISSUED FOR TENDER | A RODGERS
F | 03/08/2022 | ISSUED FOR TENDER | A RODGERS
E | 25/05/2022 | REVISED - ISSUED FOR APPROVAL | A RODGERS
REV | DATE | AMENDMENTS | INIT.
REVISIONS
SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE 1:400
SHEET A1
DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN
APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES
AlburyCity
AUSTRALIA PARK
27
CORNER OF EBDEN ST AND WODONGA PL
SEWER RISING MAIN PLAN & DETAILS
LEDGER No. 3764.5015
REV. G
No. of Sheets 28
Sheet No. 25
DRAWING NUMBER ENG21/357



AlburyCity

LEGEND
KERB EXISTING
KERB PROPOSED
TOP OF BANK
BOTTOM OF BANK
BATTER
CONCRETE PATH
EXISTING TREE
EXISTING LIGHT POLE
CONTOUR MAJOR 0.50m
CONTOUR MINOR 0.10m

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE 1:300
SHEET A1

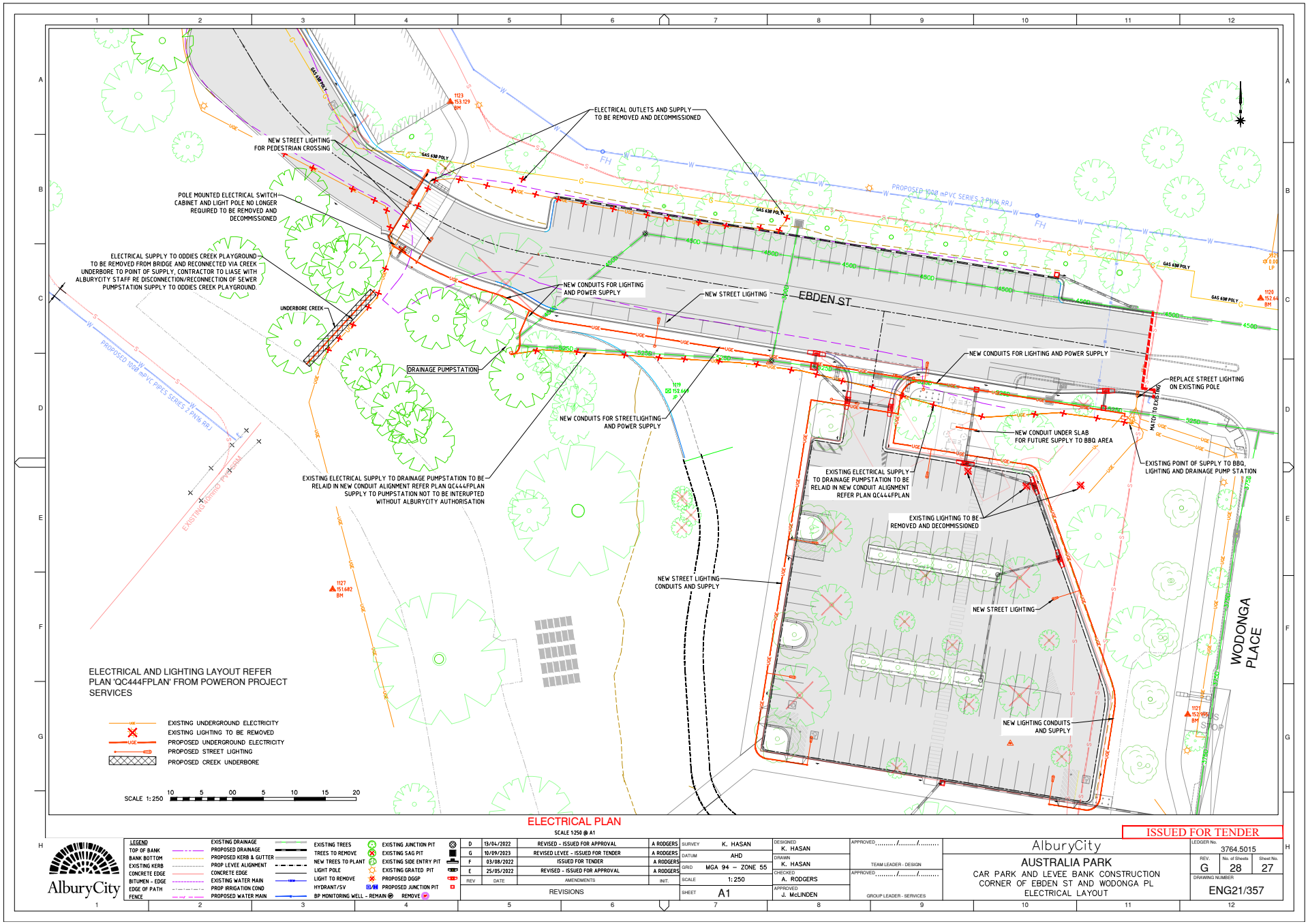
DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J. McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
BP MONITORING WELL LOCATIONS

LEDGER No. 3764.5015
REV. G | No. of Sheets 28 | Sheet No. 26
DRAWING NUMBER ENG21/357



ELECTRICAL PLAN

SCALE 1:250 @ A1

ISSUED FOR TENDER

AlburyCity

LEGEND					
TOP OF BANK	EXISTING DRAINAGE	EXISTING TREES	EXISTING JUNCTION PIT		
BANK BOTTOM	PROPOSED DRAINAGE	TREES TO REMOVE	EXISTING SAG PIT		
EXISTING KERB	PROPOSED KERB & GUTTER	NEW TREES TO PLANT	EXISTING SIDE ENTRY PIT		
CONCRETE EDGE	PROP LEVEE ALIGNMENT	LIGHT POLE	EXISTING GRATED PIT		
BITUMEN - EDGE	CONCRETE EDGE	LIGHT TO REMOVE	PROPOSED DGGP		
EDGE OF PATH	EXISTING WATER MAIN	HYDRANT/SV	PROPOSED JUNCTION PIT		
FENCE	PROP IRRIGATION COND	BP MONITORING WELL - REMAIN	REMOVE		
	PROPOSED WATER MAIN				

REV	DATE	AMENDMENTS	INIT.
D	13/04/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1:250
SHEET	A1

DESIGNED	K. HASAN
DRAWN	K. HASAN
CHECKED	A. RODGERS
APPROVED	J. McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

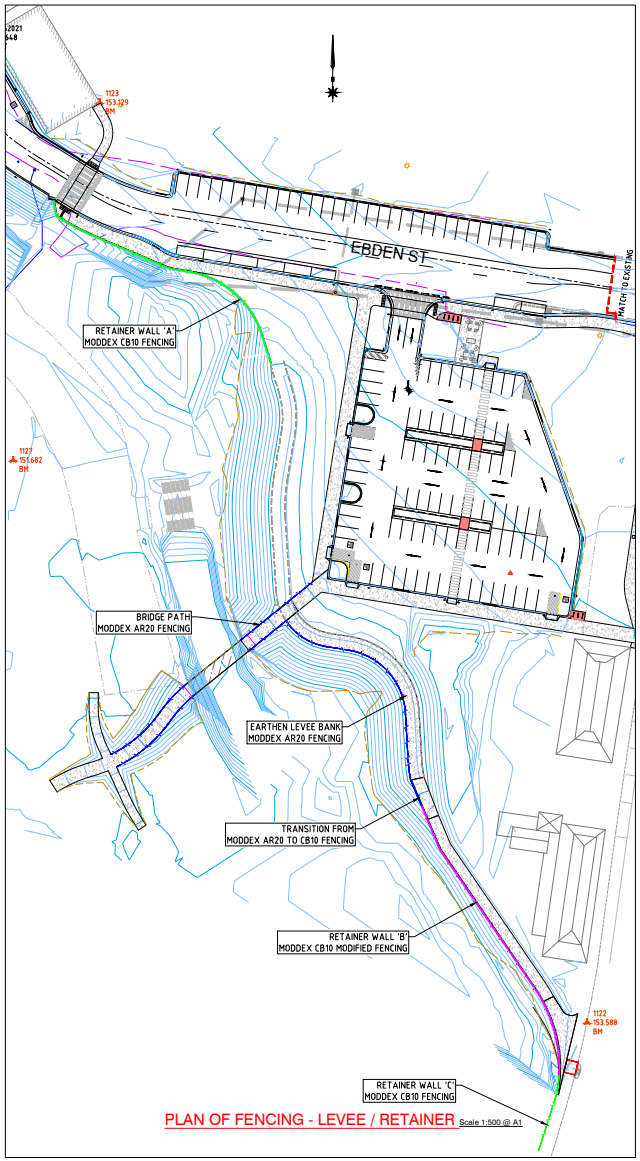
AUSTRALIA PARK

CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
ELECTRICAL LAYOUT

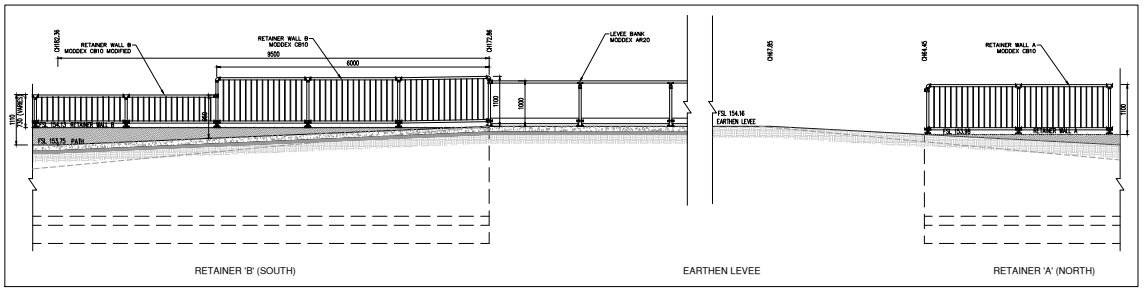
LEDGER No.		
3764.5015		
REV.	No. of Sheets	Sheet No.
G	28	27

DRAWING NUMBER

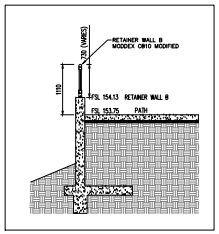
ENG21/357



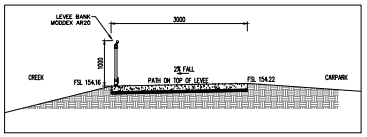
PLAN OF FENCING - LEVEE / RETAINER Scale 1:500 @ A1



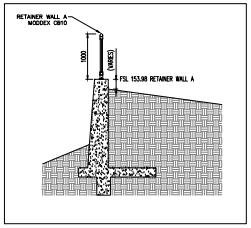
DETAIL OF FENCING - LEVEE / RETAINER
(VIEWED FROM NORTH EAST SIDE)
Scale 1:50 @ A1



FENCING - RETAINER 'B' Scale 1:50 @ A1



FENCING - PATH ON LEVEE Scale 1:50 @ A1



FENCING - RETAINER 'A' Scale 1:50 @ A1

ISSUED FOR TENDER

REV	DATE	AMENDMENTS	INIT.
G	10/09/2023	REVISED LEVEE - ISSUED FOR TENDER	A RODGERS
F	03/08/2022	ISSUED FOR TENDER	A RODGERS
E	25/05/2022	REVISED - ISSUED FOR APPROVAL	A RODGERS

REVISIONS

SURVEY K. HASAN
DATUM AHD
GRID MGA 94 – ZONE 55
SCALE 1: 200
SHEET A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED J McLINDEN

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
FENCING PLAN

LEDGER No. 3764.5015
REV. G | No. of Sheets 28 | Sheet No. 28
DRAWING NUMBER ENG21/357

SOUTH ALBURY LEVEE UPGRADE

AUSTRALIA PARK LEVEE
EBDEN ST to WODONGA PL

SHEET INDEX

1. COVER SHEET
2. CONSTRUCTION NOTES
3. TYPICAL SECTION
4. NORTH PLAN VIEW
5. SOUTH PLAN VIEW
6. TURKS HEAD PLAN VIEW
7. LEVEE TRANSITION DETAILS
8. LONG SECTION
9. CROSS SECTIONS
10. CROSS SECTIONS
11. CROSS SECTIONS
12. CROSS SECTIONS
13. EBDEN ST RETAINING WALL
14. EBDEN ST FOOTING
15. WODONGA PLACE FOOTING
16. EBDEN ST PUMP TYPICAL SECTION
17. SUBSURFACE DRAINAGE



LOCALITY PLAN

10 0 20 40

SCALE OF METRES 1 : 1,000

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AlburyCity

SHEET No: 1

DRAWING No: 6293

CLIENT: ALBURY CITY COUNCIL

GENERAL NOTES:

G1. THE CONTRACTOR IS TO CONFIRM ALL DIMENSIONS AND LEVELS SHOWN ON THE PLAN PRIOR TO COMMENCEMENT.

G2. ALL WORKS TO COMPLY WITH RELEVENT OCCUPATIONAL HEALTH AND SAFETY GUIDELINES AND REGULATIONS. THE CONTRACTOR IS TO COMPLY WITH NSW WH & S REGULATIONS.

G3. THE CONTRACTOR SHALL IMPLEMENT A MANAGEMENT SYSTEM TO ACHIEVE COMPLIANCE WITH RELEVANT WORK STANDARDS AND DOCUMENT SUCH COMPLIANCE. THE CONTRACTORS MANAGEMENT SYSTEM WILL INCLUDE OH&S, ENVIRONMENT AND QUALITY.

G4. THE CONTRACTOR IS TO LOCATE AND DEPTH ALL UNDERGROUND SERVICES PRIOR TO CONSTRUCTION. SERVICES LEVELS AND LOCATIONS SHOWN ON THE DRAWINGS PROVIDED MAY NOT BE COMPLETE OR ACCURATE AND MUST BE CONFIRMED BY THE CONTRACTOR.

G5. ANY MODIFICATION OF EXISTING SERVICES MUST BE TO THE SATISFACTION OF THE RELEVANT SERVICE AUTHORITY AND AT THE CONTRACTORS EXPENSE.

G6. CONTRACTOR TO ENSURE THAT RELEVANT CLEARANCES, PERMITS AND APPROVALS ARE OBTAINED WHEN WORKING IN THE VICINITY OF EXISTING SERVICES.

G7. CONTRACTOR MUST ENSURE SURVEY PEGS, MARKERS AND CONTROL POINTS ARE NOT DISTURBED DURING CONSTRUCTION. REINSTATEMENT WILL BE AT THE CONTRACTORS EXPENSE.

G8. THE SITES IS TO BE CLEANED OF WORK MATERIALS AND RUBBISH PRIOR TO CONTRACTOR LEAVING SITE.

G9. ALL EXISTING TREES, SHRUBS AND GRASSES TO BE RETAINED MUST BE PROTECTED AT ALL TIMES DURING CONSTRUCTION.

G10. REMOVAL AND CLEARING OF PERMITTED VEGETATION TO BE IN ACCORDANCE WITH BIODIVERSITY ASSESSMENT REPORTS AND OR SPECIFIC ENVIRONMENTAL APPROVALS FOR THE PROJECT, .

G11. NO TREES SHALL BE REMOVED WITHOUT PRIOR WRITTEN APPROVAL FROM THE RELEVANT AUTHORITIES.

G12. CONTRACTOR TO ENSURE CORRECT COMPACTION EQUIPMENT IS USED FOR SPECIFIED COMPACTION .

G13. AREAS OF CUT SHALL BE TOPSOILED TO THE SATISFACTION OF THE COUNCIL AND OR AS NOMINATED IN THE LANDSCAPE DRAWINGS.

G14. NO WORKS TO OCCUR IN PRIVATE PROPERTY UNLESS APPROVAL IS GAINED IN WRITING FROM THE PROPERTY OWNER.

G15. SITE SETOUT TO BE OVERSEEN BY A REGISTERED SURVEYOR

EARTHWORKS GENERAL:

E1. EARTHWORKS TO BE IN ACCORDANCE WITH AS 3798-2007 - GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS.

E2. CLEARING SHALL TO THE MINIMUM EXTENT ALLOWED IN IN THE ENVIRONMENTAL APPROVALS.

E3. WHERE STRUCTURES, INCLUDING FENCES EXIST, CLEARING SHALL NOT DISTURB THE EXISTING STRUCTURE UNLESS THE WORK INCLUDES REMOVAL OR MODIFICATION TO THE STRUCTURE.

E4. ALL TREES, STUMPS, ROOTS AND BRUSH TO BE CLEARED SHALL BE GRUBBED TO A DEPTH OF 300mm BELOW SUBGRADE LEVEL OF THE LEVEE, RETAINING STRUCTURE OR PAVEMENT AREA.

E5. THE SUB-GRADE ZONE SHALL BE COMPLETED IN ACCORDANCE WITH THE IDM CLAUSE 12.7.14 "SUBGRADE". ANY HOLES LEFT FROM GRUBBING AND REMOVAL OF ROCKS, WHERE ROCK IS ENCOUNTERED, IN SOLID OR BOULDER FORM, IT SHALL BE EXCAVATED TO A MINIMUM DEPTH OF 300mm BELOW THE FINISHED SUBGRADE LEVEL AND THE DEPRESSION SO FORMED FILLED WITH APPROVED COMPACTED EXCAVATED MATERIAL.

E6. ALL TOPSOIL IN THOSE AREAS SUBJECT TO CUTTING AND FILLING SHALL BE REMOVED AND STOCKPILED ON SITES WITHIN THE CONTRACT AREA. TOPSOIL STOCKPILES ARE TO BE LOCATED CLEAR OF ANY PROPOSED CONSTRUCTION WORKS ON THE SITE.

E7. THE CONTRACTOR IS RESPONSIBLE FOR OFF SITE DISPOSAL OF EXCESS MATERIAL WHERE NOT REUSED AS FILL OR SHOWN TO BE PLACED IN STOCKPILES.

E8. UNLESS DETAILED IN THE DRAWINGS OR LANDSCAPING PLANS, TOP SOILING OF DISTURBED AREAS AS SHOWN ON DRAWINGS SHALL BE SPREAD TO A DEPTH OF 100mm.

E9. TESTING OF EARTHWORKS TO COMPLY WITH AS 1289 - METHODS OF TESTING SOILS FOR ENGINEERING PURPOSES.

E10. THE CONTRACTOR SHALL ENSURE MANAGEMENT OF EARTHWORKS ON SITE OCCURS TO ENSURE RECOVERY AND REUSE OF MATERIALS AND CONTAMINATION IS MINIMISED.

E11. HOLD POINT: PROOF ROLLING (OR TEST ROLLING) OF THE COMPLETED SUBGRADE SHALL BE UNDERTAKEN AS PER THE CLAUSE 12.7.14 OF THE IDM. AREAS SUBJECT TO EXCESSIVE MOVEMENT AS AGREED WITH THE ENGINEER (GENERALLY AS PER THE DEFINITIONS IN CLAUSE 12.7.15 OF THE IDM) SHALL BE REWORKED OR REPLACED AND RETESTED.

E12. VIBRATION CONTROL: COMPACTION OF FILL ADJACENT STRUCTURES TO BE IN ACCORDANCE WITH TABLE 4.3 OF AUSTROADS GUIDE TO PAVEMENT TECHNOLOGY PART 8.

EARTH LEVEE CONSTRUCTION

EL1. ALL SURROUNDING STREETS THAT ARE USED BY CONSTRUCTION EQUIPMENT MUST BE KEPT CLEAN AND TIDY AT ALL TIMES DURING CONSTRUCTION.

EL2. THE CONTRACTOR SHALL SUPPLY TEST RECORDS OF PROPOSED MATERIALS TO BE USED TO THE SUPERINTENDENT FOR APPROVAL PRIOR TO COMMENCEMENT.

BORROW PIT TESTING SHALL INCLUDE:

TEST	FREQUENCY FOR VOLUME SUPPLIED
- GRADING	1 / 500m3
- EMERSON CLASS	1 / 500m3
- ATTERBERG LIMITS	1 / 500m3
- PERMEABILITY	1 / 2000 m3
- SHRINK SWELL INDEX	1 / 2000 m3

EL3. CORE TRENCH TO BE EXCAVATED TO DESIGN LEVELS AND FREE OF ANY UNSUITABLE MATERIAL. BASE OF CORE TRENCH TO BE RIPPED, MOISTURE CONDITIONED AND COMPACTED TO 98% STANDARD DENSITY IN ACCORDANCE WITH AS 1289.5.7.1.

EL4. FILL TO BE PLACED IN MAXIMUM 200mm LOOSE THICKNESS, MOISTURE CONDITIONED AND COMPACTED TO SPECIFIED DENSITIES.

EL5. RESULTS OF COMPACTION CONTROL TEST SHALL BE SUBMITTED TO THE SUPERINTENDENT FOR APPROVAL PRIOR TO PLACING ADDITIONAL LAYERS. ANY AREAS NOT ACHEVING THE REQUIRED COMPACTION SHALL BE REMOVED AND RE-COMPACTED AND RE-TESTED.

EL6. EARTHWORKS TO HAVE LEVEL 1 INSPECTION AND TESTING IN ACCORDANCE WITH AS 3798.

COMPACTION CONTROL TESTING

1. FREQUENCY OF COMPACTION CONTROL TEST SHALL NOT BE LESS THAN THE FOLLOWING (WHICHEVER REQUIRES THE MOST TESTS)
   1 TEST PER 500cub.m OF COMPACTED EARTH MATERIAL
2. RESULTS OF COMPACTION CONTROL TEST SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO PLACING ADDITIONAL LAYERS. ANY AREAS NOT ACHEVING THE REQUIRED COMPACTION SHALL BE REMOVED AND RECOMPACTED AND RE-TESTED AS REQUIRED BY THE ENGINEER.

ENVIRONMENTAL MANAGEMENT NOTES:

CONTRACTOR TO ENSURE CONSTRUCTION WORKS ARE IN ACCORDANCE WITH EPA ENVIRONMENTAL GUIDELINES FOR CONSTRUCTION SITES (PUBLICATION 480, 1996) AND CODE OF PRACTICE.

MINIMISING EROSION:

ENV1. MINIMISE CLEARED AREA AND KEEP THE CLEARED AREA FOR VERY SHORT TIME.
ENV2. MULCH, ROUGHEN AND SEED CLEARED SLOPES AND STOCKPILES WHERE NO WORKS ARE PLANNED FOR MORE THAN 28 DAYS, WITH STERILE GRASSES.
ENV3. KEEP VEHICLES TO WELL-DEFINED HAUL ROADS.
ENV4. REHABILITATE CLEARED AREAS PROMPTLY WITH MULCH OR ANCHORED FABRICS OR SEEDING WITH STERILE GRASS.

STORM WATER MANAGEMENT:

ENV5. MINIMISE THE QUANTITY OF UNCONTAMINATED STORM WATER ENTERING CLEARED AREAS.
ENV6. ESTABLISH CUT-OFF OR INTERCEPT DRAINS TO REDIRECT STORM WATER AWAY FROM CLEARED AREAS AND SLOPES TO STABLE (VEGETATED) AREAS OR EFFECTIVE TREATMENT INSTALLATIONS.
ENV7. REDUCE WATER VELOCITIES BY ADDING CHECK DAM BARRIERS OF MATERIAL APPROVED BY THE SUPERINTENDENT.

SEDIMENT CONTROLS:

ENV8. INSTALL EROSION AND SEDIMENT CONTROL MEASURES, IF POSSIBLE BEFORE CONSTRUCTION COMMENCES.
ENV9. IDENTIFY DRAINAGE LINES AND INSTALL CONTROL MEASURES TO HANDLE PREDICTED STORM WATER AND SEDIMENT LOADS GENERATED IN THE MINI-CATCHMENT.
ENV10. STRAW BALE FILTER AND MESH AND GRAVEL FILTER TO BE INSTALL APPROPRIATELY TO CONTROL RUN-OFF EROSION AND SEDIMENT RUN-OFF TO SITE CONDITIONS TO HANDEL A ONE-IN-TWO-YEAR STORM EVENT (TWO-YEAR ARI WITH INTENSITY OF SIX HOURL FOR TEMPORARY STRUCTURES, AND ONE-IN-FIFTY YEAR STORM EVENT, FOR PERMANENT STRUCTURES.
ENV11. ESTABLISH AND ADEQUATE INSPECTION, MAINTENANCE AND CLEANING PROGRAM FOR SEDIMENT RUN-OFF CONTROL STRUCTURES.
ENV12. CONTINUALLY ASSESS THE EFFECTIVENESS OF SEDIMENT CONTROL MEASURES AND MAKE NECESSARY IMPROVEMENTS.

DUST CONTROL:

ENV13. IMPLEMENT A DUST PREVENTION STRATEGY.
ENV14. TAKE DUST SUPPRESSION MEASURES, SUCH AS PROMPTLY WATERING EXPOSED AREAS WHEN VISIBLE DUST IS OBSERVED.

NOISE AND VIBRATION:

ENV15. FIT AND MAINTAIN APPROPRIATE MUFFLERS ON EARTH-MOVING AND OTHER VEHICLES ON THE SITE.
ENV16. ENCLOSE NOISY EQUIPMENT
ENV17. PROVIDE NOISE ATTENTION SCREENS, WHERE APPROPRIATE.
ENV18. PERMITTED WORKING HOURS ARE DETAILED WITHIN GENERAL CONDITIONS OF CONTRACT.
ENV19. SCHEDULE DELIVERIES TO THE SITE SO THAT DISRUPTION TO LOCAL AMENITY AND TRAFFIC ARE MINIMISED.

MANAGEMENT OF STOCKPILES AND BATTERS:

ENV22. MINIMISE THE NUMBER OF STOCKPILES, AND THE AREA AND THE TIME STOCKPILES ARE EXPOSED.
ENV23. KEEP TOPSOIL AND UNDER URDEN STOCKPILES SEPARATE.
ENV24. LOCATE STOCKPILES AWAY FROM DRAINAGE LINES, AT LEAST 10 METERS AWAY FROM NATURAL WATERWAY AND WHERE THEY WILL BE LEAST SUSCEPTIBLE TO WIND EROSION.
ENV25. ENSURE THAT STOCKPILES AND BATTERS HAVE SLOPES NO GREATER THAN 2:1 (HORIZONTAL/VERTICAL).
ENV26. STABILISE STOCKPILES AND BATTERS THAT WILL REMAIN BARE FOR MORE THAN 28 DAYS BY COVERING WITH MULCH OR ANCHORED FABRICS OR SEEDING WITH STERILE GRASS.
ENV27. ESTABLISH SEDIMENT CONTROLS AROUND UNSTABILISED STOCKPILES AND BATTERS.
ENV28. SUPPRESS DUST ON STOCKPILES AND BATTERS, AS CIRCUMSTANCES DEMAND.

AIR QUALITY:

ENV29. ENSURE THAT ALL VEHICLES AND MACHINERY ARE FITTED WITH APPROPRIATE EMISSION CONTROL EQUIPMENT, MAINTAINED FREQUENTLY AND SERVICED TO THE MANUFACTURERS' SPECIFICATIONS.
ENV30. SMOKES FROM INTERNAL COMBUSTION ENGINES SHOULD NOT BE VISIBLE FOR MORE THAN TEN SECONDS.

LITTER:

ENV30. MAINTAIN A HIGH QUALITY OF HOUSEKEEPING AND ENSURE THAT MATERIALS ARE NOT WHERE THEY CAN BE WASHED OR BLOWN AWAY TO BECOME LITTER.
ENV31. PROVIDE BINS FOR CONSTRUCTION WORKERS AND STAFF AT LOCATIONS WHERE THEY CONSUME FOOD.
ENV32. CONDUCT ONGOING AWARENESS WITH STAFF OF THE NEED TO AVOID LITTERING.

STORING FUELS AND CHEMICALS:

ENV33. MINIMISE FUELS AND CHEMICALS STORED ON SITE.
ENV34. INSTALL BUNDS AND TAKE OTHER PRECAUTIONS TO REDUCE THE RISK OF SPILLS.
ENV35. IMPLEMENT A CONTINGENCY PLAN TO HANDLE SPILLS, SO THAT ENVIRONMENTAL DAMAGE IS AVOIDED.
ENV36. ENSURE A SAFETY DATA SHEET IS AVAILABLE FOR ALL HAZARDOUS CHEMICALS ON SITE.

KEEPING ROADS CLEAN:

ENV37. ENSURE THAT THE ROADS ARE SWEPT AT LEAST ONCE A DAY ON UNCONTROLLED ROAD CROSSINGS WHEN CONSTRUCTION VEHICLES ARE TRAVELING OFF THE SITES.
ENV38. COVER ALL LOADS OF SOIL BEING TAKEN OFF SITE FOR DISPOSAL.
ENV39. INSTALL LITTER TRAPS LINED WITH FILTER CLOTH IN ALL SIDE-ENTRY PITS.

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DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 38342
SURVEY DATE: 27/06/17
AREA: N/A

23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC
DATE	AMENDMENT	INIT.

REVISIONS

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FIELD BOOK: N/A
LEVEL BOOK: N/A
DATUM: AHD
GRID: MGA
SCALE: A1

DESIGNED: MC
DRAWN: KW
VERIFIED: MC
APPROVED: MC

PASSED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
NOTES

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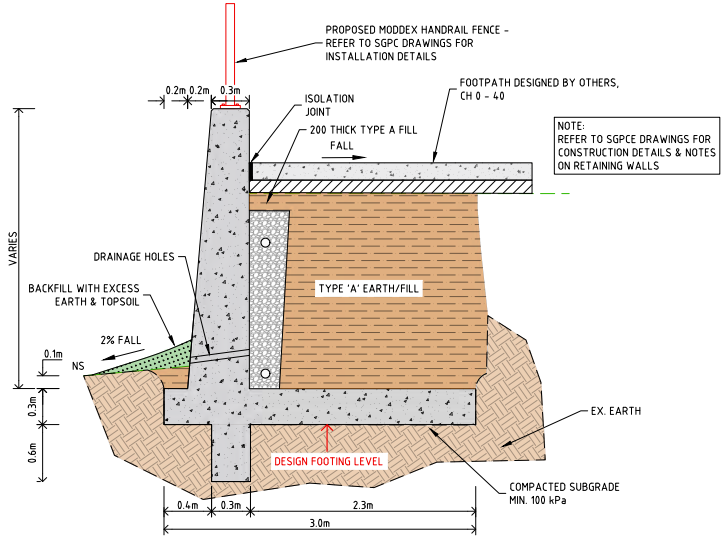
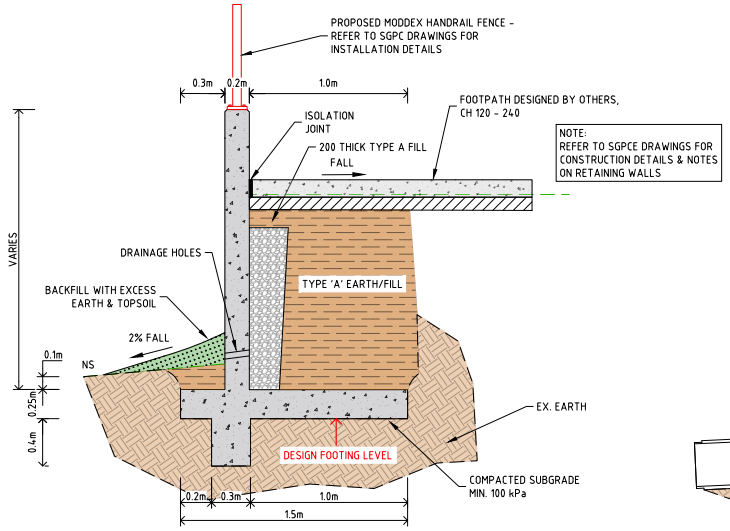
FILE No. F8323
No. of Sheets -
Sheet No. 2
DRAWING NUMBER 6293
REV. F



TYPICAL SECTION
TYPE A - CANTILEVER GRAVITY RETAINING WALL - NORTHERN END
NTS



TYPICAL SECTION
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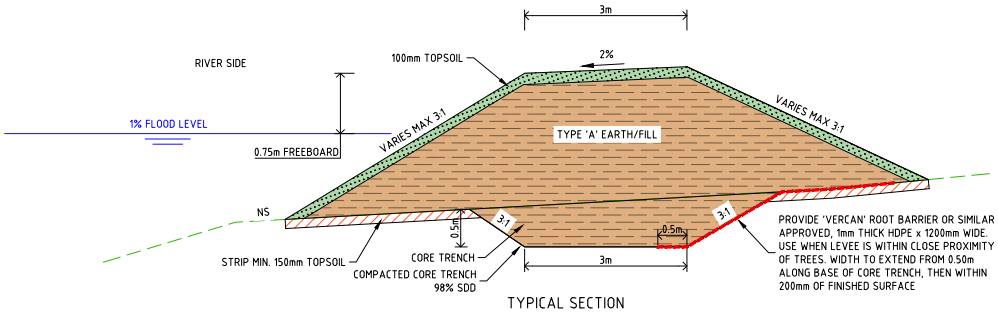
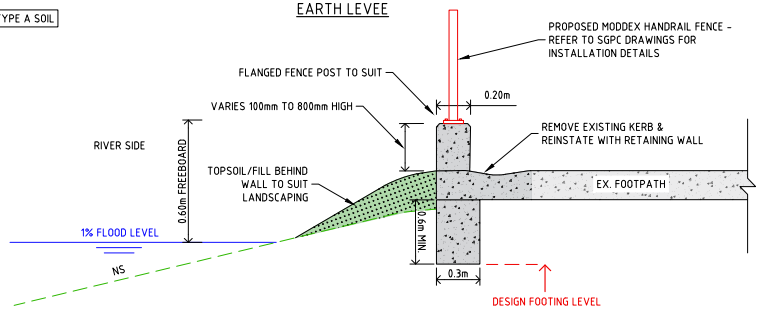
NTS

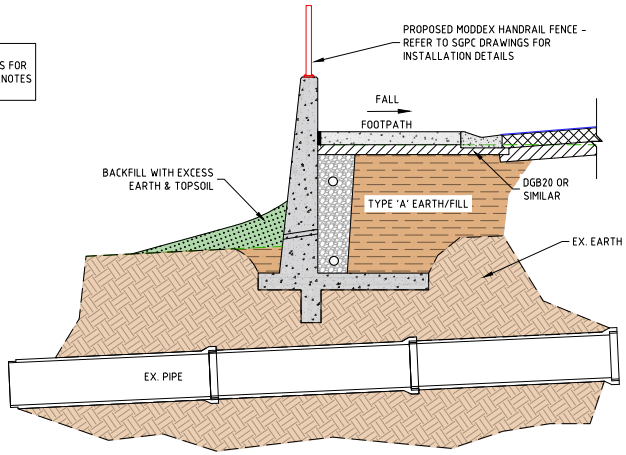


REFER TO SPECIFICATION FOR TYPE A SOIL

TYPICAL SECTION
EARTH LEVEE



TYPICAL SECTION
TYPE C - CAST INSITU CONCRETE WALL WITH STRIP FOOTING - SOUTHERN END
NTS



TYPICAL SECTION
EXISTING STORMWATER PIPE
NTS

NOTE:
SUBGRADE OF RETAINING WALLS & LEVEE TO BE FOUNDED ON MIN. 100 kPa SOIL

NOTE: THESE TYPICAL DRAWINGS ARE FOR CONCEPTUAL PURPOSES ONLY

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DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 58342
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	A1
DESIGNED	MC
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VERIFIED	MC
APPROVED	MC

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APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
TYPICAL SECTIONS

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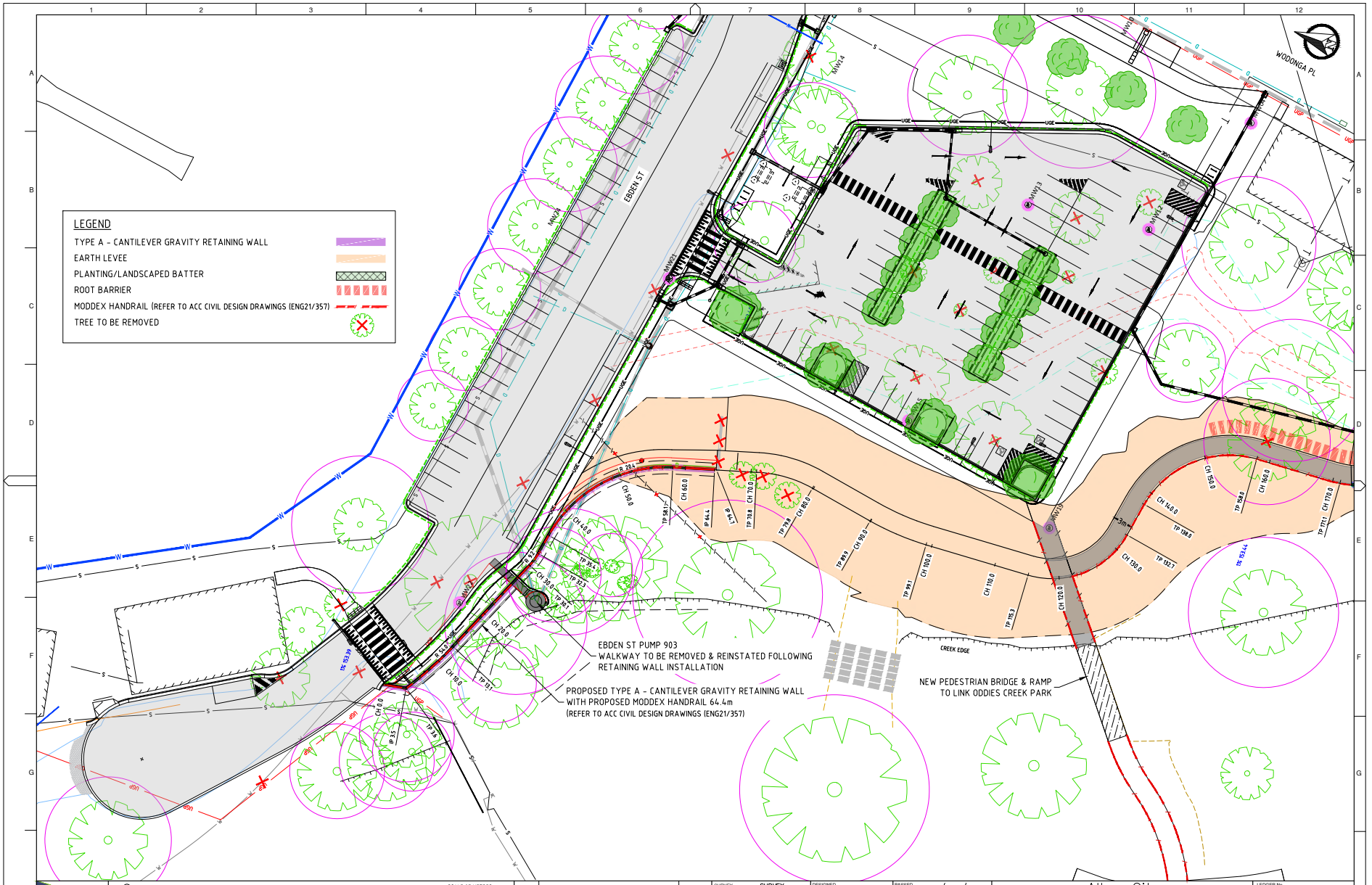

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SCALE OF METRES 2.5 0 5 10
ORIGINAL DRAWING SCALE 1 : 1:250
DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 3834-2
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	1:250
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DESIGNED	MC
DRAWN	KW
VERIFIED	MC
APPROVED	MC

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APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
NORTH PLAN VIEW

LEDGER No.			
FILE No.	No. of Sheets	Sheet No.	
F8323	-	4	
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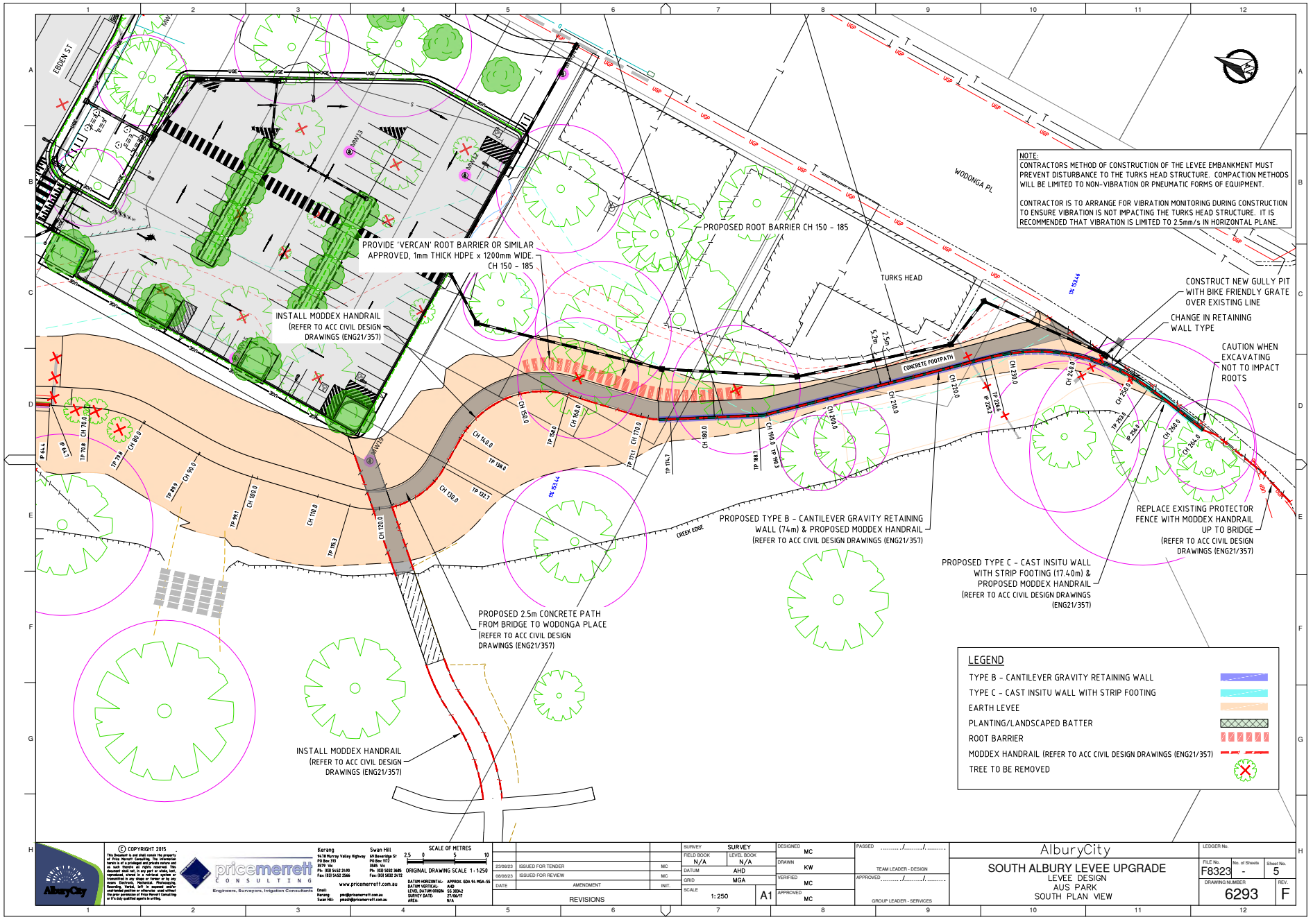

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Email: Kerang: pmc@pricemerrett.com.au Swan Hill: pmsh@pricemerrett.com.au

SCALE OF METRES 2.5 0 5 10
ORIGINAL DRAWING SCALE 1 : 1:250
DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 3834-2
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	1:250
	A1

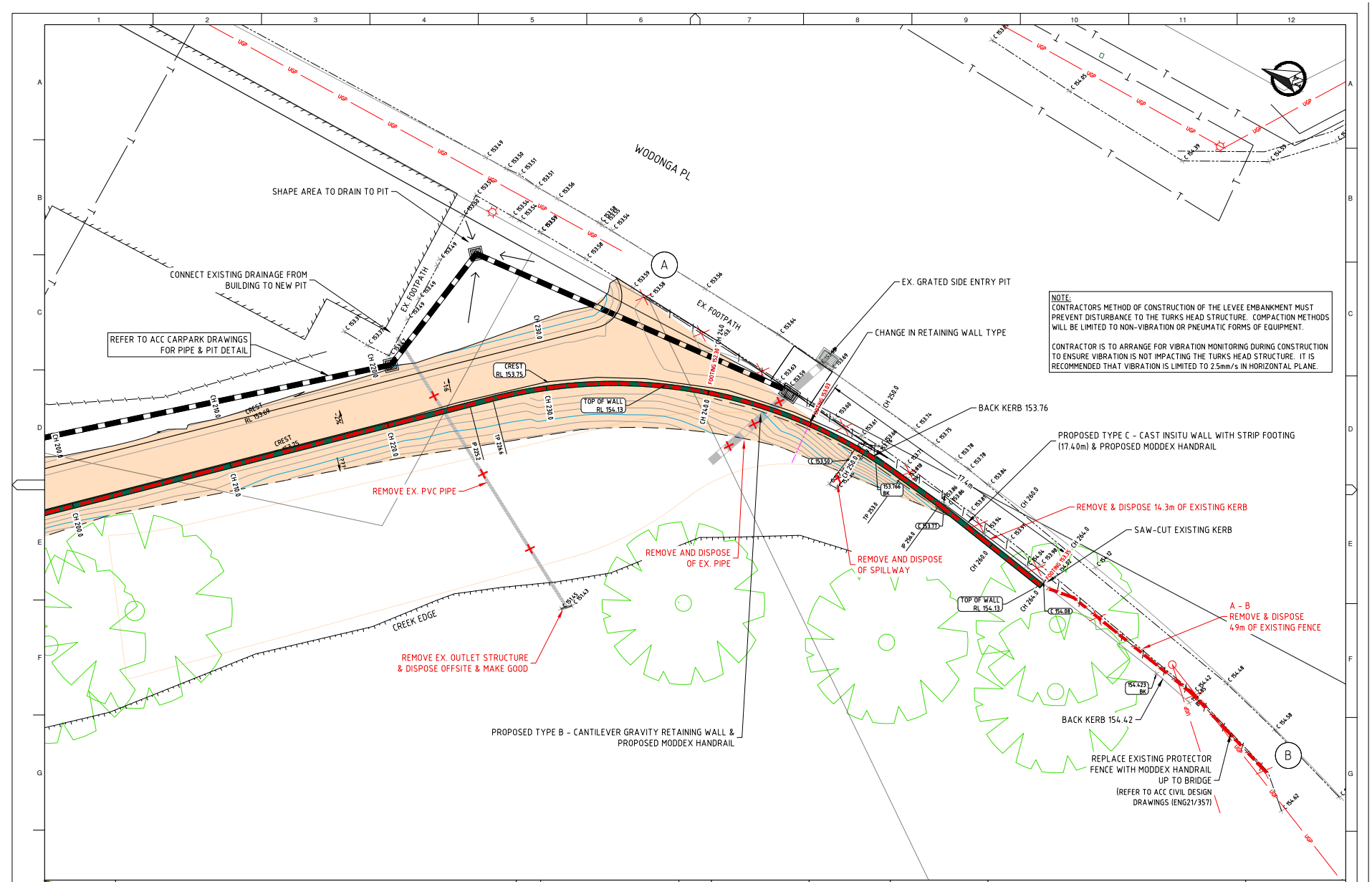
DESIGNED	MC
DRAWN	KW
VERIFIED	MC
APPROVED	MC

PASSED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
SOUTH PLAN VIEW

LEDGER No.			
FILE No.	No. of Sheets	Sheet No.	
F8323	-	5	
DRAWING NUMBER		REV.	
6293		F	



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Email: Kerang: pmc@pricemerrett.com.au Swan Hill: pmsh@pricemerrett.com.au

SCALE OF METRES 1 0 2 4
ORIGINAL DRAWING SCALE 1 : 1:100
DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 3834-2
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	1:100
A1	

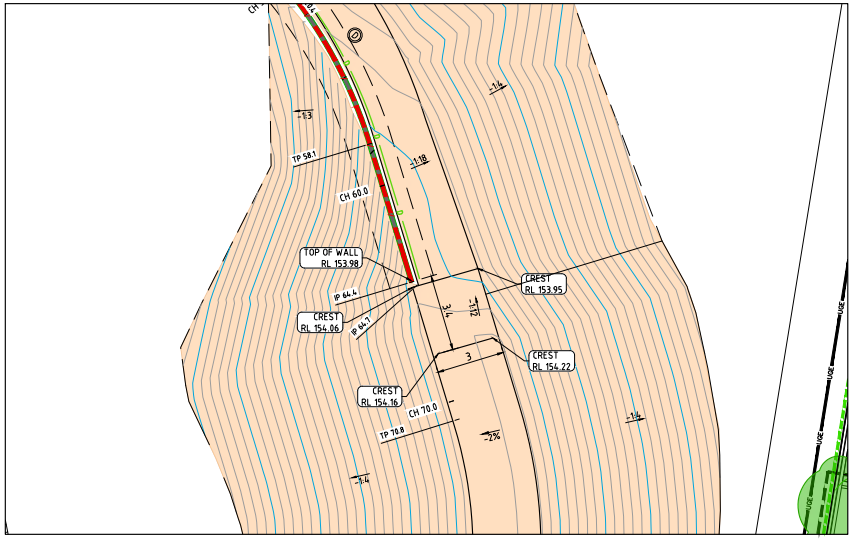
DESIGNED	MC
DRAWN	KW
VERIFIED	MC
APPROVED	MC

PASSED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

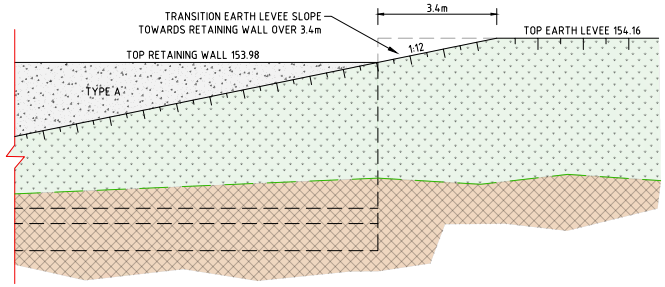
AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
TURKS HEAD PLAN VIEW

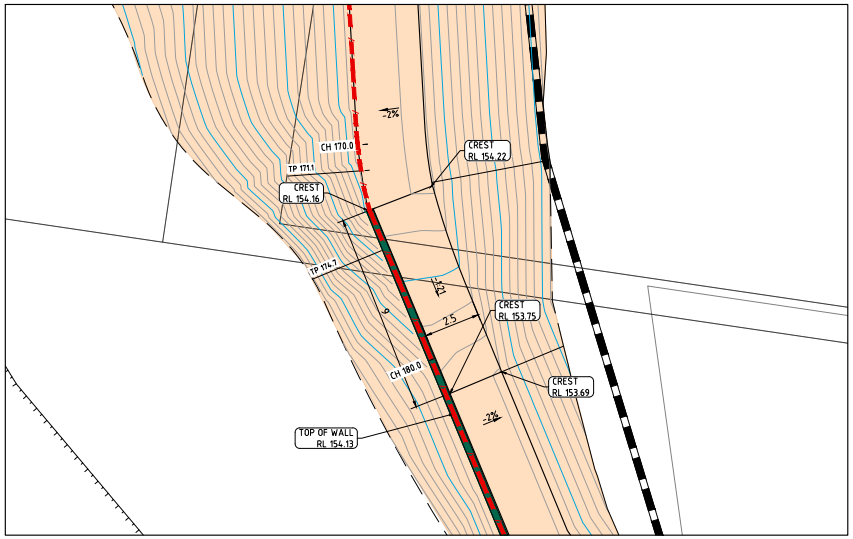
LEDGER No.			
FILE No. F8323	No. of Sheets -	Sheet No. 6	
DRAWING NUMBER 6293		REV. F	



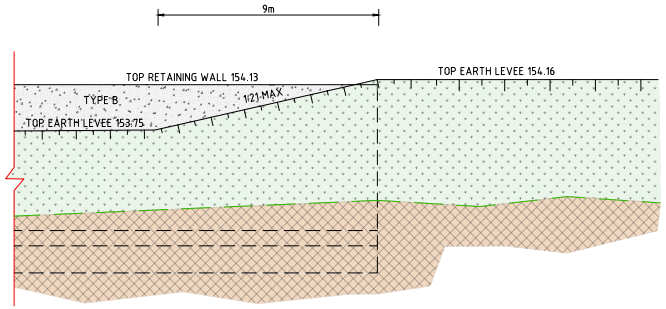
NORTHERN END LEVEE TRANSITION
SCALE 1:100



NORTHERN END TYPICAL SECTION - SIDE VIEW (LOOKING FROM WEST SIDE)
NTS



SOUTHERN END LEVEE TRANSITION
SCALE 1:100



SOUTHERN END TYPICAL SECTION - SIDE VIEW (LOOKING FROM EAST SIDE)
NTS

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3585 Vic
Ph: (03) 5032 3685
Fax: (03) 5032 2672
Email: swanhill@pricemerrett.com.au

DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 38342
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	1:150
	A1

DESIGNED	MC
DRAWN	KW
VERIFIED	MC
APPROVED	MC

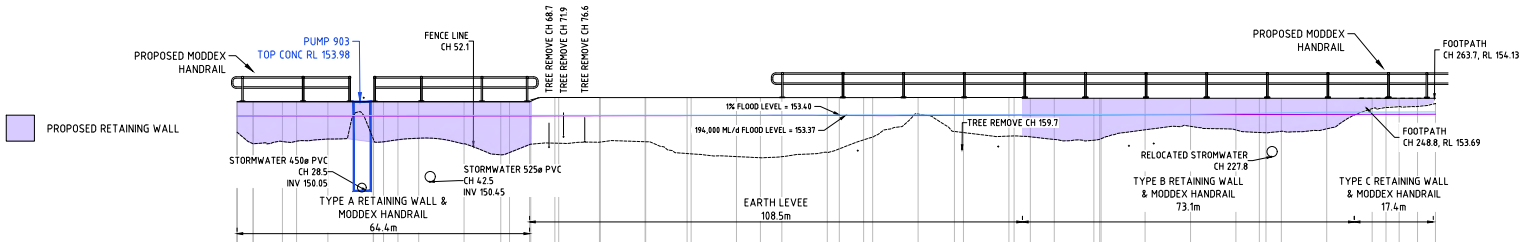
PASSED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
LEVEE TRANSITION DETAILS

LEDGER No.			
FILE No. F8323	No. of Sheets -	Sheet No. 7	
DRAWING NUMBER 6293		REV. F	





DATUM 146.00

CHAINAGE	HEIGHT OF LEVEE	1% AEP FLOOD LEVEL	DESIGN LEVEE TOP	LEVEE BANK EXISTING LEVELS
0.00	1.34	153.35	153.98	152.64
3.52	1.85	153.36	153.98	152.13
3.56	1.78	153.36	153.98	152.13
8.33	1.75	153.36	153.98	152.20
10.00	1.74	153.37	153.98	152.23
13.10	1.64	153.37	153.98	152.24
20.00				152.34
30.00	1.64	153.37	153.98	152.34
30.06	1.67	153.37	153.98	152.31
31.16	1.78	153.37	153.98	152.20
32.26	1.76	153.37	153.98	152.22
35.44	1.67	153.37	153.98	152.31
40.00	1.61	153.38	153.98	152.37
46.76	1.71	153.38	153.98	152.27
50.00	1.85	153.38	153.98	152.13
58.08	2.34	153.38	153.98	151.64
60.00	2.24	153.38	153.98	151.74
64.43	1.89	153.38	153.98	152.09
64.70	1.95	153.38	154.06	152.11
70.00	2.01	153.38	154.46	152.55
70.84	2.01	153.38	154.46	152.55
75.33	1.97	153.38	154.46	152.19
79.81	1.97	153.38	154.46	152.20
80.00	1.96	153.38	154.46	152.20
89.88	1.95	153.38	154.46	152.22
90.00	1.95	153.38	154.46	152.22
94.59	2.25	153.38	154.46	151.91
99.31	2.47	153.38	154.46	151.70
100.00	2.48	153.38	154.46	151.68
110.00	2.60	153.39	154.46	151.56
115.27	2.65	153.39	154.46	151.51
120.00	2.60	153.39	154.46	151.56
123.96	2.50	153.39	154.46	151.66
130.00	2.41	153.39	154.46	151.75
132.65	2.26	153.39	154.46	151.90
138.00	1.86	153.40	154.46	152.30
140.00	1.74	153.40	154.46	152.42
148.00	1.01	153.40	154.46	153.35
150.00	0.73	153.40	154.46	153.63
158.01	1.50	153.41	154.46	152.67
160.00	1.54	153.41	154.46	152.62
170.00	1.70	153.41	154.47	152.46
171.15	1.69	153.41	154.46	152.47
172.93	1.67	153.41	154.46	152.46
174.72	1.70	153.41	154.43	152.43
180.00	1.81	153.41	154.43	152.32
188.72	1.85	153.42	154.43	152.28
190.51	1.83	153.42	154.43	152.30
190.66	1.81	153.42	154.43	152.32
190.91	1.78	153.42	154.43	152.35
200.00	1.59	153.42	154.43	152.74
210.00	1.23	153.42	154.43	152.90
220.00	1.39	153.46	154.43	152.74
225.16	1.39	153.46	154.43	152.62
226.62	1.51	153.47	154.43	152.61
230.00	1.52	153.48	154.43	152.68
239.83	1.45	153.49	154.43	152.78
240.00	1.35	153.52	154.43	152.79
250.00	1.34	153.52	154.43	153.67
253.45	0.46	153.52	154.43	153.73
255.96	0.40	153.52	154.43	153.77
260.00	0.36	153.53	154.43	153.77
263.96	0.36	153.53		153.89

AUS PARK LEVEE 2021
SCALES: HORIZONAL 1:500 VERTICAL 1:100

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3585 Vic
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DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 38342
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	1:500
	A1

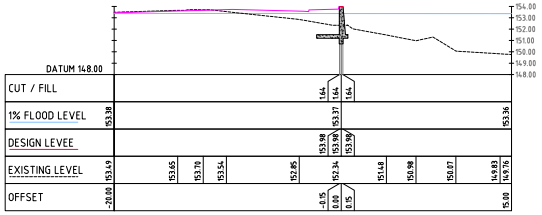
DESIGNED	MC
DRAWN	KW
VERIFIED	MC
APPROVED	MC

PASSED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
LONG SECTION

LEDGER No.			
FILE No.	No. of Sheets	Sheet No.	
F8323	-	8	
DRAWING NUMBER		REV.	
6293		F	



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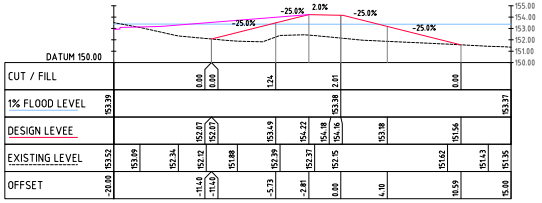

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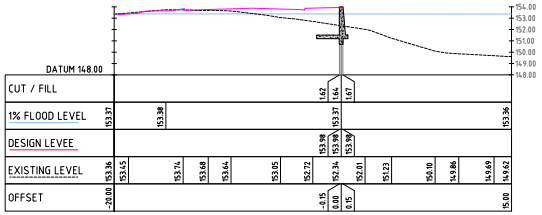

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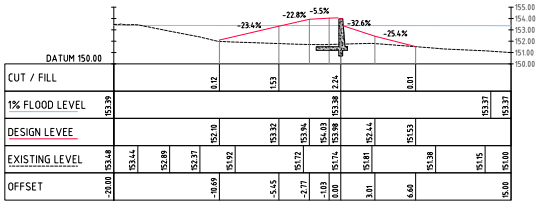

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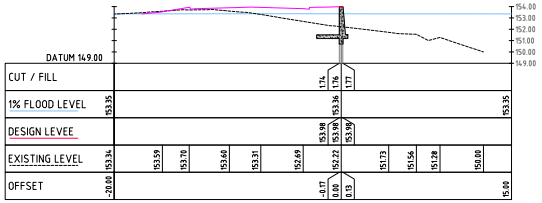

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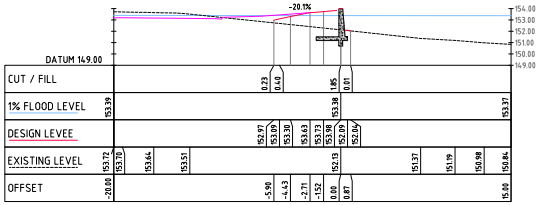
Scale H 1:200 V 1:200



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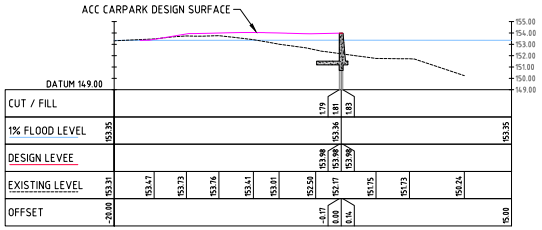

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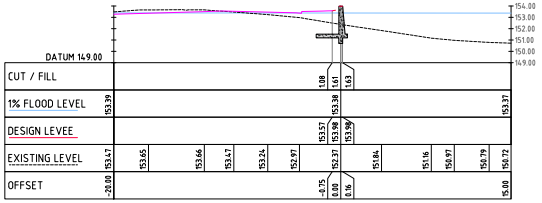

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REFER TO ACC CIVIL DESIGN DRAWINGS (ENG21/357) FOR INFORMATION RELATING TO HANDRAIL, FOOTPATHS & ADJACENT SURFACES

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DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 38342
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	1:200
	A1

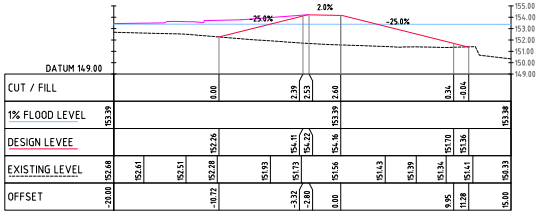
DESIGNED	MC
DRAWN	KW
VERIFIED	MC
APPROVED	MC

PASSED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
CROSS SECTIONS

LEDGER No.			
FILE No.	No. of Sheets	Sheet No.	
F8323	-	9	
DRAWING NUMBER		REV.	
6293		F	



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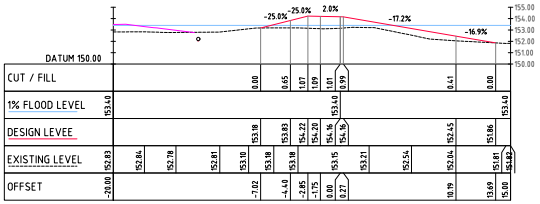

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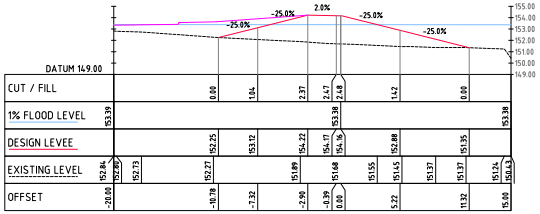

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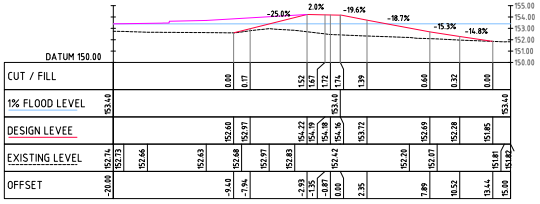

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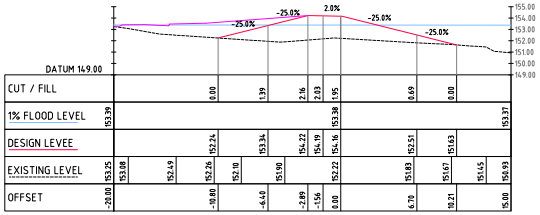

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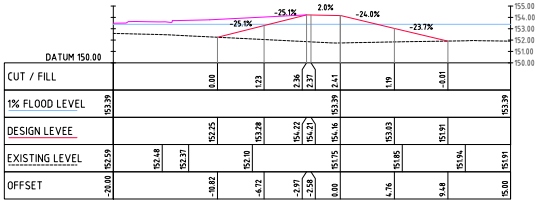
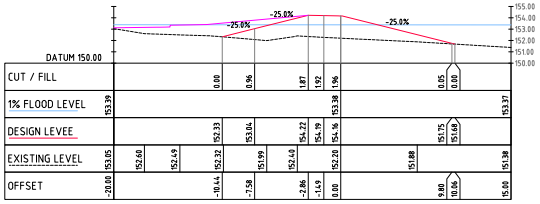
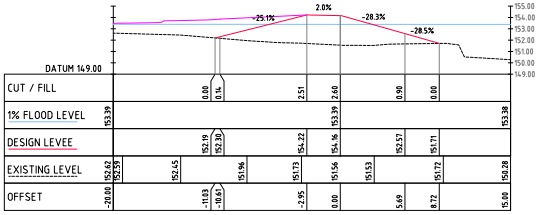


CROSS SECTION - CH 130
Scale H 1:200 V 1:200



CROSS SECTION - CH 80
Scale H 1:200 V 1:200



CROSS SECTION - CH 120
Scale H 1:200 V 1:200

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3585 Vic
Ph: (03) 5032 3685
Fax: (03) 5032 2672
Email: Kerang: prec@pricemerrett.com.au
Swan Hill: pesh@pricemerrett.com.au

DATUM HORIZONTAL: AMG66 ZONE 54 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 58342
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

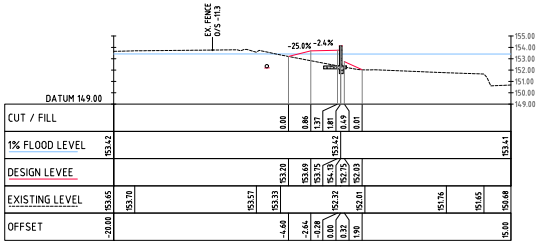
SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	1:200 A1
DESIGNED	MC
DRAWN	KW
VERIFIED	MC
APPROVED	MC

PASSED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

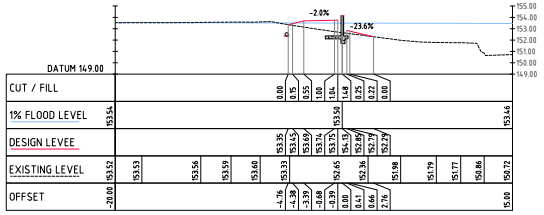
AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
CROSS SECTIONS

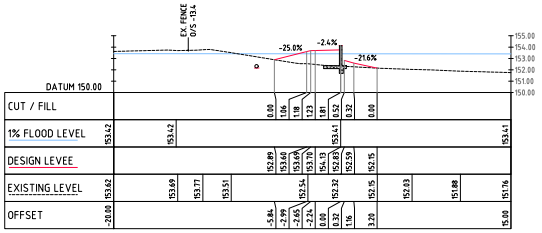
LEDGER No.
FILE No. F8323
No. of Sheets -
Sheet No. 10
DRAWING NUMBER 6293
REV. F



CROSS SECTION - CH 190
Scale H 1:200 V 1:200



CROSS SECTION - CH 233
Scale H 1:200 V 1:200



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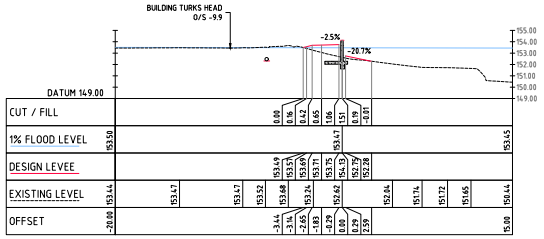
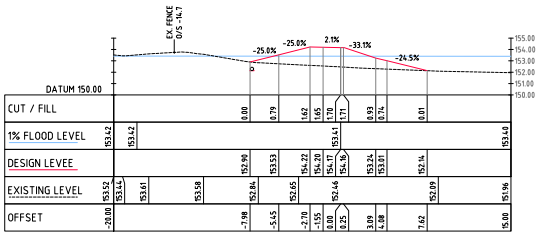
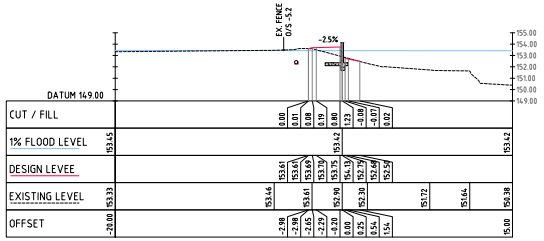
Scale H 1:200 V 1:200



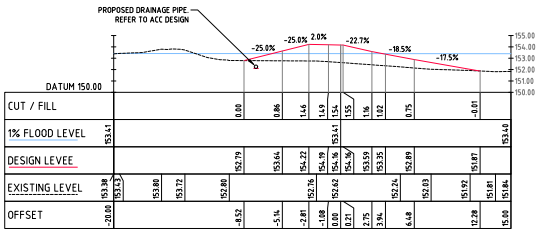
CROSS SECTION - CH 225
Scale H 1:200 V 1:200



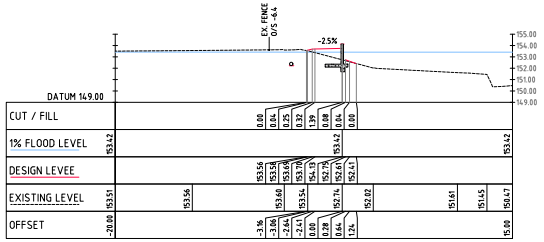
CROSS SECTION - CH 170
Scale H 1:200 V 1:200



CROSS SECTION - CH 210
Scale H 1:200 V 1:200



CROSS SECTION - CH 160
Scale H 1:200 V 1:200



CROSS SECTION - CH 200
Scale H 1:200 V 1:200

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Fax: (03) 5032 2672
Email: Kerang: pmc@pricemerrett.com.au
Swan Hill: pmsh@pricemerrett.com.au

DATUM HORIZONTAL: AMG66 ZONE 55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 38342
SURVEY DATE: 27/06/17
AREA: N/A

23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC
DATE	AMENDMENT	INIT.

REVISIONS

SURVEY: SURVEY
FIELD BOOK: N/A
LEVEL BOOK: N/A
DATUM: AHD
GRID: MGA
SCALE: 1:200
A1

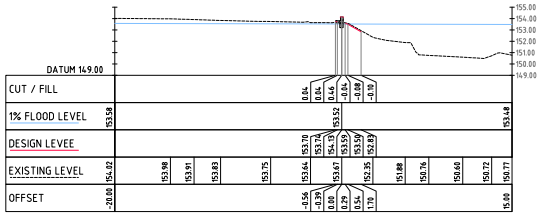
DESIGNED: MC
DRAWN: KW
VERIFIED: MC
APPROVED: MC

PASSED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

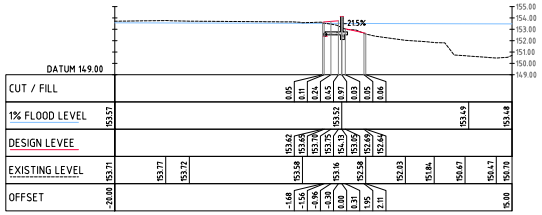
AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
CROSS SECTIONS

LEDGER No.
FILE No. F8323
No. of Sheets -
Sheet No. 11
DRAWING NUMBER 6293
REV. F



CROSS SECTION - CH 250
Scale H 1:200 V 1:200



CROSS SECTION - CH 244
Scale H 1:200 V 1:200

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Ph: (03) 5032 3685
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Email: Kerang: pmc@pricemerrett.com.au
Swan Hill: pmsh@pricemerrett.com.au

DATUM HORIZONTAL: AMG66 ZONE 55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 38342
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

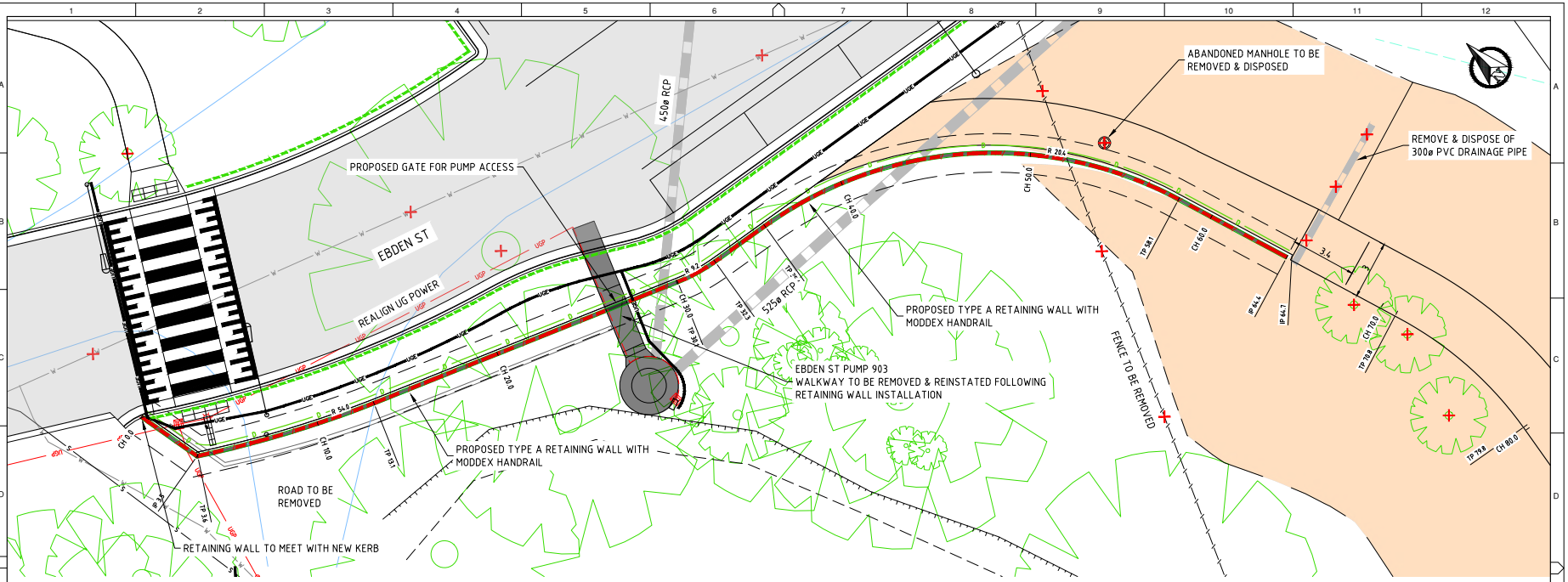
SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	1:200 A1
DESIGNED	MC
DRAWN	KW
VERIFIED	MC
APPROVED	MC

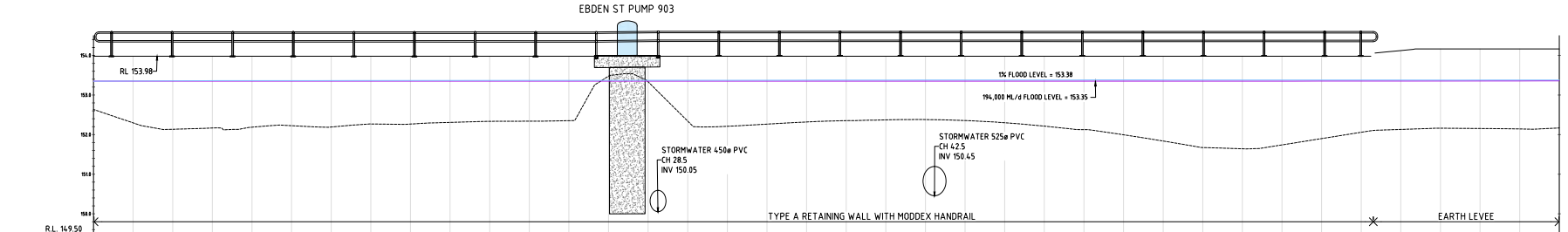
PASSED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

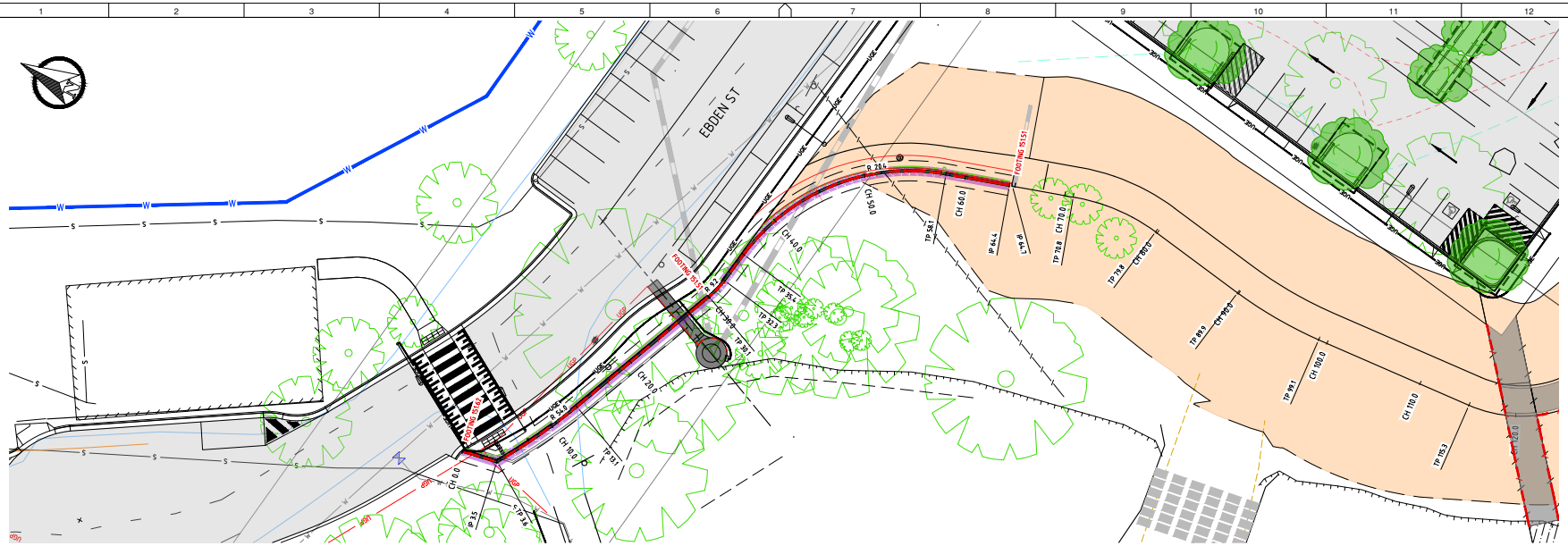
SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
CROSS SECTIONS

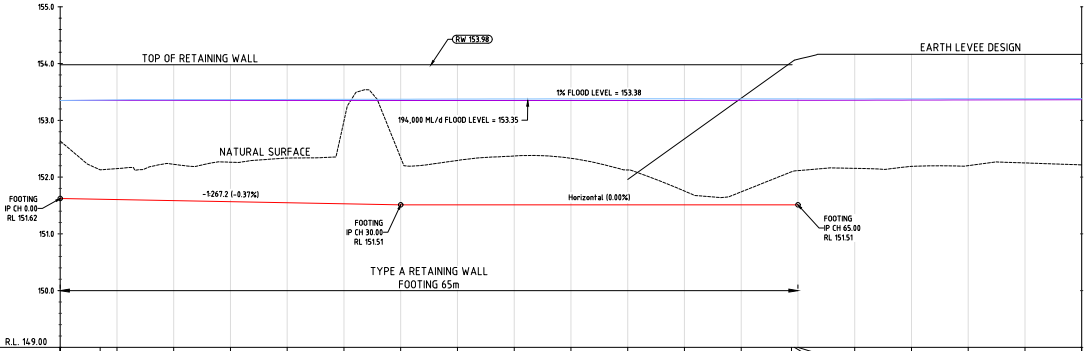
LEDGER No.
FILE No. F8323
No. of Sheets -
Sheet No. 12
DRAWING NUMBER 6293
REV. F


PROPOSED GATE FOR PUMP ACCESS
EBDEN ST
REALIGN UG POWER
450ø RCP
525ø RCP
ABANDONED MANHOLE TO BE REMOVED & DISPOSED
REMOVE & DISPOSE OF 300ø PVC DRAINAGE PIPE
PROPOSED TYPE A RETAINING WALL WITH MODDEX HANDRAIL
EBDEN ST PUMP 903
WALKWAY TO BE REMOVED & REINSTATED FOLLOWING RETAINING WALL INSTALLATION
FENCE TO BE REMOVED
PROPOSED TYPE A RETAINING WALL WITH MODDEX HANDRAIL
ROAD TO BE REMOVED
RETAINING WALL TO MEET WITH NEW KERB


EBDEN ST PUMP 903
RL 153.98
1% FLOOD LEVEL = 153.38
194,000 ML/d FLOOD LEVEL = 153.35
STORMWATER 450ø PVC
CH 28.5
INV 150.05
STORMWATER 525ø PVC
CH 42.5
INV 150.45
TYPE A RETAINING WALL WITH MODDEX HANDRAIL
EARTH LEVEE
R.L. 149.50

| | | |





CUT / FILL	-1.01	-0.52	-0.55	-0.64	-0.70	-0.79	-1.46	-0.83	-0.78	-0.86	-0.82	-0.62	-0.24	-0.23	-0.58	-0.60	-0.60					
DESIGN RETAINING WALL FOOTING	151.62	151.61	151.60	151.59	151.57	151.55	151.53	151.51	151.51	151.51	151.51	151.51	151.51	151.51	151.51	151.51	151.51					
LEVEE BANK EXISTING LEVELS	152.64	152.13	152.15	152.23	152.26	152.34	152.99	152.34	152.29	152.37	152.33	152.13	151.75	151.74	152.09	152.11	152.11	152.15	152.19	152.20	152.25	152.22
CHAINAGE	0.00	3.52	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00	64.43	64.70	65.00	70.00	75.00	80.00	85.00	90.00

EBDEN ST RETAINING WALL BASE

SCALES: HOR 1:200 / VER 1:40

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Swan Hill pmsh@pricemerrett.com.au

DATUM HORIZONTAL: AMG66 ZONE 55 GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 38342
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	1:200
	A1

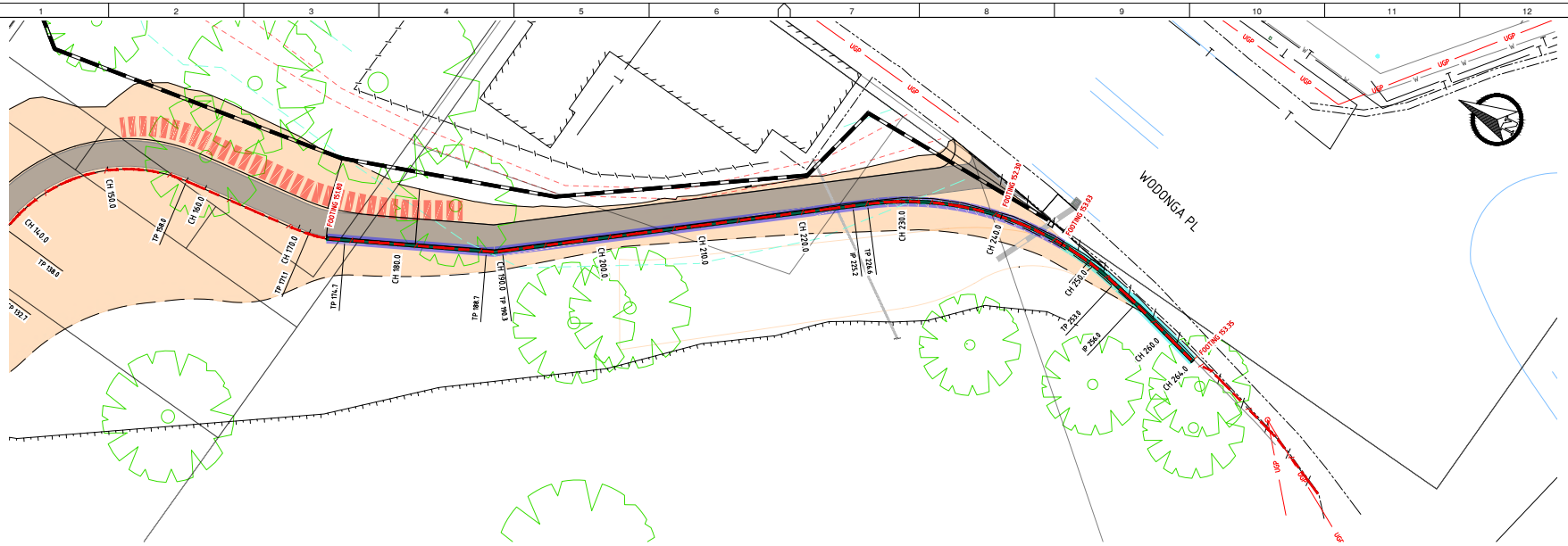
DESIGNED	MC
DRAWN	KW
VERIFIED	MC
APPROVED	MC

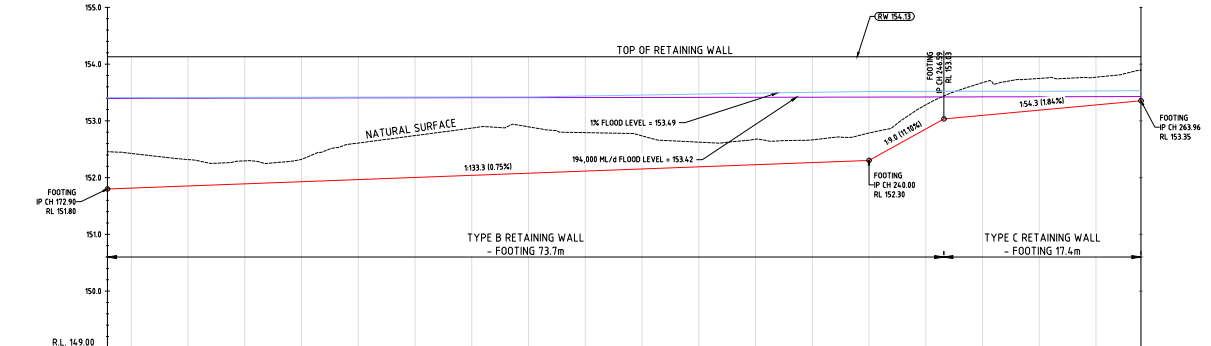
PASSED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
RETAINING WALL FOOTING LONG SECTION

LEDGER No.			
FILE No. F8323	No. of Sheets -	Sheet No. 14	
DRAWING NUMBER 6293		REV. F	





CUT / FILL	-0.66	-0.61	-0.47	-0.40	-0.40	-0.64	-0.74	-0.83	-0.82	-0.68	-0.58	-0.43	-0.43	-0.45	-0.40	-0.48	-0.42	-0.40	-0.58	-0.56	-0.56	-0.49	-0.53
DESIGN RETAINING WALL FOOTING	151.80	151.82	151.85	151.89	151.93	151.97	152.00	152.04	152.08	152.12	152.15	152.19	152.19	152.23	152.27	152.30	152.86	153.03	153.10	153.19	153.21	153.28	153.35
LEVEE BANK EXISTING LEVELS	152.46	152.43	152.32	152.30	152.32	152.61	152.74	152.87	152.90	152.79	152.74	152.62	152.62	152.68	152.67	152.79	153.28	153.44	153.67	153.75	153.77	153.77	153.89
CHAINAGE	172.90	175.00	180.00	185.00	190.00	195.00	200.00	205.00	210.00	215.00	220.00	225.00	225.16	230.00	235.00	240.00	245.00	246.59	250.00	255.00	255.96	260.00	263.96

WODONGA PL RETAINING WALL BASE

SCALES: HOR 1:200 / VER 1:40

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Email: Kerang: pmc@pricemerrett.com.au, Swan Hill: pmsh@pricemerrett.com.au

DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 3834-2
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY: SURVEY
FIELD BOOK: N/A
LEVEL BOOK: N/A
DATUM: AHD
GRID: MGA
SCALE: 1:200 A1

DESIGNED: MC
DRAWN: KW
VERIFIED: MC
APPROVED: MC

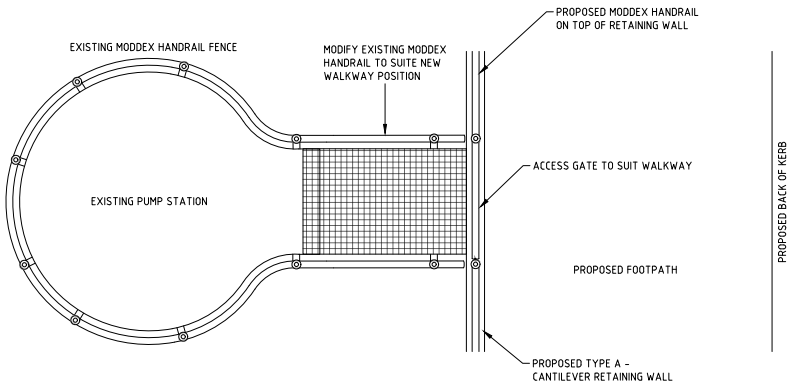
PASSED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

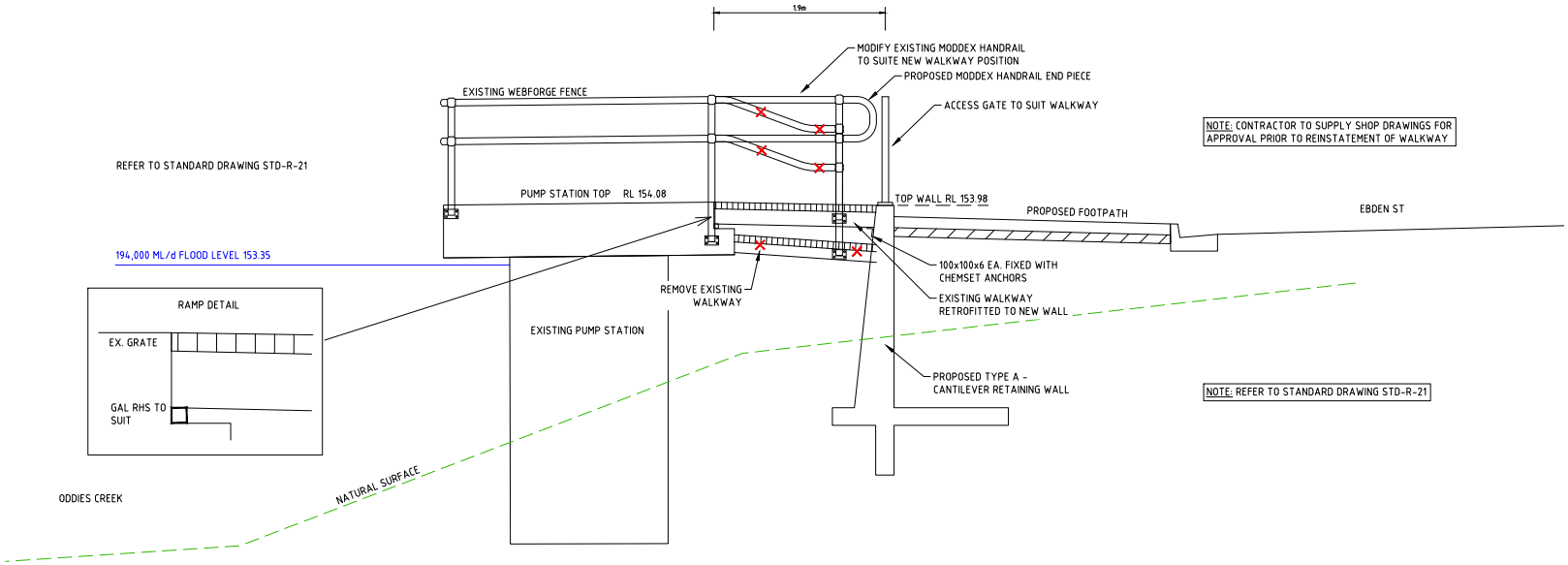
SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
RETAINING WALL FOOTING LONG SECTION

LEDGER No.
FILE No. F8323
No. of Sheets -
Sheet No. 15
DRAWING NUMBER 6293
REV. F

PLAN VIEW



SECTION VIEW



NOTE: CONTRACTOR TO SUPPLY SHOP DRAWINGS FOR APPROVAL PRIOR TO REINSTATEMENT OF WALKWAY

NOTE: REFER TO STANDARD DRAWING STD-R-21

REFERENCE DRAWING ONLY
NOT FOR CONSTRUCTION

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Swan Hill: pmsh@pricemerrett.com.au

DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 38342
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY	SURVEY
FIELD BOOK	N/A
LEVEL BOOK	N/A
DATUM	AHD
GRID	MGA
SCALE	1:25
	A1

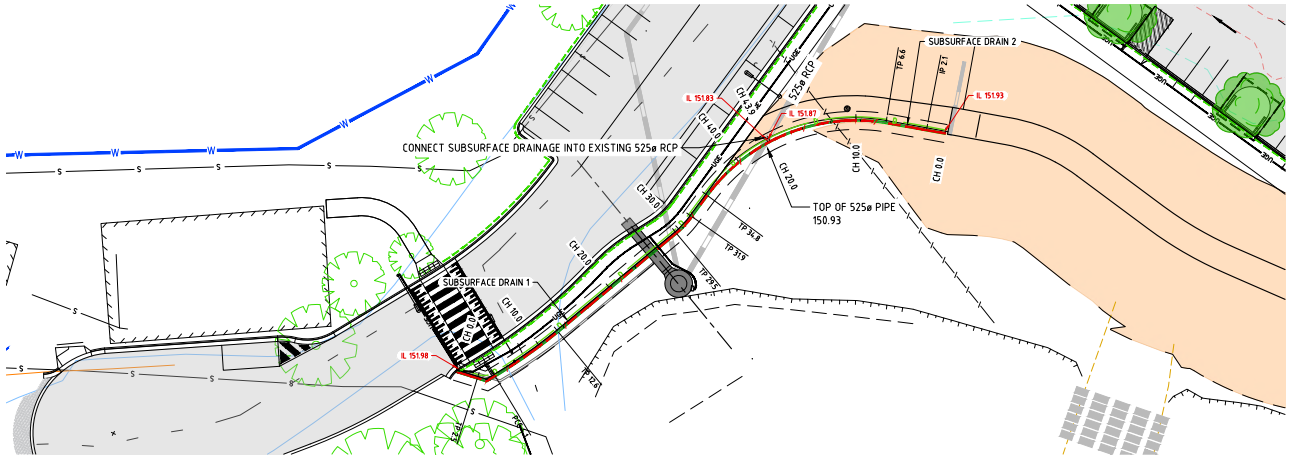
DESIGNED	MC
DRAWN	KW
VERIFIED	MC
APPROVED	MC

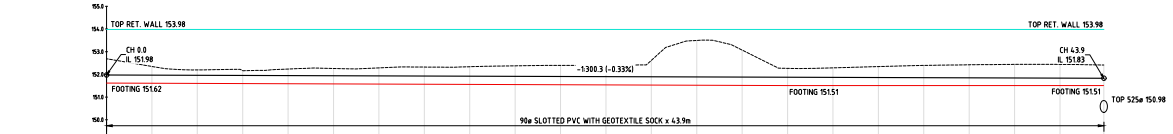
PASSED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
EBDEN ST PUMP TYPICAL SECTION

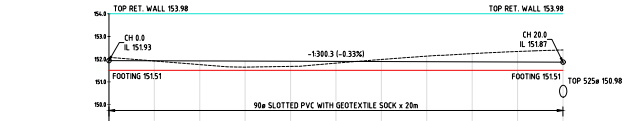
LEDGER No.			
FILE No. F8323	No. of Sheets -	Sheet No. 16	
DRAWING NUMBER 6293		REV. F	





CUT/FILL DEPTH	-0.71	-0.38	-0.23	-0.21	-0.29	-0.32	-0.35	-0.39	-0.42	-0.46	-0.49	-0.50	-0.72	-1.61	-1.19	-0.39	-0.42	-0.48	-0.54	-0.57	-0.60	-0.61	-0.58	
DESIGN SUBSURFACE INV	151.98	151.97	151.96	151.96	151.95	151.94	151.94	151.93	151.92	151.92	151.91	151.90	151.90	151.89	151.88	151.88	151.87	151.86	151.86	151.85	151.84	151.84	151.83	
NATURAL SURFACE	152.69	152.35	152.20	152.17	152.24	152.26	152.29	152.32	152.34	152.38	152.40	152.40	152.62	153.50	153.07	152.27	152.29	152.34	152.40	152.42	152.44	152.44	152.41	
CHAINAGE	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00	32.00	34.00	36.00	38.00	40.00	42.00	43.93	

SUBSURFACE DRAIN 1
SCALES: HOR 1:100 / VER 1:100



CUT/FILL DEPTH	-0.15	0.01	0.16	0.27	0.23	0.08	-0.09	-0.25	-0.36	-0.46	-0.54
DESIGN SUBSURFACE INV	151.93	151.93	151.92	151.91	151.91	151.90	151.89	151.89	151.88	151.88	151.87
NATURAL SURFACE	152.08	151.92	151.76	151.65	151.68	151.83	151.99	152.13	152.24	152.34	152.41
CHAINAGE	0.00	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00

SUBSURFACE DRAIN 2
SCALES: HOR 1:100 / VER 1:100

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Swan Hill: pmsh@pricemerrett.com.au

DATUM HORIZONTAL: APPROX. GDA 94 MGA-55
DATUM VERTICAL: AHD
LEVEL DATUM ORIGIN: SS 3834.2
SURVEY DATE: 27/06/17
AREA: N/A

DATE	AMENDMENT	INIT.
23/08/23	ISSUED FOR TENDER	MC
08/08/23	ISSUED FOR REVIEW	MC

REVISIONS

SURVEY: SURVEY
FIELD BOOK: N/A
LEVEL BOOK: N/A
DATUM: AHD
GRID: MGA
SCALE: 1:250
A1

DESIGNED: MC
DRAWN: KW
VERIFIED: MC
APPROVED: MC

PASSED ...../...../.....
TEAM LEADER - DESIGN
APPROVED ...../...../.....
GROUP LEADER - SERVICES

AlburyCity

SOUTH ALBURY LEVEE UPGRADE
LEVEE DESIGN
AUS PARK
SUBSURFACE LONG SECTION & PLAN VIEW

LEDGER No.
FILE No. F8323
No. of Sheets -
Sheet No. 17
DRAWING NUMBER 6293
REV. F

GENERAL NOTES FOR RETAINING WALLS

G1 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATION AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ALL DISCREPANCIES SHALL BE REFERRED TO THE PRINCIPAL FOR DECISION BEFORE PROCEEDING WITH THE WORK.

G2 ALL DIMENSIONS RELEVANT TO SETTING OUT AND OFF-SITE SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION AND FABRICATION IS COMMENCED. THE ENGINEER'S DRAWINGS SHALL NOT BE SCALED, WHETHER OR NOT THEY ARE COMPUTER GENERATED.

G3 DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION AND ENSURING NO PART SHALL BE OVERSTRESSED UNDER CONSTRUCTION ACTIVITIES. ALL VICTORIAN WORKCARE – OCCUPATIONAL HEALTH AND SAFETY DIVISION CODES OF PRACTICE ARE TO BE COMPLIED WITH. WHEN REQUESTED, THE CONTRACTOR SHALL PROVIDE CALCULATIONS TO JUSTIFY THE ADEQUACY OF THE STRUCTURE TO SAFELY WITHSTAND ANY IMPOSED LOADS AND/OR CONSTRUCTION PROCEDURE.

G4 WORKMANSHIP, MATERIALS AND QUALITY, TO BE IN ACCORDANCE WITH THE RELEVANT CURRENT S.A.A. CODES INCLUDING ALL ISSUE, ALL OTHER CODES OF PRACTICE, AND THE LOCAL STATUTORY AUTHORITIES REGULATIONS, EXCEPT WHERE VARIED BY CONTRACT DOCUMENTS.

G5 THE APPROVAL OF A SUBSTITUTION SHALL BE SOUGHT FROM THE ENGINEER BUT IS NOT AN AUTHORISATION FOR AN ADDITIONAL COST VARIATION. ANY VARIATION MUST BE APPROVED BY THE PRINCIPAL IN WRITING BEFORE THE WORK COMMENCES. THE CONTRACTOR IS TO RECORD ALL SUBSTITUTIONS OR DEVIATIONS FROM THE CONTRACT DOCUMENTS AND SUBMIT THEM TO THE PRINCIPAL AS THEY ARISE.

G6 ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE. ALL LEVELS ARE EXPRESSED IN METRES.

G7 THE STRUCTURAL WORK SHOWN ON THESE DRAWINGS HAS BEEN DESIGNED FOR THE FOLLOWING LIVE LOADS:

AREA	LIVE LOAD kPa
SURCHARGE – NORTHERN WALL	15.0
SURCHARGE – SOUTHERN WALL	5.0

G8 FOR ALL INSPECTIONS REQUIRED IN THESE DOCUMENTS, A MINIMUM OF 48 HOURS NOTICE IS TO BE GIVEN.

G9 COPYRIGHT IN ALL DRAWINGS AND OTHER DOCUMENTS PROVIDED SHALL REMAIN VESTED IN SGP CONSULTING ENGINEERS PTY LTD, UNLESS SPECIFICALLY ASSIGNED.

G10 COLUMN DESIGN CONSIDERS THAT SUITABLE PACKERS WILL BE USED TO PROVIDE FULL LATERAL RESTRAINT TO THE COLUMN (I.E. FOR FULL HEIGHT OF WALL). PACKERS TO BE MINIMUM H4 TREATED TIMBER PACKERS OR APPROVED EQUIVALENT DURABILITY CLASS UNTREATED TIMBER. PACK BEHIND SLEEPERS TO FULL DEPTH OF STEEL POST WEBS TO PROVIDE FULL LATERAL RESTRAINT.

CONCRETE NOTES

C1 ALL WORKMANSHIP, MATERIALS AND TESTING SHALL BE IN ACCORDANCE WITH AS 3600.

C2 MINIMUM COVER TO ALL REINFORCEMENT TO SATISFY EXPOSURE CLASSIFICATIONS WHERE STANDARD FORMWORK AND COMPACTION ARE USED SHALL BE AS FOLLOWS, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

EXPOSURE CLASS	A1	A2	A2	B1
ELEMENT	FORMED & NOT EXPOSED TO WEATHER	FORMED & EXPOSED TO WEATHER	NOT FORMED BELOW GND. IN CONTACT WITH NON-AGGRESSIVE SOIL	ABOVE GROUND EXTERIOR EXPOSED TO WEATHER
Minimum Concrete Grade MPa Refer Schedule Below	32 MPa	32 MPa	32 MPa	32 MPa
Pad Footings, Pile Caps, Strip Footings	50 mm	–	65 mm	–
Columns, Beams	40 mm	40 mm	50 mm	40 mm
Slabs, Walls	20 mm	30 mm	50 mm	40 mm

C3 SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.

C4 NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.

C5 CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED AND USED ONLY WHERE SHOWN OR SPECIFICALLY APPROVED BY THE ENGINEER.

C6 REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY SHOWN IN TRUE PROJECTION.

C7 SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN OR AS OTHERWISE APPROVED BY THE ENGINEER.

C8 WELDING OF REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN OR AS OTHERWISE APPROVED BY THE ENGINEER.

C9 THE CONTRACTOR TO GIVE THE ENGINEER A MINIMUM OF 48 HOURS NOTIFICATION OF HIS INTENTION TO POUR CONCRETE.

C10 ALL REINFORCEMENT SHALL BE SUPPORTED IN ITS CORRECT POSITION DURING CONCRETING BY APPROVED BAR CHAIRS, SPACER OR SUPPORT BARS.

C11 REINFORCEMENT SYMBOLS:
N HOT ROLLED DEFORMED BARS TO AS 1302.
R STRUCTURAL GRADE PLAIN ROUND BAR TO AS 1302.
SL HARD DRAWN STEEL RIBBED WIRE REINFORCING FABRIC TO AS 1304.
THE NUMBER FOLLOWING THE BAR SYMBOL IS THE NOMINAL BAR DIAMETER IN MILLIMETRES.

C12 CONCRETE PROPERTIES SHALL BE AS FOLLOWS:

ELEMENT & LOCATION	GRADE (MPa)
FOOTINGS	N32
CAST INSITU CONCRETE WALLS	N32

C13 THE USE OF CHLORIDE ADDITIVES AND FLY ASH IS EXPRESSLY FORBIDDEN IN ALL CONCRETE.

C14 MINIMUM LAP DISTANCE FOR REINFORCEMENT BARS TO BE 40 TIMES BAR DIAMETER FOR ROUND BAR, AND 50 TIMES BAR DIAMETER FOR DEFORMED BAR

C15 UNLESS OTHERWISE SHOWN, PROVIDE 3-N12 DIAGONAL CORNER BARS 2000 LONG AT ALL RE-ENTRANT CORNERS OF OPENINGS IN SLABS AND WALLS.

C16 FIRE RATING REQUIREMENTS FOR THE STRUCTURE ARE SPECIFIED BY THE ARCHITECT. THE FIRE RATING REQUIREMENTS MAY VARY BETWEEN AREAS AND LEVELS ON THIS PROJECT. BASED ON INFORMATION PROVIDED BY THE ARCHITECT SPECIFIC FIRE COVERS ARE NOTED ON THE DRAWINGS.

C17 ALL CONCRETE ON THIS PROJECT SHALL BE TESTED IN ACCORDANCE WITH AS 3600.

STRUCTURAL STEELWORK NOTES

S1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 4100.

S2 ALL HOT ROLLED SECTIONS ARE TO BE GRADE 300 PLUS.

S3 ALL STRUCTURAL HOLLOW SECTIONS ARE TO BE GRADE 450 MPa.

S4 WELDING SHALL BE PERFORMED BY AN EXPERIENCED OPERATOR IN ACCORDANCE WITH AS 1554, INSPECTED AND CERTIFIED BY A QUALIFIED PERSON AS DESCRIBED IN AS 2214.

S5 THE BOLTING PROCEDURES AND TYPE OF : 4.6/S, 8.8/S, 8.8/TF AND 8.8/TB ARE TO BE IN ACCORDANCE WITH AS 1111 AND AS 1252.

S6 THE CONTRACTOR SHALL PROVIDE AND LEAVE IN PLACE UNTIL PERMANENT BRACING ELEMENTS ARE CONSTRUCTED SUCH TEMPORARY BRACING AS IS NECESSARY TO STABILISE THE STRUCTURE.

S7 PAINTING, AS SPECIFIED BY THE PRINCIPAL, SHALL BE IN ACCORDANCE WITH AS 2312, TO SUIT SITE EXPOSURE CONDITIONS.

S8 EXCEPT WHERE OTHERWISE SHOWN, WELDS ARE TO BE 6 mm (MINIMUM) CONTINUOUS FILLET WELDS. ALL WELDS ARE TO BE STRUCTURAL PURPOSE U.N.O.

S9 UNLESS OTHERWISE SHOWN, PROVIDE SINGLE LINE OF BOLTS CLEATED CONNECTIONS. 10 mm CLEAT PLATE, 6 mm CONTINUOUS FILLET WELD AND M20 8.8/S BOLTS. PROVIDE 2 NO. BOLTS TO MEMBERS 200 mm DEEP & LESS. BOLTS TO ALL OTHER MEMBERS SHALL BE IN ACCORDANCE WITH : A.I.S.C. STANDARDIZED STRUCTURAL CONNECTIONS.

FOOTING NOTES

F1 FOOTINGS ARE TO BE FOUNDED IN ORIGINAL UNDISTURBED GROUND HAVING A SAFE LATERAL BEARING CAPACITIES AS NOTED. BEFORE ANY CONCRETE IS PLACED, THE SAFE BEARING CAPACITY SHALL BE VERIFIED BY A QUALIFIED ENGINEER, OR A REGISTERED BUILDING PRACTIONER. THE CONTRACTOR IS TO ALLOW IN THEIR TENDER PRICE FOR THOSE INSPECTIONS AND REPORTING TO BE UNDERTAKEN BY THEIR GEOTECHNICAL ENGINEER. ALL DOCUMENTATION IS TO BE SUBMITTED TO THE PRINCIPAL WITHIN 48 HOURS OF THE INSPECTION.

F2 THE CONTRACTOR IS TO UNDERTAKE ALL OF THE NECESSARY INVESTIGATIONS TO LOCATE UNDERGROUND SERVICES WITHIN THE SITE OR LIKELY TO BE INFLUENCED BY THE PROPOSED WORKS. THE CONTRACTOR SHALL INFORM THE PRINCIPAL IF ANY SERVICES ARE FOUND PRIOR TO PROCEEDING.

F3 ALL FOUNDATIONS ARE TO BE FREE OF WATER AND LOOSE MATERIAL PRIOR TO POURING ANY CONCRETE.

F4 THE CONTRACTOR IS TO ALLOW FOR ANY ADDITIONAL INVESTIGATIONS, TESTING, ANALYSIS OR ANY OTHER WORK TO BE UNDERTAKEN NECESSARY TO SATISFY THEMSELVES OF THE GROUND CONDITION, SUCH THAT THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALL MATERIAL QUANTITIES AND CONSTRUCTION TECHNIQUES NECESSARY TO ACHIEVE THE MINIMUM SAFE SOIL BEARING PRESSURE NOMINATED.

NOTE RE : STRUCTURAL STEEL GALVANISING

ALL EXPOSED STRUCTURAL STEEL SHALL BE HOT DIPPED GALVANISED IN ACCORDANCE WITH AS/NZS 4680 WITH A MINIMUM ZINC MASS OF 600 g/m² (85 MICRON). ALL GALVANISING DRAIN HOLES ARE TO BE PLUGGED WITH SILICONE SEALANT

ALL SITE WELDING TO GALVANISED STEELWORK SHALL HAVE TWO COATS OF ORGANIC ZINC RICH PAINT AT 50 MICRON (APPROX 350 g/m²) IN ACCORDANCE WITH AS/NZS 3750.9

ALL COLUMNS AND BASE PLATES IN CONTACT WITH THE GROUND ARE TO HAVE A BARRIER COATING APPLIED TO MANUFACTURERS SPECIFICATION (eg. 85 MICRON OR 600 g/m² H.D. GAL OR APPROVED EQUIVALENT)

NOT FOR CONSTRUCTION

TENDER ISSUE

No.	DATE	REMARKS
K	23.08.2023	TENDER ISSUE
J	08.09.2022	TENDER ISSUE
i	03.08.2022	TENDER ISSUE
H	01.08.2022	TENDER ISSUE

ISSUE

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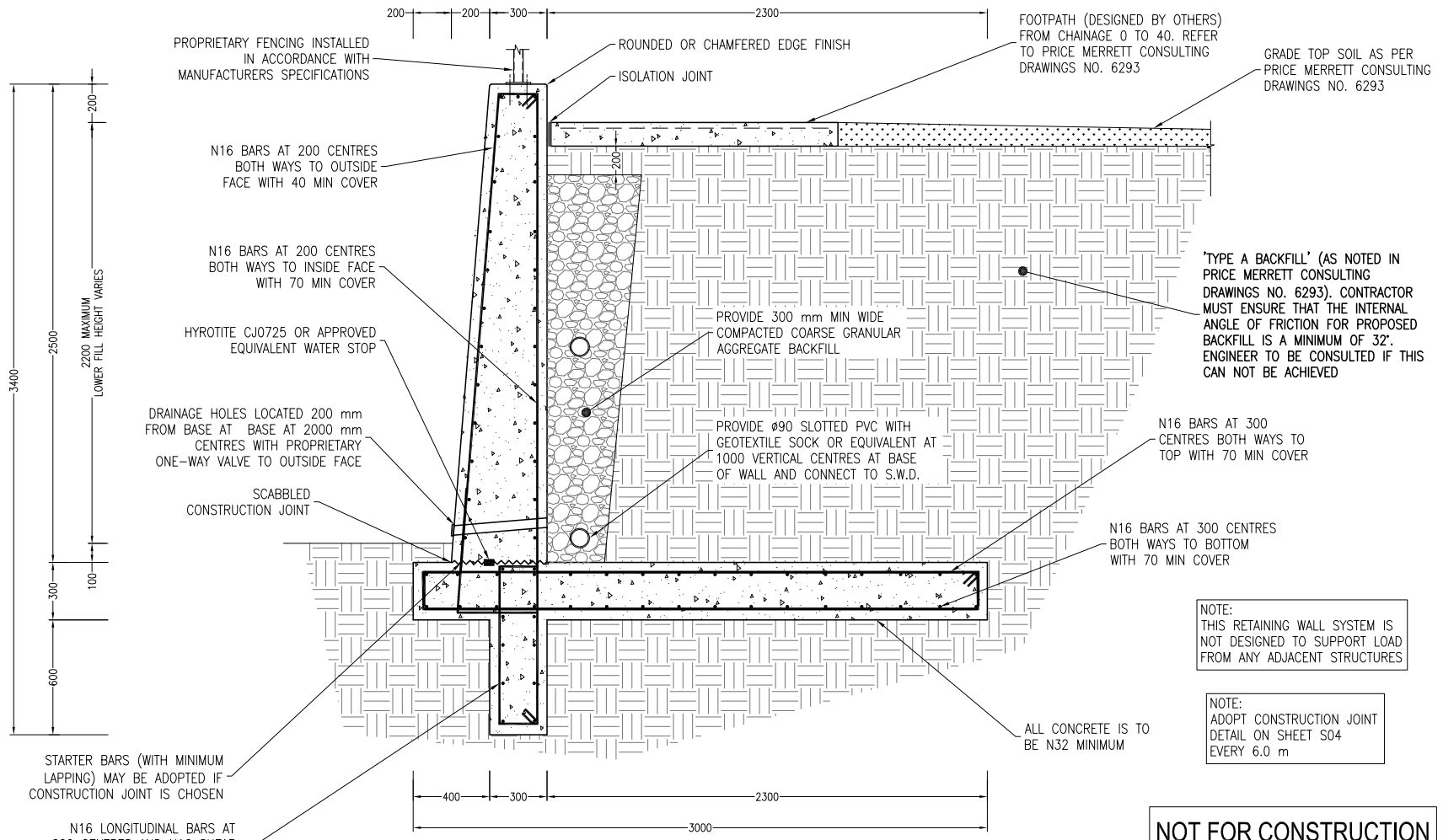
ABN 73 013 147 278

TITLE: GENERAL NOTES

PROJECT: SOUTH ALBURY LEVEE UPGRADE FOR CITY OF ALBURY AT AUS PARK

SCALE: NTS
DATE: AUGUST 2023
DESIGNED: JKG
DRAWN: LMP
DWG. No. 20-5934-S01 (of 5)



CANTILEVER GRAVITY RETAINING WALL – NORTHERN END (TYPE A)

SCALE 1:20

NOT FOR CONSTRUCTION

TENDER ISSUE

No.	DATE	REMARKS
K	23.08.2023	TENDER ISSUE
J	08.09.2022	TENDER ISSUE
i	03.08.2022	TENDER ISSUE
H	01.08.2022	TENDER ISSUE

ISSUE

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ABN 73 013 147 278

TITLE: GRAVITY RETAINING WALL OPTION

PROJECT: SOUTH ALBURY LEVEE UPGRADE FOR CITY OF ALBURY AT AUS PARK

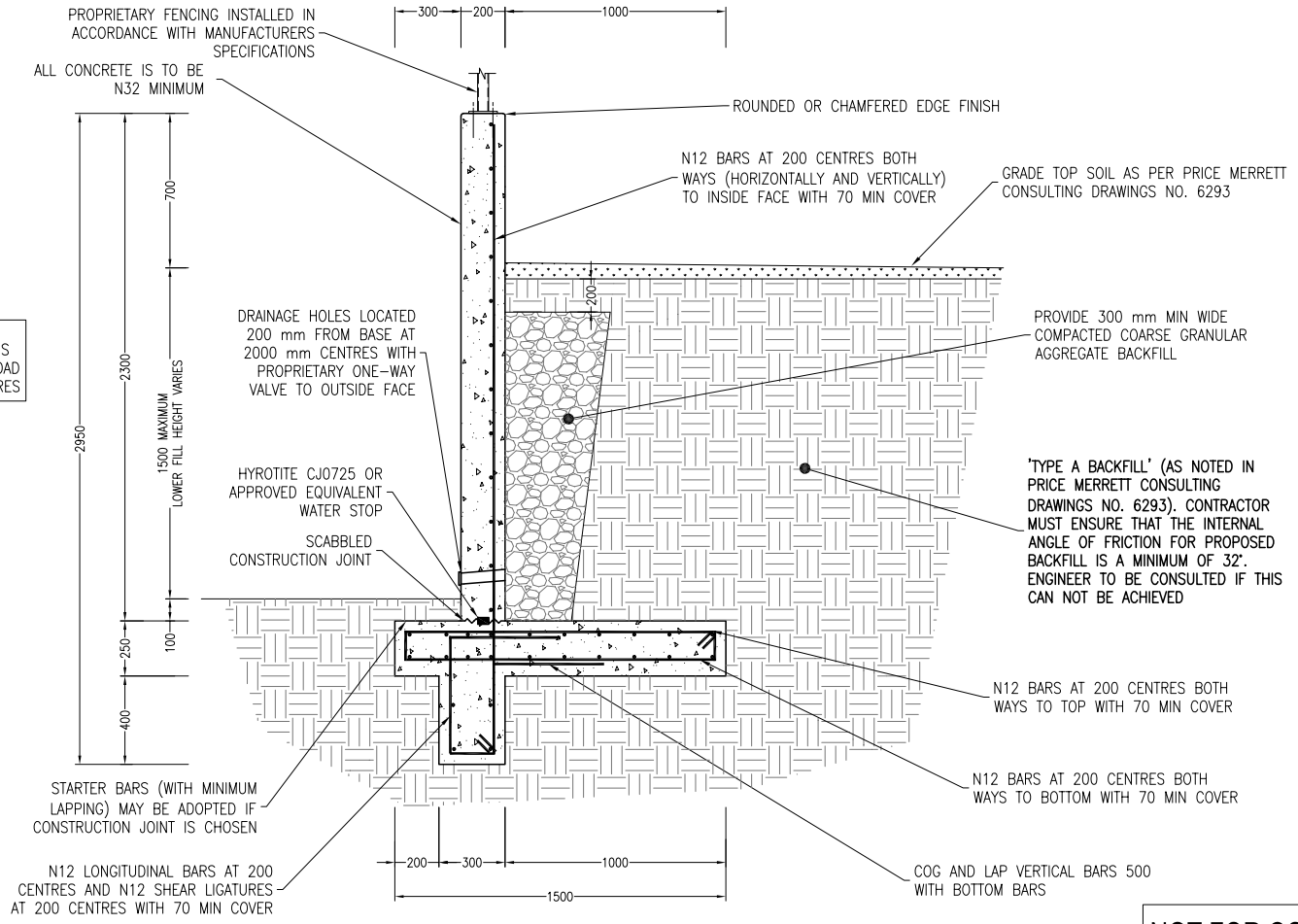
SCALE: AS NOTED (A3)

DATE: AUGUST 2023

DESIGNED: JKG

DRAWN: LMP

DWG. No. 20-5934-S02 (of 5)



NOTE:
THIS RETAINING WALL SYSTEM IS NOT DESIGNED TO SUPPORT LOAD FROM ANY ADJACENT STRUCTURES

NOTE:
ADOPT CONSTRUCTION JOINT DETAIL ON SHEET S04 EVERY 6.0 m

CANTILEVER GRAVITY RETAINING WALL – SOUTHERN END (TYPE B)

SCALE 1:20

NOT FOR CONSTRUCTION

TENDER ISSUE

No.	DATE	REMARKS
K	23.08.2023	TENDER ISSUE
J	08.09.2022	TENDER ISSUE
i	03.08.2022	TENDER ISSUE
H	01.08.2022	TENDER ISSUE

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ABN 73 013 147 278

TITLE: GRAVITY RETAINING WALL OPTION

PROJECT: SOUTH ALBURY LEVEE UPGRADE FOR CITY OF ALBURY AT AUS PARK

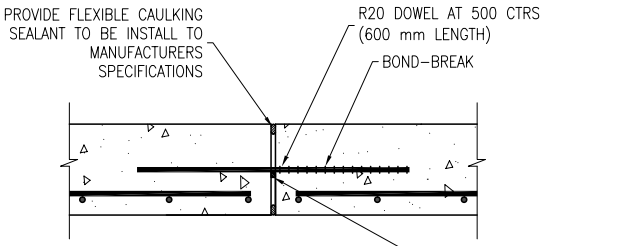
SCALE: AS NOTED (A3)

DATE: AUGUST 2023

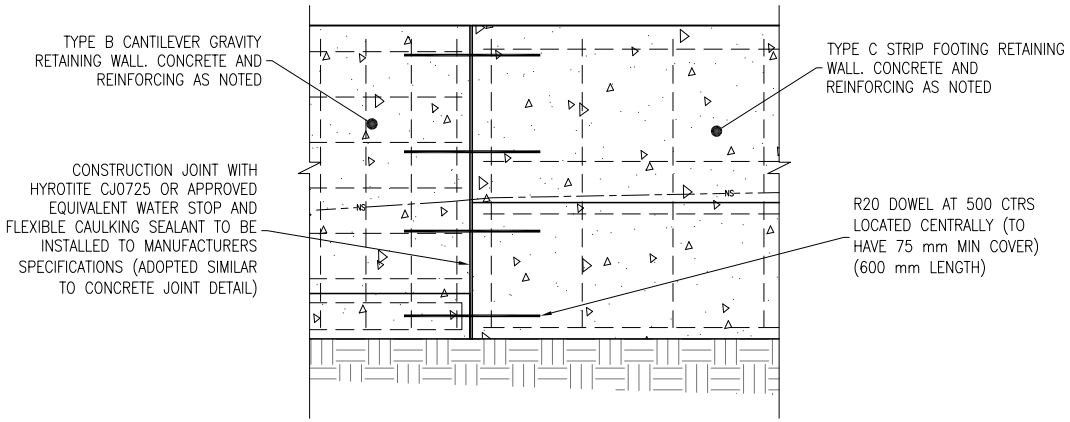
DESIGNED: JKG

DRAWN: LMP

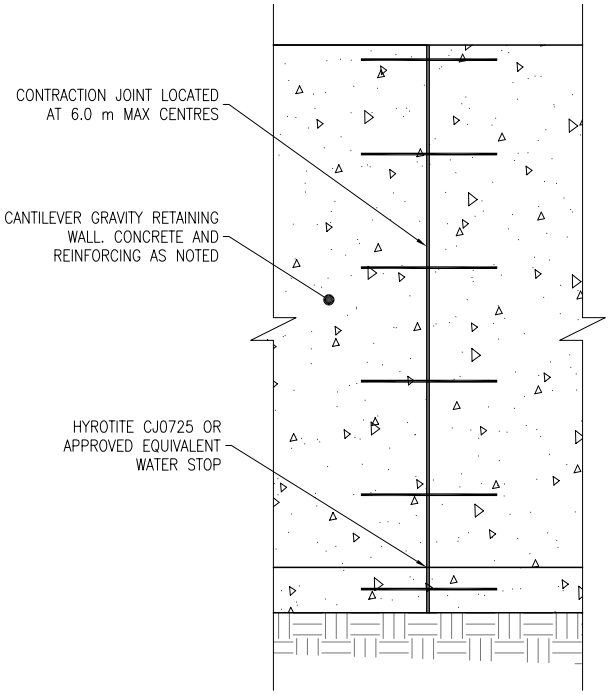
DWG. No. 20-5934-S03 (of 5)



CONCRETE JOINT DETAIL
SCALE 1:10



CANTILEVER GRAVITY RETAINING WALL AND STRIP FOOTING RETAINING WALL CONNECTION DETAIL
SCALE 1:20



CONCRETE CONTRACTION JOINT
SCALE 1:20

NOT FOR CONSTRUCTION

TENDER ISSUE

No.	DATE	REMARKS
K	23.08.2023	TENDER ISSUE
J	08.09.2022	TENDER ISSUE
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ISSUE		

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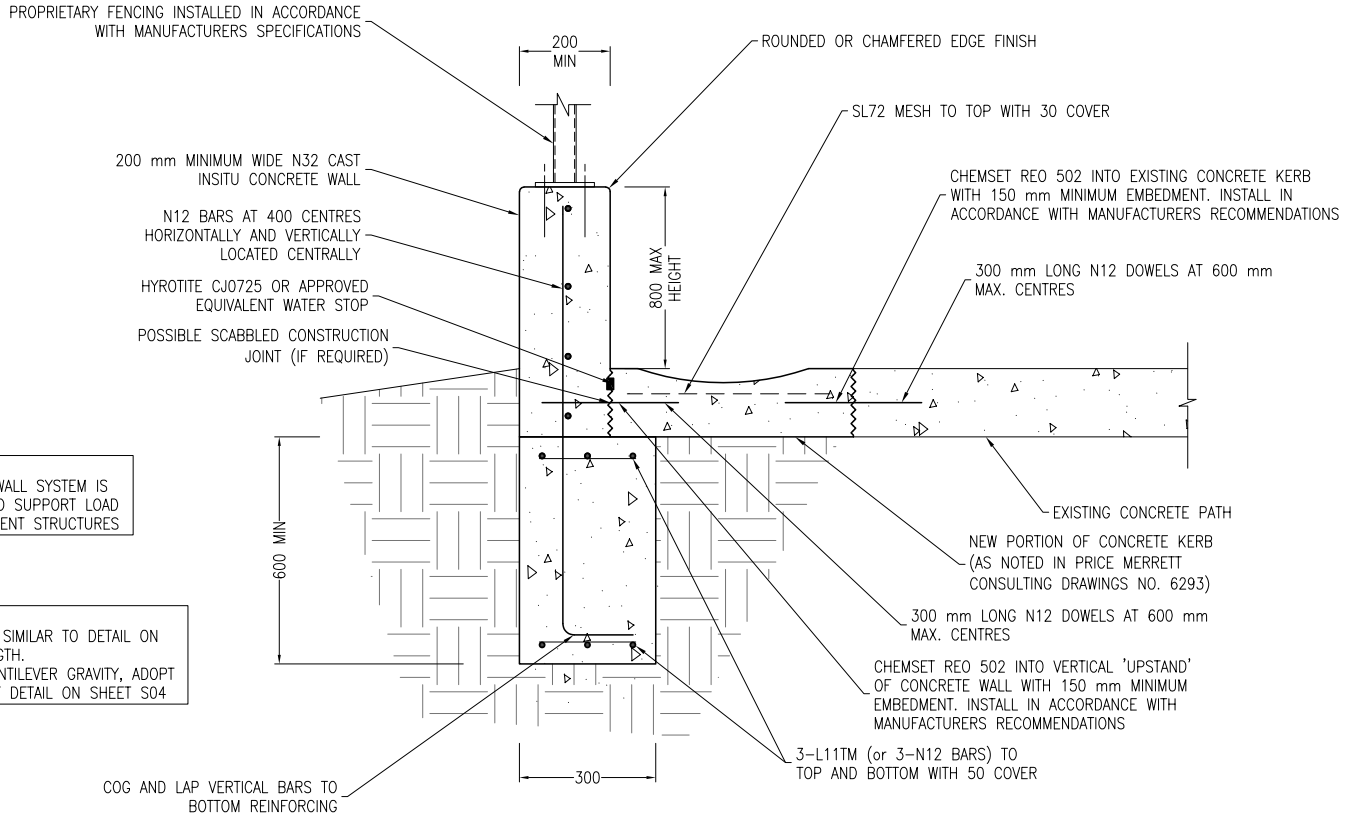
ABN 73 013 147 278

TITLE: CANTILEVER GRAVITY WALL DETAIL

PROJECT: SOUTH ALBURY LEVEE UPGRADE FOR CITY OF ALBURY AT AUS PARK

SCALE	AS NOTED (A3)
DATE	AUGUST 2023
DESIGNED	JKG
DRAWN	LMP
DWG. No.	20–5934–S04 (of 5)



NOTE:
THIS RETAINING WALL SYSTEM IS NOT DESIGNED TO SUPPORT LOAD FROM ANY ADJACENT STRUCTURES

NOTE:
ADOPT CONCRETE JOINT SIMILAR TO DETAIL ON SHEET S04 AT MID-LENGTH.
FOR CONNECTION TO CANTILEVER GRAVITY, ADOPT SIMILAR CONCRETE JOINT DETAIL ON SHEET S04

CAST INSITU CONCRETE WALL WITH STRIP FOOTING (TYPE C)

SCALE 1:10

NOT FOR CONSTRUCTION

TENDER ISSUE

No.	DATE	REMARKS
K	23.08.2023	TENDER ISSUE
J	08.09.2022	TENDER ISSUE
i	03.08.2022	TENDER ISSUE
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ABN 73 013 147 278

TITLE: CAST INSITU CONCRETE WALL DETAIL

PROJECT: SOUTH ALBURY LEVEE UPGRADE FOR CITY OF ALBURY AT AUS PARK

SCALE: AS NOTED (A3)

DATE: AUGUST 2023

DESIGNED: JKG

DRAWN: LMP

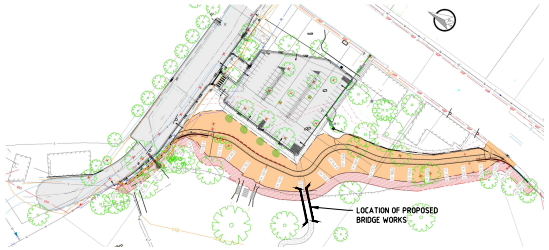
DWG. No. 20-5934-S05 (of 5)

PROPOSED PEDESTRIAN BRIDGE FOR ALBURY CITY COUNCIL AT AUSTRALIA PARK ALBURY, NSW

PROJECT NO. 21191

STRUCTURAL DRAWINGS		
DRG. No	TITLE	REVISION
S01	CONSTRUCTION NOTES	REV-C1
S02	PLAN, ELEVATION & SECTIONS	REV-C1
S03	PILE SETOUT	REV-C1
S04	ABUTMENT CONCRETE	REV-C1
S05	ABUTMENT REINFORCEMENT	REV-C1
S06	DECK & GIRDER DETAILS	REV-C1
S07	BARRIER DETAILS	REV-C1

WRIGHT CONSULTING ENGINEERS
STRUCTURAL | CIVIL | BRIDGES



SITE PLAN
N.T.S.

NOTE:
THESE PLANS HAVE BEEN PREPARED EXCLUSIVELY FOR THE CLIENT AND FOR THE PURPOSE DOCUMENTED.
ANY OTHER PERSON WHO USES OR RELIES ON THESE PLANS WITHOUT THE WRITTEN CONSENT DOES SO AT THEIR OWN RISK AND NO RESPONSIBILITY IS ACCEPTED BY THIS CONSULTANCY.

GENERAL

G1. IN RESPECT TO THESE DOCUMENTS THE RESPONSIBLE PARTIES WILL BE DEFINED AS FOLLOWS:
- CLIENT: ALBURY CITY COUNCIL
- CONTRACTOR: T.B.C.

G2. THESE DOCUMENTS REMAIN THE PROPERTY OF THE ENGINEERS UNTIL ALL ASSOCIATES FEES/COSTS ARE PAID IN FULL AND ARE SUBJECT TO COPYRIGHT CONDITIONS. ENGINEERS DOCUMENTS ARE NOT TO BE REPRODUCED IN FULL OR PART WITHOUT WRITTEN APPROVAL OF THE ENGINEERS.

G3. THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL CURRENT WORK HEALTH AND SAFETY REGULATIONS ON SITE.

G4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING BOTH EXISTING AND NEW STRUCTURES IN A STABLE CONDITION AND ENSURING THAT NO PART IS OVER STRESSED DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY WORKS AND MUST CONSULT THE ENGINEER FOR ADVICE IF UNSURE PRIOR TO STARTING THE WORKS.

READING AND RECORDING DOCUMENTATION

G5. DO NOT SCALE FROM DRAWINGS.

G6. SET OUT DIMENSIONS ARE TO BE CHECKED ON SITE AND CONFIRMED BY A LICENSED SURVEYOR.

G7. THE CONTRACTOR SHALL RECORD DETAILS OF ALL VARIATIONS AND BE RESPONSIBLE FOR PRODUCING AS CONSTRUCTED DRAWINGS IN ELECTRONIC FORMAT AT THE COMPLETION OF THE WORKS.

G8. UNLESS NOTED OTHERWISE LEVELS ARE IN METRES AND DIMENSIONS ARE IN MILLIMETRES.

G9.

ABBREVIATION LEGEND

AS	AUSTRALIAN STANDARD	FFL	FINISHED FLOOR LEVEL
BOT	BOTTOM	FSBW	FULL STRENGTH BUTT WELD
C/C	CENTRE TO CENTRE	GALV	GALVANISED
CL	CENTRE LINE	HORIZ	HORIZONTAL
CPW	CONTINUOUS FILLET WELD	KDHW	KILN DRIED HARD WOOD
CP	CAST IN PLATE	NTS	NOT TO SCALE
COL	COLUMN	RC	REINFORCED CONCRETE
CONC	CONCRETE	RL	REDUCED LEVEL
CONT	CONTINUOUS	TBC	TO BE CONFIRMED
COS	CONFIRM ON SITE	TYP	TYPICAL
E	EXPANSION BEARING	UNO	UNLESS NOTED OTHERWISE
F	FIXED BEARING	VERT	VERTICAL
FCR	FINE CRUSHED ROCK	WPM	WATER PROOF MEMBRANE

G10. DETAIL AND SECTION IDENTIFICATION

1A <--- DETAIL 1 ON SECTION A

S01 <--- DRAWING NUMBER

INSPECTIONS

G11. THE ENGINEER IS RESPONSIBLE FOR PERFORMING MONITORING INSPECTIONS ONLY, AND NOT SITE SUPERVISION OF THE WORKS WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR IS TO PROVIDE THE SUPERINTENDENT/ENGINEER WITH 2 DAYS MINIMUM NOTICE TO ENABLE INSPECTION AT THE FOLLOWING CRITICAL STAGES AS PER RMS SPECIFICATIONS:
- COMPLETION OF PILING
- PRIOR TO CONCRETE POURS - ALL REINFORCEMENT AND FIXINGS IN PLACE
- PRIOR TO CONCRETE POURS - PRECAST
- COMPLETION OF STRUCTURAL STEEL
- COMPLETION OF BEARING PADS
- COMPLETION OF SCOUR PROTECTION
- COMPLETION OF BARRIER
- FINAL

G12. IF THE CLIENT REQUIRES FULL SIGN OFF UPON COMPLETION OF WORKS THEN AN ENGINEER WILL NEED TO INSPECT ALL CRITICAL ELEMENTS. TO BE DETERMINED PRIOR TO COMMENCING WORKS AS AN INSPECTION TEST PLAN

G13. OBTAIN ENGINEERS APPROVAL OF ALL FOUNDATIONS PRIOR TO CONCRETING, GROUTING, BACKFILLING ETC.

SUBSTITUTIONS

G14. OBTAIN APPROVAL FOR SUBSTITUTIONS PRIOR TO MANUFACTURING/BUILDING. ANY COST VARIATION ISSUES TO BE REFERRED TO THE SUPERINTENDENT. ANY SUBSTITUTION OF MATERIALS SHALL BE APPROVED BY THE ENGINEER.

G15. DRAWING AMENDMENTS AND/OR PROJECT DOCUMENTS ISSUED BY ENGINEERS DURING THE COURSE OF BIL WORKS IS NOT AN AUTHORITY FOR A VARIATION AND/OR EXTENSION OF THE CLAIM. ENGINEERS WILL NOT BE LIABLE FOR ANY LOSS/ CLAIM ETC WHICH OCCURS AS A RESULT OF ANY PARTY NOT COMPLYING WITH THE REQUIREMENTS OF THESE DOCUMENTS AND ASSOCIATED REQUIREMENTS OF AUSTRALIAN REGULATIONS.

SERVICES

G16. CONTRACTOR IS TO PROCURE, IDENTIFY AND LOCATE ALL SERVICES THAT MAY AFFECT THE WORKS PRIOR TO COMMENCEMENT ON-SITE. CONTRACTOR SHALL ALLOW FOR THE CUTTING, SEALING, ALTERATIONS ETC TO NEW AND EXISTING SERVICES TO SUIT THE NEW WORKS WHETHER NOTED ON THE DRAWINGS OR NOT. ALL PLUMBING WORK SHALL BE INSTALLED WITH FLEXIBLE CONNECTIONS TO PERMIT RELATIVE MOVEMENT OF SLABS. FOOTINGS SHALL BE THICKENED WHERE WASTE PIPES ARE EMBEDDED IN THE ELEMENT TO PROVIDE A SECTION OF EQUIVALENT STRENGTH

MOVEMENTS

G17. BRIDGE STRUCTURES ARE SUBJECT TO MOVEMENTS AS A RESULT OF DEFLECTIONS, TEMPERTURE, SHRINKAGE, CREEP, SETTLEMENTS ETC AND MAY EXPERIENCE DAMAGE AS A RESULT OF THESE MOVEMENTS. CONTRACTOR ARE TO BE AWARE OF THESE MOVEMENTS AND INCORPORATE TOLERANCES INTO THEIR WORK.

G18. ALLOW, IN FIXINGS TO STRUCTURE, FOR LONG TERM DEFLECTION OF SLABS AND BEAMS.

DESIGN CRITERIA

STANDARDS

D1. ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH THE LATEST AUSTRALIAN STANDARD CODES, BUILDING CODES AND AUTHORITY REQUIREMENTS.
- AS 1163 COLD-FORMED STRUCTURAL STEEL HOLLOW SECTIONS.
- AS/NSZ 1170 STRUCTURAL DESIGN ACTIONS.
- AS 1289 METHODS OF TESTING SOILS FOR ENGINEERING PURPOSES.
- AS 1428 DESIGN FOR ACCESS AND MOBILITY.
- AS 1554 WELDING OF STEEL STRUCTURES.
- AS 2159 PILING DESIGN & INSTALLATION.
- AS 3610 FORMWORK FOR CONCRETE.
- AS 3798 GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS.
- AS 3850 TILT-UP CONCRETE CONSTRUCTION.
- AS 4671 STEEL REINFORCING MATERIALS.
- AS 4678 EARTH RETAINING STRUCTURES.
- AS 5100 BRIDGE DESIGN CODE.

DESIGN LOADINGS

D2. BRIDGE DESIGN STANDARD- AS5100-2017.

D3. DESIGN LOAD- L-T7 MAINTENANCE VEHICLE

D4. PEDESTRIAN LOAD- 5 kPa

D5. WIND LOAD (TO AS1170.2-2017 AND AS11702-2011)
- REGION A1
- TERRAIN CATEGORY 3
- V2000 = 46 m/s (ULS BASIC DESIGN WIND SPEED)
- V20 = 37 m/s (SLS BASIC DESIGN WIND SPEED)

D6. WATER FLOW FORCES
- ARI 100
- DESIGN VELOCITY = 0.42m/s @ SLS (WORST CASE)
- DEPTH OF DEBRIS MAT = 1.6 m

DESIGN REFERENCES

DR1. GEOTECHNICAL REPORT BY AITKEN ROWE TESTING LABORATORIES REPORT NO. RS-302 DATED 24/08/2016

DR2. SURVEY BY ALBURY CITY COUNCIL

DR3. BRIDGE HYDRAULIC INFORMATION BY ALBURY CITY COUNCIL

TEMPORARY WORKS

GENERAL

W1. THE CONSULTING ENGINEER HAS NOT DESIGNED AND IS NOT RESPONSIBLE FOR STRUCTURAL ELEMENTS OTHER THAN THOSE SHOWN ON THE ENGINEERING DRAWINGS.

W2. NO STRUCTURAL ELEMENTS ARE TO BE PENETRATED, NOTCHED OR CHASED WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

W3. THE ENGINEER HAS DESIGNED THE PERMANENT STRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN, IMPLEMENTATION AND CERTIFICATION OF ALL TEMPORARY WORKS, PROPPING, BRACING, FALSE WORK, BRACING, BACK-PROPPING, AND SO FORTH, NECESSARY TO COMPLETE THE WORK.

W4. DESIGN AND INSTALLATION OF ALL TEMPORARY WORKS AND PROCEDURES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. IN ADDITION, THE CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED TO ADJOINING BUILDINGS AND INFRASTRUCTURE DURING THE INSTALLATION OF THE TEMPORARY WORKS AND THE PERMANENT WORKS. ANY TEMPORARY WORK DETAILS/PROCEDURES GIVEN IN THESE DRAWINGS ARE FOR THE GUIDANCE OF THE CONTRACTOR ONLY.

W5. THE CONTRACTOR IS TO ENSURE THAT THE GROUND CONDITIONS AND NATURE OF ADJACENT FOOTINGS ARE WELL UNDERSTOOD PRIOR TO COMMENCING WORKS AND IS TO REFER TO THE GEOTECHNICAL REPORT IF AN INVESTIGATION HAS BEEN CARRIED OUT.

W6. WORKS NEAR OR OVER THE BOUNDARY HAVE POTENTIAL TO CAUSE MINOR SETTLEMENTS OR MOVEMENTS IN ADJACENT STRUCTURES. UNLESS DILAPIDATION REPORTS HAVE BEEN ALREADY BEEN CARRIED OUT, THE CONTRACTOR IS TO CARRY OUT DILAPIDATION REPORTS ON ADJACENT PROPERTY AND STRUCTURES AND IS TO PROVIDE COPIES TO THE RELEVANT OWNERS AND AUTHORITIES. ANY DAMAGE CAUSED BY THE WORKS TO ADJACENT PROPERTY OR STRUCTURES IS TO BE REPAIRED BY THE CONTRACTOR AT THEIR EXPENSE.

W7. SHOULD UNFORESEEN CIRCUMSTANCES ARISE THAT JEOPARDISE THE STABILITY OF THE WORKS THE CONTRACTOR IS TO STOP WORK, MAKE SAFE, AND THEN OBTAIN FURTHER INSTRUCTION FROM THE ENGINEER.

FOUNDATIONS

SUB-GRADE PREPARATION

F1. THE GROUND AROUND THE FOUNDATION FOR A MINIMUM 15m MUST BE WELL DRAINED BY GRADING THE SURFACE AWAY FROM THE FOUNDATION INTO DRAINS WHICH CONVEY THE WATER AWAY FROM THE SITE. WHERE WATER SEEPAGE IS A PROBLEM, SUB-SURFACE DRAINS ARE TO BE PROVIDED AROUND THE HIGH SIDE TO A DEPTH NOT LESS THAN 450mm. CONSULT ENGINEER FOR DETAILS.

F2. SOIL AND BUILDING MATERIAL REMOVED OFF SITE MUST BE DONE IN ACCORDANCE WITH THE CURRENT EPA GUIDELINES.

F3. PRIOR TO PLACEMENT OF ANY FILLING, PROOF ROLL THE EXPOSED SUBGRADE WITH A SMOOTH DRUM ROLLER OF AT LEAST 10 TONNES STATIC DEADWEIGHT CAPACITY FOLLOWED BY INSPECTION BY A GEOTECHNICAL ENGINEER AFTER A MINIMUM OF SIX PASSES OF THE ROLLER.

F4. DO NOT USE COMPACTION METHODS WHICH MAY CAUSE DAMAGE TO ADJACENT STRUCTURES. SELECTION OF METHODS SHALL BE THE CONTRACTORS RESPONSIBILITY.

F5. ANY SOFT SPOT OR LOOSE AREAS SHALL BE REMOVED AND BACKFILLED WITH SELECTED FILL MATERIAL OR AS DIRECTED BY THE SUPERINTENDENT AND COMPACTED AS SPECIFIED.

F6. FILL SHALL BE PLACED AND COMPACTED AS FOLLOWS IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND UNLESS NOTED OTHERWISE:
- TO A DRY DENSITY RATIO 100% STANDARD MAX DRY DENSITY
- WITH A MOISTURE CONTENT BETWEEN 2% DRY AND 3% WET OF OMC.
- THE FINAL SURFACE IS TO BE COVERED WITH EITHER TEMPORARY LOOSE SOIL LAYER OR CLOSE A GRANULAR SUB-BASE LAYER TO PREVENT DRYING OUT PRIOR TO ROAD CONSTRUCTION IN DRY PERIODS.

F7. IF SUBGRADE OR FILL IS TOO WET TO ACHIEVE COMPACTION, SCARIFY AND WORK MATERIAL UNTIL IT HAS DRIED.

F8. ALLOW FOR AT LEAST 3 SUCCESSFUL COMPACTION TESTS PER LAYER. CONFIRM WITH GEOTECHNICAL ENGINEER.

F9. WE SUPPORT THE USE OF CONTAMINANT FREE RECYCLED CONCRETE OR BRICK IN LIEU OF CRUSHED ROCK IN APPROPRIATE CIRCUMSTANCES. CONFIRM WITH GEOTECHNICAL ENGINEER.

FOOTINGS

F10. ALL STRIP AND PAD FOOTINGS THROUGHOUT TO BE FOUNDED A MIN. OF 350mm INTO THE APPROVED FOUNDING MATERIAL. THE CONTRACTOR SHALL REPORT ANY INCONSISTENCIES BETWEEN THE SOIL REPORT AND SITE CONDITIONS TO THE ENGINEER. ALTERNATIVELY, FOOTINGS MAY BE EXTENDED TO THIS DEPTH USING 20MPa CONCRETE BLINDING TAKEN INTO THE FOUNDING MATERIAL AS SPECIFIED.

F11. FOOTINGS TO BE CONSTRUCTED AND BACKFILLED AS SOON AS POSSIBLE FOLLOWING EXCAVATION TO AVOID EXPOSURE AND DRYING OUT BY EXPOSURE.

F12. FOOTING LEVELS, WHERE SHOWN, ARE ESTIMATES ONLY AND NEED TO BE VERIFIED DURING CONSTRUCTION.

F13. TRENCH WALLS ARE TO BE VERT STRAIGHT AND VERTICAL. TRENCH BOTTOMS TO BE CLEAN BEFORE AND AFTER VAPOUR BARRIER AND REINFORCEMENT IS PLACED.

F14. UNLESS NOTED OTHERWISE BY THE SUPERINTENDENT, THE LIMITATIONS OF EXCAVATIONS NEAR FOOTINGS ARE AS FOLLOWS:



F15. SERVICE PENETRATIONS SHALL BE PERMITTED THROUGH THE MIDDLE THIRD OF THE FOUNDING BEAMS, PROVIDED REINFORCEMENT COVER IS MAINTAINED. PENETRATIONS SHALL HAVE FLEXIBLE CONNECTIONS WHERE THEY ENTER THE BUILDING.

F16. LOCATE FOOTINGS CENTRALLY UNDER WALLS AND COLUMNS UNLESS OTHERWISE DETAILED.

F17. DO NOT ALLOW EXCAVATED MATERIAL TO STOCKPILE WITHIN 1.5m OF FOOTING TRENCHES OR PITS. MATERIAL HAS A TENDENCY TO FALL INTO FOOTING TRENCHES BEFORE OR DURING CONCRETE PLACEMENT.

F18. WATER SHALL NOT BE ALLOWED TO POND IN TRENCHES.

F19. ALL EXTERNAL FINISHED GROUND TO COMPRISE OF AN IMPERMEABLE MATERIAL FALLING AWAY FROM THE FOOTINGS.

F20. ALL SOILS ARE AFFECTED BY WATER. SILTS ARE WEAKENED BY WATER AND SOME SANDS CAN SETTLE IF HEAVILY WATERED, BUT MOST PROBLEMS ARISE ON CLAY FOUNDATIONS. CLAYS SWELL AND SHRINK DUE TO CHANGES IN MOISTURE CONTENT AND THE POTENTIAL AMOUNT OF THE MOVEMENT IS DOCUMENTED IN THE AUSTRALIAN STANDARD AS2870.
ALL SITES SHALL BE MAINTAINED AT ESSENTIALLY STABLE MOISTURE CONDITIONS AND EXTREMES OF WETTING AND DRYING PREVENTED. THIS WILL REQUIRE ATTENTION TO:
- DRAINAGE OF THE SITE IN ACCORDANCE WITH THESE NOTES- THE SITE DRAINAGE REQUIREMENTS SHALL BE MAINTAINED FOR THE LIFE OF THE BRIDGE.

EPOXY GROUT

EG1. WHERE EPOXY GROUTS ARE INDICATED ON THE DRAWINGS, UNLESS SPECIFIED OTHERWISE, THE CONTRACTOR IS TO USE A PROPRIETARY PRODUCT SUPPLIED BY EITHER RAWSET, HILTI, EPIREZ, SIKA, MBT OR EQUIPHOR THAT IS SUITABLE FOR THE PURPOSE.

EG2. THE CONTRACTOR SHALL CONSULT WITH THE SUPPLIER AND REFER TO THEIR SPECIFICATIONS TO DETERMINE SUITABILITY AND METHOD OF PREPARATION AND INSTALLATION.

EG3. UNLESS SPECIFIED OTHERWISE, ADHESIVE AND GROUTS SHALL BE LOW SHRINK WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 40MPa AND SHALL BE SUITABLE FOR THE ENVIRONMENT IN WHICH THEY WILL BE USED AND BE COMPATIBLE WITH THE SUBSTRATE TO WHICH THEY WILL BE APPLIED.

SAFETY

SA1. A MATERIAL SAFETY DATA SHEET FOR ALL CHEMICALS TO BE USED, MUST BE PRESENTED PRIOR TO THE CHEMICAL USE ON SITE.

SA2. IDENTIFY AND LOCATE ALL SERVICES PRIOR TO ANY EXCAVATION.

SA3. ALL MATERIALS HANDLING EQUIPMENT SHOULD BE FITTED WITH VOICE OVER PROTECTION, REVERSING BEEPERS AND SEAT BELTS.

SA4. WORK AREAS MUST BE KEPT CLEAN AND TIDY AND OTHER HAZARDS CLEANED UP PROMPTLY.

SA5. ALL PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN AT ALL TIMES.

SA6. NO MACHINERY, HAND TOOLS, OR ANY OTHER TYPE OF EQUIPMENT IS TO BE OPERATED WITHOUT EFFECTIVE GUARDS.

SA7. VICROADS, RMS & SRA SAFETY REQUIREMENTS REGARDING WORK ADJACENT TO ROADWAYS & RAIL LINES AND OVERHEAD WIRES TO BE FOLLOWED.

SA8. ALL ASBESTOS TO BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH WORKCOVER REQUIREMENTS.

SA9. ALL ELECTRICAL EQUIPMENT TO BE TAGGED AND POWER CABLES TO BE ELEVATED OFF FLOOR.

SA10. REMAINING POWER POLES SHALL BE ADEQUATELY HIGHLIGHTED AND AN EXCLUSION ZONE INSTALLED.

SA11. PROVIDE PROTECTION TO PREVENT FALLS DOWN EXISTING PITS, EMBANKMENTS ETC.

SA12. ALL PEDESTRIAN ACCESS WAYS MUST BE CLEAN & TIDY AT ALL TIMES.

SA13. ALL VEHICLES ENTERING AND LEAVING THE SITE SHOULD BE CAUTIOUS OF THE SURROUNDING TRAFFIC AND PEDESTRIANS.

SA14. ALL HOARDINGS AND FENCES MUST BE WELL MAINTAINED.

SA15. ALL WORK PRACTICES MUST BE APPROVED BY THE RELEVANT SUPERVISOR AND HEAD CONTRACTOR BEFORE THE WORK COMMENCES.

SA16. ENSURE ALL STARTER BARS ARE CAPPED TO PREVENT INJURY TO PERSONS AND TO ADEQUATELY PROTECT AGAINST CORROSION.

SA17. COVER ALL PIER AND FOOTING EXCAVATIONS IMMEDIATELY IF THERE IS A DELAY IN CONCRETING.

CONCRETE

CONCRETE QUALITY

C1. ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH AS 5100

C2. CONCRETE SHALL BE READY MIXED BY AN APPROVED SUPPLIER AS BELOW:

ELEMENT	MIN. F'C AT 28 DAYS (MPa)	MIN. COVER (mm)
ABUTMENTS/WING WALLS:	40	65 #
FOOTPATH	32	35
DECK:	32	35

- PRECAST ELEMENTS REQUIRE RIGID FORMWORK AND INTENSE COMPACTION
#- ADD 10mm IF PROTECTED BY DAMP PROOF MEMBRANE OR 30mm IF CAST AGAINST GROUND

C3. THE MIX DESIGN WITH THE 7 AND 28 DAYS TARGET STRENGTHS AND THE BASIC SHRINKAGE STRAIN AT 56 DAYS SHALL BE SUBMITTED FOR REVIEW PRIOR TO POURING ANY CONCRETE. ALL CONCRETE IN CONTACT WITH AGGRESSIVE SOIL SHALL HAVE SULPHATE RESISTING CEMENT OR 0.4mm SUPER FORTECON MEMBRANE AS A MINIMUM.

PLACEMENT & CURING

C4. THE MAXIMUM PERMISSIBLE TEMPERATURE OF ANY CONCRETE MIX AT POINT OF PLACEMENT SHALL BE 30 DEGREES CENTIGRADE.

C5. DO NOT USE ADMIXTURES UNLESS APPROVED BY THE ENGINEER.

C6. COMPACT CONCRETE USING APPROVED INTERNAL VIBRATORS, EXCEPT FOR CAVITY FILL WHICH SHALL BE ROODED.

C7. CURING OF ALL CONCRETE TO BE ACHIEVED BY KEEPING SURFACES CONTINUOUSLY WET FOR A PERIOD OF 3 DAYS, AND PREVENTION OF LOSS OF MOISTURE FOR A TOTAL OF 7 DAYS FOLLOWED BY A GRADUAL DRYING OUT. APPROVED SPRAYED OR CURING COMPOUNDS MAY BE USED. POLYTHENE SHEETING OR WET HESSIAN MAY BE USED IF PROTECTED FROM WIND AND TRAFFIC AND KEPT WET.

C8. SLABS LESS THAN 48 HOURS OLD SHALL NOT BE TRAFFICKED EXCEPT TO CARRY OUT CURING. SLABS LESS THAN 4 DAYS OLD SHALL NOT BE LOADED.

C9. TEST CONCRETE FOR STRENGTH AND FORWARD COPIES OF TEST RESULTS TO THE ENGINEER.

C10. FREE DROPPING OF CONCRETE FROM A HEIGHT GREATER THAN 1500mm IS NOT PERMITTED.

TOLERANCES & FINISHES

C11. THE TOLERANCE CLASSES TO UNFORMED CONCRETE SURFACES DETERMINED BY A STRAIGHT EDGE PLACED ANYWHERE ON THE SURFACE IN ANY DIRECTION ARE TO CONFORM TO AS3610.

C12. CONCRETE FINISHES TO COMPLY WITH AS 3610 AS FOLLOWS:
- FOOTINGS - CLASS 5 (BELOW GROUND)
- SLABS, COLUMNS, WALLS - CLASS 2
- PRECAST - CLASS 2
- DECK - CLASS 2 (BROOM FINISH)

C13. THE FINISHED CONCRETE IS TO BE A DENSE HOMOGENEOUS MASS, COMPLETELY FILLING THE FORMWORK, THOROUGHLY EMBEDDING THE REINFORCEMENT, AND FREE FROM STONE POCKETS.

SETOUT

C14. NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.

C15. CONDUITS AND PIPES WHEN CAST IN SLAB AND WALLS ARE TO BE PLACED BETWEEN THE TWO REINFORCEMENT LAYERS. IN WALLS, WHEN THERE IS ONLY 1 LAYER OF REINFORCEMENT, PROVIDE 50mm COVER TO CONDUIT. THE CONDUIT LOCATIONS ARE TO BE APPROVED BY THE ENGINEER.

C16. USE TEMPLATES TO LOCATE ALL BOLTS.

C17. CAST CONCRETE TO SLAB CONSTRUCTION JOINTS SHOWN ON DRAWINGS OR OTHERWISE APPROVED BY THE ENGINEER, IN A HIT AND MISS PATTERN.

C18. ALL COMPONENTS CAST AND INSTALLED IN CONCRETE

C19. SAW CUT JOINTS, AS NOMINATED, SHALL BE CUT WITHIN 24 HOURS OF POUR.

C20. EXPOSED CORNERS TO BE CHAMFERED 20mm ACROSS. U.N.O.

FORMWORK

GENERAL

FW1. FORMWORK SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH AS3610, REFER TO SPECIFICATIONS FOR CLASS OF FINISH.

FW2. CONSTRUCTION SUPPORT PROPPING IS TO REMAIN IN PLACE WHERE NEEDED TO AVOID OVER STRESSING THE STRUCTURE DUE TO CONSTRUCTION LOADING. REMOVE ALL PROPS FROM BEAMS AND SLABS PRIOR TO LAYING MASONRY OVER.

FW3. PROVIDE UPWARD CAMBER TO FORMWORK OF REINFORCED CONCRETE CANTILEVERS OF 5mm PER 1000 OF THE PROJECTION BEYOND COLUMN OR WALL FACE, AND TO FORMWORK OF SLABS WHERE SHOWN ON PLANS. MAINTAIN SLAB AND BEAM DEPTHS AS SHOWN. PROVIDE 0mm PRE-CAMBER TO POST TENSIONED SLABS UON ON PLANS.

FW4. ENSURE ALL DEBRIS ARE REMOVED FROM FORMWORK PRIOR TO CONCRETING.

FW5. BACK PROP SLABS AND BEAMS TO ENGINEERS APPROVAL FOR A MINIMUM OF 28 DAYS AFTER CASTING. BACK PROPPING TIMES MAY BE REDUCED AT THE DISCRETION OF THE ENGINEER UPON RECEIPT OF STRENGTH TEST RESULTS.

FW6. MINIMUM STRIPPING TIMES:
- WALLS & COLUMNS - 7 DAYS
- SLABS & STAIRS - 7 DAYS

STRIPPING TIMES MAY BE REDUCED OR INCREASED AT THE DISCRETION OTHER ENGINEER UPON RECEIPT OF STRENGTH TEST RESULTS.

FW7. APPROVAL SHALL BE OBTAINED FROM THE ENGINEER PRIOR TO THE REMOVAL OF FORMWORK. WHERE BACK-PROPPING OF THE SLAB WILL BE REQUIRED, THE CONTRACTOR SHALL SUBMIT A PROPPING LAYOUT TO THE ENGINEER FOR APPROVAL.

FW8. SOFFIT SLABS AND BEAMS ARE TO SUPPORT MASONRY, THE FORMWORK AND PROPS MUST BE REMOVED BEFORE LAYING MASONRY.

BONDEK

FW9. BONDEK PANELS SHALL BE 1.0 mm BMT U.N.O.

FW10. BONDEK PANELS ARE TO BE SECURELY FIXED OR HELD DOWN TO PREVENT DISPLACEMENT DUE TO CONSTRUCTION LOADING OR WIND UPLIFT PRIOR TO CONCRETING.

FW11. FIX BONDEK TO STEEL WORK BY PUDDLE WELDING, DRIVE PINS, OR OTHER APPROVED METHODS. SLIP JOINTS SHALL BE LOCATED AS SHOWN.

FW12. PIXING TO MASONRY IS NOT NECESSARY PROVIDED CONCRETE IS PLACED IMMEDIATELY AFTER PANELS ARE LAID. TOP COARSE OF BRICKWORK IS TO BE STRAIGHT AND LEVEL. IF REQUIRED PROVIDE LAYER OF SMOOTH HARD MORTAR. SLIP JOINTS SHALL BE PROVIDED AT ALL MASONRY SUPPORTS

FW13. BEFORE CONCRETE IS PLACED, ANY ACCUMULATED DEBRIS, GREASE OR ANY OTHER SUBSTANCE WILL NEED TO BE REMOVED TO ENSURE CLEAN BONDING SURFACE. ANY PONDED RAINWATER SHALL BE REMOVED BY BLOWING OR SWEEPING.

FW14. FASTENING OF SIDE LAP JOINTS OF BONDEK SHALL BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION. FOR POINT LOAD RATINGS OR EXPOSED SOFFITS ADDITIONAL FIXINGS MAY BE REQUIRED.

FW15. PROP BONDEK IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION.

FW16. PROPS SHALL NOT BE REMOVED UNTIL CONCRETE HAS REACHED SUFFICIENT STRENGTH.

REINFORCEMENT

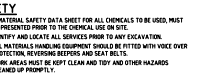
REINFORCEMENT QUALITY AND NOTATION

R1. ALL WORKMANSHIP AND MATERIALS SHALL COMPLY WITH AS 5100 AND AS/NZS 1554.

R2. SYMBOLS ON DRAWINGS FOR REINFORCEMENT ARE AS FOLLOWS:
- 'N' - DENOTES HOT ROLLED DEFORMED (RIBBED) BARS OF GRADE 500 (D500N) COMPLYING WITH AS/NZS 4671
- 'R' - DENOTES STRUCTURAL GRADE ROUND BAR OF GRADE 250 (R250N) COMPLYING WITH AS/NZ 4671
- 'SL' - DENOTES SQUARE REINFORCING MESH OF GRADE 500 HARD-DRAWN WIRE DUCTILITY CLASS L TO AS/NZS 4671
- 'RL' - DENOTES RECTANGLE REINFORCING MESH OF GRADE 500 HARD-DRAWN WIRE DUCTILITY CLASS L TO AS/NZS 4671
- 'L.TM' - DENOTES TRENCH MESH OF GRADE 500 WIRE DUCTILITY CLASS L TO AS/NZS 4671

R3. THE FOLLOWING ABBREVIATIONS APPLY TO LOCATION OF REINFORCEMENT
- EW - EACH WAY
- FF - FAR FACE
- STAG - STAGGERED
- EF - EACH FACE
- B - BOTTOM
- CTS - CENTRES
- NF - NEAR FACE
- T - TOP
- CENT - CENTRAL
- A/T - ALTERNATING

R4. REINFORCING BARS ARE SPECIFIED AS FOLLOWS:



R5. REINFORCEMENT IS SHOWN DIAGRAMMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION. REFER TO SECTIONS FOR ADDITIONAL BARS REQUIRED. PLANS TAKE PRECEDENCE OVER SECTIONS.

PLACEMENT

R6. ALL REINFORCEMENT SHALL BE SECURELY SUPPORTED IN ITS CORRECT POSITION DURING CONCRETING BY APPROVED MEANS. CHAIR REINFORCEMENT OFF FORMWORK AT 1000mm MAXIMUM CENTRES FOR BARS AND 600mm MAXIMUM CENTRES FOR MESH. IN EXPOSURE CONDITION B2 OR C, USE ONLY PERMITTED.

R7. SLOPES OF CRANKS ARE NOT TO EXCEED ONE IN SIX.

R8. CLEAN REINFORCEMENT AND FORMWORK PRIOR TO CONCRETING.

R9. REINFORCEMENT CROSSING PLANE LIGHTING SHALL BE DISPLACED AS NECESSARY AND NO REINFORCEMENT SHALL BE CUT WITHOUT PRIOR WRITTEN APPROVAL OF THE PROJECT ENGINEER.

R10. WELDING AND/OR SITE CUTTING OF REINFORCEMENT SHALL NOT BE PERMITTED WITHOUT THE APPROVAL OF THE ENGINEER. SITE BENDING OF DEFORMED REINFORCING BARS SHALL BE DONE WITHOUT HEATING USING MECHANICAL BENDING TOOLS.

R11. LAPS AND OTHER SPLICES IN REINFORCEMENT SHALL ONLY BE MADE AT THE POSITION SHOWN ON THE DRAWINGS, UNLESS ALTERNATIVE OR EXTRA LOCATIONS ARE APPROVED IN WRITING BY THE DESIGNERS. LAP LENGTH SHALL BE AS TABULATED BELOW UNLESS SHOWN OTHERWISE ON THE DRAWINGS

BAR DIAMETER	MIN. LAP LENGTH
12	350
16	500
20	750
24	1000
28	1200
32	1500
36	1800

NOTE: THE MINIMUM LAP LENGTH SHOWN SHALL BE INCREASED BY 25% FOR HORIZONTAL BARS WITH 300mm OR MORE CONCRETE CAST BELOW THE BAR)

R12. REINFORCEMENT SPLICES SHALL BE STAGGERED AND NO MORE THAN 50% OF SPLICES SHALL BE AT ANY SECTION UNLESS SHOWN OTHERWISE

R13. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN. THE WRITTEN APPROVAL OF THE ENGINEER SHALL BE OBTAINED FOR ANY OTHER SPLICES. WHERE THE LAP LENGTH IS NOT SHOWN IT SHALL BE SUFFICIENT TO DEVELOP THE FULL STRENGTH OF THE REINFORCEMENT.

R14. FABRIC MESH SHALL BE LAPPED BY ONE FULL PANEL OF FABRIC PLUS 25mm SO THAT THE TWO QUTERMOST WIRES OF ONE SHEET OVERLAP THE TWO QUTERMOST TRANSVERSE WIRES OF THE SHEET BEING LAPPED BY 25mm.

NOTE: DO NOT LAP OVER SLAB SUPPORTS

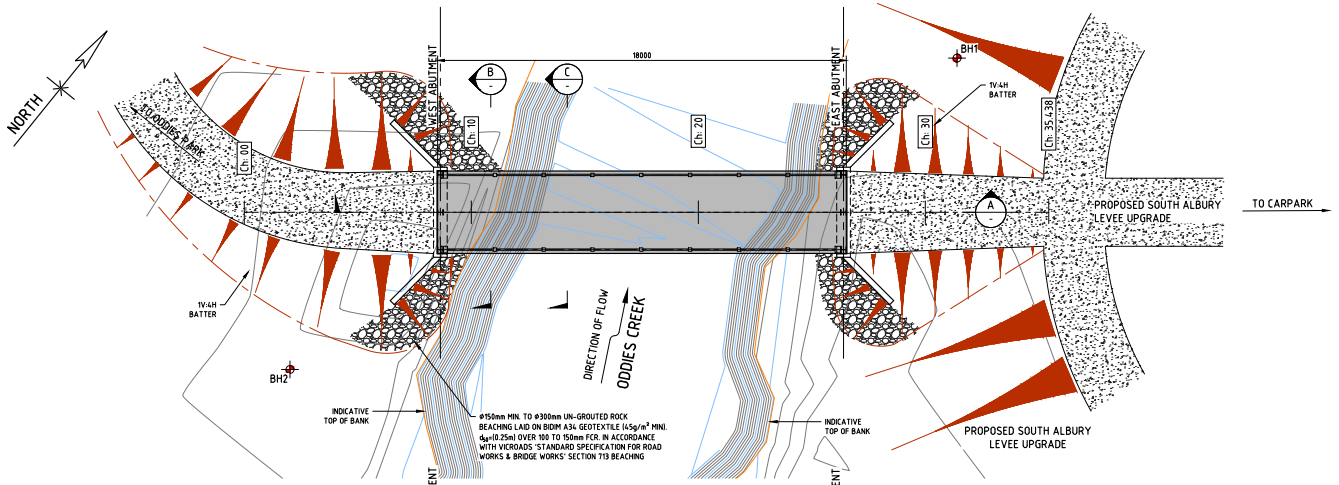
R15. DISTRIBUTION REINFORCEMENT AND TYING STEEL SHALL BE U.N.O.:
- M12-300 MIN. FOR CONTINUOUS SLABS
- M12-450 MIN. FOR POST TENSIONED SLABS
- LAP WITH MAIN BARS 400 MM. U.N.O

R16. SECURELY TIE REINFORCEMENT WITH WIRE TIES. TURN ENDS OF TIE WIRES INTO CONCRETE CLEAR OF COVER ZONE.

R17. SLAB REINFORCEMENT SHALL EXTEND MINIMUM 70mm INTO MASONRY SUPPORT WALLS AND MINIMUM 50 PERCENT OF BOTTOM REINFORCEMENT TO BE CONTINUED, TO ACHIEVE ANCHORAGE AT SIMPLY SUPPORTED ENDS. TERMINATE ALL TOP BARS WITH STANDARD COGS AT FORM EDGES.

INSPECTION

R18. ALL REINFORCEMENT SHALL BE INSPECTED AND APPROVED BY THE STRUCTURAL ENGINEER PRIOR TO PLACING OF CONCRETE. GIVE AT LEAST 48 HOURS NOTICE TO THE STRUCTURAL ENGINEER FOR INSPECTION OF REINFORCEMENT. DO NOT CONCRETE DELIVERED UNTIL FINAL APPROVAL IS OBTAINED FROM THE STRUCTURAL EN



GENERAL ARRANGEMENT PLAN
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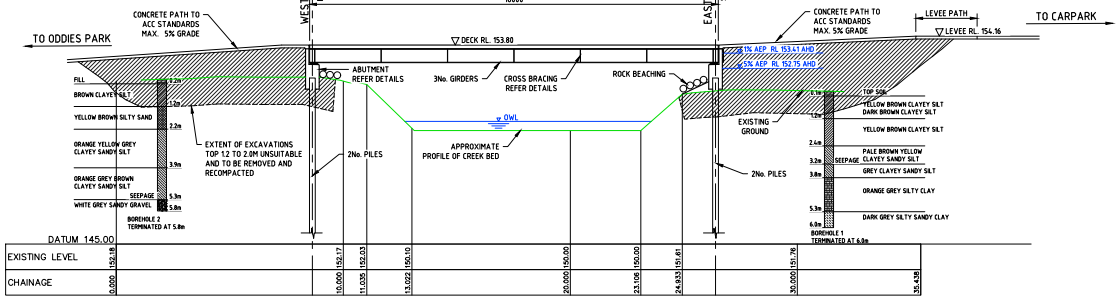

SECTION A
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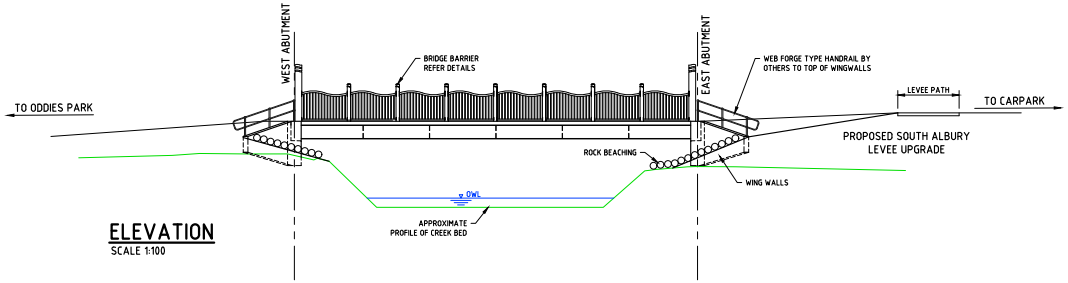
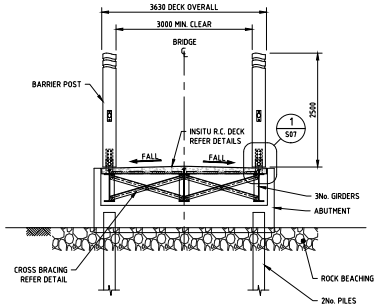


ELEVATION
SCALE 1:100



SECTION B
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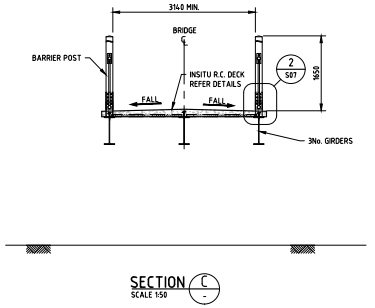

SECTION C
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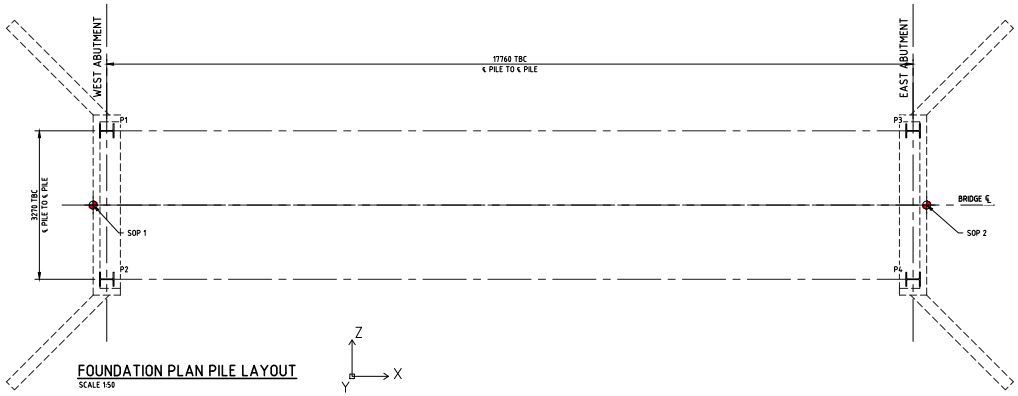
WRIGHT CONSULTING ENGINEERS (STRUCTURAL | CIVIL | BRIDGES)	ABN 64 009 570 499 P: 02 6062 2116 E: info@nwce.com.au W: www.nwce.com.au A: 183 HUON STREET GEROGERY WEST NSW 2642	
CLIENT: ALBURY CITY COUNCIL PROJECT: PROPOSED PEDESTRIAN BRIDGE AT AUSTRALIA PARK ALBURY, NSW	DRAWING TITLE: PLAN, ELEVATION & SECTIONS ALL DIMENSIONS TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORKS. USE OR COPYING OF THIS DOCUMENT IN WHOLE OR IN PART WITHOUT WRITTEN PERMISSION BY WRIGHT CONSULTING ENGINEERS CONSTITUTES AN INFRINGEMENT OF COPYRIGHT. CONSTRUCTION	

REV	DATE	DESCRIPTION
C1	14/02/2022	FOR CONSTRUCTION
P2	12/01/2022	PRELIMINARY - 70% CLIENT REVIEW
P1	22/12/2021	PRELIMINARY - CONCEPT

Plot Date: 15/02/2022 CAD File: 21191 STRUCT REV C1.dwg

DESIGNED : N. WRIGHT	SCALE : AS INDICATED		
DRAWN : H. PHILLIPS	DRAWING SIZE : A1		
CHECKED : N. WRIGHT	CONSTRUCTION ISSUE DATE: 14/02/2022		
PROJECT No. 21191	DRAWING No. S02	REVISION C1	



FOUNDATION PLAN PILE LAYOUT
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NOTES: PILED FOUNDATIONS

1. SETOUT POINTS ARE LOCATED AT INTERSECTION OF ABUTMENT/PILE CAP CENTERLINE AND DESIGN CONTROL LINE OR CENTERLINE.
2. ALL PILES ARE VERTICAL. U.N.O.
3. PILE POSITION SHOWN ARE TO UNDERSIDE OF PIER OR ABUTMENT CROSS HEAD.
4. ALL PILES TO BE INSTALLED IN ACCORDANCE WITH AS5100, AS2159 AND VICROADS SPECIFICATION 605
5. IF PDA TESTING IS UNDERTAKEN A MINIMUM OF 1 PILE PER ABUTMENT AND PIER SHALL BE UNDERTAKEN.
6. PILE CAPACITY TO BE ASSESSED USING THE HILEY FORMULA FOR BRIDGES OF LOW SIGNIFICANCE AND WHERE DYNAMIC TESTING IS NOT ECONOMICALLY JUSTIFIABLE. A GEOTECHNICAL REDUCTION FACTOR OF 0.4 TO BE USED.
7. THE CONTRACTOR SHALL EXCAVATE AS REQUIRED FOR PILE DRIVING PURPOSES.
8. TO AVOID DAMAGE TO THE PILES, PILE DRIVING SHALL CEASE AS SOON AS DRIVING INDICATES THE PILE HAS ACHIEVED AFFECTIVE REFUSAL.
9. FOR GEOTECHNICAL INFORMATION REFER TO AITKEN ROWE TESTING LABORATORIES REPORT 516-302 DATED 24 AUGUST 2016.
10. PILES TO BE DRIVEN TO ACHIEVE DESIGN ULTIMATE LOADS AS SHOWN IN THE PILE SCHEDULE.
11. PILE TOE LEVELS ARE AN ESTIMATE ONLY BASED FROM GEOTECHNICAL INFORMATION PROVIDED. ACTUAL PILE LENGTHS MAY VARY FROM THOSE INDICATED AS NECESSARY TO ACHIEVE THE REQUIRED ULTIMATE CAPACITY.
12. MINIMUM PILE EMBEDMENT TO BE 9.0m. IF EMBEDMENT CANNOT BE ACHIEVED THEN ADDITIONAL RAKING PILES OR CONCRETE ENCASED PILES MAY BE REQUIRED, CONSULT ENGINEER FOR DETAILS.
13. GEOTECHNICAL REDUCTION FACTOR AND VALUES FOR DESIGN ASSUMPTIONS ARE AS FOLLOWS;

GEOTECHNICAL REDUCTION FACTOR AND VALUES FOR DESIGN ASSUMPTIONS	
AVERAGE RISK RATING (ARR) (MODERATE RISK)	2.7
GEOTECHNICAL STRENGTH REDUCTION FACTOR, ϕ_g	0.62
BASIC GEOTECHNICAL REDUCTION FACTOR, ϕ_{gb}	0.62
INTRINSIC TEST FACTOR, ϕ_{IT}	0.62
TESTING BENEFIT FACTOR, K	0.90
PERCENTAGE OF PILES TO BE TESTED IF PDA TESTING IS TO BE UNDERTAKEN	50%

14. PILING CONTRACTOR NEEDS TO PROVIDE SUITABLE DRIVING SYSTEM TO ACHIEVE DESIRED PILE CAPACITIES.
15. PILES DESIGNED FOR 100 YEAR DESIGN LIFE WITH SECTION LOSS ACCOUNTING FOR MILDLY AGGRESSIVE SOILS TO AS2159 AND AS5100.

PILE SCHEDULE

PILE No:	TYPE	TOE LEVEL R.L.	LENGTH (m) #	VERTICAL LOAD (SLS) kN	VERTICAL LOAD (ULS) kN	ULS BENDING MOMENT kNm (Z-Z)	HILLY FORMULA DRIVING LOAD kN	PDA TESTING (kN/PILE)	COMMENTS
P1	310 UC 137✱	140.80	11.0	233	320	160	800	540	-
P2	310 UC 137✱	140.80	11.0	233	320	160	800	540	-
P3	310 UC 137✱	140.80	11.0	233	320	160	800	540	-
P4	310 UC 137✱	140.80	11.0	233	320	160	800	540	-

NOTE:
MINIMUM PILE EMBEDMENT TO BE 9m FOR LATERAL LOADS FROM FLOOD FORCES & TOE LEVEL TO BE DETERMINED BY DRIVING PILE. IF EMBEDMENT CANNOT BE ACHIEVED THEN ADDITIONAL RAKING PILES OR CONCRETE ENCASED PILES MAY BE REQUIRED, CONSULT ENGINEER FOR DETAILS.

✱OR SCREW PILES DESIGNED BY CONTRACTOR IN Φ600 PRE-BORED HOLES FOR LATERAL RESISTANCE.

BRIDGE SETOUT TABLE

POINT	EASTING	NORTHING
SOP1	491686.750	6006165.155
SOP2	491701.024	6006176.703

SETOUT POINTS ARE TO BACK OF ABUTMENT

NOTE:
CONTRACTOR TO CHECK BRIDGE ABUTMENT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION. POSITION MAY NEED TO BE ADJUSTED TO MATCH THE EXISTING PROFILE.

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NSW 2642

CLIENT:
ALBURY CITY COUNCIL

PROJECT:
PROPOSED PEDESTRIAN BRIDGE
AT AUSTRALIA PARK
ALBURY, NSW

DRAWING TITLE:
PILE SETOUT & ABUTMENT DETAILS

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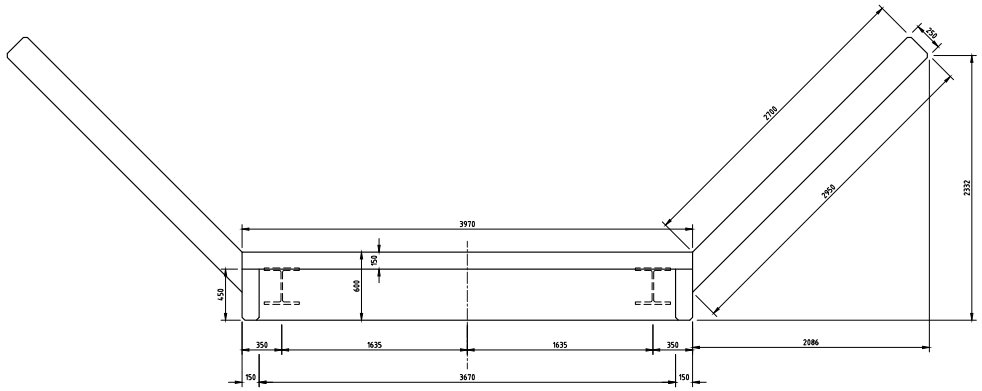
CONSTRUCTION

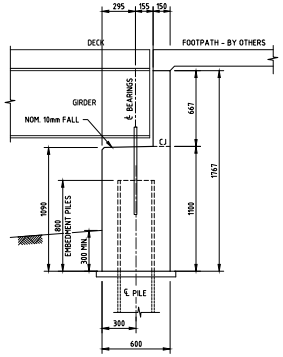
REV	DATE	DESCRIPTION
C1	14/02/2022	FOR CONSTRUCTION
P2	12/01/2022	PRELIMINARY - 70% CLIENT REVIEW
P1	22/12/2021	PRELIMINARY - CONCEPT

Plot Date: 15/02/2022 CAD File: 21191 STRUCT REV C1.dwg

DESIGNED : N. WRIGHT
DRAWN : H. PHILLIPS
CHECKED : N. WRIGHT
SCALE : 1:50
DRAWING SIZE : A1
CONSTRUCTION ISSUE DATE: 14/02/2022
PROJECT No. 21191
DRAWING No. S03
REVISION C1



ABUTMENT PLAN
SCALE 1:20



SECTION A
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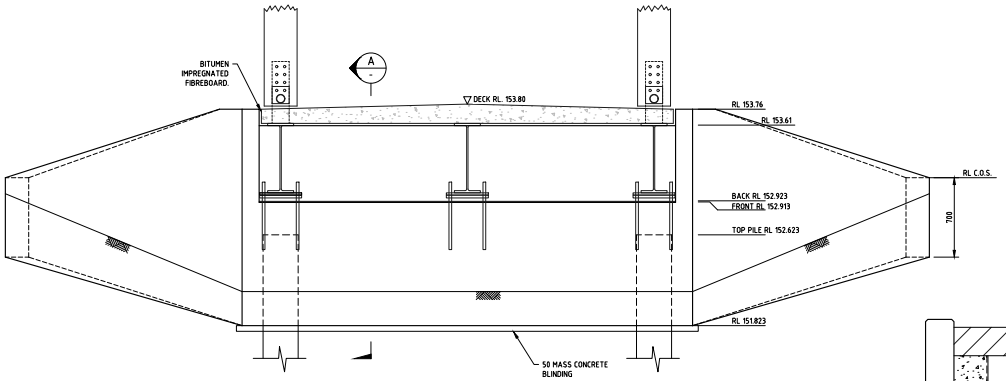
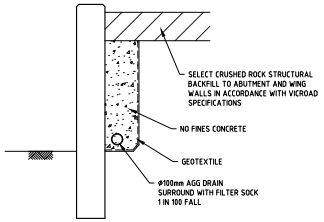


ABUTMENT ELEVATION
SCALE 1:20



SECTION Y
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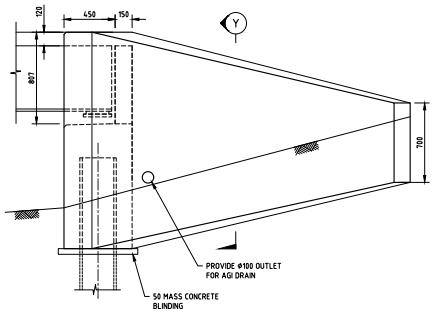

WING WALL ELEVATION
SCALE 1:20

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CLIENT: ALBURY CITY COUNCIL

PROJECT: PROPOSED PEDESTRIAN BRIDGE AT AUSTRALIA PARK ALBURY, NSW

DRAWING TITLE: ABUTMENT CONCRETE

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DRAWN : H. PHILLIPS
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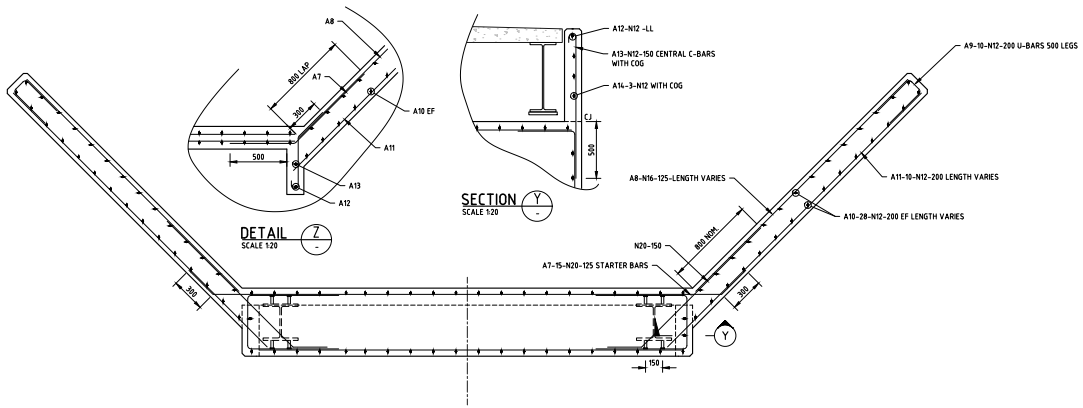
DRAWING SIZE : A1
CONSTRUCTION ISSUE DATE: 14/02/2022
PROJECT No. 21191
DRAWING No. S04
REVISION C1



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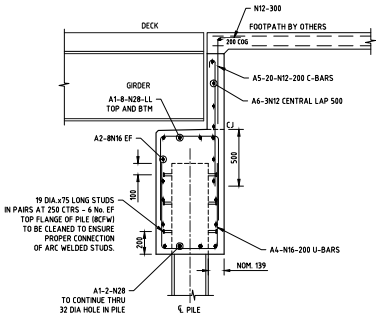
SCALE 1:20



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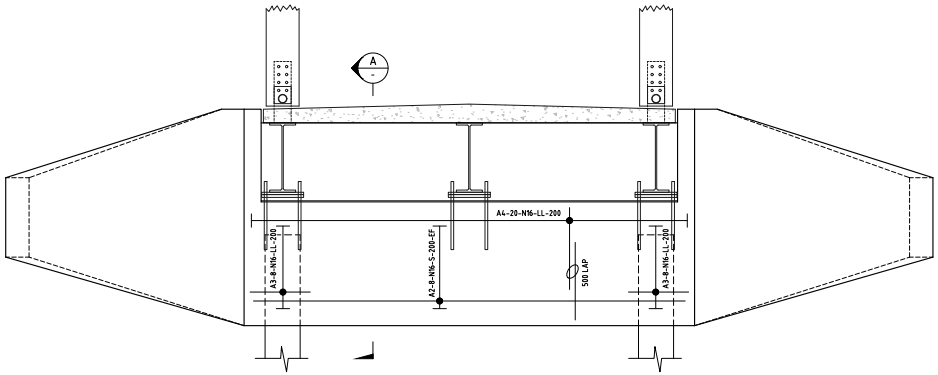

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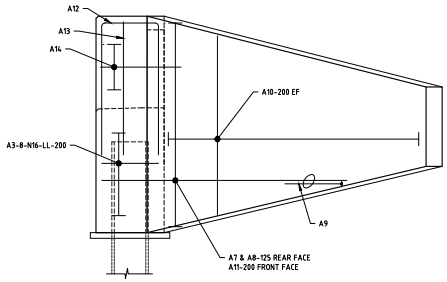

WING WALL ELEVATION
SCALE 1:20

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CLIENT: ALBURY CITY COUNCIL

PROJECT: PROPOSED PEDESTRIAN BRIDGE AT AUSTRALIA PARK ALBURY, NSW

DRAWING TITLE: ABUTMENT REINFORCEMENT

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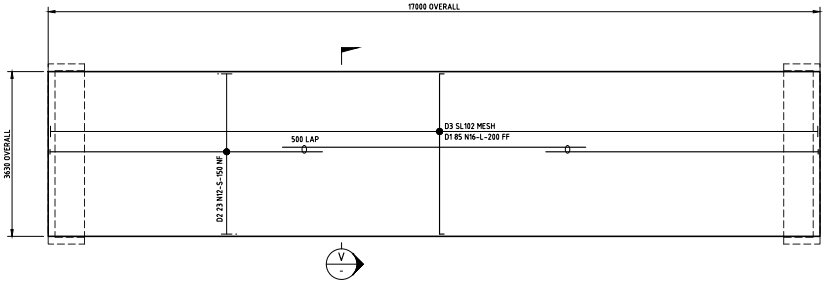
DRAWN : H. PHILLIPS
CHECKED : N. WRIGHT
SCALE : AS INDICATED
DRAWING SIZE : A1
CONSTRUCTION ISSUE DATE: 14/02/2022
PROJECT No. 21191
DRAWING No. S05
REVISION C1



DECK REINFORCEMENT PLAN
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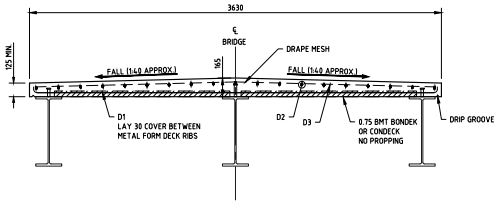


SECTION V
SCALE 1:20

NOTE - REINFORCED CONCRETE

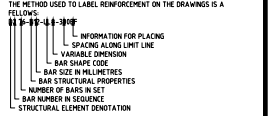
CONCRETE

1. CONCRETE TO BE 32MPa COMPRESSIVE STRENGTH AT 28 DAYS AND LOW SHRINKAGE MIX <650 MICROSTRAIN.
2. CONCRETE SLUMP TO BE 80mm.
3. CONCRETE SURFACE FINISH TO BE IN ACCORDANCE WITH RMS SPECIFICATION B80;
   - BACK OF ABUTMENTS AND WINGWALLS - CLASS 1
   - EXPOSED FACE OF ABUTMENTS AND WINGWALLS - CLASS 2
   - UNDERSIDE AND SIDE FACES OF DECK - CLASS 2
   - TOP DECK AND APPROACH SLAB - BROOMED FINISH
4. ALL CORNERS SHALL HAVE 20mm FILLETS OR CHAMFERS UNLESS NOTED OTHERWISE.
5. CONSTRUCTION JOINTS (CJ) SHALL BE WELL SCABBLED, CLEANED AND MOISTENED BEFORE NEXT CONCRETE POUR IN ACCORDANCE WITH RMS SPECIFICATION CLAUSE B80.
6. CONCRETE EXPOSURE CLASSIFICATION AND (COVER).
   - BACK OF ABUTMENTS AND WINGWALLS - B1 (55)
   - EXPOSED FACE OF ABUTMENTS AND WINGWALLS - B1 (55)
   - UNDERSIDE AND SIDE FACES OF DECK - A1 (35)
   - TOP DECK AND APPROACH SLAB - A1 (35)
7. CONCRETE IN CONTACT WITH GROUND TO BE PROTECTED BY DAMP-PROOF MEMBRANE.

REINFORCEMENT

8. GRADE - 500 (V/R) HOT ROLLED DEFORMED BARS TO AS/NZS 4671.
   - 500 (RP) WELDED WIRE FABRIC TO AS/NZS 4671.
   - (W) DENOTES HARD DRAWN REINFORCING WIRE COMPLYING WITH AS/NZS 4671.
9. SPACING - TAKEN AS EQUAL UNLESS NOTED OTHERWISE.
10. WELDING - SHALL NOT BE PERMITTED UNLESS NOTED OTHERWISE. TACK WELDING OF REINFORCEMENT CAGE IS PERMITTED.
11. AUSTRALIAN STANDARD BAR SHAPE ARE IN ACCORDANCE WITH AS1100.501.
12. BAR SIZE IS THE NOMINAL DIAMETER IN MILLIMETERS, OR THE AS/NZS4271 FABRIC NUMBER
13. WHERE SHOWN ON THE DRAWINGS, RL AND SL SHALL DENOTE WELDED REINFORCING FABRIC (RECTANGULAR AND SQUARE), RESPECTIVELY.
14. DIMENSIONS SHOWN ON BAR SHAPES DIAGRAMS ARE MEASURED FROM THE OUTSIDE FACES OF THE BARS AND ARE IN MILLIMETRES.
15. THE INCLUDED ANGLE OF ANY BEND SHALL BE A RIGHT ANGLE IF NO DIMENSION SHOWN.
16. BARS OF DIAMETER GREATER THAN 24mm SHALL NOT BE REBENT.
17. BAR BENDING AND HOOK DETAILS SHALL BE IN ACCORDANCE WITH SECTION 5.13 OF AS5100-BRIDGE DESIGN.

REINFORCEMENT NOTATION:
THE METHOD USED TO LABEL REINFORCEMENT ON THE DRAWINGS IS A FELLOWS:



WHERE THE BAR SPACING IS APPROXIMATE ONLY, THE FOLLOWING FORMAT SHALL BE USED:
A1 10-N16-S-300EF APPROX

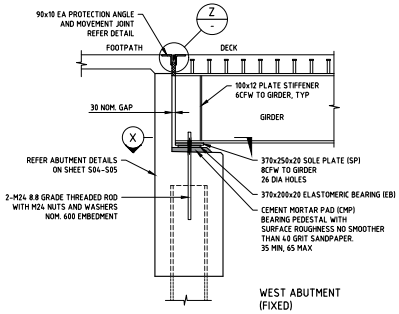
LAP LENGTHS:

BAR	LAP LENGTH
N12	500
N16	650
N20	800
N24	1000

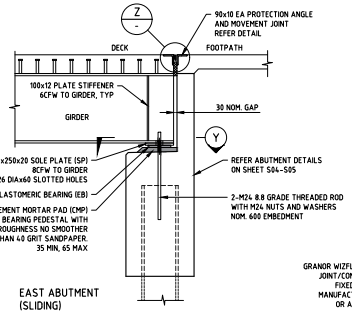


STRUCTURE ELEMENT DENOTATION COMMONLY USED ARE:
A FOR ABUTMENTS OR ABUTMENT A
B FOR ABUTMENT B
P FOR PIERS
D FOR DECK
G FOR GIRDER
S FOR APPROACH SLAB

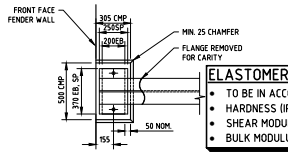
ABBREVIATIONS:
EW - EACH WAY
NF - NEAR FACE
FF - FAR FACE



WEST ABUTMENT (FIXED)

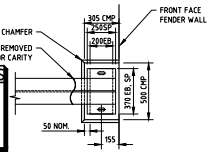


EAST ABUTMENT (SLIDING)



SOLE PLATE DETAIL AT ABUTMENT

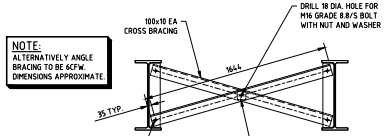
SECTION X
SCALE 1:20



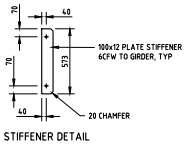
SOLE PLATE DETAIL AT ABUTMENT

SECTION Y
SCALE 1:20

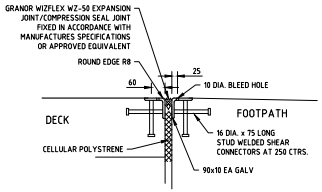
ELASTOMERIC BEARING DESIGN PROPERTIES
- TO BE IN ACCORDANCE WITH AS5100.4-2017.
- HARDNESS (IRHD±5) = 60.
- SHEAR MODULUS = 0.9 MPa.
- BULK MODULUS = 2000 MPa.



BRACING DETAIL
SCALE 1:20

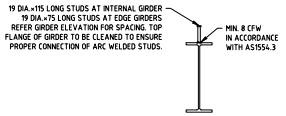


STIFFENER DETAIL

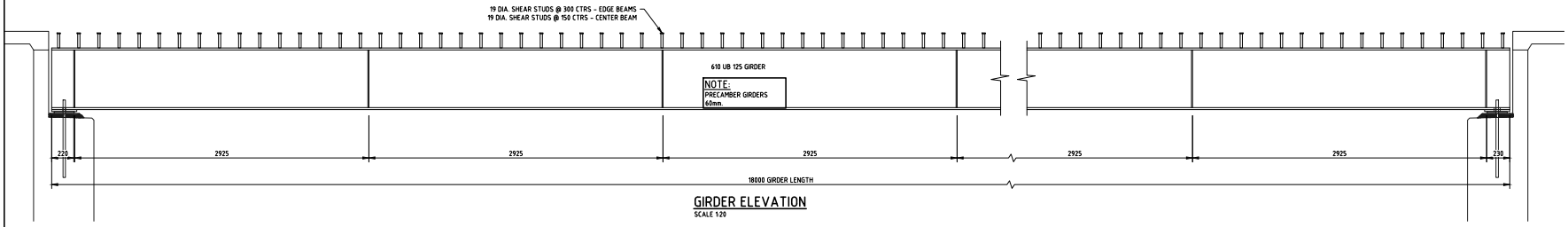


MOVEMENT JOINT DETAIL

DETAIL Z
SCALE 1:10



STUD DETAIL
SCALE 1:20



GIRDER ELEVATION
SCALE 1:20

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CLIENT: ALBURY CITY COUNCIL

PROJECT: PROPOSED PEDESTRIAN BRIDGE AT AUSTRALIA PARK ALBURY, NSW

DRAWING TITLE: DECK & GIRDER DETAILS

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CONSTRUCTION

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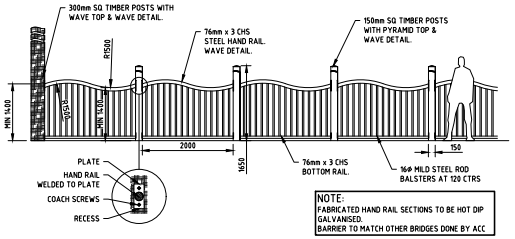
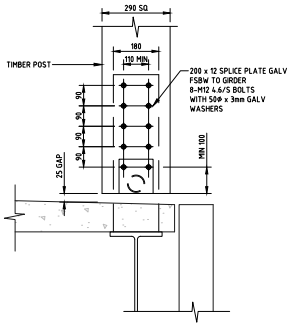
Plot Date: 15/02/2022 CAD File: 21191 STRUCT REV C1.dwg

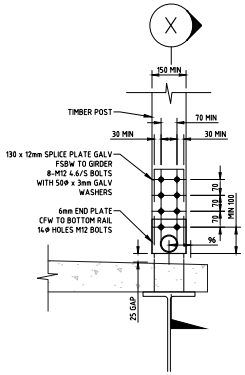
DESIGNED: N. WRIGHT | SCALE: AS INDICATED
DRAWN: H. PHILLIPS | DRAWING SIZE: A1
CHECKED: N. WRIGHT | CONSTRUCTION ISSUE DATE: 14/02/2022
PROJECT No. 21191 | DRAWING No. S06 | REVISION C1



BARRIER ELEVATION
SCALE 1:50



DETAIL 1
SCALE 1:10
S02



DETAIL 2
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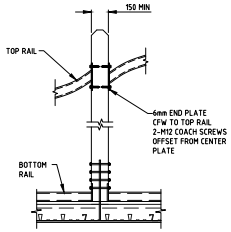
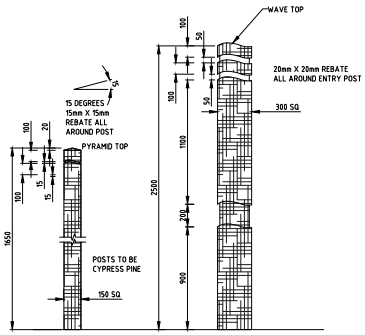
S02



SECTION X
SCALE 1:20



POST DETAILS
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CLIENT:
ALBURY CITY COUNCIL

PROJECT:
PROPOSED PEDESTRIAN BRIDGE
AT AUSTRALIA PARK
ALBURY, NSW

DRAWING TITLE:
BARRIER DETAILS

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Plot Date: 15/02/2022 CAD File: 21191 STRUCT REV C1.dwg

DESIGNED : N. WRIGHT
DRAWN : H. PHILLIPS
CHECKED : N. WRIGHT
SCALE : AS INDICATED
DRAWING SIZE : A1
CONSTRUCTION ISSUE DATE: 14/02/2022

PROJECT No. 21191
DRAWING No. S07
REVISION C1

Columns & Outreaches

7.5m Vicpole Promenade column BPM/4.5m outreach	14
M24x350 PCD Rag Bolt Assembly & Cage 2100 long x 400 diam.(6x1N16 Bars & R10 LIGS @ 500CTC	14
Paint: Iron Stone	

NOTE:

ALBURY CITY TO SUBMIT CONNECTION ALTERATION APPLICATION TO ESSENTIAL ENERGY TO CONFIRM AVAILABILITY OF SUPPLY.

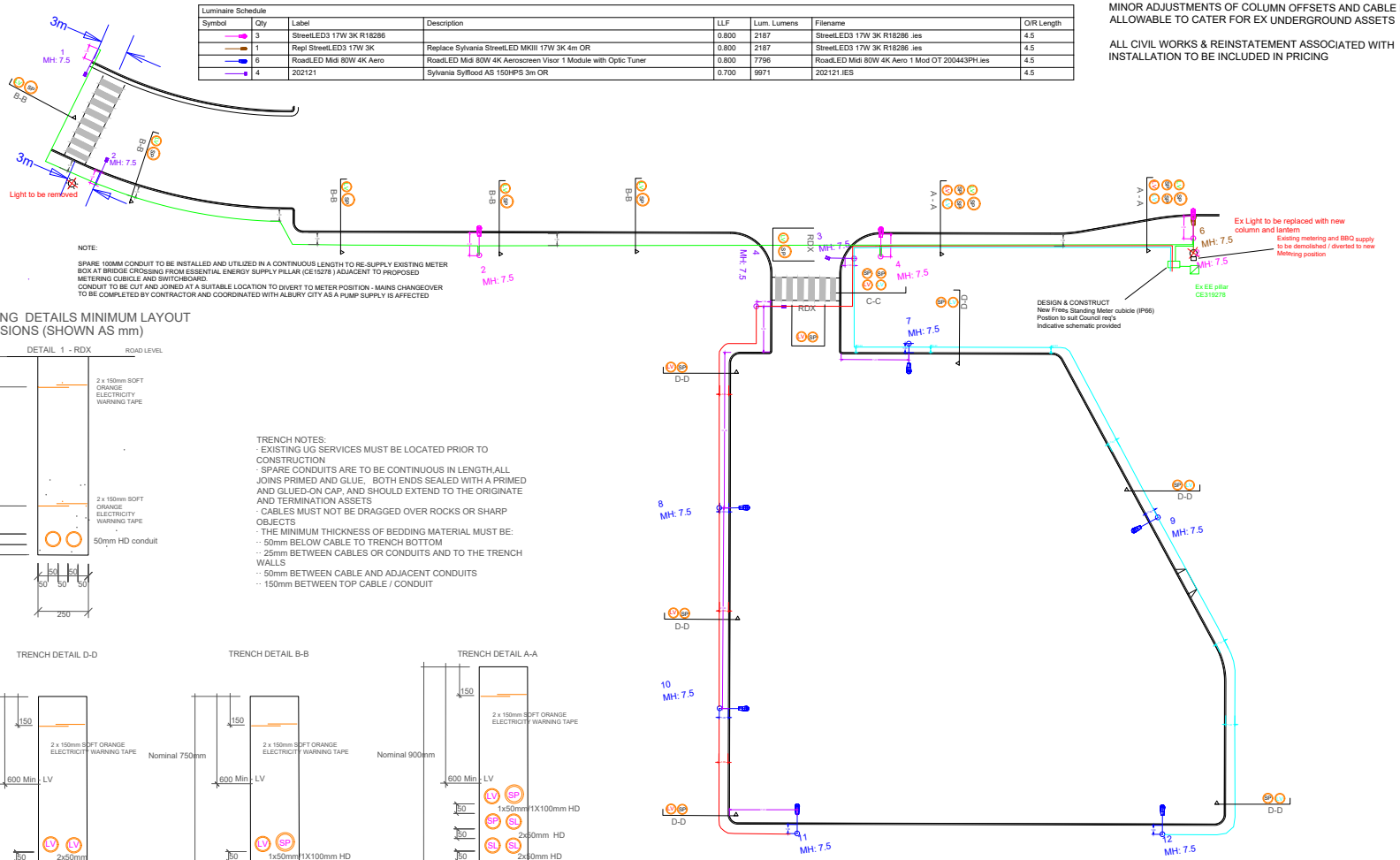
LOCATION OF ALL SERVICES TO BE UNDERTAKEN BY SUCCESSFUL CONTRACTOR BEFORE ANY INSTALLATION WORKS.

MINOR ADJUSTMENTS OF COLUMN OFFSETS AND CABLE ROUTES ALLOWABLE TO CATER FOR EX UNDERGROUND ASSETS

ALL CIVIL WORKS & REINSTATEMENT ASSOCIATED WITH INSTALLATION TO BE INCLUDED IN PRICING

Luminaire Schedule

Symbol	Qty	Label	Description	LLF	Lum. Lumens	Filename	O/R Length
	3	StreetLED3 17W 3K R18286		0.800	2187	StreetLED3 17W 3K R18286 .ies	4.5
	1	Repl StreetLED3 17W 3K	Replace Sylvania StreetLED MKIII 17W 3K 4m OR	0.800	2187	StreetLED3 17W 3K R18286 .ies	4.5
	6	RoadLED Midi 80W 4K Aero	RoadLED Midi 80W 4K Aeroscreen Visor 1 Module with Optic Tuner	0.800	7796	RoadLED Midi 80W 4K Aero 1 Mod OT 200443PH.ies	4.5
	4	202121	Sylvania Sylflood AS 150HPS 3m OR	0.700	9971	202121.IES	4.5



ROAD CROSSING DETAILS MINIMUM LAYOUT
DIMENSIONS (SHOWN AS mm)

TRENCH NOTES:
· EXISTING UG SERVICES MUST BE LOCATED PRIOR TO CONSTRUCTION
· SPARE CONDUITS ARE TO BE CONTINUOUS IN LENGTH,ALL JOINS PRIMED AND GLUE, BOTH ENDS SEALED WITH A PRIMED AND GLUED-ON CAP, AND SHOULD EXTEND TO THE ORIGINATE AND TERMINATION ASSETS
· CABLES MUST NOT BE DRAGGED OVER ROCKS OR SHARP OBJECTS
· THE MINIMUM THICKNESS OF BEDDING MATERIAL MUST BE:
·· 50mm BELOW CABLE TO TRENCH BOTTOM
·· 25mm BETWEEN CABLES OR CONDUITS AND TO THE TRENCH WALLS
·· 50mm BETWEEN CABLE AND ADJACENT CONDUITS
·· 150mm BETWEEN TOP CABLE / CONDUIT

AMMEDMENT DETAILS			
B	Issued for Construction		

PowerOn Project Services
Accreditation No. 4454
Po Box 40 Wodonga Vic, 3689
Ph:0402034009 E: poweron.enquiry@gmail.com

Carpark Lighting - Odies Creek
Odies Creek Carpark
Albury City
Car Park Lighting

PROJECT	QC444	QC444FPLAN	
SCALE	NOT TO SCALE		
DESIGN	ROD DAMM		
DRAWN BY	RD	DESIGN FILE NAME	SIZE
AREA	Albury	SHEET 1 OF 3	A1
		DRAWING NO	Oddies Creek Park Lighting_IFC.dwg
		PLOT DATE 3-Oct-22	REV B

PowerOn Project Services

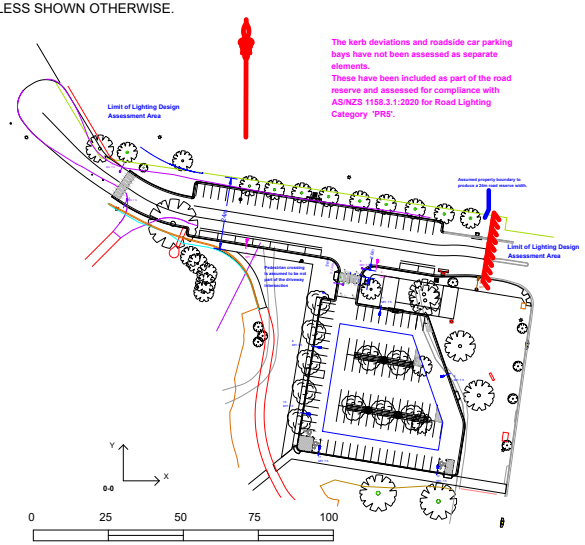
ALL SL. COLUMNS IN EBDEN ST. ARE TO BE INSTALLED 2.50m BOK
ALL SL. COLUMNS IN THE CAR PARK ARE TO BE INSTALLED 0.60m BOK
PROPOSED CONDUIT TRENCHING 0.5m BOK UNLESS SHOWN OTHERWISE.

Luminaire Schedule

Symbol	Qty	Label	Description	LLF	Lum. Lumens	Filename	O/R Length
	3	StreetLED3 17W 3K R18285		0.800	2187	StreetLED3 17W 3K R18285 .ies	4.5
	1	Repl StreetLED3 17W 3K	Replace Sylvania StreetLED MKII 17W 3K 4m OR	0.800	2187	StreetLED3 17W 3K R18285 .ies	4.5
	6	RoadLED Mid 60W 4K Aero	RoadLED Mid 60W 4K Aeraceven Visor 1 Module with Optic Tuner	0.800	7795	RoadLED Mid 60W 4K Aero 1 Mod OT 200443PH.ies	4.5
	4	202121	Sylvania Sylflood AS 150/HPS 3m OR	0.700	9971	202121.IES	4.5

Luminaire Location Summary

LumNo	Label	X	Y	Lum M.H.	Orient	Upcast Angle	Spin
1	StreetLED3 17W 3K R18285	-2.126	90.675	7.5	55.436	5	0
2	StreetLED3 17W 3K R18285	40.53	75.844	7.5	80.766	5	0
3	202121	82.573	70.296	7.5	170	0	70
4	StreetLED3 17W 3K R18285	83.097	68.791	7.5	80.538	5	0
5	202121	69.055	64.115	7.5	350	0	90
6	Repl StreetLED3 17W 3K	117.7	63.8	7.5	80.779	5	0
7	RoadLED Mid 60W 4K Aero	85.042	58.389	7.5	260.784	5	0
8	RoadLED Mid 60W 4K Aero	52.787	44.024	7.5	350.779	5	0
9	RoadLED Mid 60W 4K Aero	108.88	35.726	7.5	189.194	5	0
10	RoadLED Mid 60W 4K Aero	59.181	22.714	7.5	350.779	5	0
11	RoadLED Mid 60W 4K Aero	64.983	0.469	7.5	80.781	5	0
12	RoadLED Mid 60W 4K Aero	104.466	2.079	7.5	80.779	5	0

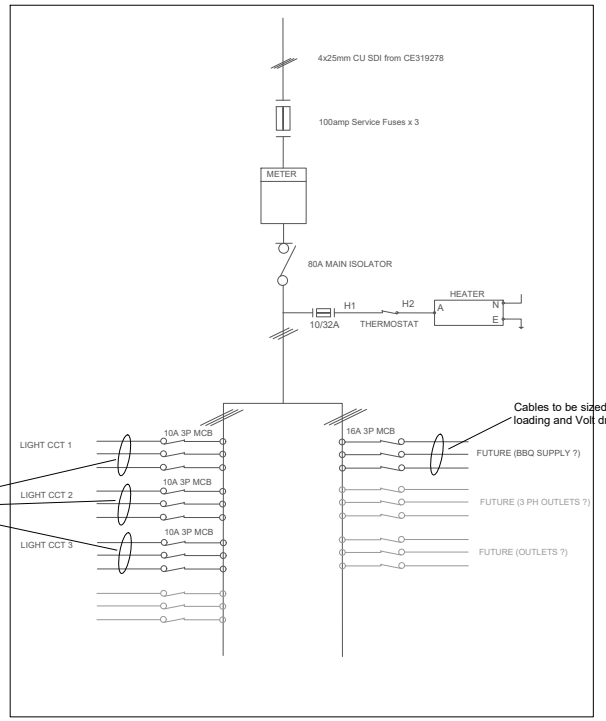


The kerb deviations and roadside car parking bays have not been assessed as separate elements.
These have been included as part of the road reserve and assessed for compliance with AS/NZS 1158.3.1:2020 for Road Lighting Category 'PR5'.

Road Lighting Categories
- Ebden Street - 'PR5'
- Car Park - 'PC3'
- Pedestrian Crossing - 'PX3'

This certification is for Ebden Street only

INDICATIVE METER /SWITCHBOARD SCHEMATIC



GENERAL NOTES

1. THE ELECTRICAL WORKS SHALL COMPLY WITH NSW SERVICE AND INSTALLATION RULES & AS/NZS 3000:2007.
2. BEFORE COMMENCING ANY CONSTRUCTION WORK, THE CONTRACTOR SHALL OBTAIN ALL NECESSARY CLEARANCES AND LOCATIONS OF EXISTING SERVICES FROM RELEVANT AUTHORITIES.
3. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF WORK - CONTACT DIAL BEFORE YOU DIG. TO VERIFY THE LOCATION OF ALL UNDERGROUND ASSETS ON SITE WITH "DIAL BEFORE YOU DIG" AND MUST HAVE A COPY OF "DIAL BEFORE YOU DIG" PLANS, NO MORE THAN 30 DAYS OLD,ON SITE FOR REFERENCE.
4. DESIGNS SHALL REMAIN VALID FOR A PERIOD OF 6 MONTHS FROM THE DATE OF CERTIFICATION.
5. CONTRACTOR TO CARRY OUT ALL CIVIL WORKS - INCLUDING TRAFFIC CONTROL, UNDERBORING, EXCAVATION, REINSTATEMENT & SEDIMENT CONTROL WORK. ALL WORKS ARE TO BE TO THE SATISFACTION OF THE LOCAL COUNCIL RERESENTATIVE.
6. CONTRACTOR IS RESPONSIBLE TO ENSURE THAT TRENCH DEPTHS COMPLY WITH MANDATORY SEPARATIONS BETWEEN ELECTRICITY, GAS, TELSTRA AND OTHER UNDERGROUND SERVICES.
7. WHEN INSTALLING SPARE CONDUITS TO BE USED IN SUBSEQUENT CONSTRUCTION STAGES, TO ENABLE THE BURIED ENDS OF THE CONDUITS TO BE LOCATED ELECTRIC MARKER TAPE WILL BE EXTENDED FROM THE END OF THE CONDUIT TO 300MM ABOVE GROUND LEVEL PRIOR TO BACKFILLING.
8. WHEN ELECTRICAL CROSSINGS ARE ESTABLISHED IN A KERBED ROADWAY, THE LOCATION SHALL BE MARKED ON BOTH KERB FACES IMMEDIATELY ABOVE THE CROSSING POINT BY EMBOSSING THE LETTER "E" IN THE CONCRETE BY THE ASP.
9. THE ELECTRICAL CONTRACTOR IS TO CHECK ALL DIMENSIONS ON SITE TO ENSURE ACCURACY AND NOTIFY THE DESIGNER OF ANY DISCREPANCIES BEFORE COMMENCING WORK.
10. ALL EXISTING SUPPLY AUTHORITIES ASSETS ARE DEEMED TO BE IN GOOD CONDITION. IF FOUND OTHERWISE CONTACT THE SUPPLY AUTHORITY INSPECTOR.
11. POWERON PROJECT SERVICES TAKES NO RESPONSIBILITY FOR ANY DAMAGE TO ASSETS CAUSED BY THE CONTRACTOR DURING THE COURSE OF THE WORKS.
12. EROSION & SEDIMENTATION -CONTROL MEASURES ARE REQUIRED TO BE INSTALLED AND OPERATIONAL. IT IS THE RESPONSIBILITY OF THE ELECTRICAL TO ENSURE THAT ANY EXCAVATION HAS ADEQUATE STEPS TAKEN TO ENSURE THAT EROSION IS MINIMISED AND SEDIMENT RUN OFF IS CONTROLLED TO COUNCIL REQUIREMENTS.

AMMEDMENT DETAILS
B Issued for Construction

PowerOn Project Services
Accreditation No. 4454
Po Box 40 Wodonga Vic, 3689
Ph:0402034009 E: poweron.enquiry@gmail.com

Carpark Lighting - Odies Creek
Odies Creek Carpark
Albury City
Car Park Lighting

PROJECT	QC444	QC444FPLAN	
SCALE	NOT TO SCALE		
DESIGN	ROD DAMM		
DRAWN BY	RD	DESIGN FILE NAME	SIZE
AREA	Albury	SHEET 2 OF 3	A1
		DRAWING NO	Oddies Creek Park Lighting_IFC.dwg
		PLOT DATE	3-Oct-22 REV B

PowerOn Project Services

ALL SL. COLUMNS IN EBDEN ST. ARE TO BE INSTALLED 1.50m BOK
ALL SL. COLUMNS IN THE CAR PARK ARE TO BE INSTALLED 0.60m BOK
UNLESS SHOWN OTHERWISE.

Luminaire Schedule

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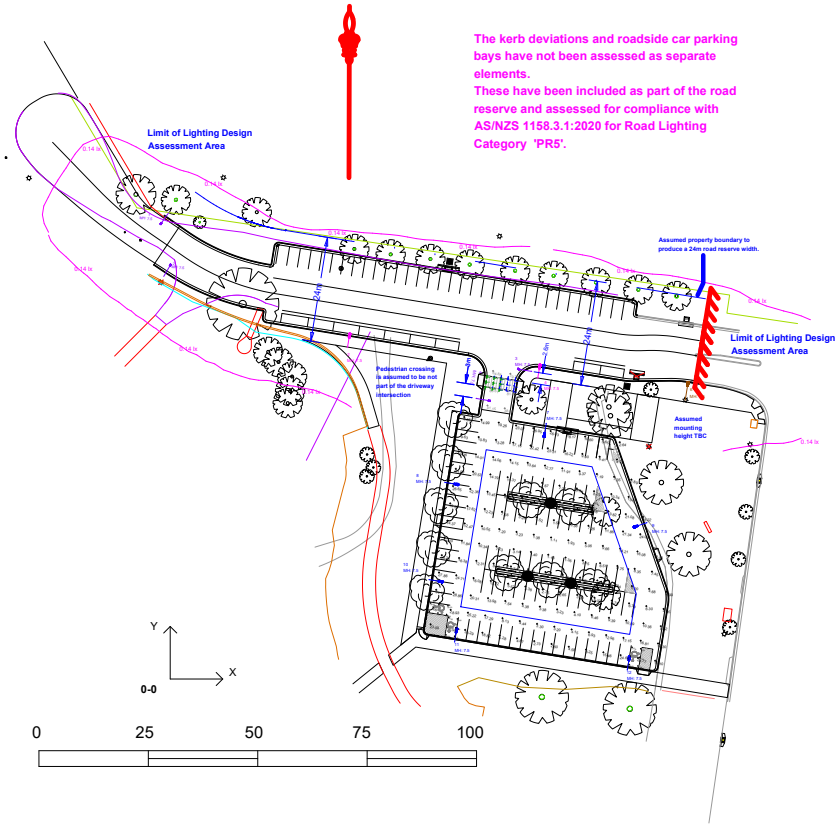

Luminaire Location Summary

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2	StreetLED3 17W 3K R18286	40.53	75.844	7.5	80.766	5	0
3	202121	82.573	70.296	7.5	170	0	70
4	StreetLED3 17W 3K R18286	83.997	68.791	7.5	80.538	5	0
5	202121	69.955	64.115	7.5	350	0	90
6	Repl StreetLED3 17W 3K	117.7	63.8	7.5	80.779	5	0
7	RoadLED Midi 80W 4K Aero	85.942	58.389	7.5	260.784	5	0
8	RoadLED Midi 80W 4K Aero	62.787	44.924	7.5	350.779	5	0
9	RoadLED Midi 80W 4K Aero	108.89	35.726	7.5	199.194	5	0
10	RoadLED Midi 80W 4K Aero	59.181	22.714	7.5	350.779	5	0
11	RoadLED Midi 80W 4K Aero	64.983	8.489	7.5	80.781	5	0
12	RoadLED Midi 80W 4K Aero	104.466	2.079	7.5	80.779	5	0

Numeric Summary

Label	CalcType	Units	Avg	Max	Min	Max/Avg	PtSpcLr	PtSpcTb
Car Park Driveway Eh 0m AGL	Illuminance	Lux	64.48	81.72	38.77	1.27	4	4
Car Park PC3 Eh 0m AGL	Illuminance	Lux	11.15	31.11	1.11	2.79	4	4
PCD 1 Eh 0m AGL	Illuminance	Lux	N.A.	29.96	23.48	N.A.	2	2
PCD 2 Eh 0m AGL	Illuminance	Lux	N.A.	33.66	25.64	N.A.	2	2
PCD 3 Eh 0m AGL	Illuminance	Lux	N.A.	27.79	20.94	N.A.	2	2
Ped Crossing Entry	Illuminance	Lux	N.A.	55.1	16.5	N.A.	N.A.	N.A.
Ped Crossing Exit	Illuminance	Lux	N.A.	54.5	21.9	N.A.	N.A.	N.A.
Road Cat PR5 Eh 0m AGL	Illuminance	Lux	2.80	65.95	0.19	23.55	2	2

The uniformity on the road is affected by the pedestrian crossing floodlights. Conformance is achieved if considered independently.

Road Lighting Categories
- Ebden Street - 'PR5'
- Car Park - 'PC3'
- Pedestrian Crossing - 'PX3'

This certification is for Ebden Street only

SYLVANIA Schréder
Experts in lightability
Schréder Australia Pty Ltd
Bldg 4A Parklands Estate | 21-23 South St
Rydalmere, NSW 2116, Australia
T 1300 489 780
www.sylvania-schreder.com
ABN 17 604 331 937

This design calculation is based upon specified parameters supplied by the client, and other design inputs assumed by us, as detailed in this document. In practice, the accuracy of the values will differ due to environmental variations such as actual luminaire positioning, room surface reflectance, supply voltage, local luminaire ambient temperature, obstacles/furniture, etc. These results are also subject to normally accepted photometric tolerances, and calculation/program rounding errors. The Company does not accept responsibility for any representation or warranty of any kind. The Company shall be under no liability to the Customer for failure to attain such performance figures unless the performance of the Goods supplied is specifically guaranteed in writing, and any such written guarantee shall be subject to recognised manufacturing variations and tolerances applicable to the Goods.

REV	DATE	COMMENTS	DESIGNER
R0	08/04/2020	Original design	RR
R1			
R2			
R3			
R4			
R5			

CLIENT

CONTACT
Rob Rich
email rrich@sylvania-schreder.com

TITLE
Ebden Street Albury, NSW
AS/NZS1158.3.1:2020 - Lighting Category - 'PR5' and 'PC3'
AS/NZS1158.4:2015 - Lighting Category - 'PX3'

DOCUMENT NO.
0246819RR21R0

REVISION: R0
SCALE: As Shown
PAGE NO.: Page 1 of 1

AMMEDMENT DETAILS
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Carpark Lighting - Odies Creek
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PROJECT	QC444	QC444FPLAN	
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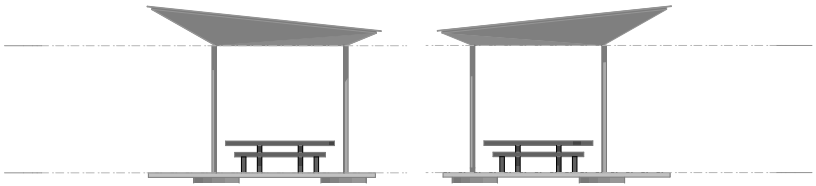
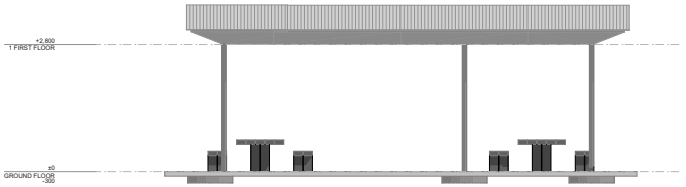
DRAWN BY	RD	DESIGN FILE NAME	SIZE
AREA	Albury	SHEET 3 OF 3	A1
ZONE SUB	----	DRAWING NO	Oddies Creek Park Lighting_IFC.dwg
FEEDER	----	PLOT DATE 3-Oct-22	REV B

PowerOn Project Services

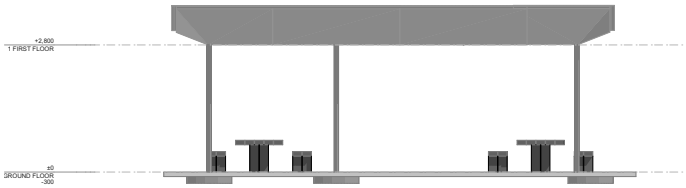


A-04 - NORTH ELEVATION 1:50

A-02 - SOUTH ELEVATION 1:50



A-03 - WEST ELEVATION 1:50



A-01 - EAST ELEVATION 1:50

All metal elements painted COLORBOND MONUMENT

Corrugated roof painted COLORBOND SURFMIST (top) and COLORBOND THREDBO WHITE (underside)

The roof structure is to be boxed in ARCHITECTURAL MESH BY KAYNEMAILE in standard colour option BRONZE (fully cladded structure - sides + ceiling). https://www.kaynemaile.com/exterior-kinetic

Roof structure A, B
Refer to shop drawings Sht 1-14 of 24 for detailed instructions.

Roof structure C
Refer to shop drawings Sht 19-22 of 24 for detailed instructions.

Columns 1
Refer to shop drawings Sht 23 of 24 for detailed instructions.

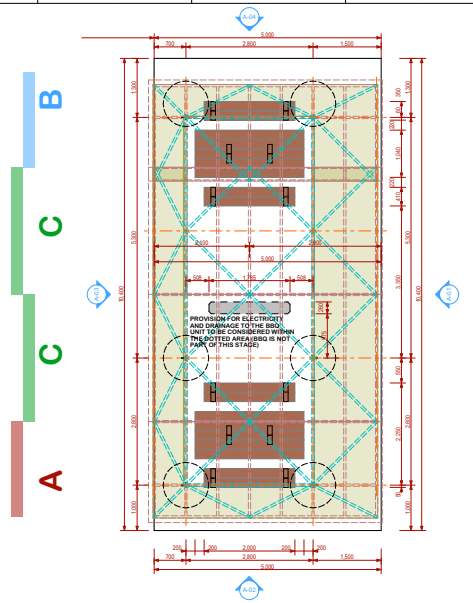
All columns are 2.8 m high.

For detailed information on A,B,C components and 1-4 column options please refer to structural shop drawings:
Andrew Baigent Consulting Engineers / Title: MODULAR PARK AMENITIES / Client:ALBURY CITY COUNCIL / Description: DETAILS referred to here as "shop drawings Sht XX of 24" (where XX is specified separately for each detailed page)
IMPORTANT: Any deviation from this ARCHITECTURAL PLAN from the shop drawings referred to above, or additional details presented here but not described in the shop drawings should be implemented as described here.

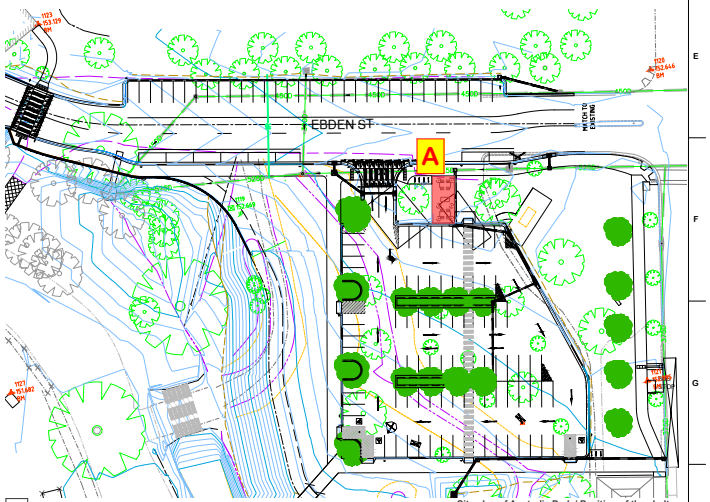
Seek Independent Structural Engineer's certification prior to construction.







0. - A shelters position 1:50



Site plan of Australia Park / Position of the shelters 1:500

AlburyCity		#### #### #### #### / #### #### #### #### / #### #### #### #### / #### #### #### ####		SURVEY		DESIGNED BY: M. SKOK	APPROVED ...../...../..... TEAM LEADER - DESIGN	Albury City
		REV DATE REVISIONS	INIT	DATUM	AHD	DRAWN BY: M. SKOK		AUSTRALIA PARK CAR PARK AND LEVEE BANK CONSTRUCTION CORNER OF EBDEN ST AND WODONGA PL - PICNIC AREA -
				GRID	MGA 94 - ZONE 55	CHECKED BY: D. HOWARD, ARB NSW: 5691	APPROVED ...../...../..... GROUP LEADER - SERVICES	
				SCALE	SCALE OF DRAWING	APPROVED BY: APPROVED BY		
				SHEET	A 1			

LEDGER No. 3.306.321 | No. of Sheets 01 | Sheet No. 01 | DRAWING NUMBER A | ARCH21/001

Appendix B: SES consultation correspondence

GHD Pty Ltd
Suite 5, 105 Hume Street
Wodonga
VIC 3690
www.ghd.com

Our ref: 313670604
Via email: rra@ses.nsw.gov.au

16 September 2021

Craig Ronan
Planning Coordinator
Southern Zone and Western Zone
State Emergency Service
79 Corporation Avenue
Bathurst NSW 2795

Review of Environmental Factors - Australia Park car park, pedestrian bridge and levee bank modification - consultation under State Environmental Planning Policy (Infrastructure) 2007

Dear Craig

GHD Pty Ltd (GHD) has been engaged by Albury City Council (Council) to prepare a review of environmental factors (REF) for the Australia Park car park, pedestrian bridge and levee bank modification project.

The objectives of the proposal are to:

– Improve car parking capacity in the area.
– Improve pedestrian safety in the area by separating motor vehicles from pedestrians and the Oddies Creek children's playground.
– Reconstruct the existing levee bank to accommodate the new works whilst also achieving improved levels of flood protection (part of Council's South Albury levee bank upgrade project).
– Improve the visitor experience through replacement of existing public BBQ, overhead shelter, picnic and seating facilities.
– Revegetate and rehabilitate the riparian areas of Oddies Creek.

The proposal site is located in public parkland adjacent at 317 Wodonga Place and south of Eben Street, approximately 900 metres south west of the Albury CBD. The land tenure at the site is Crown land managed by Council. The proposal would take place on land adjoining Oddies Creek and is approximately 160 metres north east of the Murray River.

Works required to complete the proposal would include:

– Construction of a new sealed carpark to the south of Ebden Street in Australia Park.
– Reconstruction and resealing of Ebden Street and adjoining car parks.
– Construction of a new earthen levee bank on a new alignment to the west of the existing levee bank, as well as a section of concrete retaining wall on the southern side of Ebden Street. The crest of the new levee is designed at 154.16 mAHD.
– Demolition and replacement of existing BBQ facilities, seating, overhead shelter, and pathways within Australia Park. Installation of new underground services.
– Construction of a new pedestrian bridge across Oddies Creek, linking the new carpark and the Oddies Creek Playground.
– Installation of a new service vehicle culvert crossing across Oddies Creek approximately 130 metres west of the site.
– Decommissioning of the existing vehicle bridge and Oddies Creek gravel carpark and conversion to additional green space adjacent Oddies Creek.

– Landscaping and site rehabilitation works including tree removal and replacement.

Construction of the proposal is proposed to commence in early 2022.

Works would lead to minor alterations in overall site elevation and topography. No significant impacts to flood water behaviour or floodplain storage capacity are anticipated. Please find attached a layout plan which provides information on the project design and the specific location of the proposed works.

Consultation with the SES is required under Clause 15AA of *State Environmental Planning Policy (Infrastructure) 2007*, (the Infrastructure SEPP) where development is proposed on flood liable land. The development is permissible without consent pursuant to Clauses 65(3)(a) and (b) of the Infrastructure SEPP.

We would appreciate receiving any comments regarding this proposal by 15 October 2021.

Please contact me if you require any additional information.

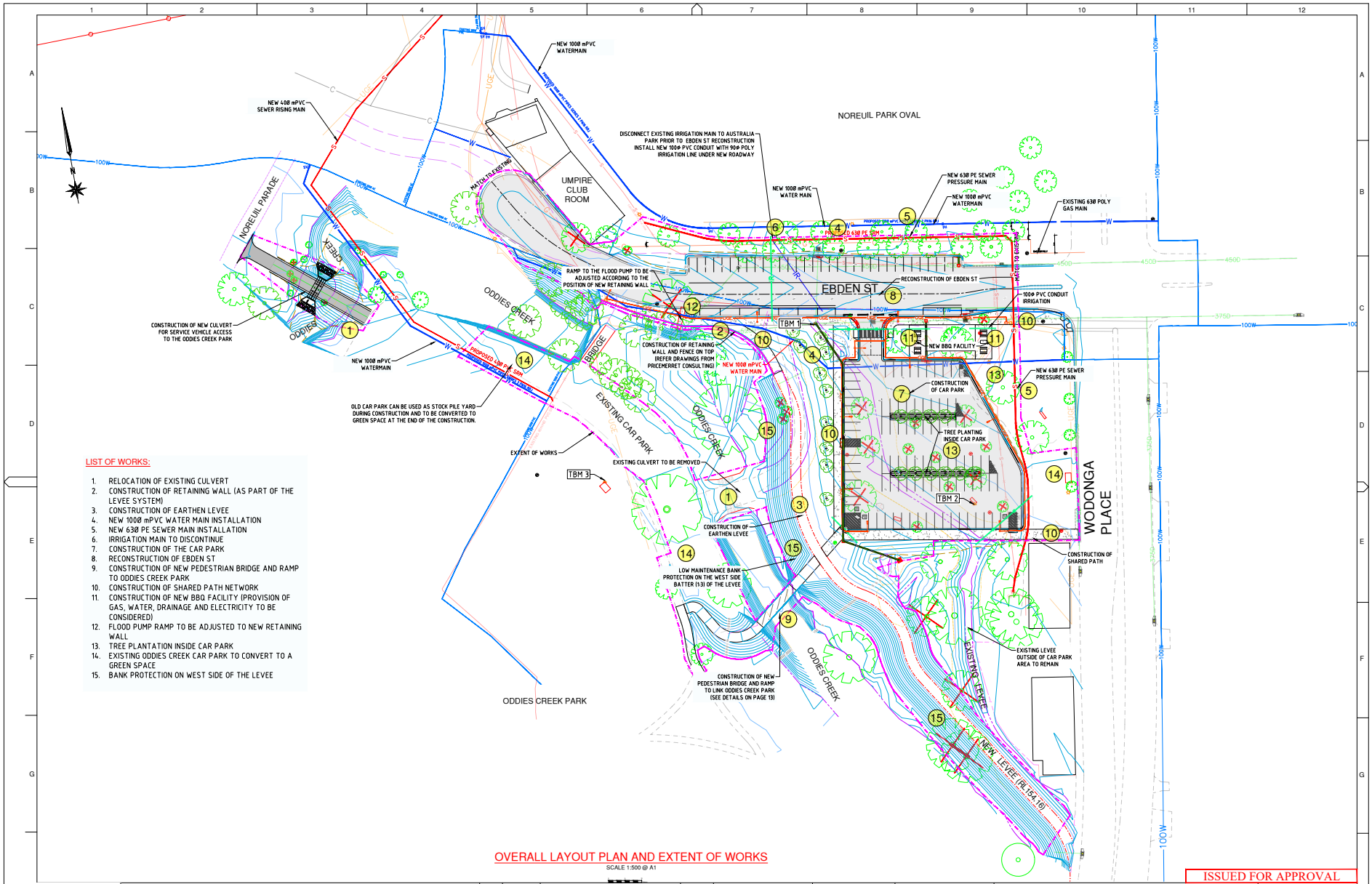
Regards



Stephen Dahl
Technical Director – Environment
GHD Pty Ltd

0432 744 775
Stephen.dahl@ghd.com

Attachment: Australia Park Overall layout plan and extent of works (ENG21/357 RevB)



LIST OF WORKS:

1. RELOCATION OF EXISTING CULVERT
2. CONSTRUCTION OF RETAINING WALL (AS PART OF THE LEVEE SYSTEM)
3. CONSTRUCTION OF EARTHEN LEVEE
4. NEW 100Ø mPVC WATER MAIN INSTALLATION
5. NEW 63Ø PE SEWER MAIN INSTALLATION
6. IRRIGATION MAIN TO DISCONTINUE
7. CONSTRUCTION OF THE CAR PARK
8. RECONSTRUCTION OF EBDEN ST
9. CONSTRUCTION OF NEW PEDESTRIAN BRIDGE AND RAMP TO ODDIES CREEK PARK
10. CONSTRUCTION OF SHARED PATH NETWORK
11. CONSTRUCTION OF NEW BBQ FACILITY (PROVISION OF GAS, WATER, DRAINAGE AND ELECTRICITY TO BE CONSIDERED)
12. FLOOD PUMP RAMP TO BE ADJUSTED TO NEW RETAINING WALL
13. TREE PLANTATION INSIDE CAR PARK
14. EXISTING ODDIES CREEK CAR PARK TO CONVERT TO A GREEN SPACE
15. BANK PROTECTION ON WEST SIDE OF THE LEVEE

OVERALL LAYOUT PLAN AND EXTENT OF WORKS

SCALE 1:500 @ A1

ISSUED FOR APPROVAL

AlburyCity

LEGEND

TOP OF BANK	EXISTING DRAINAGE	EXISTING TREES	EXISTING JUNCTION PIT		
BANK BOTTOM	PROPOSED DRAINAGE	TREES TO REMOVE	EXISTING SAG PIT		
KERB	PROPOSED KERB & GUTTER	NEW TREES TO PLANT	EXISTING SIDE ENTRY PIT		
CONCRETE EDGE	PROPOSED LEVEE TOP	LIGHT POLE	EXISTING GRATED PIT		
BITUMEN - EDGE	CONCRETE EDGE	LIGHT TO REMOVE	PROPOSED DGGP		
EDGE OF PATH	EXISTING WATER MAIN	HYDRANT/SV	PROPOSED JUNCTION PIT		
FENCE	IRRIGATION CONDUIT	BP MONITORING WELL - REMAIN (M) REINSTATE (R) RELOCATE (R)			
	PROPOSED WATER MAIN				

REV	DATE	AMENDMENTS	INIT.
C	27/07/2021	REVISED WATERMAIN & SEWER RISING MAIN ALIGNMENT	A RODGERS
B	22/06/2021	DRAW TREE PROTECTION ZONES	A RODGERS
A	25/05/2021	CONCEPT DESIGN	K. HASAN

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1:1000
SHEET	A1

DESIGNED K. HASAN
DRAWN K. HASAN
CHECKED A. RODGERS
APPROVED APPROVED BY

APPROVED ...../...../..... TEAM LEADER - DESIGN
APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
PROPOSED WORKS

LEDGER No. 3.306.321
REV. B | No. of Sheets 19 | Sheet No. 03
DRAWING NUMBER ENG21/357

Our Ref: ID 1462
Your Ref: 313670604

17th September 2021

Mr Stephen Dahl
GHD Pty Ltd
Suite 5, 105 Hume Street
Wodonga VIC 3690

Via email: Stephen.dahl@ghd.com

Dear Mr Dahl,

Notification under clause 15AA of the State Environmental Planning Policy (Infrastructure) 2007 in relation to the Review of Environmental Factors - Australia Park car park, pedestrian bridge, and levee bank modification

Thank you for the notification under clause 15AA of the *State Environmental Planning Policy (Infrastructure) 2007* in relation to the Review of Environmental Factors - Australia Park car park, pedestrian bridge, and levee bank modification.

The NSW State Emergency Service (NSW SES) has reviewed the proposed upgrade using the information provided with the proposal and the flood risk information (e.g. local flood Plan, flood studies etc.) available to the NSW SES. Based on this review the proposed works appear to have minimal risk to NSW SES response operations.

However the NSW SES recommends that Albury City Council undertake flood modelling to validate the flood immunity levels of South Albury Levee Bank and to ascertain the effects on flooding of the proposed new earther levee bank to the west of the existing levee bank. If such modelling has already been undertaken the NSW SES requests that the studies be provided to enable us to review and/or update our flood intelligence as required.

Please feel free to contact me on 0458 737 188 or via email at maria.frazer1@one.ses.nsw.gov.au should you wish to discuss any of the matters raised in this correspondence.

Yours sincerely,

MK Frazer

Maria Frazer
Coordinator Planning
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Appendix C: Biodiversity Assessment



Australia Park infrastructure works: Biodiversity assessment

FINAL REPORT

Prepared for GHD Pty Ltd (Wodonga) and Albury City Council

26 May 2022

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- NSW Environment, Energy and Science Group for access to the BioNet Atlas of NSW Wildlife.
- NSW Department of Primary Industries Fisheries for access to the predicted distribution maps for threatened species and fish communities.

Biosis staff involved in this project were:

- Luke Stone (Aquatic species assistance)
- Daeyoo Kang (mapping)
- Matt Looby (quality assurance)

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Summary

Biosis Pty Ltd was commissioned by GHD Pty Ltd (Wodonga) on behalf of Albury City Council (ACC) to undertake a Biodiversity assessment (BA) at Australia and Oddies Creek Parks in Albury, New South Wales (NSW). The study area is 1 kilometre south of Albury's central business district (CBD). The Biodiversity Impact Assessment will be used to inform the preparation of a Review of Environmental Factors (REF) under Part 5 of the NSW *Environmental Planning and Assessment Act* 1979 (EP&A Act).

The study area is defined by the extent of proposed works, which consists of an area of roughly 3.5 hectares, within Australia and Oddies Park, located adjacent to the Murray River. The assessment is being undertaken to describe the biodiversity values and constraints associated with proposed recreational infrastructure and upgrading of facilities works within the two parks. Biosis previously completed a constraints analysis in May 2020 and prepared a short letter outlying site constraints.

The biodiversity impacts assessed have been calculated based on the extent of works provided by ACC and the arborist assessment under taken by Homewood Consulting Pty Ltd (Homewood 2022). Within the extent of works, native understorey vegetation is proposed to be removed, as well as two hollow-bearing and four non-hollow bearing indigenous trees that will be removed or are considered non-viable post construction. Several non-indigenous trees of varying providence are also proposed to be removed.

This assessment has been undertaken to allow for assessment of both the subject site as well as any additional areas in the broader study area which are likely to be affected by the proposal, either directly or indirectly. Identified constraints will be used to guide detailed design, with an emphasis on avoiding impacts to biodiversity values, where feasible.

Biodiversity values and impacts

Key biodiversity values and likely impacts identified within the study area are as follows:

- 0.76 hectares of native vegetation consistent with Plant Community Type (PCT) 5 *River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion.* This area includes planted non-indigenous Flooded Gum *Eucalyptus grandis*.
- Hollow-bearing trees along the creek line.
- Oddies Creek runs through the study area and into the Murray River and may provide a habitat corridor for aquatic and riparian species.
- Potential habitat for *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed species Grey-headed Flying-fox *Pteropus poliocephalus* (Vulnerable EPBC Act, Vulnerable NSW *Biodiversity Conservation Act 2016* [BC Act]).
- Potential habitat for three EPBC Act listed aquatic species – Flat-headed Galaxias *Galaxias rostratus* (Critically Endangered EPBC Act and *NSW Fisheries Management Act 1994* [FM Act], Trout Cod *Maccullochella macquariensis* (Endangered EPBC Act and FM Act) and Murray Cod *Maccullochella peelii* (Vulnerable EPBC Act).
- Potential habitat for seven threatened species listed under the BC Act and/or *Fisheries Management Act 1994* (FM Act) within the study area:
  - Squirrel Glider *Petaurus norfolcensis* (Vulnerable under the BC Act).

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- Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris* (Vulnerable under the BC Act).
- Dusky Woodswallow *Artamus cyanopterus cyanopterus* (Vulnerable under the BC Act).
- White-bellied Sea-Eagle *Haliaeetus leucogaster* (Vulnerable under the BC Act).
- Barking Owl *Ninox connivens* (Vulnerable under the BC Act)
- Murray Crayfish *Euastacus armatus* (Endangered under the FM Act).
- Southern Pygmy Perch *Nannoperca australis* (Endangered under the FM Act).

- Removal of 0.18 hectares of native vegetation consistent with PCT 5.
- Direct removal of four non-hollow-bearing trees and encroachment of two hollow-bearing trees that are considered non-viable post construction.
- Removal of planted vegetation from within the study area, including planted non-indigenous eucalypts.

Recommendations

A range of recommendations are provided that are specifically developed to avoid and minimise impacts on biodiversity. These recommendations will need to be considered in the detailed design phase of the project.

A number of recommendations specific to tree protection are contained within Homewood (2022) and these recommendations should be implemented as required.

Biosis recommends the following design, pre-construction and construction measures be implemented:

Design responses

Biosis understands that ACC has adopted the following preliminary designs to avoid and minimise biodiversity impacts:

- Minimisation of impacts on key habitats for threatened biota including large hollow-bearing trees and remnant patches of PCT 5.
- Where practicable, ACC has designed infrastructure within previously disturbed areas or within areas of predominantly introduced vegetation.
- Minimisation of impacts on TPZs of large hollow-bearing trees by designing the infrastructure outside of TPZs, where possible and using sensitive construction methods within TPZs, see Homewood (2022) for specific detail.
- Utilising the old car park and current Oddies Creek Park as a stockpile yard during construction to avoid further impacts to native vegetation.

Recommended pre-construction measures

- Pre-clearance surveys of all vegetation to be removed should occur to identify any active nests and roost sites.

Recommended construction mitigation measures

- To the fullest extent practicable, minimise disturbance to any native vegetation surrounding the study area. Fence areas with bunting to avoid any accidental vegetation clearance.
- Soil transportation should be minimised within, into or out of the study area to reduce the spread of weeds. Vehicle hygiene should be a priority as the site contains a variety of introduced species.

- Two priority weeds within the Albury Council Local Government Area (LGA) were identified within the study area. Appropriate measures should be implemented to minimise the spread of this species.
- All access within the study area should be restricted to roads/tracks and already disturbed areas where feasible.
- Utilising the old car park as a stockpile yard during construction to avoid further impacts to native vegetation.
- Sediment fences or silt curtains should be deployed around Oddies Creek to protect against any impacts to water quality. These are to be implemented in addition to standard erosion and sediment control measures.
- Specific detail relating to preventing impacts to retained vegetation and terrestrial habitat should be addressed in a site-specific Construction Environmental Management Plan (CEMP). This will include issues relating to contractors such as environmental inductions, installation of temporary fencing/signage, drainage and sediment control.
- An 'unexpected threatened species finds protocol' should be established and appended to a CEMP, with the aim of further reducing impacts in the event of an unexpected find. The protocol should also include a notification and reporting process to ACC.
- Any fauna uncovered during removal of vegetation, should be relocated to adjacent suitable habitat.

Recommended post-construction mitigation measures

- As per ACC proposed plans, areas that have been disturbed by works during construction are recommended to be revegetated and converted to green spaces post-construction.

Additional recommendations for the protection of aquatic habitats

In particular the following management measures should be taken to protect waterways and aquatic habitats:

- The stockpiling of soil, if required, should be located as far away from the waterway as possible and managed so that it is secure against flooding.
- Any runoff from stockpiled soil must be managed to prevent any sediment entering the waterway.
- Instream works and works around waterways should be limited to calm weather conditions and during low flow periods wherever possible.
- Any woody debris encountered in the instream works zone should be relocated and reinstated within Oddies Creek.
- The use of instream structures for crossings should be avoided wherever possible.
- Waterway crossing should be designed to maintain the existing nominal flow velocity where possible.
- Waterway crossing methods should consider the principles outlined in Section 4.1 of Fairfull (2013).
- Where required, temporary crossing structures should be designed, constructed and maintained so that low flow conditions and fish passage are maintained and any material used will not result in fine sediment entering the waterway.
- The design considerations and recommendations detailed in the *Controlled activities on waterfront land - Guidelines for watercourse crossings on waterfront land* (NSW Office of Water 2012a) should be considered.

Government legislation and policy

An assessment of the project against key biodiversity legislation and policy is provided and summarised below.

Legislation / Policy	Relevant ecological feature	Permit / approval required
Environment Protection and Biodiversity Conservation Act 1999	Potential habitat for the following threatened species: • Grey-headed Flying-fox. • Flat-headed Galaxias. • Trout Cod. • Murray Cod.	Assessments against the Significant Impact Criteria (CoA 2013) have been prepared for these threatened species (Appendix 3). The assessments concluded that a significant impact is not likely to result from the project based on the relatively small construction footprint, the dispersal ability of these mobile species and the quantity of similar vegetation types and aquatic habitats surrounding the Australia Park works. A referral to the Commonwealth is not considered necessary.
Environmental Planning & Assessment Act 1979	Under Section 5.5 of the *Environmental Planning and Assessment Act 1979*, a determining authority in its consideration of an activity shall examine and take into account all matters affecting or likely to affect the environment by reason of that activity.	Preparation of a Review of Environmental Factors is recommended in order to assess the potential environmental impacts of the proposed works.

Legislation / Policy	Relevant ecological feature	Permit / approval required
SEPP (Transport and Infrastructure) 2021	Under the *SEPP (Transport and Infrastructure) 2021*a number of exemptions apply for development without consent.	Clause 2.73 (3a) of the *SEPP (Transport and Infrastructure) 2021* states that development for the purpose of (i) pedestrian pathways, cycleways, viewing platforms and pedestrian bridges, (ii) recreation areas and recreation facilities (outdoor), (v) landscaping, including landscape structures, (vi) amenities for people using the reserve, including toilets and change rooms, (vii) food preparation and related facilities for people using the reserve may be carried out by or on behalf of a public authority without consent on a public reserve under the control of or vested in the council. Division 7 flood mitigation works, Clause 2.56 (1) states development for the purpose of flood mitigation work may be carried out by or on behalf of a public authority without consent on any land.
Biodiversity Conservation Act 2016	The study area contains potential habitat for six threatened fauna species.	Tests of Significance (see Appendix 4) indicate that a significant effect is not likely to result from the proposal. A Species Impact Statement or opting into the Biodiversity Offset Scheme is therefore not required.
Fisheries Management Act 1994	Five threatened aquatic species have been recorded or have a high likelihood of occurring in the Murray River and potentially Oddies Creek.	Seven Part Tests were prepared (see Appendix 4) and indicate that a significant effect is not likely to result from the proposal. A Section 200 permit is required (unless authorised by a relevant government authority that is not NSW DPI or under the *Crown Lands Act 1989*).
Water Management Act 2000	Under the *Water Management Act 2000* an approval is required to undertake controlled activities within 40 metres of a waterway unless that activity is otherwise exempt under Section 91E.	A public authority does not need to obtain a controlled activity approval for any controlled activities that it carries out in, on or under waterfront land.

Legislation / Policy	Relevant ecological feature	Permit / approval required
Biosecurity Act 2015	The following priority weeds are present: • Willows *Salix* sp. • Cape Broom *Genista monspessulana.*	As the land manager, ACC has an obligation under the Biosecurity Act to control all weeds, including priority weeds on their land.

1 Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by GHD Pty Ltd (Wodonga) on behalf of Albury City Council (ACC) to undertake a Biodiversity Impact Assessment at Australia and Oddies Creek Parks in Albury, New South Wales (NSW). The assessment is being undertaken to describe the biodiversity values and constraints associated with proposed recreational infrastructure works in the two parks. Biosis previously completed a due diligence biodiversity assessment in May 2020 and prepared a short letter outlying site constraints.

Biosis understands that ACC proposes a number of new recreation, flood protection and/or transport-related infrastructure upgrades within Australia Park and Oddies Creek Park (the project). These upgrades will form part of a broader suite of development projects around the Murray River precinct.

In summary, ACC proposes the following types of infrastructure upgrades for the project:

- Construction of new culvert for service vehicle access to Oddies Creek Park.
- An upgraded levee.
- Reconstruction of Ebden Street.
- Construction of a new carpark and associated lighting.
- Construction of new underground services (sewer rising main and watermain).
- Construction new pedestrian bridge across Oddies Creek.
- Demolition of the existing carpark and creek crossing.

The proposed works are subject to an approval under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). For this project ACC is both a public authority proponent and the determining authority (EP&A Act s. 5.2). Determining authorities have a duty to consider all matters affecting or likely to affect the environment by reason of that activity as stated in Division 5.5 of the EP&A Act. This report will form part of a Review of Environmental Factors (REF) to be prepared for the project by ACC.

The biological impacts outlined in this report have been calculated based on the construction and access footprints provided by ACC (Australia Park - Sheet 3-PROPOSED WORKS 290721) and the arborist assessment under taken by Homewood Consulting Pty Ltd (Homewood 2022). Understory native vegetation within the construction footprint, including planted and non-planted vegetation, has been considered lost. Two hollow-bearing tree have been considered lost due to major encroachment into their Tree Protection Zones (TPZs) and four additional non-hollow bearing trees will be directly removed.

The objective of this biodiversity assessment is to determine the presence of species, populations and/or ecological communities (biota), or their habitat, listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), NSW *Biodiversity Conservation Act 2016* (BC Act) or *Fisheries Management Act 1994* (FM Act) and determine the impact of the development on these threatened species or communities under the relevant state or federal legislation.

1.2 Scope of assessment

The objectives of this investigation are to:

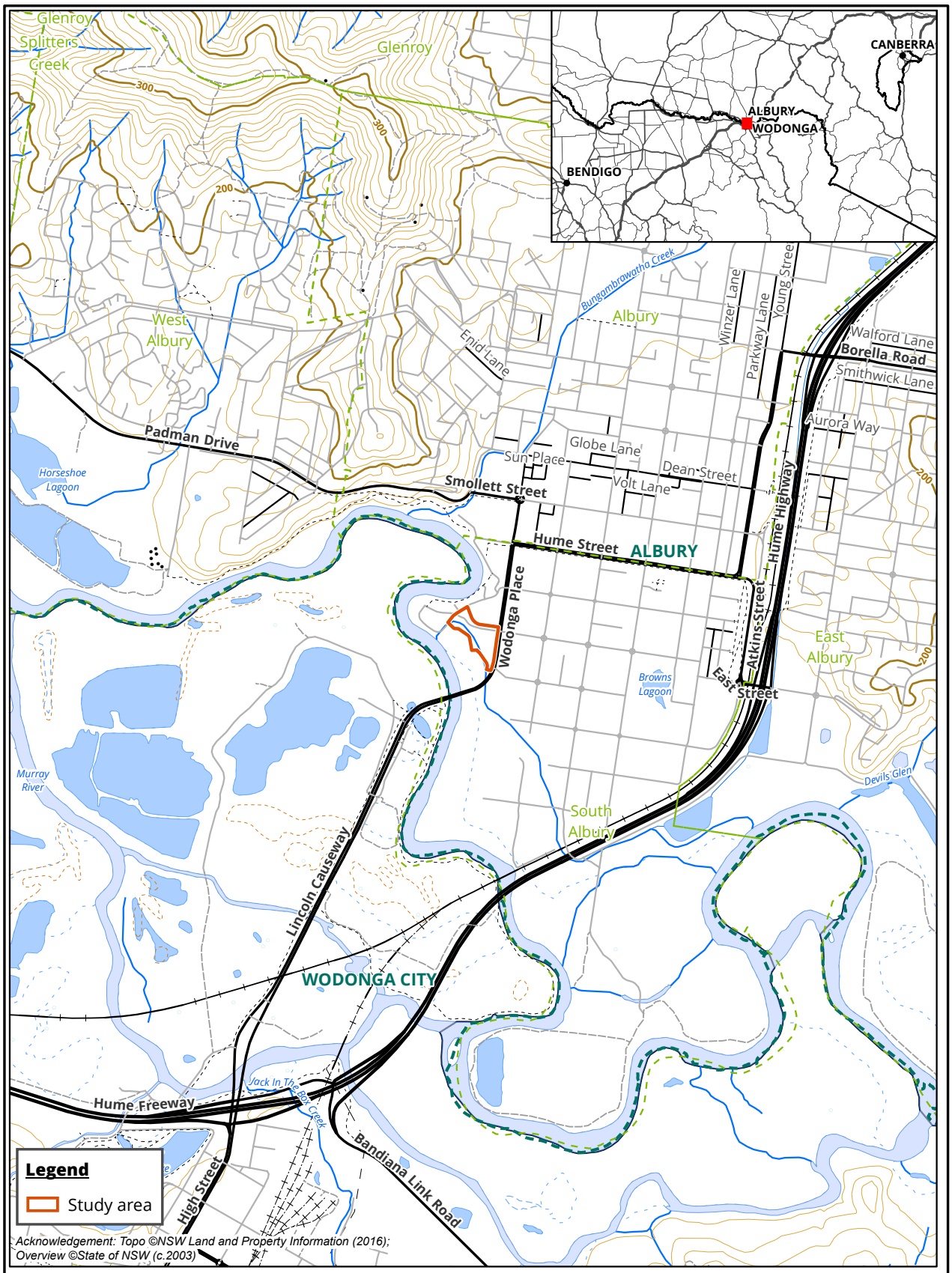
- Describe the vascular flora (ferns, conifers, and flowering plants), vertebrate fauna (birds, mammals, reptiles and frogs).
- Ground truth any mapped native vegetation and other habitat features and map any new features that are within the updated study area.
- Review the implications of relevant biodiversity legislation and policy.
- Identify potential implications of the proposed works and provide recommendations to assist with works design.
- Recommend any further assessments of the site that may be required (such as targeted searches for threatened entities).

1.3 Location of the study area

The study area is within Oddies Creek and Australia Parks, adjacent to the Murray River. These parks are currently used for recreation (Figure 1). It is within Albury City Council Local Government Area (LGA) and is zoned RE1: Public Recreation under the Albury Local Environmental Plan 2010.

The study area is within the:

- South- Western Slopes Bioregion.
- Murray catchment area (Managed by Murray Local Land Services)
- Murray Local Land Services (LLS) region.
- Albury Local Government Area (LGA).



biosis

Figure 1 Location of the study area

Matter: 35875
Date: 04 October 2021,
Drawn by: DK, Checked by: MT, Last edited by: dkang
Location:P:\35800s\35875\Mapping\
35875_AustraliaPArk, Layout: 35875_F1_Locality

0 200 400 600 800 1,000
Metres
Scale 1:1:25,000@ A4, GDA 1994 MGA Zone 55

N

2 Methods

2.1 Literature and database review

In order to provide a context for the study area, information about flora and fauna from within 10 kilometres (the locality) was obtained from relevant public databases. Database searches were undertaken in September 2021 and included:

- Department of Agriculture, Water and the Environment (DAWE) Protected Matters Search Tool for matters protected by the EPBC Act.
- NSW BioNet - *the database for the Atlas of NSW Wildlife*, Environment, Energy and Science (EES) (BC Act).
- The NSW Department of Primary Industries (DPI) Spatial Data Portal for *Fisheries Management Act 1994* (FM Act) listed threatened species, populations and communities.
- PlantNET (RBGDT 2019).
- EES Vegetation Information System (VIS) mapping, including: Riverina Region Version v1.2 -VIS_ID 4469 (OEH 2016).

The following reports were also reviewed:

- Biosis 2021a. Biodiversity constraints assessment for Oddies Creek and Australia Parks. Report for GHD.E. Kelly. Biosis Pty Ltd. Albury, NSW. Project no. 29482.

2.2 Site investigation

2.2.1 Flora assessment

The original field investigation of the study area was undertaken on 20 February 2019 by qualified ecologist Ewan Kelly with field assistance from Georgina Zacks (Botanist). A further assessment was undertaken on 28 September 2021 by Matilda Terry (Botanist) using a random meander to determine the vegetation types present and map any ecological values which were not mapped in the previous extent of works footprint. The flora assessments included:

- Mapping of the terrestrial vegetation communities within the study area.
- Mapping of all indigenous hollow-bearing trees.
- Determination of the potential for the study area to provide suitable habitat or support terrestrial threatened biota.

General classification of native vegetation in NSW used in this report is based on the classification system in Keith (2004) which uses three groupings of vegetation: vegetation formation, vegetation class and vegetation type, with vegetation type being the finest grouping. The grouping referred to in this report is Plant Community Type (PCT) as defined by the BAM.

The vegetation types were stratified into PCTs broadly based on previous vegetation mapping, and the vegetation boundaries marked with a hand-held GPS in the field. Appropriate PCTs were determined on the basis of species composition and structure, known geographical distribution, landscape position, underlying geology, soil type, and any other diagnostic features.

Tree Protection Zones for individual trees were provided by ACC.

2.2.2 Fauna assessment

A habitat-based assessment was completed to determine the presence of suitable habitat for threatened species previously recorded or predicted to occur within 10 kilometres. This list was filtered according to species descriptions, life history and habitat preference to determine those species most likely to be present within the study area.

2.2.3 Permits and licences

The flora and fauna assessment was conducted under the terms of Biosis' Scientific Licence issued by the Environment, Energy and Science Group under the *National Parks and Wildlife Act 1974* (SL100758, expiry date 31 March 2022). Fauna survey was conducted under approval 11/355 from the NSW Animal Care and Ethics Committee (expiry date 31 January 2022).

2.3 Limitations

Ecological surveys provide a sampling of flora and fauna at a given time and season. There are a number of reasons why not all species will be detected at a site during survey, such as species dormancy, seasonal conditions, ephemeral status of waterbodies, and migration and breeding behaviours of some fauna. In many cases these factors do not present a significant limitation to assessing the overall ecological values of a site.

The current flora and fauna assessment was conducted in spring, which is an optimal time for survey. The study area has been highly modified overtime and therefore there is no significant limitation to assess the general values of the study area.

Database searches, and associated conclusions on the likelihood of species to occur within the study area, are reliant upon external data sources and information managed by third parties.

2.4 Legislation and policy

The implications for the project were assessed in relation to key biodiversity legislation and policy including:

- Matters listed under the EPBC Act, associated policy statements, significant impacts guidelines, listing advice and key threatening processes.
- EP&A Act associated Test of Significance guidelines, Planning Policies and Local Environmental Plans.
- Threatened taxa, communities and key threatening processes listed under BC Act.
- Noxious weeds listed under the *Biosecurity Act 2015* (Biosecurity Act).
- Threatened aquatic species listed under the FM Act.
- Waterways listed under the *Water Management Act 2000* (WM Act).
- *Albury Development Control Plan 2010.*
- *Albury Local Environmental Plan 2010.*

2.5 Mapping

Site plans (Australia Park - Sheet 3-PROPOSED WORKS 290721) were supplied by AlburyCity.

Mapping was conducted using hand-held (uncorrected) GPS Tablet units (GDA94) and aerial photo interpretation. The accuracy of this mapping is therefore subject to the accuracy of the GPS units (generally ± 4 metres) and dependent on the limitations of aerial photo rectification and registration.

Mapping has been produced using a Geographic Information System (GIS). Electronic GIS files containing the relevant flora and fauna spatial data are available to incorporate into design concept plans. However this mapping may not be sufficiently precise for detailed design purposes.

3 Results

The ecological values of the study area are described below and mapped in Figure 2. Flora and fauna observed on site have not been attached within the Appendices as previous detailed assessments (Biosis 2020a and 2021b) with extensive lists have been conducted within Australia Park, Oddies Park and surrounding areas.

3.1 Landscape context

The study area is located within South Albury. It is a peri-urban environment where the majority of remnant native vegetation is contained within parklands, riparian areas or farmland along the river flats. Outside of these areas native vegetation has been highly modified over time for residential and industrial purposes. The study area is adjacent to the Murray River riparian corridor which, in some areas, is connected to more extensive areas of native vegetation such as Nail Can Hill (2 kilometres north of the study area).

The proposed works will occur within an area used for recreational activities. These parks along the Murray River consist of areas that have been landscaped and highly modified overtime, with fragmented patches of riparian vegetation of low quality and little understorey or structure. Along Oddies Creek, large hollow-bearing trees have been retained. Although in majority of the study area, large trees have been cleared, now supporting predominantly introduced vegetation and planted species. Oddies Park and Australia Park contain a range of playground equipment, barbeque facilities, car parking, footpaths and bike paths, sporting and other recreational facilities and associated infrastructure.

3.2 Soil description

Regional soil landscape mapping indicates that the study area occurs on the Murray Channels and Floodplains landscape of the NSW South West Slopes Bioregion (Mitchell 2002). The Murray Channels and Floodplains soils landscape includes channels and seasonally inundated floodplains of the Murray streams in Quaternary alluvium with billabongs, swamps, channels, levees and source bordering dunes to 10 metres (Mitchell 2002). Soils present include grey and brown clays around riverbanks and billabongs, brown clays or red-brown texture-contrast soils on slightly higher terraced plains and dunes and sandplains of deep sandy brown soils (Mitchell 2002).

3.3 Vegetation communities and fauna habitat

Habitats throughout the study area have been modified by past disturbance associated with agriculture, flood protection and recreational developments. The study area consists of predominantly introduced vegetation with scattered remnant indigenous trees and some small remnant patches of native vegetation (Figure 2). One Plant Community Type (PCT) occurs along Oddies Creek:

- PCT 5 - *River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion.*

River Red-gum *Eucalyptus camaldulensis* forest throughout the study area provides foraging habitat for Grey-headed Flying-fox *Pteropus poliocephalus* (Vulnerable under the EPBC and BC Act respectively) which are known to roost 2 kilometres north-west at Leaney's Bend and forage along the Murray River. River Red-gums with hollows also provide foraging and nesting opportunities for the Squirrel Glider *Petaurus norfolcensis* (Vulnerable under the BC Act) and Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris* (Vulnerable under the BC Act). Other threatened species including Dusky Woodswallow *Artamus cyanopterus cyanopterus,* White-bellied Sea-Eagle *Haliaeetus leucogaster* and Barking Owl *Ninox connivens* (species all Vulnerable under the BC Act) are all likely to forage within the study area. The ecological values are outlined below in Table 2.

Table 1 Vegetation communities and habitat types of the study area

Vegetation or habitat type	Description	Location	Significant values
PCT 5 - River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion. **Photo 1**	River Red-gum forest is found on seasonally inundated river and creek fringes and lower floodplains with soils consisting of riverine deposits of clay, silt, sand and gravel, together with alluvial loams and clays. Intact examples of this PCT include a canopy dominated by River Red-gum *Eucalyptus camaldulensis*, with a sparse mid-storey shrub layer including Silver Wattle *Acacia dealbata*, Sweet Bursaria *Bursaria spinosa* and River Bottlebrush *Callistemon sieberi*. The groundlayer consists of Common Reed *Phragmites australis* and Cumbungi *Typha orientalis* on the river bank, with sedges *Carex spp*. and Rushes *Juncus spp*. in seasonally damp areas. On slightly elevated flats, ground cover consists of grass species such as Weeping grass *Microlaena stipoides* and Tall Tussock *Poa labillardierei*. Intact PCT 5 provides habitat for a range of locally common avian, marsupial, reptile and microbat species. Within the study area this PCT is generally in a poor condition, with mid and ground layers dominated by planted and predominantly introduced vegetation. Scattered native species includes *Juncus* spp. Introduced woody vegetation is present along the banks of Oddies Creek and includes species Willow *Salix* sp., Weeping Willow *Salix babylonica,* Small-leaved Privet *Ligustrum sinense*, Canary Island Date Palm *Phoenix canariensis* and Cape Broom *Genista monspessulana*. Introduced grass and herbaceous species include Kikuyu *Cenchrus clandestinum*, Paspalum *Paspalum dilatatum*, Toowoomba Canary Grass *Phalaris aquatica*, Annual Poa *Poa annua*, Stinkgrass *Eragrostis cilianensis,* Panic Veldtgrass *Ehrharta erecta* and Catsear *Hypochaeris radicata* dominating the ground cover. The understorey of these areas is frequently mown/slashed.	Along Oddies Creek.	This PCT contains significant fauna habitat values for locally common avian, marsupial, reptile and microbat species. It may provide occasional foraging resources for threatened species, such as the Grey-headed Flying-fox, Barking Owl and Dusky Woodswallow. Large old hollow-bearing trees provide nesting habitat for the threatened Squirrel Glider and Yellow-bellied Sheathtail-bat.

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Vegetation or habitat type	Description	Location	Significant values
Scattered indigenous trees **Photo 2**	There are several River Red-gums that are scattered within the study area. These trees are up to 165 cm Diameter at Breast Height, many which are hollow-bearing.	Scattered.	Provide nesting habitat and foraging resources for a range of threatened and common fauna species.
Predominantly introduced vegetation	This is not a PCT and is considered non-native vegetation. This vegetation occurs throughout the majority of the study area, with introduced grasses such as Kikuyu, Annual Poa, Paspalum, Catsear and St John's Wort *Hypericum perforatum* subsp. *veronense* and Wall Speedwell *Veronica arvensis* dominating the ground layer. These areas are frequently mown.	Areas outside of mapped PCT.	Contains limited values for native fauna.
Planted non- indigenous trees **Photo 3**	A variety of non-indigenous planted trees have been planted across the study area. These include Spotted Gum *Corymbia maculata*, Sugar Gum *Eucalyptus cladocalyx,* London Plane Tree *Platanus x acerifolia* and English Elm *Ulmus procera*.	Trees are concentrated in the north and east of the study area.	May provide nesting and foraging resources for a range of locally common avian species.
Oddies Creek aquatic habitat **Photo 5**	Oddies Creek runs through the study area and is a small, degraded creek at this location that supports a limited number of native species. Although disturbed, it does provide habitat for a range of common and threatened aquatic species and waterbirds.	Through the middle of the study area.	Oddies Creek is roughly 2 metres wide with a depth of less than 1 metre. It has some remaining vegetation, but lacks debris for habitat. Oddies Creek could potentially provide habitat for a number of threatened aquatic species, given its close proximity to the Murray River. The creek also provides habitat for a range of common aquatic species and waterbirds. Common Eastern Froglet *Crinia signifera* was heard calling from the water and Australian Wood Duck *Chenonetta jubata* and Australian White Ibis *Threskiornis moluccus* were observed feeding on vegetation along the banks.

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Photo 1 **PCT 5 along the banks of the Oddies Creek within the study area, note non-indigenous Flooded Gum to right of Oddies Creek. Photo taken 28 September 2021.**



Photo 2 **Scattered trees within the study area. Photo taken 28 September 2021.**



Photo 3 Planted non-indigenous trees. Photo taken 28 September 2021.



Photo 4 Predominantly introduced vegetation within the study area. Photo taken 28 September 2021.



Photo 5 Oddies Creek aquatic habitat. Photo taken 28 September 2021



Figure 2 Ecological features within the study area

3.4 Threatened biota

Threatened entities includes all flora and fauna species, populations and ecological communities listed under the EPBC Act and BC Act. Lists of threatened entities recorded or predicted to occur within 10 kilometres of the study area are provided in Appendix 1 (flora) and Appendix 2 (fauna). An assessment of the likelihood of these species occurring in the study area, and an indication of the likelihood of the project resulting in a significant impact/effect, is included.

No areas of critical habitat for flora or fauna have been declared within the study area. Six terrestrial fauna and five aquatic fauna species have been identified as having a medium or greater likelihood of occurrence. No threatened flora species or communities were recorded in the study area. Table 2 discusses areas of value and potential impacts for all species with a medium or greater likelihood of occurrence, and determines the need for a ToS for terrestrial species and a 7- Part assessment for aquatic species.

Known habitats for migratory species have been assessed and are considered and addressed in Appendix 2.

Table 2 Threatened biota likely to occur in the study area

Species name	EPBC Act	BC/ FM Act	Area of value within the study area
Ecological communities			
No ecological communities are present within the study area.			
Threatened flora			
No threatened flora species are likely to persist within the study area.			
Threatened terrestrial fauna			
Grey-headed Flying-fox ***Pteropus poliocephalus***	Vulnerable	Vulnerable	Known camp at Leaney's Bend 2 kilometres north-west of the study area and suitable foraging habitat occurs within the study area. Significant Impact Criteria (SIC) assessment in accordance with the EPBC Act has been undertaken in Appendix 3 and a Test Of Significance (ToS) has been undertaken in accordance with the BC Act in Appendix 4.
Squirrel Glider ***Petaurus norfolcensis***	-	Vulnerable	Suitable habitat within large hollow- bearing River Red-gums. A ToS in accordance with the BC Act has been undertaken in Appendix 4.
Yellow-bellied Sheathtail-bat ***Saccolaimus flaviventris***	-	Vulnerable	Suitable habitat within large hollow- bearing River Red-gums. A ToS in accordance with the BC Act has been undertaken in Appendix 4.
Dusky Woodswallow Artamus ***cyanopterus cyanopterus***	-	Vulnerable	Suitable foraging resources and hollows within the study area. A ToS in accordance with the BC Act has been undertaken in Appendix 4.

Species name	EPBC Act	BC/ FM Act	Area of value within the study area
White-bellied Sea-Eagle ***Haliaeetus leucogaster***	-	Vulnerable	Species is likely to forage over the adjacent Murray River. Although this species could fly over the study area, it is unlikely to forage within the area, therefore no ToS in accordance with the BC Act has been undertaken.
Barking Owl ***Ninox connivens***	-	Vulnerable	Suitable foraging resources are present within the study area. A ToS in accordance with the BC Act has been undertaken in Appendix 4.
Threatened aquatic fauna			
Flat-headed Galaxias ***Galaxias rostratus***	CR	CE	Indicative habitat is mapped adjacent to the study area. A SIC and 7-part test in accordance with the FM Act has been prepared in Appendix 3 and 4 respectively.
Trout Cod ***Maccullochella macquariensis***	EN	EN	Known to occur within the locality. A SIC and 7-part test in accordance with the FM Act has been prepared in Appendix 3 and 4 respectively.
Murray Cod ***Maccullochella peelii***	VU	-	Known to occur within the locality. A SIC has been prepared in Appendix 3.
Murray Spiny Crayfish ***Euastacus armatus***	-	VU	Known to occur within the locality. A 7-part test in accordance with the FM Act has been prepared in Appendix 4.
Southern Pygmy Perch ***Nannoperca australis***		EN	Indicative habitat is mapped within the study area. A 7-part test in accordance with the FM Act has been prepared in Appendix 4.

4 Ecological impacts and recommendations

This section identifies the potential impacts of proposed development on the ecological values of the study area and includes recommendations to assist ACC to design the works to minimise impacts on ecological values.

A range of impact avoidance and minimisation measures have been adopted by ACC at the project design phase and these will inform the detailed design of works and proposed construction methods. Additional pre-construction and construction measures are recommended here and will be subject to endorsement by ACC and their construction contractor.

The current proposed extent of infrastructure works at Australia Park will involve:

- The removal of 0.18 hectares of low quality native vegetation consistent with PCT 5 (Figure 3).
  - This will include two hollow-bearing which have been considered non-viable due to encroachment of more than 10 percent into the TPZs and the direct removal of four non-hollow bearing trees within the works footprint.
  - Works will also remove planted indigenous and non-indigenous vegetation throughout the study area.
  - The works will contribute further to light pollution in the area due to the permanent lighting requirements of the carpark.
  - The works will also result in further vegetation loss which when considered cumulatively includes works north of the project area along the Murray River bank.
- Habitat for threatened species within the study area include:

Terrestrial species:

- Grey-headed Flying-fox
- Squirrel Glider
- Yellow-bellied Sheathtail-bat
- Dusky Woodswallow
- White-bellied Sea-Eagle
- Barking Owl

Aquatic species:

- Flat-headed Galaxias
- Trout Cod
- Murray Cod
- Murray Crayfish
- Southern Pygmy Perch.

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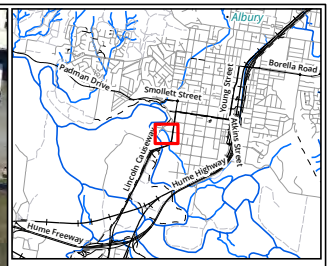
A ToS, SIC and/or 7-part assessment has been undertaken for each of these species and is provided in Appendix 3 and Appendix 4.

A summary of potential implications of development of the study area and recommendations to minimise impacts during the detailed design and construction phases of the project is provided in Section 4.1 below.





Legend

- Study area
- Extent of works
- Vegetation to be removed

Hollow-bearing trees

- HBT to be retained
- HBT with major impact - not viable

Non-hollow-bearing trees

- Non-HBT to be removed

Plant Community Type

- 5 - River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion.

Figure 3 Vegetation to be removed

0 10 20 30 40 50

Metres

Scale: 1:1,500 @ A3

Coordinate System: GDA 1994 MGA Zone 55

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N

Matter: 35875,
Date: 26 May 2022 ,
Prepared for: MT, Prepared by: DK, Last edited by: dkang
Layout: 35875_F3_VegRemoval
Project: P:\35800s\35875\Mapping\
35875_AustraliaPArk.aprx

4.1 Management of biodiversity impacts

A number of recommendations specific to tree protection are contained within Homewood (2022) and these recommendations should be implemented as required.

4.1.1 Preliminary design

Biosis understands that ACC has adopted the following preliminary design responses to avoid and minimise biodiversity impacts:

- Minimisation of impacts on key habitats for threatened biota including large hollow-bearing trees and remnant patches of PCT 5, where possible.
- Where practicable, ACC has placed infrastructure within previously disturbed areas or within areas of predominantly introduced vegetation.
- Minimisation of impacts on TPZs of large hollow-bearing trees by designing the infrastructure outside of TPZs, where possible and using low impact construction methods where TPZs cannot be avoided. See Homewood (2022) for further details.
- Utilising the current Oddies Creek Park as a stockpile yard during construction to avoid further impacts to native vegetation.

4.1.2 Recommended pre-construction measures

- Pre-clearance surveys of all vegetation to be removed should occur to identify any active nests and roost sites.

4.1.3 Recommended construction mitigation measures

- To the fullest extent practicable, minimise disturbance to any native vegetation surrounding the study area. Fence areas with bunting to avoid any accidental vegetation clearance.
- Soil transportation should be minimised within, into or out of the study area to reduce the spread of weeds. Vehicle hygiene should be a priority as the site contains a variety of introduced species.
- Two priority weeds within the Albury Council LGA were identified within the study area. Appropriate measures should be implemented to minimise the spread of this species.
- All access within the study area should be restricted to roads/tracks and already disturbed areas where feasible.
- Utilising the current Oddies Creek Park as a stockpile yard during construction to avoid further impacts to native vegetation.
- Sediment fences or silt curtains should be deployed around Oddies Creek to protect against any impacts to water quality. These are to be implemented in addition to standard erosion and sediment control measures.
- Specific detail relating to preventing impacts to retained vegetation and terrestrial habitat should be addressed in a site-specific Construction Environmental Management Plan (CEMP). This will include issues relating to contractors such as environmental inductions, installation of temporary fencing/signage, drainage and sediment control.
- An 'unexpected threatened species finds protocol' should be established and appended to a CEMP, with the aim of further reducing impacts in the event of an unexpected find. The protocol should also include a notification and reporting process to ACC.

- Any fauna uncovered during removal of vegetation, should be relocated to adjacent suitable habitat.

4.1.4 Recommended post-construction mitigation measures

- As per ACC proposed plans, areas that have been disturbed by works during construction are recommended to be revegetated and converted to green spaces post-construction.

4.1.5 Additional recommendations for the protection of aquatic habitats

A number of standard precautions and mitigations relevant to the protection of fish habitat are provided in section 3.3.2 of Fairfull (2013), these should be considered and deployed as relevant. In particular the following management measures should be taken to protect waterways and aquatic habitats:

- The stockpiling of soil, if required, should be located as far away from the waterway as possible and managed so that it is secure against flooding.
- Any runoff from stockpiled soil must be managed to prevent any sediment entering the waterway.
- Instream works and works around waterways should be limited to calm weather conditions and during low flow periods wherever possible.
- Any woody debris encountered in the instream works zone should be relocated and reinstated within Oddies Creek.
- The use of instream structures for crossings should be avoided wherever possible.
- Waterway crossings should be designed to maintain the existing nominal flow velocity where possible.
- Waterway crossing methods should consider the principles outlined in Section 4.1 of Fairfull (2013).
- Where required, temporary crossing structures should be designed, constructed and maintained in so that low flow conditions and fish passage are maintained and any material used will not result in fine sediment entering the waterway.
- The design considerations and recommendations detailed in the *Controlled activities on waterfront land - Guidelines for watercourse crossings on waterfront land* (NSW Office of Water 2012a) should be considered.

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5 Assessment against key biodiversity legislation

5.1 Environment Protection and Biodiversity Conservation Act 1999

An assessment of the impacts of the proposed development on Matters of NES, as outlined in, *Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (CoA 2013) were prepared to determine whether referral of the project to the Commonwealth Minister for the Environment and Energy is required. Matters of NES relevant to the project are summarised in Table 3.

Table 3 Assessment of the project against the EPBC Act

Matter of NES	Project specifics	Assessment against Commonwealth of Australia (2013)
Threatened species (flora and fauna)	Six listed flora species and 23 fauna species have been recorded or are predicted to occur in the locality. An assessment of the likelihood of these species occurring in the study area is provided in of Table 5 of Appendix 1 (flora) and Table 6 of Appendix 2 (fauna). Most of these species are not likely to occur within the study area and the proposed works are unlikely to constitute a significant impact.	The following species are considered to have a medium or greater likelihood of occurring within the study area: • Grey-headed Flying-fox • Flat-headed Galaxias • Trout Cod • Murray Cod Assessments against the Significant Impact Criteria (CoA 2013) has been prepared for this species (Appendix 3) and concluded that a significant impact is not likely to result from the project due to the size of the proposed works, dispersal ability of the species and the quantity of similar vegetation and aquatic habitats that will be retained within the study area and surrounding areas.
Threatened ecological communities	No EPBC Act listed TECs were mapped within the study area.	Not applicable
Migratory species	Sixteen migratory species have been recorded or are predicted to occur in the locality Table 7 of Appendix 2.	While some of these species would be expected to use the study area on occasions, some may do so regularly and others may be resident. The study area does not provide important habitat for an ecologically significant proportion of any of these species.
Wetlands of international importance (Ramsar sites)	The study area is upstream of seven Wetlands of International Importance (Ramsar sites).	The study area does not drain directly into a Ramsar site and the proposed works is not likely to result in a significant impact.

On the basis of criteria outlined in Commonwealth of Australia (2013) it is considered unlikely that a significant impact on a Matter of NES would result from the project. However, ACC may choose to refer the proposed action to the Australian Government Minister for the Environment and Energy to determine whether the action requires approval under the EPBC Act.

5.2 Environmental Planning and Assessment Act 1979

An assessment of the project against the relevant sections of the EP&A Act is provided below.

Test of Significance

Five ToS were completed for terrestrial threatened species considered to have a medium or greater likelihood of occurrence within the study area (Appendix 4). Based on the conclusion that threatened species are unlikely to be significantly affected by the project and no local viable populations will be placed at risk of extinction, neither a SIS nor consideration of opting into the BOS is required.

State Environmental Planning Policies

SEPP (Koala Habitat Protection) 2021

The SEPP (Koala Habitat Protection) 2021 aims to encourage the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free-living populations will be maintained over their present range and to reverse the current trend of koala population decline. It applies to Part 4 development where the area of native vegetation is greater than one hectare and in councils listed in Schedule 1 to the SEPP.

The Albury LGA is not listed in Schedule 1 of the SEPP, and additionally no Development Application has, or will, be made as the development is being undertaken under Part 5 of the EP&A Act, as such SEPP (Koala Habitat Protection) 2021 does not apply to this project.

SEPP (Transport and Infrastructure) 2021

Under the State Environmental Planning Policy (Transport and Infrastructure) 2021 a number of exemptions apply for development without consent. The exemptions that apply for this project under the SEPP, and therefore override any provisions in the Albury LEP, include the following:

- Division 12 Parks and other public reserves, Clause 2.73 (3a), development for the purposes of (i) pedestrian pathways, cycleways, viewing platforms and pedestrian bridges, (ii) recreation areas and recreation facilities (outdoor), (v) landscaping, including landscape structures, (vi) amenities for people using the reserve, including toilets and change rooms, (vii) food preparation and related facilities for people using the reserve may be carried out by or on behalf of a public authority without consent on any land.
- Division 7 flood mitigation works, clause 2.56 (1) Development for the purpose of flood mitigation work may be carried out by or on behalf of a public authority without consent on any land.

Although the project works are permitted without consent under the Transport and Infrastructure SEPP, the EP&A Act states that determining authorities have a duty to consider all matters affecting or likely to affect the environment by reason of that activity (Section 5.5) or a duty to consider environmental impacts. This Biodiversity Assessment has been produced to support an REF (to be prepared by ACC) to address this requirement.

Local Environmental Plans

Local environment Plans (LEPs) are created by Councils in consultation with their communities and guide planning decisions for LGAs. LEPs make provision for the protection or utilisation of the environment through zoning of land and development controls.

The study area is zoned RE1 - Public Recreation under the Albury Local Environment Plan 2010 (ALEP). The main objective of land zoned RE1 –Public Recreation is to "enable land to be used for public open space or recreational purposes; to provide a range of recreational settings and activities and compatible land uses; to protect and enhance the natural environment for recreational purposes; to protect and improve open space areas within the area of the City of Albury, including the Albury-Wodonga Regional Parklands; to offer opportunities for tourism development; and to provide public access to the foreshore of the Murray River".

Environmental protection works are permitted without consent in land zoned RE1. Construction of jetties, moorings, recreation areas, recreation facilities (outdoor) and water recreation structures are permitted with consent in land zoned RE1.

Biodiversity Certification of the Albury LEP

Biodiversity Certification has been conferred on the Albury LEP 2010. The primary effect of conferring certification on an LEP is that any development requiring consent (or any activity under Part 5 of the EP&A Act not requiring consent) is taken to be development that is not likely to significantly affect threatened species. Tests of Significance have been undertaken for five species and determined that a significant impact is not likely to occur to any species as a result of Australia Park infrastructure upgrade works.

5.3 Biodiversity Conservation Act 2016

An assessment of the likelihood of threatened entities occurring within the study area is provided in Appendix 1 (flora) and Appendix 2 (fauna) along with an assessment of whether the project has potential to result in a significant effect. These assessments determined that no communities and five terrestrial species have a medium or greater likelihood of occurring within the study area. Tests of Significance have been prepared for the threatened entities that are deemed likely to be subject to negative impacts and are provided in Appendix 4.

Tests of Significance indicate that a significant effect is not likely to result from the proposal. A Species Impact Statement is therefore not required.

The project will be assessed under Part 5 of the EP&A Act, as the significant effects are on threatened species and/or communities only. As stated in Part 7, Division 2(4) of the BC Act, a SIS or voluntary entry into the Biodiversity Offsets Scheme and the development of a Biodiversity Development Assessment Report (BDAR) can be prepared in lieu of an Environmental Impact Statement.

Biodiversity Offsets Scheme

As the project is unlikely to result in a significant impact on threatened species, populations or communities listed under the BC Act or the FM Act, consideration of the BOS is not necessary.

5.4 Fisheries Management Act 1994

As Oddies Creek may provide habitat for threatened aquatic species, it is considered TYPE 1, CLASS 1 key fish habitat (Fairfull 2013).

NSW DPI is required to assess all projects that involve structures that span the full width of a waterway (including pipe crossings) or modify the velocity or quantity of water within a waterway. As the waterways subject to crossings and crossing upgrades constitute 'water land', consultation requirements with NSW DPI will apply. Under Section 200 of the FM Act a permit is required for dredging or reclamation work carried out by a local government authority. It is recommended that the REF including this report form part of the permit application. If temporary blockages to fish passage (i.e. coffer dams spanning width of a waterway) will occur

during the works, a permit may also be required by NSW DPI under Part 7 of the FM Act to temporarily obstruct fish passage.

Local councils must also consult NSW DPI if any modification to large woody debris is proposed. Any woody debris encountered in the instream works zone should be relocated and reinstated within Oddies Creek.

An assessment of the likelihood of threatened aquatic species and communities occurring within the study area is provided in Appendix 2. These assessments determined that five aquatic species have a medium or greater likelihood of occurring within the study area. Seven-part tests have been prepared for the threatened species that are deemed likely to be subject to negative impacts and are provided in Appendix 4 in accordance with the FM Act.

5.5 Biosecurity Act 2015

During the site investigation, two regional priority weeds were detected, as per those defined in the Murray Regional Strategic Weed Management Plan. The priority weeds include:

Table 4 Priority weeds within the study area

Scientific name	Biosecurity duty (*Biosecurity Act 2015*)
Willows *Salix* sp.	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Cape Broom *Genista monspessulana*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* **Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. Plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.*

The Biosecurity Act provides for the identification, classification and control of priority weeds with the purpose of determining if a biosecurity risk is likely to occur. A priority weed is any weed identified in a local strategic plan, for a region that includes that land or area, as a weed that is or should be prevented, managed, controlled or eradicated in the region.

The General Biosecurity Duty as outlined in the Biosecurity Act states:

> *All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*

To prevent biosecurity impacts from occurring as a result of the presence of the above listed priority weeds within the study area, all practical steps should be taken to control and eradicated the weeds from the study area as per the relevant biosecurity duties outlined above, or prior to or during any future vegetation removal.

5.6 Water Management Act 2000

Public Authorities, including Local Councils, are exempt from controlled activity approvals. As such a controlled activity permit is not required from the Natural Resources Access Regulator (NRAR) for works on waterfront land.

The WM Act is supported by a series of interpretation guidelines including *Guidelines for watercourse crossings on waterfront land* (NSW Office of Water 2012a) and *Guidelines for instream works on waterfront land* (NSW Office of Water 2012b). The guideline includes design principles and overarching management measures to protect the physical and ecological functioning of waterways when undertaking instream works. The recommended controls and management measures detailed in this guideline should be considered in the detailed design and construction phase of the project.

6 Conclusion

This report is an assessment of the potential biodiversity impact of works associated with the Australia Park infrastructure upgrades within the study area in accordance with the EP&A Act, FM Act, BC Act and the EPBC Act. The Australia Park works will result in the following impacts on biodiversity values:

- The removal of 0.18 hectares of low quality native vegetation consistent with PCT 5, this vegetation removal includes:
  - Two hollow-bearing which have been considered non-viable due to TPZ encroachment of greater than 10 percent and the direct removal of four non-hollow bearing trees within the works footprint.
  - Minor habitat removal for six terrestrial and five aquatic fauna species listed under the EPBC Act and/or the BC Act.
- Works will also remove planted indigenous and non-indigenous vegetation throughout the study area.
- The works will contribute further to light pollution in the area due to the permanent lighting requirements of the carpark.
- The works will also result in further vegetation loss which when considered cumulatively includes works north of the project area along the Murray River bank.
- Minor habitat removal for six terrestrial and five aquatic fauna species listed under the EPBC Act and/or the BC Act.

Under Section 5.5 of the EP&A Act, a determining authority in its consideration of an activity shall examine and take into account all matters affecting or likely to affect the environment by reason of that activity. Therefore, a REF should be prepared to assess the potential environmental impacts of the proposed works prior to works commencing.

Following field investigations, the following EPBC Act listed threatened fauna species were determined to have a medium likelihood of occurrence within the study area: Grey-headed Flying-fox, Flat-headed Galaxias, Trout Cod and Murray Cod. An additional seven species listed under the BC Act were also considered to have a medium likelihood of occurrence in the study area. Significant Impact Assessments and Tests of Significance were carried out for these fauna species, which concluded the proposal is unlikely to have a significant impact or significant effect on BC or EPBC Act listed fauna species.

Impact avoidance and minimisation steps specific to the removal of threatened and non-threatened fauna habitat have been included in Section 4 of this report.

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Appendices

Appendix 1 Flora

Threatened flora species and ecological communities

The following table includes a list of the threatened flora species that have potential to occur within the study area. The list is based on database searches outlined in Section 2.1.

Notes to tables:

Conservation status – EPBC Act:	**Conservation status – BC Act:**
CR – Critically Endangered EN – Endangered VU – Vulnerable	E1 – endangered species (Part 1, Schedule 1) E2 – endangered population (Part 2, Schedule 1) E4 – presumed extinct (Part 4, Schedule 1) E4A – critically endangered V1 – vulnerable (Part 1, Schedule 2)
Most recent record # species predicted to occur by the PMST (not recorded on other databases). ## species predicted to occur based on natural distributional range and suitable habitat despite lack of records in the databases searched. 2017 recorded during current survey.	

Examples of criteria for determining the likelihood of occurrence for threatened entities as a guide for writing the rationale for likelihood have been listed below.

Likelihood of occurrence	Potential criteria for likely occurrence in study area
Recorded	• Recorded in the study area during current assessment. • Records in study area, as indicated by background research.
High	• Species/ecological communities recorded in study area during current or previous assessment/s. • Aquatic species recorded from connected waterbodies in close proximity to the study area during current or previous assessment/s. • Sufficient good quality habitat is present in study area or in connected waterbodies in close proximity to the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within 10 kilometres or from the relevant catchment/basin.
Medium	• Records of terrestrial entities within 10 kilometres of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within <five kilometres or 10 kilometres> of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitat present (low quality and extent). • Substantial loss of habitat since any previous record(s).

Likelihood of occurrence	Potential criteria for likely occurrence in study area
Negligible	• Habitat not present in study area. • Habitat for aquatic species not present in connected waterbodies in close proximity to the study area. • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.

Table 5 Threatened flora species recorded / predicted to occur within 10 kilometres of the study area

Scientific name	Common name	Conservation status			Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		BC	EPBC	NC*					
Amphibromus fluitans	Floating Swamp Wallaby-grass	V	VU		2005#		Low	Occurs along the banks and tributaries of the Murray River. Banks of the Murray River are not expected to be impacted and habitat within the impact area is not considered suitable for this species.	Perennial grass growing throughout the Murray Region between Cooks Lagoon and Mathoura, with isolated populations in Upper Lachlan Shire. Grows in permanent swamps and wetlands in Temperate Montane Grasslands, Inland Riverine Forests, Inland Floodplain Shrublands, and Inland Floodplain Swamps. Grows along swamp margins in mud and hard clay soils.
Caladenia concolor	Crimson Spider Orchid	E1	VU		2009#		Negligible	No suitable habitat.	Small orchid, recorded from two populations at Bethungra and Burrinjuck Nature reserve with the other at Nail Can Hill Crown Reserve near Albury. Grows in regrowth woodland on granite ridge country in Upper Riverina Dry Sclerophyll Forest and Western Slopes Grassy Woodlands. Grows in clay loams and gravel beds.
Caladenia rosella	Rosella Spider Orchid	E4	EN		1900		Negligible	Presumed extinct.	Small orchid, presumed extinct within NSW. Recorded from one site in Albury before 1896. Grows in woodlands and low forests, associated with Red Box *Eucalyptus polyanthemos,* Long-leafed Box E. *goniocalyx* and Red Stringybark E. *macrorhyncha*. Grows in well drained skeletal soils.

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Scientific name	Common name	Conservation status			Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		BC	EPBC	NC*					
Leucochrysum albicans var. *tricolor*	Hoary Sunray		EN		1997		Negligible	Not recorded during site assessment and no suitable habitat present.	Small perennial herb endemic to south-east Australia with small, fragmented populations distributed from Tasmania to New South Wales. Populations within NSW occur throughout the Southern Tablelands and the South Eastern Highlands, Australian Alps and Sydney Basin Bioregions. Grows in disturbed areas and intertussock spaces in grasslands, woodlands and forests. Grows in a variety of soils including clays, clay loams, stony and gravelly.
Pilularia novae-hollandiae	Austral Pillwort	E1			1952		Negligible	No suitable habitat.	Semi-aquatic fern with the only extant populations located at Lake Cowal and Oolambeyan National Park. Historical distribution ranged from Sydney, Khancoban, The Riverina near Albury and Urana. Grows in seasonally dry depressions, drainage lines, margins of marshes, shallow swamps and waterways in a variety of communities including Inland Riverine Forests, Inland Floodplain Swamps, Southern Tableland Dry Sclerophyll Forests, Coastal Floodplain Wetlands, Coastal Swamp Forests, Coastal Freshwater Lagoons. Grows in mud amongst grasses and sedges.

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Scientific name	Common name	Conservation status			Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		BC	EPBC	NC*					
Prasophyllum petilum	Tarengo Leek Orchid	E1	EN	en	#		Negligible	No suitable habitat.	Terrestrial orchid restricted to five sites within NSW at Boorowa, Captains Flat, Ilford, a Travelling Stock Route at Delegate and 10 kilometres south-east of Muswellbrook. Found growing in open sites and patchy forest in Natural Temperate Grassland, Box-Gum Woodlands, Temperate Montane Grasslands, Southern Tableland Grassy Woodlands, Subalpine Woodlands, Tableland Clay Grassy Woodlands, Western Slopes Grassy Woodlands. This species is cryptic and most visible when flowering between October and December. Grows in fertile soils.
Senecio garlandii	Woolly Ragwort	V			2004		Low	Recorded from more elevated, rocky areas on Nail Can Hill. Suggesting this species prefers more skeletal soils. Habitat within the study area is not suitable.	Small many branched perennial herb or shrub, distributed between Temora, Bethungra and Albury and possibly Burrinjuck near Yass. Found growing on sheltered slopes of rocky outcrops in Southern Tableland Dry Sclerophyll Forests, Upper Riverina Dry Sclerophyll Forests, Western Slopes Dry Sclerophyll Forests, Western Slopes Grassy Woodlands and Inland Rocky Hill Woodlands.

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Scientific name	Common name	Conservation status			Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		BC	EPBC	NC*					
Swainsona recta	Small Purple-pea	E1	E	en	#		Low	No records and not recorded during the site assessment.	Small erect perennial herb with a scattered distribution at Carcoar, Culcairn and Wagga Wagga from which it is possibly extinct and from Queanbeyan and Wellington - Mudgee areas where it is still extant. Found growing on stony hillsides and in the grassy understorey of Upper Riverina Dry Sclerophyll Forests, Western Slopes Dry Sclerophyll Forests, Temperate Montane Grasslands, Floodplain Transition Woodlands, Southern Tableland Grassy Woodlands and Western Slopes Grassy Woodlands.
Swainsona sericea	Silky Swainson-pea	V			1916		Negligible	No recent records. No suitable habitat present.	Small prostrate or erect perennial herb with a distribution spanning from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains with an additional outlying population in the far north-west of NSW. Found growing in a variety of communities including Natural Temperate Grasslands, Snow Gum *Eucalyptus pauciflora* Woodlands on the Monaro, Box-Gum Woodland, New England Dry Sclerophyll Forests, North-west Slopes Dry Sclerophyll Woodlands, North-west Plain Shrublands, Western Slopes Grasslands, Floodplain Transition Woodlands and Subalpine Woodlands.

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Appendix 2 Fauna

Threatened fauna species

The following table includes a list of the threatened fauna species that have potential to occur within the study area. The list is based on database searches outlined in Section 2.1.

Notes to tables:

Conservation status – EPBC Act: CR – Critically Endangered EN – Endangered VU – Vulnerable	**Conservation status – BC Act:** E1 – endangered species (Part 1, Schedule 1) E2 – endangered population (Part 2, Schedule 1) E4 – presumed extinct (Part 4, Schedule 1) E4A – critically endangered V1 – vulnerable (Part 1, Schedule 2)
Most recent record # species predicted to occur by the PMST (not recorded on other databases). ## species predicted to occur based on natural distributional range and suitable habitat despite lack of records in the databases searched. 2017 recorded during current survey.	

Examples of criteria for determining the likelihood of occurrence for threatened entities as a guide for writing the rationale for likelihood have been listed below.

Likelihood of occurrence	Potential criteria
High	• Species recorded in study area during current or previous assessment/s. • Aquatic species recorded from connected waterbodies in close proximity to the study area during current or previous assessment/s. • Sufficient good quality habitat is present in study area or in connected waterbodies in close proximity to the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within 10 kilometres or from the relevant catchment/basin.
Medium	• Records of terrestrial species within 10 kilometres of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within 10 kilometres of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitat present (low quality and extent). • Substantial loss of habitat since any previous record(s).
Negligible	• Habitat not present in study area • Habitat for aquatic species not present in connected waterbodies in close proximity to the study area. • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.
Transient/ Nomadic	• Migratory or nomadic fauna species/individuals that may occur in the study area from time to time, but are not considered resident.

Table 6 Threatened fauna species recorded, or predicted to occur, within 10 kilometres of the study area

Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Mammals									
Dasyurus maculatus	Spotted-tailed Quoll	EN	V		vu	2002#	Negligible	Wide ranging species that inhabits a range of different habitat types. Given the residential/industrial surroundings of the study area, this species is not expected to occur.	Occurs along the east coast of Australia and the Great Dividing Range. Uses a range of habitats including sclerophyll forests and woodlands, coastal heathlands and rainforests. Occasional sightings have been made in open country, grazing lands, rocky outcrops and other treeless areas. Habitat requirements include suitable den sites, including hollow logs, rock crevices and caves, an abundance of food and an area of intact vegetation in which to forage. Seventy per cent of the diet is medium-sized mammals, and also feeds on invertebrates, reptiles and birds. Individuals require large areas of relatively intact vegetation through which to forage. The home range of a female is between 180 and 1000 ha, while males have larger home ranges of between 2000 and 5000 ha. Breeding occurs from May to August.
Nyctophilus corbeni	Corben's Long-eared Bat	VU	V			#	Low	No records from the study area and on the southern extent of this species range.	Restricted to the Murray-Darling basin and western slopes. Found in a range of habitats including tall Eucalypt forests, mallee, open savanna and Black Box woodland, preferring habitats with a distinct canopy and cluttered, dense understorey. Roost in tree hollows and fissures and under exfoliating bark.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Petauroides volans	Greater Glider	VU				#	Negligible	No records or suitable habitat.	The distribution of the Greater Glider includes the ranges and coastal plain of eastern Australia, where it inhabits a variety of eucalypt forests and woodlands. Presence and density of Greater Gliders is related to soil fertility, eucalypt tree species, disturbance history and density of suitable tree hollows. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe.
Petaurus norfolcensis	Squirrel Glider		V, E2			2011	Medium	Some habitat (large hollow-bearing trees) present with the study area.	Generally occurs in dry sclerophyll forests and woodlands but is absent from dense coastal ranges in the southern part of its range. Requires abundant hollow-bearing trees and a mix of eucalypts, banksias and acacias. Within a suitable vegetation community at least one species should flower heavily in winter and one species of eucalypt should be smooth barked.
Phascolarctos cinereus	Koala	VU	V			#	Low	No records from the study area.	In NSW the Koala mainly occurs on the central and north coasts with some populations in the western region. Koalas feed almost exclusively on eucalypt foliage, and their preferences vary regionally. Primary feed trees include *Eucalyptus robusta*, *E. tereticornis*, *E. punctata*, *E. haemostoma* and *E. signata*. They are solitary with varying home ranges.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Pteropus poliocephalus	Grey-headed Flying-fox	VU	V			2014#	High	Known camp at Leaney's Bend 2km northwest of the study area and suitable foraging habitat within the study area.	Occurs along the NSW coast, extending further inland in the north. This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Roosts in large colonies, commonly in dense riparian vegetation.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat		V			2001	Medium	Suitable habitat and recorded from the Albury LGA.	Found throughout NSW in habitats including wet and dry sclerophyll forest, open woodland, acacia shrubland, mallee, grasslands and desert. They roost in tree hollows in colonies and have also been observed roosting in animal burrows, abandoned Sugar Glider nests, cracks in dry clay, hanging from buildings and under slabs of rock. Forages for insects above the canopy in forests.
Birds									
Anseranas semipalmata	Magpie Goose		V			2015	Low	No suitable habitat within the study area. Occur more broadly in the search area.	Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. They are often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes. Breeding can occur in both summer and winter dominated rainfall areas and is strongly influenced by water level. Nests are formed in trees over deep water; breeding is unlikely in south-eastern NSW. Often seen in trios or flocks on shallow wetlands, dry ephemeral swamps, wet grasslands and floodplains; roosts in tall vegetation.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Anthochaera phrygia	Regent Honeyeater	CE	E4A		en	2005#	Low	Marginal habitat present within the study area, although records do exist from areas adjacent to study area.	Regent Honeyeaters are semi-nomadic, occurring in temperate eucalypt woodlands and open forests. Most records are from box-ironbark eucalypt forest associations and wet lowland coastal forests. Nectar and fruit from mistletoes are also eaten. This species usually nest in tall mature eucalypts and sheoaks.
Artamus cyanopterus cyanopterus	Dusky Woodswallow		V			2017	Recorded	Recorded within the study area. Suitable hollow bearing trees.	Primarily inhabits dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.
Botaurus poiciloptilus	Australasian Bittern	EN	E1			1994#	Low	No suitable habitat within the study area.	The Australasian Bittern is distributed across south-eastern Australia. Often found in terrestrial and estuarine wetlands, generally where there is permanent water with tall, dense vegetation including *Typha* spp. and *Eleoacharis* spp. Typically this bird forages at night on frogs, fish and invertebrates, and remains inconspicuous during the day. The breeding season extends from October to January with nests being built amongst dense vegetation on a flattened platform of reeds.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Burhinus grallarius	Bush Stone-curlew		E1			2007	Low	Increasingly rare in southern Australia, suitable habitat present in woodland areas but unlikely to be present.	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Occurs in lightly timbered open forest and woodland, or partly cleared farmland with remnants of woodland, with a ground cover of short sparse grass and few or no shrubs where fallen branches and leaf litter are present.
Calidris ferruginea	Curlew Sandpiper	CE	E1			##	Negligible	No records or suitable habitat in impact area.	Inhabits sheltered intertidal mudflats. Also non-tidal swamps, lagoons and lakes near the coast. Infrequently recorded inland.
Callocephalon fimbriatum	Gang-gang Cockatoo		V			2017	Low	Species may fly over on occasion, but unlikely to be present within the study area due to no suitable foraging trees.	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine Snow Gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Certhionyx variegatus	Pied Honeyeater		V			2002	Low	Eruptive species that generally inhabits semi-arid areas, but may occur south and east of its range during protracted dry periods in semi-arid areas.	Mainly inhabits shrublands, often dominated by or including Eremophila and grevilleas, and sometimes with an overstorey of eucalypt woodland (mallee or bloodwood) or mulga. They feed on nectar, predominately from Eremophila, but also from mistletoe and Brachysema and Grevillea shrubs. Additionally, they eat saltbush fruit, berries, seed, flowers and some insects.
Chthonicola sagittata	Speckled Warbler		V			2017	Low	Likely to occur in woodland areas surrounding the study area but the fragmented nature of the parkland only provides marginal habitat for this species.	The Speckled Warbler occurs on the hills and tablelands of the Great Dividing Range. Found in eucalypt and cypress woodlands with a grassy understorey, often on ridges or gullies. The species nests on the ground in grass tussocks, dense litter and fallen branches. They forage on the ground for arthropods and seeds.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Circus assimilis	Spotted Harrier		V			2003	Low	Not likely to forage within urban environments that the study area is located within.	The Spotted Harrier is found throughout Australia but rarely in densely forested and wooded habitat of the escarpment and coast. Preferred habitat consists of open and wooded country with grassland nearby for hunting. Habitat types include open grasslands, acacia and mallee remnants, spinifex, open shrublands, saltbush, very open woodlands, crops and similar low vegetation. The Spotted Harrier is more common in drier inland areas, nomadic part migratory and dispersive, with movements linked to the abundance of prey species. Nesting occurs in open or remnant woodland and unlike other harriers, the Spotted Harrier nests in trees.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)		V		vu	2015	Low	Likely to occur in riparian woodland surrounding the study area but the fragmented nature (lack of understorey vegetation and structure) of the parkland only provides marginal habitat for this species.	Lives in eucalypt woodlands, especially areas of relatively flat open woodland typically lacking a dense shrub layer, with short grass or bare ground and with fallen logs or dead trees present.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Daphoenositta chrysoptera	Varied Sittella		V		vu	2017	Low	Likely to occur in riparian woodland areas surrounding the study area but the fragmented nature of the parkland only provides marginal habitat for this species.	The Varied Sittella is a sedentary species which inhabits a wide variety of dry eucalypt forests and woodlands, usually with either shrubby understorey or grassy ground cover or both, in all climatic zones of Australia. Usually inhabit areas with rough-barked trees, such as stringybarks or ironbarks, but also in mallee and acacia woodlands, paperbarks or mature Eucalypts. The Varied Sittella feeds on arthropods gleaned from bark, small branches and twigs. It builds a cup-shaped nest of plant fibres and cobweb in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.
Falco subniger	Black Falcon		V			2009	Low	May occasionally forage over the study area on rare occasion, but given the sites urban context would be an uncommon visitor at best.	Mainly occur in woodlands and open country where can hunt. Often associated with swamps, rivers and wetlands. Nest in tall trees along watercourses.
Glossopsitta porphyrocephala	Purple-crowned Lorikeet		V			2012	Low	May be present within woodland and riverine areas during periods of eucalypt flowering. Although due to the fragmented nature of the parkland, the study area only provides marginal habitat for this species.	Occurs in dry open woodlands, shrublands and mallee scrub, generally in areas with a flowering vegetation canopy. This species forage on nectar, pollen and blossoms from eucalypts, Callistemon and Banskias, they may also feed on berries and small insects. They nest away from feeding areas in hollows or dense vegetation approximately 30 to 40 m high often near water.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Glossopsitta pusilla	Little Lorikeet		V			2012	Low	May be present within woodland and riverine areas during periods of eucalypt flowering. Although due to the fragmented nature of the parkland, the study area only provides marginal habitat for this species.	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 m and 15 m, mostly in living, smooth-barked eucalypts. Most breeding records come from the western slopes.
Grantiella picta	Painted Honeyeater	VU	V		VU	2003#	Low	Appears to require Silver Wattle with abundant Grey Mistletoe for nesting. Habitat within the study area is marginal.	Found mainly in dry open woodlands and forests, where it is strongly associated with mistletoe. Often found on plains with scattered eucalypts and remnant trees on farmlands.
Haliaeetus leucogaster	White-bellied Sea-Eagle		V			2013	Medium	May forage over study area on occasion, given the sites proximity to the Murray River.	A migratory species that is generally sedentary in Australia, although immature individuals and some adults are dispersive. Found in terrestrial and coastal wetlands; favouring deep freshwater swamps, lakes and reservoirs; shallow coastal lagoons and saltmarshes. It hunts over open terrestrial habitats. Feeds on birds, reptiles, fish, mammals, crustaceans and carrion. Roosts and makes nest in trees.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Hieraaetus morphnoides	Little Eagle		V		vu	2012	Low	May occasionally forage over the study area on rare occasion, but given the sites urban context would be an uncommon visitor at best.	The Little Eagle is most abundant in lightly timbered areas with open areas nearby providing an abundance of prey species. It has often been recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. The Little Eagle nests in tall living trees within farmland, woodland and forests.
Lalage sueurii	White-winged Triller				vu	2014	Low	Likely to occur in woodland areas surrounding the study area but the fragmented nature of the parkland only provides marginal habitat for this species.	During migration it occurs in open country with trees, from inland plains to coastal farmland. Breeds in open woodlands and scrublands, riparian woodlands, native pine and other scrub.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Lathamus discolor	Swift Parrot	CE	E1		vu	2005#	Low	Cannot be discounted from occurring anywhere in SE Australia during the species winter migration where flowering feed species are present, however, limited suitable feed species occur within the study area.	The Swift Parrot occurs in woodlands and forests of NSW from May to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood C. *gummifera*, Mugga Ironbark E. *sideroxylon*, and White Box E. *albens*. Commonly used lerp infested trees include Grey Box E. *microcarpa*, Grey Box E. *moluccana* and Blackbutt E. *pilularis*. This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability.
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)		V			2010	Low	Likely to occur in woodland areas surrounding the study area but the fragmented nature of the parkland only provides marginal habitat for this species.	This species lives in a wide range of temperate woodland habitats, and a range of woodlands and shrublands in semi-arid areas.
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)		V			2007	Low	Likely to occur in woodland areas surrounding the study area but the fragmented nature of the parkland only provides marginal habitat for this species.	Found mostly in open forests and woodlands dominated by box and ironbark eucalypts. It is rarely recorded east of the Great Dividing Range.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Neophema pulchella	Turquoise Parrot		V			2017	Low	Likely to occur in woodland areas surrounding the study area but the fragmented nature of the parkland only provides marginal habitat for this species.	Occurs in open woodlands and eucalypt forests with a ground cover of grasses and understorey of low shrubs. Generally found in the foothills of the Great Divide, including steep rocky ridges and gullies. Nest in hollow-bearing trees, either dead or alive; also in hollows in tree stumps. Prefer to breed in open grassy forests and woodlands, and gullies that are moist.
Ninox connivens	Barking Owl		V			2013	Medium	May occur within the study area and highly likely to occur in riparian forest and woodland areas surrounding the study area.	Generally found in open forests, woodlands, swamp woodlands, farmlands and dense scrub. Can also be found in the foothills and timber along watercourses in otherwise open country. Territories are typically 2000 ha in NSW habitats. Hunts small arboreal mammals or birds and terrestrial mammals when tree hollows are absent.
Numenius madagascariensis	Eastern Curlew	CE				##	Low	No suitable habitat within impact area.	Occurs in sheltered coasts, especially estuaries, embayments, harbours, inlets and coastal lagoons with large intertidal mudflats or sandflats often with beds of seagrass.
Oxyura australis	Blue-billed Duck		V			2010	Low	No suitable habitat within impact area.	The Blue-billed Duck is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. It is generally only seen in coastal areas during summer. Prefers large permanent wetlands, feeding on the bottom of swaps.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Petroica boodang	Scarlet Robin		V		vu	2013	Low	Likely to occur in woodland areas surrounding the study area but the fragmented nature of the parkland only provides marginal habitat for this species.	The Scarlet Robin inhabits dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. During autumn and winter it moves to more open and cleared areas. The Scarlet Robin forages amongst logs and woody debris for insects. The nest is an open cup of plant fibres and cobwebs, sited in the fork of a tree.
Petroica phoenicea	Flame Robin		V			2010	Low	Likely to occur in woodland areas surrounding the study area but the fragmented nature of the parkland only provides marginal habitat for this species.	Flame Robins are found in a broad coastal band from southern Queensland to just west of the South Australian border. The preferred habitat in summer includes moist eucalyptus forests and open woodlands, in winter prefers open woodlands and farmlands. It is considered migratory. Diet consists mainly of invertebrates.
Polytelis swainsonii	Superb Parrot	VU	V		vu	2015	Low	May occur in Riverine vegetation on occasion.	Found mainly in open, tall riparian River Red Gum forest or woodland. Often found in farmland including grazing land with patches of remnant vegetation. Forages primarily in grassy box woodland, feeding in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)		V			2006	Low	Not recorded during the site assessment and marginal habitat present.	The eastern sub-species occurs on the western slopes of the Great Dividing Range, the western plains, woodlands in the Hunter Valley and locations on the north coast of NSW. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine, open Box Woodlands on alluvial plains and woodlands on fertile soils in coastal regions. Feeds on invertebrates and builds dome-shaped nests.
Rostratula australis	Australian Painted Snipe	EN	E1			#	Negligible	No records or suitable habitat from impact area.	Usually found in shallow inland wetlands including farm dams, lakes, rice crops, swamps and waterlogged grassland. They prefer freshwater wetlands, but have been recorded in brackish waters. Forages on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter.
Stagonopleura guttata	Diamond Firetail		V			2014	Low	Likely to occur in woodland areas surrounding the study area but the fragmented nature of the parkland only provides marginal habitat for this species.	The Diamond Firetail is widely distributed, found in a range of habitat types including open eucalypt forest, mallee and acacia scrubs. Often occur in vegetation along watercourses. Feeds exclusively on the ground on ripe grass and herb seeds, green leaves and insects.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Stictonetta naevosa	Freckled Duck		V			2014	Low	No suitable habitat within impact area.	The Freckled Duck breeds in permanent fresh swamps that are heavily vegetated. Found in fresh or salty permanent open lakes, especially during drought. Often seen in groups on fallen trees and sand spits.
Frogs									
Crinia sloanei	Sloane's Froglet	EN	V				Low	No suitable habitat within the impact area.	Sloane's Froglet is a cryptic species, usually found only after rain. This species has a widely scattered distribution throughout the floodplains of the Murray-Darling Basin in NSW and has been recorded mostly in the Darling Riverine Plains, NSW South Western Slopes, and the Riverina bioregions. It is typically associated with periodically inundated grassland, woodland and disturbed areas.

Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Litoria raniformis	Southern Bell Frog	VU	E1				Negligible	No longer thought to be present within the study area.	In NSW the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. Usually found in or around permanent or ephemeral swamps or billabongs with an abundance of bulrushes and other emergent vegetation along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. Outside the breeding season animals disperse away from the water and take shelter beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks.
Fish									
Galaxias rostratus	Flat-headed Galaxias	CE		CE			Medium	Indicative habitat mapped adjacent to the study area by NSW DPI.	Flathead Galaxias are found in still or slow moving water bodies such as wetlands and lowland streams. The species has been recorded forming shoals. They have been associated with a range of habitats including rock and sandy bottoms and aquatic vegetation. Flathead Galaxias spawn in spring and lay slightly adhesive demersal eggs.
Euastacus armatus	Murray Crayfish			VU	+		Medium	Known to occur within locality.	Endemic to the southern tributaries of the Murray Darling Basin. They can be found in habitats ranging from pasture lands to sclerophyll forest, preferring cool, flowing water that is well oxygenated.

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Scientific name	Common name	Conservation status				Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description
		EPBC	BC	FM	NC *				
Maccullochella macquariensis	Trout Cod	EN		EN	+		Medium	Known to occur within the locality.	Endemic to the southern Murray- Darling river system. Broadly found in rivers and larger streams and rarely in smaller creeks. They occupy areas which have large in stream woody debris.
Macquaria australasica	Macquarie perch	EN		EN	en		Negligible	The known current distribution of this species is located a significant distance upstream of the study area.	Macquarie Perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven catchments. Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their tributaries
Maccullochella peelii	Murray Cod	VU			#		Medium	Known to occur within the locality.	The Murray Cods natural distribution extends throughout the Murray-Darling basin ranging west of the divide from south east Queensland, through NSW into Victoria and South Australia. It is found in the waterways of the Murray–Darling Basin in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers, billabongs and large deep holes. Murray Cod is entirely a freshwater species and will not tolerate high salinity levels.
Nannoperca australis	Southern Pygmy Perch			EN	+		Medium	Known to occur within the locality.	They were once distributed throughout the Lachlan, Murrumbidgee and Murray River systems, although there have been large scale reductions in its range. Found in well- vegetated, slow flowing or still waters including streams, lakes, billabongs and other types of wetlands

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Migratory species (EPBC Act listed)

The following table includes a list of migratory species that have potential to occur within the study area. The list is based on database searches outlined in Section 2.1.

Bold denotes species recorded in the study area during the current assessment.

Table 7 Migratory fauna species recorded or predicted to occur within 10 kilometres of the study area

Scientific name	Common name	Most recent record
Actitis hypoleucos	Common Sandpiper	#
Apus pacificus	Fork-tailed Swift	2005#
Ardea ibis	Cattle Egret	2012
Calidris acuminata	Sharp-tailed Sandpiper	2005#
Calidris ferruginea	Curlew Sandpiper	#
Calidris melanotos	Pectoral Sandpiper	#
Gallinago hardwickii	Latham's Snipe	2020#
Haliaeetus leucogaster	White-bellied Sea-Eagle	2013
Hirundapus caudacutus	White-throated Needletail	2013#
Merops ornatus	Rainbow Bee-eater	2013
Motacilla flava	Yellow Wagtail	#
Numenius madagascariensis	Eastern Curlew	#
Plegadis falcinellus	Glossy Ibis	2006
Tringa glareola	Wood Sandpiper	2010
Tringa nebularia	Common Greenshank	#
Tringa stagnatilis	Marsh Sandpiper	2002

* - habitat descriptions have been adapted by qualified ecologists from the DSEWPaC Species Profile for listed migratory species, references within the above table are provided within the report reference list.

Appendix 3 Significant Impact Criteria assessments

Grey-headed Flying-fox

Table 8 Grey-headed Flying-fox - assessment against Significant Impact Criteria for a vulnerable species

Significant Impact Criteria	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population of the species	Unlikely	All Grey-headed Flying-fox in Australia are regarded as one single population that moves freely within their entire national range (Webb & Tidemann 1996; DoE 2015). Grey-headed Flying-fox can move up to 100 kilometres in a single night (McConkey et al 2012) and are known to occupy and freely disperse through urban environments, as such Grey-headed Flying-fox could be expected to occur anywhere within the study area. It is unlikely that the removal of potential foraging habitat, consisting of 0.18 hectares of native vegetation and planted vegetation from within a peri-urban recreational environment, would lead to a long term decrease in the size of an important population. Given the vegetation removal will occur outside of known camps and habitat on site, including majority of large nectar producing trees will be retained, the Grey-headed Flying-fox could be reasonably expected to occupy the retained habitat and adjacent habitat. As such, the habitat removal would be unlikely to lead to a decline in an important population, as this population would have ample habitat remaining for critical activities (i.e. foraging, breeding, dispersal etc.).
Reduce the area of occupancy of an important population	Unlikely	The proposed infrastructure upgrades to Australia park would slightly reduce the area of available native vegetation within the extent of works (0.18 hectares). However, the overall area of occupancy will remain unchanged as majority of foraging River Red-gums will be retained and the broader study area will remain suitable for this species post construction and the habitat is likely to recover after construction works take place. Habitat on site is not used for roosting and a camp is not present within the study area.

Significant Impact Criteria	Likelihood of significant impact	Justification
Fragment an existing important population into two or more populations	Unlikely	All Grey-headed Flying-fox in Australia are regarded as one single population that moves freely within their entire national range (Webb & Tidemann 1996; DoE 2015). Given Grey-headed Flying-fox can move up to 100 kilometres in a single night (McConkey et al 2012) and are known to occupy and freely disperse through urban environments, any disturbance associated with proposed infrastructure upgrades to Australia Park is not considered a barrier to dispersal for this species and as such will not fragment an existing important population.
Adversely affect habitat critical to the survival of the species	Highly unlikely	Given the type of vegetation that will be removed (majority regenerating River Red-gums), the availability of habitat retained within the works area and higher quality habitat adjacent to the works areas and the fact that no camp is located in the study area, the habitat to be affected is unlikely to constitute habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	Unlikely	For the reasons outlined above it is unlikely that proposed infrastructure upgrades to Australia Park would disrupt the breeding cycle of an important population. Secondary impacts such as noise disturbance during construction are not expected to be significant given this species' tolerance for highly noise polluted urban environments and the distance to the nearest known camp being 2 kilometres away from the study area
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	It is unlikely that the modification of habitat within the construction footprint would lead to a broader species decline, given the type of vegetation to be removed (non–roosting and not foraging habitat) and the availability of similar habitat within and surrounding habitat.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely	The proposed works at Australia Park will not 'open up' habitat that was previously inaccessible to invasive species and measures are to be put in place to reduce the risks of weed propagules and pathogens entering the site on machinery. As such, it is unlikely to exacerbate the current level of invasive species threats operating within the study area to the point that they become harmful to the Grey-headed Flying-fox.

Significant Impact Criteria	Likelihood of significant impact	Justification
Introduce disease that may cause the species to decline	Unlikely	No diseases are currently known to be transferable to Grey-headed Flying-fox as a result of human activities.
Interfere with the recovery of a species	Unlikely	The national recovery plan for the Grey-headed Flying-Fox states (DAWE 2021) actions under this plan aim to improve the national population trend; identify, protect and increase key foraging and roosting habitat; improve the community's capacity to coexist with flying-foxes'. As explained above, the proposed works are unlikely to directly interfere with the recovery of the species on a national or local scale due to the restricted nature of the impact and the dispersal ability of this species.
Grey-headed Flying-fox significant impact assessment		
The Grey-headed Flying-fox is known to fly over the study area at dusk when the population leaves the roosting site to forage. The dispersal ability of this species and its use of both native and non-native vegetation for foraging and roosting activities indicates that the proposed works at Australia Park will not act as a barrier to dispersal for this species. Furthermore, the vegetation within the study area is unlikely to constitute critical habitat for this species. On this basis it is considered unlikely that a significant impact on Grey-headed Flying-fox would result from the Australia Park infrastructure works.		

Flat-head Galaxias

Table 9 Flat-headed Galaxias - assessment against Significant Impact Criteria for a critically endangered species

Significant Impact Criteria	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Unlikely	Flat-headed Galaxias are extremely rare. NSW DPI has mapped indicative habitat for the species in the Murray River, adjacent to and connected to the study area. It is unlikely that removal of 0.222 hectares of riparian vegetation within close proximity to Oddies Creek and installation of a creek crossing will lead to a long term decrease in the size of a population. This is given the availability of higher quality habitat adjacent to the study area and consideration of the high degree of modification and current impacts already operating in the study area
Reduce the area of occupancy of the species	Unlikely	The proposed area of impact is highly localised (within the vegetation surrounding Oddies Creek) in the context of the broader locality including the Murray River. Aquatic habitats within the study area are currently subject to modification and impacts. The proposed works are not considered to significantly increase the level of modification or disturbance beyond the current levels. It is anticipated that the proposed works would contribute to an overall improvement in Oddies Creek conditions through revegetation works. Therefore the proposal is considered unlikely to reduce the area of occupancy of the species.
Fragment an existing population into two or more populations	Unlikely	Proposed works are confined to areas of vegetation are not directly on the banks of Oddies Creek, and habitat connectivity up- and downstream of the works location will not be disrupted. Therefore, the proposal is not considered likely to reduce the area of occupancy of the species.
Adversely affect habitat critical to the survival of the species	Unlikely	The area of habitat proposed to be impacted is not considered critical to the survival of the species. This is considering the limited extent of the works, in the context of available habitat within the locality and existing levels of modification and disturbance.

Significant Impact Criteria	Likelihood of significant impact	Justification
Disrupt the breeding cycle of a population	Unlikely	The extent of the works is highly limited and occurs within the context of plentiful adjacent habitat (the Murray River). Therefore the localised area of habitat to be impacted is not considered important to the breeding cycle of a Flat-headed Galaxias population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The modification to habitat as part of the proposed works is not considered likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. This is due to the small area of works, high degree of modification and current impacts (degradation of existing riparian vegetation).
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	The type and scale of potential impacts associated with the proposed works are not anticipated to favour the establishment of invasive species beyond that which the current structures and erosive processes may contribute to. Recommendations for hygiene controls to reduce the risk of the spread or introduction of aquatic biosecurity matters have been made in this report.
Introduce disease that may cause the species to decline	Unlikely	Recommendations for hygiene controls to reduce the risk of the spread or introduction of aquatic biosecurity matters have been made in this report. Further or more intensive hygiene controls have not been recommended.
Interfere with the recovery of a species	Unlikely	The proposal is not considered likely to interfere with the recovery of the species due to the localised area of potential impacts, extent of available adjacent habitat, high degree of existing modification and current impacts.

Trout Cod

Table 10 Trout Cod - assessment against Significant Impact Criteria for an endangered species

Significant Impact Criteria	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of a population	Unlikely	Trout Cod were reduced to one known wild population (downstream of Yarrawonga) but have been restocked in several major river systems, including Murray River and may occur around the proposed works location. It is unlikely that the removal of 0.222 hectares of riparian vegetation within close proximity to Oddies Creek and installation of a creek crossing will lead to a long term decrease in the size of a population. This is given the availability of similar and suitable habitat adjacent to the study area and consideration of the high degree of modification and current impacts (prior clearing of vegetation and degradation of riparian vegetation) within the study area.
Reduce the area of occupancy of the species	Unlikely	The proposed area of impact is highly localised (within the vegetation surrounding Oddies Creek) in the context of the broader locality including the Murray River. Aquatic habitats within the study area are currently subject to modification and impacts. The proposed works are not considered likely to significantly increase the level of modification or disturbance beyond the current levels. It is anticipated that the proposed works would contribute to an overall improvement in Oddies Creek conditions through revegetation works. Therefore the proposal is considered unlikely to reduce the area of occupancy of the species.
Fragment an existing population into two or more populations	Unlikely	Proposed works are confined to areas of vegetation are not directly on the banks on Oddies Creek, and habitat connectivity up- and downstream of the works location will not be disrupted. Therefore the proposal is not considered likely to reduce the area of occupancy of the species.
Adversely affect habitat critical to the survival of the species	Unlikely	The area of habitat proposed to be impacted is not considered critical to the survival of the species. This is considering the limited extent of the works, in the context of available habitat within the locality and existing levels of modification and disturbance.

Significant Impact Criteria	Likelihood of significant impact	Justification
Disrupt the breeding cycle of a population	Unlikely	The extent of the works is highly limited and occurs within the context of plentiful adjacent habitat within the locality (the Murray River). Therefore the localised area of habitat to be impacted is not considered important to the breeding cycle of a Trout Cod population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The modification to habitat as part of the proposed works are not considered likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. This is due to the small area of works, high degree of modification and current impacts (prior clearing of vegetation and degradation of riparian vegetation).
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	The type and scale of potential impacts associated with the proposed works are not anticipated to favour the establishment of invasive species beyond that which the current structures and erosive processes may contribute to. Recommendations for hygiene controls to reduce the risk of the spread or introduction of aquatic biosecurity matters have been made in this report.
Introduce disease that may cause the species to decline	Unlikely	Recommendations for hygiene controls to reduce the risk of the spread or introduction of aquatic biosecurity matters have been made in this report. Further or more intensive hygiene controls have not been recommended.
Interfere with the recovery of a species	Unlikely	The proposed is not considered likely to interfere with the recovery of the species due to the localised area of potential impacts, extent of available adjacent habitat, high degree of existing modification and current impacts.

Murray Cod

Table 11 Murray Cod - assessment against Significant Impact Criteria for a vulnerable species

Significant Impact Criteria	Likelihood of significant impact	Justification
Lead to a long-term decrease in the size of an important population of the species	Unlikely	The Murray Cod's natural distribution extends throughout the Murray-Darling basin. It is found in the waterways of the Murray–Darling Basin in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers, billabongs and large deep holes. It is unlikely that the removal of 0.222 hectares of riparian vegetation within close proximity to Oddies Creek and installation of a creek crossing will lead to a long term decrease in the size of an important population of Murray Cod. This is given the availability of similar and suitable habitat adjacent to the study area and consideration of the high degree of modification and current impacts (prior clearing of vegetation and degradation of riparian vegetation) within the study area.
Reduce the area of occupancy of an important population	Unlikely	The proposed area of impact is highly localised (within the vegetation surrounding Oddies Creek) in the context of the broader locality including the Murray River. Aquatic habitats within the study area are currently subject to modification and impacts. The proposed works are not considered to significantly increase the level of modification or disturbance beyond the current levels. It is anticipated that the proposed works would contribute to an overall improvement in Oddies Creek conditions through revegetation works. Therefore the proposal is considered unlikely to reduce the area of occupancy of the species.
Fragment an existing population into two or more populations	Unlikely	Proposed works are confined to areas of vegetation not directly on the banks of Oddies Creek, and habitat connectivity up- and downstream of the works location will not be disrupted. Therefore the proposal is not considered likely to reduce the area of occupancy of the species.
Adversely affect habitat critical to the survival of the species	Unlikely	The area of habitat proposed to be impacted is not considered critical to the survival of the species. This is considering the limited extent of the works, in the context of available habitat within the locality and existing levels of modification and disturbance.

Significant Impact Criteria	Likelihood of significant impact	Justification
Disrupt the breeding cycle of a population	Unlikely	The extent of the works is highly limited and occurs within the context of plentiful adjacent habitat within the locality (the Murray River). Therefore the localised area of habitat to be impacted is not considered important to the breeding cycle of a Murray Cod population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	The modification to habitat as part of the proposed works are not considered likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. This is due to the small area of works, high degree of modification, and current impacts (prior clearing of vegetation and degradation of riparian vegetation).
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Unlikely	The type and scale of potential impacts associated with the proposed works are not anticipated to favour the establishment of invasive species beyond that which the current structures and erosive processes may contribute to. Recommendations for hygiene controls to reduce the risk of the spread or introduction of aquatic biosecurity matters have been made in this report.
Introduce disease that may cause the species to decline	Unlikely	Recommendations for hygiene controls to reduce the risk of the spread or introduction of aquatic biosecurity matters have been made in this report. Further or more intensive hygiene controls have not been recommended.
Interfere with the recovery of a species	Unlikely	The proposed is not considered likely to interfere with the recovery of the species due to the localised area of potential impacts, extent of available adjacent habitat, high degree of existing modification and current impacts.

Appendix 4 Tests of Significance

The following section provides for Tests of Significance as outlined in Section 7.3 of the BC Act for all species listed as a medium likelihood or greater in Appendix 1 and Appendix 2. Species descriptions and occurrence within Australia Park can be found in 3.3 and 3.4. Five threatened species will be assessed and are listed below.

- Grey-headed Flying-fox *Pteropus poliocephalus*
- Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*
- Squirrel Glider *Petaurus norfolcensis*
- Dusky Woodswallow *Artamus cyanopterus cyanopterus*
- Barking Owl *Ninox connivens*

Threatened aquatic species (Flat-headed Galaxias, Trout Cod, Murray Cod, Murray Crayfish and Southern Pygmy Perch) have been assessed using the 7-part test in accordance with the FM Act.

Grey-headed Flying-fox

Table 12 Test of Significance for Grey-headed Flying-fox *Pteropus poliocephalus*

ToS Criteria	Outcome
a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	Grey-headed Flying-fox in Australia are regarded as one single population that moves freely within their entire national range (Webb & Tidemann 1996; DoE 2015). Given Grey-headed Flying-fox can move up to 100 km in a single night (McConkey et al 2012) and are known to occupy and freely disperse through urban environments, Grey-headed Flying-fox could be expected to occur anywhere within the study area on occasion. Given this high dispersal ability, it is unlikely that the removal of potential foraging habitat, consisting of 0.18 hectares of native vegetation and two hollow-bearing tree, as well as planted vegetation from within a peri-urban recreational environment would lead to a long term decrease in the size of the local population. Given the vegetation removal will occur outside of known camps, as well as retain majority of foraging trees on site, the Grey-headed Flying-fox could be reasonably expected to occupy or utilise the similar habitat within the site or adjacent to the proposed works. As such, the habitat removal would be unlikely to impact the life cycle of a population as the population would have ample habitat remaining for critical activities (i.e. foraging, breeding, dispersal etc.).

ToS Criteria	Outcome
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*** ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.***	Not applicable to threatened species.

ToS Criteria	Outcome
c) In relation to the habitat of a threatened species or ecological community: ***(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*** ***(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*** ***(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,***	The proposed Australia Park infrastructure works will result in the removal of low quality understorey vegetation, non-hollow bearing trees and the removal of two hollow-bearing tree. This foraging habitat is potentially used by Grey-headed Flying-fox but this species in not hollow-dependent. The proposal will result in the removal of understorey saplings, however majority of the canopy species and hollow-bearing trees will be retained within and adjacent to the proposed works. Therefore, habitat for Grey-headed Flying-fox will not become fragmented or isolated as a result of the proposed infrastructure upgrade at Australia Park. The habitat to be removed consists majority of understorey saplings and non-hollow bearing trees and one hollow bearing tree. No trees used for roosting will be removed as a result of the development. This habitat is not considered important in the context of the long-term survival of the species given it is not critical to roosting or breeding. Habitat removal of this type and extent will not adversely influence the long term survival of Grey-headed Flying-fox given the quality and quantity of similarly within the study area and habitat immediately adjacent to the development site and given habitat removal is outside of any known camps.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	Under the BC Act, the Minister for the Environment has the power to declare Areas of Outstanding Biodiversity Value (AOBVs). To date no AOBVs have been declared within the projects impact area.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process (KTP).	The Environment, Energy and Science (EES) profile lists a key threatening process (KTP) as 'clearing of native vegetation'. The proposed works will remove one large hollow-bearing tree that provides foraging and dispersal habitat for Grey-headed Flying-fox, which could be considered part or an exacerbation of a KTP.

ToS Criteria	Outcome
Conclusion for Grey-headed Flying-fox	

In consideration of the above five factors (a-e), the proposed works are not likely to significantly impact Grey-headed Flying-fox within the study area or broader locality, as:

- The proposed vegetation removal will occur outside of any known camps.
- The works will not impact the life cycle of Grey-headed Flying-fox such that a local population will be at risk of extinction given the type and nature of the vegetation removal (i.e. no roost trees will be removed) and the extent and quality of adjacent suitable habitat.
- Understorey vegetation is not considered to be important to the long term survival of Grey-headed Flying-fox and will not become fragmented as a result of the works.
- Secondary impacts such as noise disturbance during construction are not expected to be significant given this species' tolerance to urban environments and the distance (2 kilometres) that the construction will take place away from known camps.
- While habitat removal could be considered part of a KTP (i.e. clearing of native vegetation), the proposal is considered unlikely to result in a significant effect on Grey-headed Flying-fox given the nature of the vegetation removal and the quality and quantity of similar habitat within the study area and adjacent to the proposed works.

Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris*

Table 13 Test of Significance for Yellow-bellied Sheathtail-bat

Test of Significance	Outcome
a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	The proposed infrastructure works at Australian Park will result in the removal of up to 0.18 hectares of PCT 5 and the removal of two hollow-bearing trees. The Yellow-bellied Sheathtail- Bat may utilise the study area for nesting/roosting in hollows and foraging. Other impacts including noise pollution during construction, which may have some local influence on hollow occupancy immediately adjacent to the construction areas but given the local abundance of similar habitat it is highly unlikely this would lead to a decline in the viability of a local population. Given this relatively minor localised vegetation removal and the availability of similar suitable habitat it is highly unlikely that the works would place Yellow-bellied Sheathtail-bat at risk of local extinction.
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*** **(ii)** ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.***	Not applicable to threatened species.

Test of Significance	Outcome
c) In relation to the habitat of a threatened species or ecological community: ***(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*** ***(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*** ***(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,***	The proposal will result in the removal of roosting, breeding and foraging habitat for Yellow-bellied Sheathtail-bat., however canopy species will remain connected across the broader study area. Therefore, habitat for Yellow-bellied Sheathtail-bat will not become fragmented or isolated as a result of the works. The habitat to be removed consists of two hollow-bearing tree, saplings, modified understorey and planted vegetation from within a recreational park environment. This species requires hollows for nesting and breeding, thus hollow-bearing trees are considered important in the context of the long-term survival of the species. two hollow-bearing tree are considered non-viable, although the retention of other hollow-bearing trees on site will provide habitat. Therefore the removal of this extent and from this disturbed peri-urban setting will not adversely affect the long-term survival of Yellow-bellied Sheathtail-bat given the quality and quantity of similarly habitat immediately adjacent to the activity area.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	Under the BC Act, the Minister for the Environment has the power to declare AOBVs. To date no AOBVs have been declared within the projects impact area.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	Clearing of native vegetation is identified as a KTP on the Schedules of the BC Act. The proposed infrastructure works at Australia Park will remove canopy vegetation that provides roosting, foraging and dispersal habitat for Yellow-bellied Sheathtail-bat that could be considered part or an exacerbation of a key threatening process.

Test of Significance	Outcome
Conclusion for Yellow-bellied Sheathtail-bat	
In consideration of the above five factors (a-e), the proposed activity is unlikely to significantly impact the Yellow- bellied Sheathtail- Bat within the study area and broader locality, as: • The proposed removal of native vegetation will not fragment any patches of vegetation due to the limited extent of removal. The works will not impact the life cycle of Yellow-bellied Sheathtail-bat such that a local population will be at risk of extinction given the scale of vegetation removal, the type of vegetation to be removed, and the extent and quality of adjacent suitable habitat. • The potential habitat to be removed will not become fragmented as a result of the works. • While habitat removal could be considered part of a Key Threatening Process (i.e. clearing of native vegetation), the proposal is considered unlikely to result in a significant impact on Yellow-bellied Sheathtail-bat given the relatively minor construction footprint and the quality and quantity of similar habitat adjacent to the works.	

Squirrel Glider

Table 14 Test of Significance for Squirrel Glider *Petaurus norfolcensis*

ToS Criteria	Outcome
a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	The proposed infrastructure works at Australian Park will result in the removal of up to 0.18 hectares of PCT 5 and the expected decline of two hollow-bearing trees. The Squirrel Glider is likely to utilise hollows in the study area for nesting and some of the understorey vegetation (saplings) and nectar producing trees for foraging. It is unlikely that vegetation removal will influence the life cycle of the species, due to the avoidance of majority of the hollow-bearing trees on site and large nectar-producing trees. It is highly unlikely that the lifecycle of Squirrel Gliders will be impacted upon due to the limited extent of the works and retained habitat within the site for the species to keep persisting within the study area.
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*** ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.***	Not applicable to threatened species.

ToS Criteria	Outcome
c) In relation to the habitat of a threatened species or ecological community: ***(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*** ***(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*** ***(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,***	The proposed removal of 0.18 hectares of PCT 5 and the expected decline of two hollow-bearing trees will result in the removal of minimal foraging, shelter and breeding habitat for the Squirrel Glider. The vegetation proposed for removal provides minimal suitable habitat for the species. Majority of the suitable habitat (hollow-bearing trees) will be retained within the study area and suitable habitat is present adjacent to the study area, along the river corridor. The proposed removal will not isolate any patches of vegetation and the loss of one hollow-bearing canopy tree will not fragment vegetation. Additionally, the gap created by the removal of vegetation will not exceed the maximum gliding distance of Squirrel Gliders (between 40 to 70 metres depending on canopy height so this species should be able to continue to move freely from one side of the park to the other. The vegetation proposed for removal is not considered important to the long-term survival of the species in the locality, as it is an area of low quality forest that does not support typical understorey shrubs (i.e. *Acacia* sp.) that the Squirrel Glider relies on for foraging. As state above, suitable habitat is present adjacent to the study area.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	Under the BC Act, the Minister for the Environment has the power to declare AOBVs. To date no AOBVs have been declared within the project's impact area.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	Clearing of native vegetation is identified as a KTP on the Schedules of the BC Act. The disturbance of up to 0.18 hectares of vegetation and two-hollow bearing tree will contribute to the two threatening process listed above, although it is not considered a significant amount of disturbance to lead to a significant impact to the species.

ToS Criteria	Outcome
Conclusion for Squirrel Glider	
In consideration of the above five factors (a-e), the proposed activity is unlikely to significantly impact Squirrel Glider within the study area and broader locality, as: • The proposed infrastructure works at Australia Park provides limited breeding, foraging, or sheltering habitat and other vegetation that will be retained can provide these resources. • The proposed removal of native vegetation will not fragment any patches of vegetation due to the limited extent of removal. • The gap created by the removal of vegetation will not exceed the maximum gliding distance of Squirrel Gliders so the species should be able to continue to move freely across the study area and access higher quality vegetation along the Murray River corridor.	

Dusky Woodswallow

Table 15 Test of Significance for Dusky Woodswallow *Artamus cyanopterus cyanopterus*

ToS Criteria	Outcome
a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	Although a threatened species, the Dusky Woodswallow is a common bird within Noreuil Park (300 m north-west of the study area) and was seen adjacent to the study area during the survey. It is highly likely the Dusky Woodswallow utilises the vegetation within the study area for perching, feeding or sheltering. However the removal of 0.18 hectares of native vegetation and two hollow-bearing tree will not result in the loss an extensive amount of foraging resources (insects) or reduce canopy continuity for the Dusky Woodswallow. Removal of 0.18 hectares of vegetation of this type in the context that suitable habitat within Australia Park persists and adjacent habitat is known to be utilised. Therefore the removal will not adversely affect the life cycle of the Dusky Woodswallow that a local populations would be placed at risk of extinction.
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*** ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.***	Not relevant to threatened species.

ToS Criteria	Outcome
c) In relation to the habitat of a threatened species or ecological community: ***(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*** ***(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*** ***(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,***	The proposed infrastructure works at Australia park will result in the removal up to 0.18 hectares of PCT 5 and the removal of two hollow-bearing trees. As such, the minimal amount of vegetation removal surrounding some of the infrastructure will not further fragment or isolate habitat to the extent that it would be unusable by the Dusky Woodswallow. The removal of 0.18 hectares of planted vegetation will not affect the survival of Dusky Woodswallow local scale of or lead to long term decline in species, with retention of majority of hollows and foraging resources (insects). Although a small amount of perching and foraging resources will be removed, the project is retaining the vegetation that provides greater habitat value, and the mobility of this species means it can continue to access adjacent vegetation within the site.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	No AOBVs have been declared within the Albury LGA, the area is not part of a declared AOBV.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	Clearing of native vegetation is identified as a KTP on the Schedules of the BC Act. The disturbance of up to 0.18 hectares of vegetation and two hollow bearing trees will contribute to the one threatening process listed above.

Conclusion for Dusky Woodswallow

In consideration of the above five factors, the proposed activity is not likely to significantly impact the Dusky Woodswallow within the study area or broader locality, as:

- The vegetation proposed for removal does provide breeding or foraging habitat, although the extent is minimal and the retention of habitat on site and adjacent to the study area will allow the species to persist.
- The proposed removal of native vegetation will not fragment any patches of vegetation due to the limited extent of removal.
- The gap created by the removal of vegetation will not exceed the dispersal capacity of the Dusky Woodswallow so these species should be able to continue to move freely across the study area.

Barking Owl

Table 16 Test of Significance for Barking Owl *Ninox connivens*

ToS Criteria	Outcome
a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	The proposed Australia Park infrastructure works is confined to a relatively small footprint (0.18 hectares) and is situated within an area containing large areas of native vegetation within close (Murray River riparian corridor). Removal of vegetation on this scale will not adversely affect the life cycle of Barking Owl such that a local population would be placed at risk of extinction given the quantity and quality of suitable breeding and nesting habitat immediately adjacent to the works and the dispersal ability of this highly mobile avian species.
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*** ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.***	Not relevant to threatened species.

ToS Criteria	Outcome
c) In relation to the habitat of a threatened species or ecological community: ***(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*** ***(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*** ***(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,***	The proposed Australia Park infrastructure work will result in the removal of 0.18 hectares and two hollow-bearing trees in potential foraging and breeding habitat for Barking Owl. Given the dispersal ability of this highly mobile species and the contiguous nature of habitat surrounding the proposed works, the habitat will not become fragmented to the point that Barking Owls will not be able to freely disperse from one side of the study area to the other. The habitat to be removed consists of understorey vegetation, two hollow-bearing trees and planted vegetation from within a peri-urban recreational environment. While this vegetation is suitable habitat, it is not considered important habitat in the context of the survival of Barking Owl as it does not provide essential breeding or foraging habitat for an ecologically significant number or population of the species. Furthermore large areas of similar habitat occur immediately adjacent to the works and as such it is unlikely that small scale removal of this habitat would lead to any significant population declines. The cumulative impacts of incremental habitat loss is a key concern for bird species but given the quality and quantity of similar habitat immediately adjacent to the works site this will not adversely influence the long term survival of Barking Owl.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	No AOBVs have been declared within the Albury LGA, the area is not part of a declared AOBV.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	Clearing of native vegetation is identified as a KTP on the Schedules of the BC Act. The proposed works will remove understorey and two hollow-bearing trees that provides potential foraging and breeding habitat for Barking Owl that could be considered part of an exacerbation of a KTP.

ToS Criteria	Outcome
Conclusion for the Barking Owl	
In consideration of the above five factors, the proposed activity is not likely to significantly impact Barking Owl within the study area or broader locality, as: • The works will not impact the life cycle of Barking Owl such that a local population will be at risk of extinction given the scale of vegetation removal, the type of vegetation to be removed (i.e. from within a disturbed peri-urban recreational environment) and the extent and quality of adjacent suitable habitat. • The potential habitat to be removed is not considered to be important to the long term survival of Barking Owl and will not become fragmented as a result of the works. • While habitat removal could be considered part of a Key Threatening Process (i.e. clearing of native vegetation), the proposal is considered unlikely to result in a significant impact on Barking Owl given the relatively minor construction footprint and the quality and quantity of habitat retained within the study area and similar habitat adjacent to the works.	

Threatened aquatic species (7-part tests under FM Act)

Table 17 7-part test for five threatened aquatic species

7-Part Test Criteria	Outcome
a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	Impacts from the proposed works have potential to adversely affect the life cycle of the following threatened aquatic species: Flat-headed Galaxias, Trout Cod, Murray Cod, Murray Crayfish and Southern Pygmy Perch. The impacts include the disturbance and loss of potential habitat through excavation, introduction of artificial structures, relocation of coarse woody debris (if required), and disturbance during construction works. Impacts to the aquatic environment are proposed to occur within the riparian vegetation and infrastructure occurring surrounding the creek, such as bridges and crossings over the creek. The threatened aquatic species addressed are mobile and the extent of the proposed impacts are localised within the aquatic environment (areas within close proximity to the creek), with abundant habitat present directly adjacent to the site of works (the Murray River). The proposed works are not likely to adversely affect the life cycle of aquatic threatened species such that local populations would be placed at risk of extinction. This is due to the localised extent of impact, amount of available habitat adjacent to site of proposed works, mobility of the species and current levels of modification and impacts.
b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.	Not applicable to threatened species.

7-Part Test Criteria	Outcome
c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: ***(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*** ***(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.***	Not applicable to threatened species.
d) in relation to the habitat of a threatened species, population or ecological community: ***(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*** ***(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*** ***(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,***	The area which constitutes suitable habitat for the species to be impacted is approximately 0.222 hectares of riparian vegetation and no direct impacts to the creek. The area of habitat to be removed or modified is considered to be small in the context of surrounding available habitat. The proposal will not fragment or isolate habitat. The existing habitat is not considered critical or important to the long term survival of these threatened aquatic species locally or more broadly in southern NSW. This is due to the localised area of impact and availability of suitable habitat adjacent to the proposed works area. Impacts to these aquatic habitats will not fragment or isolate any populations or habitats. This habitat is not considered important nor-limited in the context of the long-term survival of the species, in the context of existing impacts and availability of adjacent habitat.
e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),	To date no critical habitat has been declared for the threatened aquatic species addressed in this assessment.

7-Part Test Criteria	Outcome
f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,	NSW DPI publishes recovery actions for threatened species as part of Priorities Action Statements on the Department of Primary Industries website. Additional recovery plans have been prepared for Trout Cod (NSW DPI 2006, Trout Cod Recovery Team 2008), Murray Cod (National Murray Cod Recovery Team 2010). The proposed is not consistent with the published recovery actions in these documents.
g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	The NSW Department of Primary Industries lists a number of KTPs. The proposed development may result in the operation of the following KTPs. • Degradation of native riparian vegetation along New South Wales water courses. • Removal of large woody debris from New South Wales rivers and streams. The riparian and aquatic environments within the study area are subject to substantial levels of existing habitat modification including degradation of riparian vegetation. It is considered unlikely that the proposed works would increase the degradation of native vegetation although some habitat is likely to be modified or lost. The extent and magnitude of impacts associated with the proposed works are considered to be low in the context of the scale of existing impacts. Recommendations to relocate rather than remove any coarse woody debris that must be impacted have been made to mitigate impacts associated with this KTP

Conclusion for threatened aquatic species

In consideration of the above seven factors (a-g), the proposed activity is not likely to significantly impact threatened aquatic species within the study area or broader locality, as:

- The proposed works will not impact the life cycle threatened aquatic species such that a local population will be at risk of extinction given limited area of aquatic habitat to be impacted and the extent of adjacent suitable habitat.
- The potential habitat to be removed is not considered to be important to the long term survival of threatened aquatic species and will not become fragmented as a result of the works.
- While the potential impacts could be considered part of a key threatening process the proposal is considered unlikely to result in a significant impact on threatened aquatic species, given the limited extent and magnitude of potential impacts in the context of existing impacts within the proposed area of works.

Appendix D: Arboricultural Impact Assessment

Note 1: The Arboricultural Impact Assessment was based on South Albury Levee Upgrade Plans Revision C (Drawing No 6293). This revision identified the removal of trees 67 & 68. The final version of South Albury Levee Upgrade (Revisions F) alters the alignment of the levee around trees 67 & 68 (using retaining walls) allowing the two trees to be retained. This report has not been updated to reflect these change of removing 24 trees down to 22.

Note 2: The Arboricultural Impact Assessment Report was based on revision G of the Engineering civil designs and revision C1 of the pedestrian bridge design. With the reduction of car parks from 80 to 65 a reconfiguration of the car park was required. The amended designs (Civil Design Rev H) resulted in the retention of tree no. 43 (tree protection zone (TPZ) encroachment from 15% to 0%) however there has been a minor increase in TPZ encroachment of tree no 42 (11% to 17%) and tree no. 40 (23% to 28%). This report has not been updated to reflect these changes.

HOMEWOOD CONSULTING PTY LTD

Arboricultural Impact Assessment for

AlburyCity

Assessment of trees at Australia Park, Albury

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23 March 2022

Executive Summary

137 trees were assessed at Australia Park, Albury in relation to a car park, pedestrian bridge and levee bank modification project.

The table below summarises the impact of the proposed works on the assessed trees.

Arboricultural Impact	Tree Retention Value				Total No. of Trees
	Very High	High	Medium	Low	
Impact Removal	0	4	11	9	24
Impact Major - not viable	0	11	1	0	12
Impact Major - viable	1	25	11	0	37
Impact Minor	1	6	2	1	10
No Impact	0	9	21	24	54
Total	**2**	**55**	**46**	**34**	**137**

Of the 137 trees assessed:

- 24 trees **require removal** to facilitate the proposed design. The trunks of these trees are located within the construction footprint.
  - Four trees (Trees 52, 59, 65 and 67) have High retention value and all efforts should be made to retain and protect these trees throughout the proposed works.
    - ◊ A major redesign would be required to retain Trees 52, 59, 65 and 67.
  - 11 trees (Trees 10, 35, 37, 38, 41, 48, 50, 55, 56, 68 and 94) have Medium retention value. These trees should be retained and protected where easily achievable.
    - ◊ A major redesign would be required to retain these trees.
  - Nine trees (Trees 20, 34, 36, 47, 49, 51, 53, 54 and 57) are of Low retention value and do not warrant a design modification to allow their retention.
- 49 trees have a **'Major'** Tree Protection Zone (TPZ) encroachment under the proposed design.
  - 12 trees (Trees 19, 39, 40, 69, 74 and 96-103) have 'Major' TPZ encroachments between 15 and 76% and **are not expected to remain viable** under the proposed design.
    - ◊ A major redesign is required to retain these trees.
    - ◊ Trees 39, 40 and 96-103 may be able to be retained where a combination of Project Arborist supervision and non-destructive excavation methods are utilised, and substantial root loss can be avoided.
    - ◊ Tree 69 has is not likely to tolerate these works, however could be retained in the landscape as habitat.
  - 37 trees (Trees 6, 13, 17, 18, 21, 23, 33, 42, 43, 58, 60, 63, 64, 75-77, 79, 80, 83-88, 90-92, 95 (group of 8) and 104) **are expected to remain viable** under the proposed design provided works are undertaken using a combination of sensitive construction methods and Project Arborist supervision as outlined in Section 7 and the recommendations below.

- Proposed works will have a '**Minor'** TPZ encroachment on 10 trees (Trees 8, 12, 14, 16, 61, 62, 66, 70, 82 and 93). These trees are expected to remain viable with the establishment of a TPZ and with compensation for the area lost to encroachment.
- Proposed works have **no TPZ encroachment** on 54 trees (Trees 1, 2, 3 (group of 12), 4, 5, 7 (group of 6), 9 (group of 6), 11, 15, 22, 24-32, 44-46, 71-73, 78, 81 (group of 6) and 89). These trees are expected to remain viable with the establishment of a TPZ.

All retained trees require protection to ensure they remain viable throughout the works.

The following is recommended:

1. Prior to the commencement of demolition and construction:
   - 1.1 All trees to be removed are clearly marked on site by the Project Arborist and removal works carried out.
     - 1.1.1 Where stumps are within the TPZs of retained trees, where possible these should be cut to ground level and remain in-situ to protect the roots of retained trees. Where a root ball located within the TPZ of a retained tree requires removal this should be discussed with the Project Arborist.
   - 1.2 Establish a Tree Protection Zone for all retained trees:
     - 1.2.1 Where works are permitted within the TPZ, fencing is to be taken in to only the minimum amount necessary to allow the works to be completed.
     - 1.2.2 There should be no vehicle or machinery access, or storage of machinery, vehicles, rubbish or fill within the TPZ, without ground protection measures.
     - 1.2.3 Where machinery will be working adjacent to trees to be retained, and TPZ fencing is not feasible (e.g., Trees 75 and 77) protection for the trunk and branches is required.
2. Installation of utilities within TPZs of retained trees should be installed via non-destructive digging methods (e.g., hydro-excavation, manual excavation [by hand], or directional boring) under Project Arborist supervision.
   - 2.1 Where hydro is used, any small roots (<35mm diameter) may be pruned by the Project Arborist at right angles using a clean sharp pruning saw. Where possible major roots (>35mm diameter) should remain intact. In some instances, it may be possible to route infrastructure underneath roots to accommodate this.
   - 2.2 Where boring is used, the top of the bore should be at a minimum depth of 800mm, with bore entry and exit pits located outside of the TPZs.
3. The following works should be carried out under the direct supervision of the Project Arborist (minimum AQF Level 5):
   - 3.1 Excavation for the construction of the road / new carpark within the TPZs of Trees 6, 13, 17, 42, 43 and 104.
   - 3.2 Excavation for construction of the retaining wall within TPZs Trees 17-18, 21 and 23:
     - 3.2.1 Compaction between the toe of the retaining wall and the trunks of these trees should be avoided.
   - 3.3 Removal of existing infrastructure, including hard surfaces and outdoor furniture, within TPZs. The removal of hard surfaces should not involve the use of pneumatic tools, and existing surfaces should be carefully cut and moved outside of the TPZ.
   - 3.4 Excavation for the proposed shared path within the TPZ of Tree 63.

3.5 Any works within the TPZs of Trees 39 and 40, and excavation along the road alignment within the TPZs of 96-103. Non-destructive methods (e.g., manual excavation [by hand], hydro-excavation) should be used for any excavation within the TPZs of these trees.

3.5.1 Trees 39 and 40: Where possible, limit excavations (<100mm depth), use permeable surfaces, use existing footings and / or post hole footings within TPZs.

3.5.2 Trees 96-103: The road footprint within TPZs should not change.

3.6 All root pruning should be undertaken by and at the discretion of the Project Arborist.

3.7 Where substantial root loss is unavoidable and tree viability or anchorage cannot be assured the Project Arborist may condemn tree(s) for immediate removal.

4. Where Trees 39 and 40 are retained their health and condition should be monitored every six months for a period of two years, after the completion of works.
5. No roots within the SRZs of retained trees (including Tree 92 which is dead) are to be damaged or severed by the works. Where this is not possible, the Project Arborist may condemn tree(s) for immediate removal.
6. The use of fill within TPZs should be minimised (<100mm) where possible.
7. Mulch should be applied across TPZs of Trees 75, 76, 77, 79, 80 and 83-88 to alleviate soil compaction. The combination of fill, topsoil or mulch applied within the TPZs of these trees should not exceed 150mm depth:

   7.1 Compaction could be further alleviated through radial trenching or vertical mulching (under Project Arborist supervision).

   7.2 There should be no ripping or soil cultivation within the TPZs.
8. The embankment within the TPZs of Trees 6, 13 and 17 and the existing levee bank within the TPZs of Trees 58, 60, 63 and 64 should remain intact.
9. Works to demolish the bridge within the TPZs of Trees 17, 18, 86, 87 and 88 should be undertaken with care, with footings remaining in-situ to reduce root disturbance.
10. Existing underground services should remain in-situ.
11. A Tree Management Plan Report, including a Tree Protection Plan (TPP), is prepared which identifies trees to be removed, and specifies tree protection measures for trees to be retained. Any design changes should be re-assessed as part of this report.

Further description of the tree protection measures listed can be seen in Appendix 3.

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Table 1: Table of Revisions

Ver No.	Report Date	Description	Author	Internal Review Date	Reviewed by
1	*23.03.2022*	*Updated based on design dated 23/11/2021 / client feedback*	*CB*	*21.03.2022*	*AMS*
0	*21.01.2022*	*Report for Submission to client*	*CB*	*20.01.2022*	*AMS*

1. Introduction

Homewood Consulting Pty Ltd has been engaged to provide an arboricultural impact assessment on trees at Australia Park, Albury in relation to a car park, pedestrian bridge and levee bank modification project.

This report has been prepared in accordance with Australian Standard 4970-2009 *Protection of Trees on Development Sites*. It provides an assessment of the trees with regard to their health, structure and retention value in the landscape and identifies the impact of the proposed development on the future longevity of the trees.

The report recommends design and construction methods to minimise impacts on retained trees where there is encroachment into the Tree Protection Zone.

2. Method

On Thursday, 25 November 2021 Andrew Salo conducted a site inspection.

Data collected for the trees includes:

- Botanical Name
- Canopy Dimensions
- Diameter at Breast Height (DBH)
- Diameter above basal root flare
- Health
- Structure
- Useful Life Expectancy (ULE)
- Landscape Contribution
- Retention Value

A 'Visual Tree Assessment' (VTA) was conducted for each tree. A VTA consists of a detailed visual inspection of a tree and its surrounding site, including a complete walk around the tree, looking at the buttress roots, trunk, branches and leaves. The tree is observed from a distance and close up to consider crown shape, landscape context and surroundings.

The assessment was conducted from ground level with no instruments used other than a diameter tape to measure trunk diameter. Any assessments of decay are qualitative only.

A feature survey plan has been supplied by City of Albury (dated 28.05.2021). Where applicable, the plotted trees have been aligned to the feature survey for greater location accuracy. Tree location not shown on the feature survey were recorded using differentially corrected GPS (generally +/- 1.0m accuracy).

137 trees were assessed in total. For the most part, each data record represents an individual tree, however in some circumstances (Medium and Low retention value trees only) a single data record has been used to record multiple trees. This has resulted in 104 data records being created for the 137 trees assessed. As such:

- 99 trees were individually recorded and represented as one of 99 data records;
- 38 trees were recorded as groups of varying sizes, represented as one of five data records.

Where grouping has occurred the average tree size and attributes for the group have been assigned to represent the group, with the number of trees per group reflected in the data.

Table 2 shows the data collected for the trees (page 28). For definitions and descriptors of the data collected on site see Appendix 1.

3. Protection of Trees on Development Sites

The Tree Protection Zone (TPZ) is the principal means of protecting trees on development sites. It is a combination of the root area and crown area which is isolated from construction disturbance, so that the tree remains viable. The TPZ incorporates the Structural Root Zone (SRZ), the area around the base of a tree required for the tree's stability in the ground; the woody root growth and soil cohesion in this area necessary to hold the tree upright. Further description of the TPZ and SRZ, and methods used for their calculation can be seen in Appendix 2.

3.1 Arboricultural impact

The arboricultural impact of a proposed design is determined based on the level of encroachment into the TPZ of a tree as specified in Australian Standard AS4970-2009. The broad types of impact are described below:

Table 2: Arboricultural Impact categories and descriptors

Category	Description
Impact - Removal	The tree is within the footprint of the proposed design and will require removal to facilitate the design. In order to successfully retain the tree, a design modification would be required.
Impact – Major, not viable	The proposed design has a Tree Protection Zone area encroachment greater than 10%, or it impacts the Structural Root Zone. While the tree does not require outright removal under the design, the proposed works are expected to have a significant impact on the tree such that it is expected to die or fail in the future as a result of the works. In order to successfully retain the tree, a design modification would be required which reduces the impact to an acceptable level, unless a non-destructive root exploration has demonstrated that root distribution is limited in the proposed area of works.
Impact – Major, viable	The proposed design has a Tree Protection Zone area encroachment greater than 10%, or impacts the Structural Root Zone. The tree is expected to remain viable because of one, or a combination of the following: • Alternative construction methods are proposed which reduce the impact on the tree • Site conditions have limited root development within the proposed area of works • The species is known to be particularly tolerant to root disturbance • A non-destructive root exploration was undertaken and demonstrated that root distribution was limited in the proposed area of works. The tree will require the establishment of a Tree Protection Zone prior to the commencement of works, which may require compensation for the area lost to encroachment.
Impact - Minor	The proposed design has a Tree Protection Zone area encroachment of less than 10%, and does not impact the structural root zone. The tree is expected to remain a viable landscape component with the establishment of a Tree Protection Zone prior to the commencement of works, which may require compensation for the area lost to encroachment.
No impact	The proposed design does not enter the Tree Protection Zone. The tree is expected to remain a viable landscape component with the establishment of a Tree Protection Zone prior to the commencement of works.
Remove tree (condition)	The tree is in such poor condition that it is recommended for removal, regardless of the proposed design. The tree does not warrant retention and protection throughout the proposed works.



HOMEWOOD

Assessment of trees at Australia Park, Albury

AlburyCity

Legend

- Assessed trees
- Map Grids

Base information: City of Albury / Plotted: AS / Date: 25/11/2021 / Coordinate System: GDA 1994 MGA Zone 55

5. Design Proposal

5.1 Existing Conditions

Located off Ebden Street, Australia Park is located on the southern edge of Albury, to the north of the Murray River. There are a range of facilities at the site including a playground and a picnic, BBQ and shelter area (Figure 1). The site is of undulating terrain, with large grassed areas and Oddies Creek running south-east to north-west. An existing pedestrian bridge and culvert provide access to the car park (Figure 2). The trees are mostly a mix of small to large Exotic and Indigenous species in good to fair condition, and the most common species assessed was the River Red Gum (*Eucalyptus camaldulensis).*



Figure 1: Existing shelter and picnic/BBQ area at the main entrance off Ebden Street



Figure 2: Existing culvert and parking area

5.2 Proposed Works

It is proposed to undertake works at Australia Park as part of the car park, pedestrian bridge and levee bank modification project. Major components of the project include:

- Reconstruction of Ebden Street, including new asphalt and installation of concrete edging with excavation up to 400mm depth
- Retaining wall, levee and associated bank protection works
- Removal and relocation of the existing culvert
- New pedestrian bridge and ramp
- New water and sewer main installation, and discontinue of irrigation main
- Construction of a new carpark, BBQ facilities and shared path network
- Garden bed construction and tree planting
- Conversion of existing carpark into green space

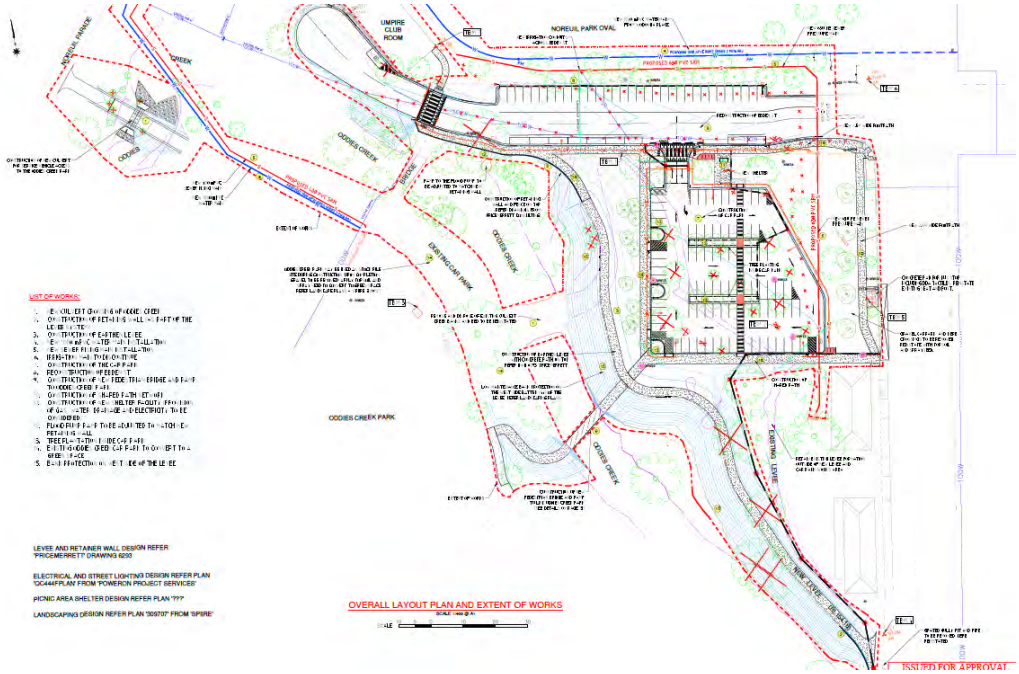


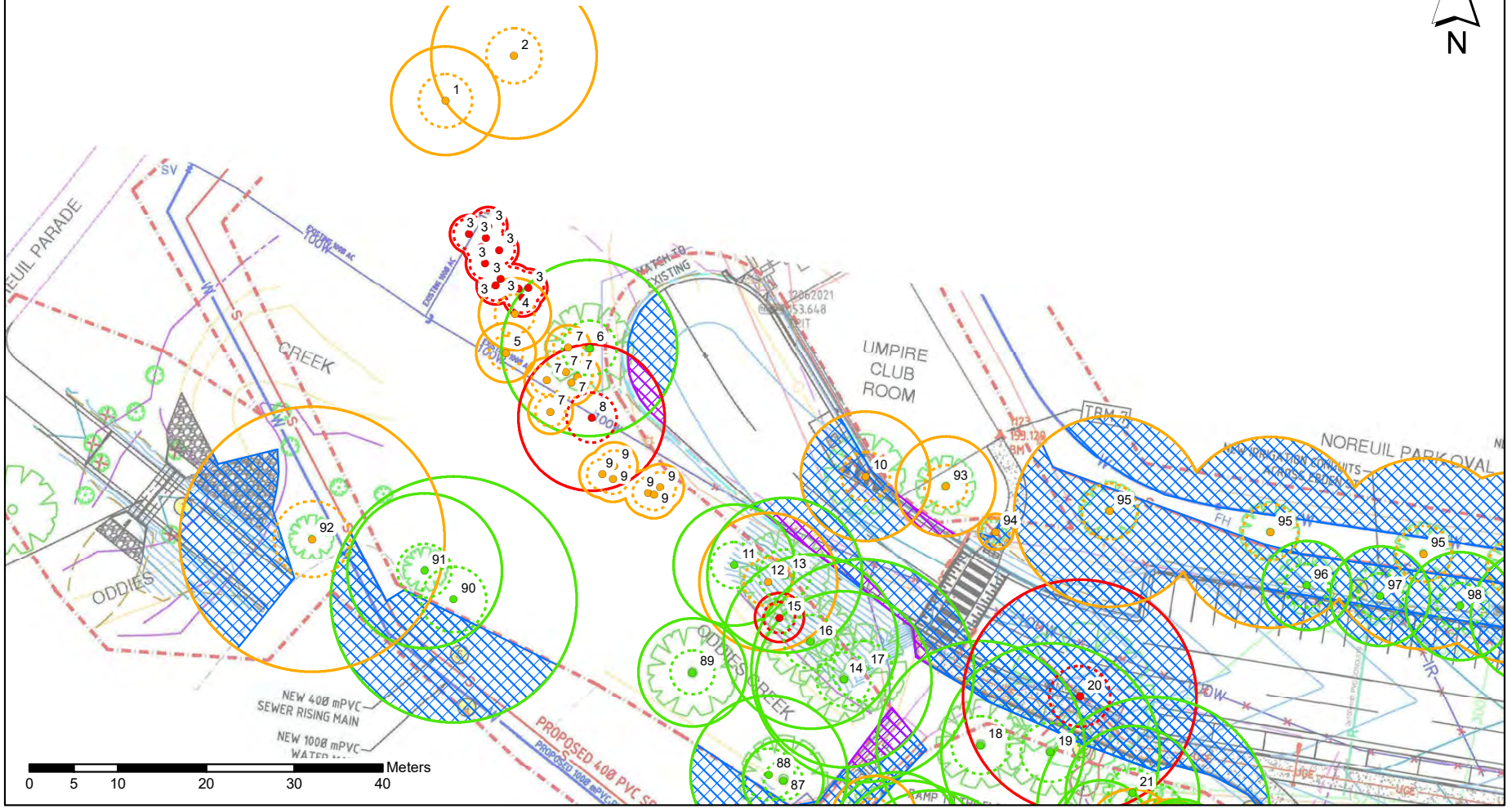
Figure 3: Overview of works at Australia Park, Albury dated 23/11/2021 (City of Albury)

A survey plan showing the location of existing trees and the proposed works have been prepared by City of Albury (dated 23/11/2021). This plan has been used to determine the impact of proposed works on the assessed trees.

Appendix 4 displays the assessment data for all trees, as well as the dimensions of the TPZs, SRZs and the arboricultural impact from the proposed design.

Section 6 shows the Arboricultural Impact Assessment Plan. TPZs and SRZs for the assessed trees are depicted to scale and the construction footprint of the proposed works is indicated.

6. Arboricultural Impact Assessment Plan 1 of 4



HOMEWOOD

Assessment of trees at Australia Park, Albury

AlburyCity

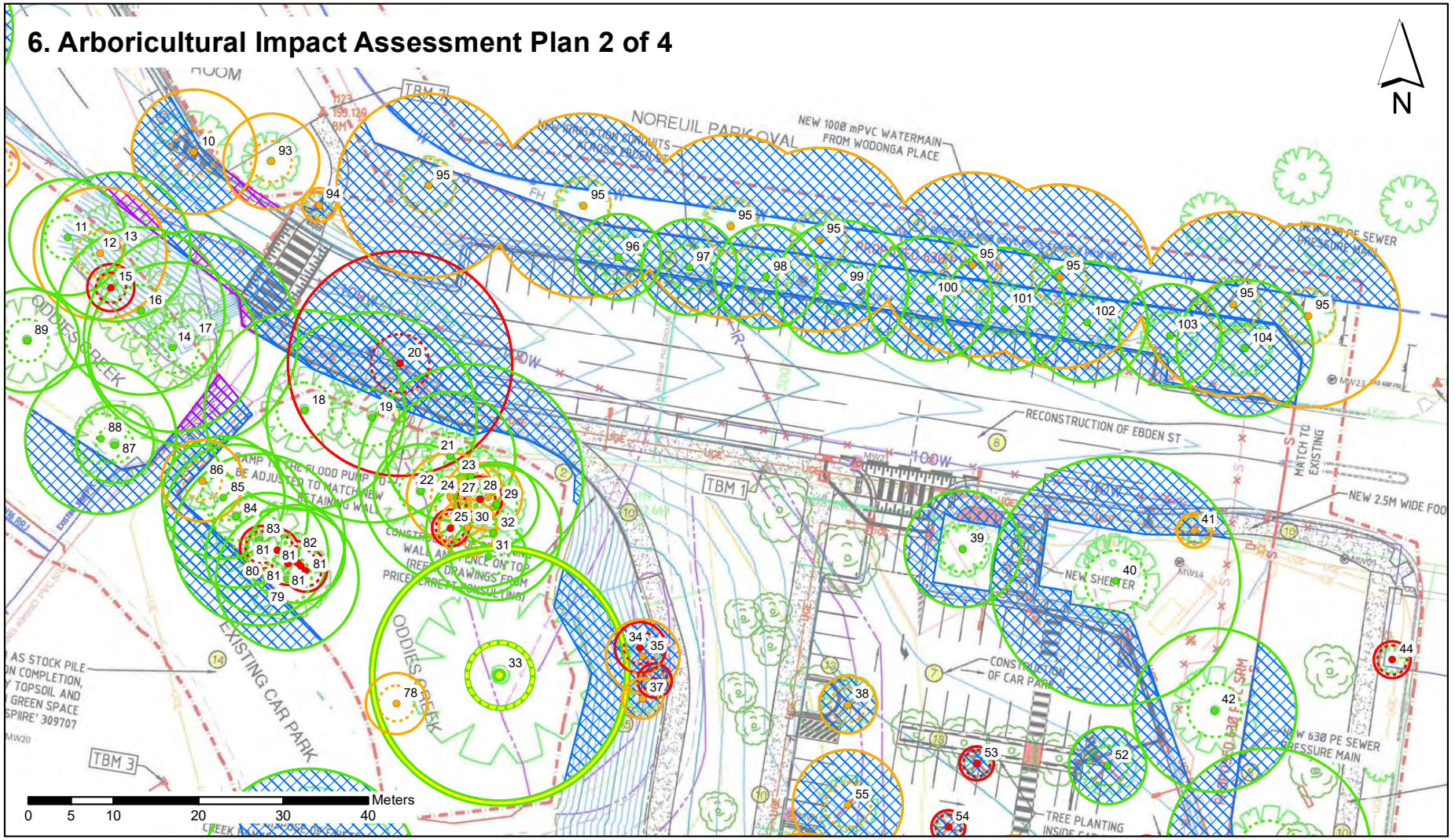
Legend

Trees/SRZ/TPZ (by retention value)
- Very High
- High
- Medium
- Low

TPZ encroachment
- Major
- Minor

Base information: City of Albury / Plotted: AS / Date: 25/11/2021 / Coordinate System: GDA 1994 MGA Zone 55

6. Arboricultural Impact Assessment Plan 2 of 4



HOMEWOOD

Assessment of trees at Australia Park, Albury

AlburyCity

Legend

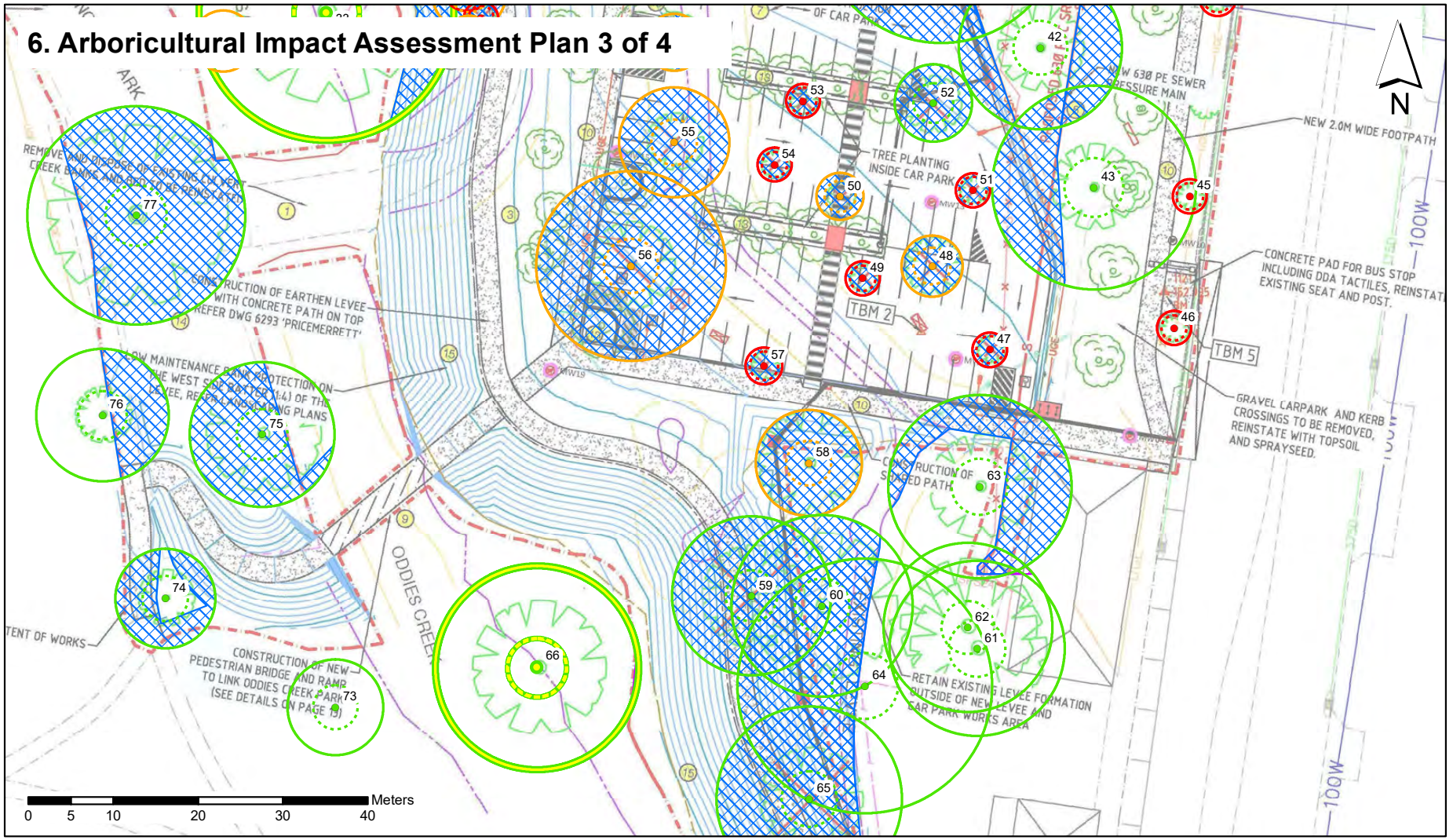
Trees/SRZ/TPZ (by retention value)

- Very High
- High
- Medium
- Low

TPZ encroachment

- Major
- Minor

Base information: City of Albury / Plotted: AS / Date: 25/11/2021 / Coordinate System: GDA 1994 MGA Zone 55



Assessment of trees at Australia Park, Albury

Legend

Trees/SRZ/TPZ (by retention value)

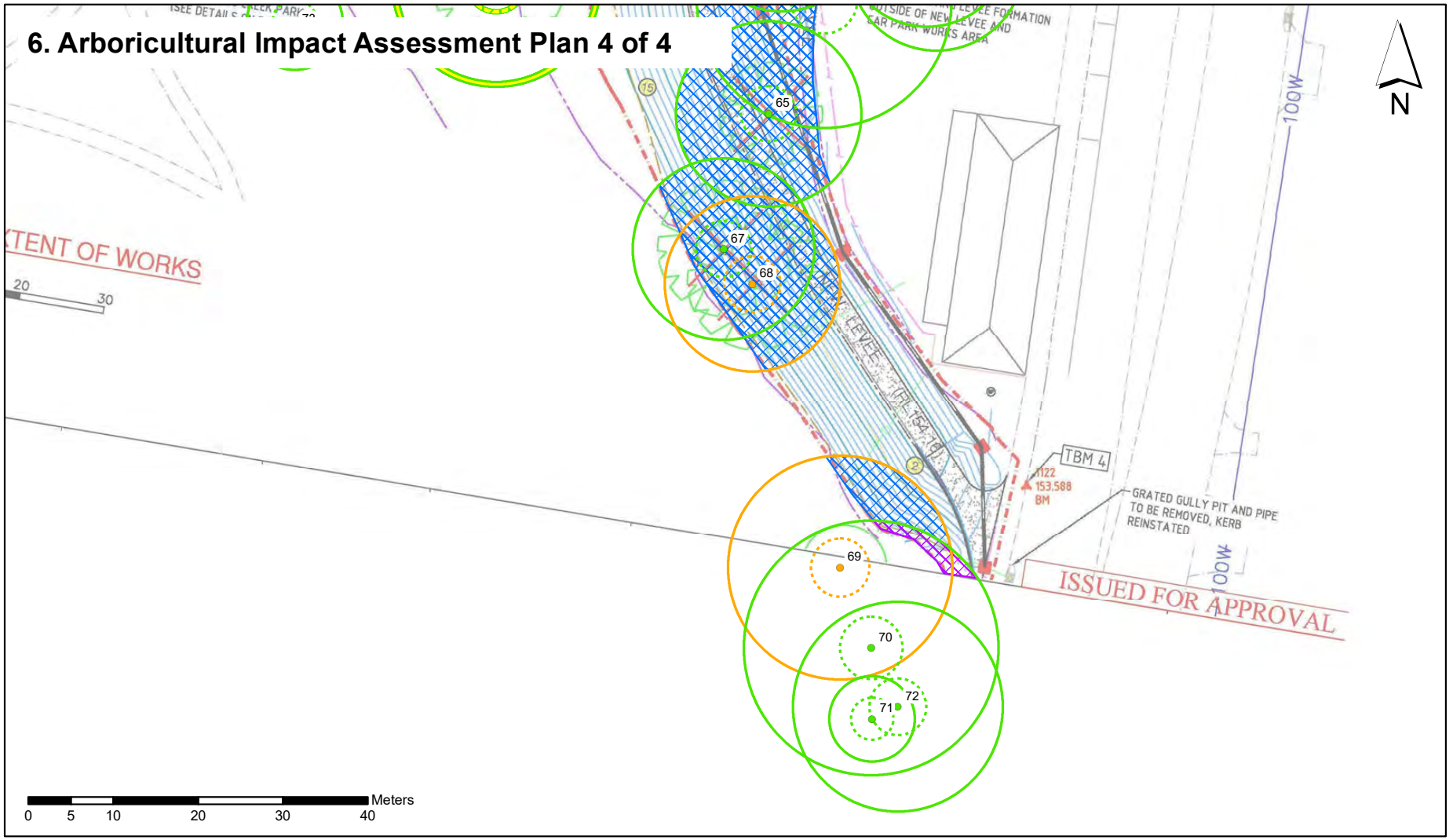
- Very High
- High
- Medium
- Low

TPZ encroachment

- Major
- Minor

Base information: City of Albury / Plotted: AS / Date: 25/11/2021 / Coordinate System: GDA 1994 MGA Zone 55

6. Arboricultural Impact Assessment Plan 4 of 4



Assessment of trees at Australia Park, Albury

Legend

Trees/SRZ/TPZ (by retention value)
- Very High
- High
- Medium
- Low

TPZ encroachment
- Major
- Minor

Base information: City of Albury / Plotted: AS / Date: 25/11/2021 / Coordinate System: GDA 1994 MGA Zone 55

7. Arboricultural Impact Assessment Summary

Table 3: Summary of impact from the proposed design

Arboricultural Impact	Tree Retention Value				Total No. of Trees
	Very High	High	Medium	Low	
Impact Removal	0	4	11	9	24
Impact Major - not viable	0	11	1	0	12
Impact Major - viable	1	25	11	0	37
Impact Minor	1	6	2	1	10
No Impact	0	9	21	24	54
Total	**2**	**55**	**46**	**34**	**137**

Of the 137 trees assessed:

- 25 trees **require removal** to facilitate the proposed design. The trunks of these trees are located within the construction footprint.
  - Four trees (Trees 52, 59, 65 and 67) have High retention value and all efforts should be made to retain and protect these trees throughout the proposed works.
    - ◊ A major redesign would be required to retain Trees 52, 59, 65 and 67.
  - 11 trees (Trees 10, 35, 37, 38, 41, 48, 50, 55, 56, 68 and 94) have Medium retention value. These trees should be retained and protected where easily achievable.
    - ◊ A major redesign would be required to retain these trees.
    - ◊ In addition, the trunk of Tree 12 is growing along the ground and as such is not able to be protected and retained as part of the re-grading of the slope.
  - Nine trees (Trees 20, 34, 36, 47, 49, 51, 53, 54 and 57) are of Low retention value and do not warrant a design modification to allow their retention.
- 49 trees **have a 'Major' TPZ encroachment** under the proposed design.
  - 12 trees (Trees 19, 39, 40, 69, 74 and 96-103) have TPZ encroachments between 15% and 76% and **are not expected to remain viable** under the proposed design.
    - ◊ A major redesign would be required to retain these trees.
      - Tree 19: The toe of the retaining wall impacts the SRZ of this tree.
      - Trees 39, 40, 96-103: Where excavation within the TPZs of these trees, including installation of utilities, is undertaken using non-destructive methods (e.g., manual excavation [by hand], hydro-excavation or boring) and substantial root loss can be avoided, the Project Arborist may deem these trees can remain viable in the landscape.
      - Trees 39 and 40: Additional measures to reduce TPZ impacts could include the use of permeable surfaces and existing footings, where possible.
      - Tree 69: Significant epicormic growth throughout the canopy of this tree is an indicator of stress and this tree is not likely to tolerate these works. This tree is considered suitable for retention in the landscape as habitat.

- Tree 74: The existing gravel path is proposed to be upgraded to concrete with significant fill also proposed within the TPZ. This tree could be retained if the path was upgraded like with like, with no excavation or compaction, and minimal use of fill (<100mm depth).

– 37 trees (Trees 6, 13, 17, 18, 21, 23, 33, 42, 43, 58, 60, 63, 64, 75-77, 79, 80, 83-88, 90-92, 95 (group of 8) and 104) have a TPZ encroachments of between 16% and 100% (due to underground services, re-grading or remediation works). These trees are **expected to remain viable** under the proposed design with a combination of Project Arborist supervision and sensitive construction methods as outlined below:

◊ Trees 6, 13, 17, 42, 43, 63 and 104 are impacted by Ebden Street upgrades, construction of a shared path or proposed new carpark. Excavation for these works should be undertaken with Project Arborist supervision. The embankment within the TPZs of Trees 6, 13 and 17 should remain intact.

◊ Given the proximity of Trees 17-18, 21 and 23 to the creek it is expected a significant portion of their roots are located on the southern side of the TPZs where conditions are more favourable. Provided excavation for construction of the retaining wall is undertaken with Project Arborist supervision these trees are expected to tolerate these works.

◊ Any works to demolish the bridge within the TPZs of Trees 17, 18, 86, 87 and 88 should be undertaken with care, with footings to remain in-situ to reduce root disturbance.

◊ The use of fill / topsoil to remediate the bank within the TPZ of Tree 33 should be minimised (<100mm depth) and there should be no excavation within the TPZ.

◊ The existing levee bank within the TPZs of Trees 58, 60, 63 and 64 should remain in-situ with the use of fill minimised (e.g., <100mm depth).

◊ It is proposed to convert the existing carpark adjacent to Trees 75, 76, 77, 79, 80, 83-88 into a green space. These trees are expected to benefit from these works provided excavation is minimal, no more than 100mm of fill, topsoil or mulch is used, and there is no ripping or cultivation of the surface within the TPZs. The application of mulch within TPZs could be used to aid in alleviating compaction. Where desired, compaction within TPZs could be further alleviated through radial trenching or vertical mulching under Project Arborist supervision.

◊ Tree 92 is a large dead tree and can be retained in the landscape provided works do not severe roots within the SRZ.

◊ In addition, within the TPZs of all retained trees:

- The installation of utilities within TPZs of retained trees should be installed via non-destructive methods (e.g., either manual excavation (by hand), hydro-excavation or boring).
  - Alternatively, Tree 95 (a group of eight) Medium retention value trees could be removed to allow the water main to be trenched.
- The removal of any existing infrastructure, including hard surfaces and outdoor furniture within TPZs should be undertaken with care and under Project Arborist supervision.

- 10 trees (Trees 8, 12, 14, 16, 61, 62, 66, 70, 82 and 93) have a **'Minor' TPZ encroachment** (less than 10% TPZ area and no SRZ incursion) from the proposed design. These trees are expected to remain viable with standard TPZ provisions and exclusions.

- 54 trees (Trees 1, 2, 3 (group of 12), 4, 5, 7 (group of 6), 9 (group of 6), 11, 15, 22, 24-32, 44-46, 71-73, 78, 81 (group of 6) and 89) **have no TPZ encroachment** from the proposed works and are expected to remain viable with standard TPZ provisions and exclusions.

All retained trees require protection to ensure they remain viable throughout demolition and construction.

8. Recommended Tree Protection Measures

See Executive Summary.

9. References

AS 4970 - 2009, *Australian Standard, Protection of Trees on Development Sites*, Standards Australia.

AS 4373 – 2007, *Australian Standard, Pruning of Amenity Trees*, Standards Australia.

Biddle, P.G., 1998, *Tree root damage to buildings, Causes, Diagnosis and Remedy,* Willowmead Publishing Ltd., Wantage,UK.

Mattheck, C. and Breloer, H. 1994, *The body language of trees: a handbook for failure analysis*, London: HMSO.

Appendix 1. Data Collection Definitions & Descriptors

Tree assessments are based on the assessor's experience and opinion of the tree.

1.1 Botanical name

The scientific name identifying the genus and species of the tree. Each species has only one scientific name.

1.2 Common Name

The colloquial name for a tree species, usually in plain English. Common names for a species are often local or regional and each species can have multiple common names.

1.3 Tree dimensions

Tree height and canopy width in metres (estimated unless stated otherwise).

1.4 DBH

Diameter of the trunk at breast height (1.4m above ground level) measured using a diameter tape. Used to calculate the Tree Protection Zone radius.

1.5 Basal diameter

Diameter of the trunk above the root buttress, measured using a diameter tape. Used to calculate the Structural Root Zone radius.

1.6 Health

Category	Description
Very Good	The tree is demonstrating excellent or exceptional growth. The tree exhibits a full canopy of foliage and is free of pest and disease problems.
Good	The tree is demonstrating good or exceptional growth. The tree exhibits a full canopy of foliage and has only minor pest or diseases problems.
Fair	The tree is in reasonable condition and growing well. The tree exhibits an adequate canopy of foliage. There may be some deadwood present in the crown. Some grazing by insects or possums may be evident.
Poor	The tree is not growing to its full capacity; extension growth of the laterals is minimal. The canopy may be thinning or sparse. Large amounts of deadwood may be evident throughout the crown. Significant pest and disease problems may be evident or there may be symptoms of stress indicating tree decline.
Very Poor	The tree appears to be in a state of decline. The tree is not growing to its full capacity. The canopy may be very thin and sparse. A significant volume of deadwood may be present in the canopy or pest and disease problems may be causing a severe decline in tree health.
Dead	The tree is dead.

1.7 Structure

Category	Description
Good	The tree has a well-defined and balanced crown. Branch unions appear to be sound, with no significant defects evident in the trunk or the branches. Major limbs are well defined. The tree is considered a good example of the species.
Fair	The tree has some minor problems in the structure of the crown. The crown may be slightly out of balance, and some branch unions may be exhibiting minor structural faults. If the tree has a single trunk, it may be on a slight lean or exhibiting minor defects.
Poor	The tree may have a poorly structured crown. The crown may be unbalanced or exhibit large gaps. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at the point of attachment. The tree may have suffered root damage.
Very Poor	The tree has a poorly structured crown. The crown is unbalanced or exhibits large gaps with possibly large sections of deadwood. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at the point of attachment. Branches may exhibit large cracks that are likely to fail in the future. The tree may have suffered major root damage.
Has Failed	A section of the tree has failed or is in imminent danger of failure and the tree is no longer a viable specimen.

1.8 Age Class

Category	Description
Mature	Tree has reached the expected size for the species at the site.
Semi-mature	Established tree that has not yet reach the expected size for the species at the site.
Young	Recently planted tree or juvenile self-sown tree (generally less than 5 years old).

1.9 Useful Life Expectancy (ULE)

Category	Description
40+ years	The tree is in excellent condition and under normal conditions and with appropriate management is expected to continue as a viable landscape component in excess of 40 years.
20 - 40 years	The tree is in good condition and under normal conditions and with appropriate management is expected to continue as a viable landscape component for 20-40 years.
10 - 20 years	The tree is in fair condition and under normal conditions and with appropriate management is expected to continue as a viable landscape component for 10-20 years.
5 - 10 years	The tree is in fair to poor condition or it is not a long lived species. Removal and replacement may be required within the next 10 years.
1 - 5 years	The tree is in poor condition due to advanced decline or structural defect. Removal and replacement may be required within the next 5 years.
0 years	The tree is dead or is considered hazardous in the location. Removal may be required.

1.10 Tree Origin

Category	Description
Exotic	The species originates in a country other than Australia.
Australian Native	The species originates within Australia.
Indigenous	The species originates within the local environs.

1.11 Contribution to the Landscape

Category	Description
High	Generally, a large tree which is a significant component of the local landscape and provides canopy cover to the site. May offer shade and other amenities such as screening. The tree may assist with erosion control, offer a windbreak or perform a vital function in the location (e.g.: Habitat, shade, flowers or fruit).
Medium	Generally, a medium sized tree or group of small-medium trees which provide a moderate contribution to the local landscape and canopy cover. The tree may offer screening in the landscape or serve a particular function in the location.
Low	The tree offers little in the way of screening, amenity or canopy cover.
Negligible	The tree offers extremely little to nothing in the way of screening, amenity or canopy cover.

1.12 Tree Retention Value

Term	Description
Very High	Tree of exceptional quality in good condition. A prominent landscape feature and/or of historic, cultural, ecological or other significance. Has the potential to be a long-term landscape component where managed appropriately. All efforts should be made to retain the tree and protect from arboricultural impact.
High	Tree of high quality in good to fair condition. Generally, a prominent landscape feature. Has the potential to be a medium to long-term landscape component where managed appropriately. All efforts should be made to retain the tree and protect from arboricultural impact.
Medium	Tree of moderate quality in fair condition. Generally, a modest landscape feature. May have a health or structural issue that can be resolved with arboricultural input or may refer to a medium to small tree in good condition. Has the potential to be a medium to long-term landscape component where managed appropriately. Where practical, design modifications should be considered in order to retain and protect from arboricultural impact.
Low	Either: Tree of low quality in poor condition. Generally, provides little amenity value. Unlikely to be a long or medium term landscape component. The tree may be considered a weed species, structurally unsound, dead/dying/diseased, nearing the end of its ULE or may not be suitable for the site. Or: small tree of good or fair condition which is easily replaced in the landscape through planting of advanced stock.
Third party ownership	The tree is located outside of the subject site and is owned by a third party. It may be owned by a private entity (residential) or public body (council). Third party owned trees must be retained and protected from arboricultural impact, unless a mutually acceptable outcome is negotiated with the tree owner and relevant authorities.

Appendix 2. Tree Protection Zones & Structural Root Zones

All parts of the tree may be damaged by development and damage to any one part of the tree may affect its functioning as a whole.

Root damage is the most common cause of damage to trees on development sites. Roots may be directly damaged when removed, wounded, crushed or torn during grading, excavation or trenching. Soil compaction from foot traffic and vehicle traffic indirectly damages tree roots, resulting in loss of pore space within the soil which is essential for the exchange of gases between the soil and atmosphere and for soil drainage.

Trunks of trees may be wounded mechanically during demolition and construction work. This not only predisposes a tree to potential decay, but it also interferes with the transport of water, nutrients and sugars throughout the tree. Serious impacts may structurally weaken the tree.

The canopy of trees can be damaged through incorrect pruning techniques or mechanical injury by trucks, cranes, excavators etc. The removal of leaves reduces the level of photosynthesis and reduces the tree's capacity to function normally and to withstand stresses. Incorrect pruning and mechanical damage can produce wounds that are susceptible to infection by wood decay organisms.

For trees to be retained and their requirements met, procedures must be in place to protect trees at every stage of the development process. This needs to be taken into account at the earliest planning stage of any outdoor event or design of a development project where trees are involved.

2.1 Tree Protection Zones

The most common method of protecting trees during construction is by establishing a Tree Protection Zone (TPZ). The TPZ is an area isolated from construction disturbance area, so that the tree remains viable. The TPZ radius has been calculated according to the Australian Standard (AS 4970-2009) for the subject trees. This method calculates the TPZ as 12 times the trunk diameter at 1.4m above ground level (DBH).

A TPZ should not be less than 2m nor greater than 15m, except where additional crown protection is required. The TPZ of palms, other monocots, cycads and tree ferns should not be less than 1m outside of the crown projection.

2.2 Structural Root Zones

The Structural Root Zone (SRZ) is the minimum volume of roots required by the tree to remain stable in the ground. If the SRZ is breached the chances of windthrow are significantly increased. Windthrow is an event where the entire tree fails/falls over.

It is important to note that the SRZ is not related to tree health. It refers to the physical volume of roots required for the tree to remain stable in the ground (Figure 4). It is in no way related to the physiological requirements of the tree but is the minimum volume of roots required for the tree to remain standing (Mattheck and Breloer 1994).

According to AS 4970-2009 the SRZ radius of the trees has been calculated using the equation:

$$R_{srz} = (D \times 50)^{0.42} \times 0.64$$

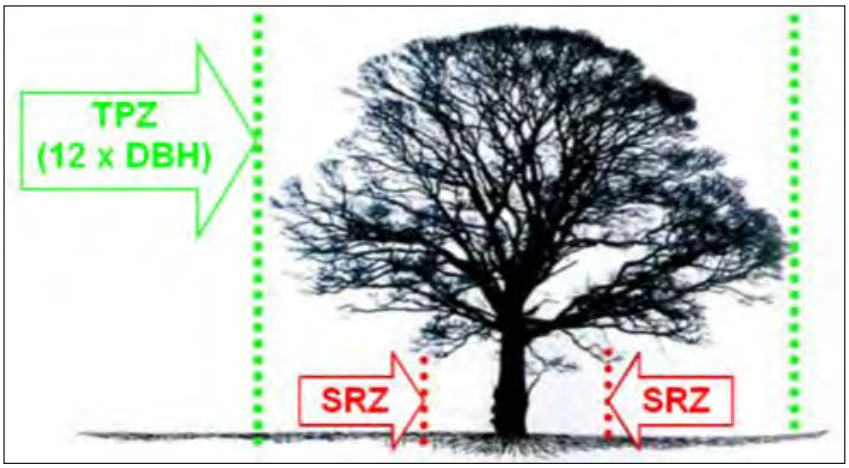


Figure 4: The SRZ = minimum volume of roots required to maintain tree stability (Biddle 1998).

2.3 TPZ and SRZ encroachment

It may be possible to encroach into or make variations to the standard TPZ. Encroachment includes (but is not limited to) excavation, compacted fill and machine trenching.

Table 4: Levels of TPZ encroachment as defined by AS 4970-2009

Level of Encroachment	Description / Definition	Requirements
Minor	Encroachment of less than 10% of the TPZ and outside the SRZ is deemed to be minor encroachment.	Detailed root investigations should not be required but the encroachment must be compensated with an extension to the TPZ elsewhere (Figure 5). Variations must be made by the Project Arborist considering other relevant factors including tree health, vigour, stability, species sensitivity and soil characteristics.
Major	Encroachment of more than 10% of the TPZ or into the Structural Root Zone (SRZ) is deemed to be major encroachment.	The Project Arborist must demonstrate that the trees would remain viable. This may require root investigation by non-destructive methods and/or consideration of relevant factors of tree health, vigour, stability, species sensitivity and soil characteristics. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ.

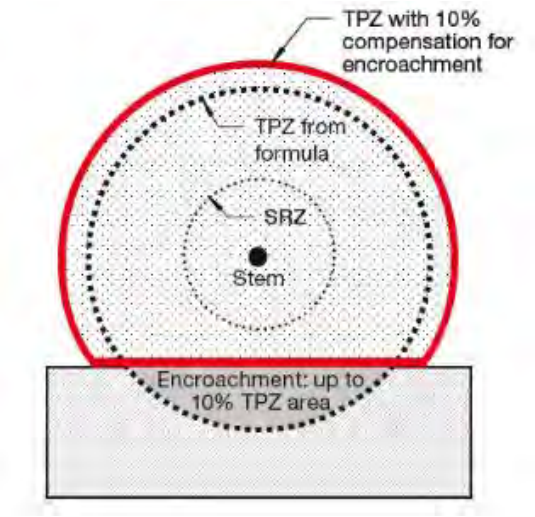


Figure 5: Example of minor TPZ encroachment and compensatory offset (image from AS 4970-2009).

Appendix 3. Tree Protection Measures

3.1 Tree Protection Fencing

The Tree Protection Zone is delineated on site by a physical barrier of protective fencing that is a minimum of 1.8m high. It is installed around retained trees prior to site establishment and retained intact until completion of the works (Figure 6). Once erected, protective fencing must not be removed or altered without approval by the Project Arborist. The TPZ fence should be secured to restrict access.

Where TPZ fencing is impractical - e.g. if site access is required through the TPZ, other tree protection measures should be used, including ground protection and/or trunk and branch protection (see 3.8 and 3.9).



Figure 6: TPZ fencing is erected around retained trees prior to site works.

3.2 Signs

Signs identifying the TPZ should be placed around the edge of the TPZ and be clearly visible from within the development site (Figure 7).



Figure 7: Example of a TPZ warning sign clearly displayed on TPZ fencing.

3.3 Activities restricted within the TPZ

Activities restricted within the TPZ include but are not limited to:

- machine excavation including trenching
- excavation for silt fencing
- cultivation and landscaping
- storage of materials
- preparation of chemicals, including preparation of cement products
- parking of vehicles and plant
- refuelling
- dumping of waste
- wash down and cleaning of equipment
- placement of fill
- lighting of fires
- soil level changes
- temporary or permanent installation of utilities and signs
- physical damage to the tree.

3.4 TPZ Maintenance

The fenced TPZ area should be mulched to retain soil moisture throughout the period of works. The mulch must be maintained to a depth of 50-100mm. Where the existing landscape within the TPZ is to remain unaltered (e.g. garden beds or turf) mulch may not be required.

Soil moisture levels should be regularly monitored by the Project Arborist. Temporary irrigation or watering may be required within the TPZ. An above-ground irrigation system should be installed and maintained by a competent individual.

All weeds should be removed by hand without soil disturbance or should be controlled with appropriate use of herbicide.

3.5 Working within the TPZ

Some works and activities within the TPZ may be permitted by the determining authority. These must be directly supervised on site by the Project Arborist. Any additional encroachment that becomes necessary as the site works progress must be reviewed by the Project Arborist and be acceptable to the determining authority before being carried out.

3.6 Landscaping

Soft and hard landscaping within Tree Protection Zones should be assessed by the Project Arborist at the design stage, and prior to the commencement of works. In general:

- There should be no grade changes within the TPZ of trees to be retained. If a level surface is required, no more than 100mm of fill (e.g. topsoil or crushed rock) should be used.
- There should be no soil preparation for landscaping (cultivation, replacement of existing substrate or compaction) within the TPZ of trees to be retained.

- Excavation for planting holes, fence posts, garden edging, etc. should be undertaken manually within the TPZ of trees to be retained. If significant roots (greater than 30mm diameter) are encountered these are to be retained unscathed and the location of the landscape component shifted. Any small roots are to be cleanly pruned by the Project Arborist, at right angles, using sharp, clean tools.

3.7 Underground services

Underground services within Tree Protection Zones should be assessed by the Project Arborist at the design stage, and prior to the commencement of works.

- All underground services (including water, sewage, electricity, gas and communications) should be located outside of the TPZ of trees to be retained.
- If underground services are to be routed within an established TPZ, they should be installed by directional boring with the top of the bore to be a minimum depth of 800mm below the existing grade.
- Bore pits should be located outside of the TPZ or manually excavated under the direct supervision of the Project Arborist.

3.8 Ground Protection

If temporary access for machinery is required within the TPZ, ground protection measures will be required. The purpose of ground protection is to prevent root damage and soil compaction within the TPZ. Examples of ground protection include track mats (Figure 8) and rumble boards strapped over mulch or crushed rock (Figure 9). Depending on weather conditions, geotextile fabric may be required to prevent mulch and crushed rock mixing into the site soils.



Figure 8: Track mats.



Figure 9: Rumble boards over crushed rock.

3.9 Trunk and Branch Protection

Where trees cannot be isolated from vehicles or machinery by TPZ fencing, trunk and branch protection may be required to prevent mechanical damage. Protection may consist of

padding surrounding the trunk or branch, held in place with batons strapped together, or similar (Figure 10). Boards are to be strapped to trees, not nailed or screwed.

Crown protection may also include pruning, tying-back of branches or other measures. If pruning is required, it must be undertaken by a qualified arborist and as per the specifications of AS 4373-2007 *Pruning of Amenity Trees* and should be undertaken before the establishment of the TPZ.

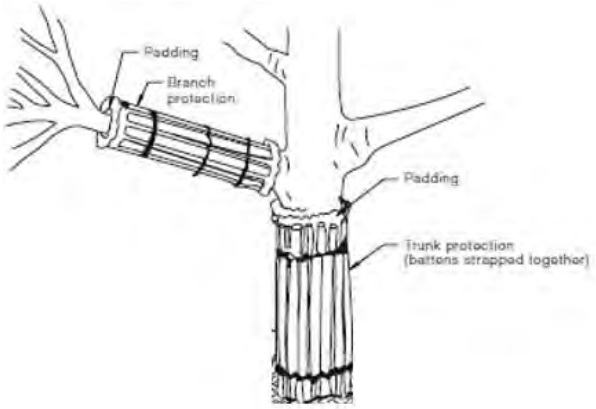


Figure 10: Example of trunk and branch protection (Source: AS 4970-2009).

Appendix 4. Individual Tree Assessments

ID	*Botanical Name*	Origin	Height & Width (m)	DBH (cm)	Age Class	Health	Structure	ULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	TPZ Encroachment (%)	TPZ Impact	No. of trees
1	*Eucalyptus camaldulensis*	Indigenous	11 x 7	51	Mature	Good	Fair	20 to 40 years	Medium	6.12	3.03	0	No impact	1
2	*Eucalyptus camaldulensis*	Indigenous	17 x 8	78	Mature	Poor	Poor	5 to 10 years	Medium	9.36	3.12	0	No impact	1
3	*Ulmus procera*	Exotic	12 x 4	18	Semi mature	Good	Good	20 to 40 years	Low	2.16	1.75	0	No impact	12
4	*Ulmus procera*	Exotic	17 x 7	34	Mature	Fair	Fair	10 to 20 years	Medium	4.08	2.25	0	No impact	1
5	*Ulmus procera*	Exotic	13 x 6	28	Mature	Good	Good	20 to 40 years	Medium	3.36	1.94	0	No impact	1
6	*Ulmus procera*	Exotic	18 x 11	83	Mature	Fair	Fair	10 to 20 years	High	9.96	3.11	17	Impact Major - viable	1
7	*Ulmus procera*	Exotic	11 x 3	21	Semi mature	Good	Good	20 to 40 years	Medium	2.52	1.72	0	No impact	6
8	*Ulmus procera*	Exotic	16 x 11	69	Mature	Fair	Poor	5 to 10 years	Low	8.28	2.83	7	Impact Minor	1
9	*Ulmus procera*	Exotic	13 x 5	22	Semi mature	Fair	Good	20 to 40 years	Medium	2.64	1.75	0	No impact	6
10	*Fraxinus ornus*	Exotic	13 x 10	61	Mature	Fair	Fair	10 to 20 years	Medium	7.32	2.74	100	Impact Removal	1
11	*Eucalyptus camaldulensis*	Indigenous	18 x 7	57	Mature	Fair	Fair	20 to 40 years	High	6.84	2.61	0	No impact	1
12	*Eucalyptus camaldulensis*	Indigenous	11 x 14	65	Mature	Good	Fair	20 to 40 years	Medium	7.8	2.76	7	Impact Minor	1

ID	*Botanical Name*	Origin	Height & Width (m)	DBH (cm)	Age Class	Health	Structure	ULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	TPZ Encroachment (%)	TPZ Impact	No. of trees
13	*Eucalyptus camaldulensis*	Indigenous	16 x 12	73	Mature	Fair	Fair	20 to 40 years	High	8.76	2.92	21	Impact Major - viable	1
14	*Eucalyptus camaldulensis*	Indigenous	19 x 17	83	Mature	Fair	Fair	10 to 20 years	High	9.96	3.06	9	Impact Minor	1
15	*Eucalyptus camaldulensis*	Indigenous	10 x 3	23	Semi mature	Fair	Fair	10 to 20 years	Low	2.76	1.79	0	No impact	1
16	*Eucalyptus camaldulensis*	Indigenous	21 x 13	82	Mature	Fair	Good	10 to 20 years	High	9.84	3.04	4	Impact Minor	1
17	*Eucalyptus camaldulensis*	Indigenous	20 x 16	105	Mature	Fair	Fair	10 to 20 years	High	12.6	3.38	27	Impact Major – viable	1
18	*Eucalyptus camaldulensis*	Indigenous	20 x 18	98	Mature	Fair	Fair	10 to 20 years	High	11.76	3.28	30	Impact Major – viable	1
19	*Eucalyptus camaldulensis*	Indigenous	21 x 15	103	Mature	Fair	Fair	10 to 20 years	High	12.36	3.35	37	Impact Major - not viable	1
20	*Populus nigra* 'Italica'	Exotic	18 x 5	110	Mature	Poor	Poor	Less than 5 years	Low	13.2	3.44	100	Impact Removal	1
21	*Eucalyptus camaldulensis*	Indigenous	15 x 12	63	Mature	Fair	Fair	10 to 20 years	High	7.56	2.73	20	Impact Major - viable	1
22	*Eucalyptus camaldulensis*	Indigenous	16 x 7	46	Mature	Fair	Good	20 to 40 years	High	5.52	2.55	0	No impact	1
23	*Eucalyptus camaldulensis*	Indigenous	20 x 14	110	Mature	Fair	Poor	10 to 20 years	High	13.2	3.44	26	Impact Major – viable	1
24	*Eucalyptus camaldulensis*	Indigenous	12 x 12	43	Mature	Fair	Fair	20 to 40 years	Medium	5.16	2.37	0	No impact	1

ID	*Botanical Name*	Origin	Height & Width (m)	DBH (cm)	Age Class	Health	Structure	ULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	TPZ Encroachment (%)	TPZ Impact	No. of trees
25	*Eucalyptus camaldulensis*	Indigenous	10 x 4	18	Semi mature	Fair	Poor	10 to 20 years	Low	2.16	1.72	0	No impact	1
26	*Eucalyptus camaldulensis*	Indigenous	11 x 7	27	Semi mature	Fair	Fair	20 to 40 years	Medium	3.24	2.02	0	No impact	1
27	*Eucalyptus camaldulensis*	Indigenous	9 x 2	22	Semi mature	Poor	Poor	5 to 10 years	Low	2.64	1.82	0	No impact	1
28	*Eucalyptus camaldulensis*	Indigenous	15 x 5	33	Mature	Fair	Good	20 to 40 years	Medium	3.96	2.15	0	No impact	1
29	*Eucalyptus camaldulensis*	Indigenous	12 x 9	41	Mature	Fair	Fair	20 to 40 years	High	4.92	2.37	0	No impact	1
30	*Eucalyptus camaldulensis*	Indigenous	9 x 7	28	Semi mature	Fair	Fair	20 to 40 years	Medium	3.36	2.05	0	No impact	1
31	*Eucalyptus camaldulensis*	Indigenous	14 x 10	37	Mature	Fair	Fair	20 to 40 years	High	4.44	2.34	0	No impact	1
32	*Eucalyptus camaldulensis*	Indigenous	12 x 12	66	Mature	Fair	Fair	20 to 40 years	High	7.92	2.78	0	No impact	1
33	*Eucalyptus camaldulensis*	Indigenous	22 x 18	131	Mature	Fair	Good	20 to 40 years	Very High	15	3.86	16	Impact Major - viable	1
34	*Eucalyptus camaldulensis*	Indigenous	8 x 5	25	Semi mature	Good	Good	20 to 40 years	Low	3	1.94	100	Impact Removal	1
35	*Eucalyptus camaldulensis*	Indigenous	10 x 6	36	Semi mature	Good	Poor	10 to 20 years	Medium	4.32	2.15	100	Impact Removal	1
36	*Eucalyptus camaldulensis*	Indigenous	6 x 3	13	Semi mature	Good	Poor	20 to 40 years	Low	2	1.5	100	Impact Removal	1
37	*Eucalyptus camaldulensis*	Indigenous	7 x 4	20	Semi mature	Good	Good	20 to 40 years	Medium	2.4	1.88	100	Impact Removal	1
38	*Ulmus parvifolia*	Exotic	8 x 9	28	Mature	Fair	Good	20 to 40 years	Medium	3.36	2.08	100	Impact Removal	1

ID	*Botanical Name*	Origin	Height & Width (m)	DBH (cm)	Age Class	Health	Structure	ULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	TPZ Encroachment (%)	TPZ Impact	No. of trees
39	*Celtis australis*	Exotic	9 x 12	57	Mature	Fair	Fair	10 to 20 years	High	6.84	2.74	64	Impact Major - not viable	1
40	*Ulmus procera*	Exotic	18 x 18	122	Mature	Fair	Fair	10 to 20 years	High	14.64	3.6	57	Impact Major - not viable	1
41	*Ulmus parvifolia*	Exotic	6 x 6	17	Semi mature	Fair	Good	20 to 40 years	Medium	2.04	1.68	100	Impact Removal	1
42	*Corymbia citriodora*	Native	20 x 17	80	Mature	Fair	Good	20 to 40 years	High	9.6	3.18	40	Impact Major - viable	1
43	*Ulmus procera*	Exotic	17 x 18	100	Mature	Good	Fair	10 to 20 years	High	12	3.47	30	Impact Major - viable	1
44	*Brachychiton acerifolius*	Native	4 x 3	18	Semi mature	Fair	Good	20 to 40 years	Low	2.16	1.75	0	No impact	1
45	*Brachychiton acerifolius*	Native	4 x 2	14	Semi mature	Fair	Good	10 to 20 years	Low	2	1.57	0	No impact	1
46	*Brachychiton acerifolius*	Native	3 x 2	7	Semi mature	Fair	Good	10 to 20 years	Low	2	1.5	0	No impact	1
47	*Ulmus procera*	Exotic	5 x 4	17	Semi mature	Good	Good	20 to 40 years	Low	2.04	1.61	100	Impact Removal	1
48	*Ulmus glabra*	Exotic	7 x 9	30	Mature	Good	Good	20 to 40 years	Medium	3.6	2.18	100	Impact Removal	1
49	*Ulmus glabra* 'Lutescens'	Exotic	3 x 2	9	Semi mature	Fair	Fair	10 to 20 years	Low	2	1.5	100	Impact Removal	1
50	*Ulmus procera*	Exotic	9 x 4	23	Semi mature	Fair	Fair	10 to 20 years	Medium	2.76	1.85	100	Impact Removal	1

ID	*Botanical Name*	Origin	Height & Width (m)	DBH (cm)	Age Class	Health	Structure	ULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	TPZ Encroachment (%)	TPZ Impact	No. of trees
51	*Ulmus parvifolia*	Exotic	5 x 6	15	Semi mature	Good	Good	20 to 40 years	Low	2	1.61	100	Impact Removal	1
52	*Ulmus minor* 'Variegata'	Exotic	11 x 5	38	Mature	Fair	Good	20 to 40 years	High	4.56	2.34	100	Impact Removal	1
53	*Ulmus parvifolia*	Exotic	5 x 5	13	Semi mature	Good	Good	20 to 40 years	Low	2	1.57	100	Impact Removal	1
54	*Ulmus procera*	Exotic	3 x 2	6	Semi mature	Good	Poor	10 to 20 years	Low	2	1.5	100	Impact Removal	1
55	*Ulmus glabra* 'Lutescens'	Exotic	9 x 8	54	Mature	Fair	Fair	10 to 20 years	Medium	6.48	2.69	100	Impact Removal	1
56	*Populus* x *canadensis*	Exotic	17 x 10	93	Mature	Fair	Fair	10 to 20 years	Medium	11.16	3.21	100	Impact Removal	1
57	*Ulmus procera*	Exotic	7 x 4	18	Semi mature	Good	Good	20 to 40 years	Low	2.16	1.68	100	Impact Removal	1
58	*Liquidambar styraciflua*	Exotic	12 x 9	52	Mature	Fair	Fair	20 to 40 years	Medium	6.24	2.65	100	Impact Major - viable	1
59	*Ulmus procera*	Exotic	12 x 10	78	Mature	Good	Fair	10 to 20 years	High	9.36	3.03	100	Impact Removal	1
60	*Ulmus procera*	Exotic	17 x 11	89	Mature	Good	Fair	10 to 20 years	High	10.68	3.22	100	Impact Major - viable	1
61	*Ulmus procera*	Exotic	19 x 13	86	Mature	Good	Fair	10 to 20 years	High	10.32	3.35	2	Impact Minor	1
62	*Ulmus procera*	Exotic	19 x 14	83	Mature	Good	Fair	10 to 20 years	High	9.96	3.12	4	Impact Minor	1
63	*Corymbia citriodora*	Native	18 x 16	90	Mature	Fair	Good	20 to 40 years	High	10.8	3.31	52	Impact Major - viable	1

ID	*Botanical Name*	Origin	Height & Width (m)	DBH (cm)	Age Class	Health	Structure	ULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	TPZ Encroachment (%)	TPZ Impact	No. of trees
64	*Ulmus procera*	Exotic	18 x 17	147	Mature	Good	Fair	10 to 20 years	High	15	3.89	48	Impact Major - viable	1
65	*Ulmus procera*	Exotic	14 x 11	91	Mature	Fair	Fair	10 to 20 years	High	10.92	3.27	100	Impact Removal	1
66	*Eucalyptus camaldulensis*	Indigenous	16 x 13	100	Mature	Fair	Good	20 to 40 years	Very High	12	3.46	1	Impact Minor	1
67	*Eucalyptus saligna*	Native	21 x 12	89	Mature	Good	Fair	10 to 20 years	High	10.68	3.31	100	Impact Removal	1
68	*Eucalyptus saligna*	Native	21 x 13	86	Mature	Fair	Fair	5 to 10 years	Medium	10.32	3.31	100	Impact Removal	1
69	*Eucalyptus camaldulensis*	Indigenous	14 x 12	110	Mature	Fair	Poor	5 to 10 years	Medium	13.2	3.44	15	Impact Major - not viable	1
70	*Eucalyptus camaldulensis*	Indigenous	14 x 14	130	Mature	Fair	Fair	10 to 20 years	High	15	3.69	3	Impact Minor	1
71	*Eucalyptus camaldulensis*	Indigenous	14 x 7	42	Mature	Fair	Fair	10 to 20 years	High	5.04	2.49	0	No impact	1
72	*Eucalyptus camaldulensis*	Indigenous	15 x 12	103	Mature	Fair	Fair	10 to 20 years	High	12.36	3.35	0	No impact	1
73	*Quercus palustris*	Exotic	13 x 8	47	Mature	Good	Good	20 to 40 years	High	5.64	2.61	0	No impact	1
74	*Fraxinus americana*	Exotic	9 x 12	49	Mature	Good	Good	20 to 40 years	High	5.88	2.67	76	Impact Major - not viable	1
75	*Platanus* x *acerifolia*	Exotic	15 x 16	71	Mature	Fair	Good	20 to 40 years	High	8.52	3	100	Impact Major - viable	1

ID	*Botanical Name*	Origin	Height & Width (m)	DBH (cm)	Age Class	Health	Structure	ULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	TPZ Encroachment (%)	TPZ Impact	No. of trees
76	*Fraxinus* 'Raywood'	Exotic	13 x 15	65	Mature	Good	Good	20 to 40 years	High	7.8	2.87	42	Impact Major - viable	1
77	*Eucalyptus camaldulensis*	Indigenous	18 x 19	107	Mature	Fair	Fair	10 to 20 years	High	12.84	3.6	100	Impact Major - viable	1
78	*Eucalyptus camaldulensis*	Indigenous	8 x 8	30	Mature	Fair	Fair	10 to 20 years	Medium	3.6	2.1	0	No impact	1
79	*Eucalyptus camaldulensis*	Indigenous	14 x 12	70	Mature	Fair	Fair	10 to 20 years	High	8.4	2.85	35	Impact Major - viable	1
80	*Eucalyptus camaldulensis*	Indigenous	17 x 14	60	Mature	Fair	Good	20 to 40 years	High	7.2	2.67	30	Impact Major - viable	1
81	*Eucalyptus camaldulensis*	Indigenous	7 x 4	21	Semi mature	Good	Fair	20 to 40 years	Low	2.52	1.91	0	No impact	6
82	*Eucalyptus camaldulensis*	Indigenous	16 x 10	48	Mature	Fair	Fair	20 to 40 years	High	5.76	2.43	4	Impact Minor	1
83	*Eucalyptus camaldulensis*	Indigenous	19 x 12	84	Mature	Fair	Fair	10 to 20 years	High	10.08	3.08	32	Impact Major - viable	1
84	*Eucalyptus camaldulensis*	Indigenous	18 x 10	70	Mature	Poor	Fair	5 to 10 years	High	8.4	2.85	32	Impact Major - viable	1
85	*Eucalyptus camaldulensis*	Indigenous	14 x 14	60	Mature	Fair	Fair	20 to 40 years	High	7.2	2.67	33	Impact Major - viable	1
86	*Eucalyptus camaldulensis*	Indigenous	9 x 8	40	Semi mature	Good	Fair	10 to 20 years	Medium	4.8	2.25	43	Impact Major - viable	1

ID	*Botanical Name*	Origin	Height & Width (m)	DBH (cm)	Age Class	Health	Structure	ULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	TPZ Encroachment (%)	TPZ Impact	No. of trees
87	*Eucalyptus camaldulensis*	Indigenous	16 x 7	38	Mature	Fair	Fair	20 to 40 years	High	4.56	2.2	26	Impact Major - viable	1
88	*Eucalyptus camaldulensis*	Indigenous	12 x 11	74	Mature	Fair	Fair	20 to 40 years	High	8.88	2.92	44	Impact Major - viable	1
89	*Eucalyptus camaldulensis*	Indigenous	11 x 9	51	Mature	Fair	Fair	20 to 40 years	High	6.12	2.49	0	No impact	1
90	*Eucalyptus camaldulensis*	Indigenous	19 x 15	116	Mature	Good	Good	20 to 40 years	High	13.92	3.72	44	Impact Major - viable	1
91	*Eucalyptus camaldulensis*	Indigenous	19 x 12	73	Mature	Fair	Good	20 to 40 years	High	8.76	3.06	29	Impact Major - viable	1
92	*Eucalyptus camaldulensis*	Indigenous	10 x 2	163	Mature	Dead	Fair	5 to 10 years	Medium	15	4.3	28	Impact Major - viable	1
93	*Alectryon excelsus*	Exotic	7 x 5	47	Mature	Good	Poor	5 to 10 years	Medium	5.64	2.41	9	Impact Minor	1
94	*Platanus* x *acerifolia*	Exotic	7 x 4	14	Semi mature	Fair	Fair	20 to 40 years	Medium	2	1.57	100	Impact Removal	1
95	*Alectryon excelsus*	Exotic	8 x 7	90	Mature	Fair	Fair	5 to 10 years	Medium	10.8	3.17	100	Impact Major - viable	8
96	*Platanus* x *acerifolia*	Exotic	12 x 10	42	Mature	Fair	Good	10 to 20 years	High	5.04	2.47	46	Impact Major - viable	1
97	*Platanus* x *acerifolia*	Exotic	11 x 10	47	Mature	Fair	Good	10 to 20 years	High	5.64	2.59	50	Impact Major - not viable	1

ID	*Botanical Name*	Origin	Height & Width (m)	DBH (cm)	Age Class	Health	Structure	ULE	Retention Value	TPZ Radius (m)	SRZ Radius (m)	TPZ Encroachment (%)	TPZ Impact	No. of trees
98	*Platanus* x *acerifolia*	Exotic	11 x 10	51	Mature	Fair	Good	10 to 20 years	High	6.12	2.61	52	Impact Major - not viable	1
99	*Platanus* x *acerifolia*	Exotic	12 x 10	65	Mature	Fair	Fair	10 to 20 years	High	7.8	2.92	60	Impact Major - not viable	1
100	*Platanus* x *acerifolia*	Exotic	13 x 11	61	Mature	Fair	Good	10 to 20 years	High	7.32	2.87	57	Impact Major - not viable	1
101	*Platanus* x *acerifolia*	Exotic	13 x 10	60	Mature	Fair	Good	10 to 20 years	High	7.2	2.85	55	Impact Major - not viable	1
102	*Platanus* x *acerifolia*	Exotic	12 x 11	59	Mature	Fair	Good	10 to 20 years	High	7.08	2.8	53	Impact Major - not viable	1
103	*Platanus* x *acerifolia*	Exotic	13 x 10	50	Mature	Fair	Good	10 to 20 years	High	6	2.63	32	Impact Major - not viable	1
104	*Platanus* x *acerifolia*	Exotic	13 x 12	67	Mature	Fair	Good	10 to 20 years	High	8.04	2.9	41	Impact Major - viable	1
													Total	**137**

Appendix 5. Individual Tree Data

Tree Number: 1 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	11 x 7		
DBH (cm)	51		
TPZ Radius (m):	6.12	**TPZ Impact:**	0%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:			



Tree Number: 2 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	17 x 8		
DBH (cm)	78		
TPZ Radius (m):	9.36	**TPZ Impact:**	0%
Health:	Poor	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	No impact
ULE:	5 to 10 years		
Landscape Contribution:	High		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 3 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	12 x 4		
DBH (cm)	18		
TPZ Radius (m):	2.16	**TPZ Impact:**	0%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:	Group of approximately 12		



Tree Number: 4 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	17 x 7		
DBH (cm)	34		
TPZ Radius (m):	4.08	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:			



Tree Number: 5 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	13 x 6		
DBH (cm)	28		
TPZ Radius (m):	3.36	**TPZ Impact:**	0%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:	DBH estimated		



Tree Number: 6 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	18 x 11		
DBH (cm)	83		
TPZ Radius (m):	9.96	**TPZ Impact:**	17%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 7 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	11 x 3		
DBH (cm)	21		
TPZ Radius (m):	2.52	**TPZ Impact:**	0%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:	Group of approximately 6		



Tree Number: 8 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	16 x 11		
DBH (cm)	69		
TPZ Radius (m):	8.28	**TPZ Impact:**	7%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	Minor
ULE:	5 to 10 years		
Landscape Contribution:	High		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 9 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	13 x 5		
DBH (cm)	22		
TPZ Radius (m):	2.64	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:	Group of approximately 6		



Tree Number: 10 **Botanical Name:** *Fraxinus ornus*

Common Name:	Manna Ash		
Origin:	Exotic		
Height & Width (m):	13 x 10		
DBH (cm)	61		
TPZ Radius (m):	7.32	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:			



Tree Number: 11 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	18 x 7		
DBH (cm)	57		
TPZ Radius (m):	6.84	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 12 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	11 x 14		
DBH (cm)	65		
TPZ Radius (m):	7.8	**TPZ Impact:**	7%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Minor
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:	Trunk leaning over, requires modified TPZ		



Tree Number: 13 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	16 x 12		
DBH (cm)	73		
TPZ Radius (m):	8.76	**TPZ Impact:**	21%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 14 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	19 x 17		
DBH (cm)	83		
TPZ Radius (m):	9.96	**TPZ Impact:**	9%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Minor
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	3 stemmed tree, 2 over creek		



Tree Number: 15 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	10 x 3		
DBH (cm)	23		
TPZ Radius (m):	2.76	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	10 to 20 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:	DBH estimated		



Tree Number: 16 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	21 x 13		
DBH (cm)	82		
TPZ Radius (m):	9.84	**TPZ Impact:**	4%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Minor
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	3 stemmed tree		



Tree Number: 17 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	20 x 16		
DBH (cm)	105		
TPZ Radius (m):	12.6	**TPZ Impact:**	27%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	Creek side stem DBH estimated		



Tree Number: 18 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	20 x 18		
DBH (cm)	98		
TPZ Radius (m):	11.76	**TPZ Impact:**	30%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	DBH estimated		



Tree Number: 19 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	21 x 15		
DBH (cm)	103		
TPZ Radius (m):	12.36	**TPZ Impact:**	37%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 20 **Botanical Name:** *Populus nigra 'Italica'*

Common Name:	Lombardy Poplar		
Origin:	Exotic		
Height & Width (m):	18 x 5		
DBH (cm)	110		
TPZ Radius (m):	13.2	**TPZ Impact:**	100%
Health:	Poor	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	Major
ULE:	Less than 5 years		
Landscape Contribution:	High		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:	DBH estimated		



Tree Number: 21 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	15 x 12		
DBH (cm)	63		
TPZ Radius (m):	7.56	**TPZ Impact:**	20%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 22 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	16 x 7		
DBH (cm)	46		
TPZ Radius (m):	5.52	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 23 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	20 x 14		
DBH (cm)	110		
TPZ Radius (m):	13.2	**TPZ Impact:**	26%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	3 stemmed tree		



Tree Number: 24 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	12 x 12		
DBH (cm)	43		
TPZ Radius (m):	5.16	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:			



Tree Number: 25 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	10 x 4		
DBH (cm)	18		
TPZ Radius (m):	2.16	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	No impact
ULE:	10 to 20 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 26 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	11 x 7		
DBH (cm)	27		
TPZ Radius (m):	3.24	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 27 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	9 x 2		
DBH (cm)	22		
TPZ Radius (m):	2.64	**TPZ Impact:**	0%
Health:	Poor	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	No impact
ULE:	5 to 10 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 28 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	15 x 5		
DBH (cm)	33		
TPZ Radius (m):	3.96	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:			



Tree Number: 29 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	12 x 9		
DBH (cm)	41		
TPZ Radius (m):	4.92	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 30 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	9 x 7		
DBH (cm)	28		
TPZ Radius (m):	3.36	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:			



Tree Number: 31 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	14 x 10		
DBH (cm)	37		
TPZ Radius (m):	4.44	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 32 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	12 x 12		
DBH (cm)	66		
TPZ Radius (m):	7.92	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 33 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	22 x 18		
DBH (cm)	131		
TPZ Radius (m):	15	**TPZ Impact:**	16%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Valuable		
Retention Value:	**Very High**		
Comments:			



Tree Number: 34 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	8 x 5		
DBH (cm)	25		
TPZ Radius (m):	3	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 35 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	10 x 6		
DBH (cm)	36		
TPZ Radius (m):	4.32	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 36 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	6 x 3		
DBH (cm)	13		
TPZ Radius (m):	2	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 37 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	7 x 4		
DBH (cm)	20		
TPZ Radius (m):	2.4	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 38 **Botanical Name:** *Ulmus parvifolia*

Common Name:	Chinese Elm		
Origin:	Exotic		
Height & Width (m):	8 x 9		
DBH (cm)	28		
TPZ Radius (m):	3.36	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 39 **Botanical Name:** *Celtis australis*

Common Name:	European Nettle Tree		
Origin:	Exotic		
Height & Width (m):	9 x 12		
DBH (cm)	57		
TPZ Radius (m):	6.84	**TPZ Impact:**	64%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 40 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	18 x 18		
DBH (cm)	122		
TPZ Radius (m):	14.64	**TPZ Impact:**	57%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	3 stemmed tree		



Tree Number: 41 **Botanical Name:** *Ulmus parvifolia*

Common Name:	Chinese Elm		
Origin:	Exotic		
Height & Width (m):	6 x 6		
DBH (cm)	17		
TPZ Radius (m):	2.04	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 42 **Botanical Name:** *Corymbia citriodora*

Common Name:	Lemon-scented Gum		
Origin:	Native		
Height & Width (m):	20 x 17		
DBH (cm)	80		
TPZ Radius (m):	9.6	**TPZ Impact:**	40%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Valuable		
Retention Value:	**High**		
Comments:			



Tree Number: 43 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	17 x 18		
DBH (cm)	100		
TPZ Radius (m):	12	**TPZ Impact:**	30%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 44 **Botanical Name:** *Brachychiton acerifolius*

Common Name:	Flame Tree		
Origin:	Native		
Height & Width (m):	4 x 3		
DBH (cm)	18		
TPZ Radius (m):	2.16	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 45 **Botanical Name:** *Brachychiton acerifolius*

Common Name:	Flame Tree		
Origin:	Native		
Height & Width (m):	4 x 2		
DBH (cm)	14		
TPZ Radius (m):	2	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	No impact
ULE:	10 to 20 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 46 **Botanical Name:** *Brachychiton acerifolius*

Common Name:	Flame Tree		
Origin:	Native		
Height & Width (m):	3 x 2		
DBH (cm)	7		
TPZ Radius (m):	2	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	No impact
ULE:	10 to 20 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 47 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	5 x 4		
DBH (cm)	17		
TPZ Radius (m):	2.04	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 48 **Botanical Name:** *Ulmus glabra*

Common Name:	Wych Elm		
Origin:	Exotic		
Height & Width (m):	7 x 9		
DBH (cm)	30		
TPZ Radius (m):	3.6	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 49 **Botanical Name:** *Ulmus glabra 'Lutescens'*

Common Name:	Golden Elm		
Origin:	Exotic		
Height & Width (m):	3 x 2		
DBH (cm)	9		
TPZ Radius (m):	2	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 50 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	9 x 4		
DBH (cm)	23		
TPZ Radius (m):	2.76	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 51 **Botanical Name:** *Ulmus parvifolia*

Common Name:	Chinese Elm		
Origin:	Exotic		
Height & Width (m):	5 x 6		
DBH (cm)	15		
TPZ Radius (m):	2	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 52 **Botanical Name:** *Ulmus minor 'Variegata'*

Common Name:	Variegated Elm		
Origin:	Exotic		
Height & Width (m):	11 x 5		
DBH (cm)	38		
TPZ Radius (m):	4.56	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 53 **Botanical Name:** *Ulmus parvifolia*

Common Name:	Chinese Elm		
Origin:	Exotic		
Height & Width (m):	5 x 5		
DBH (cm)	13		
TPZ Radius (m):	2	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 54 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	3 x 2		
DBH (cm)	6		
TPZ Radius (m):	2	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 55 **Botanical Name:** *Ulmus glabra 'Lutescens'*

Common Name:	Golden Elm		
Origin:	Exotic		
Height & Width (m):	9 x 8		
DBH (cm)	54		
TPZ Radius (m):	6.48	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:			



Tree Number: 56 **Botanical Name:** *Populus Xcanadensis*

Common Name:	Canadian Poplar		
Origin:	Exotic		
Height & Width (m):	17 x 10		
DBH (cm)	93		
TPZ Radius (m):	11.16	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:			



Tree Number: 57 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	7 x 4		
DBH (cm)	18		
TPZ Radius (m):	2.16	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:			



Tree Number: 58 **Botanical Name:** *Liquidambar styraciflua*

Common Name:	Liquidambar		
Origin:	Exotic		
Height & Width (m):	12 x 9		
DBH (cm)	52		
TPZ Radius (m):	6.24	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:			



Tree Number: 59 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	12 x 10		
DBH (cm)	78		
TPZ Radius (m):	9.36	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



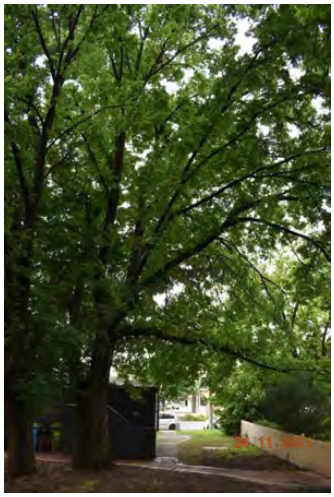
Tree Number: 60 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	17 x 11		
DBH (cm)	89		
TPZ Radius (m):	10.68	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 61 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	19 x 13		
DBH (cm)	86		
TPZ Radius (m):	10.32	**TPZ Impact:**	2%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Minor
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 62 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	19 x 14		
DBH (cm)	83		
TPZ Radius (m):	9.96	**TPZ Impact:**	4%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Minor
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 63 **Botanical Name:** *Corymbia citriodora*

Common Name:	Lemon-scented Gum		
Origin:	Native		
Height & Width (m):	18 x 16		
DBH (cm)	90		
TPZ Radius (m):	10.8	**TPZ Impact:**	52%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Valuable		
Retention Value:	**High**		
Comments:			



Tree Number: 64 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	18 x 17		
DBH (cm)	147		
TPZ Radius (m):	15	**TPZ Impact:**	48%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Valuable		
Retention Value:	**High**		
Comments:			



Tree Number: 65 **Botanical Name:** *Ulmus procera*

Common Name:	English Elm		
Origin:	Exotic		
Height & Width (m):	14 x 11		
DBH (cm)	91		
TPZ Radius (m):	10.92	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 66 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	16 x 13		
DBH (cm)	100		
TPZ Radius (m):	12	**TPZ Impact:**	1%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Minor
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**Very High**		
Comments:			



Tree Number: 67 **Botanical Name:** *Eucalyptus saligna*

Common Name:	Sydney Blue Gum		
Origin:	Native		
Height & Width (m):	21 x 12		
DBH (cm)	89		
TPZ Radius (m):	10.68	**TPZ Impact:**	100%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 68 **Botanical Name:** *Eucalyptus saligna*

Common Name:	Sydney Blue Gum		
Origin:	Native		
Height & Width (m):	21 x 13		
DBH (cm)	86		
TPZ Radius (m):	10.32	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	5 to 10 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:			



Tree Number: 69 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	14 x 12		
DBH (cm)	110		
TPZ Radius (m):	13.2	**TPZ Impact:**	15%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	Major
ULE:	5 to 10 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**Medium**		
Comments:	DBH estimated		



Tree Number: 70 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	14 x 14		
DBH (cm)	130		
TPZ Radius (m):	15	**TPZ Impact:**	3%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Minor
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	Decay in stem over creek		



Tree Number: 71 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	14 x 7		
DBH (cm)	42		
TPZ Radius (m):	5.04	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 72 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	15 x 12		
DBH (cm)	103		
TPZ Radius (m):	12.36	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 73 **Botanical Name:** *Quercus palustris*

Common Name:	Pin Oak		
Origin:	Exotic		
Height & Width (m):	13 x 8		
DBH (cm)	47		
TPZ Radius (m):	5.64	**TPZ Impact:**	0%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 74 **Botanical Name:** *Fraxinus americana*

Common Name:	White Ash		
Origin:	Exotic		
Height & Width (m):	9 x 12		
DBH (cm)	49		
TPZ Radius (m):	5.88	**TPZ Impact:**	76%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 75 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	15 x 16		
DBH (cm)	71		
TPZ Radius (m):	8.52	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 76 **Botanical Name:** *Fraxinus 'Raywood'*

Common Name:	Claret Ash		
Origin:	Exotic		
Height & Width (m):	13 x 15		
DBH (cm)	65		
TPZ Radius (m):	7.8	**TPZ Impact:**	42%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 77 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	18 x 19		
DBH (cm)	107		
TPZ Radius (m):	12.84	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 78 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	8 x 8		
DBH (cm)	30		
TPZ Radius (m):	3.6	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 79 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	14 x 12		
DBH (cm)	70		
TPZ Radius (m):	8.4	**TPZ Impact:**	35%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 80 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	17 x 14		
DBH (cm)	60		
TPZ Radius (m):	7.2	**TPZ Impact:**	30%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 81 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	7 x 4		
DBH (cm)	21		
TPZ Radius (m):	2.52	**TPZ Impact:**	0%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Low		
Individual Significance:	Low		
Retention Value:	**Low**		
Comments:	Group of approximately 6		



Tree Number: 82 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	16 x 10		
DBH (cm)	48		
TPZ Radius (m):	5.76	**TPZ Impact:**	4%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Minor
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	DBH estimated		



Tree Number: 83 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	19 x 12		
DBH (cm)	84		
TPZ Radius (m):	10.08	**TPZ Impact:**	32%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	4 minor stems at base		



Tree Number: 84 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	18 x 10		
DBH (cm)	70		
TPZ Radius (m):	8.4	**TPZ Impact:**	32%
Health:	Poor	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	5 to 10 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	3 minor stems at base		



Tree Number: 85 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	14 x 14		
DBH (cm)	60		
TPZ Radius (m):	7.2	**TPZ Impact:**	33%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	3 minor stems at base		



Tree Number: 86 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	9 x 8		
DBH (cm)	40		
TPZ Radius (m):	4.8	**TPZ Impact:**	43%
Health:	Good	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:	3 stemmed tree		



Tree Number: 87 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	16 x 7		
DBH (cm)	38		
TPZ Radius (m):	4.56	**TPZ Impact:**	26%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	DBH estimated		



Tree Number: 88 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	12 x 11		
DBH (cm)	74		
TPZ Radius (m):	8.88	**TPZ Impact:**	44%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:	3 stemmed tree		



Tree Number: 89 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	11 x 9		
DBH (cm)	51		
TPZ Radius (m):	6.12	**TPZ Impact:**	0%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	No impact
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 90 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	19 x 15		
DBH (cm)	116		
TPZ Radius (m):	13.92	**TPZ Impact:**	44%
Health:	Good	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Valuable		
Retention Value:	**High**		
Comments:			



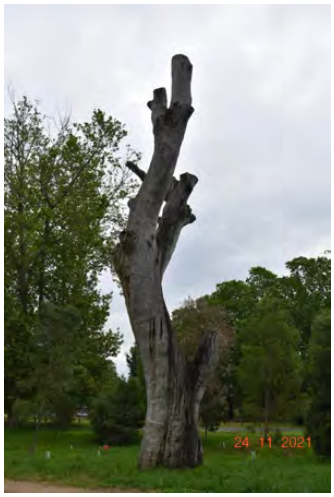
Tree Number: 91 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	19 x 12		
DBH (cm)	73		
TPZ Radius (m):	8.76	**TPZ Impact:**	29%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	High		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 92 **Botanical Name:** *Eucalyptus camaldulensis*

Common Name:	River Red Gum		
Origin:	Indigenous		
Height & Width (m):	10 x 2		
DBH (cm)	163		
TPZ Radius (m):	15	**TPZ Impact:**	28%
Health:	Dead	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	5 to 10 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:	Install artificial hollows		



Tree Number: 93 **Botanical Name:** *Alectryon excelsus*

Common Name:	New Zealand Ash		
Origin:	Exotic		
Height & Width (m):	7 x 5		
DBH (cm)	47		
TPZ Radius (m):	5.64	**TPZ Impact:**	9%
Health:	Good	**TPZ Enchroachment**	
Structure:	Poor	**(AS 4970):**	Minor
ULE:	5 to 10 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 94 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	7 x 4		
DBH (cm)	14		
TPZ Radius (m):	2	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	20 to 40 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:			



Tree Number: 95 **Botanical Name:** *Alectryon excelsus*

Common Name:	New Zealand Ash		
Origin:	Exotic		
Height & Width (m):	8 x 7		
DBH (cm)	90		
TPZ Radius (m):	10.8	**TPZ Impact:**	100%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	5 to 10 years		
Landscape Contribution:	Medium		
Individual Significance:	Low		
Retention Value:	**Medium**		
Comments:	Group of 8		



Tree Number: 96 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	12 x 10		
DBH (cm)	42		
TPZ Radius (m):	5.04	**TPZ Impact:**	46%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 97 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	11 x 10		
DBH (cm)	47		
TPZ Radius (m):	5.64	**TPZ Impact:**	50%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 98 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	11 x 10		
DBH (cm)	51		
TPZ Radius (m):	6.12	**TPZ Impact:**	52%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 99 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	12 x 10		
DBH (cm)	65		
TPZ Radius (m):	7.8	**TPZ Impact:**	60%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Fair	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 100 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	13 x 11		
DBH (cm)	61		
TPZ Radius (m):	7.32	**TPZ Impact:**	57%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 101 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	13 x 10		
DBH (cm)	60		
TPZ Radius (m):	7.2	**TPZ Impact:**	55%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 102 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	12 x 11		
DBH (cm)	59		
TPZ Radius (m):	7.08	**TPZ Impact:**	53%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 103 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	13 x 10		
DBH (cm)	50		
TPZ Radius (m):	6	**TPZ Impact:**	32%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Tree Number: 104 **Botanical Name:** *Platanus Xacerifolia*

Common Name:	London Plane		
Origin:	Exotic		
Height & Width (m):	13 x 12		
DBH (cm)	67		
TPZ Radius (m):	8.04	**TPZ Impact:**	41%
Health:	Fair	**TPZ Enchroachment**	
Structure:	Good	**(AS 4970):**	Major
ULE:	10 to 20 years		
Landscape Contribution:	Medium		
Individual Significance:	Moderate		
Retention Value:	**High**		
Comments:			



Appendix E: Aboriginal Due Diligence Assessment



Australia Park
Aboriginal Due Diligence Assessment

FINAL REPORT

Prepared for Albury City

26 May 2022

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Glossary

ACHA	Aboriginal Cultural Heritage Assessment
ADDA	Aboriginal Cultural Heritage Due Diligence Assessment
AHIMS	Aboriginal Heritage Information Management System
Biosis	Biosis Pty Ltd
Due diligence code	*Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*
EP&A Act	*Environmental Planning and Assessment Act 1979*
GSV	Ground Surface Visibility
Heritage NSW	Heritage NSW, Department of Premier and Cabinet (DPC)
ICOMOS	International Council on Monuments and Sites
LEP	Local Environment Plan
LGA	Local Government Area
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
PAD	Potential Archaeological Deposit
Study area	Wodonga Place and Ebden Street, South Albury, NSW (Table 1)
The Code	The *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*

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Summary

Biosis Pty Ltd (Biosis) has been commissioned by GHD on behalf of Albury City to undertake an Aboriginal Due Diligence Assessment (ADDA) for the proposed for the Australia Park project at Wodonga Place and Ebden Street, South Albury, New South Wales (NSW). The project is to be assessed as a Review of Environmental Factors (REF) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database was conducted on 23 September 2021. The search identified 86 Aboriginal archaeological sites within a 7.5 kilometre search area, centred on the proposed study area. None of these registered sites are located *within* the study area, however, two sites, AHIMS 60-3-0110/ Noreuil Foreshore Park and AHIMS 30-3-0111 are located within 200 metres of the study area.

Previous assessments conducted by Brooke & Jacobs (2009) and Biosis (2019) suggested that the study area possessed low archaeological potential, due to its location within the Murray Alluvium Hydrological Landscape, an alluvial floodplain landform, combined with extensive disturbances from development as a park. The study area is located within the Albury - Oaklands Hills and Footslopes soil landscape, in which scarred trees, lithic artefact scatters and midden sites bearing vertebrate and invertebrate faunal remains have previously been found. Whilst post depositional processes decrease the likelihood of archaeological deposits, there is potential for sites of this nature to be present within the study area.

An archaeological investigation of the study area was undertaken on 14 October 2021 by Biosis Archaeologist Madeleine Lucas, and Andom Rendell, representative of Albury and District Local Aboriginal Land Council (LALC) and Yalmambirra, Wiradjuri Elder. During the field investigation, no Aboriginal sites or areas of archaeological potential were identified. The field investigation noted extensive disturbance from landscaping, flood levee construction, the development of roads, recreational facilities and historical clearing. This evidence indicates that intact archaeological deposits are unlikely to remain. Therefore, the study area has been determined as possessing low archaeological potential.

Prior to any impacts occurring within the study area, the following is recommended:

Recommendation 1: No further archaeological assessment is required

No further archaeological work is required in the study area due to the entire study area assessed as having low archaeological potential.

Recommendation 2: Discovery of Unanticipated Aboriginal Objects

All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Heritage NSW. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the Heritage NSW and Aboriginal stakeholders.

Recommendation 3: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.

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2. Notify the NSW Police and Heritage NSW' Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by Heritage NSW.

1 Introduction

1.1 Project background

Biosis has been commissioned by GHD on behalf of Albury City to undertake an Aboriginal Cultural Heritage Due Diligence Assessment (ADDA) for the proposed for the Australia Park project at Wodonga Place and Ebden Street, South Albury, NSW (the project). An assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010a) has been undertaken for the study area in order to inform responsibilities with regards to Aboriginal cultural heritage in the area. In addition to the basic tasks required for a due diligence assessment, an extended background review, as well as an archaeological survey in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) (the code) was conducted, in order adequately map areas of high, moderate and low archaeological sensitivity. The project is to be assessed as a REF under Part 5 of the EP&A Act.

Biosis Pty Ltd has been previously commissioned by GHD on behalf of Albury City (the client) to undertake an ADDA for proposed developments at Oddies Creek Park. The current ADDA includes a portion of the previous study area extent.

The project involves demolition of current infrastructure and the construction and installation of new infrastructure and utilities (Figure 3). The works include:

- Demolition of existing carpark and creek crossing.
- Construction of new levee, carpark, pedestrian bridge at Oddies Creek and vehicle crossing.
- Relocation of existing culverts and construction of retaining walls.
- Installation of BBQ facility and a shared path network.
- Earthworks, landscaping, and installation of underground services including utilities, irrigation, water main, and sewage.

1.2 Location of the study area

The study area is located within the Albury Local Government Area (LGA), Parish of Albury, County of Goulburn (refer to Figure 1). The study area is located on Wodonga Place and Noreuil Parade, and incorporates Ebden Street in the north section (Lot DPs in Table 1). It is bounded by Noreuil Parade to the north and west, Oddies Creek Park to the south, and Wodonga Place to the east (refer to Figure 2).

Table 1 Lot DPs within the study area

Lot and DP	Lot and DP
Lot 9 DP 1087117	Lot 1 DP 1087117
Lot 8 DP 1087117	Lot 1 DP 542181
Lot 7 DP 1087117	Lot 1 DP 1094181 (partial)
Lot 6 DP 1087117	Lot 2 DP 1182825 (partial)
Lot 5 DP 1087117	Lot 4120 DP 1087043 (partial)
Lot 4 DP 1087117	Lot 4112 DP 1087080 (partial)

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Lot and DP	Lot and DP
Lot 3 DP 1087117	Lot 4111 DP 1087080 (partial)
Lot 2 DP 1087117	

1.3 Planning approvals

The proposed development will be assessed against Part 5 of the EP&A Act. Other relevant legislation and planning instruments that will inform the assessment include:

- *National Parks and Wildlife Act 1974* (NSW) (NPW Act).
- *National Parks and Wildlife Amendment Act 2010* (NSW).
- *Albury Local Environmental Plan 2010* (LEP).
- *Albury Development Control Plan 2010* (DCP).

1.4 Scope of the assessment

The following is a summary of the major objectives of the assessment:

- Conduct background research in order to recognise any identifiable trends in site distribution and location, including a search of the Aboriginal Heritage Information Management System (AHIMS).
- Undertake archaeological survey as per requirement 5 of the code, with particular focus on landforms with high potential for heritage places within the study area, as identified through background research.
- Record and assess sites identified during the survey in compliance with the guidelines endorsed by Heritage NSW.
- Determine levels of archaeological and cultural significance of the study area.
- Make recommendations to mitigate and manage any cultural heritage values identified within the study area.

1.5 Aboriginal consultation

Andom Rendell of the Albury District LALC and Yalmambirra, Wiradjuri Elder attended the archaeological investigation. Both discussed that the land throughout the Albury district was used extensively by Aboriginal people, with many stories that are connected to Mungabareena and the Wonga wetland areas. It was also discussed that the study area is positioned in a nice area for activities such as fishing and resource gathering, however people were more likely to live in higher positioned landforms and travel into the area for these resources.

Random test pits throughout the study area was also requested by Yalmambirra. However, due to the extensive disturbance and thus low archaeological potential identified within the study area, testing cannot be justified.



Acknowledgement: Topo ©NSW Land and Property Information (2016); Overview ©State of NSW (c.2003)

biosis

Figure 1 Location of the study area

Matter: 35886
Date: 05 October 2021,
Drawn by: JPT, Checked by: KMF, Last edited by: jturner
Location:P:\35800s\35886\Mapping\
35886_ADDA, Layout: 35886_ADDA_F1_Locality

0 250 500 750 1,000
Metres
Scale 1:25,000@ A4, GDA 1994 MGA Zone 55

N


Murray River
Murray River
Murray River
Noreuil Parade
Noreuil Parade
Noreuil Parade
Hovell Street
Hovell Street
Hovell Street
Tree Drive
Ebden Street
Ebden Street
Wodonga Place
Nurigong Street
7057/DP1023470
1/DP758013
1/DP1096801
21/DP825491
22/DP825491
1/DP712610
17/DP1102190
16/DP1102190
18/DP1102190
15/DP1102190
19/DP1102190
14/DP1102190
20/DP1102190
13/DP1102190
12/DP1102190
2/DP1182825
1/DP1094181
1/DP589337
5/DP544200
3/DP537615
2/DP518155
8/DP1024159
A/DP376146
B/DP376146
1/DP157188
2/DP157188
3/DP157188
11/DP87571
4111/DP1087080
4112/DP1087080
8/DP1087117
7/DP1087117
6/DP1087117
5/DP1087117
4/DP1087117
9/DP1087117
1/DP542181
101/DP805672
1/DP158210
2/DP158210
12/DP596299
2/DP847686
A/DP159456
E/DP159808
D/DP159456
32/DP851925
4/DP20305
5/DP20305
4120/DP1087043
32/DP792396
67/DP1012297
1/DP111576
1/DP1122603
A/DP377298
B/DP377298
C/DP377298
8/DP20305
B/DP152264
C/DP152264
A/DP152264
1/DP593719
1/DP540700
2/DP540700
3/DP540700
6/DP41002
4011/DP1087060
10/DP230221
5/11/DP573034
2/DP216331
391/DP805780
392/DP805780
2/DP151320
B/DP151341
10/DP230070
9/DP758013
Padman Drive
Smollett Street
Hume Street
Young Street
Hume Highway
ALBURY
South Albury
Legend
Study area
Lot
Figure 2 Study area detail
0 10 20 30 40 50
Metres
Scale: 1:2,000@ A3
Coordinate System:
GDA 1994 MGA Zone 55
N
biosis
Matter: 35886, Date: 05 October 2021,
Drawn by: JPT, Checked by: KMF, Last edited by: jturner
Location: P:\35800s\35886\Mapping\
35886_ADDA_Layout: 35886_ADDA_F2_StudyArea
Acknowledgements: Basemap © Land and Property Information 2016; public/NSW_Imagery: © Department of Customer Service 2020

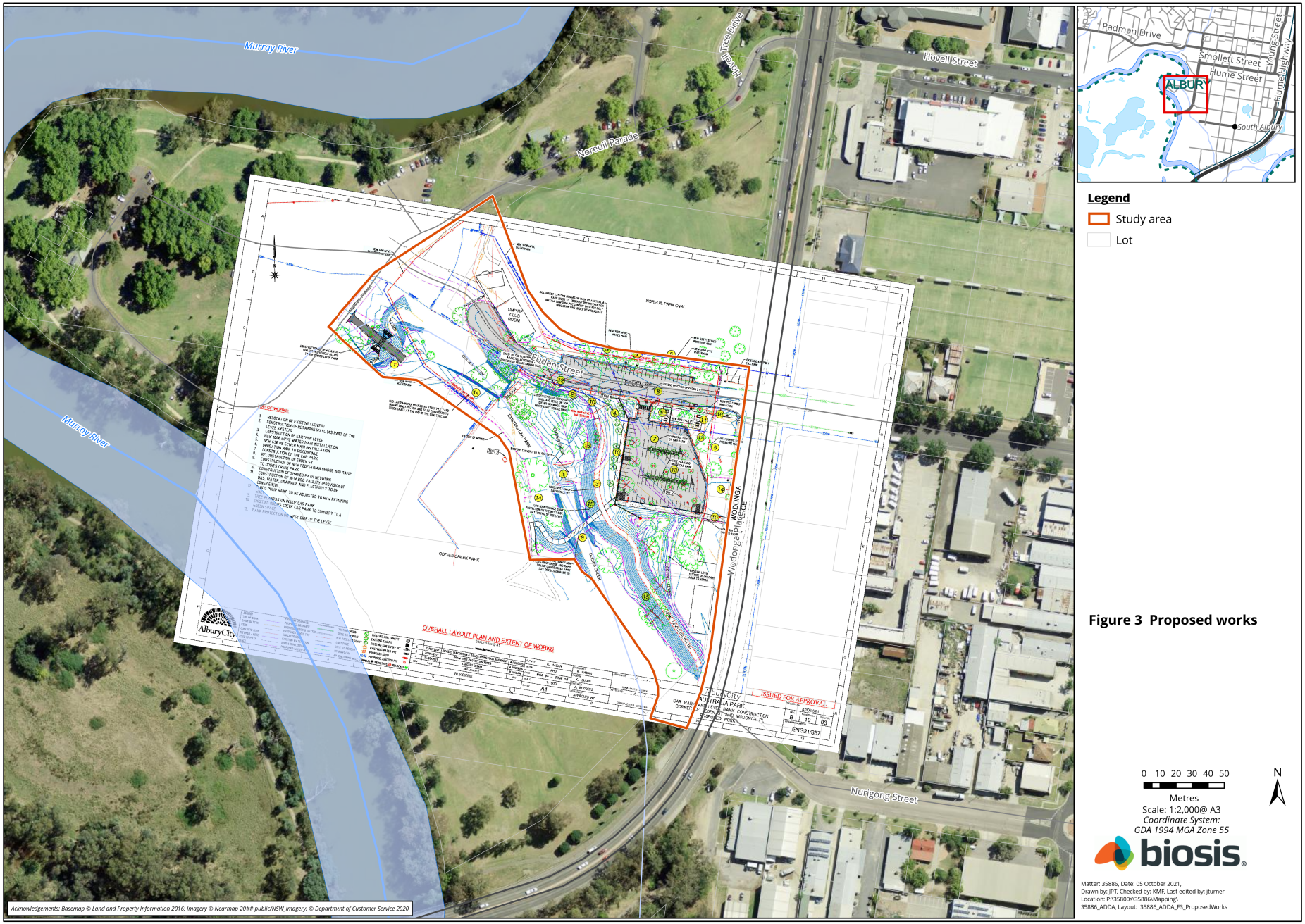

Figure 3 Proposed works

2 Desktop assessment

A brief desktop assessment has been undertaken to review existing archaeological studies for the study area and surrounding region. This information has been synthesised to develop some Aboriginal site predictive statements for the study area and identify known Aboriginal sites and/or places recorded in the study area. This desktop assessment has been prepared in accordance with requirements 1 to 4 of the code.

2.1 Landscape context

The broader topography of the Albury area is associated with the commencement of the Murray River floodplain. This region includes low-lying flood prone land and riparian zones associated with the river as well as high level terracing along valley margins. It is bounded north and south by undulating to hill country dissected by steep slopes. The flood plain extends substantially west of Albury, while to the east it contracts and is confined to the narrow river valleys of the Great Dividing Range.

The study area is located in parkland on the Murray River approximately 1.5 kilometres south-west of the Albury city centre. The immediate area is defined the Murray River to the west and the city of Albury to the east. The study area lies on a low terrace of the river that has been historically recorded as subject to seasonal flooding (Office of Environment and Heritage 2017).

2.2 Geology, soils and landforms

The study area is located within the New South Wales South West Slopes (Lower Slopes) bioregion, an extensive area of foothills and isolated ranges comprising the lower inland slopes of the Great Dividing Range (Office of Environment and Heritage 2017). The geology of the area is largely granite, volcanic or metamorphosed sediments as base rock, with some areas of unconsolidated Quaternary silts and clays. Vein quartz is common in both granite and metamorphosed sediments. The majority of previously identified artefacts in the local area are comprised of quartz, which is available regionally in exposed quartz outcrops (Kelly & Price 2004, p.17).

The topography of the surrounding area is associated with the Murray Alluvium Hydrogeological Landscape (HGL) which extends along the Murray River from Lake Hume to Walbundrie. This region is characterised by alluvial floodplains. These floodplains extend approximately 10 kilometres north across low-lying flood prone land and riparian zones associated with the river as well as high level terracing along valley margins. It is bounded north and south by undulating to hill country dissected by steep slopes. The flood plain extends substantially west of Albury, while to the east it contracts and is confined to the narrow river valleys of the Great Dividing Range. The study area lies topographically within the river terrace landform that gradually slopes west towards the Murray River (Figure 5).

Stream order is recognised as a factor which assists the development of predictive modelling in New South Wales. Predictive models that have been developed for the region have a tendency to favour higher order streams as the locations of complex sites that have been continuously occupied. This is because they would have been more likely to provide a stable source of water and by extension other resources, which would have been used by Aboriginal groups (Jo McDonald Cultural Heritage Management 2000, pp. 19).

The stream order system used for this assessment was originally developed by Strahler (1952). It functions by adding two streams of equal order at their confluence to form a higher order stream, as shown in Photo 1. As stream order increases, so does the likelihood that the stream would be a perennial source of water.

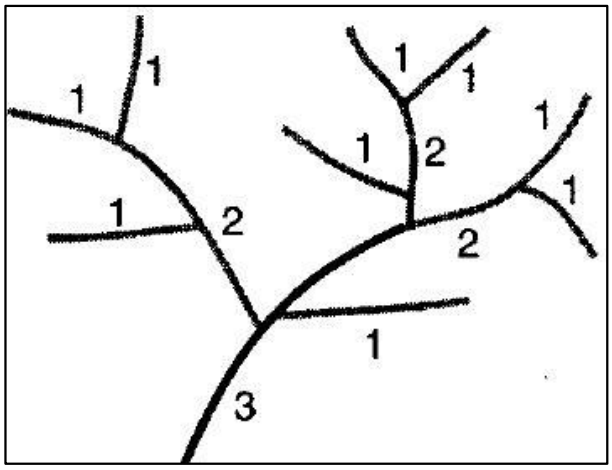

Photo 1 Diagram showing Strahler stream order (Ritter, Kochel, & Miller 1995, pp. 151)

Hydrology within the vicinity of the study area includes the Murray River, a perennial water course located approximately 200 metres west of the study area, curving around to approximately 60 metres north of the study area (Figure 5). A second order non-perennial tributary of the Murray River enters the study area through the eastern border and exits through the sourthern border, transecting the eastern and south eastern portions of the study area.

Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. They are defined by a combination of soils, topography, vegetation and weathering conditions. Soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure.

The study area lies on the Murray River floodplain within the Albury - Oaklands Hills and Footslopes landscape as defined in version 2 of the Descriptions for NSW (Mitchell) Landscapes (Mitchell 2002a). The Murray floodplain has been defined by geomorphological features as those areas of alluvial deposition characterised by level terraces adjacent a watercourse (Junor et al. 1977). Soils consist of either layered alluvium, deep uniform sand or silty clay overlaying sand. Over the Quaternary, soils in this landscape have accumulated a considerable quantity of wind-blown silt and clay (Office of Environment and Heritage 2017).

The Albury - Oaklands Hills and Footslopes landscape is the dominant landscape present throughout the study area. This is characterised as typically unconsolidated colluvial and alluvial sediments that have been deposited on lower slopes. The characteristics of this landscape are provided in (Table 2).

Landscapes that are prone to flooding experience increased levels of soil erosion and displacement. This often leads to poor site preservation upon slopes and the post-depositional processes can cause the exposure and movement of material concealed within the subsurface of the landscape. Some archaeological sites can still exist with varying degrees of preservation, and can include features such a scarred trees, artefact scatters, PADs or material relating to midden sites.

Table 2 Mitchell landscapes within the study area (Mitchell 2002a)

Soil material	Description
Albury - Oaklands Hills and Footslopes	Isolated hills and rises on folded lower Ordovician greywacke, phyllite, chert, schist and small areas of Silurian-Devonian granite, general elevation 150 to 480m, local relief 20 to 150m. Shallow gritty loam amongst rock outcrop on hills, red-brown texture-contrast

Soil material	Description
	soil on slopes with bleached A2 horizons and strongly structured subsoil. Vegetation consists of low open woodland.

Previous archaeological studies in the Albury region indicate that modified or scarred trees are the most common Aboriginal sites. There are also a significant number of isolated stone artefacts and small to medium sized artefact scatters. The majority of these archaeological sites are recorded near permanent or semi-permanent watercourses, on elevated, well-drained land (O'Halloran 2008, p.35).

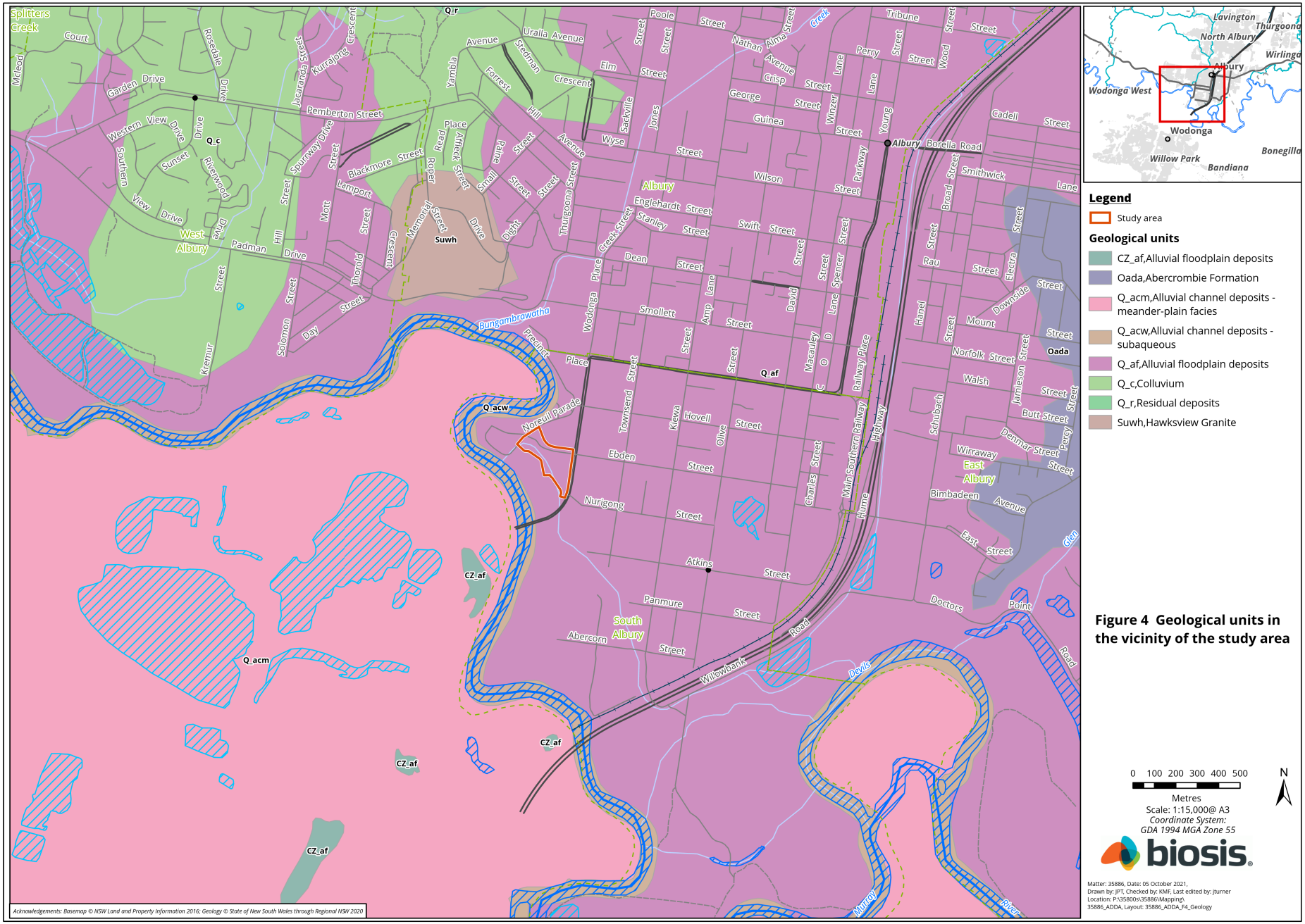

Figure 4 Geological units in the vicinity of the study area

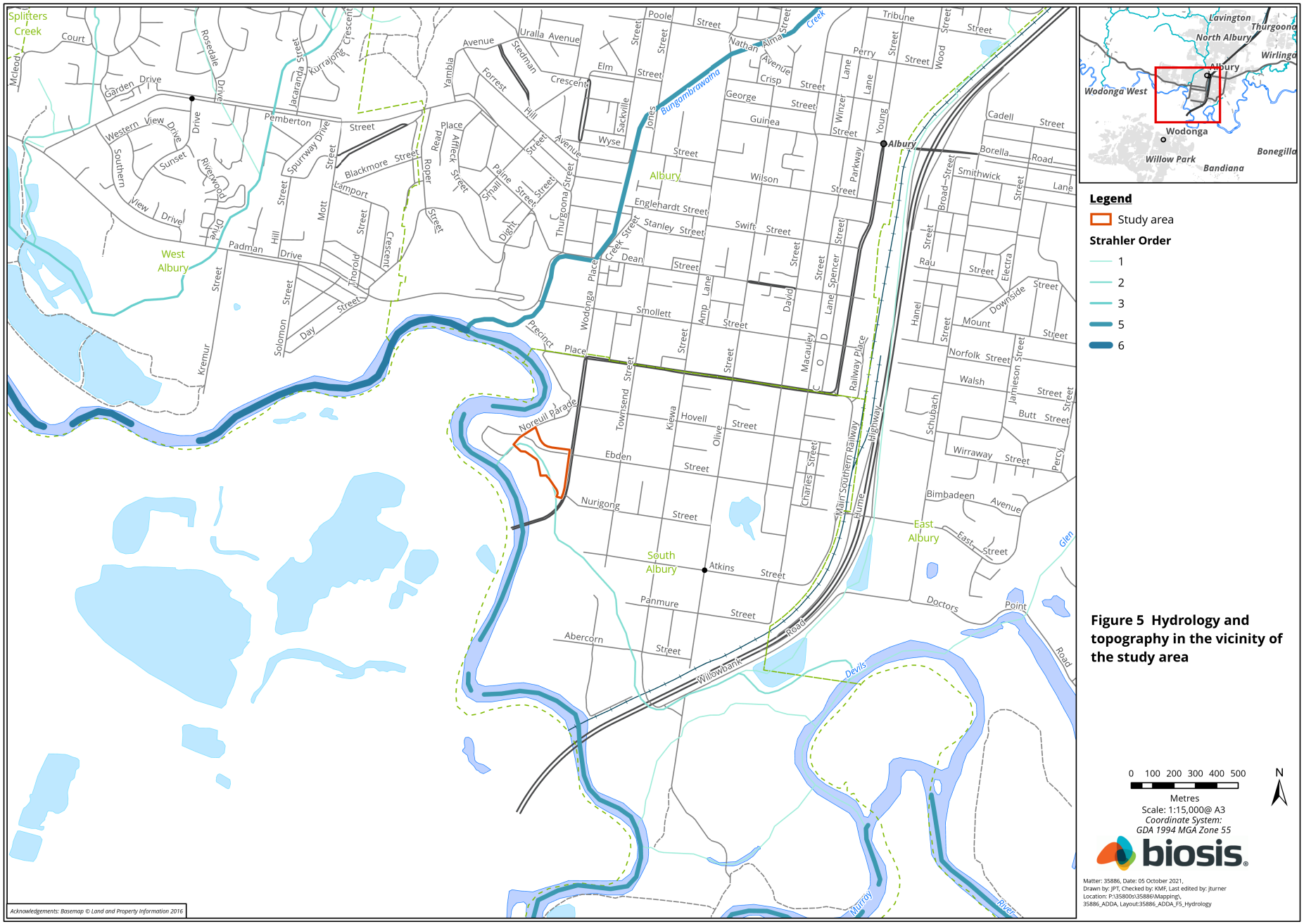

Figure 5 Hydrology and topography in the vicinity of the study area

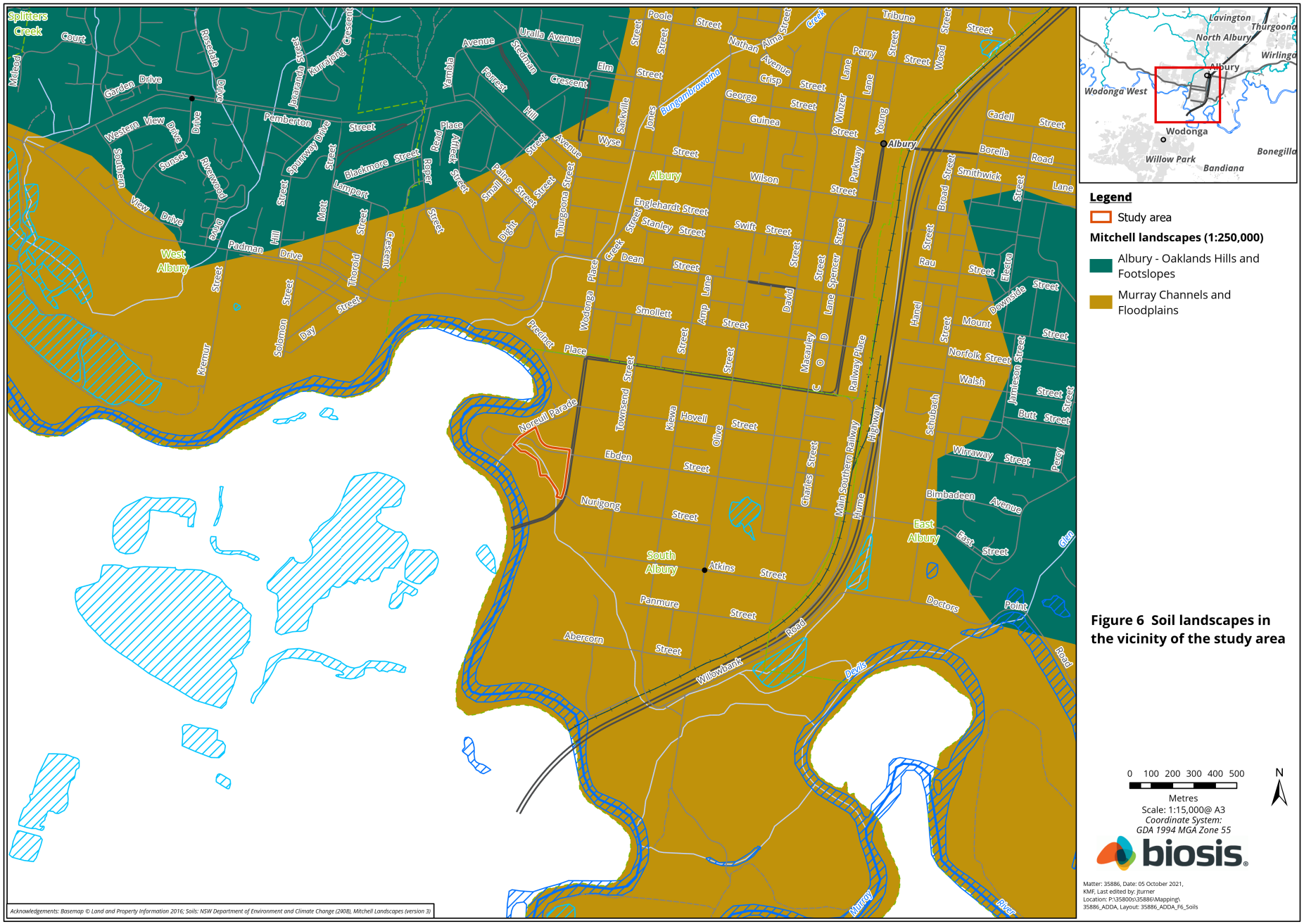

Figure 6 Soil landscapes in the vicinity of the study area

2.3 Flora and fauna

The Albury region would have generally provided a number of resources used by Aboriginal inhabitants. The study area would have contained River Red Gum eucalypts which would have provided a readily available source of bark and timber for shelters, shields, canoes, and wooden implements. In addition to this, Kelly and Price (2004) developed a list of plant sources common to the wider region which have been used by Aboriginal people (Table 3).

Table 3 Plant foods common to the Albury region (Kelly & Price 2004, p.16)

Common name	Scientific name	Use
Bracken fern	*Pteridium escientum*	Roots
Wattles	*Acacia spp.*	Seeds, gums, medicinal barks and hafting timber
Native plantain	*Plantago debilis*	Leaves processed and eaten
Common sowthistle	*Sonchus oleraceus*	Leaves eaten
Milkmaids	*Burcharoadia umbellate.*	Tubers eaten
Vanilla lilies	*Arthropodium milleflorum, α. Minus.*	Tubers eaten
Bulbine lily	*Bulbine bulbosa.*	Tubers eaten
Common fringed lily	*Thysanotus tuberosus.*	Tubers eaten
Ground orchids	*Orchideae. Family*	Tubers eaten
Murnong	*Microseris scapigera*	Tubers eaten
Long leaf mat-rush	*Lomandra longifolia*	Leaf stems eaten, leaves used for weaving

Plant resources were used in a variety of ways. Fibres were twisted into string, which was used for many purposes, including the weaving of nets, baskets and fishing lines. String was also used for personal adornment. Bark was used in the provision of shelter; a large sheet of bark being propped against a stick to form a gunyah (Attenbrow 2002).The Kurrajong tree *Brachychiton populeneus* had many uses by Aboriginal people, the bark fibres were used to make string and fishing nets, water was extracted from the roots, seeds from leathery pods were roasted and eaten after removing the irritating hairs, and the tuberous roots of young plants were eaten (Albury Wodonga Regional Parklands, n.d.).

As well as being important food sources, animal products were also used for tool making and fashioning a myriad of utilitarian and ceremonial items. For example, tail sinews are known to have been used to make fastening cord, while 'bone points', which would have functioned as awls or piercers, are often an abundant part of the archaeological record. Animals such as Brush-tailed Possums were highly prized for their fur, with

possum skin cloaks worn fastened over one shoulder and under the other. Kangaroo teeth were incorporated into decorative items, such as head bands (Attenbrow 2002).

Native birds, marsupials, reptiles and frogs would have been in abundant supply within relatively close proximity to the study area. The Murray River itself would also have provided food resources such as mussels, fish, crayfish, waterfowl and turtles. In order to feed large numbers of individuals during times of ceremonial gathering, fish traps were employed. In a diary entry dated 17 November 1824, William Hovell (as cited in Andrews 1912, pp. 137) notes:

> *The Natives frequently resort here, and I have no doubt are numerous, as fish are plentiful both in the River and Lagoons, it appears they are caught in Dams where there is a running stream as there is one they have made now in front of us, they are drawn into the dam by the natives, at one end, then closed up when they think they have sufficient, made intoxicated [as is usually done near to the Sea Coast about Five Islands] by [the bark of the Willow Tree which] they throw into the place, [by this they are made intoxicated] which I suppose bring them to the top they [the natives] then get into the water and thrown them out.*

There is suitable stone for making implements across the Albury region. Quartz is the most common raw material type used for stone tool making recovered from archaeological sites within the region. Hornfels ground axes have been found in the area, however an absence of this material within the immediate Albury region indicates that it was likely traded between Aboriginal groups.

3 Aboriginal context

3.1 Ethnohistory and contact history

Our knowledge of Aboriginal people and their land-use patterns and lifestyles prior to non-Aboriginal contact is mainly reliant on documents written by non-Aboriginal people. The inherent bias of the class and cultures of these authors necessarily affect such documents. They were also often describing a culture that they did not fully understand – a culture that was in a heightened state of disruption given the arrival of settlers and disease. Early written records can, however, be used in conjunction with archaeological information and surviving oral histories from members of the Aboriginal community in order to gain a picture of Aboriginal life in the region.

Aboriginal people within the Albury region identify with a number of traditional language groups. These groups include, among others, the *Jethi* and *Wiradjuri*. The study area and surrounding landscape is situated within the southern portion of what is now commonly accepted as traditional lands of the Wiradjuri. The area covered by the Wiradjuri encompasses a large portion of southern and central NSW, including the area surrounding much of the Murrumbidgee and Lachlan rivers, and north to Dubbo. The majority of the groups contained between 10 and 50 people, but could contain up to 100, with families sleeping in lean-tos known as gunyahs, which could take a variety of forms.

This is not to say, however, that heritage custodianship belongs exclusively to any single named group. While this may be of the utmost importance in some community contexts and some processes (such as Native Title), it can be disruptive in a heritage management process.

Early documentation of Aboriginal occupation of the Albury area is sparse, with explorers such as Hume and Hovell noting that the local population around Albury was dense and well resourced, but not providing a great deal of information beyond that (Andrews 1912, pp.1–6). The original inhabitants of the area are identified by Tindale (1974) as the Jethi people, whose area lay on the north side of the Murray from west of Tocumwal to near Howlong. Tindale states that the group once extended further east, but were displaced by the Wiradjuri during the early days of settlement. Kelly and Price (2004) state that the majority of the current Aboriginal community accept the Wiradjuri people as the traditional owners in the area.

Aboriginal communities have traditionally formed connections through shared language, geography and kinship, as well as through trade and other social ties (Brown & Wall 2017). This was largely true of most Aboriginal communities and remains so for the Aboriginal people of Albury. By fixing on any one single language group, tribe or clan name, there may be a loss of focus on the contemporary Aboriginal community (Brown & Wall 2017).

According to (Brown & Wall 2017):

> *There are, for example, key elements within the community that have strong historical association but not direct traditional owner ancestry. There are also Wiradjuri people who consider the area to be part of their large language group / tribal territory within which they have valuable custodians' roles in the Aboriginal cultural heritage management process, but whose own family ties may be more specifically associated with places to the north.*

Research conducted to the north of the study area near Wagga Wagga suggests that after the arrival of Europeans in the area, many of the local groups in the area maintained a pragmatic relationship with the local landholders and station owners, with one station owner reporting that at any one time, he had up to 20 Aboriginal people employed on his property (Montgomery 2011, p.8). Early European settlers were said to adopt Indigenous bushcraft in order to secure their own survival. One of the first settlers in the Albury area, William Wyse, set up his camp close to the Aboriginal camp at Mungabareena for such purposes

(Spennemann 2015). Trading was established between Europeans and Aboriginal people, with the Indigenous people often providing their boating skills and knowledge of the local watercourses. Bark canoes were noted as being made on demand. The first formal punt across the Murray was ran by an Aboriginal man by the name of Merriman.

Joseph Hawdon (1952, p.8) notes in his 1838 descriptions of an overland journey from Sydney to Adelaide that he met three Aboriginal males near *Oolong*, now Howlong, headed in the direction of Albury:

> *Mr. Weatherall left me on his return to the Oolong in company with a gentleman bound for Sydney. With the men in charge of the cart there came up three blacks, an old man and his two sons, the latter about 14 years of age. It appeared that about twelve months ago they had followed some gentlemen travelling with some stock to the Port Phillip district, with whom they had been subsequently residing. The old man was now returning to his home on the River Hume, for the purpose of getting his boys inducted into manhood, according to the general custom of the New Hollanders, by the knocking-out of one of his front teeth, a grand corroboree being shortly to be held in that part of the country.*

It has however been noted that initial contact between Aboriginal people and European settlers in the Albury region was characterised by a period of fierce resistance (Kelly & Price 2004, p.22). This is unsurprising, given that European squatters were beginning to occupy Murray River frontages occupied and utilised by Aboriginal groups. In the lower Ovens, squatters had been forced to abandon lands between 1836 and 1838 due to the hostility (Andrews, 1912, pp. 51,74). A police camp was established at Albury in 1838 to 'protect' European settlers from Aboriginal people. Lady Franklin, who camped briefly at Albury in 1839 recorded in her diary that a family of Aboriginal people, including a man known as *Joe*, his wife and daughter, had become *attached* to the police station at Albury (Jones 1991, p.19). This family, she notes, performed menial tasks for Albury police officers in return for *food of poor quality* (Spennemann 2015).

In 1844 it was noted that around 100 Aboriginal people were present in Albury. George Augustus Robinson counted 50 huts and 250 individuals when he passed through Albury in September 1844. The population of Aboriginal people quickly declined in the following ten years as a result of settler violence, introduced disease and dispossession due to European farming and gold extraction practices. By 1854 the decline in population was so obvious that it was remarked by Reverend Henry Elliott that "*...from Albury and its immediate neighbourhood, too, the blacks have for a considerable time past almost entirely disappeared...* " (Spennemann 2015). Many people had moved to Lake Urana with only a few campsites present on the flood plain towards Wodonga. One of these camps possibly existed at Mungabareena, near the Murray River Ford, five kilometres east of the current study area, which was described in the late 1860s as a '*camp generally occupied*' (Andrews 1912, p.35).

According to the Aboriginal Place gazettal (New South Wales, 2016):

It was the site of a 19th century campsite and ceremonial ground, and was traditionally called Mungabareena, which was translated from Wiradjuri in 1845 as follows: mun—something very (or abnormally) large; gabba—very tall talk; reena—favourable surroundings. Today, the word 'Mungabareena' is translated to mean 'place of plenty talk'. Indigenous people from the surrounding areas traditionally met near Mungabareena prior to crossing the river and travelling to the Alps to collect Bogong Moths in the summer. The natural resources available to the Wiradjuri included the Bogong moth, possum, fish, kangaroos, reptiles, fruit, nuts and seeds, tubers and various birds. Wiradjuri Elders value Mungabareena as a place where business and meetings with neighbours took place, stories were shared and ceremonies and trade occurred.

Around 1865, it is noted that there was a sudden drop in the Aboriginal population surrounding Wagga Wagga as evidenced by decreasing numbers of people attending blanket distributions. A similar trend is noted in the Albury area, with Smith and Upcher (1992, p.9) noting that Aboriginal people living in the Albury area continued living a traditional life into the 1860s, albeit in decreasing numbers. There may however, have been a more significant population of Aboriginal people in Albury than officially noted as it was deemed necessary to present one of the elders, known as *King Bungambrawartha*, a brass breastplate marking

recognition by European authorities in the area. By 1882 only one Aboriginal person was recorded as a resident in Albury (Spennemann 2015).

3.2 Land use history

Albury was first described by Europeans (Walker 1838) in 1838 as:

Generally undulating open forest, tolerably grassed, but not seemingly so sound as is desirable. On the banks of the [Murray ed.] river are swampy flats of rich soil, covered with reeds and reedy grass, but apparently often flooded and ill-drained. Behind these flats, lagoons are frequently met with. Beside these, are forest flats of inferior soils, with less herbage.

The impact of European occupation has occurred within the Albury region following settlement in the early 1830s as a series of livestock runs (NPWS 1991) has been extensive. Agricultural practices began upon settlement, and include grazing, tree clearing, land tillage associated with pasture improvement and general farming. Settlement in the Albury area was minimal until the 1850s when Albury and Wodonga became important river ports. A parish map from 1889 (Photo 2) shows the study area encompassing two lots under separate lease or ownership by Harry Ringwood and James Kesting.



Photo 2 1889 Parish map of Albury, County of Goulburn (study area in red) (Source: HLRV)

Oddies Creek, south of the study area, was cultivated as a market garden by Chinese settlers in the mid-to-late nineteenth century and was named Oddies Creek between 1886 and 1890, after the owners of the Turk's Head Hotel on Wodonga Place, adjacent south east of the study area (Livsey 1986). Oddies Creek Park

became a shipyard in 1885 when the Upper Murray Steamship Company constructed a 25.2 metre steamship on the site (the *Cumberoona*).

More significant development took place across the Albury region after the construction of the Melbourne-Wodonga and Albury-Sydney rail lines in the 1870s and again between 1919 and 1936 following the construction of the Hume Dam. The building of the Hume Dam in 1932 would also have affected riparian environmental conditions, hastening natural erosion processes along the river's banks(Herring et al. 2003).

The study area was cultivated as a market garden by Chinese settlers in the mid to late nineteenth century and was named Oddies Creek between 1886 and 1890, after the owners of the Turk's Head Hotel on Wodonga Place within eastern portion of the study area (Livsey, 1986).

In the early 1920s, the Council of the City of Albury (Albury Council) began purchasing and resumption (acquisition) of lots within the study area. Prior to the 1920s, both Harry Ringwood and James Keating subdivided and sold their land to multiple parties. Two lots were acquired by the Albury Council through notice of resumption. Lot 2 DP 1182825 was relinquished from James Thomas Robinson in 1925, and Lot 1 DP 1094181 was relinquished from Roy Robinson in 1941. Keating sold a portion of his land to William Matchell Carey (Lot 2, Lot 3, Lot 9 DP 1087117), Annie Evelyn Sharo (Lot 6, Lot 7, Lot 8 DP 1087117), and Peter Bertram Seaton (Lot 4 DP 1087117) after 1889, who all later sold the land to Albury Council during 1949/50,1958, and 1965 respectively. The remaining lots were acquired by council prior to 1979, as shown in the 1979 Charting Map (Photo 3) where the study area lots have been incorporated with the surrounding land for the Hume Highway adjacent east, and the Albury Railway Station and railway tracks north east of the study area.

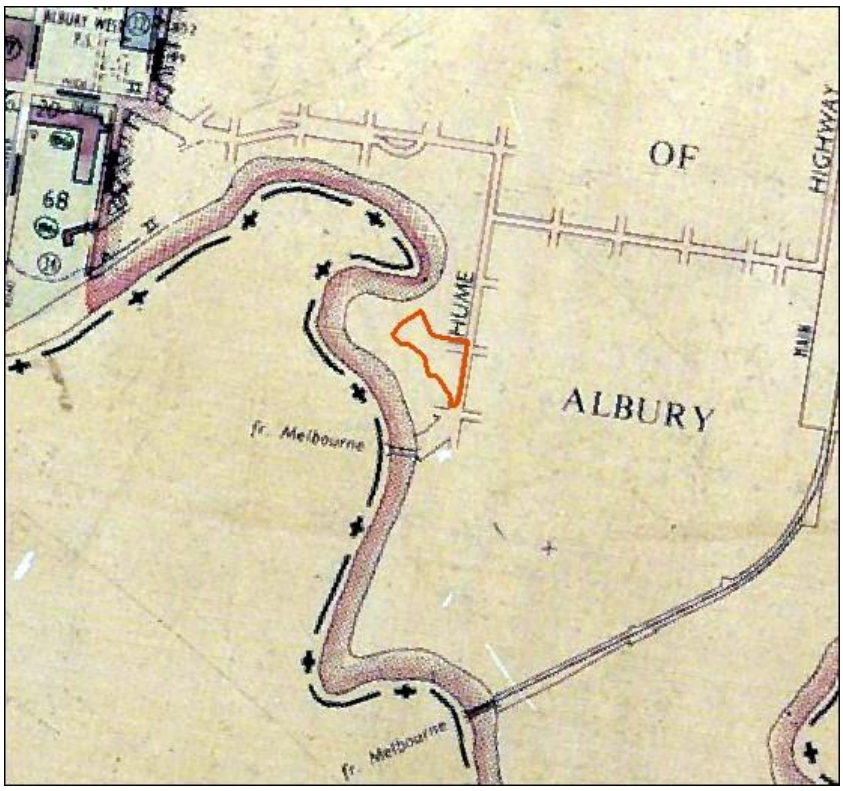

Photo 3 1979 Regional Charting Map – Parish of Albury, County of Goulburn (study area in red) (Source: HLRV)

Historical aerial imagery of the study area from 1961 (Photo 4) shows extensive development on the eastern side of the study area. The eastern side shows evidence of extensive construction of industrial buildings. A dirt road is present in the north portion of the study area, running from Wodonga Place to the north western boundary of the study area. The study area shows evidence of vegetation clearing with a few material trees remaining on the creek line, majority to the southern section of the study area.



Photo 4 1961 historical aerial imagery of the study area (study area in red) (Source: NSW Historical Imagery)

The aerial imagery from 1975 (Photo 5) show the road in the northern portion of the study area has been asphalted and straightened. Vegetation around the creek line alone the western boundary has increased, and mature trees have appeared in the eastern portion of the study area. The buildings in the eastern portion have been demolished and only two large structures remain, with the rest of the area landscaped. A structure is also present within the northern most portion.

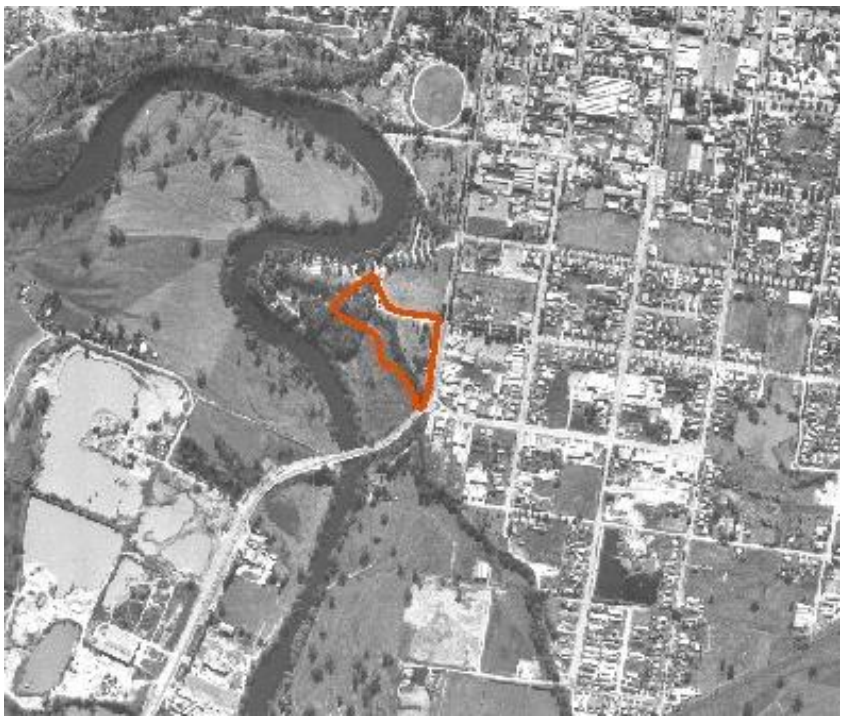

Photo 5 1975 historical aerial imagery of the study area (study area in red) (Source: NSW Historical Imagery)

An aerial image dated to 1990 (Photo 6) shows that the study area has increased vegetation through its extent. Additional structures are present in the northern portion of the study area and pathways can be seen within the west.



Photo 6 1991 historical aerial imagery of the study area (study area in red) (Source: NSW Historical Imagery)

3.3 Regional context

The majority of archaeological investigations in the Albury region have been undertaken as a result of residential, industrial or other infrastructure developments. Previous archaeological studies in the Albury region indicate that modified or scarred trees are the most common Aboriginal sites. There are also a significant number of isolated stone artefacts and small to medium sized artefact scatters. The majority of these archaeological sites are recorded near permanent or semi- permanent watercourses, on elevated, well-drained land (O'Halloran 2008, p.35).

Witter (1976) completed an archaeological survey of the Thurgoona region, approximately 7 kilometres north east of the current study area, which records quartz lithic scatters and faunal material associated with food preparation and consumption. Witter concluded that the Thurgoona area was likely visited periodically on a seasonal basis. The majority of artefacts were located in areas where food was prepared and cooked. Artefacts were utilitarian, made as required from local materials and then discarded before wear became evident. Debitage was dominated by quartz, which formed 99 per cent of all artefacts which consisted of primarily amorphous, block fractured materials (Witter 1976, p.64). Witter concluded that the evidence from sites investigated within the Thurgoona area was not sufficiently intense or varied enough to classify them as more than transitory camp sites.

McIntyre (1977) undertook an archaeological survey of the Australian Newsprint Mills site at Albury-Wodonga, approximately 9.9 kilometres north east of the current study area. McIntyre stated that emus, kangaroos, wallabies, and smaller marsupials would have been present in the area, as well as crayfish along Eight Mile Creek.

The survey targeted areas adjacent to higher order water courses, and areas of exposed ground. Lowest priority was assigned to steep slopes within the survey unit. It was noted that the groundcover hampered

survey efforts, with exposures identified only in cattle tracks plough lines, and creek banks. The survey identified a total of five sites, including one scarred tree with a scar measuring 2.3 by 0.5 metres, and five areas of charcoal or carbonaceous soil. These areas were locations where the soil profiles contained a high concentration of carbon or charcoal, evident in exposed soil profiles. McIntyre (1977) noted that these areas may have been indicative of Aboriginal activity, however they did not constitute Aboriginal sites.

Witter (1978) conducted an archaeological survey and limited test excavations to assess areas of future development near Albury and Wodonga. The areas surveyed included Thurgoona and Baranduda. The former area surveyed is located on the NSW side of the Murray River approximately 7 kilometres north east of the study area, and the latter is found on the Victorian side of the Murray River, approximately 10.5 kilometres to the south east of the study area. The Thurgoona survey recorded three lithic scatters, one of which consisted of two heavy ground stone artefacts associated with general light scatter. The other two sites were dominated by quartz debitage (99%). The Baranduda transect survey identified 12 Aboriginal sites and 62 isolated artefacts. Of these, nine sites were lithic scatters while three were scar tree sites. Of the lithic scatters, 95% were quartz debitage (Witter 1978, p.63).

Crosby (1979) conducted a survey of Aboriginal sites across the Albury region. This survey focused largely on the Thurgoona region, approximately 7 kilometres north east of the study area. The western boundary of the survey area was defined as east of Hume Highway and west of Wagga Road, while the northern boundary was Eight Mile Creek. A number of modified trees (scarred) were noted along the banks of the Murray River on raised terraces within 50 metres of the waterline. One volcanic cobble was also identified that was naturally pitted and possibly used as a hammer; however, this could not be definitively ascertained.

Kelly (2001) undertook monitoring of vegetation stripping for the residential subdivision of Thurgoona Park, 7 kilometres north east of the study area. Kelly's study area was located on an elevated landform adjacent the semi-permanent waterway, Eight Mile Creek. While the study area was located within the waterway's riparian and fluvial zone, an environment with significant potential to contain Aboriginal archaeological deposits, Kelly stated that the area did not appear to constitute alluvial or colluvial terracing (Kelly 2001, p.6). One quartz artefact, a rough blade of approximately three centimetres in length was identified during site investigations. The artefact was found in an area highly disturbed by prior agricultural practices, recreational use and construction activity.

During further monitoring of vegetation stripping, Kelly (2002) identified six Aboriginal artefacts during initial grading of a road surface at Thurgoona Park adjacent Woolshed Creek. A further thirty-five artefacts were identified during site investigations. These artefacts were observed to form 'clusters'(Kelly 2002, p.9). Thirty-four of these artefacts were identified as quartz debitage pieces, however particular note is given to a blue-grey chert artefact designated as Woolshed 9 (WS9). Kelly describes this artefact as a fine textured siliceous 'cherty' material of unknown origin, exhibiting a conchoidal fracture. Stone of this kind was unknown to the local area, however Kelly notes that three pieces of similar material had been identified within the Hume Basin. Kelly suggested that this artefact may 'represent evidence of extended transportation of high-grade stone resources into the Albury area (Kelly 2002, p.9).

Kelly and Price (2003) undertook further archaeological surface surveys of three proposed bridge areas on Woolshed and Eight Mile Creeks, Thurgoona, located approximately 8 kilometres north east of the study area. A total of five Aboriginal places were recorded as a result of the survey that included three pieces of quartz debitage, one quartz bipolar core and one flaked metasediment pebble. One previously recorded Aboriginal scarred tree was again located south of the proposed Lippsett Road bridge location.

Kelly et al. (2005) completed a preliminary archaeological investigation report for the NSW section of the Albury Wodonga Highway Project, located approximately 9.9 kilometres north east of the study area. The report describes the preliminary archaeological subsurface investigations for 11 sites of potential Aboriginal cultural heritage deposits to be impacted by the Albury Wodonga Highway project. The study area extended

from the northern bank of the Murray River at Albury to a point intersecting the existing Hume Highway near Maryvale, north of Albury. The sites were investigated using a combination of grader scrapes or test pit excavations to assess the presence of Aboriginal sites.

Of the 11 sites, Aboriginal cultural heritage material was identified at nine. The greatest number of artefacts (n=553) was recorded within an alluvial terrace landform. Of particular note were the artefacts recorded from depths between 80-100 centimetres. These were found in a fine sand context with thermoluminescence dating to 12,000 years BP +/-20%. This places the artefacts within the Holocene/Pleistocene date range which is four times older than previous dates obtained from other artefacts in the region. The artefacts collected were largely of quartz material and located within the upper 20 centimetres of pits. The investigation recommended further assessment in case of any alterations to the proposed highway development

Oliver Brown Consulting (2011a) completed a desktop assessment and site inspection for the rezoning of two lots, approximately 8.4 kilometres north east of the study area, at the junction of Hawkscote Road and the Riverina Highway. The study area comprised both floodplain and raised land adjacent the Murray River. The raised portion of the land was a mix of undulating and steep open country used for grazing. Two artefact sites (AHIMS# 61-1-0238/Thurgoona 1 and AHIMS# 61-1-0239/Thurgoona 2) were located during investigations. Thurgoona 1 was a River Red Gum which exhibited signs of cultural scarring. This scarred tree was located on a slope near a small spring that provided favourable hydrological conditions for this species. Thurgoona 2 consisted of six quartz flakes found in exposed soil. All artefacts measured between 5-17 millimetres in length. The study concluded that, while sites are commonly located within 200 metres of water, they may also occur within 500 metres of water, depending on amenity resource factors. The majority of these sites occur on level areas that are raised above floodplains and waterlogged land, such as level ridges, hills and terraces.

Biosis (2016a) conducted an Aboriginal Due Diligence Assessment (ADDA) for proposed creek crossings, a roundabout, water main and drainage works associated with the Nexus industrial estate, approximately 10.4 kilometres north east of the study area. They predicted that there was high potential for flaked stone artefact scatters and isolated artefacts and moderate potential for modified trees and PADs to be located in their study area. No Aboriginal sites or objects were identified. However, one area on Eight Mile Creek, was identified as having the potential to contain Aboriginal objects. Further archaeological work was recommended in the area.

Biosis (2016b) undertook an ADDA for the proposed Nexus industrial subdivision, approximately 10.4 kilometres north east of the study area. Three artefact scatters were identified during the survey (Nexus AS1 to 3). All three scatters were located in the disturbed, graded area along the partially constructed Knowles Road North. The topsoil had been removed to a depth of between 15 and 30 centimeters by recent earthworks. The scatters consisted of quartz and crystal quartz flakes, tools and cores. The areas east of Nexus AS1 and south of Nexus AS2 and 3 had been graded down to sterile clay. However, the less disturbed areas north and south of Nexus AS1 and north of Nexus AS2 and 3 have the potential to contain additional subsurface archaeological deposits. The survey identified four additional areas of archaeological potential. These areas represented high points in the landscape overlooking Eight Mile Creek and unnamed watercourses. The assessment recommended that an ACHA be conducted for the land north of and including Nexus AS1 to 3.

AECOM (2016) completed an ACHA to support an application for an AHIP for a proposed residential development comprising approximately 119 hectares of land within Lot 10 DP1139652 and Lot 11 DP1139652 west of Kerr Road, Thurgoona NSW. The site is located approximately 9.5 kilometres north east of the study area.

There were three previously registered Aboriginal sites within the AECOM study area: Woolshed Creek AR3 (AHIMS #61-1-0120), Woolshed Creek AR4 (AHIMS #61-1-0121) and Woolshed Creek AR5 (AHIMS #61-1-0122). All previously registered sites within the study area consisted of open artefact sites. The AECOM

archaeological survey and test excavation program identified six new Aboriginal sites, all of which were open campsites located on valley flats or on simple slopes. This indicates that terraces and landforms adjacent to creek lines were regarded as favourable sites and are the most likely to be archaeologically sensitive. The artefacts recovered were typical of the region and consisted mainly of quartz. As all Aboriginal sites within the study area were anticipated to be destroyed by the activity, it was recommended that an AHIP be submitted. Aboriginal sites TH-AS1-16 and TH-AS3-16 were of moderate significance and a salvage program was recommended prior to the commencement of proposed works. Surface collection of all new and previously identified artefact scatters and isolated artefacts was also recommended.

Biosis (2017) undertook an ACHA (including test excavations) of the proposed Nexus industrial subdivision 10.4 kilometres north east of the study area including the potential archaeological deposits that were previously identified by Biosis (2016a, 2016b). The archaeological assessment identified eight Aboriginal sites, Nexus AS1 to 8 (AHIMS 55-6-0103 to 0109 and 60-3-0121).

None of the test pits excavated show a notably high density of artefacts, with the highest densities being in test pits 30 and 34, containing four and seven artefacts, respectively. The remainder of artefact bearing pits contained one to three artefacts each.

The majority of the artefacts identified in the study area were located within small rises in the undulating foot slopes landform. Only three artefacts were identified in the creek bank/terrace landform. This suggests that the small rises in the undulating foot slopes landform were more heavily occupied by Aboriginal people, however the relatively low density of the sites identified would suggest that this occupation was sporadic, and that the area was not frequently used or occupied for long periods.

3.4 Local context

A large number of Aboriginal cultural heritage investigations have been conducted within a 5 kilometre radius of the study area. Most of these investigations were undertaken as part of development applications and included surface and sub-surface investigations. Those discussed below are significant to the current study area as they are either in near vicinity of the current study area, contain excavations undertaken on similar sites in Albury with a long history of development and redevelopment, or contribute to knowledge concerning Aboriginal archaeological materials. These investigations are summarised below in date order.

Paton (1994) completed an archaeological assessment for a proposed sewage treatment centre at Nursery Valley, West Albury, located approximately 4.5 kilometres north-west of the study area. The study area is located in a basin catchment landform overlooking the Murray River flood plain. Based on background research, the most common site type was identified to be artefact likely of quartz, silcrete and fine-grained volcanic material, followed by scarred trees. Paton undertook a survey and test excavations. A total of 107 test pits were excavated, with 30 located within the Nursery Valley area, and 77 on the Murray floodplain. Paton identified 84 stone artefacts which consisted of largely quartz and silcrete flakes and cores. These artefacts were found in both surface and subsurface contexts, with those subsurface artefacts excavated from pits located on the terraces of the Murray River's floodplain. No artefacts were identified on the floodplain itself.

Brooke and Jacobs (2009) conducted subsurface testing for Noreuil and Oddies Parks, encompassing the study area, for upgrades to the Oddies Creek car parking facilities and the creation of an adventure play-space. One PAD, a gently sloped area of the Oddies Creek Park (AHIMS 60-3-0111) previously identified by O'Halloran(2008) to the immediate west of the current study area was subsequently deemed as a non-site. Subsurface testing consisted of manual excavation of 50 x 50 centimetres test-pits, using transects or grids as the basis for the sampling on either side of the creekline. No archaeological deposits of Aboriginal cultural heritage material were found. It was concluded that it was unlikely that any unidentified Aboriginal cultural

heritage material would be present in the study area. It was recommended that no further archaeological work was required prior to the construction of the play area and wetland, including the widening of Oddies Creek in the existing Oddies Creek Car Park.

Attwood (2012) completed a cultural heritage assessment on behalf of Albury City Council and the Murray Catchment Management Authority for construction works associated with the redevelopment of the Murray River Trail as part of the Wagirra Trail Mungabareena Reserve Project, 4.2 kilometres east of the study area. Attwood concluded that modified (scarred) trees, specifically River Red Gum, and open camp sites would be the most likely Aboriginal sites within the study area. However due to historic land clearance and the location of the study area on a floodplain, Attwood declared the area of low archaeological potential. No Aboriginal cultural heritage items were identified during survey and no PADs were identified. Two potential scarred trees were identified but later dismissed, one as a natural phenomenon and one as exhibiting contemporary scarring and not culturally significant.

Edwards and Aitchison(2018) prepared an Aboriginal cultural heritage due diligence assessment for Mungabareena Place, 3.6 kilometres east of the study area. Their study area was located in lightly wooded and partially cleared wetlands and river terraces, primarily on the lower terraces of the Murray River floodplain. Thirteen Aboriginal sites were identified in the study area including two ring trees, two carved trees, three cooking ovens, five hollow trees and a circle of painted rocks. A number of these sites (AHIMS ID 60-3-0122, 60-3-0123, 60-3-0124, 60-3-0125, 60-3-0126, 60-3-0127, 60-3-0128 and 60-3-0129) were identified within five kilometres of the current study area. Three of these sites were modified trees (scarred and ring trees) and three were hollow trees with cultural significance for local Aboriginal people. There was also one PAD recorded. An Aboriginal Place management plan is currently under preparation for these sites.

Biosis (2019) conducted an ADDA within the eastern portion of the study area. Background research identified that the study area was located within a flood plain and previous assessments including the testing two previously recorded nearby PAD sites identified nil to low archaeological potential. An archaeological survey also identified extensive disturbance had occurred throughout the study area due to clearance, cultivation, installation of buildings, roads, footpaths and other infrastructure. This disturbance and the location of the study area within a flood plain was used to determine low archaeological potential. No further assessment was recommended.

3.5 Aboriginal archaeological sites

An extensive search of the AHIMS database was conducted on 23 September 2021 (Client service ID: 624961). The search identified 86 Aboriginal archaeological sites within a 7.5 kilometre search area, centred on the proposed study area (Table 4). None of these registered sites are located *within* the study area, with two sites located within 200 metres of the study area (Figure 7). The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available. These descriptions and maps were relied where notable discrepancies occurred.

It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area. Some recorded sites consist of more than one element, for example artefacts and a modified tree, however for the purposes of this breakdown and the predictive modelling, all individual site types will be studied and compared. This explains why there are 88 results presented here, compared to the 86 sites identified in AHIMS.

Table 4 AHIMS sites within the study area

Site type	Occurrences	Frequency (%)
Artefact	55	63%
Modified Tree	15	17%
PAD	10	11%
Aboriginal Ceremony and Dreaming	8	9%
Total	**88**	**100%**

A simple analysis of the Aboriginal cultural heritage sites registered within 7.5km of the study area indicates that the dominant site type is artefact, representing 63% (n=55), with Modified Tree representing 17 (n=15). PAD was represented by 11% each (n=10) and Aboriginal Ceremony and Dreaming was represented by 9& (n=8).

Two AHIMS sites are located within 200 metres of the study area, and discussed below:

AHIMS 60-3-0110/ Noreuil Foreshore Park

Noreuil Foreshore Park site is a PAD site located on a Terrace Flat Plain Landform, located approximately 1 metre from fresh water. The site is located 143 metres west of the study area, and immediately north of Oddies Creek Park. The PAD site was measured to a total length of 300 metres and 200 metres wide and identified as moderate archaeological sensitivity. An Aboriginal Site Impact Recording Form (ASIRF) was completed for the area from an approved AHIP in 2009 and undertook subsurface testing. A total of 11 test pits were excavated. No Aboriginal cultural heritage material was found during testing, attributed to the high degree of disturbance and landscape modification that has occurred in the area. The ASIRF notes the site is no longer considered a PAD site based on the results of the subsurface testing.

AHIMS 60-3-0111/ Oddies Creek Park

Oddies Creek Park is a PAD site located on a Terrace Flat Plain Landform, located approximately 1 metre from fresh water. The site is located adjacent south of the study area. The PAD site was measured to a total length of 450 metres and 150 metres wide and identified as moderate to high archaeological sensitivity. An ASIRF was completed for the area from an approved AHIP in 2009 and undertook subsurface testing. Subsurface testing was not undertaken along the north of Oddies Creek, due to the steep gradient, and was not safe for excavation. A total of 20 test pits were excavated, and no aboriginal cultural heritage material was found during testing. The site showed evidence of introduced fill in surveys and subsurface testing. The ASIRF notes the site is no longer considered a PAD site based on the results of the subsurface testing.

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60-3-0042
60-3-0045
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60-3-0038
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60-3-0126
60-3-0014
60-3-0152
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60-3-0123
60-3-0124
60-3-0130
60-3-0122
60-3-0132
60-3-0131
60-3-0125
60-3-0058
60-3-0075
60-3-0074
60-3-0073
60-3-0072
60-3-0104
60-3-0071
HUME HIGHWAY
WAGGA ROAD
RIVERINA HIGHWAY
ALBURY
PADMAN DRIVE
MATE STREET
Jindera
Albury
Wodonga
Bellbridge
Tallangatta
Legend
Study area
AHIMS
NOT TO BE MADE PUBLIC
Figure 7 AHIMS within the vicinity of the study area
0 500 1,000 1,500
Metres
Scale: 1:45,000@ A3
Coordinate System:
GDA 1994 MGA Zone 55
N
biosis
Matter: 35886, Date: 05 October 2021,
Drawn by: JPT, Checked by: KMF, Last edited by: jturner
Location: P:\35800s\35886\Mapping\
35886_ADDA, Layout: 35886_ADDA_F7_AHIMS
Acknowledgements: LPIMap: © Department of Finance, Services & Innovation 2018

3.6 Summary

3.6.1 Predictive statements

A series of statements been formulated to broadly predict the type and character of Aboriginal cultural heritage sites likely to exist throughout the study area and where they are more likely to be located.

This model is based on:

- Local and regional site distribution in relation to landform features identified within the study area.
- Consideration of site type, raw material types and site densities likely to be present within the study area.
- Findings of the ethnohistorical research on the potential for material traces to present within the study area.
- Potential Aboriginal use of natural resources present or once present within the study area.
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding region.

Based on this information, a predictive model has been developed, indicating the site types most likely to be encountered during the survey and subsequent sub-surface investigations across the present study area (Table 5). The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

Table 5 Aboriginal site prediction statements

Site type	Site description	Potential
Flaked stone artefact scatters and isolated artefacts	Artefact scatter sites can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds.	Moderate: Stone artefact sites have been previously recorded in the region on level, well-drained topographies in close proximity to reliable sources of fresh water. Due to the location of the study area within a flood plain landform, the potential for artefacts to be present is assessed as moderate.
Potential Archaeological Deposits (PADs)	Potential sub surface deposits of cultural material.	Moderate: PADs have been previously recorded in the region across a wide range of landforms. PADs are likely to be present within areas adjacent to water courses or on high points in undisturbed landforms.
Modified trees	Trees with cultural modifications	Moderate: Scarred trees are the second common site type within the vicinity of the study area. Due to extensive vegetation clearance, only a small number of mature native trees have survived within western and south-western section of the study area.
Aboriginal Ceremony and Dreaming sites	Such sites are often intangible places and features and are identified through oral histories, ethnohistoric data, or Aboriginal informants.	Moderate to Low: There are Aboriginal ceremony and Dreaming site recorded within the region.

Site type	Site description	Potential
Shell middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	Moderate: Shell midden sites have not been recorded within the vicinity of the study area. Despite this, the study area is located within close proximity to the Murray River and contains Oddies Creek which both would support shellfish species. Therefore the study area has been assessed to have moderate potential for shell.
Post-contact sites	These are sites relating to the shared history of Aboriginal and non-Aboriginal people of an area and may include places such as missions, massacre sites, post-contact camp sites and buildings associated with post-contact Aboriginal use.	Low: There are no post-contact sites previously recorded in the study area and historical sources do not identify one.
Aboriginal places	Aboriginal places may not contain any 'archaeological' indicators of a site, but are nonetheless important to Aboriginal people. They may be places of cultural, spiritual or historic significance. Often they are places tied to community history and may include natural features (such as swimming and fishing holes), places where Aboriginal political events commenced or particular buildings.	Low: There are currently no recorded Aboriginal historical associations for the study area.
Grinding grooves	Grooves created in stone platforms through ground stone tool manufacture.	Low: Suitable horizontal sandstone rock outcrops could occur along drainage lines.
Quarries	Raw stone material procurement sites.	Nil: There is no record of any quarries being within or surrounding the study area.
Burials	Aboriginal burial sites.	Nil: Aboriginal burial sites are generally situated within deep, soft sediments, caves or hollow trees. Areas of deep sandy deposits will have the potential for Aboriginal burials. The soil profiles associated with the study area are not commonly associated with burials.
Rock shelters with art and / or deposit	Rock shelter sites include rock overhangs, shelters or caves, and generally occur on, or next to, moderate to steeply sloping ground characterised by cliff lines and escarpments. These naturally formed features may contain rock art, stone artefacts or midden deposits and may also be associated with grinding grooves.	Nil: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which are not present within the study area.

4 Archaeological investigation

An archaeological investigation of the study area was undertaken on 14 October 2021 by Biosis Archaeologist Madeleine Lucas, and RAP, Andom Rendell, representative of Albury and District LALC and Yalmambirra, Wiradjuri Elder. The survey sampling strategy, methodology and a discussion of results are provided below.

4.1 Archaeological survey aims

The principle aims of the survey were to:

- Undertake a systematic survey of the study area targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of Aboriginal archaeological and cultural sensitivity.

4.2 Survey methods

The survey was conducted on foot. Recording during the survey followed the archaeological survey requirements of the code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially have been exploited by Aboriginal people.
- Landform elements, distinguishable areas of land approximately 40m across or with a 20m radius (CSIRO 2009).
- Photographs of the site indicating landform.
- Ground surface visibility (GSV) and areas of exposure.
- Observable past or present disturbances to the landscape from human or animal activities.
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

Where possible, the identification of natural soil deposits within the study area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, GSV and the recording of soil information for each survey unit were possible. Any potential Aboriginal objects observed during the survey were documented and photographed. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements were recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

4.3 Constraints to the survey

With any archaeological survey there are several factors that influence the effectiveness (the likelihood of finding sites) of the survey. The factors that contributed most to the effectiveness of the survey within the study area were extensive grass coverage and areas of disturbance limiting GSV.

4.4 Visibility

In most archaeological reports and guidelines visibility refers to GSV, and is usually a percentage estimate of the ground surface that is visible and allowing for the detection of (usually stone) artefacts that may be present on the ground surface (DECCW 2010b). GSV across the study area was typically adequate (20%), with grass coverage obscuring much of the ground surface; however, the grass was short and well maintained in most areas (Photo 7). Areas of reduced visibility were also associated with developed areas covering the grounds surface with asphalt, concrete and buildings (Photo 8 and Photo 9). Greater visibility was seen in areas of patchy grass and in gravelled places such as carparks and paths (Photo 8 and Photo 10).



Photo 7 Extensive grass coverage limiting GSV within the southern portion of the study area



Photo 8 **Area of greater GSV in patchy grass, lower GSV in background associated with development in the eastern portion of the study area**



Photo 9 **Road area with low GSV in the northern portion fo the study area**



Photo 10 Gravelled carpark area with greater GSV within the western portion of the study area

4.5 Exposure

Exposure refers to the geomorphic conditions of the local landform being surveyed, and attempts to describe the relationship between those conditions and the likelihood the prevailing conditions provide for the exposure of (buried) archaeological materials. Whilst also usually expressed as a percentage estimate, exposure is different to visibility in that it is in part a summation of geomorphic processes, rather than a simple observation of the ground surface (Burke & Smith 2004, p.79, DECCW 2010b). Overall, the study area displayed areas of exposure around areas of patchy grass (Photo 8 and Photo 11), areas with ground surface disturbance (Photo 12) and gravelled pathways and carparks (Photo 10 and Photo 13).



Photo 11 Area of exposure within patchy grass within the western portion of the study area



Photo 12 Exposure in area of disturbance within the central portion of the study area



Photo 13 High exposure along gravelled path within the central portion of the study area

4.6 Disturbances

Disturbance in the study area is associated with natural and human agents. Natural agents generally affect small areas and include the burrowing and scratching in soil by animals, such as wombats, foxes, rabbits and wallabies, and sometimes exposure from slumping or scouring. Disturbances associated with recent human action can include residential development such as landscaping and construction of residential buildings; farming practices, such as initial vegetation clearance for creation of paddocks, fencing and stock grazing; agricultural practices such as fruit orchards; light industrial practices such as nursery and creation of artificial dams throughout the entire study area.

Natural disturbances within the study area would have previously occurred through flooding events, given the location of the study area within the Murray River flood plain landform. These events would have caused movement and deposition of soil deposits within the study area disturbing archaeological remains.

A number of disturbances caused by human agents were present throughout the study area. These include underground services (Photo 14), the development of a number of buildings within the eastern and northern portions of the study area (Photo 15, Photo 16 and Photo 17) within artificially built up land, a number of park services such as barbeque areas, park benches (Photo 18 and Photo 19). A number of levee banks have been constructed within the eastern portion of the study area, which would have caused considerable disturbance through earthworks and imported fill (Photo 8, Photo 16, Photo 20 and Photo 21). Some of these levee banks are also used as pathways (Photo 21). A bridge has also been constructed from the asphalted road in the north, across the creek within the western portion of the study area to a cleared, levelled and gravelled carpark with imported fill (Photo 10 and Photo 22). This would have also caused ground disturbances within the west.



Photo 14 Underground services within the study area



Photo 15 Concreted pathway and commercial development within the east



Photo 16 Levee bank and commercial building in the east



Photo 17 Football club house and toilet block on built up ground within the northern portion of the study area



Photo 18 Brick path, car park and barbeque area in the north east



Photo 19 Park bench within the eastern portion of the study area



Photo 20 Levee bank within the eastern portion of the study area



Photo 21 Built up pathway with imported fill within the central portion of the study area



Photo 22 Road and bridge to car park over creek within the central portion of the study area

4.7 Investigation results and discussion

The archaeological investigation consisted of a series of meandering transects were walked across the entire study area. The results of the field investigation have been summarised below and provided in Figure 8. The study area is situated on a bend of the Murray River, away from the river's edge but within a floodplain landform. A creek line also transects the eastern portion of the study area.

The survey coverage was limited by grass coverage and other developments such as buildings, roads and paths throughout the study area. Extensive clearance and disturbances related to the installation of buildings, roads, footpaths and other infrastructure were also identified. These include park facilities such as roads, bridges, car parking, paths, seating and barbeque areas, in addition to residential and commercial buildings in the east, and football club buildings in the north. Underground drainage and other services were also identified, in addition to the construction of levee banks throughout the eastern portion of the study area.

A review of historical records identified that the land had previously been used for cultivation by Chinese market gardens, in addition to extensive residential development occurring in the east. Land clearance and landscaping is visible within early aerials, in addition to the construction of roads and the football club house and services in the north, and the conversion of the land for parkland purposes.

A previous assessment of the parklands conducted by O'Halloran (2008) identified two PAD sites to the west of the study area within a gently sloped landform. Testing of these PAD sites by Brooke & Jacobs (2009) identified that they had no archaeological potential and the AHIMS sites were deemed non-sites. Biosis (2019) also conducted an ADDA within the study area, identifying low archaeological potential due to the location within a floodplain landform and the extensive disturbance within it.

The archaeological investigation of the study area did not identify any Aboriginal sites or areas of archaeological potential. The study area is located within a flood plain landform impacted by rises and falls of the Murray River displacing and soil deposits within. In addition to this impacts from historical and modern

development have occurred through the extent of the study area. Due to this, there is low potential for intact archaeological deposits to remain. Therefore the study area has been determined to contain low archaeological potential.



Figure 8 Survey effort and results

5 Conclusions and recommendations

5.1 Conclusions

Based on the results of the field investigation and background review, it is unlikely that the study area will still contain areas utilised by Aboriginal people for either occupation or resource gathering. Previous assessments of the study area and the immediate vicinity have identified no to low archaeological potential within the Oddies Creek/Australia Park area (Brooke & Jacobs 2009, Biosis 2019). The field investigation did not identify any Aboriginal sites or areas of archaeological potential. Extensive disturbance from landscaping, development and services identified in historical records and previous reports were also confirmed. This evidence indicates that intact archaeological deposits are unlikely to remain. Therefore, the study area was determined to contain low archaeological potential. This is also shown within the ADDA flow chart (Figure 9).

5.2 Recommendations

The following management recommendations have been developed relevant to the study area and influenced by:

- Predicted impacts to Aboriginal cultural heritage.
- The planning approvals framework.
- Current best conservation practise, widely considered to include:
  - Ethos of the Australia ICOMOS Burra Charter (2013).
  - The Code.

Prior to any impacts occurring within the study area, the following is recommended:

Recommendation 1: No further archaeological assessment is required

No further archaeological work is required in the study area due to the entire study area assessed as having low archaeological potential.

Recommendation 2: Discovery of Unanticipated Aboriginal Objects

All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the Heritage NSW. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the Heritage NSW and Aboriginal stakeholders.

Recommendation 3: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and Heritage NSW' Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.

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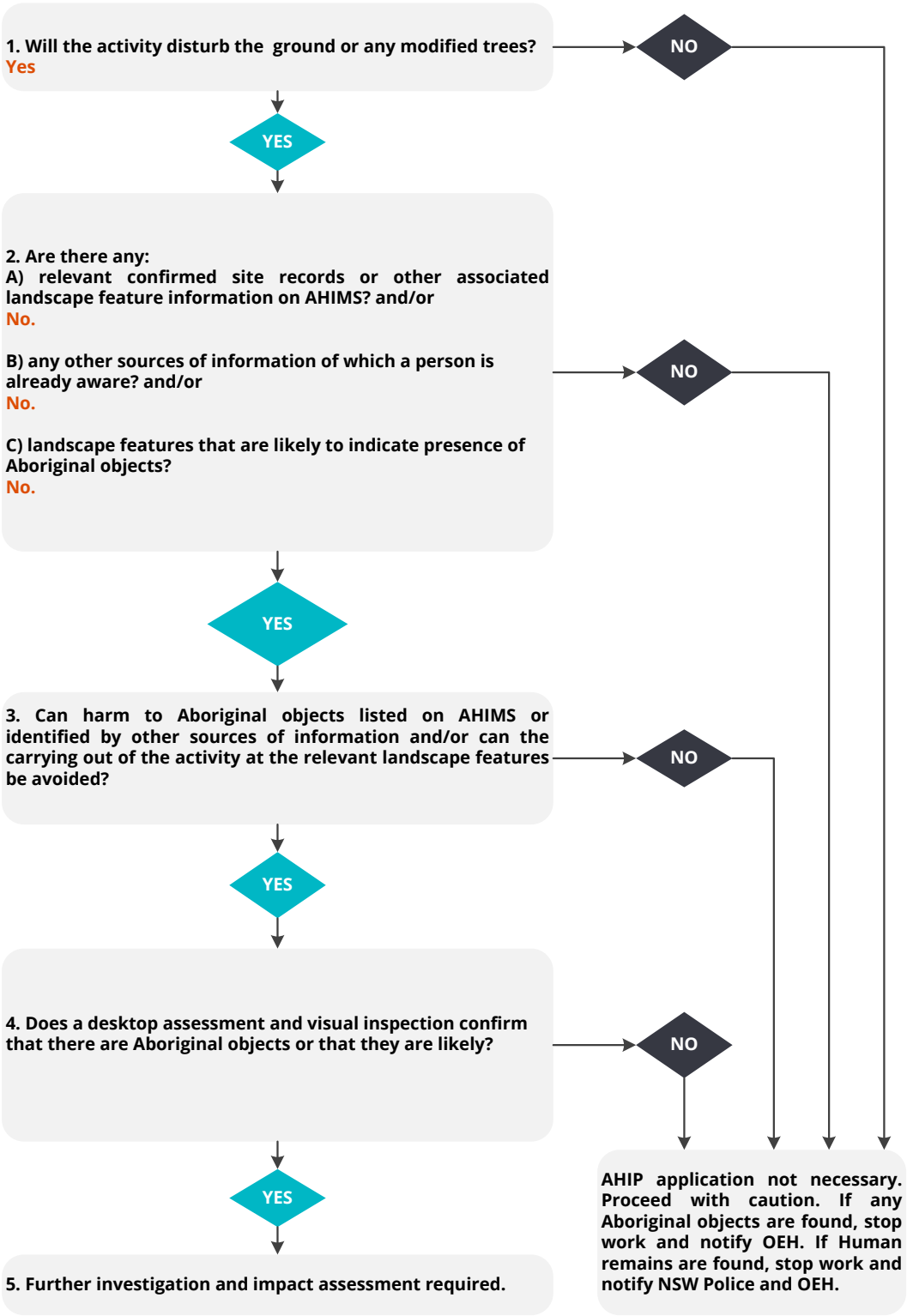
3. Not recommence work at that location unless authorised in writing by Heritage NSW.

Figure 9 Due diligence flow chart



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Appendices

Appendix 1 AHIMS search results

This Appendix is not to be made public.

Appendix F: Landscape plan

AUSTRALIA PARK

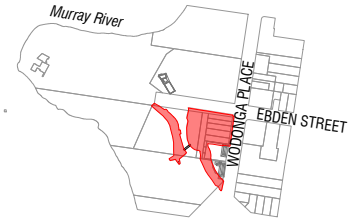
LANDSCAPE DESIGN

PROJECT NUMBER: 309707

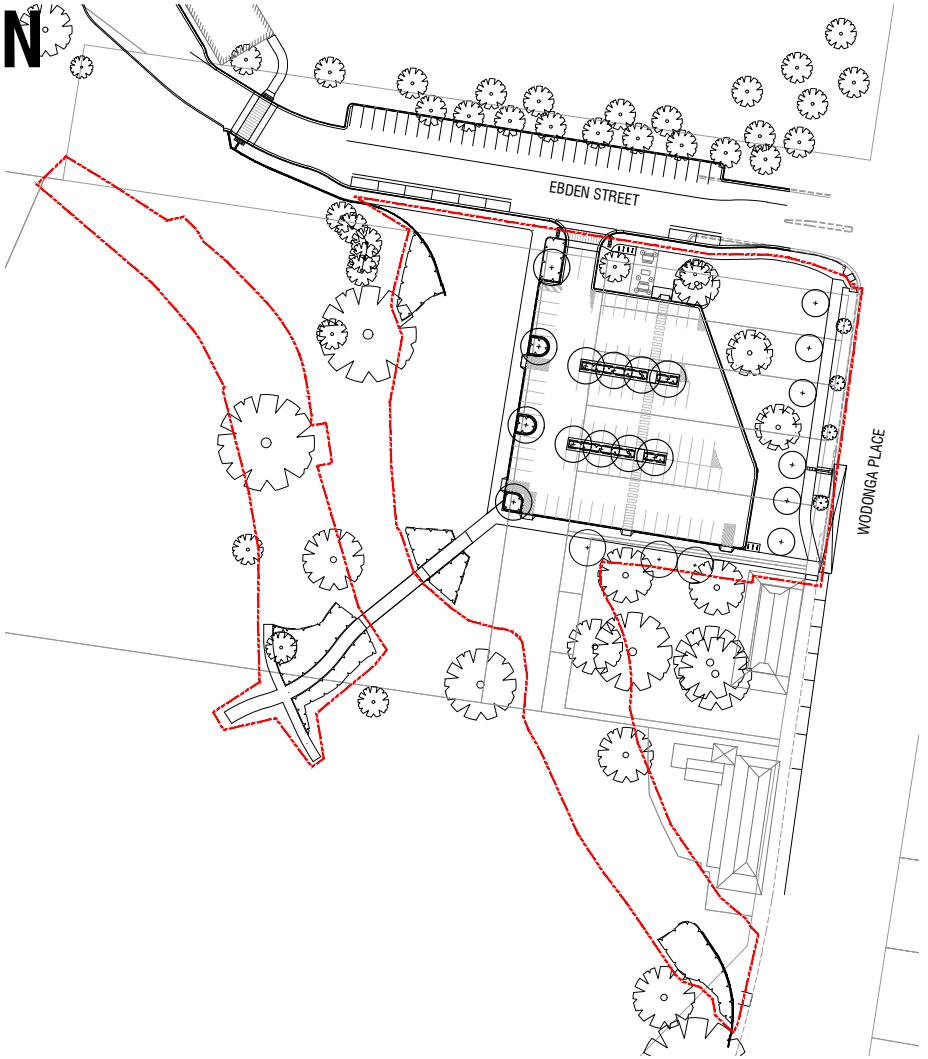
LANDSCAPE ARCHITECTURE DRAWINGS FOR ALBURY CITY COUNCIL

DRAWING SCHEDULE

DRAWING NO.	DESCRIPTION	SHEET NO.	REVISION
LD100	COVER - SHEET 1	1	F
LD200	SCHEDULES - SHEET 1	2	F
LD700	PLANTING PLANS - SHEET 1	3	F
LD701	PLANTING PLANS - SHEET 2	4	F
LD702	PLANTING PLANS - SHEET 3	5	C
LD703	PLANTING PLANS - SHEET 4	6	C
LD900	DETAILS - SHEET 1	7	E
LD901	DETAILS - SHEET 2	8	D
LD902	DETAILS - SHEET 3	9	B



1 **SITE LOCATION PLAN**
Scale 1:5000 @ A1



2 **EXTENT OF WORKS**
Scale 1:500 @ A1

GENERAL NOTES

1. Unless otherwise specified on the drawings all measurements, lengths, heights and distances to be determined from dimensions and NOT scaled off the drawings.
2. Before commencement of any works it is the responsibility of the Landscape Contractor to contact Dial Before You Dig 1100 (Fax 1300 652 077) for information on services in the area shown on the plan (www.dialbeforeyoudig.com.au)
3. The locations of underground services are approximate only and their exact position should be proven on site. No guarantee is given that all existing services are shown. The Contractor shall verify the location and depth of all services prior to commencing on site.
4. The Contractor must have a copy of Melbourne One Call/Services information and plans on site at all times.
5. The Contractor shall be liable for any damage to services during landscape works.
6. All trees shall be planted in locations shown on this plan, with setout to be approved on site by the Superintendent prior to planting.
7. Tree canopies are shown at 75% of mature diameter.
8. Any change in plant species must have the approval of the Superintendent.
9. Trees shall not be planted less than the following distances from existing elements, unless otherwise stated in the documentation:
   - Pedestrian pathways - 1.2m
   - Pedestrian pathways in reserve - 2.0m
   - Driveways and crossovers - 3.0m
   - Stormwater and sewerage pits - 2.0m
   - Intersections - 10.0m
   - Service crossings - 2.0m
   - Back of Kerb - 1.0m min.
   - Street lights and power poles - 4.0m
   - Service assets, incl. junction boxes, pits etc - 2.0m
   - Fire plugs - 3.0m
10. The Superintendent is to inspect trees supplied by the Contractor prior to planting.
11. The Principal will ensure that all property boundaries are to be pegged out by licensed surveyors prior to set out of landscape works.
12. All drawings 'For Construction' to be printed in colour.
13. **ALL TREE STOCK TO CONFORM TO AS 2303:2018; APPENDIX D.**

spiire

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PRELIMINARY

REV	DESCRIPTION	APP	DATE
F	ISSUED TO COUNCIL	SME	15/08/22
E	ISSUED TO COUNCIL	SME	12/07/22
D	ISSUED TO COUNCIL	SME	05/07/22
C	ISSUED TO COUNCIL	SME	08/06/22
B	ISSUED FOR APPROVAL	SME	02/12/21
A	FOR INFORMATION ONLY	SME	17/11/21

AUSTRALIA PARK
LANDSCAPE DESIGN
DETAILED DESIGN
COVER - SHEET 1
SHEET 1 OF 9
ALBURY CITY COUNCIL
ALBURY CITY COUNCIL

N
MGA 94 ZONE 1:500 SCALE @ A1 0 5 10 15 20 25

DESIGNED	DRAWN	CHECKED	APPROVED
ALBURYCITY	SME	LG	CME

DATE	DRG NO.	REV
17/11/2021	309707LD100	F

file name: 309707LD100.dwg layout name: LD100 plotted by: Simon Eakin
file location (option enabled/disabled): 309707 files\acad\LD plot date: 15/08/2022 5:00 PM Sheet 1 of 9 Sheets

TREE SCHEDULE

ALL TREE STOCK TO CONFORM TO AS 2303:2018, APPENDIX D. ALL TREE STOCK OF 45L TO HAVE A HEIGHT OF 1.5m - 2.0m AND CALIPER OF 25mm - 30mm UNLESS APPROVED IN WRITING BY THE SUPERINTENDENT

Install size: Min 1.8m tall, 45L Container

CODE	BOTANICAL NAME	COMMON NAME	MATURE SIZE (HxW)	QUANTITY
Ba	*Brachychiton acerifolius*	Illawarra flame tree	19 x 10	6
Cc	*Corymbia citriodora*	Lemon Scented Gum	20 x 10	12
			TOTAL TREES	**18**

GARDEN BED PLANTING MIX A - CAR PARK PLANTING							Garden Bed Number		A1	A2	A3	A4	A5	A6	A7	A8
Install size: Tubestock or 140mm pots (pending availability)							TOTAL Area/m²	143	43	14	14	14	22	7	22	7
BOTANICAL NAME	**CULTIVAR**	**COMMON NAME**	**MATURE SIZE (HxW)**	**CENTRES/SPACINGS**	**DENSITY m²**		**% DISTRIBUTION**	**TOTAL QTY**								
Chrysocephalum apiculatum		Common Everlsating	0.3 x 1.5	0.25	16		10%	227	69	22	22	22	35	11	35	11
Poa labillardierei	Eskdale'	Eskdale Tussock	0.8 x 0.4	0.5	4		40%	227	69	22	22	22	35	11	35	11
Lomandra longifolia	Katrinus'	Katrinus Mat-rush	1 x 0.7	0.6	3		40%	171	52	17	17	17	26	8	26	8
Myoporum parvifolium		Boobialla (Fine leaf form)	0.3 x 3	1	1		10%	13	4	1	1	1	2	1	2	1
						TOTAL	**100%**	638								

Planting Arrangement:
Plant the same species in clusters of 3, 5, 7 or 9 plants.
Larger growing species are to be planted at the back and/or middle of the garden bed.
Smaller growing species including grasses are to be planted to the front of larger growing species.
Groundcovers are to be planted in front of smaller growing species and along edges of garden beds.

GARDEN BED PLANTING MIX B - LEVEE BANK PLANTING							Garden Bed Number		B1	B2	B3	B4	B5	B6
Install size: Tubestock or 140mm pots (pending availability)							TOTAL Area/m²	607	60	51	130	97	156	113
BOTANICAL NAME	**CULTIVAR**	**COMMON NAME**	**MATURE SIZE (HxW)**	**CENTRES/SPACINGS**	**DENSITY m²**		**% DISTRIBUTION**	**TOTAL QTY**						
Carex appressa		Bidgee Widgee	1 - 2 x 1 - 2	0.6	3		10%	182	18	15	39	29	47	34
Ficinia nodosa		Knobby Club Rush	1 x 1	0.8	2		10%	92	9	8	20	15	23	17
Grevillea alpina		Cat's Claw Grevillea	0.2 - 2 x 0.5 - 1	0.5	4		10%	242	24	20	52	39	62	45
Lomandra longifolia		Spiny-headed Matt Rush	1 x 0.6	0.7	2		30%	365	36	31	78	58	94	68
Poa labillardierei		Common Tussock	0.8 x 1	0.6	3		30%	546	54	46	117	87	140	102
Myoporum parvifolium		Boobialla (Fine leaf form)	0.3 x 3	1	1		10%	61	6	5	13	10	16	11
						TOTAL	**100%**	1488						

Planting Arrangement:
Plant the same species in clusters of 3, 5, 7 or 9 plants.
Larger growing species are to be planted at the back and/or middle of the garden bed.
Smaller growing species including grasses are to be planted to the front of larger growing species.
Groundcovers are to be planted in front of smaller growing species and along edges of garden beds.

NOTES

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E	ISSUED TO COUNCIL	SME	12/07/22
D	ISSUED TO COUNCIL	SME	05/07/22
C	ISSUED TO COUNCIL	SME	08/06/22
B	ISSUED FOR APPROVAL	SME	02/12/21
A	FOR INFORMATION ONLY	SME	17/11/21

AUSTRALIA PARK
LANDSCAPE DESIGN
DETAILED DESIGN
SCHEDULES - SHEET 1
SHEET 2 OF 9
ALBURY CITY COUNCIL
ALBURY CITY COUNCIL

N
MGA 94 ZONE
1:250 SCALE @ A1
0 2.5 5 7.5 10 12.5

DESIGNED	DRAWN	CHECKED	APPROVED
ALBURYCITY	SME	LG	CME

DATE	DRG NO.	REV
17/11/2021	309707LD200	F

file name: 309701 LD200.dwg layout name: LD200 plotted by: Simon Eakin
file location: c:\plot_albury\albury 309707\309707 landscape\cad\ plot date: 17/08/2022 5:00 PM Sheet 2 of 9 Sheets



NOTES

1. Landscape Design prepared under the instruction of AlburyCity
2. Site layout design by AlburyCity
3. Tree layout, species and quantities shown on Landscape Plans as instructed by AlburyCity

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B	ISSUED FOR APPROVAL	SME	02/12/21
A	FOR INFORMATION ONLY	SME	17/11/21

AUSTRALIA PARK
LANDSCAPE DESIGN
DETAILED DESIGN
PLANTING PLANS - SHEET 1
SHEET 3 OF 9
ALBURY CITY COUNCIL
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MGA 94 ZONE
1:250 SCALE @ A1
0 2.5 5 7.5 10 12.5

DESIGNED	DRAWN	CHECKED	APPROVED
ALBURYCITY	SME	LG	CME

DATE	DRG NO.	REV
17/11/2021	309707LD700	F

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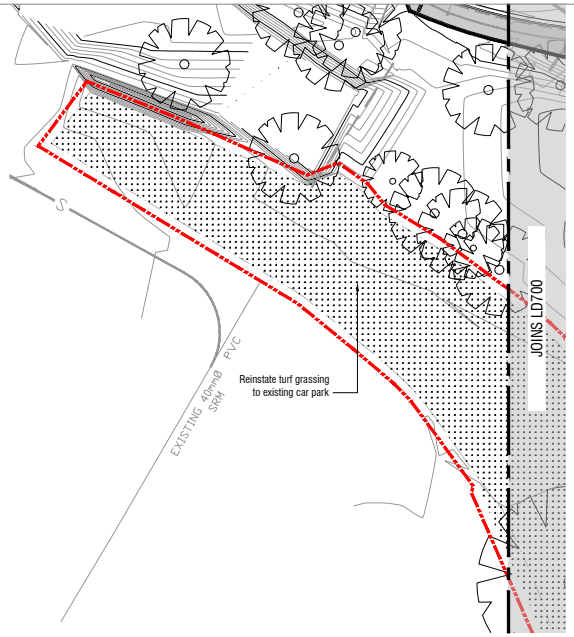
file location:c:\pdf\albert\files\309707\revit\working\ald-jsimon.1.rvt@ 3/2022 5:00 PM Sheet 3 of 9 Sheets

LEGEND

- EXTENT OF WORKS
- REMOVED TREES — Refer Civil
- EXISTING TREES — Retained and protected
- EXISTING STORMWATER — Refer Civil
- EXISTING CONDUITS / SERVICES — Refer Civil
- CONCRETE PAVING — Refer Civil
- EXISTING CONTOURS — 0.2m intervals - Refer Civil
- TREE — Refer Schedules, Details and Specification
- ROOT BARRIER — Refer Civil
- FUTURE TREE PLANTING — By Council (following completed construction)
- GRASS - TURF — Refer Details and Specification
- GRASS - TURF (REINSTATED TO FORMER GRAVEL CAR PARKS) — Refer Details and Specification
- GARDEN BED — Refer Schedules, Details and Specification
- GARDEN BED ID — Refer Schedules, Details and Specification
- SPRAYED EDGE — Refer Details





NOTES

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2. Site layout design by AlburyCity
3. Tree layout, species and quantities shown on Landscape Plans as instructed by AlburyCity

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AUSTRALIA PARK
LANDSCAPE DESIGN
DETAILED DESIGN
PLANTING PLANS - SHEET 2
SHEET 4 OF 9
ALBURY CITY COUNCIL
ALBURY CITY COUNCIL

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MGA 94 ZONE 55 | 1:250 SCALE @ A1 | 0 2.5 5 7.5 10 12.5

DESIGNED	DRAWN	CHECKED	APPROVED
ALBURYCITY	SME	LG	CME

DATE	DRG NO.	REV
17/11/2021	309707LD701	F

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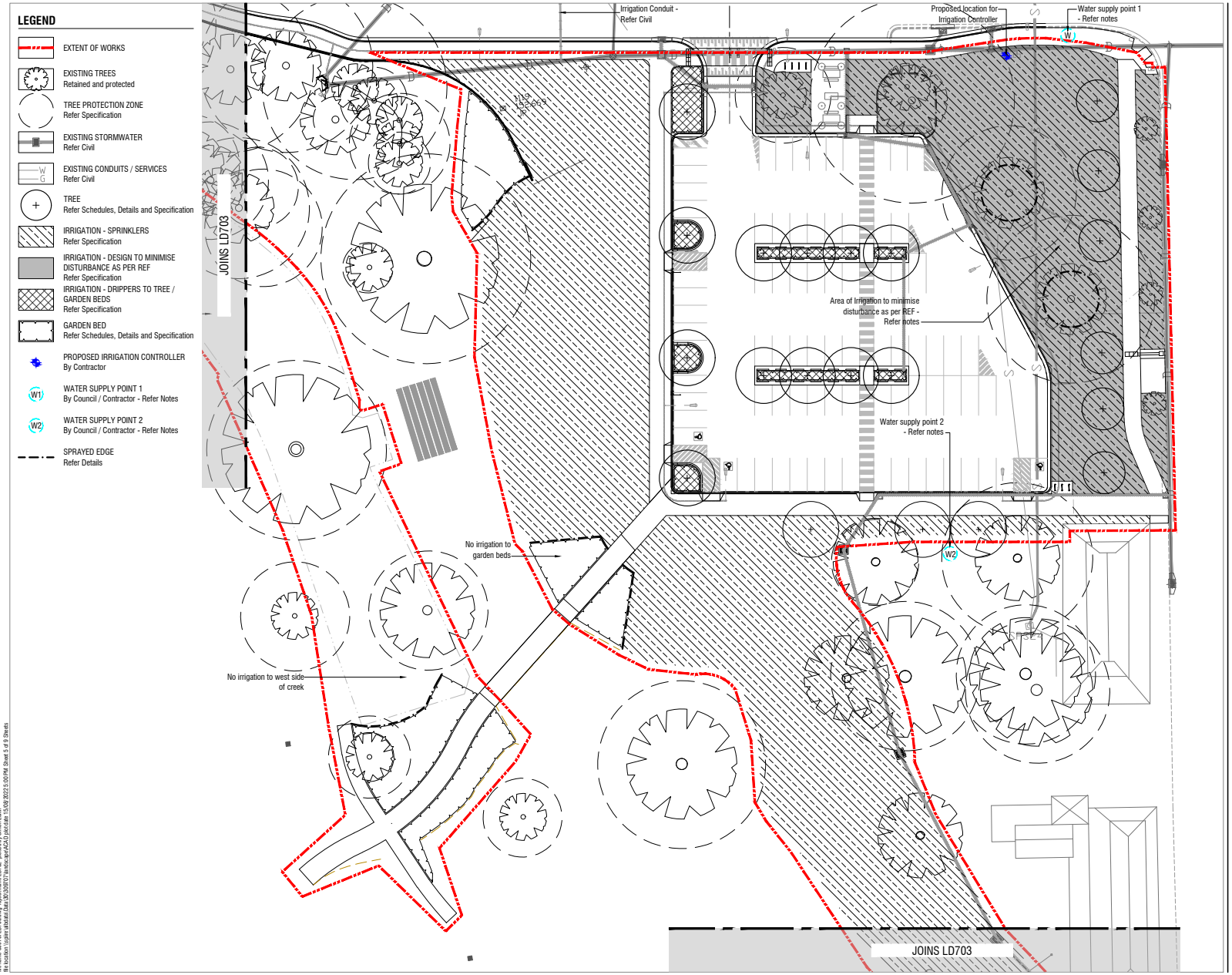
file location: plotted date: 15/08/2022 5:00 PM Sheet 4 of 9 Sheets



NOTES

1. Water supply point 1 to be constructed by Council Hydraulics Department based on Contractor's design; Contractor responsible for works from connection onwards
2. Water supply point 2 - Provide a supply point to allow for future irrigated zone behind 'Turks Head' Building. Contractor to allow for solenoid, controller programming etc
3. 'Irrigation to minimise disturbance' area to be designed to minimse disturbance within TPZs as per REF (i.e. irrigation lines to be run behind kerb and against footpath etc)

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A	ISSUED TO COUNCIL	SME	05/07/22

AUSTRALIA PARK

LANDSCAPE DESIGN

DETAILED DESIGN

IRRIGATION PLANS - SHEET 1

SHEET 5 OF 9

ALBURY CITY COUNCIL

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MGA 94 ZONE

1:250 SCALE @ A1

0 2.5 5 7.5 10 12.5

DESIGNED	DRAWN	CHECKED	APPROVED
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DATE	DRG NO.	REV
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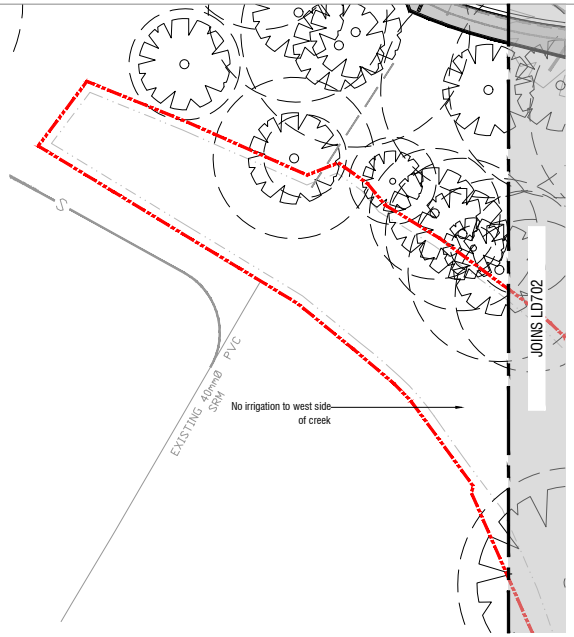
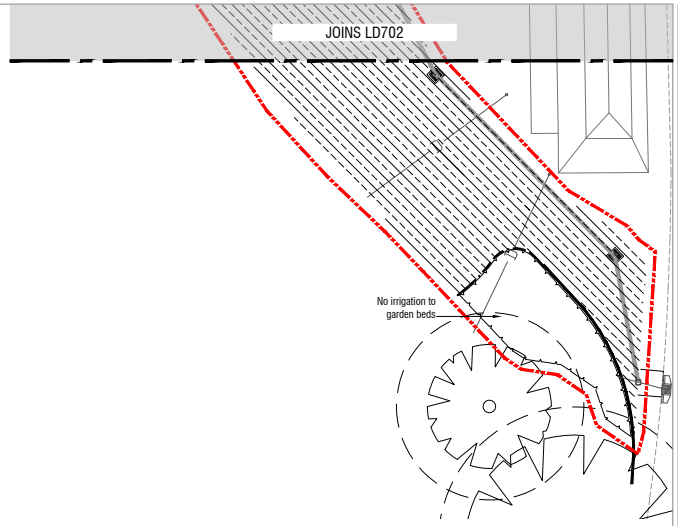
file location: cpdrt-afdesk1\data\309707\Issued\pdf\LD sheet\309707_LD702.pdf date: 15/08/2022 5:00 PM Sheet 5 of 9 Sheets

LEGEND

- EXTENT OF WORKS
- EXISTING TREES
  Retained and protected
- TREE PROTECTION ZONE
  Refer Specification
- EXISTING STORMWATER
  Refer Civil
- EXISTING CONDUITS / SERVICES
  Refer Civil
- IRRIGATION - SPRINKLERS
  Refer Specification
- GARDEN BED
  Refer Schedules, Details and Specification
- SPRAYED EDGE
  Refer Details





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AUSTRALIA PARK
LANDSCAPE DESIGN
DETAILED DESIGN
IRRIGATION PLANS - SHEET 2
SHEET 6 OF 9
ALBURY CITY COUNCIL
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N

MGA 94 ZONE 1:250 SCALE @ A1 0 2.5 5 7.5 10 12.5

DESIGNED	DRAWN	CHECKED	APPROVED
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DATE	DRG NO.	REV
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file name: 309707LD702dwg layout name: LD702 - plotted by: Simon Eakin
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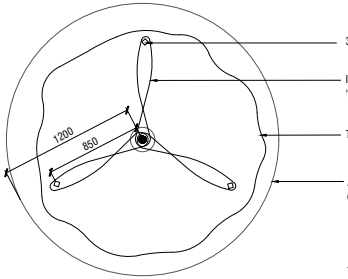


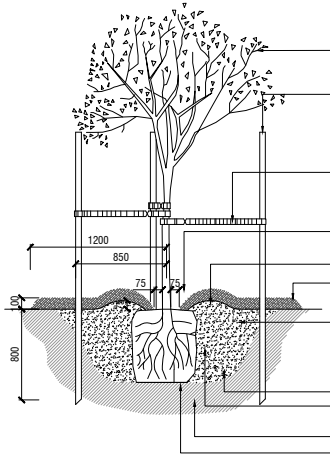
PLAN

3 no. 50 X 50 X 2400mm hardwood stakes set out as shown

Install 3 no. 50mm hessian ties stapled to hardwood stakes, looped in 'Figure 8' as shown. Fix with shade cloth fasteners

Tree

Approved mulch shall be spread a minimum of 1200mmØ from centre of tree



SECTION

Tree watering (1): immediately after planting, tree shall be watered thoroughly regardless of weather conditions, quantity of water will be adequate to saturate the root ball to its core

Tree watering (2): post planting, provide a minimum of 15 litres of water (for tree in 45 litre pot) to the newly planted tree per 7 days. Water at a slow rate so as not to displace mulch. For trees in pot size larger than 45 litres, provide quantity of water one third of that pot size.

All trees to be healthy specimens free of pests and diseases. Trees to be well watered a maximum of 24 hours prior to planting.

3 no. 50x50x2400mm hardwood stakes set vertically and clear of rootball and minimum 800mm into ground. Paint all exposed surfaces of stakes with matte black paint. Stakes are to be offset from the nearest underground service a minimum of 200mm to ensure no damage is caused to underground services

3 no. 50mm wide hessian ties loosely wrapped around trunk at 1/3 tree height and shade cloth fasterners to stakes allowing some trunk movement; refer to plan detail above.

Create dish to keep mulch clear of tree trunk. Top of root ball flush with finished level of planting hole.

75mm high berm to form a watering basin

Approved aged wood mulch. Mulch shall be spread a minimum of 1200mmØ from centre of tree and beyond of the planting hole overlapping undisturbed soil

Excavate a shallow planting hole with sloping sides 3 times the width of the root ball and break-up sides and base, refirm base. Depth of planting hole no deeper than the height of the root ball. Backfill with 50/50 blend imported topsoil/site topsoil broken up to friable texture, firming progressively.

Slow release fertiliser (for exotic species only)

Water retaining products to be mixed into backfilled soil as per manufacturers' specifications.

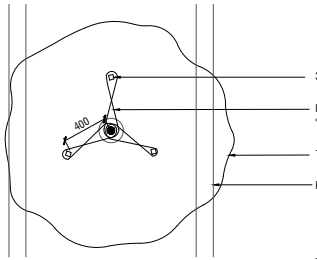
Existing subgrade

Compact soil under rootball to prevent settling

NOTE: It is the responsibility of the contractor to confirm the location of all underground services prior to commencement of any excavation works, tree planting, specifications, street tree offsets / clearances, hold points, species substitution, tree staking and tree maintenance to be undertaken in accordance with Council landscape standards.

1 **SEMI-ADVANCED TREE PLANTING DETAIL - TREES IN GRASS**

Scale 1:20 @ A1



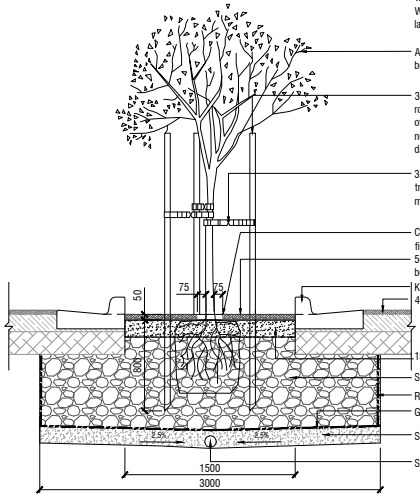
PLAN

3 no. 50 X 50 X 2400mm hardwood stakes set out as shown

Install 3 no. 50mm hessian ties stapled to hardwood stakes, looped in 'Figure 8' as shown. Fix with shade cloth fasteners

Tree

Kerb



SECTION

Tree watering (1): immediately after planting, tree shall be watered thoroughly regardless of weather conditions, quantity of water will be adequate to saturate the root ball to its core

Tree watering (2): post planting, provide a minimum of 15 litres of water (for tree in 45 litre pot) to the newly planted tree per 7 days. Water at a slow rate so as not to displace mulch. For trees in pot size larger than 45 litres, provide quantity of water one third of that pot size.

All trees to be healthy specimens free of pests and diseases. Trees to be well watered a maximum of 24 hours prior to planting.

3 no. 50x50x2400mm hardwood stakes set vertically and clear of rootball and minimum 800mm into ground. Paint all exposed surfaces of stakes with matte black paint. Stakes are to be offset from the nearest underground service a minimum of 200mm to ensure no damage is caused to underground services

3 no. 50mm wide hessian ties loosely wrapped around trunk at 1/3 tree height and shade cloth fasterners to stakes allowing some trunk movement; refer to plan detail above.

Create dish to keep mulch clear of tree trunk. Top of root ball flush with finished level of topsoil.

50mm Approved aged wood mulch. Mulch shall be spread evenly between kerbs.

Kerb and gutter - Refer Civil

40mm hot mix over base material (Refer Civil)

150mm approved topsoil

Structural soil - Refer Civil

Root barrier - Refer Civil

Geotextile non-woven root barrier - Refer Civil

Sub-soil drainage filter material - Refer Civil

Sub-soil drainage pipe - Refer Civil

NOTE: It is the responsibility of the contractor to confirm the location of all underground services prior to commencement of any excavation works, tree planting, specifications, street tree offsets / clearances, hold points, species substitution, tree staking and tree maintenance to be undertaken in accordance with Council landscape standards.

2 **SEMI-ADVANCED TREE PLANTING DETAIL - TREES IN STRUCTURAL SOIL CENTRE CAR PARK BAYS**

Scale 1:20 @ A1

NOTES

1. Refer to Civil for Structural soil, root barrier and car park details

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C	ISSUED TO COUNCIL	SME	08/06/22
B	ISSUED FOR APPROVAL	SME	02/12/21
A	FOR INFORMATION ONLY	SME	17/11/21

AUSTRALIA PARK

LANDSCAPE DESIGN

DETAILED DESIGN

DETAILS - SHEET 1

SHEET 7 OF 9

ALBURY CITY COUNCIL

ALBURY CITY COUNCIL

N

MGA 94 ZONE

AS SHOWN

DESIGNED	DRAWN	CHECKED	APPROVED
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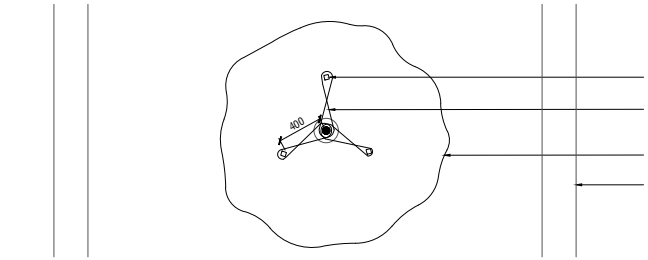
DATE	DRG NO.	REV
17/11/2021	309707LD900	E

file name: 309701.LD900.dwg layout name: LD900 plotted by: Simon Eakin
file location: plotted date/time: 05/12/2022 5:00 PM Sheet 7 of 9 Sheets



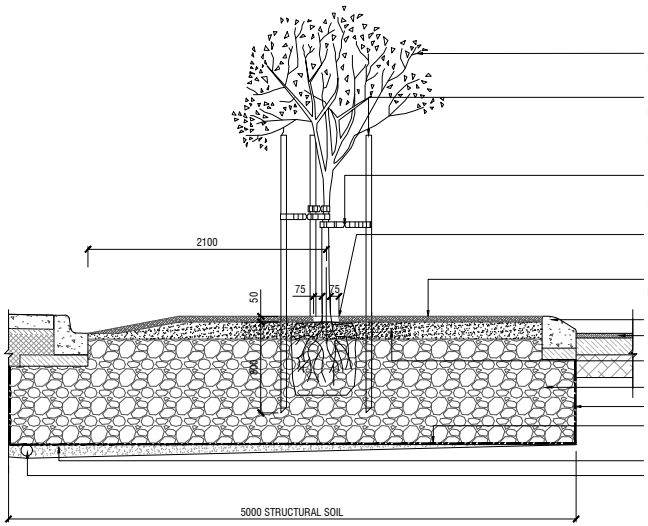
PLAN

3 no. 50 X 50 X 2400mm hardwood stakes set out as shown

Install 3 no. 50mm hessian ties stapled to hardwood stakes, looped in 'Figure 8' as shown. Fix with shade cloth fasteners

Tree

Kerb



SECTION

Tree watering (1): immediately after planting, tree shall be watered thoroughly regardless of weather conditions, quantity of water will be adequate to saturate the root ball to its core

Tree watering (2): post planting, provide a minimum of 15 litres of water (for tree in 45 litre pot) to the newly planted tree per 7 days. Water at a slow rate so as not to displace mulch. For trees in pot size larger than 45 litres, provide quantity of water one third of that pot size.

All trees to be healthy specimens free of pests and diseases. Trees to be well watered a maximum of 24 hours prior to planting.

3 no. 50x50x2400mm hardwood stakes set vertically and clear of rootball and minimum 800mm into ground. Paint all exposed surfaces of stakes with matte black paint. Stakes are to be offset from the nearest underground service a minimum of 200mm to ensure no damage is caused to underground services

3 no. 50mm wide hessian ties loosely wrapped around trunk at 1/3 tree height and shade cloth fasterners to stakes allowing some trunk movement; refer to plan detail above.

Create dish to keep mulch clear of tree trunk. Top of root ball flush with finished level of topsoil.

50mm Approved aged wood mulch. Mulch shall be spread evenly between kerbs.

Semi mountable kerb - Refer Civil

40mm hot mix over base material (Refer Civil)

150mm approved topsoil

Structural soil - Refer Civil

Root barrier - Refer Civil

Geotextile non-woven root barrier - Refer Civil

Sub-soil drainage filter material - Refer Civil

Sub-soil drainage pipe - Refer Civil

1 **SEMI-ADVANCED TREE PLANTING DETAIL - TREES IN STRUCTURAL SOIL WESTERN SIDE OF CAR PARK**

Scale 1:20 @ A1

NOTES

1. Refer to Civil for Structural soil, root barrier and car park details

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B	ISSUED TO COUNCIL	SME	08/06/22
A	ISSUED FOR APPROVAL	SME	02/12/21

AUSTRALIA PARK

LANDSCAPE DESIGN

DETAILED DESIGN

DETAILS - SHEET 2

SHEET 8 OF 9

ALBURY CITY COUNCIL

ALBURY CITY COUNCIL

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MGA 94 ZONE

AS SHOWN

DESIGNED	DRAWN	CHECKED	APPROVED
ALBURYCITY	SME	LG	CME

DATE	DRG NO.	REV
17/11/2021	309707LD901	D

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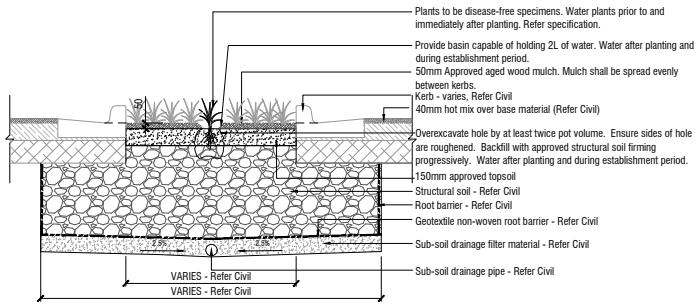
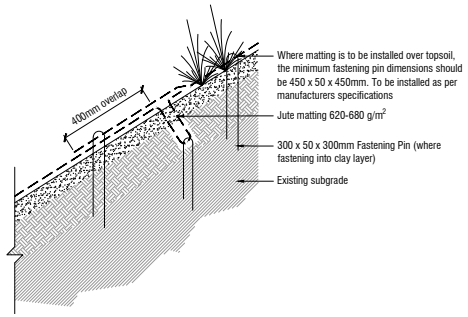
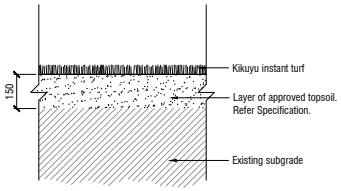


1 **GARDEN BED PLANTING DETAIL - STRUCTURAL SOILS IN CAR PARK**
Scale 1:20 @ A1

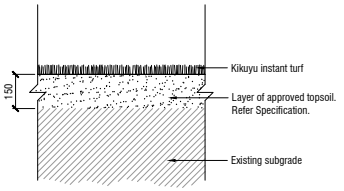


2 **JUTE MAT DETAIL - LEVEE BANK GARDEN BED AREAS ONLY**
Scale 1:20 @ A1



NOTES
1. Existing pasture grass and/or weeds are to be sprayed with herbicide.
2. No machinery to be used within the drip line of existing trees.
3. Topsoil to be raked to a fine tilth, removal of all surface rocks, large lumps of clay, weeds and rubbish prior to application of turf to all areas as shown.
4. New grassed areas to be protected from trespass and traffic with star pickets and barrier rope until grass is established.

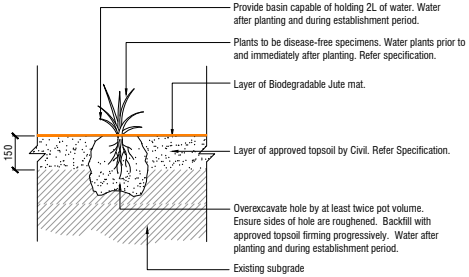
3 **GRASSING DETAIL - DISTURBED AREAS**
Scale 1:10 @ A1



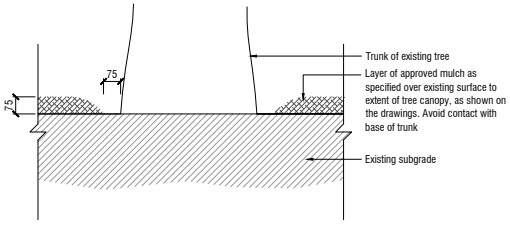
NOTES
1. Existing pasture grass and/or weeds are to be sprayed with herbicide.
2. No machinery to be used within the drip line of existing trees.
3. Topsoil to be raked to a fine tilth, removal of all surface rocks, large lumps of clay, weeds and rubbish prior to application of turf to all areas as shown.
4. New grassed areas to be protected from trespass and traffic with star pickets and barrier rope until grass is established.

4 **GRASSING DETAIL - REINSTATED GRAVEL CAR PARK AREAS**
Scale 1:10 @ A1

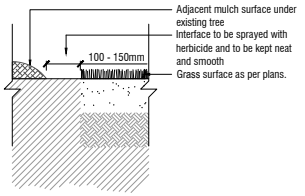
NOTE: Garden beds to be crowned towards centre of garden bed - min. 1:50 slope.



5 **GARDEN BED PLANTING DETAIL - LEVEE BANK**
Scale 1:10 @ A1



6 **MULCH BENEATH EXISTING TREES DETAIL**
Scale 1:10 @ A1



7 **SPRAYED EDGE DETAIL**
Scale 1:10 @ A1

NOTES

1. Refer to Civil for Structural soil, root barrier and car park details

spiire

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PRELIMINARY

REV	DESCRIPTION	APP	DATE
B	ISSUED TO COUNCIL	SME	12/07/22
A	ISSUED TO COUNCIL	SME	05/07/22

AUSTRALIA PARK
LANDSCAPE DESIGN
DETAILED DESIGN
DETAILS - SHEET 3
SHEET 9 OF 9
ALBURY CITY COUNCIL
ALBURY CITY COUNCIL

N
MGA 94 ZONE

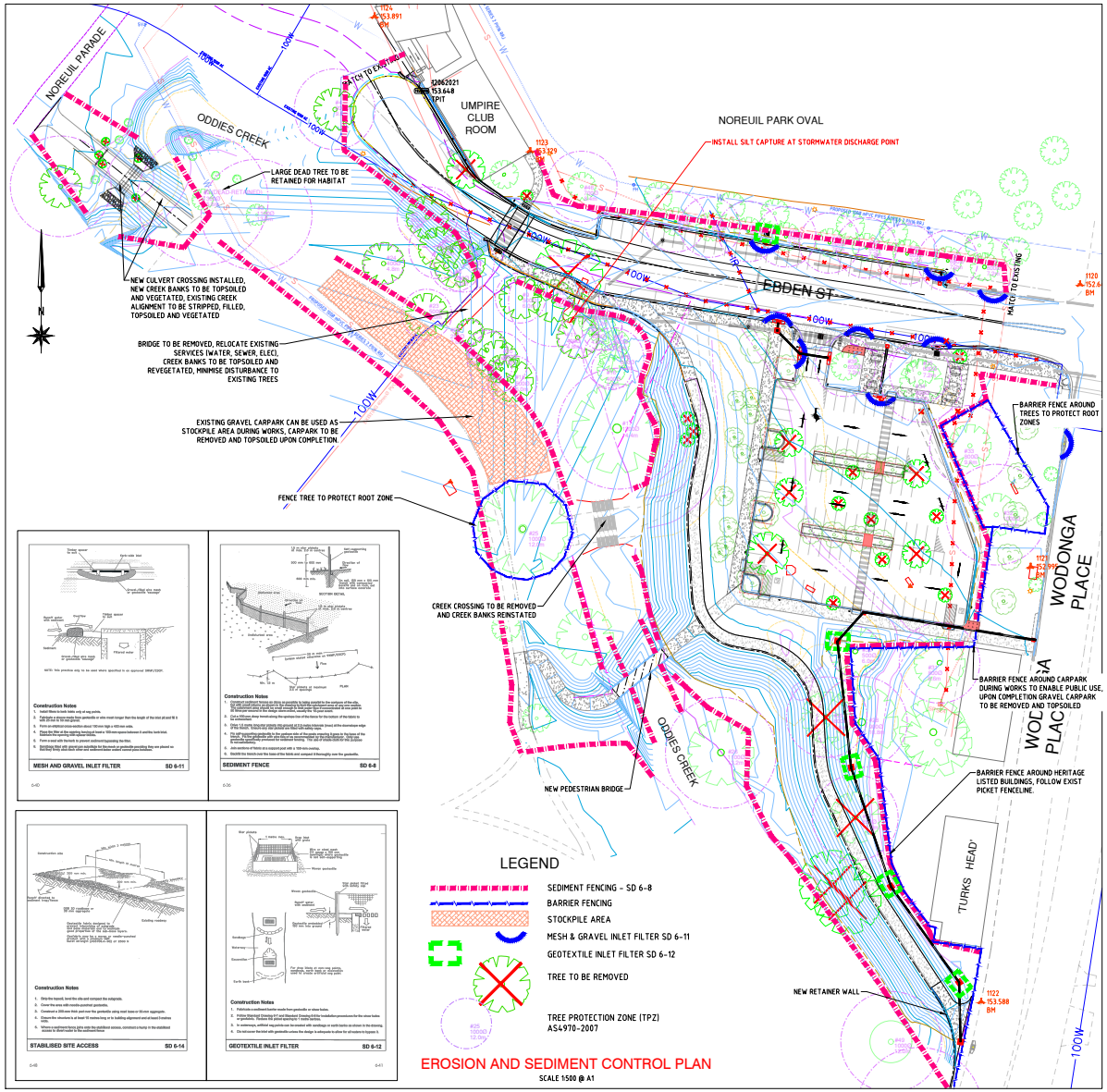
AS SHOWN

DESIGNED DRAWN CHECKED APPROVED

DATE DRG NO. REV
309707LD902 **B**

file name: 309707LD900.dwg layout name: LD902 plotted by: Simon Eakin
file location: c:\plot_whitebox\309707_thurgoona\LD\2 plot date: 13/09/2022 5:00 PM Sheet 9 of 9 Sheets

Appendix G: Erosion and sediment control plan



LEGEND

- SEDIMENT FENCING - SD 6-8
- BARRIER FENCING
- STOCKPILE AREA
- MESH & GRAVEL INLET FILTER SD 6-11
- GEOTEXTILE INLET FILTER SD 6-12
- TREE TO BE REMOVED
- TREE PROTECTION ZONE (TPZ) AS4970-2007

EROSION AND SEDIMENT CONTROL PLAN

SCALE 1:500 @ A1

REVIEW OF ENVIRONMENTAL FACTORS - MITIGATION MEASURES

GENERAL
PRIOR TO ANY WORKS COMMENCING PREPARE A CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP) THAT INCLUDES MITIGATION MEASURES FROM THIS 'REF'.

AS PART OF THE 'SITE INDUCTION' ALL WORKERS ARE TO BE PROVIDED ACCESS TO THE CEMP AND MADE AWARE OF THE SITE SENSITIVITIES IDENTIFIED IN THIS 'REF'.

BIODIVERSITY
CLEARLY DEFINE WORK AREAS WITH NO DISTURBANCE BEYOND THE EDGE OF THESE ZONES. BARRIER FENCING TO BE INSTALLED TO PROTECT EXISTING VEGETATION PRIOR TO COMMENCEMENT OF EARTHWORKS, AND MAINTAIN FENCING IN GOOD CONDITION FOR DURATION OF WORKS PERIOD.

TREES THAT ARE TO BE TRIMMED OR REMOVED WILL BE CLEARLY MARKED. ONLY REMOVE MINIMUM REQUIRED VEGETATION AND MINIMISE DISTURBANCE TO RETAINED VEGETATION.

DO NOT REMOVE TREES THAT CONTAIN HOLLOWS UNLESS SPECIFIC APPROVAL HAS BEEN GRANTED. TREES AND SHRUBS ARE TO BE CHECKED BY A SUITABLY QUALIFIED ECOLOGIST FOR NESTING/ROOSTING NATIVE FAUNA BEFORE REMOVAL.

IF ANY DAMAGE OCCURS TO VEGETATION IN NO-GO ZONES AS A RESULT OF WORKS, THE PROJECT MANAGER WILL BE NOTIFIED AND WILL ESTABLISH STRATEGIES FOR MITIGATION OF IMPACTS AND SITE RESTORATION.

CONSTRUCTION MACHINERY SHOULD BE WASHED PRIOR TO ENTERING AND LEAVING THE SITE TO ENSURE WEED PROPAGULES ARE NOT TRANSPORTED.

SOIL
MINIMISE DISTURBED AREAS, RETAIN VEGETATION WHERE POSSIBLE, STRIP TOPSOIL ONLY AS REQUIRED AS WORKS PROGRESS. DISTURBED AREAS TO HAVE TOPSOIL REPLACED AS SOON AS PRACTICABLE, AND ACHIEVE MIN 60% GRASS COVER WITHIN 20 DAYS.

SEDIMENT FENCING TO BE INSTALLED TO COUNCIL SATISFACTION PRIOR TO COMMENCEMENT OF EARTHWORKS, MAINTAIN IN GOOD CONDITION FOR DURATION OF WORKS PERIOD, INSPECT WEEKLY TO ENSURE EFFECTIVENESS, DO NOT REMOVE WITHOUT COUNCIL PERMISSION.

DO NOT UNDERTAKE WORKS DURING HEAVY RAIN PERIODS OR FLOODING.

ALL BATTERS (MIN 1 IN 3) TO BE TOPSOILED AND SPRAY SEEDED WITH HARDY COVER GRASS MIX AS SOON AS EARTHWORKS COMPLETE TO MAINTAIN SHAPE, PREVENT SCOURING AND CONTROL DUST. GRASS COVER TO ACHIEVE MIN 60% COVER WITHIN 20 DAYS.

LOCATE STOCKPILES AND CONSTRUCTION MATERIALS AWAY FROM VEGETATION, WATERWAYS AND DRAINAGE LINES. TOPSOIL STOCKPILES MUST NOT EXCEED 2.0 METRES IN HEIGHT.

STORE ALL CHEMICALS (FUEL, OILS) OFFSITE OR AWAY FROM SENSITIVE AREAS OR NATIVE VEGETATION. ENSURE APPROPRIATE SPILL KITS ARE ONSITE.

STOP WORK AND NOTIFY COUNCIL IF ANY CONTAMINATES (EG ASBESTOS, DISCOLOURED SOIL, CHEMICAL OR PETROL ODOURS, REFUSE OR LEACHATE) IS DISCOVERED.

NO WATER MAY BE DISCHARGED INTO DRAINAGE LINES OR WATERWAYS

ABORIGINAL HERITAGE
IF ABORIGINAL HERITAGE ITEMS ARE UNCOVERED DURING WORKS, ALL WORKS WITHIN THE VICINITY OF THE FIND MUST CEASE AND THE ENVIRONMENTAL PLANNER CONTACTED IMMEDIATELY.

THE FIND SHOULD NOT BE MOVED UNTIL ASSESSMENT BY A QUALIFIED ARCHAEOLOGIST.

IF ANY SUSPECTED ANCESTRAL HUMAN REMAINS ARE DISCOVERED DURING WORKS:
- IMMEDIATELY CEASE ALL WORK AT THAT LOCATION
- NOTIFY NSW POLICE OR OEH ENVIRONMENTAL LINE 131 555
- DO NO RECOMMENCE WORK AT THAT LOCATION UNLESS AUTHORIZED IN WRITING BY OEH

HERITAGE
SHOULD ANY UNEXPECTED HISTORICAL HERITAGE ITEMS BE UNCOVERED DURING WORKS, WORKS SHOULD CEASE IMMEDIATELY AND AN ARCHAEOLOGIST CONTACTED.

NOISE AND VIBRATION
WORKS TO BE CARRIED OUT DURING NORMAL HOURS (7AM TO 6PM MONDAY TO FRIDAY, 8AM TO 1PM SATURDAY).

ANY WORK PERFORMED OUTSIDE NORMAL HOURS MAY NOT BE PERMITTED, IF PERMITTED WORKS TO MINIMISE NOISE IMPACTS.

AIR QUALITY
EFFECTIVE DUST CONTROL MEASURES TO BE INTRODUCED AND MAINTAINED AT ALL TIMES. LOADS TO BE COVERED, WATERCART TO BE USED DURING STRIPPING AND PLACING OF MATERIAL, MOUNDS TO BE WATERED TO PROMOTE GRASS GROWTH OR COVERED TO PREVENT WINDBLOWN DUST.

WORKS NOT TO BE CARRIED OUT DURING STRONG WIND OR IN WEATHER CONDITIONS WHERE HIGH LEVELS OF DUST OR AIRBORNE PARTICLES ARE LIKELY.

VEGETATION OR OTHER MATERIALS ARE NOT TO BE BURNT ONSITE.

VEHICLES TRANSPORTING WASTE OR OTHER MATERIALS THAT MAY PRODUCE ODOURS OR DUST ARE TO BE COVERED DURING TRANSPORTATION.

MAINTAIN ALL MACHINES IN GOOD WORKING ORDER TO REDUCE EMISSIONS. AVOID IDLING MACHINES UNLESS IN USE.

WASTE
WASTE GENERATION SHOULD BE MINIMISED, ALL SURPLUS MATERIALS, OFFCUTS AND OTHER DEBRIS SHALL BE REMOVED FROM SITE AND DISPOSED OF BY A LICENSED CONTRACTOR TO A LICENSED WASTE MANAGEMENT FACILITY.

WORKING ARE TO BE MAINTAINED, KEPT FREE OF RUBBISH AND CLEANED UP AT THE END OF EACH WORKING DAY.

ACCESS TO SITE FROM EBDEN STREET, WODONGA PLACE, NOREUIL PARADE ONLY.
ENSURE ROADS ARE KEPT CLEAN FROM SITE MATERIAL TO ACC REQUIREMENTS.

APPLY 'TRAFFIC CONTROL MEASURES' ON ACCESS ROADS IN ACCORDANCE WITH AS 1742, TO COMPLY WITH 'RMS TRAFFIC CONTROL AT WORK SITES' GUIDELINES AND ACC REQUIREMENTS. PREPARE AND IMPLEMENT APPROVED TRAFFIC MANAGEMENT PLAN.

NOTES:

1. ALL WATER LEAVING THE SITE MUST PASS THROUGH A SEDIMENT FILTER AND BE SPREAD EVENLY ON A GRASSED AREA TO THE REQUIREMENTS LISTED ON THIS SHEET.
2. ALL SEDIMENT FENCES AND STRAW BALE SEDIMENT FILTERS UNLESS RELEASING WATER EVENLY ONTO GRASSED PASTURES ARE TO HAVE FILTER TUBES INSTALLED EVERY 20 METERS AND THE WATER CHANNELED INTO THESE FILTER TUBES.
3. ALL BARE EARTH, TABLE DRAINS AND BATTERS ARE TO BE RE-ESTABLISHED TO THE RE VEGETATION SPECIFICATION ON THIS SHEET. TABLE DRAINS ARE TO HAVE CHECK DAM SEDIMENT TRAPS CONSTRUCTED WITH OUT DAMAGING THE RE-ESTABLISHED VEGETATION MEASURES. ALLOW DEPRESSION IN CENTER OF BANK FOR SPILLWAY.
4. ALL TEMPORARY EARTH STRUCTURES INCLUDING SOIL STOCKPILES, TO BE TRACK ROLLED AND SEEDED WITHIN 14 DAYS OF THEIR CONSTRUCTION, WITH A SEED FERTILIZER MIX APPROVED BY ALBURY CITY'S COMMUNITY & RECREATION SECTION.
5. ALL DISTURBED AREAS TO BE STABILIZED AND/OR RE-VEGETATED WITHIN 14 DAYS OF EARTHWORKS COMPLETION.
6. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSTALLED PRIOR TO SITE DISTURBANCE.
7. ALL EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE CHECKED DAILY
8. ALL SEDIMENT CONTROL STRUCTURES TO BE INSPECTED AFTER EACH RAINFALL EVENT FOR STRUCTURAL DAMAGE AND ALL TRAPPED SEDIMENT TO BE REMOVED TO A NOMINATED SOIL STOCKPILE SITE
9. THE PROJECT MANAGER TO INFORM ALL CONTRACTORS AND SUB-CONTRACTORS OF THEIR OBLIGATIONS UNDER THE EROSION AND SEDIMENT CONTROL PLAN
10. REGULAR SITE INSPECTIONS ARE TO BE CONDUCTED BY THE SITE ENVIRONMENT MANAGER AND RECORDS OF ALL SUCH INSPECTIONS ARE TO BE MADE AVAILABLE UPON INSPECTION. INSPECTIONS ARE TO BE UNDERTAKEN:

- AT LEAST WEEKLY DURING NORMAL CONSTRUCTION HOURS: AND
- PRIOR TO FORECAST RAINFALL (>50% CHANCE OF 5MM OR MORE IN 24 HOURS); AND
- DURING RAIN EVENTS (IF SAFE TO DO SO); AND
- WITHIN 24 HOURS OF THE CESSATION OF A RAIN EVENT THAT CAUSES RUNOFF (IF SAFE TO DO SO)

ISSUED FOR APPROVAL

REV	DATE	AMENDMENTS	INIT.
B	28/05/2021	ISSUED FOR APPROVAL	K. HASAN
A	25/05/2021	CONCEPT DESIGN	K. HASAN

REVISIONS

SURVEY	K. HASAN
DATUM	AHD
GRID	MGA 94 – ZONE 55
SCALE	1:200
SHEET	A1
DESIGNED	K. HASAN
DRAWN	K. HASAN
CHECKED	A. RODGERS
APPROVED	APPROVED BY

APPROVED ...../...../..... TEAM LEADER - DESIGN

APPROVED ...../...../..... GROUP LEADER - SERVICES

AlburyCity

AUSTRALIA PARK
CAR PARK AND LEVEE BANK CONSTRUCTION
CORNER OF EBDEN ST AND WODONGA PL
EROSION AND SEDIMENT CONTROL PLAN

LEDGER No. 3.306.321

REV.	No. of Sheets	Sheet No.
B	24	22

DRAWING NUMBER ENG21/357

Appendix H: Tree Assessment Plan – Australia Park Car Park and Levee Realignment Project



Document Path: Q:\50. ArcView Files\1. PROJECTS\Parks\A\Australia Park Car Park A3P.mxd

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Whilst all care has been taken in the preparation of this cadastral base map, AlburyCity accepts no responsibility for the accuracy of any information shown. Users should rely on their own enquiries in order to validate information shown on this map.
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MAP GRID AUSTRALIA, ZONE 55
TRANSVERSE MERCATOR PROJECTION
HORIZONTAL DATUM: GEODETIC DATUM AUSTRALIA 1994
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM 1972
Produced by the Engineering Department, AlburyCity.

Tree Assessment Plan – Australia Park Car Park and Levee Realignment Project

SCALE:	1:750
DRAWN:	David.Armstrong
DATE:	10/08/2023

15 7.5 0 15 30
Meters

AlburyCity

N

AlburyCity

Contact: Anthony Dufty
Reference: DOC25/127218

Clenisa Canafe
AlburyCity Council
553 Kiewa Street
ALBURY NSW 2640

16 May 2025

Dear Clenisa,

Addendum to Review of Environmental Factors (REF) for Australia Park Car Park, Pedestrian Bridge and Levee Bank Reconstruction

The purpose of this letter is to serve as an addendum to the Determined REF for the Australia Park Car Park, Pedestrian Bridge and Levee Bank Reconstruction (Council reference: DOC23/369598) to reflect new plans.

The REF was prepared to meet the obligation of s.5.5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for a determining authority's duty to consider environmental impact for an activity permitted without consent. However, after the finalisation of this REF, the project was exhibited to the public and in response to community feedback, the car park was redesigned to reduce the number of spaces and further retain vegetation.

In most circumstances, a redesign will require a revised environmental assessment. However, Section 5.4 of the EP&A Act provides '*exemptions for certain activities*' having regard to a determining authorities obligation to consider environmental impact. Section 5.4(a) applies in this instance as follows:

> *Sections 5.5 and 5.7 do not apply to or in respect of the following (despite the terms of those sections)—*
> *(a) a modification of an activity, whose environmental impact has already been considered, that will reduce its overall environmental impact,*

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AlburyCity's Urban Forest Officer has reviewed the revised plans and made the following comment.

> *The revised design has reduced the footprint and reshaped the car park. This has resulted in the retention of an additional tree (Tree No.47 at south-east corner of car park) and 260m ² green space along the eastern boundary of the car park. The new green space provides the opportunity for additional tree planting. The tree protection zone encroachment has also changed for Tree No's 43, 42 and 40. Tree No. 43 now has no encroachment issues. Tree No. 42 has an increased encroachment of 6% (now 17%) and Tree No. 40 has an increased encroachment of 5% (now 28%). The trees with increased encroachment (No.40 & 42) require monitoring by a qualified arborist and any remedial works identified to be carried out such as pruning or additional deep watering around the tree root zones. This is to be noted on the landscape plan.*

Per these comments, the design has reduced the overall originally assessed footprint and impacts and therefore the works may proceed without further environmental assessment in accordance with Section 5.4 of the EP&A Act.

It is noted that the requested monitoring and remedial works are reflected in the recommendations of the Executive Summary and Appendix 3 of the *Arboricultural Impact Assessment* (Appendix D of REF), or which are required to be adhered to in accordance with the mitigation measures of the REF.

The only exception is that Tree 42 now requires additional control. Therefore, please ensure that any recommendation of the *Arboricultural Impact Assessment* which applies to Trees 39 and 40 is updated to also include Tree 42. Specifically, please regard Recommendation 3.5, 3.5.1 & 4 as now including Tree 42. Furthermore, Recommendation 3.1 must also apply to Tree 39.

All other recommendations also must be adhered to along with all other mitigation measures and conditions of the original REF as is.

As along as the above adjustments are reflected and implemented, the Environment Team supports that the revised carpark design can proceed without further assessment in accordance with s.5.4 of the EP&A Act.

Regards,

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Team Leader Environment

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