Regional Development Assessment Panel Agenda

Meeting Date and Time: Thursday, 17 September 2026; 9:30am
Meeting Number: RDAP/82
Meeting Venue: 140 William Street, Perth

A live stream will be available at the time of the meeting, via the following link:
RDAP/82 - 17 September 2026 - City of Kalgoorlie-Boulder - Shire of Dundas - Shire of Kojonup

PART A – INTRODUCTION

1. Opening of Meeting, Welcome and Acknowledgement
2. Apologies
3. Noting of Minutes

PART B – CITY OF KALGOORLIE-BOULDER

1. Declarations of Due Consideration
2. Disclosure of Interests
3. Form 1 DAP Applications
   - 3.1 Lot No. 3517 (No. 61) Wilson Street, Kalgoorlie – Redevelopment of Agricola Student Accommodation Shared Facility – DAP/26/03124
4. Form 2 DAP Applications
5. Section 31 SAT Reconsiderations

PART C – SHIRE OF DUNDAS

1. Declarations of Due Consideration
2. Disclosure of Interests
3. Form 1 DAP Applications
   - 3.1 Lots 77 (HN 96) and 78 (HN 94) Roberts Street Norseman – Proposed Workforce Accommodation – DAP/26/03129
4. Form 2 DAP Applications
5. Section 31 SAT Reconsiderations

PART D – SHIRE OF KOJONUP

1. Declarations of Due Consideration
2. Disclosure of Interests
3. Form 1 DAP Applications
   - 3.1 Lots 3194 & 8869 (No. 3680) Collie-Changerup Road, Kojonup – Kojonup Battery Energy Storage System – DAP/26/03135
4. Form 2 DAP Applications
5. Section 31 SAT Reconsiderations

PART E – OTHER BUSINESS

1. State Administrative Tribunal Applications and Supreme Court Appeals
2. Meeting Closure

Please note, presentations for each item will be invited prior to the items noted on the agenda and the presentation details will be contained within the related information documentation

DAP Members
Dale Page (Presiding Member)
Eugene Koltasz (Deputy Presiding Member)
Tony Arias
Cr Kirsty Dellar (Part B – City of Kalgoorlie-Boulder)
Cr Richard Halse (Part B – City of Kalgoorlie-Boulder)
President Laurene Bonza (Part C – Shire of Dundas)
Cr Sharon Warner (Part C – Shire of Dundas)
Cr Craig Mitchell (Part D – Shire of Kojonup)
Cr Roger Bilney (Part D – Shire of Kojonup)

DAP Secretariat
Shanara Wijethunga
Ashlee Kelly

PART A – INTRODUCTION

1. **Opening of Meeting, Welcome and Acknowledgement**

2. **Apologies**

3. **Noting of Minutes**

PART B – CITY OF KALGOORLIE-BOULDER

1. Declarations of Due Consideration

2. Disclosure of Interests

3. Form 1 DAP Applications

3.1 Lot No. 3517 (No. 61) Wilson Street, Kalgoorlie – Redevelopment of Agricola Student Accommodation Shared Facility – DAP/26/03124

4. Form 2 DAP Applications

Nil

5. Section 31 SAT Reconsiderations

Nil

Form 1: Responsible Authority Report

(Regulation 12)

Part B – ITEM 3.1 – LOT NO. 3517 (NO. 61) WILSON STREET, KALGOORLIE

RESPONSIBLE AUTHORITY REPORT – FORM 1	
DAP Name:	Regional Development Assessment Panel
DAP File No:	DAP/26/03124
LG Reference:	D052/26
Proposed Development:	Redevelopment of Agricola Student Accommodation Shared Facility
Value of Development:	$15 million
Owner:	Western Australian Institute of Technology (Curtin University)
Applicant:	Rowe Group
Local Government Area:	City of Kalgoorlie-Boulder
Responsible Authority:	City of Kalgoorlie-Boulder
Authorising Officer:	Acting Chief Executive Officer – Geoff Glass
Application Acceptance Date:	10 June 2026

LOCATION PLAN



Figure 1 – Location Plan

RESPONSIBLE AUTHORITY RECOMMENDATION

RECOMMENDATION FOR APPROVAL

That the Regional DAP resolves to **APPROVE** DAP Application reference DAP/26/03124 for the redevelopment of Agricola Student Accommodation Shared Facility at Lot 3517, No. 61 Wilson Street, Kalgoorlie, in accordance with Clause 68 of Schedule 2 (Deemed Provisions) of the *Planning and Development (Local Planning Schemes) Regulations 2015*, and the provisions of the City of Kalgoorlie-Boulder Local Planning Scheme No. 2, subject to the following conditions:

1. The development is to be undertaken in accordance with the approved plans and documents attached to this approval, as listed below, except where amended by subsequent conditions:

Plan/ Document Name	Reference	Date
Agricola shared facilities site plan – demolition works	03B781-A-DP001, Issue G	26/8/2026
Agricola shared facilities site plan – new works	03B781-A-SP001, Issue K	26/8/2026
Agricola shared facilities – level 1 floor plan	03B781-A-FP0101, Issue K	26/8/2026
Agricola shared facilities – social centre floor plan	03B781-A-FP0102, Issue H	26/8/2026
Agricola shared facilities – wellness centre floor plan	03B781-A-FP0103, Issue G	26/8/2026
Agricola shared facilities – roof plan	03B781-A-RP0101, Issue J	26/8/2026
Agricola shared facilities elevations – social centre	03B781-A-EL0101, Issue H	26/8/2026
Agricola shared facilities elevations – wellness centre	03B781-A-EL0102, Issue H	26/8/2026
Agricola shared facilities elevations – street elevation	03B781-A-EL0103, Issue C	26/8/2026
Agricola shared facilities room layout – bin store	03B781-I-RL0105, Issue A	26/8/2026
Agricola shared facilities room layout – multi-function room	03B781-I-RL0101, Issue C	26/8/2026
Agricola shared facilities internal elevations – kitchen	03B781-I-RL0102, Issue C	26/8/2026
Agricola shared facilities internal elevations – multi-function room	03B781-I-RL0103, Issue C	26/8/2026
Landscape Approach	Prepared by Aspect Studio	
Waste Management Plan	Prepared by Encycle, Rev 2	28 August 2026
Agricola Shared Facilities Civil Works – Schematic Design for 10.1m waste vehicles - bins	WGA250696-SK-CV-0003, Rev C	28 August 2026
Agricola Shared Facilities Civil Works – Schematic Design for 7.7m waste vehicle – grease trap	WGA250696-SK-CV-0004, Rev C	28 August 2026

Civil Schematic Design Report	WGA250696-RP-CV0001_C	28 July 2026

2. This decision constitutes planning approval only and is valid for a period of four years from the date of approval. If the subject development is not substantially commenced within the specified period, the approval shall lapse and be of no further effect.
3. Stormwater from roofed and paved areas must be discharged and maintained in a manner so that there is no discharge onto the adjoining properties and laneway and is to be to the satisfaction of the City. Stormwater pipes and drainage pits shall be maintained in a clean and clear condition free of obstruction.
4. All piped, ducted, and wired services, air conditioners, hot water systems, water storage tanks, service meters, and bin storage areas must be located to minimise any visual and noise impact on the occupants of nearby properties and screened from the street.
5. The Waste Management Plan, dated 28 August 2026 prepared by Encycle, must be implemented at all times to the satisfaction of the City.
6. Any liquid waste from air conditioning, swimming pools, or other liquid generating plant or activities, shall be retained on site or connected to the City's sewer system and comply with AS/NZ3500, subject to any pre-treatment requirements prior to discharge.
7. Prior to the submission of a building permit application, stormwater disposal plans, details and calculations must be submitted to and approved by the City and thereafter implemented, constructed and maintained on-site to the satisfaction of the City.
8. Prior to the submission of a building permit application, a detailed landscaping and reticulation plan for the subject site and/or road verge(s) must be submitted to, and approved to the satisfaction of the City, and must include the following:

    a. The location, number, size, density and species of proposed grasses, groundcovers, trees and shrubs;
    b. Those areas to be reticulated/irrigated and mulched;
    c. Landscaping maintenance schedule for establishment and ongoing plant maintenance;
    d. Location and details of water retention swales;
    e. Any existing vegetation and/or landscaped areas to be retained;
    f. Any verge treatments;
    g. Evidence that the proposed landscaping will not, at maturity, negatively impact the development and adjoining properties.

9. A Construction Management Plan that details how the construction of the development will be managed to minimise the impact on surrounding area must be lodged with and approved by the City prior to the submission of a building permit application (including demolition and/or forward works). The Construction Management Plan is required to address the following matters:

    a. pedestrian accessibility along Wearne Lane during construction;

b. building conditions on adjoining properties through a dilapidation report;
c. Public safety, amenity and site security;
d. Contact details of essential site personnel;
e. Construction operating hours;
f. Noise control and vibration management;
g. Air, sand and dust management;
h. Stormwater and sediment control;
i. Soil excavation method;
j. Waste management and materials re-use;
k. Traffic and access management;
l. Parking arrangements for contractors and subcontractors;
m. Community information, consultation and complaints management plan; and
n. Compliance with AS4970-2009 relating to the protection of trees on the development site.

The approved Construction Management Plan must be complied with for the duration of construction.

10. Prior to the submission of a building permit application, hydraulic drawings detailing how the proposed development will connect to the City's sewer main must be submitted to and approved by the City.

11. Prior to use, this development must be connected to the City's sewer system to the specifications of the City.

12. Prior to use or occupation of this development, sewer headworks charges are to be paid to the City in accordance with the City's Sewer Headworks Contribution Policy (DS-DS001) and the Fees and Charges schedule at the time of payment.

13. Prior to use or occupation of this development, landscaping areas shall be installed in accordance with the approved landscaping plan to the satisfaction of the City. All landscaping areas shall be maintained for the lifetime of the development to the satisfaction of the City.

14. Prior to use or occupation of this development, the vehicle crossover to Wearne Lane must be constructed to the specification and satisfaction of the City.

15. Prior to use or occupation of this development, redundant vehicle crossovers, as shown on the approved plans, must be removed and the verge, kerb and/or footpath (where relevant) reinstated to the specification and satisfaction of the City.

Advice Notes

1. If an applicant or owner is aggrieved by this determination, there is a right of review by the State Administrative Tribunal in accordance with the *Planning and Development Act 2005* Part 14. An application must be made within 28 days of the determination.

2. This is a development approval issued by the DAP under Local Planning Scheme No. 2. It is not a building permit or an approval to commence or carry out development under any other law. It is the responsibility of the applicant to obtain any other necessary approval, consents or licenses required under any other law, and to commence and carry out development in accordance with all relevant laws.

3. In accordance with the provisions of the *City of Kalgoorlie-Boulder Activities on Thoroughfares and Trading in Thoroughfares and Public Places Local Law*, an application for a vehicle crossover must be submitted to, and approval granted by, the City, prior to the commencement of the development hereby permitted.

4. The noise generated by activities on-site, including machinery motors or vehicles is not to exceed the levels as set out under the *Environmental Protection (Noise) Regulations 1997*.

   Noisy Construction Work outside the period 7.00am to 7.00pm Monday to Saturday and at any time on Sundays and Public Holidays is not permitted unless a Noise Management Plan for the construction site has been approved in writing by the City.

5. The carrying on of the development must not cause a dust nuisance to neighbours. Where appropriate, such measures as installation of sprinklers, use of water tanks, mulching or other land management systems should be installed or implemented to prevent or control dust nuisance, and such measures shall be installed or implemented within the time and in the manner directed by the City's Environmental Health Services if it is considered that a dust nuisance exists.

6. Where the development is to be used as a 'Public Building' as defined by the *Health Act 1911*, the premises must first comply with the *Health (Public Building) Regulations 1992*. A Certificate of approval detailing the approved use and maximum occupancy must be obtained from the City's Environmental Health Services prior to the use of the premises as a public building.

7. Any significant events associated with this development may require prior approvals from the City. Please contact the City's Environmental Health Services for further information.

8. The City's Water Services advises that a Reflux Valve is required where connecting to the sewer. The installation of the reflux valve must meet AS/NZS 3500.

9. The headworks charges are determined based on the current Financial Year's Schedule of Fees and Charges and will also be determined on building drawings and advised by the City's Water Services.

10. The hydraulic drawings must include a detailed floor plan showing all fixtures and any pre-treatment devices.

11. Any upsized or additional sewer junction(s) that may be required to service the proposed development are at no cost to the City.

Please contact Water Services on Water@ckb.wa.gov.au to request the works and arrange payment.

PROPOSAL:

The application seeks development approval for works associated with the redevelopment of Agricola Student Accommodation Shared Facility at Lot 3517 (No. 61) Wilson Street, Kalgoorlie (the site). The proposal includes the following components:

- Demolition works of the shared facilities, including 'Max's Café' building, gym, squash court, outdoor hard court, study room, TV room, vehicle crossover to Wearne Lane, selected trees, landscaping and swales, and all remaining built form associated with the shared facilities (i.e. light poles, concrete areas, footpaths, steps, redundant utilities, etc).

- Construction of a new 'Social Centre', including multi-functional space, lounge, bookable space, games room, kitchen, male and female bathrooms, and associated plant, communication and storage rooms.

- Construction of a new 'Wellness Centre', including study room, meeting room, gym, gym showers and bathrooms, 'zen den' and zen courtyard, and associated plant and storage rooms.

- Construction of a new hardcourt accommodating various sports.

The proposal represents a significant investment in the future of student living in the Goldfields, delivering contemporary, purpose-built communal, recreational and wellness facilities that respond to the evolving needs and expectations of residents.

The proposed development plans and technical reports are provided at **Attachments 1 and 2** respectively.

SUBJECT SITE AND SURROUNDS:

The site is located within the Kalgoorlie Town Centre, approximately 400 metres south-east of Hannan Street. The surrounding locality comprises a mix of civic, education, cultural, recreational and residential land uses. Key public facilities and reserves in proximity to the site include Kingsbury Park and former Lord Forrest Olympic Pool to the north-west, and Central Regional TAFE and the Goldfields Arts Centre to the north-east. Medium-density residential development is located to the south-east and south-west of the site.

The site is bounded by Hanbury Street to the south-east and Wilson Street to the south-west. Wearne Lane adjoins the north-eastern lot boundary and provides rear access to the shared facilities located within the rear portion of the site.

The site currently contains the Curtin University Agricola student accommodation facility. Existing development includes four four-storey apartment buildings, eight

single-storey accommodation buildings, shared indoor facilities, a playing court, car parking areas and associated landscaping.

BACKGROUND:

At its meeting of 20 January 2015, the then Goldfields-Esperance Joint Development Assessment Panel resolved to approve redevelopment of the site, which included four (4) four-storey student buildings.

A subsequent Form 2 application proposing minor amendments was approved by the Mid-West/Wheatbelt Joint Development Assessment Panel on 26 August 2015.

In April 2016, the first stage of the accommodation buildings, including Blocks B and C, was completed. In 2017, all four student accommodation buildings reached practical completion.

City Officers and the applicant held a pre-lodgement meeting to discuss an initial development proposal in April 2026, after which comments regarding the City's requirements were provided to the applicant for the proposal to be further developed.

In June 2026, Rowe Group, acting on behalf of the Curtin University, lodged an application seeking approval from the Regional Development Assessment Panel for the redevelopment of the Agricola student accommodation shared facilities on Lot 3517 (No. 61) Wilson Street, Kalgoorlie.

After the lodgement of the application, modifications were made to the design of both the Wellness Centre and the Social Centre; and the width of Wearne Lane crossover was increased from 6m to 11m to facilitate waste vehicle movements and a Waste Management Plan was included. The final set of development plans were submitted on 28 August 2026 and are provided in the attachments for consideration.

Legislation and Policy:

Legislation

Planning and Development Act 2005
Planning and Development (Local Planning Schemes) Regulations 2015 (Planning Regulations)
Planning and Development (Development Assessment Panel) Regulations 2011
City of Kalgoorlie-Boulder Local Planning Scheme No. 2 (LPS2)

State Government Policies

N/A

Structure Plans/Activity Centre Plans

N/A

Local Policies

Advertising Planning Proposals Policy – LPP2

Landscaping Policy – LPP10
Sewer Headworks Contributions Policy – DS-DS-001

PLANNING ASSESSMENT:

PLANNING FRAMEWORK	
Region Scheme	N/A
Region Scheme - Zone/Reserve	N/A
Local Planning Scheme	City of Kalgoorlie-Boulder Local Planning Scheme No. 2
Local Planning Scheme - Zone	'Public Purpose – Education' Reserve
Lot Size	1.613 hectares
Existing Land Use	Student accommodation buildings and shared facilities
Heritage Status	☒ N/A ☐ State Register of Heritage Places ☐ Local Heritage List ☐ Local Heritage Area
Bushfire Prone Area	No

The proposal has been assessed against all the relevant legislative requirements of the Scheme, State and Local Policies outlined in the 'Legislation and Policy' section of this report. The following matters have been identified as key considerations for the determination of this application.

Zoning and Land Use Permissibility

The subject land is designated in LPS2 as 'Public Purpose – Education' reserve. The objective of the reserve is as follows.

- *To set aside land that provides a range of essential physical and community infrastructure.*

The previous Development Assessment Panel approved the assessment of the redevelopment of four four-storey student accommodation buildings against the standards for 'holiday accommodation' development under the City's former Local Planning Scheme No. 1 in 2015. It is noted that the definition of 'holiday accommodation' has since been slightly modified under LPS2, when it was gazetted in October 2023.

Notwithstanding, this proposal relates to the redevelopment of the shared facilities, which is incidental to the existing development, and does not seek to change the approved land use.

Assessment against the provisions of LPS2

As the subject land is a reserve, LPS2 does not provide any specific development standards in Table 7 'General development standards and requirements for non-residential development'. The subject land is located in proximity to the Kalgoorlie Town Centre and is surrounded by Commercial-zoned land and public buildings. As such, it is considered appropriate to use the development standards of Commercial

zone to assess the proposed development. It is noted that the applicant also adopts the same approach to assess this proposal, as provided in the planning report (refer to **Attachment 2**)

Provision	Requirement	Proposal	Assessment
Max. Plot Ratio – Non Residential	Table 7 of LPS2 – 1.0	0.4	Complies.
Average Front Setback (m)	Table 7 of LPS2 – N/A	92.7	Noted.
Min. Side Setback (m)	Table 7 of LPS2 – N/A	North – 1.97 South – 48.3	Noted.
Min. Rear Setback (m)	Table 7 of LPS2 – 1.0	2.29	Complies.
Min. Landscaping Area	Table 7 of LPS2 – 15%	63% approximately (30% soft landscaping across the redeveloped area)	Complies.
Max. Building Height (m)	Table 7 of LPS2 – 25	7.9	Complies.
Max. Boundary Wall Height (m)	Table 7 of LPS2 – 6	None	Noted.

Landscaping

As previously discussed, it is considered appropriate to apply the landscaping standards of the Commercial zone under LPS2 to this development. These requirements are supplemented by Local Planning Policy for Landscaping, which provides guidance on the application of discretion for the landscaping requirements in the Scheme.

Table 7 of LPS2 stipulates that 15% of the site should be landscaped. The applicant advises that 30% of the redeveloped area will be provided with soft landscaping. On a broader scale, 63% of the entire site area is capable of being landscaped through either hard or soft landscaping.

The vision of the landscape design is to:

'Create a welcoming and vibrant campus heart that supports student life through social connection, active living and share meals. The design provides spaces for gathering, engagement and respite, acknowledging the site's cultural heritage as a significant meeting place and guided by the Water Story. Shaped in partnership with the Kaalamaya Kupurn Traditional Owners and grounded in a Caring for Country approach, the centre fosters belonging and wellbeing within a landscape that is distinctly of place, curated gardens will celebrate diverse local flora and respond to the transitions through Country'.

A comparison table of the existing and proposed landscaping elements is provided below. It is noted that the proposal will include an enlarged garden bed and lawn area and an increase in the number of trees on site.

Existing	Proposed
Garden bed – 161m^2	Garden bed – 535m^2
Lawn – 55m^2	Lawn – 215m^2
Trees – 17	Trees – 12 existing; 30-40 proposed trees

The proposed landscaping is considered to be generally consistent with the requirements of the Local Planning Policy for Landscaping for the following reasons:

- The majority of the landscaping area is located in an area visible from the streetscape, providing a visual connection with Kingsbury Park public open space on the opposite side of Wearne Lane;
- The proposed landscaping includes the planting of new trees and the retention of existing trees;
- The proposed landscaping incorporates both hard and soft landscaping design measures; and
- The proposed landscaping creates places where people can meet and gather.

Planning conditions requiring a detailed landscaping plan and implementation have been included in the recommendation.

Access and Parking

The previous Development Assessment Panel agreed that the four (4) four-storey student accommodation buildings could be assessed against the standards for 'holiday accommodation' development under the City's former Local Planning Scheme No. 1 in 2015. It is noted that the definition of 'holiday accommodation' has since changed under LPS2, when it was gazetted in October 2023.

The parking requirements for 'holiday accommodation' under LPS2 are as follows:

Land use	Car parking	Staff parking	Delivery or queuing	Employee bicycle parking	Visitor bicycle parking
Holiday accommodation	1 bay per bedroom or 2 bays per unit whichever is greater	1 bay per 1 staff	N/A	N/A	1 space per 2 units

The applicant has advised that the application will not introduce any new land uses or activities on-site, nor will it result in an increase in staff or students attending to the facilities. Any events associated with development will be attended by students and faculty only and will not be open to the public. As such, the proposed development will not require additional car or bicycle parking to be provided.

The proposed redevelopment will not alter the existing access arrangement to the site for students or staff members as well as service vehicles. The main vehicle access will still be via Wilson Street with service vehicles accessing the site through Wearne Lane.

Wearne Lane is an 8.5m wide lane that provides service vehicle access to the student accommodation site and also functions as a key pedestrian route for students attending the Eastern Goldfields College and Central Regional TAFE.

Service vehicles, including delivery vehicles, waste collection vehicles and tanker trucks, are proposed to access the site via a new 11m crossover located west of the existing crossover. The increased crossover width has been incorporated to facilitate safe service vehicle access and to reduce potential conflict with pedestrians using Wearne Lane.

Swept path analysis included in the Waste Management Plan demonstrate that service vehicle movements can be accommodated within the existing road pavement and will not encroach onto the footpath of the laneway.

Clause 33 Amenity of Non-Residential Development

The amenity of non-residential development will need to satisfy the following provisions.

Provisions	Officer comment
a) the form, bulk, and scale of development is to be compatible with surrounding land uses; and	The proposed development incorporates generous single storey spaces and has been architecturally designed to complement the existing campus development through their form, scale, materials and colour finishes. The design also responds positively to Kingsbury Park.
b) the impacts of the development are to be contained on site and/or suitably managed to limit impacts on adjoining properties; and	As the shared facilities buildings are located on the rear portion of the subject land, away from the residential areas along Hanbury Street and Wilson Street, the expected impact on these areas will be minimal.
c) the impact of the development on the road network and traffic management is to be consistent with the road function and hierarchy; and	As the proposal does not include an increase in staff and student numbers, it does not generate any additional traffic movements or demand for more parking bays.
d) adequate and safe provision and access is to be made for parking and service, haulage and waste vehicles, and loading areas where required; and	Service vehicles will access the site via a newly constructed 11m wide crossover on Wearne Lane.
e) storage of plant and equipment, services, and areas for waste management and essential services, to be screened or separated from public areas, particularly from street frontages; and	Storage and waste services areas are screened from Wilson Street and Hanbury Street frontages.
f) external lighting of public space is proposed and designed to minimise	Nearby residences will not be impacted by this development as external lighting will be screened by the existing

light spill and glare on adjoining properties; and	accommodation units and public buildings.
g) visual impacts are to be minimised by the use of vegetation screening and tree retention; and	The proposed landscape design presents attractive public spaces for residents and includes more tree planting.
h) buildings are to have coordinated or complementary materials, colours and styles, and be reflective of the character of the locality	The proposal presents a cohesive, high-quality design that aligns with surrounding accommodation building(s) design, drawing inspiration from the Kalgoorlie landscape through tinted concrete, earth-red coloured metal cladding, steel framing referencing mining infrastructure, and concrete blockwork that reflects both the earth tones and thermal qualities of masonry.

CONSULTATION:

PUBLIC CONSULTATION

Public consultation was undertaken in the following manner:

Requirement

Schedule 2, part 8 cl. 64(4) of the *Planning and Development (Local Planning Schemes) Regulations 2015* states that a non-complex application is advertised by doing any or all of the following, as determined by the local government:

- Cl. 64(4)(a) in accordance with clause 87 public notice in the newspaper and website publishing;
- Cl. 64(4)(b) giving notices to owners and occupiers in the vicinity of the development, who in the opinion of the local government, are likely to be affected by the granting of development approval; and
- Cl. 64(4)(c) erecting, in the manner approved by the commission, a sign or signs;

Method

In considering the requirements for public consultation, City officers determined that notification (advertising) to landowners and occupiers of the surrounding properties and the properties along Cheetham Street, Wearne Lane and Wilson Street was sufficient to ascertain any potential effects the proposal may have on surrounding areas. All consulted properties have been identified in Figure 2 below. The full proposal was also published on the City's 'Your Say' website during the public consultation period and a physical copy was made available upon request.



Figure 2 Consultation Map

Duration

14 days, from 6 July 2026 to 21 July 2026.

Submissions Received

The City has received two submissions from the community during the public consultation period, which raise off site concerns about the proposal. The concerns and City's responses are provided in the table below. A redacted copy of all submissions is provided in **Attachment 4**.

Comment/Matter Raised	**Responsible Authority response**
Will a broader scale dilapidation report be undertaken prior to any works to capture and potential damage/cracking to buildings in the vicinity? Could the report be shared with the submitter?	Request for a dilapidation report to be completed prior to the submission of a building permit application has been included as a planning condition relating to the construction management plan. The applicant has advised that they are open to further engagement with the submitter on this matter.
Impacts on pedestrian access on Wearne Lane	Refer to 'Access and Parking' section of the report for more detailed discussion. The proposal has demonstrated that service vehicle movements will be

	contained within the existing road pavement area and will not encroach onto the footpath on Wearne Lane.
Supports the project and believes it will be an excellent enhancement to the education and training precinct in Kalgoorlie-Boulder	Noted.

REFERRALS/CONSULTATION WITH GOVERNMENT/SERVICE AGENCIES

No referrals to other government agencies were required.

DESIGN REVIEW PANEL ADVICE

Not applicable.

OTHER ADVICE

The proposal has been circulated to the relevant departments within the City, and their requirements have been included in the recommended draft conditions.

CONCLUSION:

The proposed development will support the continued redevelopment of a regionally significant educational institution and deliver improved amenities for existing and prospective students attending the Curtin University Kalgoorlie Campus.

The proposed buildings have been architecturally designed to complement the existing campus development through their form, materials and colour finishes. The design also provides an open and contemporary built form that responds positively to Kingsbury Park and contributes to the broader education and training precinct.

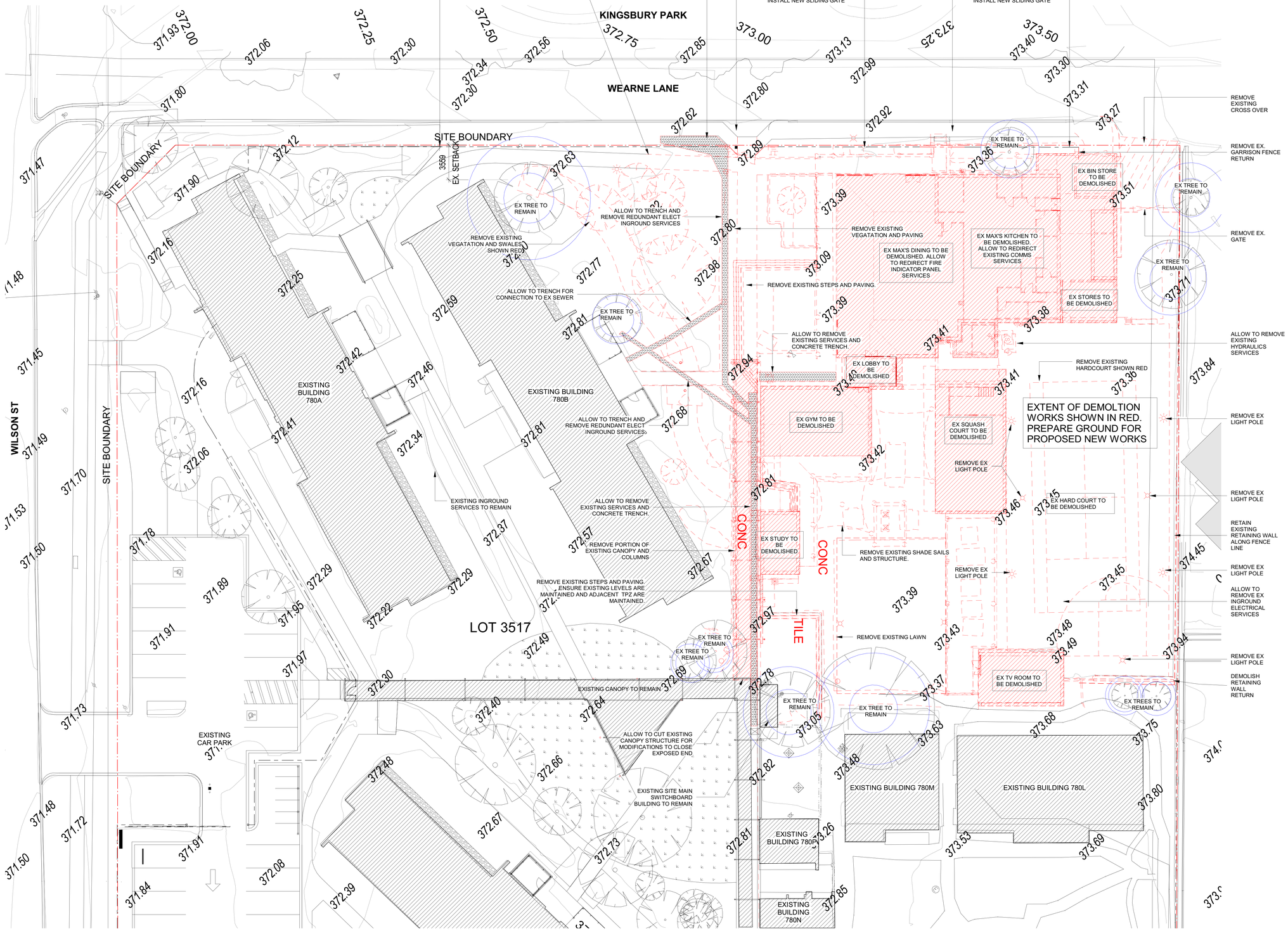
The proposal will also enhance the landscape setting of the site through increased tree planting, expanded garden beds and additional lawn areas, thereby improving the quality and usability of outdoor spaces within the campus.

The development is located within the rear portion of the subject land and is sufficiently separated from surrounding residential areas. As such, the proposal is not expected to result in any undue amenity impact on nearby residential properties.

The proposal is considered to be consistent with the relevant planning framework and can be appropriately managed through conditions and advice notes. Accordingly, the application is recommended for approval.

ATTACHMENTS

1. Development Plans (as listed in Condition No. 1)
2. Technical Document(s) that form part of the approval (as listed in Condition No.1)
3. Applicant's full proposal, including additional information received on 7 August 2026 and 28 August 2026
4. A redacted copy of public submissions



1 SITE PLAN - DEMOLTION WORKS
A-CP0103 SCALE 1 : 200

LEGEND

- EXTENT OF DEMOLITION
- DEMOLITION OF EXISTING BUILDING. ALLOW FOR REMOVAL OF EXISTING EQUIPMENT.
- EXISTING BUILDING TO REMAIN
- EXISTING TREE TO BE REMOVED
- EXISTING TREE TO BE RETAINED & PROTECTED FOR DURATION OF CONSTRUCTION. TPZ SHOWN IN BLUE.

GENERAL NOTES

1. PRIOR TO UNDERTAKING ANY WORK, CONTRACTOR SHALL UNDERTAKE HAZARDOUS MATERIALS SURVEY INCLUDING BUT NOT LIMITED TO COMPLIANCE WITH CURTIN UNIVERSITY ASBESTOS MANAGEMENT PLAN.
2. INTRUSIVE HAZARDOUS MATERIALS REPORT PROVIDED FOR INFORMATION ONLY.
3. THE DEMOLITION IS SUBJECT TO THE STAGING OVERLAY.
4. DEMOLISH AND REMOVE ALL EXISTING WALLS, PARTITIONS, DOORS, JOINERY, SANITARY WARE, FIXTURES AND FITTINGS AS INDICATED WITH DASHED LINES.
5. DEMOLISH ALL EXISTING CEILINGS AND BULKHEADS UNLESS NOTED OTHERWISE ON DRAWING. MAKE GOOD TO THE UNDERSIDE OF ALL SLABS/ FLOOR SURFACES ABOVE WHERE SURFACE IS TO BE EXPOSED. SEAL ALL REDUNDANT PENETRATIONS TO RELEVANT AUSTRALIAN STANDARD.
6. REMOVE ALL EXISTING FLOOR FINISHES AND SUBSTRATES, UNLESS NOTED OTHERWISE, IN PREPARATION FOR NEW FINISHES. MAKE GOOD TO EXISTING FLOOR SURFACE WHERE DAMAGED.
7. ALL EXISTING WALLS, PARTITIONS, DOORS, FIXTURES AND FITTINGS TO BE RETAINED ARE TO BE MADE GOOD.
8. REMOVE ALL EXISTING DUCT WORK, PLUMBING, FIRE AND ELECTRICAL SERVICES AS SPECIFIED IN THE ENGINEERING DOCUMENTS.
9. CUT AND SEAL AT FLOOR SOURCE, ALL SERVICES TO BE REMOVED IN ACCORDANCE WITH ALL RELEVANT AUTHORITY REQUIREMENTS. FIRE SEAL ALL REDUNDANT PENETRATIONS TO RELEVANT AUSTRALIAN STANDARD.
10. THIS DEMOLITION PLAN SHOULD BE READ IN CONJUNCTION WITH ALL STRUCTURAL AND SERVICE DRAWINGS.
11. THE DEMOLITION PLAN INDICATES SCOPE OF WORKS. THE CONTRACTOR IS TO ALLOW FOR ALL DEMOLITION REQUIRED TO COMPLETE THE WORKS.

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B	13/03/2026	ISSUE TO CONSULTANTS			
C	20/03/2026	SCHEMATIC DESIGN ISSUE			
D	10/04/2026	SD ISSUE FOR APPROVAL			
E	22/07/2026	ISSUED TO CONSULTANTS			
F	05/08/2026	ISSUED FOR DA UPDATE			
G	26/08/2026	ISSUED TO CONSULTANTS - REMOVAL OF SKIP BIN STORE			

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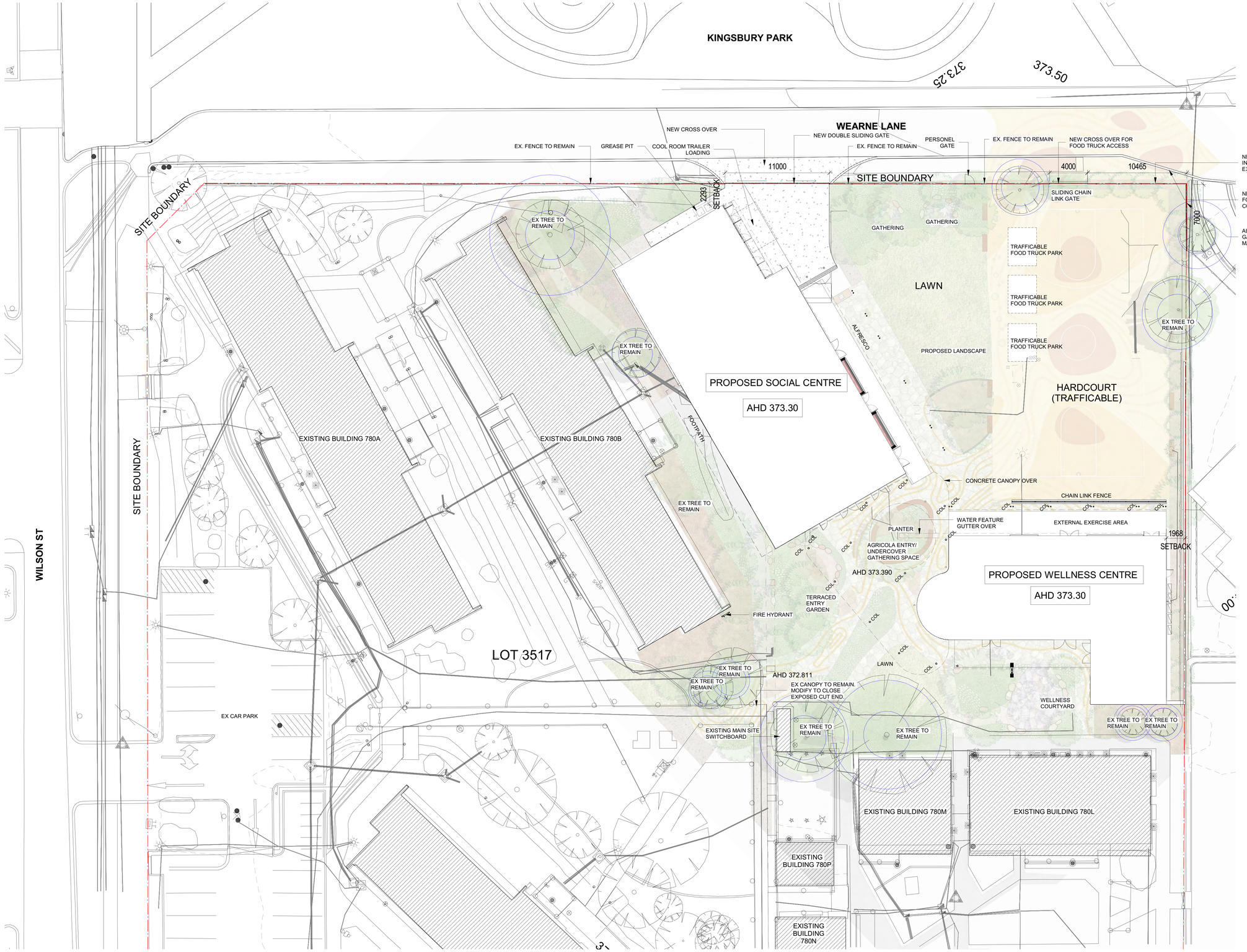
DRN BY	Author
DATE	26/04/17
DESIGNED	Designer
CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

SITE PLAN - DEMOLITION WORKS

CURTIN PROJ No	CP354	SCALE: UNIT:	As indicated
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-DP0001	SHEET / OF	ISSUE G



LEGEND

EXISTING TREE TO BE RETAINED & PROTECTED FOR DURATION OF CONSTRUCTION. TPZ SHOWN IN BLUE.

NEW TREE. REFER TO LANDSCAPE DRAWINGS.

FLOOR AREA CALCULATION

AREA OF EX BUILDING TO BE DEMOLISHED	= 800 m²
AREA OF PROPOSED EARTHWORKS	= 2503 m²
AREA OF PROPOSED BUILDINGS	= 855 m²
EXISTING CAR BAYS TO REMAIN	= 78

PRELIMINARY

REV	DATE	REVISION	DRN	CHK	PROJ APP
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F	10/04/2026	SD ISSUE FOR APPROVAL			
G	5/06/2024	BIN STORE ADDED			
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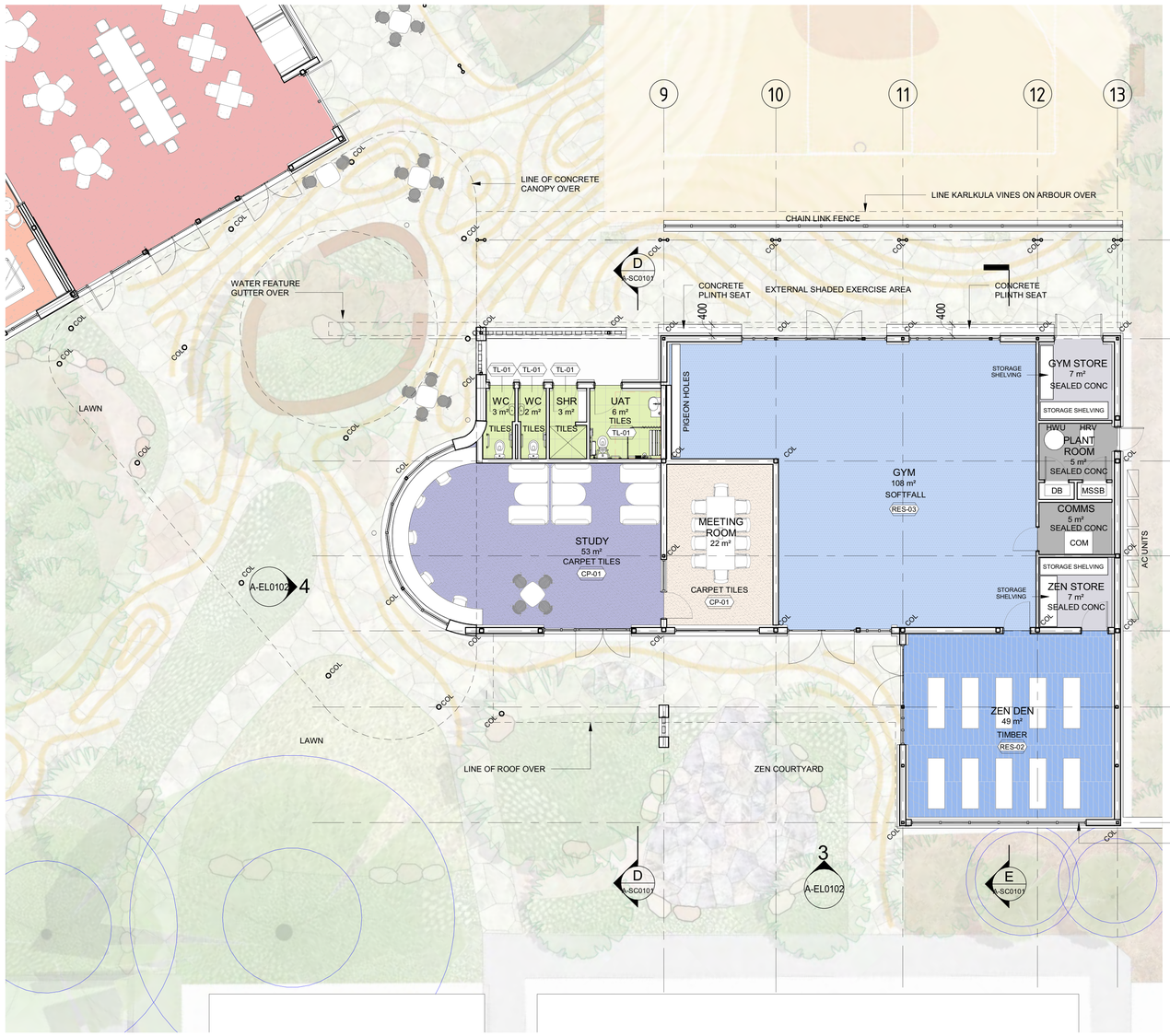
CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

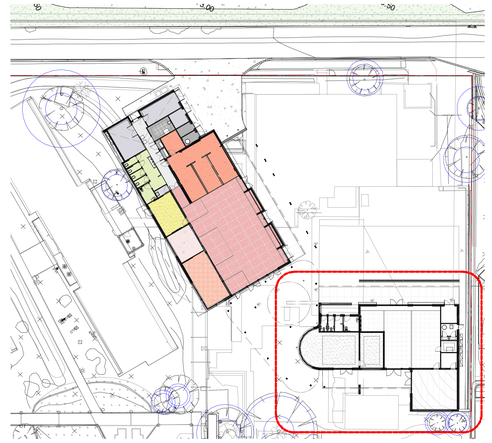
SITE PLAN - NEW WORKS

CURTIN PROJ No	CP354	SCALE:	As indicated
		UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-SP0001	SHEET	OF ISSUE K

1 SITE PLAN
A-CP0103 SCALE 1 : 200



1 WELLNESS CENTRE
A-CP0103 SCALE 1 : 100



2 KEY PLAN
A-CP0103 SCALE 1 : 500

REV	DATE	REVISION	DRN	CHK	PROJ APP
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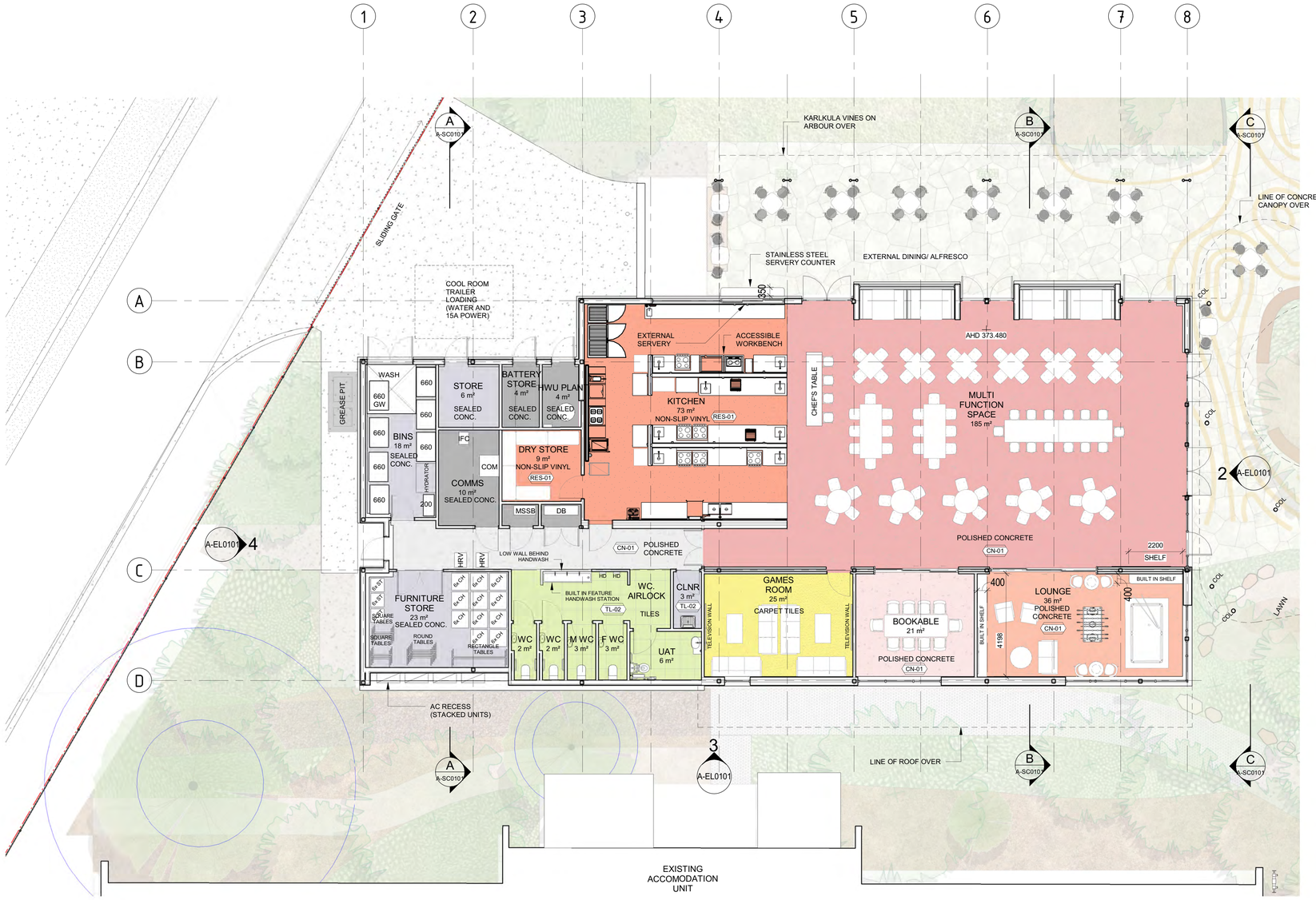
DRN BY	Author
DATE	02/23/26
DESIGNED	Designer
CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

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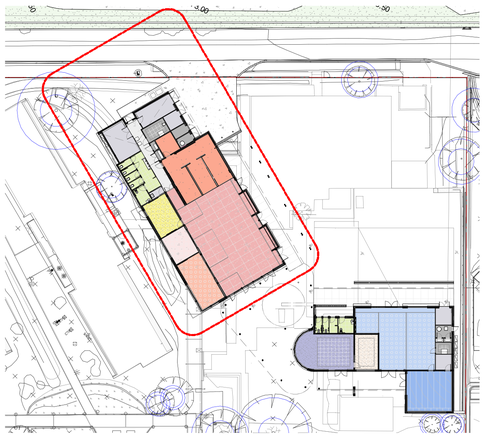
AGRICOLA SHARED FACILITIES

WELLNESS CENTRE FLOOR PLAN

CURTIN PROJ No	CP354	SCALE: UNIT:	As indicated
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-FP0103	SHEET / OF	ISSUE G



1 SOCIAL CENTRE
SCALE 1 : 100



2 KEY PLAN
SCALE 1 : 500

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CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

SOCIAL CENTRE FLOOR PLAN

CURTIN PROJ No	CP354	SCALE: UNIT:	As indicated
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-FP0102	SHEET / OF	ISSUE H

SLIDING GARISON GATE
SLIDING CHAIN LINK GATE
CHAIN LINK FENCE
BINS 18 m²
STORE 6 m²
COMMS 10 m²
BATTERY STORE 4 m²
HWU PLANT 4 m²
DRY STORE 9 m²
FURNITURE STORE 23 m²
MSSB 1 m²
DB 1 m²
KITCHEN 73 m²
UAT 6 m²
CLNR 3 m²
GAMES ROOM 25 m²
BOOKABLE 21 m²
LOUNGE 36 m²
MULTI FUNCTION SPACE 185 m²
CHEFS TABLE
SHADED AREA
COOL ROOM TRAILER LOADING (WATER AND 15A POWER)
BOLLARDS
BBQ AREA
LINE OF ROOF OVER
EXTERNAL SERVERY
PERGOLA ABOVE OUTDOOR SEATING AREA
LAWN
TRAFFICABLE FOOD TRUCK PARK (WATER & POWER)
TRAFFICABLE FOOD TRUCK PARK (WATER & POWER)
TRAFFICABLE FOOD TRUCK PARK (WATER & POWER)
COURT SEATING
LINE OF CONCRETE AWNING OVER
LINE OF ROOF OVER
EXISTING ACCOMODATION UNIT
RAMP
LAWN
UNDERCOVER AREA / GATHERING SPACE
LAWN
EXTERNAL SHADED EXERCISE AREA
WC 3 m²
WC 2 m²
SHR 3 m²
UAT 6 m²
PIGEON HOLES
GYM 108 m²
GYM STORE 7 m²
COMMS 5 m²
COM
ZEN STORE 7 m²
MEETING ROOM 22 m²
STUDY 53 m²
ZEN DEN 49 m²
ZEN COURTYARD
VIEW TO EXISTING LEMON TREES
372.92
372.77
372.68
372.67
373.84
373.39
373.37
3968
4500
7609
9498
4333
3367
2650
2702
4006

LEGEND

EXISTING TREE TO BE RETAINED & PROTECTED FOR DURATION OF CONSTRUCTION. TPZ SHOWN IN BLUE.

NEW TREE. REFER TO LANDSCAPE DRAWINGS.

PRELIMINARY

REV	DATE	REVISION	DRN	CHK	PROJ APP
C	9/12/25	FLOOR PLAN UPDATE			
D	15/01/26	ISSUE FOR APPROVAL			
E	23/01/26	ISSUED FOR APPROVAL			
F	03/02/26	ISSUED FOR APPROVAL			
G	25/02/2026	ISSUE TO CONSULTANTS & QS			
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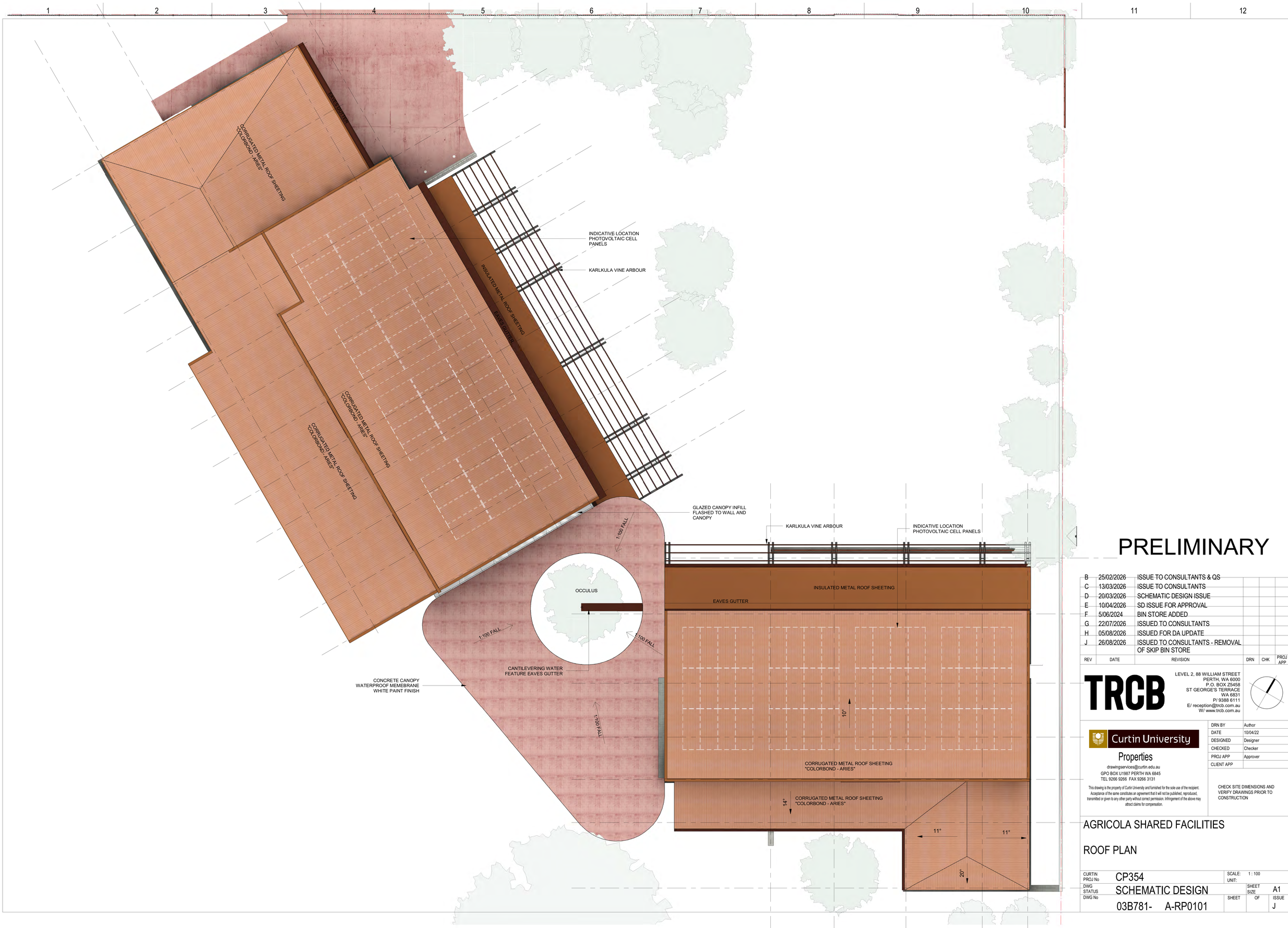
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DATE	10/04/22
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PROJ APP	Approver
CLIENT APP	

CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

LEVEL 1 FLOOR PLAN

CURTIN PROJ No	CP354	SCALE:	1 : 100
DWG STATUS	SCHEMATIC DESIGN	UNIT:	
DWG No	03B781- A-FP0101	SHEET SIZE	A1
		SHEET	
		OF	
		ISSUE	K



PRELIMINARY

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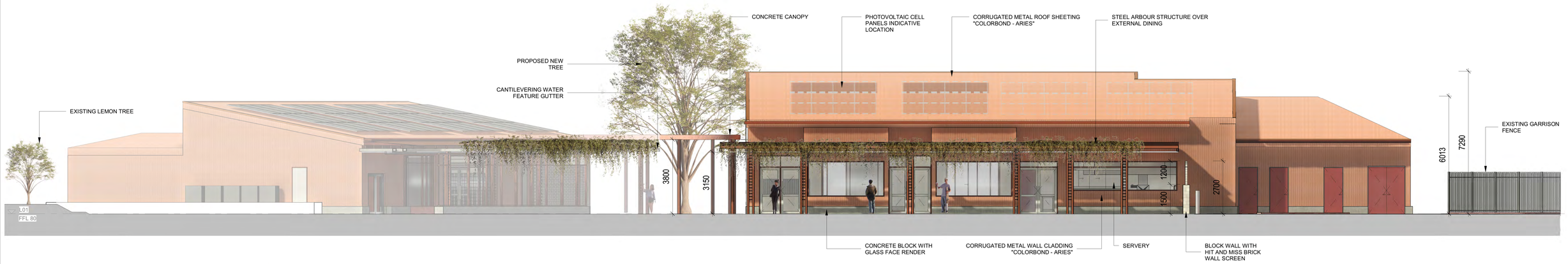
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AGRICOLA SHARED FACILITIES

ROOF PLAN

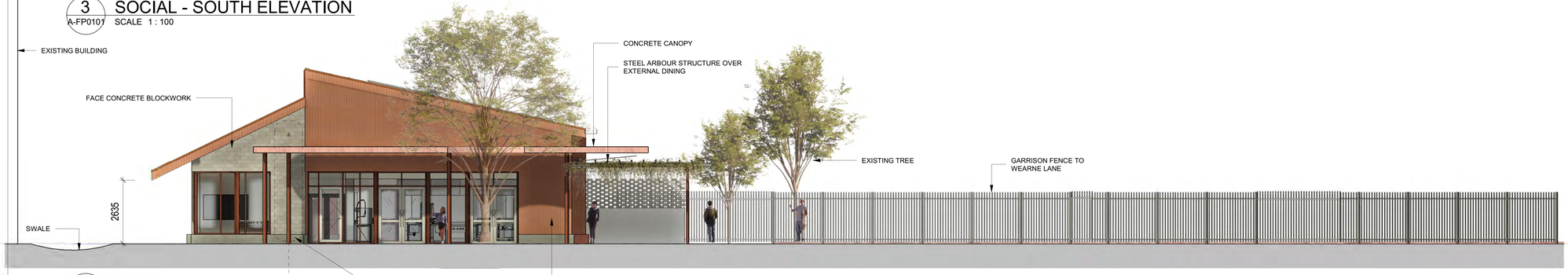
CURTIN PROJ No	CP354	SCALE:	1 : 100
DWG STATUS	SCHEMATIC DESIGN	UNIT:	
DWG No	03B781- A-RP0101	SHEET SIZE	A1
		SHEET	OF / ISSUE J



1 SOCIAL - NORTH ELEVATION
A-FP0101 SCALE 1 : 100



3 SOCIAL - SOUTH ELEVATION
A-FP0101 SCALE 1 : 100



2 SOCIAL - EAST ELEVATION
A-FP0101 SCALE 1 : 100



5 SIGNAGE
SCALE 1 : 100



4 SOCIAL - WEST ELEVATION
A-FP0101 SCALE 1 : 100

PRELIMINARY

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AGRICOLA SHARED FACILITIES

ELEVATIONS - SOCIAL CENTRE

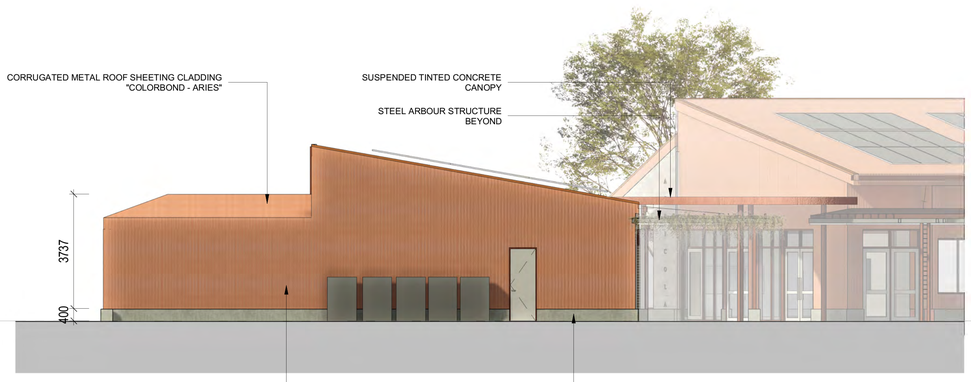
CURTIN PROJ No	CP354	SCALE:	1 : 100
		UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-EL0101	SHEET	
		OF	
		ISSUE	H



1 WELLNESS - NORTH WEST ELEVATION
A-FP0102 SCALE 1 : 100



3 WELLNESS - SOUTH EAST ELEVATION
A-FP0101 SCALE 1 : 100



2 WELLNESS - NORTH EAST ELEVATION
A-FP0101 SCALE 1 : 100



4 WELLNESS - SOUTH WEST ELEVATION
A-FP0101 SCALE 1 : 100

PRELIMINARY

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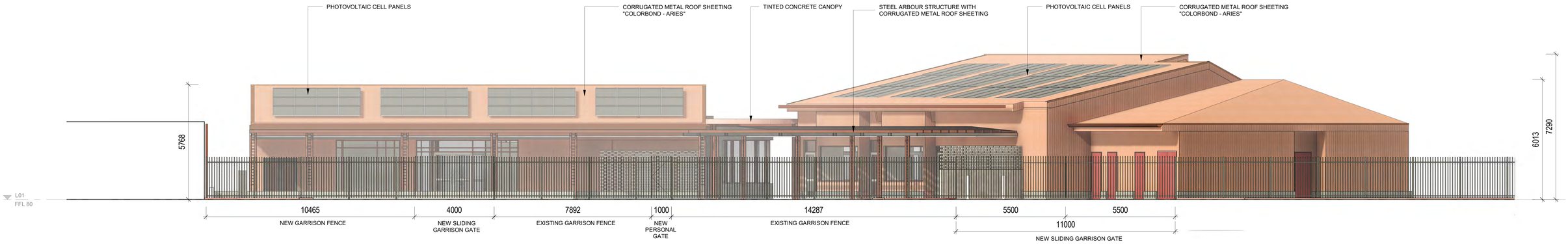
DRN BY	Author
DATE	10/04/22
DESIGNED	Designer
CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

ELEVATIONS - WELLNESS CENTRE

CURTIN PROJ No	CP354	SCALE:	1 : 100
		UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-EL0102	SHEET / OF / ISSUE	H



1 STREET ELEVATION

A-FP0102 SCALE 1 : 100

PRELIMINARY

REV	DATE	REVISION	DRN	CHK	PROJ APP
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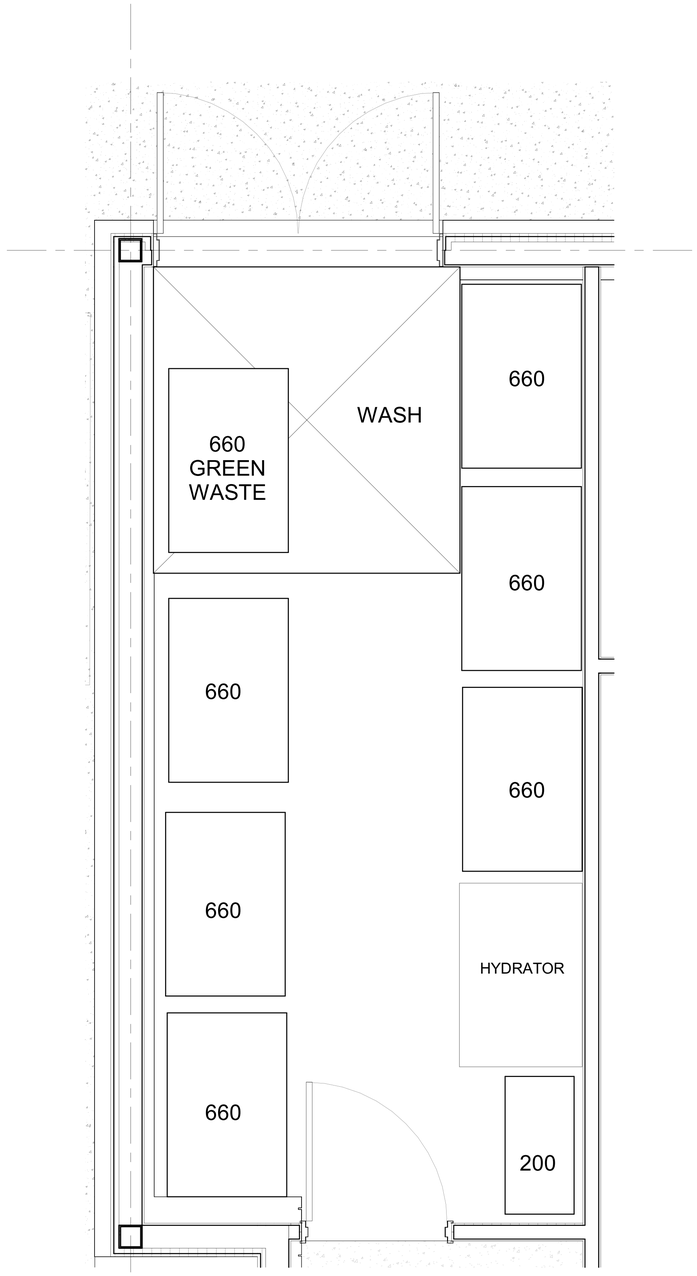
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AGRICOLA SHARED FACILITIES

ELEVATIONS - STREET ELEVATION

CURTIN PROJ No	CP354	SCALE: UNIT:	1 : 100
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-EL0103	SHEET / OF	ISSUE C

CODE LEGEND	
CODE	DESCRIPTION



1 BIN STORE - PLAN
SCALE 1 : 20

REV	DATE	REVISION	DRN	CHK	PROJ APP
A	26/08/2026	ISSUED TO CONSULTANTS - REMOVAL OF SKIP BIN STORE			

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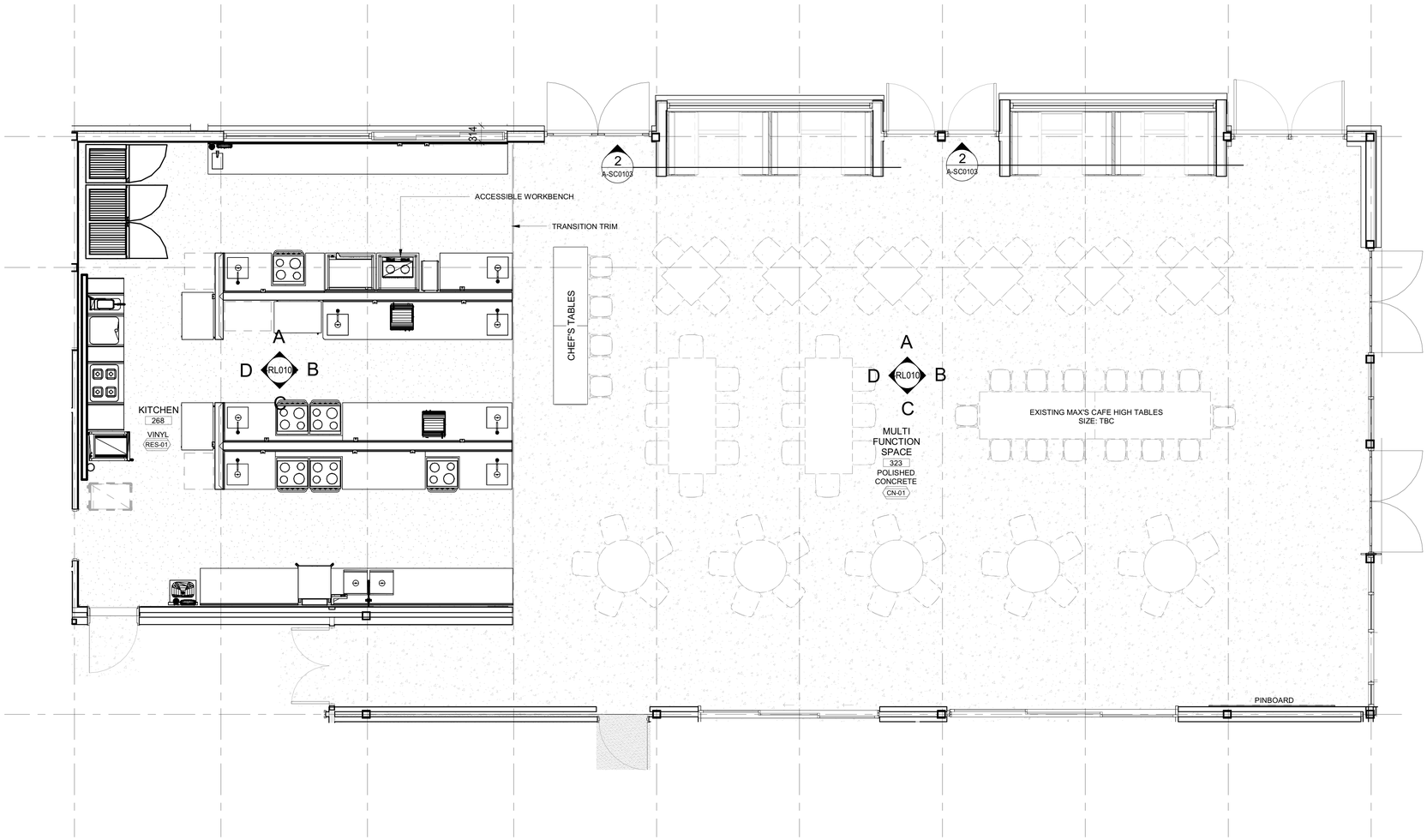
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AGRICOLA SHARED FACILITIES

ROOM LAYOUT - BIN STORE

CURTIN PROJ No	CP354	SCALE: UNIT:	1 : 20
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- I-RL0105	SHEET / OF	ISSUE A

CODE LEGEND	
CODE	DESCRIPTION
CN-01	Feature Concrete Finish
RES-01	Resilient Floor - Vinyl - Non-slip



1 MULTI FUNCTION ROOM - PLAN
SCALE 1 : 50

REV	DATE	REVISION	DRN	CHK	PROJ APP
A	22/07/2026	ISSUED TO CONSULTANTS			
B	05/08/2026	ISSUED TO CONSULTANTS			
C	26/08/2026	ISSUED TO CONSULTANTS - REMOVAL OF SKIP BIN STORE			

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CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

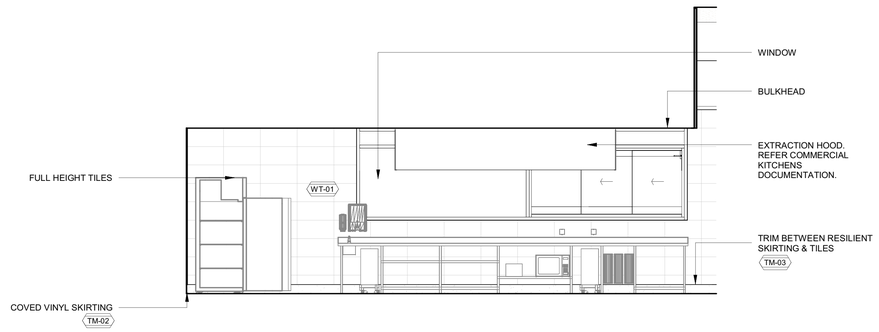
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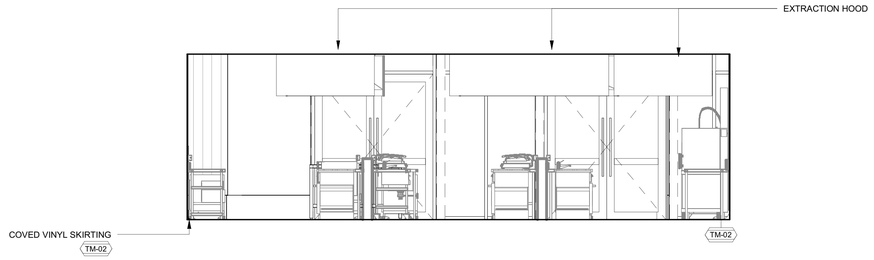
ROOM LAYOUT - MULTI FUNCTION ROOM

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DWG No	03B781- I-RL0101	SHEET	OF ISSUE C

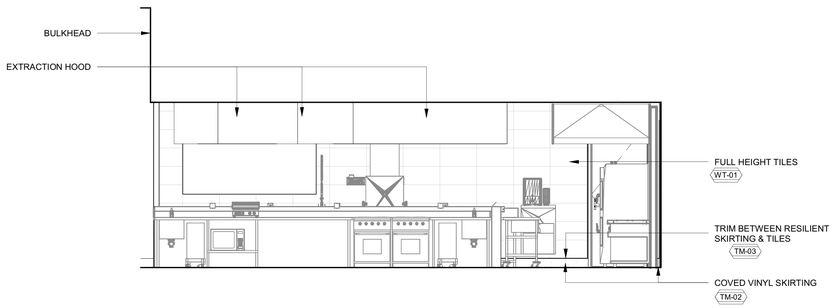
CODE LEGEND	
CODE	DESCRIPTION
TM-02	Coved Skirting
TM-03	Coved Skirting - Capping Strip Detail to Wall Tiling
WT-01	Wall Tiling - Porcelain



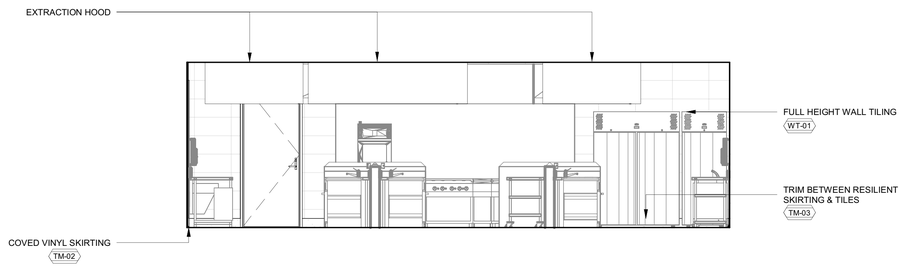
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SCALE 1 : 50



B FURN-02 INTERIOR ELEVATION - KITCHEN B
SCALE 1 : 50



C FURN-02 INTERIOR ELEVATION - KITCHEN C
SCALE 1 : 50



D FURN-02 INTERIOR ELEVATION - KITCHEN D
SCALE 1 : 50

REV	DATE	REVISION	DRN	CHK	PROJ APP
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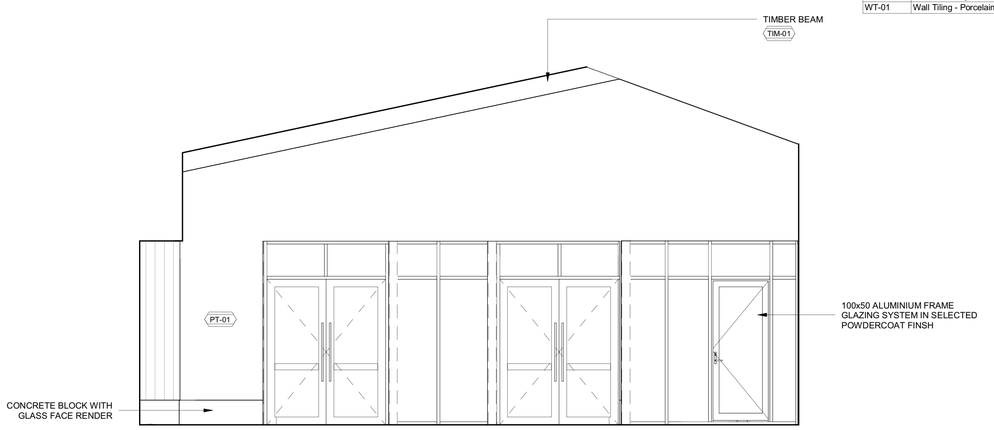
INTERNAL ELEVATIONS - KITCHEN

CURTIN PROJ No	CP354	SCALE: UNIT:	1 : 50
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- I-RL0102	SHEET / OF	ISSUE C

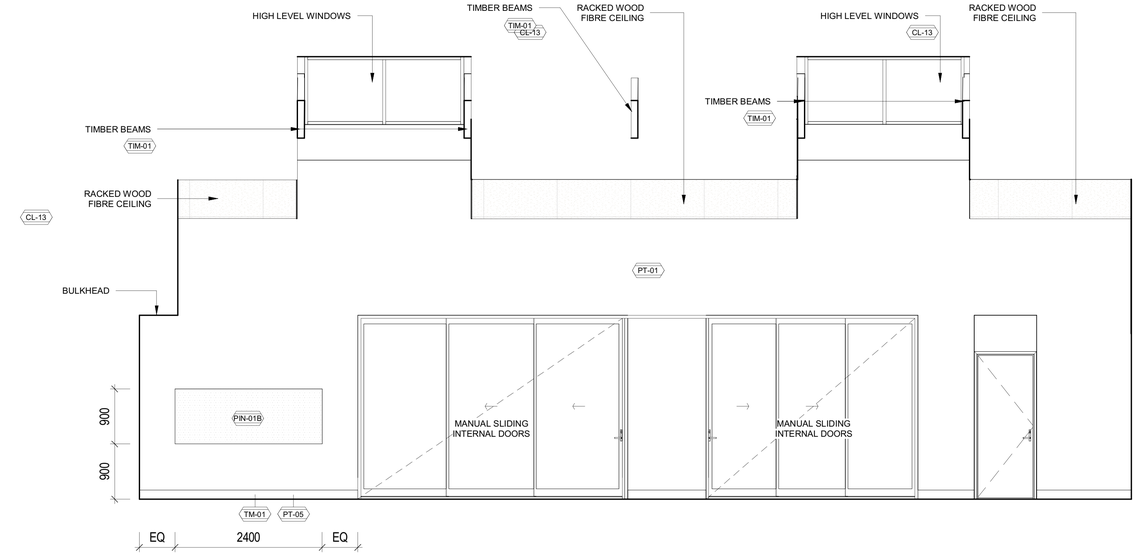
CODE LEGEND	
CODE	DESCRIPTION
CL-13	Suspended Ceiling - Wood Fibre Ceiling
FAB-01A	Joinery Finish - Fabric
FAB-01B	Joinery Finish - Fabric
FAB-02A	Joinery Finish - Vinyl
FAB-02B	Joinery Finish - Vinyl
LM-01	Joinery Finish - Laminate
PIN-01B	Pinboard
PT-01	Internal Paint - Wall
PT-05	Internal Paint - Timber door frames and trims
TIM-01	Solid Timber
TM-01	Skirting - Medium-Density Fibreboard (MDF)
TM-02	Coved Skirting
WT-01	Wall Tiling - Porcelain



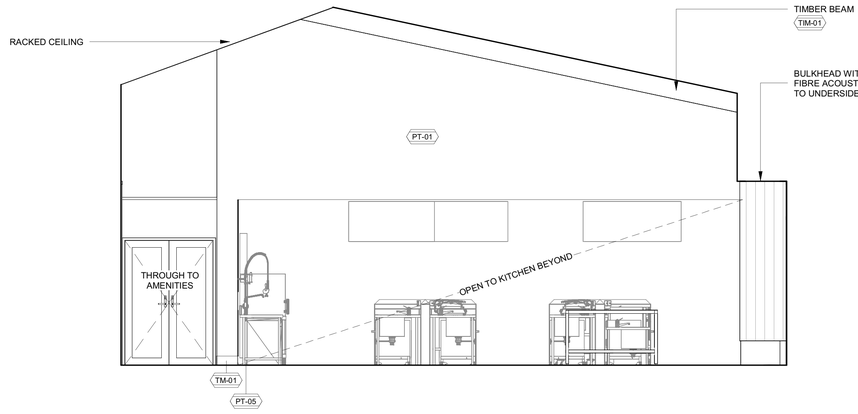
A I-RL0101 INTERIOR ELEVATION - M.FUNCTION ROOM A
SCALE 1 : 50



B I-RL0101 INTERIOR ELEVATION - M. FUNCTION ROOM B
SCALE 1 : 50



C I-RL0101 INTERIOR ELEVATION - M.FUNCTION ROOM C
SCALE 1 : 50



D I-RL0101 INTERIOR ELEVATION - M. FUNCTION ROOM D
SCALE 1 : 50

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CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

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INTERNAL ELEVATIONS - MULTI FUNCTION ROOM

CURTIN PROJ No	CP354	SCALE:	1 : 50
		UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- I-RL0103	SHEET	
		OF	
		ISSUE	C

05. Landscape Approach



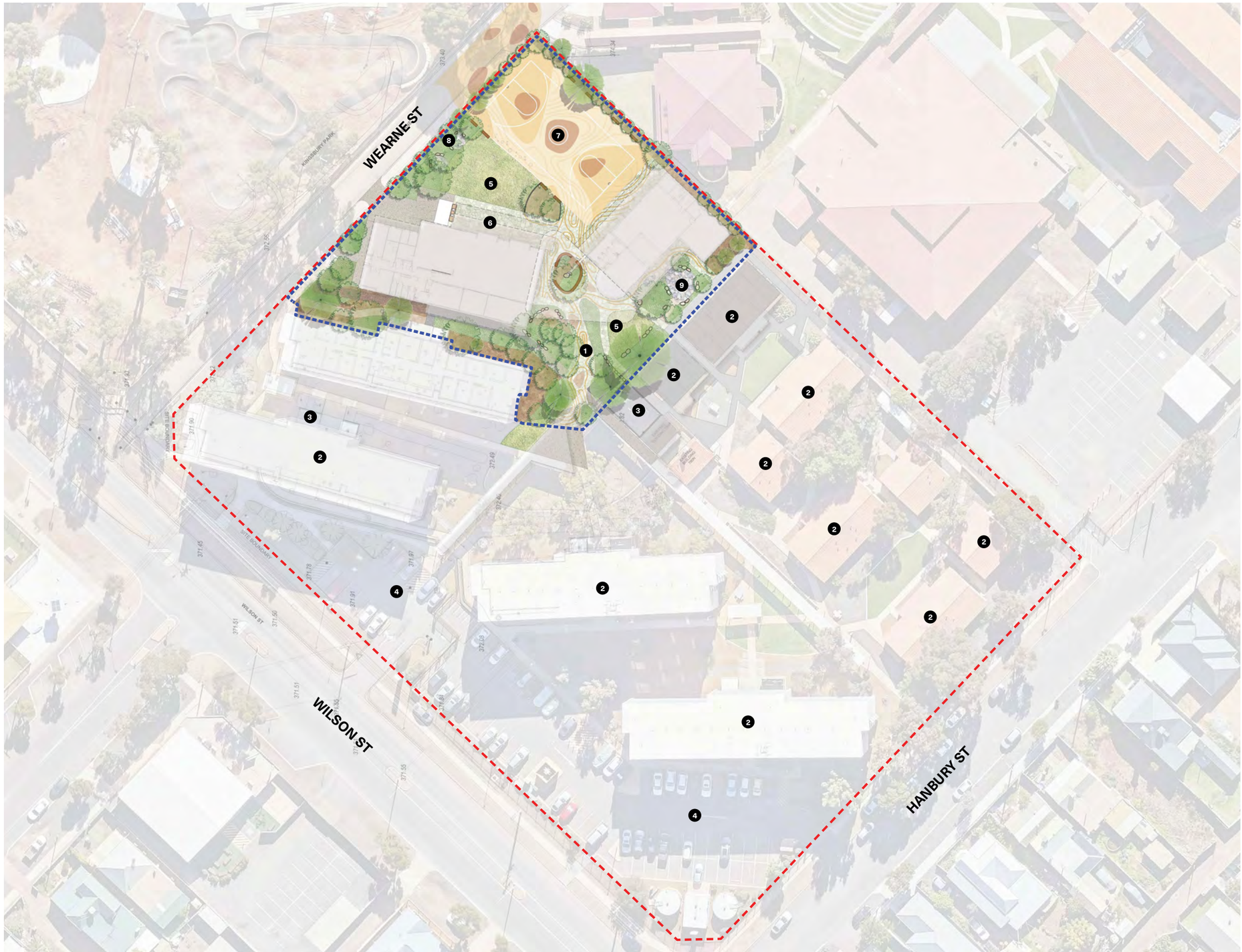
5.1 Masterplan

Key

1	Arrival to Shared Facilities
2	Existing Student Accommodation
3	Existing laundry drying area
4	Existing parking
5	Proposed lawn areas
6	Proposed alfresco space
7	The Court
8	Proposed diverse feature native planting
9	Contemplative Space

Site Boundary

Extent of work

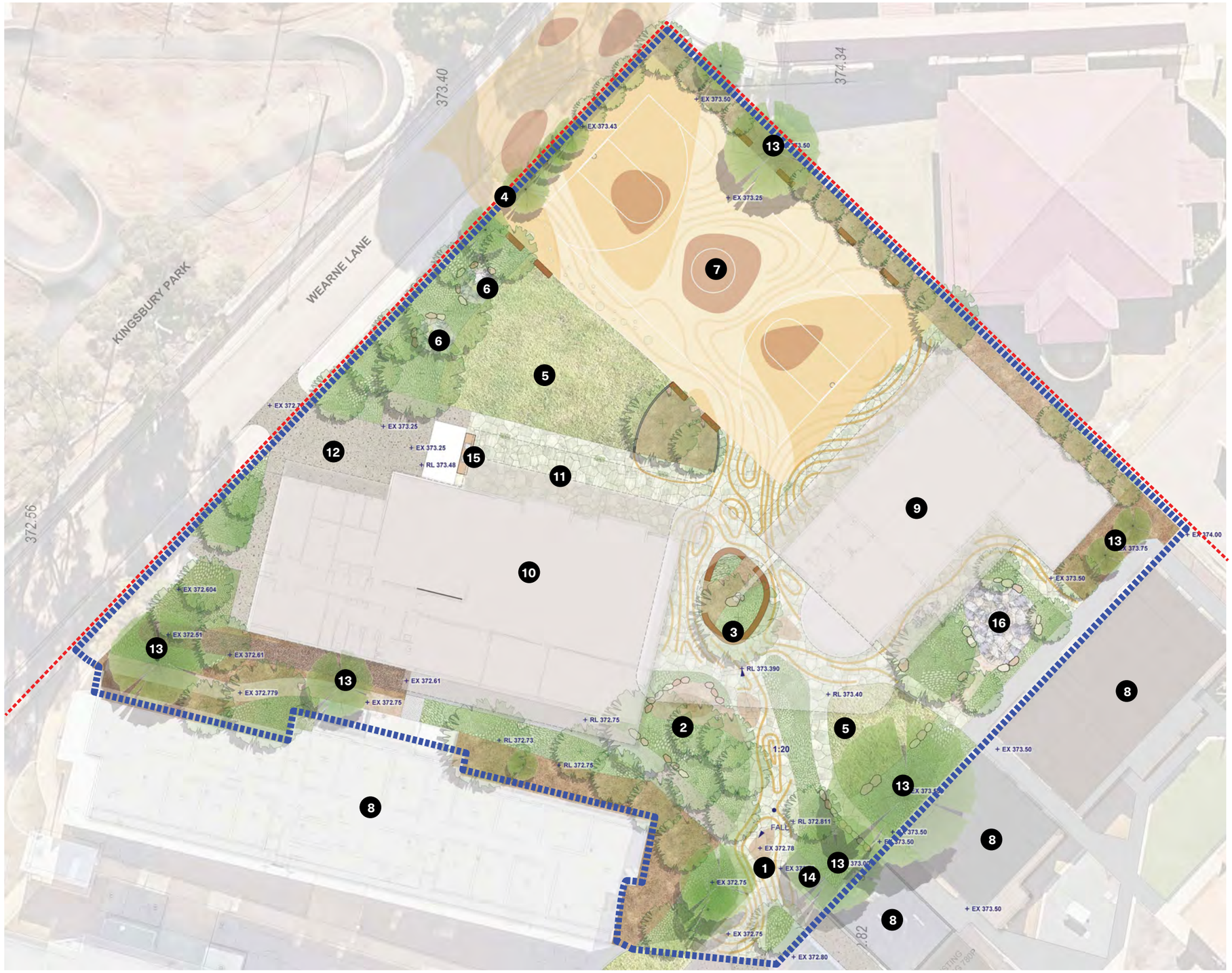


SCHEMATIC DESIGN SITE PLAN - SCALE: NTS

5.2 Landscape Site plan

Key	
1	Entry node
2	Terraced entry garden
3	Arrival Space
4	Wearne Lane entry
5	Lawn area
6	Gathering nooks
7	Multi-sport court
8	Existing Building
9	Wellness centre
10	Social Centre
11	Alfresco space
12	Loading zone
13	Existing tree
14	Existing Service building
15	Outdoor BBQ
16	Contemplative Space

	Site Boundary
	Extent of work

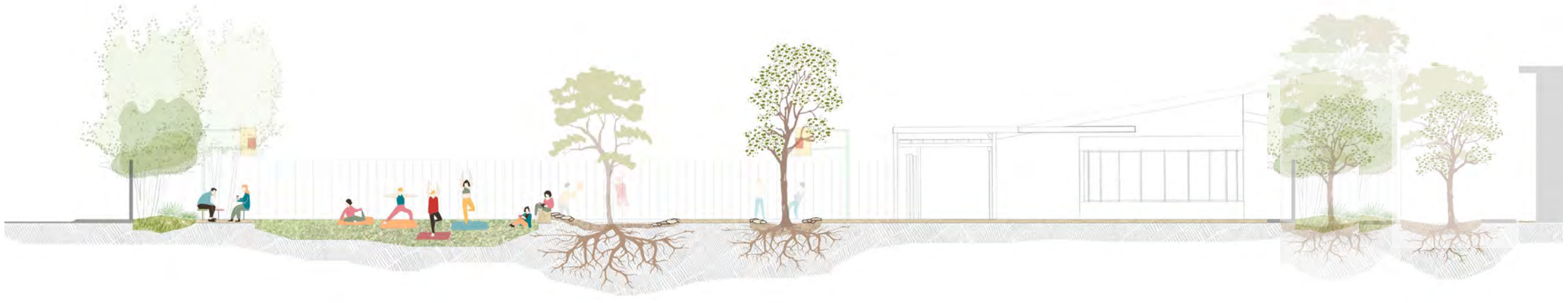


LANDSCAPE PLAN - SCALE: NTS

5.3 Landscape Site Sections



A



B



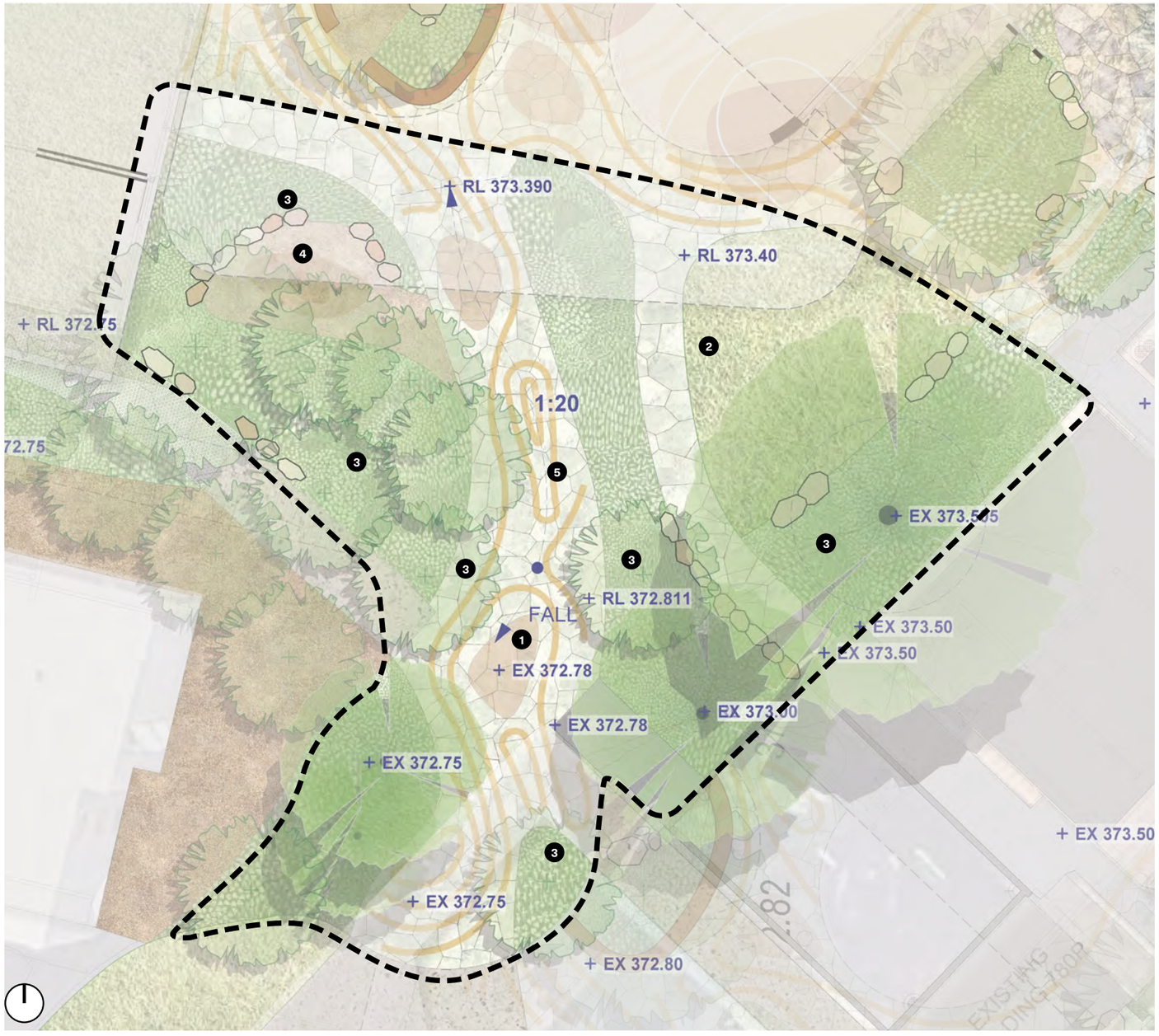
C







5.4 Landscape Amenity - Arrival











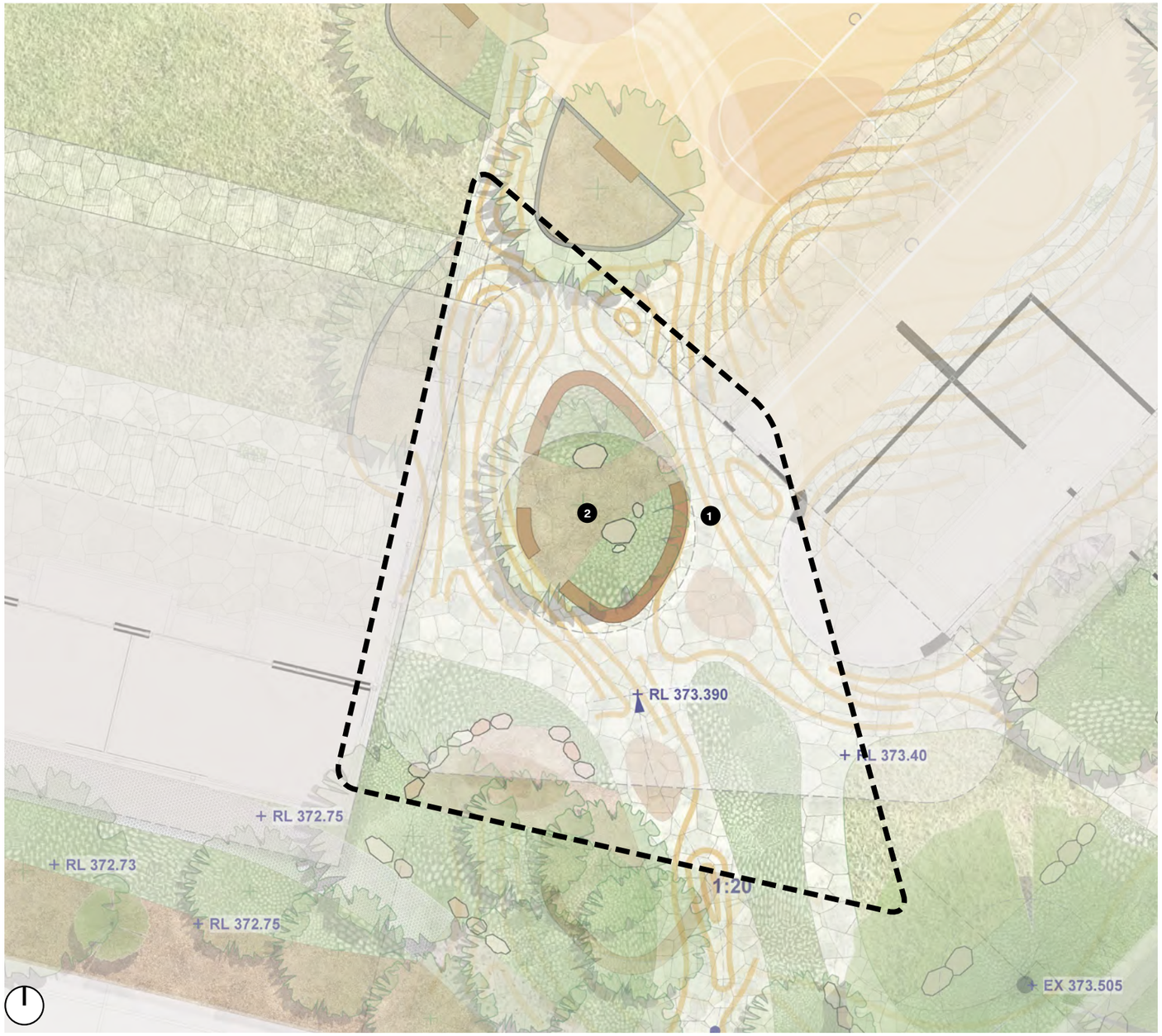




Key

1	Arrival
2	Lawn Area
3	Endemic planting around boulders
4	Meeting spaces
5	Paving feature

5.5 Landscape Amenity - Meeting place













Key

1	Canopy with Oculus
2	Feature tree with seating node

5.6 Landscape Amenity - The green

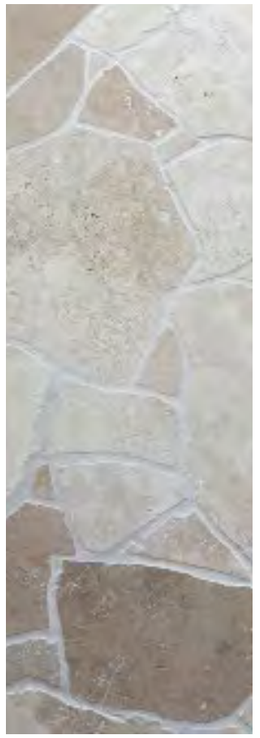












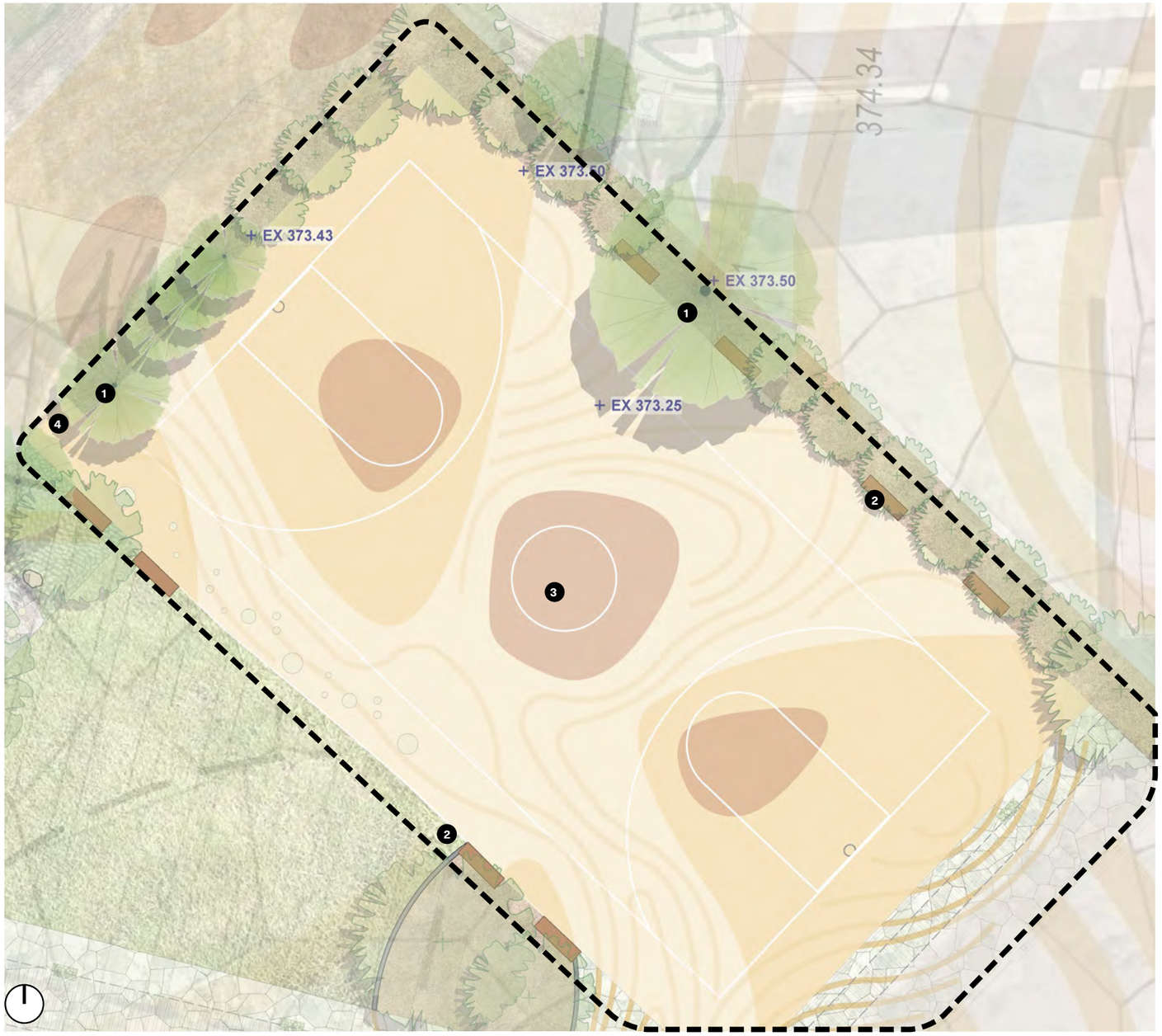


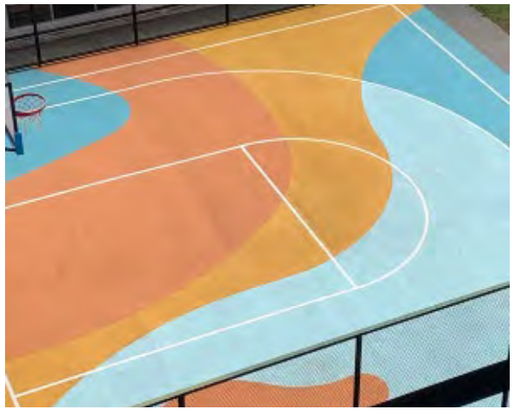


Key

1	Flexible lawn area
2	Shade trees
3	Gathering nooks
4	Seating
5	Climber to Pergola

5.7 Landscape Amenity - Court

















Key

1	Shade trees
2	Seating
3	Multi-use sport court
4	Wearne Lane entry

Curtin University

Agricola Shared Facilities

CIVIL SCHEMATIC DESIGN REPORT

WGA250696

WGA250696-RP-CV-0001_C

28 July 2026

Revision History

REV	DATE	ISSUE	ORIGINATOR	CHECKER	APPROVER
A	19/03/2026	For Review	RM	AY	MH
B	24/04/2026	For DA	RM	AY	WB
C	28/07/2026	For DA	RM	AY	WB

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1 INTRODUCTION 1
1.1 Project Background 1
1.2 Project Location 1
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4 QUALITY AND SAFETY 7
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Appendices

APPENDIX A STORMWATER SKETCH

1 INTRODUCTION

1.1 Project Background

WGA have been engaged by Curtin University as consulting civil and structural engineers for the modernisations, improvement and infrastructure upgrades to Agricola, Curtin University's on-campus student accommodation in Kalgoorlie, WA.

The proposed additions and refurbishments include a social centre, wellness centre and outdoor hardcourt. New landscaped areas are also to be incorporated in the shared facilities upgrades.

Civil services will provide drainage strategy for new buildings, hardcourt and hard landscaped area as well as new loading area to be used for a cool room trailer laydown. This report aims to outline the design basis with the available information at schematic design stage.

1.2 Project Location

Agricola Shared Facilities are located in the town of Kalgoorlie-Boulder, approximately 600km east of Perth.

Extent of project works on the accommodation site is indicated below in Figure 1.



Figure 1: Agricola Shared Facilities Project Extent

1.3 Relied Upon Information

The following documents were utilised to inform design decisions related to the existing site conditions:

- Golder Associates Geotechnical Investigation – Curtin University Kalgoorlie Campus Student Accommodation (Stage 1) – *"137642054-001-R-Rev0, May 2013"*
- Feature and Contour Survey by RM Surveys – 61 Wilson St, Kalgoorlie, WA 6430 – *"PROV-AGRIC-DW-002 Rev03, 3 March 2026"*

It is important to note that assumptions in this report have been made on the historic information found by the Golder Associates investigation from 2013. However, these assumptions should not be relied upon given the previous investigation was for the whole Agricola Shared campus with limited investigations on the project extent. It is understood that an updated geotechnical investigation will be conducted and report to be provided to WGA in the next design phase with specific test pits in the location of the project upgrade.

2 EARTHWORKS

2.1 Geometry

The existing Curtin University Agricola Shared Facilities area is on a relatively flat lot with an approximate grade of 1% toward the western boundary. This grade will be targeted to be replicated for the proposed shared facilities site works.

Table 1 provides a summary of the relevant design standards that will govern the shared facilities upgrade civil design.

Table 1: General Design Criteria

ITEM	DESIGN CRITERIA	REFERENCE/COMMENTS
Maximum Grades Across Hardscapes (%)	25%	AS 2890.1
Minimum Grades Across Hardscapes (%)	1%	AS 2890.1
Maximum Grade Along Footpath (%)	3%	AS 1428.1
Maximum Grade Across Footpath (%)	2.5%	AS 1428.1
Earthworks Batters	Des. 1V:4H	-
Maximum Side Slope of Swale	1V:4H	City of Kalgoorlie Boulder – Local Planning Scheme 2

2.2 Excavation

Geotechnical investigations performed by Golder Associates (May 2013) notes the site lies on a conglomerate rock layer ranging from a 0.5m to 2m depth. Therefore, excavation through this rock layer would require larger plant, such as a 30t excavator fitted with a rock breaker.

However, the shared facilities upgrade is intended to generally maintain existing levels therefore, significant excavation/rock breaking is not expected to be required.

Detailed earthworks will likely be restricted to relocating services and open channel drains.

As in Table 1, permanent batters will be limited to a desirable grade of 1V:4H slope. If steeper batters are required, this will be verified by a Geotechnical Engineer

2.3 Pavement

2.3.1 Cool Room Trailer Loading Area

The design of the driveway access and ‘cool room trailer’ laydown area off Wearne Lane, will be documented and coordinated across disciplines to comply with AS 2890.1 for Off Street Parking.

Pavement designs will be completed as part of design development when a geotechnical report has been completed and supplied.

2.3.2 Footpath Infill Area

The existing driveway in the Northern corner of the site will be removed and infilled to reinstate the footpath in the verge. The footpath will receive artwork as part of the landscaping package design. The footpath can either be of concrete or pavers to be detailed at the next design stage. Typical details for concrete and pavers footpath are indicated below which will be refined at detailed design stage.

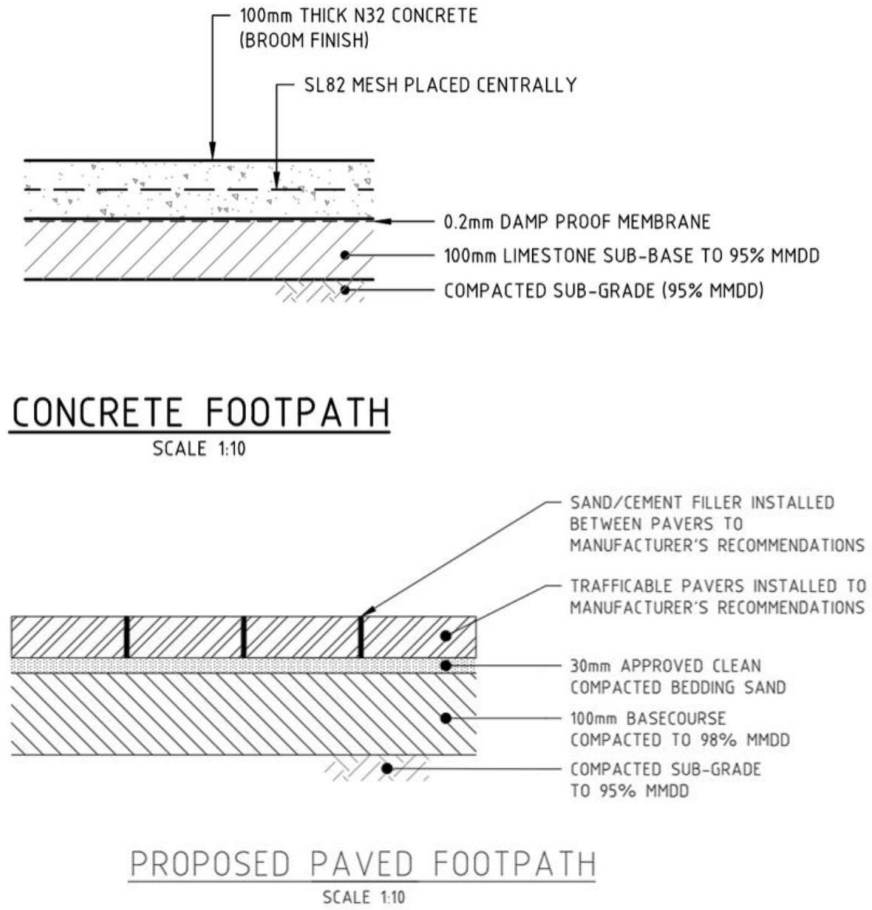


Figure 2 Typical footpath options for Infill

3 STORMWATER DRAINAGE

3.1 Design Criteria

The following design codes and standards form the basis of the stormwater drainage design:

- City of Kalgoorlie-Boulder Local Planning Scheme No. 2 (2023)
- Austroads Guide to Road Design Part 5 (AGRD5) – Drainage General and Hydrology Considerations (2013).
- Australian Rainfall and Runoff (2019).

According to City of Kalgoorlie-Boulder Local Planning Scheme No. 2 (2023) stormwater discharge is to be uncontaminated and discharged to the street, or to an alternative location, to the satisfaction of the local government and any relevant authority.

City of Kalgoorlie-Boulder Local Planning Scheme No. 2 (2023) does not dictate stormwater events to be modelled for stormwater infrastructure upgrades.

3.2 Stormwater Management

The proposed drainage strategy for the development will maintain the existing philosophy. The existing site stormwater runoff are graded towards swales within landscaped areas via overland flow paths and conveyed South through the site towards rock pitched detention basins at the Southern boundary of the campus. The collected runoff will ultimately overflow through kerb opening onto Wilson Street into the City of Kalgoorlie-Boulder drainage network.

The ground condition is found to be impermeable from the geotechnical investigation, infiltration has not been explored as a viable stormwater option, runoff will need to be carried through the proposed overland flow paths. Noting that existing site area prior to development was mainly impervious, and the proposed development design proposes more landscaped pervious footprint than existing hence reducing the amount of stormwater runoff from the area.

The proposed development is on the Northern end of the campus and overland flow will generally be directed towards the South into the existing drainage system as much as practicable. The schematic design intends to direct runoff from proposed buildings and footpath into existing swales that tie-in to downstream system for most of the development footprint.

The northern impervious hard court will be graded south towards the lawn area into a new swale within the landscaped area. A swale or basin will be provided in a similar manner to the existing to provide detention of water to remove pollutants via sedimentation. Treated runoff will overflow via kerb opening into the cool-rom trailer loading area which will be directed onto Wearn Lane. Runoff on Wearn Lane ultimately flows onto Wilson Street into the council network. This hardcourt area was previously conveyed within the existing site swales before eventually overflowing onto Wilson Street.

An indication of existing and proposed flow paths is shown in Figure 3 below and included in Appendix A.

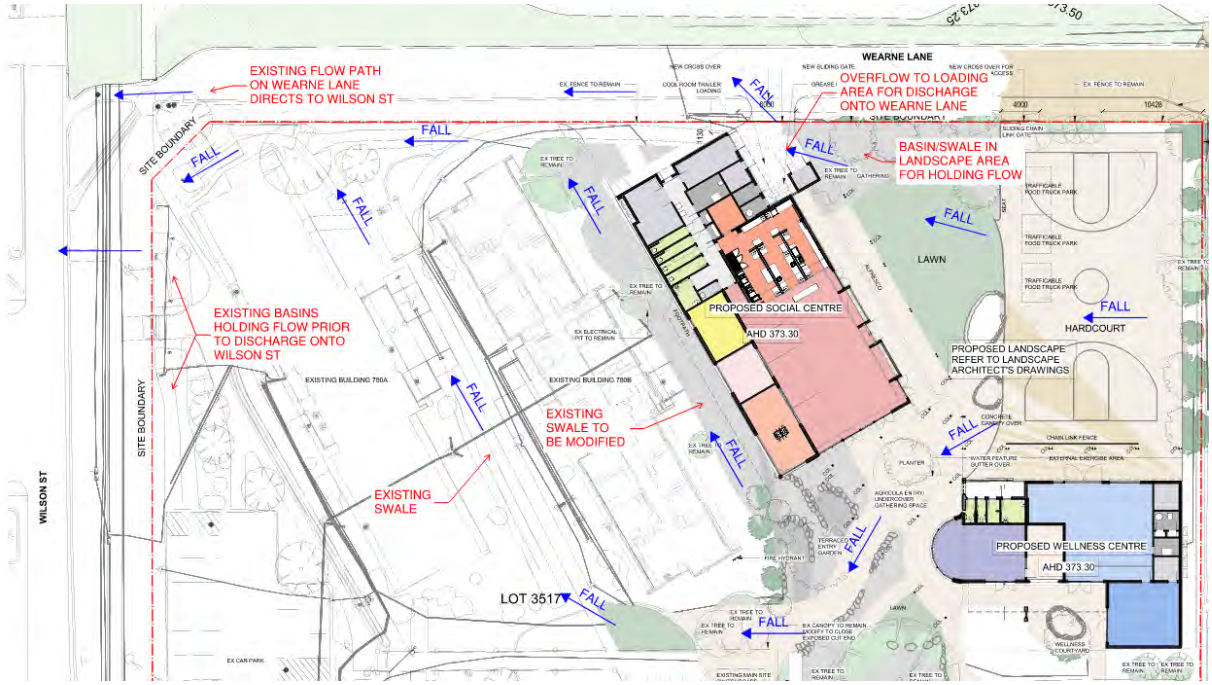


Figure 3 Overland Flow Proposed Across Site

Consideration has been made to provide a rock pitched in the detention swale or basin to contain the redirected flow from the hard court and turfed space area. It is anticipated that gross pollutants and sediment will be regularly removed from the detention basin during maintenance operations outside of rainfall events.

Where practicable, runoff will be directed away from the existing and proposed buildings to minimise damage to infrastructure in a major storm event.

3.3 Groundwater

The geotechnical investigations performed by Golder Associates (May 2013) detailed that groundwater was not encountered during the investigation.

4 QUALITY AND SAFETY

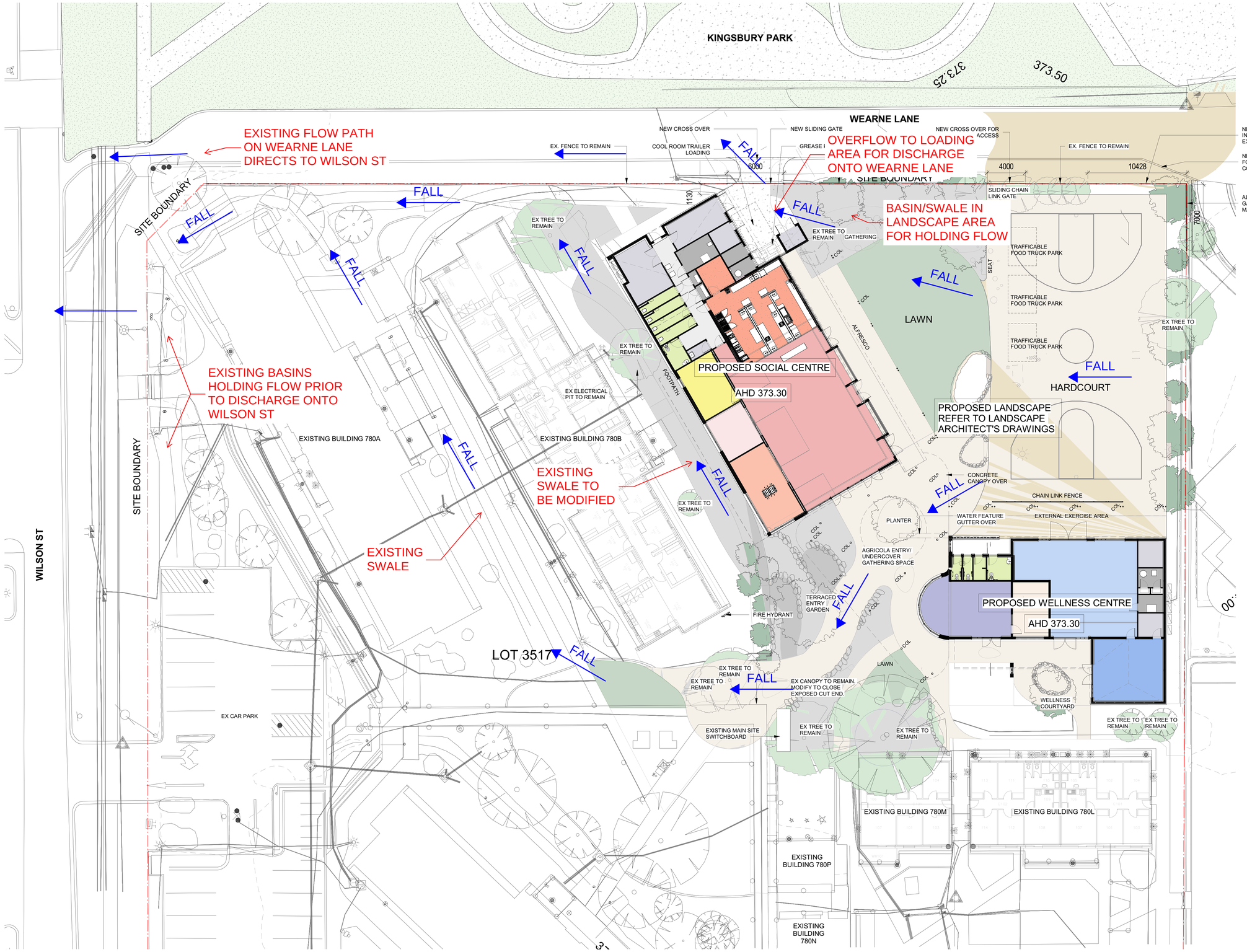
4.1 Safety In Design

WGA is dedicated to adopting Safety in Design (SiD) in accordance with the designer's responsibilities under State and National Occupational Health, Safety and Welfare Acts and Regulations. WGA considers safety through the lifecycle of the plant and structures and integrates a Hazard Identification and Risk Assessment early in the design process to achieve a safe design for the intended use, fabrication and construction of the project. As part of the process input from the Client, end user and Contractor are required for inclusion.

The SiD register will be developed in conjunction with the relevant stakeholders following the Schematic Design submission.

APPENDIX A
STORMWATER SKETCH





1 SITE PLAN
A-CP0103 SCALE 1 : 200

PRELIMINARY

REV	DATE	REVISION	DRN	CHK	PROJ APP
A	15/01/26	ISSUE FOR APPROVAL			
B	23/01/26	ISSUED FOR APPROVAL			
C	03/02/26	ISSUED FOR APPROVAL			
D	25/02/2026	ISSUE TO CONSULTANTS & QS			
E	20/03/2026	SCHEMATIC DESIGN ISSUE			
F	10/04/2026	SD ISSUE FOR APPROVAL			
G	5/06/2024	BIN STORE ADDED			
H	22/07/2026	ISSUED TO CONSULTANTS			

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CHECKED	Checker
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AGRICOLA SHARED FACILITIES

SITE PLAN - NEW WORKS

CURTIN PROJ No	CP354	SCALE:	1 : 200
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-SP0001	SHEET	OF ISSUE H

WGA

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Waste Management Plan

CP354 Curtin Agricola,

Kalgoorlie WA

Rev_2

Project No. 26-1799

TRCB

28 August 2026

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JCampbell@encycle.com.au

Revision	Drafted by	Reviewed by	Date issued
Rev_0	K Stewart	J Campbell	30 June 2026
Rev_1	K Stewart	J Campbell	4 August 2026
Rev_2	K Stewart	J Ferguson	28 August 2026

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Encycle Consulting 2026

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1 Development details

This Waste Management Plan (WMP) has been prepared for the following project:

Project name / address	**CP354 Agricola Shared Facilities, Curtin University** 61 Wilson Street, Kalgoorlie WA
Client	Curtin University
Architect	TRCB
Project manager	Proven Project Management
Main point of contact	Alan Tham, TRCB Architects
Planning status	DA was submitted on 1 May 2026
Overview of development	The CP354 project includes development of the following key spaces within the existing Agricola Student Accommodation site: • New Social Centre/New Living Pavilion • New Wellbeing Centre • Outdoor amenities (associated with the two new buildings)
Sustainability objectives and targets	Future consideration of Green Star Buildings rating may be considered at a later stage.
Architectural plans / area schedule / development information	• Schedule of Accommodation received from TRCB on 4 May 2026 • Architectural plans received from TRCB on 26 August 2026 • Swept paths received from WGA on 28 August 2026

1.1 Context

For efficient and effective waste management, the collection and centralisation of waste and recyclables have been carefully considered at the building design phase. Key factors considered at the design phase include:

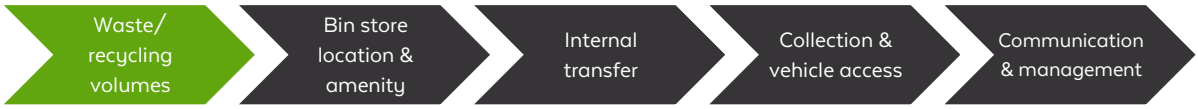
- Local government requirements for determining waste generation rates
- Waste and recycling volumes likely to be generated during building operation
- Number and types of bins required
- Bin store size, location and amenity (odours and noise)
- Internal transfer and access to bins and storage areas from within the building
- Access for vehicles for waste collection
- Safety for all operatives involved in waste management
- Communication and ongoing management of waste and recycling services

1.2 Key components of the Waste Management Plan

This Waste Management Plan (WMP) consists of five core components. It presents detailed information on each of the following components.



2 Estimated waste and recycling volumes



2.1 Project parameters

The development when operational will include the following:

- Total number of buildings 2 (two) and both buildings are only 1 (one) single storey:
    - Social Centre NLA – 641 m^2
    - Wellness Centre NLA – 271 m^2
- Total number and breakdown of waste-generating spaces:
    - Social Centre includes:
        - Large multi-function space 181 m^2
        - Kitchen 73 m^2
        - Games room 26 m^2
        - Lounge 36 m^2
        - Bookable space 21 m^2
    - Wellness Centre includes:
        - Gym 108 m^2
        - Zen Den 49 m^2
        - Study 53 m^2
        - Meeting room 22 m^2

2.2 Local Government Guidelines

The following have been used in the development of this report:

- City of Kalgoorlie-Boulder Waste Management Plan Guidelines
- City of Kalgoorlie-Boulder Consolidated Health Local Laws 2001
- WALGA Commercial and Industrial Waste Management Plan Guidelines (2018)

2.3 Waste generation rates

WALGA waste generation rates have been used in addition to Encycle's experience and knowledge of the uses of the building to calculate the estimated generation of waste and recyclables.

Specifically, the generation rates applied to each building use are presented in Table 1. The City of Kalgoorlie-Boulder and WALGA rates do not include a breakdown of material streams included in the 'recycling' stream. The final column presents Encycle Consulting's in-house estimate of the material streams present in the recycling stream based on our working experience of operational buildings in Perth.

Table 1: Commercial waste generation rates

Premises type/ building use and rate applied	Waste generation rate	Recycling generation rate	Percentage breakdown of recycling stream by material
Social Centre – Lounge/Games & Wellness Centre – Zen Den/Study – (Office–208 m^2)	0.1 L /1m^2/day	0.1 L /1m^2/day	7% commingled 79% paper 14% cardboard 10% soft plastics
Wellness Centre / (Gymnasium – 108 m^2)	0.1 L /1m^2/day	0.1 L /1m^2/day	40% commingled 50% cardboard 10% soft plastics
Social Centre Multi-Function / (Function rooms – 185 m^2)	2.0 L /1m^2/day	1.0 L /1m^2/day	40% commingled 50% cardboard 100% glass (in addition, if licenced) 10% used cooking oil 10% soft plastics
Social Centre (Kitchen / Café – 73 m^2)	3 L /1m^2/day	2 L /1m^2/day	40% commingled 50% cardboard 100% glass (in addition) 10% used cooking oil 10% soft plastics

2.4 Number of bin stores required

The Social Centre and Wellness Centre buildings share one bin store for all waste streams. The existing skip bin will be replaced with a garden organics bin located in the bin store servicing the wider Campus.

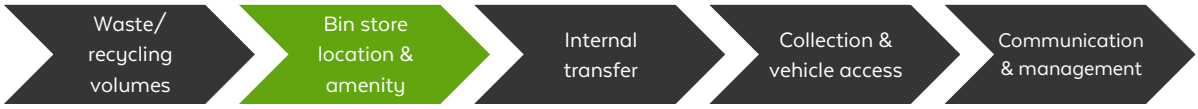
2.5 Number of bins required

The number of bins required are set out in Table 2.

Table 2: Number of bins to be stored in the bin store

Waste stream	Bin size (L)	Number of bins	Collection frequency	Colour code
General waste (excluding food waste)	660	3	3 x weekly	W
Commingled recycling	660	1	Weekly	CM
Cardboard recycling	660	2	Weekly	CB
CDS recycling	240	6	As required	CDS
Used cooking oil	200	1	As required	CO
Garden Organics	660	1	As required	GO

3 Bin store locations and amenity



3.1 Bin store location

The bin store will be located on the ground floor of the Social Centre (refer Figure 1). Figure 2 shows the layout of the shared bin store.

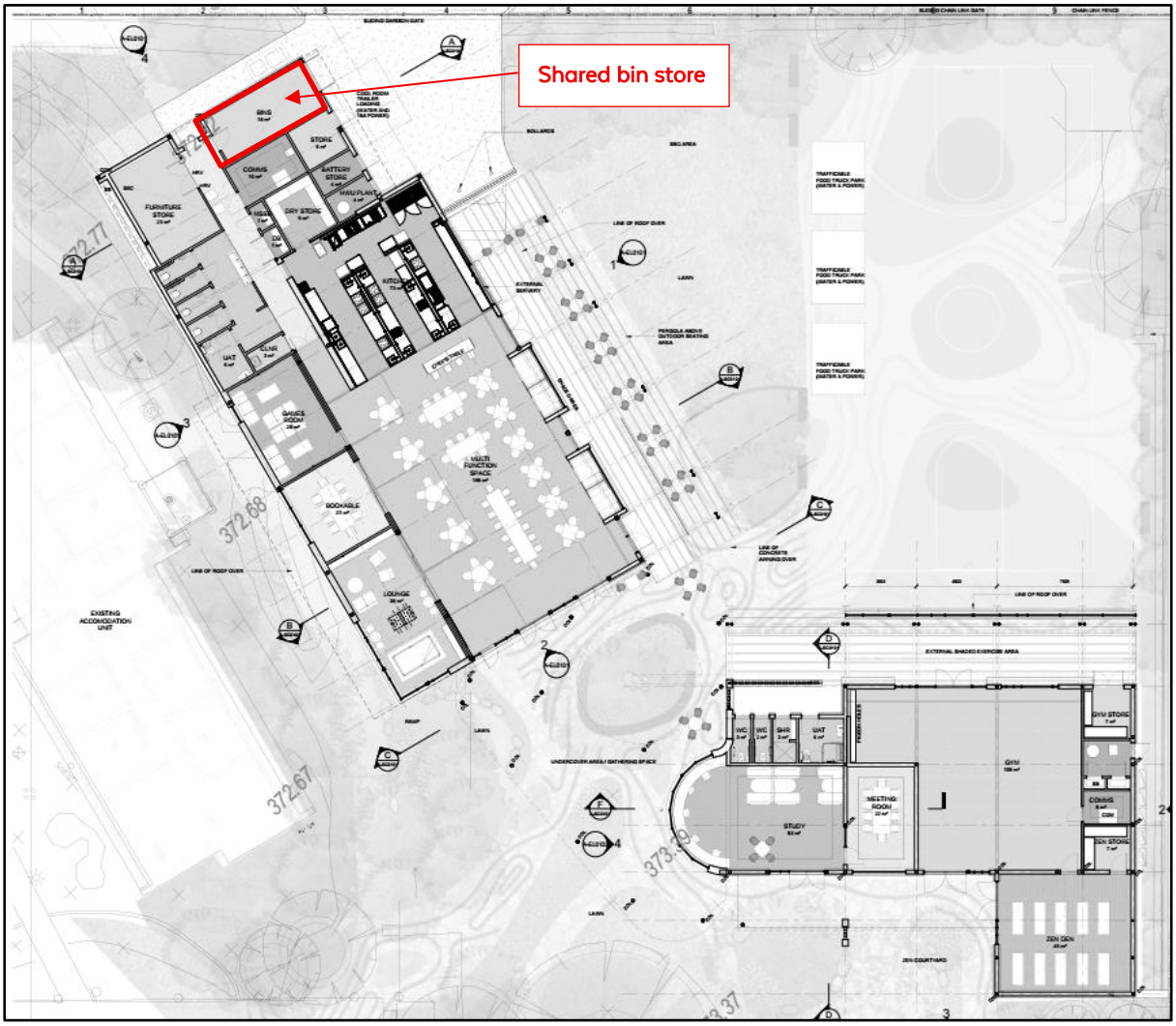


Figure 1: Site plan showing location of the shared bin store and service area for both the Social Centre and the Wellness Centre (not to scale)

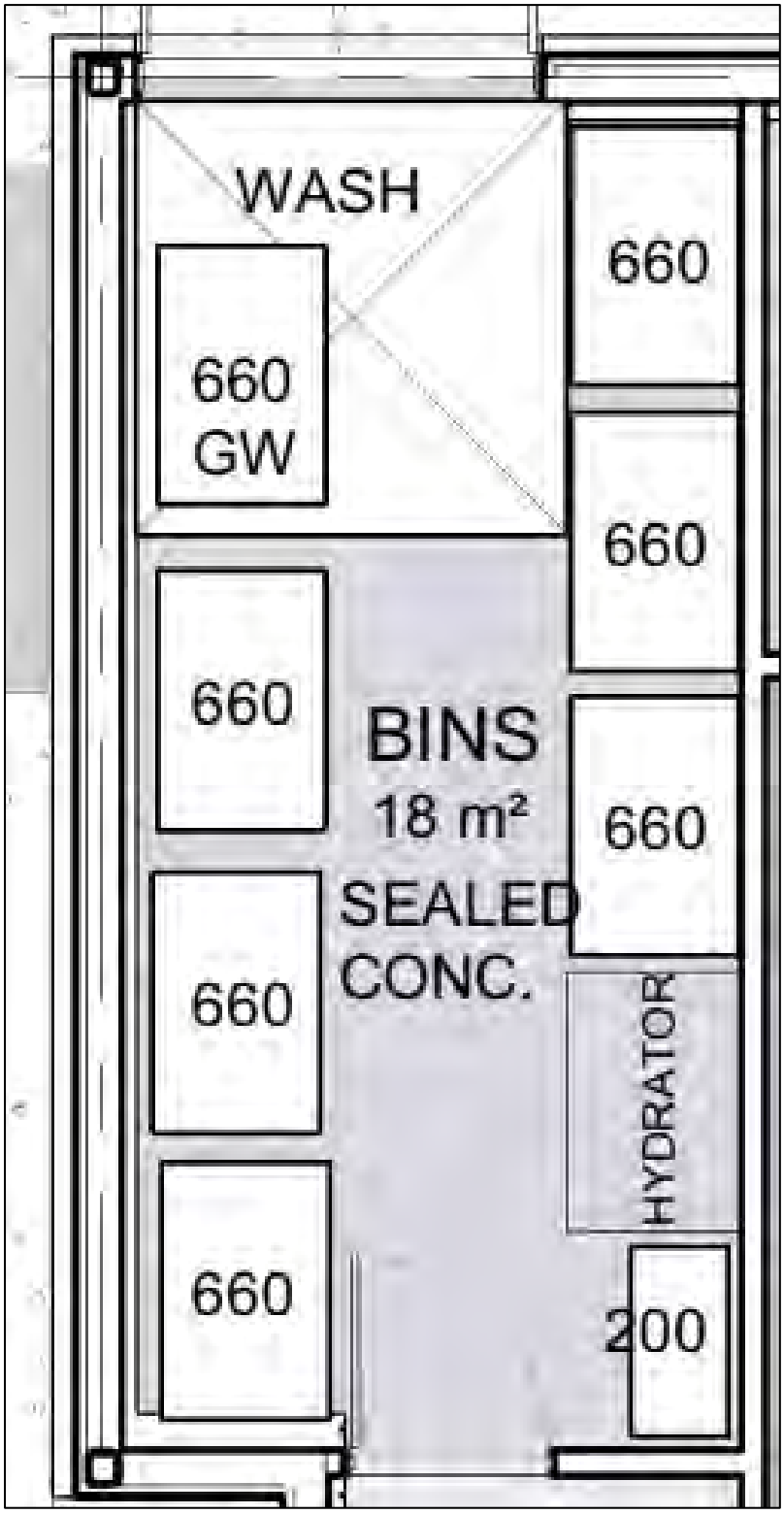


Figure 2: Layout of the bin store (not to scale)

3.2 Bin store amenity

The bin store has been designed to include the following requirements in Table 3.

Table 3: Bin store amenity requirements

Aesthetics	The bin store is consistent with the overall aesthetics of the development.
Fully enclosed	The bin store is fully enclosed and weatherproof, and only accessible by cleaners, facility management and waste service providers.
Spatial requirements	The bin store allows sufficient space to accommodate, manoeuvre and wash the bins. Space for personnel access way between rows of bins is included.
Bin wash	The bin store has impermeable walls and floors grading to an industrial floor waste (including a charged 'water-trap' connected to sewer/an approved septic system), with a hose cock to enable bins and/or the enclosure to be washed out. A 100 mm floor waste gully to waste outlet is included. Both hot and cold water is available.
Doors	Doors are ventilated both internally and externally to the bin store. Self-closing doors are installed to the bin store to eliminate access to vermin. Doors from the bin store to the servicing/collection area can be locked open. Doors are designed to fit the largest bin, to enable bins to be easily wheeled into and out of the bin store.
Security	Security measures are designed to limit access to the bin store, e.g. PIN code that can be easily changed and reduces loss of key cards etc.
Walls and ceilings	Internal bin store walls are cement rendered (solid and impervious) to enable easy cleaning. Ceilings are finished with a smooth faced, non-absorbent material that can be easily cleaned. Walls and ceilings are finished or painted in a light colour.
Floors	Floors are constructed in concrete in accordance with AS 2870. Floors are evenly graded to an approved liquid refuse disposal system. Slab thickness is a minimum of 100 mm, impervious and with a brush finish treatment.
Ventilation and odour	The design of the bin store provides for adequate separate ventilation with a system that complies with Australian Standard 1668 (AS1668). The ventilation

	outlet is not in the vicinity of windows or intake vents associated with other ventilation systems.
Lighting	Bin store is provided with artificial lighting, with sensor or switch controls both internal/external to the bin store. Artificial lighting in laneways/loading bays and access walkways to bin store will ensure staff safety and decrease antisocial behaviour.
Noise	Noise is minimised through considering the location of the bin store and collection point and the timing of collections to prevent disruption to occupants or neighbours.
Signage	Visual aids and signage will be provided when the bin store is operational to ensure that the area works as intended.
Cooking oils	Used cooking oil storage will be bunded.

4 Internal transfer

4.1 Transfer of waste to bin store

Staff from the Wellness Centre will manually transfer waste and recyclables to the bin store in the Social Centre building (refer Figure 3). Kitchen staff and/or cleaners of the Social Centre will use service corridors to transfer waste and recyclables from the kitchen and function room to the bin store.

Curtin University cleaners will transfer the bins from the general office/study areas to the bin store for collection.

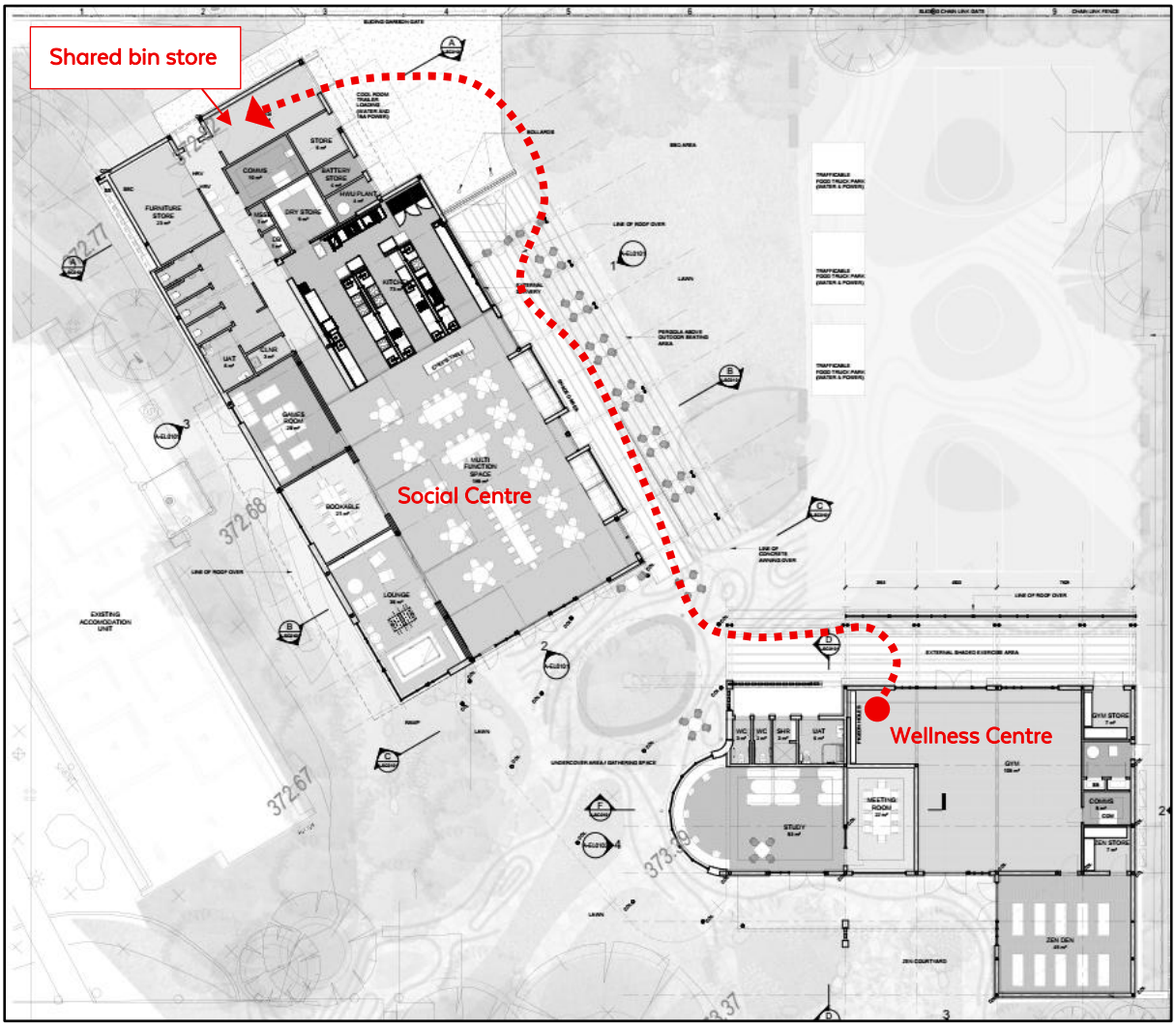


Figure 3: Transfer route from Wellness Centre to bin store (shown dashed red)

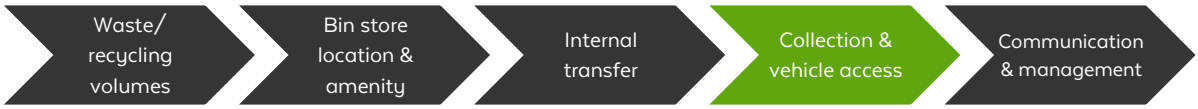
4.2 Bin transfer requirements

All bin transfer routes have been designed to include the following requirements in Table 4.

Table 4: Bin transfer requirements

Bin transfer requirements	
User access route	Waste transfer routes avoid stairs/steps and steep ramps (grade of slope <1:14) and other potential hazards between points of waste generation, storage and collection. Waste transfer routes are designed to ensure that bins (particularly when full) are not moved over any significant distances.
Manual handling	Manual handling of waste in garbage bags is excluded from the waste management systems wherever possible.
Transfer route width	All doors, corridors and lifts on the transfer route are designed to fit the largest bin.
Access for waste collection vehicles	Waste collection vehicles will safely enter, operate and exit the development with minimal reversing or manoeuvring.
Walkways	Safe access to waste collection vehicles have been provided to reduce the risk of accidents.

5 Collection and vehicle access



A private waste service provider will service the general waste, recycling and garden organics bins using rear-lift vehicles. A tanker vehicle will require access to service the grease trap. In addition, a small tanker vehicle will require access to service the used cooking oil storage unit.

On collection days', rear-lift vehicles for general waste, commingled recycling and cardboard, a tanker to empty the grease trap and a tanker for used cooking oil, will enter the site from Wearne Lane. The vehicles will reverse into the service yard and stop outside the bin store. The operatives will enter the bin store to retrieve and service the relevant bins. The operatives will return the empty bins to the bin store.

Access to the grease trap located at the rear of the driveway, will be from Wearne Lane where the tanker will reverse into position. Swept path analysis for vehicle ingress and egress has been completed by the consulting civil engineers WGA, taking into consideration the specifications of a 10.1 m rear-lift collection vehicle (see Figure 4).

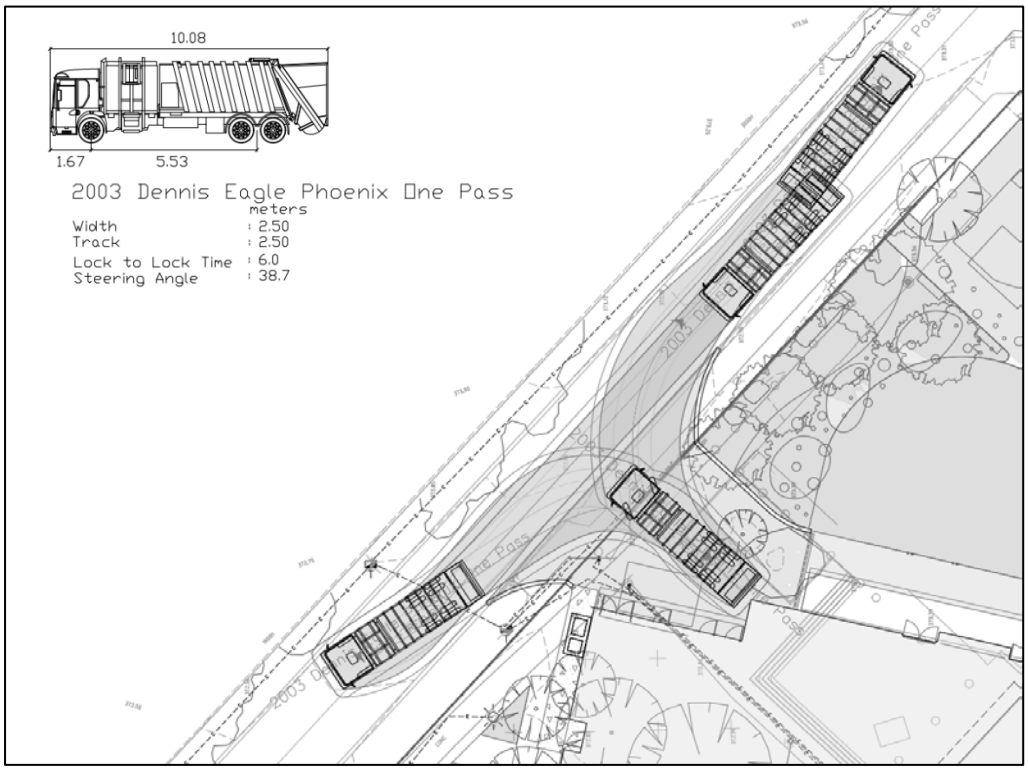
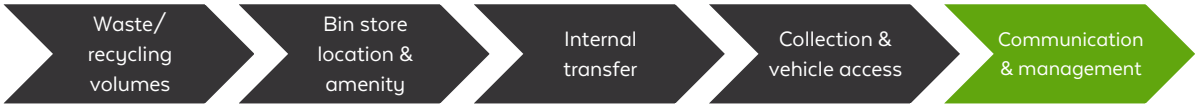


Figure 4: Swept path analysis showing access for 10.1 m rear-lift truck accessing the loading area

6 Ongoing communication and management



6.1 Management

The Facility management team, will be responsible for overseeing the waste management systems. The facility manager will be trained and informed about their responsibility to work closely with the private waste service provider regarding the schedule for collection and presentation of bins in the bin store. The Facility Manager will be responsible for maintaining the bin store in a clean and tidy condition at all times and ensuring bins are washed regularly.

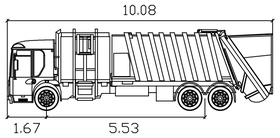
6.2 Communication

All staff and students will be made aware through a campus wide management document (or equivalent) of the waste and recycling systems and how they should be used.

Facility management will be responsible for the continuing education of student and staff on correct segregation of waste and recyclables to ensure successful performance of the waste management system within the buildings.

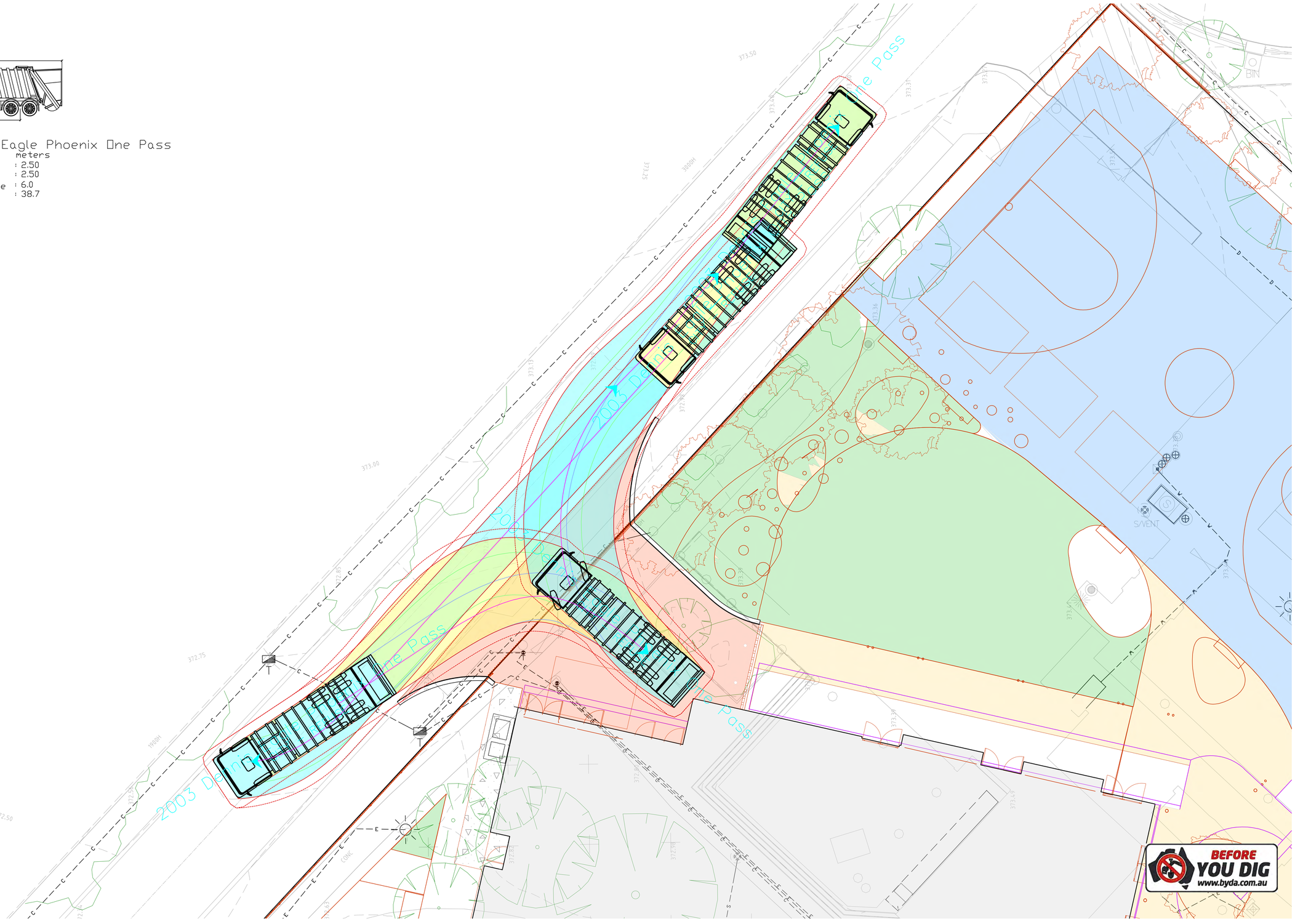
Appendix A: Glossary of terms and acronyms

Collection point	The permitted area on a footpath, roadway or private property (where applicable) that waste, recyclables and bulky waste are loaded into collection vehicles.
Commingled recycling	Common recyclables, mostly packaging; such as glass, plastics, aluminium, steel, liquid paper board (milk cartons). Commingled recycling may include paper but often, and particularly in offices, paper and cardboard are collected separately.
Container Deposit Scheme (CDS)	Also known as Containers for Change: In Western Australia 'eligible containers' (usually for soft and alcoholic drinks) have a 10 cent deposit which can be refunded when the container is redeemed at a refund facility.
Garden organics	Separated 'green' material (e.g. grass clippings or vegetation prunings).
General waste	Material that is intended for disposal to landfill (or in some States, incineration), normally what remains after the recyclables have been collected separately.
Grease trap	Collection of solid greases and oils in a tanker system to remove this material from water discharged to sewer from commercial kitchens or food processing facilities. Grease trap collection vehicle requirements can be included in the Waste Management Plan where relevant. Encycle are not hydraulics engineers and do not specify or advise on grease trap systems.
Recyclable	Material that can be collected separately from the general waste and sent for recycling. The precise definition will vary, depending upon location (i.e. systems exist for the recycling of some materials in some areas and not in others).
Recycling	Where a material or product undergoes a form of processing to produce a feedstock suitable for the manufacture of new products.



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Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7



SITE PLAN
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SCALE BAR (m)
1:200

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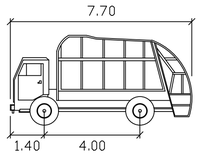
WGA

AGRICOLA SHARED FACILITIES
KALGOORLIE
10.1m WASTE VEHICLE - BINS
CIVIL WORKS - SCHEMATIC DESIGN ©

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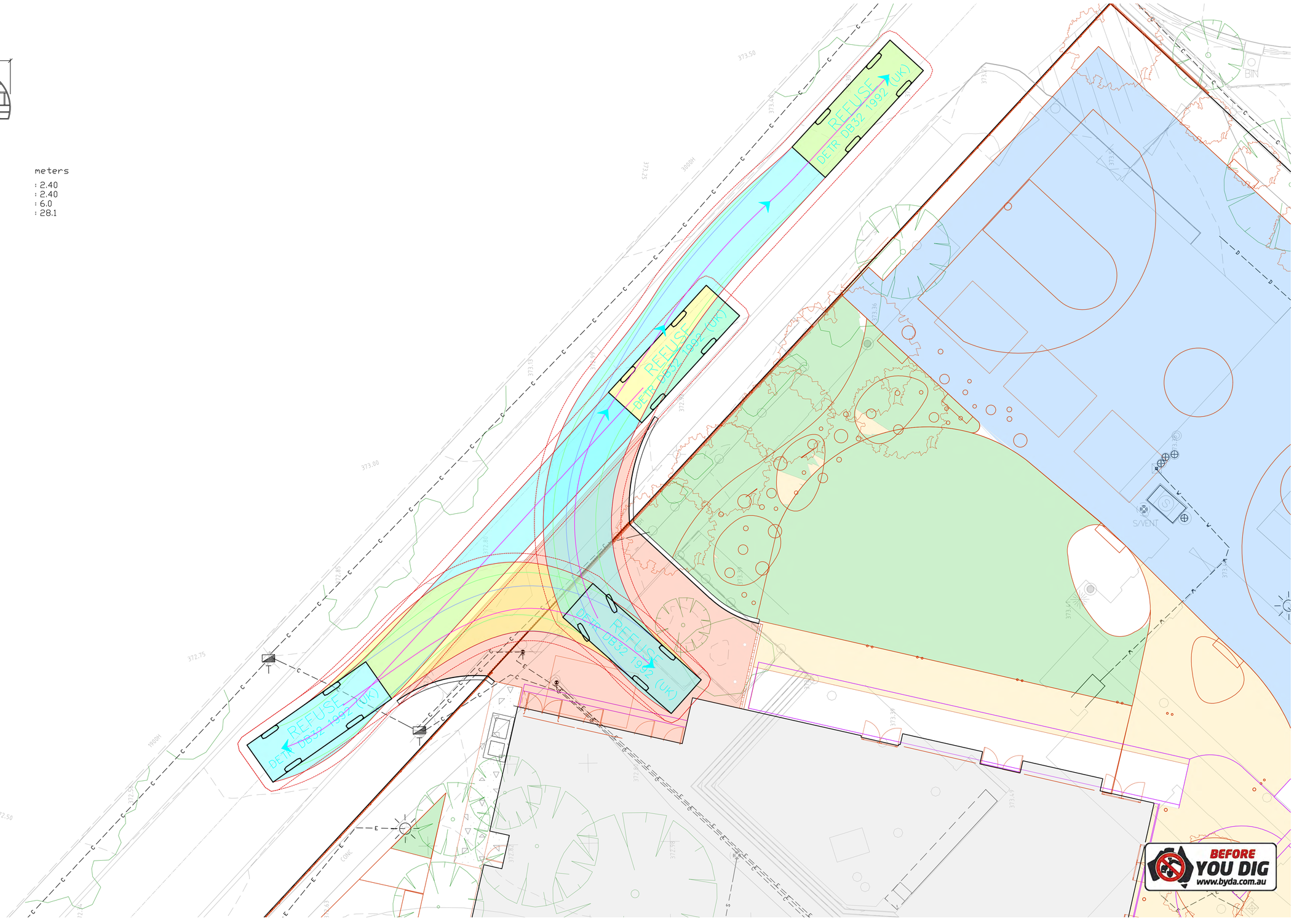
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SITE PLAN
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SCALE BAR (m)
1:200

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WGA

AGRICOLA SHARED FACILITIES
KALGOORLIE
7.7m WASTE VEHICLE - GREASE TRAP
CIVIL WORKS - SCHEMATIC DESIGN ©

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Curtin University Agricola Shared Facilities

Application for Development Approval

Lot 3517 (No. 61) Wilson Street, Kalgoorlie



ROWE GROUP PLANNING

OUR REF: 10187_IND01A

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Version: 3, Version Date: 05/05/2026

Document Control

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2. General Development Standards of Local Planning Scheme No. 2
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1. Certificate of Title
2. Development Plans
3. Architectural Presentation
4. Landscape Report
5. Public Art Strategy
6. Indigenous Engagement Strategy
7. Civil Engineering Report

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1. Introduction

Rowe Group acts on behalf of Curtin University, the landowner of Lot 3517 (No. 61) Wilson Street, Kalgoorlie ('subject site').

This report has been prepared in support of a Development Application ('Application') lodged with the City of Kalgoorlie-Boulder for determination by the Regional Development Assessment Panel, for the redevelopment of the shared facilities at the 'Agricola' student accommodation at the Curtin University Kalgoorlie campus.

The proposal represents a significant investment in the future of student living in the Goldfields, delivering contemporary, purpose-built communal, recreational and wellness facilities that respond to the evolving needs and expectations of residents.

The development seeks to establish a vibrant and cohesive campus heart that supports connection, wellbeing and day-to-day student life. The design integrates high-quality built form, landscape and public art outcomes, grounded in a strong response to local context and guided by meaningful engagement with the Kaalamaya Kupurn Traditional Owners.

This report provides:

- A description of the subject site and its context;
- A description of the project background, vision, and proposed development;
- A summary of the stakeholder engagement processes and outcomes;
- Planning justification demonstrating the proposal's consistency with the relevant statutory framework; and
- A summary of technical considerations for the proposal.

The Project Team for this development is outlined in Table 1 below.

Discipline	Company
Landowner	Curtin University
Project Manager	Proven Project Management
Architect	TRCB Architects
Landscape Architect	ASPECT Studios
Town Planning	Rowe Group
Public Art	FORM
Civil & Structural Engineering	WGA
Cultural	Ochre
Heritage	Griffiths Architects
Hydraulic	Plexus
Electrical	BEST
Kitchen	HFC
Access	O'Brien Harrop Access

Table 1: Project Team.

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2. Description of Site

2.1 Location

The subject site is located in the municipality of the City of Kalgoorlie-Boulder ('City'). The subject site is located within the Kalgoorlie City Centre and is situated approximately 550 kilometres east of the Perth Central Area.

Refer **Figure 1 – Regional Location**.

The subject site is situated within the locality of Kalgoorlie and bounded by Wearne Lane to the northwest, Hanbury Street to the southeast, Wilson Street to the southwest and the remainder of the Kalgoorlie Curtin Campus to the northeast. All of the aforementioned roads are sealed, gazetted roads.

Refer **Figure 2 – Local Context.**

2.2 Cadastral Information

The subject site comprises of one (1) land parcel, and is legally described as follows:

- Lot 3517 on Plan 175108 Certificate of Title Volume 1678, Folio 602.

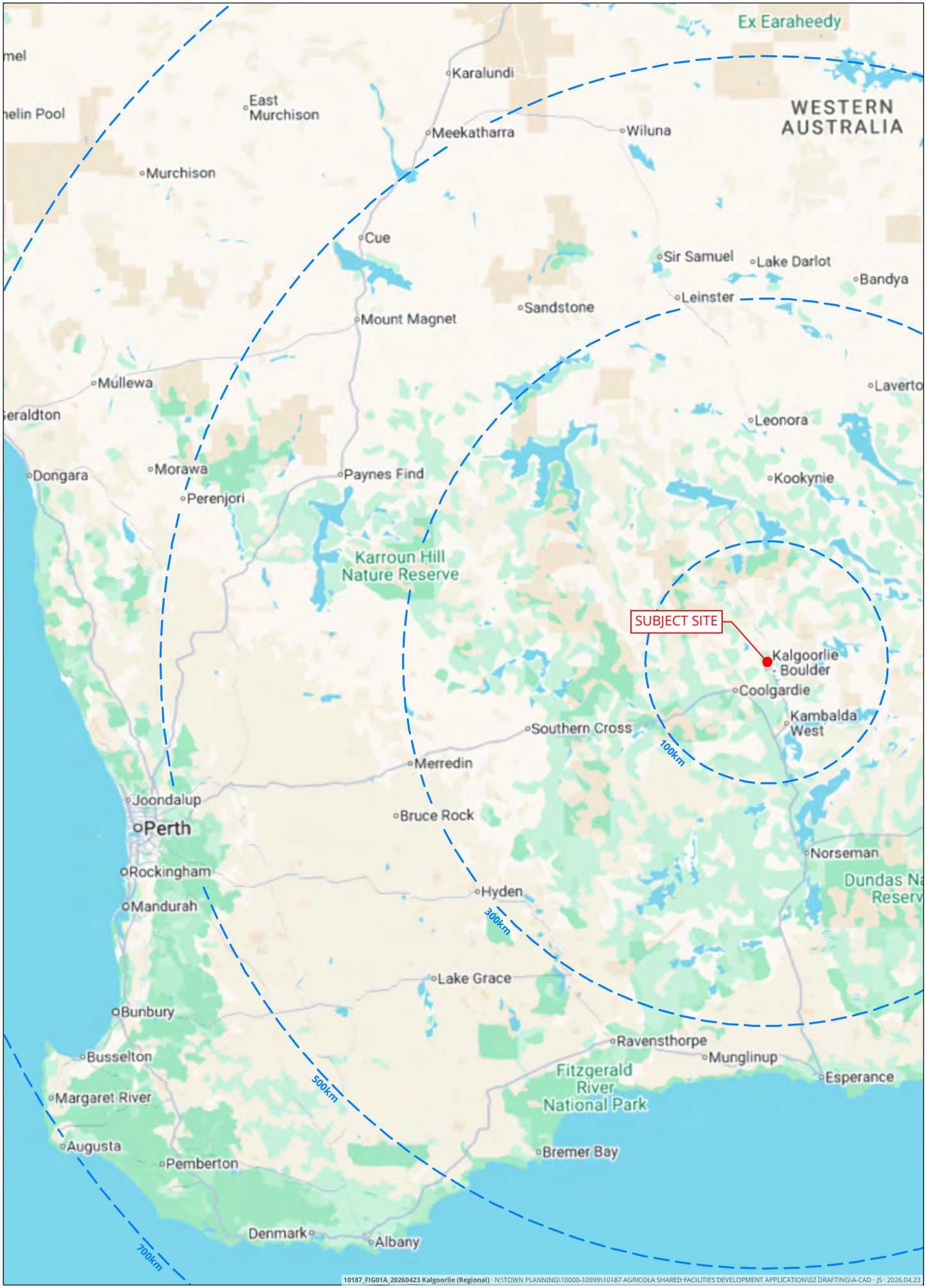
The subject site has a total land area of 1.61 hectares, with frontages of 103m to Wearne Lane, 136.19m to Wilson Street, and 102.7m to Hanbury Street respectively.

Refer **Figure 3 – Site Plan** and **Attachment 1 – Certificate of Title**.

2.3 Existing Improvements

The subject site contains the existing Curtin University Agricola student accommodation, which is comprised by four (4) four-storey apartment buildings, eight (8) single-storey accommodation buildings, shared indoor facilities, a playing court, parking and landscaping.

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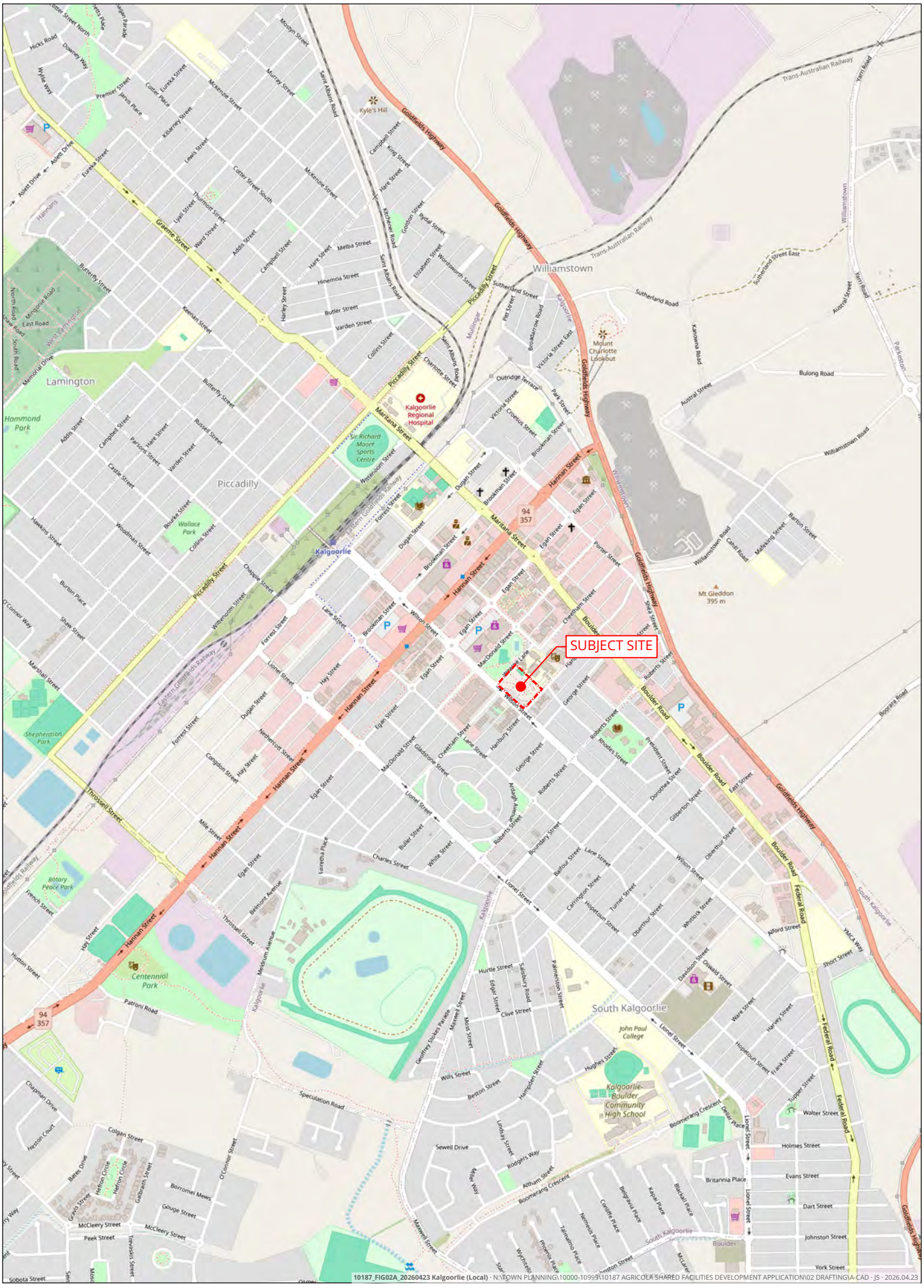
0 100,000m

SCALE @ A4: 1:4,000,000

FIGURE 1

REGIONAL LOCATION

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0 500m

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FIGURE 2

LOCAL CONTEXT

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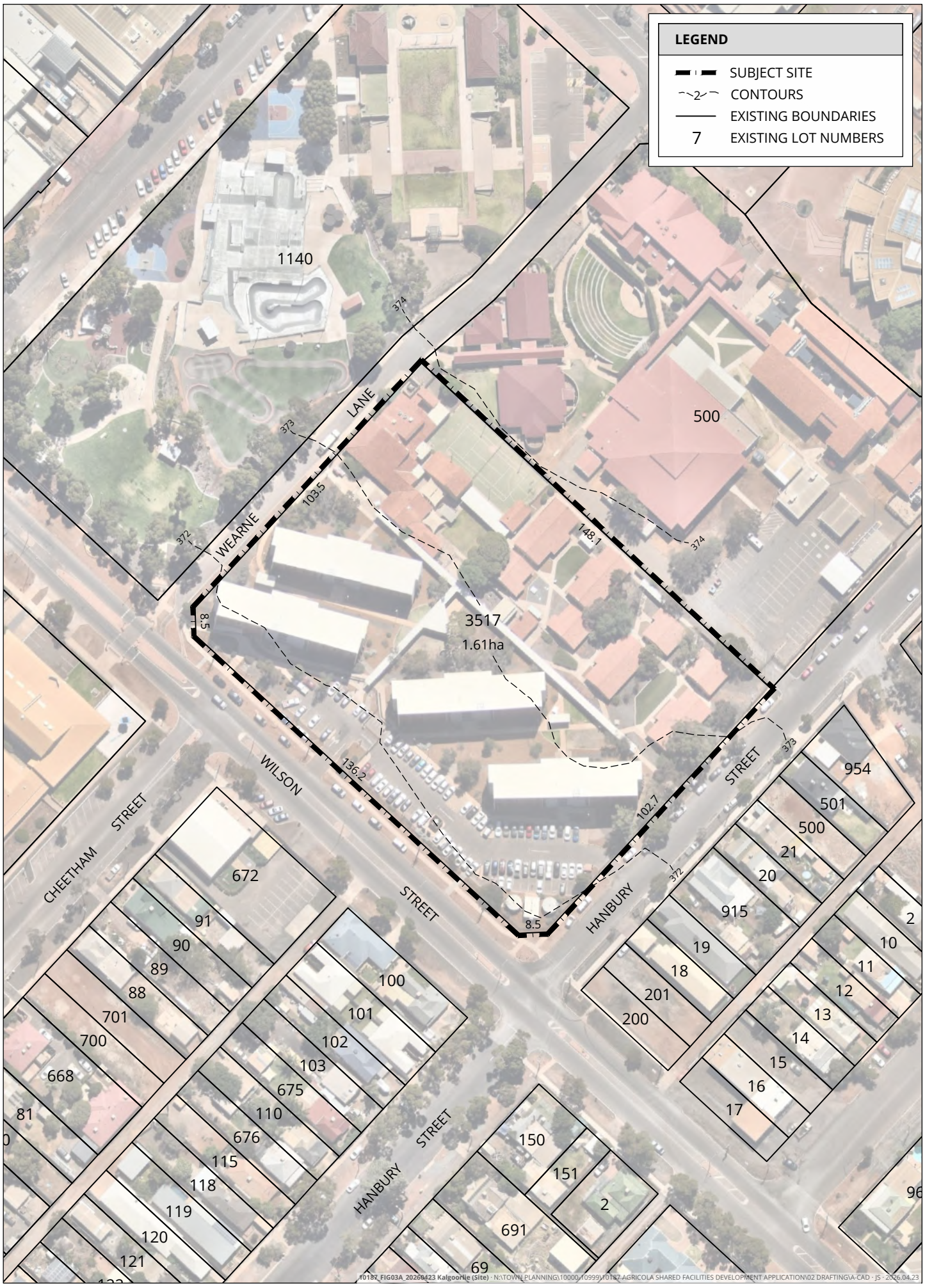


FIGURE 3
SITE PLAN

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3. Description of Proposal

3.1 Project Background

Curtin Agricola is Curtin University's on-campus student accommodation in Kalgoorlie, providing residential facilities for students studying in the Goldfields region. The existing accommodation was partially redeveloped in 2017 and now provides 180 student beds across several multi-storey and refurbished buildings, supported by shared amenities including study areas, recreational spaces and communal facilities.

This Application is seeking development approval for works associated with the redevelopment of the shared facilities at Agricola, which consists of the demolition of existing facilities that have reached their end of life, and construction of new amenities including a dining hall, kitchen, bookable spaces, study rooms, fitness spaces, landscaped gathering spaces and a hardcourt.

3.2 Project Vision & Objectives

The vision for the project is to create a welcoming place for a diverse cohort of students who are living at the Agricola Residential College and studying at the Curtin University Kalgoorlie Campus.

The project objectives are as follows:

PEOPLE

- STUDENT EXPERIENCE
  - Improve and enhance student experience living in the Agricola Student accommodation.
- LIFESTYLE ASPECT
  - Provide a design outcome that is in line with lifestyle requirements on student living away from home and in the Kalgoorlie environment.

PLANET

- ENVIRONMENTAL ASPECT
  - Provide an environmentally conscious and sustainable driven facility to address and respond to the unique environment of Kalgoorlie.
- LANDSCAPING ASPECT
  - Provide a range of indoor and outdoor zones with a focus on environmental design and incorporation of native, edible and cultural plants.

PARTNERSHIP

- CULTURAL ASPECTS
  - Provide a facility that addresses a culturally diverse cohort.
  - Provide flexible bookable spaces for engagement with clubs.
  - Respond to and celebrate the rich cultural heritage of Kalgoorlie: Kaalamaya Kapurn culture and history and Goldfields' history, gold-rush/ WASM.

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3.3 Built Form

As illustrated in the attached development plans, the proposed development includes the following built form components:

- Demolition works, including:
  - 'Max's Cafe' building, comprised of a kitchen, dining area, and store rooms;
  - Gym, squash court and outdoor hard court;
  - Study room and TV room;
  - Vehicle crossover to Wearne Lane;
  - Selected trees, landscaping and swales associated with the shared facilities; and
  - All remaining built form associated with the shared facilities (i.e. light poles, concrete areas, footpaths, steps, redundant utilities, etc.).
- Construction of a **new 'Social Centre'**, including:
  - Multi-function space;
  - Lounge;
  - Bookable space;
  - Games room;
  - Kitchen;
  - Male and Female Bathrooms; and
  - Associated plant, communication and storage rooms.
- Construction of a **new 'Wellness Centre'**, including:
  - Study room;
  - Meeting room;
  - Gym;
  - Gym showers and bathrooms;
  - 'Zen Den' and Zen courtyard;
  - 'Reflection' room; and
  - Associated plant and storage rooms.
- Construction of a **new hardcourt** accommodating various sports.

Refer **Attachment 2 – Development Plans** and **Attachment 3 – Architectural Presentation**.

3.4 Landscape

A comprehensive landscape design has been prepared by ASPECT Studios to support the proposed development, which establishes a cohesive and site-responsive landscape framework that enhances the amenity, functionality and cultural identity of the Curtin Agricola precinct.

Refer **Attachment 4 – Landscape Report**.

3.4.1 Landscape Vision

ASPECT Studios has developed the following landscape vision for the project:

> *Our vision is to create a welcoming and vibrant campus heart that supports student life through social connection, active living and shared meals. The design provides spaces for gathering, engagement and respite, acknowledging the site's cultural heritage as a significant meeting place and guided by the Water Story.*

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Shaped in partnership with the Kaalamaya Kupurn Traditional Owners and grounded in a Caring for Country approach, the centre fosters belonging and wellbeing within a landscape that is distinctly of place. Curated gardens will celebrate diverse local flora and respond to the transitions through Country.

3.4.2 Key Landscape Elements

Key elements of the landscape approach include:

- **A sequence of outdoor experiences**, incorporating terraced seating, shaded nooks and informal gathering spaces that encourage social interaction and respite;
- A **central landscaped node and arrival experience**, providing legibility and orientation within the precinct and strengthening connections between existing accommodation and new facilities;
- A **generous lawned area and multipurpose court**, supporting active recreation and communal use;
- **Increased tree canopy coverage** to provide shade, improve microclimate conditions and enhance outdoor comfort; and
- The integration of **endemic and climate-responsive planting**, supporting biodiversity while ensuring long-term sustainability in Kalgoorlie's semi-arid environment.

The design also responds to site-specific constraints and opportunities, including existing drainage conditions, limited irrigation availability and the need to prioritise canopy planting over understory vegetation in certain areas. Stormwater is managed through an integrated approach, with runoff directed to landscaped areas where practicable, contributing to both water-sensitive design outcomes and the expression of natural processes within the site.

3.4.3 Landscape Character & Cultural Integration

The landscape design Imagines Country through guidance from the Kaalamaya Kupurn people. The design translates the cultural narrative of the Water Story and the site as an important place to meet, gather and engage. The planting palette will look to contribute aesthetically to the Shared Facilities as well as contribute to biodiversity and habitat enhancement. It will be informed by the Coolgardie bioregion and the Great Western Woodlands vegetation complexes, as well as showcase plant species, culturally significant to the Kaalamaya Kupurn people.

3.4.4 Experience & Community

The landscape design has developed a sequence of experiences for the residents to enjoy, access respite as well as social interaction and recreation. On arrival the residents will be guided through a series of terraced nooks with endemic plantings as well as places to dwell and 'hang-out'. The oculus signifies a place of welcome and orientation, from which to experience the curated outdoor amenity areas that complement and are an extension of the Wellness and Social Hubs. The informal breakout and gathering spaces, as well as a generous lawned green and multipurpose court, support a wide range of activities for the residents to enjoy in support of the holistic health and wellbeing approach.

3.4.5 Climatic Response & Sustainability

To address Kalgoorlie's climate and the potential impacts of a drying climate, the design focuses on creating good outdoor comfort for residents through new tree plantings to provide shade and natural cooling, as well as hydro-zoned garden beds and lawn areas to enable a water wise approach. The design is integrated into

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the stormwater strategy, directing runoff to garden beds where possible as well as expressing and acknowledging rainfall events within the landscape and architecture through cultural guidance. Living Architecture through deciduous planting to proposed trellis will further assist with seasonal solar management. Opportunities to re-purpose site materials will also be explored to reduce waste and reference histories and memories of place.

3.4.6 Plant Palette

A plant palette will be developed in detailed design, guided by the Cultural Reference Group, referencing the character of Kaalamaya Kupurn Country. It will also complement and support student residential life, health, wellbeing and a connection to nature. Plant selections will respond to Karlkurla's (Kalgoorlie) changing climate and contribute to biodiversity enhancement, as well as a water wise and low maintenance approach. Selections will also be cross-referenced against the City's Plant List.

3.5 Public Art Strategy

A Public Art Strategy has been prepared by FORM in support of the proposed development, establishing a clear curatorial framework for the integration of culturally meaningful and site-responsive artworks throughout the Curtin Agricola precinct.

The strategy is grounded in the recognition of Karlkurla (Kalgoorlie) as a place of deep cultural significance for the Kaalamaya Kupurn people, where stories of Ngurra (Country), pinta (water), and knowledge systems have historically shaped patterns of movement, gathering and exchange. The proposed public art responds to this context by embedding cultural narratives within the built environment.

Refer **Attachment 5 – Public Art Strategy.**

3.5.1 Location

The Strategy identifies specific opportunity areas for public art, with a focus on locations that maximise visibility and contribution to the public realm. In particular, the Wearne Lane interface and the edge condition adjoining Kingsbury Park are identified as priority locations, where artworks can operate at both a pedestrian scale and as broader visual markers. Additional opportunities are located along key movement corridors and arrival points within the precinct, where integrated and navigational works can reinforce legibility and strengthen the sense of arrival.

3.5.2 Opportunities

The Strategy identifies three primary artwork opportunities:

An integrated artwork within the boundary fence addressing Wearne Lane, transforming the edge condition into a visually engaging and culturally expressive element. This opportunity has a strong public interface, contributing to the identity of the precinct and creating a recognisable marker that can be experienced by both campus users and the wider community.

1. **Chainlink Fence Artwork (Wearne Lane interface)**

   An integrated artwork within the boundary fence addressing Wearne Lane, transforming the edge condition into a visually engaging and culturally expressive element. This opportunity has a strong public interface, contributing to the identity of the precinct and creating a recognisable marker that can be experienced by both campus users and the wider community.

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2. **Ground Plane Artwork – Arrival / Threshold**

   An integrated artwork within the ground plane at key entry or arrival points, designed to reinforce the sense of arrival and orientation into the precinct. This may be expressed through paving treatments, inlays or surface patterning that reference cultural narratives and guide movement.

3. **Ground Plane Artwork – Internal Movement / Gathering Spaces**

   A series of smaller-scale, discovery-based interventions within internal pathways and communal areas, embedded into paving or landscape elements. These works are intended to support wayfinding, encourage interaction, and create moments of engagement throughout the site, particularly within social and recreational spaces.

3.5.3 Procurement

FORM's Land.Mark.Art program is a culturally grounded procurement and professional development model that supports Aboriginal artists to develop and deliver public artworks. The process involves an open Expression of Interest, followed by a structured workshop where selected artists develop concepts with mentorship and collaboration. FORM then presents a shortlist of refined concepts for client selection, with the chosen artist progressing the work through detailed design, fabrication and installation in partnership with FORM and specialist fabricators. This approach both delivers culturally meaningful artworks and builds local artistic capacity.

3.6 Parking and Access

No changes are proposed to the existing parking arrangements for staff and students, which consists of a car park access from Wilson Street and Hanbury Street. The existing Wearne Lane crossover will be relocated closer to the proposed Social Centre, to provide access for deliveries and for a cool room trailer to cater for events. Waste collection will occur from the Wearne Lane kerb via a private waste contractor.

3.7 Opening Hours

The Agricola reception will be open 8:30am to 4:30pm on Monday to Friday, and all other proposed buildings will be accessible 24/7 for residents via a swipe access card.

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4. Stakeholder Engagement

4.1 City of Kalgoorlie-Boulder

The project team met with the City of Kalgoorlie-Boulder planning staff on 14 April 2026 to discuss the proposed development and the documentation requirements for lodgement. The project team received positive feedback on the design and its integration of cultural narratives and themes. The City also provided advice regarding additional information to be included in the final lodgement package, including:

- Clarity on the integration of the proposed development with the balance of the student accommodation facilities;
- Clarity regarding parking for events;
- Statement addressing State Planning Policy 7.0 Design of the Built Environment;
- High-level information regarding waste management; and
- High-level information regarding stormwater management.

These items have been addressed throughout this report and in the updated development plans and landscape plans.

4.2 Traditional Owners

Curtin University is committed to meaningful, respectful and culturally guided engagement with the Kupurn claim group as the recognised Traditional Owners and custodians of Karlkurla (Kalgoorlie).

Curtin University has engaged Ochre Project Services as the lead Indigenous Consultant for this proposal, to act as the primary point of contact for Indigenous engagement. As part of this role, Ochre Project Services has prepared an Indigenous Engagement Strategy ('IES'), which establishes a culturally respectful and design-focused framework for engagement during the detailed design stages for this Application, which are guided by cultural authority and informed by recognised Traditional Owner knowledge systems. The strategy ultimately provides a foundation for culturally informed design outcomes and positions the project for deeper cultural integration in future stages.

Furthermore, the IES outlines that an Aboriginal Reference Group ('ARG') was established to provide guidance, advice and endorsement throughout the design process, ultimately aiding with the finalisation of the proposed design.

Refer **Attachment 6 – Indigenous Engagement Strategy.**

In accordance with *Department of Planning, Lands and Heritage* ('DPLH') Aboriginal Cultural Heritage ('ACH') Register, the subject site is located within the following ACH Places:

- Place ID: 1541 – Nanny Goat Hill (Pilyurru);
- Place ID: 1421 – Paddy Hannans Tree; and
- Historic Place ID: 36995 – Warta Kutju (One Tree).

The abovementioned heritage places encompass large areas of developed urban land and are not specifically in relation to the subject site. Notwithstanding, the project team acknowledges its obligations under the *Aboriginal Heritage Act 1972* and will undertake the necessary due diligence to ensure ACH is not negatively impacted by the proposed works.

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5. Town Planning Considerations

5.1 City of Kalgoorlie-Boulder Local Planning Scheme No. 2

5.1.1 Zoning & Land Use

Under the provisions of *Local Planning Scheme No. 2* ('LPS2'), the subject is reserved 'Public Purpose – Education'. The objective of the Public Purpose reserves is stipulated in LPS2 as follows:

> *"To set aside land that provides a range of essential physical and community infrastructure."*

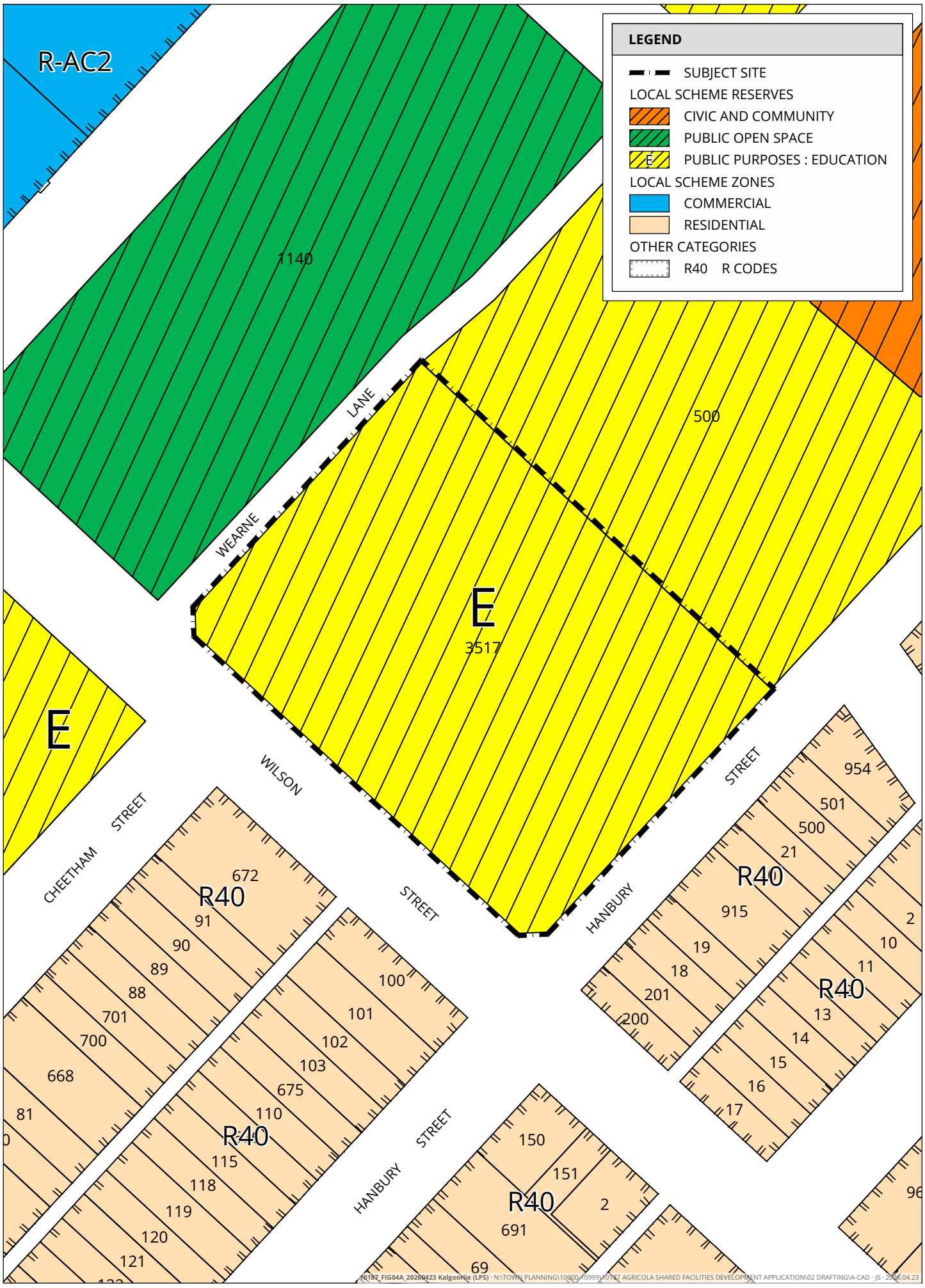
The existing and proposed development is understood to be consistent with the 'Educational Establishment' land use classification. This Application will not change the existing land use at the subject site, and on this basis, the proposed development is capable of approval at the subject site.

Refer **Figure 4 – Local Planning Scheme No. 2 Zoning.**

5.1.2 Development Standards

Table 7, Clauses 32 to 40, and Schedule 1 of LPS2 outline development standards and requirements relevant to the proposed development. These standards include, but are not limited to, building height, building setbacks, landscaping, amenity impacts, and vehicle parking, and are addressed at section 6 of this report.

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0 40m

SCALE @ A4: 1:1500

FIGURE 4

CITY OF KALGOORLIE-BOULDER LOCAL PLANNING SCHEME No.2 ZONING

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5.2 State Planning Policy 7.0 – Design of the Built Environment

State Planning Policy 7.0 ('SPP7.0') aims to deliver the broad economic, environmental, social and cultural benefits that derive from good design outcomes and supports consistent and robust design review and assessment processes across WA.

The project architect and landscape architect, TRCB and Aspect Studios, have prepared the following design statement responding to the 10 principles of SPP7.0.

1. **Context And Character**

   The proposed development is located to establish a connection to the existing Agricola Residential College accommodation units and pedestrian interface. It provides connection to the broader Curtin University Kalgoorlie campus.

   The development also considers the potential for the public artwork to interact with Wearne Lane and potential visual connections to Kingsbury Park.

   The design team has engaged with Kaalamaya Kapurn elders through Aboriginal Reference Group meetings to provide cultural advice which has been integrated into the design, alongside a landscape response that reflects endemic flora species.

2. **Landscape Quality**

   The landscape design establishes a welcoming and vibrant campus heart that supports social interaction, recreation and wellbeing, while acknowledging the site's cultural significance as a traditional meeting place.

   Informed by engagement with the Kaalamaya Kupurn Traditional Owners, the design adopts a Caring for Country approach, translating cultural narratives—particularly the Water Story—into a landscape that is distinctly of place. A series of interconnected outdoor spaces, including shaded gathering areas, landscaped nodes and recreation spaces, provide a diverse range of experiences that complement and extend the proposed built form.

   The design also responds to Kalgoorlie's climate through increased tree canopy, water-wise planting and integrated stormwater management, ensuring a sustainable and comfortable outdoor environment.

3. **Built Form and Scale**

   The design carefully balances massing and height to suit its Agricola context, transitioning between the existing three-storey and single-storey accommodation units. It uses generously scaled single-storey spaces to mediate between these forms while responding to the character of existing Tony Brand architecture.

4. **Functionality And Build Quality**

   The design has collaborated with Curtin University through several workshops to develop a design that meets the residential college's needs. Rooms and spaces have considerations to be flexible, and multi-functional (e.g. weekday dining spaces that also function as student event spaces).

   Use of durable, low-maintenance materials (concrete, masonry, metal cladding) to ensure long-term quality. Colour choices also consider practicality by choosing colours to conceal dust.

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5. Sustainability

The design enhances sustainability by optimising passive solar orientation of the buildings (north facing), natural ventilation, and strategic shading.

This is supported by efficient mechanical systems. It incorporates low–global warming potential air conditioning, heat recovery ventilation, and natural ventilation.

The design also considers renewable energy through PV cells and battery storage, while also considering social and economic benefits such as reusing/ distribution of materials during demolition for local community use.

6. Amenity

The design creates a comfortable and healthy environment by offering diverse spaces for activity and relaxation, an Oasis for students outside of university work. The proposed spaces include indoor and outdoor areas that supports different uses throughout the day (social and wellness spaces/ indoor and outdoor rooms).

It prioritises accessibility with step-free movement (1:20 walkways in lieu of stairs) and accessible facilities/ furniture, while enhancing amenity through generous spaces, natural ventilation, access to day lighting, and practical storage solutions.

7. Legibility

The design directs entry through a prominent, civic-scale entry concrete canopy and a central nodal point marked with a Kurradong tree.

The entry node is open and provides a strong visual connection from existing Agricola into key social and outdoor spaces. The entry sequence proposed is intuitive and experiential, guiding users naturally into active areas – a journey.

The design also contemplates a potential for public artwork to guide students from the University back "home" which is one of the cultural narratives discussed with the Kapurn community.

8. Safety

Clear sightlines from the entry and across all external areas promote visibility and passive surveillance. Access to external amenities is both legible and discreet, with entries screened by hit-and-miss masonry work.

Security is further reinforced through fencing along Wearne Lane and the integration of lighting and CCTV into the College's existing systems, ensuring a well-monitored and secure environment.

9. Community

The proposed development fosters connection within the university's diverse student cohort while promoting learning and engagement through shared cooking and dining experiences.

The design also prioritises inclusive and equitable spaces that welcome and support all student residents through accessible fixed and loose furniture and spaces.

10. Aesthetics

The development presents a cohesive, high-quality aesthetic that aligns with surrounding accommodation buildings, drawing inspiration from the local Kalgoorlie landscape through tinted

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concrete, earth-red coloured metal cladding, steel framing referencing mining infrastructure, and concrete blockwork that reflects both the earth tones and thermal qualities of masonry.

It also acknowledges and responds to the early Tony Brand architectural work (existing buildings demolished), grounding the design in both local context and architectural heritage.

5.3 Local Planning Policies

5.3.1 Local Planning Policy – Landscape Policy

The City adopted *Local Planning Policy – Landscape Policy* ('Landscape Policy') in December 2023 with the purpose of ensuring that new development includes suitable landscaping. The objectives of the Landscape Policy are detailed as follows:

- *Incorporate landscaping as a fundamental element of the design process to ensure integration with development in a meaningful and functional manner;*
- *Ensure the suitable provision of landscaping relative to the development size to complement and soften the built environment, reduce the dominance of hard surfaces and articulate open space;*
- *Provide for shade and green relief in built up areas to minimise the effects of urban heat;*
- *Reduce environmental health issues through dust suppression;*
- *Encourage the retention of existing native plant species to promote environmental sustainability; and*
- *Enable landscaping plantings to be easily maintained and sustainable.*

The objectives and guidelines of the Landscape Policy are addressed at section 6.3 of this report.

5.3.2 Local Planning Policy – Parking Policy

The City's Local Planning Policy – Parking Policy ('Parking Policy') provides guidance on parking requirements and the ability to grant concessions depending on the nature, magnitude and composition of development, and the related parking requirements, demand and utilisation.

We confirm that no changes are proposed to the existing parking provision, and the proposal will not generate any additional parking need. Refer to section 6.5 of this report for further discussion on parking.

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6. Development Standards

6.1 General Requirements for Non-Residential Development

Table 7 of LPS2 outlines the built form and landscaping standards for non-residential development for each of the City's zones, but no standards are prescribed for reservations. However, we understand that the City has advised the project architect during their preliminary meeting on the proposal that the 'Commercial' zone standards are appropriate in this instance. The proposed development has therefore been designed in accordance with these standards.

The table below sets out the built form and landscaping standards for the 'Commercial' zone, where relevant to the proposed development.

DESIGN ELEMENT		STANDARD	PROPOSED
Minimum Setbacks	Average Front	N/A	Approx. 65m
	Side	N/A	Approx. 83m
	Rear	1.0m	N/A
Maximum Height	Building	25.0m	Max. 7.9m
	Boundary Wall	6.0m	N/A
Minimum Landscaping		15% of site area	Approx. 30% soft landscaping across redeveloped area

Table 2: General Development Standards of Local Planning Scheme No. 2.

In accordance with the above, the proposed development is consistent with the general development standards of LPS2.

6.2 Amenity

Clause 33(1) of LPS2 outlines provisions that relate to the amenity of non-residential development within the City, as detailed below:

> *The amenity of non-residential development shall be in accordance with the following –*
>
> *a) The form, bulk, and scale of development is to be compatible with surrounding land uses;*
>
> *b) The impacts of the development are to be contained on site and/or suitably managed to limit impacts on adjoining properties;*
>
> *c) The impact of the development on the road network and traffic management is to be consistent with the road function and hierarchy;*
>
> *d) Adequate and safe provision and access is to be made for parking and service, haulage and waste vehicles, and loading areas where required;*
>
> *e) Storage of plant and equipment, services, and areas for waste management and essential services, to be screened or separated from public areas, particularly from street frontages and external lighting of public spaces is to be provided and designed to minimise light spill and glare on adjoining properties;*
>
> *f) Visual impacts are to be minimised by the use of vegetation screening and tree retention; and*

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g) *Buildings are to have coordinated or complementary materials, colours and styles, and be reflective of the character of the locality.*

The proposed development is compatible with the above amenity provisions for the following reasons:

- The proposed buildings comprise predominantly single-storey elements that mediate between the existing multi-storey and single-storey accommodation, ensuring a compatible built form outcome within the established Curtin Agricola campus context.
- The development is internally focused, with communal facilities serving existing residents and no intensification of land use.
- The proposal does not materially alter traffic generation, as it supports an existing residential college. Access and stormwater arrangements remain consistent with the existing road hierarchy, with no adverse impact on the surrounding road network.
- Existing access arrangements are retained, and the development is supported by established parking and servicing infrastructure within the campus.
- Servicing, loading and waste collection can be accommodated safely within the site without conflict with pedestrian areas.
- Plant, storage and service areas are incorporated within the built form or discretely located within the site, away from primary public interfaces.
- Lighting is designed to maintain safety while minimising spill and visual intrusion beyond the site.
- The proposal includes a comprehensive landscape strategy that increases canopy cover, retains existing vegetation where practicable and introduces new planting to soften built form and enhance visual amenity.
- The development adopts a cohesive material palette and architectural language that responds to the existing Agricola buildings and broader campus character, incorporating durable materials and colours reflective of the local Kalgoorlie environment.

6.3 Landscaping

As described within **Table 3**, LPS2 requires that a minimum of 15% of the site area is provided as landscaping, and we confirm that soft landscaping is provided across approximately 30% of the redeveloped portion of the subject site.

Clause 34 of LPS4 also stipulates that landscaping shall be predominately street facing, and we confirm that landscaping is provided addressing Wearne Lane as well as throughout the site.

The table below sets out the objectives and guidelines from the Landscape Policy for the practical implementation of the landscaping objectives to the City.

OBJECTIVES	GUIDELINES
Enhance the visual amenity of the City through landscape beautification.	▪ *Use of art or sculptures in landscaping;* ▪ *Use of plant species that include flowering plants;* ▪ *Use local plant species where possible; and* ▪ *Incorporate perennial plant species where suitable for year-round flowering cycles.*

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Provide for shade and green relief in built up areas to minimise the effects of the urban heat islands.	▪ *Plant mature trees with a minimum height of 1m or as defined by the R-Codes for residential proposals;* ▪ *Use of plant species that provide a year-round canopy cover;* ▪ *Minimise the use of hardstand areas where possible; and* ▪ *Select plant species that are evergreen.*
Ensure landscaping is safe and accessible for the public.	▪ *Locate and design landscaping to avoid impeding traffic movement and sight lines along access ways and driveways;* ▪ *Avoid landscaping that creates hidden areas or areas of concealment;* ▪ *Maintain clear sight lines between road and building entrances;* ▪ *Use hard landscaping design measures to delineate between private landscaping and public areas;* ▪ *Avoid using plant species that can cause injury (thorns etc.).*
Minimise environmental health issues through dust suppression.	▪ *Use of mulch in all landscaping beds to ensure adequate coverage;* ▪ *Use of ground-cover plant species. Planting of trees to create shared spaces; and* ▪ *Maintenance schedule to achieve minimum watering frequency.*
Encourage the retention of existing native plant species to promote environmental sustainability.	▪ *The siting of buildings is to consider the retention of existing native plant species and utilisation as design features;* ▪ *Show the location of existing native plant species in landscape design;* ▪ *If existing native plant species are to be removed this must be shown on the plan and justification provided as to the reason the existing trees are to be removed; and* ▪ *Nominate plant species that complement the existing native plant species to be retained.*
Enable landscape designs to be easily maintained and suitable for the environmental conditions.	▪ *Use of reticulated potable or non-potable water supply;* ▪ *Drought tolerant species integrated into landscape design;* ▪ *Use of mulch and its regular replacement and upkeep;* ▪ *Plants are regularly fertilised with appropriate nutrients for species;* ▪ *Use naturally occurring plant species to reduce pruning regimes and plant refurbishment; and* ▪ *Use of on-site water harvesting if achievable.*

Table 3: General Landscaping Guidelines of Landscape Policy.

The proposed landscaping is consistent with the above objectives for the following reasons:

- Landscaping is coordinated with the Public Art Strategy, allowing for the integration of artistic elements within the landscape (including fence treatments and ground plane works), contributing to site identity and cultural expression.
- The planting palette is informed by the Coolgardie bioregion and Great Western Woodlands, prioritising local and endemic species where appropriate. A mix of trees, shrubs and groundcovers is proposed, including flowering and culturally significant species to enhance visual interest and biodiversity.
- The design emphasises increased tree canopy coverage through the planting of mature trees, providing shade, improving microclimate conditions and supporting year-round amenity within key gathering spaces and along circulation routes.

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- Hardstand areas are minimised where practicable and balanced with generous soft landscaping, including lawn areas, garden beds and planted zones, to soften the built form and support recreational use.
- Landscaping is designed to maintain clear sightlines along accessways, building entries and key movement corridors, avoiding concealed areas and ensuring planting does not impede pedestrian or vehicle movement.
- Landscape beds incorporate mulch and groundcover planting to improve soil health, reduce water loss and limit weed growth, while contributing to a cohesive and low-maintenance outcome.
- Existing trees and vegetation are retained where practicable and incorporated into the landscape design, with any removal undertaken selectively and supported by the overall site layout.
- A water-wise and climate-responsive approach is adopted, including the use of drought-tolerant and predominantly evergreen species, hydro-zoned planting areas, and integration with the stormwater management strategy to direct runoff into garden beds where feasible.
- Plant species have been selected for durability and suitability to local conditions, supported by irrigation and maintenance regimes to ensure long-term establishment, performance and reduced ongoing maintenance requirements.

6.3.1 Clearing of Vegetation

Further to the above, as per Clause 35 of LPS2, no clearing or destruction of remnant vegetation or revegetation is permitted without the City's approval (i.e. through a development application), unless it relates to the following:

a) *Clearing to comply with the requirements of the Bush Fires Act 1954 (as amended), the Local Governments Bushfire Notice and/or any bushfire management plan approved by the local government, and the Environment Protection (Clearing of Native Vegetation) Regulations 2004;*

b) *Clearing as may reasonably be required to accommodate an approved building and curtilage, access, and/or other land use/s approved by the local government;*

c) *Trees that are diseased, dangerous or have been assessed as a significant bushfire risk;*

d) *Clearing of vegetation that is not native to the locality; and*

e) *Clearing of remnant vegetation where required for 'agriculture – extensive' in the Rural zone where in accordance with the Environmental Protection Act 1986 or Environment Protection and Biodiversity Conservation Act 1999 (as amended) and Environment Protection 9Clearing of Native Vegetation) Regulations 2004.*

Of the 17 trees currently on site, the proposed development will result in the removal of five (5) trees to accommodate the new buildings. A total of 30 – 40 new trees will be planted throughout the site, however, resulting in a significant increase to the tree canopy.

6.4 Wastewater & Stormwater Disposal

Clause 36 of LPS4 sets out requirements for all development with respect to wastewater and stormwater disposal. These provisions are outlined below:

(1) *All development generating wastewater shall connect to reticulated sewerage where available, wastewater disposal shall be in accordance with the Government's sewerage policy and the local*

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government and Department responsible for health must be satisfied that on-site wastewater disposal will not result in adverse health or environmental issues;

(2) *Unsewered industrial development will be restricted to dry industry (i.e. industries which generate less than 540L of wastewater per 1,000m^2 daily and where trade waste is to be managed/or disposed of on-site or off-site the associated risks must be identified and addressed, including the vulnerability of the receiving environment where relevant;*

(3) *Stormwater discharge is to be uncontaminated and discharged to the street, or to an alternative location, to the satisfaction of the local government and any relevant authority, but is not to be discharged into the City's reticulated sewer network or onto adjoining properties.*

We confirm that the existing development is connected to the reticulated sewerage system, operated by Water Corporation. Furthermore, the nature of the existing and proposed development does not result in wastewater and/or pollutants entering the surrounding land or any natural water bodies. On this basis, the proposed development is considered capable of approval from a wastewater disposal perspective.

The proposed stormwater management strategy retains the existing site drainage approach, whereby runoff is conveyed via overland flow paths into landscaped swales and directed south through the site to existing and new detention basins. Due to impermeable ground conditions, infiltration is not viable, and runoff will continue to be managed through surface conveyance; however, the increased proportion of landscaped (pervious) areas will assist in reducing overall runoff volumes.

Stormwater from buildings, paths and the new hardcourt will be directed into swales and landscaped areas for temporary detention and passive treatment prior to discharge, with flows ultimately connecting to the City of Kalgoorlie-Boulder drainage network via Wilson Street. Stormwater management is discussed in further detail at section 7.2 of this report.

6.5 Parking

Schedule 1 of LPS2 details the parking requirements for all land use classifications within the City.

As previously stated, this Application will not introduce any new land uses or activities on-site, nor will it result in an increase in staff or students attending the facilities. Any events held at the proposed development will be attended by students and faculty only. On this basis, the proposed development will not generate any additional car parking demand at the subject site.

We further confirm that this Application proposes no changes to the existing car parking arrangements at the subject site.

The proposed development is therefore consistent with the existing development approval for the subject site with respect to car parking.

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7. Technical Considerations

7.1 Environmentally Sustainable Design

A range of sustainable design measures are proposed across the development, with a target of net zero carbon emissions during operation. Curtin University has engaged Cundall to undertake a Green Star assessment of the proposal, which has confirmed that the proposed measures target a 5 Star Green Star rating, to be confirmed at the detailed design stage.

7.2 Stormwater Management

A Civil Engineering Report has been prepared by WGA which addresses earthworks and stormwater drainage. The report provides the following overview regarding stormwater management at the subject site:

> *The proposed drainage strategy for the development will maintain the existing philosophy. The existing site stormwater runoff are graded towards swales within landscaped areas via overland flow paths and conveyed South through the site towards rock pitched detention basins at the Southern boundary of the campus. The collected runoff will ultimately overflow through kerb opening onto Wilson Street into the City of Kalgoorlie-Boulder drainage network.*
>
> *The ground condition is found to be impermeable from the geotechnical investigation, infiltration has not been explored as a viable stormwater option, runoff will need to be carried through the proposed overland flow paths. Noting that existing site area prior to development was mainly impervious, and the proposed development design proposes more landscaped pervious footprint than existing hence reducing the amount of stormwater runoff from the area.*
>
> *The proposed development is on the Northern end of the campus and overland flow will generally be directed towards the South into the existing drainage system as much as practicable. The schematic design intends to direct runoff from proposed buildings and footpath into existing swales that tie-in to downstream system for most of the development footprint.*
>
> *The northern impervious hard court will be graded south towards the lawn area into a new swale within the landscaped area. A swale or basin will be provided in a similar manner to the existing to provide detention of water to remove pollutants via sedimentation. Treated runoff will overflow via kerb opening into the cool-room trailer loading area which will be directed onto Wearne Lane. Runoff on Wearne Lane ultimately flows onto Wilson Street into the council network. This hardcourt area was previously conveyed within the existing site swales before eventually overflowing onto Wilson Street.*

Refer **Attachment 7 – Civil Engineering Report**.

7.3 Waste Management

A Waste Management Plan ('WMP') is currently being prepared in support of this Application, and will be made available to the City shortly following lodgement.

In the interim, we can advise that a bin store has been provided adjacent to the new Social Centre, with capacity for two (2) 240L general waste bins and one (1) 240L recycling bin.

Curtin Agricola utilises a private consultant, Veolia, for regular waste collection, which are scheduled for pick-ups on Monday, Wednesday and Friday each week.

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8. Conclusion

This Application seeks development approval from the Regional Development Assessment Panel for the redevelopment of the shared facilities at the Curtin Agricola student accommodation at Curtin University's Kalgoorlie campus, situated at Lot 3517 (No. 61) Wilson Street, Kalgoorlie. The proposal represents a significant upgrade to existing infrastructure, delivering contemporary, fit-for-purpose communal, recreational and wellness facilities that support the evolving needs of students residing in the Goldfields region.

The proposed development is appropriate for the subject site and capable of approval for the following reasons:

- The development is consistent with the intent of the 'Public Purpose – Education' reservation under Local Planning Scheme No. 2 ('LPS2'), continuing to support essential educational infrastructure without altering the established land use;
- The scale, form and siting of the proposed buildings are compatible with the existing Agricola campus, providing a well-integrated outcome that responds to the established built form and spatial hierarchy;
- The proposal demonstrates a high-quality design outcome in accordance with State Planning Policy 7.0, incorporating strong responses to context, landscape quality, sustainability, amenity and cultural integration;
- A comprehensive landscape strategy enhances the visual amenity, usability and environmental performance of the site, including increased tree canopy, water-wise planting and integration with stormwater management;
- The Public Art Strategy provides a robust framework for delivering culturally meaningful and site-responsive artwork, reinforcing the identity of the precinct and its connection to Kaalamaya Kupurn Ngurra;
- The development will not result in any material increase in traffic generation or parking demand, with existing access, servicing and parking arrangements remaining appropriate;
- Potential impacts are appropriately managed within the site, including stormwater, waste, servicing and amenity considerations, ensuring no adverse impacts on adjoining land or the surrounding road network; and
- The proposal is consistent with the relevant development standards of LPS2 and aligns with the objectives of the City's Landscape and Parking Policies.

Accordingly, the proposed development represents a well-considered and integrated outcome that will significantly improve the functionality, amenity and cultural value of the Curtin Agricola precinct.

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ATTACHMENT 1

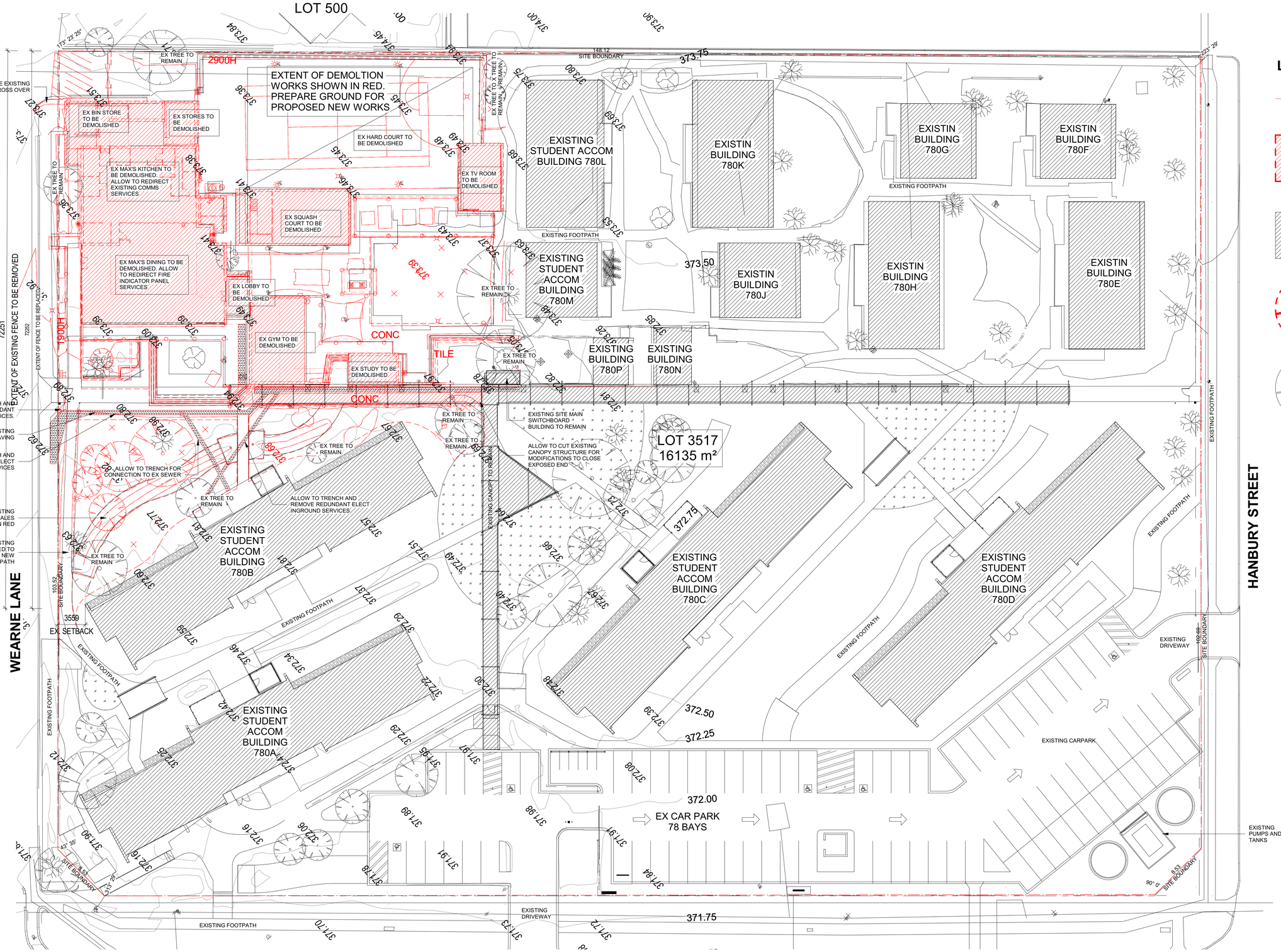
Certificate of Title

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ATTACHMENT 2

Development Plans

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LEGEND

- EXTENT OF DEMOLITION
- DEMOLITION OF EXISTING BUILDING. ALLOW TO STORE BLOCKWORK, ROOF TILES AND HARDWOOD TIMBER BEAMS TO BE REUSED IN NEW WORKS OR RETURNED TO CURTIN UNIVERSITY FOR DISTRIBUTION TO LOCAL COMMMUNITY.
- EXISTING BUILDING TO REMAIN
- EXISTING TREE TO BE REMOVED
- EXISTING TREE TO BE RETAINED

FLOOR AREA CALCULATION

AREA OF EX BUILDING TO BE DEMOLISHED	= 800 m²
AREA OF PROPOSED EARTHWORKS	= 2503 m²
AREA OF PROPOSED BUILDINGS	= 825 m²
EXISTING CAR BAYS TO REMAIN	= 78

SCALE 1:500 @ A3

0 2.5 5 7.5 10 12.5 25m

DEMOLITION PLAN

25016 Agricola Shared Facilities **Development Application** A 24/04/2026 DA00

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LOT 500

NEW KERB AND FOOTPATH TO CONNECT TO EXISTING

173° 23' 25"

RL 373.48

EX TREE TO REMAIN

NEW TREES

RL 373.20

1979

SETBACK

DA06 2

5885

148.12
SITE BOUNDARY

223° 29'

POTENTIAL PUBLIC ART LOCATION

HARDCOURT

CHAIN LINK FENCE

EXTERNAL EXERCISE AREA

PROPOSED WELLNESS CENTRE
AHD 373.30

NEW TREE

WELLNESS COURTYARD

EX TREE TO REMAIN

EX TREE TO REMAIN

EXISTING STUDENT ACCOM BUILDING 780L

DA05 3

EXISTIN BUILDING 780K

EXISTIN BUILDING 780G

EXISTIN BUILDING 780F

EXISTING FOOTPATH

SLIDING CHAIN LINK GATE FOR FOOD TRUCK ACCESS

RL 373.30

SEAT

SEAT

PERSONEL GATE

GATHERING SPACE

LAWN

NEW TREES

DA06 1

DA04 1

GATHERING SPACE

RL 373.20

NEW TREE

DA06

4

3

DA06

SIGN LOCATION 01

EXISTING FOOTPATH

EXISTING STUDENT ACCOM BUILDING 780M

EXISTIN BUILDING 780J

EXISTIN BUILDING 780H

EXISTIN BUILDING 780E

EX TREE TO REMAIN

1.8m HIGH CHAINLINK FENCE

3.8m H FENCE

GATHERING SPACE

ALFRESCO

EX TREE TO REMAIN

DA04 2

NEW FOOTPATH

EX TREE TO REMAIN

EXISTING BUILDING 780P

EXISTING BUILDING 780N

1244sqm building area

RL 372.75

RL 372.78

NEW VEHICLE CROSS OVER

COOL ROOM TRAILER LOADING

7 ADDRESS

PROPOSED SOCIAL CENTRE
AHD 373.30

SLIDING CHAIN LINK GATE

NEW TREES

8343

EXISTING MAIN SITE SWITCHBOARD

1757.6sqm building area

GREASE PIT

SWALE

EX TREE TO REMAIN

EX TREES TO REMAIN

RL 372.69

LOT 3517
16135 m²

RL 373.20

SETBACK

1130

DA05 1

FOOTPATH

DA04

FIRE HYDRANT

EXISTING FOOTPATH

EX TREE TO REMAIN

EXISTING STUDENT ACCOM BUILDING 780B

SWALE

EX ELECTRICAL PIT TO REMAIN

EX TREE TO REMAIN

EXISTING FOOTPATH

EXISTING STUDENT ACCOM BUILDING 780C

EXISTING STUDENT ACCOM BUILDING 780D

EXISTING FOOTPATH

EXISTING FOOTPATH

EXISTING DRIVEWAY

192.69
SITE BOUNDARY

103.52
SITE BOUNDARY

EXISTING STUDENT ACCOM BUILDING 780A

EXISTING CARPARK

EX CAR PARK
78 BAYS

EXISTING PUMPS AND TANKS

43° 35'

8.53
SITE BOUNDARY

137.28

90° 0'

8.53
SITE BOUNDARY

136.19
SITE BOUNDARY

EXISTING DRIVEWAY

EXISTING FOOTPATH

Parking - 2027sqm

KINGSBURY PARK
LOT 1140

WEARNE LANE

HANBURY STREET

WILSON STREET

FLOOR AREA CALCULATION

AREA OF EX BUILDING TO BE DEMOLISHED	= 800 m²
AREA OF PROPOSED EARTHWORKS	= 2503 m²
AREA OF PROPOSED BUILDINGS	= 825 m²
EXISTING CAR BAYS TO REMAIN	= 78

SCALE 1:500 @ A3

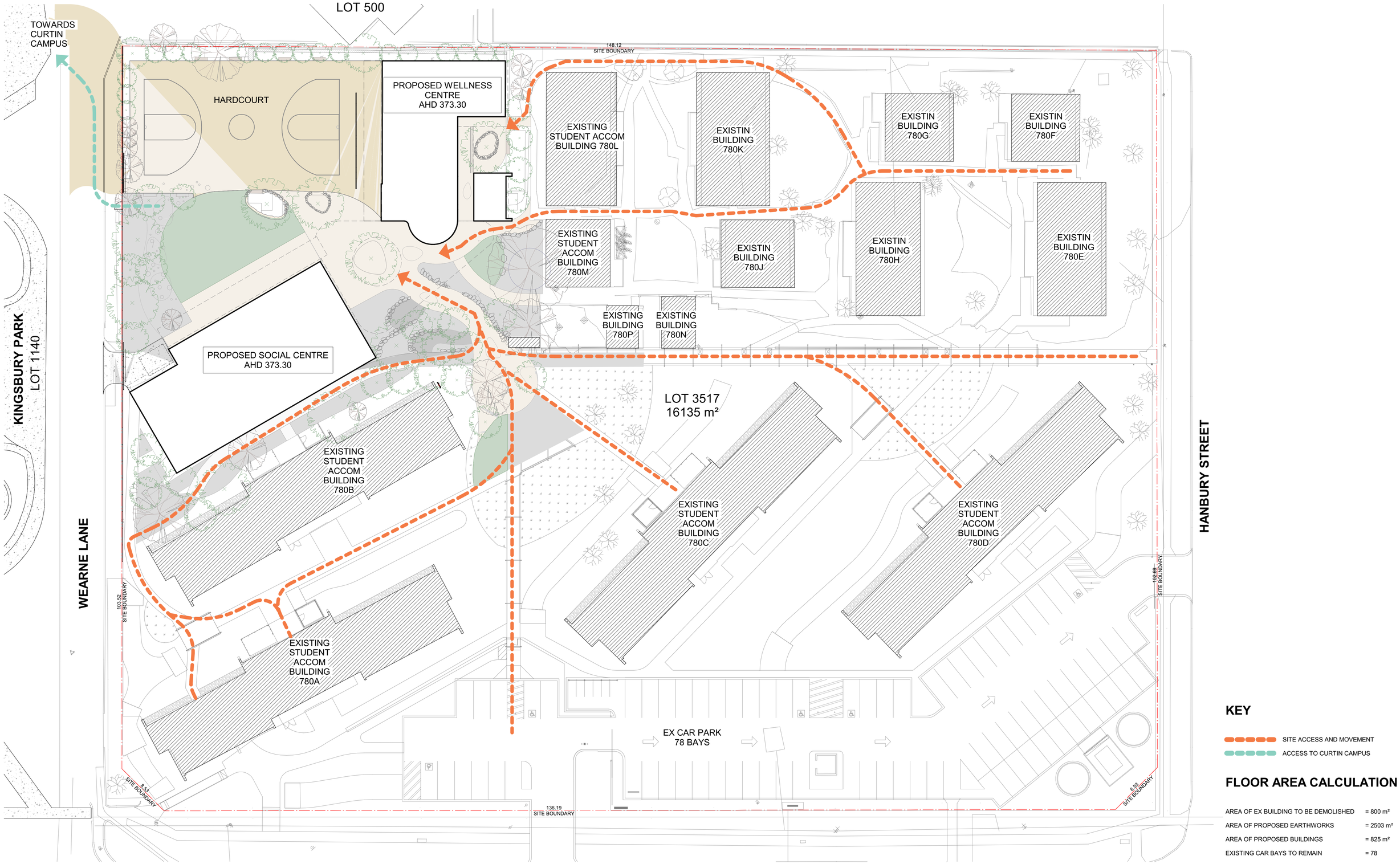
0 2.5 5 7.5 10 12.5 25m

SITE PLAN

25016 Agricola Shared Facilities **Development Application** A 24/04/2026 DA01

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KEY

SITE ACCESS AND MOVEMENT

ACCESS TO CURTIN CAMPUS

FLOOR AREA CALCULATION

AREA OF EX BUILDING TO BE DEMOLISHED	= 800 m²
AREA OF PROPOSED EARTHWORKS	= 2503 m²
AREA OF PROPOSED BUILDINGS	= 825 m²
EXISTING CAR BAYS TO REMAIN	= 78

SCALE 1:500 @ A3

0 2.5 5 7.5 10 12.5 25m

SITE ACCESS DIAGRAM

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DA05 1

PLANT 11 m²

COOL ROOM TRAILER LOADING (WATER AND 15A POWER)

COMMS 8 m²

FURNITURE/ EXTERNAL STORE 17 m²

DRY STORE 9 m²

M. WC 15 m²

F. WC 15 m²

UAT 6 m²

CLNR 3 m²

KITCHEN 73 m²

GAMES ROOM 26 m²

MULTI FUNCTION SPACE 181 m²

BOOKABLE 21 m²

LOUNGE 37 m²

DA04 3

EXTERNAL SERVERY

PERGOLA ABOVE OUTDOOR SEATING AREA

SHADED AREA

NEW TREES

BBQ AREA

LAWN

DA04 1

NEW TREES

TRAFFICABLE FOOD TRUCK PARK (WATER & POWER)

TRAFFICABLE FOOD TRUCK PARK (WATER & POWER)

TRAFFICABLE FOOD TRUCK PARK (WATER & POWER)

HARDCOURT

COURT SEATING

3597

8047

3592

6477

2914

6139

8782

8360

LINE OF ROOF OVER

EXISTING ACCOMODATION UNIT

8654

10757

4186

DA04 2

LINE OF CONCRETE AWNING OVER

CHAIN LINK FENCE

6169

12925

2578

5998

7208

9915

3768

9125

EXTERNAL SHADED EXERCISE AREA

UNDERCOVER AREA / GATHERING SPACE

9958

5805

WC 3 m²

WC 2 m²

SHR 3 m²

UAT 6 m²

GYM STORE 7 m²

GYM 108 m²

COMMS 5 m²

STUDY 53 m²

MEETING ROOM 22 m²

ZEN STORE 7 m²

DA06 4

2 DA06

374.45

373.94

SIGN LOCATION 01

6498

LAWN

3698

DA06 3

REFLECTION 24 m²

NEW TREES

ZEN COURTYARD

ZEN DEN 49 m²

NEW TREES

VIEW TO EXISTING LEMON TREES

SCALE 1:300 @ A3

0 1.5m 3m 4.5m 6m 7.5m 15m

FLOOR AREA CALCULATION

AREA OF EX BUILDING TO BE DEMOLISHED	= 800 m²
AREA OF PROPOSED EARTHWORKS	= 2503 m²
AREA OF PROPOSED BUILDINGS	= 825 m²
EXISTING CAR BAYS TO REMAIN	= 78

FLOOR PLAN

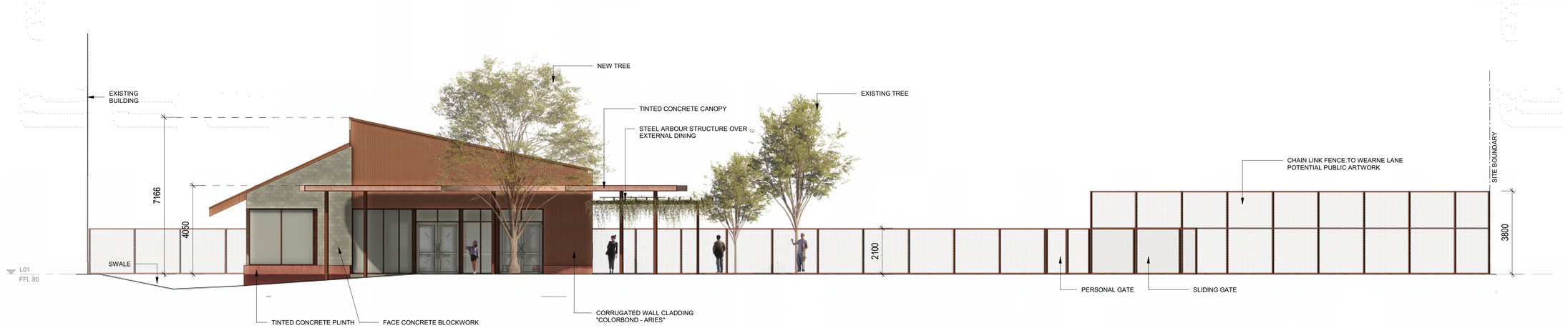
25016 Agricola Shared Facilities **Development Application** A 24/04/2026 DA03

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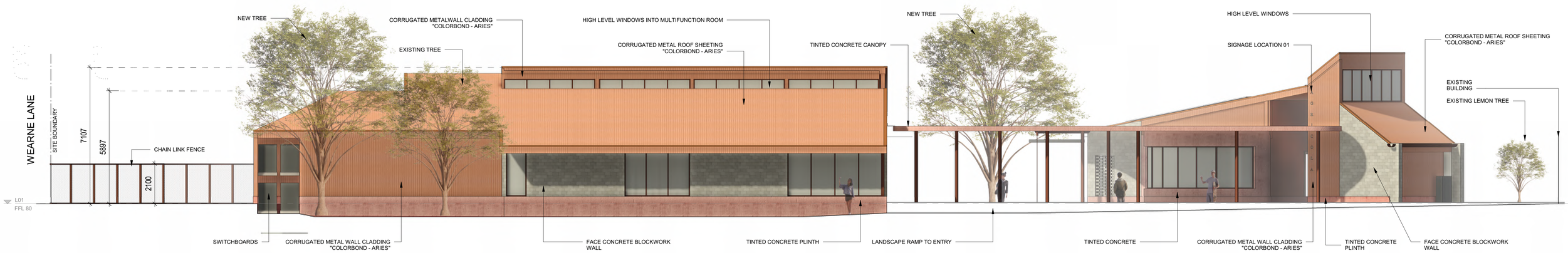
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1 ELEVATION 1
A-FP0101 SCALE 1 : 100



2 ELEVATION 2
A-FP0101 SCALE 1 : 100



3 ELEVATION 3
A-FP0101 SCALE 1 : 100

SCALE 1:200 @ A3

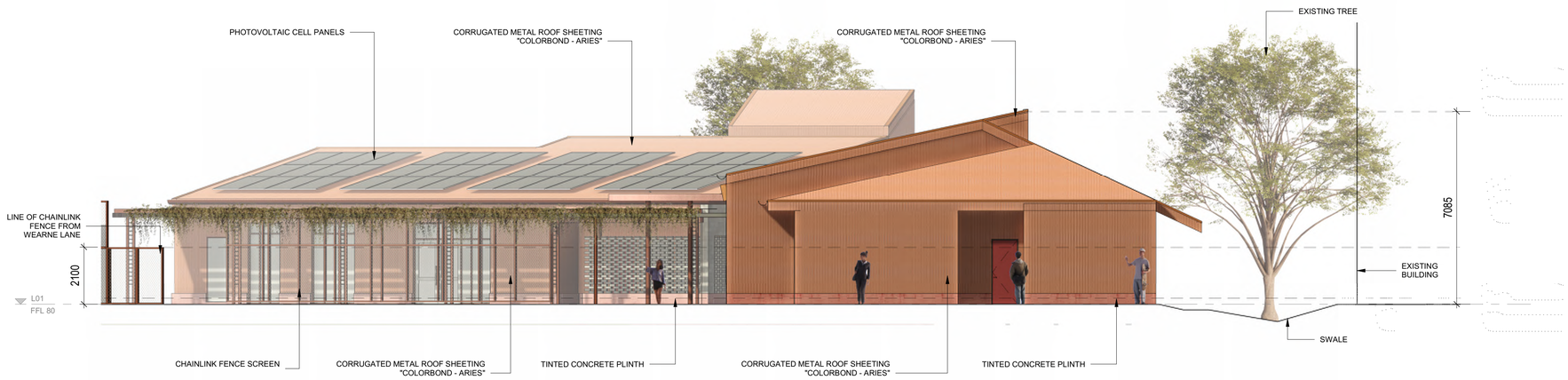
0 1 2 3 4 5 10m

ELEVATIONS

25016 Agricola Shared Facilities **Development Application** A 24/04/2026 DA04

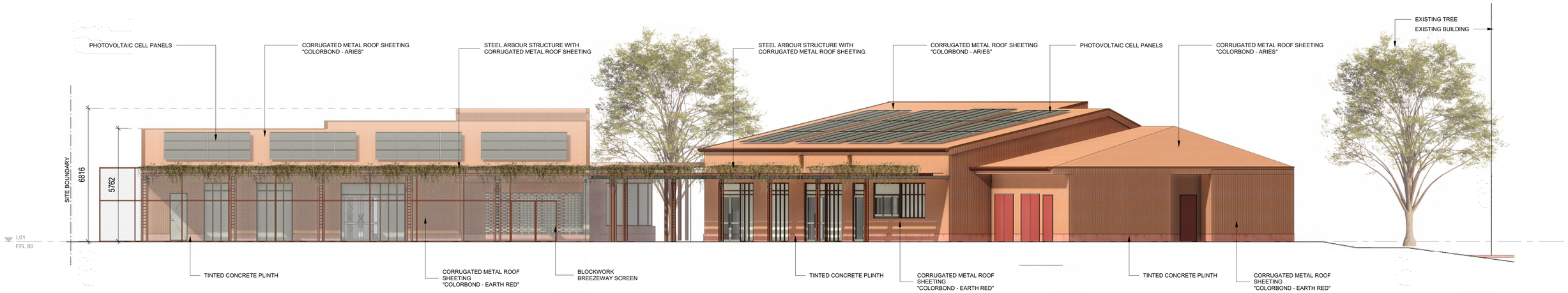
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1 ELEVATION 4

A-FP0101 SCALE 1 : 100



2 ELEVATION 5

A-FP0102 SCALE 1 : 100



3 ELEVATION 6

A-FP0101 SCALE 1 : 100

SCALE 1:200 @ A3

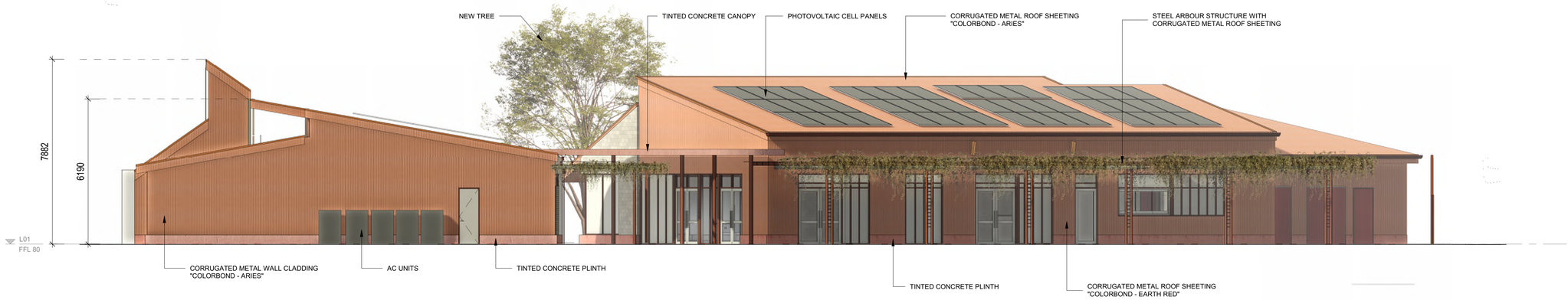
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ELEVATIONS

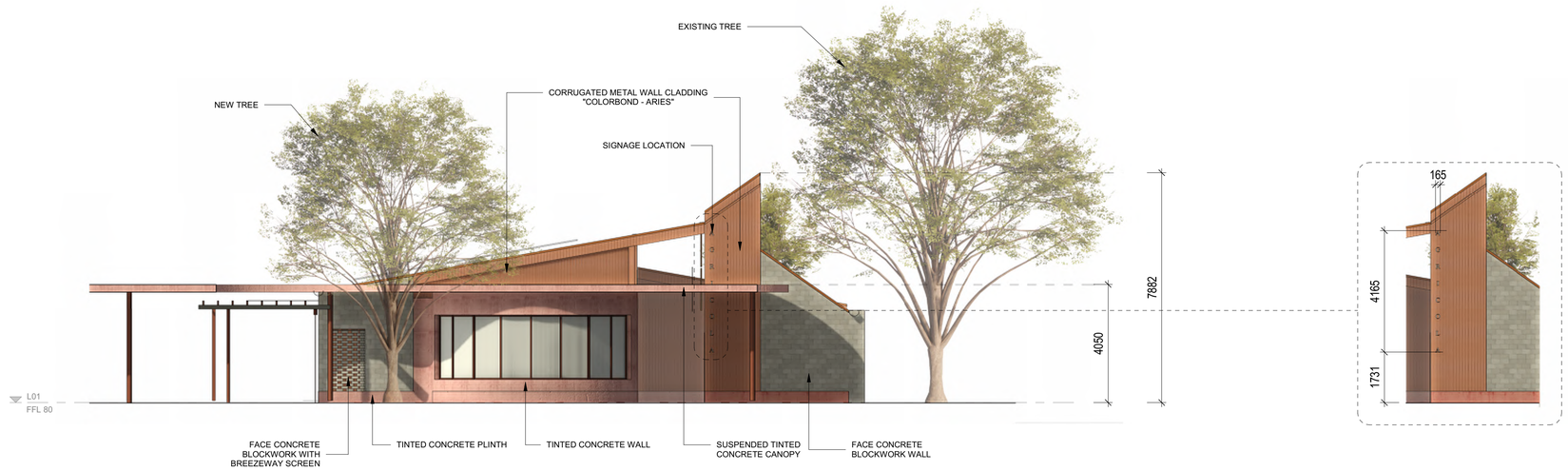
25016 Agricola Shared Facilities **Development Application** A 24/04/2026 DA05

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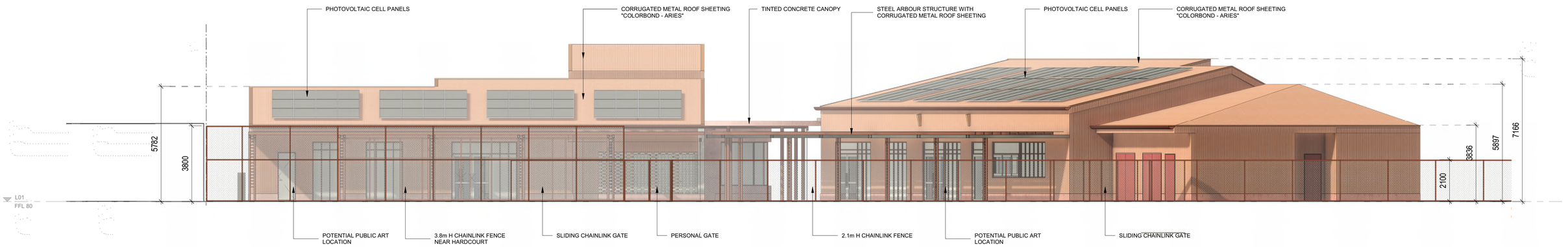


2 ELEVATION 7
A-FP0101 SCALE 1 : 100



3 SIGNAGE
A-FP0101 SCALE 1 : 100

4 ELEVATION 8
A-FP0101 SCALE 1 : 100



1 ELEVATION 9 - STREET ELEVATION
A-FP0102 SCALE 1 : 100

SCALE 1:200 @ A3

0 1 2 3 4 5 10m

ELEVATIONS

25016 Agricola Shared Facilities **Development Application** A 24/04/2026 DA06

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ATTACHMENT 3

Architectural Presentation

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NGURRA (LAND COUNTRY)



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Colours drawn from ground variation

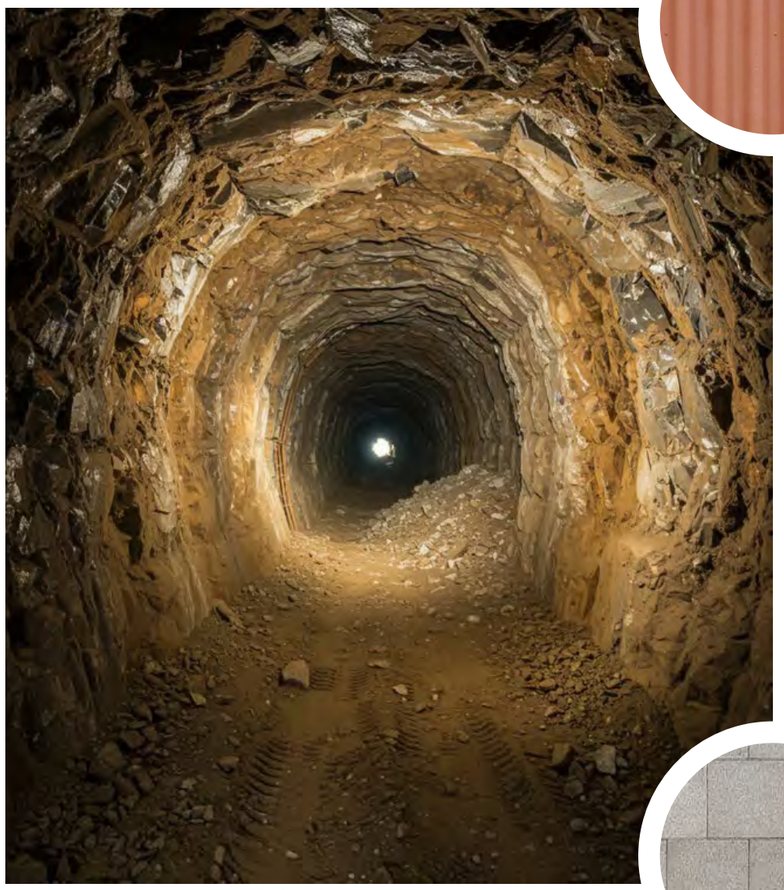


STRATIFICATION OF LAYERS

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YANTI YURI (TREE)
JUNTU (SUN)
PILTHANGKA (SKY)
PIRA (MOON)
PURNGA (STARS)

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Textures and materials drawn from Kalgoorlie

Masonry
Thermal mass
Light weight
Construction
Utilitarian
Material Scarcity



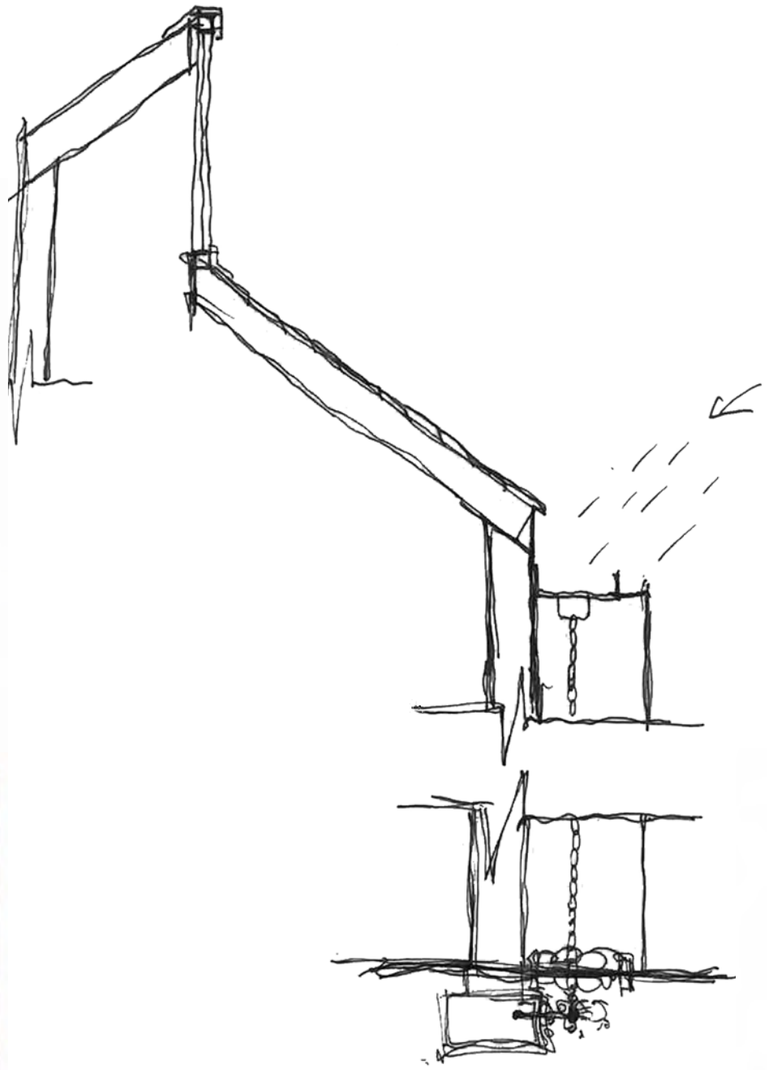


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HONORING THE WATER CORROBOREE
PINTA / NGAPARU (WATER)

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ATTACHMENT 4

Landscape Report

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AGRICOLA SHARED FACILITIES UPGRADE
CURTIN UNIVERSITY

LANDSCAPE

—

ASPECT Studios



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We would like to pay our respects to the Traditional Owners and Custodians of Karlkula (Kalgoorlie), the Kaalamaya Kupurn People, where Curtin Agricola Shared Facilities is located.

We would like to celebrate the shared stories, connections both tangible and intangible to the site and recognise the ongoing resilience of the Kaalamaya Kupurn people.

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01. Introduction



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1.1 Overview - Landscape Quality



Vision

Our vision is to create a welcoming and vibrant campus heart that supports student life through social connection, active living and shared meals. The design provides spaces for gathering, engagement and respite, acknowledging the site's cultural heritage as a significant meeting place and guided by the Water Story. Shaped in partnership with the Kaalamaya Kupurn Traditional Owners and grounded in a Caring for Country approach, the centre fosters belonging and wellbeing within a landscape that is distinctly of place. Curated gardens will celebrate diverse local flora and respond to the transitions through Country.

Landscape Character & Cultural Integration

The landscape design Imagines Country through guidance from the Kaalamaya Kupurn people. The design translates the cultural narrative of the water story and the site as an important place to meet, gather and engage. The planting palette will look to contribute aesthetically to the Shared Facilities as well as contribute to biodiversity and habitat enhancement. It will be informed by the Coolgardie bioregion and the Great Western Woodlands vegetation complexes, as well as showcase plant species, culturally significant to the Kaalamaya Kupurn people.

Experience & Community

The landscape design has developed a sequence of experiences for the residents to enjoy, access respite as well as social interaction and recreation. On arrival the residents will be guided through a series of terraced nooks with endemic plantings as well as places to dwell and 'hang-out'. The oculus signifies a place of welcome and orientation, from which to experience the curated outdoor amenity areas that complement and are an extension of the Wellness and Social Hubs. The informal breakout and gathering spaces, as well as a generous lawned green and multipurpose court, support a wide range of activities for the residents to enjoy in support of the holistic health and wellbeing approach.

Climatic Response & Sustainability

To address Kalgoorlie's climate and the potential impacts of a drying climate, the design focuses on creating good outdoor comfort for residents through new tree plantings to provide shade and natural cooling, as well as hydro-zoned garden beds and lawn areas to enable a water wise approach. The design is integrated into the stormwater strategy, directing runoff to garden beds where possible as well as expressing and acknowledging rainfall events within the landscape and architecture through cultural guidance. Living Architecture through deciduous planting to proposed trellis will further assist with seasonal solar management. Opportunities to re-purpose site materials will also be explored to reduce waste and reference histories and memories of place.

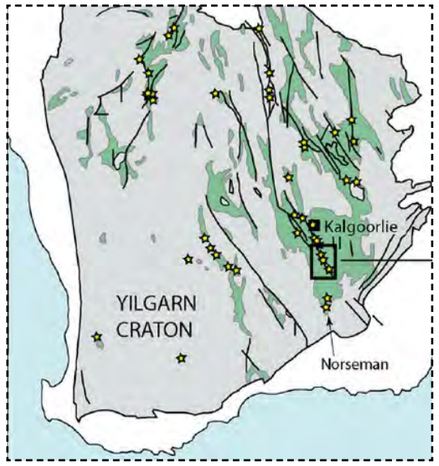
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02. Context

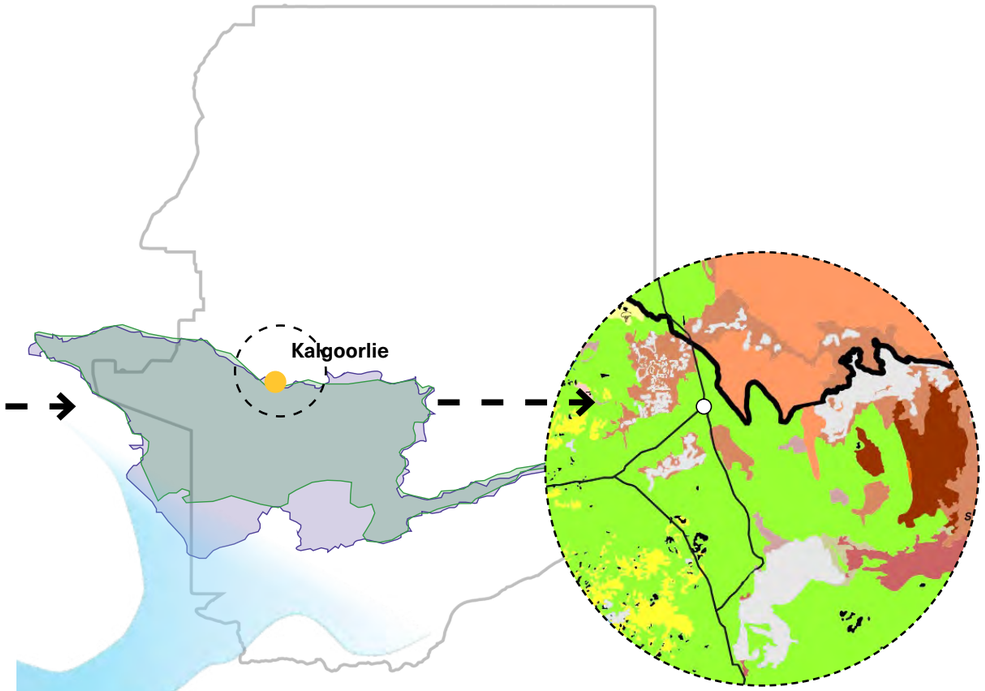


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2.1 Regional Context







Natural Systems

Geology:

- Yilgarn Craton: 2.5 billion years old, Kalgoorlie is situated in the eastern section.
- Norseman-Wiluna Belt - Archaean rocks, predominantly granite crossed by north-northwest-trending belts of greenstones. The Archaean greenstone belts is where gold can be found.
- The region has diverse range of landforms - granite rocky outcrops, low greenstone hills, laterite uplands and broad plains.
- Kalgoorlie is centered on an array of old river systems that originally drained eastward to the sea in the area that is now the Nullabor Plain. Vast salt lakes are what remain of the ancient river systems, that when periodically flood, are plentiful with invertebrates, fish and water birds.

Climate:

Kalgoorlie experiences Mediterranean to semi-arid conditions with rain in summer and winter. Averages approximately 200 to 300 mm annually. Summers are hot.

Coolgardie Bioregion

Vegetation

IBRA region (Bioregion):

- Coolgardie Bioregion - characterised by mallee Eucalypts, Acacia thickets and shrub-heaths on sandplains. Rich in endemic species. Vegetation occurs around salt lakes, on ranges and in valleys. The salt lakes have dwarf shrublands of samphire (Mackenzie et al 2002).
- Vegetation Type: Great Western Woodland - largest intact temperate woodland remaining in the world. Mallee, shrublands and grasslands.
- Vegetation Communities: Woodland, Saltbush and/ or bluebush and Saltlake, lagoon and claypan.

Today the majority of the woodlands around Kalgoorlie and Coolgardie are regrowth.

Fauna:

Threatened species include the Mulgara, Marsupial Mole, Sandhill Dunnart, Bilby, Black-footed Rock-wallaby, Malleefowl, Australian Painted Snipe, Night Parrot and the Giant Desert Skink. Other species include Emu, Echidna, Carpet Pythons, Honey-eaters, Yellow Throated Miners, Rainbow Bee-eaters and wild Budgerigars.

Coolgardie Bioregion

Great Western Woodlands

Gondwana Project

Woodland

Wheatbelt – York gum (*E. loxophelba*, salmon gum (*E.salmonophloia*) etc.

Goldfields – gimlet (*E.salubris*), redwood (*E.transcontineltalis*) etc.

Salt bush and/or bluebush with scattered low trees

Atriplex spp. Maireana spp with mulga (*Acacia aneura*), other wattle (*A.papyocarpa*), cauarina (*Allocasuarina cristata*).

Salt lake, lagoon, clay pan

Resource:

Department of Biodiversity, Conservation and Attractions, DPAW. Visiting the Great Western Woodlands

Department of Biodiversity, Conservation and Attractions, DPAW. Mapping of the south west corner was complied by A.J.M. The vegetation of Western Australia at the 1:3 000 000 scale Explanatory Memoir Second Edition

In: Conservation Science Western Australia-Vol 9. Hopkins from various sources.

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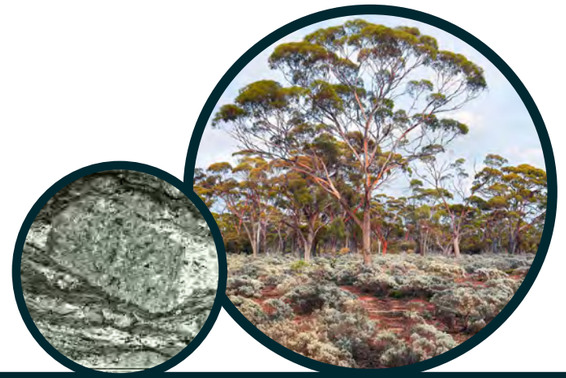
https://www.kalgoorlietourism.com

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2.2 Regional Context

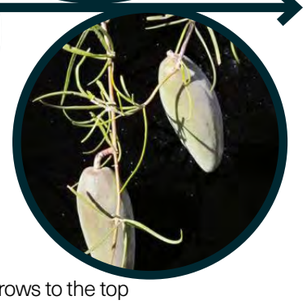
An Ancient and Continuous Culture

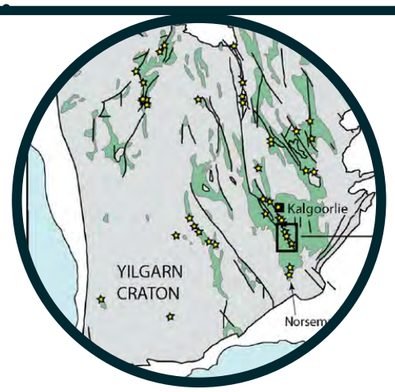
Kaalamaya Kupurn People are recognised as the Traditional Owners and custodians of Karlkula (Kalgoorlie) with Curtin Agricola Shared Facilities project located on the lands of the Kaalamaya Kupurn People Country. Guided by the Emu origin narrative and stories about flora and water.













Pinta/Ngaparu (Water)

As rainfall is low and unpredictable, water sources were protected and conserved by the Aboriginal people for thousands of years. They were wells, claypans, soaks and springs or 'Gnammas'

'Gnammas' are natural cavities that are commonly found in granite outcrops. They act as natural water tanks, which are replenished from underground stores and rainwater run-off. The small surface area of the hole helps to minimise evaporation.

An Ancient Landscape

Karlkula (Kalgoorlie) is situated in the eastern section of the approx. 2.5 billion year old Yilgarn Craton. It is one of the most ancient landscapes preserved anywhere on Earth.

Karlkula (Kalgoorlie) is part of the Norseman-Wiluna Belt, a greenstone belt consisting of ancient volcanic and sedimentary rocks that have been metamorphosed over millions of years and is surrounded by extensive granite.

Karlkula (Kalgoorlie) is centered on an array of old river systems that originally drained eastward to the sea in the area that is now the Nullabor Plain. Vast salt lakes are what remain of the ancient river systems, that when periodically flood, are plentiful with invertebrates, fish and water birds.

Botanical Wonder

Karlkula (Kalgoorlie) is located in the Coolgardie Bioregion - an interzone between the moist south-west and the arid interior of the Western Australia.

The landscapes surrounding Karlkula (Kalgoorlie) have been described as 'a rich tapestry connecting Australia's south-west corner to its inland deserts.'

The Great Western Woodlands is considered the largest intact temperate woodland remaining in the world. Offering vast carbon stores.

The vegetation ranges from mature Eucalyptus woodlands dominating the landscape, interspersed with large areas of mallee, shrublands and grasslands.

Abundant botanical diversity with 20% of Australia's plant species and the highest diversity of Eucalyptus species in the world. A great richness of vertebrate and invertebrate fauna also exists.

Majority of the woodlands around Karlkula (Kalgoorlie) and Coolgardie are regrowth from the clearing for fuel by the mining industry between 1900 to 1965.

The Wildflower season runs between July to October.

Karlkula

Karlkula (silky pear) is a vine that grows to the top of other shrubs and trees, where it forms a mass of vegetation and flowers. It has small cream flowers, large pear shaped fruit and seeds with tufts of white, silky hairs. Almost the entire plant being edible. It is thought to have informed the name 'Kalgoorlie'.

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2.3 Regional Context

Pinta / Ngaparu, yanti yuri (water tree)

Elders described 'water trees' as a key to survival, noting the water is like 'mother's milk'. Salmon gum or Karadong are very significant because of the water in it. Water tree business was passed down and are still carried out today.

Reference: Kalgoorlie Trip – Stories/Yarns from Elders and Knowledge Holders





A Meeting Place

The last corroboree was held in Karlkula (Kalgoorlie) in the mid-to-late 1960s. Tribes from all over were invited due to a big drought. There were dances for water which lasted day and night. 'Two days later, it started to rain... for two weeks nonstop.' Curtin Agricola Shared Facilities project is said to be the spot where the corroboree was held.

Reference: Kalgoorlie Trip – Stories/Yarns from Elders and Knowledge Holders





The Landscape of Mining

Paddy Hannan's discovery of gold in 1893 followed by Brookman and Pearce registering the Great Boulder lease, set a course for the unimaginable transformation of this landscape.

European settlement of Karlkula (Kalgoorlie) was the first Australian settlement not informed by recognisable 'European' landscape features such as a river, coast, mountain ranges, nor was it militarily defensible. Karlkula (Kalgoorlie) was gazetted in 1894 to service the Golden Mile. It was thought such interest in Karlkula (Kalgoorlie) from the east coast that cemented West Australia joining the other colonies in Federation.

Mining began to alter the Karlkula (Kalgoorlie) landscape with surrounding woodlands cleared and defoliated by the woodcutters who worked the woodlines bringing firewood, to fuel steam boilers and gas producers for lighting, pumping and ore treatment. Mining structures began to dominate the relatively flat terrain with towering smoke stacks, tailings dumps, and processing plants.

By the late 1980's, the underground operations that formed labyrinths of tunnels and shafts ceased and open-cut mining began, creating an extensive terraced landscape. Through the amalgamation of multiple leases the Super Pit

Unique, Diverse and Resilient

Today Karlkula (Kalgoorlie) represents Australia's largest outback City. Surrounded by the ecological richness of the Greater Western Woodlands, Karlkula (Kalgoorlie) is outer regional, and isolated. Karlkurla heritage is informed by the traditional custodians of this land - ancient and continuous Aboriginal cultures, and the transformative gold rush of the 1890's. This has shaped Karlkula (Kalgoorlie) as a resilient and diverse place, with a committed and engaged community, offering distinct and unique experiences to all who reside and visit.



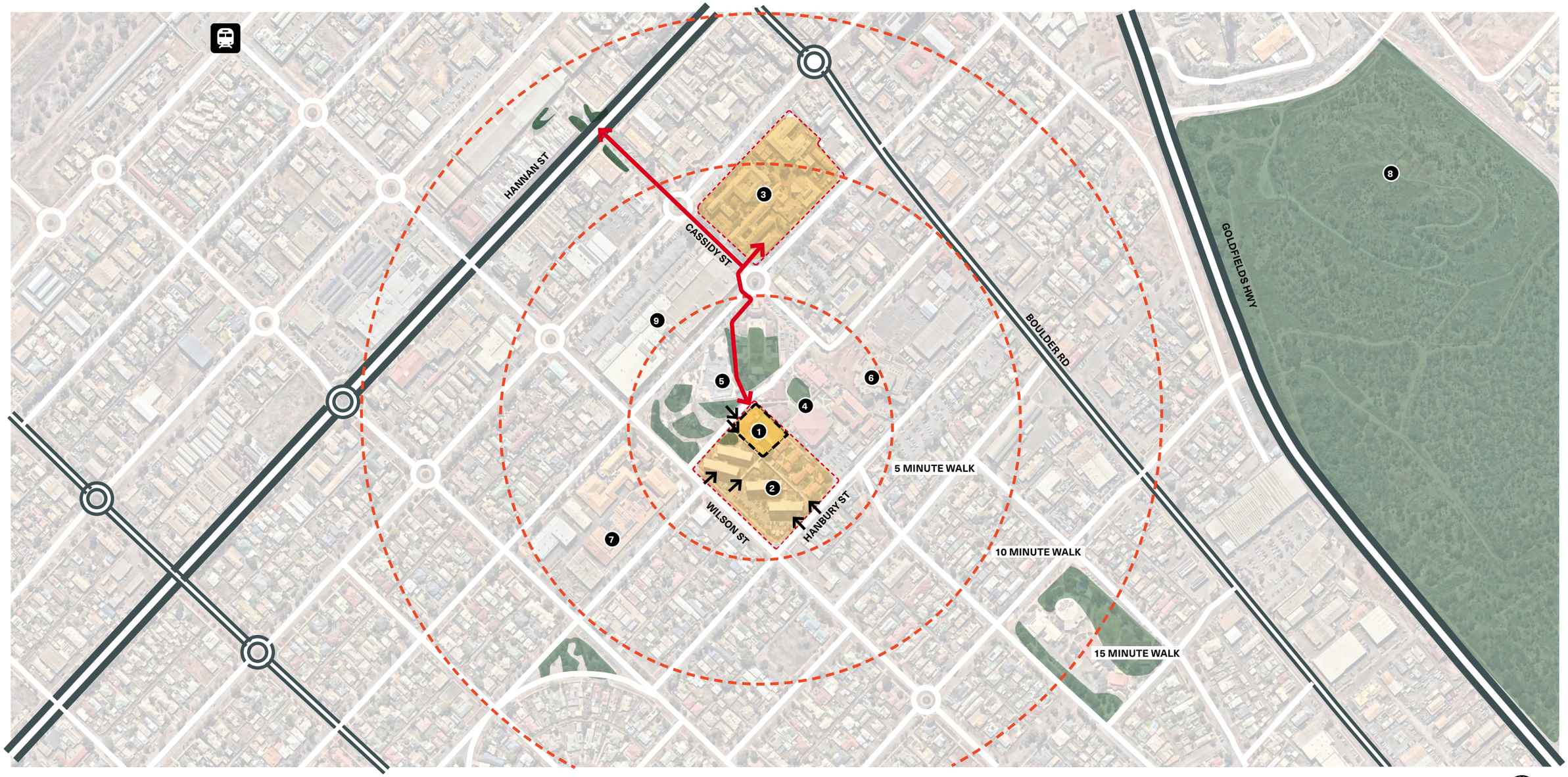


Student Experiences

Agricola Residence provides accommodation and a home away from home. It enables a balanced, immersive experience for those studying in the Goldfields region. An opportunity to explore, participate and create forever memories of their time in this unique and culturally rich place. It combines academic focus with social and community engagement.

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2.4 Local Context



Key

- Major highway
- Primary road
- Kalgoorlie Railway Station
- Site boundary
- Walking distance

Key

1	Curtin Agricola Shared Facilities
2	Curtin Agricola Student Accommodation
3	Curtin Kalgoorlie
4	Eastern Goldfields College
5	Kingsbury Park Youth Precinct
6	Goldfields Arts Centre
7	Curtin School of Mines Site.
8	Mt Gleddon / Nanny Goat Hill Rehabilitation Project (Significant Aboriginal Heritage Site)
9	Supermarket
10	Hannan Street

CONTEXT PLAN - SCALE: NTS

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03. Site Considerations



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3.1 Site Analysis - Existing Condition



KEY

- Project Boundary
- Existing tree
- Existing shrubs
- Existing turf
- Existing building
- Shaded structure (solid)
- Shaded structure (shade sail)
- Existing hard court
- Level change c.400-500mm
- Open drain
- Drain with grate
- Primary Pedestrian Path

Considerations

1	Multi-use Court - frequent use.
2	Citrus trees - in good health.
3	Consider screening between shared facility and existing residential unit.
4	Existing mature *Jacaranda mimosifolia* tree.
5	Existing mature tree to be retained and protected. Existing tree provides important shade and is attractive to look out onto.
6	Key view through to shared facility.
7	Existing turf area used to play volleyball. Well used.
8	Outdoor shaded seating areas.
9	Blank fence with wire to top and lower retaining wall. Option to offset court to allow for planting to screen and soften area.
10	Service Access.



EXISTING SITE PLAN - SCALE: NTS

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3.2 Site Analysis - Observations

DRAINAGE

Existing Condition:

Open conveyance drains designed to manage high volumes of stormwater in short periods of time. Ballast, basalt and laterite. Loose and rock pitched in areas. No planting.

Opportunity:

Understand performance requirements of site drainage and integrate into landscape narrative and design, including material selection.






TREE CANOPY

Existing Condition:

Sparse tree planting, single and in groups. Predominately endemic and native, some exotic species. (i.e Citrus tree, Jacaranda). Tree canopies provide important shade and lower outdoor temperature.

Opportunity:

Increase tree canopy cover to manage micro climate and outdoor climate. Planting selection to be guided by suitable local endemic species, performance/functional requirements, and the Cultural narrative.






UNDERSTORY PLANTING

Existing Conditions:

Sparse pockets of understory planting. Currently no irrigation to planted areas, only turf areas. Turf areas in proximity to seating and amenity areas. Predominately nature and endemic, with some exotic shrub and groundcover species.

Opportunity:

Due to existing and possible future irrigation constraints, prioritise canopy cover over understory planting. Understory planting selection to be associated with primary amenity areas, cultural narrative and where can be watered and maintained.






OUTDOOR COMFORT MANAGEMENT

Existing Conditions:

Covered primary accessways to provide solar and rain protection, including night-time lighting. Shelters and shade sails over seating areas.

Opportunity:

Coordinated all-weather strategy to manage outdoor urban comfort year round and also maximise use of outdoor facilities.






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3.3 Site Analysis - Observations

PRIMARY ACCESSWAYS

Existing Condition:

Circulation is straight and direct. Primary access into site from Wilson Street (south-west) , as well as Hanbury Street (south-east). Access also from Wearne Lane (north-west). Secondary paths connect into these primary axis.

Opportunity:

Curate an arrival experience to the shared facility off the primary axis. One that is culturally safe, enables users to orientate themselves first, before moving into the space.






RECREATIONS FACILITIES

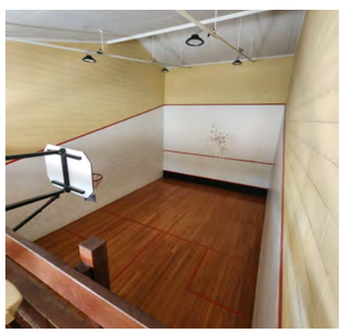
Existing Condition:

Recreational facilities include informal grass volleyball area, multipurpose hard court, activity wall, and an indoor squash court and basketball hoop.

Opportunity:

Feedback indicates students enjoy using the grassed area for volleyball and would be important to continue this opportunity in future grassed areas. The squash court will be removed. Ensure multi-purpose nature of new court. Explore if desire to integrate activity wall and/or other types of outdoor activities.



AMENITY AREAS

Existing Conditions:

Greater site amenity areas sit in proximity/offset to the primary links. Table/seats/ BBQ areas with irrigated grass areas. Sparse planting or trees. Very open/exposed. Variety of outdoor furniture styles. Universal accessibility considerations to shared facilities area with c.450mm level change. No sequence of arrival to the amenity areas.

Opportunity:

Re imagine the shared facilities as a sequence of considered spaces that make students feel safe and comfortable, provide the appropriate variety of spaces to dwell, gather, and use for a wide range of activities. To feel like a home away from home. To support wellbeing, and a connection to nature.






MATERIALS

Existing Conditions:

Hardscape materials - insuti concrete paths, concrete pre-cast pavers, in-organic gravels - basalt and laterite, jarrah timber (squash court), timber and aluminum outdoor furniture, blockwork, hardcourt, steel canopies, and shade sails.

Opportunity:

Ensure material palette is of place and in accordance with Greenstar and Aspect's Regenerative Design Guidelines. Re-use and repurpose building materials where practicable. Gravels, retaining and low walling, pavement and surface treatments, and seating.






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04. Landscape Themes

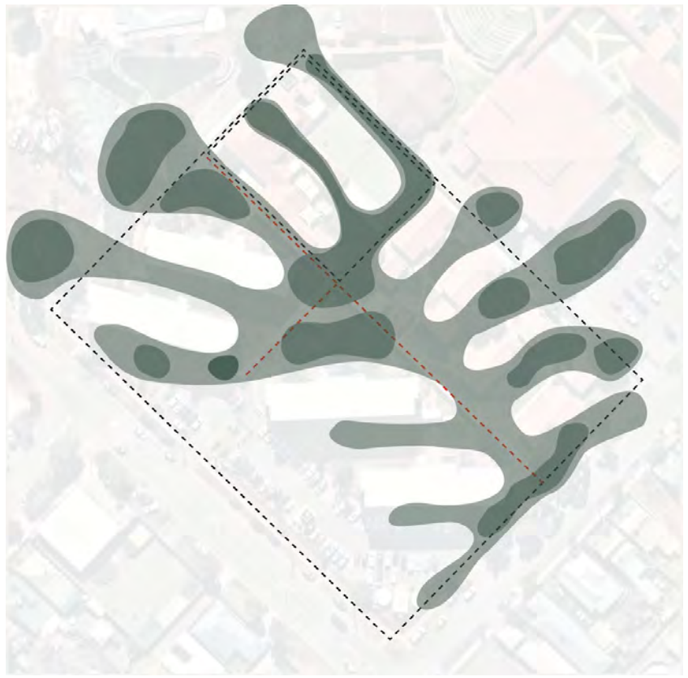


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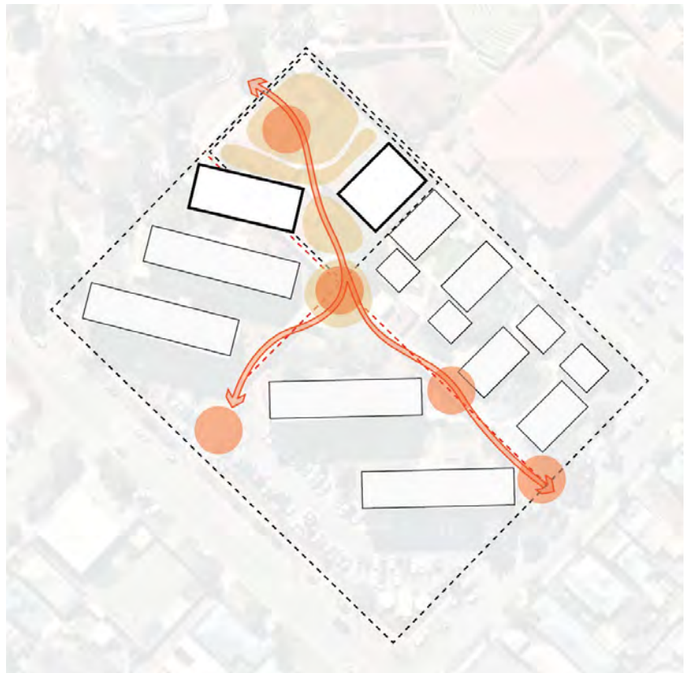
4.1 Landscape Opportunities



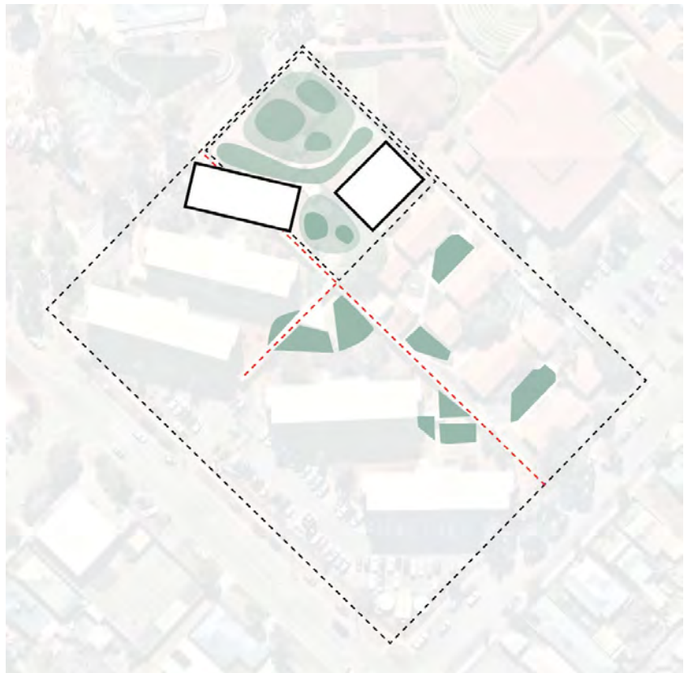
Living Stream



Re-connected Canopy



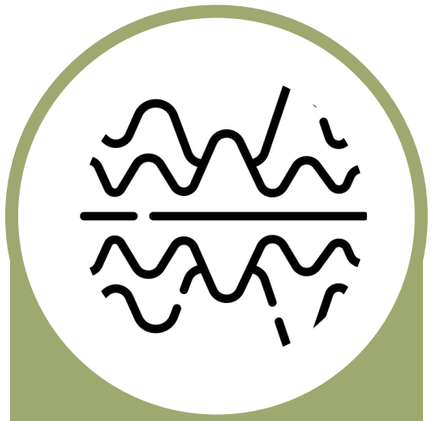
Connected Community



Outdoor Community/Living

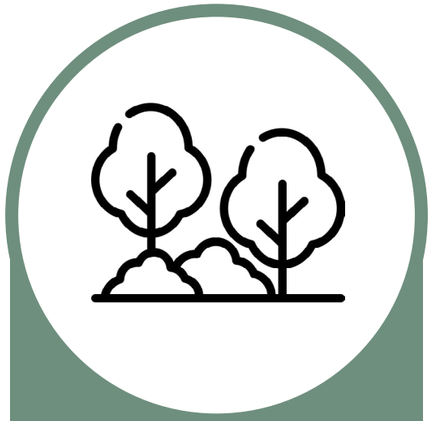
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4.2 Landscape Design Principles



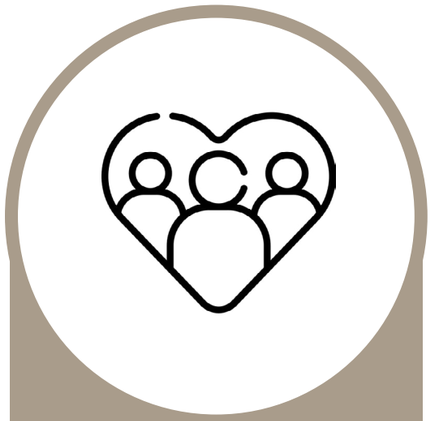
Caring for Country

Partnerships: Support a Caring for Country Approach, that begins with Starting with Country and guidance from Traditional Owners and Knowledge Holders. Creation of culturally safe and respectful spaces for all.



Woodland Campus

Planet: Re-discover the unique Greater Western Woodlands character within the campus to create comfortable microclimates, user amenity and a regenerative landscape.

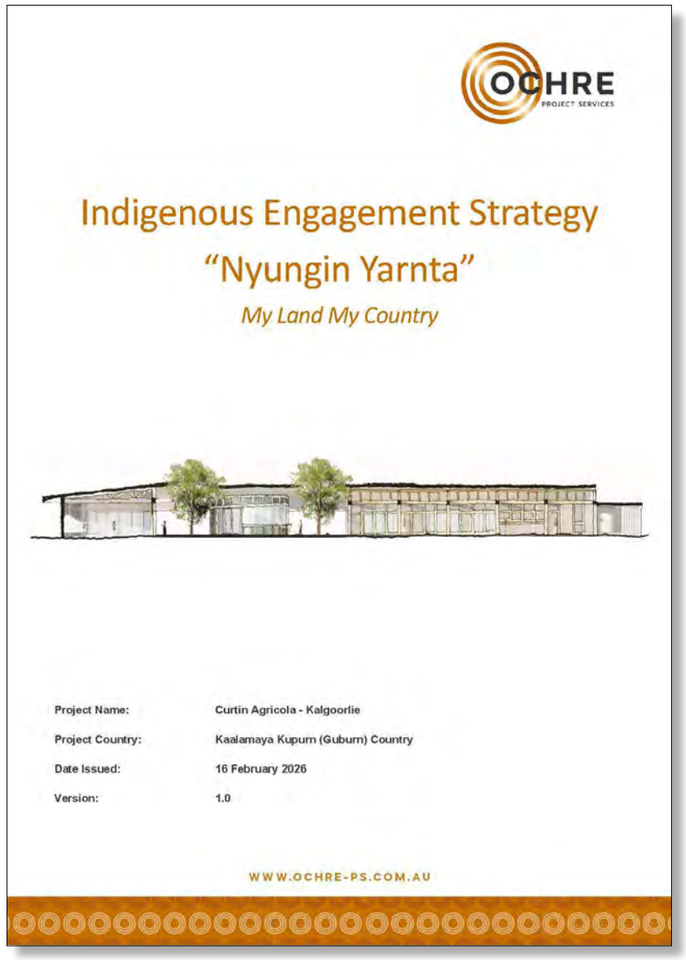


Community

People: Reimagine the site to create a vibrant, safe, inclusive and active social and wellness hub for students. A place that nurtures memorable experiences, support students and enables meaningful engagement and contributions to the wider community.

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4.3 Cultural Engagement



OCHRE PROJECT SERVICES

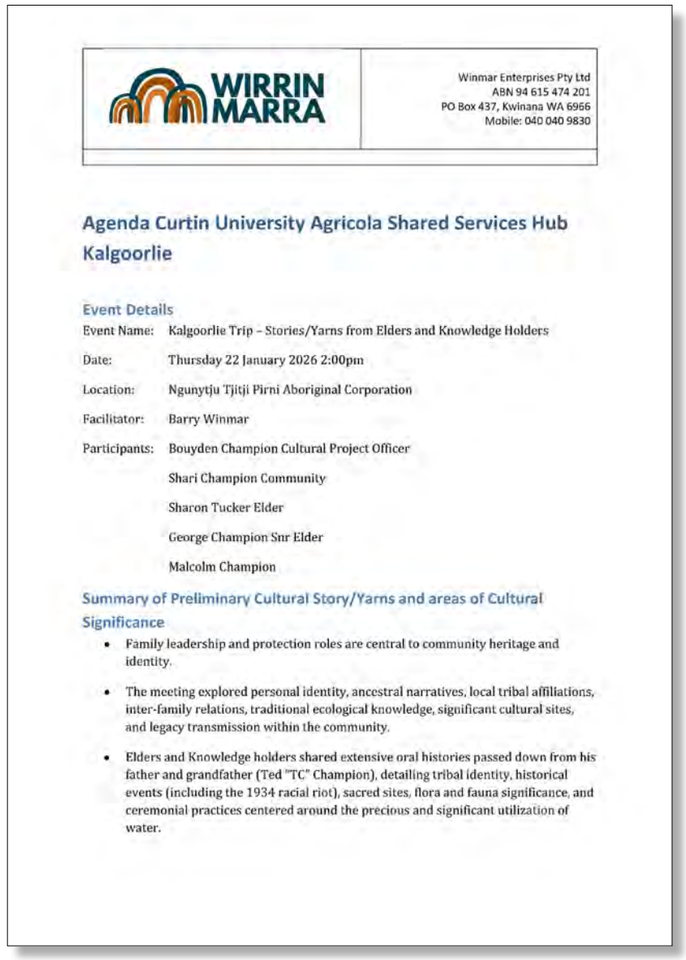
Indigenous Engagement Strategy

"Nyungin Yarnta"

My Land My Country

Project Name:	Curtin Agricola - Kalgoorlie
Project Country:	Kaalamaya Kupurn (Guburn) Country
Date Issued:	16 February 2026
Version:	1.0

WWW.OCHRE-PS.COM.AU



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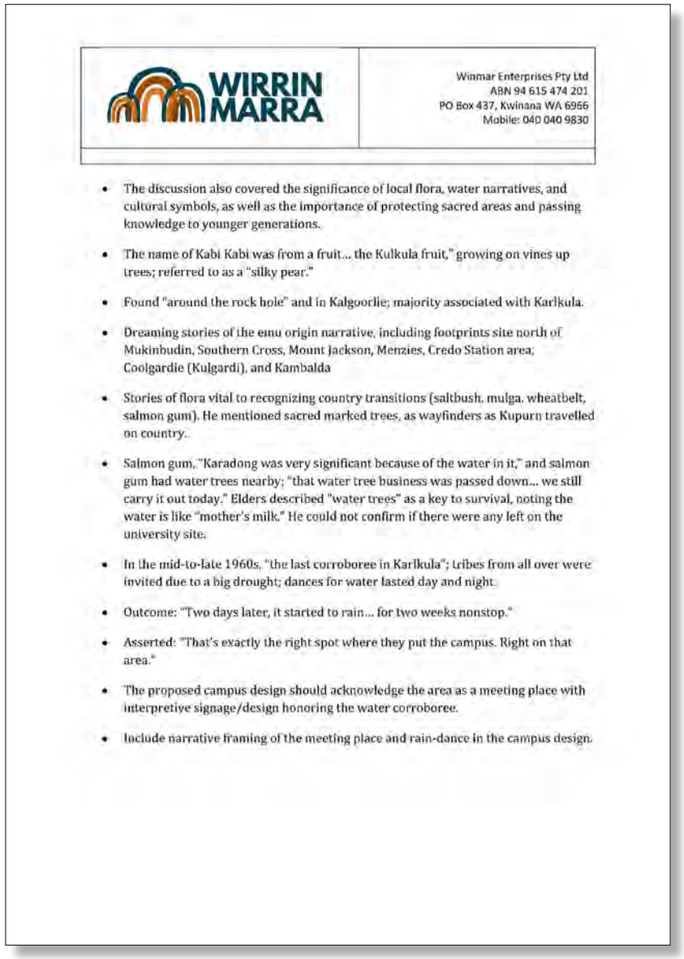
Agenda Curtin University Agricola Shared Services Hub Kalgoorlie

Event Details

Event Name:	Kalgoorlie Trip – Stories/Yarns from Elders and Knowledge Holders
Date:	Thursday 22 January 2026 2:00pm
Location:	Ngunytju Tjitji Pirni Aboriginal Corporation
Facilitator:	Barry Winmar
Participants:	Bouyden Champion Cultural Project Officer
	Shari Champion Community
	Sharon Tucker Elder
	George Champion Snr Elder
	Malcolm Champion

Summary of Preliminary Cultural Story/Yarns and areas of Cultural Significance

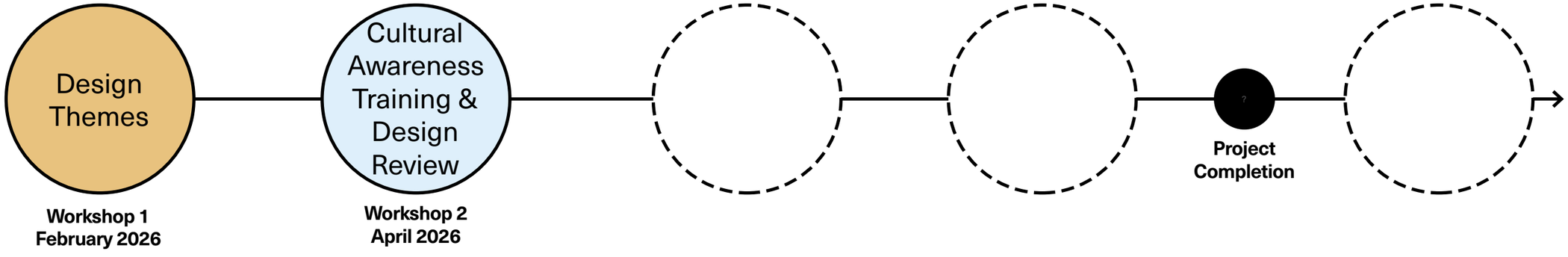
- Family leadership and protection roles are central to community heritage and identity.
- The meeting explored personal identity, ancestral narratives, local tribal affiliations, inter-family relations, traditional ecological knowledge, significant cultural sites, and legacy transmission within the community.
- Elders and Knowledge holders shared extensive oral histories passed down from his father and grandfather (Ted "TC" Champion), detailing tribal identity, historical events (including the 1934 racial riot), sacred sites, flora and fauna significance, and ceremonial practices centered around the precious and significant utilization of water.



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- The discussion also covered the significance of local flora, water narratives, and cultural symbols, as well as the importance of protecting sacred areas and passing knowledge to younger generations.
- The name of Kabi Kabi was from a fruit... the Kulkula fruit," growing on vines up trees; referred to as a "silky pear."
- Found "around the rock hole" and in Kalgoorlie; majority associated with Karlkula.
- Dreaming stories of the emu origin narrative, including footprints site north of Mukinbudin, Southern Cross, Mount Jackson, Menzies, Credo Station area, Coolgardie (Kulgardi), and Kambalda
- Stories of flora vital to recognizing country transitions (saltbush, mulga, wheatbelt, salmon gum). He mentioned sacred marked trees, as wayfinders as Kupurn travelled on country.
- Salmon gum, "Karadong was very significant because of the water in it," and salmon gum had water trees nearby; "that water tree business was passed down... we still carry it out today." Elders described "water trees" as a key to survival, noting the water is like "mother's milk." He could not confirm if there were any left on the university site.
- In the mid-to-late 1960s, "the last corroboree in Karlkula"; tribes from all over were invited due to a big drought; dances for water lasted day and night.
- Outcome: "Two days later, it started to rain... for two weeks nonstop."
- Asserted: "That's exactly the right spot where they put the campus. Right on that area."
- The proposed campus design should acknowledge the area as a meeting place with interpretive signage/design honoring the water corroboree.
- Include narrative framing of the meeting place and rain-dance in the campus design.



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4.4 Cultural Engagement - Key takeaways

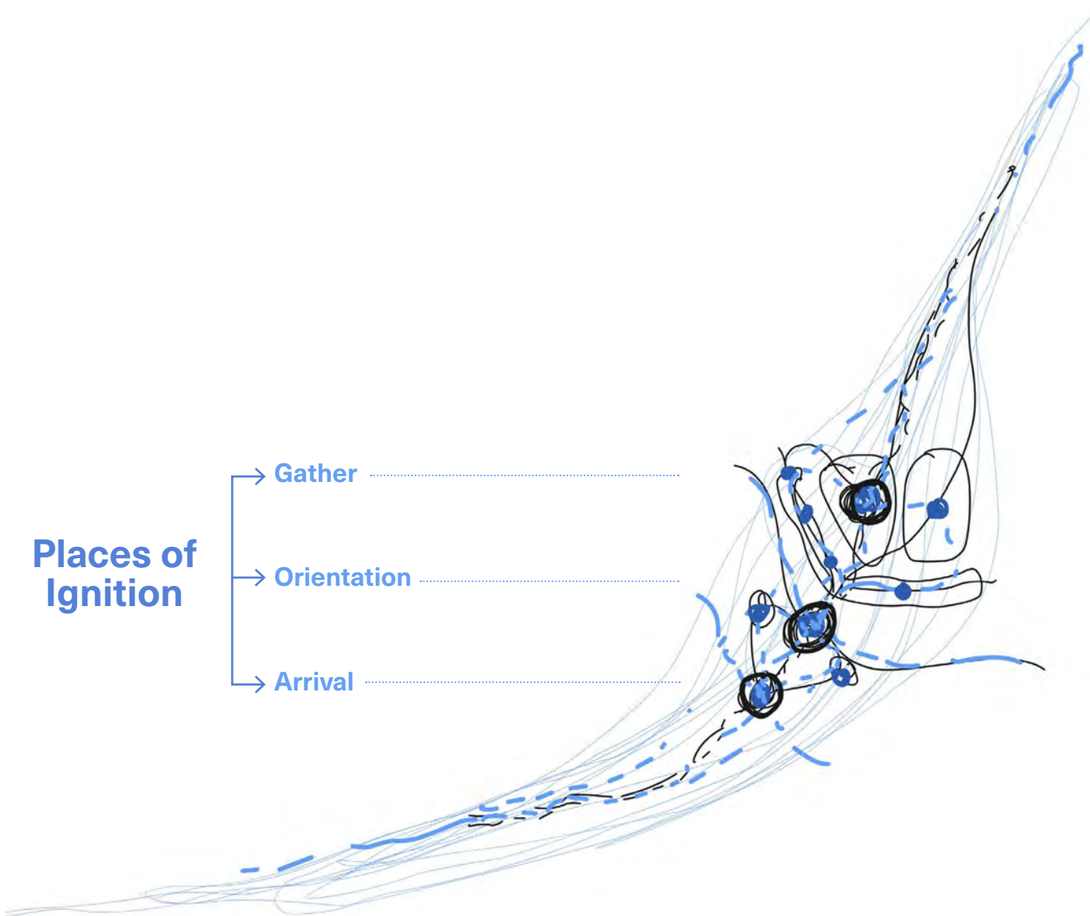
Takeaway 1 - Respectfully respond to the Ngalpu (Emu) Origin Narrative & Pinta / Ngaparu, Story - subterranean water movements and the expression of the gnammas.

Takeaway 2 - A site for meeting and gathering - a variety of spaces for students to dwell and enjoy.

Takeaway 3 - Curating planting palette to reflect culturally important plants and compositions in the landscape.

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4.5 Applying Key Themes



Sequence of Spaces

Ngalpu (Emu) origin story in the purnga (stars)

Story telling, Cultural safety & protocols, caring for Ngurra (Country)

Gnamma

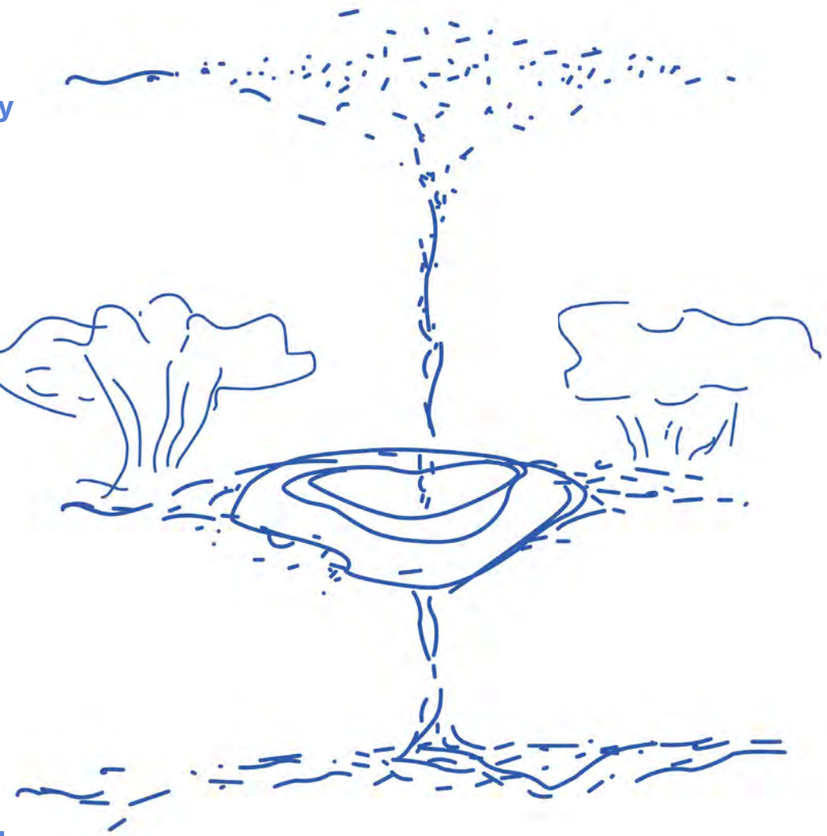
& pinta / ngaparu, yanti yuri (water tree)

A place of delight to meet, gather, & engage

Subterranean

What lives beneath

Paleochannels, ancient jukulu (streams) Flows, Journeys, Track



Landscape themes

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4.6 Emerging Themes



Pinta / Ngaparu (Water)

Flows, journeys, tracks, movement through the site



Gnamma (Water Hole)

A place of delight to meet, gather and engage

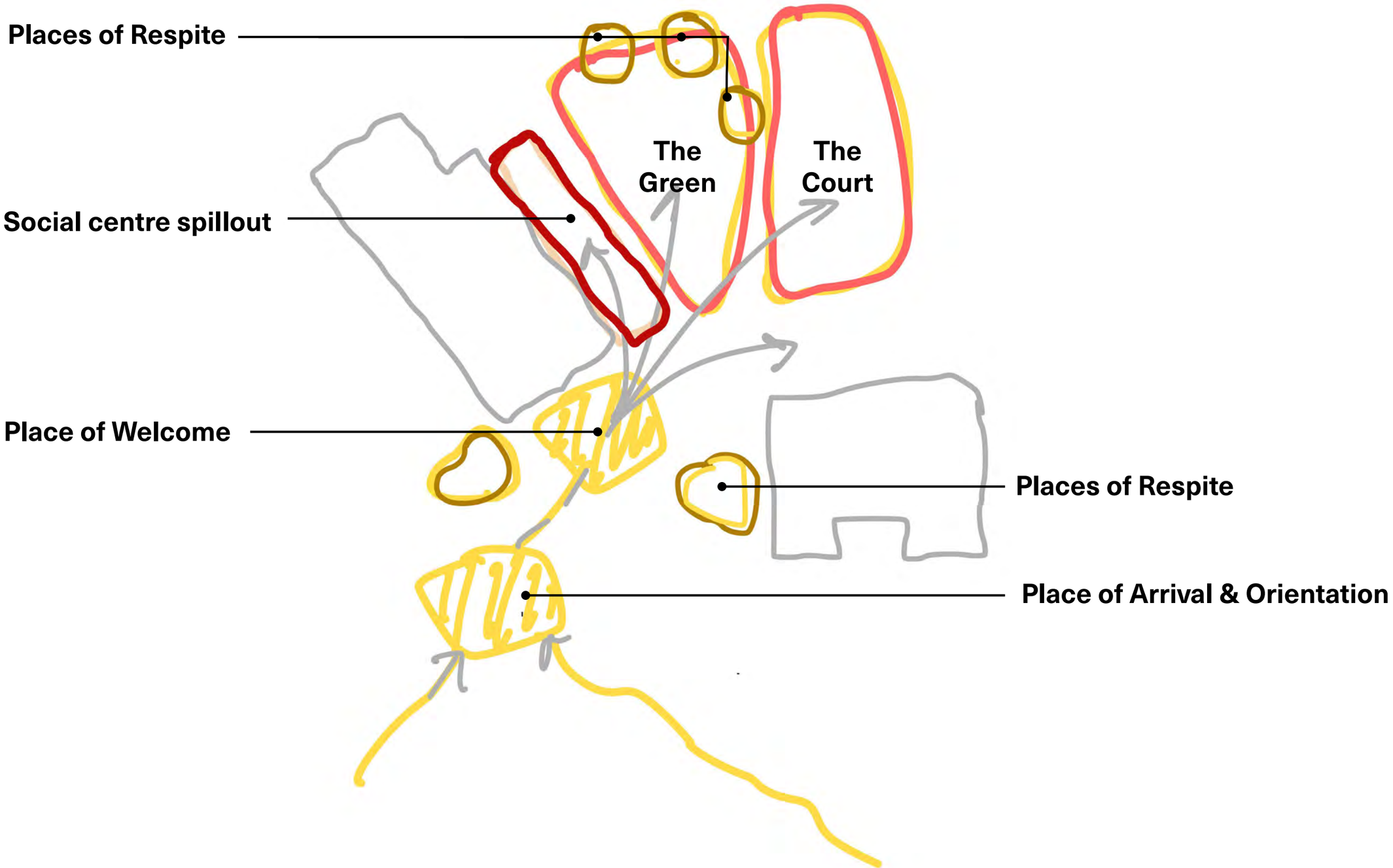


Pilthangka & Purnga (Sky & Stars)

Story telling & truth telling

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4.7 Landscape Programme



4.8 Landscape Vision

Our vision is to create a welcoming and vibrant campus heart that supports student life through social connection, active living and shared meals.

The design provides spaces for gathering, engagement and respite, acknowledging the site's cultural heritage as a significant meeting place and guided by the Water Story.

Shaped in partnership with Kaalamaya Kupurn Traditional Owners and grounded in a Caring for Country approach, the centre fosters belonging and wellbeing within a landscape that is distinctly of place. Curated gardens will celebrate diverse local flora and respond to the transitions through Country.

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05. Landscape Approach



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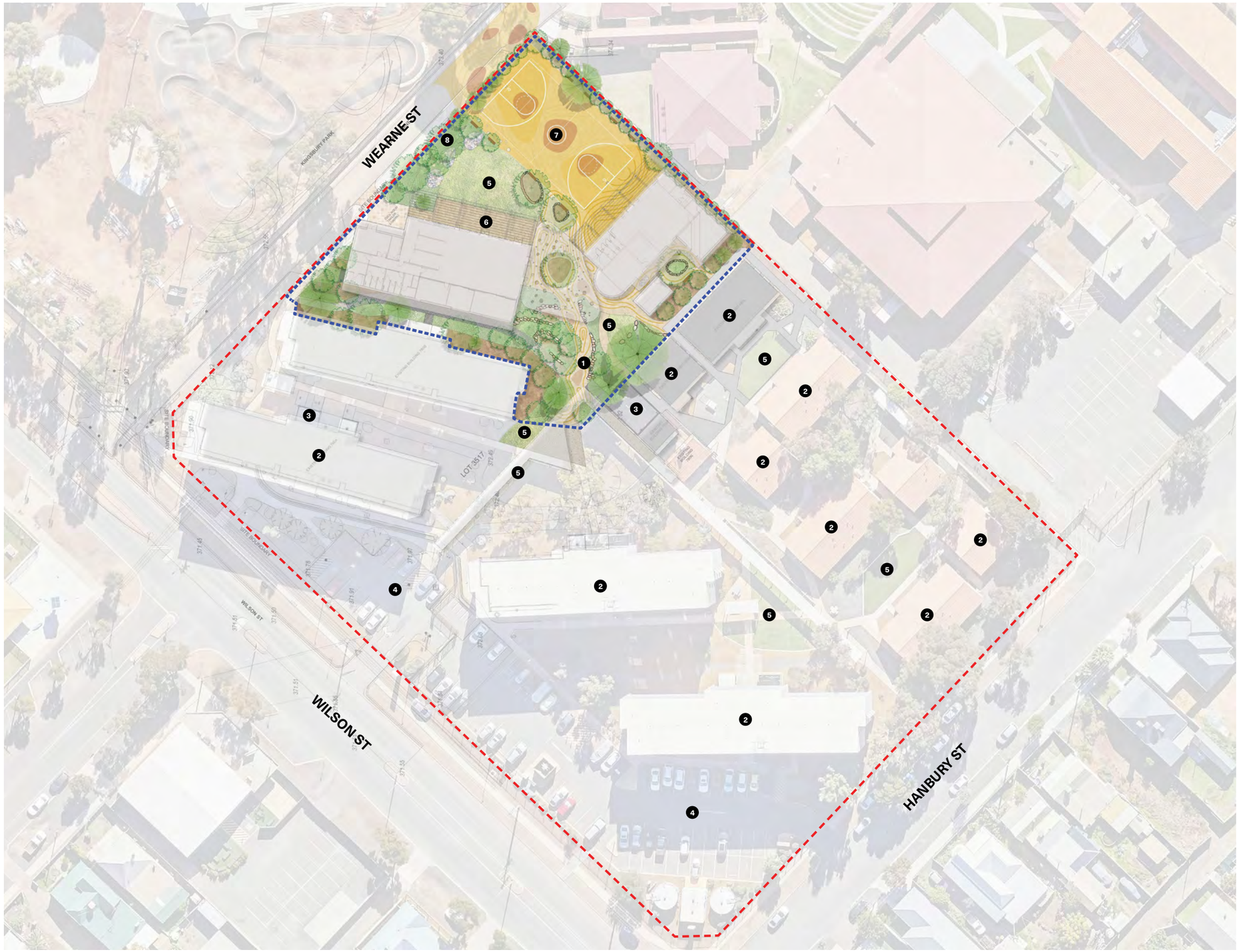
5.1 Masterplan

Key

1	Arrival to Shared Facilities
2	Existing Student Accommodation
3	Existing laundry drying area
4	Existing parking
5	Proposed lawn areas
6	Proposed alfresco space
7	The Court
8	Proposed diverse feature native planting

Site Boundary

Extent of work



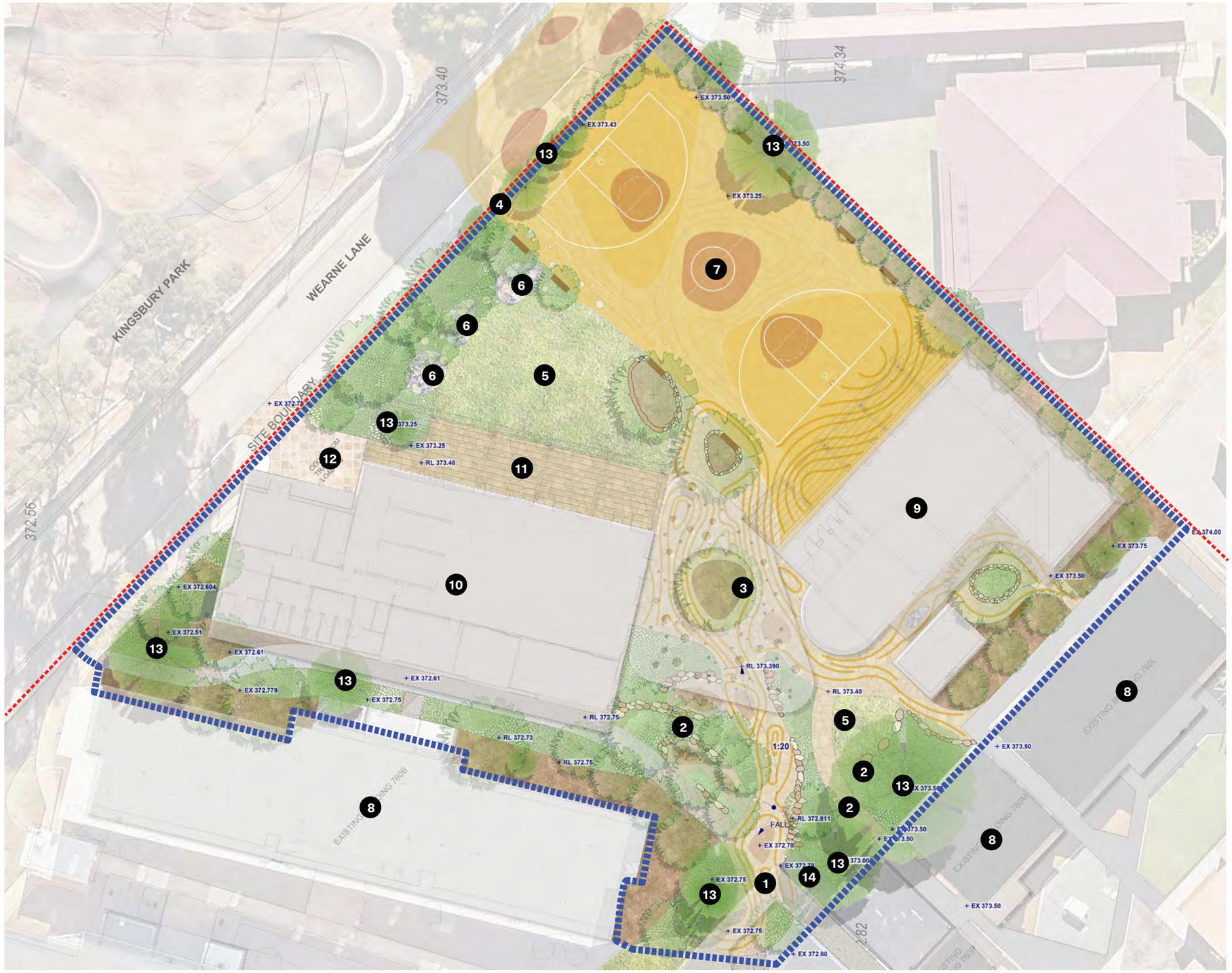
SCHEMATIC DESIGN SITE PLAN - SCALE: NTS

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5.2 Landscape Site plan

Key	
1	Entry node
2	Terraced entry garden
3	Arrival Space
4	Wearne Lane entry
5	Turfed space
6	Gathering nooks
7	Multi-sport court
8	Existing Building
9	Wellness centre
10	Social Centre
11	Alfresco space
12	Loading zone
13	Existing tree
14	Existing Service building

	Site Boundary
	Extent of work



LANDSCAPE PLAN - SCALE: NTS

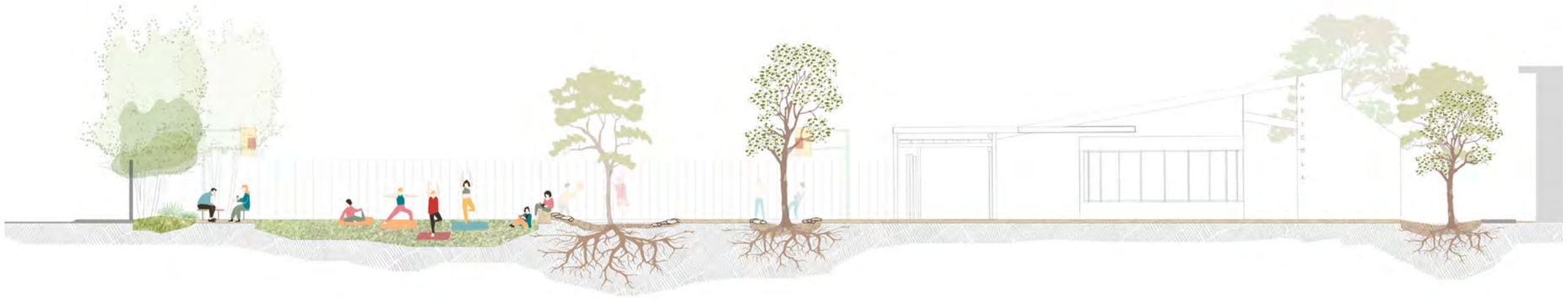
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5.3 Landscape Site Sections



A





B





C



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5.4 Landscape Amenity - Arrival















Key

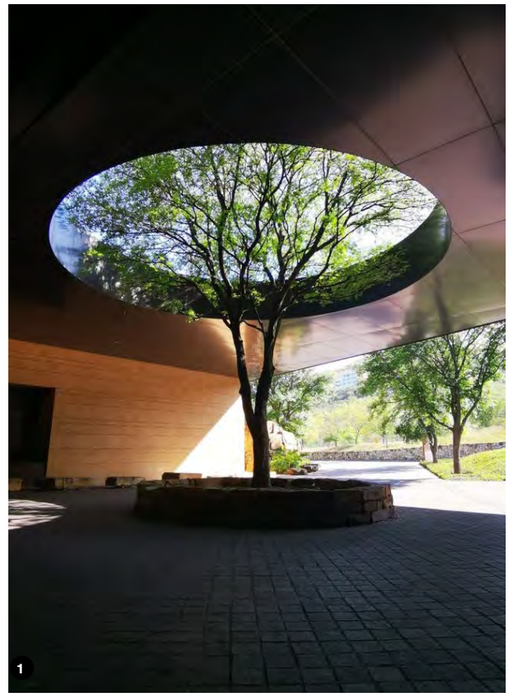
1	Meeting spaces
2	Turfed zone
3	Endemic planting around boulders
4	Existing canopy
5	Paving inlay

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5.5 Landscape Amenity - Meeting place











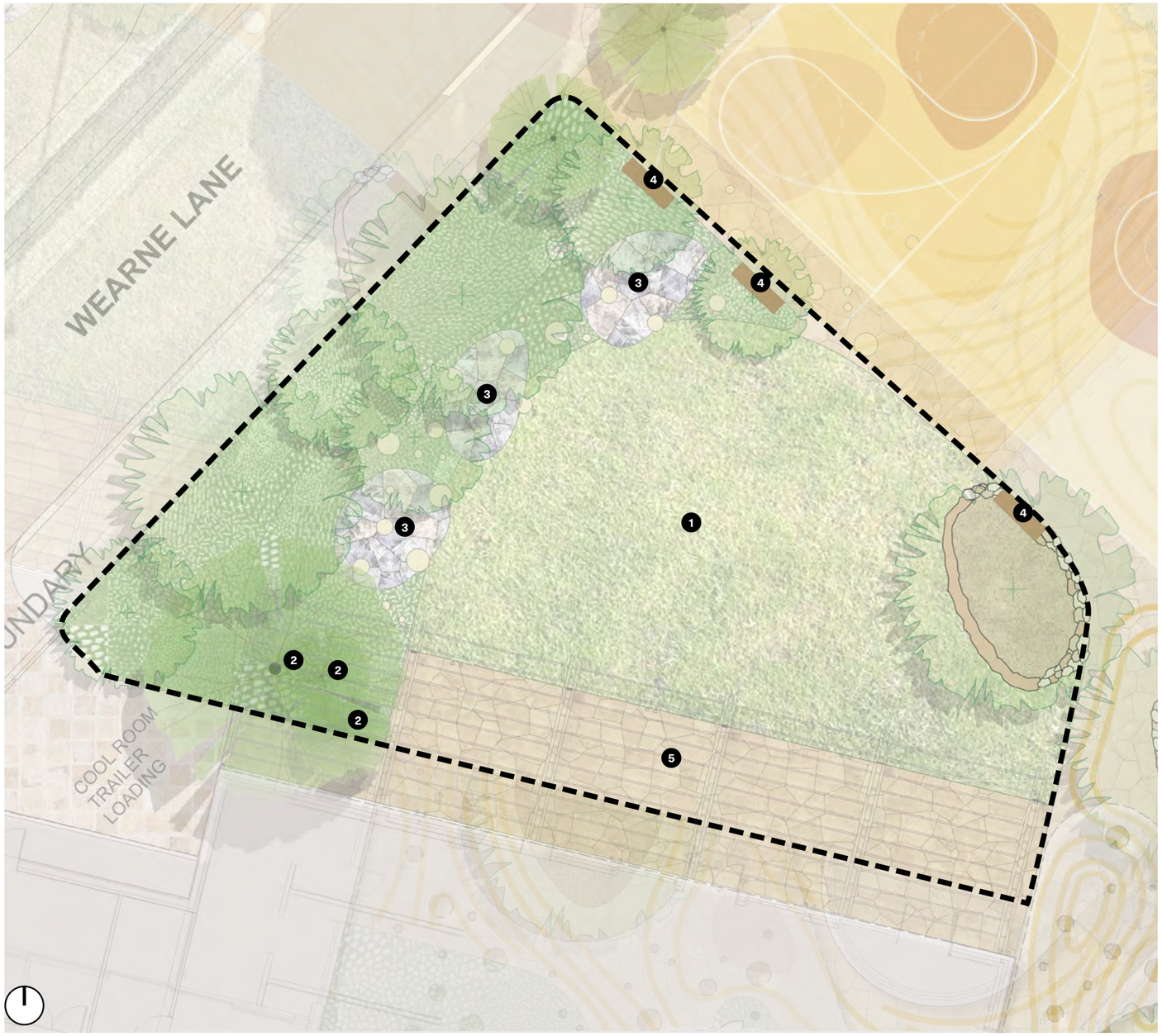


Key

1	Oculus - Feature tree with seating node
2	Perforations in ceiling above

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5.6 Landscape Amenity - The green

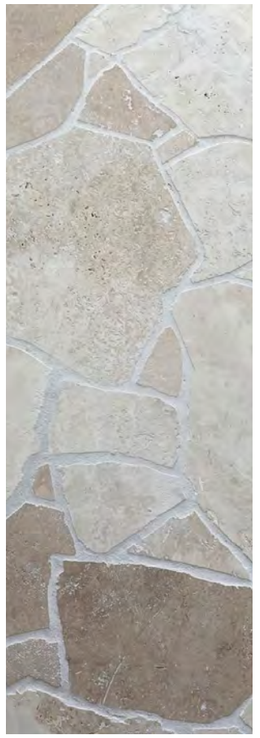














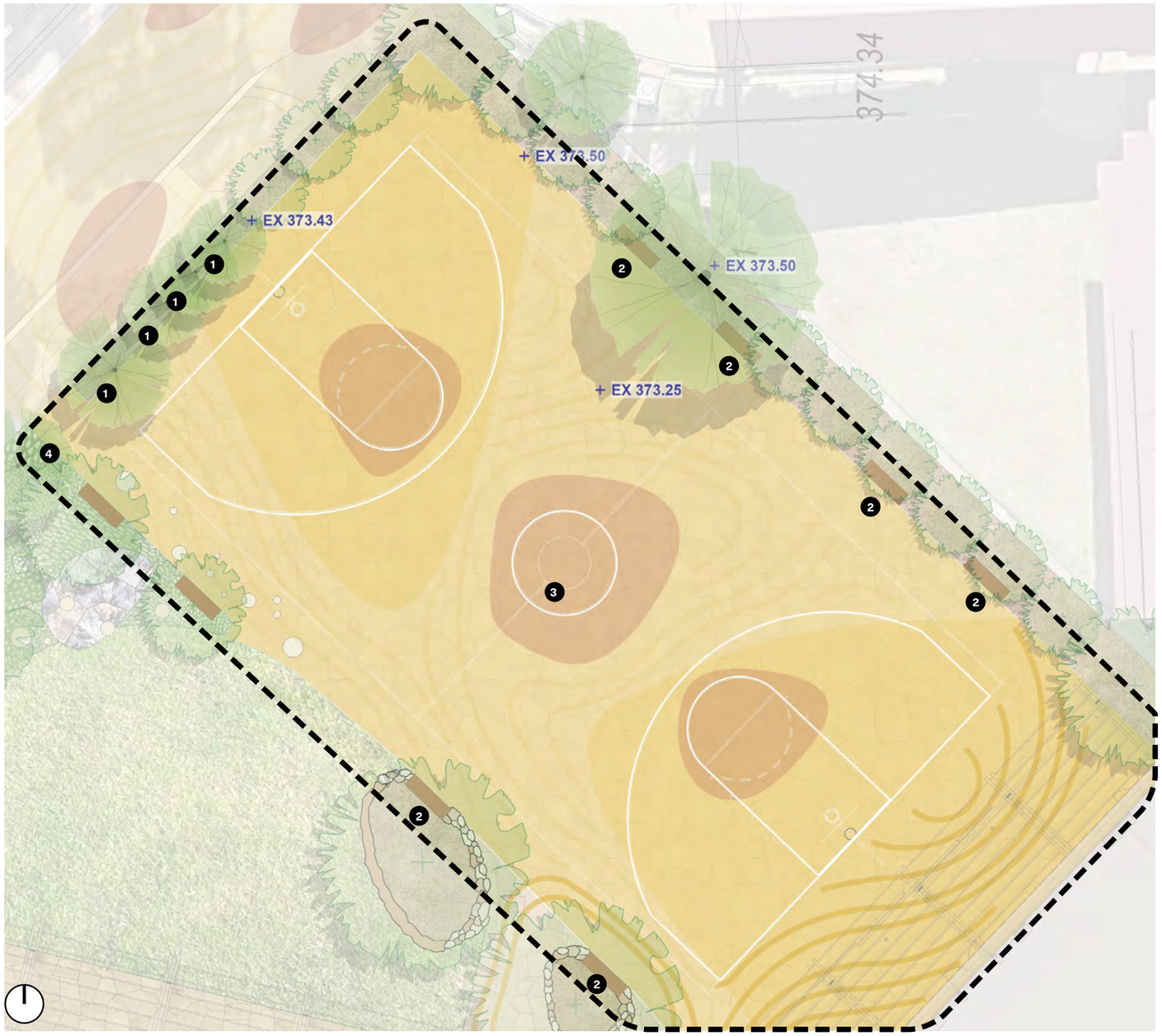


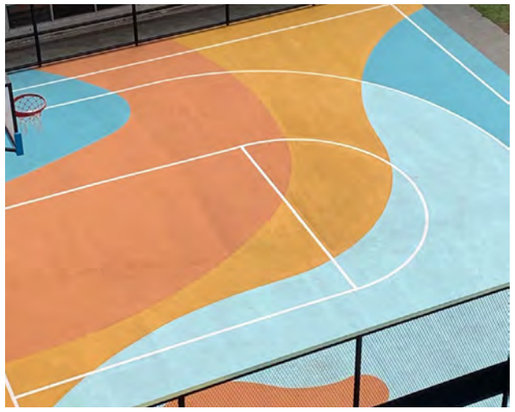
Key

1	Flexible turfed zone
2	Existing trees
3	Gathering nooks
4	Seating wall
5	Climber to Pergola

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5.7 Landscape Amenity - Court



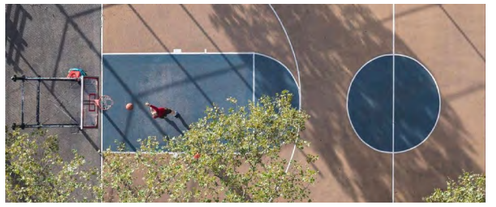














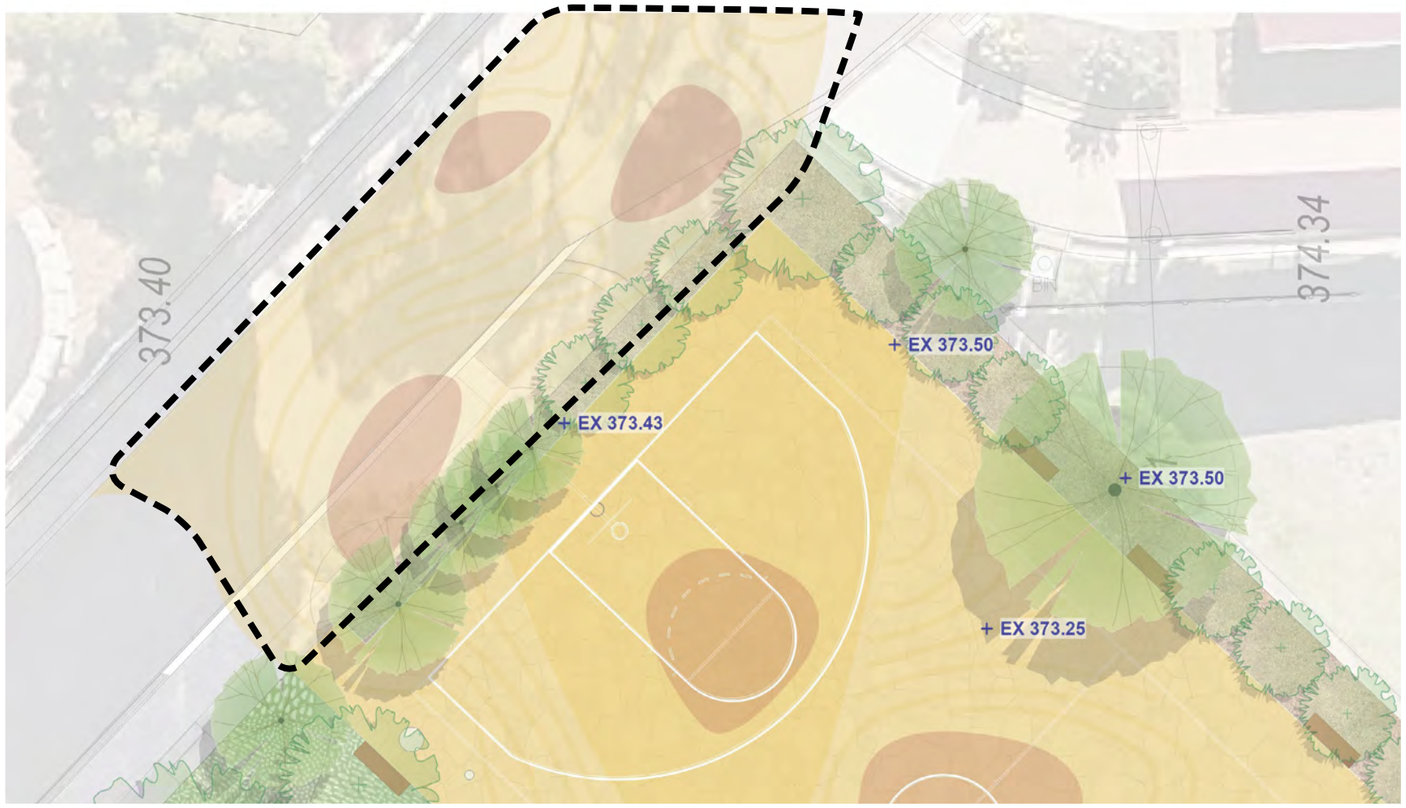
Key

1	Existing trees
2	Seating
3	Multi-use sport court
4	Secondary pedestrian thoroughfare

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5.8 Public Amenity - Opportunity

Potential Opportunities:
- Community engagement through collaborative art installation
- Potential for local engagement with artists
- Lower installation costs
- Minimise complexity in pattern to assist with maintenance









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06. Landscape Quality



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6.1 Regenerative Design Opportunities

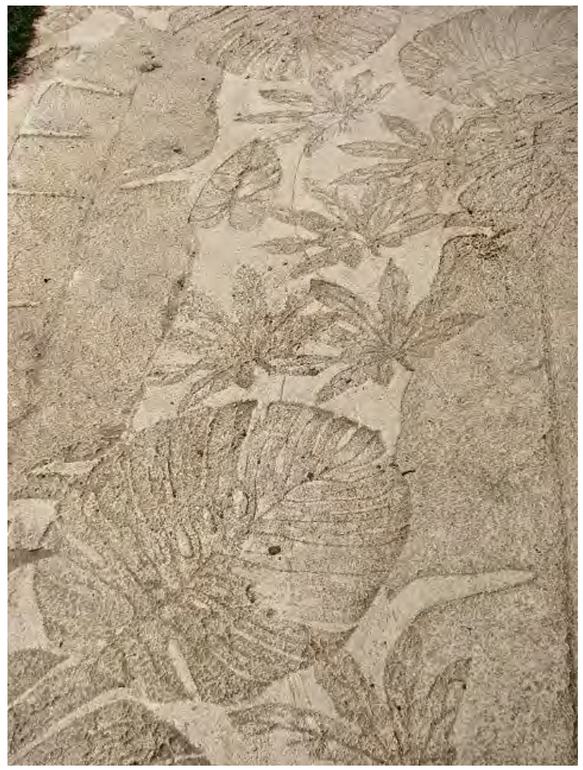


6.2 Landscape Materials & Character



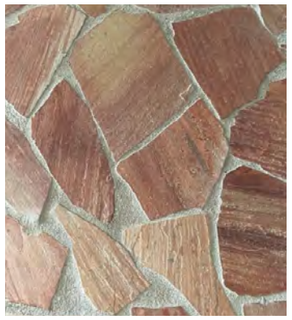












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6.3 Landscape Zoning & Character

A plant palette will be developed in detailed design, guided by the Cultural Reference Group, referencing the character of Kaalamaya Kupurn Country. It will also compliment and support student residential life, health, wellbeing and a connection to nature. Plant selections will respond to Karlkula's (Kalgoorlie) changing climate and contribute to biodiversity enhancement, as well as a water wise and low maintenance approach. Selections will also be cross-referenced against City of Kalgoorlie Boulder's Plant List.

Key

- Planted zones
- Trees & spot planting only in gravel
- Turf

















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6.4 Landscape Analysis

Key

- Planted zones
- Turf

Before



- 161 sqm - GARDEN BED
- 55 sqm - LAWN
- 17 EXISTING TREES

After



- 535 sqm - GARDEN BED
- 215 sqm - LAWN
- 12 EXISTING TREES
- 30-40 PROPOSED TREES

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6.5 Landscape Site plan



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ASPECT Studios

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ATTACHMENT 5

Public Art Strategy

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CURTIN UNIVERSITY AGRICOLA SHARED FACILITIES

PUBLIC ART STRATEGY
23 MARCH 2026

Arts & Cultural
Consultancy Services

FORM.
building a state of creativity



Image Credit: Tourism WA

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FORM acknowledges the Traditional Owners and Custodians throughout Western Australia both past and present, whose enduring connection to this Ngurra and ongoing contributions to our collective culture and communities we respect and honour. We appreciate and are deeply grateful for the privilege of working on these lands.

CULTURAL SENSITIVITY WARNING
FORM would like to warn people viewing this document that some sections may contain images, names or stories of Aboriginal Australians who have passed away. FORM will respect any request to remove images or names of the deceased persons from this document if necessary.

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INTRODUCTION

This opportunity connects to stories held within Karlkurla - the Ngurra (Country) of the Kupurn people, where culture, landscape and knowledge continue to shape the spirit of place.

For generations, this land has carried Dreaming stories of ancestral journeys, survival and care for Ngurra, where knowledge of pinta (water), flora and the rhythms of the landscape sustained life.

Karlkurla has long been a meeting place, where people gathered to share knowledge, ceremony and leadership. Elders recall a corroboree held here during a time of drought, when communities travelled across Ngurra to dance for rain - a moment of collective hope, resilience and connection to pinta.

Today, Curtin Agricola continues this story: a place where learning, community and culture meet, honouring the enduring relationship between Ngurra, people and knowledge.

It is the story of Ngurra and meeting, of learning and exchange: wisdom carried forward.



Image Credit: ABC News

STRATEGIC ALIGNMENT

The Plan has been developed in response to the following documents:

- Curtin University Agricola Shared Facilities Upgrades, Design Review, TRCB
- Indigenous Engagement Strategy, Ochre
- Curtin Agricola Early Themes, Winmar Enterprises
- Agricola Shared Facilities, Lead Design Consultant Scope of Service

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PROJECT BACKGROUND

Curtin Agricola is Curtin University's on-campus student accommodation in Kalgoorlie, providing residential facilities for students studying in the Goldfields region.

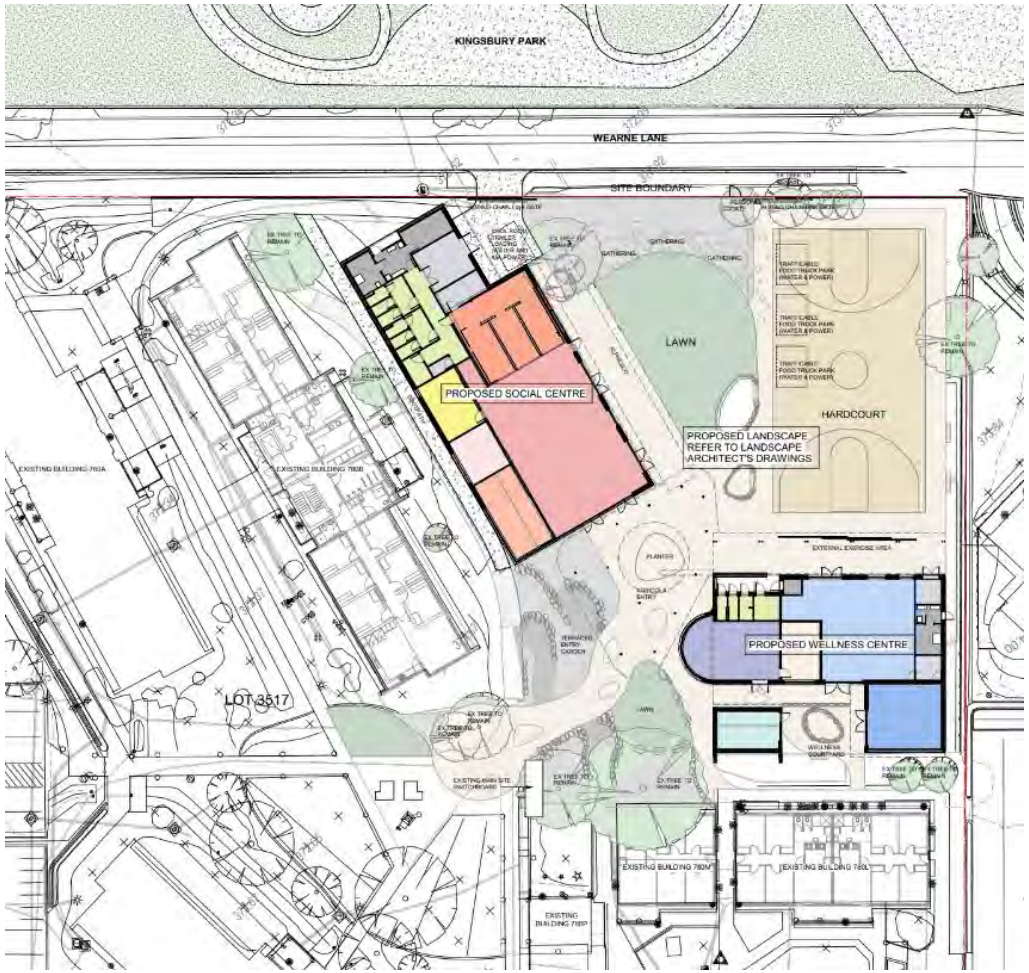
The Agricola precinct sits close to Curtin Kalgoorlie and the town's central area, forming an important hub for student life and community.

The existing accommodation was partially redeveloped in 2017 and now provides 180 student beds across several multi-storey and refurbished buildings, supported by shared amenities including study areas, recreational spaces and communal facilities.

The Agricola Shared Facilities project will deliver new communal spaces and upgraded amenities designed to support contemporary student living. These include a flexible dining hall and event spaces, a communal kitchen, collaborative study areas, wellness and fitness facilities, and outdoor social and recreation spaces.

The project seeks to create a welcoming hub for students, strengthening connections between learning, wellbeing and community. The design draws inspiration from the landscape, materiality and cultural context of the Western Australian Goldfields, acknowledging the region's mining heritage and the cultural significance of Ngurra for the Kupurn people.

Connection to Ngurra
Connection to Learning
Connection to Community



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PROJECT BACKGROUND

Connection to Country, Community and Learning

Karlkurla (Kalgoorlie) on Kaalamaya Kupurn (Guburn) Ngurra is an area of deep cultural, spiritual and historical significance within the Goldfields landscape. The Kupurn claim group are the recognised Traditional Owners of this Ngurra, holding cultural authority and responsibility for land, story and heritage.

The Curtin Agricola Shared Facilities project seeks to strengthen connections between students, community, learning and place through a culturally informed design process. Engagement with Traditional Owners, Elders and knowledge holders helps shape the cultural narrative of the site and identify opportunities for storytelling, gathering and cultural expression within the evolving campus environment. These insights establish three thematic foundations that inform the cultural and spatial framework of the project:

Meeting Place

Cultural engagement identified the Agricola area as a long-standing place of gathering and exchange. Elders recalled corroborees held in Karlkurla, including ceremonies during times of drought where communities travelled across Ngurra to dance for rain.

Country and Cultural Knowledge

Stories shared through engagement highlight the importance of pinta, flora and ecological knowledge within the Goldfields landscape. Elders described pinta trees, salmon gum and other plants that guided survival and movement across Ngurra, reflecting the deep cultural responsibility to recognise, protect and honour pinta as a source of life.

Living Campus

The new shared facilities will form the heart of student life at Agricola, supporting connection, belonging and cultural exchange through shared spaces for dining, study, recreation and wellbeing. As a place of gathering, the campus will encourage everyday encounters between students, community and culture.



Water Snake, Lena Willalang
Spinifex Hill Studio

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VISION

This Public Art Strategy creates space for cultural expression that reflects the relationship between Ngurra, people and learning within Karlkurla (Kalgoorlie). Through artistic interpretation, the Strategy acknowledges the cultural knowledge, ecological systems and living stories that shape this place.

It recognises Kaalamaya Kupurn (Guburn) Ngurra as a landscape of deep cultural significance, where Dreaming stories, ecological knowledge and cultural responsibility remain embedded in land, pinta and sacred places. The Strategy honours the enduring connection of the Kupurn people to Ngurra and recognises the importance of cultural authority in guiding how these narratives are respectfully shared.

Grounded in the idea of a meeting place, Curtin Agricola brings students, community and culture together through learning, exchange and shared experience, while recognising the importance of pinta, flora and ecological knowledge within the Goldfields landscape.

By acknowledging both the natural landscapes of Karlkurla and the evolving built environment of the Agricola precinct, the Strategy encourages artworks that explore how we adapt, coexist and build relationships with each other, with Ngurra, and with the layers of cultural knowledge and ecological memory embedded in the Ngurra.



Reflection, Larissa Brown, 2024.
Spoilbank Marina, WA.
Photgraph by AB Videography.

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GUIDING PRINCIPLES

The following Guiding Principles support the delivery of public art for the Curtin Agricola Shared Facilities project and guide the implementation of this Strategy through culturally informed engagement and design.

1. RESPECT

Encourage respect for Kaalamaya Kupurn (Guburn) Ngurra by fostering awareness, understanding and recognition of the cultural significance of Karlkurla. Artists are invited to engage with Ngurra through respectful design approaches that acknowledge Traditional Owner authority and respond to the stories, knowledge and cultural responsibilities embedded in the landscape.

2. CONNECTION

Bring the stories of Ngurra to life through cultural works that honour its knowledge, histories and living presence. Artworks should strengthen connections between campus, community and Ngurra, creating spaces for learning, cultural exchange and shared experience within the Agricola precinct.

3. CURIOSITY

Inspire creative exploration through diverse textures, materials and artistic approaches, inviting works that awaken curiosity and discovery. Through deep listening and co-design, artists are encouraged to engage with cultural knowledge and community perspectives, shaping works that respond thoughtfully to Ngurra.

4. EXCELLENCE

Deliver high-quality, durable and contemporary public artworks that demonstrate excellence in both conceptual thinking and physical realisation. Works should respond to their environment and evolve over time, offering layered experiences that deepen with each encounter.



Banksia Nut, Chris Collard, Paris Grove, Australnd, 2024. Photograph by Lauren Dixon.

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CURATORIAL RATIONALE

CONFLUENCE

Confluence reflects the meeting of pinta, people and knowledge systems. In Karlkurla, where pinta has long guided movement across Ngurra, places of pinta became places of gathering - sites where stories, ceremony and cultural knowledge were shared.

Within Curtin Agricola, Confluence symbolises the meeting of students, cultures and ideas. As a place of learning and community, the campus becomes a contemporary meeting point where knowledge flows between people, disciplines and generations.

Artists are invited to explore how stories move through pinta, time, and place, weaving ancient knowledge with contemporary experience.

This theme can be approached through three poetic threads, Pinta and Memory, Ceremony and Gathering, and Living Ngurra, each offering a lens into the deep relationships between people, place, and purpose.

THEME 1

CONFLUENCE: PINTA AND MEMORY

Water carries stories across Ngurra, marking pathways of movement, survival and connection. In the Goldfields landscape, where pinta is precious, its presence holds memory, shaping how people travelled, gathered and shared knowledge across generations.

This theme explores water as both a physical and cultural connector, linking people, place and story through time.

- Pinta
- Memory
- Pathways
- Continuity

THEME 2

CONFLUENCE: CEREMONY AND GATHERING

Karlkurla has long been a place where people come together. Elders recall corroborees and rain dances held during times of drought, when communities gathered to honour pinta and seek renewal.

This theme celebrates the cultural rhythms of gathering, reflecting the energy of ceremony, dance and collective experience.

- Ceremony
- Gathering
- Renewal
- Exchange

THEME 3

CONFLUENCE: LIVING NGURRA

This theme celebrates the deep relationships between people, pinta, flora and fauna that sustain life across Ngurra. Species such as salmon gum, pinta trees and the Karlkurla (Kulkurla) fruit, from which Kalgoorlie takes its name, reflect the ways people read and move through Ngurra. These plants and the animals that depend on them embody knowledge of survival, care and reciprocity between people and the environment.

Within Curtin Agricola, this theme encourages artworks that respond to the rhythms of the natural world, acknowledging the interconnected relationships between land, pinta, plants, animals and community.

- Fauna
- Flora
- Sustenance
- Harmony

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TYPOLOGIES AND CATEGORIES

The term 'public art' is broad, with many diverse types of works, scale, purposes, materials, and degrees of permanence. Artworks on this site are envisaged more as cultural expressions of the themes, encompassing the typologies and categories, as detailed below:

TYPOLOGY

INTEGRATED: Integrated with the fabric of the built form, including building facades, walls, fences, balustrades, awnings, footpaths or with the natural environment to create greater connection to place.

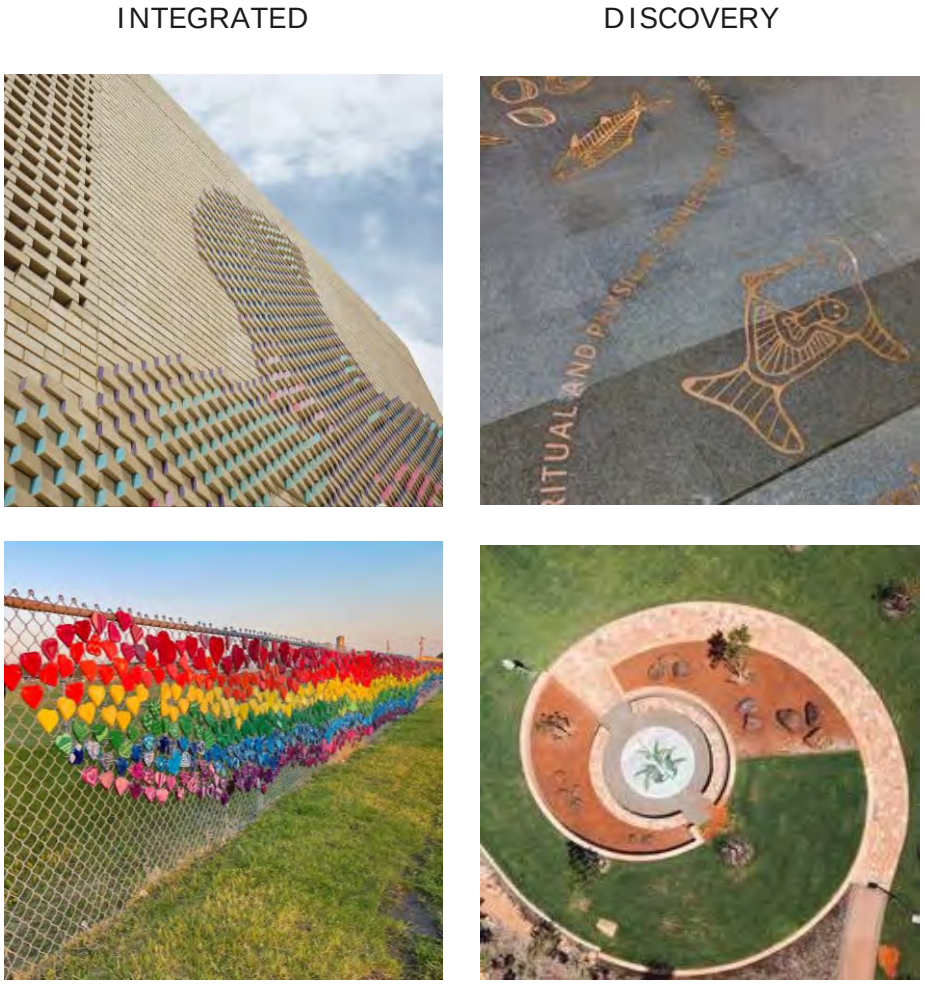
DISCOVERY: Small to medium scale tactile artwork that promotes exploration and engagement, either physically or intellectually, with the visitor to enhance connection to place.

CATEGORY

STATEMENT: A large-scale work located in a significant or high-traffic area. These types of artworks can provide an entrance statement or act as a gateway to a precinct.

NAVIGATIONAL: Artworks (variety of scale and forms) that assist with wayfinding and directional objectives.

Embedding these artistic elements into the facility's fabric will create a space that is deeply resonant and functional, offering an environment of comfort, inspiration, and connection for residents and visitors alike.



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OPPORTUNITIES OVERVIEW

SITE CONSIDERATIONS

The Curtin Agricola precinct occupies a prominent edge condition along Wearne Lane, with the site boundary directly addressing both the laneway and the adjacent Kingsbury Park. This interface presents an opportunity for public art to contribute to the identity of the precinct while engaging both campus users and the wider community.

The boundary condition is highly visible from Kingsbury Park, where open sightlines across the landscape create strong visual connections between the park, laneway and the student accommodation buildings. Artworks located along this edge therefore have the potential to operate at multiple scales, functioning both as elements experienced up close along the pedestrian pathway and as larger visual markers when viewed from the park.

The park itself already contains a number of public art and landscape elements that contribute to the character of the area. New artworks within the Agricola precinct should therefore consider visual continuity and dialogue with these existing works, ensuring the site forms part of a broader cultural landscape rather than an isolated intervention.

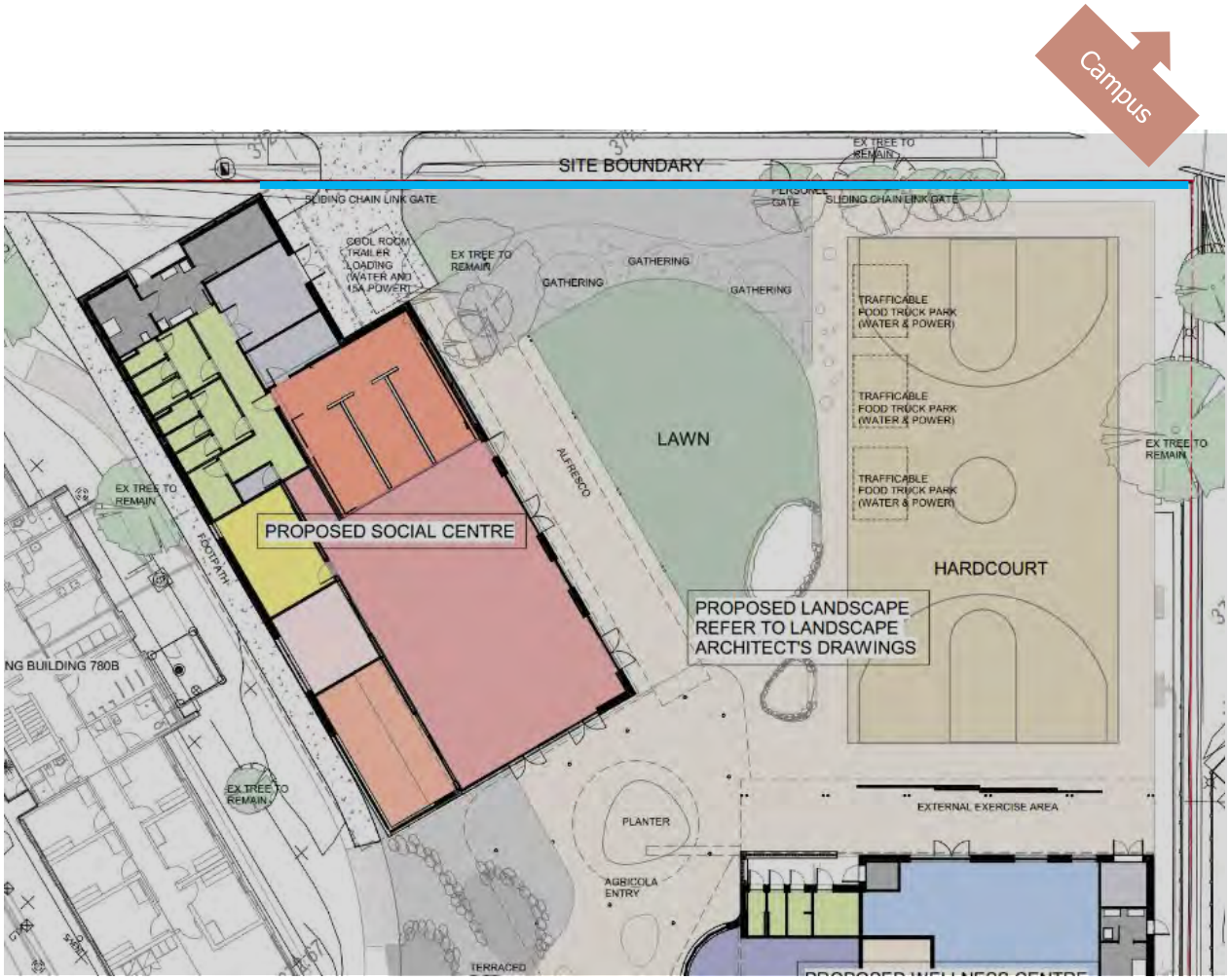
The laneway environment along Wearne Lane also presents an opportunity to enhance the pedestrian experience and strengthen the sense of arrival to the campus. Integrated artworks along the boundary and pathways can reinforce this threshold condition while maintaining permeability and visual openness between the campus and surrounding public realm.

Together, these considerations support a public art approach that prioritises visibility, continuity and connection to place.



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OPPORTUNITIES OVERVIEW



Through consultation and site analysis, FORM has identified two key preliminary locations within the precinct that present strong potential for integrating public art. These are:

1. Wearne Lane - Chainlink Fence
2. Wearne Lane into Campus – Footpaths
   *(*suitable footpaths to be determined)*

Beginning at the site boundary, artworks integrated within the chainlink fencing establish a strong visual identity and a recognisable gateway to the student accommodation hub. From there, artistic interventions embedded within the footpaths extend the experience from the exterior into the heart of the precinct, creating a connective journey through public art that guides movement and reinforces a sense of arrival.

The focus on Wearne Lane reflects its role as a key pedestrian corridor, accommodating high levels of student movement between the accommodation and the main Curtin campus. Positioning artworks along this route ensures the work is highly visible and experienced as part of everyday campus life.

Together, these opportunities form a layered sequence that supports movement, arrival and connection to place, strengthening the identity of the Curtin Agricola precinct.

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OPPORTUNITY 1

CHAINLINK ARTWORK

TYPE: Integrated

CATEGORY: Statement | Navigational

DESCRIPTION:
An artwork is proposed for the chain-link boundary fence along Wearne Lane and Kingsbury Park, transforming a utilitarian edge into a visually engaging, site-responsive installation. While the Lace Fence architectural material presents an environmentally robust approach, the opportunity extends to a broader exploration of chain-link as an artistic medium, investigating alternative patterning, weaving, infill, or sculptural interventions that embed imagery and texture directly into or onto the mesh.

From a distance, the artwork can read as a bold graphic gesture along the site edge; up close, it reveals finer details, layered narratives, and material intricacies. As light passes through and interacts with the structure, shifting patterns of shadow animate the footpath and adjacent landscape throughout the day, creating a dynamic and evolving public interface.

Visible from both the street and park, the artwork establishes a distinctive identity for the student hub while maintaining visual permeability and openness to the surrounding landscape.



Jacaranda Lace Fence, Paula Hart

LOCATION: Site Boundary facing Wearne Lane

SCALE: Medium

OBJECTIVES:
- Transform a functional boundary fence into a distinctive public artwork.
- Create a strong visual identity along the Wearne Lane and Kingsbury Park interface.
- Introduce texture and craftsmanship that rewards close viewing while remaining legible at urban scale.
- Enhance the pedestrian experience along the site edge.
- Establish a welcoming threshold to the student accommodation precinct.

CONSIDERATIONS:
- Maintain the safety, durability and performance of the boundary fencing system.
- Ensure appropriate transparency for visibility between the site, street and park.
- Design panels to withstand weather exposure and long-term outdoor conditions.
- Coordinate panel placement with landscape design and pedestrian movement.
- Consider lighting opportunities to enhance the artwork at night.

MATERIALS AND FABRICATION:
- Lace Fence architectural fabric or alternative custom-designed inserts, weaving, cutting, or applied elements integrated into the chain-link fencing system.
- Powder-coated or treated finish suitable for external environments.

BUDGET RANGE:
- A budget range of $200,000 (ex GST) is recommended to cover all artwork-related costs, including EOI fees, commissioning, design development, fabrication, transport, and installation.
- *Note: The budget is indicative only and subject to confirmation. Final scope, scale, materials and delivery to be aligned accordingly. FORM reserves the right to adjust the scope or approach to ensure feasibility within the confirmed budget.*

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OPPORTUNITY 1

CHAINLINK ARTWORK



Grafting Architecture, Catalan Pavilion


Birds of Peace, Paula Hall


Unwoven LightUnwoven Light


Dedots method, Roan Victor

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OPPORTUNITY 2

GROUND PLANE MARKERS

TYPE: Integrated

CATEGORY: Discovery / Navigational

DESCRIPTION:
A series of ground plane artworks is proposed along the pedestrian footpaths leading from Wearne Lane into the Curtin hub. Embedded within the paving, these markers create a visual pathway that guides visitors toward the Agricola precinct while reinforcing a strong sense of arrival.

The artworks may take the form of inlaid terrazzo, stone, metal, or patterned paving elements that reference themes of gathering, knowledge exchange, and connection to place. Subtle at first, the markers can increase in scale, density, and detail as visitors move deeper into the campus, forming a gradual visual narrative that links the public realm to the student accommodation hub.

Working at the scale of the pedestrian, the ground plane artworks encourage moments of discovery and interaction while strengthening the identity of this key campus threshold.


Winin Katidjin Bilya, Kambarni

LOCATION: Footpaths from Wearne Lane

SCALE: Small to Medium

OBJECTIVES:
- Create a clear and welcoming pedestrian pathway from Wearne Lane into the Agricola precinct.
- Establish a strong sense of arrival to the Curtin student accommodation hub.
- Embed storytelling and cultural references into the everyday movement of the campus.
- Encourage moments of pause, discovery and interaction along the pedestrian journey.

CONSIDERATIONS:
- Ensure surfaces are slip-resistant, level and accessible for all users, including those with mobility aids.
- Locate artwork elements to avoid disrupting pedestrian movement or circulation.
- Design for durability under high foot traffic and exposure to sun, rain and temperature changes.
- Consider drainage, maintenance requirements and long-term surface performance.

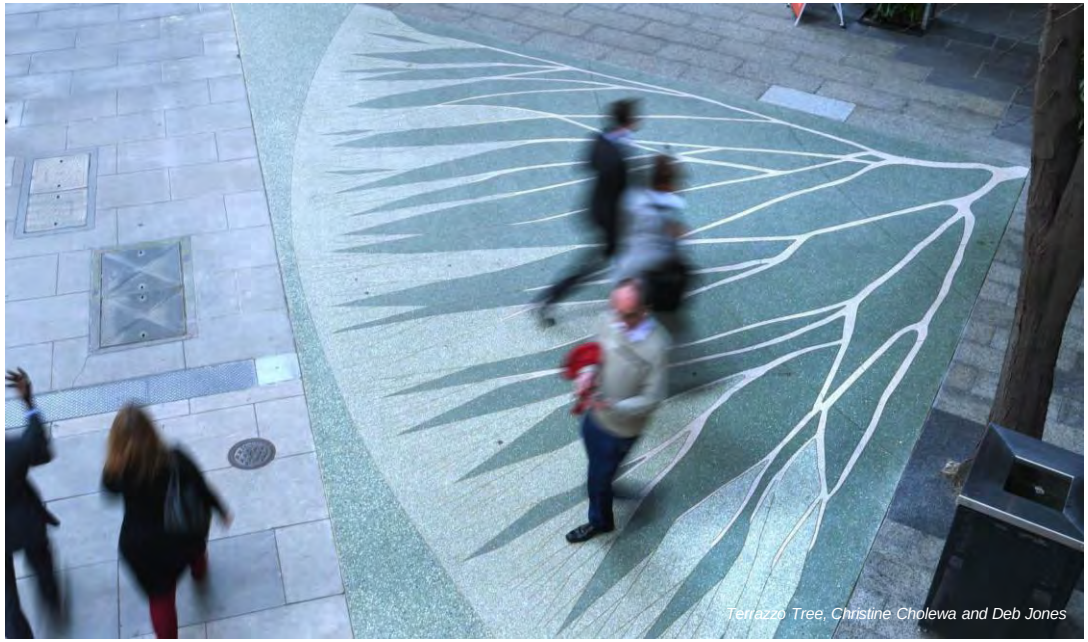
MATERIALS AND FABRICATION:
- Terrazzo or concrete paving with integrated inlaid designs.
- Stone, metal or pigment inlays integrated into paving surfaces.
- Durable materials designed for high pedestrian use and long-term outdoor performance.
- Maintenance requirements should be minimal.

BUDGET RANGE:
- A budget range of $120,000 (ex GST) is recommended to cover all artwork-related costs, including EOI fees, commissioning, design development, fabrication, transport and installation.

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OPPORTUNITY 2

GROUND PLANE MARKERS



Terrazzo Tree, Christine Cholewa and Deb Jones



Wahganmuggalee, Brenda L Croft



Winin Katidjin Bilya, Kambarni



Reflection, Larissa Brown, 2024

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RECOMMENDED PROCUREMENT METHOD

LAND.MARK.ART

FORM proposes to engage with the community of Karlkurla (Kalgoorlie) through the Land.Mark.Art initiative, supporting local voices to translate Ngurra, culture and community knowledge into enduring public artworks for the Curtin Agricola precinct.

FORM's Land.Mark.Art initiative is a culturally grounded professional development model that supports Aboriginal artists to translate cultural knowledge into significant public artworks. Through skills development, mentorship and pathways to commissioning, Land.Mark.Art builds local capacity while delivering enduring artworks that contribute to a more inclusive and representative cultural landscape.

The methodology begins with an open Expression of Interest (EOI) inviting artists to participate, with submissions evaluated and selected by FORM for client approval.

Chosen artists attend a three-day workshop to develop public art concepts through collaboration, knowledge sharing, and material exploration, receiving professional fees for their participation.

FORM compiles up to three concepts for each opportunity into a report for client review and commissioning. The selected artist then works with FORM and a professional public art fabricator to refine the design, finalise installation plans, and participate in fabrication wherever possible, ensuring the creation of culturally significant and impactful public artworks while fostering professional growth and community engagement.





Lauren Nannup during Land.Mark.Art workshop for development of *First Contact*, 2015. Photograph courtesy of UAP.

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LAND.MARK.ART PROCUREMENT PROCESS

PHASE 1: EXPRESSION OF INTEREST

Targeted EOIs will be issued to the art and cultural centres in consultation with Ochre and may include the Goldfields Aboriginal Art Gallery, Goldfields Arts Centre, Walkatjurra Cultural Centre and Laverton Aboriginal Art Gallery.

Artists will be invited to submit an expression of interest to participate in a Concept Development Workshop, facilitated by FORM with technical and engineering support.

SUBMISSION REQUIREMENTS

Essential:

- Contact details
- A short (minimum one paragraph, maximum one page) written statement about the artist/artist's background and art practice.
- Supporting materials (images of previous artworks – maximum 5 images)

Desirable:

- A resume/curriculum vitae
- A brief written response/approach to the brief describing the conceptual intent of the artwork the artist wishes to create (minimum 1 paragraph, maximum 1 page).

SELECTION PROCESS

FORM will review all submissions and provide a recommendation to the selection panel for the selection of artists to be shortlisted for Phase 2 (Concept Design Workshop).

PHASE 2: CONCEPT DEVELOPMENT WORKSHOP

Participants: Shortlisted artists only

Shortlisted artists will be invited to take part in a three–day workshop, during which they will be mentored and supported to create concept designs for each of the artwork opportunities. Artists may choose to collaborate or work individually.

Each participating artist will receive professional fees and technical support.

CONCEPT PROPOSALS

FORM will compile up to three concepts for each opportunity into a report for client review and commissioning.

COMMISSIONING

Concept Design Proposals will be reviewed by a selection panel, established in consultation with the Client. Following assessment, one artist (or team) per opportunity will be selected for commissioning. The selected artists will then work with FORM and a professional public art fabricator to refine the design, finalise installation plans and participate in fabrication wherever possible.

FORM will oversee fabrication, quality assurance and installation, ensuring cultural and safety compliance.

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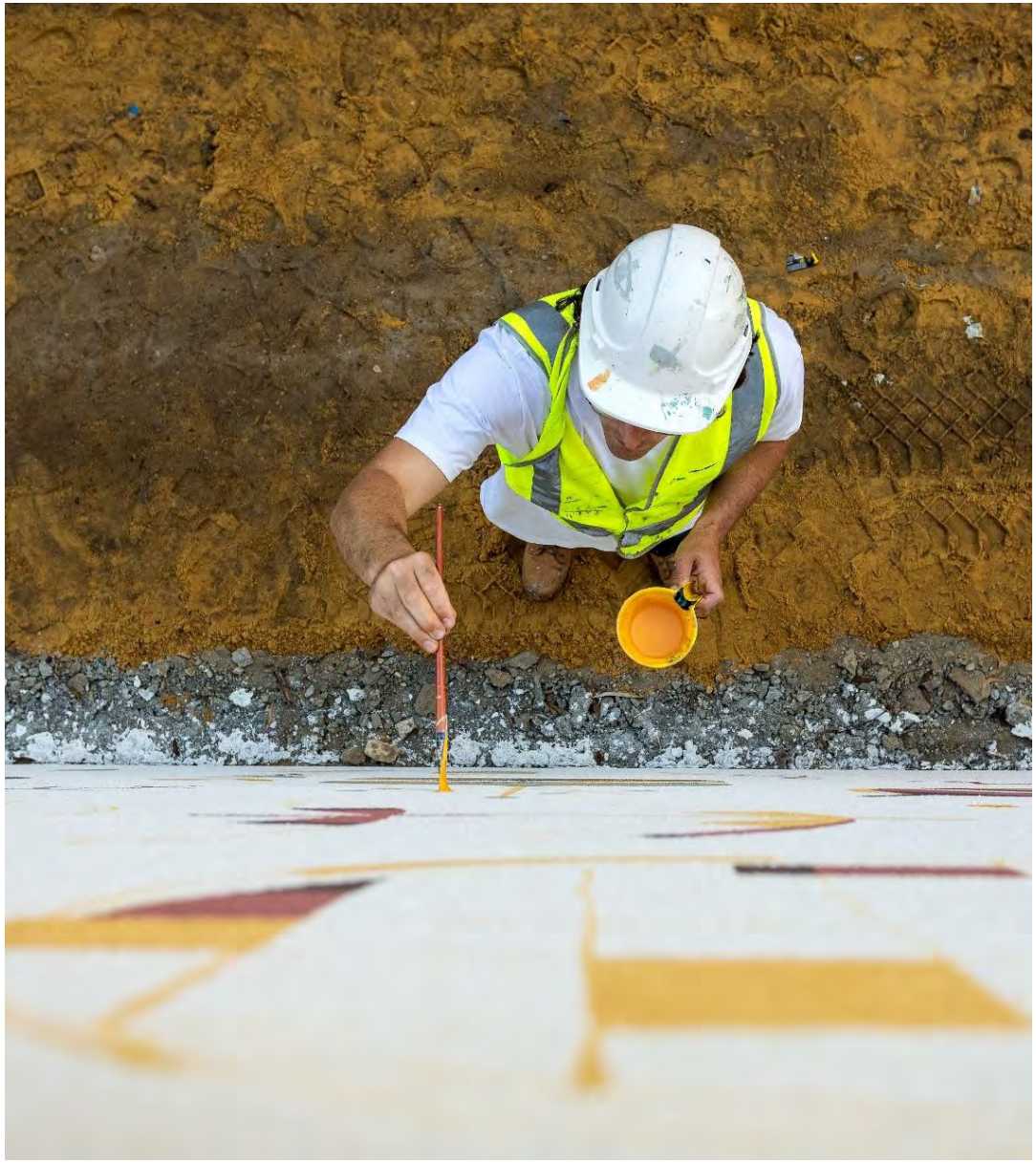
ALTERNATIVE PROCUREMENT METHOD

EXPRESSONS OF INTEREST

This commissioning pathway invites expressions of interest from established artists, either through a broad public call or targeted invitation. This approach provides opportunities for creatives from diverse backgrounds to contribute proposals, ensuring a wide and competitive field of ideas.

FORM will manage the process end-to-end, facilitating submissions, coordinating consultation sessions, and providing guidance and feedback to artists throughout.

Shortlisted artists would be invited to develop artwork concepts for presentation to a Selection Committee, comprising project representatives, for final concept selection and commissioning.



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THANK YOU

For any queries regarding this document, please contact FORM's Arts and Cultural Consultancy Team.

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Arts & Cultural
Consultancy Services

FORM.
building a state of creativity

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ATTACHMENT 6

Indigenous Engagement Strategy

Document Set ID: 4139048
Version: 3, Version Date: 05/05/2026

Indigenous Engagement Strategy

“Nyungin Yarnta”

My Land My Country



Project Name:	**Curtin Agricola - Kalgoorlie**
Project Country:	**Kaalamaya Kupurn (Guburn) Country**
Date Issued:	**16 February 2026**
Version:	**1.0**

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1. ENGAGEMENT STRATEGY

1.1. BACKGROUND

Curtin University is committed to meaningful, respectful and culturally guided engagement with the Kupurn (pronounced: *Guburn*) claim group as the recognised Traditional Owners and custodians of Karlkurla (Kalgoorlie). The Curtin Agricola Shared Facilities project is located on the lands of the Kupurn People Country and seeks to strengthen connections between students, community, learning, and place through a culturally informed design process.

The Indigenous Engagement Strategy for the Curtin Agricola Shared Facilities has been prepared to guide engagement during the Schematic and Design Development stages, ensuring that cultural authority, knowledge systems and lived experience inform the emerging design in an appropriate and respectful manner. This strategy establishes principles, governance arrangements and engagement pathways to support the development of a strong cultural foundation for the project.

This document is a design-stage strategy and focuses on principles and intended engagement processes rather than construction or delivery commitments. It aligns with Curtin University's broader reconciliation objectives and commitment to embedding First Nations perspectives within the built environment.

1.2. CULTURAL CONTEXT – KARLKURLA (KALGOORLIE)



Diagram 1: Cultural Narrative Process

The Curtin Agricola Shared Facilities project is located within Karlkurla, an area of deep cultural, spiritual and historical significance within the Goldfields region.

The Kupurn claim group has been formally recognised by the Federal Court as the Traditional Owners of the Kalgoorlie–Boulder area, including the project site. This recognition affirms the Kupurn people's enduring connection to Country and their cultural authority and responsibilities for land, law, story and heritage.

The Goldfields region has also long been associated with Wongatha/Wangkatha cultural identities, languages and family networks. This Indigenous Engagement Strategy recognises this broader cultural context while clearly acknowledging that cultural authority for Karlkurla rests with the Traditional Owners, Kupurn people.

Engagement will be undertaken in accordance with recognised Traditional Owner authority, appropriate cultural protocols and respect for Indigenous intellectual property.

1.3. CULTURAL GOVERNANCE

Recognised Traditional Owners: Kupurn claim group
Indigenous Consultant: Ochre Project Services
Cultural Guidance: Barry Winmar / Winmar Enterprises

Ochre Project Services (Ochre) has been engaged as the Lead Indigenous Consultant for the project and will act as the primary point of contact for Indigenous engagement. Ochre will manage engagement processes, documentation, and coordination between the project team, the Aboriginal Reference Group and recognised Traditional Owner representatives.

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Barry Winmar of Winmar Enterprises (Winmar) will provide Cultural Authority to guide the engagement process. His role is to support culturally safe engagement, ensure appropriate protocols are observed, and assist in navigating cultural governance in alignment with the recognised Traditional Owners, the Aboriginal Reference Group and Curtin University.

Cultural governance for the project acknowledges the recognition of the Kupurn claim group as Traditional Owners and is structured to ensure that engagement outcomes are respectful, inclusive and appropriately authorised.

1.4. ABORIGINAL REFERENCE GROUP (ARG)

An Aboriginal Reference Group (ARG) for the Curtin Agricola Shared Facilities project will be established by Barry Winmar through community invite. The ARG will be led by Kupurn representatives consisting of 3 women and 3 men and may include invited cultural advisors where endorsed. The ARG provides cultural guidance, advice and endorsement throughout the design process.

The ARG will:

- Provide cultural guidance on matters relating to Country, story and protocol
- Provide final endorsement of the Cultural Narrative
- Review and respond to emerging design concepts
- Support culturally appropriate integration of narratives into the built form and landscape design

A Terms of Reference (ToR) will be developed to formally define the operation of the Aboriginal Reference Group (ARG), including governance arrangements, decision-making processes, and mechanisms for endorsement and communication back to the broader design team and Curtin University. The ToR will clearly articulate the Group's purpose, objectives, roles and responsibilities, as well as remuneration arrangements (current ARG sitting fee of $660 ex GST per member).

The Curtin University Project Responsible Officer will attend all Reference Group meetings to demonstrate the University's commitment to meaningful Indigenous engagement. All Aboriginal participants will be remunerated in accordance with the agreed rates.

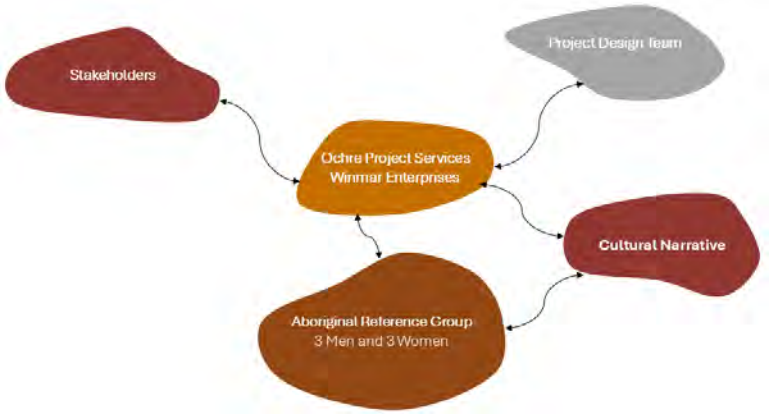


Diagram 2: Indigenous Engagement

1.5. ENGAGEMENT PRINCIPLES

Engagement for the Curtin Agricola Shared Facilities project will be guided by the following principles:

- **Led by Country:** Country is recognised as an active participant and co-author in the design process
- **Cultural Authority:** Decisions are informed by recognised cultural authority and Traditional Owner governance
- **Deep Listening:** Engagement is iterative, respectful and responsive rather than transactional
- **Co-design:** Cultural input informs design thinking from the outset
- **Cultural Safety:** Engagement processes support safe participation and respect Indigenous knowledge systems
- **Integrity of Knowledge:** Indigenous cultural and intellectual property is respected and protected

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2. ENGAGEMENT PROCESS – SCHEMATIC AND DESIGN DEVELOPMENT

2.1. OVERVIEW

Indigenous engagement will align with the Schematic and Design development programme for the Curtin Agricola Shared Facilities project. Engagement activities have been structured to ensure that cultural input occurs early enough to meaningfully influence design outcomes.

The engagement process is non-linear and iterative, recognising that cultural knowledge is shared through conversation, reflection and ongoing dialogue rather than one-off consultation events.

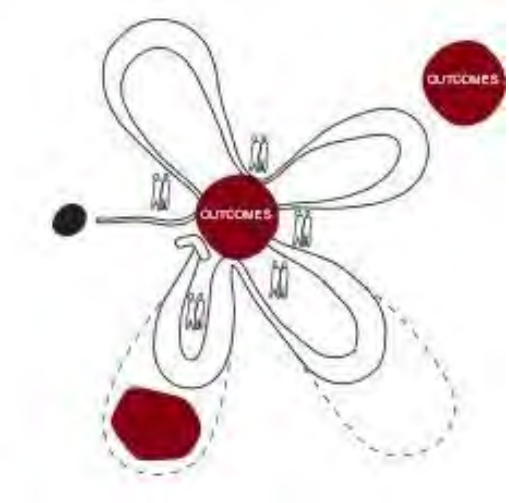


Diagram 3: Supplied by the Fulcrum Agency

2.2. SCHEMATIC DESIGN PHASE

During the Schematic Design phase, engagement will focus on establishing cultural foundations and informing design direction.

Key activities include:

- On-Country engagement and site visits in Kalgoorlie
- Initial engagement and formation of the Aboriginal Reference Group
- Development of a Preliminary Cultural Narrative for the site and broader context
- Cultural briefings to inform architectural, landscape and spatial concepts

Outputs from this phase will include:

- ARG membership
- Draft engagement documentation
- Preliminary Cultural Narrative themes
- Initial design responses informed by cultural values and stories
- Public Art Strategy endorsement (Public Art scope by others)

2.3. DESIGN DEVELOPMENT PHASE

During the Design Development phase, engagement will focus on testing, refining and embedding cultural narratives within the developing design.

Key activities include:

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- Follow-up on-Country engagement and workshops
- Presentation of design responses to the Aboriginal Reference Group
- Review, endorsement and finalisation of the Cultural Narrative
- Cultural awareness engagement with the project team (where appropriate)

Outputs from this phase will include:

- Refined Cultural Narrative
- Cultural input into schematic design outcomes
- Identification of opportunities for future stages (e.g. interpretation, room naming)
- Endorsement of public artist and proposed art

2.4. ARG MEETINGS

Ochre will lead ARG meetings, managing meeting attendees, communications and will document all indigenous briefing notes for issue to the wider design team. It is anticipated the project design team would engage with the Reference Group three times in Kalgoorlie during the design process. Any queries or correspondence between these design meetings will be directed to Ochre who will coordinate a response.

- Meeting 1: Introductions and presentation of preliminary cultural design integration following the draft Cultural Narrative. Review and feedback of the draft Cultural Narrative. Endorsement of indigenous Public Art Strategy and procurement process.
- Meeting 2: Presentation of cultural design integration, endorsement of public artist and public artist design narrative.
- Meeting 3: Final endorsement of cultural design integration, public art and any indigenous room names.

3. FURTHER PROJECT CONSIDERATIONS (DESIGN STAGE)

3.1. CULTRAL AWARENESS TRAINING

The project should include Indigenous Cultural Awareness Training delivered on site in Kalgoorlie by respected local Aboriginal Elders, tailored specifically for the project design team. The session will provide place-based cultural context and practical guidance to support culturally informed design decision-making. The training will cover:

- an introduction to local Aboriginal history, culture and connection to Country
- the cultural significance of the Kalgoorlie region and surrounding lands
- protocols, responsibilities and respectful engagement with Aboriginal stakeholders
- practical insights on how cultural values can inform and influence project design outcomes

3.2. PUBLIC ART, INTERPRETATION AND STORYTELLING

Public Art Strategy and Procurement is to be delivered by others with Ochre's input and guidance through the design stages. Early identification of opportunities for cultural expression is encouraged. This may include:

- Integrated storytelling elements
- Landscape and spatial moments for reflection or gathering
- Future opportunities for Indigenous-led artwork or interpretation

All future initiatives will be guided by cultural authority and ARG input.

3.3. NAMING AND WAYFINDING (FUTURE CONSIDERATION)

Any Indigenous naming of buildings, spaces or landscape elements is not determined at this stage. However, the Cultural Narrative may identify future opportunities for culturally appropriate naming, subject to ARG endorsement and cultural authority.

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4. INDIGENOUS INTELLECTUAL PROPERTY

All Indigenous knowledge, stories and cultural information shared through the engagement process remain the intellectual property of the relevant Traditional Owners. Any use of Indigenous language, narratives, artwork or cultural content will be subject to:

- Appropriate permissions
- Agreed scope of use
- Clear acknowledgement and attribution

This strategy does not authorise the use of Indigenous cultural material beyond design-stage consideration.

5. CONCLUSION

This Indigenous Engagement Strategy establishes a culturally respectful and design-focused framework for engagement during the Schematic Design and Design Development stages of the Curtin Agricola Shared Facilities project. Guided by cultural authority, informed by recognised Traditional Owner knowledge systems, and supported by Ochre, the engagement process seeks to ensure that the project is grounded in Country and shaped through meaningful collaboration.

The strategy provides a foundation for culturally informed design outcomes and positions the project for deeper cultural integration in future stages.



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ATTACHMENT 7

Civil Engineering Report

Document Set ID: 4139048
Version: 3, Version Date: 05/05/2026

Curtain University

Agricola Shared Facilities

CIVIL SCHEMATIC DESIGN REPORT

WGA250696

WGA250696-RP-CV-0001_B

24 April 2026

Document Set ID: 4139048
Version: 3, Version Date: 05/05/2026

Revision History

REV	DATE	ISSUE	ORIGINATOR	CHECKER	APPROVER
A	19/03/2026	For Review	RM	AY	MH
B	24/04/2026	For DA	RM	AY	WB

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2.2 EXCAVATION 3
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Appendices

APPENDIX A SCHEMATIC DESIGN SKETCHES

1 INTRODUCTION

1.1 Project Background

WGA have been engaged by Curtin University as consulting civil and structural engineers for the modernisations, improvement and infrastructure upgrades to Agricola, Curtin University's on-campus student accommodation in Kalgoorlie, WA.

The proposed additions and refurbishments include a social centre, wellness centre and outdoor hardcourt. New landscaped areas are also to be incorporated in the shared facilities upgrades.

Civil services will provide drainage strategy for new buildings, hardcourt and hard landscaped area as well as new loading area to be used for a cool room trailer laydown. This report aims to outline the design basis with the available information at schematic design stage. Civil design sketches developed based on the report can be found in Appendix A.

1.2 Project Location

Agricola Shared Facilities are located in the town of Kalgoorlie-Boulder, approximately 600km east of Perth.

Extent of project works on the accommodation site is indicated below in Figure 1.



Figure 1: Agricola Shared Facilities Project Extent

1.3 Relied Upon Information

The following documents were utilised to inform design decisions related to the existing site conditions:

- Golder Associates Geotechnical Investigation – Curtin University Kalgoorlie Campus Student Accommodation (Stage 1) – *"137642054-001-R-Rev0, May 2013"*
- Feature and Contour Survey by RM Surveys – 61 Wilson St, Kalgoorlie, WA 6430 – *"PROV-AGRIC-DW-002 Rev03, 3 March 2026"*

It is important to note that assumptions in this report have been made on the historic information found by the Golder Associates investigation from 2013. However, these assumptions should not be relied upon given the previous investigation was for the whole Agricola Shared campus with limited investigations on the project extent. It is understood that an updated geotechnical investigation will be conducted and report to be provided to WGA in the next design phase with specific test pits in the location of the project upgrade.

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2 EARTHWORKS

2.1 Geometry

The existing Curtin University Agricola Shared Facilities area is on a relatively flat lot with an approximate grade of 1% toward the western boundary. This grade will be targeted to be replicated for the proposed shared facilities site works.

Table 1 provides a summary of the relevant design standards that will govern the shared facilities upgrade civil design.

Table 1: General Design Criteria

ITEM	DESIGN CRITERIA	REFERENCE/COMMENTS
Maximum Grades Across Hardscapes (%)	25%	AS 2890.1
Minimum Grades Across Hardscapes (%)	1%	AS 2890.1
Maximum Grade Along Footpath (%)	3%	AS 1428.1
Maximum Grade Across Footpath (%)	2.5%	AS 1428.1
Earthworks Batters	Des. 1V:4H	-
Maximum Side Slope of Swale	1V:4H	City of Kalgoorlie Boulder – Local Planning Scheme 2

2.2 Excavation

Geotechnical investigations performed by Golder Associates (May 2013) notes the site lies on a conglomerate rock layer ranging from a 0.5m to 2m depth. Therefore, excavation through this rock layer would require larger plant, such as a 30t excavator fitted with a rock breaker.

However, the shared facilities upgrade is intended to generally maintain existing levels therefore, significant excavation/rock breaking is not expected to be required.

Detailed earthworks will likely be restricted to relocating services and open channel drains.

As in Table 1, permanent batters will be limited to a desirable grade of 1V:4H slope. If steeper batters are required, this will be verified by a Geotechnical Engineer

2.3 Pavement

2.3.1 Cool Room Trailer Loading Area

The design of the driveway access and ‘cool room trailer’ laydown area off Wearne Lane, will be documented and coordinated across disciplines to comply with AS 2890.1 for Off Street Parking.

Pavement designs will be completed as part of design development when a geotechnical report has been completed and supplied.

2.3.2 Footpath Infill Area

The existing driveway in the Northern corner of the site will be removed and infilled to reinstate the footpath in the verge. The footpath will receive artwork as part of the landscaping package design. The footpath can either be of concrete or pavers to be detailed at the next design stage. Typical details for concrete and pavers footpath are indicated below which will be refined at detailed design stage.

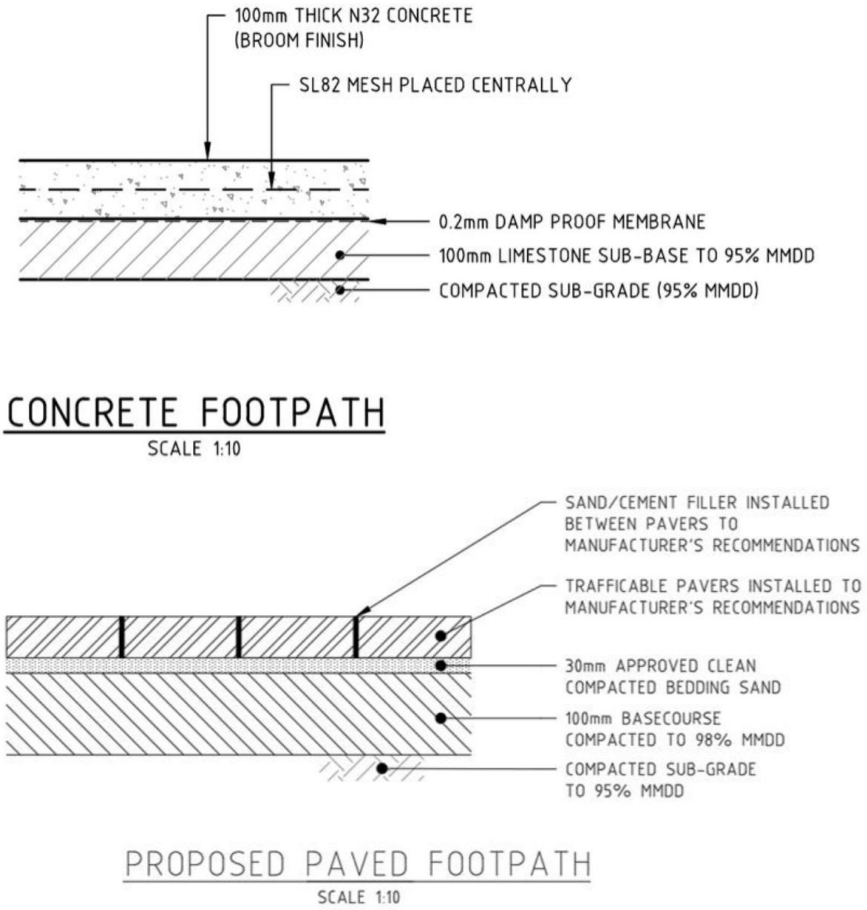


Figure 2 Typical footpath options for Infill

3 STORMWATER DRAINAGE

3.1 Design Criteria

The following design codes and standards form the basis of the stormwater drainage design:

- City of Kalgoorlie-Boulder Local Planning Scheme No. 2 (2023)
- Austroads Guide to Road Design Part 5 (AGRD5) – Drainage General and Hydrology Considerations (2013).
- Australian Rainfall and Runoff (2019).

According to City of Kalgoorlie-Boulder Local Planning Scheme No. 2 (2023) stormwater discharge is to be uncontaminated and discharged to the street, or to an alternative location, to the satisfaction of the local government and any relevant authority.

City of Kalgoorlie-Boulder Local Planning Scheme No. 2 (2023) does not dictate stormwater events to be modelled for stormwater infrastructure upgrades.

3.2 Stormwater Management

The proposed drainage strategy for the development will maintain the existing philosophy. The existing site stormwater runoff are graded towards swales within landscaped areas via overland flow paths and conveyed South through the site towards rock pitched detention basins at the Southern boundary of the campus. The collected runoff will ultimately overflow through kerb opening onto Wilson Street into the City of Kalgoorlie-Boulder drainage network.

The ground condition is found to be impermeable from the geotechnical investigation, infiltration has not been explored as a viable stormwater option, runoff will need to be carried through the proposed overland flow paths. Noting that existing site area prior to development was mainly impervious, and the proposed development design proposes more landscaped pervious footprint than existing hence reducing the amount of stormwater runoff from the area.

The proposed development is on the Northern end of the campus and overland flow will generally be directed towards the South into the existing drainage system as much as practicable. The schematic design intends to direct runoff from proposed buildings and footpath into existing swales that tie-in to downstream system for most of the development footprint.

The northern impervious hard court will be graded south towards the lawn area into a new swale within the landscaped area. A swale or basin will be provided in a similar manner to the existing to provide detention of water to remove pollutants via sedimentation. Treated runoff will overflow via kerb opening into the cool-rom trailer loading area which will be directed onto Wearn Lane. Runoff on Wearn Lane ultimately flows onto Wilson Street into the council network. This hardcourt area was previously conveyed within the existing site swales before eventually overflowing onto Wilson Street.

An indication of existing and proposed flow paths is shown in Figure 3 below.

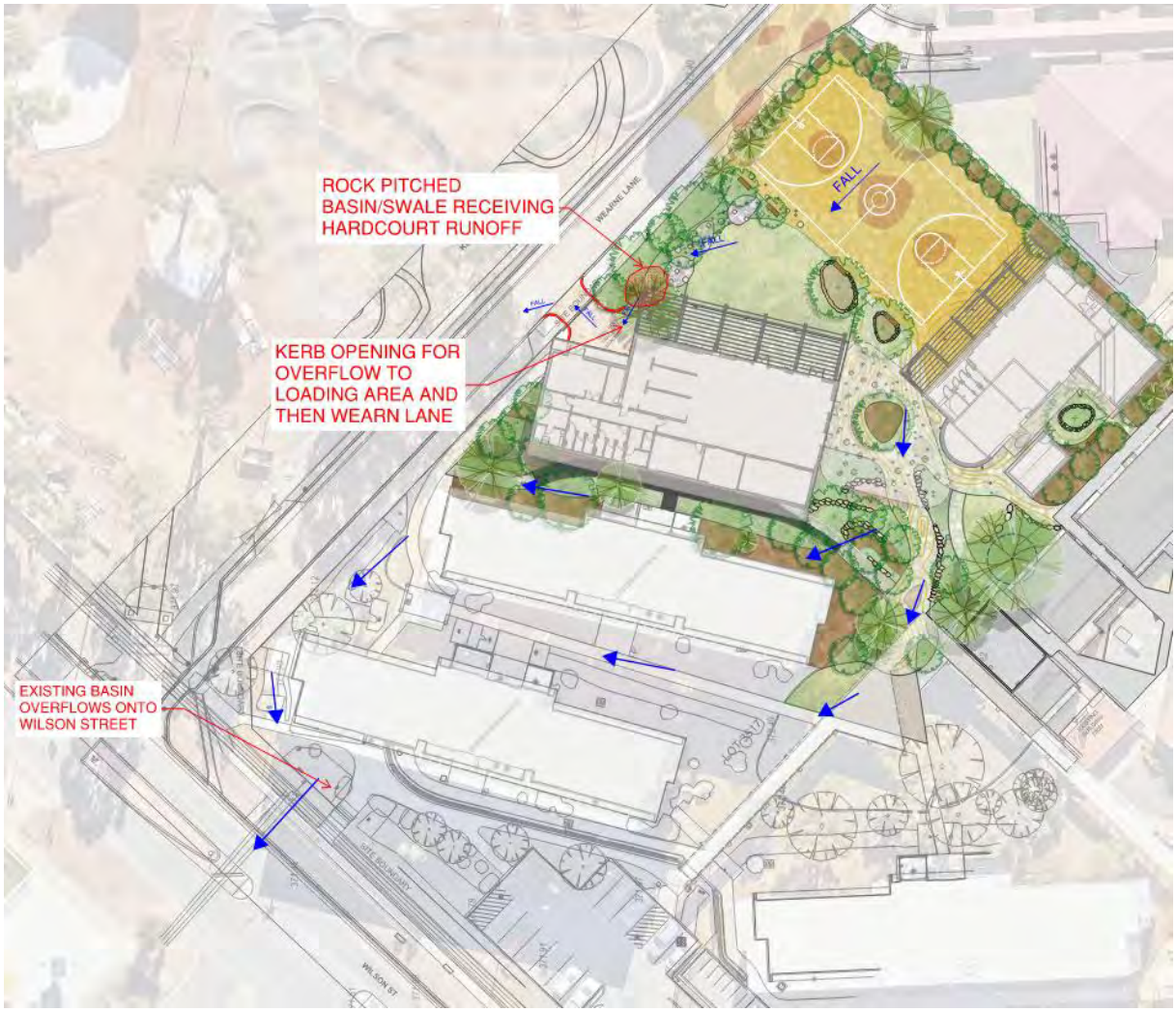


Figure 3 Overland Flow Proposed Across Site

Consideration has been made to provide a rock pitched in the detention swale or basin to contain the redirected flow from the hard court and turfed space area. It is anticipated that gross pollutants and sediment will be regularly removed from the detention basin during maintenance operations outside of rainfall events.

Where practicable, runoff will be directed away from the existing and proposed buildings to minimise damage to infrastructure in a major storm event.

3.3 Groundwater

The geotechnical investigations performed by Golder Associates (May 2013) detailed that groundwater was not encountered during the investigation.

4 QUALITY AND SAFETY

4.1 Safety In Design

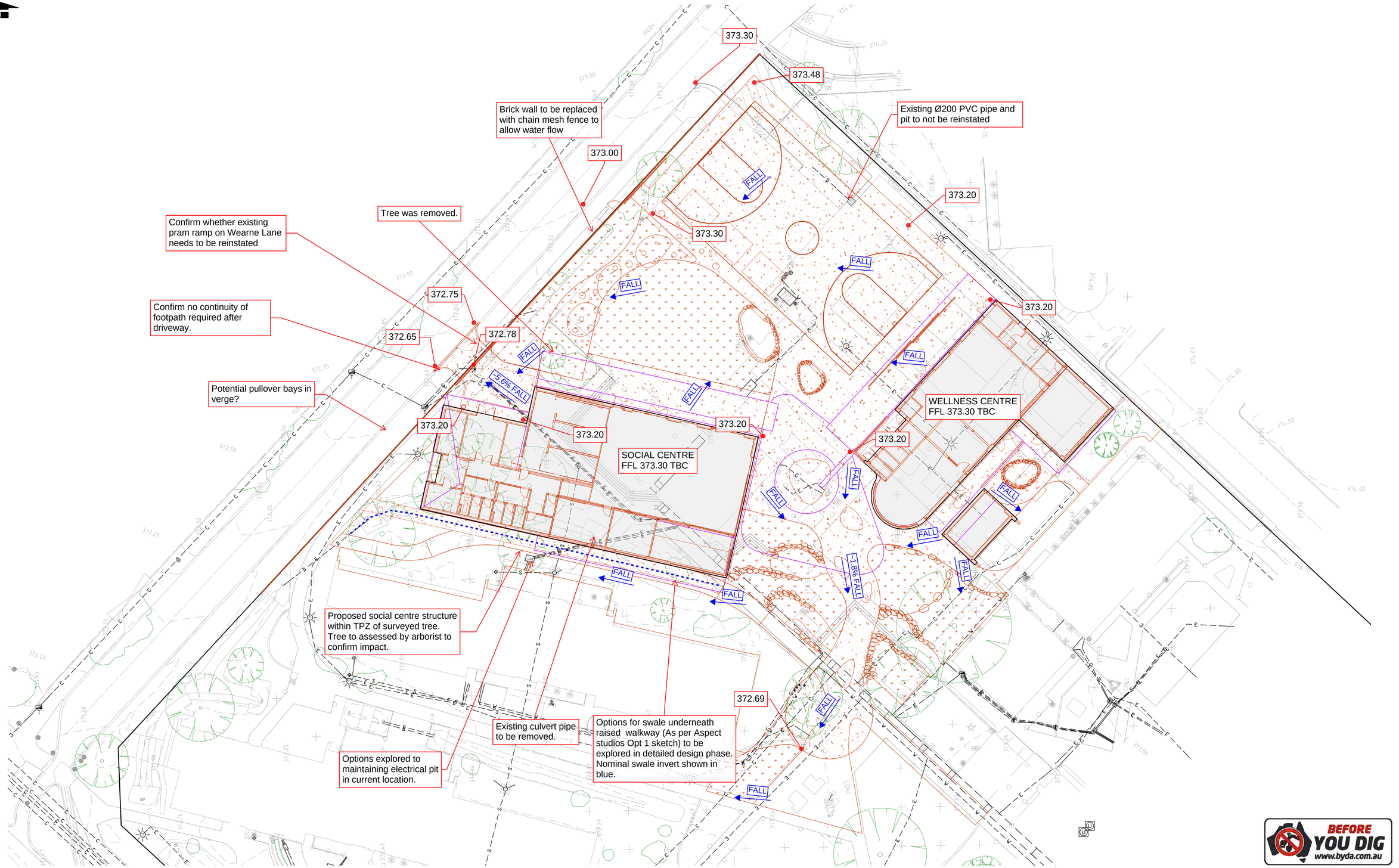
WGA is dedicated to adopting Safety in Design (SiD) in accordance with the designer's responsibilities under State and National Occupational Health, Safety and Welfare Acts and Regulations. WGA considers safety through the lifecycle of the plant and structures and integrates a Hazard Identification and Risk Assessment early in the design process to achieve a safe design for the intended use, fabrication and construction of the project. As part of the process input from the Client, end user and Contractor are required for inclusion.

The SiD register will be developed in conjunction with the relevant stakeholders following the Schematic Design submission.

APPENDIX A
SCHEMATIC DESIGN SKETCHES



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Version: 3, Version Date: 05/05/2026



SITE PLAN
SCALE 1:200

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When sheet printed full size, the scale bar is 100mm.
0 50 100mm

SCALE BAR (m)
1:200
4 2 0 4 8

THIS DRAWING INCLUDES COLOURED INFORMATION
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REV.	DATE	DESCRIPTION	DRAFT	ENG.	CHKD
A	16.03.2026	ISSUED FOR SCHEMATIC DESIGN	JC	RM	AY

WGA

AGRICOLA SHARED FACILITIES
KALGOORLIE

CIVIL WORKS - SCHEMATIC DESIGN ©

A1 DOCUMENT NUMBER
Project Number WGA250696-SK-CV-0001 Sheet No. A Rev.

Design RM Drawn JC

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Version: 3, Version Date: 05/05/2026

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Version: 3, Version Date: 05/05/2026

Additional information received on 7 August 2026

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35 YEARS 1991 – 2026

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info@rowegroup.com.au
rowegroup.com.au

Job Ref: 10187
6 August 2026

City of Kalgoorlie-Boulder
577 Hannan Street
KALGOORLIE WA 6430

Attention: Kevin Tang – Coordinator Statutory Planning

Dear Mr Tang

Application for Development Approval – Curtin Agricola Shared Facilities
Revised Plans and Further Information
Lot 3517 (No. 61) Wilson Street, Kalgoorlie (DAP/26/03124)

We refer to the application for development approval for the proposed redevelopment of the shared facilities at the Agricola student accommodation at the Curtin University Kalgoorlie campus ('Application'), located at Lot 3517 (No. 61) Wilson Street, Kalgoorlie ('subject site').

This letter outlines minor modifications to the design of the proposed development and summarises the updated civil report and the waste management plan. In this regard, please find attached the following documentation:

- Revised Architectural Plans;
- Revised Landscape Report;
- Updated Civil Engineering Report; and
- Waste Management Plan.

This letter also provides responses to the submissions received by the City of Kalgoorlie-Boulder ('City') during the public consultation period.

MODIFICATIONS TO PROPOSED DEVELOPMENT

We refer to our email to the City dated 19 June 2026, which outlined a range of modifications to the proposed design that were under consideration by the project team. In this regard, we provide the below list of confirmed modifications as depicted in the revised plans.

<u>Architectural Modifications</u>

The modifications to the architectural plans are summarised as follows:

- Reflection space in Wellness Centre replaced with landscaped Wellness Courtyard / Contemplative Space;

- Relocation of Social Centre approximately 1.5m southeast to allow for additional back-of-house ('BOH') space, resulting in the setback to Wearne Lane increasing from 1.13m to 2.293m;
- Minor modifications to the internal layout of the Social Centre BOH;
- Bin Store at Social Centre BOH increased from 4m^2 to 18m^2 to accommodate 6 x 600L bins, 1 x 240L bin, 1 x 200L bin and washdown space (discussed in detail below in relation to the Waste Management Plan); and
- Additional 12m^2 external enclosure for the garden waste skip bin adjacent to Social Centre BOH;
- Increased width of Wearne Lane crossover from 6m to 7.5m to accommodate waste vehicle swept paths;
- Retention of existing garrison fence to Wearne Lane and extension to northeast boundary; and
- Tinted concrete plinth for both buildings replaced with concrete block with glass face render.

Refer **Attachment 1 – Revised Architectural Plans.**

Landscape Modifications

ASPECT Studios has revised Section 4 – Landscape Approach of the Landscape Report to reflect and suit the architectural design changes. The revised drawings include the Masterplan, Landscape Site Plan, Landscape Sections, and several Landscape Amenity drawings. The modifications to the landscape drawings can be summarised as follows:

- Addition of a Contemplative Space in place of the Reflection space;
- Addition of an outdoor barbecue to the Social Centre alfresco area; and
- Minor alterations to the layout of the Arrival, Meeting Place, The Green, and Court landscaped areas;

Refer **Attachment 2 – Revised Landscape Approach.**

UPDATED STORMWATER MANAGEMENT PLAN

An updated Civil Report has been issued by WGA that progresses and refines the stormwater management for the proposed development. No changes have been made to the text of the report, but its site plan has been updated to depict the proposed stormwater management measures, which are summarised as follows:

- Overland flow will be directed in a generally north-south direction, from the hardcourt, to either side of the Social Centre, and out to Wilson Street or Wearne Lane (which in turn directs to Wilson Street);
- Existing swale located south of the proposed Social Centre is to be modified;
- New basin/swale proposed in landscape area abutting Wearne Lane to hold flow;
- No changes proposed to the existing swale between Buildings 780A and 780B or the basins adjacent to Wilson Street; and
- The existing flow path on Wearne Lane directs to Wilson Street and into existing basins holding flow prior to the discharge into Wilson Street.

Refer **Attachment 3 – Updated Civil Report.**

WASTE MANAGEMENT PLAN

A Waste Management Plan ('WMP') has been prepared by Encycle, which sets out the estimated waste and

recycling generation, specifications of the proposed bin store and number/type of bins, internal transfer of waste protocols, and waste collection and vehicle access for the proposed development. The WMP was developed with regard for the City's Waste Management Plan Guidelines, the City's Consolidated Health Local Laws 2001, and the WALGA Commercial and Industrial Waste Management Plan Guidelines (2018).

As mentioned above, one (1) bin store with a washdown area is proposed in the Social Centre BOH, accessible from both within the Centre an externally from the loading area. An external enclosure for the garden waste skip bin is also located adjacent to the Social Centre. The number and type of bins stored in these areas, and their collection schedules, are as follows:

Waste Stream	Bin Size (L)	Number of Bins	Collection Frequency
General waste (excluding food waste)	660	3	3 x weekly
Commingled recycling	660	1	Weekly
Cardboard recycling	660	2	Weekly
CDS recycling	240	6	As required
Used Oil	200	1	As required
Garden Organics	3000	1	As required

Staff will manually transfer waste and recyclables from the Social Centre and Wellness Centre to the bin store via service corridors.

A private waste service provider will service the general waste and recycling bins using rear-lift vehicles. A lift on - lift off vehicle will service the skip bin containing green organics. A tanker vehicle will require access to service the grease trap. In addition, a small tanker vehicle will require access to service the used cooking oil storage unit.

On collection days, waste vehicles will reverse into the loading area from Wearne Lane, retrieve and return the bins, and exit onto Wearne Lane in forward gear. To accommodate these vehicle movements, the proposed crossover has been widened from 6m to 7.5m. A swept path analysis is included with the attached WMP.

Refer **Attachment 4 – Waste Management Plan** for further detail**.**

RESPONSE TO SUBMISSONS

The City advised via a 27 July 2026 email that it received two (2) submissions on the Application during the public consultation period, and provided a redacted copy of these submissions. A copy of the submissions and our responses are provided on the following page.

Submitter	Submission	Applicant Response
Department of Mines, Petroleum and Exploration	*Thank you for your letter dated 02/07/2026 inviting comment on the proposed redevelopment of the Agricola student shared facility on Lot 3517 (61) Wilson St, Kalgoorlie, into a social and wellness centre.* *The Department of Mines, Petroleum and Exploration (DMPE) has determined that this proposal raises no significant issues with respect to mineral and petroleum resources, geothermal energy, and basic raw materials.* *DMPE lodges no objections to the above development application.*	We note the Department has determined that no significant issues will arise from the Application, and we thank the Department for its consideration.
Central Regional TAFE on behalf of the VET Ministerial Corporation	*Noting that CRTAFE's buildings are located in close proximity to the proposed development we would like to request the following information from the owner/developer/contractor.* ▪ *Will a broader scale diplidation [sic] report be undertaken prior to any works to capture any potential damage/cracking to the buildings in the vicinity? Could the report be shared with CRTAFE?* ▪ *Can the developer outline any impacts on the pedestrian access to Wearne Lane, as this road is used extensively by CRTAFE and EGC students.* *CRTAFE supports the project and believes it will be an excellent enhancement to the education training and training precinct in Kalgoorlie-Boulder.*	We thank the CRTAFE for its submission and its support for the Application. It is anticipated that a dilapidation report will form part of the Construction Management Plan, which we expect to be required as a condition on the Development Approval, and will be prepared following appointment of builder and before works commence. A standard dilapidation report would assess the condition of buildings, roads and other infrastructure on any immediately adjoining properties. The project team is open to further engagement with CRTAFE on this matter. The proposal includes the relocation of a crossover on Wearne Lane further south, and widening of the crossover to 7.5m. Notwithstanding this, we confirm the pedestrian network will not be impacted during operations. Any impact during construction will be subject to approval by the City as part of the Construction Management Plan.

We trust the above and attached is sufficient to enable the City to complete it assessment of the Application. Should you require any further information or clarification in relation to this matter, please contact the undersigned on 0432 007 256.

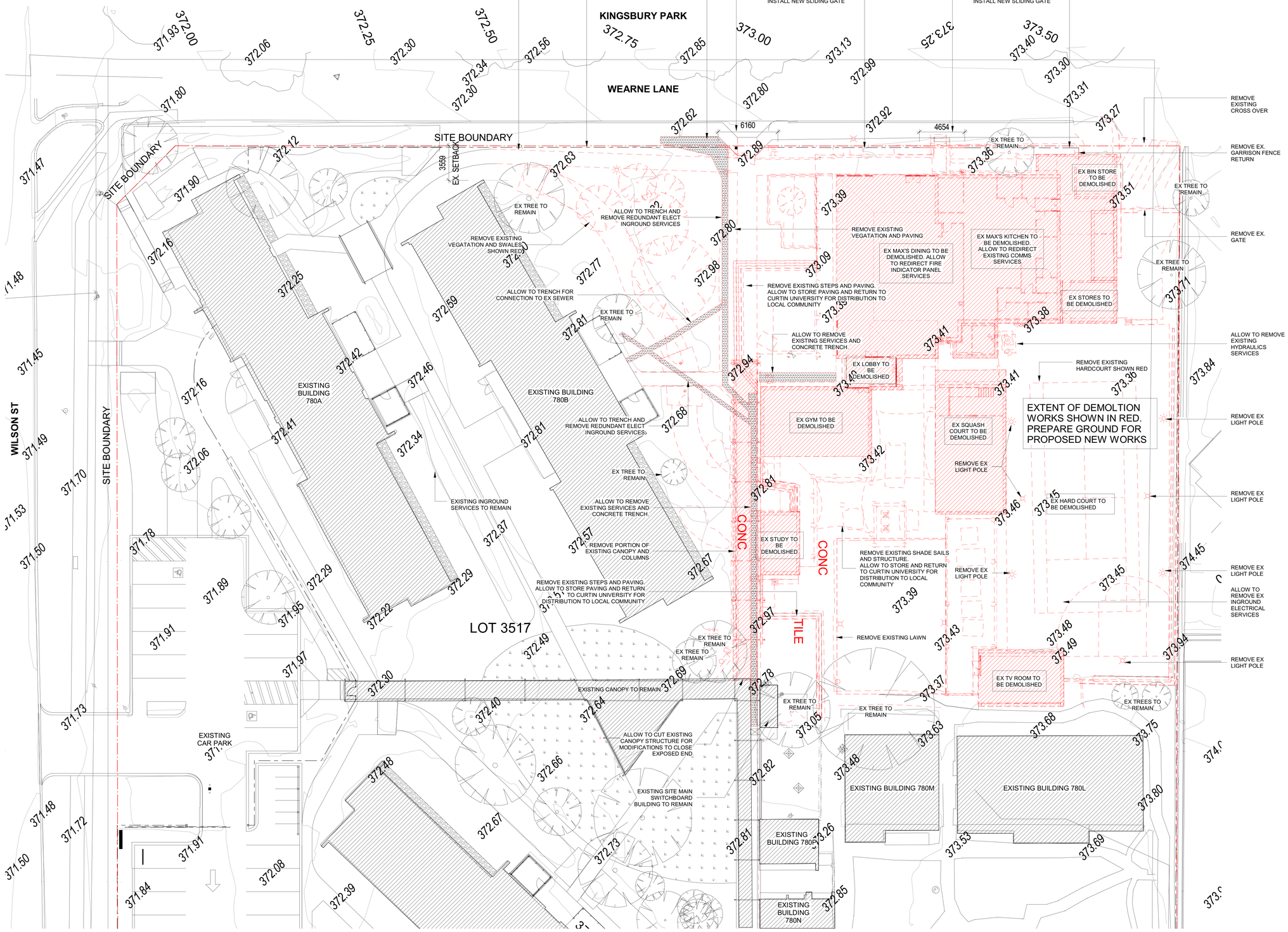
Yours faithfully,

Belle Smithies

Belle Smithies
Rowe Group

Attachment One

Revised Architectural Plans



LEGEND

- EXTENT OF DEMOLITION
- DEMOLITION OF EXISTING BUILDING. ALLOW TO STORE BLOCKWORK, ROOF TILES AND HARDWOOD TIMBER BEAMS TO BE REUSED IN NEW WORKS OR RETURNED TO CURTIN UNIVERSITY FOR DISTRIBUTION TO LOCAL COMMMUNITY.
- EXISTING BUILDING TO REMAIN
- EXISTING TREE TO BE REMOVED
- EXISTING TREE TO BE RETAINED

1 SITE PLAN - DEMOLTION WORKS
A-CP0103 SCALE 1 : 200

REV	DATE	REVISION	DRN	CHK	PROJ APP
A	25/02/2026	ISSUE TO CONSULTANTS & QS			
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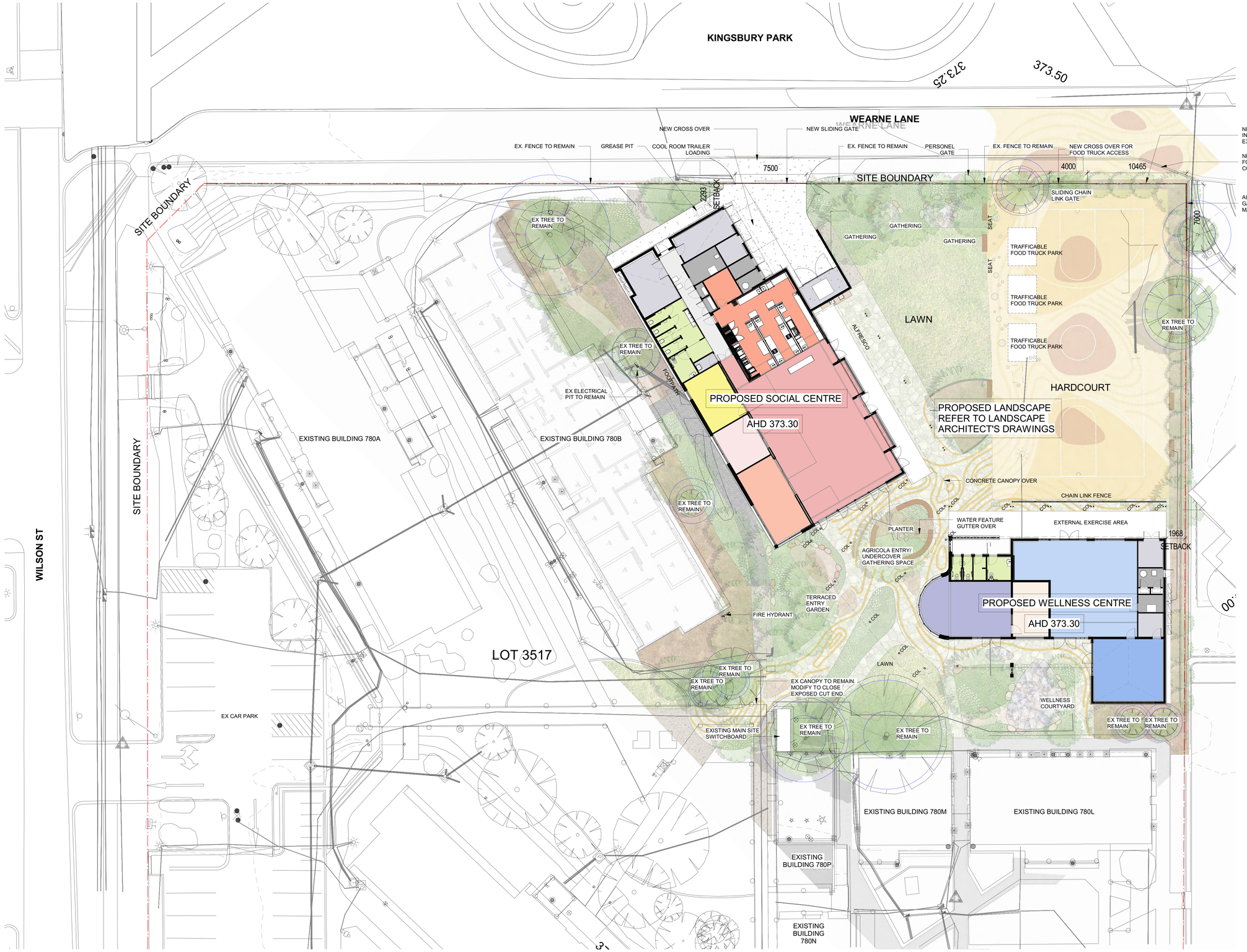
DRN BY	Author
DATE	26/04/17
DESIGNED	Designer
CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

SITE PLAN - DEMOLITION WORKS

CURTIN PROJ No	CP354	SCALE:	As indicated
		UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-DP0001	SHEET	OF ISSUE F



1 SITE PLAN
A-CP0103 SCALE 1 : 200

PRELIMINARY

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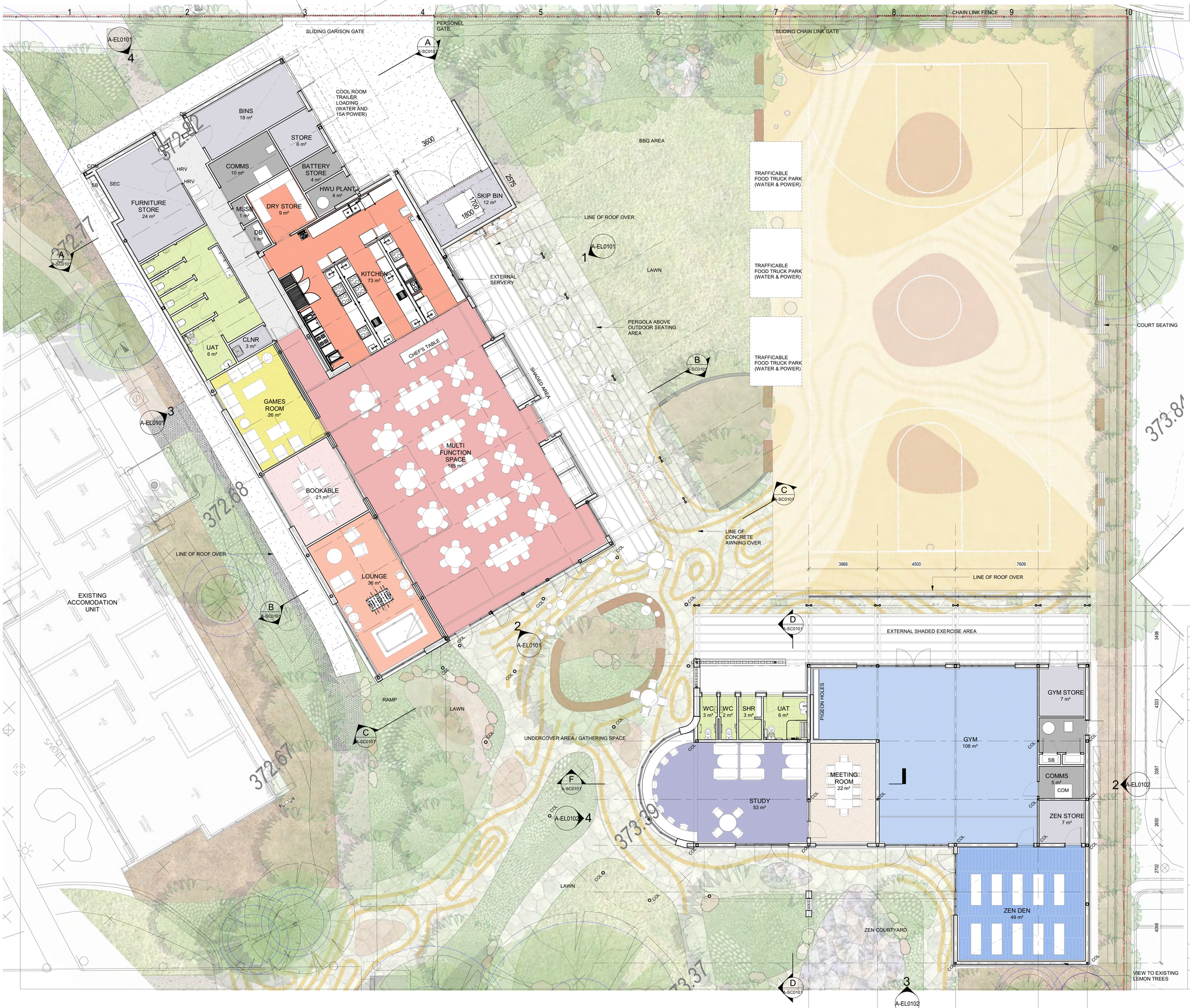
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SITE PLAN - NEW WORKS

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DWG No	03B781- A-SP0001	SHEET	OF ISSUE J



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C	9/12/25	FLOOR PLAN UPDATE			
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E	23/01/26	ISSUED FOR APPROVAL			
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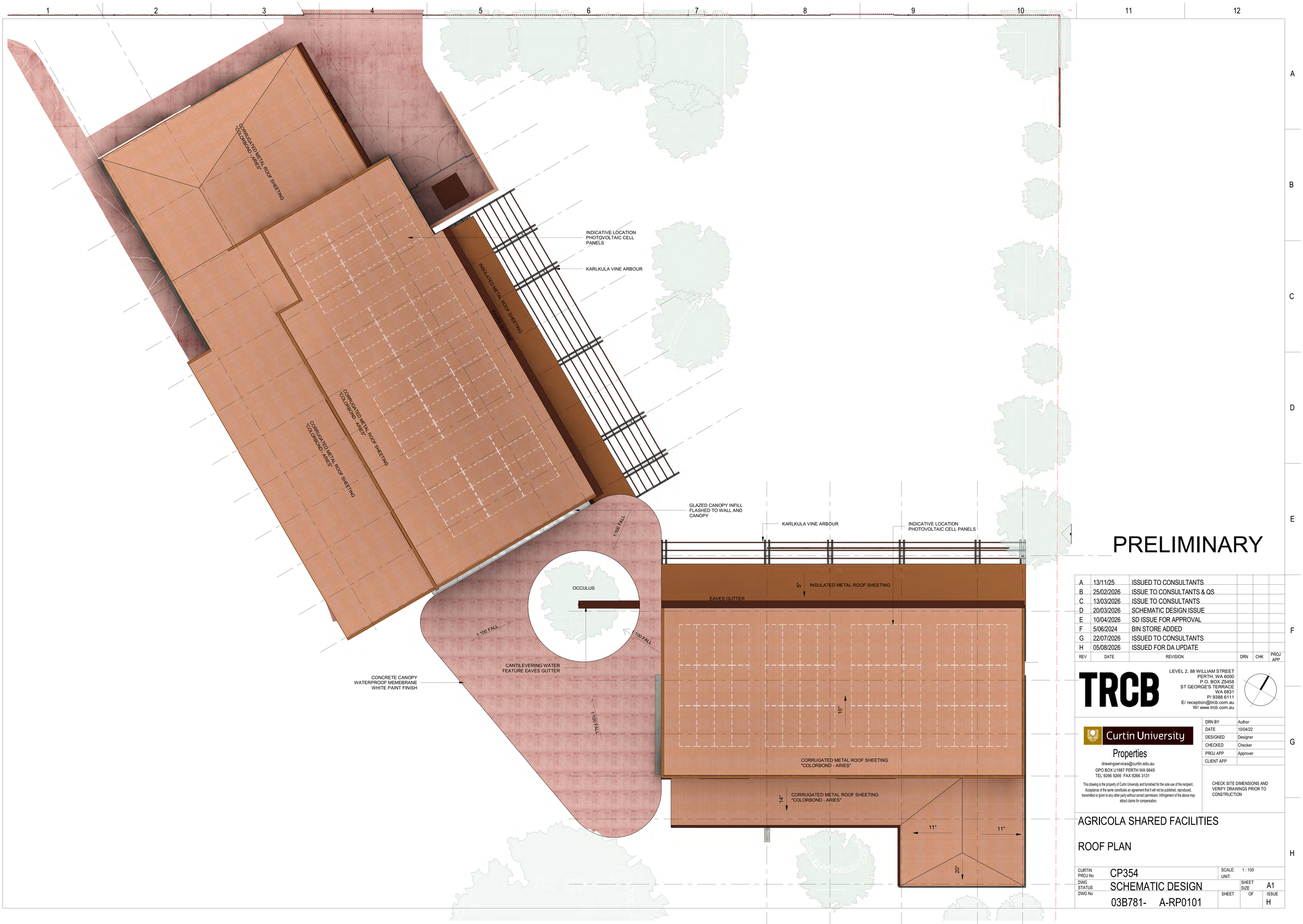
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LEVEL 1 FLOOR PLAN

CURTIN PROJ No	CP354	SCALE:	1 : 100
DWG STATUS	SCHEMATIC DESIGN	UNIT:	
DWG No	03B781- A-FP0101	SHEET SIZE	A1
		SHEET	OF / ISSUE J



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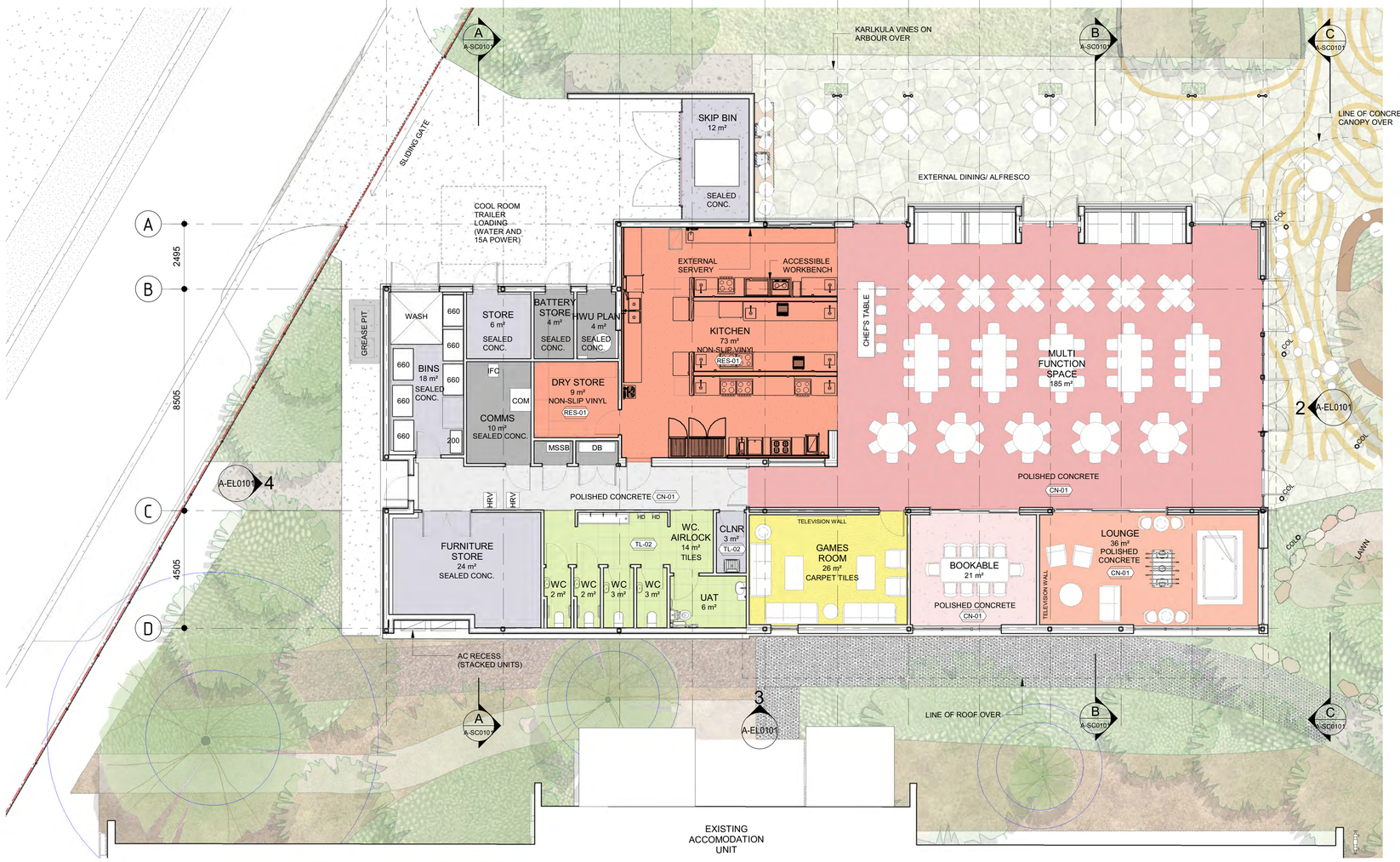
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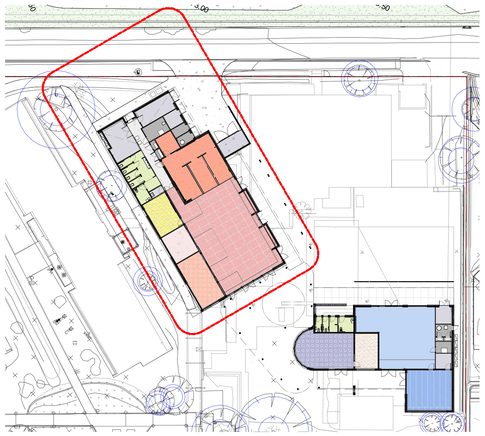
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ROOF PLAN

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		SHEET	OF / ISSUE H



1 SOCIAL CENTRE
A-CP0103 SCALE 1 : 100



2 KEY PLAN
A-CP0103 SCALE 1 : 500

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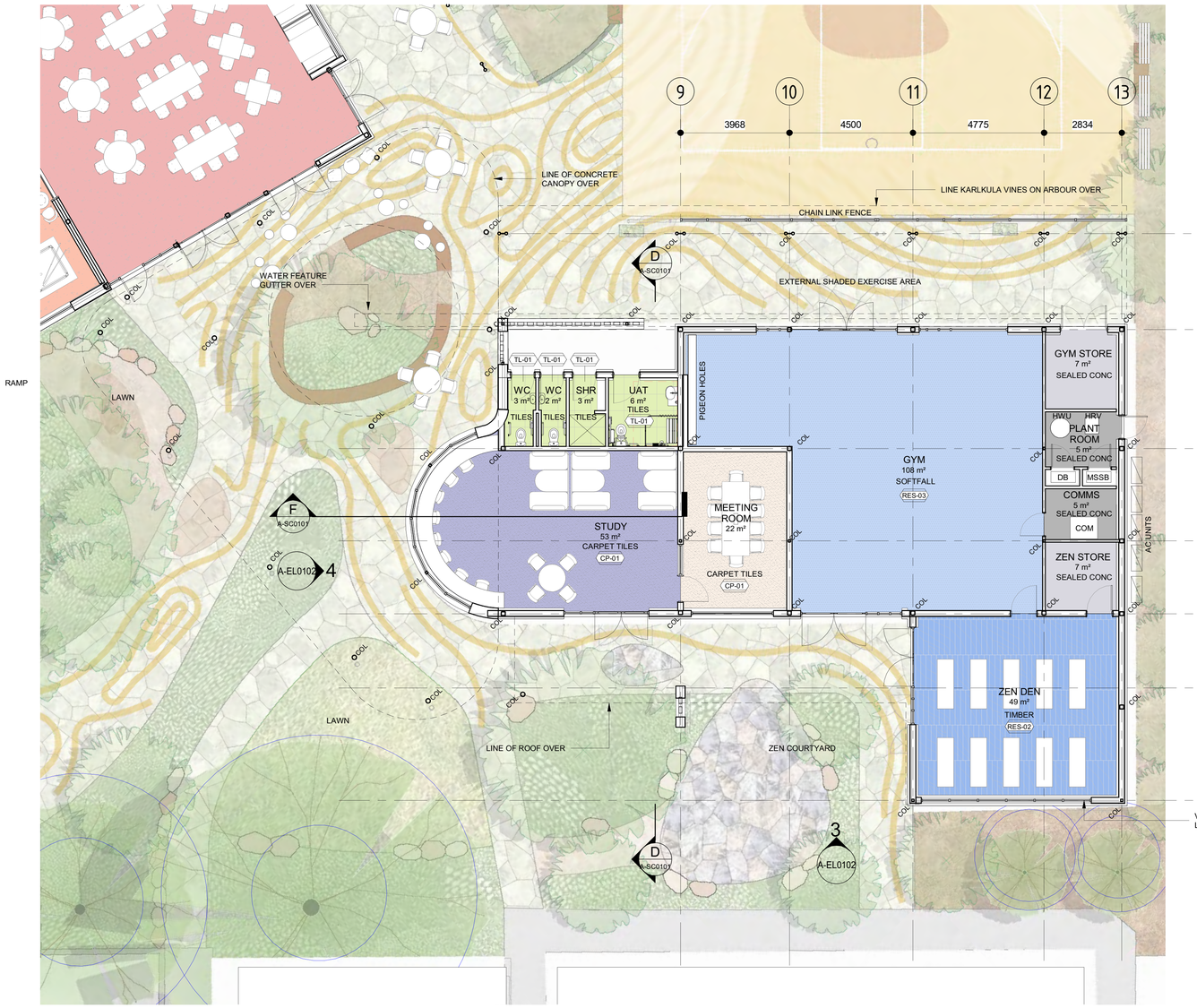
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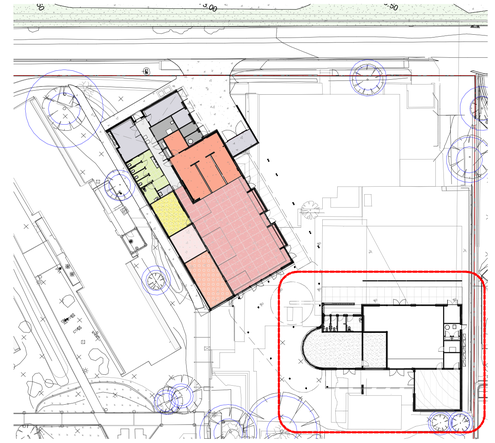
AGRICOLA SHARED FACILITIES

SOCIAL CENTRE FLOOR PLAN

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DWG No	03B781- A-FP0102	SHEET / OF	ISSUE G



1 WELLNESS CENTRE
A-CP0103 SCALE 1 : 100



2 KEY PLAN
A-CP0103 SCALE 1 : 500

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WELLNESS CENTRE FLOOR PLAN

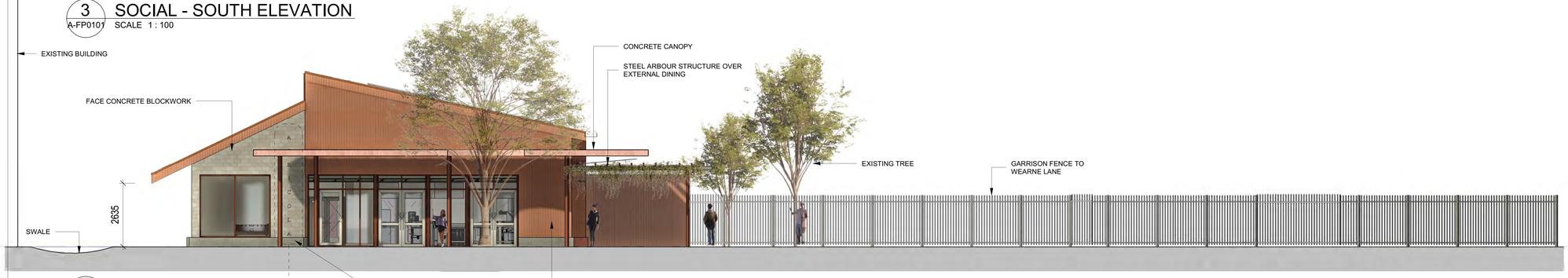
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DWG No	03B781- A-FP0103	SHEET / OF / ISSUE	F



1 SOCIAL - NORTH ELEVATION
A-FP0101 SCALE 1 : 100



3 SOCIAL - SOUTH ELEVATION
A-FP0101 SCALE 1 : 100



2 SOCIAL - EAST ELEVATION
A-FP0101 SCALE 1 : 100



5 SIGNAGE
SCALE 1 : 100



4 SOCIAL - WEST ELEVATION
A-FP0101 SCALE 1 : 100

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AGRICOLA SHARED FACILITIES

ELEVATIONS - SOCIAL CENTRE

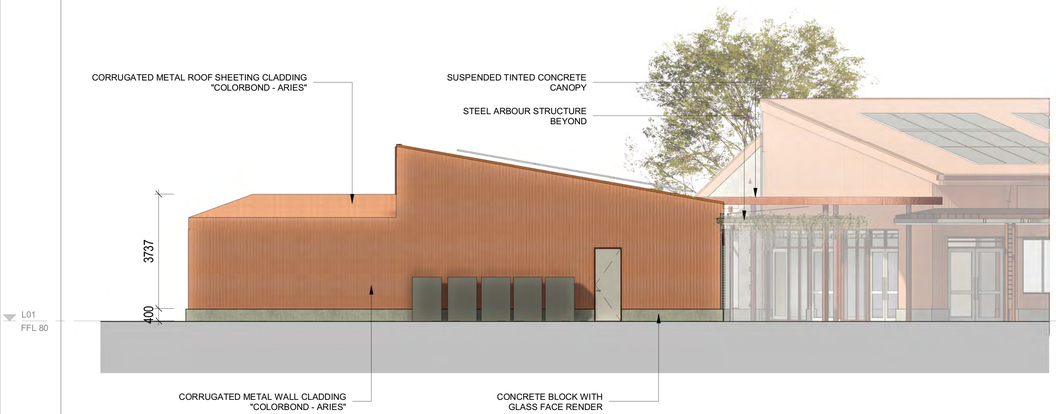
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DWG No	03B781- A-EL0101	SHEET	
		OF	
		ISSUE	G



1 WELLNESS - NORTH WEST ELEVATION
A-FP0102 SCALE 1 : 100



3 WELLNESS - SOUTH EAST ELEVATION
A-FP0101 SCALE 1 : 100



2 WELLNESS - NORTH EAST ELEVATION
A-FP0101 SCALE 1 : 100



4 WELLNESS - SOUTH WEST ELEVATION
A-FP0101 SCALE 1 : 100

PRELIMINARY

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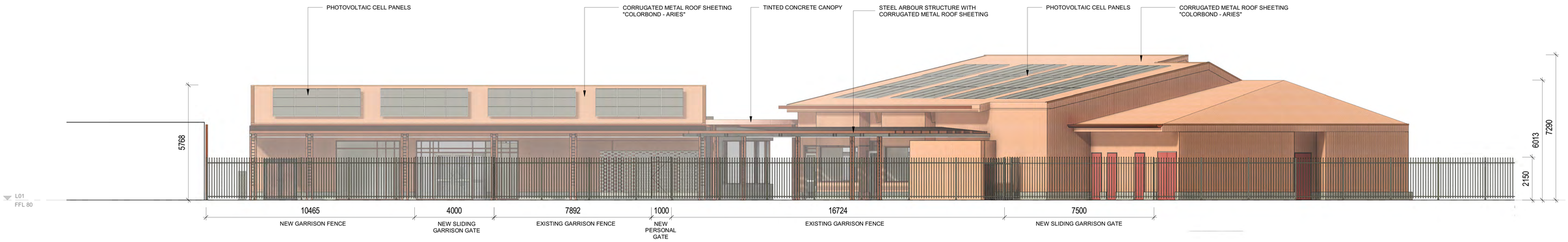
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AGRICOLA SHARED FACILITIES

ELEVATIONS - WELLNESS CENTRE

CURTIN PROJ No	CP354	SCALE:	1 : 100
		UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-EL0102	SHEET	OF ISSUE G



1 STREET ELEVATION

A-FP0102 SCALE 1 : 100

PRELIMINARY

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DATE	10/04/22
DESIGNED	Designer
CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

ELEVATIONS - STREET ELEVATION

CURTIN PROJ No	CP354	SCALE: UNIT:	1 : 100
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-EL0103	SHEET / OF	ISSUE B

Attachment Two

Revised Landscape Approach

05. Landscape Approach



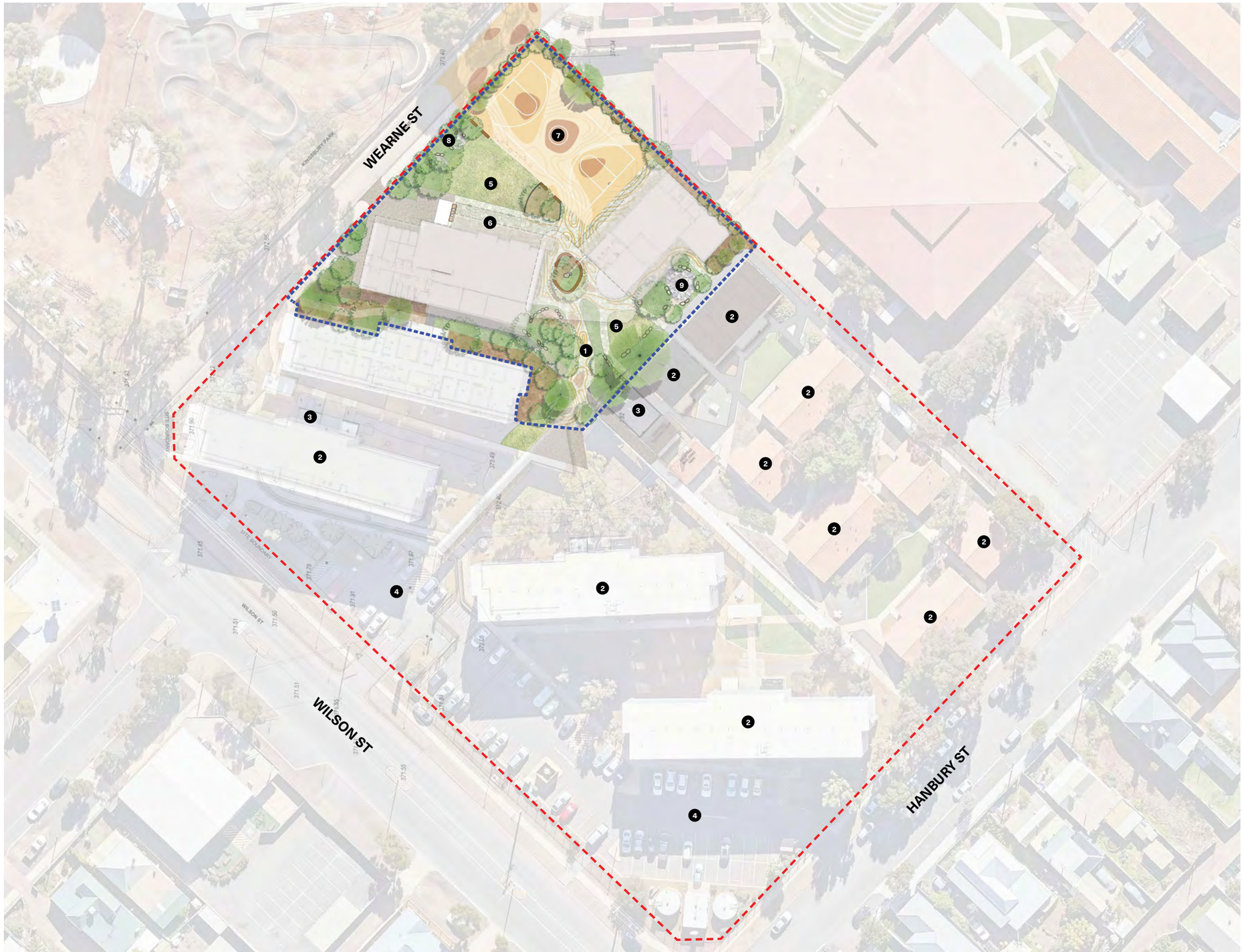
5.1 Masterplan

Key

1	Arrival to Shared Facilities
2	Existing Student Accommodation
3	Existing laundry drying area
4	Existing parking
5	Proposed lawn areas
6	Proposed alfresco space
7	The Court
8	Proposed diverse feature native planting
9	Contemplative Space

Site Boundary

Extent of work

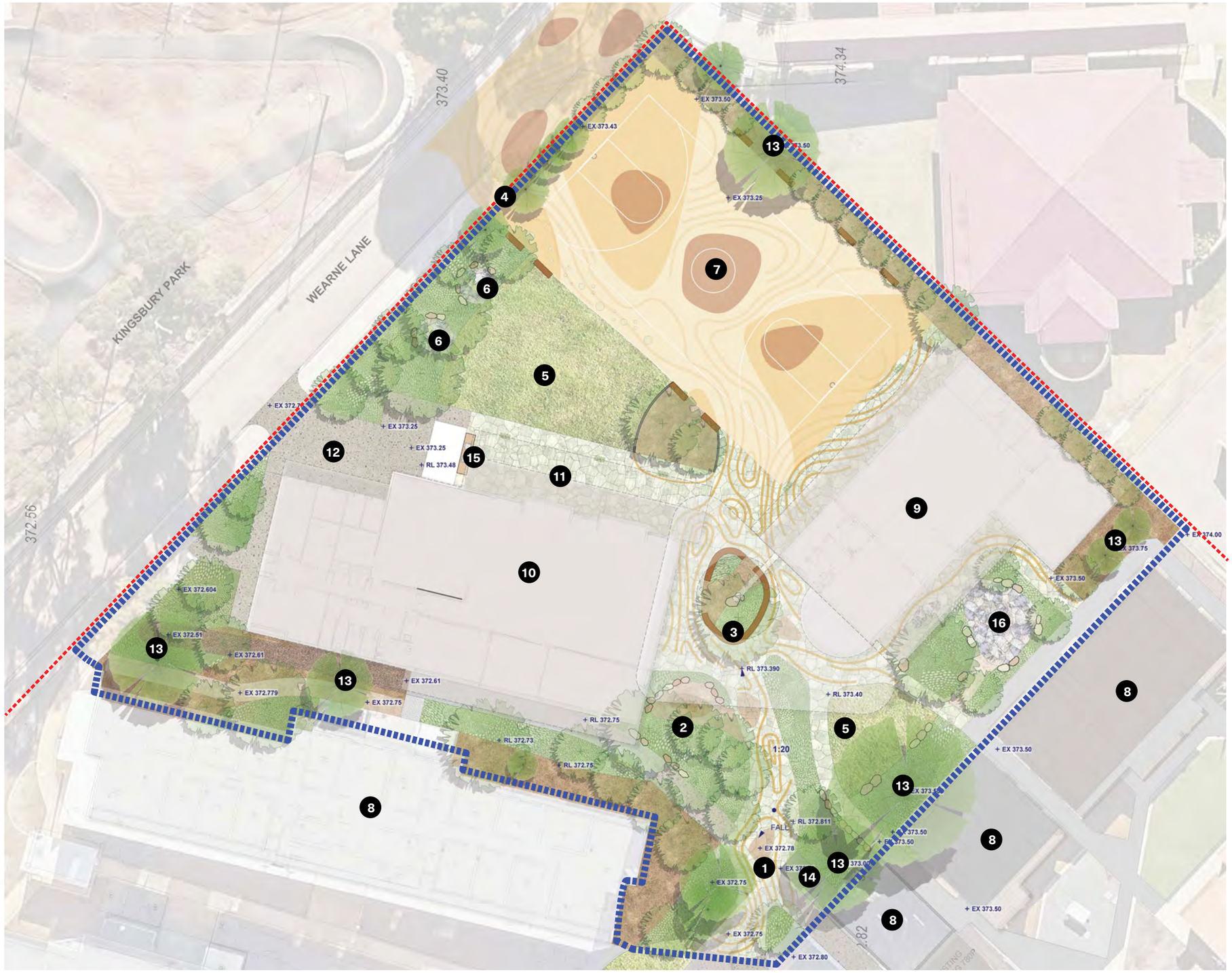


SCHEMATIC DESIGN SITE PLAN - SCALE: NTS

5.2 Landscape Site plan

Key	
1	Entry node
2	Terraced entry garden
3	Arrival Space
4	Wearne Lane entry
5	Lawn area
6	Gathering nooks
7	Multi-sport court
8	Existing Building
9	Wellness centre
10	Social Centre
11	Alfresco space
12	Loading zone
13	Existing tree
14	Existing Service building
15	Outdoor BBQ
16	Contemplative Space

	Site Boundary
	Extent of work

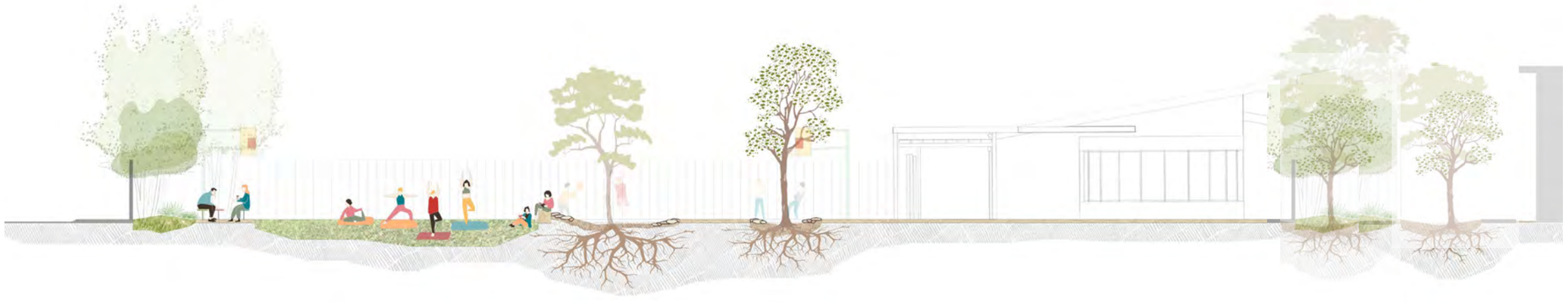


LANDSCAPE PLAN - SCALE: NTS

5.3 Landscape Site Sections



A



B



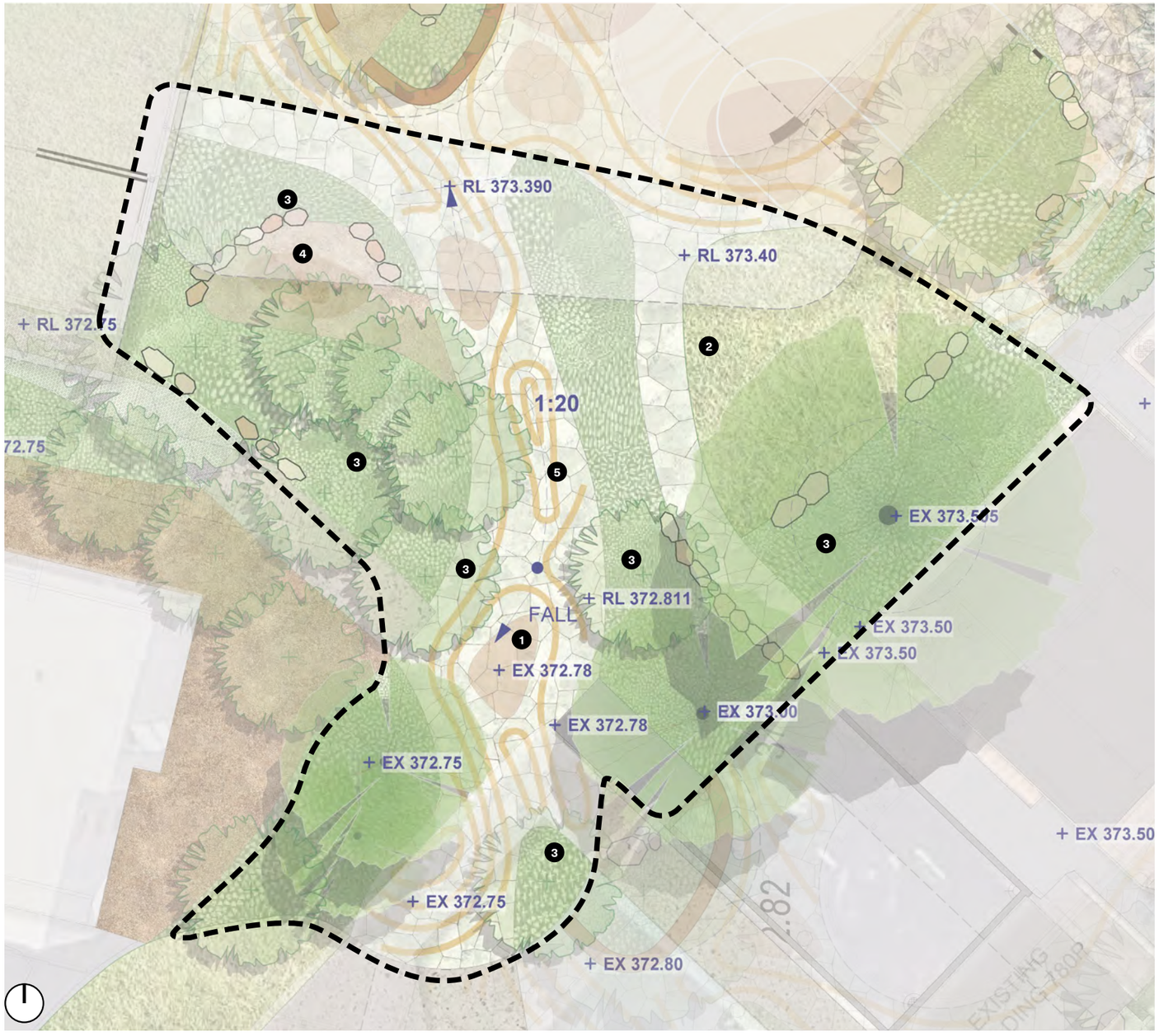
C







5.4 Landscape Amenity - Arrival











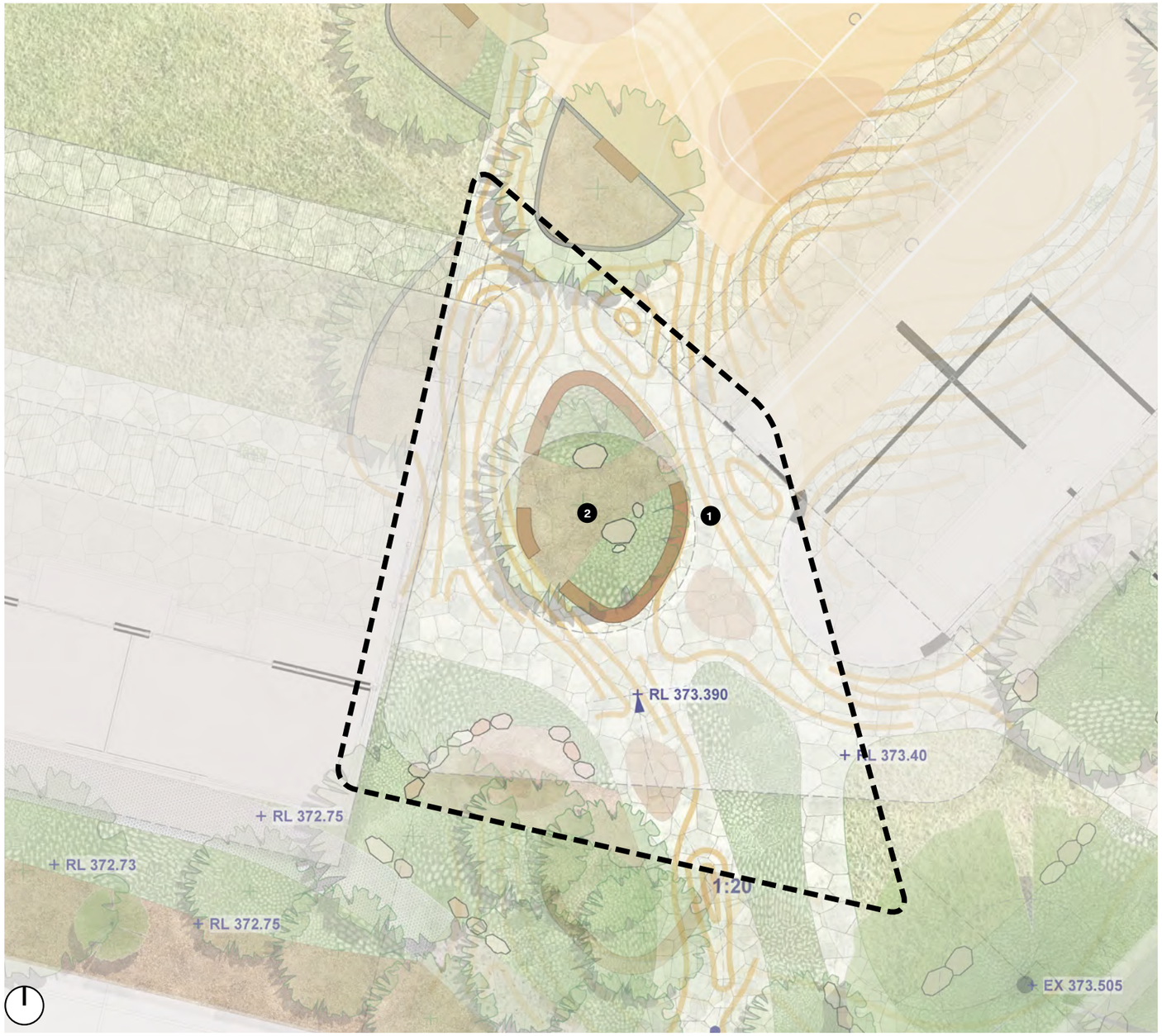




Key

1	Arrival
2	Lawn Area
3	Endemic planting around boulders
4	Meeting spaces
5	Paving feature

5.5 Landscape Amenity - Meeting place













Key

1	Canopy with Oculus
2	Feature tree with seating node

5.6 Landscape Amenity - The green

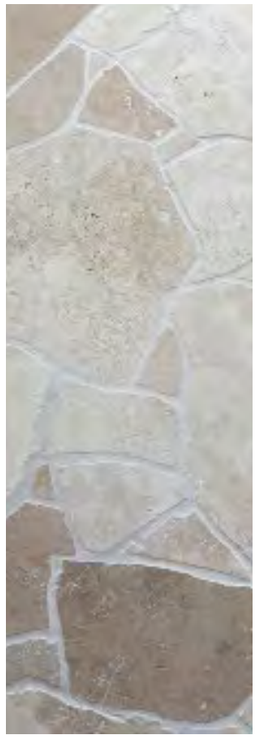












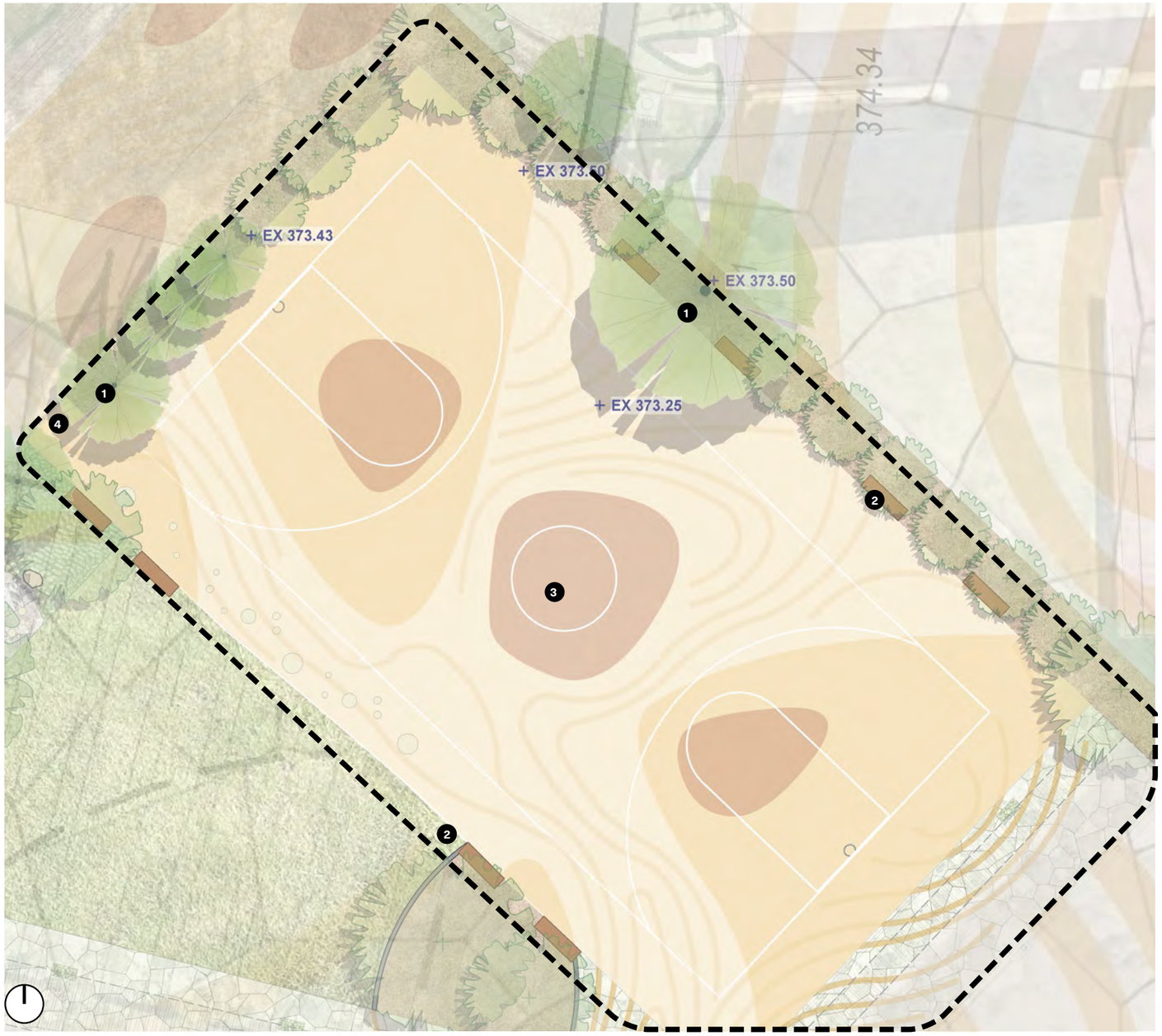


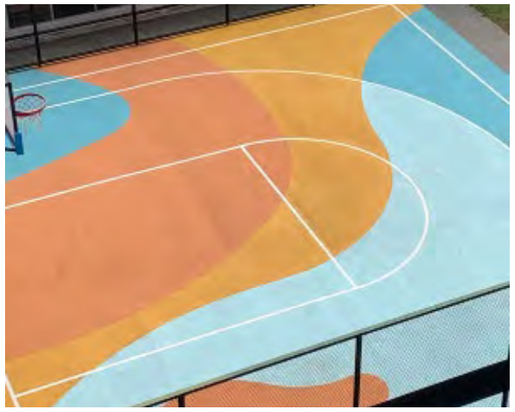


Key

1	Flexible lawn area
2	Shade trees
3	Gathering nooks
4	Seating
5	Climber to Pergola

5.7 Landscape Amenity - Court

















Key

1	Shade trees
2	Seating
3	Multi-use sport court
4	Wearne Lane entry

Attachment Three

Updated Civil Report

Curtin University

Agricola Shared Facilities

CIVIL SCHEMATIC DESIGN REPORT

WGA250696

WGA250696-RP-CV-0001_C

28 July 2026

Revision History

REV	DATE	ISSUE	ORIGINATOR	CHECKER	APPROVER
A	19/03/2026	For Review	RM	AY	MH
B	24/04/2026	For DA	RM	AY	WB
C	28/07/2026	For DA	RM	AY	WB

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Appendices

APPENDIX A STORMWATER SKETCH

1 INTRODUCTION

1.1 Project Background

WGA have been engaged by Curtin University as consulting civil and structural engineers for the modernisations, improvement and infrastructure upgrades to Agricola, Curtin University's on-campus student accommodation in Kalgoorlie, WA.

The proposed additions and refurbishments include a social centre, wellness centre and outdoor hardcourt. New landscaped areas are also to be incorporated in the shared facilities upgrades.

Civil services will provide drainage strategy for new buildings, hardcourt and hard landscaped area as well as new loading area to be used for a cool room trailer laydown. This report aims to outline the design basis with the available information at schematic design stage.

1.2 Project Location

Agricola Shared Facilities are located in the town of Kalgoorlie-Boulder, approximately 600km east of Perth.

Extent of project works on the accommodation site is indicated below in Figure 1.



Figure 1: Agricola Shared Facilities Project Extent

1.3 Relied Upon Information

The following documents were utilised to inform design decisions related to the existing site conditions:

- Golder Associates Geotechnical Investigation – Curtin University Kalgoorlie Campus Student Accommodation (Stage 1) – *"137642054-001-R-Rev0, May 2013"*
- Feature and Contour Survey by RM Surveys – 61 Wilson St, Kalgoorlie, WA 6430 – *"PROV-AGRIC-DW-002 Rev03, 3 March 2026"*

It is important to note that assumptions in this report have been made on the historic information found by the Golder Associates investigation from 2013. However, these assumptions should not be relied upon given the previous investigation was for the whole Agricola Shared campus with limited investigations on the project extent. It is understood that an updated geotechnical investigation will be conducted and report to be provided to WGA in the next design phase with specific test pits in the location of the project upgrade.

2 EARTHWORKS

2.1 Geometry

The existing Curtin University Agricola Shared Facilities area is on a relatively flat lot with an approximate grade of 1% toward the western boundary. This grade will be targeted to be replicated for the proposed shared facilities site works.

Table 1 provides a summary of the relevant design standards that will govern the shared facilities upgrade civil design.

Table 1: General Design Criteria

ITEM	DESIGN CRITERIA	REFERENCE/COMMENTS
Maximum Grades Across Hardscapes (%)	25%	AS 2890.1
Minimum Grades Across Hardscapes (%)	1%	AS 2890.1
Maximum Grade Along Footpath (%)	3%	AS 1428.1
Maximum Grade Across Footpath (%)	2.5%	AS 1428.1
Earthworks Batters	Des. 1V:4H	-
Maximum Side Slope of Swale	1V:4H	City of Kalgoorlie Boulder – Local Planning Scheme 2

2.2 Excavation

Geotechnical investigations performed by Golder Associates (May 2013) notes the site lies on a conglomerate rock layer ranging from a 0.5m to 2m depth. Therefore, excavation through this rock layer would require larger plant, such as a 30t excavator fitted with a rock breaker.

However, the shared facilities upgrade is intended to generally maintain existing levels therefore, significant excavation/rock breaking is not expected to be required.

Detailed earthworks will likely be restricted to relocating services and open channel drains.

As in Table 1, permanent batters will be limited to a desirable grade of 1V:4H slope. If steeper batters are required, this will be verified by a Geotechnical Engineer

2.3 Pavement

2.3.1 Cool Room Trailer Loading Area

The design of the driveway access and ‘cool room trailer’ laydown area off Wearne Lane, will be documented and coordinated across disciplines to comply with AS 2890.1 for Off Street Parking.

Pavement designs will be completed as part of design development when a geotechnical report has been completed and supplied.

2.3.2 Footpath Infill Area

The existing driveway in the Northern corner of the site will be removed and infilled to reinstate the footpath in the verge. The footpath will receive artwork as part of the landscaping package design. The footpath can either be of concrete or pavers to be detailed at the next design stage. Typical details for concrete and pavers footpath are indicated below which will be refined at detailed design stage.

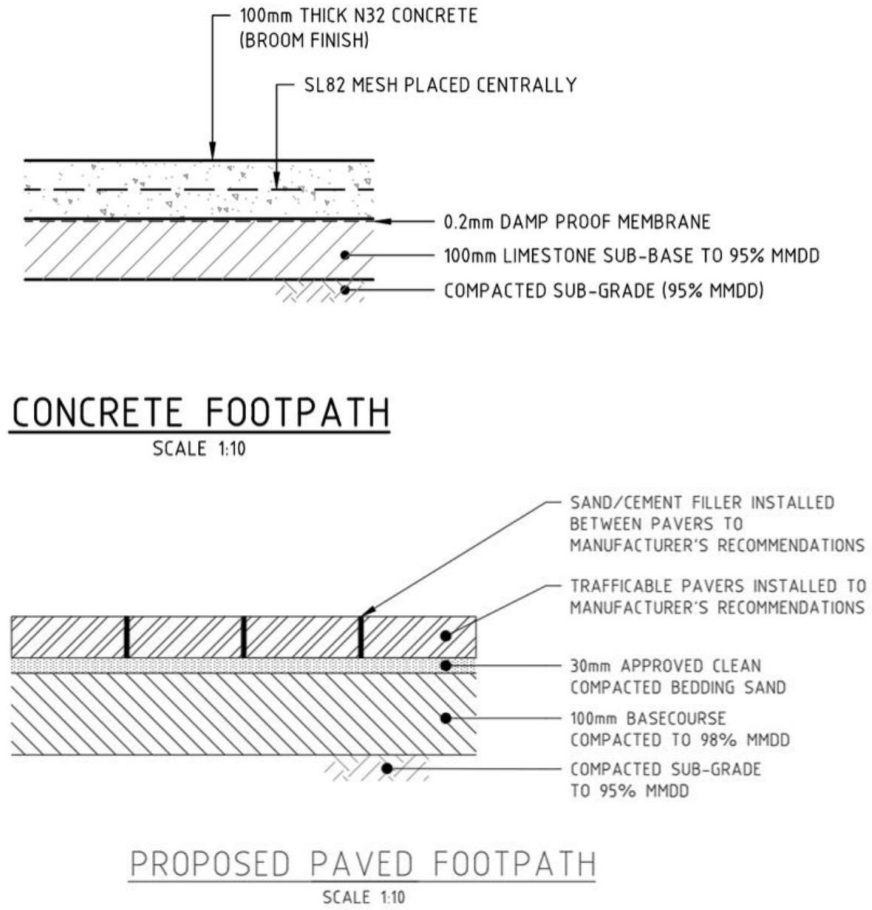


Figure 2 Typical footpath options for Infill

3 STORMWATER DRAINAGE

3.1 Design Criteria

The following design codes and standards form the basis of the stormwater drainage design:

- City of Kalgoorlie-Boulder Local Planning Scheme No. 2 (2023)
- Austroads Guide to Road Design Part 5 (AGRD5) – Drainage General and Hydrology Considerations (2013).
- Australian Rainfall and Runoff (2019).

According to City of Kalgoorlie-Boulder Local Planning Scheme No. 2 (2023) stormwater discharge is to be uncontaminated and discharged to the street, or to an alternative location, to the satisfaction of the local government and any relevant authority.

City of Kalgoorlie-Boulder Local Planning Scheme No. 2 (2023) does not dictate stormwater events to be modelled for stormwater infrastructure upgrades.

3.2 Stormwater Management

The proposed drainage strategy for the development will maintain the existing philosophy. The existing site stormwater runoff are graded towards swales within landscaped areas via overland flow paths and conveyed South through the site towards rock pitched detention basins at the Southern boundary of the campus. The collected runoff will ultimately overflow through kerb opening onto Wilson Street into the City of Kalgoorlie-Boulder drainage network.

The ground condition is found to be impermeable from the geotechnical investigation, infiltration has not been explored as a viable stormwater option, runoff will need to be carried through the proposed overland flow paths. Noting that existing site area prior to development was mainly impervious, and the proposed development design proposes more landscaped pervious footprint than existing hence reducing the amount of stormwater runoff from the area.

The proposed development is on the Northern end of the campus and overland flow will generally be directed towards the South into the existing drainage system as much as practicable. The schematic design intends to direct runoff from proposed buildings and footpath into existing swales that tie-in to downstream system for most of the development footprint.

The northern impervious hard court will be graded south towards the lawn area into a new swale within the landscaped area. A swale or basin will be provided in a similar manner to the existing to provide detention of water to remove pollutants via sedimentation. Treated runoff will overflow via kerb opening into the cool-rom trailer loading area which will be directed onto Wearn Lane. Runoff on Wearn Lane ultimately flows onto Wilson Street into the council network. This hardcourt area was previously conveyed within the existing site swales before eventually overflowing onto Wilson Street.

An indication of existing and proposed flow paths is shown in Figure 3 below and included in Appendix A.

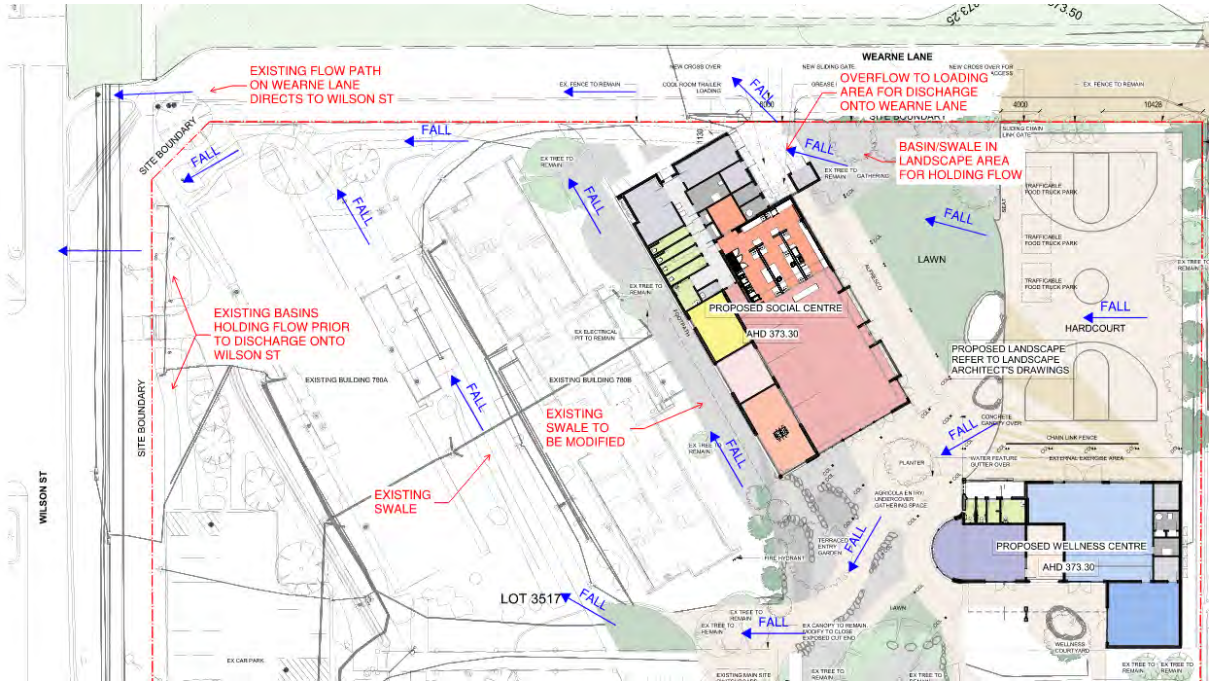


Figure 3 Overland Flow Proposed Across Site

Consideration has been made to provide a rock pitched in the detention swale or basin to contain the redirected flow from the hard court and turfed space area. It is anticipated that gross pollutants and sediment will be regularly removed from the detention basin during maintenance operations outside of rainfall events.

Where practicable, runoff will be directed away from the existing and proposed buildings to minimise damage to infrastructure in a major storm event.

3.3 Groundwater

The geotechnical investigations performed by Golder Associates (May 2013) detailed that groundwater was not encountered during the investigation.

4 QUALITY AND SAFETY

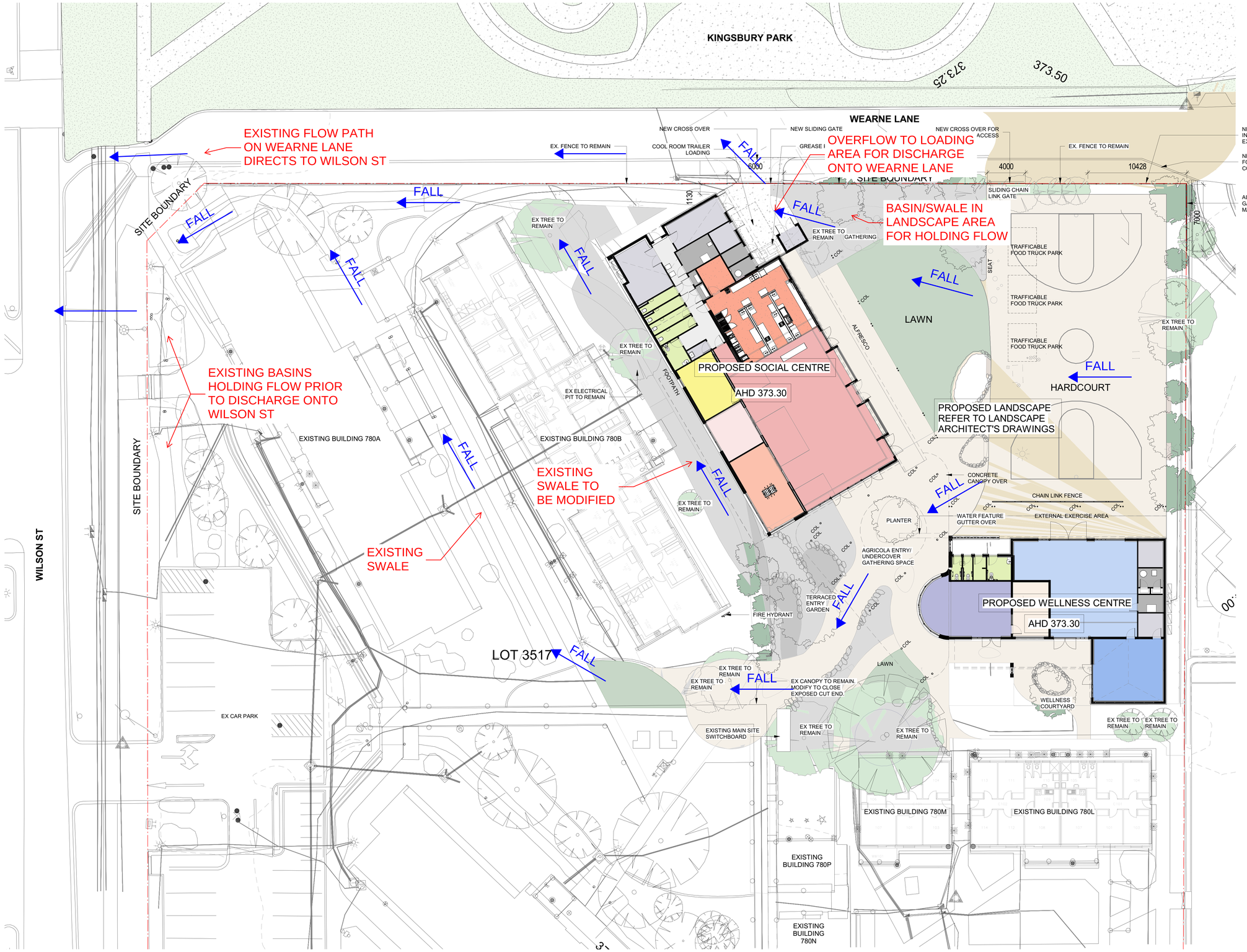
4.1 Safety In Design

WGA is dedicated to adopting Safety in Design (SiD) in accordance with the designer's responsibilities under State and National Occupational Health, Safety and Welfare Acts and Regulations. WGA considers safety through the lifecycle of the plant and structures and integrates a Hazard Identification and Risk Assessment early in the design process to achieve a safe design for the intended use, fabrication and construction of the project. As part of the process input from the Client, end user and Contractor are required for inclusion.

The SiD register will be developed in conjunction with the relevant stakeholders following the Schematic Design submission.

APPENDIX A
STORMWATER SKETCH





1 SITE PLAN
A-CP0103 SCALE 1 : 200

PRELIMINARY

REV	DATE	REVISION	DRN	CHK	PROJ APP
A	15/01/26	ISSUE FOR APPROVAL			
B	23/01/26	ISSUED FOR APPROVAL			
C	03/02/26	ISSUED FOR APPROVAL			
D	25/02/2026	ISSUE TO CONSULTANTS & QS			
E	20/03/2026	SCHEMATIC DESIGN ISSUE			
F	10/04/2026	SD ISSUE FOR APPROVAL			
G	5/06/2024	BIN STORE ADDED			
H	22/07/2026	ISSUED TO CONSULTANTS			

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DRN BY	Author
DATE	26/04/17
DESIGNED	Designer
CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

SITE PLAN - NEW WORKS

CURTIN PROJ No	CP354	SCALE:	1 : 200
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-SP0001	SHEET	OF ISSUE H

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Attachment Four

Waste Management Plan

Waste Management Plan

CP354 Curtin Agricola, Kalgoorlie

Rev_0

Project No. 26-1799

TRCB

30 June 2026

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Revision	Drafted by	Reviewed by	Date issued
Rev_0	Kirstie Stewart	Jenny Campbell	30 June 2026

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1 Development details

This Waste Management Plan (WMP) has been prepared for the following project:

Project name / address	CP354 Agricola Shared Facilities, Curtin University 61 Wilson Street, Kalgoorlie
Client	Curtin University
Architect	TRCB
Project manager	Proven Project Management
Main point of contact	Alan Tham, TRCB Architects
Planning status	DA was submitted on 1 May 2026 - awaiting feedback
Overview of development	The CP354 project includes development of the following key spaces within the existing Agricola Student Accommodation site: • New Social Centre/New Living Pavilion • New Wellbeing Centre • Outdoor amenities
Sustainability objectives and targets	Future consideration of Green Star Buildings rating may be considered at a later stage.
Architectural plans / area schedule / development information	• Architectural plans received from TRCB on 30 April 2026 • Schedule of Accommodation received from TRCB on 4 May 2026

1.1 Context

For efficient and effective waste management, the collection and centralisation of waste and recyclables has been carefully considered at the building design phase. Key factors considered at the design phase include:

- Local government requirements for determining waste generation rates
- Waste and recycling volumes likely to be generated during building operation
- Number and types of bins required
- Bin store size, location and amenity (odours and noise)
- Internal transfer and access to bins and storage areas from within the building
- Access for vehicles for waste collection
- Safety for all operatives involved in waste management

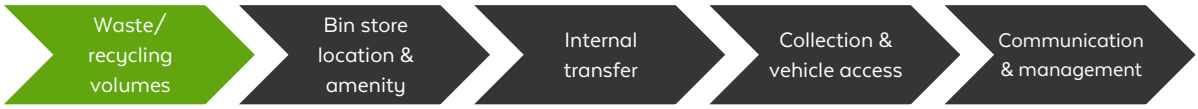
- Communication and ongoing management of waste and recycling services

1.2 Key components of the Waste Management Plan

This Waste Management Plan (WMP) consists of five core components. It presents detailed information on each of the following components.



2 Estimated waste and recycling volumes



2.1 Project parameters

The development when operational will include the following:

- Total number of buildings 2 (two) and both buildings are only 1 (one) single storey:
    - Social Centre NLA – 641 m^2
    - Wellness Centre NLA – 295 m^2
- Total number and breakdown of waste-generating spaces:
    - Social Centre includes:
        - Large multi-function space 181 m^2
        - Kitchen 73 m^2
        - Games room 26 m^2
        - Lounge 37 m^2
        - Bookable space 21 m^2
    - Wellness Centre includes:
        - Gym 108 m^2
        - Zen Den 49 m^2
        - Study 53 m^2
        - Meeting room 22 m^2
        - Reflection Space 24 m^2

2.2 Local Government Guidelines

The following have been used in the development of this report:

- City of Kalgoorlie-Boulder Waste Management Plan Guidelines
- City of Kalgoorlie-Boulder Consolidated Health Local Laws 2001
- WALGA Commercial and Industrial Waste Management Plan Guidelines (2018)

2.3 Waste generation rates

WALGA waste generation rates have been used in addition to Encycle's experience and knowledge of the uses of the building to calculate the estimated generation of waste and recyclables.

Specifically, the generation rates applied to each building use are presented in Table 2. The City of Kalgoorlie-Boulder and WALGA rates do not include a breakdown of material streams included in the 'recycling' stream. The final column presents Encycle Consulting's in-house estimate of the material streams present in the recycling stream based on our working experience of operational buildings in Perth.

Table 1: Commercial waste generation rates

Premises type/ building use and rate applied	Waste generation rate	Recycling generation rate	Percentage breakdown of recycling stream by material
Social Centre – Lounge/Games & Wellness Centre – Zen Den/Study – (Office – 232 m^2)	0.1 L /1m^2/day	0.1 L /1m^2/day	7% commingled 79% paper 14% cardboard 10% soft plastics
Wellness Centre / Gymnasium – 108 m^2	0.1 L /1m^2/day	0.1 L /1m^2/day	40% commingled 50% cardboard 10% soft plastics
Social Centre Multi-Function / (Function rooms – 181 m^2)	2.0 L /1m^2/day	1.0 L /1m^2/day	40% commingled 50% cardboard 100% glass (in addition, if licenced) 10% used cooking oil 10% soft plastics
Social Centre (Kitchen / Café – 73 m^2)	3 L /1m^2/day	2 L /1m^2/day	40% commingled 50% cardboard 100% glass (in addition) 10% used cooking oil 10% soft plastics

2.4 Number of bin stores required

The buildings share one bin store. In addition, the existing skip bin will remain and is to be dedicated solely to garden waste from the Campus.

2.5 Number of bins required

The number of bins required for the commercial waste are set out in Table 2. The skip bin will be located externally to the bin store.

Table 2: Number of bins to be stored in the bin store

Waste stream	Bin size (L)	Number of bins	Collection frequency	Colour code
General waste (excluding food waste)	660	3	3 x weekly	W
Commingled recycling	660	1	Weekly	CM
Cardboard recycling	660	2	Weekly	CB
CDS recycling	240	6	As required	CDS
Used cooking oil	200	1	As required	CO
Garden Organics	3000	1	As required	GO

3 Bin store locations and amenity

Waste/ recycling volumes | Bin store location & amenity | Internal transfer | Collection & vehicle access | Communication & management

3.1 Bin store location

The bin store will be located on the ground floor of the Social Centre (refer Figure 1). The skip bin will be located in the driveway area. Figure 2 shows the layout of the bin store and service area in relation to both the Social Centre and the Wellness Centre on the site.

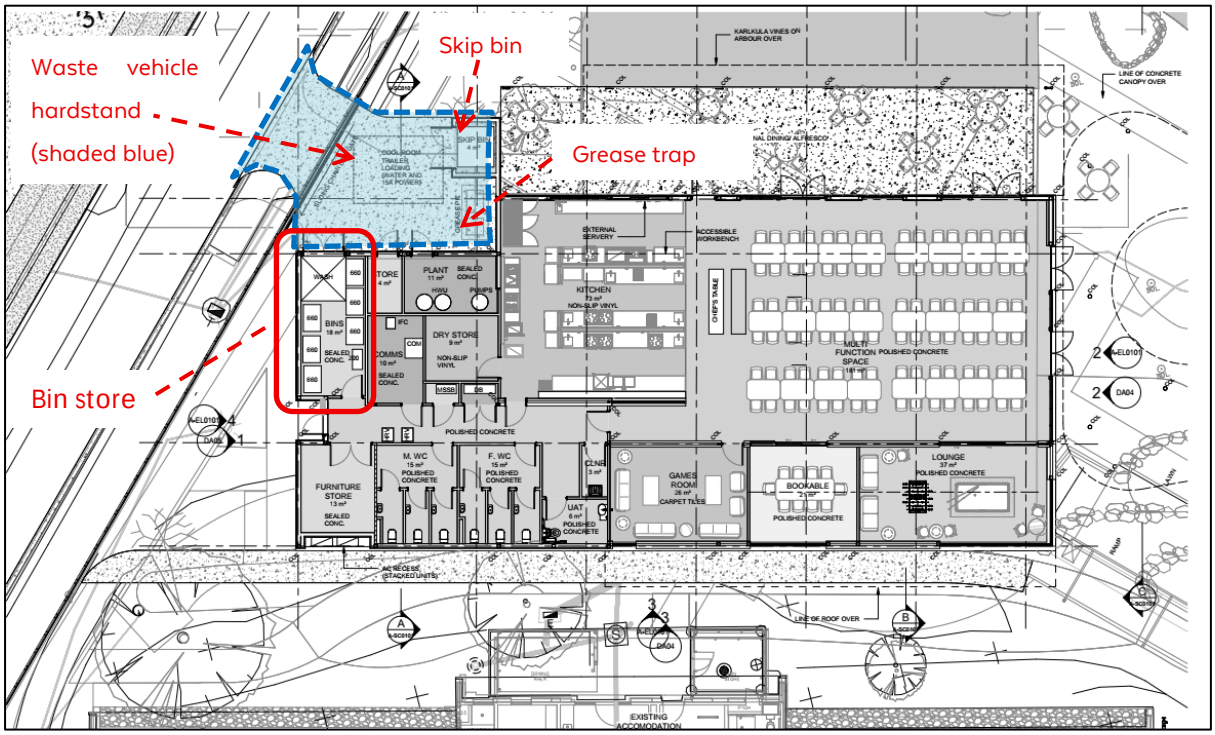


Figure 1: Social Centre floor plan showing Social Centre and Wellness Centre shared bin store

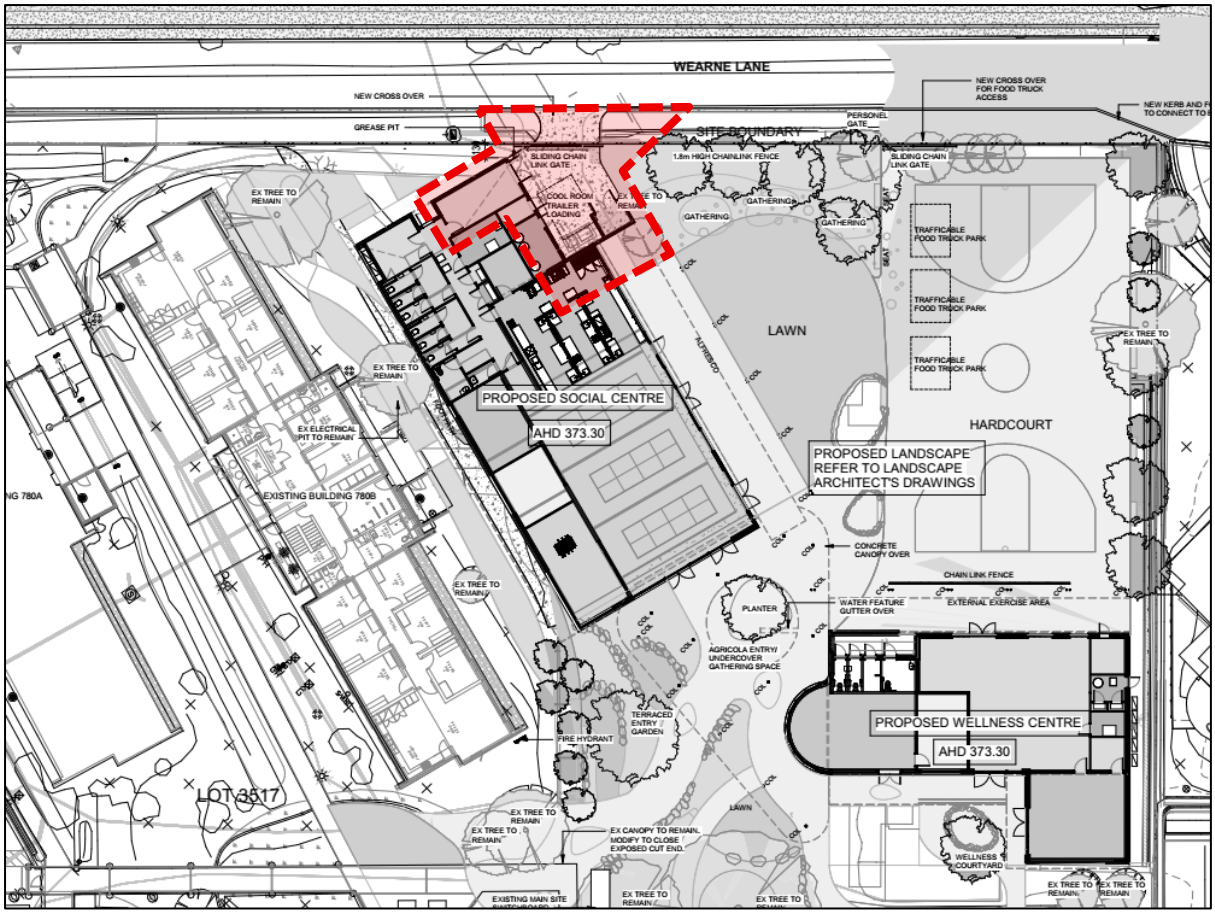


Figure 2: Site plan showing location of the shared bin store and service area for both the Social Centre and the Wellness Centre

3.2 Bin store amenity

The bin store has been designed to include the following requirements in

Table 3.

Table 3: Bin store amenity requirements

Aesthetics	The bin store is consistent with the overall aesthetics of the development.
Fully enclosed	The bin store is fully enclosed and weatherproof, and only accessible by cleaners, facility management and waste service providers.
Spatial requirements	The bin store allows sufficient space to accommodate, manoeuvre and wash the bins. Space for personnel access way between rows of bins is included.
Bin wash	The bin store has impermeable walls and floors grading to an industrial floor waste (including a charged 'water-trap' connected to sewer/an approved septic system), with a hose cock to enable bins and/or the enclosure to be washed out. A 100 mm floor waste gully to waste outlet is included. Both hot and cold water is available.
Doors	Doors are ventilated both internally and externally to the bin store. Self-closing doors are installed to the bin store to eliminate access to vermin. Doors from the bin store to the servicing/collection area can be locked open. Doors are designed to fit the largest bin, to enable bins to be easily wheeled into and out of the bin store.
Security	Security measures are designed to limit access to the bin store, e.g. PIN code that can be easily changed and reduces loss of key cards etc.
Walls and ceilings	Internal bin store walls are cement rendered (solid and impervious) to enable easy cleaning. Ceilings are finished with a smooth faced, non-absorbent material that can be easily cleaned. Walls and ceilings are finished or painted in a light colour.
Floors	Floors are constructed in concrete in accordance with AS 2870.Floors are evenly graded to an approved liquid refuse disposal system.Slab thickness is a minimum of 100 mm, impervious and with a brush finish treatment.
Ventilation and odour	The design of the bin store provides for adequate separate ventilation with a system that complies with Australian Standard 1668 (AS1668). The ventilation

	outlet is not in the vicinity of windows or intake vents associated with other ventilation systems.
Lighting	Bin store is provided with artificial lighting, with sensor or switch controls both internal/external to the bin store. Artificial lighting in laneways/loading bays and access walkways to bin store will ensure staff safety and decrease antisocial behaviour.
Noise	Noise is minimised through considering the location of the bin store and collection point and the timing of collections to prevent disruption to occupants or neighbours.
Signage	Visual aids and signage will be provided when the bin store is operational to ensure that the area works as intended.
Cooking oils	Used cooking oil storage will be bunded.

4 Internal transfer

Waste/ recycling volumes | Bin store location & amenity | **Internal transfer** | Collection & vehicle access | Communication & management

4.1 Transfer of waste to bin store

Staff from the Wellness Centre will manually transfer waste and recyclables to the bin store in the Social Centre building (refer Figure 3). Kitchen staff and/or cleaners of the Social Centre will use service corridors to transfer waste and recyclables from the kitchen and function room to the bin store.

Curtin University cleaners will transfer the bins from the general office/study areas to the bin store for collection.

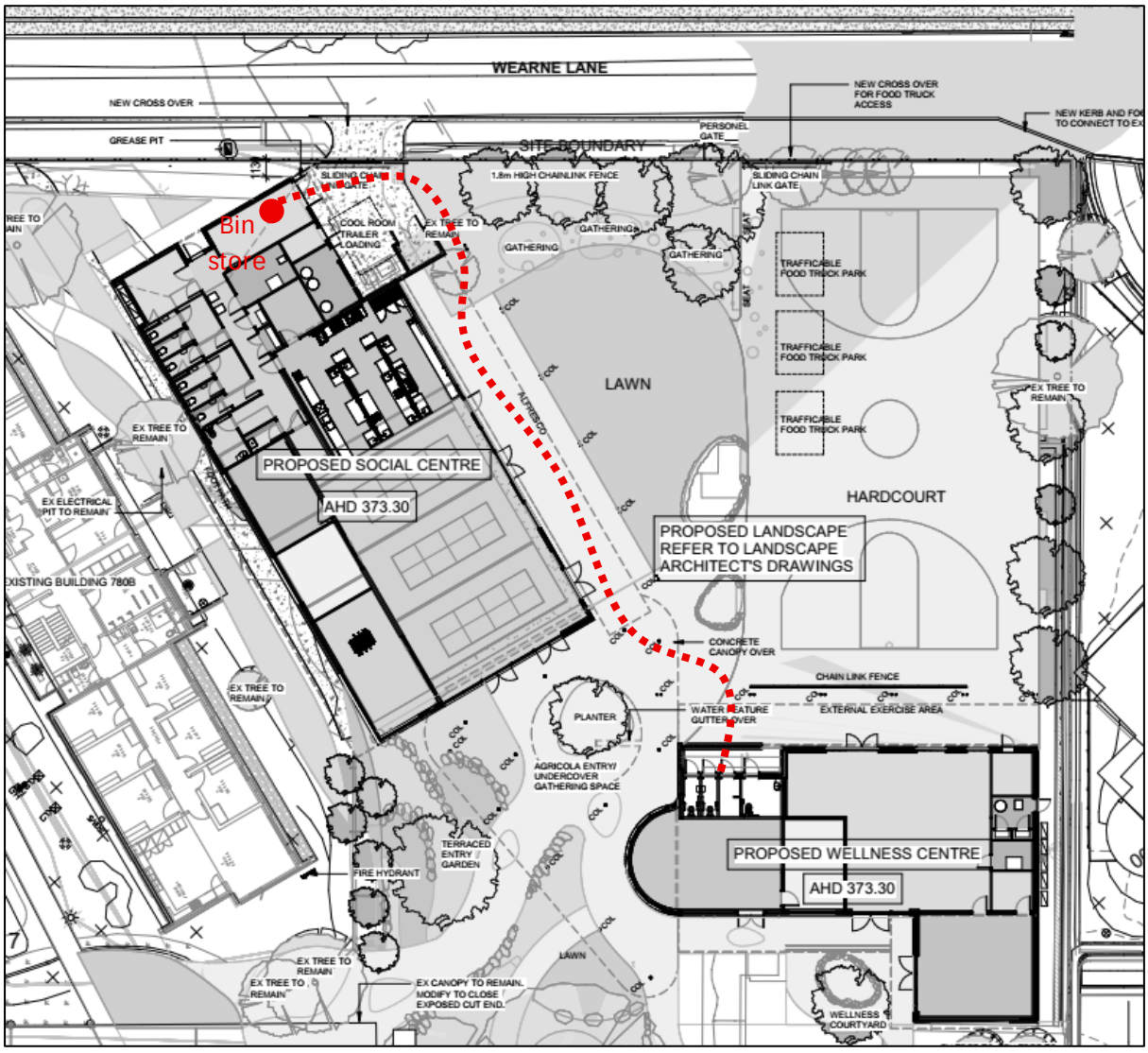


Figure 3: Transfer route from Wellness Centre to bin store (shown dashed red)

4.2 Bin transfer requirements

All bin transfer routes have been designed to include the following requirements in Table 4.

Table 4: Bin transfer requirements

Bin transfer requirements	
User access route	Waste transfer routes avoid stairs/steps and steep ramps (grade of slope <1:14) and other potential hazards between points of waste generation, storage and collection. Waste transfer routes are designed to ensure that bins (particularly when full) are not moved over any significant distances.
Manual handling	Manual handling of waste in garbage bags is excluded from the waste management systems wherever possible.
Transfer route width	All doors, corridors and lifts on the transfer route are designed to fit the largest bin.
Access for waste collection vehicles	Waste collection vehicles will safely enter, operate and exit the development with minimal reversing or manoeuvring.
Walkways	Safe access to waste collection vehicles have been provided to reduce the risk of accidents.

5 Collection and vehicle access

Waste/ recycling volumes | Bin store location & amenity | Internal transfer | Collection & vehicle access | Communication & management

A private waste service provider will service the general waste and recycling bins using rear-lift vehicles. A lift on – lift off vehicle will service the skip bin containing green organics. A tanker vehicle will require access to service the grease trap. In addition, a small tanker vehicle will require access to service the used cooking oil storage unit.

On collection days', rear-lift vehicles for general waste, commingled recycling and cardboard , a tanker to empty the grease trap and a tanker for used cooking oil, will enter the site from Wearne Lane. The vehicles will drive in reverse gear into the service yard and stop outside the bin store. The operatives will enter the bin store to retrieve and service the relevant bins. The operatives will return the empty bins to the bin store.

The lift on – lift off truck will also reverse into the service yard to access the skip on an 'as-required' basis, which will be loaded onto the rear of the vehicle.

Access to the grease trap located at the rear of the driveway, will be from Wearne Lane where the tanker will reverse into position.

Swept path analysis for vehicle ingress and egress has been completed by the consulting civil engineers WGA, taking into consideration the specifications of the lift-on lift-off vehicle waste collection vehicle (see Figure 3).

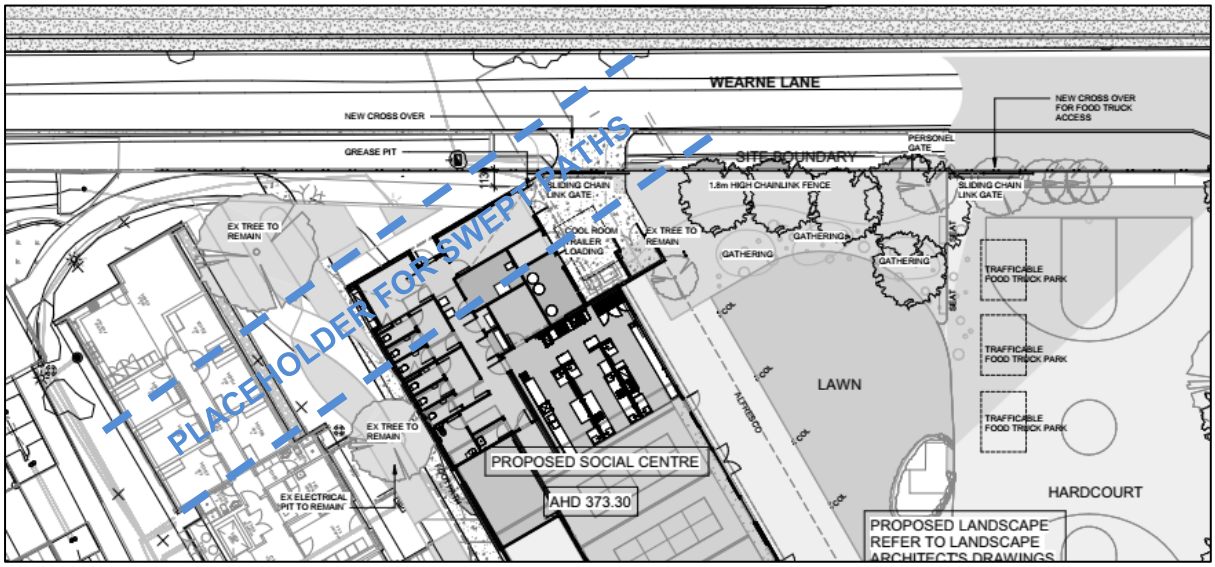
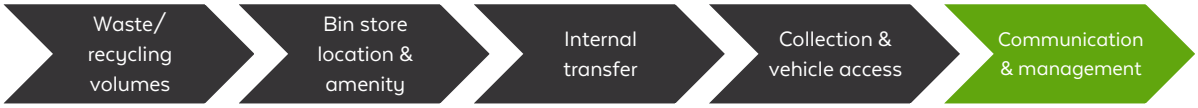


Figure 3: Swept path analysis showing access and confirmation of length and minimum height clearance for 4m high lift-on/lift-off waste collection vehicles.

6 Ongoing communication and management



6.1 Management

The Facility management team, will be responsible for overseeing the waste management systems. The facility manager will be trained and informed about their responsibility to work closely with the private waste service provider regarding the schedule for collection and presentation of bins in the bin store. The Facility Manager will be responsible for maintaining the bin store in a clean and tidy condition at all times and ensuring bins are washed regularly.

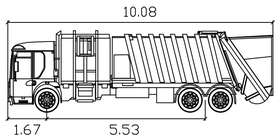
6.2 Communication

All staff and students will be made aware through a campus wide management document (or equivalent) of the waste and recycling systems and how they should be used.

Facility management will be responsible for the continuing education of student and staff on correct segregation of waste and recyclables to ensure successful performance of the waste management system within the buildings.

Appendix A: Glossary of terms and acronyms

Collection point	The permitted area on a footpath, roadway or private property (where applicable) that waste, recyclables and bulky waste are loaded into collection vehicles.
Commingled recycling	Common recyclables, mostly packaging; such as glass, plastics, aluminium, steel, liquid paper board (milk cartons). Commingled recycling may include paper but often, and particularly in offices, paper and cardboard are collected separately.
Container Deposit Scheme (CDS)	Also known as Containers for Change: In Western Australia 'eligible containers' (usually for soft and alcoholic drinks) have a 10 cent deposit which can be refunded when the container is redeemed at a refund facility.
Garden organics	Separated 'green' material (e.g. grass clippings or vegetation prunings).
General waste	Material that is intended for disposal to landfill (or in some States, incineration), normally what remains after the recyclables have been collected separately.
Grease trap	Collection of solid greases and oils in a tanker system to remove this material from water discharged to sewer from commercial kitchens or food processing facilities. Grease trap collection vehicle requirements can be included in the Waste Management Plan where relevant. Encycle are not hydraulics engineers and do not specify or advise on grease trap systems.
Recyclable	Material that can be collected separately from the general waste and sent for recycling. The precise definition will vary, depending upon location (i.e. systems exist for the recycling of some materials in some areas and not in others).
Recycling	Where a material or product undergoes a form of processing to produce a feedstock suitable for the manufacture of new products.



2003 Dennis Eagle Phoenix One Pass

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

SITE PLAN
SCALE 1:200

SCALE BAR (m)
1:200
4 2 0 4 8

When sheet printed full size, the scale bar is 100mm.
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A	03.08.2026	ISSUED FOR SCHEMATIC DESIGN	JC	RM	AY

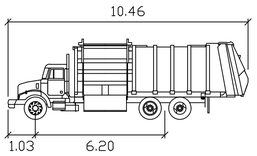
WGA

AGRICOLA SHARED FACILITIES
KALGOORLIE
10.1m WASTE VEHICLE
CIVIL WORKS - SCHEMATIC DESIGN ©

Design	Drawn	DOCUMENT NUMBER Project Number	Sheet No.	Rev.
RM	JC	WGA250696-SK-CV-0003	A	

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Heil Recycle 2000

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Track	: 2.45
Lock to Lock Time	6.0
Steering Angle	: 31.3

SITE PLAN
SCALE 1:200

SCALE BAR (m)
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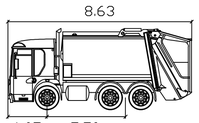
WGA

AGRICOLA SHARED FACILITIES
KALGOORLIE
10.5m WASTE VEHICLE
CIVIL WORKS - SCHEMATIC DESIGN ©

Design	Drawn	DOCUMENT NUMBER Project Number	Sheet No.	Rev.
RM	JC	WGA250696-SK-CV-0004	A1	A

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2003 Dennis Eagle Phoenix 2

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.5

SITE PLAN
SCALE 1:200

When sheet printed full size, the scale bar is 100mm.
0 50 100mm

SCALE BAR (m)
1:200
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WGA

AGRICOLA SHARED FACILITIES
KALGOORLIE
8.6m WASTE VEHICLE
CIVIL WORKS - SCHEMATIC DESIGN ©

A1
DOCUMENT NUMBER
Project Number: WGA250696-SK-CV-0002
Sheet No.: A
Rev.:
Design: RM
Drawn: JC

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Additional information received on 28 August 2026

From:	Belle Smithies
To:	Kevin Tang
Subject:	[EXTERNAL] RE: Service vehicle manoeuvring on Wearne Lane - Request for Further Information - proposed redevelopment of Agricola Student Accommodation shared facilities - 61 Wilson Street, Kalgoorlie (JobRef: 10187)
Date:	Friday, 28 August 2026 6:10:16 PM
Attachments:	image001.png image002.png image005.png image006.png image007.png image008.png image009.png image010.png image011.png image013.png image014.png image015.png image016.png image017.png image018.png image019.png

CAUTION: This email originated from outside of the City of Kalgoorlie-Boulder. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Kevin,

As discussed, the project team has undertaken design and waste management changes to enable all waste vehicles to enter and exit the site without mounting or ‘overhanging’ the kerb on either side of Wearne Lane.

Please find the updated architectural drawings, vehicle swept path diagrams and Waste Management Plan at the following OneDrive link: CURTIN AGRICOLA SHARED FACILITIES - 28-AUG-2026 SUBMISSION

We note the swept path diagram for the 10.08m vehicle shows corner of the vehicle meeting, but not hanging over, the outer kerb line. Whilst this appears to be close to encroaching on the kerb, we can advise that this vehicle model has a ground clearance of 250mm, meaning there will be reasonable clearance between the kerb and the vehicle. The project engineers, WMP, also advise that these swept paths are calculated using a conservative model with respect to turning capacity, and so the vehicles are unlikely to approach the kerb as closely as depicted in the diagrams.

The design modifications consist of increasing the crossover width, as suggested by the City, and removal of the external skip bin store. The number and size of the required waste vehicles have also been reduced. An explanation of and justification for these modifications is provided below.

Widening of Crossover

The proposed crossover has been widened from 7.5m to 11m at the boundary to accommodate wider vehicle movements.

While the proposed crossover is wider than is standard, we don’t consider it will have a negative visual impact on the streetscape. The crossover forms only a relatively small proportion of the site's overall frontage to Wearne Lane and will be framed by substantial landscaping on both sides, including the retention and establishment of mature trees and other planting. This landscaping will soften the appearance of the crossover and ensure that it is experienced as one component of a broader, well-landscaped streetscape rather than a dominant hardstand element.

In addition, the crossover does not serve a long, visually exposed driveway. Instead, it provides access to a carefully designed arrival and servicing area that is integrated with the proposed Social Centre. The architectural presentation of the Social Centre, together with the use of concrete paving rather than conventional bitumen surfacing, will create visual interest and contribute to an attractive forecourt environment.

The widened crossover is also not expected to adversely impact pedestrian safety, for the following reasons:

- Vehicle movements associated with the crossover will occur infrequently, resulting in limited interaction between vehicles and pedestrians;

- The existing pedestrian path on either side of the crossover will be maintained, and has adequate sight lines;
- The adjacent pedestrian path is expected to be utilised less frequently than the path on the opposite side of Wearne Lane, given it spans only a short distance, being a portion of the street boundary of the subject site; and
- The generous crossover width will facilitate smoother vehicle turning movements, reducing the need for complex manoeuvring and minimising the potential for vehicles to encroach onto adjoining areas.

Removal of Skip Bin Store

After further consultation with Curtin staff, the project team was advised that a full-size skip bin is no longer necessary. The facility has previously used a skip bin for green waste as well as other general waste, but with the additional bin storage proposed, the skip bin would only be used for green waste.

As a result, a smaller, 660L bin can be utilised for green waste instead of a skip bin. This bin is proposed to be stored within the internal bin store over the washdown area, and will be rolled outside during washdown of the other bins. The 660L garden organics bin will be collected by the same rear lift vehicle as for the general waste and recycling.

Changes to Waste Vehicles

The removal of the skip bin has resulted in the lift on/lift off skip bin vehicle no longer being required. Additionally, the two (2) remaining vehicles have been reduced in size.

The proposed waste vehicles are now as follows:

- 10.08m rear lift – general waste, recycling and garden organics; and
- 7.70m vacuum tanker – grease trap.

We trust the above is acceptable and will enable the City to finalise its RAR. Please let me know if you need any further information.

Regards,

Belle Smithies
Senior Town Planner

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W: www.rowegroup.com.au
Level 3 369 Newcastle Street,
Northbridge WA 6003

Development Approval granted for $70 million Shopping Centre in Perth's south

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From: Belle Smithies
Sent: Friday, 21 August 2026 3:10 PM

Waste Management Plan

CP354 Curtin Agricola,

Kalgoorlie WA

Rev_2

Project No. 26-1799

TRCB

28 August 2026

Encycle Consulting Pty Ltd

ABN 41 129 141 484

PO Box 6044

East Perth WA 6892

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JCampbell@encycle.com.au

Revision	Drafted by	Reviewed by	Date issued
Rev_0	K Stewart	J Campbell	30 June 2026
Rev_1	K Stewart	J Campbell	4 August 2026
Rev_2	K Stewart	J Ferguson	28 August 2026

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Encycle Consulting 2026

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1 Development details

This Waste Management Plan (WMP) has been prepared for the following project:

Project name / address	**CP354 Agricola Shared Facilities, Curtin University** 61 Wilson Street, Kalgoorlie WA
Client	Curtin University
Architect	TRCB
Project manager	Proven Project Management
Main point of contact	Alan Tham, TRCB Architects
Planning status	DA was submitted on 1 May 2026
Overview of development	The CP354 project includes development of the following key spaces within the existing Agricola Student Accommodation site: • New Social Centre/New Living Pavilion • New Wellbeing Centre • Outdoor amenities (associated with the two new buildings)
Sustainability objectives and targets	Future consideration of Green Star Buildings rating may be considered at a later stage.
Architectural plans / area schedule / development information	• Schedule of Accommodation received from TRCB on 4 May 2026 • Architectural plans received from TRCB on 26 August 2026 • Swept paths received from WGA on 28 August 2026

1.1 Context

For efficient and effective waste management, the collection and centralisation of waste and recyclables have been carefully considered at the building design phase. Key factors considered at the design phase include:

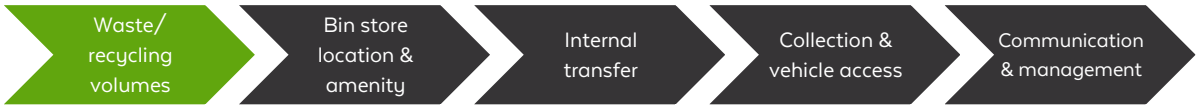
- Local government requirements for determining waste generation rates
- Waste and recycling volumes likely to be generated during building operation
- Number and types of bins required
- Bin store size, location and amenity (odours and noise)
- Internal transfer and access to bins and storage areas from within the building
- Access for vehicles for waste collection
- Safety for all operatives involved in waste management
- Communication and ongoing management of waste and recycling services

1.2 Key components of the Waste Management Plan

This Waste Management Plan (WMP) consists of five core components. It presents detailed information on each of the following components.



2 Estimated waste and recycling volumes



2.1 Project parameters

The development when operational will include the following:

- Total number of buildings 2 (two) and both buildings are only 1 (one) single storey:
    - Social Centre NLA – 641 m^2
    - Wellness Centre NLA – 271 m^2
- Total number and breakdown of waste-generating spaces:
    - Social Centre includes:
        - Large multi-function space 181 m^2
        - Kitchen 73 m^2
        - Games room 26 m^2
        - Lounge 36 m^2
        - Bookable space 21 m^2
    - Wellness Centre includes:
        - Gym 108 m^2
        - Zen Den 49 m^2
        - Study 53 m^2
        - Meeting room 22 m^2

2.2 Local Government Guidelines

The following have been used in the development of this report:

- City of Kalgoorlie-Boulder Waste Management Plan Guidelines
- City of Kalgoorlie-Boulder Consolidated Health Local Laws 2001
- WALGA Commercial and Industrial Waste Management Plan Guidelines (2018)

2.3 Waste generation rates

WALGA waste generation rates have been used in addition to Encycle's experience and knowledge of the uses of the building to calculate the estimated generation of waste and recyclables.

Specifically, the generation rates applied to each building use are presented in Table 1. The City of Kalgoorlie-Boulder and WALGA rates do not include a breakdown of material streams included in the 'recycling' stream. The final column presents Encycle Consulting's in-house estimate of the material streams present in the recycling stream based on our working experience of operational buildings in Perth.

Table 1: Commercial waste generation rates

Premises type/ building use and rate applied	Waste generation rate	Recycling generation rate	Percentage breakdown of recycling stream by material
Social Centre – Lounge/Games & Wellness Centre – Zen Den/Study – (Office–208 m^2)	0.1 L /1m^2/day	0.1 L /1m^2/day	7% commingled 79% paper 14% cardboard 10% soft plastics
Wellness Centre / (Gymnasium – 108 m^2)	0.1 L /1m^2/day	0.1 L /1m^2/day	40% commingled 50% cardboard 10% soft plastics
Social Centre Multi-Function / (Function rooms – 185 m^2)	2.0 L /1m^2/day	1.0 L /1m^2/day	40% commingled 50% cardboard 100% glass (in addition, if licenced) 10% used cooking oil 10% soft plastics
Social Centre (Kitchen / Café – 73 m^2)	3 L /1m^2/day	2 L /1m^2/day	40% commingled 50% cardboard 100% glass (in addition) 10% used cooking oil 10% soft plastics

2.4 Number of bin stores required

The Social Centre and Wellness Centre buildings share one bin store for all waste streams. The existing skip bin will be replaced with a garden organics bin located in the bin store servicing the wider Campus.

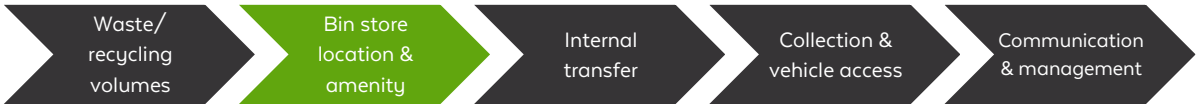
2.5 Number of bins required

The number of bins required are set out in Table 2.

Table 2: Number of bins to be stored in the bin store

Waste stream	Bin size (L)	Number of bins	Collection frequency	Colour code
General waste (excluding food waste)	660	3	3 x weekly	W
Commingled recycling	660	1	Weekly	CM
Cardboard recycling	660	2	Weekly	CB
CDS recycling	240	6	As required	CDS
Used cooking oil	200	1	As required	CO
Garden Organics	660	1	As required	GO

3 Bin store locations and amenity



3.1 Bin store location

The bin store will be located on the ground floor of the Social Centre (refer Figure 1). Figure 2 shows the layout of the shared bin store.

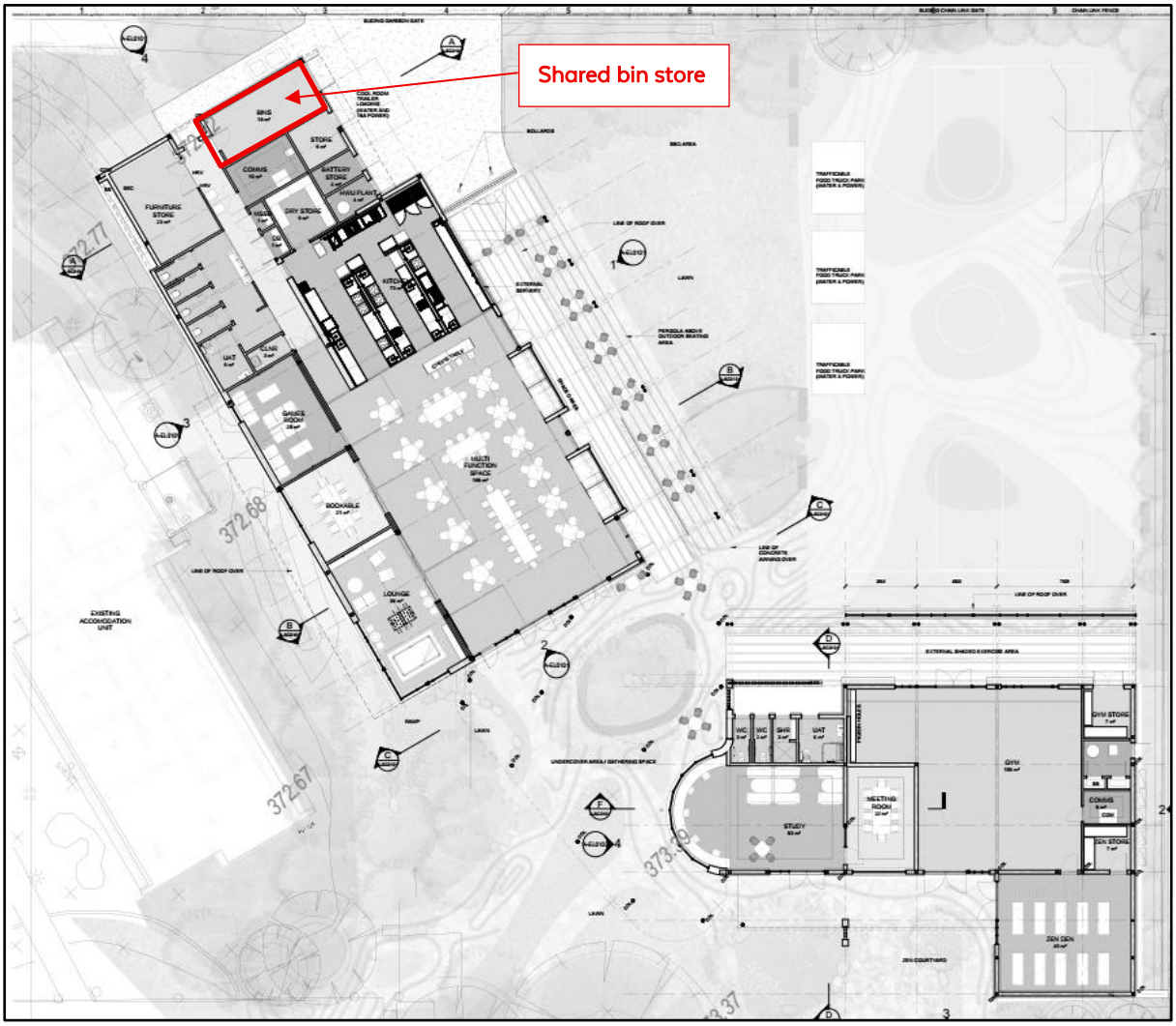


Figure 1: Site plan showing location of the shared bin store and service area for both the Social Centre and the Wellness Centre (not to scale)

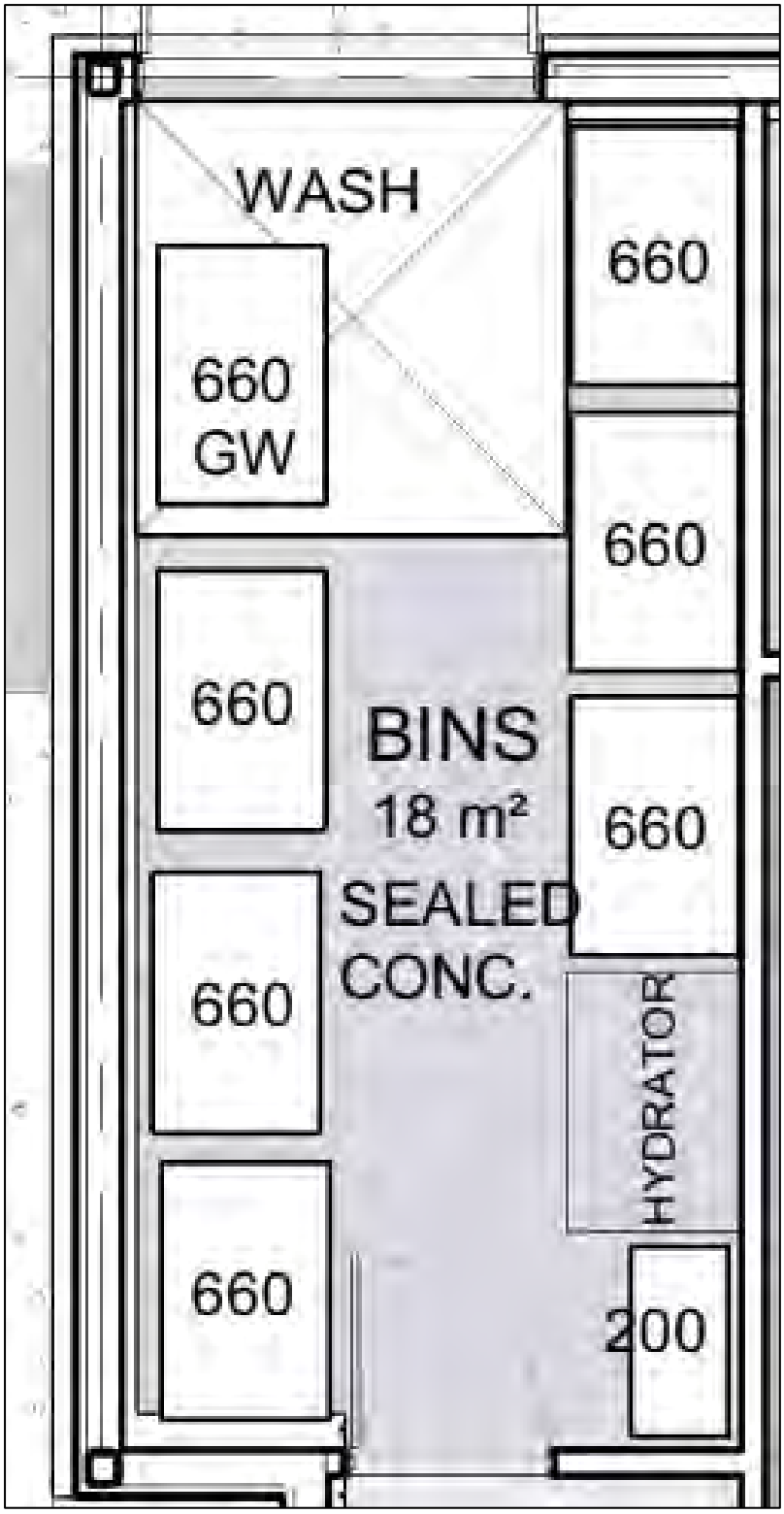


Figure 2: Layout of the bin store (not to scale)

3.2 Bin store amenity

The bin store has been designed to include the following requirements in Table 3.

Table 3: Bin store amenity requirements

Aesthetics	The bin store is consistent with the overall aesthetics of the development.
Fully enclosed	The bin store is fully enclosed and weatherproof, and only accessible by cleaners, facility management and waste service providers.
Spatial requirements	The bin store allows sufficient space to accommodate, manoeuvre and wash the bins. Space for personnel access way between rows of bins is included.
Bin wash	The bin store has impermeable walls and floors grading to an industrial floor waste (including a charged 'water-trap' connected to sewer/an approved septic system), with a hose cock to enable bins and/or the enclosure to be washed out. A 100 mm floor waste gully to waste outlet is included. Both hot and cold water is available.
Doors	Doors are ventilated both internally and externally to the bin store. Self-closing doors are installed to the bin store to eliminate access to vermin. Doors from the bin store to the servicing/collection area can be locked open. Doors are designed to fit the largest bin, to enable bins to be easily wheeled into and out of the bin store.
Security	Security measures are designed to limit access to the bin store, e.g. PIN code that can be easily changed and reduces loss of key cards etc.
Walls and ceilings	Internal bin store walls are cement rendered (solid and impervious) to enable easy cleaning. Ceilings are finished with a smooth faced, non-absorbent material that can be easily cleaned. Walls and ceilings are finished or painted in a light colour.
Floors	Floors are constructed in concrete in accordance with AS 2870. Floors are evenly graded to an approved liquid refuse disposal system. Slab thickness is a minimum of 100 mm, impervious and with a brush finish treatment.
Ventilation and odour	The design of the bin store provides for adequate separate ventilation with a system that complies with Australian Standard 1668 (AS1668). The ventilation

	outlet is not in the vicinity of windows or intake vents associated with other ventilation systems.
Lighting	Bin store is provided with artificial lighting, with sensor or switch controls both internal/external to the bin store. Artificial lighting in laneways/loading bays and access walkways to bin store will ensure staff safety and decrease antisocial behaviour.
Noise	Noise is minimised through considering the location of the bin store and collection point and the timing of collections to prevent disruption to occupants or neighbours.
Signage	Visual aids and signage will be provided when the bin store is operational to ensure that the area works as intended.
Cooking oils	Used cooking oil storage will be bunded.

4 Internal transfer

4.1 Transfer of waste to bin store

Staff from the Wellness Centre will manually transfer waste and recyclables to the bin store in the Social Centre building (refer Figure 3). Kitchen staff and/or cleaners of the Social Centre will use service corridors to transfer waste and recyclables from the kitchen and function room to the bin store.

Curtin University cleaners will transfer the bins from the general office/study areas to the bin store for collection.

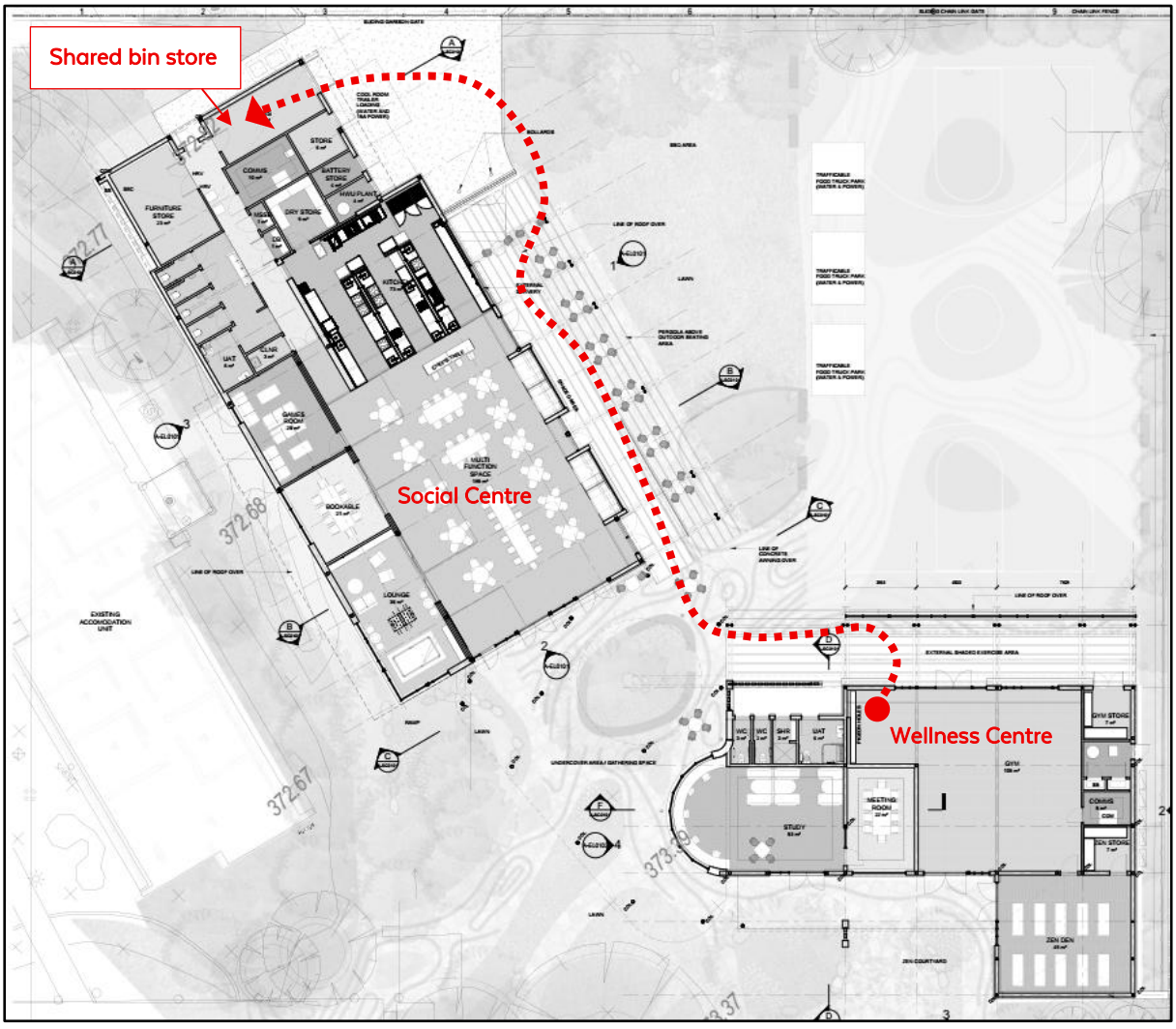


Figure 3: Transfer route from Wellness Centre to bin store (shown dashed red)

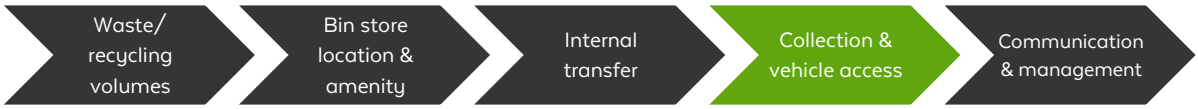
4.2 Bin transfer requirements

All bin transfer routes have been designed to include the following requirements in Table 4.

Table 4: Bin transfer requirements

Bin transfer requirements	
User access route	Waste transfer routes avoid stairs/steps and steep ramps (grade of slope <1:14) and other potential hazards between points of waste generation, storage and collection. Waste transfer routes are designed to ensure that bins (particularly when full) are not moved over any significant distances.
Manual handling	Manual handling of waste in garbage bags is excluded from the waste management systems wherever possible.
Transfer route width	All doors, corridors and lifts on the transfer route are designed to fit the largest bin.
Access for waste collection vehicles	Waste collection vehicles will safely enter, operate and exit the development with minimal reversing or manoeuvring.
Walkways	Safe access to waste collection vehicles have been provided to reduce the risk of accidents.

5 Collection and vehicle access



A private waste service provider will service the general waste, recycling and garden organics bins using rear-lift vehicles. A tanker vehicle will require access to service the grease trap. In addition, a small tanker vehicle will require access to service the used cooking oil storage unit.

On collection days', rear-lift vehicles for general waste, commingled recycling and cardboard, a tanker to empty the grease trap and a tanker for used cooking oil, will enter the site from Wearne Lane. The vehicles will reverse into the service yard and stop outside the bin store. The operatives will enter the bin store to retrieve and service the relevant bins. The operatives will return the empty bins to the bin store.

Access to the grease trap located at the rear of the driveway, will be from Wearne Lane where the tanker will reverse into position. Swept path analysis for vehicle ingress and egress has been completed by the consulting civil engineers WGA, taking into consideration the specifications of a 10.1 m rear-lift collection vehicle (see Figure 4).

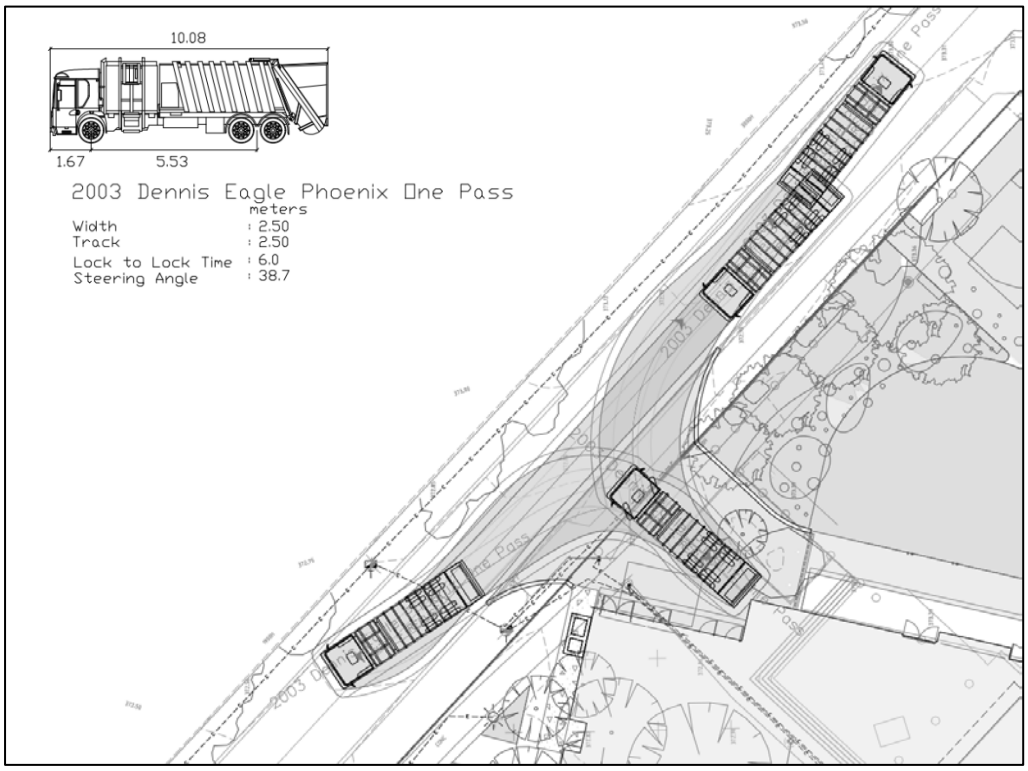
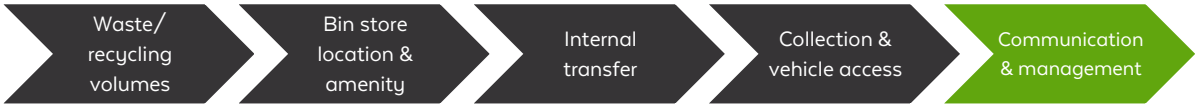


Figure 4: Swept path analysis showing access for 10.1 m rear-lift truck accessing the loading area

6 Ongoing communication and management



6.1 Management

The Facility management team, will be responsible for overseeing the waste management systems. The facility manager will be trained and informed about their responsibility to work closely with the private waste service provider regarding the schedule for collection and presentation of bins in the bin store. The Facility Manager will be responsible for maintaining the bin store in a clean and tidy condition at all times and ensuring bins are washed regularly.

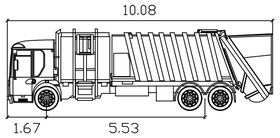
6.2 Communication

All staff and students will be made aware through a campus wide management document (or equivalent) of the waste and recycling systems and how they should be used.

Facility management will be responsible for the continuing education of student and staff on correct segregation of waste and recyclables to ensure successful performance of the waste management system within the buildings.

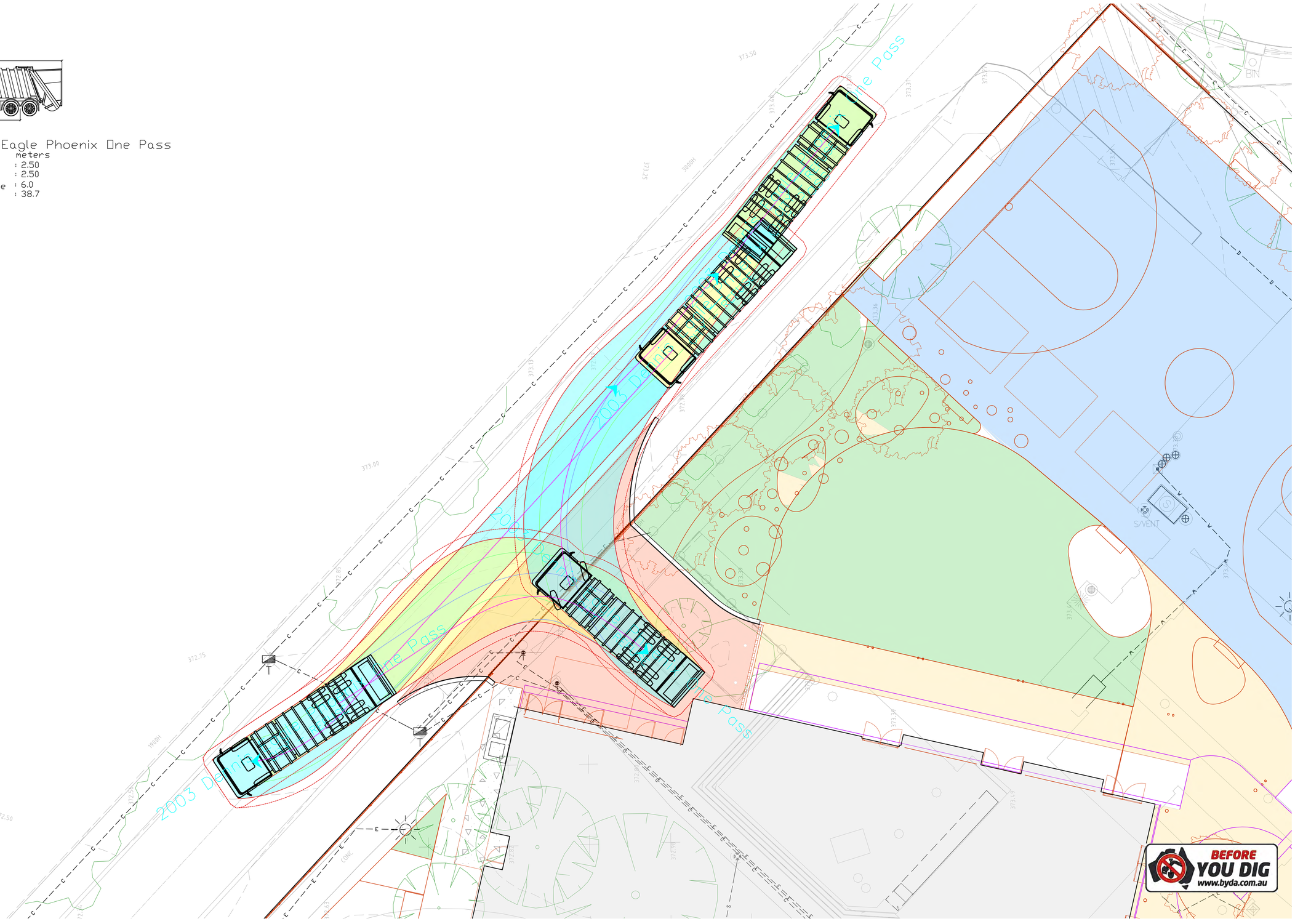
Appendix A: Glossary of terms and acronyms

Collection point	The permitted area on a footpath, roadway or private property (where applicable) that waste, recyclables and bulky waste are loaded into collection vehicles.
Commingled recycling	Common recyclables, mostly packaging; such as glass, plastics, aluminium, steel, liquid paper board (milk cartons). Commingled recycling may include paper but often, and particularly in offices, paper and cardboard are collected separately.
Container Deposit Scheme (CDS)	Also known as Containers for Change: In Western Australia 'eligible containers' (usually for soft and alcoholic drinks) have a 10 cent deposit which can be refunded when the container is redeemed at a refund facility.
Garden organics	Separated 'green' material (e.g. grass clippings or vegetation prunings).
General waste	Material that is intended for disposal to landfill (or in some States, incineration), normally what remains after the recyclables have been collected separately.
Grease trap	Collection of solid greases and oils in a tanker system to remove this material from water discharged to sewer from commercial kitchens or food processing facilities. Grease trap collection vehicle requirements can be included in the Waste Management Plan where relevant. Encycle are not hydraulics engineers and do not specify or advise on grease trap systems.
Recyclable	Material that can be collected separately from the general waste and sent for recycling. The precise definition will vary, depending upon location (i.e. systems exist for the recycling of some materials in some areas and not in others).
Recycling	Where a material or product undergoes a form of processing to produce a feedstock suitable for the manufacture of new products.



2003 Dennis Eagle Phoenix One Pass

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7



SITE PLAN
SCALE 1:100

SCALE BAR (m)
1:200

When sheet printed full size, the scale bar is 100mm.
0 50 100mm

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B	21.08.2026	ISSUED FOR DEVELOPMENT APPROVAL	JC	RM	AY
C	28.08.2026	REISSUED FOR DEVELOPMENT APPROVAL	JC	RM	AY

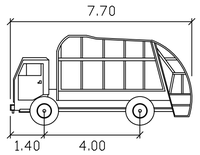
WGA

AGRICOLA SHARED FACILITIES
KALGOORLIE
10.1m WASTE VEHICLE - BINS
CIVIL WORKS - SCHEMATIC DESIGN ©

A1
DOCUMENT NUMBER
Project Number: WGA250696
Sheet No.: -SK-CV-0003
Rev.: C

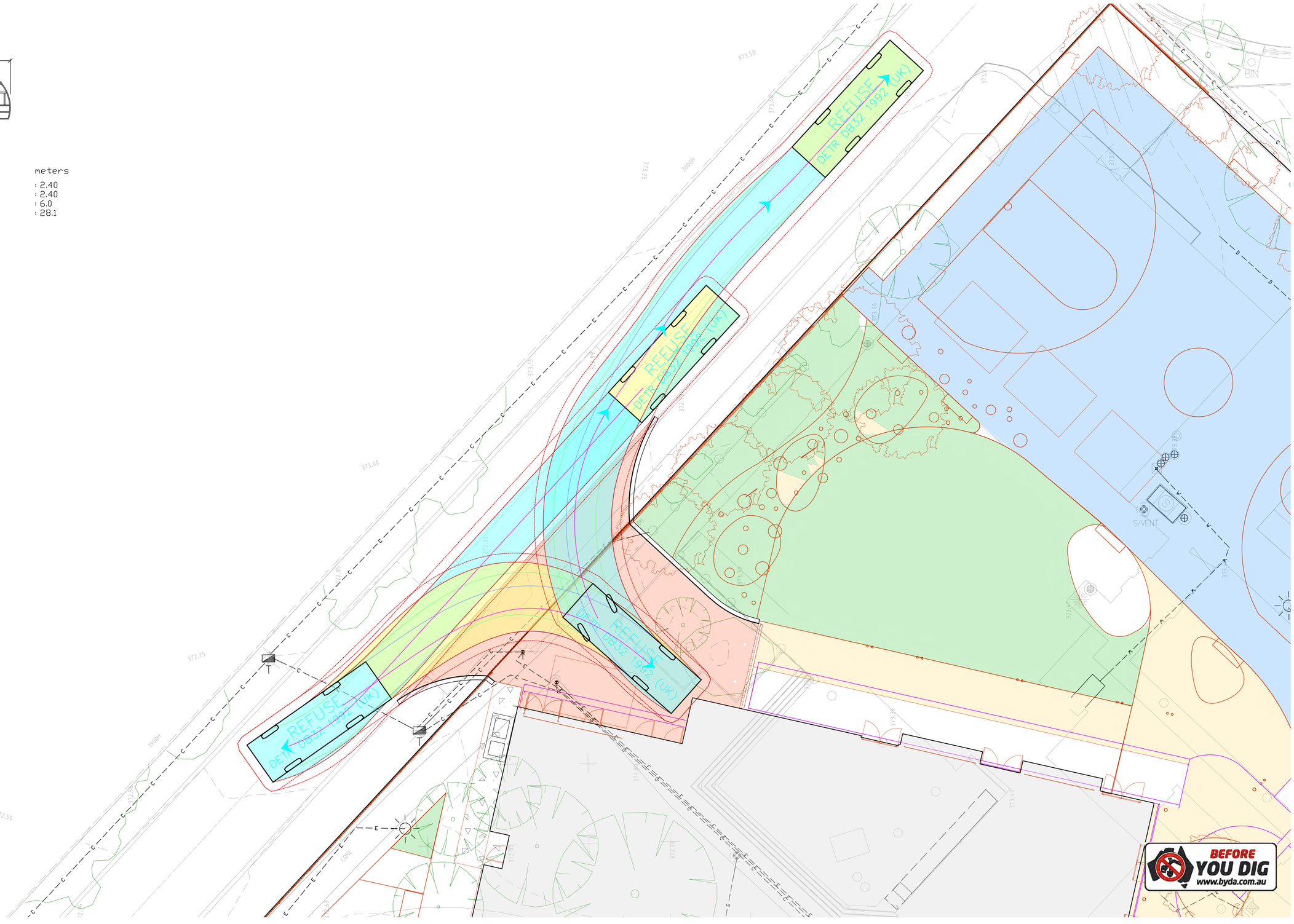
Design: RM
Drawn: JC

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REFUSE

	meters
Width	: 2.40
Track	: 2.40
Lock to Lock Time	: 6.0
Steering Angle	: 28.1



SITE PLAN
SCALE 1:100

SCALE BAR (m)
1:200

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WGA

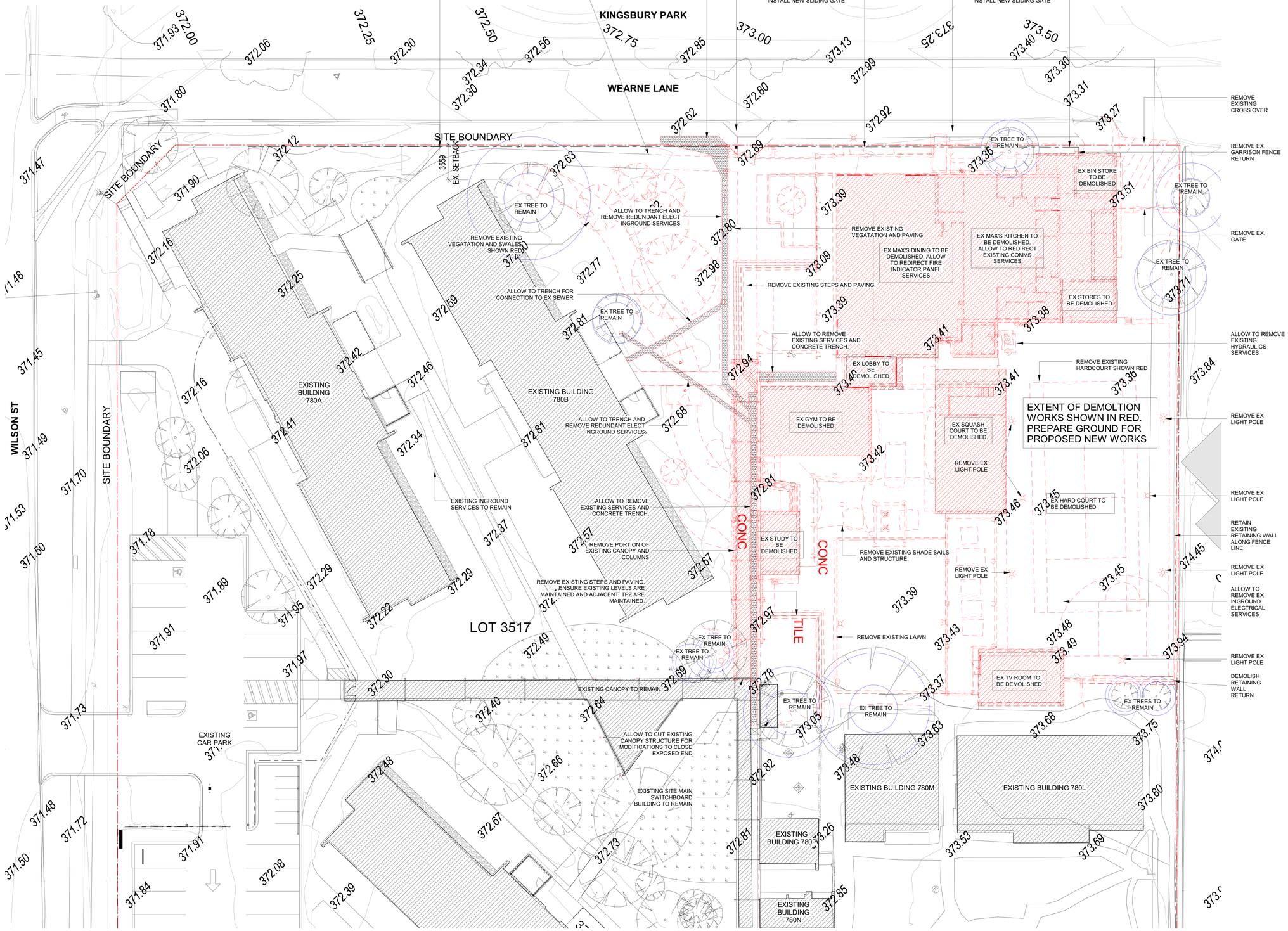
AGRICOLA SHARED FACILITIES
KALGOORLIE
7.7m WASTE VEHICLE - GREASE TRAP
CIVIL WORKS - SCHEMATIC DESIGN ©

A1
DOCUMENT NUMBER
Project Number | Sheet No. | Rev.
WGA250696-SK-CV-0004 C

Design RM | Drawn JC

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0 50 100mm

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1 SITE PLAN - DEMOLTION WORKS
A-CP0103 SCALE 1 : 200

LEGEND

- EXTENT OF DEMOLITION
- DEMOLITION OF EXISTING BUILDING. ALLOW FOR REMOVAL OF EXISTING EQUIPMENT.
- EXISTING BUILDING TO REMAIN
- EXISTING TREE TO BE REMOVED
- EXISTING TREE TO BE RETAINED & PROTECTED FOR DURATION OF CONSTRUCTION. TPZ SHOWN IN BLUE.

GENERAL NOTES

1. PRIOR TO UNDERTAKING ANY WORK, CONTRACTOR SHALL UNDERTAKE HAZARDOUS MATERIALS SURVEY INCLUDING BUT NOT LIMITED TO COMPLIANCE WITH CURTIN UNIVERSITY ASBESTOS MANAGEMENT PLAN.
2. INTRUSIVE HAZARDOUS MATERIALS REPORT PROVIDED FOR INFORMATION ONLY.
3. THE DEMOLITION IS SUBJECT TO THE STAGING OVERLAY.
4. DEMOLISH AND REMOVE ALL EXISTING WALLS, PARTITIONS, DOORS, JOINERY, SANITARY WARE, FIXTURES AND FITTINGS AS INDICATED WITH DASHED LINES.
5. DEMOLISH ALL EXISTING CEILINGS AND BULKHEADS UNLESS NOTED OTHERWISE ON DRAWING. MAKE GOOD TO THE UNDERSIDE OF ALL SLABS/ FLOOR SURFACES ABOVE WHERE SURFACE IS TO BE EXPOSED. SEAL ALL REDUNDANT PENETRATIONS TO RELEVANT AUSTRALIAN STANDARD.
6. REMOVE ALL EXISTING FLOOR FINISHES AND SUBSTRATES, UNLESS NOTED OTHERWISE, IN PREPARATION FOR NEW FINISHES. MAKE GOOD TO EXISTING FLOOR SURFACE WHERE DAMAGED.
7. ALL EXISTING WALLS, PARTITIONS, DOORS, FIXTURES AND FITTINGS TO BE RETAINED ARE TO BE MADE GOOD.
8. REMOVE ALL EXISTING DUCT WORK, PLUMBING, FIRE AND ELECTRICAL SERVICES AS SPECIFIED IN THE ENGINEERING DOCUMENTS.
9. CUT AND SEAL AT FLOOR SOURCE, ALL SERVICES TO BE REMOVED IN ACCORDANCE WITH ALL RELEVANT AUTHORITY REQUIREMENTS. FIRE SEAL ALL REDUNDANT PENETRATIONS TO RELEVANT AUSTRALIAN STANDARD.
10. THIS DEMOLITION PLAN SHOULD BE READ IN CONJUNCTION WITH ALL STRUCTURAL AND SERVICE DRAWINGS.
11. THE DEMOLITION PLAN INDICATES SCOPE OF WORKS. THE CONTRACTOR IS TO ALLOW FOR ALL DEMOLITION REQUIRED TO COMPLETE THE WORKS.

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C	20/03/2026	SCHEMATIC DESIGN ISSUE			
D	10/04/2026	SD ISSUE FOR APPROVAL			
E	22/07/2026	ISSUED TO CONSULTANTS			
F	05/08/2026	ISSUED FOR DA UPDATE			
G	26/08/2026	ISSUED TO CONSULTANTS - REMOVAL OF SKIP BIN STORE			

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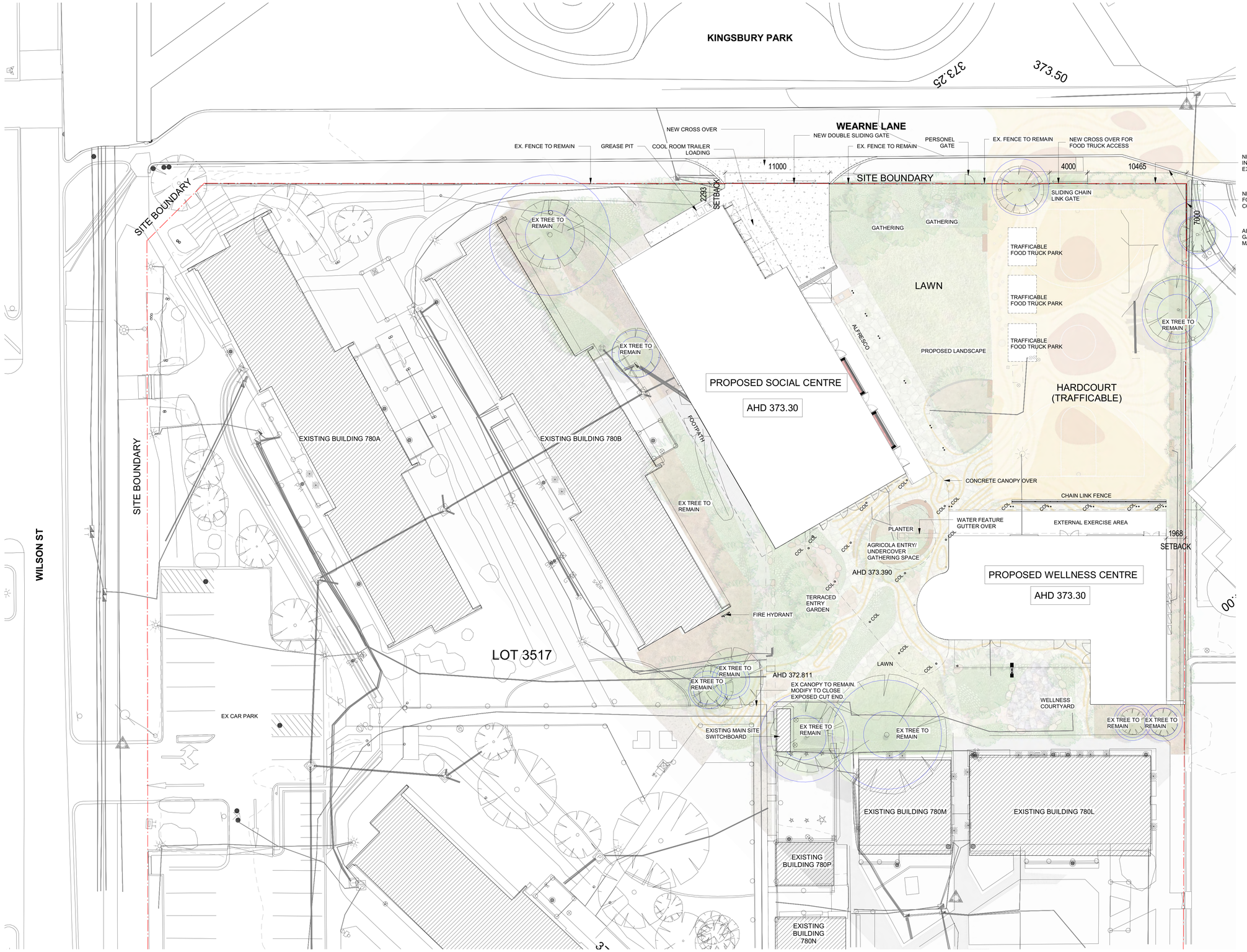
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PROJ APP	Approver
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AGRICOLA SHARED FACILITIES

SITE PLAN - DEMOLITION WORKS

CURTIN PROJ No	CP354	SCALE: UNIT:	As indicated
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-DP0001	SHEET / OF	ISSUE G



LEGEND

EXISTING TREE TO BE RETAINED & PROTECTED FOR DURATION OF CONSTRUCTION. TPZ SHOWN IN BLUE.

NEW TREE. REFER TO LANDSCAPE DRAWINGS.

FLOOR AREA CALCULATION

AREA OF EX BUILDING TO BE DEMOLISHED	= 800 m²
AREA OF PROPOSED EARTHWORKS	= 2503 m²
AREA OF PROPOSED BUILDINGS	= 855 m²
EXISTING CAR BAYS TO REMAIN	= 78

PRELIMINARY

REV	DATE	REVISION	DRN	CHK	PROJ APP
C	03/02/26	ISSUED FOR APPROVAL			
D	25/02/2026	ISSUE TO CONSULTANTS & QS			
E	20/03/2026	SCHEMATIC DESIGN ISSUE			
F	10/04/2026	SD ISSUE FOR APPROVAL			
G	5/06/2024	BIN STORE ADDED			
H	22/07/2026	ISSUED TO CONSULTANTS			
J	05/08/2026	ISSUED FOR DA UPDATE			
K	26/08/2026	ISSUED TO CONSULTANTS - REMOVAL OF SKIP BIN STORE			

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SITE PLAN - NEW WORKS

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		UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-SP0001	SHEET	OF ISSUE K

1 SITE PLAN
A-CP0103 SCALE 1 : 200

SLIDING GARISON GATE
SLIDING CHAIN LINK GATE
CHAIN LINK FENCE
BINS 18 m²
STORE 6 m²
COMMS 10 m²
BATTERY STORE 4 m²
HWU PLANT 4 m²
DRY STORE 9 m²
FURNITURE STORE 23 m²
MSSB 1 m²
DB 1 m²
KITCHEN 73 m²
UAT 6 m²
CLNR 3 m²
GAMES ROOM 25 m²
BOOKABLE 21 m²
LOUNGE 36 m²
MULTI FUNCTION SPACE 185 m²
CHEFS TABLE
SHADED AREA
COOL ROOM TRAILER LOADING (WATER AND 15A POWER)
BOLLARDS
BBQ AREA
LINE OF ROOF OVER
EXTERNAL SERVERY
PERGOLA ABOVE OUTDOOR SEATING AREA
LAWN
TRAFFICABLE FOOD TRUCK PARK (WATER & POWER)
TRAFFICABLE FOOD TRUCK PARK (WATER & POWER)
TRAFFICABLE FOOD TRUCK PARK (WATER & POWER)
COURT SEATING
LINE OF CONCRETE AWNING OVER
LINE OF ROOF OVER
EXISTING ACCOMODATION UNIT
RAMP
LAWN
UNDERCOVER AREA / GATHERING SPACE
LAWN
EXTERNAL SHADED EXERCISE AREA
WC 3 m²
WC 2 m²
SHR 3 m²
UAT 6 m²
PIGEON HOLES
GYM 108 m²
GYM STORE 7 m²
COMMS 5 m²
COM
ZEN STORE 7 m²
MEETING ROOM 22 m²
STUDY 53 m²
ZEN DEN 49 m²
ZEN COURTYARD
VIEW TO EXISTING LEMON TREES
372.92
372.77
372.68
372.67
373.84
373.39
373.37
3968
4500
7609
9498
4333
3367
2650
2702
4006

LEGEND

EXISTING TREE TO BE RETAINED & PROTECTED FOR DURATION OF CONSTRUCTION. TPZ SHOWN IN BLUE.

NEW TREE. REFER TO LANDSCAPE DRAWINGS.

PRELIMINARY

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D	15/01/26	ISSUE FOR APPROVAL			
E	23/01/26	ISSUED FOR APPROVAL			
F	03/02/26	ISSUED FOR APPROVAL			
G	25/02/2026	ISSUE TO CONSULTANTS & QS			
H	22/07/2026	ISSUED TO CONSULTANTS			
J	05/08/2026	ISSUED FOR DA UPDATE			
K	26/08/2026	ISSUED TO CONSULTANTS - REMOVAL OF SKIP BIN STORE			

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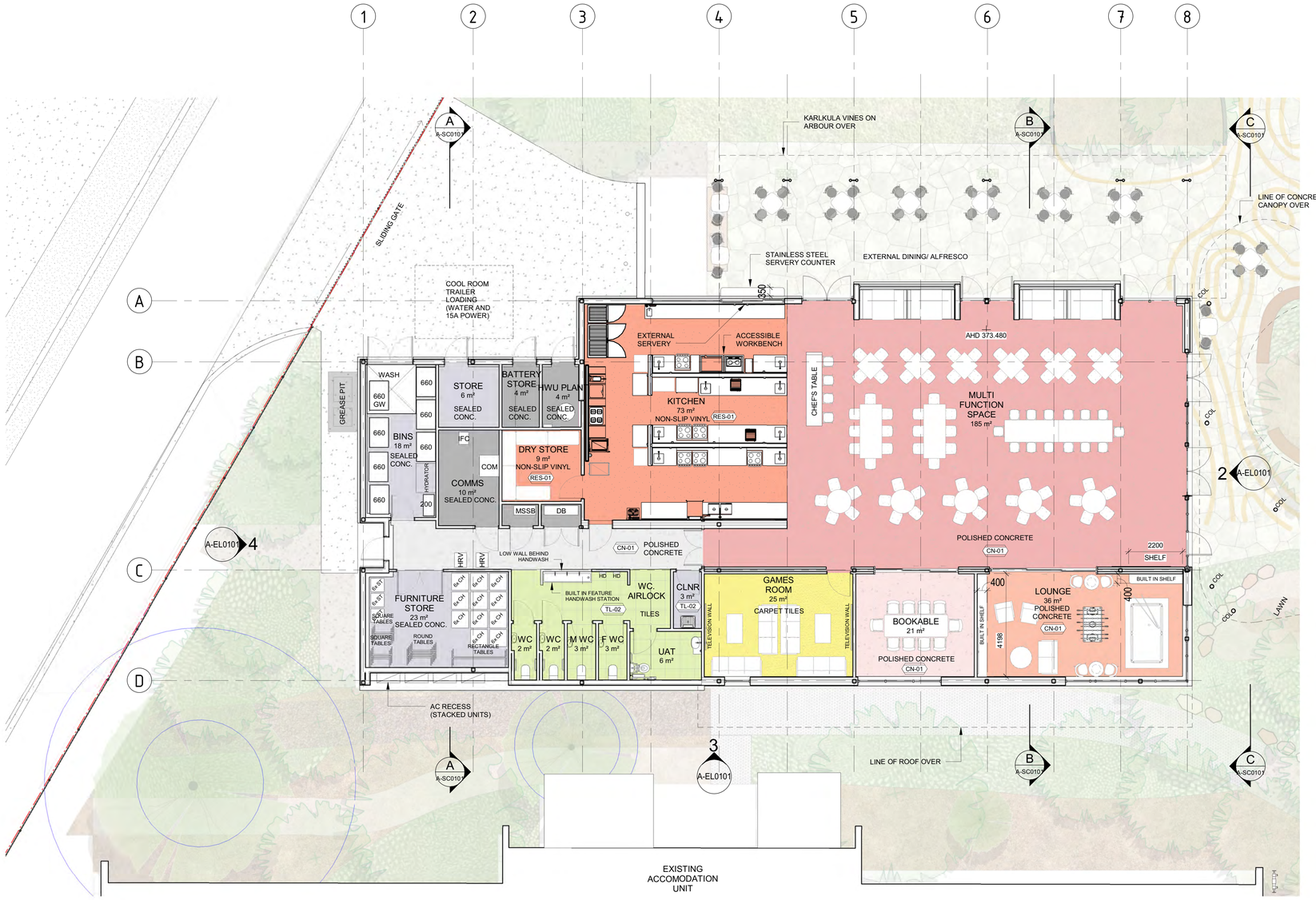
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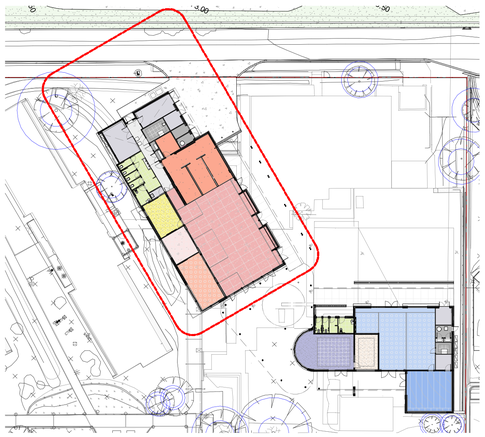
AGRICOLA SHARED FACILITIES

LEVEL 1 FLOOR PLAN

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DWG STATUS	SCHEMATIC DESIGN	UNIT:	
DWG No	03B781- A-FP0101	SHEET SIZE	A1
		SHEET	
		OF	
		ISSUE	K



1 SOCIAL CENTRE
SCALE 1 : 100



2 KEY PLAN
SCALE 1 : 500

REV	DATE	REVISION	DRN	CHK	PROJ APP
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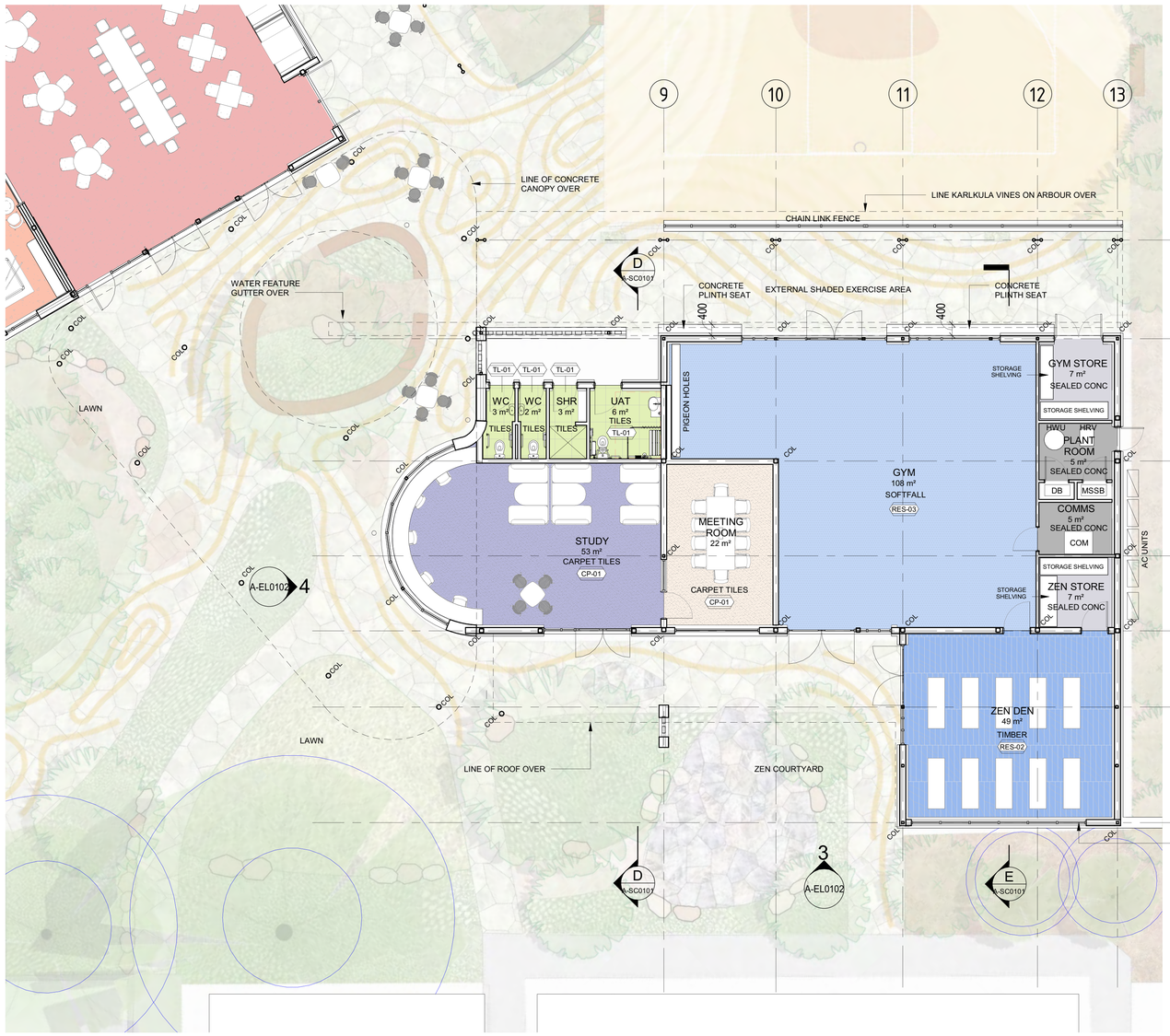
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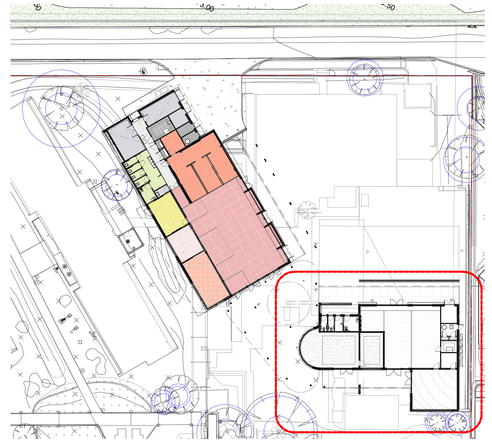
AGRICOLA SHARED FACILITIES

SOCIAL CENTRE FLOOR PLAN

CURTIN PROJ No	CP354	SCALE: UNIT:	As indicated
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-FP0102	SHEET / OF	ISSUE H



1 WELLNESS CENTRE
A-CP0103 SCALE 1 : 100



2 KEY PLAN
A-CP0103 SCALE 1 : 500

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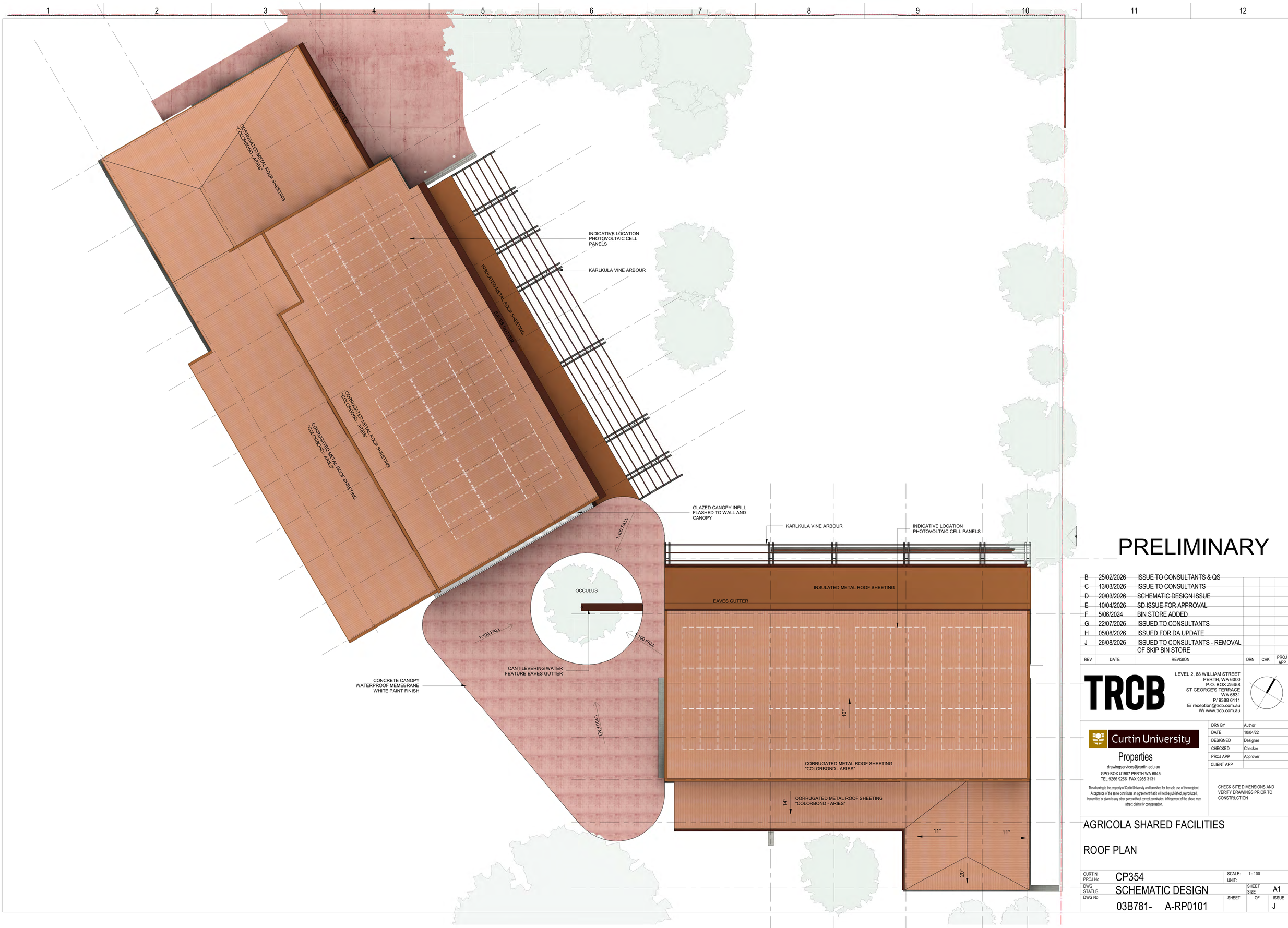
DRN BY	Author
DATE	02/23/26
DESIGNED	Designer
CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

WELLNESS CENTRE FLOOR PLAN

CURTIN PROJ No	CP354	SCALE: UNIT:	As indicated
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-FP0103	SHEET / OF	ISSUE G



PRELIMINARY

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CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

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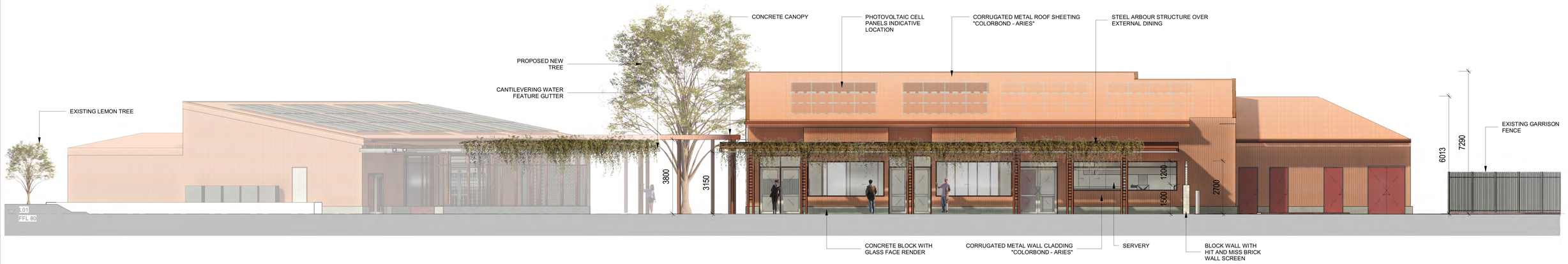
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AGRICOLA SHARED FACILITIES

ROOF PLAN

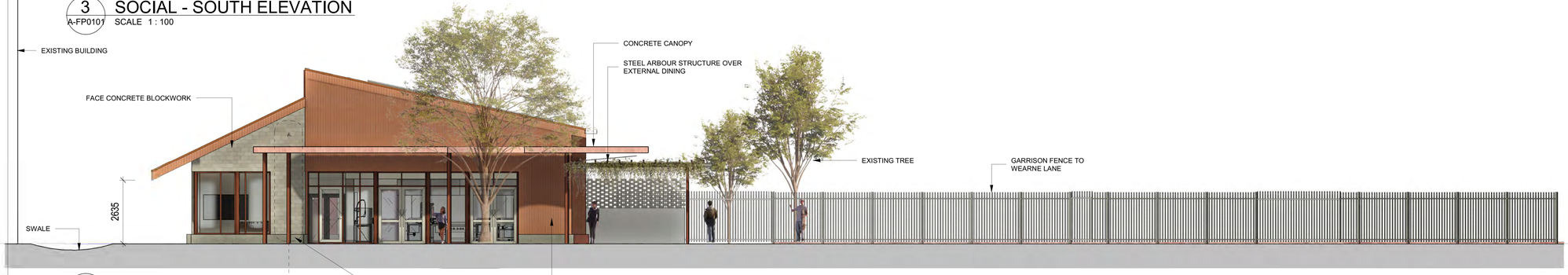
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DWG STATUS	SCHEMATIC DESIGN	UNIT:	
DWG No	03B781- A-RP0101	SHEET SIZE	A1
		SHEET	OF / ISSUE J



1 SOCIAL - NORTH ELEVATION
A-FP0101 SCALE 1 : 100



3 SOCIAL - SOUTH ELEVATION
A-FP0101 SCALE 1 : 100



2 SOCIAL - EAST ELEVATION
A-FP0101 SCALE 1 : 100



5 SIGNAGE
SCALE 1 : 100



4 SOCIAL - WEST ELEVATION
A-FP0101 SCALE 1 : 100

PRELIMINARY

REV	DATE	REVISION	DRN	CHK	PROJ APP
A	25/02/2026	ISSUE TO CONSULTANTS & QS			
B	13/03/2026	ISSUE TO CONSULTANTS			
C	20/03/2026	SCHEMATIC DESIGN ISSUE			
D	10/04/2026	SD ISSUE FOR APPROVAL			
E	5/06/2024	BIN STORE ADDED			
F	22/07/2026	ISSUED TO CONSULTANTS			
G	05/08/2026	ISSUED FOR DA UPDATE			
H	26/08/2026	ISSUED TO CONSULTANTS - REMOVAL OF SKIP BIN STORE			

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DRN BY	Author
DATE	10/04/22
DESIGNED	Designer
CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

ELEVATIONS - SOCIAL CENTRE

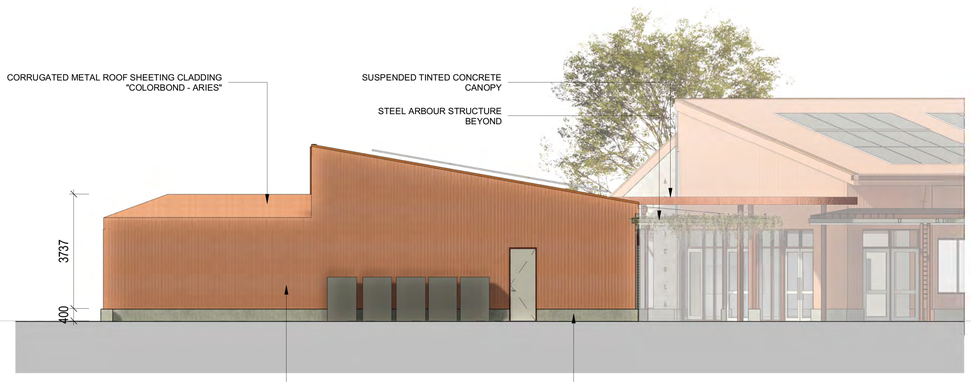
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		UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-EL0101	SHEET	
		OF	
		ISSUE	H



1 WELLNESS - NORTH WEST ELEVATION
A-FP0102 SCALE 1 : 100



3 WELLNESS - SOUTH EAST ELEVATION
A-FP0101 SCALE 1 : 100



2 WELLNESS - NORTH EAST ELEVATION
A-FP0101 SCALE 1 : 100



4 WELLNESS - SOUTH WEST ELEVATION
A-FP0101 SCALE 1 : 100

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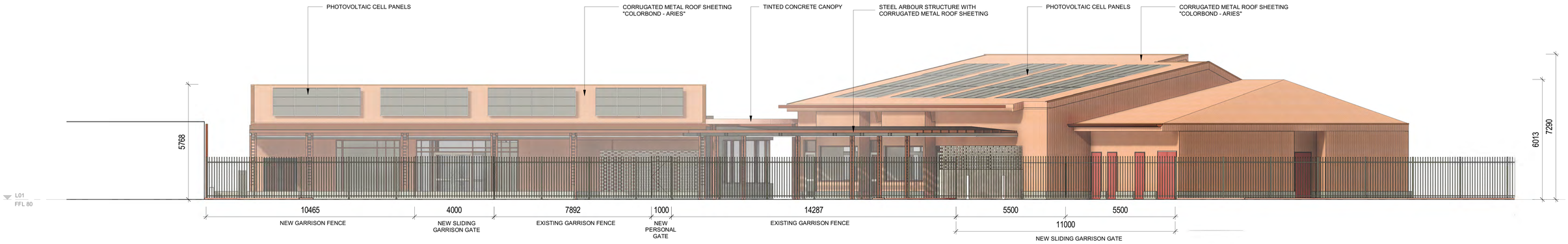
DRN BY	Author
DATE	10/04/22
DESIGNED	Designer
CHECKED	Checker
PROJ APP	Approver
CLIENT APP	

CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

ELEVATIONS - WELLNESS CENTRE

CURTIN PROJ No	CP354	SCALE:	1 : 100
		UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-EL0102	SHEET / OF / ISSUE	H



1 STREET ELEVATION

A-FP0102 SCALE 1 : 100

PRELIMINARY

REV	DATE	REVISION	DRN	CHK	PROJ APP
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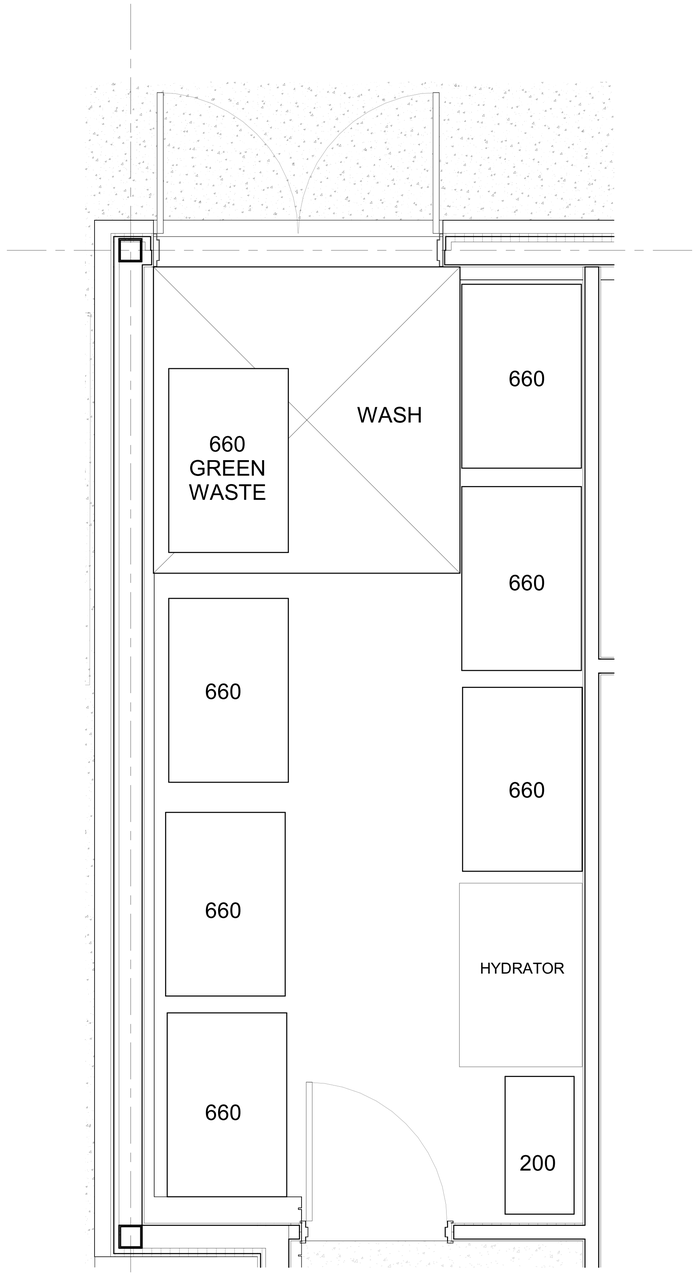
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AGRICOLA SHARED FACILITIES

ELEVATIONS - STREET ELEVATION

CURTIN PROJ No	CP354	SCALE: UNIT:	1 : 100
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- A-EL0103	SHEET / OF	ISSUE C

CODE LEGEND	
CODE	DESCRIPTION



1 BIN STORE - PLAN
SCALE 1 : 20

REV	DATE	REVISION	DRN	CHK	PROJ APP
A	26/08/2026	ISSUED TO CONSULTANTS - REMOVAL OF SKIP BIN STORE			

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PROJ APP	Approver
CLIENT APP	

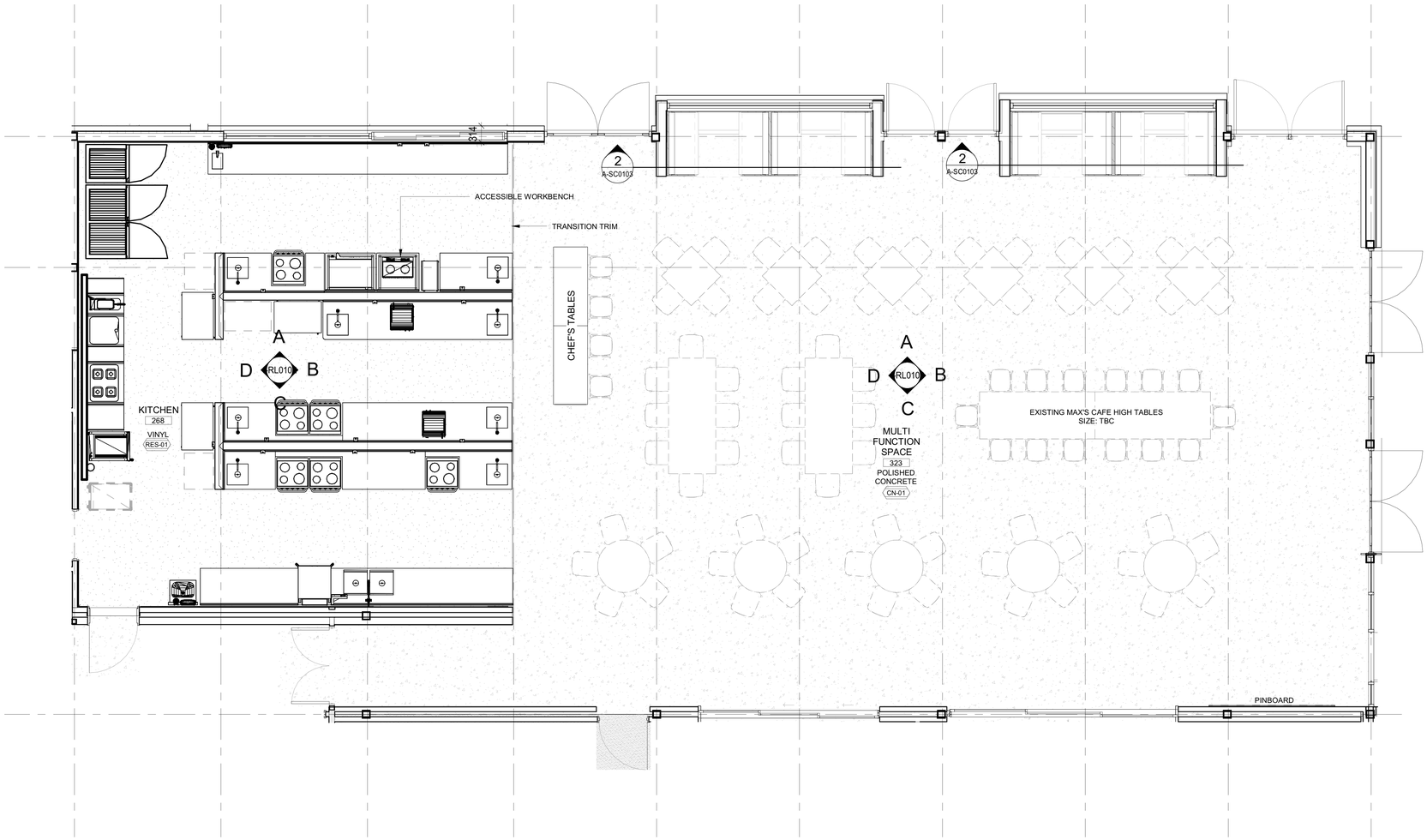
CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

ROOM LAYOUT - BIN STORE

CURTIN PROJ No	CP354	SCALE: UNIT:	1 : 20
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- I-RL0105	SHEET / OF	ISSUE A

CODE LEGEND	
CODE	DESCRIPTION
CN-01	Feature Concrete Finish
RES-01	Resilient Floor - Vinyl - Non-slip



1 MULTI FUNCTION ROOM - PLAN
SCALE 1 : 50

REV	DATE	REVISION	DRN	CHK	PROJ APP
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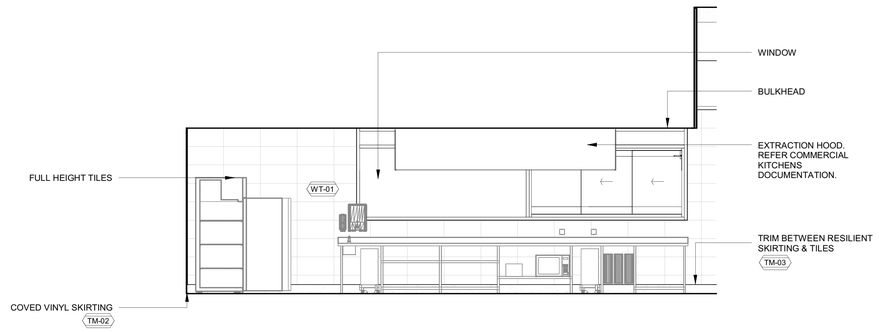
CHECK SITE DIMENSIONS AND VERIFY DRAWINGS PRIOR TO CONSTRUCTION

AGRICOLA SHARED FACILITIES

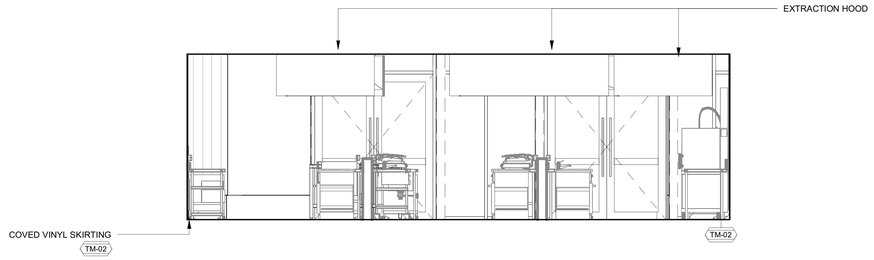
ROOM LAYOUT - MULTI FUNCTION ROOM

CURTIN PROJ No	CP354	SCALE: 1 : 50 UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- I-RL0101	SHEET	OF ISSUE C

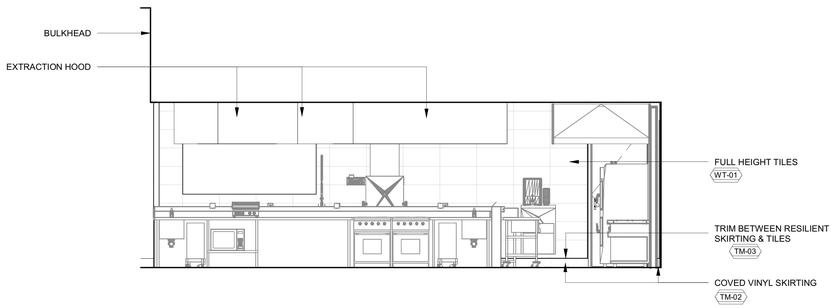
CODE LEGEND	
CODE	DESCRIPTION
TM-02	Coved Skirting
TM-03	Coved Skirting - Capping Strip Detail to Wall Tiling
WT-01	Wall Tiling - Porcelain



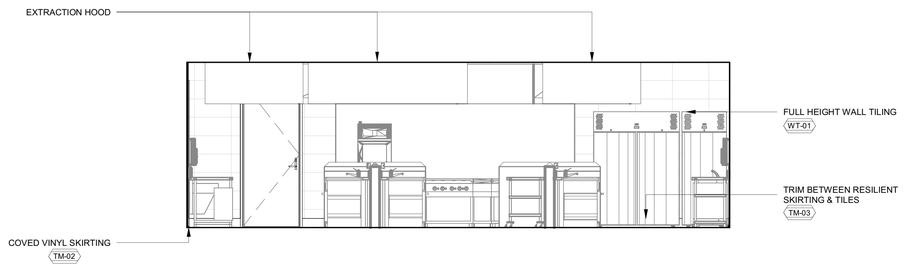
A FURN-02 INTERIOR ELEVATION - KITCHEN A
SCALE 1 : 50



B FURN-02 INTERIOR ELEVATION - KITCHEN B
SCALE 1 : 50



C FURN-02 INTERIOR ELEVATION - KITCHEN C
SCALE 1 : 50



D FURN-02 INTERIOR ELEVATION - KITCHEN D
SCALE 1 : 50

REV	DATE	REVISION	DRN	CHK	PROJ APP
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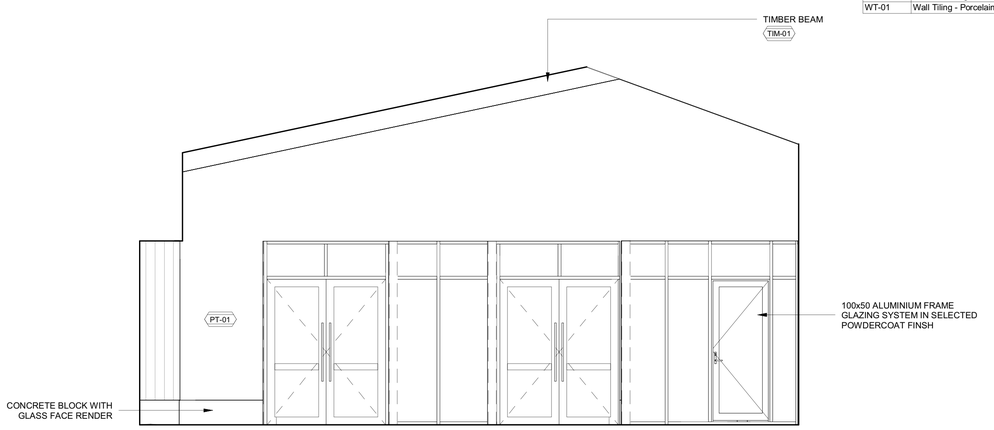
INTERNAL ELEVATIONS - KITCHEN

CURTIN PROJ No	CP354	SCALE: UNIT:	1 : 50
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- I-RL0102	SHEET / OF	ISSUE C

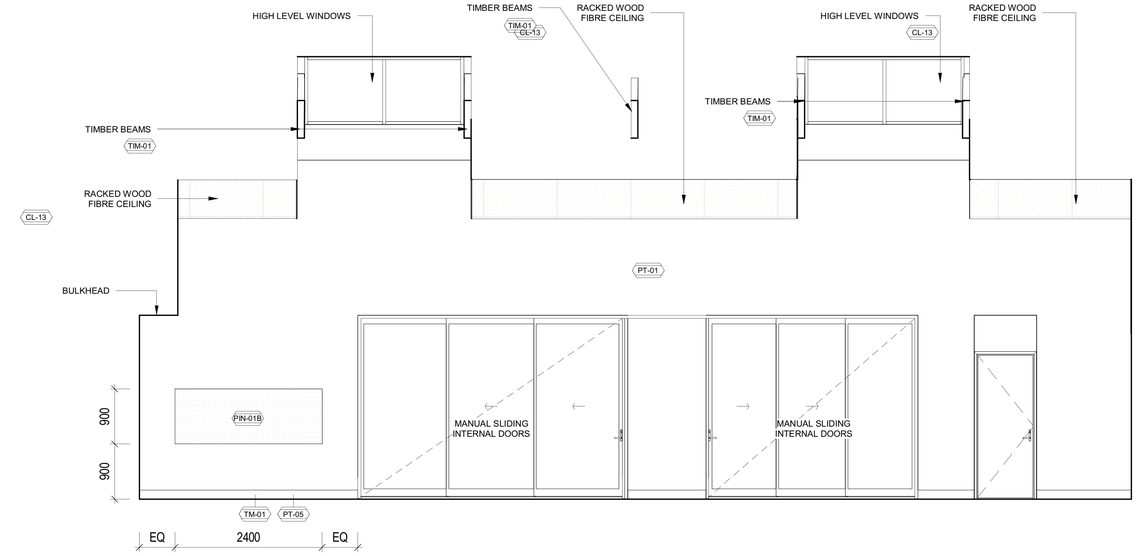
CODE LEGEND	
CODE	DESCRIPTION
CL-13	Suspended Ceiling - Wood Fibre Ceiling
FAB-01A	Joinery Finish - Fabric
FAB-01B	Joinery Finish - Fabric
FAB-02A	Joinery Finish - Vinyl
FAB-02B	Joinery Finish - Vinyl
LM-01	Joinery Finish - Laminate
PIN-01B	Pinboard
PT-01	Internal Paint - Wall
PT-05	Internal Paint - Timber door frames and trims
TIM-01	Solid Timber
TM-01	Skirting - Medium-Density Fibreboard (MDF)
TM-02	Coved Skirting
WT-01	Wall Tiling - Porcelain



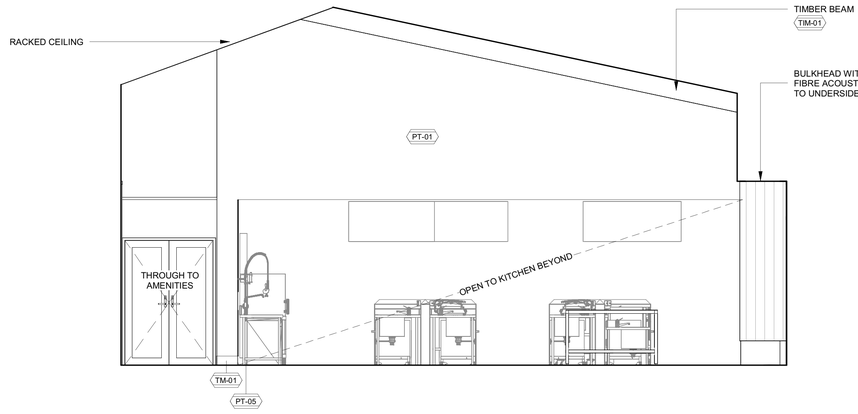
A I-RL0101 INTERIOR ELEVATION - M.FUNCTION ROOM A
SCALE 1 : 50



B I-RL0101 INTERIOR ELEVATION - M. FUNCTION ROOM B
SCALE 1 : 50



C I-RL0101 INTERIOR ELEVATION - M.FUNCTION ROOM C
SCALE 1 : 50



D I-RL0101 INTERIOR ELEVATION - M. FUNCTION ROOM D
SCALE 1 : 50

REV	DATE	REVISION	DRN	CHK	PROJ APP
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AGRICOLA SHARED FACILITIES

INTERNAL ELEVATIONS - MULTI FUNCTION ROOM

CURTIN PROJ No	CP354	SCALE:	1 : 50
		UNIT:	
DWG STATUS	SCHEMATIC DESIGN	SHEET SIZE	A1
DWG No	03B781- I-RL0103	SHEET	
		OF	
		ISSUE	C

Department of **Mines, Petroleum and Exploration**

GOVERNMENT OF WESTERN AUSTRALIA

[redacted]

Resource and Environmental Regulation
20 July 2026

Mr Kevin Tang
Coordinator Statutory Planning
City of Kalgoorlie-Boulder
Sent by email - mailbag@ckb.wa.gov.au

Dear Sir

DEVELOPMENT APPROVAL - REDEVELOPMENT OF AGRICOLA STUDENT SHARED FACILITY INTO A SOCIAL AND WELLNESS CENTRE - LOT 3517 (61) WILSON ST, KALGOORLIE

Thank you for your letter dated 02/07/2026 inviting comment on the proposed redevelopment of the Agricola student shared facility on Lot 3517 (61) Wilson St, Kalgoorlie, into a social and wellness centre.

The Department of Mines, Petroleum and Exploration (DMPE) has determined that this proposal raises no significant issues with respect to mineral and petroleum resources, geothermal energy, and basic raw materials.

DMPE lodges no objections to the above development application.

Yours sincerely

[redacted]

Locked Bag 100 East Perth WA 6892
www.dmpe.wa.gov.au
ABN 69 410 335 356

[redacted]

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OFFICIAL

Good morning,

Please find attached a submission to the proposed redevelopment of the Agricola Shared Facility, from CR TAFE on behalf of the VET Ministerial Corporation.

For your consideration.

[redacted]



Study with us!

[redacted]

Request for Comment Form
Adjoining Owner or Occupier Request

City of Kalgoorlie Boulder

SUBMISSION STATEMENT: All comments received by the City are given due consideration as part of the decision making process. The fact an adjoining owner objects does not compel the City to refuse an application. The City will carefully consider the application as required. Adjoining owner/occupiers comments do not constitute directions to the City's in the decision making process.

Details of Proposed Development

Name:	Proposed Redevelopment of Agricola Student Shared Facility				
Lot No:	3517	**Street No:**	61	**Street Name:**	Wilson Street
Suburb:	Kalgoorlie			**Postcode:**	6430
Details of proposal:	—				

Details to be considered by owner/occupier

	Plan attached		**Report attached**

Adjoining Property Owner or Occupier Details

Name:	Central Regional TAFE on behalf of the VET Ministerial Corporation				
Lot No:		**Street No:**		**Street Name:**	
Suburb:	Kalgoorlie			**Postcode:**	6430

ADJOINING PROPERTY OWNER/OCCUPIER COMMENTS

I/we have inspected the plans and comment as follows: (Please feel free to attach additional commentary and/or plans if necessary)

Noting that CRTAFE's buildings are located in close prixinity to the proposed development we would like to request the following information from the owner / developer / contractor.

- Will a broader scale dilipidation report be undertaken prior to any works to capture and potential damage / cracking to buildings in the vacinity? Could the report be shared with CRTAFE?
- Can the developer outline any impacts on the pedestrian access to Wearne Lane, as this road is used extensively by CRTAFE and EGC students.

CRTAFE supports the project and believes it will be an excellent enhancement to the education and training precinct in Kalgoorlie - Boulder.

Document Set ID: 4174182
Version: 1, Version Date: 22/07/2026

Request for Comment Form
Adjoining Owner or Occupier Request

City of Kalgoorlie Boulder

PRIVACY STATEMENT: The personal information requested on this form is being collected by the City for the purposes of assessment as required. The personal information will be used by the City for that primary purpose or directly related purposes. The City may disclose the information where required including in Council reports and Agendas. Disclosure will only be as permitted by law and in accordance with permissions. The City may contact the adjoining owners direct if required and disclose the contents of this application, including personal information. The signatory acknowledges the personal information provided is for purpose of consultation and that he or she may apply to the City for access to and/or amendment of the information. Requests for access and/or correction should be made to CKB Officers.

- ☐ I/We do not provide permission for my/our name and other relevant information to be published where any comments made herein are required to be published.

[redacted]

OFFICE USE ONLY *(Information Management Team, please distribute this form to the Assessing Officer)*

Assess. No: **Assessing Officer:**

Document Set ID: 4174182
Version: 1, Version Date: 22/07/2026

PART C – SHIRE OF DUNDAS

1. Declarations of Due Consideration

2. Disclosure of Interests

3. Form 1 DAP Applications

3.1 Lots 77 (HN 96) and 78 (HN 94) Roberts Street Norseman – Proposed Workforce Accommodation – DAP/26/03129

4. Form 2 DAP Applications

Nil

5. Section 31 SAT Reconsiderations

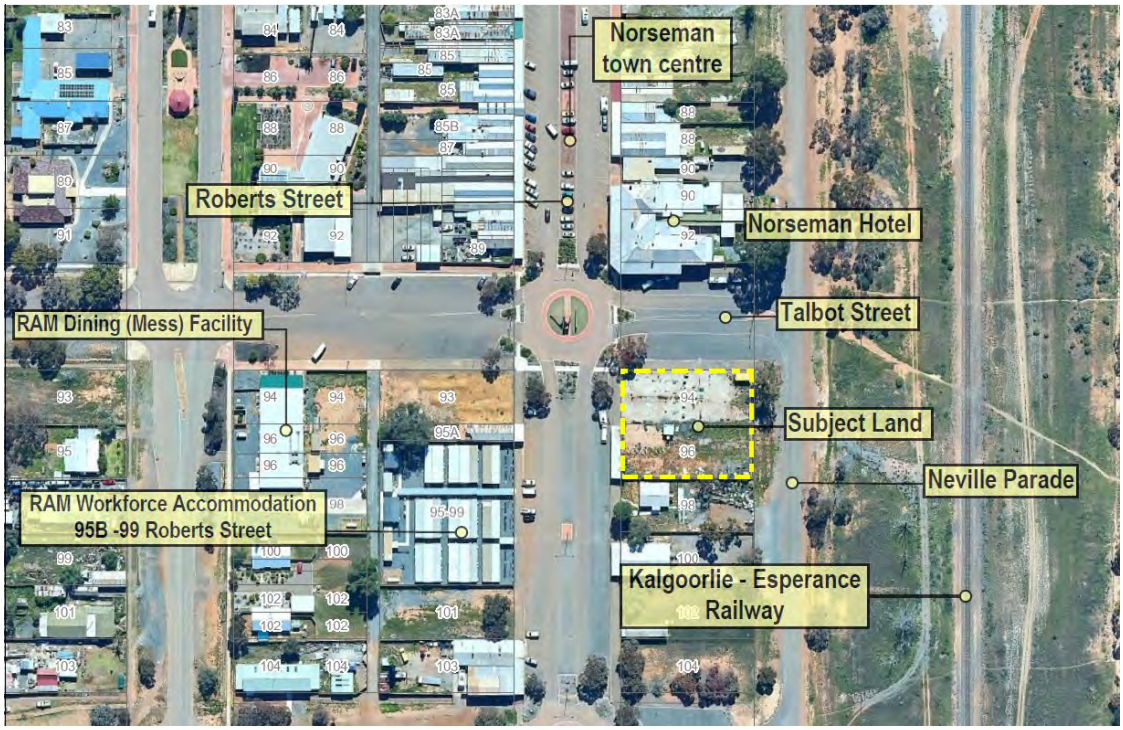
Nil

Form 1: Responsible Authority Report
(Regulation 12)

PART C – Item 3.1 – Proposed Workforce Accommodation – Lots 77 (HN 96) and 78 (HN 94) Roberts Street Norseman

RESPONSIBLE AUTHORITY REPORT – FORM 1	
DAP Name:	Regional Development Assessment Panel
DAP File No:	DAP/26/03129
LG Reference:	DA01.2026
Proposed Development:	Proposed Workforce Accommodation
Value of Development:	$4 million
Owner:	Lot 77 – GT Jones and KEJ Jones - Administrators of the estate of SJL Jones (deceased) Lot 78 – Resource Accommodation Management Pty Ltd
Applicant:	Rowe Group
Local Government Area:	Shire of Dundas
Responsible Authority:	Shire of Dundas
Authorising Officer:	Peter Fitchat, Chief Executive Officer, Shire of Dundas
Application Acceptance Date:	30 May 2026

LOCATION PLAN



(Source: Google Streetview, extracted 2 September 2026)

RESPONSIBLE AUTHORITY RECOMMENDATION

RECOMMENDATION FOR APPROVAL

That the Regional DAP resolves to **APPROVE** DAP Application reference DAP/26/03129 for workforce accommodation upon lot 77 on Deposited Plan 222908 (HN 94) Roberts Street, and lot 78 on Deposited Plan 222908 (HN 96) Roberts Street Norseman, in accordance with Clause 68 of Schedule 2 (Deemed Provisions) of the Planning and Development (Local Planning Schemes) Regulations 2015, and the provisions of Clause numbers 18(4)(b), 32(1)(g), and 32(3)(i) and (ii) of the Shire of Dundas Local Planning Scheme No. 2, subject to the following conditions:

1. The development is to be undertaken in accordance with the approved plans and documents attached to this approval, as listed below, except where amended by subsequent conditions:

Plan/ Document Name	Reference	Date
CP – Site Area Plan	25-116-SK-02-C	Feb 2025
CP – Site Plan	25-116-SK-04-C	Feb 2025
CP – Site Ground Floor Plan	25-116-SK-05-C	Feb 2025
Street Elevations	25-116-SK-06-A	April 2026
1 Module Accommodation Building	25-116-SK-10-A	Feb 2026
Typical 4 Module Accommodation Building	25-116-SK-20-A	April 2026
Typical 4 Module Accommodation Building - Elevation	25-116-SK-21-	April 2026
Typical 4 Module Accommodation Building – Typical Section	25-116-SK-22-	April 2026
Laundry Building	25-116-SK-30-A	May 2025
BBQ/Shelter	25-116-SK-40-A	March 2025
Landscape Plan – Appendix 6		

2. This decision constitutes planning approval only and is valid for a period of four years from the date of approval, being 17 September 2030. If the subject development is not substantially commenced within the specified period, the approval shall lapse and be of no further effect.

3. Lots 77 and 78 on Plan 222908 Roberts Street are to be legally amalgamated into a single lot and be comprised within a single Certificate of Title, prior to the use commencing;

4. The CP – Site Plan (reference 25-116-SK-04-C and dated Feb 2025) and the CP – Ground Floor Plan (reference 25-116-SK-05-C and dated Feb 2025) being suitably modified (as marked up on the CP – Site Plan copy provided at Attachment K to the Responsible Authority Report) to delineate the following:

   (i) Provision of a bus bay within the Neville Parade reserve adjacent to the proposed access gate delineated in the fence proposed along the subject land's Neville Parade lot boundary;

(ii) The replacement of the 5th and 10th proposed on-street parking bays in both Roberts and Talbot Streets with landscaped nibs;

(iii) A minimum 6.0 metre wide landscaped garden extending across the subject land's Roberts Street front setback area (excluding the proposed feature entry);

(iv) A minimum 2.0 metre wide landscaped garden extending across the subject land's Talbot Street front setback area (excluding the proposed feature entry and the street setback area immediately in front of the proposed gazebo and gas bullet);

(v) Replacement of the proposed 1.8 metre high colorbond fence along the subject land's Talbot Street boundary (except for alongside the proposed gazebo and the gas bullet) with a 1.8 metre high pier and open powder-coated fence;

(vi) Increasing the height of the proposed perimeter colorbond fence alongside the proposed gazebo and gas bullet from 1.8 metres to 2.0 metres high — unless it can be demonstrated by a qualified acoustic consultant to the satisfaction of the Shire of Dundas that the 1.8 metre fence will adequately mitigate the impact of noise emissions from the adjacent Esperance – Kalgoorlie railway;

5. The Street Elevations (reference 25-116-SK-06-A and dated April 2026) being suitably modified as per the requirements in preceding condition nos. 4 (v) and (vi);

6. The bus bay required by condition no. 4 (i) being designed, constructed, drained, and delineated on the ground to the specifications and satisfaction of the Shire of Dundas, prior to the use commencing;

7. The pick up and set down of workers by bus in either Roberts Street or Talbot Street is not permitted at any time;

8. The adjacent Roberts and Talbot Street reserves proposed to be utilised for on-street parking being upgraded and line marked to the satisfaction of the Shire of Dundas, prior to the use commencing;

9. The on-street parking bays referenced in preceding condition no. 8 are to be freely available for public parking when not being used for vehicle parking by the proponent's workforce;

10. The existing footpaths extending along the subject land's Roberts and Talbot Street frontages being upgraded to the satisfaction of the Shire of Dundas, prior to the use commencing;

11. The proposed perimeter fencing, being constructed to the satisfaction of the Shire of Dundas, prior to the use commencing;

12. The landscaping plan provided in Appendix 6 to the development application, being suitably modified to the satisfaction of the Shire of Dundas to include the landscaping required in condition nos. 4 (ii), (iii) and (iv), and the landscaping of the adjoining Neville Street reserve that extends along the rear lot boundary of the subject land.

    The modified landscaping plan being duly executed prior to the use commencing;

13. The proponent entering into a legal agreement with the Shire of Dundas to maintain at the proponent's expense, and at all times to the satisfaction of the Shire, the on-street parking bays to be utilised by the development, the bus bay required by condition no. 4 (i), the landscaped nibs required by condition no. 4 (ii), and the landscaping of the adjoining Neville Parade verge that extends along the rear lot boundary of the subject land.

    The legal agreement is to be duly executed prior to the use commencing;

14. The development being connected to the Water Corporation's reticulated water supply network, prior to the use commencing.

    The expense of any upgrades required to the network by the Water Corporation are to be fully borne by the applicant;

15. The development being connected to the wastewater treatment plant (WWTP) located upon lot 51 Richardson Street Norseman, prior to the use commencing.

    The route and alignment of wastewater pipes and associated infrastructure required to connect the development to the WWTP are to be designed and installed to the specifications and satisfaction of the Shire of Dundas.

    The WWTP is to be fully functional/operational to the satisfaction of the Shire of Dundas, prior to the use commencing;

    The proposed private pump station being located within the subject land to the satisfaction of the Shire of Dundas, prior to the use commencing;

16. The development being satisfactorily connected to the Shire's stormwater drainage system, prior to the use commencing.

    The burden and expense of any upgrading of this system required by the Shire as a consequence, is to be fully borne by the applicant;

17. The proposed bin store being designed and installed to the satisfaction of the Shire of Dundas, prior to the use commencing, ;
18. Submission of a Construction Management Plan (CMP) for approval by the Shire of Dundas before construction commences.

The CMP shall detail how it is proposed to manage:

(i) noise from carrying out work and from plant and trucks;

(ii) hours of operation;

(iii) light;

(iv) dust emissions;

(v) the delivery of materials and equipment to the site;

(vi) protection of existing roads, footpaths and services;

(vii) site security and the storage of materials and equipment on the site; and

(viii) the parking arrangements for contractors and subcontractors; and

19. A maximum of (1) person occupying each accommodation unit at any time;

Advice Notes

1. This is a development approval only, and does not constitute nor is to be taken as any other approval, permit, license etc required to be obtained under other legislation.

   It is the applicant's responsibility to identify and obtain any other relevant approvals, permits, licences etc required as well as any relevant due diligence to be undertaken, before the approved use commences.

2. Upon completion of the requirements prescribed in condition numbers 3, 4, 5, 6, 8, and 10–17, the Shire of Dundas is to be duly notified in order to check and confirm the conditions have been fulfilled to its satisfaction;

3. In respect to condition 2, if the approval lapses, no development shall be carried out without further approval having first been sought and obtained, unless the applicant has applied for and obtained Development Assessment Panel approval to extend the approval term pursuant to regulation 17(1)(a) or local government approval under regulation 17A of the *Planning and Development (Development Assessment Panels) Regulations 2011*.

PROPOSAL:

Development approval is sought by the Rowe Group, on behalf of Resource Accommodation Pty Ltd ('**the proponent**'), for a proposed **48-bed single occupancy, single-storey workforce accommodation (and associated amenities)** development upon lots 77 (HN 96) and 78 (HN 94) Roberts Street Norseman ('**subject land**').

The purpose of the development is to provide for **transient accommodation for mine workers** employed in the nearby Central Norseman Gold mine and other nearby mines which are owned and operated by Pantoro.

The development proposes—

- 48 single bedroom (single occupancy) accommodation units comprised within 12 modules.

  Each module (138m^2 in size) comprises 4 accommodation units, with each accommodation unit (internal floor area approximately 10.8 m^2) comprising a single bedroom and ensuite.

  A 1.5 m wide bull-nosed roof verandah is proposed to extend across the full front façade of the two modules that will front Roberts Street (A1 and A2).

  3.0 m wide covered links (or breezeways), comprising a curved roof, are proposed to extend across the frontage of all of the other modules;

- A single laundry/linen/ice store (42 m^2 floor area);

- A BBQ shelter (78 m^2 floor area);

- Utilising existing on-street parking bays in Roberts Street (10 bays) and Talbot Street (14 bays) for the workforce car parking;

- Utilising the aforementioned street reserves abutting the subject land for the pickup and drop off of workers at this facility by the proponent's buses; and

- A 1.8 m high fence around the perimeter of the subject site with feature entry gates incorporated within the proposed Roberts and Talbot Streets fences.

  The proposed fence along the Roberts Street frontage is intended to be of a pier and open powder-coating construction with the remainder proposed fencing being of a colorbond construction

- Landscaping of the subject land by way of strip plantings (1.0 m ~ 1.5 m wide), generally along either side of the internal footpaths and the covered links.

The development is proposed to be setback approximately 8 metres from the subject site's Roberts Street boundary (measured from the front facades of accommodation modules A1 and A2), approximately 3 metres from its Talbot Street boundary (measured from the northern side of accommodation module D2), 3.35 metres from its Neville Parade boundary (measured from the eastern side of the proposed laundry/linen store), and 2 metres from the common boundary with adjoining lot 76 measured from the rear facades of accommodation modules B1 and B3).

A location map, site development plan, floor plans, elevations, section plans and perspective drawings illustrating the proposed development are provided in **Attachment C** to this report.

A landscape plan is provided at **Attachment D** to this report.

Justification for the provision of only 24 car parking bays to service the development, and for these to utilise the existing parking spaces within the abutting street reserves is provided via a Traffic Impact Statement (TIS) at **Attachment E** together with a justification letter at **Attachment F** to this report.

Given the proximity of the subject land to the Esperance – Kalgoorlie railway (about 80 metres away from the subject land's eastern lot boundary), a noise attenuation report addressing relevant requirements of *State Planning Policy (SPP) — 5.4 Road and Rail Transport Noise* has been provided with the application, a copy of which is provided at **Attachment G** to this report.

The proposed development has been designed having regard to the 'Quiet House Design Package A+' prescribed in SPP 5.4.

The development will be connected to Horizon Power's reticulated electricity network, the Water Corporation's water supply scheme, and the Shire of Dundas drainage network. These proposed connections are further outlined in **Attachment H** to this report.

Wastewater disposal from the development will be directed to the proponent's existing private wastewater scheme that serves the proponent's other workforce accommodation facilities and its dining (mess) facility. The infrastructure required to direct wastewater disposal from the development to this scheme includes a proposed onsite pumping station. Further details on wastewater disposal are also provided at Attachment H to this report.

The workforce accommodation will be accessible to occupants at all times (e.g. 24/7).

SUBJECT SITE AND SURROUNDS:

The subject land itself is centrally-located within the designated townsite of Norseman, bound on 3 sides by Roberts Street (to the west), Talbot Street (to the north), and Neville Parade (to the east).

It is 2,024 m^2 in size with a frontage measuring 40.24 metres to both Roberts Street and Neville Parade, and 50.2 metres to Talbot Street.

The site is generally level but with a slight crossfall from east to west. It is presently vacant and disused, with its most recent previous use being for the carrying out of 'rock-drill' activities and exhibition.

There are some existing containers and a shed located within the subject land. Together with an existing verandah awning extending along the Roberts Street frontage of lot 77, these structures will be demolished and/or removed.

There is presently no constructed vehicle access provided into the subject land.

Both Roberts and Talbot Streets are local roads under the care and control of the Shire of Dundas. Roberts Street is reserved as a 'Local Distributor Road' under LPS 2 whilst the section of Talbot Street abutting the subject land is zoned 'Commercial' under the same scheme.

Figure 1 below provides a Google Streetview of the subject land, taken from the corner of Talbot Street and Neville Parade, looking to the southwest.

Figure 1 – View of the subject land looking southwest



(Source: Google Streetview, extracted 2 September 2026)

Figure 2 below provides a Google Streetview of the subject land, looking eastwards from Roberts Street.

Figure 2 – View of the subject land looking eastwards



(Source: Google Streetview, extracted 2 September 2026)

Surrounding use/development is commercial.

Lot 67 (HN 93) Roberts Street, which lies directly opposite, is presently **vacant** although it is understood a future commercial development is planned for this site in the near future. Adjoining this lot on its southside is lot 300 (HN95A) Roberts Street (a narrow allotment) which contains an existing but vacant (disused) building.

Adjoining the other side (southside) of lot 300, and also lying directly opposite to the subject land is the proponent's existing mining workforce accommodation facility on 95B – 99 Roberts Street.

The proposal under consideration here will be similar to the type, design and layout of this workforce accommodation facility. **Figure 3** below provides a Google Streetview of that facility.

Figure 3 – View of the proponent's workforce accommodation facility at 95B-99 Roberts Street



(Source: Google Streetview, extracted 2 September 2026)

The facility at 95B – 99 Roberts Street was originally granted conditional development approval by the Dundas Shire Council on 21 December 2021, and subsequently amended on 24 September 2022.

It also utilises existing adjacent on-street vehicle parking in Roberts Street for the parking of workers own vehicles and mine vehicles.

A number of conditions of the amended development approval (carried through from the original development approval) for this facility required the line-marking of the existing parking bays in Roberts Street (2.7 metres wide), and the installation of a 1.5 metre wide landscaping nib, containing a tree, contiguous with every 5th parking bay.

It is understood that these conditions remain outstanding.

The subject land also lies adjacent to the **'commercial heart'** of Norseman which is centred about Roberts Street immediately to the north.

The Norseman Hotel lies directly across from the subject land on Talbot Street. It is understood that the hotel is owned by the proponent with the existing hotel accommodation units occupied by Pantoro's workforce.

Figure 4 over provides a Google Streetview of Roberts Street looking north from the northeast corner of the subject land.

Figure 4 – View of the Norseman town centre looking north along Roberts Street



(Source: Google Streetview, extracted 2 September 2026)

Beyond Neville Parade lies the Esperance – Kalgoorlie freight railway, aligned along a north-south axis passing through the Norseman townsite. It is predominantly used for the haulage of ore extracted from mine sites within the Goldfields region to the port of Esperance.

The southern boundary of the subject land adjoins lot 76 Roberts Street, which presently comprises an operating **funeral parlour.**

The subject land can be serviced by public reticulated electricity, water, telecommunication and on-street stormwater drainage networks.

However, there is no public reticulated sewerage scheme available. Instead, and as previously stated, the subject site is proposed to be connected to the proponent's existing (private) sewerage scheme which services its other Norseman workforce accommodation facilities.

This scheme comprises a treatment facility and an irrigated spray-field located upon lot 874 on DP 172130 (HN 51) Richardson Street Norseman, approximately 680 metres northwest of the subject site.

This scheme received development approval from the Dundas Shire Council on 28 January 2021. However, not long after its installation the spray-field failed. The proponent is presently upgrading this wastewater treatment facility for which a subsequent amended development approval was granted by the Dundas Shire Council on 18 November 2025.

This amended approval includes the trucking of treated wastewater to the Norseman Central Gold mine, subject to this occurring only along a designated route and within daylight hours only.

As for the occupants of the proponent's other workforce accommodation facilities, meals for occupants of this proposed accommodation facility will be taken at the proponent's dining (mess) facility, which is a short walk of about 130 metres. It is understood that the proponent is presently seeking to extend this dining (mess) facility to accommodate a planned increase of its mining workforce.

BACKGROUND:

This proposal is the fifth in a series of workforce accommodation facilities either having been developed or are in the process of being developed by the proponent within the Norseman townsite.

The proponent provides off-site mining services (including workforce accommodation) for its joint-venture mining partner Pantoro, the latter which owns and operates the Central Norseman Gold mine and other nearby mines.

The Central Norseman Gold mine — once Australia's longest continuously operated gold mine — is located approximately 3.4 kilometres from the subject land (by road) — at the eastern edge of the Norseman townsite.

It is understood from previous advice provided by the applicant/proponent that this mine has a current 'life expectancy' of between 7 – 10 years, however, Pantoro has a pipeline of other proposed nearby mine operations within the Norseman region, which if they come 'on-stream' are likely to extend Pantoro's current mining operations within the Norseman region beyond the next 10 years, possibly up to 30 years or thereabouts.

Pantoro's transient workforce predominantly comprises fly-in/fly-out (FIFO) workers with some drive-in/drive-out (DIDO) workers.

The FIFO workers arrive and depart via the Norseman aerodrome which is located at the western edge of the Norseman townsite and are transported by bus to and from the proponent's workforce accommodation facilities.

DIDO workers arriving in their own vehicles park these at their respective accommodation.

Unless provided with a mine vehicle, workers are transported by buses operating daily to and from the mine sites.

The proponent currently operates three (3) workforce accommodation facilities within the Norseman townsite, namely —

(i) A single-storey 206-bed facility (comprised within 47 motel-style accommodation modules) and associated amenities upon 105-111 Prinsep Street and 106-114 Angove Street;

(ii) A single-storey 56-bed facility (comprised within 14 motel-style accommodation modules) and associated amenities upon 95B-99 Roberts Street (located directly opposite the subject land); and

(iii) A two-storey facility comprising 7 self-contained accommodation units and associated amenities upon 128 Prinsep Street.

A fourth workforce accommodation facility — a single-storey 64-bed facility (comprised within 16 motel-style accommodation modules) and associated amenities — is presently being developed upon 70 – 76 Goodliffe Street (corner of Alsopp Street).

All these facilities have received conditional development approval from the Dundas Shire Council, although the development application for the proposed facility at 70 – 76 Goodliffe Street was initially refused to be approved by the Council, principally on the grounds that —

- permanent use/occupancy within the facility was contrary to the definition of 'workforce accommodation' contained in LPS2; and
- that no evidence had been provided by the applicant to support permanent occupancy of the facility, especially in respect to ensuring that the type of building would support long term occupancy.

In other words, the Council was concerned, or harboured reservations, as to the durability of the facilities and their subsequent ongoing use once Pantoro's mining activities within the Norseman region cease, and the workforce accommodation facility is consequently vacated and lies dormant, leading to potential 'urban blight'.

Following a review of the Council's decision by the State Administrative Tribunal (SAT) and the SAT's subsequent order for Council to reconsider its decision — having regard to SAT's determination in *Goldfield Villages Pty Ltd and City of Kalgoorlie-Boulder* [2023] WASAT 6 (especially at paragraphs [95] and [102]) and the National Construction Code (NCC) — the application was conditionally approved.

The aforementioned SAT determination found that the 'temporary' element contained in the definition of 'Workforce Accommodation' pertains to the stay of each worker — not to the use (or to the premises) as a whole.

PLANNING ASSESSMENT:

PLANNING FRAMEWORK	
Region Scheme	N/A
Region Scheme - Zone/Reserve	N/A
Local Planning Scheme	Shire of Dundas Local Planning Scheme 2
Local Planning Scheme - Zone	Commercial
Lot Size	2,024m^2
Existing Land Use	Vacant
Proposed Land Use/s	**Workforce Accommodation**
Heritage Status	☒ N/A ☐ State Register of Heritage Places ☐ Local Heritage List ☐ Local Heritage Area
Bushfire Prone Area	No

The proposal has been assessed against all relevant legislative requirements of LPS 2 and relevant State Planning Policies.

The following matters arise from the assessment and are presented for consideration:

Permissibility

The proposed use can be classified as a '**workforce accommodation**' pursuant to LPS2 clause 38. As this use class is not listed in the scheme's zoning table (Table 3) the provisions expressed in clause 18(4) of the scheme ordinarily apply to determine whether —

(a) the use is consistent with the objectives of the Commercial zone and is therefore a use that may be permitted in the zone subject to conditions imposed by the local government; or

(b) the use may be consistent with the objectives of the Commercial zone and therefore, give notice under clause 64 of the deemed provisions before considering an application for development approval for the use of the land; or

(c) the use is not consistent with the objectives of the Commercial zone and is therefore not permitted in the zone.

Notwithstanding, because the proposed use is deemed an 'unlisted' use, the development application is classed as a '**complex application**' pursuant to clause 1 in Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015* (hereinafter referred to the '**LPS Regs**'). Hence, it must be advertised for a minimum period of **28 days** pursuant to clause 64 in Schedule 2 of the LPS Regs prior to the application being considered and determined.

Advertising of the application subsequently took place, a summary of which is provided in the section **Consultation** of this report.

Conformance with Commercial zone objectives

Each Commercial zone objective in LPS2 is listed below followed by commentary (by the author of this report) as to the proposal's conformance with the respective objective:

(i) *To provide for a range of shops, offices, restaurants and other commercial outlets in defined townsites*

The proposal is not a commercial use, however, it is considered that it will not adversely impact the current (and likely future) availability of land currently zoned commercial in Norseman for commercial uses.

The population of Norseman has substantially declined in recent decades which has led to the decline of commercial uses and activities requiring physical premises to operate from within the Norseman townsite.

There are a number of commercial zoned premises and land within the Norseman town centre that currently lie vacant, and have been for a number of years. These are considered likely to satisfy any future demand in the short-medium term for commercial premises/land.

In response to these vacancies, the Shire of Dundas has embarked on a strategy of potential acquisition of these and other existing commercial premises within the Norseman town centre with a view to facilitating the carrying on of future mixed use development in them and revitalisation of the Norseman town centre in general.

Less restrictive use of land and more flexibility in the type of uses allowed within the town centre and the Commercial zone generally is seen as a key to revitalising the Norseman town centre.

On this basis, and given that Dundas Shire Council approved the proponent's workforce accommodation facility at 95B-99 Roberts Street directly opposite (which is also zoned Commercial), no objection is raised to the proposed facility in this location.

(ii) *To maintain the compatibility with the general streetscape, for all new buildings in terms of scale, height, style, materials, street alignment and design of facades*; and

The scale and height of the proposed development is considered compatible with the existing streetscape.

Whilst the provision of a verandah across the facades of accommodation modules A1 and A2 (which front Roberts Street) is consistent with the town centre streetscapes, the bullnose form of this is not typical. Neither are the proposed building setbacks from Roberts and Talbot Streets consistent with the generally nil street setbacks of adjacent buildings.

Arguably, it will be more desirable if the verandah forms and style proposed for modules A1 and A2 were to match or be consistent with existing verandah forms and styles on adjacent buildings.

Nevertheless, a precedent has been set for allowing the bullnose verandah form by the approval of the proponent's accommodation facility at 95B-99 Roberts Street which also comprises a bullnose verandah stretching across the facades of its accommodation modules fronting Roberts Street.

(iii) *To ensure that development is not detrimental to the amenity of adjoining owners or residential properties in the locality*.

There are no existing residential properties adjoining or adjacent to the subject land. As previously described, Pantoro's workforce currently occupies workforce accommodation facilities directly opposite the subject land — at 95B-99 Roberts Street and the Norseman Hotel in Talbot Street.

Given the nature of the use, quiet amenity for the proposed facility is paramount, and therefore, is unlikely to adversely impact the amenity of adjacent and surrounding uses.

Presumption Against 'Skid' and 'Mining Camps'

Clause 32(1)(g) in LPS 2 is a provision that generally disfavours 'mining camp' type workforce accommodation developments within the town centre of Norseman, however, there is discretion to approve such developments — in extenuating circumstances.

Whilst the applicant has not provided any extenuating circumstances which might give rise to the favourable consideration of the proposal, it may well argue that this location, and the proposed form of development upon it, is the only realistic option available to it at this point in time to meet its immediate workforce accommodation needs.

More broadly, the importance of the mining industry in supporting the local economy is widely understood. In fact, a key objective of the Shire's *Community Strategic Plan (2022-2032)* is for "*a vibrant economy that supports opportunities for **mining*** [author emphasis], *industry, creative and cultural industries, tourism, shopping and business* (*cf*. objective 4.2.1)."

Further, the approval and development of the proponent's other existing workforce accommodation facilities within the Norseman townsite have set a precedent for this particular development to be favourably considered.

It is assumed that clause 32(1)(g) was written into LPS2 to preclude the installation of mining camps comprising typical donga buildings (mostly likely second-hand) that lacked detail and decoration, provided no shade structures for the comfort of occupants and weather protection, nor any semblance of orderly development (in other words they often do not have a coherent site layout). In essence, they are seen as incongruent with the town's character, setting, and built form — which is predominantly single residential dwellings for the purpose of permanent occupancy.

The proponent's workforce accommodation facilities are relatively well-ordered with reasonable presentation to their street frontages. However — and arguably — the utilisation of existing on-street parking and/or within adjoining street verges for the contiguous parking of worker vehicles is perhaps a design and streetscape issue that requires further addressing and resolution.

Car Parking Provision

Table 7 in clause 32(3) of LPS 2 prescribes the minimum number of car parking bays required to be provided for a select range of uses contemplated for the Commercial zone.

The use class 'workforce accommodation' is not included in this table, therefore the minimum number of car parking bays to be provided for this type of use is left to the discretion of the local government pursuant to LPS2 clause 32(3)(d). In exercising discretion regard is to be had to the nature of the proposed development, the number of employees likely to be on the site, the prevention or obstruction of roads and streets, and the orderly and proper planning of the locality and the preservation of its amenity.

As a guide to the number of car parking bays that might be required, a comparison to the use class 'residential' in Table 7 could be made. This use class requires the provision of **1 car bay per bedroom**, which is a typical parking requirement for motel and similar short-term or short-stay accommodation typologies. This ratio has been previously applied to the assessment of car parking requirements for the proponent's other workforce accommodation facilities. As such, a total of **48 car bays** for a 48 bedroom workforce accommodation facility might, ordinarily, be considered warranted.

However, as the applicant has indicated in its Transport Impact Statement (TIS) most of the occupants of this facility will be bussed to and from Pantoro's mine site and the Norseman aerodrome (for FIFO workers), utilising buses having various passenger capacities of between 12 to 40 seats, thus negating the need to provide for up to say, 48 parking bays.

Pursuant to clause 32(3)(d)(ii), the prescribed amount of car parking required can also be waived if adequate constructed car parking is available in close proximity to the proposed development (in this case, in Roberts and Talbot Streets immediately adjacent to the subject land).

On this basis, and given that the Dundas Shire Council has previously approved the proponent's three (3) other workforce accommodation facilities with a reduced number of parking bays (when **applying the 1 car bay per bedroom ratio**) for the same reason — and **without any cash-in-lieu payment required** — the provision of only 24 car parking bays seems reasonable in the circumstance.

A further reduction of 4 bays could also be favourably if 4 bays were to be substituted for 4 landscaped nibs. This is discussed further in the subsequent section of this report 'Landscaping of on-street parking spaces' (see over).

Proposed On-street Parking Arrangements

With reference to the applicant's justification for proposed adjacent on-street parking in Roberts and Talbot Streets, the provision of the 24 bays Streets also seems reasonable, especially as the approvals for the 3 other aforementioned workforce accommodation facilities also allowed for similar street verge/on-street parking for those facilities (with no onsite parking provision).

It should be noted, however, that two of the aforementioned facilities — at 95B-99 Roberts Street and 105-111 Prinsep Street/106-114 Angove Street — utilise existing constructed parking spaces within those adjacent street reserves.

In respect to the proposed facility at 70-76 Goodliffe Street this proposes new constructed parking bays within the adjacent Goodliffe and Alsopp Street verges (including a proposed sealed bus bay within the Alsopp Street verge) as no on-street parking bays exist.

In considering that proposal it was noted from advice provided by the Shire's solicitor that car parking within the street reserve/verge cannot be legally devoted to the exclusive use of the development, and could be used on a first-come first-served basis by members of the public. However, as with any scenario where the proponent relies on street parking to accommodate its own users, the applicant must be taken to be confident that, in reality, any competition from other users for those bays will not be problematical.

Thus, this same consideration ought to apply to the proposal being considered here, noting as well that the adjoining on-street parking spaces available in Roberts and Talbot Streets appear to be considerably underutilised.

Landscaping of on-street parking spaces

One further consideration in allowing the existing on-street parking spaces to be utilised by the proposed development (on a *quid pro pro* basis) ought to be a requirement (as a condition of approval) for the installation of landscaped nibs say, after every 5th parking bay (see **Attachment K** to this report).

The purpose of this is to provide shade, reduce heat island effects emanating from the presence of contiguous and extensive hard-paved surfaces, and to lessen the visual impact of the resulting building mass and a continuous line of parked vehicles. It will also have the effect of enhancing the existing streetscape. Such a condition was imposed on the approvals granted for 95B – 99 Roberts Street (which is still yet to be complied with) and for 70 – 76 Goodliffe Street.

The provision of landscaped nibs will further reduce the amount of on-street parking immediately available in front of the workforce accommodation facility but this reduction is unlikely to be significant given the availability of existing surrounding underutilised on-street parking, including immediately opposite in front of the Norseman Hotel to compensate (if necessary). For example, although the TIS states that up to 10 bays are likely to be utilised for the parking of work (Pantoro) vehicles, and the remaining 14 proposed bays will be available for the proponent's DIDO workforce, it does not specify any minimum number of DIDO bays required.

Subject Site Landscaping

It is noted from the landscaping plan that landscaping of the subject land across its Roberts and Talbot Streets frontages is not detailed.

Given the subject land's prominent location, and in order to present an attractive streetscape in both Roberts and Talbots Streets, it is recommended that these frontages (see also **Attachment K** to this report) be suitably landscaped with water-wise trees, shrubs, lawn or other plantings as opposed to purely using stone (e.g. 'blue-metal'), gravel, cracker-dust, or other like materials.

Proposed Perimeter fencing

It is noted that the noise attenuation report (NAR) recommends the proposed perimeter fencing extending along the northern and eastern sides of the gazebo and be at least 2 metres high. However, the CP Site Plan and the Elevation Drawings delineate this fence to be 1.8 metres high.

No justification, nor a further report by a suitably qualified acoustic consultant in support of this fence height, has been provided with the application. A suitable condition ought to be imposed requiring the fence height to be at least 2 metres high alongside the gazebo (as well as extending past the gas bullet), or a further acoustic report being submitted for approval justifying the proposed 1.8 metre high fence alongside the gazebo.

CONSULTATION:

PUBLIC CONSULTATION

The development application was publicly advertised for 36 days, commencing on 25 July 2026 and concluding on 30 August 2026.
This extended period of advertising was given to ensure that registered proprietors of land located within 200 metres of the subject land, and who reside interstate, would have at least the minimum 28 days in which to consider and lodge a submission on the proposal.

This was also compounded by the need to forward the letters giving notification of the proposal to resident occupiers and land owners to the Perth mail sorting centre for mailing (notwithstanding that the Shire is the licensee and operator of the Norseman Post Office). Unfortunately, due to a lack of Shire resources and other priority tasks being attended to by Shire staff at the time advertising of the application was being arranged, Shire staff were not available to hand-deliver these letters — which would have expedited delivery.

As a consequence, approval from the DAP Executive Director was sought and granted (with the consent of the applicant) for the submission date of this report to be extended.

The application was advertised as follows:

- By way of a notice posted on the Shire of Dundas website
- By way of letter to owners and occupiers of land within 200 metres of the subject site; and
- By way of a sign notice placed at the frontage of the development site

At the conclusion of the advertising period the Shire had **not received any submissions**.

REFERRALS/CONSULTATION WITH GOVERNMENT/SERVICE AGENCIES

Nil

DESIGN REVIEW PANEL ADVICE

Not applicable

(NB: The Shire of Dundas does not have an established design review panel)

OTHER ADVICE

The application was referred to the Shire's Works and Services Manager, the Shire's Environmental Health consultant, and the Shire's Consulting Engineer.

The Shire's Works and Services Manager did not provide any comment on the proposal.

The Shire's Environmental Health consultant advised of no objection to the proposal subject to the imposition of 13 recommended conditions as set out in **Attachment I** to this report.

The Shire's engineering consultant also provided comments and raised a number of queries about the proposal as set out in **Attachment J** to this report.

The applicant was provided an opportunity to consider and respond to the comments made by the aforementioned consultants.

In respect to the 13 conditions recommended by the Shire's Environmental Health consultant, the applicant has requested that condition numbers 2, 4, 5, 7, 8, 11 and 13 be reviewed prior to inclusion in any development approval on the basis that these either duplicate requirements under other legislation or contain broad and subjective wording that may create uncertainty regarding their implementation and enforcement through a development approval.

The applicant notes that the removal or amendment of these conditions would not negate the requirement for compliance with the relevant statutory obligations and approvals under the applicable legislation.

It is agreed with the applicant that most of these recommended conditions are more appropriately addressed via other legislation. Recommended **Advice Note 1** provides advice to the applicant of its obligation to address these as required by relevant legislation.

In respect to the comments/queries raised by the Shire's engineering consultant, the applicant responded as follows:

- No vehicle parking bays are proposed within the Neville Parade verge. Reference to the provision of 13 car parking bays within this verge in the original development application submitted was an error

- No objection is raised to the provision of a bus bay within the Neville Parade verge, subject to it not being sealed.

ALTERNATIVE TO RESPONSIBLE AUTHORITY RECOMMENDATION

As the exercise of discretion is required to determine whether the proposed 'workforce accommodation' use ought to be approved — by virtue of LPS2 clauses 18(4) and 32(1)(g) — the application is capable of being determined differently to the Responsible Authority Recommendation.

To this end, having regard to clause 18(4), the use does not specifically meet the objective *"… to provide for a range of shops, offices, restaurants and other commercial outlets in defined townsites."*

Nor does it specifically accord with the objective *"… to maintain the compatibility with the general streetscape, for all new buildings in terms of … style, … street alignment and design of facades."*

On this basis it could be determined that the use is not consistent with two (2) of the three objectives of the Commercial zone, and therefore, ought not to be permitted.

Having regard to clause 32(1)(g), it is relatively clear — by its nature, proposed operation, layout, and building typologies — that the proposed development presents as a 'mining camp'.

Further, the applicant has not provided particular extenuating circumstances as to why the proposed development ought to be allowed.

An alternate Responsible Authority Recommendation, including recommended reasons for not approving the proposed development, is provided at **Attachment L** to this report.

CONCLUSION:

As previously stated, the proposal under consideration is the next stage in the provision of workforce accommodation for Pantoro's mining operations in and around Norseman.

Notwithstanding that LPS2 has a general presumption against 'mining camps' being located within the Norseman townsite — without extenuating circumstances — approval of previous stages of the proponent's workforce accommodation facilities has been granted by the Dundas Shire Council, establishing precedence for approval of this proposed and type of facility, especially as the design and layout of it, including the provision of on-street parking, will be consistent with those approved facilities.

Should development approval be granted, it is recommended that the following specific requirements be imposed as conditions of development approval (which were similarly imposed for the proponent's other accommodation facilities), and be fulfilled prior to any first occupancy of the development —

(i) The landscaping of the proposed adjacent on-street parking bays in Roberts and Talbot Streets;

(ii) The installation of a hardstand bus bay within the adjacent Neville Parade reserve, designed to the specifications and satisfaction of the Shire of Dundas;

(iii) A legal agreement between the Shire and the proponent requiring the proponent to maintain at its expense these bays and the associated landscaping required; and

(iv) Connection of the development to the proponent's private sewerage scheme.

ATTACHMENTS

A. Development Application (DA) covering letter
B. Copies of the certificates of title to lots 77 and 78 (Attachment 1 to the DA letter)
C. Development Plans (Attachment 2 to the DA letter)
D. Landscaping Plan (Attachment 6 to the DA letter)

E. Traffic Impact Statement (TIS) (Attachment 3 to the DA letter)
F. Offsite Parking justification
G. Noise Attenuation Report (Attachment 4 to the DA letter)
H. Civil Engineering Report (Attachment 5 to the DA letter)
I. Shire of Dundas environmental health consultant comments
J. Shire of Dundas consultant engineer comments
K. Recommended marked-up modifications to the CP – Site Plan
L. Alternative to the Responsible Authority Recommendation

ROWE GROUP

35 YEARS 1991 – 2026

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Job Ref: 10209
18 May 2026

Shire of Dundas
PO Box 163
NORSEMAN WA 6443

Attention: Chief Executive Officer

Dear Mr Fitchat

Application for Development Approval through Development Assessment Panels – Workers' Accommodation Facility
Lots 77-78 (Nos. 96-94) Roberts Street, Norseman

Rowe Group acts on behalf of Resource Accommodation Management Pty Ltd ('**Client**') for the development of Lots 77 and 78 (Nos 96 and 94) Roberts Street, Norseman (collectively the '**subject site**'). We have been instructed by our Client to prepare and lodge this Development Application ('**Application**'), for the Southern Goldfields Development Assessment Panel's ('**DAP**') consideration. This Application seeks approval for a Workers' Accommodation Facility to support the Pantoro Gold Mining operation within the town of Norseman.

In support of this application, please find enclosed the following:

- A completed and signed DAP Form 1;
- A copy of the current Certificates of Title;
- A copy of the proposed development plans; and
- The accompanying technical reporting.

SUBJECT SITE

The subject site is situated within the municipality of the Shire of Dundas ('Shire'), located within the town of Norseman, and is located approximately 161 kilometres south of Kalgoorlie-Boulder, being the nearest major centre.

Refer **Figure 1 – Regional Location** and **Figure 2 – Local Location.**

The subject site is approximately 2,024m^2 in area and is bound by Roberts Street to the west, Talbot Street to the north and Neville Parade to the east.

The subject site is currently 'improved' by a mass of bulk objects, two sea containers, a small garden sized shed with signage affixed, and an awning that overhangs the public footpath. The site prior to 2012 contained adjoining single

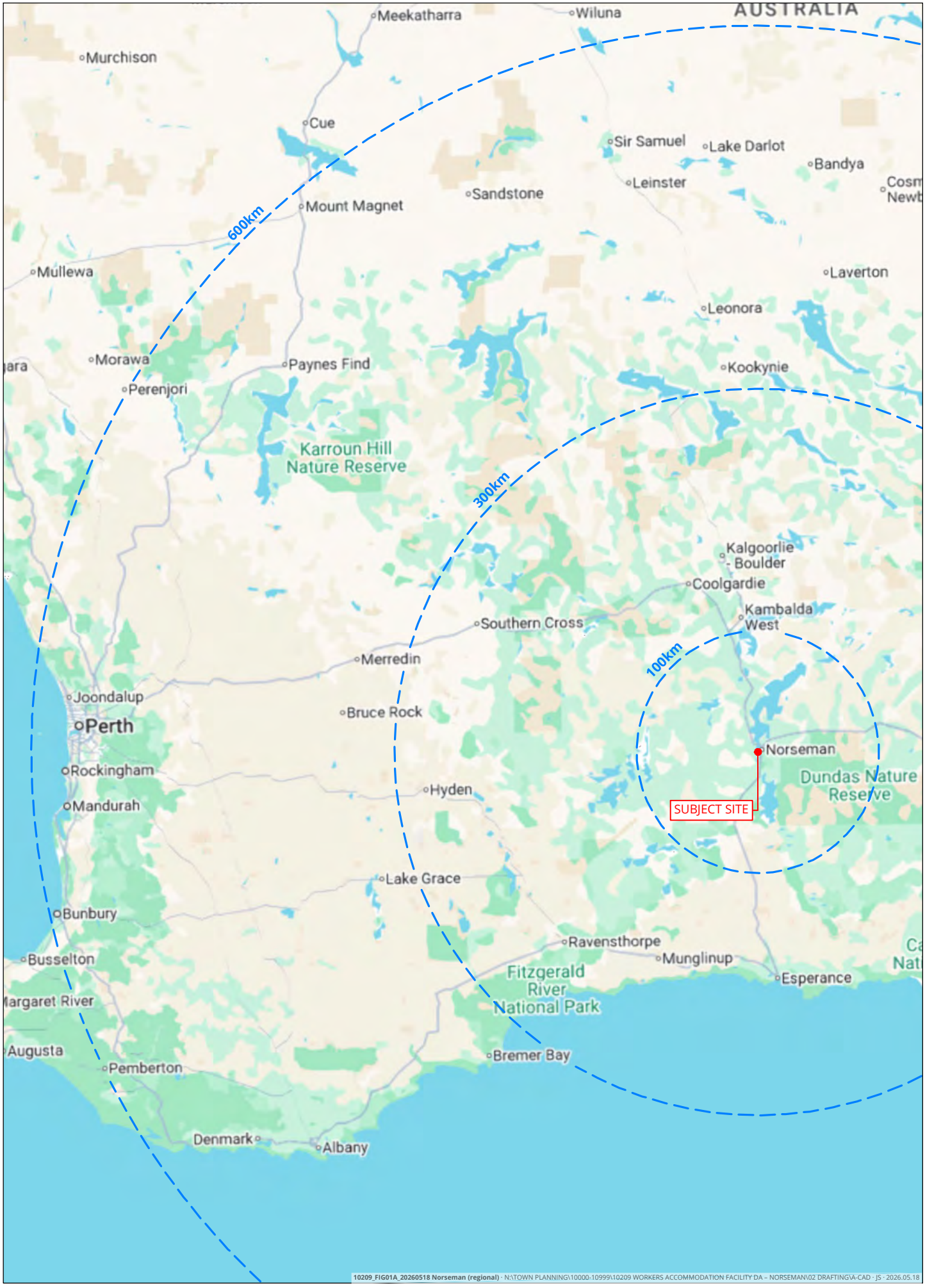
storey buildings, and which appear to have been demolished c. 2009, with the exception of the awnings. The northern building's awning appears to have been removed shortly after, leaving only the awning from the former building located on No.96 Roberts Street.

The Pantoro Gold Mine is located immediately east of the Norseman townsite.

The subject site comprises of four (4) separate land parcels, legally described as follows:

STREET ADDRESS	LOT NO.	PLAN/DIAGRAM	VOLUME/FOLIO	REGISTERED PROPRIETOR
94 Roberts Street	78	222908	1955/334	Resource Accommodation Management Pty Ltd
96 Roberts Street	77	222908	1040/401	Keven Ernest Joseph Jones Gregory Thomas Jones

Table 1: Cadastral Information.



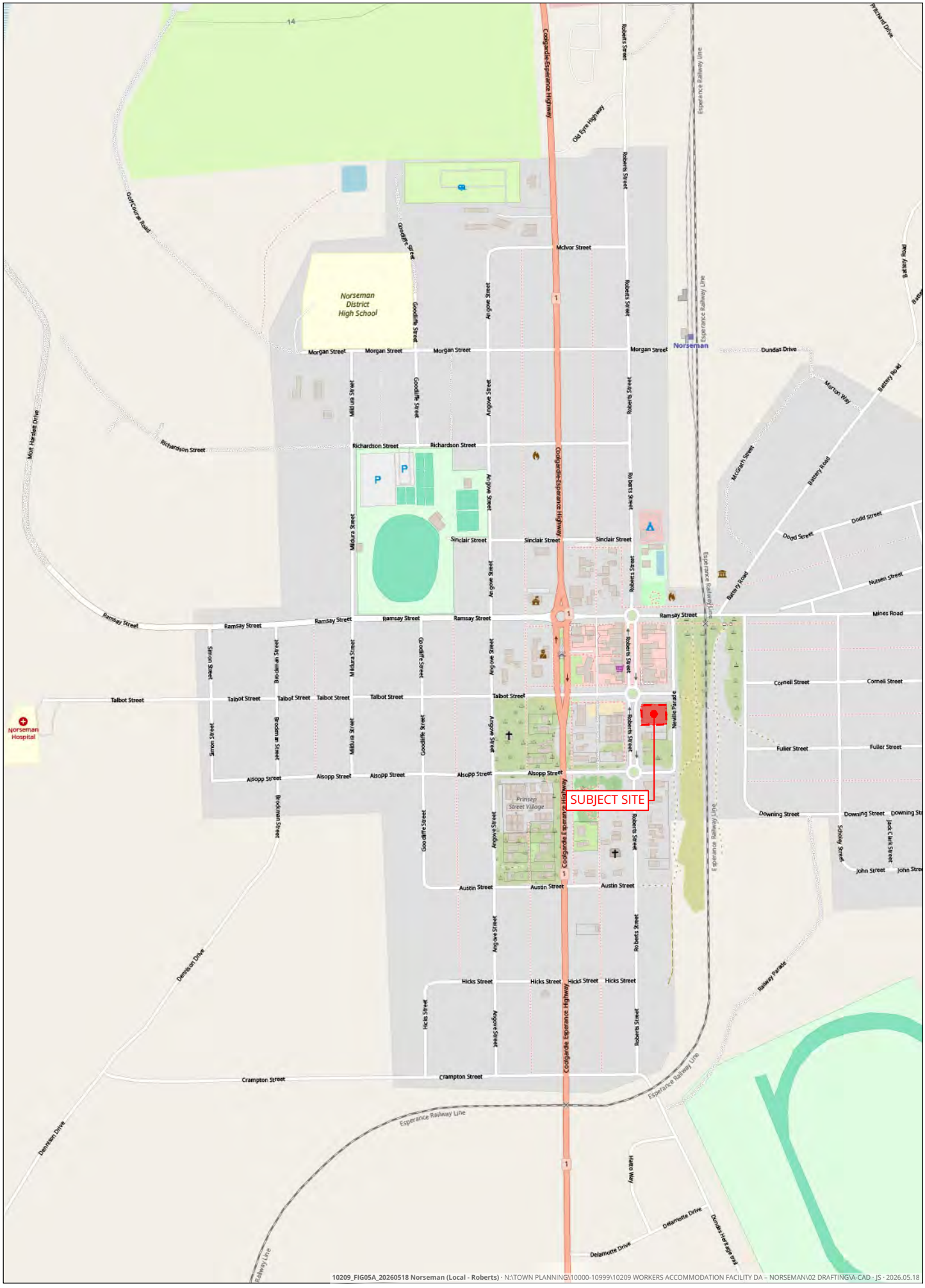
0 100,000m

SCALE @ A4: 1:4,000,000

N

FIGURE 1

REGIONAL LOCATION



0 250m

SCALE @ A4: 1:10,000

N

FIGURE 2

LOCAL CONTEXT

STRATEGIC FRAMEWORK

Goldfields-Esperance Regional Planning and Infrastructure Framework

The subject site is located within the Goldfields-Esperance Regional Planning and Infrastructure Framework 2015 (**Framework**), which is a high-level strategic document prepared by the Western Australian Planning Commission (**WAPC**) to guide long-term land use planning, infrastructure coordination and regional development across the Goldfields-Esperance region, including the Shire of Dundas and more specifically the town of Norseman. The framework is a non-statutory, ongoing strategic document published in 2015 and currently in effect until superseded by a new Regional Planning Strategy.

In the context of this Application, the Framework is relevant because it:

- Recognises the region's economy as resource-based and reliant on mining, which directly drives demand for worker housing and support infrastructure.
- Supports planning responses that strengthen regional settlements, improve liveability, and ensure appropriate services and accommodation for a mobile workforce.
- Provides strategic justification for developments that help sustain workforce availability and economic activity in remote communities such as Norseman, without placing additional strain on existing residential areas or local infrastructure.

Overall, the subject proposal aligns with the Framework's direction by supporting the operational needs of the mining / resource sector, contributing to Norseman's role as a small but strategically located service settlement within the region, and ensuring workforce accommodation is delivered in a planned and consolidated manner.

Goldfields-Esperance Development Commission Strategic Plan 2025-2027

The Goldfields-Esperance Development Commission's Strategic Plan 2025–2027 (**Strategic Plan**) identifies the Goldfields-Esperance region as a significant mining region with a continuing reliance on a mobile, project-based workforce to support resource sector operations. The plan emphasises the need for adequate and appropriate workers accommodation to sustain economic activity and ensure that regional centres can continue supporting mining, logistics, and associated industries. This proposal in Norseman directly responds to this strategic direction by providing reliable, fit-for-purpose housing that supports ongoing mining and service-industry operations in the Shire of Dundas.

A key priority of the Strategic Plan is to enhance regional liveability, including improving access to essential infrastructure, services, and accommodation options across diverse and remote communities. In smaller towns like Norseman—where the private housing market is limited and demand fluctuates with mining activity—purpose-built workforce accommodation reduces pressure on local residential stock while improving safety, amenity, and management outcomes. The proposal aligns with this objective by offering a managed, single-storey development that avoids impacts on existing residents while contributing positively to the town's accommodation capacity.

The Strategic Plan also highlights the importance of place-based, locally responsive solutions that strengthen economic resilience and support the long-term sustainability of regional settlements. Delivering dedicated workforce accommodation in Norseman supports the town's role as a service and logistics hub on a major transport route, enabling businesses and contractors to operate efficiently without creating unintended housing or amenity impacts. By supporting stable workforce supply and local economic participation, the proposal directly contributes to the Strategic Plan's broader goals of fostering regional development, industry continuity, and community wellbeing across the Goldfields-Esperance region.

PROPOSED DEVELOPMENT

This Application proposes the development and use of a Workers' Accommodation Facility at the subject site. The proposed development comprises of 48 single occupancy accommodation rooms and associated service facilities including a communal barbeque shelter, associated open space and laundry facilities. The proposed development also includes the following in relation to the workers' accommodation facility:

- 37 sealed car parking bays, with 10 bays in the Robert Street paved roadside area, 14 bays in the Talbot Street paved road area, and the remaining 13 bays in the Neville Parade verge;
- An entry feature;
- New Colorbond perimeter fencing; and
- New lighting for amenity and safety.

Refer **Attachment 2 – Development Plans.**

TOWN PLANNING CONSIDERATIONS

Shire of Dundas Local Planning Scheme No. 2

Under the provisions of the Shire of Dundas *Local Planning Scheme No. 2* ('**LPS2**'), the subject site is zoned 'Commercial'. The objectives of the Residential zone are stipulated within LPS2 below:

- *"To provide for a range of shops, offices, restaurants and other commercial outlets in defined townsites.*
- *To maintain the compatibility with the general streetscape, for all new buildings in terms of scale, height, style, materials, street alignment and design of facades.*
- *To ensure that development is not detrimental to the amenity of adjoining owners or residential properties in the locality.*

All surrounding streets hold local road status only.

Refer **Figure 3 – Local Planning Scheme No. 2 Zoning.**

Land Use Permissibility

The proposed development is consistent with the 'Workforce Accommodation' land use classification, which is defined within Division 2, Clause 38 of LPS2 as follows:

*"**Workforce Accommodation –** means premises, which may include modular or relocatable buildings, used -*

a) Primarily for the accommodation of workers engaged in construction, resource, agricultural or other industries on a temporary basis; and

b) For any associated catering, sporting and recreation facilities for the occupants and authorised visitors.

However, the land-use is not included within the LPS2 Zoning Table. As such, the proposed development must be assessed as a 'use not listed'. Clause 18(4) of LPS2 relates to Use Not Listed applications:

"4) The local government may, in respect of a use that is not specifically referred to in the zoning table and that cannot reasonably be determined as falling within a use class referred to in the zoning table –

a) Determine that the use is consistent with the objectives of a particular zone and is therefore a use that may be permitted in the zone subject to conditions imposed by the local government; or
b) Determine that the use may be consistent with the objectives of a particular zone and give notice under Clause 64 of the deemed provisions before considering an application for development approval for the use of the land; or
c) Determine that the use is not consistent with the objectives of a particular zone and is therefore not permitted in the zone."

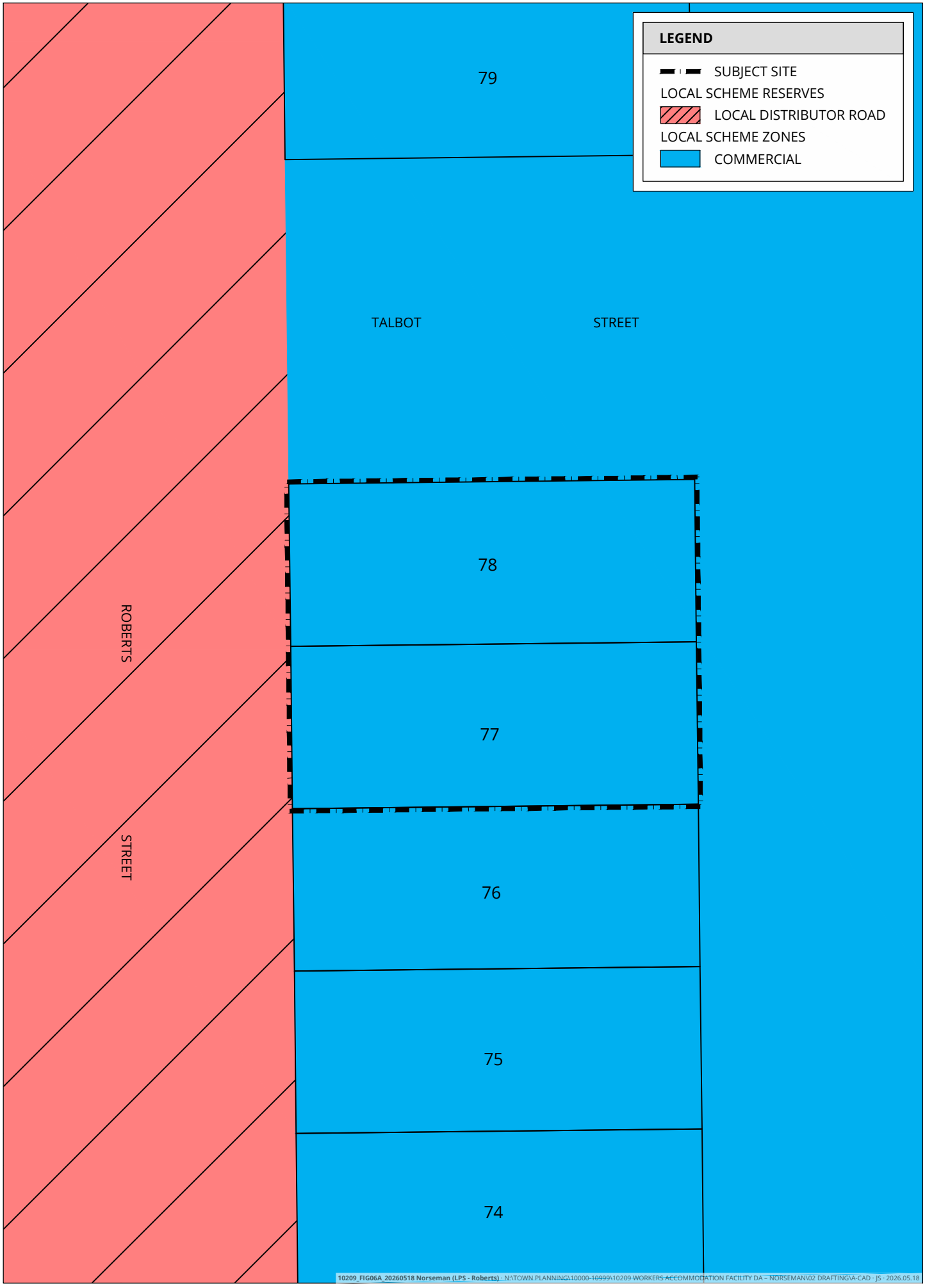
The proposed development is therefore required to be consistent with the objectives of the Commercial zone, as detailed above. The table below provides an assessment of the proposed development against the objectives of the Residential zone:

'COMMERCIAL' ZONE OBJECTIVE	**COMMENT**
To provide for a range of shops, offices, restaurants and other commercial outlets in defined townsites.	The proposal introduces *workforce accommodation* to support local businesses, mining and service industries by housing staff close to the town centre. While not a retail/commercial tenancy, the ground interface is designed to contribute to main-street activity (e.g., transparent fencing to Roberts Street, and clear pedestrian entry from the footpath). The Application does not prevent or constrain commercial uses within the town centre and maintains the ability of adjoining land to continue supporting retail and service activities. The development's low-impact, single-storey form ensures it remains compatible with the surrounding commercial and residential environment without introducing conflicting activities.
To maintain the compatibility with the general streetscape, for all new buildings in terms of scale,	The development is single storey, ensuring it fits comfortably within the scale and built form of Norseman's commercial streetscape. The building will utilise materials, colours and simple architectural treatments consistent with existing commercial buildings in the locality, while also providing for

height, style, materials, street alignment and design of facades.	an easy transition to the residential buildings south of the subject property. Street alignment and setbacks remain consistent with neighbouring development, and the façade design incorporates appropriate articulation and glazing to maintain a presentable street presence. Servicing areas are screened and all utilities are low-profile to protect streetscape character.
To ensure that development is not detrimental to the amenity of adjoining owners or residential properties in the locality	The single-storey building height, separation distances, and screened boundaries ensure there are no privacy impacts. Noise will be managed through appropriate acoustic design and onsite management procedures typical for workforce accommodation. Parking is provided onsite to avoid overflow onto adjoining lots or streets. Lighting is designed to avoid glare or spill beyond the site. Landscaping softens the interface with neighbouring properties and helps manage dust. Overall, the development is expected to operate with minimal impact on surrounding commercial or residential amenity.

Table 2: Assessment against Objectives of the Commercial zone.

Based on the above, the proposed land-use and development is considered consistent with the objectives of the Commercial zone and therefore capable of approval.



0 15m

SCALE @ A4: 1:600

FIGURE 3

SHIRE OF DUNDAS LOCAL PLANNING SCHEME No.2 ZONING

Local Planning Scheme No. 2 – Development Standards and Requirements

Clause 32 of LPS2 sets out the General Development Standards and Requirements for development, with Clause 32 (2)(a) relating to the Residential zone within the Norseman Townsite:

CLAUSE	COMMENT
a) Minimum lot area and frontage - 800m2 and 10 metres.	The total lot area for the Proposal is 2024m2, with a minimum frontage of 40.24m
b) Plot Ratio *The local government shall permit a building in the Commercial Zone to have a plot ratio of 1.0 and may permit an increase of 50 per cent providing that the local government is satisfied on matters relating to access, car parking servicing, loading and unloading and any other matter the local government by its absolute majority may take into consideration.*	This Proposal seeks a plot ratio of approximately 05:1, being well within the 1:1 ratio
c) Upper Floors *Where the ground floor of a two-storey building is used for the purposes of shops or offices, the local government may permit upper floors of such buildings to be used for the purposes of shops, offices or residential accommodation providing that:* *(i) the residential use is confined to the upper floor;* *(ii) the residential use is used only by the owner/occupier of the shop or office within the same building*	This development is single storey only.
d) Car Parking Requirements *(i) Where an application is made for development and the purpose for which the land or building is to be used is not specified in Table 7 the local government shall determine the number of car parking spaces to be provided on the land having regard to the nature of the*	The development provides satisfactory access, parking and servicing arrangements commensurate with its scale and operational characteristics. No new vehicle crossovers are proposed, with access managed via existing streets and a rear laneway for service vehicles, thereby minimising impacts on frontage roads. A total of 24 on-street parking bays are proposed, which

proposed development, the number of employees likely to be on the site, the prevention or obstruction of roads and streets, and the orderly and proper planning of the locality and the preservation of its amenity. *(ii) Notwithstanding the provisions of Table 7, local government may waive a requirement for parking on a site if it is satisfied that adequate constructed car parking is available in close proximity to the proposed development, and where this is not available, the local government may accept a cash payment in lieu of provisions of parking to be applied in accordance with the following sub-clause.* *(iii) Any payment made under the provisions of the preceding sub-clause shall be not less than the estimated cost of providing and constructing the parking spaces required by the Scheme plus the value of the area of land which might have been occupied by the parking spaces and be paid by the local government into a special fund to be applied solely to the provision, construction and maintenance of car parking facilities within the Zone.* *(iv) The dimensions of car parking spaces parking angle, driveway widths and landscaping detail specified in Schedule 1 shall be used by the local government in determining the layout of car parking areas. The local government may vary the dimensions specified by up to 10 percent where obstructions site dimensions or topography result in the loss of a car parking space in any run of car parking spaces. This provision shall be used in order to obtain one additional space in a run of spaces and shall not be used to modify landscaping, shade tree or driveway access requirements.*	exceeds the anticipated demand given that the majority of occupants are FIFO workers transported by bus. The parking layout has been designed in accordance with AS2890.5:2020 and is considered appropriate for the location. Bus pick-up and drop-off, servicing and waste collection can be safely and efficiently accommodated within the existing road reserve without disrupting traffic flow or pedestrian movement- as is common with similar developments within the Norseman townsite, and in particular is commensurate with the streetscape by utilising the large existing road reserves for its parking facilities. It is therefore respectfully requested that subclause (ii) is applied for these reasons.
e) Loading and Unloading *Where areas for the loading and unloading of vehicles carrying goods or commodities to or from premises are to be provided the same shall be provided and*	There is no loading or unloading required as part of this development.

maintained in accordance with the approved plan relating thereto.	
f) Bin Areas *The local government will require adequate provision for bin storage to be made readily accessible by truck for refuse disposal purposes*	The shire does not have a recycling service, nor are kitchen facilities proposed as part of this development. Accordingly, waste is expected to be generated at a minimum rate. Where green bins are allocated, these are contained within the site, and maintained by the accommodation provider's staff. On each collection day, these are rolled onto the verge for collection. Any recyclables are collected (and capable of being accepted for containers-for-change) and deposited in a containers-for-change depot.

The proposed development is considered to be adherent with this provision for the following reasons:

- The proposed development achieves a low-density character through its single-storey design and low site coverage. Given the proposal incorporates four standard residential lots, the layout of the buildings enable generous setbacks, landscaping buffers and open space areas which ultimately maintains a development pattern that is visually and spatially consistent with the surrounding area;
- The subject site is located in close proximity to Norseman's commercial zone and key transport infrastructure (i.e. the Coolgardie-Esperance Highway), therefore making an appropriate location for a higher intensity of land use;
- LPS2 contemplates a mix of activities within the Residential zone in order to further contribute to the economic and tourism functions of Norseman. The proposed development directly supports the continued operation of mining and construction projects within the region, in which these projects generate economic activity, ultimately underpinning tourism, retail and service provisions within Norseman; and
- The proposed development has been specifically designed to preserve the amenity of the local area through appropriate setbacks, boundary fencing and building orientation. Operations will be managed by an on-site manager, with site rules and procedures in place to ensure no adverse impacts are imposed on the surrounding area and affecting the residential amenity.

TRAFFIC CONSIDERATIONS

To demonstrate and confirm the low vehicle trip usage, a Traffic Impact Statement ('TIS') has been prepared by Shawmac in support of this Application, in accordance with the *Western Australian Planning Commission* ('WAPC') Transport Impact Assessment Guidelines for Individual Developments. The TIS can be summarised as follows:

Traffic Generation and Network Capacity

The proposed 48-room workers' accommodation is expected to generate very low traffic volumes, with an

estimated increase of approximately 22 vehicles per day and 11 vehicles per peak hour. While this represents a moderate percentage increase over existing peak hour traffic due to the very low baseline volumes, the surrounding road network has ample spare capacity, and all resulting traffic levels remain well below accepted thresholds for local access roads and the broader network.

Road Hierarchy and Frontage Conditions

The site is serviced by low-volume local roads within the Norseman townsite. Estimated daily traffic on the surrounding streets is less than 300 vehicles per day, compared to the 3,000 vehicles per day guideline for access roads under *Liveable Neighbourhoods*. The development does not require upgrades to the existing road network.

Vehicle Access Arrangements

No new crossovers or access points are proposed. All vehicle access and manoeuvring will occur on existing streets, consistent with the established urban form and without alteration to road layouts.

Parking Provision and Design

A total of 24 on-street car parking bays are proposed along Roberts Street and Talbot Street. This provision exceeds anticipated demand and reflects the operational model, where most workers are FIFO and transported by bus. The on-street parking design complies with AS2890.5:2020 (On-Street Parking) in terms of bay dimensions and manoeuvring space.

Bus Operations and Servicing

The majority of workers will be transported via a variety of buses, ranging from a 40-seater, 24-seater and 6 seaters, to transport workers between the accommodation, workers' club, mine site and airport. Bus pick-up and drop-off will occur from the street verge, which is sufficiently wide to accommodate temporary stopping without impeding traffic. Service vehicles, including maintenance and linen vans, will access the site via the rear laneway, reducing impacts on frontage streets.

Pedestrian Connectivity

The surrounding pedestrian infrastructure is considered adequate. Footpaths are provided on at least one side of all adjacent streets, enabling safe and convenient pedestrian movement, particularly between the accommodation site and the nearby workers' club approximately 130 metres to the west.

Public Transport

Public transport availability in Norseman is limited, with the nearest TransWA service located approximately 1.6km from the site. Given the reliance on private buses and work vehicles, no demand for public transport is anticipated as a result of the development.

Safety and Crash History

A review of crash data for the five-year period from January 2021 to December 2025 indicates a very low incidence of crashes in the surrounding road network. There are no identifiable safety issues, and the scale and nature of the development are not expected to materially increase crash risk.

Based on the above, the TIS concludes that the proposed development is compliant with the provisions of the WAPC Transport Impact Assessment Guidelines for Individual Developments and that no adverse impacts will be imposed on the surrounding area.

Refer **Attachment 3 – Traffic Impact Statement.**

FREIGHT NOISE CONSIDERATIONS

This Application is located within a freight noise sensitive location, owing to its relative distance to the Esperance-Kalgoorlie freight rail link; and Princep Street, which serves as the major road freight link, connecting to the Coolgardie-Esperance Highway. Therefore State Planning Policy 5.4 – Road and Rail Noise (**SPP5.4**) is invoked.

Accordingly, Herring Storer Acoustics Consultants has prepared a Noise Attenuation report, which is summarised as follows:

The assessment confirms that the site is located approximately 80 metres from the freight rail corridor and is therefore within the policy trigger distance, requiring consideration under SPP 5.4. A noise exposure forecast undertaken in accordance with the SPP5.4 Implementation Guidelines indicates a predicted rail noise level of 57 dB(A) at the site.

Based on this outcome, the report concludes that the development is suitable subject to incorporation of Quiet House Design Package A+, which is a deemed-to-satisfy mitigation approach under the policy. The package includes appropriate building design measures to ensure compliance with internal noise targets for sleeping and living areas, consistent with SPP5.4 objectives.

The assessment also identifies the need for a two (2) metre high acoustic boundary fence to the gazebo area to support reasonable acoustic amenity in communal outdoor spaces. With these measures in place, the proposal is considered capable of achieving acceptable acoustic outcomes for both internal and external areas.

Overall, the Acoustic Assessment demonstrates that the proposed development can be satisfactorily designed to comply with SPP5.4 and that rail noise impacts can be appropriately managed through standard, policy-endorsed mitigation measures, supporting the suitability of the site for workers' accommodation.

Refer **Attachment 4 – Noise Attenuation Report.**

CIVIL ENGINEERING

All wastewater is proposed to be pumped via pressurised pipes to the Wastewater Treatment Plant (WWTP) located on Lot 874 (No.51) Richardson Street, Norseman – a dedicated wastewater treatment plant approved on 18 November 2025.

The civil engineering report confirms that the site is capable of being connected to the WWTP, with a pump station being constructed at the pipehead to maintain pressure.

Stormwater is expected to be contained where possible and appropriate, with overflow being directed to the Shire's existing stormwater drains within the road reserve.

Attachment 5 – Civil Engineering Report.

LANDSCAPING

The accompanying Landscape Plan has been prepared with careful regard to the semi-arid climatic conditions of Norseman and the site's location within the ecologically significant Great Western Woodlands region. The planting strategy prioritises hardy, drought-tolerant and predominantly native species that are well suited to local conditions, ensuring long-term viability, reduced water demand and minimal maintenance requirements. Selected species including a mix of shrubs, groundcovers and flowering plants, are intended to contribute to local biodiversity outcomes while creating an attractive, functional and resilient landscape setting.

The landscape response also supports the amenity and liveability objectives of the development by softening the built form, providing visual relief and contributing to a more comfortable microclimate for residents. Landscaping treatments are designed to enhance streetscape presentation along Roberts Street and adjoining interfaces, while also creating defined communal and transitional spaces that support passive use and informal interaction. Practical measures such as mulching and reticulated irrigation (via drip or micro-spray systems) are incorporated to improve plant establishment and water efficiency, consistent with best-practice landscape management in semi-arid environments.

Overall, the Landscape Plan delivers a robust and contextually responsive outcome that balances environmental considerations with functional amenity, reinforcing the development's integration within the Norseman townsite while contributing positively to local character and ecological value.

Attachment 6 – Preliminary Landscaping Plan.

SOCIAL AND ECONOMIC DEVELOPMENT

Resource Accommodation Management's co-living model is designed to provide a contemporary, non-institutional form of workforce accommodation that supports the mental health and overall wellbeing of residents. By offering a more normalised living environment that is distinct from traditional camp-style facilities, the development enables workers to disengage from the demands of the worksite, reducing known risks associated with isolation, fatigue and mental health pressures common in "Fly-in-Fly-Out" (FIFO) arrangements. Its central location within Norseman allows the residents of the accommodations to walk, access local services, and experience a change of environment between shifts, helping to break up the work cycle and support healthier daily routines that are critical to mental health awareness.

From an economic development perspective, the development will generate consistent and recurring expenditure within the local economy, which is particularly significant in the context of a small and constrained regional town. Unlike self-contained camps, the co-living format actively encourages its residents to engage with existing businesses, resulting in regular spending on groceries, meals, hospitality and day-to-day services. This increased patronage supports the viability of key local enterprises such as the IGA, cafés, takeaway outlets and the Norseman Hotel, helping to stabilise trade volumes and sustain employment. The presence of a resident workforce within walking distance of the town centre also increases foot traffic and activity levels throughout the day and evening, contributing to improved business confidence and potentially enabling extended trading hours or service offerings over time.

Importantly, this form of distributed economic participation creates a multiplier effect, where expenditure by workers circulates within the local economy rather than being captured within a closed facility. For a town such as Norseman where economic activity is closely tied to resource sector cycles, this consistent inflow of spending assists in smoothing demand fluctuations and reinforces the role of the town as a service hub for both industry and the surrounding region. In this way, the proposal not only supports the operational needs of the mining sector but also delivers broader economic resilience benefits, strengthening the sustainability and vibrancy of the local community.

CONCLUSION

This Application is seeking approval for a Workers' Accommodation Facility at the subject site. The proposed development is adherent to the provisions of the Shire of Dundas Local Planning Scheme No. 2 and is considered to be consistent with the objectives of the 'Commercial' zone. This Application is also supported by technical reports confirming that the proposal will not cause any adverse impacts upon its surroundings.

The land-use is wholly related to transient mine workers, meaning the works only use the accommodation on a temporary basis, where the accommodation is shared with another worker on an alternative roster, as is common throughout Western Australia. The built form is intended to be permanent. Accordingly, the proposal is consistent with the Workforce Accommodation land-use definition and is capable of approval as such.

Accordingly, a favourable determination by the Southern Goldfields Development Assessment Panel for this Application is requested.

Attachment One

Certificates of Title

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1040	**401**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 77 ON DEPOSITED PLAN 222908

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

GREGORY THOMAS JONES OF 91 FREMANTLE ROAD GOSNELLS WA 6110
KEVEN ERNEST JOSEPH JONES OF 1440 NEEDHAM ROAD WOOROLOO WA 6558
AS ADMINISTRATORS OF THE ESTATE OF STANLEY JOSEPH LUCAS JONES WHO DIED ON 23/02/2002

(TA Q602447) REGISTERED 1/10/2025

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. B003357 MORTGAGE TO LEONARD DAW, RAYMOND CLIVE DAW, BOTH OF ESPERANCE REGISTERED 6/8/1975.

   B426135 TRANSMISSION AFFECTING MORTGAGE B003357, MORTGAGEE NOW LEONARD THEODORE DAW OF 12 CROSSLAND STREET, ESPERANCE, AUSTIN KEITH DAW OF 4 MITCHELL STREET, ESPERANCE, FREDERICK MAURICE DAW OF 16 PITT STREET, KENSINGTON, AS EXECUTOR OF THE WILL OF LEONARD DAW, DECEASED IN 1/2 SHARE, RAYMOND CLIVE DAW OF ESPERANCE, IN 1/2 SHARE, AS TENANTS IN COMMON REGISTERED 1/11/1977.

   B426136 TRANSFER OF MORTGAGE B003357, MORTGAGEE NOW LEONARD THEODORE DAW OF 12 CROSSLAND STREET, ESPERANCE, IN 1/6 SHARE, AUSTIN KEITH DAW OF 4 MITCHELL STREET, ESPERANCE, IN 1/6 SHARE, FREDERICK MAURICE DAW OF 16 PITT STREET, KENSINGTON, IN 1/6 SHARE, RAYMOND CLIVE DAW OF ESPERANCE, IN 3/6 SHARE, AS TENANTS IN COMMON REGISTERED 1/11/1977.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

END OF PAGE 1 - CONTINUED OVER

Subject to dealing

LANDGATE COPY OF ORIGINAL NOT TO SCALE 24/04/2026 02:46 PM Request number: 69741303

Landgate
www.landgate.wa.gov.au

SKETCH OF LAND:	1040-401 (77/DP222908)
PREVIOUS TITLE:	85-116
PROPERTY STREET ADDRESS:	96 ROBERTS ST, NORSEMAN.
LOCAL GOVERNMENT AUTHORITY:	SHIRE OF DUNDAS

Subject to dealing

WESTERN AUSTRALIA

TITLE NUMBER	
Volume	Folio
1955	**334**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

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BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 78 ON DEPOSITED PLAN 222908

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

RESOURCE ACCOMMODATION MANAGEMENT PTY LTD OF SUITE 5 LEVEL2 2 GROSVENOR STREET BONDI JUNCTION NSW 2022

(T P717684) REGISTERED 21/9/2023

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	1955-334 (78/DP222908)
PREVIOUS TITLE:	1242-607
PROPERTY STREET ADDRESS:	94 ROBERTS ST, NORSEMAN.
LOCAL GOVERNMENT AUTHORITY:	SHIRE OF DUNDAS

LANDGATE COPY OF ORIGINAL NOT TO SCALE 24/04/2026 02:46 PM Request number: 69741303

Landgate
www.landgate.wa.gov.au

Attachment Two

Development Plans

PROPOSED ACCOMMODATION VILLAGE

94-96.ROBERTS STREET NORSEMAN, WA, 6443

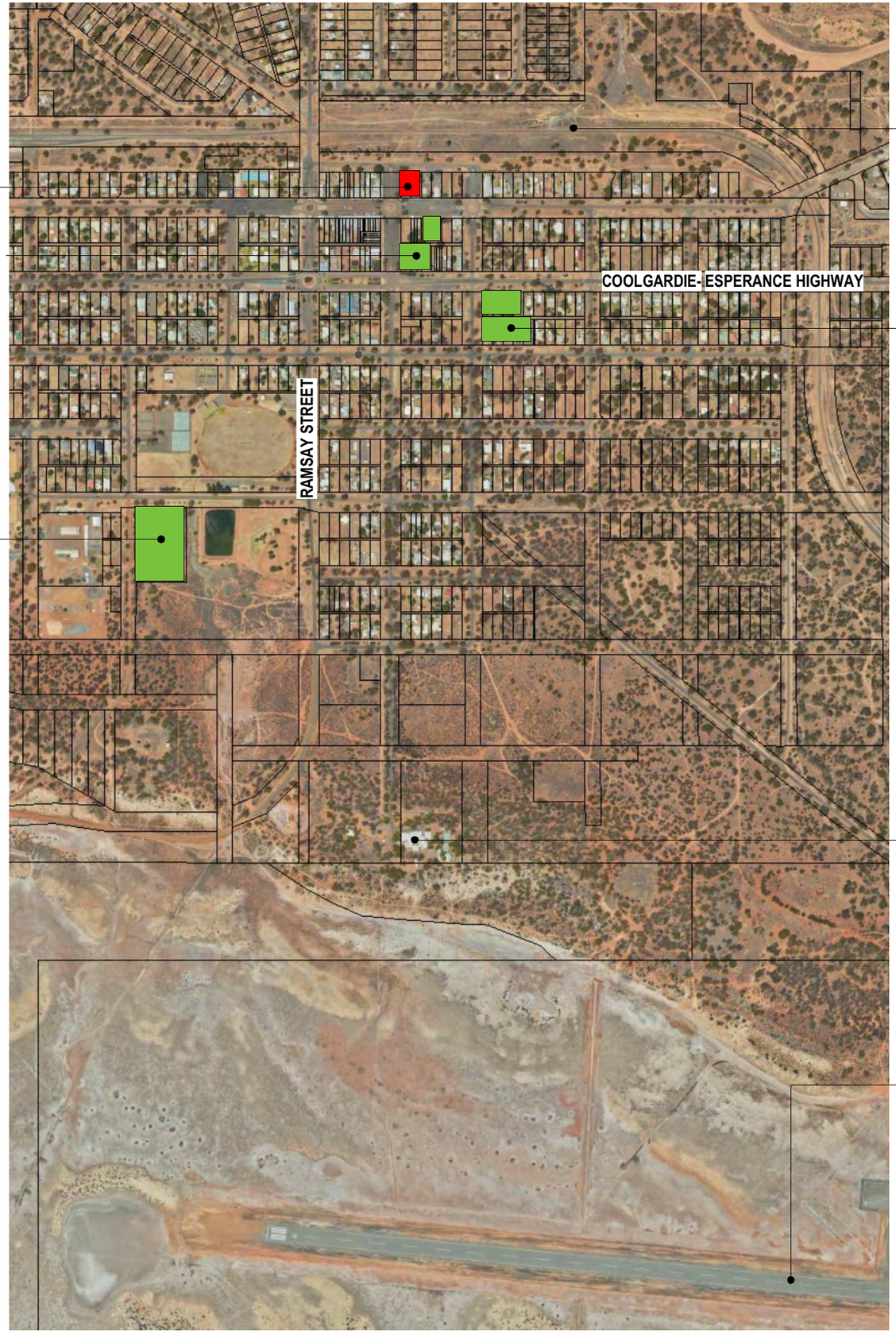


SHEET No.	SHEET NAME	REVISION	REVISION DATE
SK-00	TITLE PAGE	C	05/07/26
SK-01	SITE LOCATION PLAN	C	05/07/26
SK-02	SITE OVERALL PLAN	C	05/07/26
SK-03	EXISTING SITE PLAN	C	05/07/26
SK-04	SITE PLAN	C	05/07/26

SHEET No.	SHEET NAME	REVISION	REVISION DATE
SK-05	GROUND FLOOR PLAN	C	05/07/26
SK-06	STREET ELEVATION	A	05/07/26
SK-50	PERSPECTIVES	A	26/02/26
SK-51	PERSPECTIVES	A	26/02/26
SK-52	PERSPECTIVES	A	26/02/26
SK-53	PERSPECTIVES	A	26/02/26

ANDRE MELVILLE BUILDING DESIGN
& DRAFTING SERVICES
P.O BOX 8, LABRADOR, QLD 4814
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E-MAIL: admin@ambd.com.au
www.ambd.com.au
QBCC No. 1222804
ABN No. 37 155 932 675
ENDORSED Sustainable Building Designer
Townsville - Brisbane - **Goldcoast**

7/07/2026 9:00:02 AM



PROPOSED SITE LOCATION

EXISTING ACCOMMODATION DINING FACILITIES

EXISTING SEWERAGE TREATMENT PLANT

TRAIN LINE CORRIDOR

EXISTING ACCOMMODATION VILLAGE

LOCAL HOSPITAL

LOCAL AIRPORT

NORTH

NOT FOR CONSTRUCTION

CP-SITE LOCATION PLAN

1 : 10000@A3

NOTE:
- VERIFY ALL DIMENSIONS ON SITE
- NOTED DIMENSIONS TAKE PRESIDENT OVER SCALED DIMENSIONS

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PROJECT : PROPOSED ACCOMMODATION VILLAGE
CLIENT : Resource Accommodation Management Pty Ltd
LOCATION: 94-96.ROBERTS STREET NORSEMAN, WA, 6443

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QBCC No. 1222804
ABN No. 37 155 932 675
ENDORSED Sustainable Building Designer

No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26
C	UPDATED DA ISSUE	05/07/26

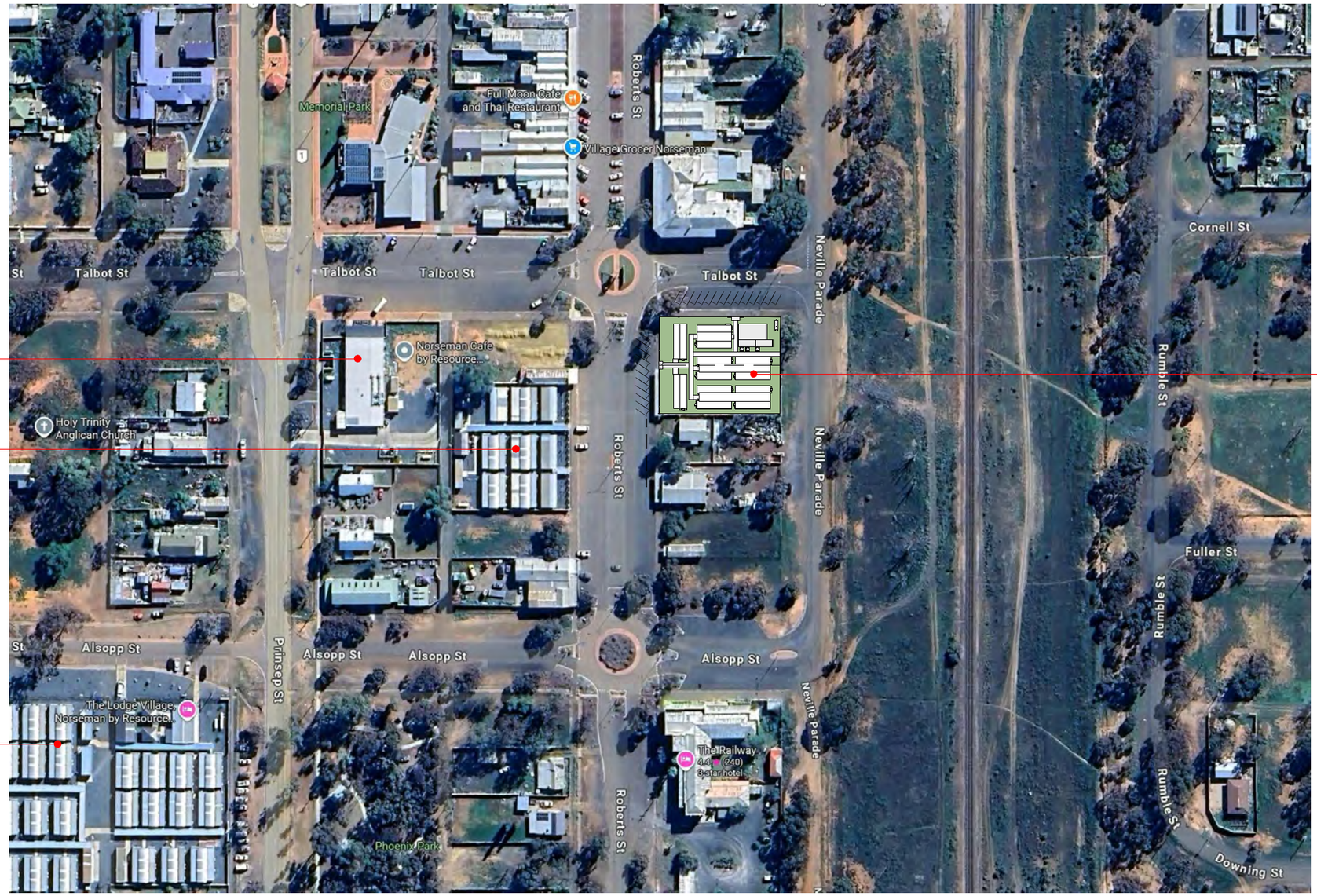
DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3 1 : 10000
ISSUED	05/07/26

SITE LOCATION PLAN

25-116 - SK-01 - C

7/07/2026 9:00:02 AM

NORTH



NORSEMAN CAFE

NORSEMAN ACCOMMODATION

THE LODGE VILLAGE
EXISTING ACCOMMODATION

PROPOSED SITE

SITE AREA PERCENTAGE		
Name	Area	AREA AS %
CONCRETE PATH	324.4 m²	16.027
LANDSCAPING	1011.0 m²	49.949
NEW ACCOMMODATION	570.2 m²	28.174
NEW LAUNDRY	42.0 m²	2.075
RECREATION SLAB AREA	78.0 m²	3.854

SITE AREAS	
Name	Area
CONCRETE PATH	324.4 m²
LANDSCAPING	1011.0 m²
NEW ACCOMMODATION	570.2 m²
NEW LAUNDRY	42.0 m²
RECREATION SLAB AREA	78.0 m²

SITE INFO

LOT 77 & 78 ON DP222908
SITE AREA 2022m²

NOT FOR CONSTRUCTION

CP-SITE AREA PLAN

1 : 2000@A3

NOTE:
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No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26
C	UPDATED DA ISSUE	05/07/26

DESIGNED		AM
DRAWN		AM
DATE		FEB 2025
SCALE	A3	As indicated
ISSUED		05/07/26

SITE OVERALL PLAN

25-116 - SK-02 - C

7/07/2026 9:00:03 AM

NORTH



EXISTING CONTAINER TO BE REMOVED

EXISTING CONTAINER TO BE REMOVED

EXISTING SHED TO BE REMOVED

EXISTING AWNING TO BE DEMOLISHED

GOODLIFE STREET

CP - EXISTING SITE PLAN

1 : 500@A3

NOT FOR CONSTRUCTION

1.5 0.75 0 0.75 1.5 2.25 3.0 3.75 1:750 @ A3
1:1500 @ A4

NOTE:
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CLIENT : Resource Accommodation Management Pty Ltd
LOCATION: 94-96.ROBERTS STREET NORSEMAN, WA, 6443

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No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26
C	UPDATED DA ISSUE	05/07/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3 : 1 : 500
ISSUED	05/07/26

EXISTING SITE PLAN

25-116 - SK-03 - C

7/07/2026 9:00:03 AM

SITE AREA PERCENTAGE		
Name	Area	AREA AS %
CONCRETE PATH	324.4 m²	16.027
LANDSCAPING	1011.0 m²	49.949
NEW ACCOMMODATION	570.2 m²	28.174
NEW LAUNDRY	42.0 m²	2.075
RECREATION SLAB AREA	78.0 m²	3.854

SITE AREAS	
Name	Area
CONCRETE PATH	324.4 m²
LANDSCAPING	1011.0 m²
NEW ACCOMMODATION	570.2 m²
NEW LAUNDRY	42.0 m²
RECREATION SLAB AREA	78.0 m²

SITE INFO

LOT 77 & 78 ON DP222908
SITE AREA 2022m²

PROPOSED ON STREET PARKING AREA (14 BAYS)
PROPOSED NEW FEATURE ENTRY
EXISTING BITUMEN WALK WAY
PROPOSED NEW 1800H COLORBOND FENCE

NORTH

TALBOT STREET

2 x GUM TREE 10m HIGH
PATHWAY
90° 09' 32" 50.29 m
50.29
GATE
CONTAINER
PROPOSED ON SITE 4,900L GAS BULLET
HYG
WSV
BOL
UMP HIGH
BOL
GUM TREE 10m HIGH
0° 09' 02" 20.12 m
20.12
BLOCK D2
COVERED LINK
BLOCK D1
GAZEBO
LDRY/ LIN/ STORE
180° 09' 02" 20.11 m
PROPOSED BIN STORE
2 x STUMP 0.2m HIGH
PROPOSED 1800H FEATURE FENCE
PROPOSED NEW ACCESS GATE
ROBERTS STREET
PROPOSED NEW FEATURE ENTRY
BLOCK C2
BLOCK C4
CONTAINER
COVERED LINK
BLOCK C1
BLOCK C3
WMT
PROPOSED ON STREET PARKING AREA (10 BAYS)
COVERED LINK
BLOCK A2
BLOCK A1
BLOCK B2
BLOCK B4
COVERED LINK
EXISTING BITUMEN WALK WAY
BLOCK B1
BLOCK B3
NEVILLE PARADE
PROPOSED NEW 1800H COLORBOND FENCE
270° 09' 02" 50.29 m
76
1012m²
PROPOSED NEW 1800H COLORBOND FENCE

NOT FOR CONSTRUCTION

6.0 3.0 0 3.0 6.0 9.0 12.0 15.0 1:300 @ A3 1:600 @ A4

CP - SITE PLAN

1 : 300@A3

NOTE:
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No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26
C	UPDATED DA ISSUE	05/07/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3 As indicated
ISSUED	05/07/26

SITE PLAN
25-116 - SK-04 - C

7/07/2026 9:00:03 AM

SITE AREA PERCENTAGE		
Name	Area	AREA AS %
CONCRETE PATH	324.4 m²	16.027
LANDSCAPING	1011.0 m²	49.949
NEW ACCOMMODATION	570.2 m²	28.174
NEW LAUNDRY	42.0 m²	2.075
RECREATION SLAB AREA	78.0 m²	3.854

SITE AREAS	
Name	Area
CONCRETE PATH	324.4 m²
LANDSCAPING	1011.0 m²
NEW ACCOMMODATION	570.2 m²
NEW LAUNDRY	42.0 m²
RECREATION SLAB AREA	78.0 m²



SITE INFO

LOT 77 & 78 ON DP222908
SITE AREA 2022m²

NOT FOR CONSTRUCTION

1.5 0.75 0 0.75 1.5 2.25 3.0 3.75
1:750 @ A3
1:1500 @ A4

CP-SITE GROUDN FLOOR PLAN

1 : 300@A3

NOTE:
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No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26
C	UPDATED DA ISSUE	05/07/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3 As indicated
ISSUED	05/07/26

GROUND FLOOR PLAN

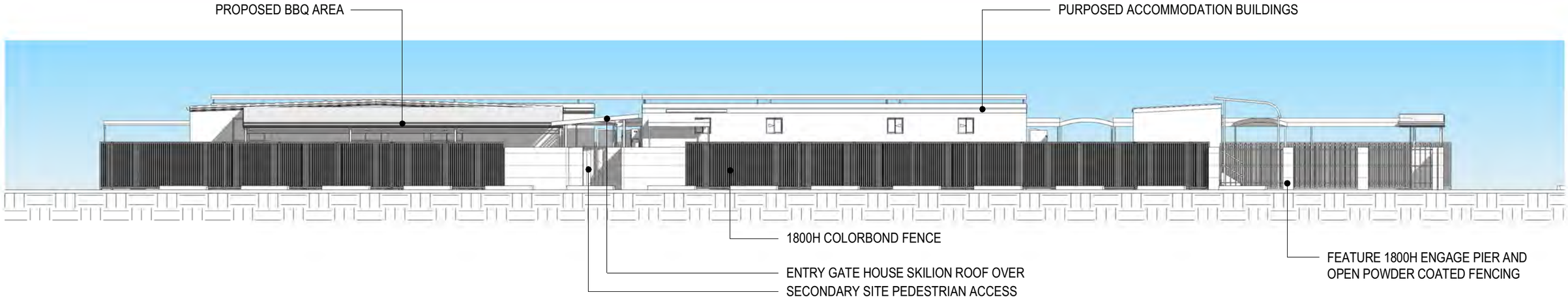
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7/07/2026 9:00:05 AM



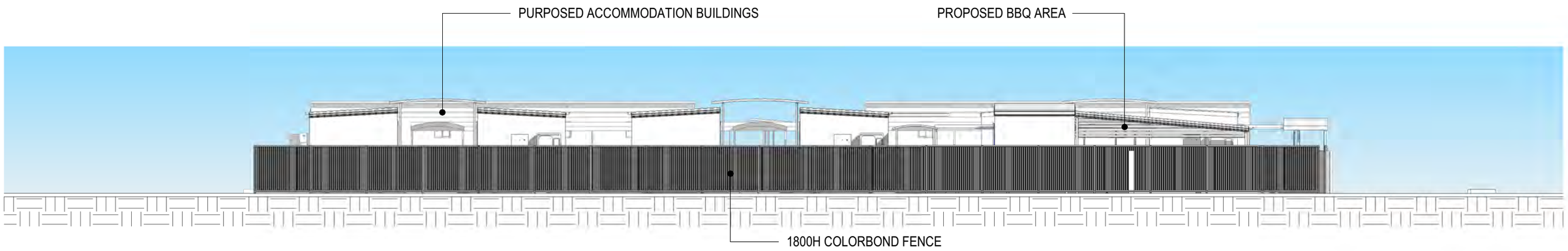
ROBERTS STREET ELEVATION

1 : 150@A3



TALBOT STREET ELEVATION

1 : 150@A3



NOT FOR CONSTRUCTION

NEVILLE PARADE ELEVATION

1 : 150@A3

NOTE:
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LOCATION: 94-96.ROBERTS STREET NORSEMAN, WA, 6443

QBCC No. 1222804
ABN No. 37 155 932 675

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ENDORSED Sustainable Building Designer

No.	Description	Date
A	UPDATED DA ISSUE	05/07/26

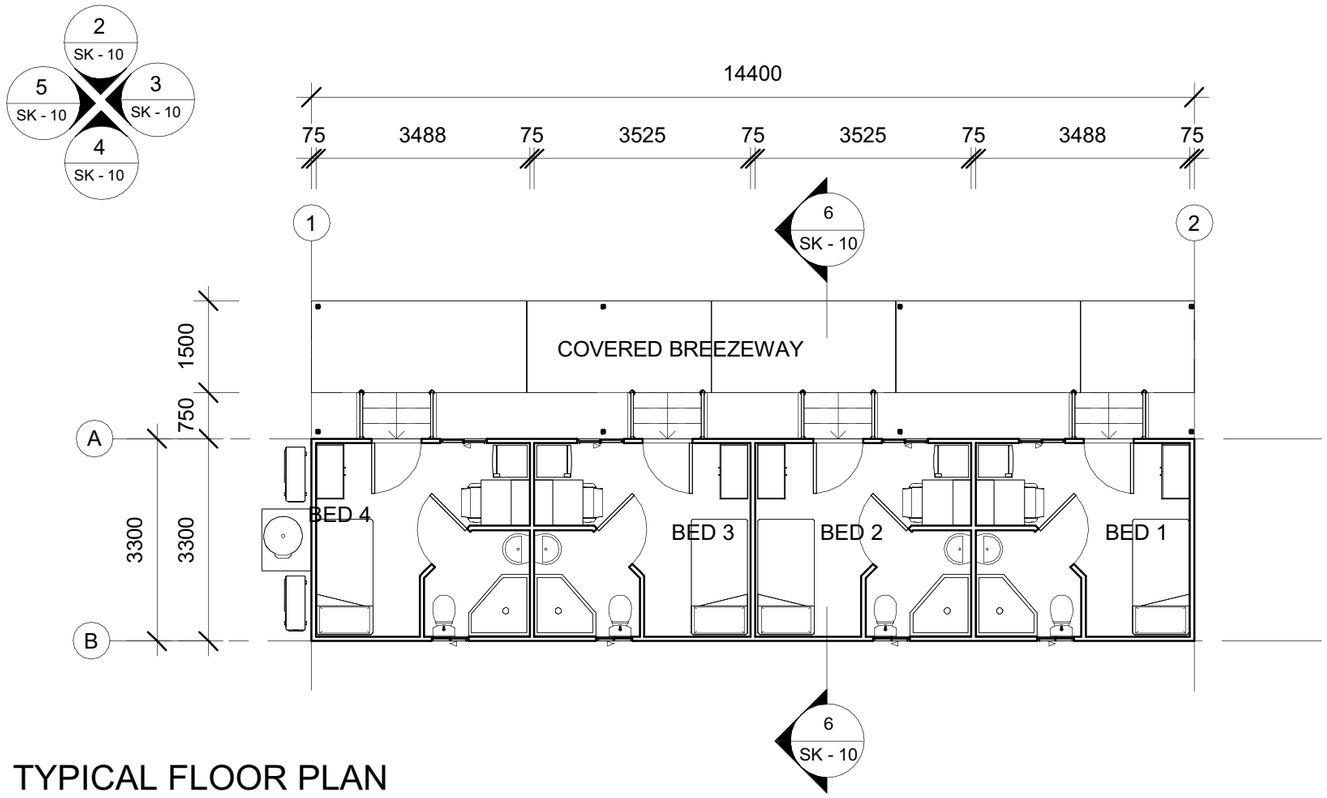
DESIGNED	AM
DRAWN	AM
DATE	APRIL 2026
SCALE	A3 1 : 150
ISSUED	05/07/26

STREET ELEVATION

25-116 - SK-06 - A

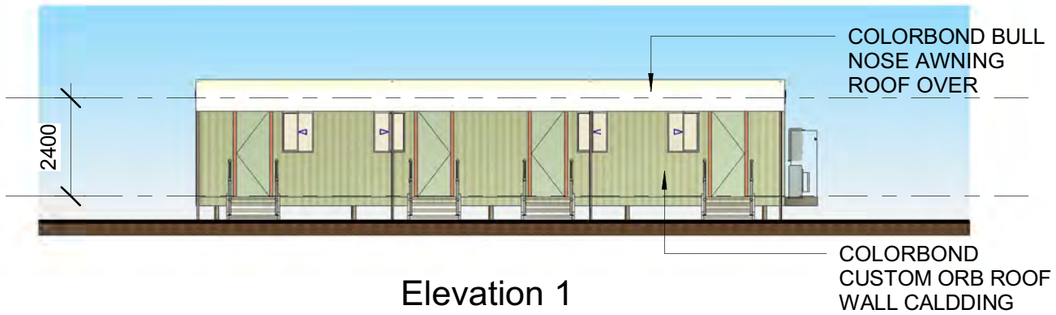
7/07/2026 1:04:56 AM

1 MODULE ACCOMMODATION BUILDING



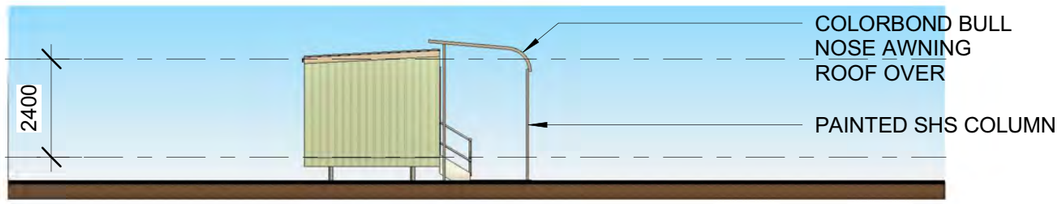
TYPICAL FLOOR PLAN

1 : 100 @ A3



Elevation 1

1 : 150 @ A3



Elevation 2

1 : 150 @ A3

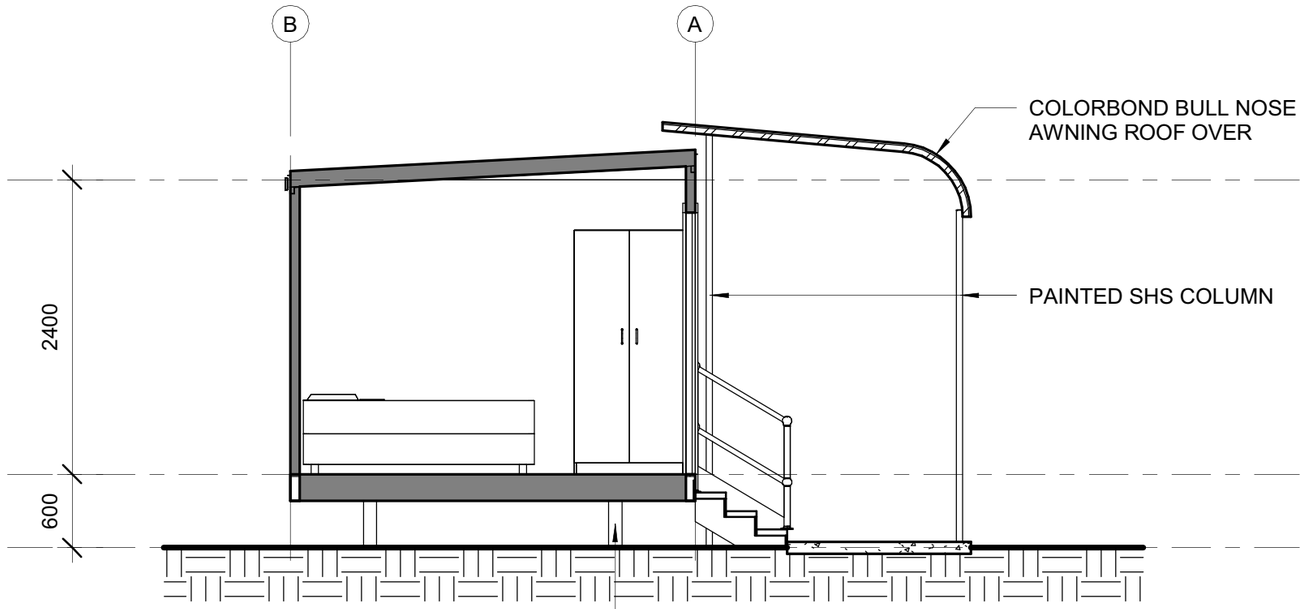
Elevation 3

1 : 150 @ A3



Elevation 4

1 : 150 @ A3



Section AA

1 : 50 @ A3

MODULES	47.5m²
TOTAL m²	**47.5m²**

NOTE: THESE PLANS ARE TO BE READ IN CONJUNCTION WITH STANDARD ATCO APPROVED PLANS

NOTE: TOTAL LENGTH OF BUILDING NOT TO EXCEED 45M. ALL SOME ALARMS MUST BE INTERCONNECTED IF MODULES HAVE LESS THAN 1.5M SPACING END TO END.

NOT FOR CONSTRUCTION

2.0 1.0 0 1.0 2.0 3.0 4.0 5.0

1:100 @ A3
1:200 @ A4

NOTE:
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PROJECT : PROPOSED ACCOMMODATION VILLAGE
CLIENT : Resource Accommodation Management Pty Ltd
LOCATION: 94-96 ROBERTS STREET NORSEMAN, WA 6443

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QBCC No. 1222804
ABN No. 37 155 932 675
Townsville - Brisbane - **Goldcoast**

ENDORSED Sustainable Building Designer

No.	Description	Date
A	DA APPLICATION	19/11/20

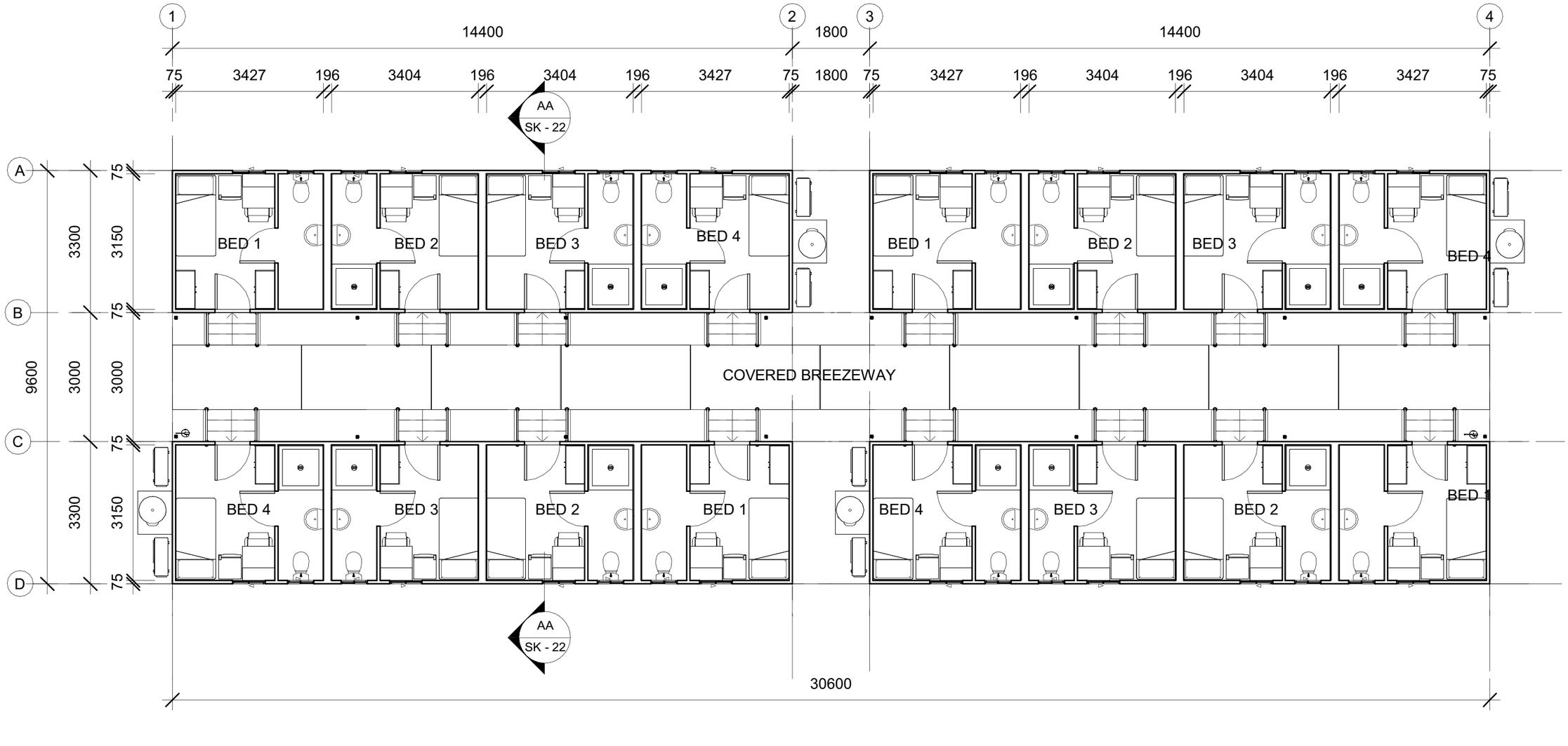
DESIGNED	AM
DRAWN	AM
DATE	FEB 2026
SCALE	A3 As indicated
ISSUED	19/11/20

TYPICAL ACCOMMODATION WITH BULL NOSE FLY OVER ROOF, PLAN AND ELEVATIONS

25-116 - SK - 10 - A

6/07/2026 12:35:15 AM

TYPICAL 4 MODULE ACCOMMODATION BUILDING



MODULES	190m²
TOTAL m²	**190m²**

GROUND FLOOR TYPICAL AREA PLAN

1 : 100 @ A3

NOTE: THESE PLANS ARE TO BE READ IN CONJUNCTION WITH STANDARD ATCO APPROVED PLANS

NOTE: TOTAL LENGTH OF BUILDING NOT TO EXCEED 45M. ALL SOME ALARMS MUST BE INTERCONNECTED IF MODULES HAVE LESS THAN 1.5M SPACING END TO END.

NOT FOR CONSTRUCTION

2,0 1,0 0 1,0 2,0 3,0 4,0 5,0

1:100 @ A3
1:200 @ A4

NOTE:
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No.	Description	Date
A	DA APPLICATION	05/07/26

DESIGNED		AM
DRAWN		AM
DATE		APRIL 2026
SCALE	A3	1 : 100
ISSUED		05/07/26

TYPICAL 4 MODULE ACCOMMODATION - FLOOR PLAN

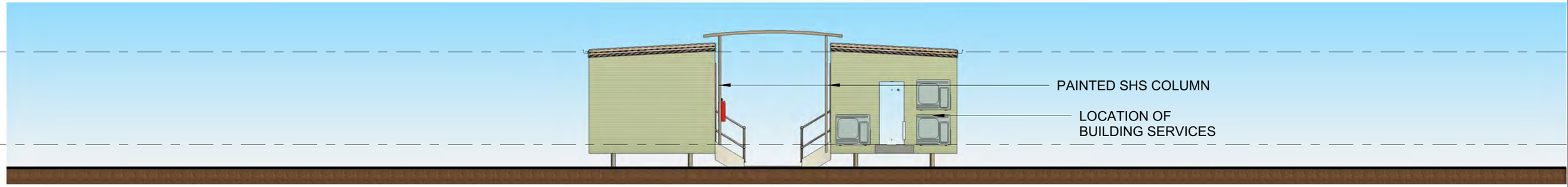
25-116 - SK - 20 - A

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Elevation 1

1 : 100 @ A3



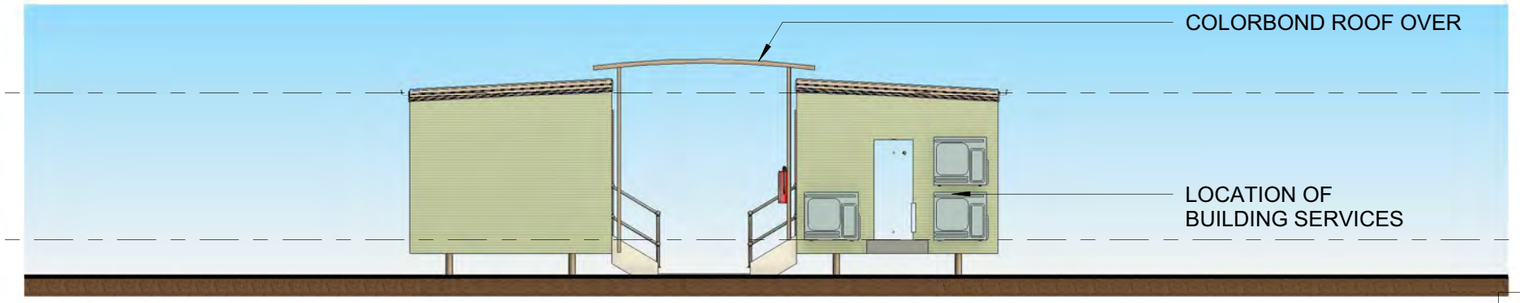
Elevation 2

1 : 100 @ A3



Elevation 3

1 : 100 @ A3



Elevation 4

1 : 100 @ A3

NOT FOR CONSTRUCTION

2.0 1.0 0 1.0 2.0 3.0 4.0 5.0

1:100 @ A3
1:200 @ A4

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PROJECT : PROPOSED ACCOMMODATION VILLAGE
CLIENT : Resource Accommodation Management Pty Ltd
LOCATION: 94-96 ROBERTS STREET NORSEMAN, WA 6443

QBCC No. 1222804
ABN No. 37 155 932 675

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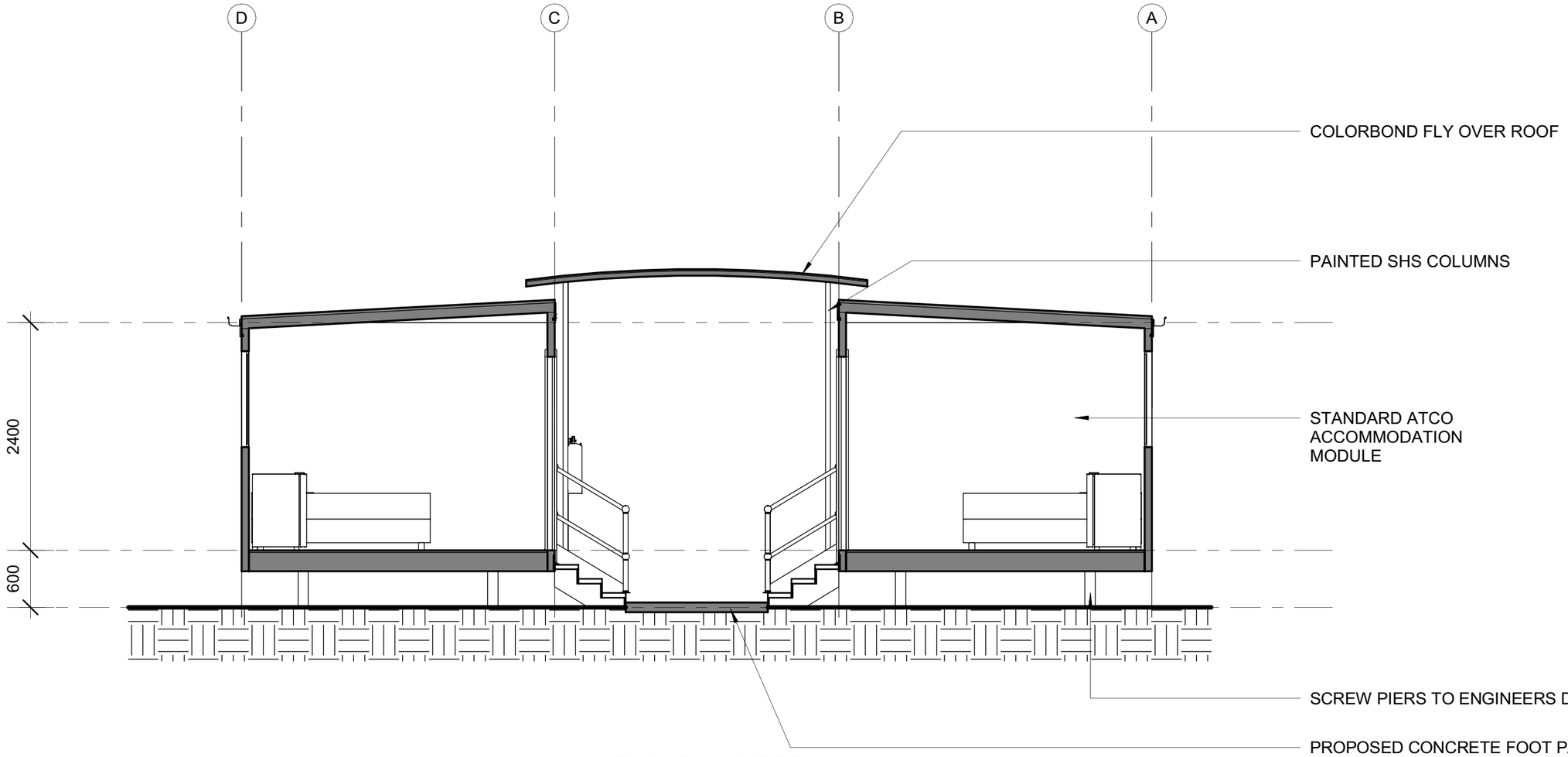
No.	Description	Date

DESIGNED	AM
DRAWN	AM
DATE	APRIL 2026
SCALE	A3 1 : 100
ISSUED	

TYPICAL 4 MODULE ACCOMMODATION - ELEVATION

25-116 - SK - 21 -

6/07/2026 11:38:08 PM



TYPICAL SECTION AA

1 : 50 @ A3

NOT FOR CONSTRUCTION

1.0 0.5 0 0.5 1.0 1.5 2.0 2.5

1:50 @ A3
1:100 @ A4

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No.	Description	Date

DESIGNED	AM
DRAWN	AM
DATE	APRIL 2026
SCALE	A3 1 : 50
ISSUED	

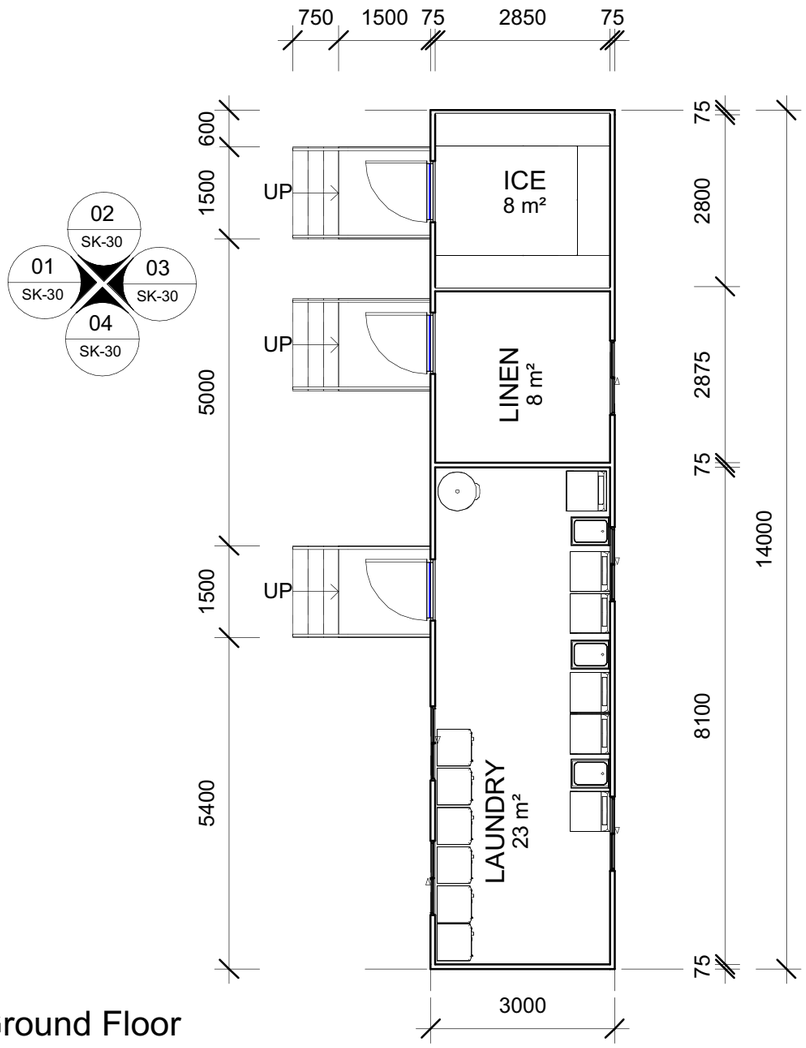
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25-116 - SK - 22 -

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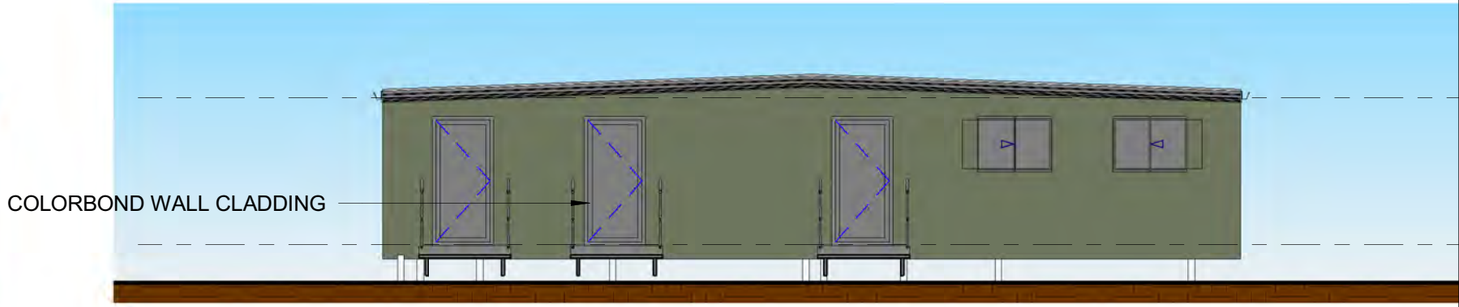
LAUNDRY BUILDING





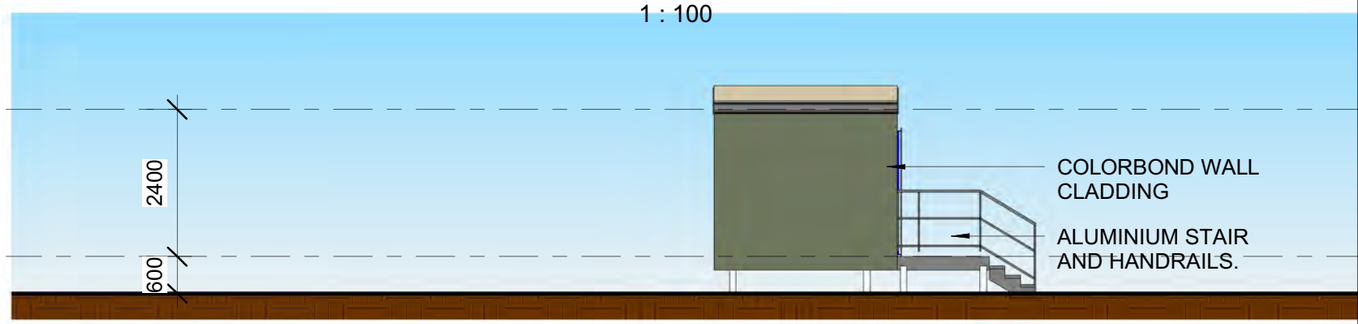
Ground Floor

1 : 100



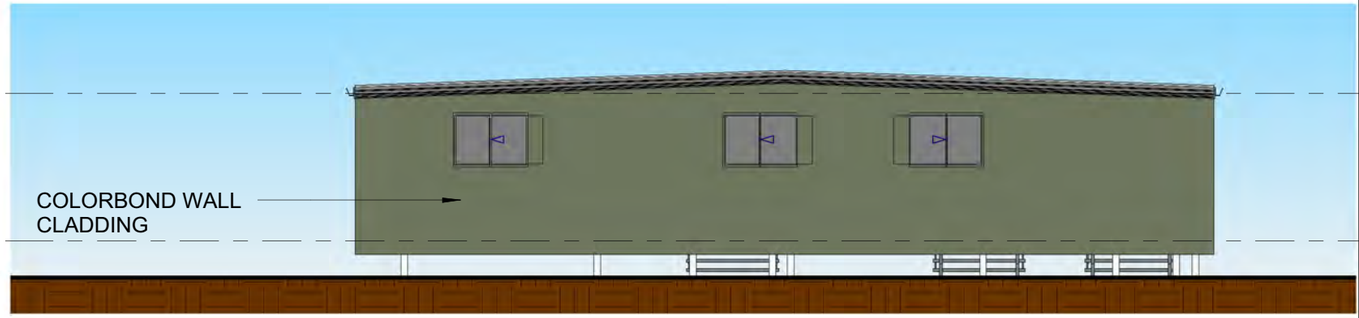
ELEVATION 01

1 : 100



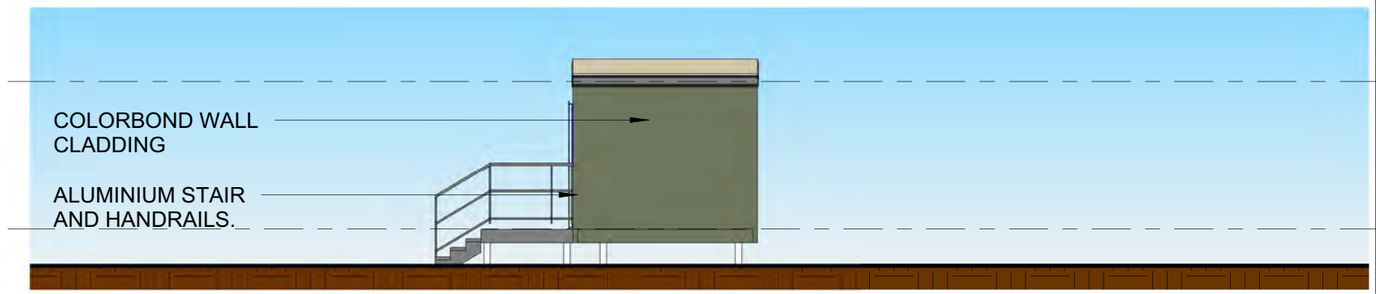
ELEVATION 02

1 : 100



ELEVATION 03

1 : 100



ELEVATION 04

1 : 100

THESE PLANS ARE TO BE READ INCONJUNCTION WITH STANDARD ATCO APPROVED PLAN.

NOTE:
ALL STAIRS AND RAMPS MUST HAVE THE MINIMUM SLIP RESISTANCE AS NOMINATED BY THE NATIONAL CODE OF CONSTRUCTION (N.C.C) VOLUME 2 *"SECTION 3.9.1.4-SLIP RESISTANCE"*.REFER TO COLOUR SCHEDULE/ SPECIFICATIONS FOR REQUIRED METHOD TO SUIT FINISH.

NOT FOR CONSTRUCTION

2.0 1.0 0 1.0 2.0 3.0 4.0 5.0

1:100 @ A3
1:200 @ A4

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LOCATION: 94-96 ROBERTS STREET NORSEMAN, WA 6443

QBCC No. 1222804
ABN No. 37 155 932 675

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No.	Description	Date
A	DA ISSUE	16/06/25

DESIGNED	AM
DRAWN	AM
DATE	MAY 2025
SCALE A3	1 : 100
ISSUED	16/06/25

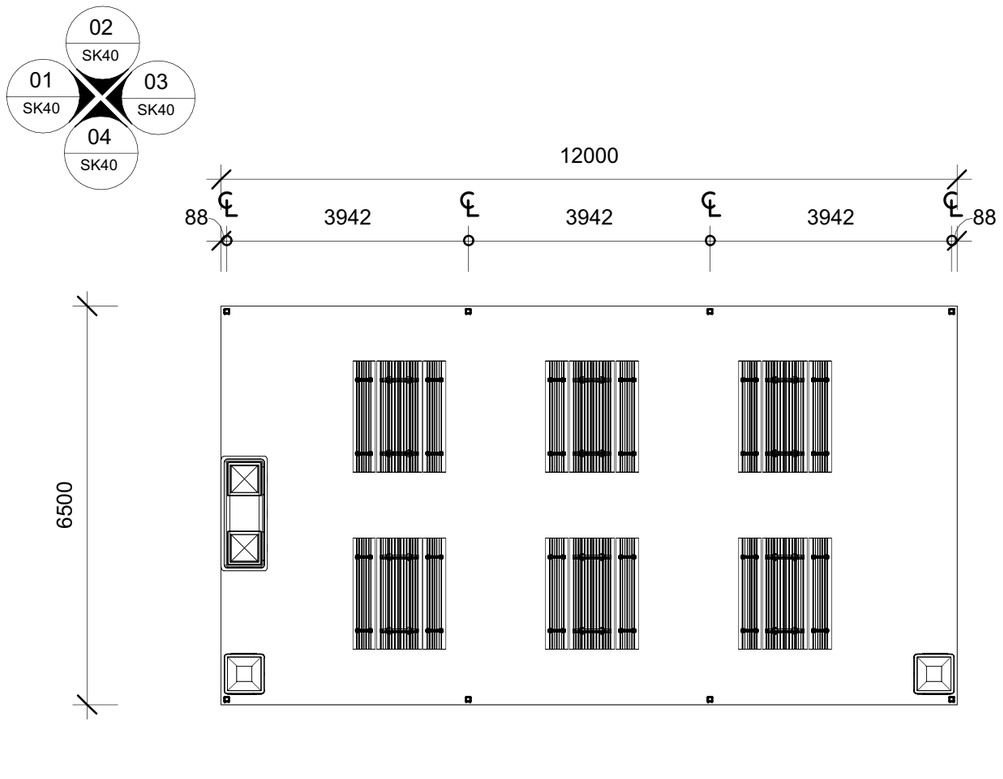
LAUNDRY BUILDING FLOOR PLAN AND ELEVATIONS

25-116 - SK-30 - A

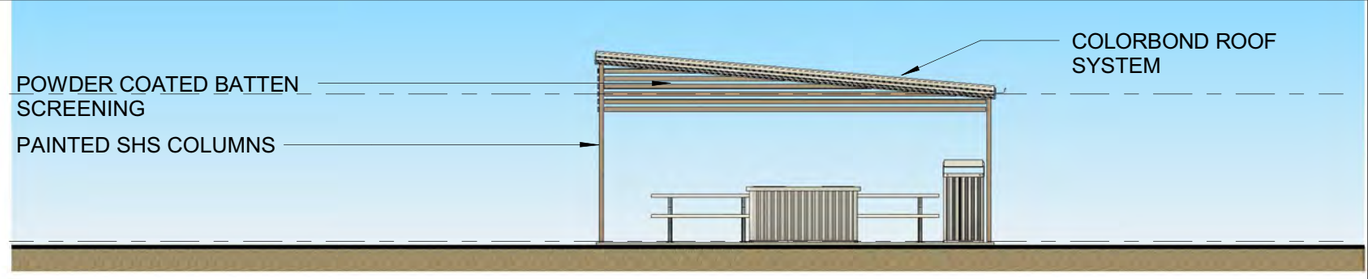
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BBQ/ SHELTER

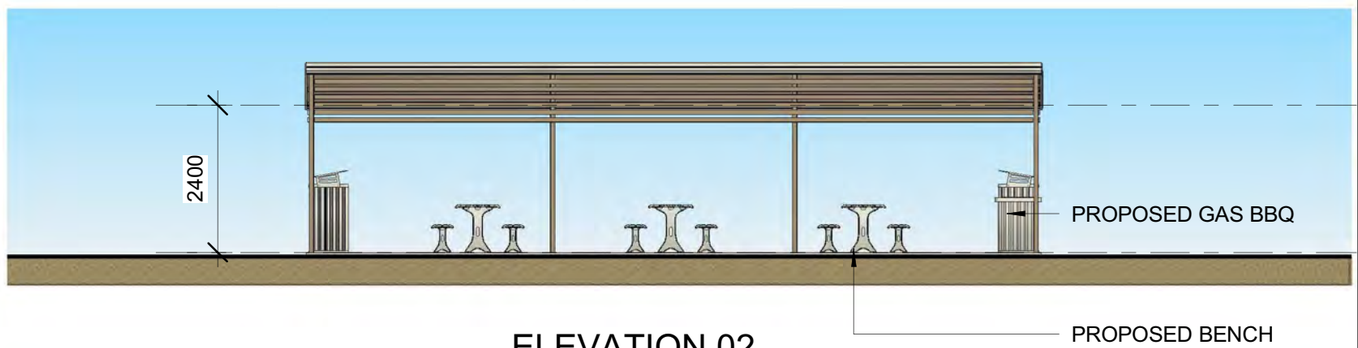




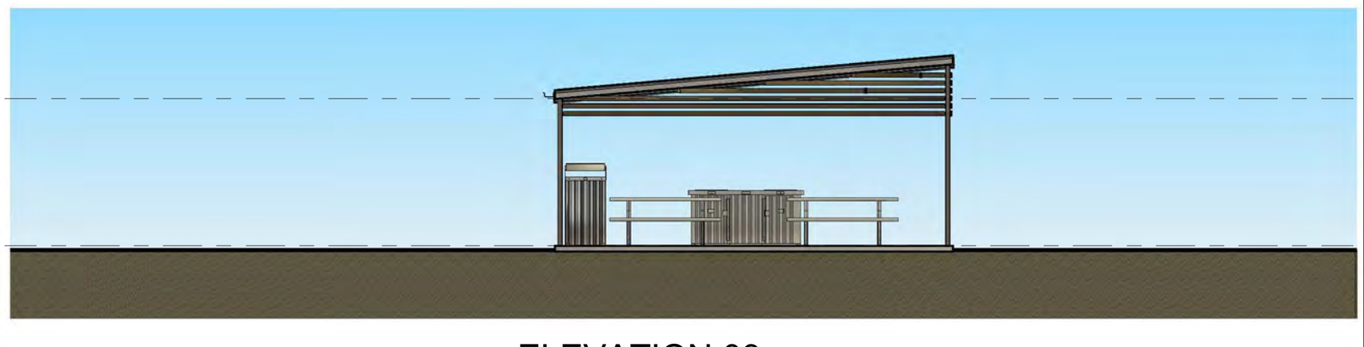
FLOOR PLAN
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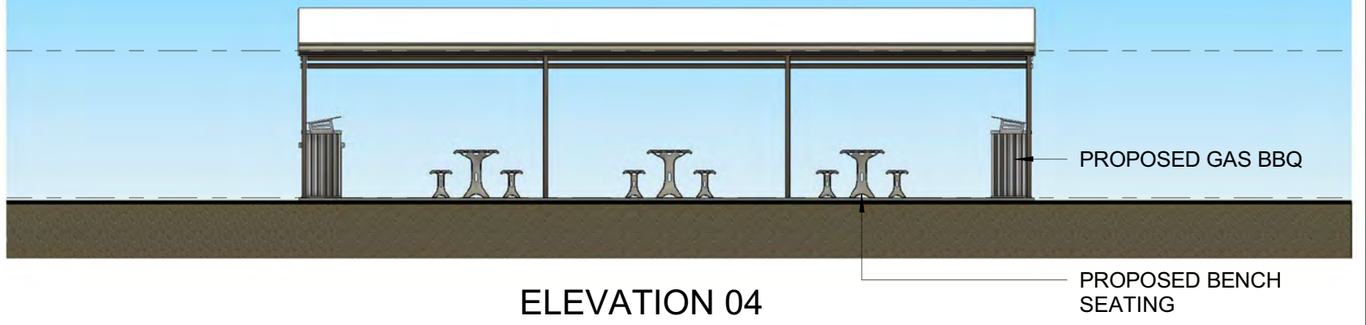
ELEVATION 01
1 : 100



ELEVATION 02
1 : 100



ELEVATION 03
1 : 100



ELEVATION 04
1 : 100

NOT FOR CONSTRUCTION

2.0 1.0 0 1.0 2.0 3.0 4.0 5.0
1:100 @ A3
1:200 @ A4

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No.	Description	Date
A	DA ISSUE	05/07/26

DESIGNED	AM
DRAWN	AM
DATE	MARCH 2025
SCALE	A3 1 : 100
ISSUED	05/07/26

BBQ/ SHELTER FLOOR PLAN AND ELEVATIONS

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No.	Description	Date
A	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3
ISSUED	26/02/26

PERSPECTIVES

25-116 - SK-50 - A

7/07/2026 1:04:56 AM



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No.	Description	Date
A	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3
ISSUED	26/02/26

PERSPECTIVES

25-116 - SK-51 - A

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LOCATION: 94-96.ROBERTS STREET NORSEMAN, WA, 6443

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No.	Description	Date
A	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3
ISSUED	26/02/26

PERSPECTIVES

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7/07/2026 1:04:57 AM



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LOCATION: 94-96.ROBERTS STREET NORSEMAN, WA, 6443

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No.	Description	Date
A	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3
ISSUED	26/02/26

PERSPECTIVES

25-116 - SK-53 - A

7/07/2026 1:04:57 AM

PROPOSED ACCOMMODATION VILLAGE

94-96.ROBERTS STREET NORSEMAN, WA, 6443

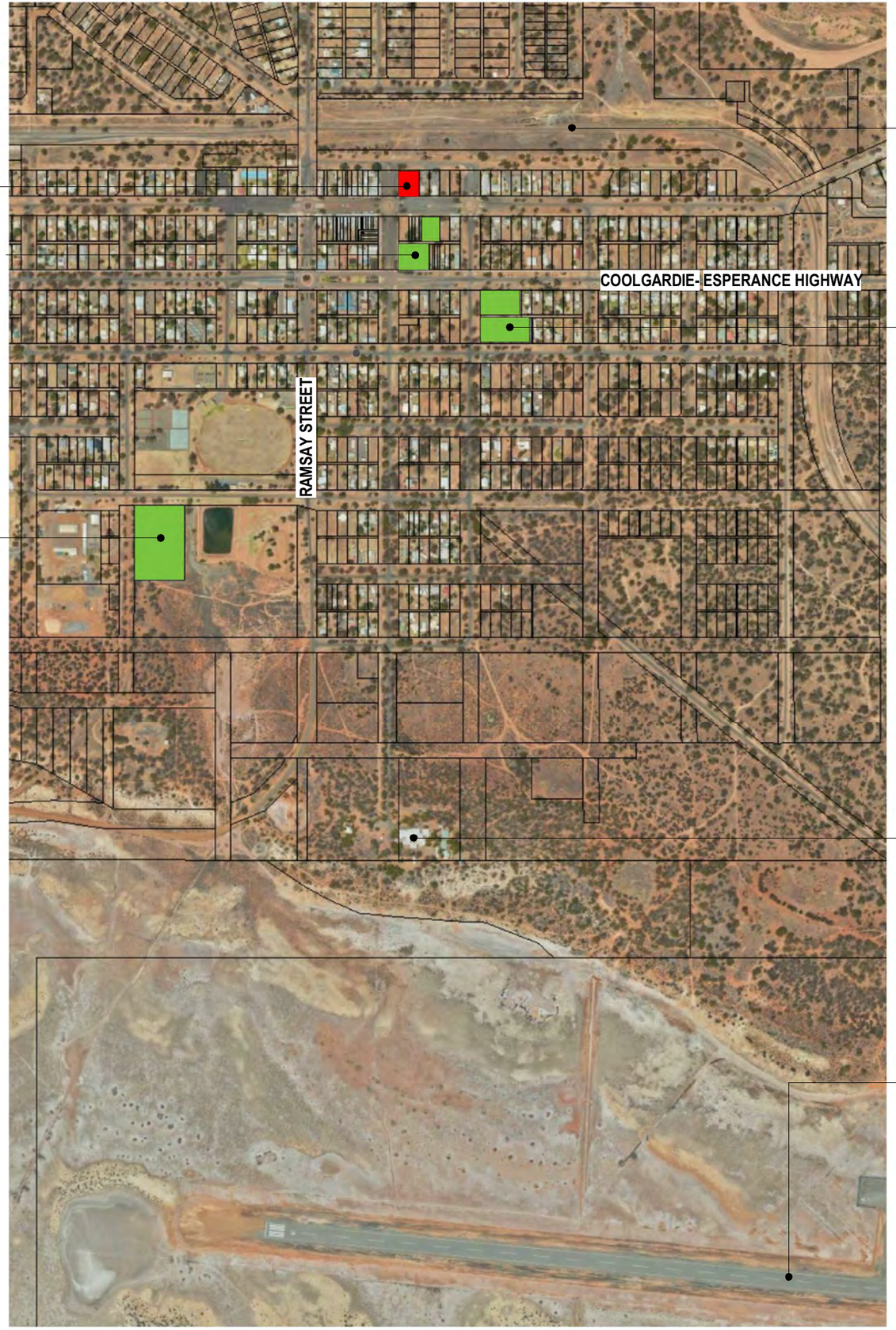


SHEET No.	SHEET NAME	REVISION	REVISION DATE
SK-00	TITLE PAGE	B	26/02/26
SK-01	SITE LOCATION PLAN	B	26/02/26
SK-02	SITE OVERALL PLAN	B	26/02/26
SK-03	EXISTING SITE PLAN	B	26/02/26
SK-04	SITE PLAN	B	26/02/26

SHEET No.	SHEET NAME	REVISION	REVISION DATE
SK-05	GROUND FLOOR PLAN	B	26/02/26
SK-20	PERSPECTIVES	A	26/02/26
SK-21	PERSPECTIVES	A	26/02/26
SK-22	PERSPECTIVES	A	26/02/26
SK-23	PERSPECTIVES	A	26/02/26

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2/03/2026 7:56:20 AM



CP-SITE LOCATION PLAN

1 : 10000@A3

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ABN No. 37 155 932 675
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No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26

DESIGNED		AM
DRAWN		AM
DATE		FEB 2025
SCALE	A3	1 : 10000
ISSUED		26/02/26

SITE LOCATION PLAN

25-116 - SK-01 - B

2/03/2026 7:56:21 AM

BEE FRIENDLY GARDENS

Planting Guide & Species List

94-96 Roberts Street, Norseman, WA, 6443

Climate:

Semi-Arid

Environmental Overview:

Norseman is located within The Great Western Woodlands region of Western Australia and is part of one of the world's global biodiversity hotspots. More than 20% of Australia's flowering plant species and 30% of Australia's Eucalyptus species are found within the Great Western Woodlands – making it a highly significant bioregion at a national and international level.

Site:



Species List	
Local Nursery (KBULG) **Subject to availability**	**Bunnings / Online Vendors (e.g. Benara Nurseries)**
Large Shrubs	*Large Shrubs*
Eremophila youngii	Callistemon spp. (Dawson River Weeper, Perth Pink)
Senna artemisioides	Atriplex nummularia
	Grevillea spp. (Kings Park)
Small Shrubs	*Small Shrubs*
Westringia spp. (rigida / fruticosa)	Westringia fruticosa
Eremophila glabra	Eremophila glabra
Eremophila maculata	Eremophila maculata
Ground Covers / Flowering Plants	*Ground Covers / Flowering Plants*
Myoporum spp.	Gossypium sturtanum
Eremophila glabra (Kalbarri Carpet)	Myoporum spp.(parvifolium, insulare)
	Eremophila glabra (Kalbarri Carpet)
	Scaevola aemula

Contact for Local Nursery:
Kim Eckert OAM GAICD | CEO
Kalgoorlie-Boulder Urban Landcare Group

“As KBULG is a small not-for-profit, our funded project work is limited to the Kalgoorlie–Boulder area. That said, we’re more than happy to support other regional projects on an ad-hoc, fee-for-service basis, without any ongoing contractual arrangements.
We’d also be happy to help by suggesting suitable local species from the Kalgoorlie–Boulder area that we’d expect to do well in a camp garden setting. We would just need to know in advance how many large, medium and low-growing plants are required, so we have enough time to propagate them.
Please let me know if you’d like to involve us in this project… we’d love to be part of it and assist where we can.”

PO Box 8133, Hannans WA 6433
Karlkurla Bushland Park, Tumbarri Way, Kalgoorlie, WA 6430
Phone: 0429 805 521
Email: ceo@kbulg.org.au
Website: www.kbulg.org.au

NORTH



Key

- 1.5m Wide Planting
- 1m Wide Covered Planting

76
1012m²

6098 2250 3300 4000 30600 4044

PP PP

CP-SITE GROUDN FLOOR PLAN

1 : 300@A3

NOT FOR CONSTRUCTION

1.5 0.75 0 0.75 1.5 2.25 3.0 3.75

1:150 @ A3
1:300 @ A4

NOTE:

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Sustainable Building Designer

No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3 1 : 300
ISSUED	26/02/26

GROUND FLOOR PLAN

25 B

2/03/2026 7:56:27 AM

Planting Pattern:

Key:



Shrub



Ground Cover



Large Shrub / Tree

1 METRE WIDE PLANTING

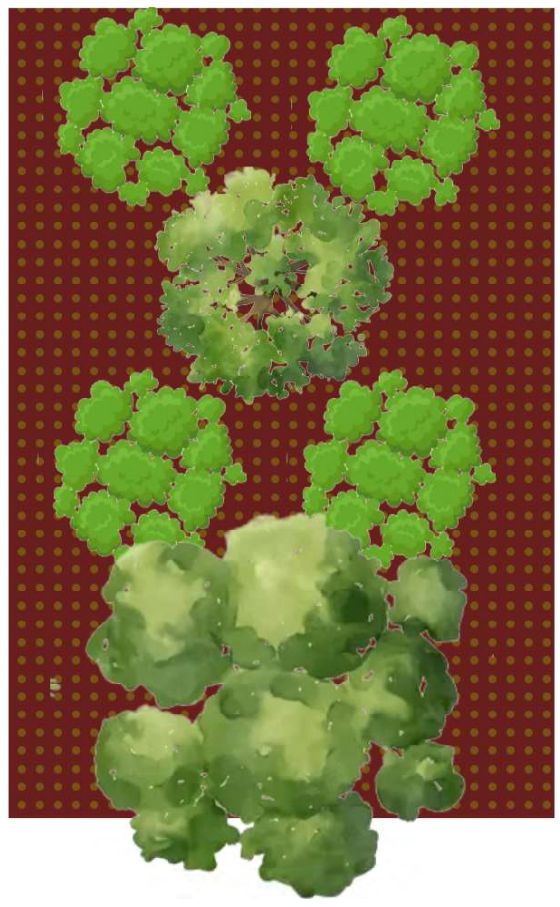
Pattern repeating every 2.5 metres

Note No large shrubs/trees in covered linkways



1.5 METRE WIDE PLANTING

Pattern repeating every 2.5 metres



Plant Maintenance:

(For optimum results and increased success rate)

Planting
Water thoroughly as soon as the plant is in the ground. For larger plants, fill the planting hole with water, let it drain completely, then fill again and insert the plant. This ensures the entire root ball is saturated and helps the surrounding soil settle in place. Once the plant is planted, press the soil firmly and saturate the ground to ensure any remaining air pockets are removed.

Watering
A reticulation system is recommended with drip or micro-spray irrigation due to semi-arid climate. A watering schedule (weather depending) of 3 times per week for the first 12-18 months will ensure best results (a government irrigation guideline will be attached as a separate document).

Mulch
Mulching of all planted areas is recommended to retain moisture.

Attachment Three

Traffic Impact Statement



Transport Impact Statement

Project:	Proposed Workers Accommodation 94-96 Roberts Street, Norseman
Client:	Resource Accommodation Management c/- Rowe Group
Author:	T. Yangden
Date:	13th May 2026
Shawmac Document #:	2603011-TIS-001

CONSULTING CIVIL AND TRAFFIC ENGINEERS
1 ST. FLOOR, 908 ALBANY HIGHWAY, EAST VICTORIA PARK WA 6101.
PHONE|+61 8 9355 1300
EMAIL| admin@ shawmac.com.au

Document Status: Client Review

Version	Prepared By	Reviewed By	Approved By	Date
A	T. Yangden	P. Nguyen	P. Nguyen	14/04/2026
B	T. Yangden	P. Nguyen	P. Nguyen	13/05/2026

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File Reference: Y:\Jobs Active 2026\T & T - Traffic & Parking\Rowe Group_94-96 Roberts St, Norseman_TIS_2603011\3. Documents\3.20 TIS\2603011_Rowe Group_94-96 Robert Street, Norseman_TIS_Rev B.docx

Contents

1. Introduction 1

1.1. Proponent 1

1.2. Site Location 1

1.3. Land Use 3

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1. Introduction

1.1. Proponent

Shawmac Pty Ltd has been engaged by Rowe Group on behalf of Resources Accommodation Management to prepare a Transport Impact Statement (TIS) for a proposed worker's accommodation development in Norseman.

This TIS has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines Volume 4 – Individual Developments*. The assessment considers the following key matters:

- Details of the proposed development.
- Vehicle access and parking.
- Provision for service vehicles.
- Daily traffic volumes and vehicle types.
- Traffic management on frontage streets.
- Public transport access.
- Pedestrian access.
- Site specific and safety issues.

1.2. Site Location

The site is located at 94 – 96 Robert Street in Norseman. The local authority is the Shire of Dundas.

The general site location is shown in Figure 1. An aerial view of the existing site is shown in Figure 2.

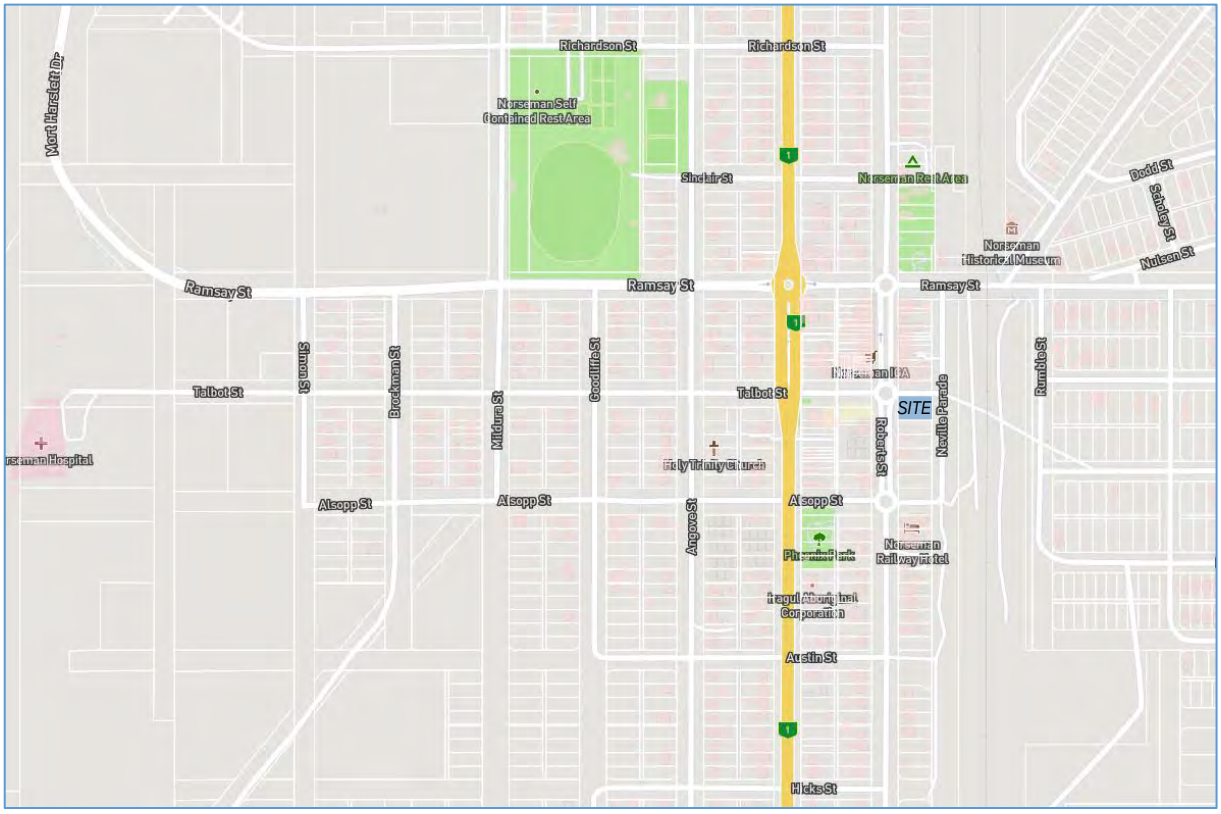


Figure 1: Site Location



Figure 2: Aerial View

1.3. Land Use

The proposed development is part of the proposed workers accommodation sites in Norseman to ultimately accommodate a total of 500 workers.

The current stage is for 48 rooms and associated facilities to be located at 94 to 96 Roberts Street, Norseman.

It is proposed to construct an additional 24 on-street parking bays along Robert Street and Talbot Street.

The site layout is shown in Figure 3.

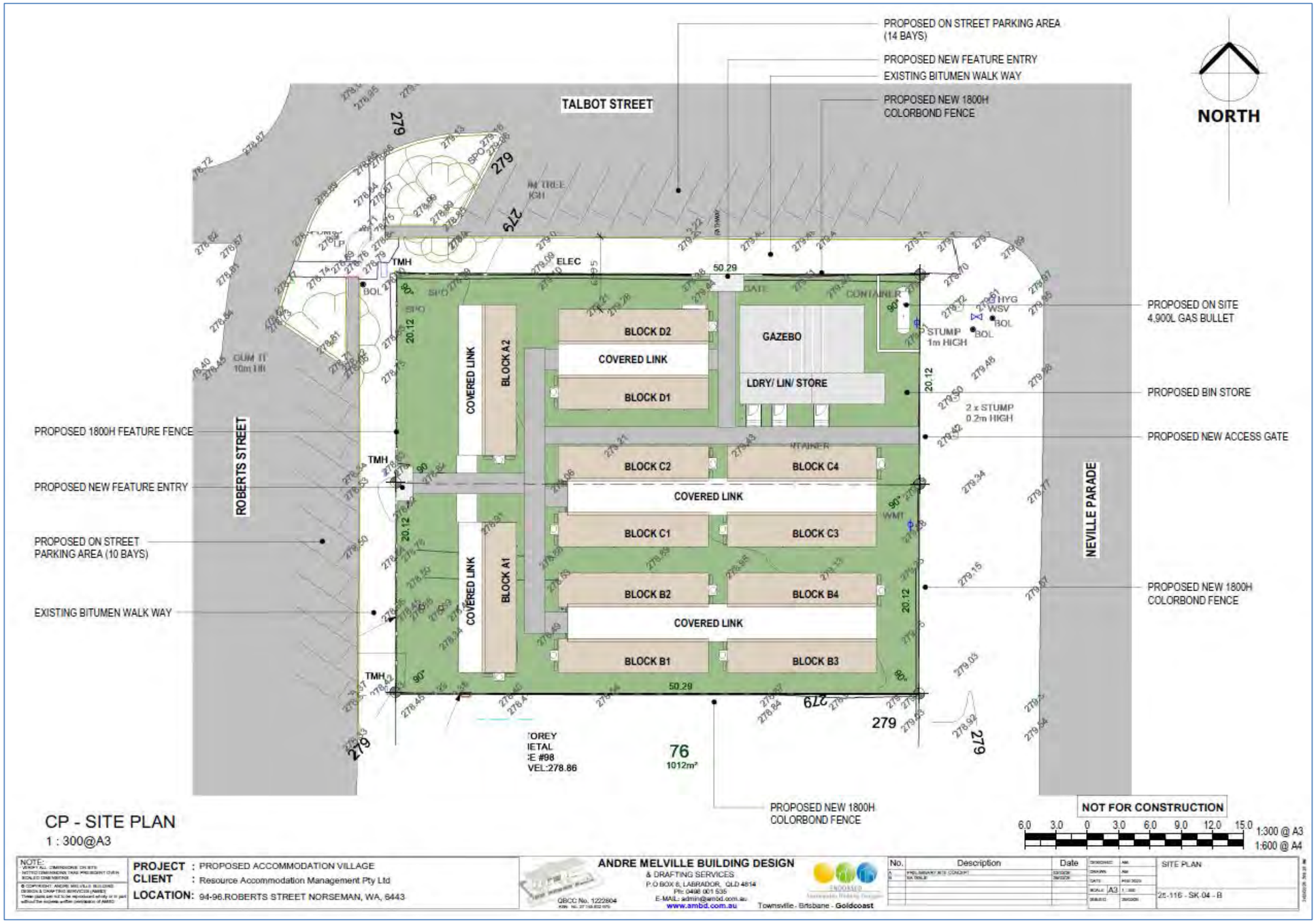


Figure 3: Site Layout

2. Traffic Management on Frontage Streets

2.1. Road Network Layout and Hierarchy

The layout and hierarchy of the existing local road network according to the Main Roads WA *Road Information Mapping System* is shown in Figure 4.

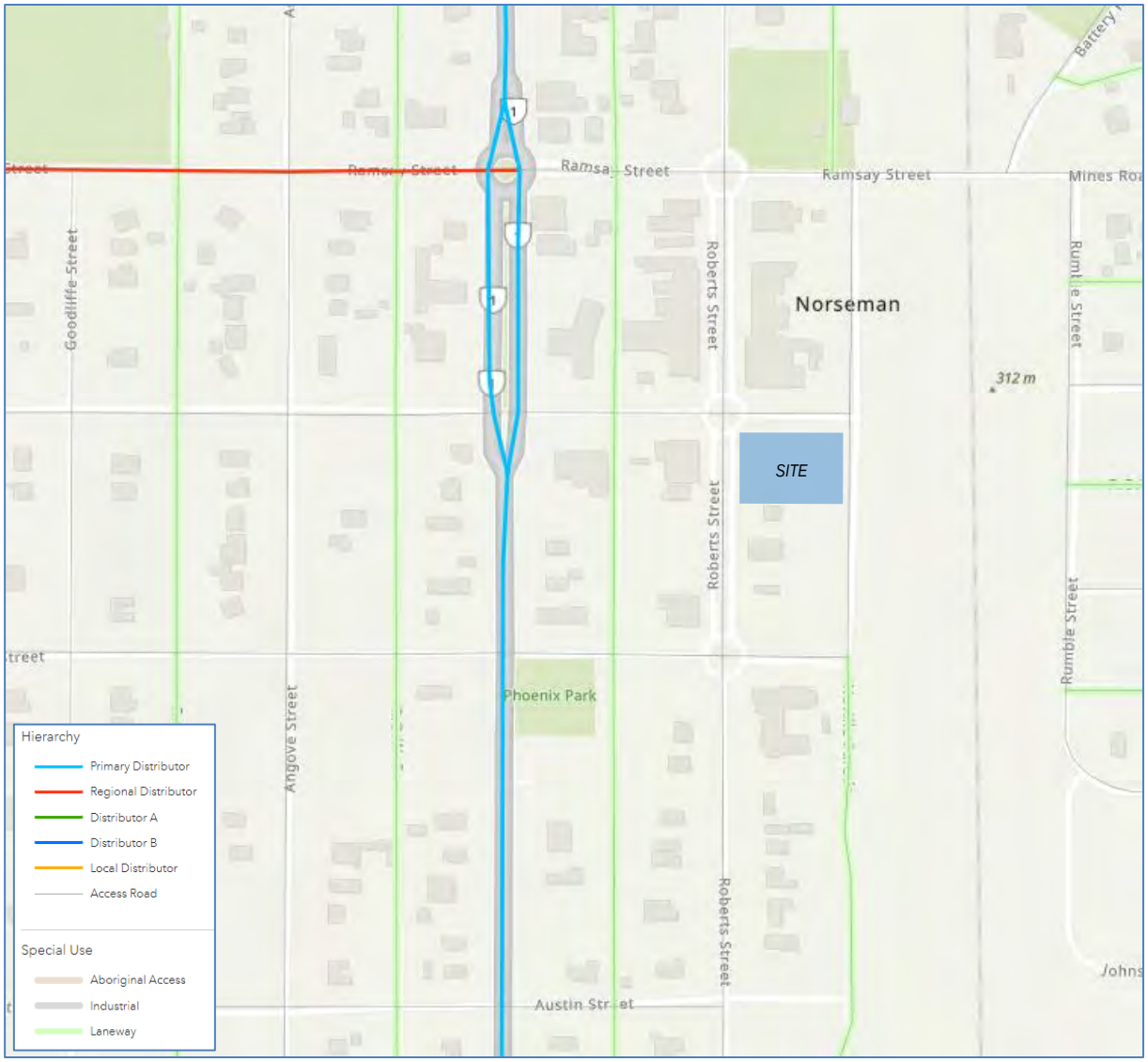


Figure 4: Existing Road Network Hierarchy

2.2. Speed Limit

The existing speed limits are shown in Figure 5.

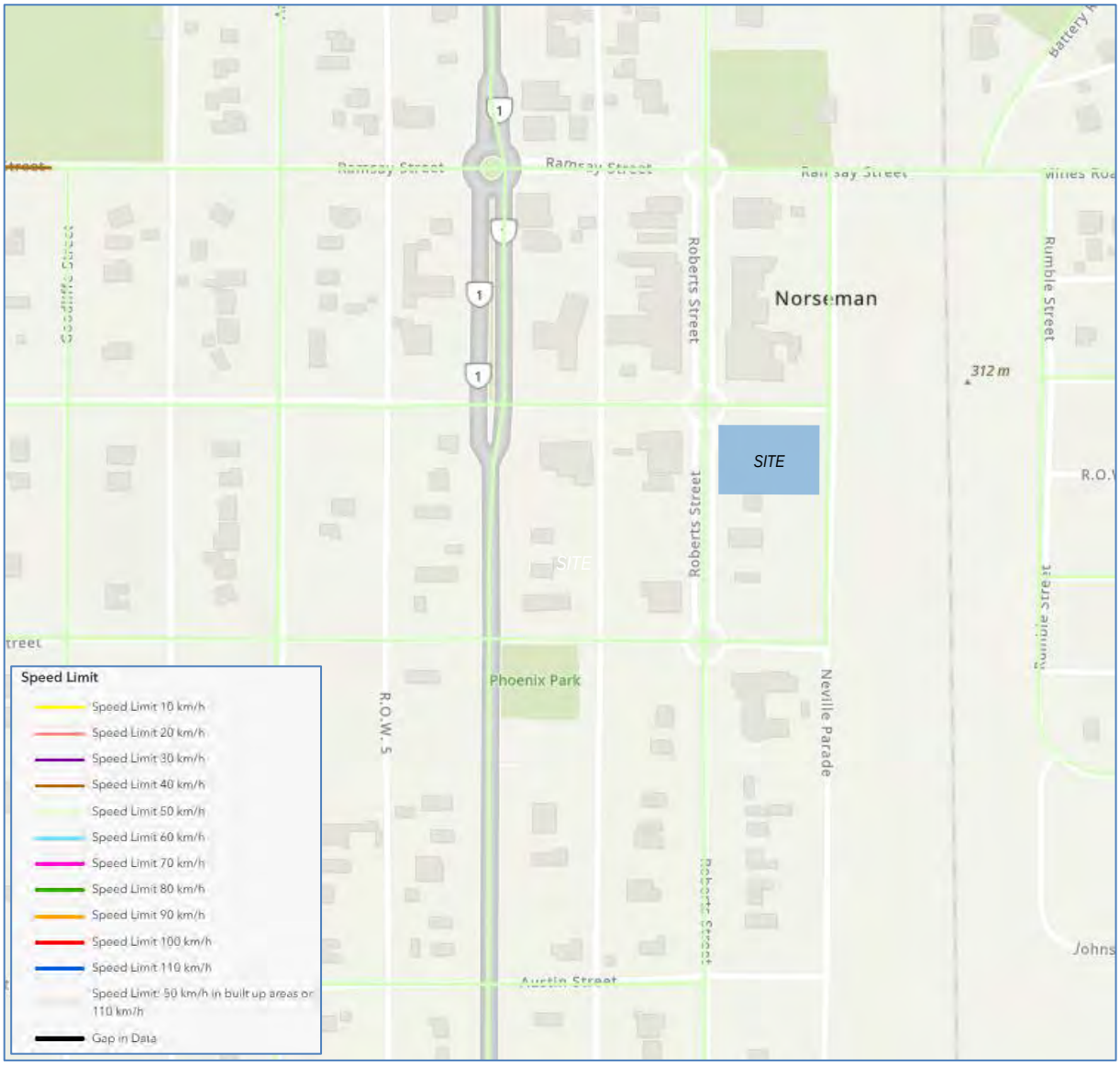


Figure 5: Existing Speed Limits

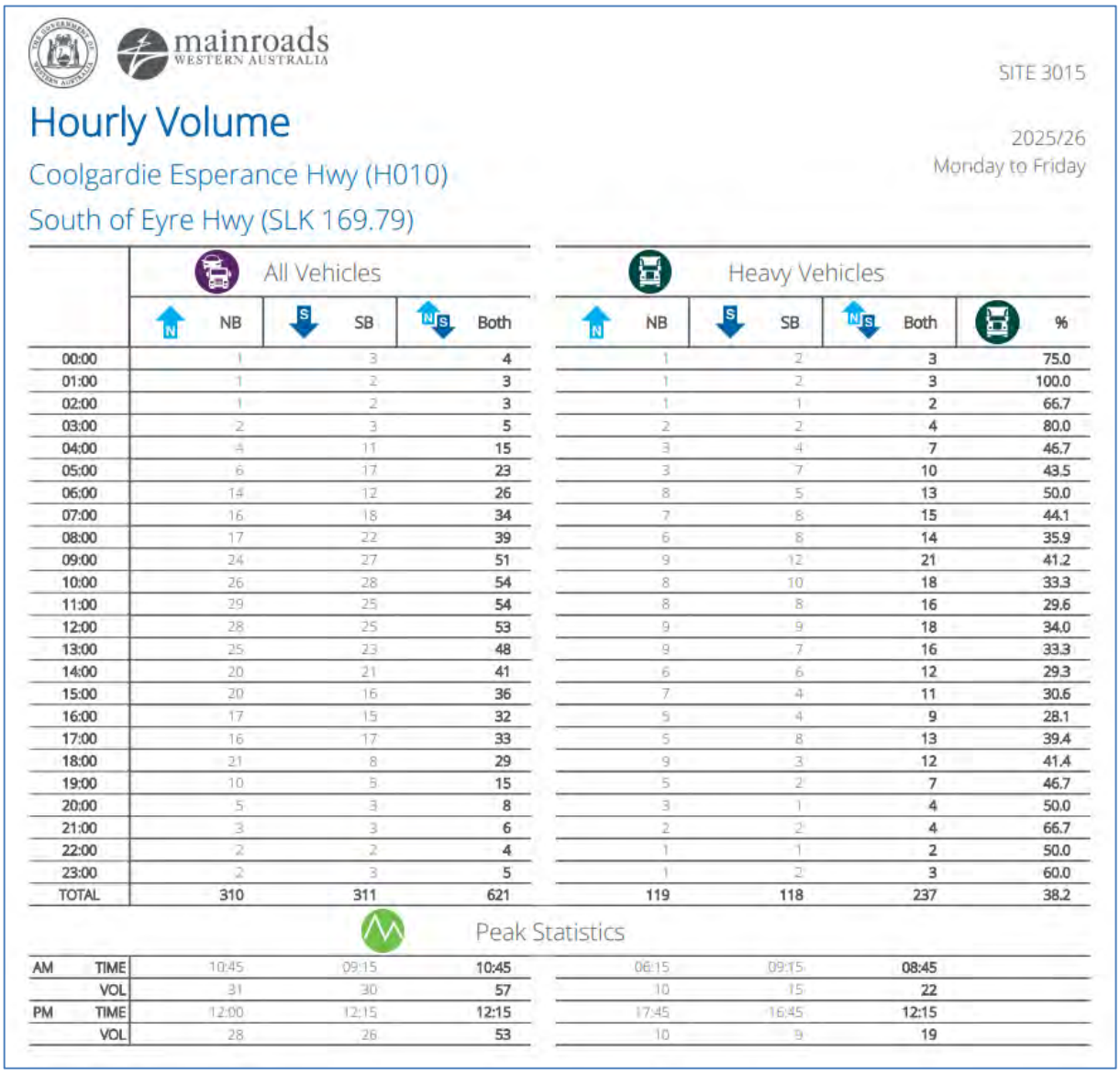
2.3. Traffic Volumes

The closest available traffic counts from Main Roads WA Traffic Map are on Coolgardie Esperance Highway south of the townsite as shown in Figure 6.

According to Austroads *Guide to Traffic Management Part 3: Transport Study and Analysis Methods* (AGTM3), the capacity of a two-lane highway is 1,700 vehicles per hour for each direction of travel. The current hourly volumes along the highway are well within capacity.

Traffic volumes along the roads fronting the site were not available. Based on the volumes on the highway, the daily volumes on the frontage roads are estimated to be less than 300 vehicles per day (vpd) and less than 30 vehicles per hour (vph).

According to WAPC *Liveable Neighbourhoods*, the target maximum daily traffic volume for an access road is 3,000vpd.



mainroads WESTERN AUSTRALIA

SITE 3015

Hourly Volume

Coolgardie Esperance Hwy (H010)

South of Eyre Hwy (SLK 169.79)

2025/26
Monday to Friday

	All Vehicles			Heavy Vehicles			
	NB	SB	Both	NB	SB	Both	%
00:00	1	3	4	1	2	3	75.0
01:00	1	2	3	1	2	3	100.0
02:00	1	2	3	1	1	2	66.7
03:00	2	3	5	2	2	4	80.0
04:00	4	11	15	3	4	7	46.7
05:00	6	17	23	3	7	10	43.5
06:00	14	12	26	8	5	13	50.0
07:00	16	18	34	7	8	15	44.1
08:00	17	22	39	6	8	14	35.9
09:00	24	27	51	9	12	21	41.2
10:00	26	28	54	8	10	18	33.3
11:00	29	25	54	8	8	16	29.6
12:00	28	25	53	9	9	18	34.0
13:00	25	23	48	9	7	16	33.3
14:00	20	21	41	6	6	12	29.3
15:00	20	16	36	7	4	11	30.6
16:00	17	15	32	5	4	9	28.1
17:00	16	17	33	5	8	13	39.4
18:00	21	8	29	9	3	12	41.4
19:00	10	5	15	5	2	7	46.7
20:00	5	3	8	3	1	4	50.0
21:00	3	3	6	2	2	4	66.7
22:00	2	2	4	1	1	2	50.0
23:00	2	3	5	1	2	3	60.0
TOTAL	310	311	621	119	118	237	38.2

Peak Statistics

AM	TIME	10:45	09:15	10:45	06:15	09:15	08:45
	VOL	31	30	57	10	15	22
PM	TIME	12:00	12:15	12:15	17:45	16:45	12:15
	VOL	28	26	53	10	9	19

Figure 6: Weekday Traffic Counts – Coolgardie Esperance Highway south of Norseman

3. Daily Traffic Volumes

The volume of traffic generated by the proposed development has been estimated based on the operating details provided by the client which are detailed below.

Approximately 70% of workers will be on day shift from 6am to 6pm and 30% will be on night shift. Based on a typical 90% occupancy (43 workers), there would be 30 workers on day shift and 13 workers on night shift. Of these, up to 10 are assumed to have work vehicles.

Workers with company vehicles will transport themselves between the site and the mine which equates to 10 vehicle trips or 20 vehicle movements per day. Workers without a company vehicle will walk from the site to the Workers club on Talbot Street located approximately 130m to the west to have breakfast and then they are transported to the mine site via bus. In the evening, the workers are then dropped off at the site and then walk to and from the club for dinner.

The same procedure is expected for the night shift with workers being picked up at the club after dinner and dropped off at the site before breakfast.

The location of the site relative to the club and the mine site is shown in Figure 7.

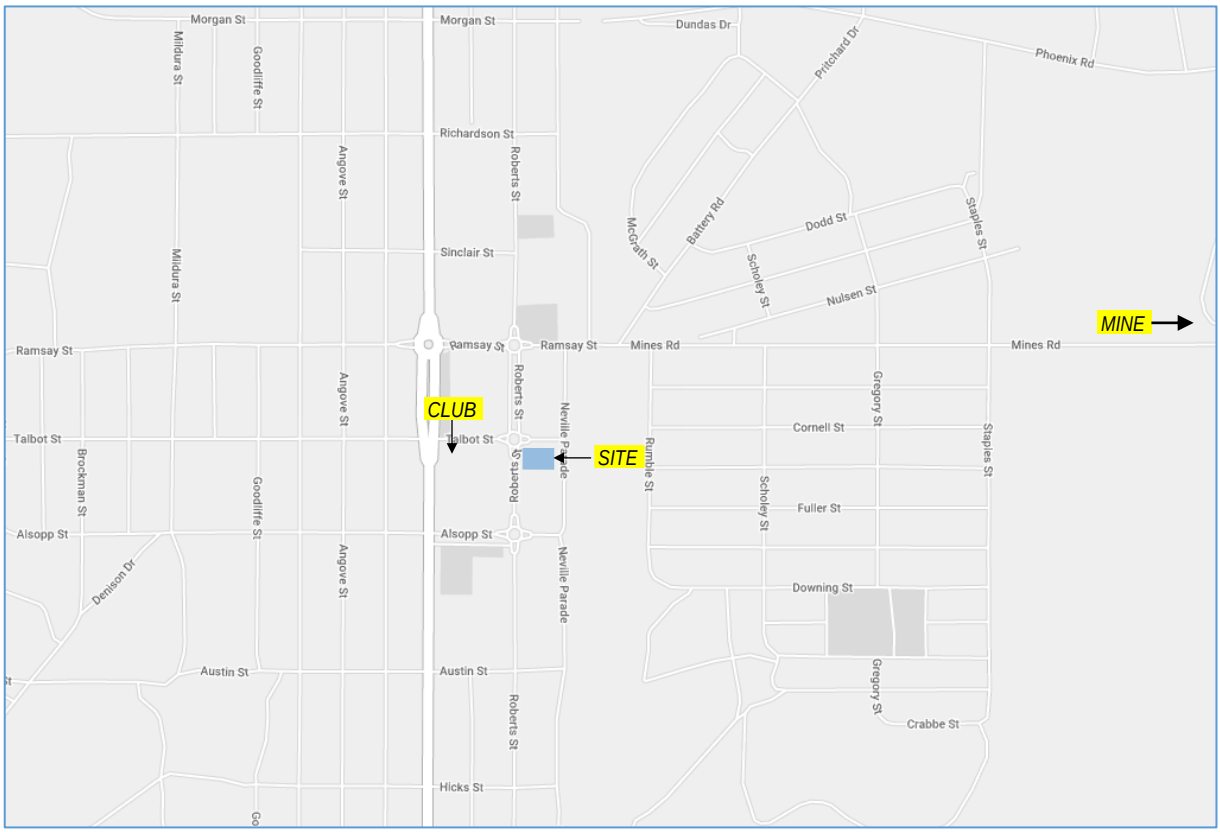


Figure 7: Accommodation, Workers Club and Mine Location

Workers without vehicles will be transported using buses (various sizes from 12 to 40 seats) and so each shift change will only require 1 to 3 bus trips between the accommodation and the mine site.

Additional vehicle trips generated by the site include:

- 1 van trip per day (maintenance).
- 2 van trips per week (linen).
- Weekly bus trips between the airport and the accommodation.

The proposed vans will access the laundry and general maintenance of the site via the rear laneway.

In accordance with WAPC TIA guidelines, an increase of between 10 to 100 peak hour vehicles is considered to have a low to moderate impact and is generally deemed acceptable without requiring detailed capacity analysis. The estimated 13 vehicles (10 cars and 3 bus) per hour is at the lower end of this range and therefore the traffic impact is very low.

As mentioned previously, the current volume of traffic on the frontage roads surrounding the site are estimated to be less than 300 vpd or 30 vph. The estimated increase of 26 vpd or 13 vph represents a 9% increase in daily traffic and a 43% increase in peak hour traffic. Although the percentage increase in peak hour traffic is moderate, the baseline volumes are very low and there is ample spare capacity to accommodate the additional volume of development traffic.

On Coolgardie Esperance Highway, the current traffic volumes at around 6am and 6pm are in the order of 25 vph which is very low. Although the projected 13 vph represents a moderate increase compared to the existing traffic, there is ample spare capacity in the road network to accommodate the additional volume of development traffic. Further, it is noted that the peak hour on the road network occurs around late morning to mid-day when the proposed development will not be generating any traffic.

The overall generated volume of traffic for the site is considered to be low and can be accommodated within the existing capacity of the road network. The resulting daily and peak hour traffic volumes would remain well within the typical thresholds for these roads.

4. Vehicle Access and Parking

4.1. Access

No new vehicle access is proposed to the site as all parking and vehicle movement will be accommodated on the street.

4.2. Parking

It is proposed to mark 24 car parking bays on Robert Street and Talbot Street.

The Shire's Local Planning Scheme does not specify parking requirements for workers accommodation and therefore the car parking provision is at the discretion of the Shire.

As advised by the client, the majority of workers will be FIFO and will be transported by bus between the site, the mine and the airport. Based on other similar mine worker accommodation sites (including nearby Kambalda), the client and operators have estimated conservatively that up to 20% of workers could be given access to a company vehicle. Based on a typical 90% occupancy (43 workers), there would be approximately 10 work vehicles.

The remaining 14 parking spaces are proposed for mine workers drive to the accommodation site from home and leave their vehicles parked at the accommodation during their swing. These workers are then transported to and from the mine site via bus.

The proposed 24 on-street parking bays would be more than adequate to accommodate the likely parking demand of the proposed development.

4.3. Parking Design

The proposed on-street parking layout will need to comply with the requirements outlined in Australian Standard AS2890.5:2020 – On-Street Parking. The user class is likely classified as low as detailed in Figure 8.

Table 3.2 — Classification of on-street angle parking facilities

Class	Typical uses
Low	Generally all-day parking, e.g. commuter parking
Medium	Generally more than 2 h parking but less than a full day, e.g. town centre, sports facility, airport visitor parking
High	Generally short-term parking, including areas where children and goods are frequently loaded into vehicles, e.g. at shopping centres
Accessible	Parking spaces for people with disabilities (see also Clause 4.5)

Figure 8: Classification of Parking Facilities

An assessment of the AS2890.5 parking requirements is detailed in Table 1.

Table 1: AS2890.5 On-Street Car Parking Requirements

Dimension	Requirement	Provided
90 degree parking – Long Term Parking (Low)		
Car Bay Width	2.4m	3.0m minimum
Car Bay Length	5.4m	6.0 to 6.8m (approx.)
Manoeuvre Space	6.2m	9.0m (Talbot Street) 6.7m (Robert Street)

As shown, all relevant parking layout dimensions are compliant with AS2890.5 requirements.

4.4. Bus Parking

The majority of workers will be transported via bus (various sizes from 12 to 40 seats). It is understood that buses will pick-up and drop-off workers from the verges adjacent to the site. The adjacent pavements are sufficiently wide for a bus to temporarily park without blocking other traffic.

4.5. Provision for Service Vehicles

Waste from the site will be collected by council waste collection services via kerbside collection. The proposed bin store is located along the north-east corner of the site.

5. Pedestrian Access

5.1. Existing Path Network

All surrounding roads have at least one pedestrian footpath on one side of the road as shown in Figure 9. The pedestrian footpaths are shown in yellow and the crossing locations are shown in red.

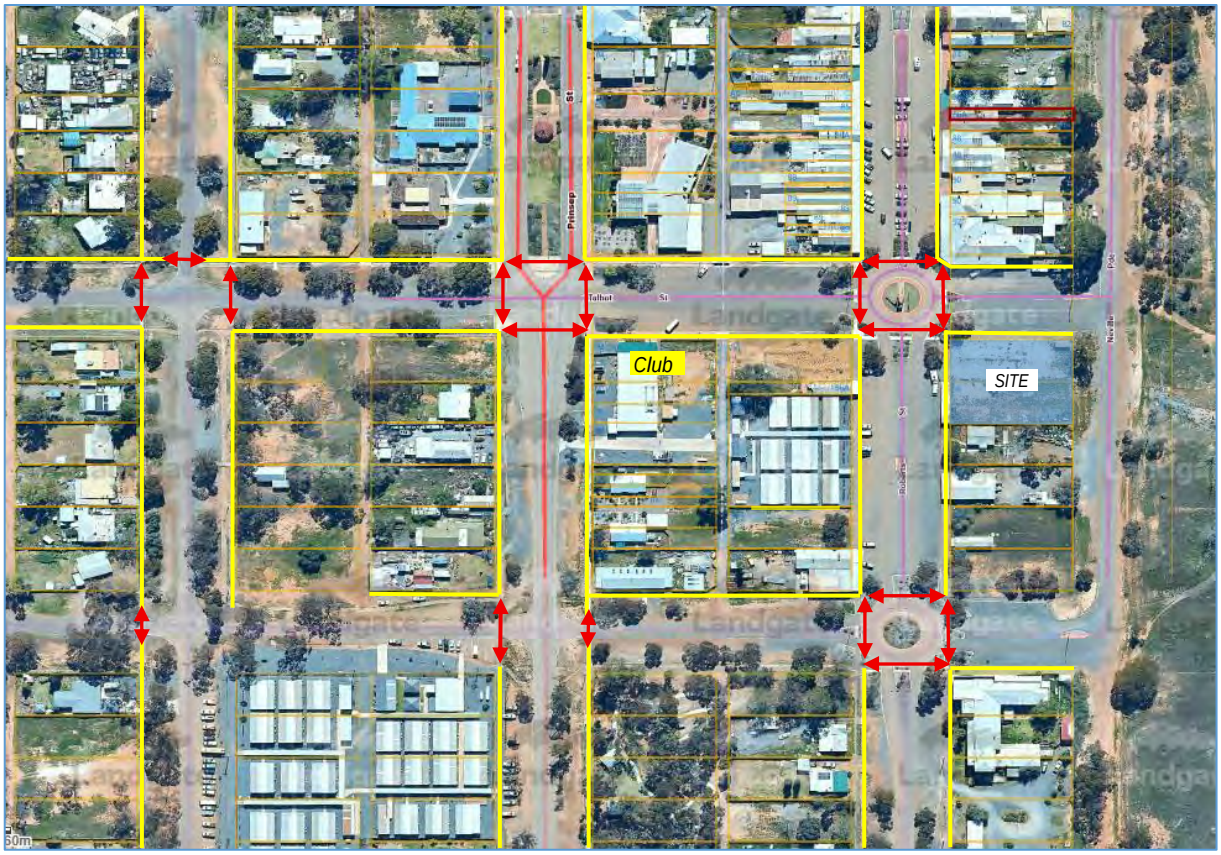


Figure 9: Existing Pedestrian Pathway to/from Workers Club

The existing path network is considered to be adequate for the likely pedestrian movements between the site and the workers club.

6. Public Transport Access

The only public transport service in the area is the TransWA Kalgoorlie – Esperance bus service which stops at the BP truck stop approximately 1.6km north/west of the site.

As all workers are bussed to and from the site or have work vehicles, there is no demand for public transport use.

7. Site Specific Issues and Safety Issues

7.1. Crash History

The crash history of the adjacent road network was obtained from the MRWA Reporting Centre. A summary of the recorded incidents over the five-year period from January 2021 to December 2025 is shown in Figure 10.

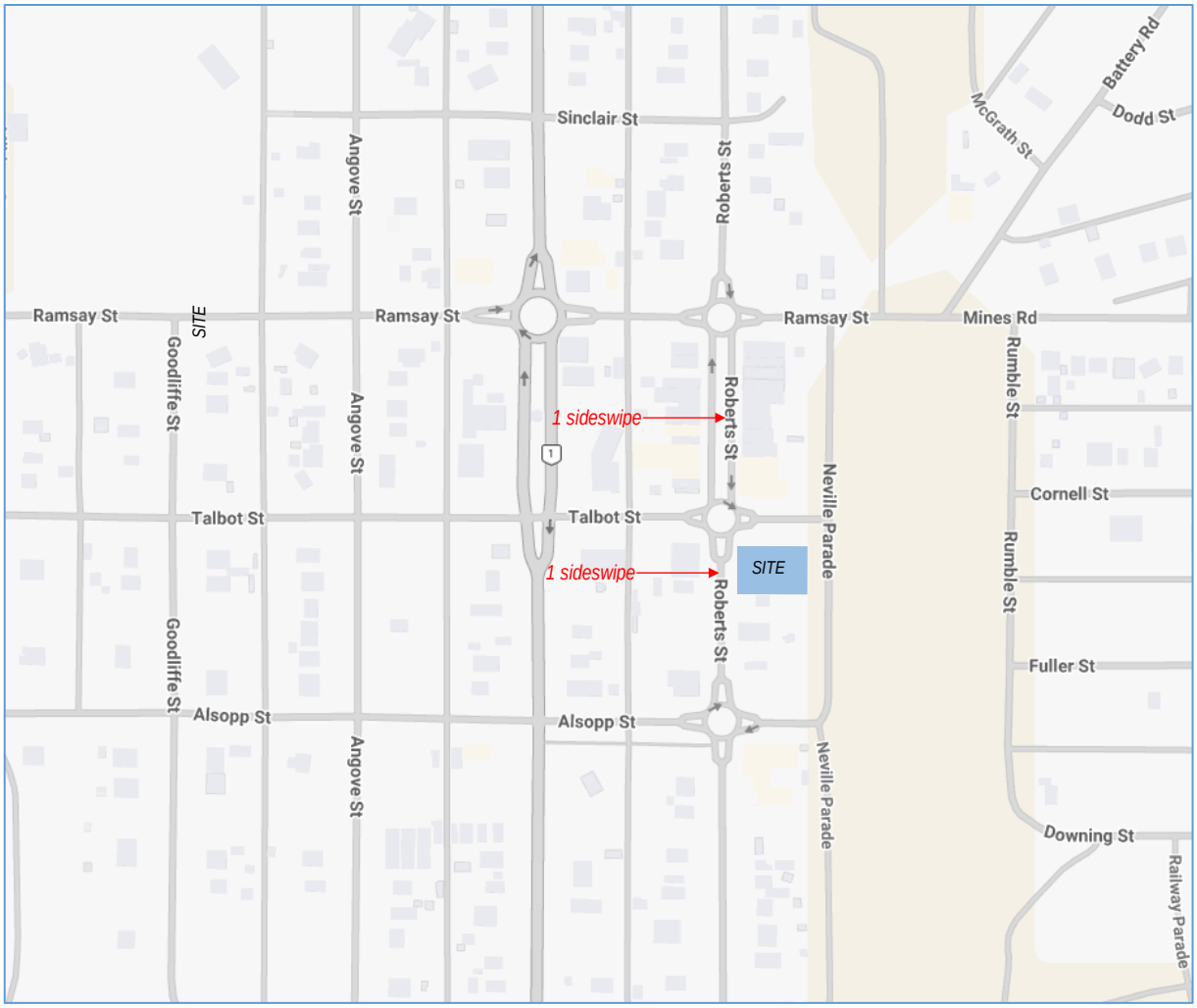


Figure 10: Crash History January 2021 to December 2025

The number of crashes is very low and does not appear to indicate any major safety issue. There is no indication that the development will increase the risk of crashes significantly.

8. Conclusion

This Transport Impact Statement for the proposed workers accommodation in Norseman concluded the following:

- Traffic data for the frontage roads were not available. The daily traffic volumes along these roads are estimated to be less than 300 vehicle per day (vpd). According to WAPC *Liveable Neighbourhoods*, the maximum desirable traffic volume for an access road is 3,000vpd.
- The overall generated volume of traffic for the site is considered to be low and can be accommodated within the existing capacity of the road network. The resulting daily and peak hour traffic volumes would remain well within the typical thresholds for these roads.
- No new vehicle access is proposed to the site as all parking and vehicle movement will be accommodated on the street.
- The proposed 24 on-street parking would be more than adequate to accommodate the likely parking demand of the proposed development.
- All relevant parking layout dimensions are compliant with AS2890.5 requirements.
- The majority of workers will be transported via bus (various sizes from 12 to 40 seats). It is understood that buses will pick-up and drop-off workers from the verges adjacent to the site. The adjacent pavements are sufficiently wide for a bus to temporarily park without blocking other traffic.
- Waste from the site will be collected by council waste collection services via kerbside collection. The proposed bin store is located along the north-east corner of the site.
- The existing path network is considered to be adequate for the likely pedestrian movements between the site and the workers club.
- The only public transport service in the area is the TransWA Kalgoorlie – Esperance bus service which stops at the BP truck stop approximately 2km north/east of the site. As all workers are bussed to and from the site or have work vehicles, there is no demand for public transport use.
- The number of crashes is low and does not appear to indicate any major safety issue. There is no indication that the development will increase the risk of crashes significantly.

ROWE GROUP

35 YEARS 1991 – 2026

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Job Ref: 10209
22 June 2026

Shire of Dundas
PO Box 163
NORSEMAN WA 6443

Attention: Attention: Tony Dowling, Consultant Planner

Dear Mr Fitchat

Additional Justification – Proposed Workforce Accommodation
Lots 77-78 (Nos. 96-94) Roberts Street, Norseman

The following serves as additional justification for seeking nil on-site parking.

Background

The proposed development as submitted does not include on-site car parking. While the planning report submitted with the application provides a level of justification within it, additional information has been requested.

Local Planning Scheme No.2

The nil on-site parking is considered appropriate having regard to the provisions of the Shire of Dundas Local Planning Scheme No. 2 (**LPS2**) and the nature of the use. Workforce Accommodation is not identified within Table 7 of LPS2 and, accordingly, Clause 32(2)(d) provides that the local government is to determine parking requirements having regard to the characteristics of the development, with discretion to waive on-site provision where adequate parking is available in direct proximity.

Existing Verge Bays

In this instance, formal on-street parking bays are already established within the surrounding road reserves, supplemented by the provision of additional compliant bays immediately adjacent to the site along Roberts Street and Talbot Street. Collectively, these bays are designed to an appropriate standard and provide a consolidated and accessible supply of parking within direct proximity of the development.

Proposal

A total of 24 formal on-street parking bays are proposed immediately adjacent to the site along Roberts Street and Talbot Street, designed in accordance with AS2890.5:2020 and capable of accommodating the anticipated demand. This approach is consistent with the established pattern of development in

Norseman, where wide road reserves and low traffic volumes support verge and on-street parking solutions. Importantly, the operational characteristics of the development result in a materially reduced parking demand compared to conventional land uses. The Traffic Impact Statement confirms that the majority of occupants will be FIFO workers associated with the Pantoro Gold Mine, and transported by bus between the accommodation, mine site and airport, with only a limited proportion of workers expected to have access to a vehicle. As a result, overall traffic generation is low and can be readily accommodated within the existing road network without adverse impacts.

Bus parking

The proposal also does not provide dedicated bus parking on-site. This is considered appropriate given the physical constraints of the site and the scale of the development. The accommodation facility has been deliberately designed to maximise landscaping, communal open space and resident amenity within a relatively modest 2,024m² site, and the provision of bus parking would require substantial areas of additional hardstand and vehicle manoeuvring space. Accommodating a 12-seat or larger 24-seat bus would also necessitate a dedicated access arrangement, turning areas and internal circulation infrastructure, fundamentally altering the layout and reducing the quality of the residential-style accommodation environment proposed. Given that surrounding roads are local roads with low traffic volumes and generous road reserves, any occasional bus pick-up or drop-off activity can be safely accommodated from the street frontage without requiring a permanently allocated on-site bus bay. The provision of dedicated bus parking would therefore represent an inefficient use of land and would unnecessarily compromise landscaping, open space and overall site amenity without delivering a commensurate planning benefit. In any event, bus parking is momentary at best (busses and work vehicles are provided by the place of employment – not by the accommodation provider), meaning they are best placed in the shared verge parking areas rather than on-site.

Conclusion

In this context, the provision of on-site parking would result in an inefficient use of land and an unnecessary increase in hardstand areas, to the detriment of site layout, landscaping and amenity. Reliance on the existing and augmented on-street parking supply therefore represents a practical, contextually appropriate and orderly planning outcome.

Should you require any further information or clarification in relation to this matter, please contact Peter Stuart on 9221 1991.

Yours faithfully,



Peter Stuart
Rowe Group

Attachment Four

Noise Attenuation Report

PROPOSED ACCOMMODATION VILLAGE
94 – 96 ROBERTS STREET
NORSEMAN

STATE PLANNING POLICY 5.4 ACOUSTIC ASSESSMENT

MARCH 2026

OUR REFERENCE: 36236-1-26104

Rochdale Holdings Pty Ltd A.B.N. 85 009 049 067 trading as:
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ACOUSTIC ASSESSMENT

WORKERS ACCOMMODATION: ROBERTS STREET, NORSEMAN

Job No: 26104

Document Reference: 36236-1-26104

FOR

ROWE GROUP

DOCUMENT INFORMATION			
Author:	Tim Reynolds	**Checked By:**	Geoff Harris
Date of Issue:	31 March 2026		

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1	Rowe Group Attn: Peter Stuart Email: Peter.Stuart@rowegroup.com.au

This report has been prepared in accordance with the scope of services and on the basis of information and documents provided to Herring Storer Acoustics by the client. To the extent that this report relies on data and measurements taken at or under the times and conditions specified within the report and any findings, conclusions or recommendations only apply to those circumstances and no greater reliance should be assumed. The client acknowledges and agrees that the reports or presentations are provided by Herring Storer Acoustics to assist the client to conduct its own independent assessment.

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	3.1 ROAD AND RAIL TRAFFIC NOISE	1
4.	ASSESSMENT	4

APPENDICIES

A	PLANS
B	QUIET HOUSE DESIGN PACKAGE A+

1. INTRODUCTION

Herring Storer Acoustics was commissioned to undertake an acoustic assessment for the proposed workers accommodation, located at 94 – 96 Roberts Street, Norseman with regards to Esperance-Kalgoorlie freight railway line. The acoustic assessment is to comply with the requirement of State Planning Policy 5.4 *"Road and Rail Transport Noise"* (SPP5.4).

As the development is within the trigger distance of Esperance-Kalgoorlie freight railway line, an acoustic assessment with regards to State Planning Policy 5.4 has been undertaken. As part of this assessment, the following was carried out:

- Determine by modelling, the noise that would be received at workers accommodation development site from freight trains travelling along the Esperance – Kalgoorlie railway line.
- Assess the predicted noise levels for compliance with the appropriate criteria.
- If exceedances are predicted, comment on possible noise amelioration options for compliance with the appropriate criteria.

For information, the relevant concept plans are attached in Appendix A.

2. SUMMARY

The proposed development is located approximately 80 metres from the Esperance – Kalgoorlie freight railway line, which is within the trigger distance, as outlined in SPP 5.4.

Based on a distance of 80 metres, from Table 2 of the Implementation Guidelines for SPP 5.4, the noise received at the development site would be 57 dB(A). At this noise level "Quiet House" design package A+ would be required.

We note that the boundary fences to the gazebo area should under the deemed to satisfy requirements be 2 metres high. This fence height should be for the locations as shown in Figure 5.1 in section 5 – Assessment.

The summary of the deemed to satisfy requirements for "Quiet House" Design Package A+ are attached in Appendix B. We note that alternative constructions would be acceptable, provided they are supported by an acoustic report prepared by a suitably qualified acoustic consultant.

3. CRITERIA

Road traffic noise received at a sensitive premise needs to comply with the requirements of State Planning Policy 5.4 "*Road and Rail Transport Noise*".

3.1 ROAD AND RAIL TRAFFIC NOISE

The Western Australian Planning Commission (WAPC) released on 6th September 2019 State Planning Policy 5.4 *"Road and Rail Noise".* The requirements of State Planning Policy 5.4 are outlined below.

POLICY APPLICATION (Section 4)

When and where it applies (Section 4.1)

SPP 5.4 applies to the preparation and assessment of planning instruments, including region and local planning schemes; planning strategies, structure plans; subdivision and development proposals in Western Australia, where there is proposed:

*a) noise-sensitive land-use within the policy's trigger distance of a transport corridor as specified in **Table 1**;*

*b) New or major upgrades of roads as specified in **Table 1** and maps **(Schedule 1,2 and 3);** or*

*c) New railways or major upgrades of railways as specified in maps (**Schedule 1, 2 and 3);** or any other works that increase capacity for rail vehicle storage or movement and will result in an increased level of noise.*

Policy trigger distances (Section 4.1.2)

***Table 1** identifies the State's transport corridors and the trigger distances to which the policy applies.*

*The designation of land within the trigger distances outlined in **Table 1** should not be interpreted to imply that land is affected by noise and/or that areas outside the trigger distances are un-affected by noise.*

*Where any part of the lot is within the specified trigger distance, an assessment against the policy is required to determine the likely level of transport noise and management/ mitigation required. An initial screening assessment (**guidelines: Table 2: noise exposure forecast**) will determine if the lot is affected and to what extent."*

TABLE 1: TRANSPORT CORRIDOR CLASSIFICATION AND TRIGGER DISTANCES

Transport corridor classification	*Trigger distance*	*Distance measured from*
Roads		
Strategic freight and major traffic routes *Roads as defined by Perth and Peel Planning Frameworks and/or roads with either 500 or more Class 7 to 12 Austroads vehicles per day, and/or 50,000 per day traffic volume*	*300 metres*	*Road carriageway edge*
Other significant freight/traffic routes *These are generally any State administered road and/or local government road identified as being a future State administered road (red road) and other roads that meet the criteria of either >=23,000 daily traffic count (averaged equivalent to 25,000 vehicles passenger car units under region schemes)*	*200 metres*	*Road carriageway edge*
Passenger railways		
	100 metres	*Centreline of the closest track*
Freight railways		
	200 metres	*Centreline of the closest track*

Proponents are advised to consult with the decision making authority as site specific conditions (significant differences in ground levels, extreme noise levels) may influence the noise mitigation measures required, that may extend beyond the trigger distance.

POLICY MEASURES (Section 6)

The policy applies a performance-based approach to the management and mitigation of transport noise. The policy measures and resultant noise mitigation will be influenced by the function of the transport corridor and the type and intensity of the land-use proposed. Where there is risk of future land-use conflict in close proximity to strategic freight routes, a precautionary approach should be applied. Planning should also consider other broader planning policies. This is to ensure a balanced approach takes into consideration reasonable and practical considerations.

Noise Targets (Section 6.1)

***Table 2** sets out noise targets that are to be achieved by proposals under which the policy applies. Where exceeded, an assessment is required to determine the likely level of transport noise and management/mitigation required.*

In the application of the noise targets the objective is to achieve:

- *indoor noise levels as specified in **Table 2** in noise sensitive areas (for example, bedrooms and living rooms of houses, and school classrooms); and*
- *a reasonable degree of acoustic amenity for outdoor living areas on each residential lot. For non-residential noise-sensitive developments, for example schools and child care centres the design of outdoor areas should take into consideration the noise target.*

It is recognised that in some instances, it may not be reasonable and/or practicable to meet the outdoor noise targets. Where transport noise is above the noise targets, measures are expected to be implemented that balance reasonable and practicable considerations with the need to achieve acceptable noise protection outcomes.

TABLE 2: NOISE TARGETS

Proposals	***New/Upgrade***	***Noise Targets***		
		Outdoor		***Indoor***
		Day (L_{Aeq}(Day) dB) (6 am-10 pm)	***Night (L_{Aeq}(Night)dB) (10 pm-6 am)***	***(L_{Aeq} dB)***
Noise-sensitive land-use and/or development	*New noise sensitive land use and/or development within the trigger distance of an existing/proposed transport corridor*	*55*	*50*	*L_{Aeq} (Day) 40(Living and work areas)* *L_{Aeq} (Night) 35 (bedrooms)*
Roads	*New*	*55*	*50*	*N/A*
	Upgrade	*60*	*55*	*N/A*
Railways	*New*	*55*	*50*	*N/A*
	Upgrade	*60*	*55*	*N/A*

Notes:

- *The noise target is to be measured at one metre from the most exposed, habitable façade of the proposed building, which has the greatest exposure to the noise-source. A habitable room has the same meaning as defined in State Planning Policy 3.1 Residential Design Codes.*

- *For all noise-sensitive land-use and/or development, indoor noise targets for other room usages may be reasonably drawn from Table 1 of Australian Standard/New Zealand Standard AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors (as amended) for each relevant time period.*

- *The 5dB difference in the criteria between new and upgrade infrastructure proposals acknowledges the challenges in achieving noise level reduction where existing infrastructure is surrounded by existing noise-sensitive development.*

- *Outdoor targets are to be met at all outdoor areas as far as is reasonable and practical to do so using the various noise mitigation measures outlined in the guidelines. For example, it is likely unreasonable for a transport infrastructure provider to achieve the outdoor targets at more than 1 or 2 floors of an adjacent development with direct line of sight to the traffic.*

Noise Exposure Forecast (Section 6.2)

*When it is determined that SPP 5.4 applies to a planning proposal as outlined in Section 4, proponents and/or decision makers are required to undertake a preliminary assessment using **Table 2**: noise exposure forecast in the guidelines. This will provide an estimate of the potential noise impacts on noise-sensitive land-use and/ or development within the trigger distance of a specified transport corridor. The outcomes of the initial assessment will determine whether:*

- *no further measures is required;*

- *noise-sensitive land-use and/or development is acceptable subject to deemed-to- comply mitigation measures; or*

- *noise-sensitive land-use and/or development is not recommended. Any noise-sensitive land-use and/ or development is subject to mitigation measures outlined in a noise management plan."*

4. ASSESSMENT

The proposed development is located at 94 – 96 Roberts Street, Norseman. As shown below in Figure 4.1, the Esperance – Kalgoorlie freight railway line is located to the east of the development.



FIGURE 4.1 – SITE LOCATION

From Google Earth, the eastern boundary of the development is approximately 80 metres from the railway line. Thus, based on Table 2 of the Implementation Guidelines (part table shown below), the noise received at 80 metres of the edge of the railway line would be 57 dB(A).

Railway Transport Corridor Classification		Forecast period average noise level and exposure category based on distance from near									
		adjacent	10	20	30	40	50	60	70	80	90	100
Passenger railways	Fremantle, Midland and Thornlie main lines only	68	64	62	60	59	58	56	56	55	54
	All other metro passenger rail lines, and where multiple metro rail services share the same transport corridor	70	66	64	62	61	60	58	57	56	56
Freight railways, up to 1 movement per hour		72	68	65	63*	62*	60*	59*	58*	57*	57*

Under the WAPC State Planning Policy 5.4, for this development, the "Noise Target" as listed in Table 1 are the appropriate noise levels for to be achieved for this development. The policy states that the outdoor criteria apply to the ground floor level only, however, it also states that noise mitigation measures should be implemented with a view to achieving the “Noise Target” levels in least one outdoor living area. The Policy states the following acceptable internal noise levels:

Internal

Living and Work Areas	$L_{Aeq(Day)}$ of 40 dB(A)
Bedrooms	$L_{Aeq(Night)}$ of 35 dB(A)

Based on a distance of 80 metres, from Table 2 of the Implementation Guidelines for SPP 5.4, the noise received at the development site would be 57 dB(A). At this noise level “Quiet House” design package A+ would be required.

We note that the boundary fences to the gazebo area should under the deemed to satisfy requirements be 2 metres high. This fence height should be for the locations as shown in Figure 4.1.

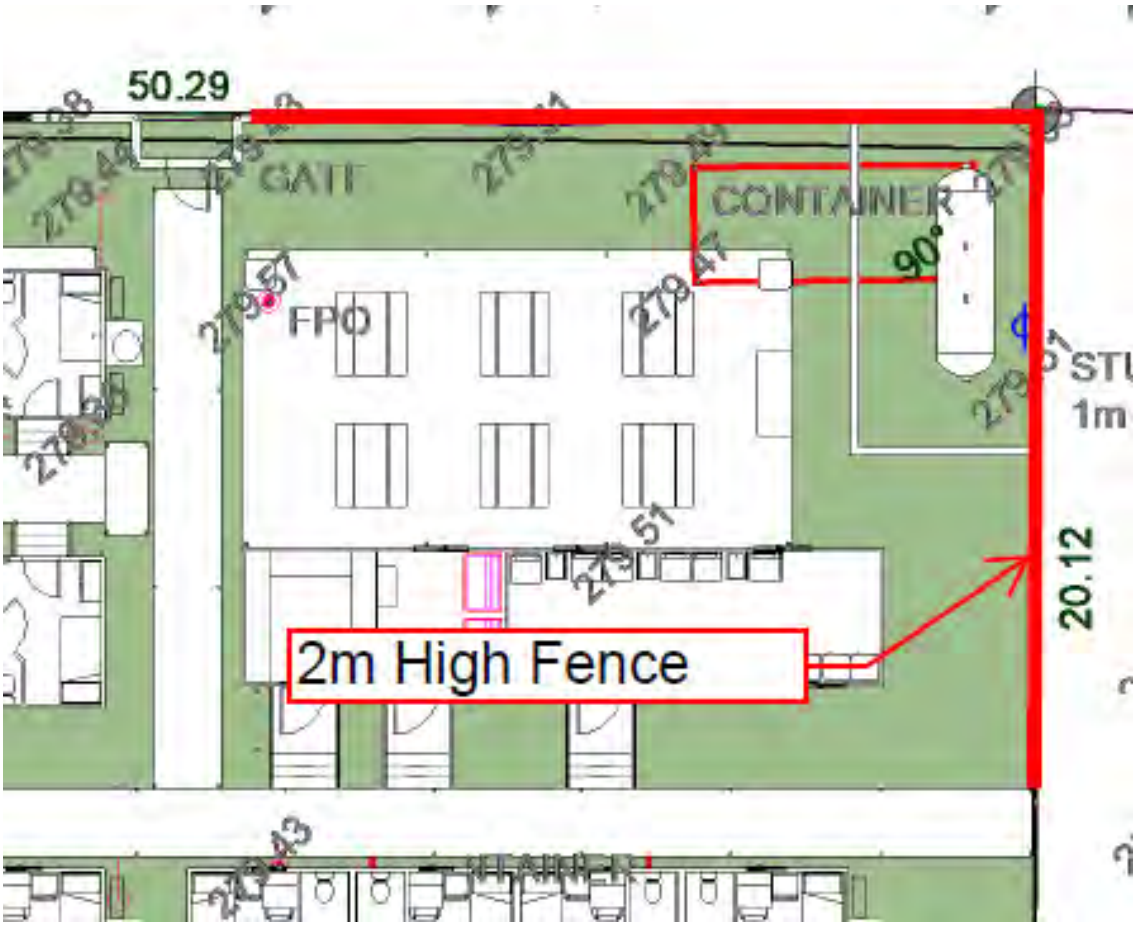


FIGURE 4.1 – BOUNDARY FENCE

The deemed to satisfy requirements for Package A+ are attached in Appendix B.

Notes:

1 The summary of the Quiet House Design Package A+ attached in Appendix B, are "Deemed to Satisfy" constructions. Alternative constructions would be acceptable, provided they are supported by an acoustic report prepared by a suitably qualified acoustic consultant.

2 The boundary fence to the outdoor gazebo to have a minimum surface density of 15kg/m^2.

3 Additionally, a Notifications on the Title is required for this development.

APPENDIX A

PLANS

PROPOSED ACCOMMODATION VILLAGE

94-96.ROBERTS STREET NORSEMAN, WA, 6443



SHEET No.	SHEET NAME	REVISION	REVISION DATE
SK-00	TITLE PAGE	B	26/02/26
SK-01	SITE LOCATION PLAN	B	26/02/26
SK-02	SITE OVERALL PLAN	B	26/02/26
SK-03	EXISTING SITE PLAN	B	26/02/26
SK-04	SITE PLAN	B	26/02/26

SHEET No.	SHEET NAME	REVISION	REVISION DATE
SK-05	GROUND FLOOR PLAN	B	26/02/26
SK-20	PERSPECTIVES	A	26/02/26
SK-21	PERSPECTIVES	A	26/02/26
SK-22	PERSPECTIVES	A	26/02/26
SK-23	PERSPECTIVES	A	26/02/26

ANDRE MELVILLE BUILDING DESIGN
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PROPOSED ON STREET PARKING AREA (14 BAYS)

PROPOSED NEW FEATURE ENTRY

EXISTING BITUMEN WALK WAY

PROPOSED NEW 1800H COLORBOND FENCE

NORTH

PROPOSED ON SITE 4,900L GAS BULLET

PROPOSED BIN STORE

PROPOSED 1800H FEATURE FENCE

PROPOSED NEW ACCESS GATE

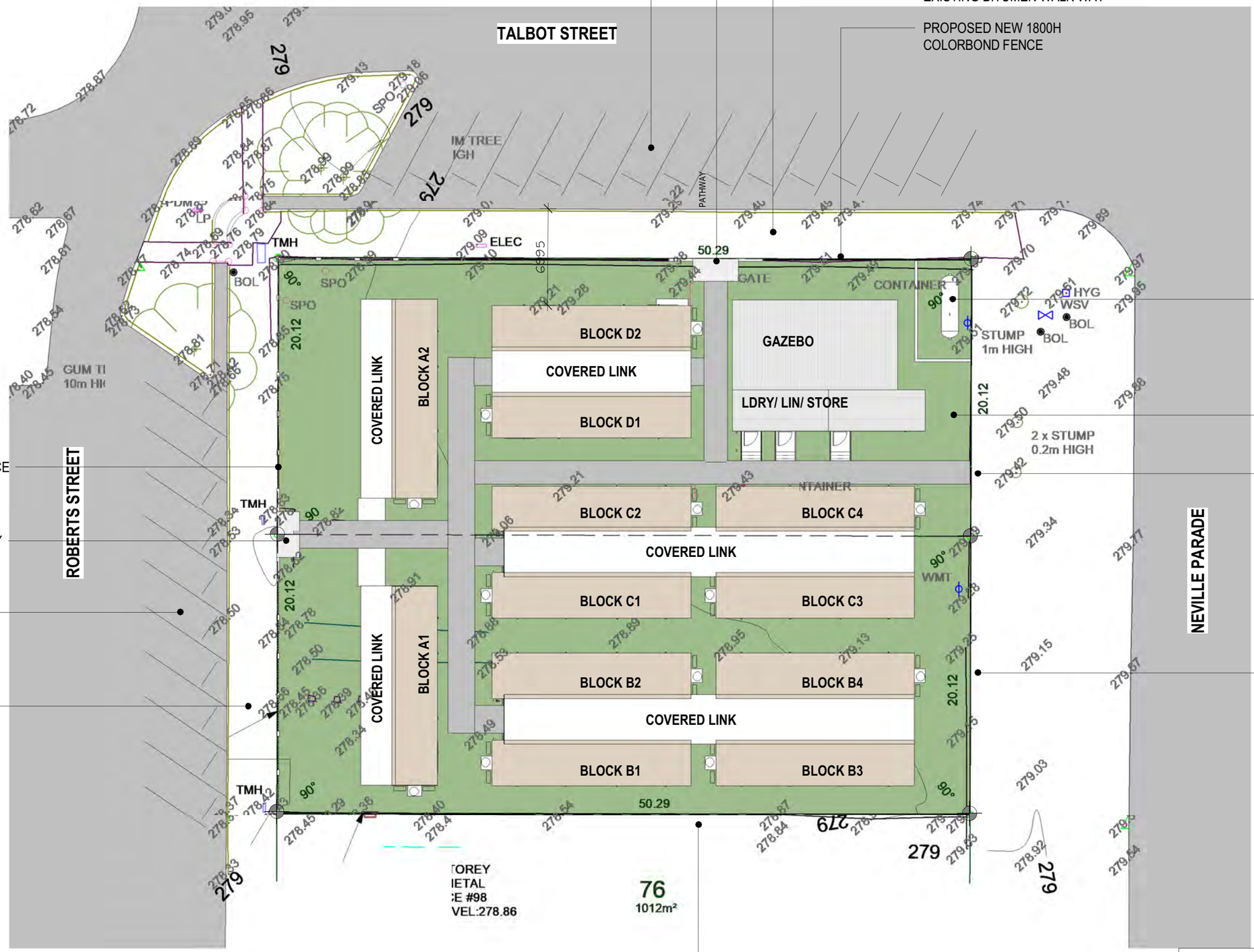
PROPOSED NEW FEATURE ENTRY

PROPOSED ON STREET PARKING AREA (10 BAYS)

EXISTING BITUMEN WALK WAY

PROPOSED NEW 1800H COLORBOND FENCE

PROPOSED NEW 1800H COLORBOND FENCE



NOT FOR CONSTRUCTION

CP - SITE PLAN

1 : 300@A3

6.0 3.0 0 3.0 6.0 9.0 12.0 15.0

1:300 @ A3
1:600 @ A4

NOTE:
- VERIFY ALL DIMENSIONS ON SITE
- NOTED DIMENSIONS TAKE PRESIDENT OVER SCALED DIMENSIONS

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PROJECT : PROPOSED ACCOMMODATION VILLAGE
CLIENT : Resource Accommodation Management Pty Ltd
LOCATION: 94-96.ROBERTS STREET NORSEMAN, WA, 6443

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No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3 1 : 300
ISSUED	26/02/26

SITE PLAN

25-116 - SK-04 - B

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NORTH



CP-SITE GROUDN FLOOR PLAN

1 : 300@A3

PP PP

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1.5 0.75 0 0.75 1.5 2.25 3.0 3.75 1:750 @ A3
1:1500 @ A4

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DESIGNED		AM
DRAWN		AM
DATE		FEB 2025
SCALE	A3	1 : 300
ISSUED		26/02/26

GROUND FLOOR PLAN

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No.	Description	Date
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PERSPECTIVES

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DESIGNED	AM
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ISSUED	26/02/26

PERSPECTIVES

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DATE	FEB 2025
SCALE	A3
ISSUED	26/02/26

PERSPECTIVES

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DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3
ISSUED	26/02/26

PERSPECTIVES

25-116 - SK-23 - A

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APPENDIX B

QUIET HOUSE DESIGN PACKAGE A+

Exposure Category	Orientation to corridor	Acoustic rating and example constructions				
		Walls	**External doors**	**Windows**	**Roofs and ceilings of highest floors**	**Outdoor living areas**
A **Quiet House A**	Facing	Bedroom and indoor living and work areas to Rw+Ctr 45dB • One row of 92mm studs at 600mm centres with: – Resilient steel channels fixed to the outside of the studs; and – 9.5mm hardboard or 9mm fibre cement sheeting or 11mm fibre cement weatherboards or one layer of 19mm board cladding fixed to the outside of the channels; and – 75mm glass wool (11kg/m3) or 75mm polyester (14kg/m3) insulation, positioned between the studs; and – Two layers of 16mm fire-protective grade plasterboard fixed to the inside face of the studs. – Single leaf of 150mm brick masonry with 13mm cement render on each face. – Double brick: two leaves of 90mm clay brick masonry with a 20mm cavity between leaves.	Bedrooms: • Fully glazed hinged door with certified Rw+Ctr 28dB rated door and frame including seals and 6mm glass Other external doors to Rw+Ctr 25dB, e.g. • 35mm solid core timber hinged door and frame system certified to Rw 28dB including seals • Glazed sliding door with 10mm glass and weather seals	Bedrooms: • Total external door and window system area up to 40% of room floor area: Sliding or double hung with minimum 10mm single or 6mm-12mm-10mm double insulated glazing (Rw+Ctr 28 dB). Sealed awning or casement windows may use 6 mm glazing instead. • Up to 60% floor area: as per above but must be sealed awning or casement type windows (Rw+Ctr 31dB). Indoor living and work areas • Up to 40% floor area: Sliding, awning, casement or double hung with minimum 6mm single pane or 6mm-12mm-6mm double insulated glazing (Rw+Ctr 25dB). • Up to 60% floor area: As per Bedrooms at up to 40% area (Rw+Ctr 28 dB). • Up to 80% floor area: As per Bedrooms at up to 60% area (Rw+Ctr 31dB).	To Rw+Ctr 35dB • Concrete or terracotta tile or metal sheet roof with sarking and at least 10mm plasterboard ceiling	At least one outdoor living area located on the opposite side of the building from the transport corridor and/or at least one ground level outdoor living area screened using a solid continuous fence or other structure of minimum 2 metres height above ground level.
	Side on					
	Opposite		As per 'Facing' above, except Rw+Ctr values may be 3dB less, e.g. glazed sliding door with 10mm glass and weather seals for bedrooms.	As above, except Rw+Ctr values may be 3dB less, or max % area increased by 20%		
			No specific requirements			
A **Quiet House A+**	All	As per Quiet House A, except double leaf masonry / brick construction only.	As per Quiet House A.	As per Quiet House A, except that • 'Side-on' requirements same as 'Facing'. • All windows comprise minimum 6 mm thick laminated or toughened glass in sealed awning or casement frames. Polymer (e.g. uPVC) window framing should be used. Evaporative air conditioning systems are not recommended. • No external doors for bedrooms with entry 'Facing' transport corridor	No specific requirements	

Attachment Five

Civil Engineering Report

Porter

Level 2 Kishorn Court
58 Kishorn Road
Mount Pleasant WA 6153

PO Box 1036
Canning Bridge WA 6153

Tel: (08) 9315 9955
Email: office@portereng.com.au
www.portereng.com.au

Our Ref: NV/JT L094.26
Job No: 26-04-034

18 May 2026

Rowe Group
Level 3 369 Newcastle Street
NORTHBRIDGE WA 6003

Attention: Peter Stuart

Dear Peter,

94-96 ROBERTS STREET, NORSEMAN
SERVICING ASSESSMENT
PROPOSED ACCOMMODATION VILLAGE

Porter Consulting Engineers has been engaged by Rowe Group to prepare a servicing assessment of a proposed workforce accommodation village located at 94-96 Roberts Street in Norseman. Refer to Figure 1 below for the location of the site.

The village is expected to incorporate 48 rooms, a gazebo, laundry and storage facilities.



Figure 1: Locality Plan

1.0 Background Information

This servicing report has been prepared based on a desktop investigation of the site with reference to the following documents:

- Preliminary Design Drawings (Andre Melville Building Design, Feb 2026) – **Attachment A.**
- Dial Before You Dig records – **Attachment B.**
- Effluent Disposal Assessment (Galt Geotechnics, June 2021).

2.0 Planning

Mapping indicates that the site is zoned as Commercial, which allows the site to be developed as work force accommodation.

3.0 Landform

Survey levels shown on the preliminary design drawings indicate that the site is relatively flat, with levels ranging from 279.50m at the northeast corner of the site to 278.40 at the southwest corner of the site.

Historical street view photography suggests the site has been used as storage yard. A shed, awning, several sea containers and other various materials have been left on site. Historical aerial mapping indicates that a building was previously located on the 96 Roberts Street but has been mostly demolished.

A geotechnical investigation was completed for the wastewater treatment plant located north of site at the corner of Richardson Street and Mildura Street. For the purposes of this servicing report, it is assumed that the ground conditions at the Roberts Street site will be similar to that of the wastewater plant, which was found to consist of a combination of clay, sand, silt and gravel. The measured infiltration rates were found to be between 0.04m/day and 1.6m/day which indicates that disposal of stormwater via soakwell infiltration is not suitable.

Groundwater was not encountered during the geotechnical investigation. It is expected that perched groundwater during wet periods due to the presence of clayey soils.

A site specific geotechnical investigation is recommended for detailed design.

4.0 Environmental & Heritage

As the site was previously developed and lies within the townsite, the environmental and heritage considerations are minor. Mapping indicates that the site does not lie within a bushfire prone area, areas containing unexploded ordnance, or any areas containing threatened ecological communities.

The site lies within an Aboriginal Heritage zone; however, most of the Norseman townsite is also located within this area so it is not expected to be an issue.

The site is also immediately adjacent to a freight railway line and may therefore be affected by rail noise.

5.0 Siteworks, Earthworks & Retaining

Based on aerial imagery and Street View, it appears 94 Roberts Street is currently surfaced with a concrete slab. It is expected that this slab will be removed as part of the overall demolition works. 96 Roberts Street may require a topsoil strip prior to construction. Norseman does not appear to utilise a traditional pit and pipe stormwater network but instead relies on overland flow paths into open drains. Street view photography indicates that there are outlet pipes located in the kerb along Roberts Street (refer **Figure 2** below). Stormwater discharge from the site appears to flow south to the large open drain that runs west to east along Austin St.



Figure 2: Existing Stormwater Discharge Pipes

Based on the site levels, it is expected that some minor filling of site will be required to facilitate stormwater drainage into the outlet pipes in the kerb.

6.0 Sewer Reticulation

The sewer reticulation within Norseman is privately owned so information on the existing network is not readily available. A wastewater treatment plant (WWTP) owned by Resource Accommodation Management is located at the corner of Richardson Street and Mildura Street. It is expected that a private pump station will be required on site to pump wastewater to the WWTP.

It is anticipated that the sewer pressure main will run west along Talbot Street before discharging to a proposed private pump station at the Mildura Street accommodation village. From the village, wastewater would be pumped north towards the existing WWTP (refer **Figure 3** below).



Figure 3: Expected Sewer Servicing

7.0 Water Reticulation

There is an existing 100PVC Water Corporation water main with the Neville Parade verge. Water Corporation's online asset mapping (refer **Figure 4)** indicates there are existing meters to both lots. It is assumed that one or both of these meters can be used to service the accommodation village and upgraded to meet demand as necessary.

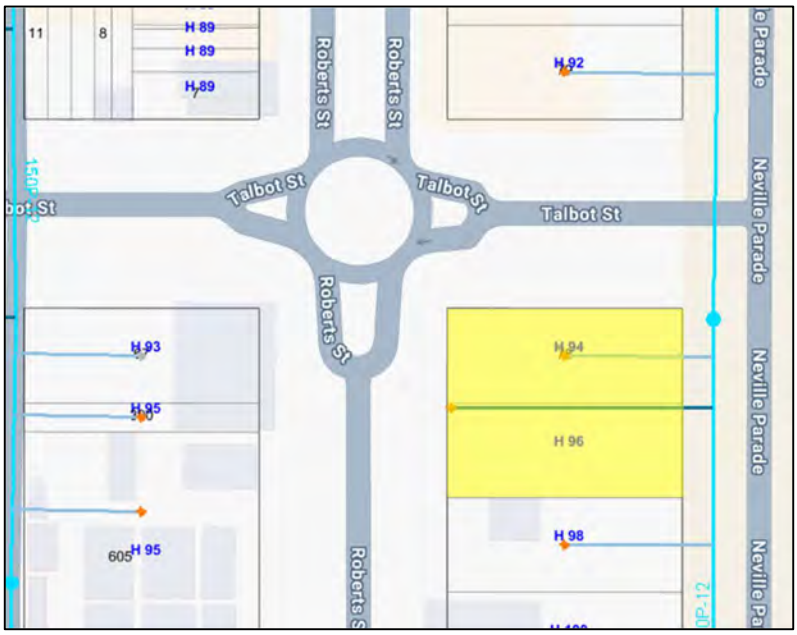


Figure 4: Existing Water Reticulation

8.0 Stormwater Drainage

It is expected that site levels will need to be raised in order to facilitate overland flow paths for stormwater drainage. This flow will need to be directed towards the Roberts St gutter and the Neville Pde swale and can be achieved by grading the site from the centre towards the east and west verges and use of trench / floor grates connected with shallow pipework. The pipework shall connect into the existing kerb outlets on Roberts St with new shallow outlets constructed in the Neville Pde verge to discharge stormwater to the shallow swale. It is expected that this flow will continue south to the open drain located along Austin Street.

9.0 Roads, Paths, and Fencing

The surrounding road network is sealed and kerbed. There are suitable areas for the proposed parking bays which will require new pavement marking. The existing bitumen path bordering the site has been noted by the surveyor to be in average condition and may need to be upgraded or repaired in areas. There is no proposed vehicle access to the site so no new crossover will be required.
1800mm high Colorbond fencing has been noted to be installed around the site as per the preliminary design drawings.

10.0 Power

The DBYD records from Horizon Power (refer **Figure 5**) show that there is an existing power connection to 94 Roberts Road. It is expected that this feed can be used to service the accommodation village.

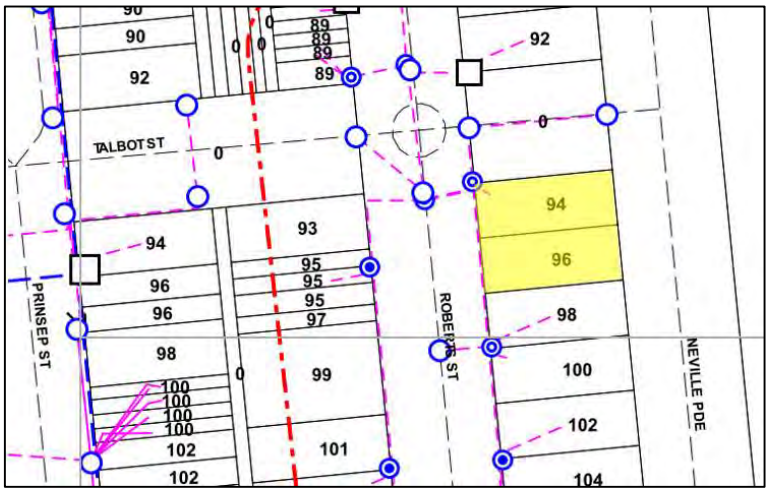


Figure 5: Existing Power Infrastructure

No data is available regarding the current or forecasted capacity of the network. It is recommended that the developer seek advice from an electrical engineer to confirm expected requirements and any additional costs to provide an adequate power supply.

11.0 Communications

The DBYD records from Telstra and NBN (refer **Figure 6**) show that there is an existing NBN communications connection to both lots. It is expected that this feed can be used to service the accommodation village.

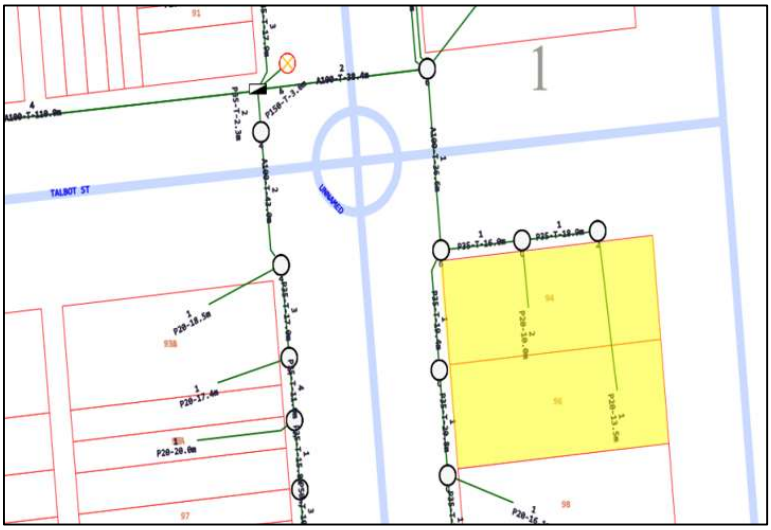


Figure 6: Existing Communications Infrastructure

12.0 Mobile Communications

Mobile connectivity (4G and 5G) for new developments is an important consideration. A mobile service is received from local and regional antennae that are operated by various communications providers. **Figure 7** below shows the location of existing antennae (blue and green dots) near the site (red).



Figure 7: Existing Mobile Service Antennae

Figure 8 shows Telstra's 4G network coverage. Norseman is not currently within Telstra's 5G coverage zone.



Figure 8: Telstra 4G Coverage

Based on the above, there are multiple mobile service antennae in close proximity to site, and the site has only 4G coverage. It is anticipated that mobile connectivity will be available for the Roberts Street accommodation village.

13.0 Gas

There is no reticulated gas within Norseman; however, a gas storage bullet has been proposed as part of the design for this lot.

14.0 Summary

It appears the site is relatively constraint free with no servicing or engineering limitations that prohibit development. The following comments are noted:

- Due to the clayey soil system in the area, a geotechnical investigation of the site is recommended.
- It is anticipated that fill will be required for the lot in order to direct stormwater flow into the existing Norseman stormwater system.
- To manage wastewater, it is anticipated that a private pump station will be required to transport wastewater to the treatment plant.
- It is recommended that Horizon Power are engaged early into the development phase to ensure they do not impact the development program.

Yours faithfully,



Jarryd Treacy
Senior Civil Engineer

Enc.

ATTACHMENT A
Preliminary Design Drawings

PROPOSED ACCOMMODATION VILLAGE

94-96.ROBERTS STREET NORSEMAN, WA, 6443

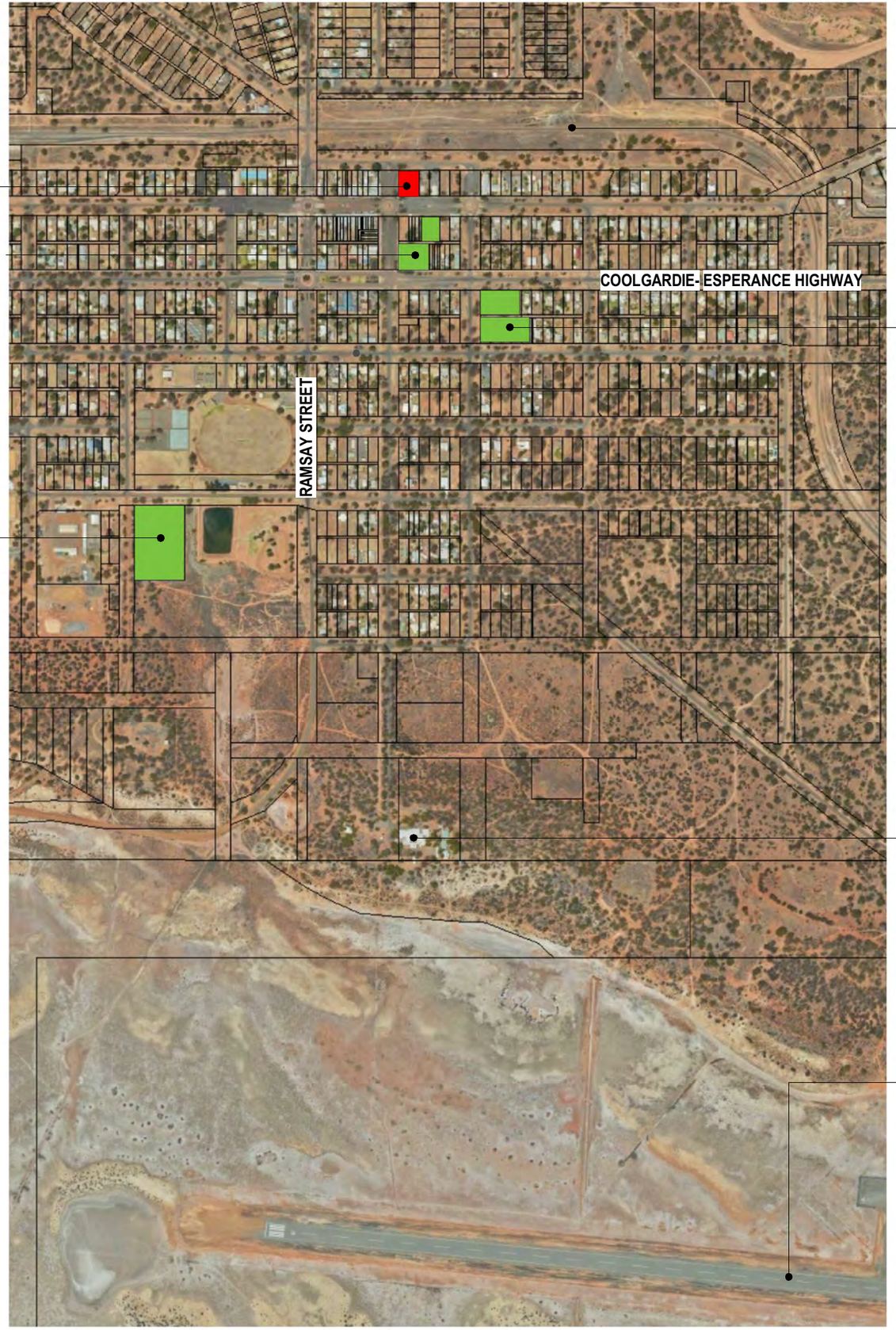


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CP-SITE LOCATION PLAN

1 : 10000@A3

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PROJECT : PROPOSED ACCOMMODATION VILLAGE
CLIENT : Resource Accommodation Management Pty Ltd
LOCATION: 94-96.ROBERTS STREET NORSEMAN, WA, 6443

ANDRE MELVILLE BUILDING DESIGN
& DRAFTING SERVICES
P.O BOX 8, LABRADOR, QLD 4814
Ph: 0498 001 535
E-MAIL: admin@ambd.com.au
www.ambd.com.au
QBCC No. 1222804
ABN No. 37 155 932 675
ENDORSED Sustainable Building Designer
Townsville- Brisbane - **Goldcoast**

No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26

DESIGNED		AM
DRAWN		AM
DATE		FEB 2025
SCALE	A3	1 : 10000
ISSUED		26/02/26

SITE LOCATION PLAN

25-116 - SK-01 - B

2/03/2026 7:56:21 AM

NORTH



NORSEMAN CAFE

NORSEMAN ACCOMMODATION

THE LODGE VILLAGE
EXISTING ACCOMMODATION

PROPOSED SITE

NOT FOR CONSTRUCTION

CP-SITE AREA PLAN

1 : 2000@A3

NOTE:
- VERIFY ALL DIMENSIONS ON SITE
- NOTED DIMENSIONS TAKE PRESIDENT OVER SCALED DIMENSIONS

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DESIGNED		AM
DRAWN		AM
DATE		FEB 2025
SCALE	A3	1 : 2000
ISSUED		26/02/26

SITE OVERALL PLAN

25-116 - SK-02 - B

2/03/2026 7:56:23 AM

NORTH



EXISTING CONTAINER TO BE REMOVED

EXISTING CONTAINER TO BE REMOVED

EXISTING SHED TO BE REMOVED

EXISTING AWNING TO BE DEMOLISHED

GOODLIFE STREET

CP - EXISTING SITE PLAN

1 : 500@A3

NOT FOR CONSTRUCTION

1.5 0.75 0 0.75 1.5 2.25 3.0 3.75

1:750 @ A3

1:1500 @ A4

NOTE:
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No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3 1 : 500
ISSUED	26/02/26

EXISTING SITE PLAN

25-116 - SK-03 - B

2/03/2026 7:56:24 AM

PROPOSED ON STREET PARKING AREA (14 BAYS)

PROPOSED NEW FEATURE ENTRY

EXISTING BITUMEN WALK WAY

PROPOSED NEW 1800H COLORBOND FENCE

NORTH

PROPOSED ON SITE 4,900L GAS BULLET

PROPOSED BIN STORE

PROPOSED 1800H FEATURE FENCE

PROPOSED NEW ACCESS GATE

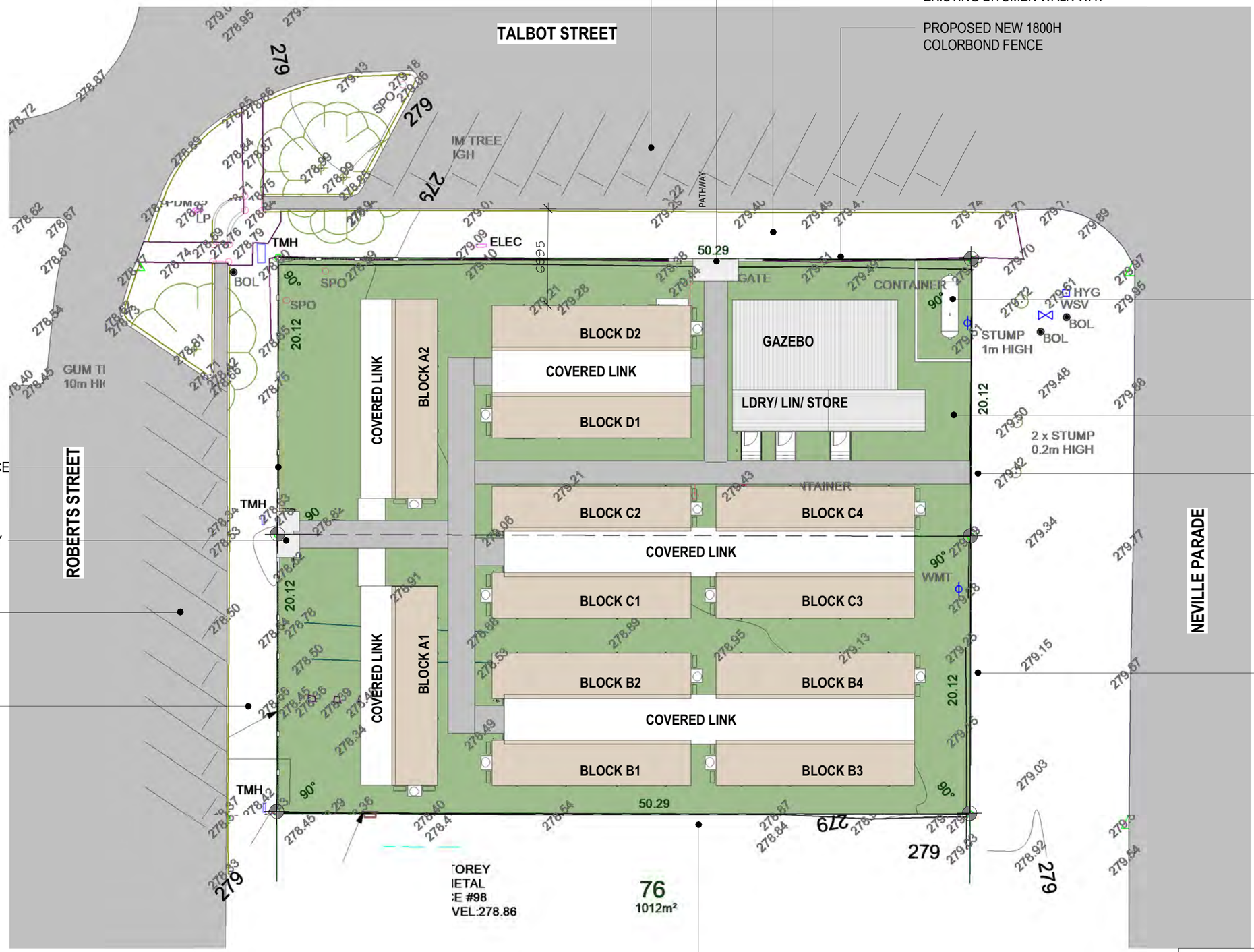
PROPOSED NEW FEATURE ENTRY

PROPOSED ON STREET PARKING AREA (10 BAYS)

EXISTING BITUMEN WALK WAY

PROPOSED NEW 1800H COLORBOND FENCE

PROPOSED NEW 1800H COLORBOND FENCE



NOT FOR CONSTRUCTION

CP - SITE PLAN

1 : 300@A3

6.0 3.0 0 3.0 6.0 9.0 12.0 15.0

1:300 @ A3
1:600 @ A4

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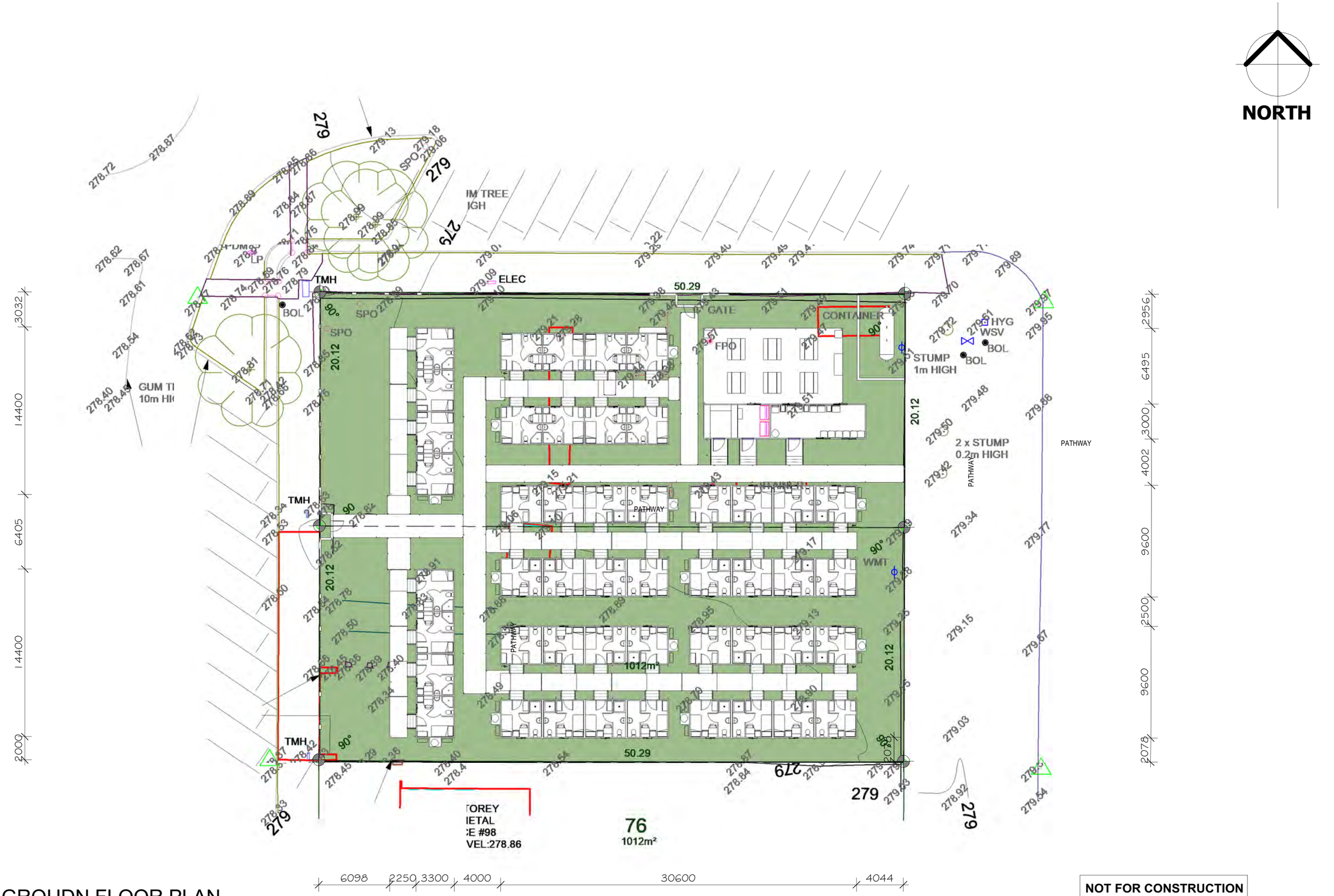
No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3 1 : 300
ISSUED	26/02/26

SITE PLAN

25-116 - SK-04 - B

2/03/2026 7:56:26 AM



CP-SITE GROUDN FLOOR PLAN

1 : 300@A3

NOT FOR CONSTRUCTION

1.5 0.75 0 0.75 1.5 2.25 3.0 3.75 1:750 @ A3

1:1500 @ A4

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No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26

DESIGNED	AM	GROUND FLOOR PLAN	
DRAWN	AM		
DATE	FEB 2025		
SCALE	A3 1 : 300	25-116 - SK-05 - B	
ISSUED	26/02/26		

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No.	Description	Date
A	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3
ISSUED	26/02/26

PERSPECTIVES

25-116 - SK-20 - A

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ABN No. 37 155 932 675
ENDORSED Sustainable Building Designer
Townsville - Brisbane - **Goldcoast**

No.	Description	Date
A	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3
ISSUED	26/02/26

PERSPECTIVES

25-116 - SK-21 - A

2/03/2026 7:56:28 AM



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No.	Description	Date
A	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3
ISSUED	26/02/26

PERSPECTIVES

25-116 - SK-22 - A

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ENDORSED
Sustainable Building Designer

No.	Description	Date
A	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3
ISSUED	26/02/26

PERSPECTIVES

25-116 - SK-23 - A

2/03/2026 7:56:28 AM

ATTACHMENT B
Dial Before You Dig Records



Overview

WATER CORPORATION

Scale: 1:1538
Job No.: 52888989
Sequence No.: 271316490
Print Date: 15 Apr 2026

N

Water

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H85
13
H85
12
H87
H89
1
H89
H89
H89
H89
H89
H89
H89
11
8
7
150P-12
TALBOT
H88
H88
603
H90
H90
605
H92
ST
PDE
H93
H95
300
H85-99
605
H94
H96
H98

Page No: 1

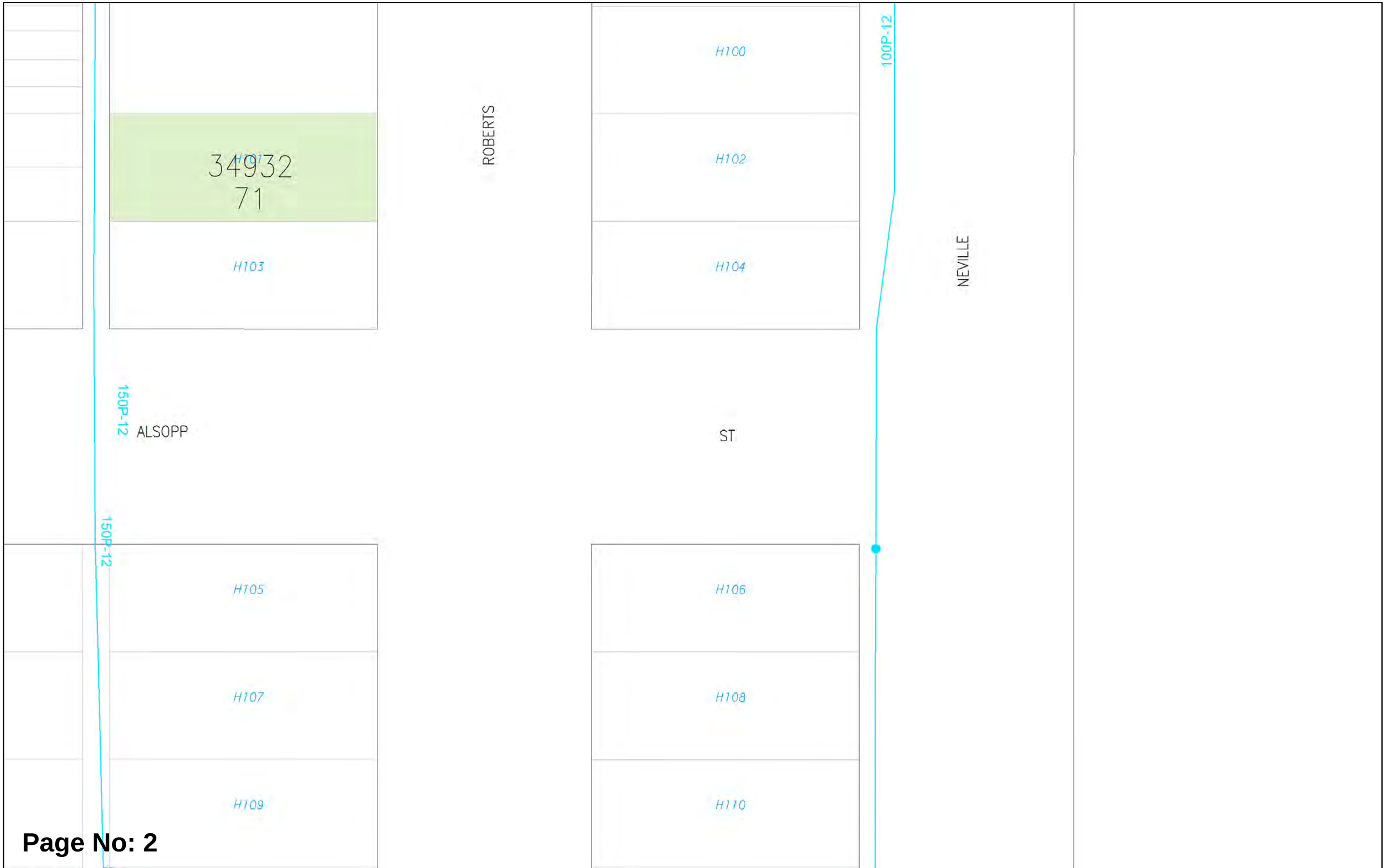
WATER CORPORATION

Scale: 1:750
Job No.: 52888989
Sequence No.: 271316490
Print Date: 15 Apr 2026

N

Water

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Page No: 2

WATER CORPORATION

Scale:	1:750
Job No.:	52888989
Sequence No.:	271316490
Print Date:	15 Apr 2026

N

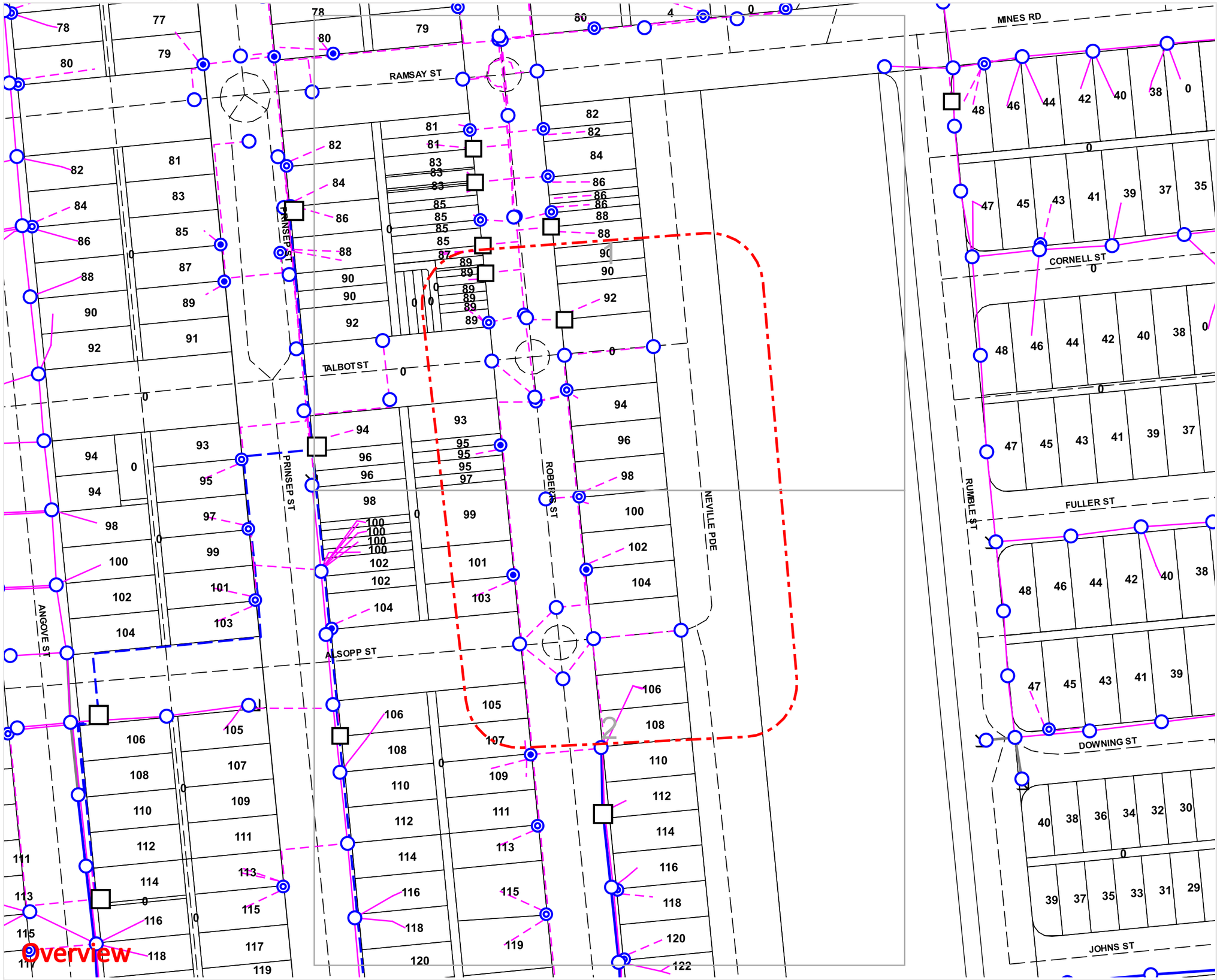
Water

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HORIZON POWER *energy for life*

Sequence No: 271316488
Job No: 52888989
Location: 98 Roberts Street, Norseman, WA 6443

DIAL BEFORE YOU DIG www.1100.com.au *The Essential First Step.*



Legend

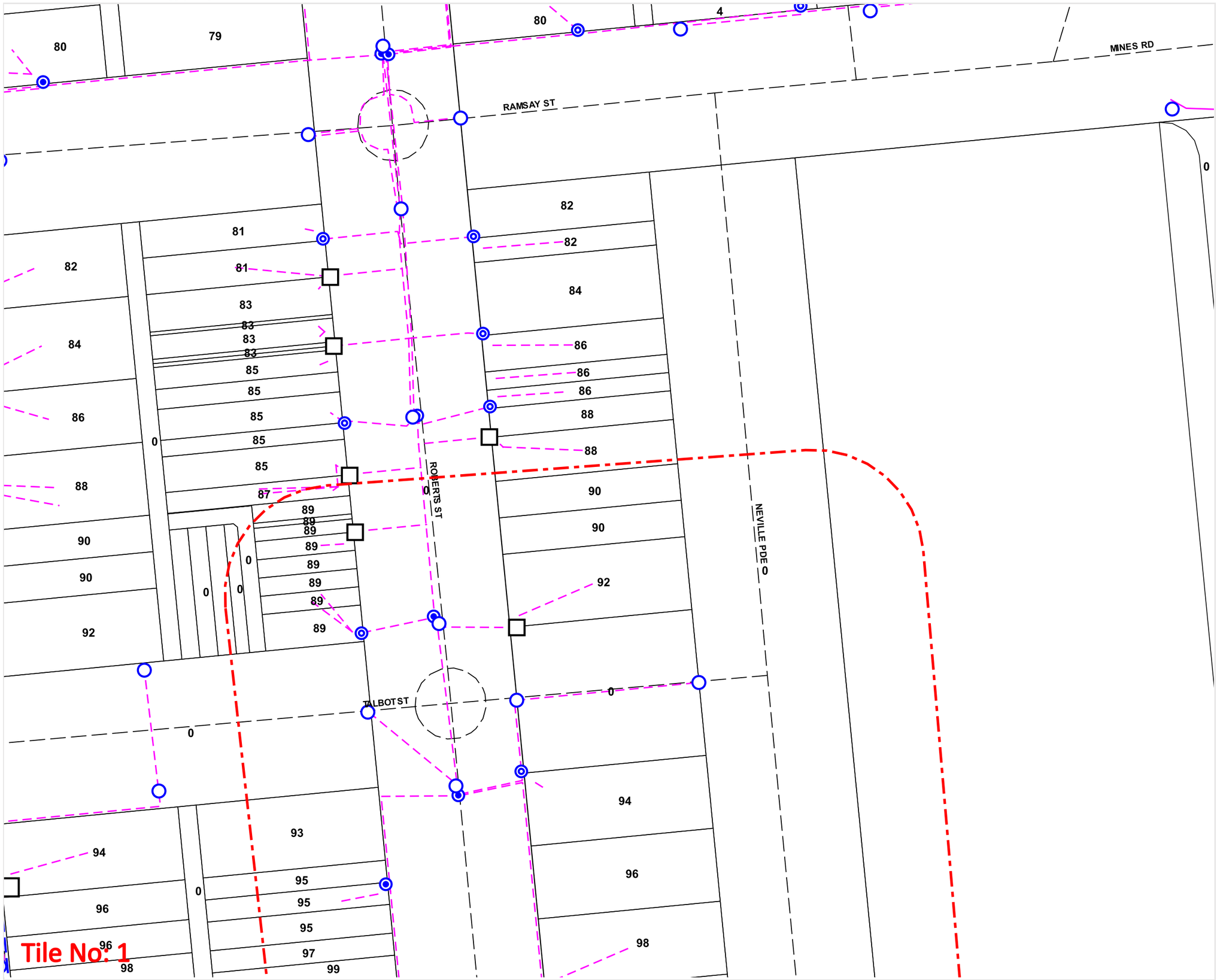
Existing	Proposed	
SUB	SUB	Distribution Substation
○	○	Distribution Pole
◎	◎	LV Mini Pillar
◉	◉	LV Universal Pillar
LVF	LVF	LV Cabinet
UMS	UMS	LV Unmetered Supply Pit
PIT	PIT	LV Service Pit
FB	FB	LV Wall Mounted Box
LV	LV	LV Unknown Structure
- - -	- - -	LV Distribution Cable - Underground
———	———	LV Distribution Wire - Overhead
- - -	- - -	HV Distribution Cable - Underground
———	———	HV Distribution Wire - Overhead
Ø	Ø	Stay Anchor
		Stay Wire
		Transmission Cable - Underground
		Transmission Wire - Overhead
●	●	Transmission Pole
a	a	Transmission Tower
		Communications Cable
		Fibre Optic Cable
		Zone Substation

N

Scale: 1:2050
Expires: 13 May 2026

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Sequence No: 271316488
Job No: 52888989
Location: 98 Roberts Street, Norseman, WA 6443



Legend

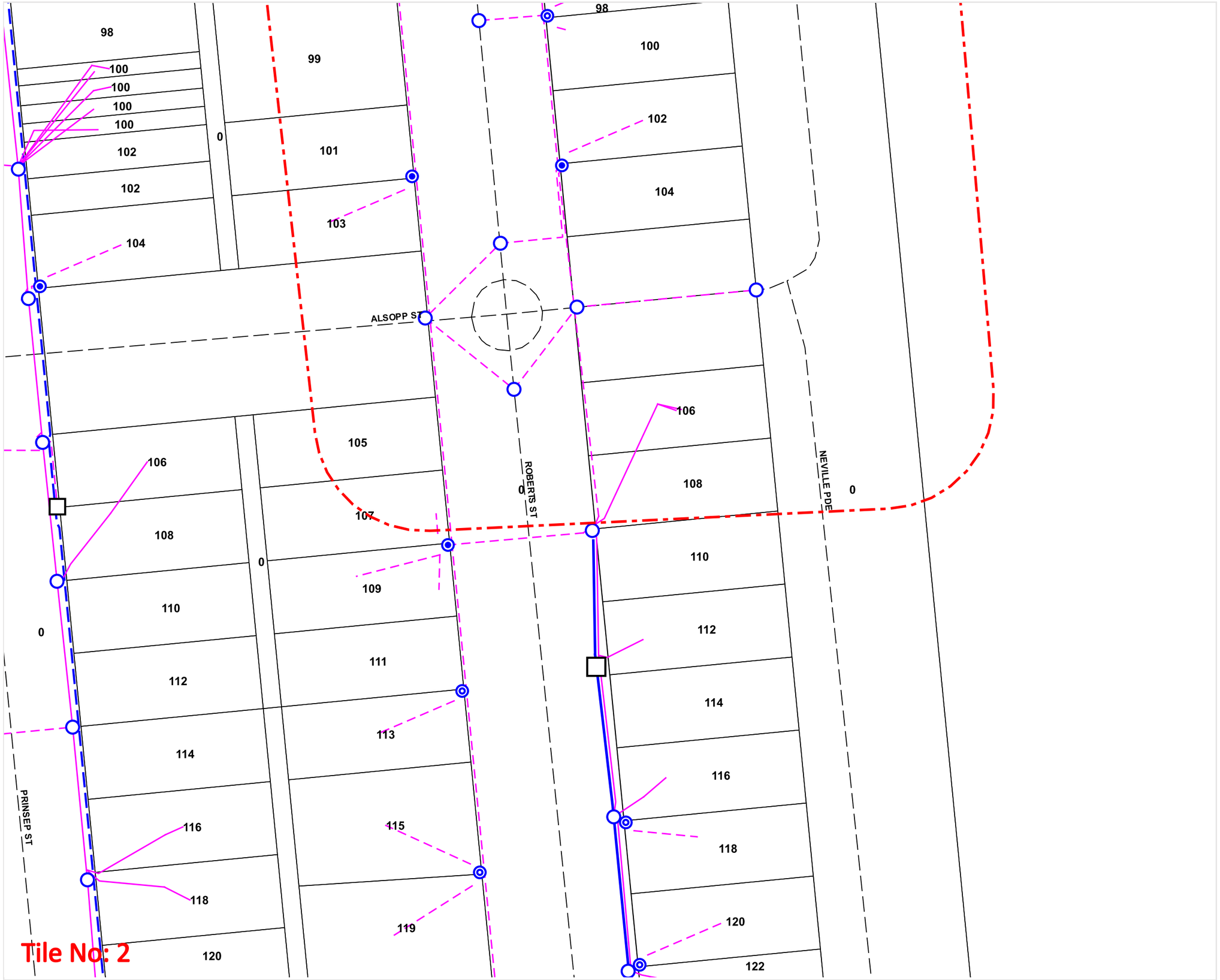
Existing	Proposed	
SUB	SUB	Distribution Substation
		Distribution Pole
		LV Mini Pillar
		LV Universal Pillar
LVF	LVF	LV Cabinet
UMS	UMS	LV Unmetered Supply Pit
PIT	PIT	LV Service Pit
FB	FB	LV Wall Mounted Box
LV	LV	LV Unknown Structure
		LV Distribution Cable - Underground
		LV Distribution Wire - Overhead
		HV Distribution Cable - Underground
		HV Distribution Wire - Overhead
Ø	Ø	Stay Anchor
		Stay Wire
		Transmission Cable - Underground
		Transmission Wire - Overhead
		Transmission Pole
a	a	Transmission Tower
		Communications Cable
		Fibre Optic Cable
		Zone Substation

N

Scale: 1:1000
Expires: 13 May 2026

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Sequence No: 271316488
Job No: 52888989
Location: 98 Roberts Street, Norseman, WA 6443



Legend

Existing	Proposed	
SUB	SUB	Distribution Substation
		Distribution Pole
		LV Mini Pillar
		LV Universal Pillar
LVF	LVF	LV Cabinet
UMS	UMS	LV Unmetered Supply Pit
PIT	PIT	LV Service Pit
FB	FB	LV Wall Mounted Box
LV	LV	LV Unknown Structure
		LV Distribution Cable - Underground
		LV Distribution Wire - Overhead
		HV Distribution Cable - Underground
		HV Distribution Wire - Overhead
Ø	Ø	Stay Anchor
		Stay Wire
		Transmission Cable - Underground
		Transmission Wire - Overhead
		Transmission Pole
a	a	Transmission Tower
		Communications Cable
		Fibre Optic Cable
		Zone Substation

N

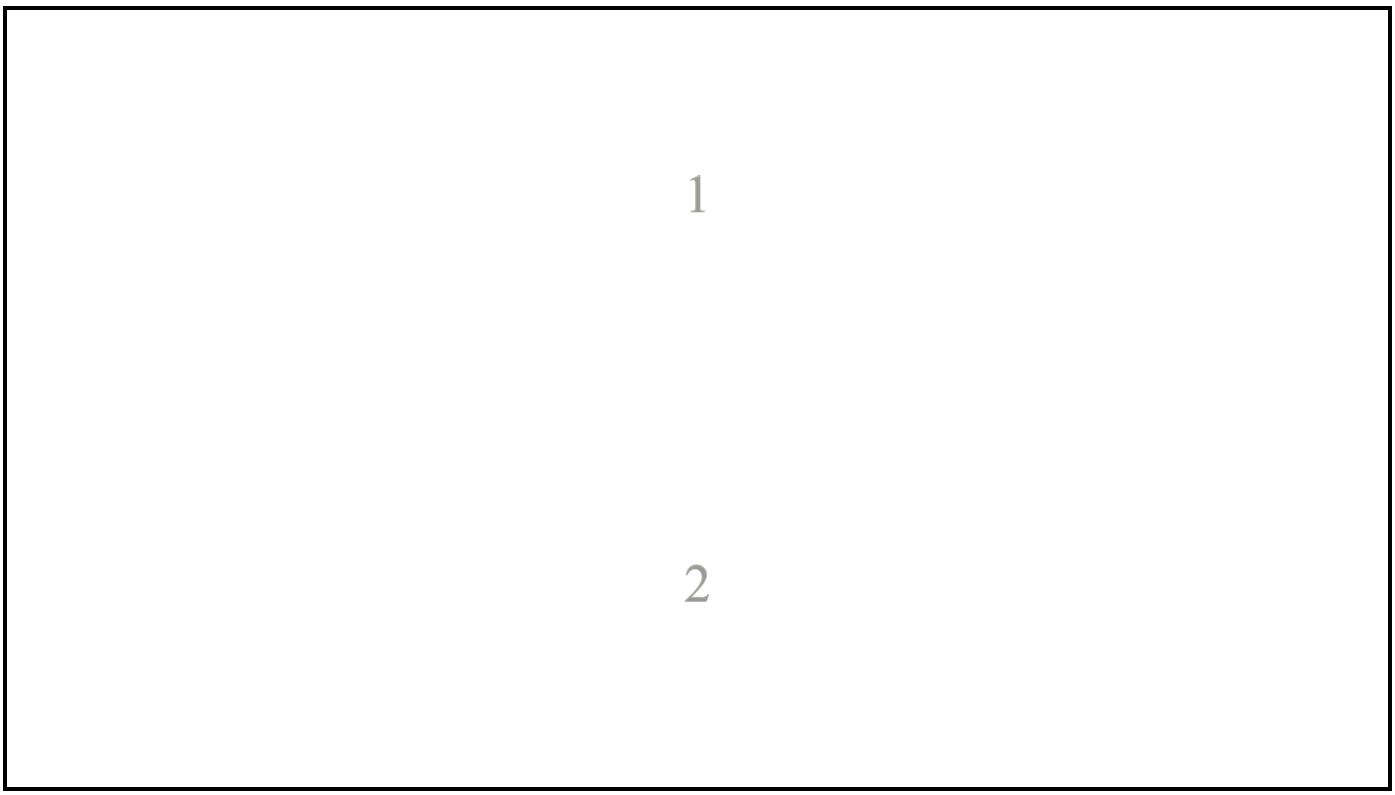
Scale: 1:1000
Expires: 13 May 2026

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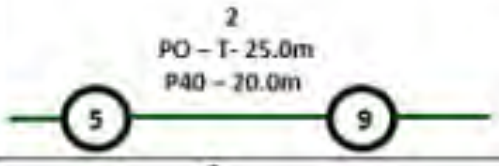
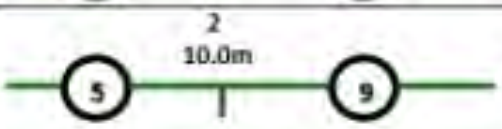
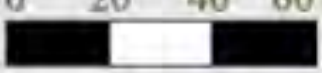
To:	Jarryd Treacy
Phone:	Not Supplied
Fax:	Not Supplied
Email:	jarryd@portereng.com.au

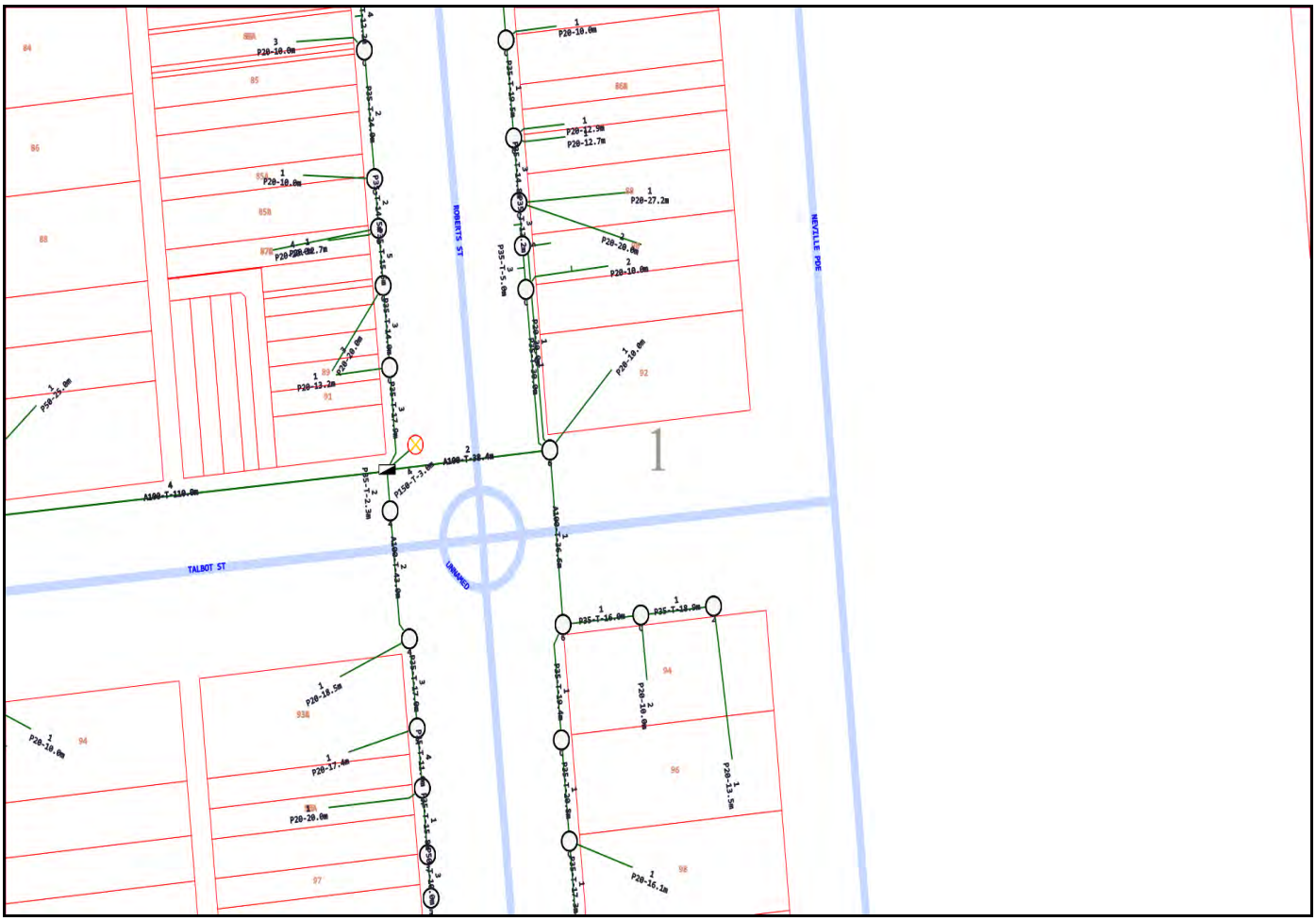
Dial before you dig Job #:	52888989
Sequence #	271316487
Issue Date:	15/04/2026
Location:	98 Roberts Street , Norseman , WA , 6443

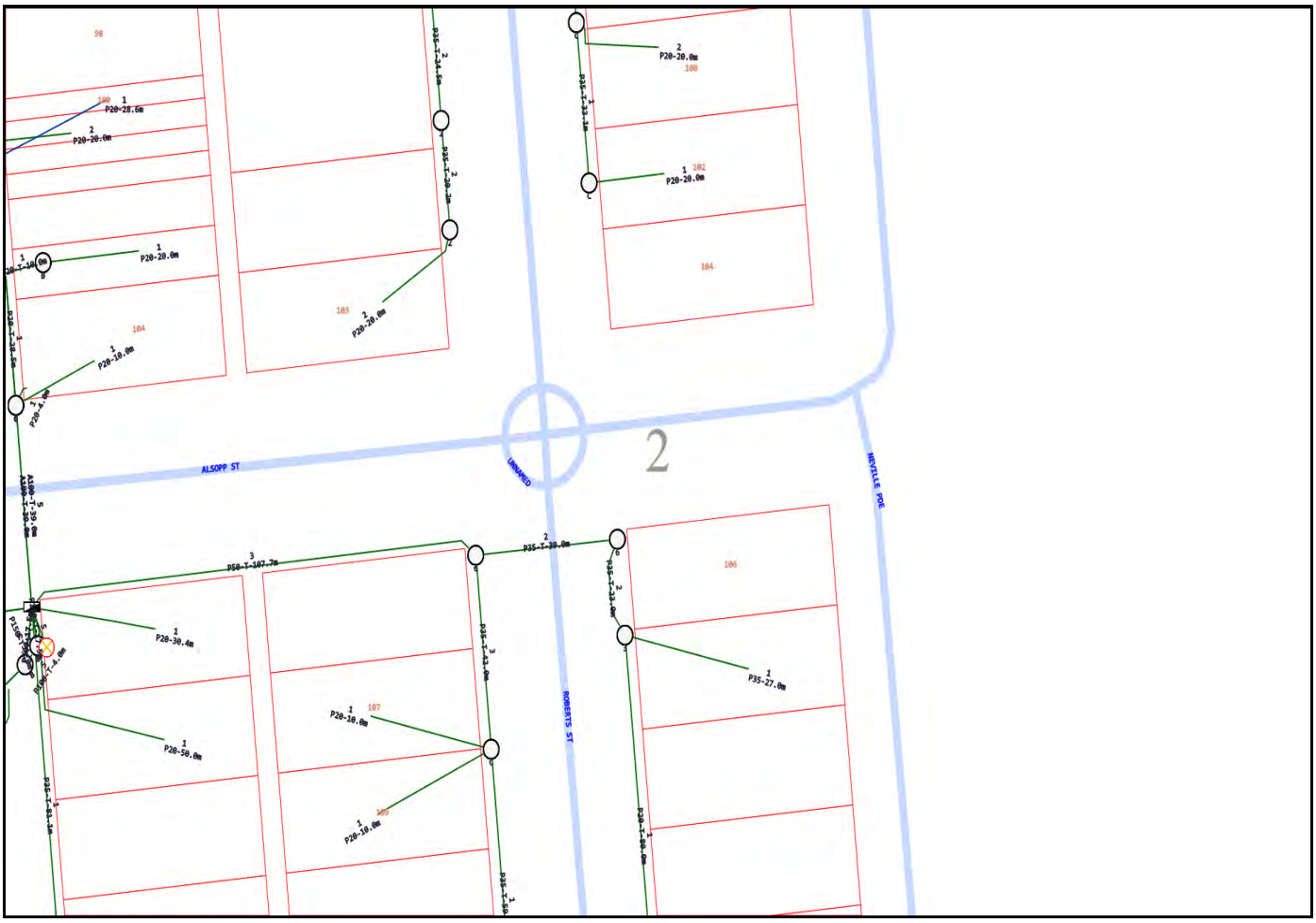
Indicative Plans are tiled below to demonstrate how to layout and read nbn asset plans



LEGEND

	Parcel and the location
	Pit with size "5"
	Power Pit with size "2E". Valid PIT Size: e.g. 2E, 5E, 6E, 8E, 9E, E, null.
	Manhole
	Pillar
	Cable count of trench is 2. One "Other size" PVC conduit (PO) owned by Telstra (-T-), between pits of sizes, "5" and "9" are 25.0m apart. One 40mm PVC conduit (P40) owned by NBN, between pits of sizes, "5" and "9" are 20.0m apart.
	2 Direct buried cables between pits of sizes ,"5" and "9" are 10.0m apart.
	Trench containing any INSERVICE/CONSTRUCTED (Copper/RF/Fibre) cables.
	Trench containing only DESIGNED/PLANNED (Copper/RF/Fibre/Power) cables.
	Trench containing any INSERVICE/CONSTRUCTED (Power) cables.
	Road and the street name "Broadway ST"
Scale	 1:2000 1 cm equals 20 m

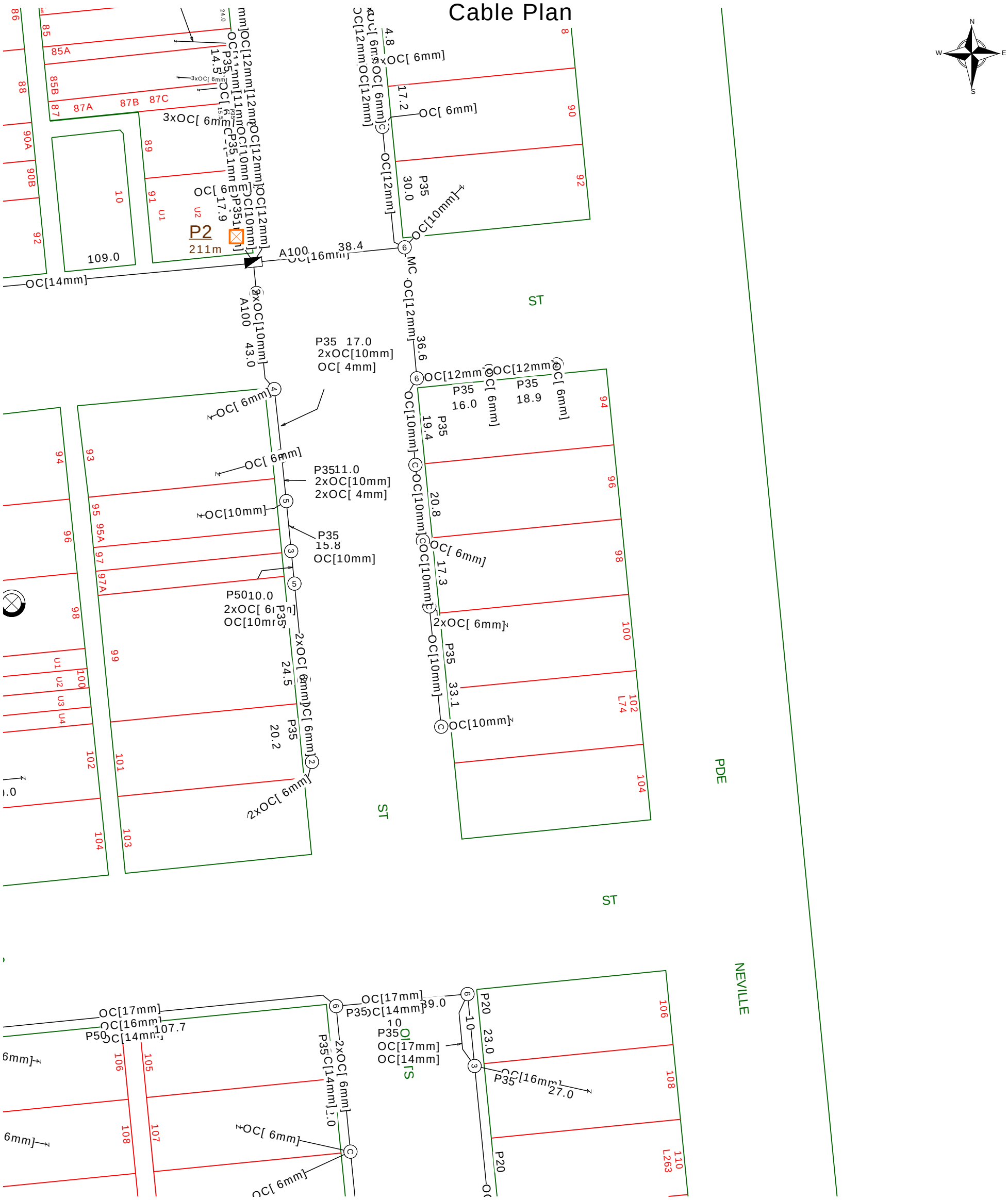

ROBERTS ST
NEVILLE PDE
TALBOT ST
UNMADED
1
P20-10.0m
P20-12.9m
P20-12.7m
P20-27.2m
P20-10.0m
P20-13.2m
P20-18.5m
P20-17.4m
P20-20.0m
P20-16.1m
P20-13.5m
A100-T-110.0m
A100-T-38.4m
A100-T-36.6m
A100-T-43.4m
P35-T-16.0m
P35-T-18.0m
P35-T-2.2m
P35-T-7.5.0m
P35-T-37.0m
P35-T-44.4m
P35-T-19.4m
P35-T-38.8m
P35-T-12.2m
P35-T-10.6m
P35-T-24.0m
P35-T-34.0m
P35-T-37.0m
P35-T-14.2m
P35-T-15.0m
P35-T-36.0m
P35-T-36.0m
P35-T-36



Emergency Contacts

You must immediately report any damage to the **nbn™** network that you are/become aware of. Notification may be by telephone - 1800 626 329.

Cable Plan



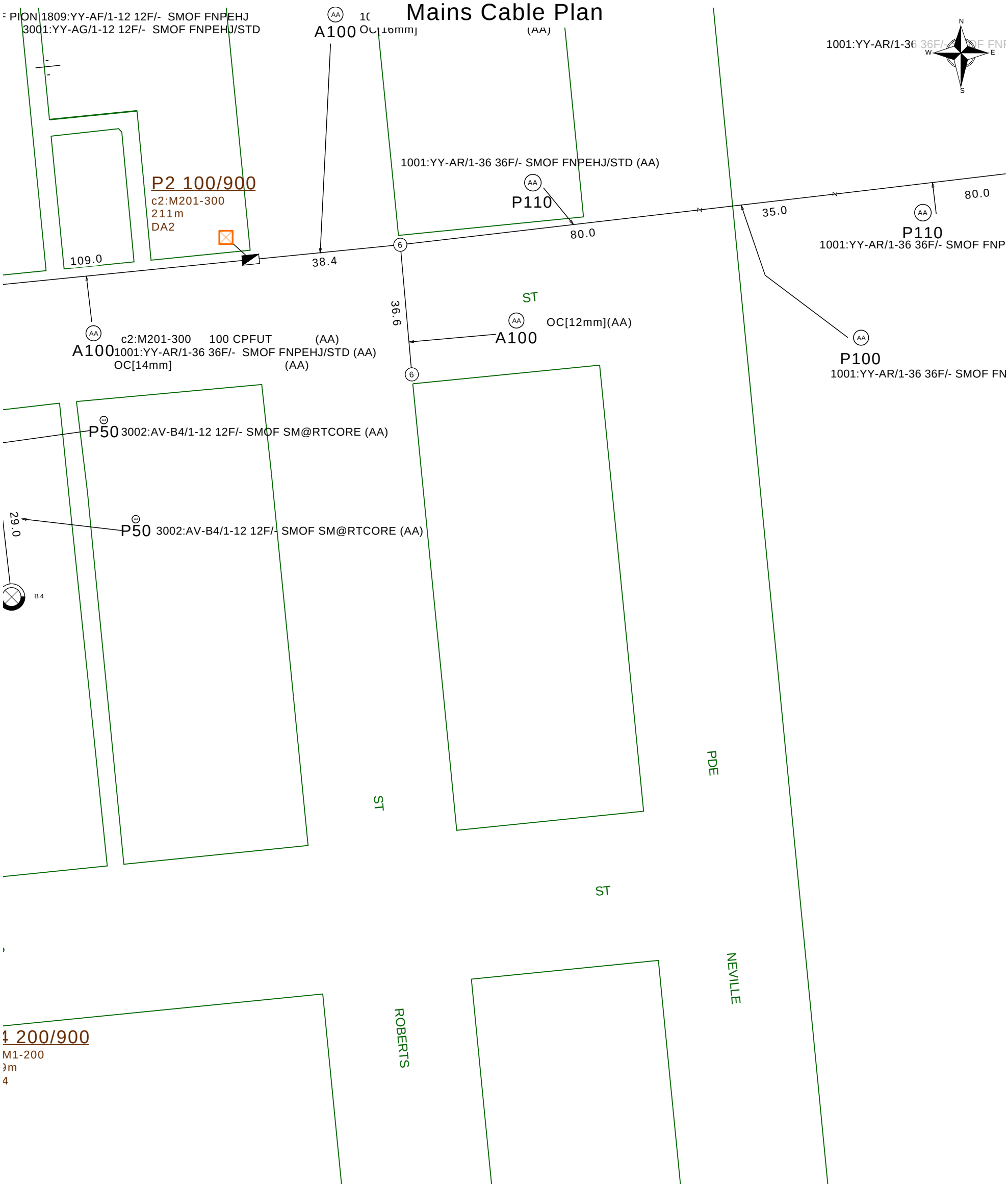
Report Damage:https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-(Ph - 13 22 03 Email - Telstra.Plans@team.telstra.com Planned Services - ph 1800 653 935 (AEST bus hrs only) General Enquiries	Sequence Number: 271316489
TELSTRA LIMITED A.C.N. 086 174 781	CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact InfraCo Plan Services should you require any assistance.
Generated On 15/04/2026 12:16:54	

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

WARNING
Telstra plans and location information conform to Quality Level "D" of the Australian Standard AS 5488-Classification of Subsurface Utility Information.
As such,Telstra supplied location information is indicative only.Spatial accuracy is not applicable to Quality Level D.
Refer to AS 5488 for further details. The exact position of Telstra assets can only be validated by physically exposing it.
Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy.
Further on site investigation is required to validate the exact location of Telstra plant prior to commencing construction work.
A Certified Locating Organisation is an essential part of the process to validate the exact location of Telstra assets and to ensure the asset is protected during construction works.

See the Steps- Telstra Duty of Care that was provided in the email response.

Mains Cable Plan



Report Damage:https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-
Ph - 13 22 03
Email - Telstra.Plans@team.telstra.com
Planned Services - ph 1800 653 935 (AEST bus hrs only) General Enquiries

TELSTRA LIMITED A.C.N. 086 174 781

Generated On 15/04/2026 12:16:55

Sequence Number: 271316489

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Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy.
Further on site investigation is required to validate the exact location of Telstra plant prior to commencing construction work.
A Certified Locating Organisation is an essential part of the process to validate the exact location of Telstra assets and to ensure the asset is protected during construction works.

See the Steps- Telstra Duty of Care that was provided in the email response.

Attachment Six

Landscaping Plan

BEE FRIENDLY GARDENS

Planting Guide & Species List

94-96 Roberts Street, Norseman, WA, 6443

Climate:

Semi-Arid

Environmental Overview:

Norseman is located within The Great Western Woodlands region of Western Australia and is part of one of the world's global biodiversity hotspots. More than 20% of Australia's flowering plant species and 30% of Australia's Eucalyptus species are found within the Great Western Woodlands – making it a highly significant bioregion at a national and international level.

Site:



Species List	
Local Nursery (KBULG) **Subject to availability**	**Bunnings / Online Vendors (e.g. Benara Nurseries)**
Large Shrubs	*Large Shrubs*
Eremophila youngii	Callistemon spp. (Dawson River Weeper, Perth Pink)
Senna artemisioides	Atriplex nummularia
	Grevillea spp. (Kings Park)
Small Shrubs	*Small Shrubs*
Westringia spp. (rigida / fruticosa)	Westringia fruticosa
Eremophila glabra	Eremophila glabra
Eremophila maculata	Eremophila maculata
Ground Covers / Flowering Plants	*Ground Covers / Flowering Plants*
Myoporum spp.	Gossypium sturtanum
Eremophila glabra (Kalbarri Carpet)	Myoporum spp.(parvifolium, insulare)
	Eremophila glabra (Kalbarri Carpet)
	Scaevola aemula

Contact for Local Nursery:
Kim Eckert OAM GAICD | CEO
Kalgoorlie-Boulder Urban Landcare Group

"As KBULG is a small not-for-profit, our funded project work is limited to the Kalgoorlie–Boulder area. That said, we're more than happy to support other regional projects on an ad-hoc, fee-for-service basis, without any ongoing contractual arrangements.
We'd also be happy to help by suggesting suitable local species from the Kalgoorlie–Boulder area that we'd expect to do well in a camp garden setting. We would just need to know in advance how many large, medium and low-growing plants are required, so we have enough time to propagate them.
Please let me know if you'd like to involve us in this project… we'd love to be part of it and assist where we can."

PO Box 8133, Hannans WA 6433
Karlkurla Bushland Park, Tumbarri Way, Kalgoorlie, WA 6430
Phone: 0429 805 521
Email: ceo@kbulg.org.au
Website: www.kbulg.org.au

NORTH



Key

- 1.5m Wide Planting
- 1m Wide Covered Planting

76
1012m²

6098 2250 3300 4000 30600 4044

PP PP

CP-SITE GROUDN FLOOR PLAN

1 : 300@A3

NOT FOR CONSTRUCTION

1.5 0.75 0 0.75 1.5 2.25 3.0 3.75

1:150 @ A3
1:300 @ A4

NOTE:

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PROJECT : PROPOSED ACCOMMODATION VILLAGE

:

94 3

ANDRE MELVILLE BUILDING DESIGN
& DRAFTING SERVICES
P.O BOX 8, LABRADOR, QLD 4814
Ph: 0498 001 535
E-MAIL: admin@ambd.com.au
www.ambd.com.au
Townsville - Brisbane - Goldcoast
QBCC No. 1222804
ABN No. 37 155 932 675

ENDORSED Sustainable Building Designer

No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26

DESIGNED	AM
DRAWN	AM
DATE	FEB 2025
SCALE	A3 1 : 300
ISSUED	26/02/26

GROUND FLOOR PLAN

25 B

2/03/2026 7:56:27 AM

Planting Pattern:

Key:



Shrub



Ground Cover



Large Shrub / Tree

1 METRE WIDE PLANTING

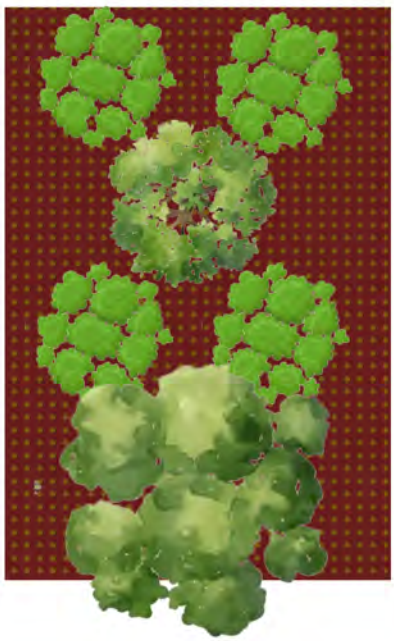
Pattern repeating every 2.5 metres

Note No large shrubs/trees in covered linkways



1.5 METRE WIDE PLANTING

Pattern repeating every 2.5 metres



Plant Maintenance:

(For optimum results and increased success rate)

Planting
Water thoroughly as soon as the plant is in the ground. For larger plants, fill the planting hole with water, let it drain completely, then fill again and insert the plant. This ensures the entire root ball is saturated and helps the surrounding soil settle in place. Once the plant is planted, press the soil firmly and saturate the ground to ensure any remaining air pockets are removed.

Watering
A reticulation system is recommended with drip or micro-spray irrigation due to semi-arid climate. A watering schedule (weather depending) of 3 times per week for the first 12-18 months will ensure best results (a government irrigation guideline will be attached as a separate document).

Mulch
Mulching of all planted areas is recommended to retain moisture.

17/07/2026

DA-01 2026 ACCOMODATION 94 AND 96 ROBERTS STREET NORSEMAN

1. Environmental Health Officer Referral Comments

Environmental Health – No Objection Subject to the Following Conditions

1. The development shall be carried out generally in accordance with the approved plans and supporting documentation to the satisfaction of the Local Government.
2. The accommodation building shall not be occupied until all health requirements have been satisfied to the satisfaction of the Local Government.
3. The applicant shall ensure an adequate supply of potable drinking water is provided to the accommodation facility at all times in accordance with the Australian Drinking Water Guidelines.
4. All wastewater generated from the accommodation shall be disposed of via an approved sewerage system or other wastewater disposal system approved by the relevant authority.
5. Adequate toilet, shower and hand washing facilities shall be provided and maintained for the maximum approved occupancy.
6. The accommodation shall not accommodate more persons than the maximum occupancy approved by the Local Government.
7. All bedrooms shall be provided with adequate natural or mechanical ventilation and lighting and maintained in a habitable condition.
8. Air conditioning and mechanical ventilation systems shall be installed and maintained to provide a suitable indoor environment for occupants.
9. Adequate refuse storage facilities shall be provided and maintained. Refuse shall be removed at a frequency sufficient to prevent the creation of a nuisance or health risk.
10. All stormwater shall be collected and disposed of to the satisfaction of the Local Government and shall not create ponding or mosquito breeding.
11. If food is prepared or supplied from the premises, the kitchen shall comply with the requirements of the Food Act 2008, the Australia New Zealand Food Standards Code and any relevant approvals required by the Local Government.
12. Any changes to the approved plans affecting the health aspects of the development shall be submitted to, and approved by, the Local Government prior to implementation.
13. Noise emitted from the site shall comply with the Environmental Protection (Noise) Regulations 1997.

2. Advisory Notes

- Building approval may be required prior to commencement of construction.
- Separate approvals may be required for onsite wastewater treatment systems.
- Separate registration or notification under the Food Act 2008 may be required where commercial food preparation occurs.
- The applicant should consult with the Department of Fire and Emergency Services regarding fire safety requirements.
- The applicant should ensure compliance with all applicable provisions of the Public Health Act 2016, Health (Miscellaneous Provisions) Act 1911 (where still applicable), Building Act 2011 and associated regulations.

Tony Dowling

From: Joshua Kirk <josh.kirk@greenfieldtech.com.au>
Sent: Tuesday, 4 August 2026 9:43 AM
To: Tony Dowling
Cc: Tracy Gray
Subject: RE: [#J1388] Proposed Workforce Accommodation - 94 and 96 Roberts Street Norseman (DA01.2026)

Hi Tony

Please see our comments below.

Parking

1. The covering letter makes reference to 37 on street parking bays, 13 of which would be on Neville Pde. However, the civil engineering report, design drawings and TIS only refer to 24 bays which are on Roberts St and Talbot St. It is recommended that the Shire seek clarification about this inconsistency.

Bus transport

1. There are various references to the majority of workers being transported to and from the site via bus. Reliance on this mode of transport is part of the justification for the 24 bays in a 48-room development.
2. On this basis, there are going to be regular bus movements at the site. Currently, given the proposed layout, the proponent is proposing that the bus would temporarily park on either the Roberts St or Talbot St carriageway whilst picking up or dropping off workers.
3. As there would generally be cars parked at the front of the development adjacent the kerb, other vehicles using either of these roads would need to go around the bus which would involve travelling in the centre of the road between islands (and street lights on Roberts St).
4. Additionally, persons walking to the bus would need to walk between parked vehicles to the bus.
5. The above would seem to present several new hazards.
6. Given that there is a new access gate proposed on Neville Pde, it is recommended that a dedicated bus pickup / drop off area is provided on Neville Pde to eliminate the risk of pedestrian / vehicle and vehicle / vehicle interactions on Roberts St or Talbot St associated with this development.

Kind Regards

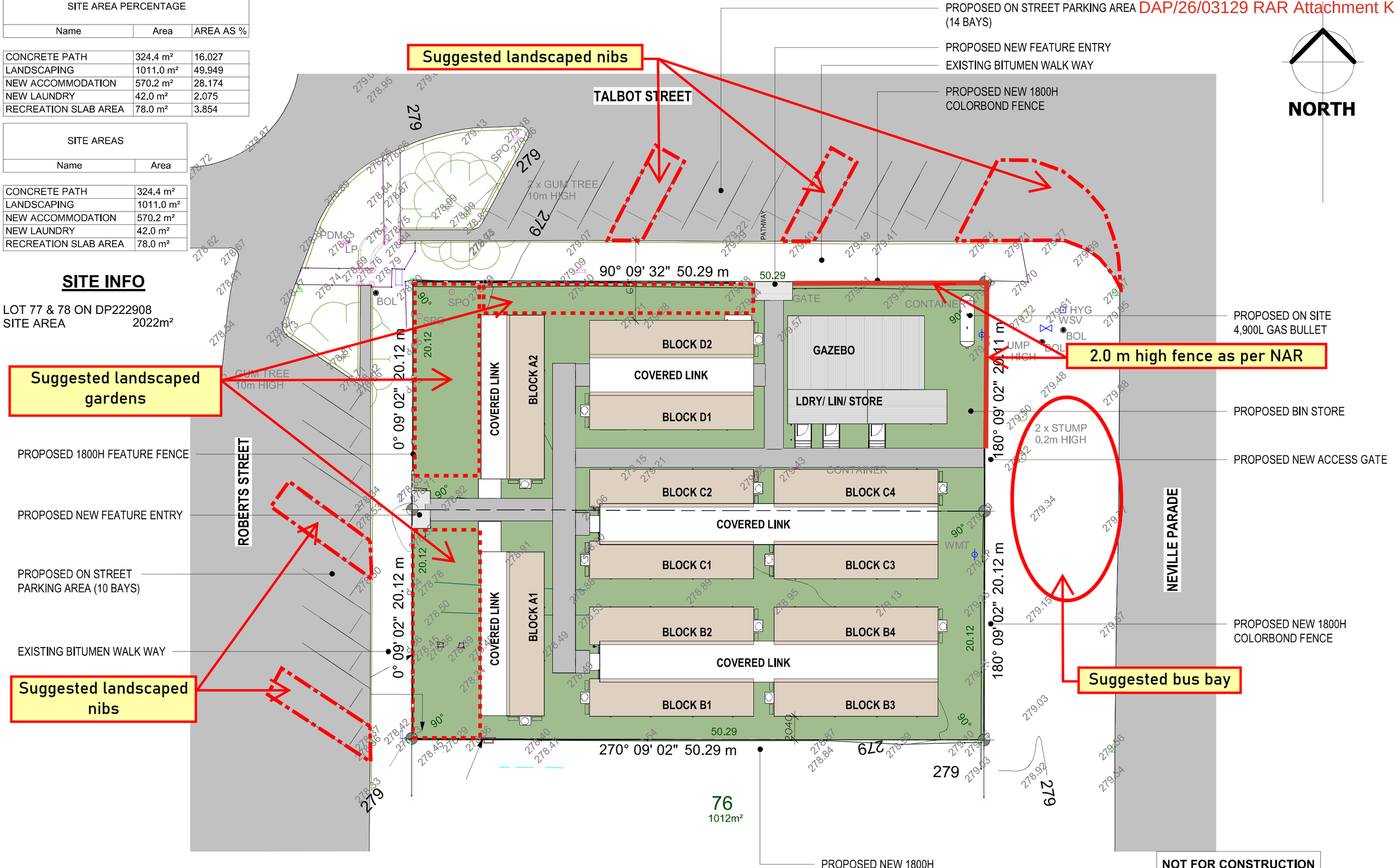
Josh Kirk
Principal
josh.kirk@greenfieldtech.com.au
M 0498 999 484

SITE AREA PERCENTAGE		
Name	Area	AREA AS %
CONCRETE PATH	324.4 m²	16.027
LANDSCAPING	1011.0 m²	49.949
NEW ACCOMMODATION	570.2 m²	28.174
NEW LAUNDRY	42.0 m²	2.075
RECREATION SLAB AREA	78.0 m²	3.854

SITE AREAS	
Name	Area
CONCRETE PATH	324.4 m²
LANDSCAPING	1011.0 m²
NEW ACCOMMODATION	570.2 m²
NEW LAUNDRY	42.0 m²
RECREATION SLAB AREA	78.0 m²

SITE INFO

LOT 77 & 78 ON DP222908
SITE AREA 2022m²



CP - SITE PLAN

1 : 300@A3

NOTE:
- VERIFY ALL DIMENSIONS ON SITE
- NOTED DIMENSIONS TAKE PRESIDENT OVER SCALED DIMENSIONS

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PROJECT : PROPOSED ACCOMMODATION VILLAGE
CLIENT : Resource Accommodation Management Pty Ltd
LOCATION: 94-96.ROBERTS STREET NORSEMAN, WA, 6443

ANDRE MELVILLE BUILDING DESIGN
& DRAFTING SERVICES
P.O BOX 8, LABRADOR, QLD 4814
Ph: 0498 001 535
E-MAIL: admin@ambd.com.au
www.ambd.com.au
QBCC No. 1222804
ABN No. 37 155 932 675
ENDORSED Sustainable Building Designer
Townsville - Brisbane - **Goldcoast**

No.	Description	Date
A	PRELIMINARY SITE CONCEPT	03/02/26
B	BA ISSUE	26/02/26
C	UPDATED DA ISSUE	05/07/26

DESIGNED	AM	SITE PLAN
DRAWN	AM	
DATE	FEB 2025	
SCALE	A3 As indicated	25-116 - SK-04 - C
ISSUED	05/07/26	

7/07/2026 9:00:03 AM

ALTERNATIVE TO RESPONSIBLE AUTHORITY RECOMMENDATION

RECOMMENDATION FOR REFUSAL

That the Regional DAP resolves to **REFUSE** DAP Application reference DAP/26/03129 for workforce accommodation upon lot 77 on Deposited Plan 222908 (HN 94) Roberts Street, and lot 78 on Deposited Plan 222908 (HN 96) Roberts Street Norseman in accordance with Clause 68 of Schedule 2 (Deemed Provisions) of the Planning and Development (Local Planning Schemes) Regulations 2015, and the provisions of clauses 18(4)(c) and 32(1)(g), of the Shire of Dundas Local Planning Scheme No. 2, for the following reasons:

1. The proposed development does not accord with the scheme's Commercial zone objective to provide for a range of shops, offices, restaurants and other commercial outlets in defined townsites;

2. The proposed development does not accord with the scheme's Commercial zone objective to maintain the compatibility with the general streetscape for all new buildings in terms of style, street alignment and design of facades; and

3. The proposed development is considered a 'mining camp' that will comprise transportable buildings, to be located within the gazetted Norseman townsite; and

4. No extenuating circumstances have been provided by the applicant in regard to 3 above to support the proposed development being allowed within the Norseman townsite.

PART D – SHIRE OF KOJONUP

1. Declarations of Due Consideration

2. Disclosure of Interests

3. Form 1 DAP Applications

3.1 Lots 3194 & 8869 (No. 3680) Collie-Changerup Road, Kojonup – Kojonup Battery Energy Storage System – DAP/26/03135

4. Form 2 DAP Applications

Nil

5. Section 31 SAT Reconsiderations

Nil

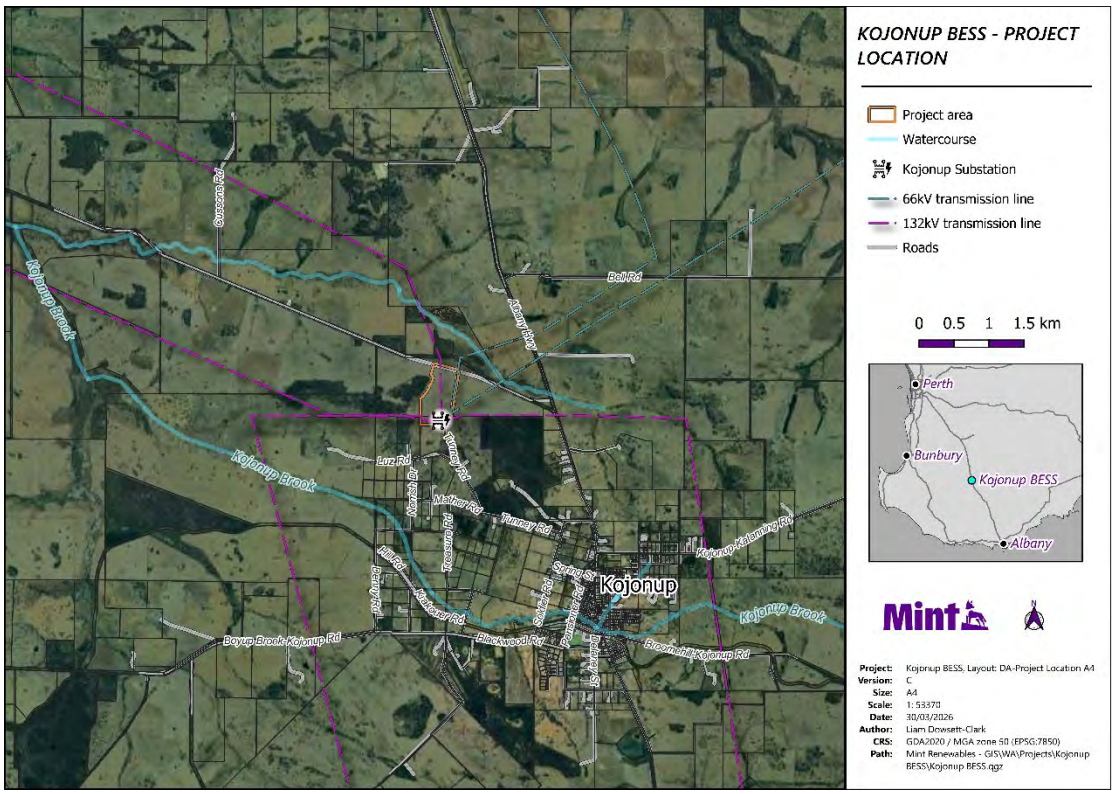
Form 1: Responsible Authority Report

(Regulation 12)

PART D – Item 3.1 – KOJONUP BATTERY ENERGY STORAGE SYSTEM – LOTS 3194 & 8869 (No. 3680) COLLIE-CHANGERUP ROAD, KOJONUP

RESPONSIBLE AUTHORITY REPORT – FORM 1	
DAP Name:	Regional Development Assessment Panel
DAP File No:	DAP/26/03135
LG Reference:	2026/06
Proposed Development:	Battery Energy Storage System
Value of Development:	$240 million
Applicant:	Mint Renewables Pty Ltd
Local Government Area:	Shire of Kojonup
Responsible Authority:	Shire of Kojonup
Authorising Officer:	Jill Johnson, Acting Chief Executive Officer
Application Acceptance Date:	24 June 2026

LOCATION PLAN



RESPONSIBLE AUTHORITY RECOMMENDATION

RECOMMENDATION FOR APPROVAL

That the Regional Development Assessment Panel resolves to **APPROVE** DAP Application reference DAP/26/03135 for a Battery Energy Storage System at Lots 3194 and 8869 (No. 3680) Collie-Changerup Road, Kojonup in accordance with Clause 68 of Schedule 2 (Deemed Provisions) of the Planning and Development (Local Planning Schemes) Regulations 2015, and the provisions of Clause No. 6.3 of the *Shire of Kojonup Town Planning Scheme No. 3*, subject to the following conditions:

1. The development is to be undertaken in accordance with the approved plans and documents attached to this approval, except where amended by subsequent conditions.

Plan/ Document Name	Reference	Date
Development Application Report	Development Application - DAP/26/03135	Not stated in RAR
Conceptual Plans and Elevations	Appendix A	Not stated in RAR
Environmental Assessment Report	Appendix B	Not stated in RAR
Bushfire Risk Report	Appendix E	Not stated in RAR
Bushfire Management Plan	Appendix F	Not stated in RAR

2. This decision constitutes planning approval only and is valid for a period of 4 years from the date of approval, being 17 September 2026. If the subject development is not substantially commenced within the specified period, the approval shall lapse and be of no further effect.

3. Prior to the commencement of development, final details of the approved development are to be submitted to the satisfaction of the Local Government, to include the following:

   (i) The location, specifications, materials and finishes of the battery energy storage system;
   (ii) The final location and finished floor levels of ancillary buildings and associated services, including sanitary facilities;
   (iii) The location of construction activities, including laydown, car parking and storage locations; and
   (iv) The colours and finishes must be non-reflective and compatible with the surroundings to minimise the visual impacts of the development.

4. Prior to commencement of development, the applicant is to prepare an Operational Management Plan to the satisfaction of the Local Government. Amongst matters it is to include a system to record, manage and report on complaints. The approved Operational Management Plan is to be implemented and maintained to the satisfaction of the Local Government.

5. Prior to commencement of development, detailed design for stormwater and drainage management must be submitted to and approved by the Local

Government. The approved design must be implemented prior to occupation and suitably maintained for the duration of the development to the satisfaction of the Local Government.

6. Prior to commencement of development, a water balance/water source strategy must be submitted to and approved by the Local Government. The approved strategy must be implemented prior to occupation and suitably maintained for the duration of the development to the satisfaction of the Local Government.

7. Prior to commencement of development, the applicant shall prepare a Construction and Environmental Management Plan to the satisfaction and specification of the Local Government. The approved plan is to be implemented by the applicant to the satisfaction of the Local Government.

8. Recommendations and mitigation measures in the Environmental Assessment Report are to be implemented, during construction and for the duration of the development, to ensure the protection and management of the site and area's environmental assets, to the satisfaction of the Local Government.

9. Prior to commencement of development, detailed design for the proposed effluent disposal system is to be submitted to the specifications and satisfaction of the Local Government, based on a Site and Soil Evaluation. The effluent system design is to be implemented prior to occupation and suitably maintained for the duration of the development.

10. Prior to commencement of development, detailed design for the crossover to Collie-Changerup Road is to be prepared to the satisfaction of the Local Government. The crossover (construction, sealing and drainage) is to be implemented prior to occupation to the satisfaction of the Local Government.

11. Prior to commencement of development, the applicant is to prepare and implement a Traffic Management Plan, to the specifications and satisfaction of the Local Government.

12. Prior to commencement of development, engineering drawings and specifications for the upgrading of Tunney Road between its intersection with Collie-Changerup Road and the proposed Tunney Road crossover must be submitted to and approved by the Local Government. The drawings must address pavement construction, sealing, width, drainage, intersection treatment, signage and any other works reasonably required by the Local Government. The approved works must be completed at the applicant's cost prior to commissioning of the development, unless an alternative staging arrangement is approved in writing by the Local Government.

13. Vehicle access, internal access ways, parking, loading and manoeuvring areas shall be designed, constructed and drained prior to occupation and maintained to the satisfaction of the Local Government.

14. Prior to commencement of development, the Bushfire Management Plan is updated and submitted to the Local Government for approval upon advice from the Department of Fire and Emergency Services. Once approved, the Bushfire Management Plan to be implemented to the satisfaction of the Local Government prior to occupation and for the duration of the development.

15. Prior to occupation, certification by an accredited bushfire consultant is to be provided certifying that all relevant mitigation measures and applicant responsibilities set out in the Bushfire Management Plan have been implemented in the completed development to the satisfaction of the Local Government. Following this, all of the required Bushfire Protection Measures contained in the approved Bushfire Management Plan are maintained for the duration of the development.

16. Prior to commencement of development, the Risk Management Plan is updated and submitted to the Local Government for approval upon advice from the Department of Fire and Emergency Services. Once approved, the Risk Management Plan to be implemented to the satisfaction of the Local Government. Mitigation measures are to be implemented to the satisfaction of the Local Government prior to occupation and on an ongoing basis.

17. A Bushfire Emergency Plan, detailing appropriate response actions to address public health risks that may arise from an emergency at the BESS facility is prepared prior to occupation to the satisfaction of the Local Government. Following this, it is appropriately reviewed and implemented to the satisfaction of the Local Government.

18. A Section 70A Notification pursuant to the *Transfer of Land Act 1893* is placed on the Certificate of Title advising of the Bushfire Management Plan and Risk Management Report and advising the landowner of their obligations in respect to the use and ongoing management of the land.

19. Prior to commencement of development, a detailed Landscaping Plan is submitted to and approved by the Local Government. The Landscaping Plan to address matters including:

    (i) The location, species and size of existing vegetation and vegetation to be removed;
    (ii) Exact species, maturity, location and number of proposed trees, shrubs and plants; and
    (iii) A key or legend detailing proposed species type grouped under the subheadings of tree, shrub and groundcover.

    Prior to occupation, the landscaped areas are planted and established in accordance with the Landscaping Plan. The landscaping is then maintained to the satisfaction of the Local Government. The Landscaping plan must be consistent with the approved Bushfire Management Plan and must demonstrate that species selection, planting density, setbacks and ongoing maintenance will not increase bushfire risk or interfere with emergency access, firefighting infrastructure or drainage.

20. Prior to commencement of development, plans and details of the proposed fencing are to be submitted to, and approved by, the Local Government. The fencing is to be constructed in accordance with the approved plans and thereafter maintained in a good state of repair, to the satisfaction of the Local Government.

21. Prior to commencement of development, a Lighting Strategy detailing external illumination of the development in accordance with AS4282:2023, including consideration of the dark sky principles, is to be submitted to and approved by the Local Government. Prior to occupation, the recommendations of the approved Lighting Strategy are to be implemented to the satisfaction of the Local Government.

22. Prior to commencement of development, the Environmental Noise Assessment is to be updated and approved by the Local Government.

23. Prior to commencement of development, an updated Environmental Noise Assessment based on the final equipment selection and site layout must be submitted to and approved by the Local Government. The assessment must include source sound-power and tonal data, cumulative noise from the BESS and existing substation, applicable influencing factors, relevant meteorological conditions, predicted day and night noise levels at all identified sensitive receptors, and any mitigation required to demonstrate compliance with the *Environmental Protection (Noise) Regulations 1997*.

24. Prior to commencement of development, a Noise Management Plan (focussing on construction noise) is to be prepared and approved by the Local Government. The recommendations of the plan are to be implemented to the satisfaction of the Local Government.

25. The applicant is required to undertake a noise monitoring program within the first 6 months after commissioning of the project and must be undertaken during representative operating and meteorological conditions, including operation at the highest reasonably foreseeable noise-emission mode to demonstrate compliance with acceptable criteria of the *Environmental Protection Act 1986* and the *Environmental Protection (Noise) Regulations 1997*. A Noise Assessment and Compliance Report shall be prepared by a qualified acoustic consultant to the satisfaction of the Local Government on advice from the Department of Water and Environmental Regulation. The Report is to include:

    (i) Confirmation that all relevant provisions and recommendations of the approved Environmental Noise Assessment have been suitably implemented in the construction of the development;
    (ii) Day and night-time noise assessment undertaken at the nearest residential dwellings, or selection of at least 2 monitoring locations representative of the nearest sensitive receiver (distance from source, ground cover etc.); and
    (iii) Any remedial actions to be undertaken to address any non-compliance with the approved Environmental Noise Assessment and/or the *Environmental Protection (Noise) Regulations 1997*, and the date by which the actions will be completed.

26. Noise emissions shall comply with the *Environmental Protection (Noise) Regulations 1997*.

27. At least 12 months prior to discontinuation of the development, a Decommissioning and Rehabilitation Management Plan is to be prepared and approved to the satisfaction of the Local Government. The Plan must describe

the scope and staging of decommissioning and rehabilitation works, and address matters including:

(i) Safety;
(ii) Waste management;
(iii) Timeframes;
(iv) Clarifying what infrastructure is to be retained on site and its treatment to allow for continued agricultural use; and
(v) Implementation of suitable mechanisms to alert prospective purchasers of retention of any below ground infrastructure which may affect future building locations or development.

Decommissioning and rehabilitation works are required to be completed within 18 months of the BESS ceasing operation to the satisfaction of the Local Government.

Advice Notes

1. This is a development approval only. The applicant is advised that it is their responsibility to ensure the proposed development also complies with all other applicable legislation, and/or licence/permit requirements that may relate to the development. This includes the *Biodiversity Conservation Act 2016, Environmental Protection (Noise) Regulations 1997, Environmental Protection Act 1986, Aboriginal Heritage Act 1972, Environmental Protection (Clearing of Native Vegetation) Regulations 2004* and *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007.*

2. A copy of the final working drawings prepared for the submission of an application for a Building Permit and all associated reports and information that address the conditions of approval are to be submitted to and cleared by the Local Government. The final working drawings and associated documents are to comply with all conditions of development approval, as confirmed by the Local Government, and any variations from the approved development plans are required to be clearly identified.

3. In relation to the Construction and Environmental Management Plan, the following information should be included:

   (i) Hours of construction;
   (ii) Storage of materials and other items on site;
   (iii) Provision of parking for contractors and subcontractors;
   (iv) Locations of temporary construction and hardstand areas;
   (v) Vegetation clearing, ground disturbance, flora and fauna management;
   (vi) Surface water and drainage management;
   (vii) Noise, vibration, air quality and dust management;
   (viii) Construction waste, hydrocarbon and chemical management;
   (ix) Weed, biosecurity and pest management;
   (x) Occupational health and safety, and emergency management;
   (xi) Fire management;
   (xii) Aboriginal heritage management;
   (xiii) Site traffic management; and
   (xiv) Demobilisation.

4. All drinking water must meet the health-related requirements the *Australian Drinking Water Quality Guidelines 2011*. Any non-drinking water (i.e., water that is not intended or suitable for drinking) must be managed to ensure it cannot be confused with or contaminate the drinking water supply.

5. The applicant is strongly encouraged to establish and implement a Community Benefits Fund in conjunction with the Shire of Kojonup, consistent with the WA Government '*Community Benefits Guideline for Large-Scale Renewable Energy Projects in the South-West Interconnected System.*

6. A Clearing Permit may be required under the *Environmental Protection Act.*

7. The applicant is encouraged to work with the Local Government to dedicate the constructed section of Collie-Changerup Road as a road reserve and progress the permanent closure of the reductant section of road reserve.

8. Should the applicant be aggrieved by this determination there is a right, pursuant to the *Planning and Development Act 2005,* to have the decision reviewed by the State Administrative Tribunal. Such application must be lodged within 28 days from the date of determination.

PROPOSAL:

The applicant, Mint Renewables Pty Ltd, seeks development approval to construct and operate a battery energy storage system (BESS) at Lots 3194 and 8869 on Deposited Plan 227649 (No. 3680) Collie-Changerup Road, Kojonup. The site is approximately 3 km north-west of the Kojonup townsite. The BESS will store energy during periods of network oversupply and discharge it back to the electricity network during periods of peak demand and is proposed to connect to the South-West Interconnected System (SWIS) via nearby Western Power transmission infrastructure.

The BESS will have an indicative storage capacity of up to 800 MWh (100 MW x 8 hours).

The total indicative disturbance footprint of the project is approximately 8.1 hectares while permanent infrastructure will cover approximately 3.6 hectares. The BESS will be located within a secured compound on cleared area near existing Western Power transmission infrastructure and will include the following key components:

- BESS substation, including transformers, switchyard and associated connection infrastructure;
- BESS units, inverters, transformers, cabling and battery storage containers;
- Operations and maintenance facility, including site office and parking areas;
- Water storage and water management infrastructure, including stormwater detention basins, bunding and drainage;
- Vehicle access points, internal access roads and emergency access arrangements; and
- Ancillary infrastructure, including fencing, signage, gates and other supporting development.

The facility will operate 24 hours a day, typically charging during the day while there is excess energy generation and discharging during peak period.

Proposed Land Use	Use Not Listed- Battery Energy Storage System (Kojonup Battery)
Proposed Net Lettable Area	N/A
Proposed No. Storeys	N/A
Proposed No. Dwellings	N/A

The proposal is supported by the following technical documentation and information contained in the Development Application Report:

- Certificate of Title (Appendix A);
- Conceptual Site Plans and Elevations (Appendix B);
- Environmental Assessment Report (Appendix C);
- Stakeholder and Community Engagement Plan (Appendix D);
- Consultation Summary (Appendix E);
- Bushfire Risk Report (Appendix F); and
- Bushfire Management Plan (Appendix G).

Additionally, the following technical documentation are contained in the Environmental Assessment Report:

- Aboriginal Cultural Heritage Briefing Note;
- Stakeholder and Community Engagement Plan, Consultation Summary;
- Reconnaissance and Targeted Flora and Vegetation Survey and Basic Terrestrial Fauna Survey;
- Hydrological Assessment;
- Landscape and Visual Impact Assessment;
- Environmental Noise Assessment; and
- Transport Impact Assessment.

SUBJECT SITE AND SURROUNDS:

The site is Lots 3194 and 8869 on Deposited Plan 227649 (No. 3680) Collie-Changerup Road, Kojonup. Lot 3194 is 564.94 hectares in area while Lot 8869 is 2.03 hectares in area. The broader locality is predominantly rural in character. There is also a Western Power sub-station plus rural living properties to the south-west and south.

BACKGROUND:

The applicant has secured an agreement with the landowner for development on the site. The site is approximately 3 km north-west of the Kojonup townsite and is located on the corner of Collie-Changerup Road and Tunney Road.

The property is zoned Rural under the *Shire of Kojonup Town Planning Scheme No. 3*. The development site is primarily cleared land used for rural purposes, with some native vegetation in the south-west section.

The site was selected primarily because of its proximity to existing Western Power infrastructure. The proposed development will connect into the South-West Interconnected System (SWIS) via the existing 132 kV transmission line that traverses the site in a north-south direction.

Several dwellings and sheds are located to the south-west and south of the site. The site is dissected by Collie-Changerup Road which is constructed but is not within a road reserve.

PLANNING ASSESSMENT:

PLANNING FRAMEWORK	
Region Scheme	N/A
Region Scheme - Zone/Reserve	N/A
Local Planning Scheme	*Shire of Kojonup Town Planning Scheme No. 3*
Local Planning Scheme - Zone	Rural
Structure Plan/Precinct Plan	N/A
Structure Plan/Precinct Plan - Land Use Designation	N/A
Lot Size	564.94 hectares
Existing Land Use	Agriculture
Heritage Status	☒ N/A ☐ State Register of Heritage Places ☐ Local Heritage List ☐ Local Heritage Area
Bushfire Prone Area	Yes Refer to SPP3.7 for further information

The proposal has been assessed against the requirements of the *Shire of Kojonup Town Planning Scheme No. 3* and the relevant State and local planning framework. The applicant has addressed these requirements in the Development Application report. It is suggested the key planning considerations with the proposal include:

- Bushfire risk and emergency management;
- Environmental considerations, including noise impacts;
- Visual and landscape impacts; and
- Detailed design, construction, operations and decommissioning phases.

The key matters for consideration are as below:

Bushfire Risk and Emergency Management

Provision	Requirement	Proposal	Assessment
State Planning Policy 3.7 Bushfire and associated Guidelines	Bushfire Management Plan, Risk Management Plan and Bushfire Emergency Plan.	A Bushfire Management Plan and Bushfire Risk Report have been submitted.	There is a need to update the Bushfire Management Plan and prepare a Risk Management Plan and prepare a Bushfire Emergency Plan.

Considerable portions of the site are within a designated bushfire prone area. However, much of the development footprint is located outside of the bushfire prone

area. *State Planning Policy 3.7 – Bushfire* provides direction for managing bushfire risk in Western Australia and applies to land designated as bushfire prone by the Fire and Emergency Services Commissioner.

The applicant's Bushfire Management Plan (BMP) has assessed the proposal against the Victoria Country Fire Authority *Design Guidelines and Model Requirements for Renewable Energy Facilities* (CFA Guidelines) to demonstrate that bushfire risk can be managed to an acceptable level.

DFES has requested modifications to the BMP and recommend preparation of a detailed Risk Management Plan. The bushfire practitioner's response is set out in Attachment 6. Matters can be addressed through recommended conditions of approval.

The bushfire practitioner has provided considerable information, and supporting justification. The Local Government considers this information is sufficient, noting that the CFA Guidelines do not have statutory effect in Western Australia.

The current bushfire and emergency response documents set out mitigation strategies, emergency response coordination and water supply and availability.

Based on DFES advice, an Emergency Evacuation Plan and Risk Management Plan are required in accordance with the CFA Guidelines. These documents should be prepared and submitted before development commences and addressed through conditions of approval.

Noting the proposed development is located near the Kojonup townsite and a BESS contains temperature sensitive infrastructure, bushfire risk is a key consideration that was also raised in many of the community submissions.

The community and the Local Government seek that best practice is adopted and maintained relating to fire risks. This includes access to sufficient water for firefighting, capacity and capability of sprinkler systems, emergency access/egress for the site, contact details for any management staff in case of an emergency and suitably addressing impact on local emergency services.

There is a need to ensure the risk management and mitigation measures are effective and can be implemented on an ongoing basis to an acceptable level and appropriate to the land use and location.

Land Use Permissibility and Zone Objectives

Provision	Requirement	Proposal	Assessment
TPS3 – clause 3.3 Zoning Table and clause 3.3.5 - interpretation of the Zoning Table.	Use not listed may be considered if consistent with zone objectives.	Use Not Listed (renewable energy facility / BESS)	Consistent with Rural zone objectives.

The purpose of TPS3 is to set out the planning aims and intentions for the Scheme area, control and guide development and set out procedures for the assessment and determination of Development Applications. The site is zoned 'Rural'.

The proposed BESS use (renewable energy facility) is not a defined land use under TPS3 and has been assessed as a 'Use Not Listed' in accordance with Clause 3.3.5. This sets out the Local Government may determine 'that the proposed use may be consistent with the objectives and purposes of the zone'. The proposed use is considered to be consistent with the objectives of the Rural zone as outlined in Clause 3.2.7 of TPS3, which are:

(a) The zone shall consist of predominantly rural uses.
(b) To protect land from urban uses that may jeopardise the future use of that land for other planned purposes which are compatible with the zoning.
(c) To protect the land from closer development which would detract from the rural character and amenity of the area.
(d) To prevent any development which may affect the viability of a holding.

In reviewing the consistency of the BESS (renewable energy facility) use in the Rural zone, the objectives of *State Planning Policy 2.5 - Rural planning* (SPP 2.5) in relation to regional variation, economic opportunities and regional development should also be considered. SPP 2.5 aims to continue to promote rural zones in schemes as flexible zones that cater for a wide range of land uses that may support primary production, regional facilities, environmental protection and cultural pursuits.

Although the development is not proposing a rural use, the proposal could be considered consistent with the objectives of SPP 2.5 and the model zone objectives, which enable the consideration of non-rural uses for regional facilities where they have demonstrated benefit and are compatible with surrounding land uses.

Potential impacts of the proposed BESS are considered in this report.

Concerns raised during advertising include that the development would have a detrimental impact on surrounding landowners. The main concerns include fire risks, inadequate buffers, amenity and lifestyle impact (such as noise, visual impacts and light spill), and impacts on Tunney Road. There is a need to give consideration to orderly and proper planning and ensuring there is appropriate amenity in the area.

It is concluded that, subject to addressing measures recommended in the management plans and addressing conditions, the proposed land use is suitable noting the context (including existing Western Power substation) and is overall compatible with surrounding land uses. The development will occupy only a permanent development footprint of approximately 3.6 hectares from a property which is 565 hectares in area. This, in the broader context, will result in reduction of marginal agricultural land considering the land size and location in an area that is already impacted by the Western Power substation.

Separation Distances

Provision	Requirement	Proposal	Assessment

Clause 67, (f), (m), (n), (r) of Deemed Provisions and EPA Separation Distances between Industrial and Sensitive Land Uses	Avoid or minimise land use conflict.	Various technical reports prepared which conclude there is appropriate separation distances.	Based on reviewing technical reports and noting State Government advice, the separation distances appear appropriate.

The closest dwelling is approximately 750m from the proposed BESS to the south. It is noted that Western Power's substation is located between.

A key concern raised by various submissions is the closeness of the BESS to dwellings and associated concerns including:

- Impact on dark sky and visual impacts;
- Noise impacts; and
- Safety and fire risks.

There is no national separation distance standard for BESS developments. It is suggested the separation distance is then largely determined by noise impacts.

Noise Impacts

Provision	**Requirement**	**Proposal**	**Assessment**
Environmental Protection (Noise) Regulations 1997 and Clause 67 (m) and (n) of the Deemed Provisions	Development must comply with prescribed noise limits.	An Environmental Noise Assessment was submitted revealing compliance with the Noise Regulations.	The Local Government has some queries on aspects of the ENA but notes the development should be able to address the *Environmental Protection (Noise) Regulations 1997*.

Potential noise sources include construction activities and operational plant. This includes containerised battery banks, inverters, power skid transformers, high-voltage transformers and heating, cooling systems, fans, ventilation and air-conditioning equipment.

Various submissions raised concerns regarding impacts of noise relating to the operation of the development that could impact on the lifestyle, amenity and the health of local residents.

An Environmental Noise Assessment (ENA) has been prepared to assess potential noise impacts associated with the development in accordance with the *Environmental Protection (Noise) Regulations 1997*. The ENA is included in Appendix C of the EAR.

The ENA sets out predicted cumulative noise levels for ongoing operations will adhere with applicable noise compliance criteria at surrounding receivers. In terms of construction noise, the ENA commits to preparing a Noise Management Plan.

The Local Government notes that if final equipment differs to that assessed in the ENA, there may be higher noise levels. There is also no margin of error in complying with assigned noise levels. Risks include fan assumptions need to be enforceable, a need to review final equipment sound and tonal data and the influencing factor should be documented. It would also assist if meteorological conditions at the time of assessment were provided.

Accordingly, the ENA should be updated to the satisfaction of the Local Government.

Conditions should require ongoing operational noise monitoring to demonstrate compliance with the *Environmental Protection (Noise) Regulations 1997* and to manage any noise complaints during operation. In particular, the Noise Assessment and Compliance Report and the Operational Management Plan should include complaint-handling procedures for noise and other matters and set out any further mitigation measures identified through post-construction monitoring.

It can therefore be concluded that the ENA demonstrates that the proposal is capable of complying with the Noise Regulations applicable at the time. If the RDAP is satisfied that compliance with the Noise Regulations has been suitably demonstrated, various conditions are recommended relating to noise. This includes the submission of an ENA which includes a post-construction noise assessment to validate the preliminary noise assessments and confirm that the development complies with the Noise Regulations. An Operational Management Plan includes a complaint handling procedure to manage and address any noise complaints.

Environmental Considerations

Provision	Requirement	Proposal	Assessment
Clause 67(n), (o), (q) and (p) of the Deemed Provisions	Consideration of environmental impacts	Minor clearing is proposed. Noise considerations are separately considered in this report.	Based on State Government advice and technical reports, the environmental impacts are modest. Further assessment will occur prior to construction commencing.

To support the Development Application, the applicant prepared an Environmental Assessment Report (EAR) which is supported by other technical reports. The EAR identifies the site's environmental features, key environmental issues, potential impacts and proposed avoidance and mitigation measures.

The EAR concluded that the proposed development footprint does not contain any suitable habitat to support any threatened species or any threatened ecological communities. Biological surveys and assessments have been undertaken to establish

baseline biodiversity values and inform avoidance and mitigation measures. The development footprint consists predominantly of cleared land used for farming, with native vegetation generally in the south-west section of the site. The BESS is located on cleared land.

The level of clearing associated with the development will be modest and subject to a separate Clearing Permit. No objections were raised by DWER. Generally, the temporary construction areas and the BESS and associated buildings are proposed on cleared land.

Environmental matters raised by DWER can be addressed through conditions. This includes requiring a Construction Environmental Management Plan (CEMP) and an Operational Management Plan. The CEMP should address matters such as erosion and sediment control, water management, waterway protection, biosecurity and flora and fauna management.

Conditions are recommended to ensure that natural environment and vegetation are protected during the construction and operational phases of the development.

Hazards

Related to fire risks are public health and hazard management.

The Department of Health recommend the Emergency Management Plan address public health measures with battery failure scenarios. This includes community notification, smoke management, emergency exclusion arrangements, agency co-ordination and public communication.

Significant environmental impacts may be possible in the event of a BESS fire depending on the extent of the fire and the time and resources it takes to extinguish. This includes:

- Fire water runoff generated during the control of a bushfire, impacting local flora and fauna and contaminating soil, groundwater and/or surface water;
- Air emissions produce during combustion;
- Radiant heat; and
- Reviewing consequences of off-site impacts including serious injury due to heat radiation or irritation from toxic combustion products to off-site receptors.

There is a requirement for the batteries to have appropriate safety features, including fire detection and alarms, explosion prevention, uninterruptable power supply, emergency stop/automatic shut-off and fire suppression.

The final details of hazard management are required prior to construction, however the preliminary hazard assessment submitted indicates that the risks can be appropriately managed. For instance:

- The design and construction of the BESS must comply with the *Electricity Act 1945*, *Electricity (Licencing) Regulations 1991* and the *Western Australian Electrical Requirements*;

- The BESS, in connecting to the Western Power network, will need to meet Western Power Safety in Design requirements and other relevant standards and approval processes; and
- The facility may also require licencing under the *Dangerous Goods Safety Act 2004* and are likely to require a dangerous goods storage license under the *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007*.

Whilst it is acknowledged that further work is required, it is generally agreed that the risks can be mitigated. If the RDAP resolve to approve the application, conditions have been recommended accordingly.

Stormwater Management

The applicant's assessment in the Hydrological Assessment is supported. Accordingly, stormwater management can be suitably addressed through a development condition and detailed design and implementation.

Proposed mitigation measures include reducing risk of contaminated or sediment laden runoff from the site during construction or operations through appropriate drainage control and retention basins, storage and handling procedures for any potentially hazardous goods such as hydrocarbons, designated storage and handling areas with bunding, spill-kits and site procedures in the event of a spill and dust management procedures during construction.

Access and Traffic Impact

Provision	Requirement	Proposal	Assessment
Clause 67(t) and (y) of Deemed Provisions; WAPC Transport Impact Assessment Guidelines	Traffic impacts must be assessed and managed.	Impacts on local roads during construction and during ongoing operations.	Proposed access arrangements are suitable, safe and the local community are not impacted financially for road upgrading as a result of the development. Suitably addressed subject to the applicant upgrading Tunney Road and constructing crossovers.

Both Collie-Changerup Road and Tunney Road are Local Government managed roads. Collie-Changerup Road is sealed while Tunney Road is unsealed.

The applicant proposes primary access from Collie-Changerup Road and secondary access from Tunney Road.

A Traffic Impact Assessment (TIA) has been prepared for the development. The TIA identifies the traffic volumes for the construction period and for ongoing operations.

The proposal will result in increased traffic on Collie-Changerup Road during construction. Vehicles accessing the site will need to be managed safely.

Main Roads WA has reviewed the TIA and the development and raise no objections. Main Roads WA suggest the main access should be from Tunney Road and not from Collie-Changerup Road.

Concerns were raised during consultation about construction traffic impacts on the safety and the condition on Tunney Road. As a result, the main access is Collie-Changerup Road.

The Local Government is satisfied with the TIA both for construction and ongoing operations. This is subject to the applicant upgrading Tunney Road to a sealed standard between the Collie-Changerup Road/Tunney Road intersection and the proposed crossover on Tunney Road.

It can be concluded from the TIA and assessments that the traffic associated with the phases of the development can be appropriately managed. If the RDAP support the proposal, conditions are recommended to address the issues identified.

It is recommended that a Construction Traffic Management Plan be prepared to minimise the impacts of construction traffic and to promote safety.

Visual and Landscape Impact

Provision	Requirement	Proposal	Assessment
Clause 67(m), (n), (p) and (y) of Deemed Provisions	Consider bulk, scale, and impact on landscape.	The BESS covers a development footprint of 3.6 hectares.	Complies with TPS3 setbacks. Low visual impacts for this locality noting the BESS adjoins Western Power's substation.

The development plans propose a 5m landscape buffer on the northern, eastern and western boundaries of the development footprint and a 3m buffer on the southern boundary of the footprint.

A Landscape and Visual Impact Assessment (LVIA) is included in the EAR. The LVIA assesses potential visual impacts from key public view points and from neighbouring dwellings and recommends mitigation measures to reduce impacts on identified viewpoints.

The LVIA includes photomontages and concludes that the proposal will modify the existing visual character of the locality. However, visual impacts are expected to be low, having regard to the modified agricultural landscape, existing energy infrastructure and distance to sensitive receptors. Overall, the BESS is a low rise development other than the slender lightning protection rods which are approximately 20m in height.

Visual and landscape amenity is a key consideration when assessing energy or infrastructure proposals in rural areas. Various submissions raised concerns about visual impacts on nearby dwellings and the rural character of the locality.

The BESS will present as a utilitarian element within the rural landscape. While the proposal is considered generally compatible with the rural setting, its scale, siting and visibility require careful consideration. There is a need for appropriate landscape screening to reduce impacts on rural character and amenity.

The BESS may be visible, through filtered views, from some nearby dwellings and will be briefly visible from adjoining public roads. The extent of visibility will depend on topography, roadside vegetation, distance from the development and the effectiveness of screening measures.

The proposed development exceeds the setback requirements under clause 5.7.3(d) of TPS3 which specifies minimum setbacks of 20 metres to the front boundary and 15 metres to the rear and side boundaries for buildings.

The general provisions in TPS3 require landscaping where a development may detract from the visual amenity of the landscape. For industrial and infrastructure development, this requires appropriate siting, design and landscaping. The landscaping is to focus on the perimeter of the site or of the development footprint.

To reduce visual impacts, the LVIA recommends retaining existing vegetation and proposes new landscaping. Providing landscaping will limit impacts from nearby dwellings and public roads.

Conditions are recommended to include mitigation strategies including building and equipment colours and materials and the preparation and implementation of a Landscaping Plan.

Lighting

Whilst there is no reference to lighting of the development in the Development Application or in the LVIA, lighting associated with the development should be designed to ensure that amenity impacts are minimised on nearby residents or on the locality. The WAPC's Position Statement: *Dark Sky and Astrotourism* provides a set of principles and measures to reduce artificial light. It is recommended a Lighting Strategy be prepared, approved and implemented.

Aviation Impacts

Provision	Requirement	Proposal	Assessment
Clause 67 (y) of Deemed Provisions	Consider impacts on aviation.	The development is low-rise other than lightning protection rods.	Matters are suitably addressed.

Some submissions raised concerns on aviation impacts. Given the development is single storey, other than lightning protective rods which are approximately 20m in height, it is suggested there are no impacts on aviation activities.

Amenities Servicing

Provision	Requirement	Proposal	Assessment
Clause 67 (q), (r), (s) of the Deemed Provisions	Development must be adequately serviced	Onsite water tanks and effluent disposal	Acceptable subject to detailed design.

The site is not connected to reticulated water or reticulated sewerage. The proposed site office and maintenance buildings with associated lunchrooms and amenities will require the provision of potable water tanks and a suitable wastewater system(s).

Conditions require the provision of a suitable potable water supply and effluent disposal systems that are designed, installed and maintained.

Community Benefit Funding

Provision	Requirement	Proposal	Assessment
Clause 67(v) and (y) of the Deemed Provisions	Development should provide positive community benefits.	The applicant has provided a commitment to establish a community benefit fund which aligns with the WA Government's *Community Benefits Guideline for Large-Scale Renewable Energy Projects in the South-West Interconnected System*.	An advice note is included in the recommendation.

Western Australia's energy sector is transforming to achieve the State and Australian Governments' net zero emissions targets. Local Government is a key stakeholder in this change, with many regional communities such as the Shire of Kojonup experiencing an increase in engagement from renewable energy proponents and the prospect of their regions undergoing significant transformation.

It is essential that the energy transition currently underway delivers economic opportunities, ensures reliable and affordable electricity, and results in benefits for local communities that host the energy transition infrastructure. Many Local

Governments see the benefit that large scale renewable energy projects can bring to their area, however a transformation of this size doesn't come without its challenges.

The Western Australian Government, via Powering WA, released the final *Community Benefits Guideline for Large-Scale Projects in the South-West Interconnected System* (Guideline). The Guideline states that community benefit sharing involves sharing the rewards of renewable energy development with local communities. It aims to integrate a development in the local community by contributing to the future vitality and success of the region. It is based on a desire to establish and maintain positive long-term connections to the area and to be a good neighbour.

The Guideline is intended to be applied to large-scale, grid-connected renewable energy generation and storage projects, such as BESS. The principles in the Guideline can be applied to this Development Application.

The Guideline recommends $125 per MW per annum while the applicant has committed to contributing at least $150 per MW.

It is the Local Government's position that this BESS has a material impact on the community. The Local Government supports the applicant's commitment of $150 per MW. It is acknowledged that the provision of community benefit payments is not addressed through a condition of development approval but is raised as a non-binding advice note.

Detailed Design, Construction, Operations and Decommissioning

Provision	Requirement	Proposal	Assessment
Clause 67(zb) of Deemed Provisions	Detailed information is required to be submitted prior to commencing any development works with other matters to be addressed during construction or post-construction.	The Development Application Report, EAR and development plans will be refined through detailed design.	To be addressed through development conditions.

As identified in the Development Application Report and EAR, various management plans and studies will be prepared or updated following determination of the Development Application. This includes through the detailed design, construction, operations and also the decommissioning phase of the project. Some of these requirements need to occur prior to construction commencing while other matters will be addressed during construction or post-construction. Amongst matters, the management plans will identify and address monitoring processes and complaint processes.

A recommended condition is the submission of a Decommissioning and Rehabilitation Management Plan at least 12 months prior to the project ceasing. The operator is responsible for funding the decommissioning process. Subject to landowner

approval and requirements, it is expected that decommissioning and rehabilitation will ensure that the land is suitably returned to its predevelopment (agricultural) condition.

CONSULTATION:

PUBLIC CONSULTATION

In accordance with Clause 64 of Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015*, the application was advertised as a 'complex application' due to its classification as a 'Use Not Listed' under the Zoning Table of the *Shire of Kojonup Town Planning Scheme No. 3*.

The proposal was advertised for a period of 42 days.

Landowners within a 2km radius from the development site and various stakeholders were written to. The proposal was also advertised on the Shire's website, and the Shire's Facebook page, and notices were placed in the Kojonup News and Great Southern Herald newspapers along with a notice on the noticeboard at the Shire of Kojonup administration office.

As a result of advertising, a total of 14 public submissions were received, all raising issues or objections. The public Schedule of Submissions are set out in Attachment 2 while the full submissions are outlined in Attachment 3.

The key themes raised in the public submissions included fire risks and hazards, separation distances, visual impacts, noise, impacts on local roads and property values. The matters raised in the public submissions are discussed throughout the Planning Assessment section of this report.

Based on the public submissions, it is suggested that various conditions and advice notes are required to mitigate BESS impacts and address amenity and to achieve positive benefits for the community.

The applicant also undertook their own stakeholder and community engagement prior to lodging the Development Application and during the Shire's advertising period.

REFERRALS/CONSULTATION WITH GOVERNMENT/SERVICE AGENCIES

The proposal was advertised to government/service agencies for 42 days. In particular, the application was referred to the following agencies:

- Department of Health (DoH)
- Department of Water and Environment Regulation (DWER)
- Department of Biodiversity, Conservation and Attractions (DBCA)
- Department of Fire and Emergency Services (DFES)
- Department of Primary Industries and Regional Development (DPIRD)
- Department of Energy and Economic Diversification (DEED)
- Department of Mines, Petroleum and Exploration (DMPE)
- Department of Planning, Lands and Heritage (DPLH)
- Main Roads Western Australia (MRWA)
- Tourism WA
- Western Power

- Synergy

A copy of each agency submission is contained at Attachment 5. The applicant and the Local Government have provided responses to each submission, which has been included in the Schedule of Submissions set out at Attachment 4.

A summary of the main issues raised by agencies who provided advice are outlined below. Comment on these issues are contained in this report under 'Planning Assessment'.

Issue Raised	Comment
DMPE – no objection given the proposal raises no significant issues relating to mineral and petroleum resources, geothermal energy and basic raw materials.	Noted.
MRWA – no preliminary objection. Various comments provided including suggesting the main access should be from Tunney Road rather than Collie-Changerup Road.	The Local Government prefers the main access from Collie-Changerup Road. The Local Government also seeks for the applicant to seal the section of Tunney Road between the Collie-Changerup Road intersection and the proposed crossover on Tunney Road.
DWER – provide various advice including water supply, surface water management, construction, environmental management plan and native vegetation.	These matters can be addressed through conditions, advice notes and as required, through separate legislative processes.
DoH – no objection but provided advice on water supply, waste water disposal, public health and hazard management and separation distances.	These matters can be addressed through conditions, advice notes and as required, through separate legislative processes.
DFES – Bushfire Management Plan (BMP) and Bushfire Risk Report. Seek modifications to the BMP and seek a detailed Risk Management Plan.	These matters can be addressed as development conditions. It is critical there is effective fire mitigation measures for the BESS which are suitably reviewed and maintained.

DESIGN REVIEW PANEL ADVICE

Not applicable

OTHER ADVICE

Internal referral at the Shire of Kojonup was undertaken at pre-lodgement and lodgement stage. Internal advice is reflected in the assessment and recommendation.

CONCLUSION:

The proposed BESS has been assessed against the *Planning and Development (Local Planning Schemes) Regulations 2015*, TPS3, relevant State Planning Policies and guidance, and applicable local planning instruments. The proposed land use is not defined under TPS3 and has therefore been considered as a 'Use Not Listed' under Clause 3.3.5. The assessment has found that the proposal is generally consistent with the objectives of the Rural zone and is capable of approval under the current planning framework.

The proposal is considered to support State Government objectives relating to renewable energy, energy storage and the security of the State's electricity infrastructure. Although the development will introduce infrastructure into a rural setting, the development footprint affects only a small portion of the site and enables the continuation of broadacre farming. The proposal also has the potential to provide local economic benefits through construction and operational employment, investment in the locality, diversification of the local economic base and strengthening the electricity network capacity.

The application has been the subject of public consultation and agency referral. The matters raised in public submissions and agency responses have been reviewed and addressed through the assessment and, where appropriate, through recommended conditions of approval.

Potential impacts relating to bushfire risk, amenity, landscape character, environmental impacts, servicing and traffic are capable of being appropriately managed through detailed design, management plans and recommended conditions. A key risk to the community relates to fire risks, however the proposal seeks to mitigate impacts.

The proposal requires the RDAP to determine that the proposed use is consistent with the objectives of the Rural zone. The RDAP also need to be satisfied that potential impacts can be adequately managed through the proposed management measures and further detail as required through conditions.

It is concluded that the Development Application is consistent with orderly and proper planning and is accordingly recommended for approval, subject to conditions.

ATTACHMENTS

1. Development Application Report
    - Appendix A: Conceptual Plans and Elevations
    - Appendix B: Environmental Assessment Report
        - Aboriginal Cultural Heritage Briefing Note
        - Stakeholder and Community Engagement Plan, Consultation Summary
        - Reconnaissance and Targeted Flora and Vegetation Survey and Basic Terrestrial Fauna Survey
        - Hydrological Assessment
        - Landscape and Visual Impact Assessment
        - Environmental Noise Assessment
        - Transport Impact Assessment
    - Appendix C: Stakeholder and Community Engagement Plan
    - Appendix D: Consultation Summary
    - Appendix E: Bushfire Risk Report

- Appendix F: Bushfire Management Plan

2. Schedule of Submissions (Public)
3. Copy of Public Submissions
4. Schedule of Submissions (Agencies)
5. Copy of Agency Submissions
6. Bushfire Practitioner review of DFES submission
7. Applicant Commitments

KOJONUP BESS - PROJECT AREA AND INDICATIVE LAYOUT



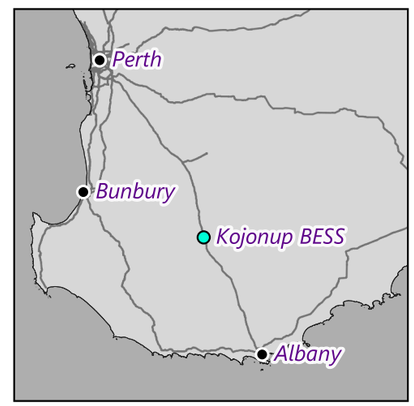
Indicative Project Infrastructure

- Project area
- Western Power land
- BESS bench
- BESS substation bench
- Underground cable
- Access track
- Detention basin
- Landscape screening
- O&M building and carpark
- Water tank
- Security fence

Existing Infrastructure

- Kojonup Substation
- Existing 66kV transmission line
- Existing 132kV transmission line
- Roads

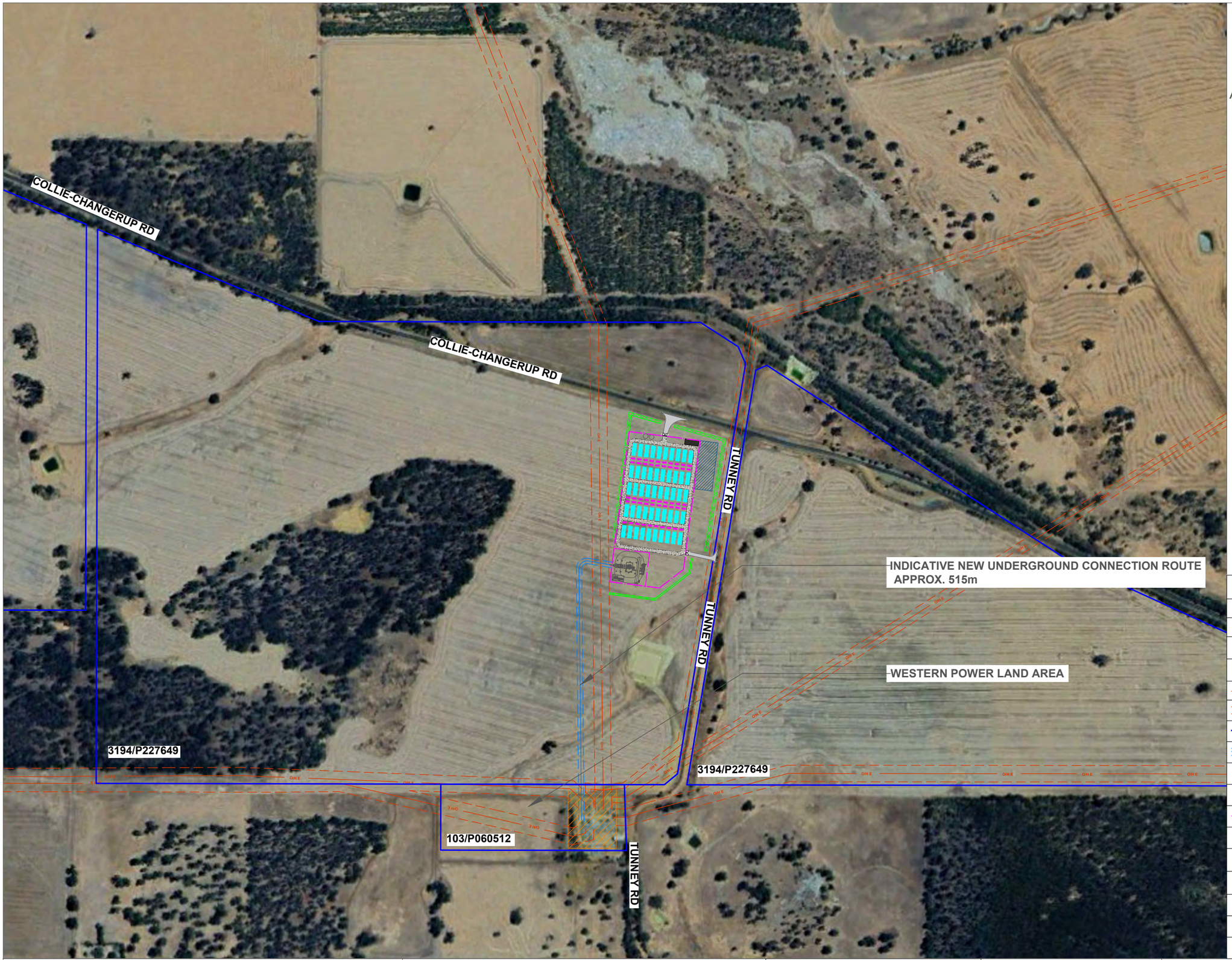
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Mint

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Project:	Kojonup BESS, Layout: DA - Indicative Layout
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Size:	A3
Scale:	1: 4570
Date:	31/03/2026
Author:	Liam Dowsett-Clark
CRS:	GDA2020 / MGA zone 50 (EPSG:7850)
Path:	Mint Renewables - GIS\WA\Projects\Kojonup BESS\Kojonup BESS.qgz



N

NOTES:

1. *Layout is indicative and for planning purposes only, subject to equipment selection.*
2. *All dimensions are in metres (m), unless noted otherwise.*
3. *The route of the underground cable and associated easement connecting the Project Substation to the existing Kojonup Substation is indicative only. Exact grid connections and configuration to be confirmed by Western Power.*
4. *Indicative permanent infrastructure shown on this plan.*
5. *Water basin designed to meet volume requirements. Final volumes and configuration to be calculated in detailed design phase.*
6. *The Main access point for the Project will be a new access point off Collie-Changerup Road, with a new secondary access proposed off Tunney Road.*

LEGEND	
	SITE ACCESS GATE
	PROPOSED NEW ACCESS TRACK
	BATTERY CONTAINER
	POWER CONVERSION SYSTEM UNIT (PCS)
	EXISTING OVERHEAD LINE
	EXISTING OVERHEAD LINE EASEMENT
	PROPERTY BOUNDARY
	PROPOSED NEW CONNECTION ROUTE
	PROPOSED WATER TANK
	PROPOSED O&M BUILDING AND CAR PARK AREA
	PROPOSED SECURITY FENCE
	EXISTING SUBSTATION
	PROPOSED LANDSCAPE SCREENING (APPROX. 5m WIDE)
	PROPOSED LANDSCAPE SCREENING (APPROX. 3m WIDE)
	INTERNAL ACCESS TRACK
	PROPOSED SUBSTATION AREA
	PROPOSED WATER DETENTION BASIN AREA

REVISIONS

REV	*STATUS*	*DESCRIPTION*	*DATE*	*D.B.*	*C.B.*
A	DA	INITIAL ISSUE	10/02/26	X.Z	S.Y
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E	DA	DETAILS INFORMATION AMENDED	23/03/26	X.Z	S.Y
F	DA	NOTES AMENDED	25/03/26	X.Z	S.Y

PROJECT DETAILS:

KOJONUP BESS

Collie–Changerup Rd, Kojonup WA 6395
–33.804452, 117.136471

PROJECT DEVELOPER:

MINT RENEWABLES

DRAWING TITLE:

INDICATIVE PROJECT LAYOUT

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LEGEND

	SITE ACCESS GATE		PROPOSED SECURITY FENCE
	PROPOSED NEW ACCESS TRACK		EXISTING SUBSTATION
	BATTERY CONTAINER		PROPOSED LANDSCAPE SCREENING (APPROX. 5m WIDE)
	POWER CONVERSION SYSTEM UNIT (PCS)		PROPOSED LANDSCAPE SCREENING (APPROX. 3m WIDE)
	EXISTING OVERHEAD LINE		INTERNAL ACCESS TRACK
	EXISTING OVERHEAD LINE EASEMENT		PROPOSED SUBSTATION AREA
	PROPERTY BOUNDARY		PROPOSED WATER DETENTION BASIN AREA
	PROPOSED NEW CONNECTION ROUTE		
	PROPOSED WATER TANK		
	PROPOSED O&M BUILDING AND CAR PARK AREA		

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F	DA	NOTES AMENDED	25/03/26	X.Z	S.Y

PROJECT DETAILS:

KOJONUP BESS

Collie-Changerup Rd, Kojonup WA 6395
-33.804452, 117.136471

PROJECT DEVELOPER:

MINT RENEWABLES

DRAWING TITLE:

INDICATIVE SITE LAYOUT

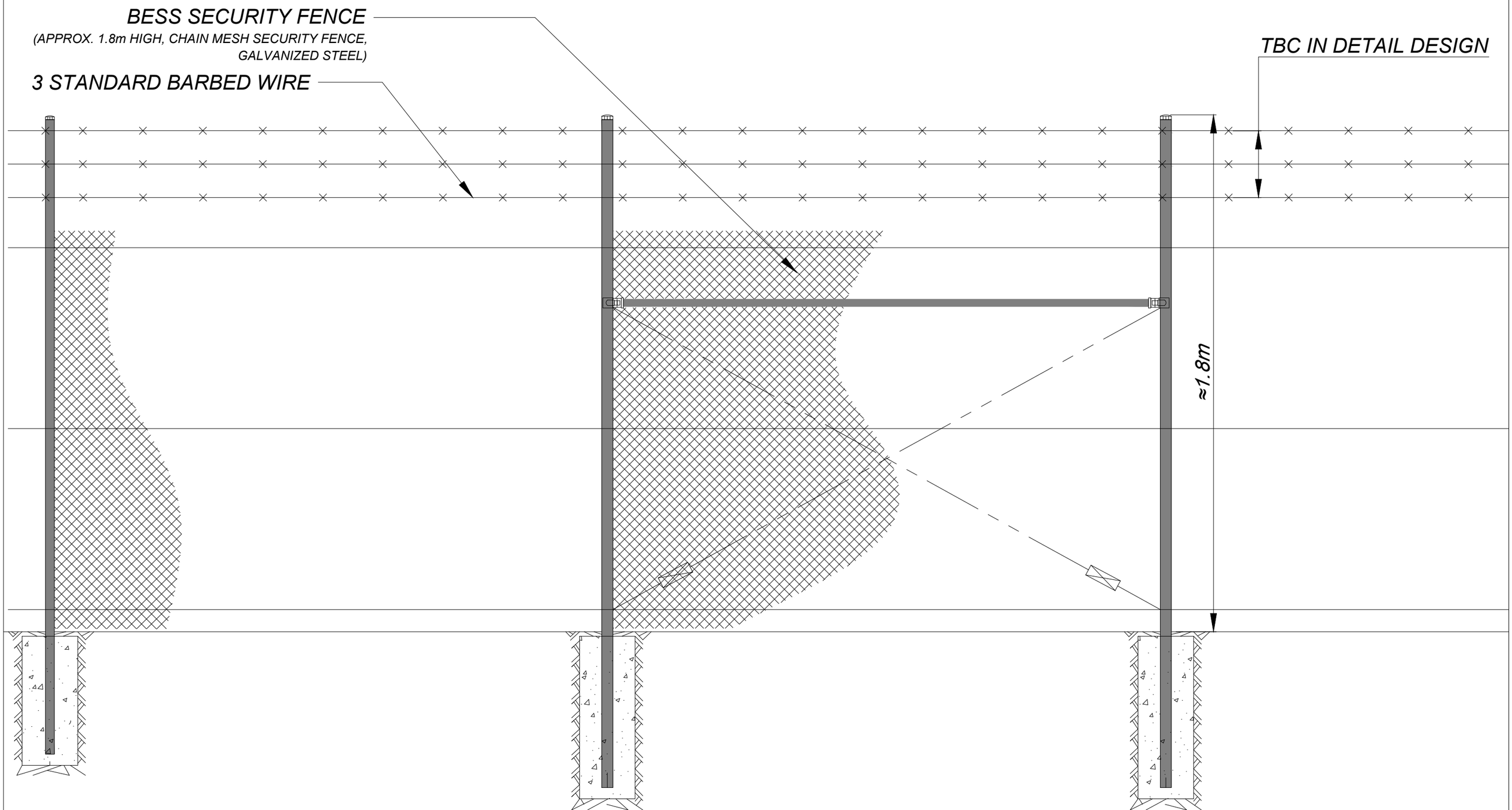
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SECURITY FENCE FRONT VIEW



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PROJECT DETAILS:

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INDICATIVE SECURITY FENCE ELEVATIONS

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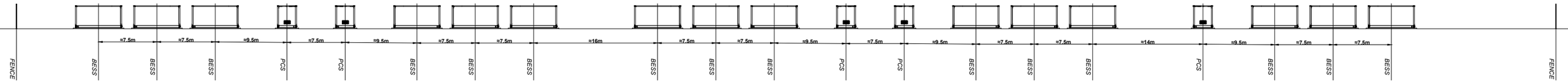
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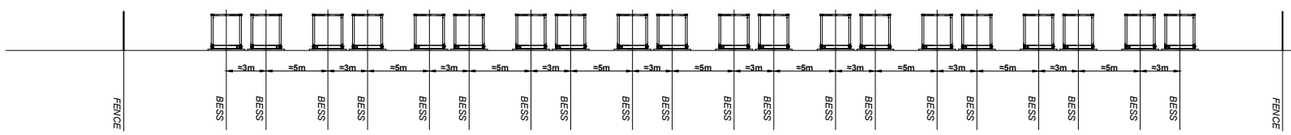
LEGEND:

BESS - BATTERY ENERGY STORAGE SYSTEM CONTAINERS
PCS - POWER CONVERSION SYSTEM CONTAINERS
FENCE - INDICATIVE SECURITY FENCE

ELEVATION A
DA4.0



ELEVATION B
DA4.0



REVISIONS					
REV	STATUS	DESCRIPTION	DATE	D.B.	C.B.
A	DA	INITIAL ISSUE	26/03/26	X.Z	S.Y

PROJECT DETAILS:
KOJONUP BESS
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-33.804452, 117.136471

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INDICATIVE SITE ELEVATION

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132kV CLEARANCES

SECTION CLEARANCE (S) = 3870mm
GROUND CLEARANCE (G) = 2440mm
PHASE - PHASE (P-P) = 1495mm
PHASE - EARTH (P-E) = 1300mm

132kV CONDUCTOR

INTERPLANT - TWIN VENUS

33kV CLEARANCES

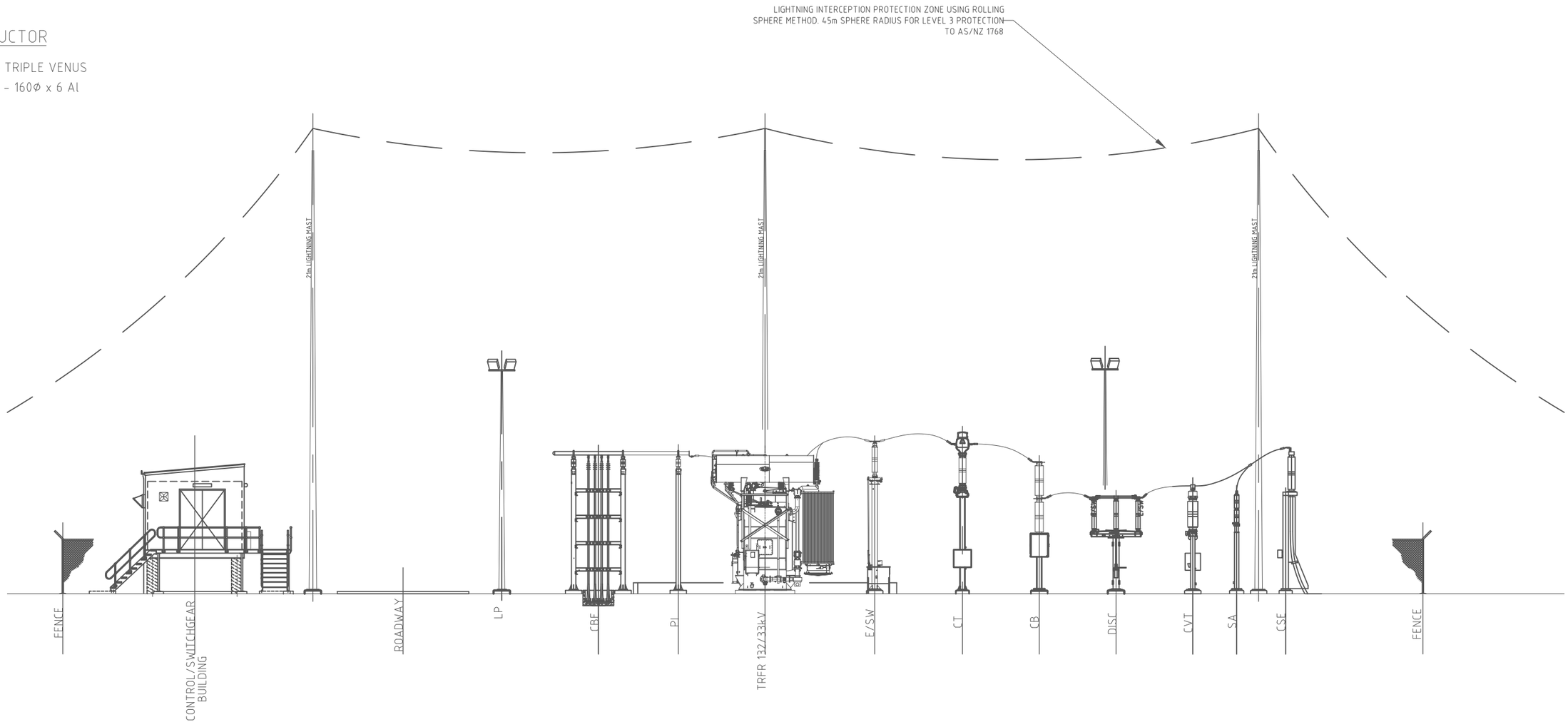
SECTION CLEARANCE (S) = 2860mm
GROUND CLEARANCE (G) = 2440mm
PHASE - PHASE (P-P) = 440mm
PHASE - EARTH (P-E) = 380mm

33kV CONDUCTOR

INTERPLANT - TRIPLE VENUS
TUBULAR BUS - 160Ø x 6 Al

LEGEND:

TRFR - POWER TRANSFORMER
NET - NEUTRAL EARTHING TRANSFORMER
GEN - GENERATOR
BSEP - OIL/WATER SEPARATOR
DISC - DISCONECTOR
E/SW - EARTH SWITCH
CVT - CAPACITIVE VOLTAGE TRANSFORMER
CB - CIRCUIT BREAKER
DTCB - DEAD TANK CIRCUIT BREAKER
SA - SURGE ARRESTER
CSE - CABLE SEALING END
PI - POST INSULATOR
LP - LIGHTING POLE
LM - LIGHTNING MAST
RPC - REACTIVE POWER COMPENSATION



REVISIONS					
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LEGEND:

TRFR – POWER TRANSFORMER
NET – NEUTRAL EARTHING TRANSFORMER
GEN – GENERATOR
BSEP – OIL/WATER SEPARATOR
DISC – DISCONECTOR
E/SW – EARTH SWITCH
CVT – CAPACITIVE VOLTAGE TRANSFORMER
CB – CIRCUIT BREAKER
DTCB – DEAD TANK CIRCUIT BREAKER
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PI – POST INSULATOR
LP – LIGHTING POLE
LM – LIGHTNING MAST
RPC – REACTIVE POWER COMPENSATION

132kV CLEARANCES

SECTION CLEARANCE (S) = 3870mm
GROUND CLEARANCE (G) = 2440mm
PHASE – PHASE (P-P) = 1495mm
PHASE – EARTH (P-E) = 1300mm

132kV CONDUCTOR

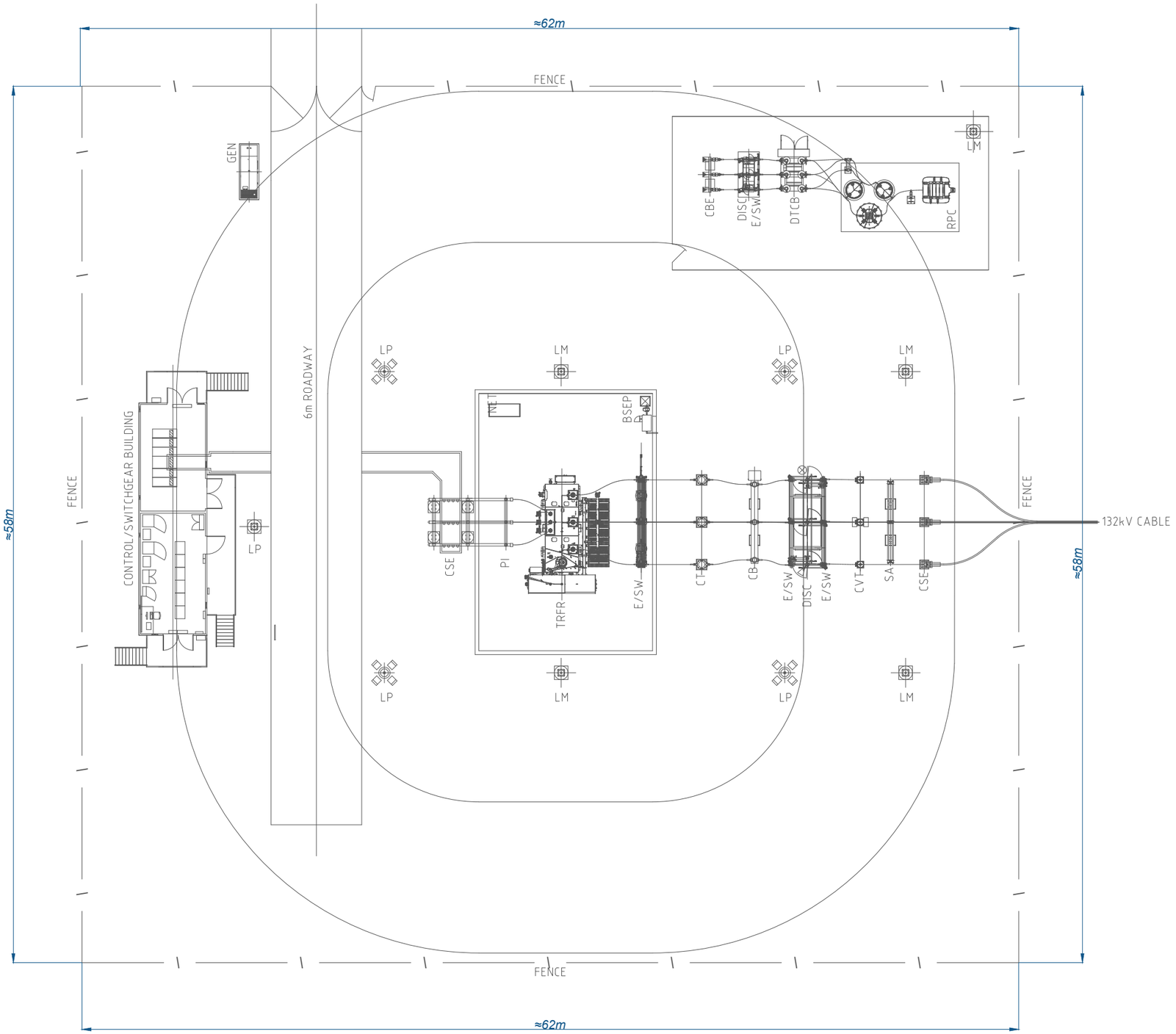
INTERPLANT – TWIN VENUS

33kV CLEARANCES

SECTION CLEARANCE (S) = 2860mm
GROUND CLEARANCE (G) = 2440mm
PHASE – PHASE (P-P) = 440mm
PHASE – EARTH (P-E) = 380mm

33kV CONDUCTOR

INTERPLANT – TRIPLE VENUS
TUBULAR BUS – 160Φ x 6 Al



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INDICATIVE SUBSTATION GENERAL ARRANGEMENT

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KOJONUP BESS

Environmental Assessment Report

Final

May 2026

KOJONUP BESS

Environmental Assessment Report

Final

Prepared by
Umwelt (Australia) Pty Limited

On behalf of
Mint Renewables

Project Director:	Rob Karelse
Project Manager:	Megan Stalker
Technical Director:	Rob Karelse
Report No.:	32760/R05
Date:	May 2026

This report was prepared using
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Document Status

Rev No.	Reviewer Name	Date	Approved for Issue Name	Date
V1	Megan Stalker	11/02/2026	Rob Karelse	11/02/2026
V2	Megan Wood	21/04/2026	Rob Karelse	10/04/2026

Executive Summary

Mint Renewables is proposing to develop the Kojonup Battery Energy Storage System (BESS) (the Project) within the Shire of Kojonup, Western Australia, approximately 3 km north-west of the Kojonup town centre. The Project proposes a utility-scale BESS with an indicative installed capacity of up to 100 megawatts (MW) and 800 megawatt-hours (MWh), supporting the integration of renewable energy generation and enhancing reliability and resilience of the South West Interconnected System.

The Project is proposed on predominantly cleared agricultural land adjacent to the existing Kojonup Substation. The Indicative Disturbance Footprint is approximately 8.09 ha, including around 3.6 ha of permanent infrastructure. Proposed infrastructure includes containerised battery units, inverters and transformers, internal access roads and hardstands, underground cabling, an on-site substation, operations and maintenance facilities, stormwater and firewater infrastructure, and ancillary works.

This Environmental Assessment Report (EAR) has been prepared to support a Development Application for the Project under the *Planning and Development Act 2005* (WA). The EAR describes the receiving environment, identifies potential impacts associated with construction and operation, and outlines measures to avoid, minimise, and manage impacts in accordance with the mitigation hierarchy. The assessment has been informed by supporting technical studies addressing hydrology, flora and vegetation, terrestrial fauna, Aboriginal cultural heritage, environmental noise, landscape and visual amenity, and traffic and transport.

Hydrological investigations indicate the site is subject primarily to shallow overland sheet flow during larger rainfall events, with flooding hazards predominantly classified as low. Stormwater and flood mitigation measures (including swales, drainage controls, and on site detention) will be incorporated into detailed design to maintain post development flows consistent with pre development conditions and to avoid significant off site flooding impacts.

The Project Area occurs in a highly modified agricultural landscape where native vegetation persists mainly as fragmented remnants and roadside vegetation. The Project design avoids clearing of remnant native vegetation within the main BESS footprint. However, minor clearing of degraded native vegetation may be required within the indicative disturbance footprint (up to approximately 0.09 ha), subject to detailed design and any required approvals. No Threatened or Priority flora species were recorded during the September 2024 survey, and the Project has been designed to avoid the Eucalyptus Woodlands of the Western Australian Wheatbelt Threatened Ecological Community identified to the west of the Project Area.

A desktop soil assessment indicates that the Project is located within land of moderate to high agricultural capability. However, impacts to soils will be limited to the small indicative disturbance footprint and are expected to be negligible at a local and regional scale. Potential soil risks, including erosion, contamination and acidification, can be effectively managed through standard construction controls. Agricultural practices will continue on the adjoining land during the Project operations.

No registered Aboriginal heritage sites are located within the Project Area. However, parts of the surrounding landscape (including areas of remnant vegetation and drainage features) have the potential to contain previously unrecorded Aboriginal cultural heritage. Further archaeological and ethnographic surveys and consultation will be undertaken prior to ground-disturbing works, and statutory requirements will be completed in accordance with applicable legislation.

Supporting assessments indicate that potential off-site impacts can be managed to an acceptable level. Operational noise from the BESS, in combination with the existing substation, is predicted to comply with the applicable criteria at surrounding noise-sensitive premises under the *Environmental Protection (Noise) Regulations 1997*, based on conservative modelling assumptions. The Landscape and Visual Impact Assessment concluded that visual impacts would be low to negligible from surrounding public viewpoints; further mitigated through landscape screening. Construction traffic would be temporary, with access and any infrequent oversized movements managed through detailed access design, relevant permits and implementation of a Traffic Management Plan.

The Project layout, infrastructure configuration, and disturbance footprint presented in this EAR are indicative and subject to refinement during detailed design, and the environmental assessments have been undertaken based on the current design to inform impact identification and mitigation measures.

Abbreviations

Abbreviation	Definition
ABS	Australian Bureau of Statistics
ACH	Aboriginal Cultural Heritage
ACHIS	Aboriginal Cultural Heritage Information System
AEP	Annual Exceedance Probability
ARR	Australian Rainfall and Runoff
BC Act	*Biodiversity Conservation Act 2016* (WA)
BESS	Battery Energy Storage System
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
DA	Development Application
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEM	Digital Elevation Model
DFES	Department of Fire and Emergency Services
DPLH	Department of Planning, Lands and Heritage
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environmental Regulation
EAR	Environmental Assessment Report
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EPA	Environmental Protection Authority (WA)
EP Act	*Environmental Protection Act 1986* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
GKB AC	Gnaala Karla Booja Aboriginal Corporation
H1–H5	Flood Hazard Categories
IBRA	Interim Biogeographic Regionalisation of Australia
IBSA	Index of Biodiversity Surveys for Assessment
ILUA	Indigenous Land Use Agreement
IUCN	International Union for Conservation of Nature
LCU	Landscape Character Unit
MNES	Matters of National Environmental Significance
NMP	Noise Management Plan
NVCP	Native Vegetation Clearing Permit
O&M	Operations and Maintenance
PMST	Protected Matters Search Tool
RAV	Restricted Access Vehicle
RIWI Act	*Rights in Water and Irrigation Act 1914* (WA)
SPP	State Planning Policy
TEC	Threatened Ecological Community
TIA	Transport Impact Assessment
VSA	Vegetation System Association

Abbreviation	Definition
VT	Vegetation Type
WA	Western Australia
WKSN AC	Wagyl Kaip Southern Noongar Aboriginal Corporation
ZTV / ZVI	Zone of Theoretical Visibility / Zone of Visual Influence

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Appendix F Landscape Visual Impact Assessment

Appendix G Transport Impact Assessment

1.0 Introduction

1.1 Background

Mint Renewables (Mint) (the Proponent) is proposing to develop the Kojonup Battery Energy Storage System (BESS) (the Project) within the Shire of Kojonup, approximately 3 km north-west of the Kojonup town centre **(**Figure 1.1**).** The Project will accommodate a utility-scale BESS with an indicative capacity up to approximately of 100 MW / 800 MWh and is proposed to be sited on predominantly cleared rural land.

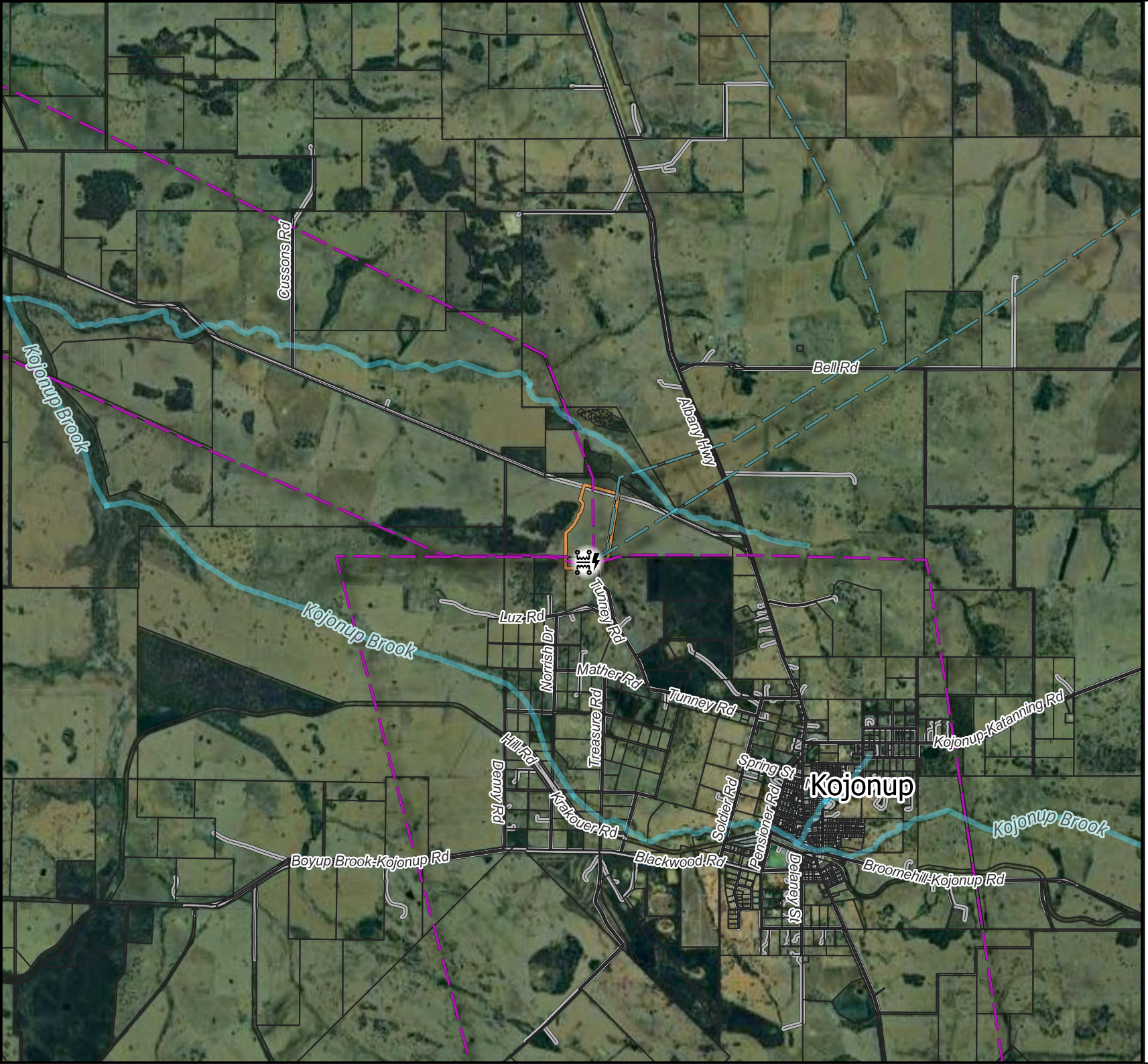
1.2 Project Description

The Proponent is proposing to build a BESS, with an indicative installed capacity of up to approximately 800MWh (100 MW x 8 hours), the Project area and indicative layout can be seen in Figure 1.2. Development is proposed within a Project Area of approximately 34.5 ha, with an Indicative Disturbance Footprint of approximately 8.09 hectares (including around 3.6 ha of permanent infrastructure) (Figure 1.3). The Project will include:

- BESS units, inverters, and transformers.
- Civil and structural works including laying of crushed rock.
- Internal access roads and access (and egress) points.
- Underground cabling (33 kV) to provide a connection between the battery units and inverters and on-site substation.
- On-site substation including transformer to step up from 33 kV to the connection voltage at 132 kV, reactive power support equipment, protection and control devices.
- Underground cabling (132 kV) to connect the onsite substation to the existing Kojonup Substation.
- Permanent Operations and Maintenance (O&M) Facility.
- Water storage (including firefighting water supply and fire water runoff containment / stormwater detention basin).
- A new access point off Collie-Changerup Road (Main Access), and a new access point off Tunney Road (Secondary Access).
- Security fencing.
- Car parking.
- Landscape mitigation screening, as required.
- Business identification signage, at the Main Access point.
- Temporary disturbance for construction compound and laydown and work areas.

The Project layout, infrastructure configuration and disturbance footprint presented in this report are indicative and subject to refinement during detailed design. Environmental assessments have been

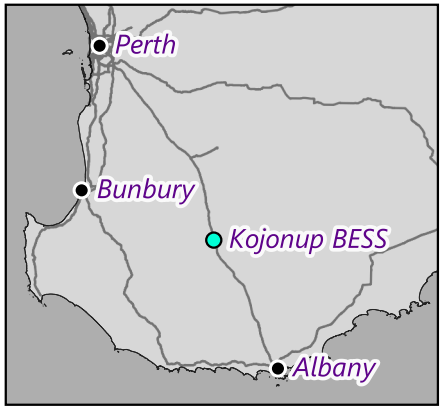
undertaken based on the current design to identify potential impacts and inform appropriate mitigation measures.



KOJONUP BESS - PROJECT LOCATION

- Project area
- Watercourse
- Kojonup Substation
- 66kV transmission line
- 132kV transmission line
- Roads

0 0.5 1 1.5 km



Mint

N

Project:	Kojonup BESS, Layout: DA-Project Location A4
Version:	C
Size:	A4
Scale:	1: 53370
Date:	30/03/2026
Author:	Liam Dowsett-Clark
CRS:	GDA2020 / MGA zone 50 (EPSG:7850)
Path:	Mint Renewables - GIS\WA\Projects\Kojonup BESS\Kojonup BESS.qgz



KOJONUP BESS - PROJECT AREA AND INDICATIVE LAYOUT

Indicative Project Infrastructure

- Project area
- Western Power land
- BESS bench
- BESS substation bench
- Underground cable
- Access track
- Detention basin
- Landscape screening
- O&M building and carpark
- Water tank
- Security fence

Existing Infrastructure

- Kojonup Substation
- Existing 66kV transmission line
- Existing 132kV transmission line
- Roads

Mint

N

Project:	Kojonup BESS, Layout: DA - Indicative Layout A4
Version:	A
Size:	A4
Scale:	1: 5185
Date:	30/03/2026
Author:	Liam Dowsett-Clark
CRS:	GDA2020 / MGA zone 50 (EPSG:7850)
Path:	Mint Renewables - GIS\WA\Projects\Kojonup BESS\Kojonup BESS.qgz



KOJONUP BESS - INDICATIVE DISTURBANCE AREA

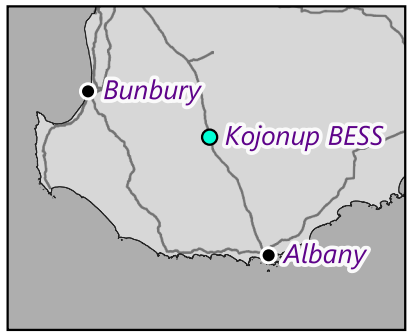
Indicative Project Infrastructure

- Project area
- Western Power land
- Disturbance footprint

Existing Infrastructure

- Kojonup Substation
- Existing 66kV transmission line
- Existing 132kV transmission line
- Roads

0 100 200 m



Mint

N

Project:	Kojonup BESS, Layout: DA-Disturbance Area
Version:	A4
Size:	A
Scale:	A4
Date:	1: 5160
Author:	30/03/2026
CRS:	Liam Dowsett-Clark
Path:	GDA2020 / MGA zone 50 (EPSG:7850)
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1.3 Purpose and Scope

Development approval is required for the Project under the *Planning and Development Act 2005* (WA). This Environmental Assessment Report (EAR) will support the Development Application (DA) by documenting the existing environmental context, identifying potential impacts associated with the Project, and outlining measures to avoid, minimise, and manage those impacts.

The assessment includes an evaluation of potential impacts on flora, vegetation and fauna, including any species or ecological communities listed as Threatened under the *Biodiversity Conservation Act 2016 (BC Act)* or as Matters of National Environmental Significance (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*. All assessments have considered relevant Western Australian Environmental Protection Authority (EPA) guidance and Department of Climate Change, Energy, the Environment and Water (DCCEEW) guidelines.

At the time of lodgement, certain relevant policy and guidance documents are in draft form or under preparation. This assessment has therefore been undertaken with reference to the most current available guidance and accepted methodologies.

1.4 Technical Studies

This EAR includes a summary of the supporting technical reports for each environmental value, as listed in **Table 1.1**.

Table 1.1 Summary of Technical Studies

Environmental Value	Technical Study Scope	Report	Section
Hydrology	Assessment of surface water features, drainage, local hydrological function, flood modelling.	Hydrology Assessment (Water Technology, 2026).	**Section 4.1**
Flora & Vegetation	Desktop assessment, field survey, vegetation mapping, TEC assessment, weed survey.	Reconnaissance and Targeted Flora and Vegetation Survey and Basic Terrestrial Fauna Survey (Umwelt, 2024).	**Section 4.2**
Terrestrial Fauna	Desktop assessment, habitat assessment, targeted black-cockatoo assessment.	Reconnaissance and Targeted Flora and Vegetation Survey and Basic Terrestrial Fauna Survey (Umwelt, 2024).	**Section 4.3**
Soils	Desktop assessment of soil landscape units, agricultural land capability, contamination risk and soil constraints (including acidification potential)	Desktop assessment of DPIRD-015, DPIRD-044, DPIRD-031, DWER-059.	**Section 4.4**
Heritage	Desktop ACH review, ACHIS search, and assessment of heritage potential, constraints and management requirements.	Aboriginal Cultural Heritage Briefing Note (Archae-aus, 2026).	**Section 4.5**
Noise	Desktop review, substation noise measurements, and modelling of BESS operational noise using manufacturer data.	Environmental Noise Assessment (Sonus, 2026).	**Section 4.6.1**
Visual Amenity	Desktop review and visual impact assessment using ZVI/ZTV modelling, viewpoint analysis and photomontages.	Landscape Visual Impact Assessment (UDLA, 2026).	**Section 4.6.2**

Environmental Value	Technical Study Scope	Report	Section
Traffic and Transport	Assessment of road network conditions, site access, traffic generation and heavy vehicle movements, including swept path and sight distance analysis.	Transport Impact Assessment (Flyt, 2026).	**Section 4.6.3**

2.0 Key Environmental Legislation

2.1 *Environmental Protection Act 1986* (Western Australia)

The EP Act is Western Australia's primary environmental legislation, administered by Department of Water and Environmental Regulation (DWER) and supported by the EPA as an independent statutory authority. Part IV of the EP Act outlines the environmental impact assessment process, which evaluates a proposal and the measures available to avoid or mitigate its environmental impact. Proposals that are likely to have a significant environmental effect must be referred to the EPA, which determines whether an assessment is required and sets the level of assessment.

An assessment has been undertaken against the EPA Factor and Objectives guidance (**Table 2.1**), as well as consideration of significance criteria (**Table 2.2**). From this assessment, the Project is unlikely to be considered a "significant proposal" due to the limited environmental values and low quality of the Project Area, the limited extent and low consequence of potential impacts, and the high degree of certainty by which impacts can be predicted. As such referral and assessment under Part IV of the EP Act is unlikely to be required.

Table 2.1 EPA Environmental Factors and Objectives

Theme	Factor	Objective	Assessment
Sea	Benthic communities and habitats	To protect benthic communities and habitats so that biological diversity and ecological integrity are maintained.	Not relevant. The Project is not located near coastal or marine environments, therefore it will not impact coastal or marine environmental values. As such, these factors are not considered relevant and are not discussed further.
	Coastal processes	To maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.	
	Marine environmental quality	To maintain the quality of the water, sediment and biota so that environmental values are protected.	
	Marine fauna	To protect marine fauna so that biological diversity and ecological integrity are maintained.	
Land	Flora and vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.	Relevant surveys and assessments have been undertaken for the Project. The Project has been designed to avoid vegetation clearing, a small area of native vegetation (approximately 0.09 ha) may need to be cleared. The mitigation hierarchy has been applied to avoid and minimise direct and indirect impacts to native vegetation, and no significant impacts to flora and vegetation will occur. Further discussion on Flora and Vegetation values is provided in **Section 4.2**.
	Landforms	To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected.	There are no distinctive physical landforms in the vicinity of the Project. The variety and integrity of distinctive physical landforms will not be impacted.

Theme	Factor	Objective	Assessment
	Subterranean fauna	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.	There will not be any material interaction with groundwater as part of the Project and so no risk of impact to subterranean fauna.
	Terrestrial environmental quality	To maintain the quality of land and soils so that environmental values are protected.	Potential soil impacts such as acid sulphate soils and erosion will be managed through the Construction Environmental Management Plan (CEMP).
	Terrestrial fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	Relevant surveys and assessments have been undertaken for the Project, and no significant impacts to terrestrial fauna are likely to occur.
Water	Inland waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	The required hydrological studies have been undertaken and the Project appropriately sited to ensure the regimes and quality of groundwater and surface water are maintained.
Air	Air quality	To maintain air quality and minimise emissions so that environmental values are protected.	Not relevant. The Project is not likely to result in any significant air emissions or impacts to air quality.
	Greenhouse gas emissions	To minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable.	Not relevant. There will be no significant greenhouse gas emissions as a result of the Project. As the Project plays a supporting role for renewable energy generation, it will assist in the transition to renewable electricity as coal generators reach their end of life.
People	Social surroundings	To protect social surroundings from significant harm.	The Project has been sited to minimise impacts to social surroundings.
	Human Health	To protect human health from significant harm.	Not relevant. The Project will not involve radioactive materials and as such this factor is not relevant.

Under Part V of the EP Act, a Native Vegetation Clearing Permit (NVCP) is required to clear native vegetation unless an exemption applies. Although the Project has been designed to avoid vegetation clearing, a small area of native vegetation (approximately 0.09 ha) may need to be cleared. Appropriate permits will be sought if required.

2.2 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)

The EPBC Act, administered by the DCCEEW, is the principal Commonwealth legislative instrument for environmental protection and biodiversity conservation in Australia. It provides the statutory framework for the identification and protection of MNES.

Under the EPBC Act, any action that has the potential to result in a significant impact on one or more MNES must be referred to the Commonwealth Minister for the Environment (or delegate) for a controlled action decision. Actions determined to be a controlled action are subject to formal impact assessment and approval, including the imposition of conditions, prior to the action proceeding.

An assessment for the Project has been undertaken with regard to the EPBC Act significant impact guidelines (Department of the Environment, 2013). Based on the limited extent of native vegetation clearance and the low likelihood of significant impacts to any MNES, it is considered unlikely that the Project will trigger the requirement for referral under the EPBC Act.

Table 2.2 EPBC Referral Criteria Assessment

Referral Criteria	Assessment
Listed threatened species and communities	**Not triggered** The DCCEEW database identified a total of 11 Threatened flora species within a 10 km buffer of the Project Area. One species (*Adenanthos pungens subsp. effusus*; Endangered) is classified as 'likely to occur', and the remaining 10 species 'may occur' within the buffer area only. Full database search results can be found in **Appendix B.** The DCCEEW database identified a total of 17 Threatened fauna species (14 species are birds and three are mammals) recorded or with potential to occur within a 30 km buffer of the Project Area. Of these, the following species or their habitat are classified by DCCEEW as 'known to occur': • *Zanda baudinii* (Baudin's Cockatoo; Endangered). • *Zanda latirostris* (Carnaby's Black Cockatoo; • Endangered). • *Phascogale calura* (Red-tailed Phascogale; • Vulnerable). Additionally, the following species or their habitat are classified by DCCEEW as 'likely to occur': • *Leipoa ocellata (Malleefowl; Vulnerable).* • *Dasyurus geofroii (Chuditch; Vulnerable).* However, field surveys described in **Section 4.2** confirmed that the Indicative Disturbance Footprint does not support habitat of significance for these species. While desktop searches identified listed threatened species with potential to occur in the wider area, field surveys confirmed that the Indicative Disturbance Footprint does not intersect any known threatened flora, threatened ecological communities, or black cockatoo habitat. The Project is therefore not likely to have a significant impact on listed threatened species or communities.
Listed migratory species	**Not triggered** Eight threatened/migratory fauna species were considered to have a moderate likelihood of occurrence (**Section 4.3.2**). However, the Project Area does not contain wetlands that could provide important habitat or support regular use by migratory species.
Ramsar wetlands of international importance	**Not triggered** The Project is located greater than 80 km from the nearest Ramsar wetlands (Lake Muir - Byenup Lagoon). The Project will not impact on any Ramsar wetland of international or national importance.
Commonwealth marine environment	**Not triggered** The Project Area is not within a Commonwealth Marine Environment.
World heritage properties	**Not triggered** There are no world heritage areas within or near the Project.

Referral Criteria	Assessment
National heritage places **This includes:** • **Natural, historic or Indigenous places of outstanding national heritage value.** • **Heritage places on or in Commonwealth lands and waters, or under Australian Government control.** • **Areas on the World Heritage List, or that the minister declares as a World Heritage property.**	**Not triggered** There are no National heritage places within or near the Project.
The Great Barrier Reef Marine Park	**Not triggered** The Project area is not situated within the Great Barrier Reef Marine Park.
Nuclear Actions	**Not triggered** The Project does not involve Nuclear Actions.
A water resource, in relation to coal seam gas development and large coal mining development	**Not triggered** The Project is not a coal seam gas or large coal mining development.

3.0 Environmental Context

3.1 Land Use

The Project is located within the Shire of Kojonup in the Great Southern region of Western Australia, which covers an area of approximately 2,932 km^2 with a population of 1,901 (Australian Bureau of Statistics (ABS), 2021). The Shire comprises a mix of agricultural land, crown reserves, and small rural townsites, with Kojonup functioning as the principal service centre for the surrounding rural community.

The broader region is predominantly rural and sparsely populated, characterised by broadacre farming and large private landholdings, providing opportunities for the Project design to avoid sensitive receptors and minimise amenity impacts. The Project occurs within an established agricultural landscape that has been extensively cleared and modified for cropping, with current land use dominated by generalised agriculture.

Most vegetation surrounding the Project has been highly modified since European settlement and is no longer considered intact remnant vegetation. The area is cleared and used for farming, containing existing rural infrastructure such as access tracks, fencing, a farm dam, and established electricity infrastructure including the Kojonup substation and associated distribution and transmission lines.

All land parcels (**Table 3.1**) within the Project are zoned Rural under the Shire of Kojonup Town Planning Scheme No. 3. The Western Power substation is the closest non-residential building near the Project, and the nearest dwelling is approximately 210 m to the south from the Project Area. Overall, the Project Area reflects a long history of agricultural land use with minimal built development consistent with ongoing rural production activities.

Table 3.1 Associated Land Parcels

Address	Land Description	Status	Easements or Restrictions
3680 Collie-Changerup Rd, Kojonup	Lot 3194 on deposited plan 227649.	Privately owned by host landowners.	None
	Lot 8869 on deposited plan 227649.		
262 Tunney Rd, Kojonup	Lot 103 on deposited plan 60512.	Private (Western Power).	None

3.2 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the DWER to protect important environmental values such as Threatened flora, Threatened Ecological Communities (TEC)s, or significant wetlands.

There are no known ESAs within the Project Area (Department of Water and Environmental Regulation (DWER), 2023). A desktop assessment identified the following conservation reserves within a 10 km buffer surrounding the Project Area, none of which are classified as ESA:

- Myrtle-Benn Flora and Fauna Sanctuary – located approximately 1 km to the south-east of the Project Area.

- Unnamed Department of Biodiversity, Conservation and Attractions (DBCA)managed nature reserve – protected under Section 5(1)(d) of the *Conservation and Land Management Act 1984* (WA), approximately 1.6 km south of the Project Area, reserved for flora and fauna conservation.
- Unnamed nature reserve located approximately 5.8 km southwest of the Project Area.

3.3 Climate

Long term mean monthly precipitation and monthly precipitation data for the 12 months preceding the survey at Kojonup Station (10582, data from 1885 to current), as well as the long term mean maximum monthly temperature and monthly maximum temperature for the 12 months preceding the survey at Katanning Station (10916, data from 1999 to current) (BoM, 2026) are shown in **Figure 3.1**. Temperature data was not sourced from Kojonup Station, as records were discontinued in 1997. Katanning Station is located 45 km northeast of the Project Area.

Long-term average monthly maximum temperatures at Katanning peak from December to February (33.1 °C – 32.0 °C), while long-term average monthly precipitation at Kojonup peaks from May to August (a total of 311.6 mm received over this period on average) (**Figure 3.1**).

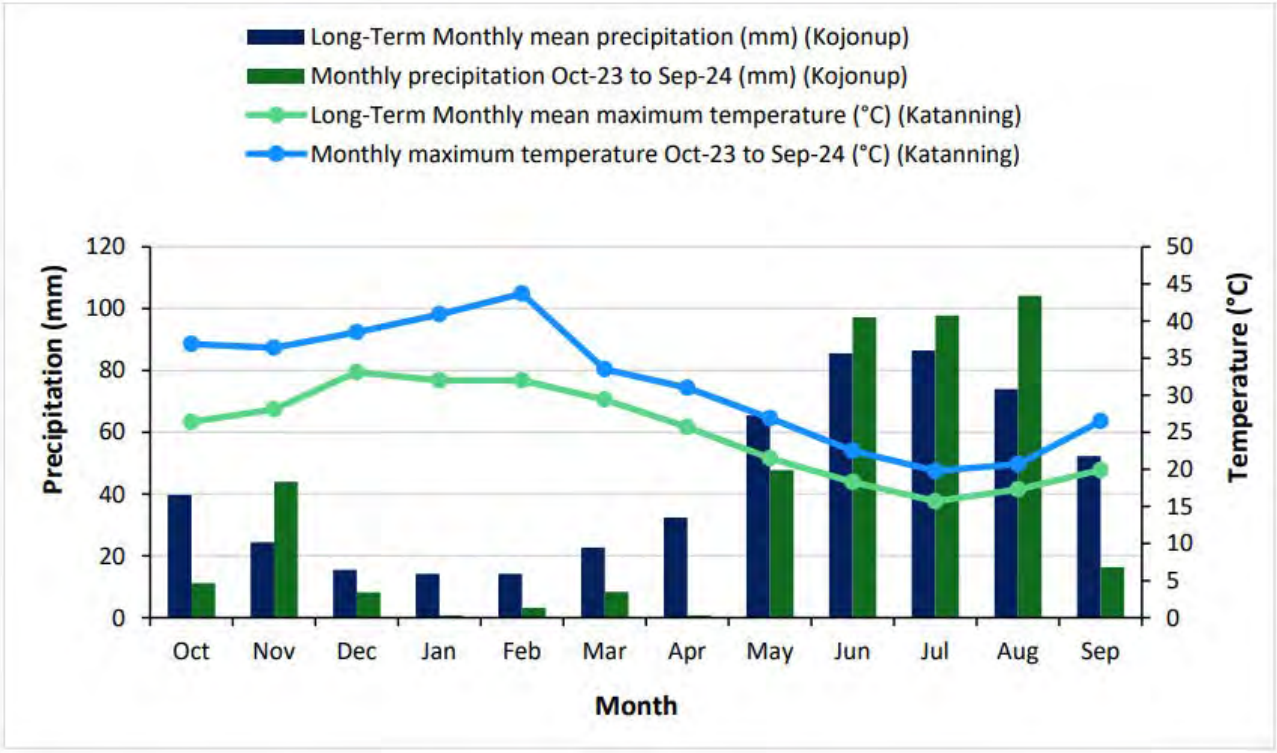


Figure 3.1 Climate Statistics for Katanning (Station 10916) and Kojonup (Station 10582)

3.4 Topography

The Project Area comprises gently undulating topography that generally falls toward the north, with elevations ranging from approximately 290 mAHD to 330 mAHD as interpreted from 2 m contour mapping and a 1 m resolution Digital Elevation Model (DEM) (Water Technology, 2026).

4.0 Potential Impacts and Mitigations

Potential impacts and appropriate mitigations during construction and operations have been assessed through a range of studies. This provides an initial assessment of risks and potential impacts from the Project and will form the basis for a Construction Environmental Management Plan (CEMP) which will be developed and implemented for the Project.

The following sections provide a summary of the studies completed, potential impacts, and proposed mitigations during construction and operations. Further details are provided in **Appendix A** to **Appendix G.**

4.1 Hydrology

4.1.1 Supporting Studies

A hydrological assessment was undertaken for the Project which included hydrologic and hydraulic modelling to characterise surface water conditions. Detailed methods and results are provided in the Hydrological Assessment report (**Appendix A**) by Water Technology (2026).

4.1.2 Receiving Environment

The Project is located within a predominantly agricultural catchment characterised by gently undulating topography and shallow overland flow paths. Surface water runoff across the site generally flows north towards Collie-Changerup Road and ultimately drains to Kojonup Brook (Murchison River system). Flooding behaviour within the Project is driven primarily by local catchment runoff rather than riverine flooding.

Hydrological modelling indicates that flooding across the Project Area is typically shallow and characterised by sheet flow, with limited defined drainage channels. The modelled flood hazard is predominantly classified as H1, representing a relatively low-risk flood zone that is generally safe for vehicles, people and buildings during flood events and is suitable for BESS development.

Localised areas of deeper water are predicted where ponding occurs behind road embankments and where more channelised flow paths concentrate, including at locations where existing flow paths have been culverted under Collie-Changerup Road. While these areas have a higher hazard rating than the surrounding sheet flow, the calculated hazard remains low overall, and it is anticipated the deeper, localised inundation can be traversed by vehicle.

The Proponent has consulted with the DWER regarding the licensing requirements for the proposed BESS. Based on DWER advice, the site is located within a ‘non-proclaimed’ area for groundwater and, as such, no water licensing is required under the *Rights in Water and Irrigation Act 1914* for groundwater abstraction.

4.1.3 Potential Impacts

The hydrological assessment has identified the following potential impacts prior to mitigation and management:

- Minor changes to existing surface water flow paths due to ground disturbance, cut and fill activities, and the placement of infrastructure within areas subject to shallow overland sheet flow.
- Localised afflux and changes in flood behaviour where infrastructure intersects natural drainage pathways or existing road drainage infrastructure, including culverts along Collie-Changerup Road.
- Increased runoff and modified drainage patterns resulting from the introduction of compacted or impervious surfaces, with a corresponding risk of erosion along preferential flow paths if not appropriately managed.
- Localised areas of higher flood hazard (H4–H5) associated with defined flow paths, which may constrain the placement of sensitive infrastructure and require avoidance or mitigation through detailed design.
- Temporary impacts to water quality during construction, including increased sediment mobilisation and the potential for hydrocarbon contamination associated with earthworks and vehicle movements.
- Periodic impacts to site access and egress during larger rainfall events (greater than the 5% AEP); however, modelling indicates flood hazards are generally low and safe access is expected to be maintained via Collie-Changerup Road, Tunney Road and Albany Highway.

4.1.4 Mitigation and Management

Mitigation and management measures have been developed to address the identified hydrological impacts (further detailed in **Appendix A**):

- The Project infrastructure has been sited to avoid natural drainage lines and areas subject to concentrated flow, with development largely confined to areas characterised by shallow sheet flow and low flood hazard.
- To minimise afflux and altered flood behaviour near drainage infrastructure, swales, culverts, and drainage crossings will be designed to maintain existing flow conveyance and hydraulic connectivity, with backflow prevention incorporated where required.
- To address increased runoff and erosion risk from compacted or impervious surfaces, a stormwater management system comprising perimeter swales and an on-site detention basin will intercept and attenuate runoff, ensuring post-development discharge rates are comparable to pre-development conditions.
- To avoid impacts associated with higher flood hazard areas, infrastructure layout and finished design levels will avoid areas modelled as H4–H5 hazard, with sensitive infrastructure designed to remain above predicted 1% AEP flood levels.
- To minimise temporary water quality impacts during construction, erosion and sediment control measures will be implemented through a Construction Environmental Management Plan (CEMP), including management of disturbed areas, stabilisation of exposed surfaces, and appropriate handling of fuels and hazardous substances.
- To manage periodic impacts to site access and egress during larger rainfall events, access routes have been assessed under design flood conditions and will be supported by an Emergency

Management Plan (EMP), and prepared prior to construction, outlining procedures for safe access, monitoring, and response during extreme rainfall events.

4.2 Vegetation and Flora

4.2.1 Supporting Studies

A reconnaissance and targeted flora and vegetation survey was conducted for the Project on 25 and 26 September 2024 to determine the flora, vegetation, and fauna values. The area surveyed included the current Project Area and adjacent areas (**Appendix B**). The surveys have been used to inform Project design and provide suitable information for this environmental assessment report.

4.2.2 Receiving Environment

4.2.2.1 Vegetation Types

The Project is located in the Southern Jarrah Forest (JF2) subregion of the Jarrah Forest Interim Biogeographic Regionalisation of Australia (IBRA) region. The Southern Jarrah Forest subregion is characterised by a warm Mediterranean climate (Hearn et al., 2002) and as such experiences wet, cool winters and hot, dry summers.

Pre-European vegetation mapping (Beard, 1976; Beard et al., 2013, p. 201; Shepherd et al., 2002) identifies one Vegetation System Association (VSA) occurring within the Project: Jingalup_4 (**Table 4.1**). The VSAs comprises jarrah *(Eucalyptus marginata)*, marri *(Corymbia calophylla)* and wandoo *(E. wandoo)* woodlands, representing the dominant association locally.

The current extent, remaining proportion of pre-European vegetation, and conservation protection levels for these VSA are summarised in **Table 4.1**. As of 2019, this VSA has less than 30% pre-European extent remaining within the Southern Jarrah Forest subregion, placing it below the threshold considered adequate for regional retention. Current extent protected for conservation is also low based on the DBCA-Legislated Lands and Waters dataset (DBCA, 2025), which includes Crown reserves and lands managed under Section 8A of the *Conservation and Land Management Act 1984* (WA) with International Union for Conservation of Nature (IUCN) categories I–IV.

Although the vegetation is not formally reserved, its low remaining extent and fragmentation within the region mean that remnant patches contribute to local biodiversity and landscape connectivity within an otherwise highly cleared agricultural setting.

Table 4.1 Vegetation System Associations of the Project Area

VSA	Name and Description	Current Extent[1] (ha)	Pre-European Extent Remaining[1] (%)	Current Extent Protected for Conservation[1] (%)
4	**Jingalup_4** Jarrah, marri and wandoo *Eucalyptus marginata, Corymbia calophylla, E. wandoo*.	35,568.5	21.3	1.08

[1] Data source: DBCA Statewide Vegetation Statistics: Full Report (DBCA, 2019).
[2] Data source: Pre-European Vegetation Mapping (DPIRD, 2019).

Four vegetation types (VTs) were mapped during the field survey, of which two occur in the current Indicative Disturbance Footprint (**Figure 4.1**). VT3 occurs along Tunney Road verge and consists of mixed eucalypt and sheoak woodland with isolated shrubs and pasture grasses. VT2 is present in a small area adjacent to the substation, containing a subset of VT3 species. The remainder of the Indictive Disturbance Footprint is cleared.

Table 4.2 Vegetation Types within Indicative Disturbance Footprint

VT	Description	Extent within Survey Area (ha)	Extent within Indicative Disturbance Footprint (ha)
Native Vegetation			
1	Mid woodland to mid open forest of Eucalyptus wandoo subsp. wandoo usually with *Eucalyptus astringens* subsp. *astringens*, occasionally with *Eucalyptus marginata* subsp. marginata and/or *Corymbia calophylla*, over low isolated clumps of shrubs of *Hibbertia commutata* and *Bossiea eriocarpa*, over low isolated clumps of tussock grasses of *Vulpia bromoides and **Aira cupaniana*, over low isolated clumps of forbs of *Millotia tenuifolia* var. *tenuifolia*, *Trachymene pilosa* and **Romulea rosea*, on slopes with grey sandy loam, and laterite coarse fragments.	22.9 ha (15.1%)	0
2	Mid open woodland of *Allocasuarina huegeliana* over tall shrubland of *Banksia sessilis* var. *sessilis*, over low sparse shrubland of *Styphelia erectifolia, Hibbertia commutata* and *Acacia lasiocarpa* var. *bracteolata* over mid isolated clumps of sedges of *Lepidosperma leptostachyum* over low tussock grassland of **Ehrharta longiflora* and *Neurachne alopecuroidea*, on slopes with brown sandy loam and laterite coarse fragments.	0.5 ha (0.3%)	0.06
3	Mid open woodland of mixed species including *Corymbia calophylla*, *Eucalyptus marginata* subsp. *marginata*, *Eucalyptus wandoo* subsp. *wandoo, Allocasuarina huegeliana* and *Eucalyptus astringens* subsp. *astringens*, over tall isolated clumps of shrubs of *Hakea prostrata* and *Banksia sessilis* var. *sessilis*, over low isolated clumps of shrubs over closed tussock grassland of pasture weeds.	2.9 ha (1.9%)	0
4	Low isolated trees of *Corymbia calophylla* over tall sparse to open shrubland of *Jacksonia sternbergiana* and/or *Allocasuarina huegeliana* over mixed native shrubland, over pasture weeds.	0.8 ha (0.5%)	0.03
Highly Modified Areas			
Cl	Cleared paddocks with isolated paddock trees, includes roads, tracks and infrastructure.	123.1 ha (81.5%)	8.0*
Dm	Artificial dam.	0.3 ha (0.2%)	0
Pn	Mid open woodland of planted trees of *Eucalyptus camaldulensis* over isolated clumps of shrubs to mid open shrubland of remnant native shrubs over tussock grassland of pasture weeds.	0.1 ha (0.01%)	0
Dr	Low to mid isolated trees of unidentified Eucalypts over closed tussock grassland of pasture weeds, located along a drainage line.	0.5 ha (0.3%)	0

*Note that the Project Area was redefined after the VTs were mapped. There is a small area (~0.04 ha) at the northern most aspect of the Survey Area that has not been mapped for VTs. Satellite imagery/site photos confirm that this area entirely bituminised (as part Collie-Changerup Rd) and is therefore considered to be cleared. This 0.04 ha is not reflected in the 8.0 ha presented in the above table.

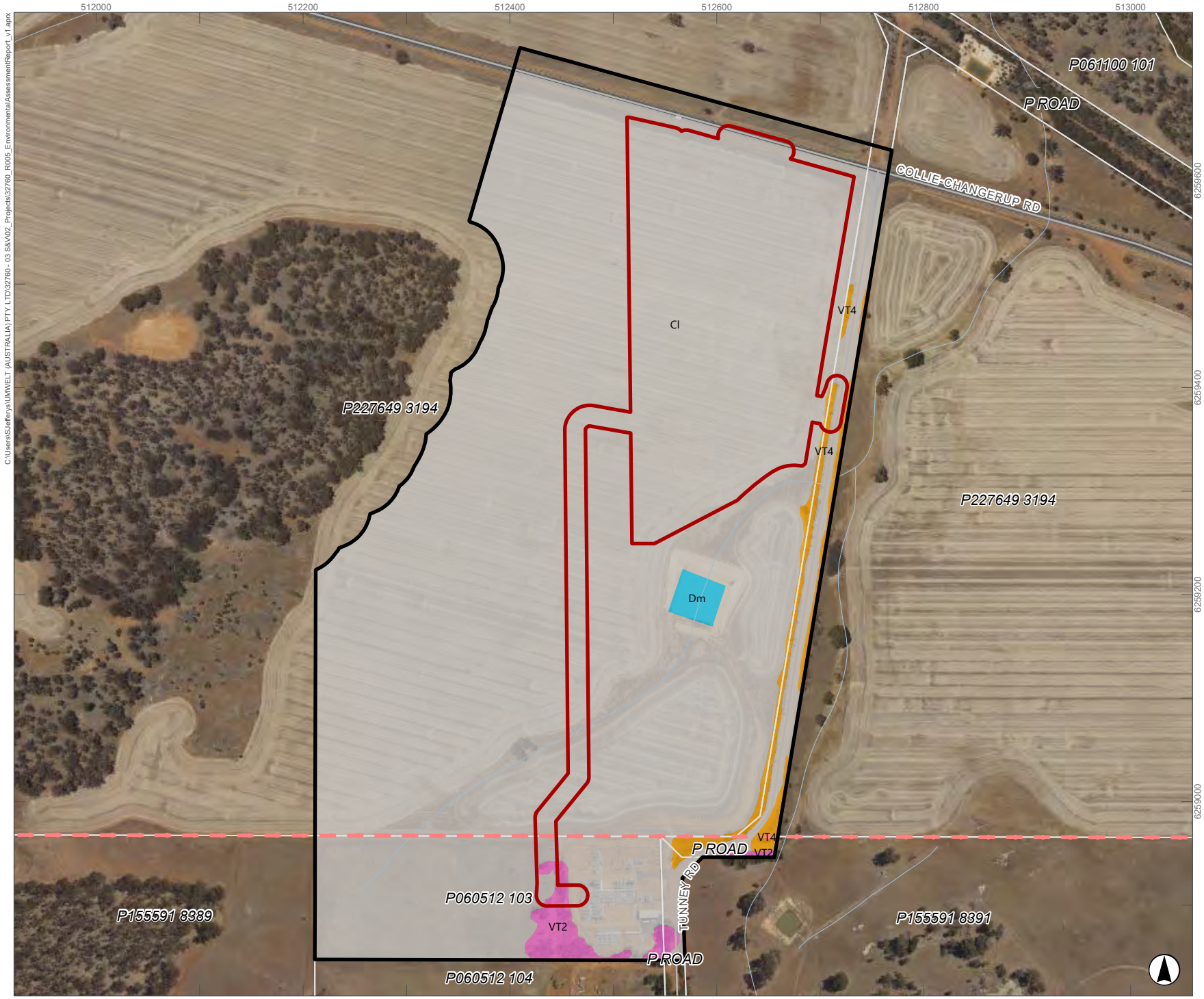


FIGURE 4.1

Vegetation Types in the Project Area

Legend

- Project Area
- Disturbance Footprint
- Kojonup Townsite Boundary
- Road
- Watercourse
- Property Boundary

Vegetation Type

- VT2 Mid open woodland of *Allocasuarina huegeliana* over tall shrubland of *Banksia sessilis* var. *sessilis*, over low sparse shrubland of *Styphelia erectifolia*, *Hibbertia commutata* and *Acacia lasiocarpa* var. *bracteolata* over mid isolated clumps of sedges of *Lepidosperma leptostachyum* over low tussock grassland of **Ehrharta longiflora* and *Neurachne alopecuroidea*, on slopes with brown sandy loam and laterite coarse fragments
- VT4 Low isolated trees of *Corymbia calophylla* over tall sparse to open shrubland of *Jacksonia sternbergiana* and/or *Allocasuarina huegeliana* over mixed native shrubland, over pasture weeds
- CI Cleared paddocks with isolated paddock trees, includes roads, tracks and infrastructure
- Dm Artificial dam

0 100 200 m

Scale 1:5,000 at A4
GDA2020 MGA Zone 50

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Image Source: Landgate (2024) | **Data Source:** Landgate (2022, 2026), Umwelt (2026), Mint (2026)

4.2.2.2 Vegetation Condition

The Project Area vegetation is predominantly mapped as Completely Degraded due to extensive historical clearing and the presence of only isolated remnant trees (**Table 4.3** and **Figure 4.2**). During the survey, areas of vegetation were mapped as Degraded and Good condition, however these are primarily associated with remnant native vegetation that has been avoided by the current Project Area. No areas were recorded in Pristine, Excellent, or Very Good condition.

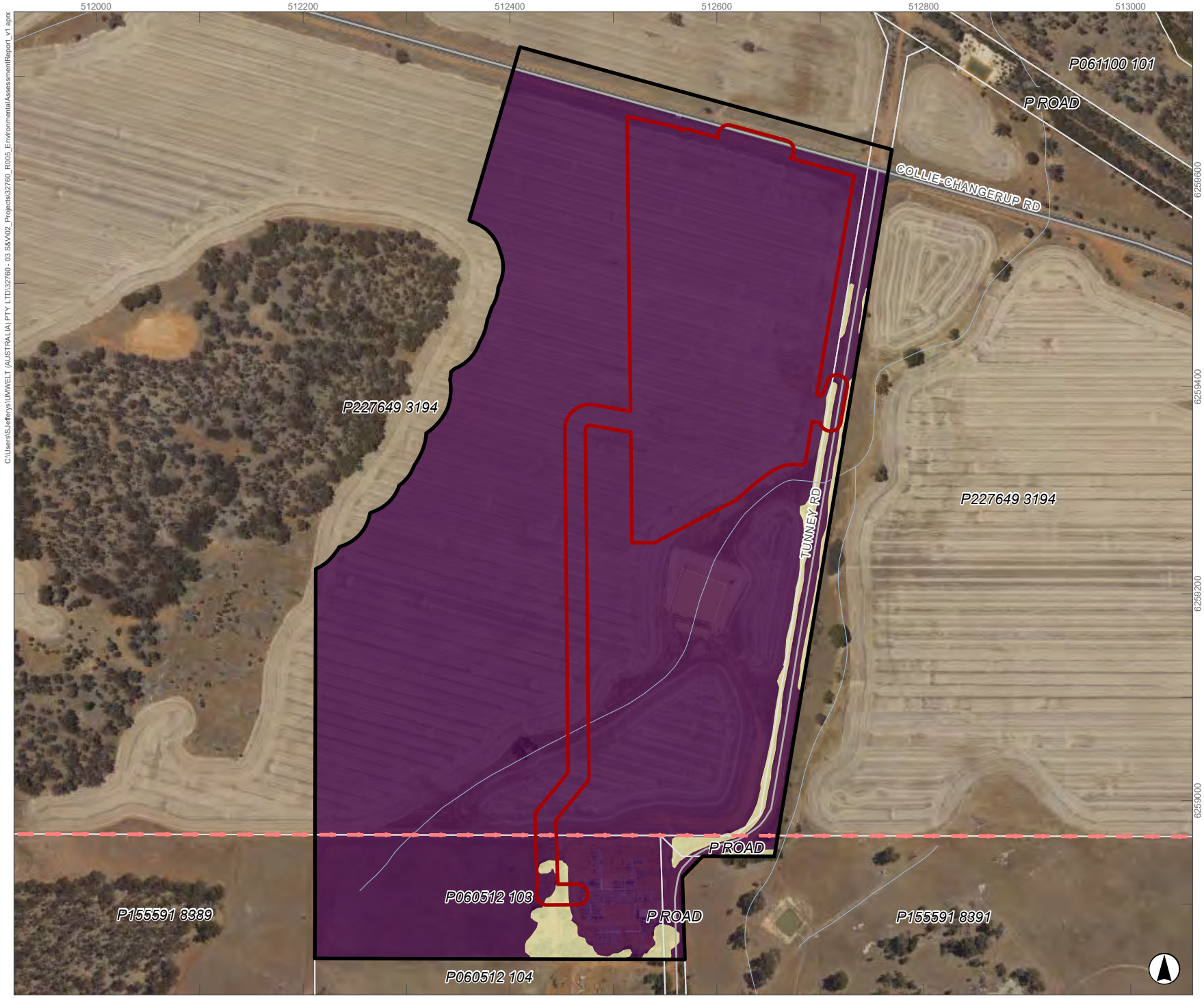
Table 4.3 Vegetation Condition in the Indicative Disturbance Footprint

Vegetation Condition	Extent within Survey Area (ha)	Extent within Indicative Disturbance Footprint (ha)
Good	10.9	0
Degraded	15.5	0.09
Completely Degraded	124.7	8.0*
Total	**151.1**	**8.09**

*This area is equivalent to VT Cl.

FIGURE 4.2

Vegetation Condition in the Project Area



Legend

- Project Area
- Disturbance Footprint
- Kojonup Townsite Boundary
- Road
- Watercourse
- Property Boundary

Vegetation Condition

- Degraded
- Completely Degraded

0 100 200 m

Scale 1:5,000 at A4
GDA2020 MGA Zone 50

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4.2.2.3 Significant Vegetation Communities

Vegetation was assessed against criteria for three significant ecological communities identified during the desktop assessment, two of which were determined to be unlikely to occur due to unsuitable soils and the absence of diagnostic species. One community, the Eucalypt Woodlands of the Western Australian Wheatbelt TEC, was considered likely to occur based on vegetation structure, dominant tree species, and understorey characteristics.

A single patch of vegetation in the Survey Area, corresponding to VT1, was identified as meeting the diagnostic criteria for the TEC. This patch covers approximately 22.8 ha and occurs in a combination of 'Good' and 'Degraded' condition. The TEC patch is located to the west of the Project Area, with a minimum buffer of 40 m applied (**Figure 4.3**). No works or disturbance will occur within this TEC area and will not be cleared as part of the Project. Other vegetation types within the Project Area do not meet the TEC requirements due to condition, understorey composition, or insufficient patch size.

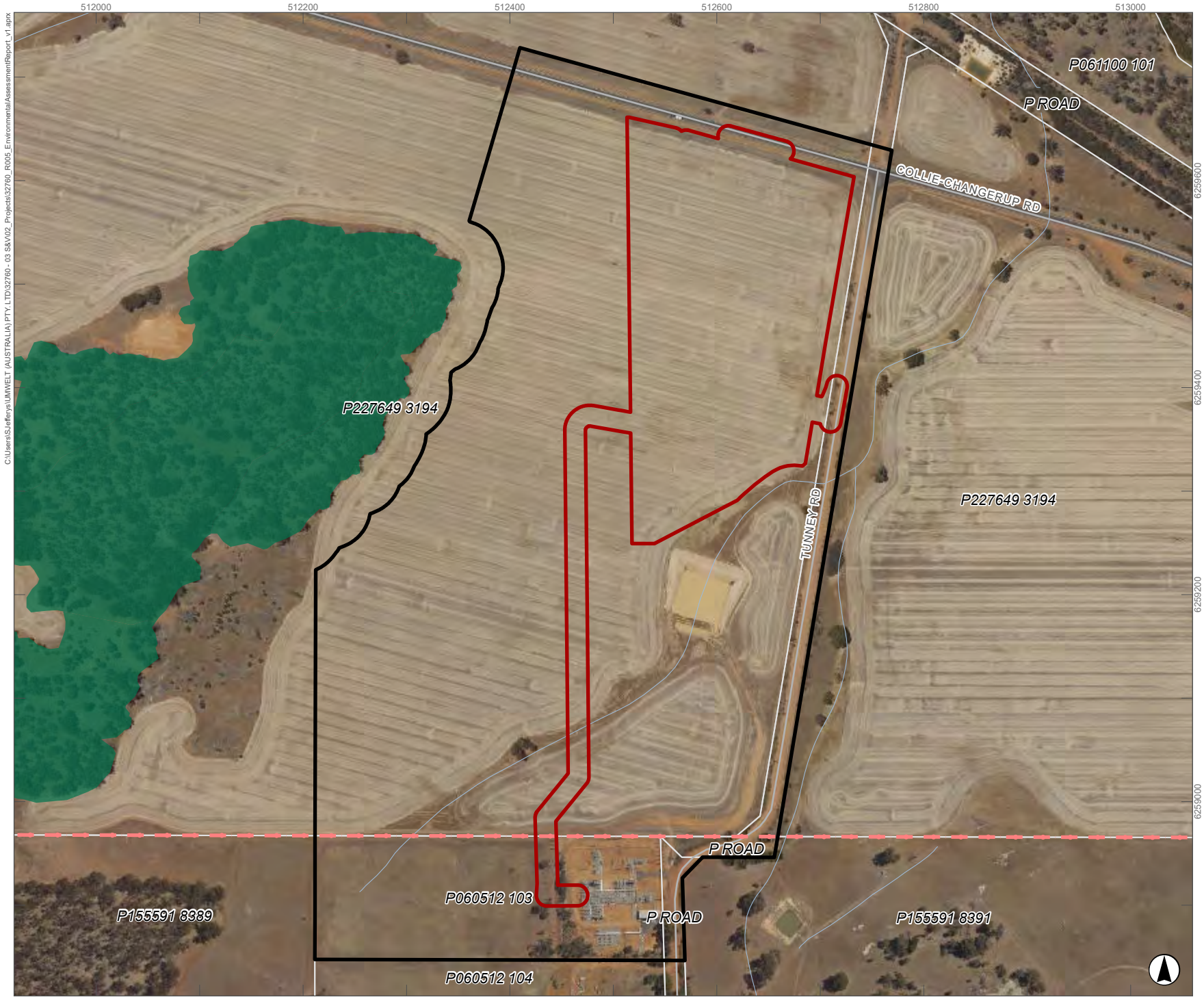


FIGURE 4.3

Eucalyptus Woodlands of the Western Australian Wheatbelt TEC

Legend

- Project Area
- Disturbance Footprint
- Kojonup Townsite Boundary
- Road
- Watercourse
- Property Boundary
- TEC

0 100 200 m

Scale 1:5,000 at A4
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4.2.2.4 Flora

A desktop assessment (including database searches such as DBCA and the Protected Matters Search Tool (PMST)) identified 86 significant flora taxa within 30 km of the Project Area. Of these, 12 taxa were considered potentially occurring in the Survey Area and seven taxa were assessed as possibly occurring based on habitat suitability and proximity of known records (generally within ~5 km). These taxa were all identifiable during the survey period due to either being during the flowering period, or identifiable when sterile.

During the survey (September 2024) a total of 90 vascular flora taxa from 31 plant families were recorded within the Survey Area. The assemblage recorded is consistent with a highly modified agricultural landscape where remnant native vegetation persists as fragmented patches.

No Threatened or priority flora species listed under the BC Act or EPBC Act were recorded during the survey. It was noted that significant flora taxa that are cryptic or small in size may not have been identified during the survey if present (Umwelt, 2024).

No significant flora taxa identified during the desktop assessment were recorded during the field survey.

There were 23 introduced taxa recorded during the reconnaissance survey, representing approximately 28% of the total flora assemblage. Most introduced taxa recorded were common pasture weeds associated with disturbed soils. One Declared Pest species under the *Biosecurity and Agriculture Management Act 2007, Asparagus asparagoides*, was recorded within the Survey Area during survey period.

4.2.3 Potential Impacts

Potential impacts to flora and vegetation values as a result of the Project may include:

- Localised loss of native flora and vegetation within an already highly modified landscape due to clearing, noting the Project Area is mostly cleared.
- Spread of introduced flora species, including the Declared Pest *Asparagus asparagoides*, as a result of ground disturbance and vehicle movement.
- Indirect impacts associated with erosion, sedimentation, contamination, or dust.

4.2.4 Mitigation and Management

Mitigation and management measures have been developed to directly address the identified flora and vegetation impacts and are informed by the Project design and supporting technical studies.

- The Project has been sited and designed to avoid clearing of native vegetation as far as practicable. Infrastructure is preferentially located within previously cleared agricultural land. Remnant native vegetation of higher ecological value within the Project has been excluded from disturbance, with a 40 m buffer (i.e. no-go area) applied to prevent inadvertent impacts.
- The native vegetation clearing of 0.09 ha is the maximum clearing extent at the conceptual design stage to provide construction flexibility. Detailed design will seek to further reduce native vegetation clearing. Additionally, to minimise disturbance to vegetation adjacent to works, clearly defined construction boundaries and no-go areas will be established prior to construction.

- Indirect impacts will be further managed through implementation of CEMP, including measures to control runoff, erosion, and dust generated by construction activities.
- To prevent the spread of introduced flora species, including the Declared Pest *Asparagus asparagoides*, weed hygiene and management measures will be implemented through the CEMP. These will include vehicle and machinery hygiene procedures, management of disturbed soils, and avoidance of unnecessary ground disturbance, particularly in areas supporting native vegetation.

4.3 Terrestrial Fauna

4.3.1 Supporting Studies

Survey methods for terrestrial fauna were developed and implemented based on a combination of desktop assessment and field survey methodologies. Detailed survey and analysis methods can be found in the terrestrial fauna survey report (**Appendix B**).

4.3.2 Receiving Environment

4.3.2.1 Fauna Habitats

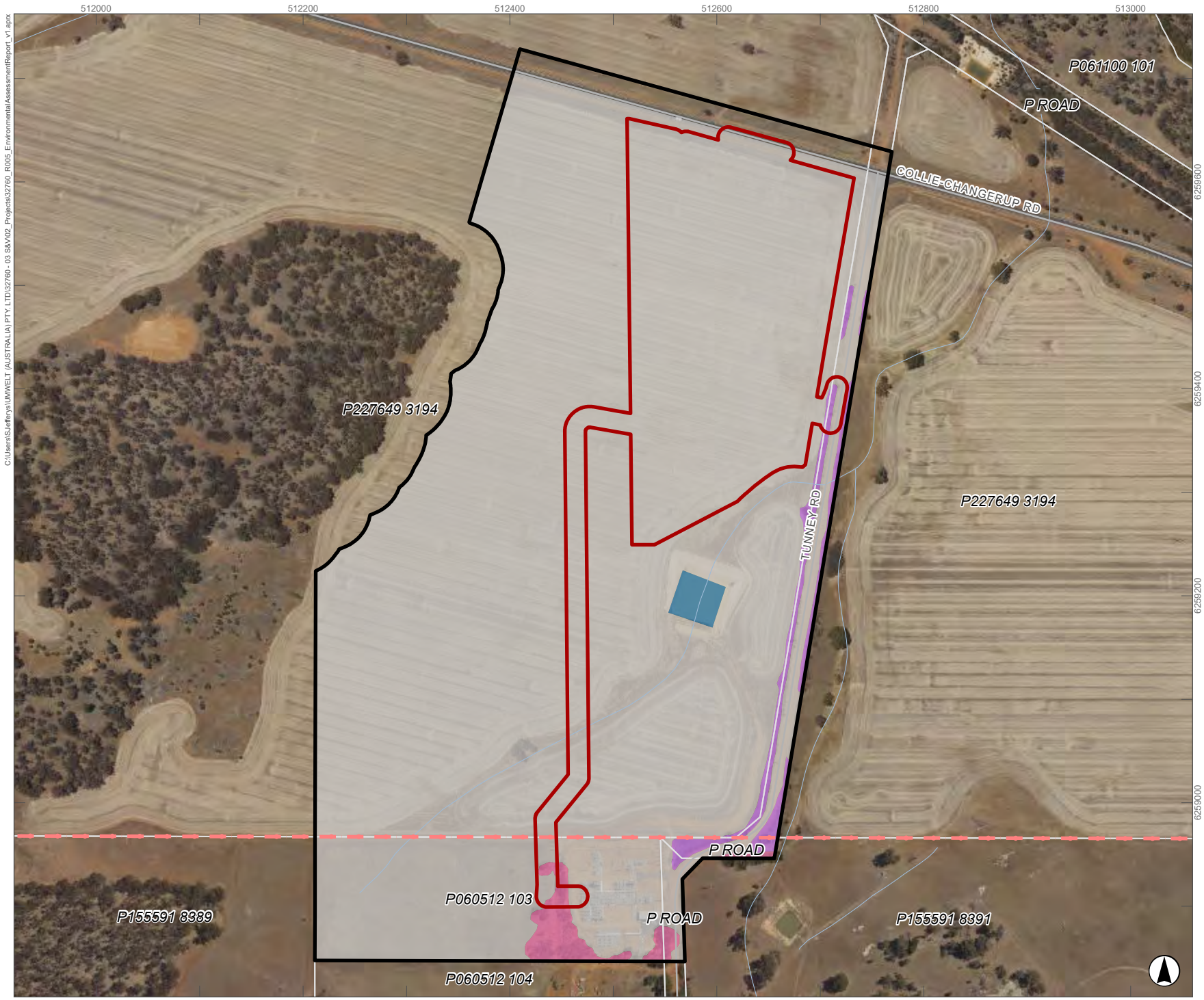
The Survey Area consisted of small, fragmented patches of remnant vegetation, including road verges, surrounded by agricultural land. Six Fauna Habitat Types (FHT) were identified during field investigations; only three of those occur in the Indicative Disturbance Footprint (**Table 4.4** and **Figure 4.4**). Although many remnant patches have been affected by weed invasion and grazing, they continue to provide some habitat value for local fauna. Connectivity across the landscape is limited, with only small remnants available for fauna movement.

Table 4.4 Fauna Habitat Types of the Project Area

Fauna Habitat Type	Associated Vegetation Types	Area (ha) mapped in Survey Area	Area (ha) mapped in Indicative Disturbance Footprint
Eucalyptus Woodland (Ew)	VT1	22.9 ha (15.1%)	0 (0%)
Allocasuarina Woodland (Aw)	VT2	0.5 ha (0.3%)	0.06 (0.7%)
Mixed Woodland (Mw)	Dr, Pn, VT3	3.5 ha (2.3%)	0 (0%)
Mixed Shrubland (Ms)	VT4	0.8 ha (0.5%)	0.03 (0.4%)
Cleared (Cl)	Cl	123.2 ha (81.5%)	8.0* (98.9%)
Artificial Dam (Dm)	Dm	0.3 ha (0.2%)	0 (0%)
Total		**151.2 ha (100%)**	**8.09 ha (100%)**

FIGURE 4.4

Fauna Habitat Types in the Project Area



Legend

- Project Area
- Disturbance Footprint
- Kojonup Townsite Boundary
- Road
- Watercourse
- Property Boundary

Fauna Habitat Type

- Aw Mid open woodland of *Allocasuarina huegeliana* over tall shrubland of *Banksia sessilis* var. *sessilis*, over low sparse shrublands, sedges and grasses, on slopes with brown sandy loam and laterite coarse fragments
- Ms Low isolated trees of *Corymbia calophylla* over tall sparse to open shrubland of *Jacksonia sternbergiana* and/or *Allocasuarina huegeliana* over mixed native shrubland, over pasture weeds
- Cl Cleared paddocks with isolated paddock trees, includes roads, tracks and infrastructure
- Dm Artificial dam

0 100 200 m

Scale 1:5,000 at A4
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4.3.2.2 Fauna of Conservation Significance

Field investigations recorded vertebrate fauna assemblages typical of a highly modified agricultural landscape, with only one conservation-significant species, the Western Rosella *(Platycercus icterotis xanthogenys)* (inland) (EPBC status – N/A, WA status – P4) confirmed during the survey. No additional listed taxa were observed directly or indirectly, despite targeted inspection of suitable habitat features.

A desktop assessment identified other conservation-significant species with the potential to occur within the Project Area. These are discussed below in **Table 4.5** and **Table 4.6**.

Black Cockatoos

A targeted habitat assessment was undertaken during the field survey to evaluate suitability for the three threatened Black-Cockatoo species known from the broader Kojonup region: Forest Red-tailed Black-Cockatoo, Baudin's Black-Cockatoo, and Carnaby's Black-Cockatoo.

The assessment considered breeding habitat availability, foraging resources, roosting potential, watering points, and overall habitat value using both the Bamford (2022) and DCCEEW (2022) habitat assessment frameworks.

No individuals or indirect evidence of Black-Cockatoo use were recorded during field surveys. Nonetheless, habitat attributes indicate the remnant vegetation to the west of the current Project Area may function as secondary habitat within the wider agricultural landscape. A comparative summary of habitat values for each species is provided in **Table 4.5**. The Project Area avoids this area of remnant vegetation.

Table 4.5 Summary of Black-cockatoo Habitat Values Adjacent to Project Area

Attribute	Forest Red-tailed Black-Cockatoo (VU)	Baudin's Black-Cockatoo (EN)	Carnaby's Black-Cockatoo (EN)
Regional occurrence	Known breeding resident in the wider region.	Occurs at eastern edge of range, irregular visitor.	Known seasonal breeding migrant in region.
Likelihood of occurrence in Project Area	Likely.	Possible (irregular).	Likely.
Recorded during survey	Not recorded, no indirect evidence.	Not recorded, no indirect evidence.	Not recorded, no indirect evidence.
Breeding habitat availability	14 potential nest trees meeting DCCEEW criteria present.	14 potential nest trees meeting DCCEEW criteria present.	14 potential nest trees meeting DCCEEW criteria present.
Nest tree quality (Bamford)	Rank 3 potential breeding trees.	Rank 3 potential breeding trees.	Rank 3 potential breeding trees.
Breeding likelihood within site	Possible where hollow-bearing trees occur.	Possible where hollow-bearing trees occur.	Possible where hollow-bearing trees occur.
Foraging habitat availability	Limited preferred food species present as scattered individuals or small patches.	Similar limited availability.	Slightly higher suitability in Allocasuarina/Mixed Woodland patches.
Foraging evidence recorded	None.	None.	None.
Bamford foraging score	Overall FHQS: 2/10 (Low).	Overall FHQS: 2/10 (Low).	Overall FHQS: 2/10 (Low).
DCCEEW foraging value	Negligible-Low (locally Low-Moderate in small patches).	Negligible-Low (locally Low-Moderate in small patches).	Low-Moderate in limited woodland patches.

Attribute	Forest Red-tailed Black-Cockatoo (VU)	Baudin's Black-Cockatoo (EN)	Carnaby's Black-Cockatoo (EN)
Night roosting potential	The Project is unlikely to support roosting; nearest known roost ~1 km south.	The Project is unlikely to support roosting; nearest known roost ~1 km south.	The Project is unlikely to support roosting; nearest known roost ~1 km south.
Water availability	Farm dams may provide opportunistic seasonal watering points.	Farm dams may provide opportunistic seasonal watering points.	Farm dams may provide opportunistic seasonal watering points.

Other Significant Fauna

A small number of additional conservation significant species may occur in and around the Project Area based on habitat characteristics. Although none were recorded during field surveys, habitat structure, connectivity, and disturbance history were used to assess their likelihood of occurrence and the site's ecological function. A summary of these assessments is provided in **Appendix B.**

Table 4.6 Assessment of Other Conservation Significant Fauna Species

Species	Habitat Suitability within Project Area	Evidence Recorded During Survey	Landscape Function of Site	Overall Habitat Value
Peregrine Falcon (*Falco peregrinus*)	Open farmland provides foraging airspace; lacks cliffs or tall nesting structures; occasional hunting habitat only.	None	Transient foraging habitat only	Low
Western Rosella (Inland) (*Platycercus icterotis xanthogenys*)	Woodland remnants provide limited foraging and shelter resources; fragmented habitat reduces suitability.	None	Secondary woodland habitat	Low–Moderate
Chuditch (*Dasyurus geoffroii*)	Highly fragmented landscape with limited dense understorey and hollow logs; lacks core habitat features.	None	Marginal dispersal habitat at best	Low
Red-tailed Phascogale (*Phascogale calura*)	Requires large intact woodland with hollow-bearing trees and complex ground structure; habitat largely cleared.	None	Highly degraded remnant habitat	Low
Western Brush Wallaby	Small woodland/shrubland patches may provide temporary shelter; surrounding clearing reduces persistence potential.	None	Secondary refuge habitat	Low

4.3.3 Potential Impacts

The Project Area is situated within a highly modified agricultural landscape, with fauna habitat largely limited to fragmented patches of remnant vegetation located outside of the Project Area. Therefore, potential impacts to terrestrial fauna are expected to be localised and primarily associated with vegetation clearing and construction activities. These may include:

- Localised loss of degraded fauna habitat resulting from the clearing of vegetation.
- Disturbance to fauna during construction activities, which may result in temporary displacement of individuals from the area.
- Reduction in habitat availability and quality within an already modified and fragmented landscape.

Given the degraded and fragmented nature of the fauna habitat in the Project Area and the limited extent of suitable habitat, impacts to terrestrial fauna are expected to be low, and largely confined to common and widespread species.

4.3.4 Mitigation and Management

Mitigation and management measures have been developed to directly address the identified terrestrial fauna impacts and are informed by the modified nature of the Project design:

- The Project has been designed to avoid the clearing of remnant native vegetation as far as practicable, with infrastructure preferentially located within previously cleared agricultural land.
- Construction activities will be confined to clearly defined work areas and undertaken progressively to limit the extent and duration of disturbance at any one time, reducing temporary displacement of fauna during works.
- Construction activities will be predominantly undertaken during daylight hours, where practicable, and confined to defined work areas to enable fauna to move away from active construction zones. Where excavations or trenches are left open overnight, they will be inspected prior to the commencement of daily works to manage any fauna interactions.
- Vehicle movements and construction activities will be restricted to designated access tracks and work zones, with no-go areas established around retained vegetation to prevent inadvertent disturbance and maintain habitat quality within the already fragmented landscape.
- A Construction Environmental Management Plan (CEMP) will be developed with appropriate measures to minimise indirect impacts to native vegetation adjacent to the Indicative Disturbance Footprint.

4.4 Soils

4.4.1 Receiving Environment

A desktop assessment was undertaken as part of this report to characterise the soil landscape for the Project Area and to understand potential risks arising from Project activities to land capability values (dryland cropping) and soil quality (DPIRD-031).

Soil landscape mapping of WA has been compiled from the results of various surveys across the State by the Department of Agriculture (now the Department of Primary Industries and Regional Development (DPIRD, 2025). The Project Area is mapped within the Southern Zone of Rejuvenated Drainage, characterised by gently undulating rises to low hills with soils formed in colluvial deposits and weathered in-situ material. The Farrar 2 Subsystem soil unit, characterised by undulating rises and low hills with mainly grey deep sandy duplex soils, is mapped within the Indicative Disturbance Footprint (**Appendix B**). These soil types typically support a Wandoo–Jarrah–Marri woodland vegetation complex.

The following soil risk profiles have previously been mapped within the Project Area or surrounding Study Area by DPIRD:

- Ease of excavation: 82% of the larger Study Area are mapped as “<5% of the map unit has a very low to low rating”.
- Land instability: The entire Study Area is mapped as “0% of map unit has a moderate to high hazard”.

- Waterlogging risk: 82% of the Study Area are mapped as ">5% of the map unit has a moderate to very high hazard".
- Acid Sulphate Soil risk: 96% of the Study Area are mapped as "High subsurface acidification susceptibility or presently acid" (DWER-049) (DWER, 2017).
- No registered contaminated sites were identified within the Project Area or within a 10 km buffer (DWER-059) (DWER, 2018).

It should be noted that the legacy DWER-049 dataset was previously used to determine acid sulphate soil risk; however, this dataset has since been retired and is no longer in use for the Project. A review of DPIRD-011 (DBCA, 2025) identified a high susceptibility of subsurface acidification risk for the Project. Soil properties should be assessed as part of the site geotechnical assessment, to determine any potential impacts as related to soil acidification.

4.4.2 Potential Impacts

Potential impacts to soil associated within the Project Area might include:

- Localised loss or temporary disturbance of productive agricultural soils within the Indicative Disturbance Footprint.
- Indirect impacts to soil quality during construction due to erosion, sediment mobilisation, dust generation, or contaminated runoff if not appropriately managed.
- Indirect impacts to soil quality during construction or operation, due to contaminated runoff, dust, or erosion and sedimentation.

The land use within the Project Area is cropping, mapped by (DPIRD-031) (DPIRD, 2025) as:

- "50-70% of the land has moderate to very high capability" (100%)

While the land is of moderate to high quality, the proposed Indicative Disturbance Footprint represents less than 0.004% of this land capability classification within the Kojonup Local Government Area (LGA). Impacts to these soil landscape units are expected to be negligible in comparison their remaining areas mapped within both Kojonup LGA and the region.

4.4.3 Mitigation and Management

It is expected that potential indirect impacts to soils as a result of the Project can be adequately managed through controls included in the CEMP, which may include but are not limited to:

- Reducing risk of contaminated or sediment laden runoff from site during construction and operations through appropriate drainage control and retention basins (as described in **Section 4.1.4**).
- Management, via the CEMP, of any deep excavations or soil disturbance that may expose or interact with acid sulphate soils.
- Storage and handling procedures for any potentially hazardous goods.
- Spill-kits and site procedures in the event of a spill.
- Dust management procedures during construction.

- Minimising impacts to cropping land by confining construction activities, laydown areas, and access tracks to the approved disturbance footprint and avoiding unnecessary disturbance of surrounding paddocks.
- Progressive rehabilitation of temporarily disturbed areas to reinstate ground cover and enable ongoing agricultural use where practicable.

4.5 Heritage

The following section summarises both Indigenous and European heritage values for the Project Area and its surrounds.

4.5.1 Aboriginal Cultural Heritage Due Diligence Assessment

The Project is located within the Gnaala Karla Booja (GKB) and Wagyl Kaip Southern Noongar (WKSN) Indigenous Land Use Agreement (ILUA) areas.

An Aboriginal Cultural Heritage (ACH) Due Diligence Assessment has been undertaken for the Project (Archae-aus, 2026) (**Appendix C**). The assessment was completed in accordance with relevant legislation, including the *Aboriginal Heritage Act 1972 (WA), Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth)* and *Heritage Act 2018 (WA)*.

There are no known Registered Sites or Lodged or Historic Record Places within the Project Area, although there is one Registered Site, three Lodged Places, and one Historic Place within 5 km. The assessment considers that the likelihood of encountering ACH is low in highly disturbed areas but increases to medium or high in minimally altered environments, including native bushland and drainage lines.

The Proponent has lodged a Noongar Standard Heritage Agreement (NSHA) with GKB and WKSN AC.

4.5.1.1 Potential Impacts

Potential impacts to Aboriginal cultural heritage may include:

- Direct disturbance to previously unidentified Aboriginal archaeological or ethnographic heritage values during site preparation and civil works.
- Potential disturbance to subsurface Aboriginal cultural material during excavation, underground cabling, access formation and associated infrastructure installation.
- Elevated risk of impact within remnant vegetation, drainage line areas, and other less disturbed landforms identified in the due diligence assessment as having higher Aboriginal cultural heritage potential.
- Inadvertent disturbance to culturally sensitive areas associated with temporary construction work areas, vehicle movement and ancillary disturbance outside the core infrastructure footprint.

4.5.1.2 Mitigation and Management

Effective management of Aboriginal cultural heritage for the Project will focus on minimising risks to cultural values and ensuring Traditional Owners are actively involved in decision-making processes.

This will be achieved through a staged approach to cultural heritage management implemented prior to and during construction, and integrated into Project design, planning and construction controls.

Further measures will also be implemented prior to and during construction and include the following:

- Archaeological and ethnographic heritage surveys will be undertaken, in liaison with appropriate cultural heritage advisers, in areas of proposed ground disturbance prior to works, with outcomes used to inform avoidance, design refinement, adaptive management or statutory management where required.
- Ground-disturbing activities will only proceed following completion of heritage surveys and in accordance with endorsed heritage management procedures, including unexpected finds protocols and will be responsive to any additional heritage information identified during Project delivery.
- Areas identified as having higher Aboriginal cultural heritage potential will be subject to targeted heritage surveys and, where practicable, avoided through Project design and construction planning.
- Clearly defined work boundaries, no-go areas and construction-phase heritage controls, including Traditional Owner participation where required, will be implemented to minimise the risk of unintentional impacts.

4.5.2 Historic and European Heritage Assessment

Historic and European heritage is protected under the *Heritage Act 2018* (WA), with additional protection applying under the EPBC Act for places of national significance.

No European heritage places listed as MNES under the EPBC Act, or local heritage sites have been identified in the Project Area.

Based on the available information, the Project is considered to have low potential for impacts to known historic or European heritage values.

4.5.2.1 Mitigation and Management

Given the absence of recorded heritage places, no specific mitigation measures are required.

4.6 Amenity

4.6.1 Noise

An Environmental Noise Assessment (**Appendix E**) was undertaken by Sonus (2026) to assess potential noise impacts associated with the Project on surrounding noise sensitive receivers, including nearby rural dwellings.

The assessment considered operational noise, considering proposed battery units (228), inverters (40 with noise reduction kits), transformer (1 x 120 MVA), and cumulative noise from the adjacent existing substation. The baseline conditions were informed by field measurements undertaken in June 2025. Final plant numbers and specifications will be confirmed during detailed design. The noise assessment is based on conservative scenarios and will be reviewed if subsequent design changes

would increase overall sound power levels or introduce new dominant noise sources. Worst-case meteorological conditions and a 5 dB(A) tonal adjustment in accordance with the *Environment Protection (Noise) Regulations 1997* was adopted.

The assessment predicts that cumulative noise levels from the Project and existing substation will comply with applicable regulatory criteria at all nearby dwellings during all time periods.

4.6.1.1 Potential Impacts

Potential noise impacts associated with the Project may include:

- Generation of continuous operational noise from battery units, inverters and transformers during charging and discharge cycles.
- Cumulative increase in ambient noise levels in combination with the adjacent existing substation.
- Tonal noise emissions associated with electrical infrastructure equipment.
- Temporary construction noise impacts during site establishment and installation works.

4.6.1.2 Mitigation and Management

Proposed measures to manage noise impacts include:

- Undertaking a pre-construction environmental noise assessment prior to construction with the final selected equipment and layout to confirm compliance with the applicable operational noise criteria.
- Management of temporary construction noise in accordance with Regulation 13 of the *Environmental Protection (Noise) Regulations 1997* and AS 2436-2010 *Guide to noise and vibration control on construction, maintenance and demolition sites*, including limiting construction to daytime hours.

4.6.2 Land and Visual

A Landscape and Visual Impact Assessment (**Appendix F**) was undertaken by UDLA in April 2026 to assess the potential landscape and visual effects of the Project on the surrounding rural setting, nearby public viewing locations and neighbouring sensitive receptors.

The assessment examined the indicative Project layout, infrastructure scale and height, surrounding landscape character, existing visual context, and potential visibility of the Project within a 2.5 km Project Area. This included Zones of Visual Influence and Zones of Theoretical Visibility modelling, field inspections, photomontage preparation, and viewpoint assessments from representative locations along Collie-Changerup Road and Tunney Road, together with consideration of nearby dwellings and cumulative views associated with the existing Kojonup Substation. The study concluded that the Project would be viewed within an already modified agricultural and electrical infrastructure landscape, with overall visual effects generally assessed as low to negligible from surrounding public viewpoints.

4.6.2.1 Potential Impacts

Potential landscape and visual impacts associated with the Project may include:

- Introduction of additional built electrical infrastructure into views from surrounding local roads, particularly Collie-Changerup Road and Tunney Road, where breaks in vegetation and open agricultural sightlines occur.
- Cumulative increase in the visibility of utility infrastructure where the proposed BESS is viewed in conjunction with the existing Kojonup Substation, transmission lines, and associated above-ground electrical assets.
- Localised change to the visual character of the cleared agricultural landscape through the addition of containerised battery units, onsite substation infrastructure, security fencing, and lightning protection rods.
- Partial visibility of Project infrastructure from nearby sensitive receptors where direct sightlines toward the Project footprint are available.
- Temporary visual disturbance associated with construction compounds, equipment laydown areas, and construction activity during the establishment phase.

4.6.2.2 Mitigation and Management

Landscape and visual impacts associated with the Project will be managed through the following measures:

- The location of the proposed BESS, adjacent to the existing Kojonup Substation and transmission lines, has been considered so that the development is visually read as an expansion of an established electrical infrastructure setting rather than a standalone feature within the rural landscape
- Installation of a 5 m wide vegetated landscape buffer along the northern, eastern, and western boundaries of the BESS footprint to provide layered visual screening of battery units, fencing, and associated infrastructure from surrounding road corridors and nearby receptors.
- Installation of a reduced 3 m wide planting buffer along sections of the southern boundary adjoining the onsite substation and along the diagonal eastern connection between the substation and BESS footprint, balancing visual softening with operational access, defensible space, and maintenance requirements.
- Finalisation of planting species, density, and detailed landscape treatments during detailed design to maximise long-term screening effectiveness. Landscape screening will prioritise the use of local native species consistent with the surrounding landscape character. Planting design and species selection will be undertaken in accordance with applicable bushfire protection requirements, including asset protection zone and defendable space considerations, and in liaison with relevant authorities. The exact composition, layout, and planting design will be confirmed post-approval during detailed design.
- Removal and rehabilitation of temporary construction compounds, laydown areas, and ancillary disturbance areas following completion of construction to minimise residual visual disturbance associated with construction activities.

4.6.3 Traffic and Transport

A Transport Impact Assessment (TIA) was prepared by Flyt (2026) to support the Development Application (**Appendix G**). The assessment was undertaken in accordance with the WA Planning Commission's Transport Impact Assessment Guidelines.

During construction, traffic will include light vehicles associated with the construction workforce and heavy vehicles delivering materials and equipment. Light vehicle traffic will largely reflect workforce needs, with up to 174 daily trips based on a peak construction crew of approximately 87 personnel. Heavy vehicle movements will vary by construction stage, ranging from occasional trips (e.g. fuel and waste) to more frequent daily movements during peak civil, electrical, and installation works. Approximately 168 heavy vehicle trips are expected during the BESS installation stage, with construction traffic spread across approximately 55 weeks.

The surrounding road network, including Collie-Changerup Road (Regional Distributor) and Tunney Road (Access Road), were assessed as suitable to accommodate the proposed construction and operational traffic, including heavy vehicles, and is not expected to experience a material change in capacity or safety conditions. During construction, some Project-related traffic may also access the existing Kojonup Substation via Tunney Road, consistent with existing access arrangements.

4.6.3.1 Potential Impacts

Potential impacts to traffic and transport associated with the Project are primarily related to construction-phase vehicle movements and the use of the existing rural road network:

- Increase in light and heavy vehicle movements during construction, with traffic volumes varying depending on the stage of works.
- Generation of construction traffic associated with workforce access and delivery of materials and equipment, including heavy vehicles.
- Increased turning movements at the proposed access points on Collie-Changerup Road and Tunney Road.
- Interaction between Project-related traffic and existing rural traffic on surrounding roads.
- Occasional oversized overmass (OSOM) vehicle movements requiring permits and specific traffic management measures.
- Road safety considerations associated with vehicle access to a high-speed rural road network, including sight distance requirements.

4.6.3.2 Mitigation and Management

Traffic and transport impacts associated with the Project will be managed through appropriate access design and compliance with relevant regulatory requirements**:**

- Project access intersections have been incorporated into the site design to accommodate safe turning movements from both Collie-Changerup Road and Tunney Road. The design has been developed to accommodate safe turning movements without requiring significant modification to the surrounding road network.

- Swept path analysis relates to the design verification of infrequent construction heavy vehicles only and does not represent routine day-to-day traffic movements throughout the life of the Project.
- Site access points will be designed in accordance with Main Roads WA and Shire of Kojonup standards, including provision for safe vehicle movements and adequate sight distances.
- A Traffic Management Plan (TMP) will establish safe working parameters at the site access during construction. The TMP will:
    - A Traffic Management Plan will need to be completed by the Transport Operator associated with the Project, with relevant permits and requirements covered through Main Roads WA.
    - Cover all construction periods for the site and any other agreed periods as required by Main Roads WA.
    - Provide recommendations for site-based safety measures, such as temporary reduction in speed limits on Collie-Changerup Road, signage on approach to the site access, and manual management of specific movements if required.
    - Address other safety related measures as nominated by Main Roads WA or the Shire of Kojonup.
- Heavy vehicle access and routes will be undertaken in accordance with the approved Restricted Access Vehicle (RAV) network and relevant permitting requirements.
- Temporary laydown areas, construction compounds, site offices, workforce parking, and materials storage areas will be contained within the approved disturbance footprint. These areas have been considered in the Project layout and will be managed and monitored through CEMP to ensure safe and orderly site operations during construction.

5.0 Conclusions

This EAR has been prepared to support the Development Application for the Kojonup BESS. It draws on the supporting technical studies and identifies the key environmental constraints, potential impacts, and the mitigation and management measures required for construction and operation.

The Project is located within a highly modified agricultural landscape. The indicative design largely avoids remnant native vegetation; however, minor clearing of degraded native vegetation may be required (up to approximately 0.09 ha), subject to detailed design, and any required approvals.

Hydrological investigations indicate the Project Area is subject primarily to shallow overland sheet flow during larger rainfall events, with flooding hazards predominantly classified as low; stormwater and flood mitigation measures will be incorporated into detailed design to avoid significant off-site impacts.

Surveys and assessments indicate that the Project is not expected to result in significant impacts to flora, vegetation, or terrestrial fauna. No Threatened or Priority flora species were recorded during the September 2024 survey, and the Project Footprint has been designed to avoid the Eucalyptus Woodlands of the Western Australian Wheatbelt Threatened Ecological Community. Fauna habitat within the Project Area is highly degraded and fragmented, and impacts are expected to be localised and low.

A desktop soil assessment indicates that the Project is located within land of moderate to high agricultural capability. However, impacts to soils will be limited to the small indicative disturbance footprint and are expected to be negligible at a local and regional scale. Potential soil risks, including erosion, contamination, and acidification, can be effectively managed through standard construction controls.

No registered Aboriginal heritage sites are located within the Project Area; however, areas of remnant vegetation and drainage features have the potential to contain previously unrecorded heritage, and further archaeological and ethnographic surveys and consultation will be completed prior to ground-disturbing works in accordance with statutory requirements.

Operational noise from the BESS, in combination with the existing Kojonup Substation, is predicted to comply with the applicable criteria under the *Environmental Protection (Noise) Regulations 1997*. Visual impacts are anticipated to be low to negligible within the existing electrical infrastructure context, with landscape screening to be finalised during detailed design (subject to bushfire requirements). Construction traffic would be temporary and managed through detailed access design, permitting (where required) and implementation of a Traffic Management Plan.

Overall, the Project is considered capable of being developed and operated with a low likelihood of unacceptable environmental impacts.

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Appendix A

Hydrological Assessment



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Appendix B

Reconnaissance and Targeted Flora and Vegetation Survey and Basic Terrestrial Fauna Survey

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Appendix C

Aboriginal Cultural Heritage Briefing Note

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Appendix D

Stakeholder and Community Engagement Plan and Consultation Summary



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Appendix E

Environmental Noise Assessment



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Appendix F

Landscape Visual Impact Assessment



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Appendix G

Transport Impact Assessment



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Kojonup BESS

Stakeholder and Community Engagement Plan

16 April 2026



Kojonup BESS

Stakeholder and Community Engagement Plan

Revision: 3

Date: 16 April 2026

Document History

Revision	Date	Description	Author	Review	Approved
1	19/12/2024	First draft of SCEP	Amy Billing	Cara Layton	Cara Layton
2	30/10/2025	Updates to SCEP following October consultation	Amy Billing	Cara Layton	Cara Layton
3	16/4/2026	Updates to SCEP to include consultation summary	Amy Billing	Cara Layton	Cara Layton

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1. Background

Mint Renewables Pty Ltd (the Proponent) is committed to engaging respectfully with the communities in which they plan and operate their projects, to be sensitive to environmental and cultural values and to make a positive contribution to the regions in which they will operate.

The Proponent aims to be long-term members of the communities they invest in. There is a lot of uncertainty in development, and the Proponent believe in maintaining transparency with stakeholders as they navigate those uncertainties.

The Proponent is proposing to develop a Battery Energy Storage System (BESS) located 3 km north west of Kojonup next to the existing Kojonup Substation in the Great Southern region of Western Australia.

The Kojonup BESS is strategically located near the Kojonup Substation, located off Tunney Road, to enhance grid reliability in the Great Southern Region while reducing the need for additional transmission infrastructure. The site offers suitable cleared land and proximity to the Albany Highway, minimising environmental and construction impacts.

The Project is in the **Development phase**, and the Proponent have completed a comprehensive planning and environmental assessment process to ensure the Project's impacts are minimised and managed during construction and operations. Table 1 below provides a summary of key Project attributes.

Table 1: Project Summary

Location	Kojonup
LGA(s)	Shire of Kojonup
Technology	Battery Energy Storage System (BESS)
Indicative Capacity / Size	Up to 800 MWh
Project Phase	Development
Primary Approvals Process(es)	*Planning and Development Act 2005* (P&D Act)

1.1. Purpose of the Plan

The purpose of this Stakeholder and Community Engagement Plan (the Plan) is to guide stakeholder engagement for the Kojonup BESS. It sets out how the team will:

- establish channels for local conversations and information sharing with Traditional Owners, First Nations Peoples, landholders and communities
- inform key stakeholders, neighbours and community about the proposed Project and opportunities for participation
- encourage participation and seek input at appropriate points in the Project development process, to identify potential issues or areas of concerns, obtain local insight, and gain feedback on measures to address concerns
- use and respond to public input to inform design.

The approach to engagement aligns with the Proponents values, centred around being "Partners for Good", including:

- integrity in action
- a Mint team to depend on
- we care about what we do and how we do it.

The Plan is intended to be a 'live' document and will be updated where necessary throughout the life cycle of the Project, capturing activities undertaken to date and reviewing their effectiveness in achieving the objectives of the Plan. It will be updated at key milestones to ensure engagement activities are tailored to the Project's needs.

The Proponent is a signatory to the Clean Energy Council's Best Practice Charter for Renewable Energy Developments (**here**).

1.2. Consultation Undertaken to Date

Consultation undertaken to date for the proposed Kojonup Battery Energy Storage System (BESS) has included neighbour door knocking, pop-up sessions, community drop-in sessions, meetings with stakeholders, and an online community survey.

The Project's engagement program commenced publicly in September 2025. The Project notified nearby neighbours of the proposal by door knock, issued letters and offered one-on-one meetings. This activity was followed by establishing a dedicated website (www.kojonupbess.com.au), and two pop-ups located outside the Kojonup IGA, on Albany Highway. The first edition of the community newsletter was distributed during the pop-up, made available in the Kojonup Library, Australia Post - Kojonup LPO and the Kojonup Community Resource Centre, on the Project website and emailed to e-newsletter subscribers.

In late October 2025, the Project held three community drop-ins on Friday 24 and Saturday 25 October at the Kojonup RSL Hall. The drop-in sessions were advertised and promoted across a broad range of channels. The Project launched a community survey to gather local insights on the environment, heritage, water and bushfire history, traffic, communication, and benefit sharing opportunities. The survey remained open until early 2026. In November, the Project undertook another round of neighbour outreach, offering one-on-one meetings and door knocked adjoining properties.

Feedback received through these activities has informed an understanding of local values, sensitivities, concerns, and expectations relevant to the Project's design, assessment and management.

2. Context

2.1. Project Location

The Project Area is located approximately 3 km north-west of Kojonup, next to the existing Kojonup Substation. Kojonup is a rural town in Western Australia's Great Southern region, 256 km south-east of Perth and 160 km from Albany. It is located in state electorate of Roe and the Federal Division of O'Connor.

The Project Area is accessible from the north via Collie-Kojonup Road or from the east via Tunney Road. The closest non-associated dwellings are approximately 700 metres from the Project infrastructure.

The Noongar people are the Traditional Owners and inhabitants of Kojonup.

The Project Area is within the Gnaala Karla Booja Indigenous Land Use Area (ILUA), administered by Gnaala Karla Booja Aboriginal Corporation (GKB AC), and the Wagyl Kaip & Southern Noongar ILUA, administered by Wagyl Kaip Southern Aboriginal Corporation (WKSN AC).

The surrounding area is made up of a combination of lifestyle blocks, and agricultural land. The Myrtle Benn Flora & Fauna Sanctuary, a walking trail that is home to many native orchids and wildflowers mainly seen during Spring, is located 1.6 km north west of the Project.



Figure 1: Project Location

2.2. Community Profile

Kojonup is a rural town in Western Australia's Great Southern region. The name "Kojonup" is derived from the Noongar word "Kodja," meaning stone axe, reflecting the area's Indigenous heritage. The Noongar people are the traditional owners and inhabitants of Kojonup.

The town's European history dates back to 1837 when surveyor Alfred Hillman, guided by local Aboriginal people, identified the freshwater spring that made Kojonup a vital stopover for travellers. By 1845, a military barracks was established as an outpost for the British Military; this building still stands today as part of the Kojonup Historical Society Pioneer Museum.

According to the 2021 Census, the Shire of Kojonup has a population of approximately 1,901 residents, with a median age of 45 years. The community is predominantly Australian-born, with 87.7% born in Australia, and a significant portion identifying with English and Australian ancestry. Aboriginal and/or Torres Strait Islander people comprise about 5.2% of the population, reflecting the area's rich Aboriginal heritage. The local economy is largely driven by agriculture, particularly wool and grain production. Kojonup is located in state electorate of Roe and the Federal Division of O'Connor.

An analysis of the Shire of Kojonup's Strategic Community Plan (July 2023–June 2033) highlights key aspirations for the region: reversing population decline, sustaining essential services (education, health, retail, accommodation, and road maintenance) and strengthening economic development. The plan also emphasises cultural vitality through improved streetscapes, community events, arts, and heritage initiatives.

Telecommunications black spots, critical for bushfire communications, remain a priority for advocacy. The Shire has a strong volunteering culture, with 81% of residents giving time in some capacity. Separately, the region hosts more than 40 sporting and community clubs. Limited accommodation may constrain future project construction and should be factored into project planning. Together, these elements reflect deep community pride in local spirit, culture, and place.

3. Communication and Engagement Framework

3.1. Objectives

The objectives of the engagement strategy for the Project are to:

- build strong connections with the community, including host landowners, neighbours, Traditional Owners and the wider community
- set clear expectations for the community to build trust in the process and acceptance or understanding of the Project
- provide opportunities for the community and stakeholders to ask questions, provide feedback and ideas and participate in decision-making
- provide timely responses and feedback to the community's concerns and use this feedback to positively influence the development of the Project where possible
- build a deeper understanding within the community of the potential benefits and impacts of the Project and how these will be managed
- ensure that there are opportunities to share the benefits of the Project with the host landowners and neighbours, Traditional Owners, and the local and regional community
- uphold the Proponents commitment to the Clean Energy Council Best Practice Charter.

Figure 2 below outlines key engagement activities through the development phases of the Project.

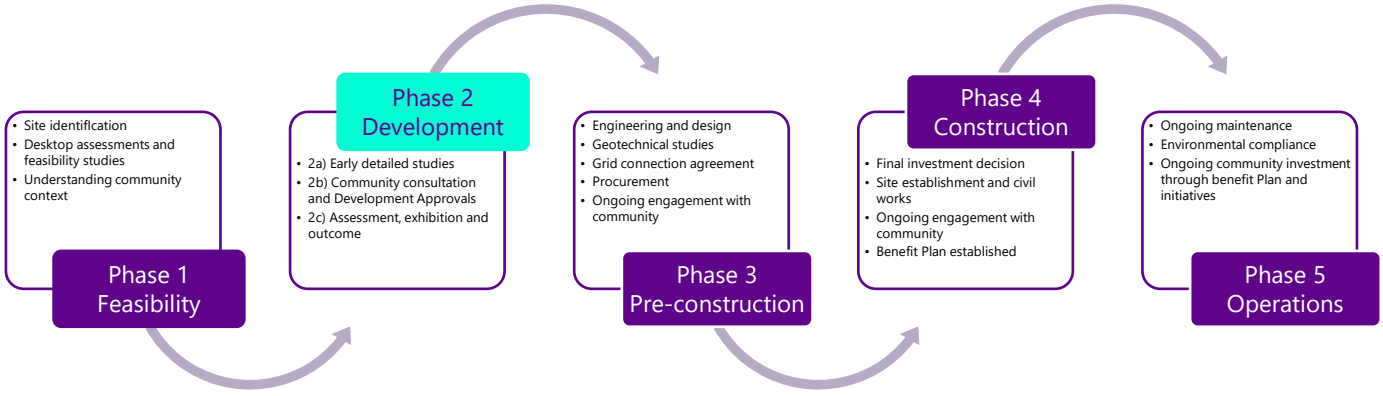


Figure 2: Project Development Phases

3.2. Relevant Legislation and Best Practices

This Plan has been developed with awareness and consideration of the following legislation requirements and best practice guidance:

- IAP2 Core Values and Public Participation Spectrum
- Clean Energy Council – Best Practice Charter for Renewable Energy Developments

- Clean Energy Council – Best Practice Guidelines for Implementation of Wind Energy Projects in Australia, 2018
- Clean Energy Council – A Guide to Benefit Sharing Options for Renewable Energy Projects, 2019
- Clean Energy Council and KPMG – Leading Practice Principles: First Nations and Renewable Energy Projects, 2024
- Department of Environment Land Water and Planning – Community Engagement and Benefit Sharing in Renewable Energy Development, A Guide for Renewable Energy Developers, VIC 2021
- Department of Planning, Housing and Infrastructure – Undertaking Engagement Guidelines for State Significant Projects, NSW, 2024
- Department of Climate Change, Energy, the Environment and Water (DCCEEW) – The First Nations Clean Energy Strategy 2024-2030, 2024
- Department of Planning, Lands and Heritage – Guide to Best Practice Planning Engagement in Western Australia.
- Department of Energy and Economic Diversification – Community Benefits Guideline for Large-scale Renewable Energy Projects, WA, 2026

Consideration of new or updated guidelines or specific jurisdictional or project-based engagement requirements will be part of this Plan review process.

3.3. IAP2 Spectrum

> The International Association for Public Participation (IAP2) defines public participation as the involvement of those affected by a decision in the decision-making process. IAP2's core values of public participation include promoting sustainable decisions by recognising the interests of all decision-makers, actively facilitating the involvement of those potentially affected by or interested in a decision, providing participants the information they need to participate in a meaningful way, and communicating to participants how their input affected the decision. (*Source: IAP2 Federation*)

The IAP2 Spectrum is a best practice and internationally recognised tool for planning public participation. It includes different levels of public participation, ranging from:

Inform – to provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions

Consult – to obtain public feedback on analysis, alternatives and/or decisions

Involve – to work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered

Collaborate – to partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution

Empower – to place final decision making in the heads of the public

3.4. Communications and Consultation Approach

The Proponent strives to be active and caring neighbours, dedicated stewards of the environment, and create meaningful, lasting benefits for the broader community. The Proponent is committed to positive engagement practices and ongoing engagement throughout all stages of a project's life – from site selection through to decommissioning.

The Proponent is committed to engaging respectfully with the communities in which they plan and operate their projects, to be sensitive to environmental and cultural values and to make a positive contribution to the regions in which they will operate.

The Proponent aims to be long-term members of the communities they invest in. There is a lot of uncertainty in development, and the Proponent believe in maintaining transparency with stakeholders as they navigate those uncertainties.

Project planning will involve complex decisions that require consideration of a broad range of issues. The Proponent will seek to build genuine, trust-based relationships with communities and stakeholders to enable constructive discussion and exploration of these complexities and achieve mutual understanding and beneficial outcomes.

3.5. Guiding Principles

The Proponents communication and engagement approach is guided by the principles listed in Table 2 below.

Table 2: Guiding Principles of Engagement

Principle	What this means for the current phase
Be transparent, responsive and accountable	• Ensure there is a dedicated Proponent representative for the community throughout the Project. • Respond to issues, no matter how large or small. • Be respectful and honest in all interactions. • Behave in accordance with the Proponents values. • Take ownership of issues that arise, particularly those that could have an impact on communities or stakeholders. • Explain how and why decisions are being made and how input is used to inform decisions. • Establish respectful relationships with community and First Nations Peoples, through identification of rights-holders, obtaining Free, Prior and Informed Consent, and building capacity for local communities. • Deliver on commitments made to the community – effective record-keeping and documentation will help achieve this.
Spend time talking with people	• Be available to communities and stakeholders to have conversations and share project information and updates. • Ensure ongoing and regular communication, particularly when development activities slow down. • Listen with an open mind. • Be open and honest about considerations, impacts and opportunities. • Provide access to senior team members and technical specialists.
Reduce the 'don't knows'	• Be first to inform key stakeholders and the community about the Project, its context, risks and benefits, and other relevant information.

Principle	What this means for the current phase
	• Explain formal environmental approvals and assessment process in plain language. • Share information about environmental assessments, what has been found, what it means and how information will be used to inform project designs and planning. • Share information that allows people with an interest to provide informed feedback.
Provide effective channels for feedback and input	• Use a range of communication methods to reach different audiences through their preferred channels. • Periodic targeted feedback to the community on key achievements and deliverables. • Seek feedback on the Proponents communication and consultation approach and make any necessary adjustments in response to feedback. • Communicate in plain English and accessible formats. • Use established local networks and groups to keep people informed. • Be flexible about how and when the Proponent accepts feedback so that timely input can shape the Project to achieve beneficial outcomes.
Partner with the community	• Look for opportunities to involve the community, e.g. employ locals where possible, engage with the community on project planning, use local accommodation, and buy food and beverages locally. • Ensure sponsorships or financial investments in the community are in the long-term interest of that community and have community support. • Facilitate knowledge sharing where possible, e.g. land management and caring for the Country between stakeholders, project proponents and First Nations peoples.

3.6. How Feedback will be Used

Community and stakeholder feedback will inform various aspects of the Project development (including relevant environmental assessments and approvals), construction, operations and how the Proponent engage and share the benefits. How feedback will be used is outlined in Table 3 below.

Table 3: How Feeback will be Used

Project Stage	How feedback will be used
Feasibility	• Inform indicative design. • Considered in location of infrastructure. • Enhances the Proponents understanding of the local community.
Development	• Enhances the Proponents understanding of the local environment, potential issues and opportunities.

Pre-construction	• Considered in preparing environmental assessments, approval applications, and developing management and mitigation measures. • Informs communication and consultation approach.
	• Considered in developing management plans. • Considered in construction methodology, timing and impact mitigation. • Informs key themes and options for aligned, proportionate and sustainable Benefit Sharing Plan.
Construction	• Informs communication and consultation approach. • Continuous improvement (including construction, ongoing communications and Benefit Sharing Plan).
Operations (including Benefit Sharing Plan)	• Ongoing maintenance and environmental compliance. • Involves and, where appropriate, empowers the community in the operation of the Benefit Sharing Plan.

The Proponent will be clear about which aspects of the Project can be shaped by community feedback, when and why it seeks input, and how it will be used.

When it is impossible to incorporate community or stakeholder preferences, the reasons will be clearly explained, and the rationale and decision-making process will be shared.

4. Traditional Owners and First Nations Peoples

The Noongar people are the Traditional Owners (TOs) of the land on which the Project is located. The Project Area lies within the Gnaala Karla Booja Indigenous Land Use Area (ILUA), administered by Gnaala Karla Booja Aboriginal Corporation (GKB AC), as well as the Wagyl Kaip & Southern Noongar ILUA, administered by Wagyl Kaip Southern Noongar Aboriginal Corporation (WKSN AC).

As part of the development phase of the Project, the Proponent will prepare an Aboriginal Cultural Heritage Due Diligence Assessment (ACHDDA) that will identify key cultural heritage matters and risks, the nature of the activity and the likelihood of causing harm to Aboriginal cultural heritage.

The Proponent looks forward to understanding the ways in which the Project might benefit or support goals of the local Noongar community and are committed to developing the Project in a way that supports the identification and preservation of any cultural artefacts, and is sensitive to any cultural significance of the site.

As the clean energy transition continues it is imperative that the industry, including the Proponent, build meaningful, and mutually beneficial relationships with TOs and First Nations peoples of the lands on which renewable energy and storage projects will be developed. TOs and First Nations peoples play a central role in and should benefit from Australia's renewable energy transition. Equally, it is essential the transition to renewable energy occurs fairly.

As stated in the Proponents Environment, Social and Governance (ESG) Policy (November 2025), the Proponent is committed to balancing business growth and performance with the protection and enhancement of the environment, as well as promoting the well-being of our people and communities. Of relevance to engagement with TOs and First Nations Peoples, the Proponent is committed to:

- ensure they engage meaningfully with TOs and First Nations Peoples to develop long-term relationships
- foster strong relationships with stakeholders to ensure respect for diverse views, the environment, and lasting community benefits
- collaborate with communities to provide economic, social, and employment benefits, including local procurement, training, and community development programs.

The Proponent takes a partnership approach to engaging with TOs and will seek involvement on a range of topics beyond Cultural Heritage, such as native title, project design, construction and procurement.

The Proponent has developed a First Nations Engagement Strategy (2024) that outlines their approach to engagement with TOs and First Nations Peoples, including those on which the Proponents projects are proposed. The First Nations Engagement Strategy has been prepared in consideration of the Leading Practice Principles: First Nations and Renewable Energy Projects (2024) developed by the Clean Energy Council (CEC) in collaboration with the First Nations Clean Energy Network. The Guide outlines industry expectations and is the most current and trusted resource produced by the peak industry body.

Key Principles of the First Nations Engagement Strategy

1. Engage respectfully
2. Prioritise clear, accessible and accurate information
3. Ensure cultural heritage is preserved and protected
4. Protect Country and environment
5. Be a good neighbour
6. Ensure economic benefits are shared
7. Provide social benefits for community
8. Embed land stewardship
9. Ensure cultural competency
10. Implement, monitor and report back

The Proponents strategy includes project and corporate based actions. For each project, at minimum, the Proponent will:

- conduct an Aboriginal and Cultural Heritage Desktop Assessment
- develop a First Nations Benefit Sharing Plan within the broader project Benefit Sharing Plan.

The Proponent acknowledges that no two projects are the same, and the level of engagement and benefit sharing will vary from project to project.

5. Stakeholders

The following broad types of stakeholders may have an interest in the Project:

- Federal and State Government Ministers and Members of Parliament
- Government agencies
- Regulators
- Local government
- First Nations peoples
- Host landholders
- Neighbours
- Community members
- Emergency services
- Environmental, recreational and community groups
- Local business
- Utility/Infrastructure services
- Industry and corporate representatives
- Education providers
- Local supply chain
- Contractors and suppliers
- Hard to reach and vulnerable members of the community
- Media outlets.

5.1. Hard to Reach and Vulnerable Groups

The Proponent will work with local government and other service providers to identify relevant individuals, groups and those who support them. The best approach for engagement will be determined on a case-by-case basis.

6. Key Messages

Key messages provide clear and consistent information about the Project, environmental approval processes and opportunities for public involvement. This plan will be refined as needed to incorporate updated messages as the Project progresses. Table 4 below outlines company key messages.

Table 4: The Company Key Messages

Topic	Message
Who Are We	• Mint Renewables was established in late 2022 in response to the enormous challenges and opportunities of Australia's energy transition. • Two of the most successful long-term investors in the Australian renewable energy sector, Infratil and CSC, have brought together a team of deeply experienced renewables players to create a project developer based in Melbourne, with a fresh approach and a national focus. • We bring a fresh approach to transforming the future of energy by developing, constructing and operating large-scale renewable energy and storage projects.
Our Mission	• At Mint Renewables, our mission is to develop, build and operate renewable energy and storage projects and generate clean energy for our partners.
Local Partners	• We form long-term partnerships with the communities in which we develop and operate. • We strive to be active and caring neighbours, dedicated stewards of the environment, and create meaningful, lasting benefits for the broader community. • We know that engagement with key stakeholders, landholders, neighbours, First Nations peoples, communities, and local authorities, is important to the success of our projects. • We believe in open, honest, and authentic engagement. We work hard to develop strong relationships to ensure we become valued members of the communities in which we invest and operate. • Our projects will bring inherent economic and social benefits to our communities, through direct payments to landowners and neighbours who are participating in the Project, local procurement and employment, and a boost in spending within the local and regional area.
About the Project	• Mint is proposing to develop the Kojonup Battery Energy Storage System (BESS) located 3 km north west of Kojonup next to the existing Kojonup Substation off Tunney Road in the Great Southern region of Western Australia. • Battery Energy Storage Systems, or BESS are safe technology that stores energy in rechargeable batteries for use when it is needed most. It acts like a large-scale version of the batteries in our phones, or laptops, but it's designed for large-scale grid energy storage. • BESS provide the ability to store energy, so that excess energy produced during periods of low demand or high output (e.g., from variable sources such as wind or

Topic	Message
	solar) can be stored for use during periods when there might otherwise be a shortfall in supply. • The Kojonup BESS could have an indicative capacity of up to 800 megawatt hour (MWh) (e.g. 100 MW 8 hour system) and an indicative permanent footprint of approximately 4 hectares. The final size and layout of the Project will depend on the environmental considerations, grid requirements, the selected BESS model, and feedback from stakeholders.
Development	• Mint has been fortunate to partner with a local landholder, and we are currently proposing to develop a BESS on their land, located 3 km north west of Kojonup, next to the existing Kojonup Substation. • Development of a BESS undergoes a comprehensive planning and environmental assessment process to ensure the Project's impacts are minimised and managed during construction and operations. This process also involves engaging with the community to understand local concerns and incorporate them into the development of the Project. • We will continue to engage with the Shire, landowners, neighbours, First Nations peoples and surrounding communities as early as possible, keeping people informed and involved.
Community	• We know that for our projects to be successful, we must work closely with our stakeholders, including landholders, project neighbours, First Nations peoples and the broader community. • Feedback is an essential part of project development. • We know that locals have important insights and knowledge about the land they live on, and we plan to listen to and learn from local voices. • Feedback will help us understand the local context, inform the Project's design and construction, guide how we communicate, and help identify meaningful ways to share benefits with the community.
Benefits	• We know that our Project will bring inherent economic and social benefits to the Kojonup community, through a boost to the local economy, local businesses and jobs during construction and operations. • In addition to creating opportunities for local workers, the Project will bring benefits to other industries, including accommodation providers, cafés, and restaurants. Mint is committed to employing local people, sourcing locally wherever possible, and engaging local service providers. • We will also develop other ways to share benefits of the Project, informed by engagement with stakeholders throughout the development phases of the Project. • As an initial benefit sharing commitment, we are committed to contributing a minimum of $150 per megawatt per year in community benefits from the commencement of operations.

Topic	Message
	• This is intended as a starting point only and represents the minimum commitment. The final approach to benefits will be shaped by feedback from the community and a clear understanding of local priorities, project constraints, and potential impacts.
Jobs	• Mint is committed to employing local people and buying local wherever possible. • During the operation of the BESS, employment is generally limited to inspection and maintenance activities by the BESS operator. • A Goods and Services Register has been set up for the project. The Goods and Services Register is an opportunity for businesses and interested people to register their interest in supplying goods and services for the Project. • For a project of this size, it could include around 110 direct construction jobs.

7. Communications and Engagement Tools

Table 5 outlines the engagement tools available to the Project. The Proponent will select appropriate tools for use at different phases, depending on the stakeholders, communication and engagement purposes of the Project.

Table 5: Communications & Engagement Tools

Tool	Description	Engagement Level
Stakeholder Meetings, Briefings, Workshops and Site Tours	• Briefings provide information about the Project and updates at key milestones. • Meetings and workshops will be held to address and seek input on specific matters from individuals, groups and organisations with local or specialist knowledge. • Briefings, meetings and workshops may be held in person or via video conference. • Meeting agendas will be developed, and feedback will be captured and included in an engagement register and Stakeholder Management System.	Inform, consult, involve
Media	• Local media will be utilised proactively at key times/milestones throughout the Project to provide Project information and updates.	Inform
Website – Project Webpage	• The dedicated Project webpage provides a central location for information about the Project	Inform
Personalised Letters	• Letters to stakeholders, agencies, MPs and government (as identified).	Inform
Printed and Electronic Newsletters	• Newsletters provide project updates and information about how to get involved. • Print newsletters will be sent to residents across the Project area (where requested), available and displayed in local shops, libraries and other public spaces where possible. • Regular e-newsletters will be distributed to subscribers.	Inform
Advertisements and Local Media	• Ads in local papers to notify of drop-in information sessions through the public notice period or other key notifications. • Ads on local radio stations to notify of drop-in information sessions and provide Project updates as required. • Advertisements, news coverage and interviews in local newspapers, radio and TV channels and on digital news and social media channels will be used to reach a broad audience across the region.	Inform

Tool	Description	Engagement Level
Social Media	• Use of social media platforms if appropriate and catered to local context. • Mint's LinkedIn may be used to communicate key project milestones to a corporate / industry audience.	Inform
Information Materials (flyers, fact sheets)	• A suite of project information materials to be available on the Project website and in hard copy at events and information sessions. • Hard copy information packs sent via post upon request and to those nominated to receive updates by mail. • Materials will be updated regularly as the Project development and environmental assessments progress.	Inform
Posters and Signage	• Posters and signs in local communities, such as community notice boards, will be used to share information with a local audience and raise awareness of the Project, site investigations and opportunities to participate.	Inform
Maps and Visuals	• Maps and other visual aids such as diagrams, renders, photographs and illustrations will be used to show the Project location, components, appearance and processes. • Interactive maps and online renders may be considered to support consultation if appropriate for the community and audience.	Inform, consult
Video	• Videos will be used to communicate information in an engaging and accessible way for a broad audience and shared with the media, posted on social media (LinkedIn), the Project website and used in presentations to stakeholder and community groups.	Inform
Community Drop-in Sessions	• Drop-in information sessions held over a day or multiple days to allow for attendance by interested community members and stakeholders. • Sessions to be advertised across several mediums to provide strong awareness of these opportunities for engagement.	Inform, consult, involve
Community Group Presentations	• Presentations will be given to community groups interested in the Project to share information and promote opportunities to get involved. • Community presentations may be held in person or via video conference. • Opportunities for feedback and input will be considered and included where practical to do so.	Inform, consult

Tool	Description	Engagement Level
Local Festivals, Events and Information Displays	• The Project's participation in local events will provide an opportunity for informal engagement and information sharing to raise awareness of the Project and opportunities to participate.	Inform, consult
Community Surveys and Feedback Forms	• Surveys and forms will be used to collect data and feedback at information sessions and community meetings/briefings.	Consult
School Engagement	• Engagement with local schools will be undertaken where possible to involve young people in discussions about the Project and energy future. School engagements may be undertaken online or in person.	Inform
Goods and Services Register	• Details of interested parties to be provided to contractors engaged (or selected as preferred). Available via the Project website.	Inform
Telephone, Email and Online	• Community enquiries are received via email and 1800 HI MINT (1800 446 468).	Inform, consult
Q&A Enquiries	• All enquiries are recorded in Mint's Stakeholder Management System.	Inform

8. Benefit Sharing

The Project will have inherent benefits through a boost to the local and regional economy and local businesses and jobs during construction and operations. The Proponent will also look to develop other ways to share the Project's benefits, informed by engagement with stakeholders throughout the Project's development phases.

An analysis of the Shire of Kojonup's Strategic Community Plan (July 2023–June 2033) highlights key aspirations for the region: reversing population decline, sustaining essential services (education, health, retail, accommodation, and road maintenance) and strengthening economic development. The plan also emphasises cultural vitality through improved streetscapes, community events, arts, and heritage initiatives.

Telecommunications black spots, critical for bushfire communications, remain a priority for advocacy. The Shire has a strong volunteering culture, with 81% of residents giving time in some capacity. Separately, the region hosts more than 40 sporting and community clubs. Limited accommodation may constrain future construction phases and should be factored into project planning. Together, these elements reflect deep community pride in local spirit, culture, and place.

To build on these insights, the Proponent aim to validate these themes and priorities through direct engagement with the community and stakeholders. This process will allow the Proponent to align the benefit sharing approach with the unique challenges and opportunities identified, while also addressing any additional concerns or priorities that emerge during our engagement.

As an initial benefit sharing commitment, the Proponent has committed to contributing a minimum of $150 per megawatt per year in community benefits from the commencement of operations. This is intended as a starting point only and represents the minimum commitment. The final approach to benefits will be shaped by feedback from the community and a clear understanding of local priorities, Project constraints, and potential impacts.

In developing its approach, the Proponent intends to align with the recently released *Community Benefits Guideline for Large-scale Renewable Energy Projects in the South West Interconnected System*, issued by the Department of Energy and Economic Diversification. The Guideline provides a best-practice framework to support fair, transparent and locally led community benefit arrangements and will guide the development of benefit sharing principles, governance arrangements and engagement processes for the Project.

Under the Guideline, the Western Australian Government has set recommended community benefit contribution levels for large-scale renewable energy projects. The Proponents minimum commitment of $150 per megawatt per year is above the recommended minimum contribution level applicable under the Guideline for BESS projects, demonstrating their commitment to meaningful and proportionate benefit sharing with the host community.

Consistent with the Guideline, the Proponent will:

- engage with the local community, local government and relevant Traditional Owners to help identify local priorities for benefit sharing
- develop a Benefit Sharing Plan prior to construction, setting out how community benefits will be directed, governed and reported on
- ensure benefit arrangements are transparent, equitable and proportionate to the scale and impacts of the Project
- focus on benefits that deliver enduring social, economic and community outcomes for the region.

The Benefit Sharing Plan will be implemented during construction and operations. During the development phase, the Proponent will also consider ad hoc sponsorship of local initiatives and events, where appropriate.

Specifically, the Proponent plans to utilise benefit sharing to:

- ensure that the immediate community directly benefits from the presence of the Project in their community, including sharing benefits with local TOs and First Nations peoples
- contribute to broader public benefits and economic development that address the needs of the region
- build on strategic opportunities to drive local innovation
- create a legacy beyond the immediate benefits of the Project.

8.1.1. Other Programs

Potential other benefit sharing opportunities that will be explored include (but are not limited to):

- scholarships with local educational institutes targeted at local students and STEM or environmental courses
- educational site visits during operations for school groups with an interest in electrical engineering or renewables
- school or university visits by Project staff to talk about the Project and careers within the renewables industry.

8.2. Sponsorship

The Proponent will also consider ad hoc sponsorship of local initiatives and events, particularly during the 'Development' phase of the Project. Sponsorships will be considered on a case-by-case basis in line with the Proponents Benefit Sharing and Sponsorships Procedure, including consideration of the sponsorship opportunity's ability to support the needs of the community and promote the visibility of the Proponent and the Project.

8.3. Employment, Goods and Services

The Proponent is committed to employing local people and buying local wherever possible. Goods and Services Registers are set up for each of Proponents projects.

The purpose of the register is to provide an avenue for interested parties to register their interest in providing goods and services to the Project. While the Proponent will not undertake much of the procurement and hiring, the Goods and Services Register will be provided to the Proponents delivery partners and contractors (and their sub-contractors).

Additionally, the Proponent will work with these partners to develop a local content and employment strategy. This will include exploring opportunities to target TO and First Nation peoples' participation in the Project, such as engaging with First Nations businesses and directly employing TOs and First Nations peoples. Where they have opted in, interested parties are added to the newsletter subscription so they can be kept up to date with the Project's progress.

8.4. Jobs

For a project of this size, it could include around 110 direct construction jobs.

The Kojonup BESS Project will provide benefits through a boost to the local and regional economy, local businesses, and jobs during construction. Typical jobs created during construction include:

Electrical	Civil and mechanical	Substation
Electricians Trade Assistants	Civil Labourers Concreters Dump Truck Operators Excavator Operators Foremen / Supervisors Forklift & Telehandler Operators	Administration Staff Equipment Maintenance Technicians Crane Operators

Electrical	Civil and mechanical	Substation
	General Labourers Grader Operators Loader Operators Mechanical Fitters Roller Operators Trade Assistants Truck Drivers / Operators	

In addition to creating opportunities for local workers, the Project will bring benefits to other industries, including accommodation providers, cafés, and restaurants. The Proponent is committed to employing local people, sourcing locally wherever possible, and engaging local service providers.

9. Complaints and Enquiries Management Procedure

9.1. Guiding Principles

Acknowledge

The Proponent acknowledge receipt within two business days of receiving an enquiry or complaint.

Record

The Proponent record the personal details of the enquirer/complainant and the details of the enquiry or complaint and assign a reference number. Personal information will be recorded in accordance the Proponents Privacy Policy.

Review

The Proponent undertake an initial review of the enquiry or complaint, determine who is best placed to help respond and determine what additional information or documentation may be required to complete an investigation. The Proponent may need to contact the enquirer or complainant to clarify details or request further information.

Resolve and communicate

Within 7 business days of receiving an enquiry or complaint, the Proponent will endeavour to investigate it objectively and impartially and close or resolve it. If the Proponent is not able to close or resolve the enquiry or complaint within 7 business days, they will provide an update to the enquirer or complainant and provide regular updates on the status of the outstanding enquiry or complaint.

Take action

Where appropriate, the Proponent amend their business practices, procedures, or policies.

9.2. Complaints

A good complaint handling process can address potential issues before they escalate, help the Proponent to understand its stakeholders, provide insights and better resolutions for complainants, enhance the organisation's reputation and strengthen trust.

Complaints not handled correctly can incur significant cost through reputational damage or fines, loss of trust and missed opportunities to improve the way that the Proponent conducts its business.

A high-quality complaint management process is expected by all stakeholders, including regulatory bodies, investors, customers and the communities in which the Proponent operates.

All complaints will be managed in accordance with the Proponents Complaints Handling Procedure, available on the Mint Renewables website (www.mintrenewables.com/esg).

This procedure outlines how the Proponent will receive and handle complaints and has been prepared in accordance with Australian Standard 10002:2022 – Guidelines for complaint management in organizations (AS 10002:2022).

All enquiries and complaints will be recorded in the Proponents Stakeholder Relationship Management System.

Additionally, a project-specific Complaints Management Plan will be prepared prior to construction, in line with the Proponents Complaints Handling Procedure and to capture any project specific obligations or commitments.

9.3. Media Engagement

The Proponent is a growing company operating in an increasingly complex stakeholder, media and social media environment.

The media are key stakeholders and a critical channel for the organisation. They frame the Proponents work for the public and across all key stakeholder groups. The media helps shape perceptions that can help achieve the Proponents strategic objectives.

The Proponent is proud of their story and want to empower their people to work effectively with the media to tell that story.

All media engagement for the Project will be in accordance with the Proponents Media Policy. The Proponents Media Engagement Procedure provides additional guidance on the approach and process to traditional media engagement.

The policy and procedure apply to all contractors and employees performing activities for the Proponent.

9.4. Privacy

The Proponent is committed to protecting the privacy of all individuals by applicable privacy and data protection laws. The Proponents Privacy Policy (available on the Mint Renewables website: www.mintrenewables.com/esg) sets out their policy on collecting, holding, using and disclosing, or otherwise handling personal information.

All data collected from stakeholders (e.g. through engagement activities, Goods and Services Register, complaints etc.) will be collected, handled, stored/secured and shared in accordance with this policy.

10. Indicative Engagement Program

Planned communication and consultation activities are shown in Table 6 below. This Plan will be reviewed regularly and updated as needed. Action Plans for each phase of the Project will be developed closer to the time and attached to this Plan as an appendix. The dates shown in Table 6 below are indicative and subject to change based on progression of border development activities of the Project.

Table 6: Indicative Engagement Program

Phase	Communication and consultation	
	Purpose	**Activities**
Phase 1 Feasibility **2024**	• Build relationships with host landholder • Stakeholder mapping and engagement strategy development	• Host landholder engagement • Early engagement with regulators/agencies
Phase 2 Development **Phase 2a** **Early detailed studies** **Early - late 2025**	• Build awareness and understanding of the Project, and the next steps • Share information about specialist studies being undertaken • Build awareness about the development and approvals process • Explain how to get involved in consultation and encourage participation • Gather information and local knowledge to inform site investigations and Project development • Identify consultation and communication preferences • Communicate procurement opportunities and promote the Goods and Service Register • Assure the community that this is a 'first step' in the process	• Establish a dedicated project page on the Mint website • Newsletter (print and e-newsletter) • Stakeholder letters • Host landholder engagement • Outreach to near neighbours • Commence engagement with TOs • Preliminary information materials and maps • Broad engagement with regulators/agencies • Media statements and local media outreach
Phase 2b **Approvals and Community Consultation** **Late 2025 – early 2026**	• Provide information about the approvals process and encourage participation • Explain how feedback influences the Project • Obtain feedback on specific matters to inform the Project (design refinement, mitigation, how we engage, benefit sharing) • Involve communities and stakeholders in discussions to understand issues, identifying suitable mitigations thoroughly	• As above, plus: • Outreach to community • Advertisements (print) • Signage / posters on community noticeboards and other identified public spaces • Community drop-in sessions • Stakeholder meetings/workshops • Community surveys and feedback forms

Phase	Communication and consultation	
	Purpose	**Activities**
	• Identify and implement improvements to the consultation approach	
Phase 2c **Assessment, Exhibition and Outcome** **Early 2026 - TBC** **WE ARE HERE**	• Share consultation report and/or explain how feedback has shaped the Project and informed mitigation / DA • Communicate the public exhibition/notice period for the development application and explain how to make a submission • Share the outcome of the development application. • Communicate Project next steps	• Newsletter (print and e-newsletter) • Stakeholder letters • Formal public notice (as directed by the regulator) • Outreach to host landholders, near neighbours and community • Media release and local media outreach • Advertisements (print)
Phase 3 **Pre-construction** **TBC**	• Work with local communities and stakeholders to identify and mitigate local impacts • Work with impacted landholders and neighbours to ensure impacts are minimised where possible • Communicate procurement opportunities and promote the Goods and Service Register • Share and explain the final project design and how community input has been incorporated • Outline the impacts expected during construction	• As above, plus: • Neighbour engagement (as required) • Contractor days • Community drop-in session (as required) • Schools' engagement
Phase 4 **Construction** **TBC**	• Work with local communities and stakeholders to identify and mitigate local impacts • Work with host landholders and neighbours to ensure impacts are minimised where possible • Provide regular project updates • Communicate Benefit Sharing Plan updates	• Newsletter (print and e-newsletter) • Construction updates • Stakeholder letters • Host landholder engagement • Neighbour engagement • School engagement • Benefit sharing program/s commence (as required)
Phase 5 **Operation** **TBC**	• Provide relevant updates on the Project during the operational phase • Communicate benefit sharing program updates • Provide notification of any maintenance or planned works • Work with host landholders and neighbours to ensure ongoing compliance	• Host landholder and neighbour engagement (as required) • Newsletter (print and e-newsletter) • Works notifications (as required) • Social media • School engagement • Benefit sharing program/s commence (as required)

11. Recording, Monitoring and Evaluation

11.1. Consultation Report

Reports outlining consultation and engagement undertaken, feedback received, and how the Proponent has responded to feedback will be produced on an ad hoc basis to support various processes (e.g., approval applications tenders, etc.).

11.2. Evaluation & Reporting

Evaluation and reporting are key steps in all communication and engagement activities. The effectiveness of communications and engagement will be monitored and revised or adapted as necessary to ensure engagement objectives are met. The Plan will be reviewed and revised as the Project progresses.

To ensure effective communication and engagement, the Project:

- has developed a comprehensive engagement strategy (this Plan), building on existing project stakeholder relationships and community project understanding
- will review engagement objectives through each phase to ensure they are being met.

Communication and engagement measures will be measured by:

- participation in engagement activities, including information sessions
- comments and feedback received through the engagement, website, emails and phone enquiries
- participation in and content of public submissions during specific planning approval processes
- comments received about the engagement process or design including content frequency and accessibility of information
- website and newsletter statistics relating to reach, engagement and sentiment.

Feedback will be recorded, collected, and considered as part of the Project's development. Data will be collected and stored in line with the Proponents Privacy Policy.

A summary of participation, feedback received and how feedback has been considered will be made available via newsletter, or on the Project website.

11.3. Review Schedule

The Plan is a 'live' document and will be updated where necessary throughout the life cycle of the Project, capturing activities undertaken to date and reviewing their effectiveness in achieving the objectives of the Plan, as described above.

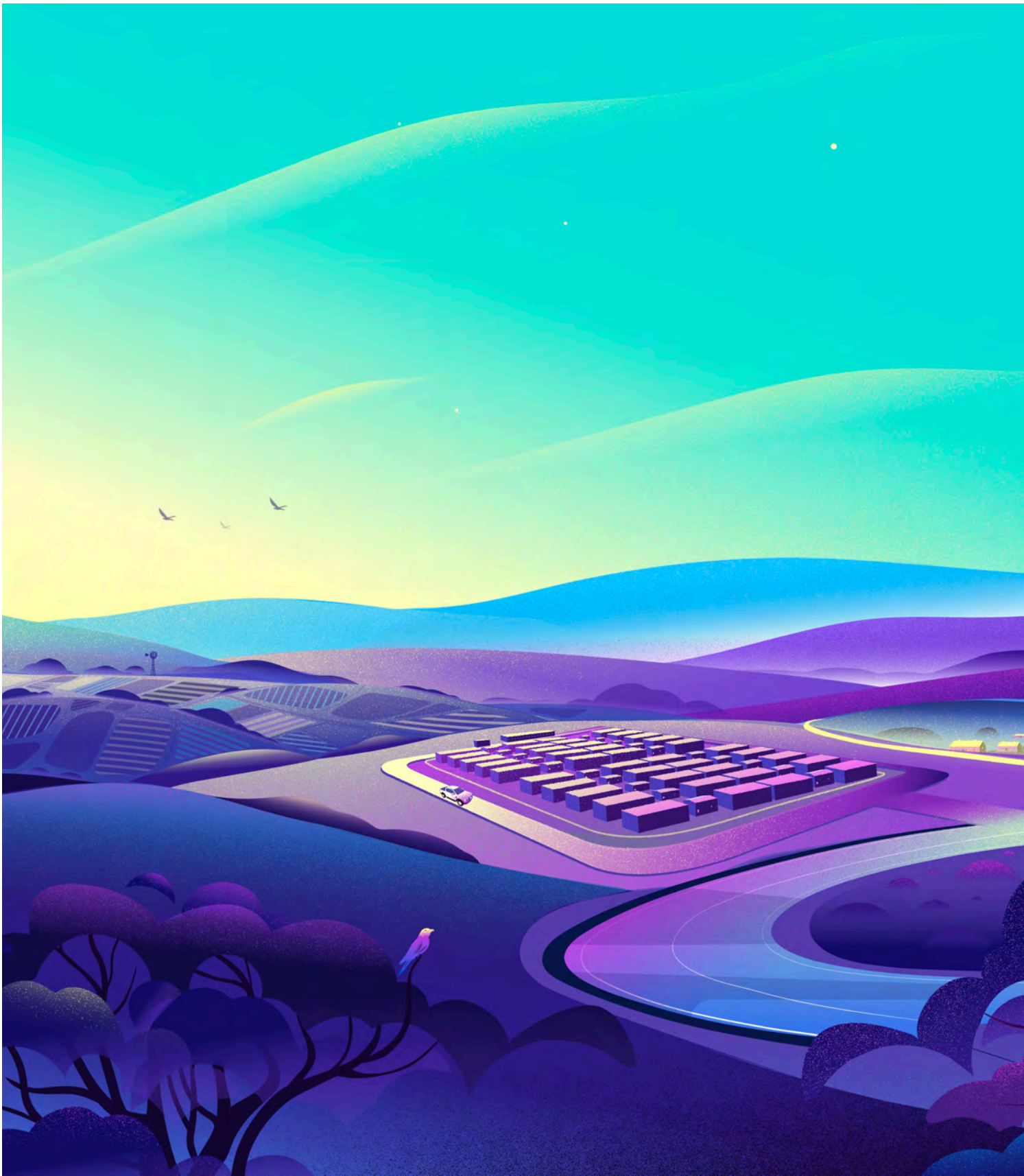
The Plan will be reviewed (and updated, where required) prior to commencing a new phase, or at the minimum frequency during the following phases:

- **During Development and Pre-construction (Pre-FID):** every 12 months
- **During Construction:** every 12 months
- **During Operations:** 12 months from the commencement of operations, and every two years thereafter.

Consultation Summary

Kojonup Battery Energy Storage System (BESS)

11 May 2026



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1. Introduction

Mint Renewables (the Proponent) strive to be active and caring neighbours, dedicated stewards of the environment, and create meaningful, lasting benefits for the broader community. The Proponent is committed to positive engagement practices and ongoing engagement throughout all stages of a project's life – from site selection through to decommissioning. The Proponent employs engagement approaches according to the IAP2 Public Participation Spectrum (Inform, Consult, Involve, Collaborate and Empower).

1.1. Purpose of the Report

This report describes how the Proponent has consulted with community, neighbours, First Nations peoples and stakeholders about the proposed Kojonup Battery Energy Storage System (BESS) (the Project). This report will accompany the planning permit application for the Project.

1.2. About the Project

The Proponent is proposing to develop a Battery Energy Storage System (BESS) located 3 km north west of Kojonup next to the existing Kojonup Substation in the Great Southern region of Western Australia.

The Kojonup BESS could have an indicative capacity of up to 800MWh (e.g. 100MW x 8 hour system) and an indicative footprint of approximately 4 hectares. The final size of the Project will depend on planning and environmental considerations, grid requirements, the selected BESS model and feedback from stakeholders. The site will be accessed via Collie-Changerup Road and Tunney Road.

The Project will likely include:

- BESS units, inverters and transformers.
- Access roads in and out of the site, and upgrades to the site entrance.
- Underground cabling to connect the battery units, inverters and transformers.
- Onsite substation and underground powerlines/cable to connect the BESS to the existing Dederang Terminal
- Station.
- Permanent operations and maintenance facility, including car parking.
- Temporary site compound facilities for construction.
- Civil and structural works including laying of crushed rock.
- Water storage (including firefighting water supply and fire water runoff containment) and fire breaks.
- Landscaping to mitigate visual impacts.
- Security fencing and signage.

Additionally, works are likely required within the existing Kojonup Terminal Station site (e.g., high voltage electrical equipment installation and associated permanent and temporary buildings and works).

The site is proposed to be accessed via a new access point off Collie-Changerup Road (main access), with a new secondary access and egress proposed off Tunney Road (secondary access). During construction, the site will be accessed via both the main access and secondary access.

The final design of the Project will be determined once a BESS supplier has been selected and will be in accordance with commitments made within the development application.

1.3. Project Location

The Project Area is located approximately 3 km north west of Kojonup, next to the existing Kojonup Substation. Kojonup is a rural town in Western Australia's Great Southern region, 256 km south east of Perth and 160 km from Albany. It is located in state electorate of Roe and the Federal Division of O'Connor.

The Project Area is accessible from the north via Collie-Changerup Road or from the east via Tunney Road. The closest non-associated dwellings are approximately 700 metres from the Project infrastructure.

The Noongar people are the Traditional Owners and inhabitants of Kojonup.

The Project Area is within the Gnaala Karla Booja Indigenous Land Use Area (ILUA), administered by Gnaala Karla Booja Aboriginal Corporation (GKB AC), and the Wagyl Kaip & Southern Noongar ILUA, administered by Wagyl Kaip Southern Aboriginal Corporation (WKSN AC).

The surrounding area is made up of a combination of lifestyle blocks, and agricultural land. The Myrtle Benn Flora & Fauna Sanctuary is located 1.6 km north west of the Project.

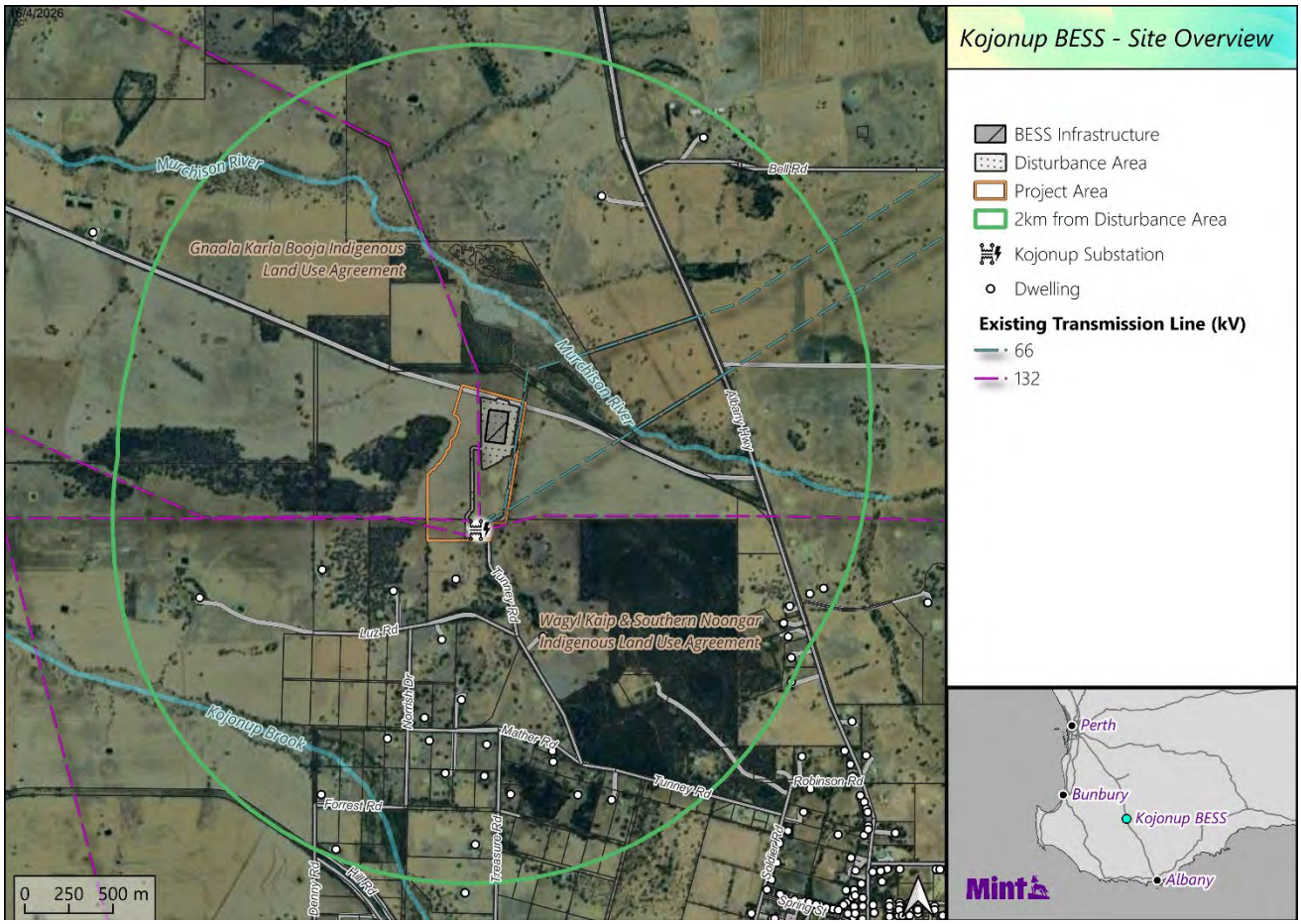


Figure 1: Site Overview

1.4. Community Context

Kojonup is a rural town in Western Australia's Great Southern region. The name "Kojonup" is derived from the Noongar word "Kodja," meaning stone axe, reflecting the area's Indigenous heritage. The Noongar people are the traditional owners and inhabitants of Kojonup.

The town's European history dates back to 1837 when surveyor Alfred Hillman, guided by local Aboriginal people, identified the freshwater spring that made Kojonup a vital stopover for travellers. By 1845, a military barracks was established as an outpost for the British Military; this building still stands today as part of the Kojonup Historical Society Pioneer Museum.

According to the 2021 Census, the Shire of Kojonup has a population of approximately 1,901 residents, with a median age of 45 years. The community is predominantly Australian born, with 87.7% born in Australia, and a significant portion identifying with English and Australian ancestry. Aboriginal and/or Torres Strait Islander people comprise about 5.2% of the population, reflecting the area's rich Indigenous heritage. The local economy is largely driven by agriculture, particularly wool and grain production.

An analysis of the Shire of Kojonup's Strategic Community Plan (July 2023–June 2033) highlights key aspirations for the region: reversing population decline, sustaining essential services (education, health, retail, accommodation, and road maintenance) and strengthening economic development. The plan also emphasises cultural vitality through improved streetscapes, community events, arts, and heritage initiatives.

Telecommunications black spots, critical for bushfire communications, remain a priority for advocacy. The Shire has a strong volunteering culture, with 81% of residents giving time in some capacity. Separately, the region hosts more than 40 sporting and community clubs. Limited accommodation may constrain future project construction and should be factored into project planning. Together, these elements reflect deep community pride in local spirit, culture, and place.

2. Stakeholder Engagement Plan

The purpose of this Stakeholder and Community Engagement Plan (the Plan) is to guide stakeholder engagement for the Kojonup BESS. It sets out how the Proponent will:

- establish channels for local conversations and information sharing with Traditional Owners, First Nations peoples, landholders and communities
- inform key stakeholders, neighbours and community about the proposed Project and opportunities for participation
- encourage participation and seek input at appropriate points in the development process, to identify potential issues or areas of concerns, obtain local insight, and gain feedback on measures to address concerns
- use and respond to public input to inform design.

Our approach to engagement aligns with the Proponents values, centred around being "Partners for Good", including:

- integrity in action
- a Mint team to depend on
- we care about what we do and how we do it.

The Plan is intended to be a 'live' document and will be updated where necessary throughout the life cycle of the Project, capturing activities undertaken to date and reviewing their effectiveness in achieving the objectives of the Plan.

The Proponent is a signatory to the Clean Energy Council's Best Practice Charter for Renewable Energy Developments (here).

2.1. IAP2 Spectrum of Engagement

The International Association for Public Participation (IAP2) defines public participation as the involvement of those affected by a decision in the decision-making process. IAP2's core values of public participation include promoting sustainable decisions by recognising the interests of all decision-makers, actively facilitating the involvement of those

potentially affected by or interested in a decision, providing participants the information they need to participate in a meaningful way, and communicating to participants how their input affected the decision. (Source: IAP2 Federation)

The IAP2 Spectrum is a best practice and internationally recognised tool for planning public participation. It includes different levels of public participation, ranging from:

- **Inform** – to provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions
- **Consult** – to obtain public feedback on analysis, alternatives and/or decisions
- **Involve** – to work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered
- **Collaborate** – to partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution
- **Empower** – to place final decision making in the heads of the public

2.2. Communications and Engagement Approach

The Proponent strives to be active and caring neighbours, dedicated stewards of the environment, and create meaningful, lasting benefits for the broader community. The Proponent know that engagement with key stakeholders, landholders, neighbours, First Nations peoples, communities, and local authorities, is important to the success of their projects.

The Proponent aims to be long-term members of the communities they invest in. There is a lot of uncertainty in development, and the Proponent believe in maintaining transparency with stakeholders as they navigate those uncertainties.

Project planning will involve complex decisions that require consideration of a broad range of issues. The Proponent will seek to build genuine, trust-based relationships with communities and stakeholders to enable constructive discussion and exploration of these complexities and achieve mutual understanding and beneficial outcomes.

3. Stakeholder Mapping

Table 1 below provides an overview of the stakeholders who were identified by the Project, level of IAP2 engagement, and method for engagement.

Table 1: Initial Stakeholder Identification

Stakeholder group	Stakeholder	Level of Engagement	Tools/channel
Neighbouring landholders	Neighbours and landholders adjoining or located near the site	Inform, consult	Door knocking Meetings Letter Newsletter Phone calls/emails
Community	Kojonup community	Inform, consult	Newsletter Phone calls/email Drop-in session Pop-up Social media
Council	Shire of Kojonup	Inform, consult	Meeting/briefings

Stakeholder group	Stakeholder	Level of Engagement	Tools/channel
			Phone/email Newsletters
Community interest groups	Rotary Club of Kojonup	Inform	Phone/email Newsletter Social media Drop-ins Pop-ups
	Community Resource Centre, Kojonup	Inform	
	Men's Shed	Inform	
	Mobrup Progress Association	Inform	
	Community Resource Centre, Katanning	Inform	
Media	Kojonup News	Inform	Advertisements
	The Great Southern Herald	Inform	
Emergency services	Kojonup Bushfire Association	Inform, consult	Phone call/emails Newsletter
	Kojonup Police	Inform	Phone call
Utility/Infrastructure	Water Corporation	Inform	Phone calls/emails Meetings
Government – Federal	Federal Member for O'Connor, Rick Wilson MP	Inform, consult	Letter Email/phone call
Government – State	State Member for Roe, Peter Rundle MP	Inform, consult	Letter Email/phone call
	Department of Energy and Economic Diversification (DEED) – Green Energy Major Projects	Inform, consult	Letter
	Department of Water and Environmental Regulation (DWER)	Inform, consult	Meeting/briefing
	Main Roads Western Australia (MRWA)	Inform, consult	Phone/email
	Department of Fire and Emergency Services (DFES)	Inform, consult	Newsletter
	Environment Protection Authority of Western Australia (EPA)	Inform, consult	Letter

3.1. First Nations

Table 2: First Nations Corporations

First Nations	Level of Engagement	Tools /method of engagement
Gnaala Karla Booja Aboriginal Corporation (GKB AC)	Inform, consult, involve	Briefing On Country meetings Phone/email Newsletter Workshops Community events

Wagyl Kaip Southern Noongar Aboriginal Corporation (WKSN AC)	Inform, consult, involve	Briefings On Country meetings Phone/email Newsletter Workshops Community events
First Nations peoples	Inform, consult	Newsletter Phone/email Advertising Social media Website Survey Drop-ins/pop-ups

4. Communications and Engagement Tools

Table 3 outlines the engagement tools used during this stage of consultation. Tools were selected to suit the stakeholders involved and the communication and engagement objectives for this phase of the Project.

Table 3: Communications and Engagement Tools

Tool/activity	Description and purpose	Engagement Level
Neighbour door knocking	Door knocking involves visiting neighbouring landholders to notify them about the Project, introduce the Project team, and provide initial information as part of the Project's launch. This approach supports early awareness, establishes a point of contact, and provides an opportunity for neighbours to ask questions and share initial feedback.	Inform, consult
Stakeholder meetings/briefings	Briefings and meetings provide information about the Project and updates at key milestones and offer an opportunity to seek feedback and targeted input on specific matters from stakeholders, groups and organisations with local or specialist knowledge.	Inform, consult, involve
Media	Proactive media outreach will be undertaken at key Project milestones to raise awareness of the Project, share accurate information, and support opportunities to respond to community questions and promote opportunities for input.	Inform
Project website	www.kojonupbess.com.au The dedicated Project webpage provides a central location for information about the Project.	Inform
Project phone line	1800 446 468 Community phone line used to receive community enquiries, answer questions and coordinate opportunities for sharing and exchanging information relating to the Project.	Inform, consult
Letters	Letters issued to stakeholders, agencies, MPs, community groups and government (as identified) to introduce the Project and offer briefings/follow up meetings.	Inform

Tool/activity	Description and purpose	Engagement Level
Printed and electronic newsletters	Newsletters provide Project updates, explain how the community can be involved, and support broader awareness of the Project. Print newsletters will also be sent to residents where requested and made available in local shops, libraries and other public spaces where possible. Regular newsletters will be distributed to subscribers.	Inform
Advertisements	Advertisements and information notices will be placed in local newspapers to raise awareness of the Project and promote opportunities for community engagement, such as drop-in information sessions and key consultation periods. Where appropriate, editorial coverage and interviews may also be used to support broader awareness and understanding of the Project across the region	Inform
Social media	Social media was used where appropriate, to share Project information and promote engagement opportunities in a way that reflects the local context. This may include posting in locally relevant Facebook groups and community pages to raise awareness of the Project and provide timely updates.	Inform
Information materials (flyers, fact sheets)	Project information materials will be made available online and provided directly to stakeholders during door knocks, drop-in sessions, meetings and briefings. Hard copy information packs will also be sent by post upon request and to stakeholders who have nominated to receive updates by mail. Materials will be updated regularly as the Project progresses through development.	Inform
Posters and signage	Posters and signs installed in community notice boards, will be used to share information with a local audience and raise awareness of the Project and opportunities to participate.	Inform
Maps and visuals	Maps and other visual aids, including diagrams, renders, photographs and illustrations, are used to explain the Project location, layout, key components, appearance and processes. An interactive map is available on the Project website to support understanding and enable stakeholders to explore the Project in a local context. These visuals support clear communication and informed feedback during consultation.	Inform, consult
Community drop-in Sessions	Drop-in information sessions held over multiple days to allow for attendance by interested community members and stakeholders. Sessions were advertised across several mediums to provide strong awareness of these opportunities for engagement.	Inform, consult, involve
Pop-ups	Pop-up sessions were held outside the local IGA to raise awareness of the Project and promote opportunities for community engagement.	Inform, consult
Survey	Online and hard-copy surveys and feedback forms were used to collect feedback on the Project from stakeholders and the wider community. The survey was available online, during door knocking and at drop-in sessions and helped identify key concerns as well as capture local knowledge of the area.	Consult
Goods and Services Register	Details of interested parties to be provided to contractors engaged (or selected as preferred). Available via the Project website.	Inform

5. First Nations Engagement

The Noongar people are the Traditional Owners (TOs) of the land on which the Project is located. The Project Area lies within the Gnaala Karla Booja Indigenous Land Use Area (ILUA), administered by Gnaala Karla Booja Aboriginal Corporation (GKB AC), as well as the Wagyl Kaip & Southern Noongar ILUA, administered by Wagyl Kaip Southern Noongar Aboriginal Corporation (WKSN AC).

The Proponent takes a partnership approach to engaging with Traditional Owners (TOs), including the GKB AC, as well WKSN AC.

To support this commitment, The Proponent has looked for opportunities to embed First Nations Engagement into the broader engagement for the Project that will aim to:

- Deepen the Proponents understanding of Traditional Owners' and First Nations peoples' connection to the area and strengthen their collective cultural awareness.
- Understand the barriers and challenges First Nations Peoples may face in active participation and work collaboratively to address and mitigate them.
- Identify opportunities for Traditional Owners and First Nations peoples to participate in the development process, beyond compliance.
- Seek input on benefit sharing opportunities and initiatives that deliver meaningful, lasting impact for First Nations communities.

5.1. Consultation Undertaken to Date

Table 4 outlines the consultation undertaken to date with relevant Aboriginal Corporations.

Table 4: First Nations Consultation

First Nations	Timing	Outcome
Gnaala Karla Booja Aboriginal Corporation (GKB AC)	August 2025 – February 2026	• The Proponent provided a general introduction to the Project. • GKB AC confirmed the correct process for Noongar Standard Heritage Agreement under the Aboriginal Cultural Heritage Act. Advised also engaging with Wagyl Kapi Southern Noongar Aboriginal Corporation. • Requested further information on environmental impacts. • Feedback provided by GKB AC regarding First Nations employment strategies, social outcomes and benefit sharing. • The Proponent has lodged a Noongar Standard Heritage Agreement with GKB AC.
Wagyl Kaip Southern Noongar Aboriginal Corporation (WKSN AC)	September 2025 – February 2026	• The Proponent provided a general introduction to the Project. • WKSN AC requested more information regarding likely water sources for the Project and depth of excavation works.

First Nations	Timing	Outcome
		• WKSN AC shared the Kojoup BESS community survey on the Wagyl Kaip Southern Noongar Aboriginal Corporation Facebook page. • The Proponent has lodged a Noongar Standard Heritage Agreement with WKSN AC.

6. Consultation Undertaken to Date

Consultation undertaken to date for the proposed Kojonup BESS has included neighbour door knocking, pop-up sessions, community drop-in sessions, meetings with stakeholders, and an online community survey.

The Project's engagement program commenced publicly in September 2025. The Project notified nearby neighbours of the proposal by door knock, issued letters and offered one-on-one meetings. This activity was followed by establishing a dedicated website (www.kojonupbess.com.au), and two pop-ups located outside the Kojonup IGA, on Albany Highway. The first edition of the community newsletter was distributed during the pop-up, made available in the Kojonup Library, Australia Post - Kojonup LPO and the Kojonup Community Resource Centre, on the Project website and emailed to newsletter subscribers.

In late October 2025, the Project held three community drop-ins on Friday 24 and Saturday 25 October at the Kojonup RSL Hall. The drop-in sessions were advertised and promoted across a broad range of channels. In November, the Project undertook another round of neighbour outreach, offering one-on-one meetings and door knocked adjoining properties. The Project launched a community survey to gather local insights on the environment, heritage, water and bushfire history, traffic, communication, and benefit sharing opportunities. The survey remained open until early 2026.

Feedback received through these activities has informed an understanding of local values, sensitivities, concerns, and expectations relevant to the Project's design, assessment and management. A detailed summary of consultation is summarised in Table 5 below.

Table 5: Consultation Undertaken to Date

Timing	Activity / outcome	Stakeholder group
August 2025	Project introduction email. Introduced Project and sought to arrange an initial Project introduction meeting.	Shire of Kojonup
August 2025	Project introduction email. Introduced Project and sought to arrange an initial in-person Project introduction meeting/briefing.	Gnaala Karla Booja Aboriginal Corporation (GKB AC)
Early September 2025	Project briefing. Received feedback on engagement program, and likely community concerns relating to the development.	Shire of Kojonup
Mid September	Project introduction email. Introduced Project and sought to arrange an initial Project introduction meeting.	Wagyl Kaip Southern Noongar Aboriginal Corporation (WKSN AC)
Mid September 2025	Project briefing. Received feedback regarding First Nations employment strategies, social outcomes and benefit sharing. Established ongoing communication and engagement preferences.	Gnaala Karla Booja Aboriginal Corporation (GKB AC)

Timing	Activity / outcome	Stakeholder group
Mid September 2025	Door knocking neighbours to introduce the Project, letters distributed and one-on-one meetings offered. Spoke directly with 9 neighbours, left letters with 6 neighbours offering follow up one-on-one meetings.	Neighbours
Mid September	Website (www.kojonupbess.com.au), dedicated email and phone line established	Community
Early October	Pop-up to support Project awareness. Pop-up x 2 at Kojonup IGA (3 – 6pm on 2 October and 9 – 12 pm on 3 October). Spoke with approximately 10 community members.	Community
Early October	Project introduction letter sent via email to MP.	Federal Member for O'Connor, Rick Wilson MP
Early October	Project introduction letter sent via email to MP.	State Member for Roe, Peter Rundle MP
10 October	Advertising drop-in sessions in Kojonup News.	Community (Kojonup locality)
Mid October	Emails to community groups introducing the Project and inviting to attend drop-in sessions.	Community group outreach: Kojonup Aboriginal Corporation Mobrup Progress Association Lions Club Rotary Club of Kojonup
23 October	Advertising drop-in sessions in the Great Southern Herald.	Community (Kojonup, Katanning locality)
24 October	Advertising drop-in sessions in Kojonup News.	Community (Kojonup locality)
Late October	Project briefing. WKSN AC requested more information regarding likely water sources for the Project and depth of excavation works. Provided feedback on opportunities to engage with First Nations peoples and benefit sharing opportunities.	Wagyl Kaip Southern Aboriginal Corporation
Late October 2025	Held three drop-in sessions on Friday 24 & Saturday 25 October. Spoke with approximately 11 community members over the course of the sessions.	Community
Late October 2025	Survey available on www.kojonupbess.com.au and during in-person sessions. Survey remained open from late October 2025 – February 2026. Received 6 submissions.	All stakeholders
Late November 2025	Neighbour one-on-one meetings/ door knocking. Met directly with 9 neighbours about Project, provided update and answered questions. Left collateral/notes with 5 neighbours.	Neighbours
Early December	Neighbour meeting. Met with Project neighbour to discuss impacts of Project.	Neighbour

Timing	Activity / outcome	Stakeholder group
Early January 2026	Outreach to Kojonup Bushfire Association to offer briefing/meeting with interested members.	Kojonup Bushfire Association
Early February	Neighbour meeting. Met with Project neighbour to discuss impacts of Project.	Neighbour
March 2026	Email to survey respondents. Sent follow up information to approximately 5 survey respondents.	Community
May 2026	Outreach to neighbours via letter, email and phone to provide Project update.	Neighbours

6.1. Examples of Project collateral

6.1.1. Newsletters

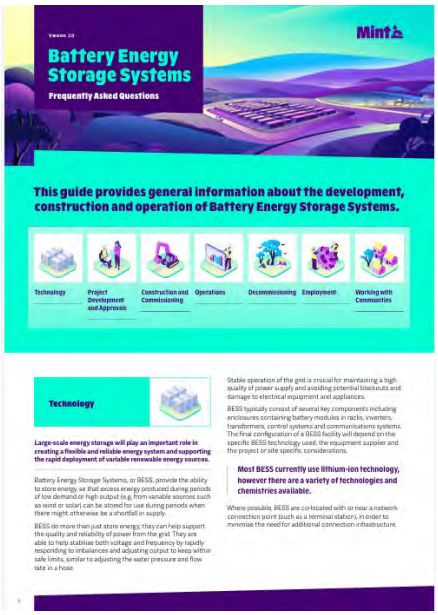


Kojonup BESS Newsletter - Edition 1

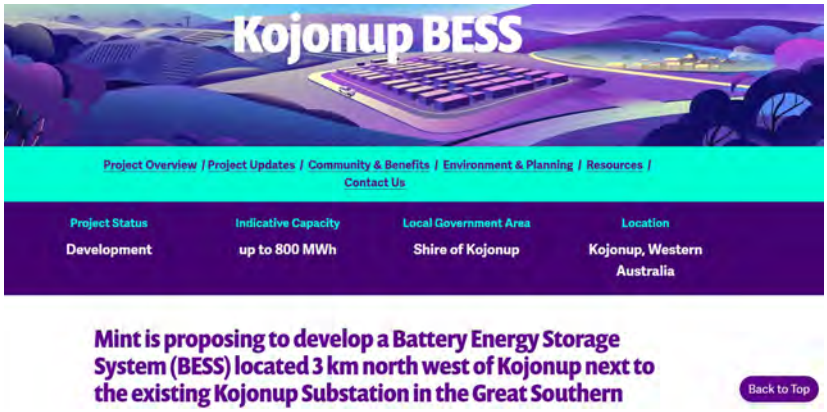


Kojonup BESS Newsletter - Edition 2

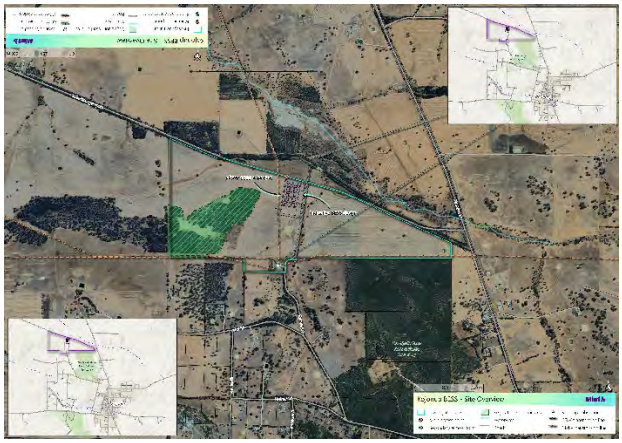
6.1.2. FAQs



6.1.3. Website



6.1.4. Maps and Visual Aids



Indicative Project map shared at engagement sessions

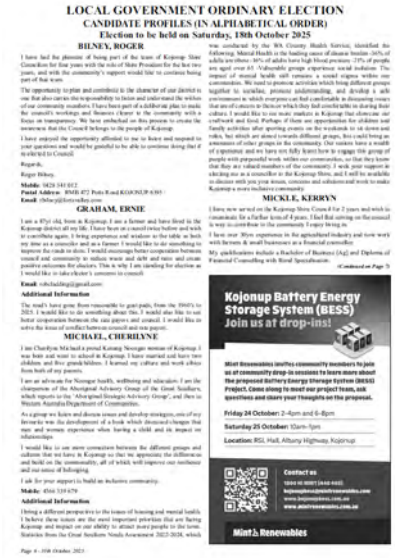


Photomontage showing Project infrastructure and proposed landscaping, shown at engagement sessions

6.1.5. Advertising



Flyer promoting drop-in sessions

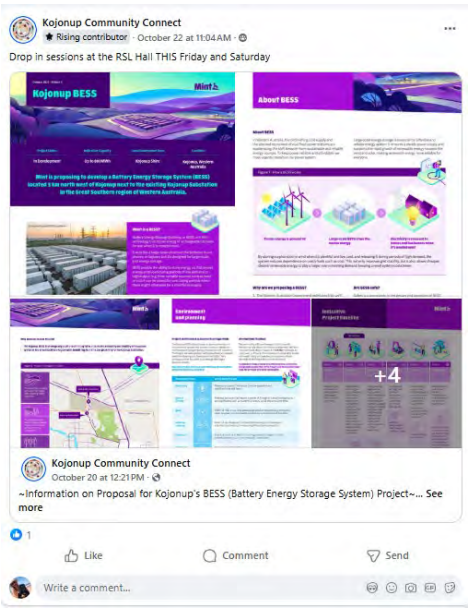


Advertisement in Kojonup News



Advertisement in the Great Southern Herald

6.1.6. Social Media







6.2. What We Heard

A summary of the Proponent has feedback received from the consultation undertaken to date is summarised in Table 6 below.

Table 6: What We Heard

Theme	What we heard
Bushfire risk, battery safety and emergency management	Bushfire risk emerged as the most prominent issue raised during consultation, particularly among nearby residents and those with experience of local fire events. Stakeholders raised concerns regarding: • the potential for a fire originating within the BESS • the potential for an external bushfire to impact the facility, given surrounding vegetation and historical fire activity • battery chemistry, fire suppression measures and emergency response planning • the proximity of the Project to Myrtle Benn reserve and the Kojonup town centre, including concerns about ember attack under adverse weather conditions. There was also a strong interest in clear, transparent communication about bushfire management measures and emergency response arrangements as the Project progresses.
Environmental values: biodiversity, waterways, wet areas and local species	Consultation identified strong community awareness of local environmental and ecological values. Key themes included: • the presence and movement of black cockatoo species within the broader area, including nearby reserves and properties with mature vegetation • the importance of waterways, creeks and seasonal drainage lines, including the presence of aquatic species such as gilgies and frogs • observations that parts of the local area become boggy during winter months. Stakeholders emphasised the importance of understanding local hydrological conditions and ensuring that construction and operation of the Project does not adversely affect surface water flows, water quality, or biodiversity values.

Theme	What we heard
Water, contamination and liability (construction and operations)	Through neighbour door knock discussions, specific questions were raised regarding potential contamination risks associated with the BESS. These included: • whether BESS could leak or fail and the potential implications for soil, surface water and groundwater • the risk of contaminants entering waterways and affecting livestock or aquatic species • responsibility and liability in the unlikely event of spill or contamination event. These discussions highlighted the importance of clearly explaining containment systems, spill prevention measures, stormwater management, and incident management procedures, as well as regulatory oversight and accountability frameworks that would apply to the Project.
Visual amenity, screening and light spill (including dark-sky considerations)	Visual impact and amenity were raised as matters of importance, particularly by nearby residents. Specific issues included: • potential changes to landscape character and views from private properties • concern about impacts on perceived property values • the extent and effectiveness of proposed landscape screening • the use of lighting at the facility, including the potential for light spill and impacts on night-time amenity. Some residents expressed particular sensitivity to night lighting due to the rural setting and low existing levels of light pollution. There was an expectation that lighting would be minimised, directional, and used only where necessary for safety and security purposes.
Noise and rural amenity	Noise was identified as a potential issue, particularly in relation to maintaining the quiet, rural character of the area. While some near neighbours indicated they did not expect to be impacted if the facility could not be heard at their properties, others emphasised the importance of compliance with noise regulations and appropriate assessment of potential impacts. Stakeholders expressed an expectation that noise impacts would be assessed through formal studies and communicated clearly to affected residents.
Traffic, road safety and seasonal movements	Consultation identified concerns related primarily to construction-phase traffic and road safety, including: • the use of local roads by heavy vehicles • interactions with agricultural traffic, particularly during harvest periods • use of narrow rural roads and the presence of school bus routes • the need to manage construction timing and traffic movements to minimise disruption and safety risks. Stakeholders emphasised the importance of advance notification, careful traffic management planning, and coordination with relevant authorities.
Construction workforce, housing and accommodation pressure	Housing availability and affordability were noted as broader community challenges. Concerns were raised that accommodation for a construction workforce could exacerbate existing pressures if not appropriately managed. While this issue was not raised exclusively by near neighbours, it formed part of the broader context in which the Project is being considered.
Community benefits, local priorities and preferred benefit-sharing mechanisms	There was strong interest in how benefits from the Project would be shared with the local community. Feedback highlighted preferences for: • a formalised and transparent community benefit mechanism, such as a community fund

Theme	What we heard
	• benefits that reflect local priorities, including road safety, community facilities, emergency services, youth services, health services, environmental initiatives, and local employment and training • long-term and equitable benefit sharing rather than short-term or ad hoc sponsorship. Support for local volunteer organisations and emergency services was consistently identified as important.
Decommissioning, lifespan and "legacy" concerns	Some stakeholders raised questions regarding the expected lifespan of the BESS and arrangements for decommissioning at the end of operations. These discussions reflected a broader desire for assurance that end-of-life responsibilities would be clearly defined, enforceable and planned from the outset, and that the Project would not leave a long-term legacy issue for landholders or the community.
Cumulative development context, transmission fatigue and community cohesion	Door knock discussions indicated some sensitivity to cumulative development pressures, particularly relating to previous or ongoing approaches regarding transmission lines and other energy projects in the region. Concerns were expressed that past developments have created division within the community, especially where impacts and benefits are perceived to be unevenly distributed.
Engagement preferences and expectations	Across consultation channels, stakeholders expressed a preference for: • ongoing access to Project information through newsletters, email updates and the Project website • opportunities for in-person engagement for nearby residents with specific concerns • transparency about how feedback is being considered and incorporated into project decision-making where possible.

6.3. Agency Engagement

The Proponent has been engaging with a range of agencies through the development of the Project. Table 7 below provides a summary of the engagement undertaken, and feedback received. Engagement will continue with these agencies.

Table 7: Agency Engagement

Agency	Timing	Topics discussed and feedback received
Shire of Kojonup	August 2025 – March 2026	• The Shire of Kojonup provided general direction in relation to the relevant assessment pathway and approvals for this Project's Development Application (DA). • The Shire of Kojonup suggested expectations likely aligned with LPP 10 (Wind Energy Policy). • Access and noise identified as key risks. The Shire of Kojonup concurred early consideration for these aspects, as well as stormwater management, decommissioning and community benefit planning. • The Shire of Kojonup stated proposed access seemed appropriate. • Suggested early circulation of application documents is welcomed by the Shire.
Department of Energy and	October 2025 –	• The Proponent provided general introduction to the Project.

Agency	Timing	Topics discussed and feedback received
Economic Diversification (DEED) – Green Energy Major Projects	December 2026	• DEED provided the proponent with relevant contact details for agency stakeholders. • DEED provided the proponent with advice regarding calculation of payment rates.
Department of Water and Environmental Regulation (DWER)	October 2025	• The Proponent provided a general introduction to the Project. • Required permits and licenses discussed. • DWER stated likely documents to be expected as conditions of consent (subject to approval being granted). • DWER confirmed a BESS is not a prescribed premise under Part V of the EP Act; no works approval or licence required.
Main Roads Western Australia (MRWA)	October 2025	• The Proponent provided a general introduction to the Project. • Discussion of new access points, with MRWA suggesting to minimise new access points on high-speed roads; preference for existing side-road access. • Discussion of Traffic Impact Assessment (TIA) requirements. • MRWA suggested engagement with Heavy Vehicle Services regarding permitting. • MRWA stated Main Roads Driveway policy not mandatory but relevant for design guidance.
Department of Fire and Emergency Services (DFES)	September – October 2025	• The Proponent provided a general introduction to the Project. • Relevant guidelines and legislation discussed. • Access options discussed, potential intersection design to address with MRWA's concerns. • Limited local firefighting capacity noted; emphasis on prevention and automated systems. • Water supply to be designed in accordance with AS 2419.1. • DFES encouraged documentation circulation and engagement with local fire brigades.
Department of Water, Environment and Regulation (DWER) / Environment Protection Authority of Western Australia (EPA)	February 2025	• Introduction to Mint Renewables. • Discussion of Project Portfolio. • Clarify referral requirements with the EPA

6.4. Project Contact Information

6.4.1. Email Address and 1800 Number

A dedicated Project email address (www.kojonupbess.com.au) was established for the community and other stakeholders to contact the Project team and provide an avenue for direct communication.

This email address was established in September 2025 and promoted through all private and public communications materials (e.g. personalised letters, newsletters, webpage, newspaper advertisements etc). Additionally, the Proponent's 1800 phone number (1800 HI MINT / 1800 446 468) was also promoted through these means.

6.5. Policies and Procedures

6.5.1. Complaints Handling

All complaints will be managed in accordance with the Proponents Complaints Handling Procedure, available on the Mint Renewables website (www.mintrenewables.com/esg).

This procedure outlines how the Proponent will receive and handle complaints and has been prepared in accordance with Australian Standard 10002:2022 – Guidelines for complaint management in organizations (AS 10002:2022).

Additionally, a Project specific Complaints Management Plan may be prepared prior to construction, in line with the Proponent Complaints Handling Procedure and to capture any other obligations or commitments.

All enquiries and complaints will be recorded in the Proponents Stakeholder Relationship Management System.

6.5.2. Privacy Policy

The Proponent is committed to protecting the privacy of all individuals by applicable privacy and data protection laws. The Proponents Privacy Policy (available on Mint Renewables website here: www.mintrenewables.com/esg) sets out their policy on collecting, holding, using and disclosing, or otherwise handling personal information.

All data collected from stakeholders (e.g. through engagement activities, Goods and Services Register, complaints etc.) will be collected, handled, stored/secured and shared in accordance with this policy.

7. Approach to Benefit Sharing

The Project will have inherent benefits through a boost to the local and regional economy and local businesses and jobs during construction and operations. The Proponent will also look to develop other ways to share the Project's benefits, informed by continued engagement with stakeholders, community and First Nations groups throughout the Project's development and pre-construction phases.

As an initial benefit sharing commitment, the Proponent has committed to contributing a minimum of $150 per MW per year in community benefits from the commencement of operations. This is intended as a starting point only and represents the minimum commitment. The final approach to benefits will be shaped by feedback from the community and a clear understanding of local priorities, Project constraints, and potential impacts.

In developing its approach, the Proponent intends to align with the recently released *Community Benefits Guideline for Large-scale Renewable Energy Projects in the South West Interconnected System*, issued by the Department of Energy and Economic Diversification. The Guideline provides a best-practice framework to support fair, transparent and locally led community benefit arrangements and will guide the development of benefit sharing principles, governance arrangements and engagement processes for the Project.

Under the Guideline, the Western Australian Government has set recommended community benefit contribution levels for large-scale renewable energy projects. The Proponents minimum commitment of $150 per megawatt per year is above the recommended minimum contribution level applicable under the Guideline for BESS projects, demonstrating the Proponents commitment to meaningful and proportionate benefit sharing with the host community.

Consistent with the Guideline, the Proponent will:

- engage with the local community, local government and relevant Traditional Owners to help identify local priorities for benefit sharing

- develop a Benefit Sharing Plan prior to construction, setting out how community benefits will be directed, governed and reported on
- ensure benefit arrangements are transparent, equitable and proportionate to the scale and impacts of the Project
- focus on benefits that deliver enduring social, economic and community outcomes for the region.

The Benefit Sharing Plan will be implemented during construction and operations. During the development phase, the Proponent will also consider ad hoc sponsorship of local initiatives and events, where appropriate.

Specifically, the Proponent plans to utilise benefit sharing to:

- ensure that the immediate community directly benefits from the presence of the Project in their community, including sharing benefits with local TOs and First Nations peoples
- contribute to broader public benefits and economic development that address the needs of the region
- build on strategic opportunities to drive local innovation
- create a legacy beyond the immediate benefits of the Project.

7.1. Employment, Goods and Services

The Proponent is committed to employing local people and buying local wherever possible. Goods and Services Registers are set up for each of the Proponents projects.

The purpose of the register is to provide an avenue for interested parties to register their interest in providing goods and services to the Project. While the Proponent will not undertake much of the procurement and hiring, the Goods and Services Register will be provided to the Proponents delivery partners and contractors (and their sub-contractors).

At the time of writing this report, 8 had signed up to the Goods and Services Register.

Additionally, the Proponent will work with these partners to develop a local content and employment strategy. This will include exploring opportunities to target First Nation peoples' participation in the Project, such as engaging with First Nations businesses and directly employing First Nations peoples. Where they have opted in, interested parties are added to the newsletter subscription so they can be kept up to date with the Project's progress.

7.1.1. Jobs

The Kojonup BESS Project will provide benefits through a boost to the local and regional economy, local businesses, and jobs during construction. Typical jobs created during construction are summarised below.

Table 8: Typical Jobs Created during construction

Electrical	Civil and mechanical	Substation
Electricians	Civil Labourers	Administration Staff
Trade Assistants	Concreters	Equipment Maintenance Technicians
	Dump Truck Operators	Crane Operators
	Excavator Operators	
	Foremen / Supervisors	
	Forklift & Telehandler Operators	
	General Labourers	
	Grader Operators	
	Loader Operators	
	Mechanical Fitters	

	Roller Operators Trade Assistants Truck Drivers / Operators	

In addition to creating opportunities for local workers, the Project will bring benefits to other industries, including accommodation providers, cafés, and restaurants. The Proponent is committed to employing local people, sourcing locally wherever possible, and engaging local service providers.

8. Upcoming Consultation

The Proponent will continue to communicate and engage with key stakeholders, First Nations groups.

Table 9: Upcoming Consultation

Development phase	Communication and consultation Purpose	Activities
Development – Development Application public notice, assessment and outcome	• Share consultation report and/or explain how feedback has shaped the Project and likely to inform mitigation / management plans • Communicate the public exhibition/notice period for the development application and explain how to make a submission • Share the outcome of the development application. • Communicate Project next steps	• Newsletter (print and e-newsletter) • Stakeholder letters to MPs • Email/phone calls and emails to interested community groups • First Nations engagement with GKB AC and WKSN AC, including working to execute Noongar Standard Heritage Agreement and submitting Activity Notices as required • Formal public notice (as directed by the approval authority) • Outreach to neighbours and community via email, phone and letter • Pop-up during formal exhibition period of DA to answer questions and explain information in the DA • Local media outreach • Advertisements (print) • Key stakeholder briefings/meetings to discuss development application outcome

Kojonup BESS

Bushfire Risk Report

Assessments of Risk Levels and Risk Management



3680 Collie-Changerup Road, Kojonup

Shire of Kojonup

11 May 2026

Job Reference No: 241243

BPP GROUP PTY LTD T/A BUSHFIRE PRONE PLANNING

ACN: 39 166 551 784 | ABN: 39 166 551 784

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Ali Whittaker	ali.whittaker@mintrenewables.com	1.2	1	☐	☒

Limitations: The protection measures contained in this Bushfire Risk – Assessment and Management Report, are considered to be minimum requirements and they do not guarantee that buildings or infrastructure will not be damaged in a bushfire, persons injured, or fatalities occur either on the subject site or off the site while evacuating. This is substantially due to the unpredictable nature and behaviour of fire and fire weather conditions. Additionally, the correct implementation of the recommended protection measures will depend upon, among other things, the ongoing actions of the landowners and/or operators over which Bushfire Prone Planning has no control.

All surveys, forecasts, projections, and recommendations made in this report associated with the proposed development are made in good faith based on information available to Bushfire Prone Planning at the time. All maps included herein are indicative in nature and are not to be used for accurate calculations.

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EXECUTIVE SUMMARY

This Bushfire Risk Report has been prepared to support a Development Application for the proposed Kojonup Battery Energy Storage System (BESS) (the 'Project') located at 3680 Collie-Changerup Road, Kojonup, within the Shire of Kojonup. The subject site is located within a bushfire-prone landscape, where surrounding vegetation and fire weather conditions present a relatively low bushfire hazard. Ember attack, radiant heat and direct flame contact remain risks to be addressed by the proposal.

The report provides a comprehensive assessment of bushfire risk and demonstrates how the proposal achieves an acceptable level of risk to satisfy the Policy Intent of *State Planning Policy 3.7 Bushfire*:

> *"To implement effective, risk-based land use planning and development which in the first instance avoids the bushfire risk, but where unavoidable, manages and/or mitigates the risk to people, property and infrastructure to an acceptable level. The preservation of life and the management of bushfire impact are paramount."*

While specific guidance for renewable energy facilities is limited in Western Australia, the assessment has also considered:

- Best-practice guidance including the Victorian Country Fire Authority's *Guidelines and Model Requirements – Renewable Energy Facilities* v4.4.
- Standards Australia (AS series) and International Organization for Standardization (ISO series).
- Professional experience and expert opinion
- Academic research

This ensures a robust and conservative approach.

Methodology

The assessment has been undertaken whereby bushfire risk is determined through the interaction of hazard, exposure and vulnerability. This is an appropriate methodology in considering natural disasters, adopted by:

- *Sendai Framework for Disaster Risk Reduction 2015-2030* (United Nations Office for Disaster Risk Reduction)
- *National Disaster Risk Reduction Framework* (National Resilience Taskforce, Australian Department of Home Affairs)
- *Australian Emergency Management Arrangements Handbook* (Australian Institute for Disaster Resilience, National Emergency Management Agency)

The analysis considers all relevant elements at risk of bushfire impact, including persons, buildings and structures, BESS infrastructure, substations, and access/egress arrangements.

Inherent and Residual Risk levels have been summarised in Section 3.1.

- Inherent Risk represents the risk based on current conditions, including the application of minimum bushfire planning requirements in alignment with the *Planning for Bushfire Guidelines*.
- Residual Risk represents the risk where the additional recommendations (Table 4.2.1), beyond the minimum bushfire planning requirements, are applied.

The subject proposal therefore achieves a risk level which is ALARP (As Low As Reasonably Practicable).

Compliance with Bushfire Planning Framework

The proposal has been assessed against the intent of the *Planning for Bushfire Guidelines* and relevant bushfire protection principles, including:

- Location – The development is sited within predominantly cleared land, minimising exposure to unmanaged vegetation.
- Siting and Design – Adequate separation distances (Asset Protection Zones - APZs) are applied to achieve acceptable radiant heat thresholds for all assets.

- Vehicular Access – Access and egress arrangements are designed to support safe evacuation and emergency services access.
- Water Supply – A compliant firefighting water supply is provided to support both bushfire and asset protection.
- Emergency Management – A comprehensive Emergency Management Plan will be implemented to support Prevention, preparedness, response and Recovery.

Risk Mitigation and Outcomes

The development has incorporated a suite of bushfire protection measures, including:

- Establishment and ongoing maintenance of appropriate APZs;
- Provision of a minimum 288,000L firefighting water supply with appropriate access;
- Multiple fit-for-purpose access arrangements;
- Bushfire-resilient construction standards for buildings and critical infrastructure;
- Implementation of operational procedures to minimise ignition risk;
- Development and maintenance of a detailed Emergency Management Plan, including staff training, monitoring and communication protocols;
- Ongoing engagement with local emergency services.

Following implementation of these measures, the assessment demonstrates that:

- All elements achieve acceptable residual risk levels;
- Risks to life are reduced to acceptable or ALARP levels;
- Risks to property and infrastructure are appropriately mitigated consistent with planning policy expectations.

Conclusion

The proposed development is considered to achieve an acceptable level of bushfire risk, consistent with the objectives of the *State Planning Policy 3.7 Bushfire* and the broader State planning framework.

The report demonstrates that bushfire risk has been appropriately identified, assessed and mitigated, and that the development can be supported from a bushfire planning perspective, subject to the implementation and ongoing management of the recommended protection measures through design, construction and operation.

1 REPORT USE GUIDANCE - FOR MANAGERS & DECISION MAKERS

LOCATION OF KEY INFORMATION	
The applied risk assessment process as pre-requisite reading to assist with understanding the assessments and the presentation of the results.	Section 2 and Appendices 1 & 2
The assessed bushfire risk levels and the relative contribution of each primary factor contributing to that risk.	Section 3
The recommended additional bushfire protection measures and their implementation priority rating.	Section 4.2.1
Identified additional issues and advice provided for consideration by management.	Section 4.2.2

SECTION 5 - THE ASSESSMENT OF BUSHFIRE RISK

For the proposed Kojonup Battery Energy Storage System (BESS) (the 'Project') facility at the intersection of Tunney Road and Collie-Changerup Road, Kojonup, the risk assessment derives defined levels of risk associated with a bushfire event within the immediate and broader surrounding landscape, to the identified elements at risk (i.e., relevant classes of persons and property).

The adopted assessment approach applies a methodology that considers bushfire risk levels to be determined due to the interaction of three factors:

1. The bushfire hazard (which presents varying threats and threat levels);
2. The levels of exposure of each element at risk to those threats; and
3. The levels of vulnerability of each element at risk to those threats.

The assessment considers both the current level of risk (inherent), and the potential level of risk (residual) should proactive management be able to implement the recommended additional bushfire protection measures.

The assessment is largely qualitative in nature but incorporates quantitative processes and information when relevant and available. This results in the derivation of 'indicative' bushfire risk levels.

The assessment is conducted by a bushfire planning consultant with practical bushfire event management experience and relevant accreditation. An important objective is to present understandable and practical protection measures that can be justifiably applied by management.

SECTION 6 - THE ASSESSMENT OF BUSHFIRE RISK MANAGEMENT

Assessments are conducted that consider how well two defined pathways for implementing both the required and any additionally recommended bushfire protection measures, are being applied. Guidance for best practice application of these measures is provided. The two pathways are:

1. The application of 'informative' risk management mechanisms which include:
    a. The organised application and maintenance of all applicable bushfire protection measures through a range of operational documents, as relevant to a site and its use; and
    b. The development and application of advice to inform management's planning of future modifications and/or development of a site and its use. This is necessary where bushfire risk mitigation measures are necessary inputs to design and construction.
2. The application of 'regulatory' risk management mechanisms that are to be complied with. These include operating and construction regulations and standards, and relevant planning authority guidelines/standards.

*****

2 INTRODUCTION

2.1 THE ASSESSED ASSET AND ITS USE

SITE USE AND DESIGN

The Project is proposed to be sited in cleared pasture in the north-eastern corner of Lot 3194 (#3680) Collie-Changerup Road.

A 330kV transmission line runs approximately north-south through the eastern portion of the subject lot. The Project will be located between the transmission line and Tunney Road. it will connect to the existing Kojonup Substation (262 Tunney Road, Kojonup- operated by Western Power) immediately to the south of the lot.

The Project has an intended operating capacity of approximately 800MWh (100MW x 8 hours). An onsite electrical substation will be installed as part of the Project. An Operation and Maintenance (O&M) compound will be included, with the intent to house majority temporary staff during construction. During operations, the O&M compound will be used by the 1-2 permanent staff as required.

A comprehensive Bushfire Advice Brief has previously been provided, which has been integrated into the submitted design and supported by the submitted Bushfire Management Plan and this Bushfire Risk Report.

The site assessment for the Project was conducted on the 27th March 2025.

ASSESSED ASSETS

Numerous components have been identified for assessment. This Bushfire Risk Report considers each asset, or group of comparable assets, separately.

- The BESS and PCS.
- The onsite Substation.
- An Operations and Maintenance building.
- Laydown areas.
- Internal access network.

ASSETS NOT ASSESSED

Some assets/components of the site have not been assessed. These are described below.

Transmission Lines (conductors)

The conductors will be installed below ground. Below ground conductors are not subject to bushfire impact.

Roads/Tracks

Persons on access routes are assessed. The roads/tracks themselves are not, as any damage to the track itself (tree strike, melting bitumen etc) is relevant to its usability by people rather than its own inherent value.

2.2 ESTABLISHING THE REPORT OBJECTIVES

The applied risk assessment process (refer to s2.3 and Appendix 1), and the methodology used to inform the management of risk (refer to s2.4), provide a flexible platform for producing the required evaluations and reporting.

It can account for all types of development and use and be constructed to deliver the required management and decision-making information.

Consequently, to ensure the required information outcomes are met, the specific objectives for the Project need to be identified to guide the report development.

These objectives are established in the checklist on the following page.

CHECKLIST ESTABLISHING THE REPORT OBJECTIVES TO BE MET FOR THE PROJECT					
AVAILABLE OBJECTIVES			THE OBJECTIVES TO BE MET	THE OBJECTIVES TO BE MET ARE ESTABLISHED BY	
				The Owner and/or Operator of the Project in Discussion with the Bushfire Consultant	The 'Planning' Bushfire Management Plan
RISK ASSESSMENT					
Hazard	Identify all bushfire hazards with potential to impact the Project.		✓		✓
Risk Levels	Assess inherent bushfire risk levels, for each identified element at risk, by accounting for existing and/or planned implementation of bushfire protection measures, along with all other interacting factors.		✓	✓	
	Assess residual bushfire risk levels, for each identified element at risk, by additionally accounting for implementation of recommended bushfire protection measures, along with all other interacting factors.		✓	✓	
RISK MANAGEMENT					
Compliance	Assess current compliance and/or future compliance capability against the 'mandatory' bushfire risk management mechanisms. Note for operating standards, assessment is restricted to the requirements that have direct relevance to a bushfire event. These can include: • Separation from bushfire prone vegetation (APZ/firebreaks); • Access/egress for firefighting services/site occupants, including firebreaks; and • Firefighting water supply & delivery for structure and surrounds fire, not the bushfire.	Planning Guidelines/Standards - for development & uses on bushfire prone land	✓		✓
		Operating Standards / Regulations			
		Construction Standards - for buildings in bushfire areas			
Recommendations	Recommend additional bushfire protection measures to be implemented and their priority.		✓	✓	
	Identify the relevant planning and/or site operations documents in which the recommended bushfire protection measures should be included.		✓	✓	
Advice	Provide specific advice to inform planning for design and construction.		✓		✓
	Provide general advice that identifies issues for management to consider.		✓	✓	

OBJECTIVE VARIATIONS TO BE APPLIED:

Planning advice regarding bushfire risks to/from renewable energy facilities is not available in Western Australia. The most comprehensive and stringent guidance globally is provided in the Guidelines and Model Requirements – Renewable Energy Facilities v4.4 (Victorian Country Fire Authority June 2025).

Risk assessments are tenure-blind, and thus the capacity of the proposal to align with the CFA Guidelines has been assessed. The recommendations within the CFA Guidelines are integrated into the appropriate protection measures within the relevant section of this Report, as this allows a single 'package' of protection measures to be provided.



LEGEND

	SITE ACCESS GATE		PROPOSED SECURITY FENCE
	PROPOSED NEW ACCESS TRACK		EXISTING SUBSTATION
	BATTERY CONTAINER		PROPOSED LANDSCAPE SCREENING (APPROX. 5m WIDE)
	POWER CONVERSION SYSTEM UNIT (PCS)		PROPOSED LANDSCAPE SCREENING (APPROX. 3m WIDE)
	EXISTING OVERHEAD LINE		INTERNAL ACCESS TRACK
	EXISTING OVERHEAD LINE EASEMENT		PROPOSED SUBSTATION AREA
	PROPERTY BOUNDARY		PROPOSED WATER DETENTION BASIN AREA
	PROPOSED NEW CONNECTION ROUTE		
	PROPOSED WATER TANK		
	PROPOSED O&M BUILDING AND CAR PARK AREA		

REVISIONS

REV	STATUS	DESCRIPTION	DATE	D.B.	C.B.
A	DA	INITIAL ISSUE	10/02/26	X.Z	S.Y
B	DA	DETAIL AMENDED	19/02/26	X.Z	S.Y
C	DA	DETAIL AMENDED	03/03/26	X.Z	S.Y
D	DA	DETAIL AMENDED	10/03/26	X.Z	S.Y
E	DA	DETAILS INFORMATION AMENDED	23/03/26	X.Z	S.Y
F	DA	NOTES AMENDED	25/03/26	X.Z	S.Y

PROJECT DETAILS:

KOJONUP BESS

Collie-Changerup Rd, Kojonup WA 6395
-33.804452, 117.136471

PROJECT DEVELOPER:

MINT RENEWABLES

DRAWING TITLE:

INDICATIVE SITE LAYOUT

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DA-2.0_F_KOJONUP

DRAWN BY :	APPROVED BY :	PROJECT MANAGER :
X.Z	S.Y	K.D
SCALE : NOT SCALED	ISSUE : CONCEPT PLAN	ISSUE DATE : 25/03/2026
SHEET SIZE: A3	CONCEPT ONLY NOT FOR CONSTRUCTION PURPOSE	REV. NO: F

Mint

2.3 BUSHFIRE RISKS AND THE APPLIED ASSESSMENT PROCESS

THE RELEVANT RISKS

For this Bushfire Risk Report, the relevant risks:

- Are associated with the natural hazard event of a bushfire; and
- Are the potential for loss of life, injury, or destroyed or damaged assets resulting in personal loss and economic loss due to disruption of services and/or repair or replacement of buildings and infrastructure.

Note that the 'risk' of a bushfire event occurring (as might be determined by consideration of the calculated likelihood of its occurrence), is not part of the relevant risk in this report. For most scenarios, it is assumed that due to the presence of bushfire prone vegetation, a bushfire will occur at some time and the inherent and residual risk levels need to be known for this worst case scenario.

THE APPLIED RISK ASSESSMENT PROCESS

Bushfire Prone Planning (BPP) has adapted the concept for 'Understanding Disaster Risk' as recognised by the United Nations Office for Disaster Risk Reduction [46].

In applying this concept, bushfire risk can be considered a consequence of the interaction of bushfire hazard threats and the exposure and vulnerability of the elements at risk from those threats (i.e., the 'exposed elements' which can include various classes of persons and/or property).

The level of risk associated with bushfire will be reduced by applying bushfire protection measures that:

- Reduce the number and/or level of hazard threats; and/or
- Reduce the level of exposure and/or vulnerability of the elements at risk.

The risk assessment process framework is shown in Figure 2.2 and additional detail is presented in Appendix 1.

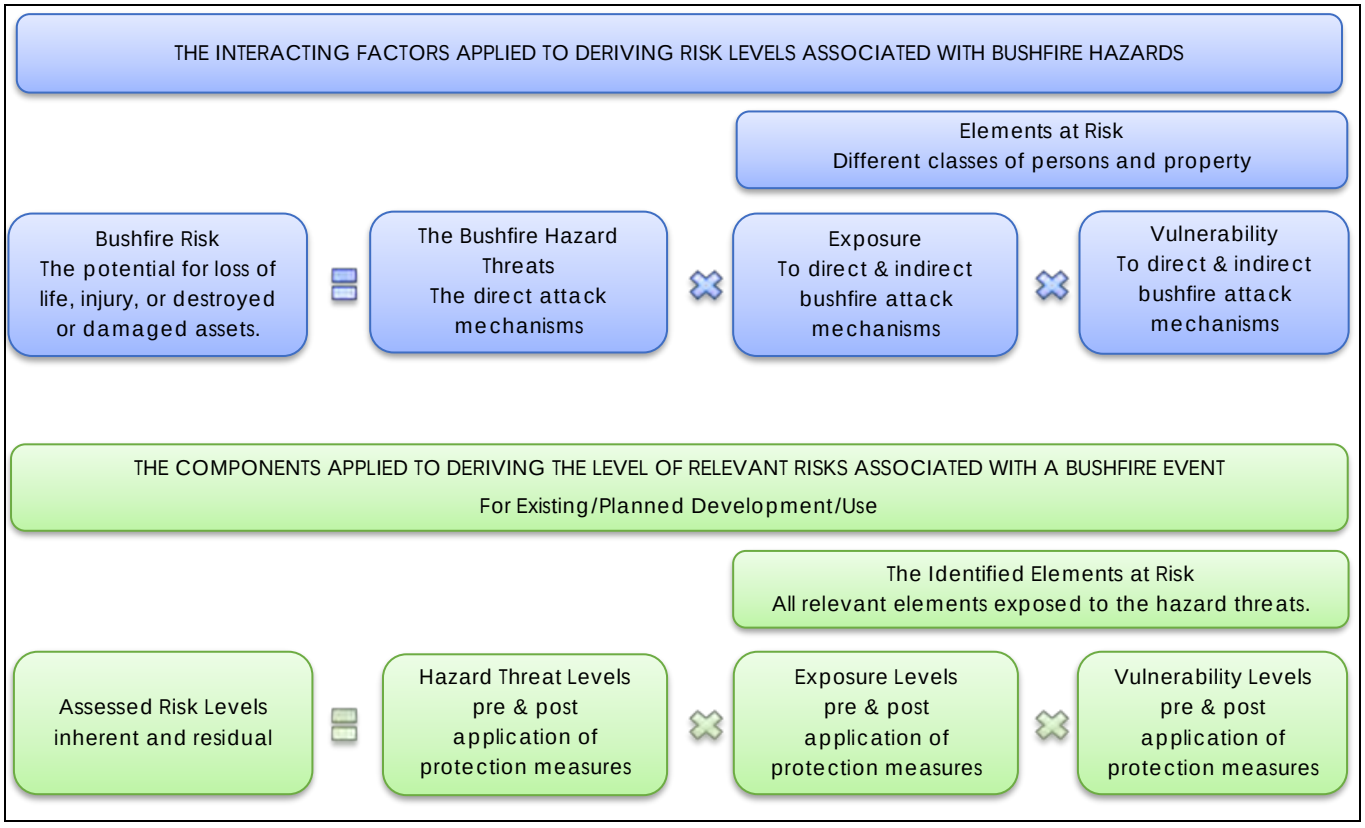
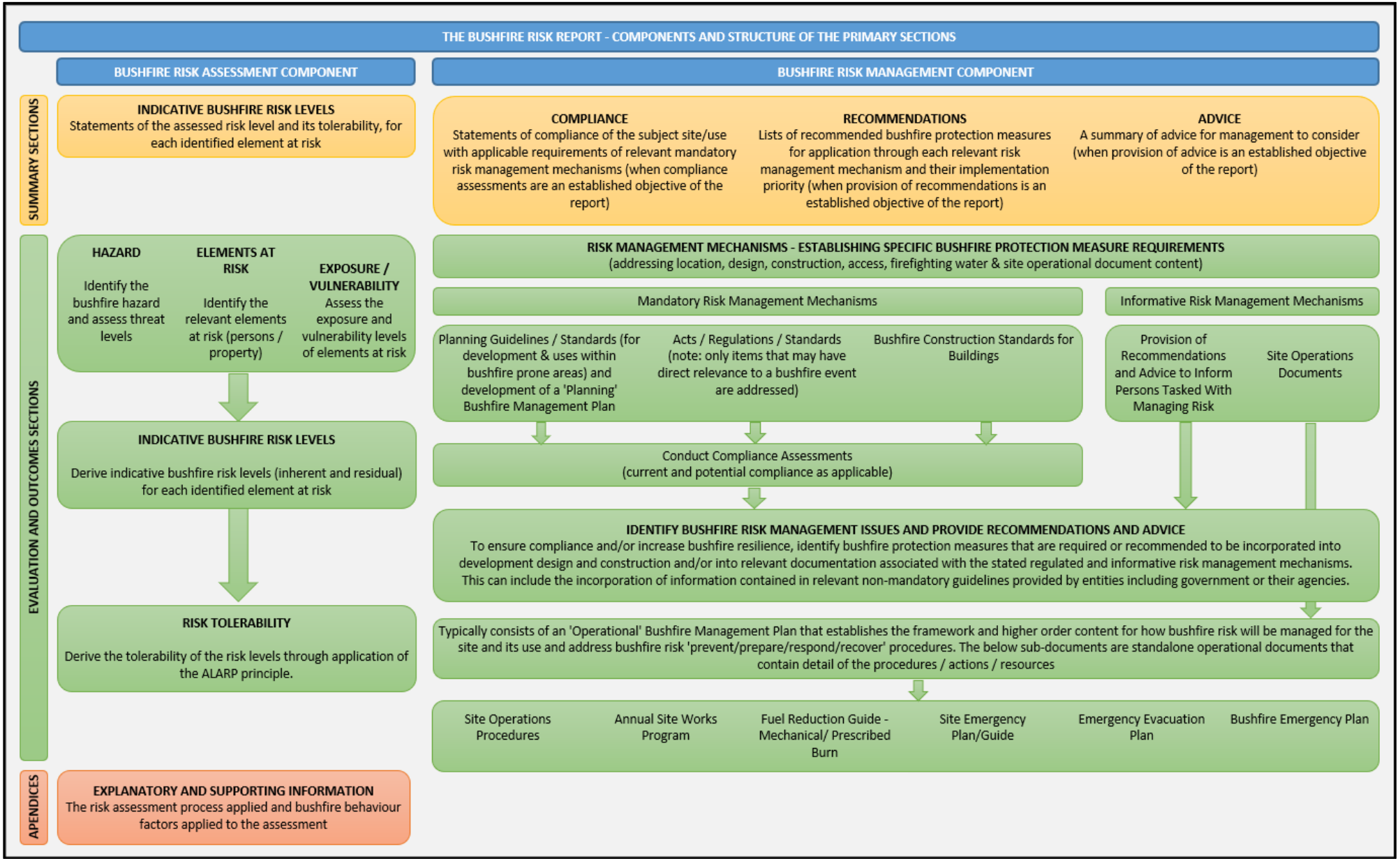


Figure 2.2: The framework of the applied bushfire risk assessment process.

2.4 REPORT STRUCTURE OVERVIEW



3 SUMMARY: BUSHFIRE RISK ASSESSMENT

The Summary: Presents the outcomes of the risk assessment process conducted for the Project and use which is presented in Section 5.

The Worst Case: For each identified element at risk, the worst assessed risk level is stated, along with its tolerability. This will correspond to the worst levels of bushfire hazard threats, and exposure and vulnerability of the element to those threats. Refer to Section 3.2. for the relative contributions of each component that has been assessed as the primary drivers of the level of risk associated with a bushfire event.

Indicative Risk versus Determined Risk: When the assessed bushfire risk levels are stated as 'indicative', rather than 'determined', as they have been derived through the application of a largely qualitative assessment process that applies quantitative information when it exists. Refer to Appendix A1.3 for explanatory and supporting information.

Appendix 1: Explains the bushfire risk level analysis, the risk tolerance methodologies applied, and the terminology used.

3.1 THE ASSESSED BUSHFIRE RISK LEVELS (INDICATIVE) AND THEIR TOLERABILITY

THE ASSESSED BUSHFIRE RISK LEVEL AND ITS TOLERABILITY					
ASSESSED ELEMENTS AT RISK [1]	LEVEL OF RISKS ASSOCIATED WITH A BUSHFIRE EVENT [2]		TOLERABILITY OF THE BUSHFIRE RISK LEVEL (ALARP) [3]		
	Inherent Risk	Residual Risk	Inherent Risk Tolerability	Residual Risk Tolerability	Adjusted Residual Risk Tolerability
Persons onsite and temporarily offsite	L5	VL3	Acceptable but NOT ALARP	Acceptable	N/A
Persons on access/egress routes in vehicles	L4	VL3	Acceptable but NOT ALARP	Acceptable	Tolerability can be adjusted. However, Residual Risk is Very Low regardless of Tolerability.
Buildings/Structures - NCC classes 1-10 (Operations and Maintenance)	M8	L4	Tolerable but NOT ALARP	Acceptable	N/A
Materials stored outdoors	H9	M7	Intolerable as NOT ALARP	Acceptable as IS ALARP	N/A
BESS units and Associated Infrastructure	L6	VL3	Acceptable but NOT ALARP	Acceptable	N/A
Substation	L6	L4	Acceptable but NOT ALARP	Acceptable	N/A

Note 1: Refer to Section 5.2.

Note 2: Refer to Appendices A1.1 and A1.3.3 and the Glossary for explanatory and supporting information. The Bushfire Risk Level is not the risk of a bushfire event occurring. The relevant risks are those associated with a bushfire event and to which the assessed elements at risk are potentially subjected.

Inherent risk accounts for the risk reducing impact of bushfire protection measures already or planned to be implemented. Residual risk additionally accounts for any protection measures recommended for implementation by the bushfire consultant.

Note 3: Refer to Appendix A1.3.6 for explanatory and supporting information and adjustment justification when applicable.

3.2 THE DERIVATION OF THE BUSHFIRE RISK LEVELS (SUMMARISED)

BUSHFIRE HAZARD THREAT LEVEL AND EXPOSURE AND VULNERABILITY LEVELS OF ELEMENTS AT RISK						
ASSESSED ELEMENTS AT RISK [2]	THE INTERACTING FACTORS FROM WHICH THE BUSHFIRE RISK LEVEL IS DERIVED [1]					
	ASSESSED INHERENT LEVELS [3]			ASSESSED RESIDUAL LEVELS [3]		
	Bushfire Hazard Threat [Section 5.1]	Exposure of Element at Risk [Section 5.3]	Vulnerability of Element at Risk [Section 5.4]	Bushfire Hazard Threat [Section 5.1]	Exposure of Element at Risk [Section 5.3]	Vulnerability of Element at Risk [Section 5.4]
Persons onsite and temporarily offsite	Low	Moderate	Low	Low	Low	Very Low
Persons on access/egress routes in vehicles		Low	Low		Low	Very Low
Buildings/Structures - NCC classes 1-10 (Operations and Maintenance)		High	High		Low	Low
Materials stored outdoors		Extreme	High		High	Moderate
BESS unitsand Associated Infrastructure		Moderate	Moderate		Very Low	Low
Substation		Moderate	Moderate		Low	Low

Note 1: Refer to Appendix 1 and Appendix 2 for explanatory and supporting information.

Note 2: Refer to Section 5.2.

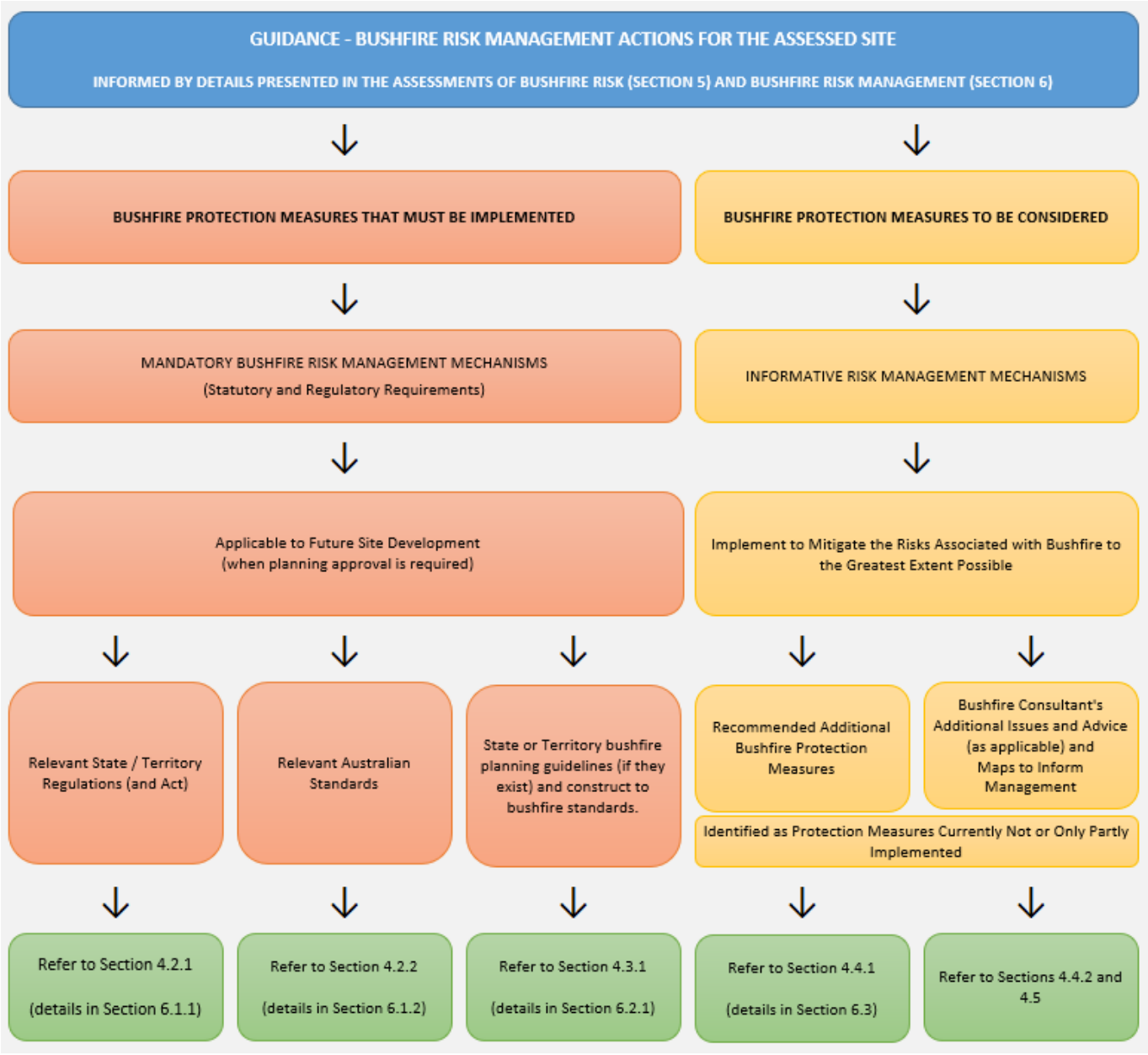
Note 3: Refer to Appendix A1.3.3. Inherent levels account for the threat/exposure/vulnerability reducing impact of applying existing and planned bushfire protection measures. Residual levels additionally account for any protection measures recommended by the bushfire consultant.

4 SUMMARY: BUSHFIRE RISK MANAGEMENT

4.1 MANAGEMENT ACTIONS TO BE ADDRESSED

The following diagram identifies:

1. The components associated with the mandatory and informative risk management mechanisms; and
2. The location within this summary that presents their corresponding bushfire protection measures as:
    a) Those currently not fully implemented that must be implemented; and
    b) Those that are recommended to be implemented.



4.2 INFORMATIVE MECHANISMS – RECOMMENDED ACTIONS

4.2.1 ADDITIONAL BUSHFIRE PROTECTION MEASURES - RECOMMENDED BY THE BUSHFIRE CONSULTANT

4.2.1.1 THREAT REDUCING MEASURES - BUSHFIRE HAZARD

BUSHFIRE HAZARD THREAT REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
Prevent bushfire ignition by managing heat energy sources	1.9	Layout and Design Management of Planned Revegetation	Where vegetation screening is <10m width and continuous with pasture only, vegetation classification should not exceed Class D Scrub. Where vegetation screening is <10m in width and isolated from significant vegetation, exclusion as a 'nature strip' may be appropriate. This will be reflected within the associated 'planning' Bushfire Management Plan for the Development Application.	Medium
	1.10	Procedures & Ongoing Management Robust and effective site operational procedures	The following procedures should be completed prior to the bushfire season (see the Shire of Kojonup Prohibited Burning Period): • Scheduled maintenance to assets, emergency equipment, or fire detection/prevention systems. • The ongoing requirements outlined in the Bushfire Management Plan. • Scheduled housekeeping inspections including: o Hazard identification - ensuring that infrastructure, plant, equipment, vehicles and safety/warning signs show no signs of damage or dilapidation. o Facility access - ensuring all vehicle site access points, including emergency access points, are clear and accessible. o Fire protection systems and equipment – ensuring that all equipment is unobstructed, clearly identifiable, in-service and performing optimally. o Vegetation management - ensuring that any accumulation of combustible materials is cleared from infrastructure, buildings and fire breaks, and removed from the site. o Security measures - ensuring that fences, gates, and security cameras are inspected for damage, and that any damage is immediately actioned (e.g., repaired or replaced).	Medium

BUSHFIRE HAZARD THREAT REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
			• Ad-hoc or annual invitations extended to the local emergency services through the Local Government's Community Emergency Services Manager to offer a familiarisation visit and explanation of emergency procedures, access, hazards, and fire detection and suppression systems.	

[1] The full description of each bushfire protection measure and the detail of the assessment is presented in Section 5.1.4.

[2] Refer to Appendix A1.3.5 for implementation priority rating explanation.

4.2.1.2 EXPOSURE REDUCING MEASURES – ALL STRUCTURES

ALL STRUCTURES EXPOSURE REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
Establish sufficient separation from relevant bushfire hazard threats	4.3 5.2 6.3 8.3	Procedures & Ongoing Management Landscaping - asset protection zone (APZ)	An APZ must be installed around all identified assets. The dimensions are provided below. <u><10kW/m2 (calculated at 1200K flame temperature):</u> • Operations and Maintenance Buildings (Class 1-9) <u><10kW/m2 (calculated at 1090K flame temperature):</u> • Critical Class 10 Buildings • BESS units and PCS o The 10m portion of the APZ immediately around BESS units must be entirely and permanently non-vegetated (sealed, compacted limestone, gravel, mineral earth etc). BESS units are recommended to be sited on concrete slabs or other sealed, non-combustible surface. <u><19kW/m2 (BAL-19):</u> • Substations <u><29kW/m2 (BAL-29):</u> • Laydown Areas o Outdoor material storage areas are recommended to have surfacing applied, extending 2m beyond the storage area. • Construction Compounds • Other Class 1-10 Buildings • Water Tanks	Highest

ALL STRUCTURES EXPOSURE REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
	4.4 6.4 8.4	Layout and Design Landscaping - tree location	Any future Landscape Management Plan should be reviewed by the Bushfire Consultant to provide additional advice on vegetation location, demographics, and structure. Trees over 6m tall are not recommended to be planted within 10m of assets to reduce the capacity for ongoing fuel accumulation or tree strike.	Lowest
	4.7 5.4 6.7 8.7	Layout and Design Procedures & Ongoing Management Separation from stored and constructed combustible items (consequential fire fuels)	All non-structural combustible materials are to be removed within 10m of assets. This includes but is not limited to; waste, leaf litter, machinery, grasses, vehicles, fuel, furniture, and timber. When storage of flammable items or materials are stored on site temporarily (for maintenance etc), separation distances must be complied with. This requirement is to be included in the Site Operating Procedures document. The product datasheet or manufacturer is likely to specify a setback between BESS units. Where this is not provided, a setback of >1m on the shorter and >3m on the longer side is recommended. Where the product datasheet or manufacturer specification does not specify a distance between battery containers and other constructed combustible/critical assets, the applied distance should be 15m (based on >1 hour intervention). This does not apply to any constructed asset required to be reasonably adjacent. For outdoor storage areas, higher flammability or dangerous materials should be positioned toward the centre of the storage areas, to limit the exposure to direct bushfire impacts. Note this may include materials such as tarpaulin.	High
Establish shielding from relevant bushfire hazard threats	4.12 6.12 8.12	Construction Shield operation critical non-structural elements	Electrical cabling associated with built assets (not transmission lines) which are beyond the >10kW/m2 setback (thus subject to radiant heat fluxes >10kW/m^2), or beyond footprint of buildings or constructed assets, are recommended to be installed underground, or shielded with non-combustible material (or enclosed) where practical.	Medium

[1] The full description of each bushfire protection measure, the detail of the assessment and any recommendation, is presented in Sections 5.3.3 & 5.3.4 & 5.3.5 & 5.3.6.

[2] Refer to Appendix A1.3.5 for implementation priority rating explanation.

4.2.1.3 VULNERABILITY REDUCING MEASURES - PERSONS

PERSONS VULNERABILITY REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
Provision of bushfire emergency information and education	9.3	Emergency Planning Develop a bushfire emergency plan	The following details have been identified for inclusion within the Emergency Management Plan (and/or the Site Operating Procedures, as appropriate to the document structure): **Details and Information** • A summary of fire hazards and risks to and from the site, specific to its location, infrastructure, activities and occupancy. • A facility description, including infrastructure details, operations, number of personnel, and operating hours. • A site plan depicting structures/built assets, operational areas, site access points and internal roads, firefighting infrastructure, drainage (as applicable), and neighbouring properties. • Up-to-date contact details for facility personnel, including for at least two persons who may be able to provide information or support during emergencies (24 hours a day). Update contact information when necessary. • Details of emergency resources, including fire detection and suppression systems and equipment; gas detection; emergency eye-wash and shower facilities; spill containment systems and equipment; emergency warning systems; communication systems; personal protective equipment; first aid. • Contact information for 24/7/365 specialist technical support for the battery energy storage system. • Specifications for safe operating conditions for temperature. • Schematics and technical data for battery energy storage system containers/enclosures, the number of containers/enclosures on-site, and the number of battery racks or modules within each container/enclosure. • Details of the hazards for the battery energy storage system, including thermal events/runaway, electrical safety hazards, explosion hazards, dangerous goods hazards (including off-gassing), and the effects of fire on the battery energy storage system (eg., explosion, release of toxic gases). • Details of all provided battery failure/safety and protective systems, including a description, the activation process/automatic trigger, and any hazards associated with these systems.	High

PERSONS VULNERABILITY REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
			Procedures Prevention • Smoking restrictions or designated smoking locations. • Procedures regarding vegetation management and accidental ignition prevention. • The specifications of Schedule 1 of the Planning for Bushfire Guidelines and the Shire of Kojonup Section 33 Notice can be achieved via livestock grazing. If grazing is used, the vegetation must continue to be monitored for compliance with Schedule 1, and additional vegetation management works undertaken as required. • Heavy equipment is not to be operated where long grass (>100mm) or heavy leaf litter is present, particularly during the bushfire season (see the Local Government Prohibited Burning Period). • Servicing of battery energy storage systems should not take place on days of High, Extreme or Catastrophic Fire Danger Rating, except where the system is experiencing malfunction or abnormal behaviour. • Bushfire response training should be provided to all permanent staff. Training should be scheduled at appropriate intervals, accounting for staff turnover and the complexity of firefighting equipment. Preparedness • Annual emergency exercises should be conducted. Contact the local emergency control agencies; the Shire Emergency Management Coordinator (CBFCO) for input/inclusion. Emergency exercises should include bushfire as a potential emergency scenario. • Evacuation and shelter-in-place triggers and procedures, unless included within a Bushfire Emergency Plan. • Procedures for review of the Emergency Management Plan, including the ongoing effectiveness of control measures. • An ongoing schedule to contact the local emergency control agencies; Shire of Kojonup Emergency Services Manager and Chief Bush Fire Control Officer (CBFCO) prior to the bushfire season.	

PERSONS VULNERABILITY REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
			• The Emergency Management Plan and any Emergency Response Guide (FES-ERG) should contain procedures for isolation, shut-down, fail safe or management of critical/high-risk plant, equipment, and utilities, and their advised triggers. • Visitors must provide mobile phone numbers to site management. Within the Emergency Management Plan, a key response will be to contact and advise all persons onsite. Site vehicles are required to have a secondary communication system installed (e.g. two-way radio). • A bushfire monitoring procedure for the Restricted/Prohibited Burning Period (see Shire of Kojonup Section 33 Notice), including: o Nominating a person/role in your Emergency Control Organisation to be responsible for identifying, responding to, and communicating Fire Danger Ratings in advance. o Identifying bushfire activity within 10km of the facility. o Communicating this information to everyone likely to be present on-site, and relevant off-site personnel. o An outline of site activities to be modified or cease as a response (if any). Response DFES Comcen should immediately be notified of: • Any shorts, faults, temperature increases above normal parameters (eg. precursor to thermal events/runaway). • Equipment failures with the potential to ignite or propagate fire. • Off-gassing, smoke or fire. • The monitoring personnel can determine if Emergency Services response is necessary. The notification is for awareness. Bushfire emergency response procedures must include: • Evacuation and shelter-in-place triggers and procedures, unless included within a Bushfire Emergency Plan.	

PERSONS VULNERABILITY REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
			• Response procedures by Emergency Services (including Bushfire Brigades) should include the safe distances from asset fire to establish a containment perimeter to monitor and respond to potential bushfire ignition. • A specific action to notify (or verify notification) the Emergency Services, at the earliest possible stage of the emergency. • The person or role responsible for making or verifying the notification. • The '000' number in the procedure. • Communicating with site personnel and supporting their physical relocation. Bushfire alerts within a 10km radius should be communicated to persons onsite. • Ensuring all buildings and plant are adequately secured. • Initiating any bushfire protection measures such as activating sprinkler or deluge systems or pre-emptive shut-down, prior to the arrival of the fire front. • Liaising with the emergency services where possible. • Consideration of arc flash risk due to bushfire smoke (transmission lines, substations).	
	9.6	Emergency Planning Direct to persons emergency messaging system	Site personnel should download the EmergencyWA app (or equivalent), be trained in its use and information provided in the app. The app should be referred to prior to travelling to or from the sites.	Medium
	9.10	Emergency Planning Build community resilience through education	An information package detailing emergency considerations and response should be provided to landowners leasing land for the proposed development. The proponent may consider extending this information to neighbouring landowners or the local community, recognising the potential for adverse community attitudes.	Medium
	9.15	Emergency Planning External Emergency Response Services Available	Contact the local emergency control agencies; Shire of Kojonup Emergency Services Manager and Chief Bushfire Control Officer (CBFCO) prior to commissioning and offer a familiarisation visit and explanation of emergency procedures, access, hazards, and fire detection and suppression systems. Local Volunteer Fire and Rescue Services (VFRS) and Bush Fire Brigades (BFB) may be invited through the Shire Emergency Management Coordinator (CBFCO). The particular services should be determined by the CBFCO. Establish an ongoing schedule to contact the Shire Emergency Services Manager and/or CBFCO prior to the bushfire season.	High

PERSONS VULNERABILITY REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
Lower risk road construction (design and materials)	Persons on Access / Egress Routes in Vehicles			
	10.7	Construction Interconnected road network to provide route options	Access points will be gated but should be openable in the same manner (the same key, keycard, access code, remote etc). Internal roads (driveways) accessing site assets are to comply, at a minimum, with the specifications for Private Driveways within the *Planning for Bushfire Guidelines.*	Medium
[1] The full description of each bushfire protection measure, the detail of the assessment and any recommendation, is presented in Section 5.4.1 and Section 5.4.2. [2] Refer to Appendix A1.2.5 for implementation priority rating explanation.				

4.2.1.4 VULNERABILITY REDUCING MEASURES – ALL STRUCTURES

ALL STRUCTURES VULNERABILITY REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
Construction design and materials	11.1	Construction Construct to AS 3959:2018	All permanent Class 1-9 buildings are required to apply bushfire resistant construction following their assessed BAL under AS 3959. The standard of construction may align with AS 3959 (to a minimum of BAL-12.5) or NASH Steel Framed Construction in Bushfire Prone Areas. See Figure 3.2 of the associated Bushfire Management Plan. The Operations and Maintenance Building has been designated as an on-site shelter building and must be constructed to AS 3959 requirements for BAL-29 and have a minimum internal floor area equal to 1m^2 per proposed person (e.g. 24m^2 for 24 workers).	Highest
	11.3 13.3	Construction Construction materials for external and internal cavity building elements	For any future Class 1-10 buildings, include non-combustible structural elements where practical. In particular, avoid: polycarbonate (sheeting and skylights), softwoods (<650 kg/m3 density at 12% moisture content), and fibrous materials.	Lowest

ALL STRUCTURES VULNERABILITY REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
			Review compliance of the selected BESS product against NFPA 855 - Standard for the Installation of Stationary Energy Storage Systems (2023) noting that as a North American planning standard, all requirements may not be applicable.	
	11.8 13.8 15.8	Construction Minimise re-entrant detail to minimise debris and ember accumulation	Where electrical cabling, or gas or liquid piping, contacts the ground or any arrangement of associated structures creates a 'pocket' for accumulation of debris, this should be rectified by design or filling with non-combustible material such as mineral earth. Consideration should be given to making the arrangement self-cleaning through wind action to the greatest extent possible. These measures will reduce accumulation and/or make the management (clearing) of accumulated debris easier. E.g. cable raking to be 100mm above ground.	Lowest
	11.11 13.11 15.11	Construction Minimise construction cavities to minimise debris and ember accumulation	Any subfloor cavities must have exposed subfloor spaces enclosed, sealed with non-combustible material, or be ember screened. Ember screening mesh is to be maximum 2mm aperture and composed of corrosion-resistant steel, bronze, or aluminium. This includes ramps/stairs to the building entry.	Highest
	11.12 13.12 15.12	Construction Minimise external openings to limit flame / radiant heat / ember / debris entry	Review the design of warehouse/workshop buildings to ensure they can be fully enclosed.	Medium
	11.13 13.13 15.13	Construction Screen and seal gaps and penetrations	<u>Workshop/warehouse buildings</u> Recommended to have ember screening/sealants installed on any gaps, penetrations, and external glazed elements. Ember screening mesh is to be maximum 2mm aperture and composed of corrosion-resistant steel, bronze, or aluminium. <u>Substations</u> Consider application of ember screening to the external vent interface of the control room, switch room, terminal boxes etc. The intention is to prevent both ember ingress and debris accumulation. Ember screening mesh is to be maximum 2mm aperture and composed of corrosion-resistant steel, bronze, or aluminium.	Medium

ALL STRUCTURES VULNERABILITY REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
	11.15 13.15 15.15	Construction Shutter external doors and windows	External doors (if present) to BESS units should be self-closing.	Lowest
	13.16 15.16	Construction Construction materials for critical non-structural elements	Review *FM Global Property Loss Prevention Data Sheet 5-33 (2020) Electrical Energy Storage Systems* for additional measures applicable to the development.	Lowest
Availability of a firefighting response capability	11.16 12.2 13.17 15.17	Construction Firefighting water supply	The firefighting water supply requirements for the proposal are as follows: <u>Access</u> • Firefighting water access points (hydrants, hard suction, or drafting) must be clearly identifiable, visible from internal roads, and unobstructed. • Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest firefighting water access point. • An all-weather hardstand turnaround area meeting the requirements of the *Planning for Bushfire Guidelines* (Figure 30) must be provided within 4 metres static water storage tank(s) and any independent hard suction points (hydrants). • Site Operating Procedures must include that access routes must be unobstructed at all times. <u>Siting and Capacity</u> • The BESS development requires a minimum 288,000L firefighting water tank. This is to account for both bushfire and asset fire. o Where another firefighting water supply is determined elsewhere (for asset fire etc), the greater volume is to apply. o The required water supply in compliance with AS 2419.1 will be determined based on the final footprint of the BESS development. A footprint exceeding 9000m2 will require additional water supply (per AS 2419.1). • All BESS units must be wholly within 70m of a water outlet. • Water tanks must be positioned >15m from BESS units and PCUs.	Highest

ALL STRUCTURES VULNERABILITY REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
			• Water tanks should apply a BAL-29 dimensioned APZ at a minimum. <u>Construction</u> • Static water storage tanks must be an above-ground water tank constructed of concrete or steel. • An external water level indicator must be installed on static water storage tanks and be visible from internal roads and the adjoining turnaround area. • Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank. Couplings at hard suction points are required to be 125mm Storz fittings (*Guidelines B.4.1.2*). DFES Built Environment and the local emergency services should be contacted for input on appropriate couplings and adaptors.	
	11.17 12.3 13.18 15.18	Emergency Planning Firefighting equipment actively operated	Two suitable fire extinguishers should be provided within 20m of each PCU.	Medium
	11.18 13.19 15.19	Construction Firefighting equipment passively operated	Automatic fire detection and suppression systems should be installed and maintained, as appropriate to the BESS details and recommended by the manufacturer.	Highest
	11.19 13.20 15.20	Construction Firefighting equipment operability maintained	All firefighting water tanks, pumps, connections, couplings, and pipes are to be metal or else non-combustible.	High
Manage and maintain effectiveness of applied protection measures	11.21 12.7 13.22 15.22	Procedures & Ongoing Management Formal documents created to guide and enforce management	The decision maker should note that multiple international standards and guidelines exist, and full compliance with all may not be achievable. Australia lacks a guiding standard, as discussed in the *Battery Energy Storage Systems Guidance Report* (GHD March 2023, prepared for the Australian Energy Council). The decision maker may choose to review this report for an overview of context, concerns, and outcomes, for the construction and installation of BESS proposals. Ongoing requirements established in this Risk Assessment must be included in operational documents. Site Operating Procedures must include the following information: <u>Maintenance</u>	Medium

ALL STRUCTURES VULNERABILITY REDUCTION RECOMMENDED ADDITIONAL BUSHFIRE PROTECTION MEASURES				
The Protection Mechanism	Ref No	Brief Description [1]	Recommendation Details	Implementation Priority Rating [2]
			• Maintenance intervals. Scheduling can be detailed within a supporting document. • Assigned responsibilities of staff. • Maintenance procedures and servicing to manufacturer's specifications. • Testing procedures of the firefighting water supply and equipment. <u>Inspections</u> • Inspection intervals. Frequency of inspections are recommended to be increased during the bushfire season (see the Local Government Prohibited Burning Period) where practical. • Inspection triggers, including extreme weather events or seismic activity. • Established inspection criteria, including: o Accumulation of debris and vegetative material within 10m of battery modules. o Mechanical damage to exterior elements. o Vegetation regrowth within the APZ, particularly immediately prior to and during bushfire season (see the Local Government Prohibited Burning Period). o Obstruction of access routes including firebreaks. o Volume of the firefighting water supply.	
[1] The full description of each bushfire protection measure, the detail of the assessment and any recommendation, is presented in Sections 5.4.3 & 5.4.4 & 5.4.5 & 5.4.6. [2] Refer to Appendix A1.2.5 for implementation priority rating explanation.				

4.2.2 ADDITIONAL ISSUES AND ADVICE FOR CONSIDERATION

This section presents items the bushfire consultant has identified as being:

- Issues that are additional to or not specifically addressed within the assessment of bushfire risk management conducted in Section 6; and
- Advice for dealing with these issues or other issues that require emphasising, for consideration by management.

The *Guidelines and Model Requirements – Renewable Energy Facilities v4* (Victorian Country Fire Authority June 2025) has been considered in the construction of this Bushfire Risk Report. Some considerations are outside the scope of bushfire assessment.

Consider the following criteria for inclusion within the Emergency Management Plan, to be prepared prior to commercial operation. All criteria are for consideration only, being non-bushfire measures identified within *Design Guidelines*.

- Emergency procedures based on identified risks and hazards of the battery energy storage system and related infrastructure, including but not limited to:
    - Electrical infrastructure faults and fire.
    - Battery energy storage system damage or faults, including battery monitoring faults, temperature increases above normal operating parameters, electrical faults, chemical spills or reactions, off-gassing, thermal events/runaway, smoke and fire.
    - The management of fire water runoff.
- A plan for partial and full decommissioning of the battery energy storage system in the event of an emergency incident that renders the facility inoperable or unsafe, prior to its anticipated end-of-life.
- The shut down and/or isolation procedures if the batteries are involved in fire, and appropriate personnel contact details for verifying that the battery enclosure/container system has been isolated/shut-down and de-energised during emergencies.

Within the *Design Guidelines*, s4.2.6.4 Management of Fire Water Runoff states:

> *CFA recommends that infrastructure is provided for the containment and management of contaminated fire water runoff from battery energy storage systems.*
>
> *Infrastructure may include bunding, sumps and/or purpose-built, impervious retention facilities. A fire water management plan may consist of the containment and disposal of contaminated fire water.*
>
> *CFA recommends a containment and management capacity equivalent to the on-site fire protection system. Containment is to be provided as per AS 4681- 2000: The storage and handling of class 9 dangerous goods, Section 7.3.9: Control of run-off.*

A detention basin is included within the submitted design, to the east of the development. The dimensions and capacity of the basins will be confirmed within the civil engineering design. This measure does not directly influence fire risk to/from the site, so is not addressed in this report. The inclusion of this comment is to confirm the consideration has been included in design.

5 BUSHFIRE RISK ASSESSMENT

5.1 THE SURROUNDING LANDSCAPE - BUSHFIRE HAZARD THREAT LEVEL ASSESSMENT

INFORMATION TO ASSIST INTERPRETATION

AREA OF LAND TO BE ASSESSED AS THE SURROUNDING LANDSCAPE

The assessment for this report considers the surrounding landscape to be comprised of two parts:

1. The Project and all land surrounding the subject land extending out to 150 metres as the 'Subject Land + 150m Extent'; and
2. The land surrounding the 'Subject Land + 150m Extent' extending out to the maximum distance that will be established by one or more of the following factors:
    - The distance away from the subject land that will result in an area of land that, when supporting bushfire prone vegetation, is of sufficient size such that a large-scale bushfire can develop (landscape scale fire);
    - The distance away from the subject land from which the bushfire direct attack mechanism of embers/ burning debris may reasonably be expected impact the subject land. This is highly dependent on the 'category' of vegetation present regarding its potential ember/burning debris threat (refer to Appendix 2 for explanatory information); and/or
    - The distance away from the subject land that contains the road network that persons in vehicles (including emergency services) would traverse in evacuating or accessing the subject land in the event of a bushfire.

To achieve the required assessment outcomes a maximum distance of 5 km from the subject land is likely to be considered sufficient, with this distance being reduced when the vegetation categories presenting the higher ember/burning debris threat level do not exist.

ASSESSMENT PURPOSE - EXISTENCE OF RELEVANT PHYSICAL FACTORS

To identify whether the land surrounding the existing or proposed development and its use contains the physical factors necessary for any of the following scenarios to exist:

1. The potential exists for the bushfire hazard threat of embers/burning debris to impact elements at risk on the subject land. It is particularly important this threat is identified when any vegetation planned to be retained and/or established on the subject land and within 100 metres (the 'Subject Land + 150m Extent') may not present this threat - or at least not to the same level. Refer to Appendices A1.3 and A1.6 for additional information.

    Note: Scientific research indicates that at least 80% of building losses from past Australian bushfires can be attributed to ember/firebrand attack (mostly in isolation but also in combination with radiant heat), and the resultant consequential fires. It is a very important threat to be identified; and/or

2. The potential exists for development of a large-scale bushfire event(s) that can impact the subject land because the necessary extent of bushfire prone vegetation exists. Such events may increase the severity of bushfire behaviour within the 'Subject Land + 150m Extent' vegetation, consequently increasing the levels of all bushfire hazard threats impacting elements at risk; and/or
3. The potential exists for development of dynamic fire behaviours and deep flaming that are associated with extreme bushfire events (including pyroconvective events). Dynamic fire propagation arises from complex interactions between the terrain, the atmosphere, and the fire (refer to Appendix 3 for additional information).

    Extreme bushfire events have the potential to impact subject land through generating fire driven strong winds, increasing erratic fire behaviour and increasing the levels of all bushfire hazard threats impacting elements at risk; and/or
4. The potential exists for increased levels of bushfire hazard threats, to persons in vehicles who need to move through this area of land (i.e., persons evacuating from the subject land and emergency services), thereby increasing level of risks associated with bushfire.

5.1.1 DETERMINATION OF THE ASSESSMENT EXTENT TO BE APPLIED

THE SURROUNDING LANDSCAPE ASSESSMENT EXTENT	
BASIS FOR DETERMINATION	
The vegetation categories identified surrounding the subject land include significant extents and continuity of those that contain trees with bark hazards. These present the potential for developing significant ember/burning debris threat levels. These threats are either medium (up to 5km) and/or long distance (greater than 5km) spotting. [1]	
The vegetation categories identified surrounding the subject land only include those that have the potential for shorter distance spotting (ember/burning debris attack) of up to 500-750m. [1]	✓
The distance away from the subject land that contains the road network that persons in vehicles would traverse in evacuating or accessing the subject land in the event of a bushfire, has determined the assessment extent.	
Assessment Comments: The dominant vegetation in the region is unlikely to generate moderate or long-range ember attack during a bushfire. No significant vegetation assemblages with spotting distances exceeding 700m were noted. However, a 2km extent was considered to make this determination. Overall, the vegetation types present are not conducive to the production of significant long-distance embers. Ribbon and candle bark species, which are known to generate longer-range embers due to their structure and burn characteristics, are uncommon in the area. The vegetation tends to include smooth and platy/papery barks which pose a lesser threat or fibrous barks which typically produce embers with shorter burnout times and limited travel distance, thereby reducing the potential ember threat to assets located further from the fire front.	
The extent of land surrounding the subject land that is to be considered as being the surrounding landscape for assessment purposes:	Approximately 2 km
Note 1: Refer to Appendix 2 and Appendix 3 for additional information.	

5.1.2 IDENTIFICATION OF VEGETATION CATEGORIES PRESENT AND RANGE OF POTENTIAL THREAT LEVELS

INFORMATION TO ASSIST INTERPRETATION

Vegetation categories are established to enable a comprehensive assessment of the type and severity of the direct bushfire attack mechanisms (i.e., the bushfire threats – refer to Appendix 2), potentially generated by bushfire prone vegetation on surrounding land. This enables variations in vegetation composition and structure to be more appropriately accounted for in the determination of the levels of risk associated with a local bushfire event.

The potential threat level ranges assigned to each vegetation category in the table below are the result of these variations in vegetation composition.

The vegetation 'Categories' applied are necessarily different to the vegetation 'Classifications' applied in the BAL determination methodology of AS 3959:2018. This building Standard primarily considers the flame contact and radiant heat attack mechanisms to inform construction requirements to resist the bushfire itself.

The BAL determination methodology does not fully address ember/firebrand attack with respect to spotting range and density associated with the types of available fuel (or any other threats from direct or indirect attack mechanisms).

Higher levels of ember/firebrand threat have implications for the initiation of consequential fire as a very significant bushfire indirect attack mechanism that can subject elements at risk to flame contact and high levels of radiant heat, even though the bushfire itself is not close and could be kilometres away. It is important not to overlook this threat.

VEGETATION CATEGORIES IDENTIFIED IN THE SURROUNDING LANDSCAPE (AND CORRESPONDING POTENTIAL THREAT LEVEL RANGES)		
Vegetation Category [1 & 2]	Assessment Comments	Potential Threat Level Range [2]
Tree-1	Substantial remnant banksia woodlands within the local area, and pockets of marri trees either within these areas or isolated within pasture areas. Very low density areas of low eucalypts have been included within this category due to the bark type, however the fire intensity in such areas is unlikely to dislodge significant embers or form a pyroconvective column to create an attack vector.	Moderate to Extreme
Tree-2	Not Present	Moderate to Extreme
Tree/Shrub	Scrubby heathland areas common throughout the region, and treed areas with inconsistent or lower hazard bark types (smooth/flaky/spongy) such as melaleuca and whitegums. Tree/Shrub functionally applies to non-grassland vegetation assemblages with limited bark hazards.	Moderate to Very High
Shrub	Not Present	Low to Moderate
Grass	Pasture consistent with the region. Pasture areas display regular grazing or slashing.	Low to Moderate
No / Low Threat	Not Present	None to Low

Note 1: Refer to Figure 5.1: Surrounding landscape – the identified vegetation categories.

Note 2: Refer to Appendix 5 for a description of the criteria that establish the vegetation categories, the base bushfire hazard scenario and the potential threat levels and the application of these levels.

Figure 5.1

Vegetation Categories Map

Lot 3194 on Plan 227649, Area : 97.29 ha
Collie-Changerup Road
KOJONUP
SHIRE OF KOJONUP

BELL RD
ALBANY HWY
COLLIE-CHANGERUP RD
LUZ RD
NORRISH DR
TUNNEY RD
MATHER RD

------ LEGEND ------

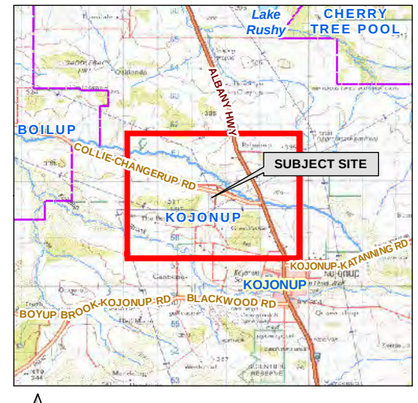
- Development Extent
- 2km from Development

Vegetation Categories

- Tree-1
- Tree/Shrub
- Grass

0 250 500 750 1,000
Metres

------ LOCALITY ------



N

Aerial Imagery : Landgate/SLIP
Image Date : Nov 2024

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Neil Stoney 6/01/2026
Map updated by: Neil Stoney 6/01/2026
A3 Scale 1:15,800

BUSHFIRE PRONE PLANNING

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Map Document Path / Name: K:\Projects\Jobs 2024\241243 - 3680 Collie - Changerup Rd, Kojonup (BRMP)\Mapping\MXD\241243_Fig5-1_CAT.mxd

5.1.3 DETERMINING THE POTENTIAL THREAT LEVEL TO APPLY - EXISTENCE OF RELEVANT PHYSICAL FACTORS

5.1.3.1 VEGETATION EXTENT AND CONTINUITY FACTORS

THE EXISTENCE OF RELEVANT PHYSICAL FACTORS AND THEIR LIKELY IMPACT ON THE BASE POTENTIAL THREAT LEVEL (VEGETATION EXTENT AND CONTINUITY OF IDENTIFIED VEGETATION CATEGORIES)						
Relevant Physical Factors [1,4 & 6]	Vegetation Location Within the Surrounding Landscape [2]	Vegetation Classification AS 3959:2018 [3]	Vegetation Category [4]	Existence of Physical Factor	Assessment Comments (As Needed)	Resultant Modification of the Threat Level [4 & 5]
The extent of vegetation is sufficient to support a fully developed bushfire but insufficient to result in an extreme bushfire event. [4] Note: Vegetation within the 'Subject Land + 150m Extent' is only assessed independently of the surrounding vegetation when it is sufficiently isolated. If the relevant area of vegetation is not isolated or can support an extreme bushfire event (see next physical factor) the assessment response will be N/A.	N/A Vegetation within the 150 metre assessment area is not isolated from other external vegetation areas.					

THE EXISTENCE OF RELEVANT PHYSICAL FACTORS AND THEIR LIKELY IMPACT ON THE BASE POTENTIAL THREAT LEVEL (VEGETATION EXTENT AND CONTINUITY OF IDENTIFIED VEGETATION CATEGORIES)						
Relevant Physical Factors [1,4 & 6]	Vegetation Location Within the Surrounding Landscape [2]	Vegetation Classification AS 3959:2018 [3]	Vegetation Category [4]	Existence of Physical Factor	Assessment Comments (As Needed)	Resultant Modification of the Threat Level [4 & 5]
The extent of vegetation is sufficient to support large active flaming zones (landscape scale fire). This presents one of the physical factors required for the development of an extreme bushfire event. [6]	The 'Subject Land + 150m Extent'.	A. FOREST	Tree-1	Does Not Exist	Not present within the assessment extent.	Major Decrease
		B. WOODLAND				
		A. FOREST	Tree/Shrub	Insignificant / Unlikely to Occur	Limited to road verge vegetation only.	Major Decrease
		B. WOODLAND				
		D. SCRUB				
		G. GRASSLAND	Grass	Substantially Exists	Grassland is of substantial extent.	Neutral
	The Land Surrounding the 'Subject Land + 150m Extent'		Tree-1	Partially Exists	Continuous large extents are present to the south-east, >500m from the site.	Neutral
			Tree/Shrub	Partially Exists	Often irregularly shaped or smaller areas, but do exist to the west and north.	Minor Decrease
			Grass	Partially Exists	Cleared pasture areas are common locally.	Neutral
The bushfire fuels are continuous. Fire can spread uninterrupted and not be slowed by the intermittent absence of fuels. This presents one of the physical factors required for the development of an extreme bushfire event. [6]	The 'Subject Land + 150m Extent'.	A. FOREST	Tree-1	Does Not Exist	Not present within the assessment extent.	Major Decrease
		B. WOODLAND				
		A. FOREST	Tree/Shrub	Does Not Exist	Road verge vegetation is limited and fragmented by roads and pasture.	Major Decrease
		B. WOODLAND				
		D. SCRUB				
		G. GRASSLAND	Grass	Substantially Exists	Access tracks and external roads fragments the vegetation to a limited extent.	Minor Decrease
	The Land Surrounding the 'Subject Land + 150m Extent'		Tree-1	Substantially Exists	The fuels within these areas are continuous, and the area to the south-east is of sufficient extent that fire spread would be uninterrupted.	Minor Increase

THE EXISTENCE OF RELEVANT PHYSICAL FACTORS AND THEIR LIKELY IMPACT ON THE BASE POTENTIAL THREAT LEVEL (VEGETATION EXTENT AND CONTINUITY OF IDENTIFIED VEGETATION CATEGORIES)						
Relevant Physical Factors [1,4 & 6]	Vegetation Location Within the Surrounding Landscape [2]	Vegetation Classification AS 3959:2018 [3]	Vegetation Category [4]	Existence of Physical Factor	Assessment Comments (As Needed)	Resultant Modification of the Threat Level [4 & 5]
			Tree/Shrub	Partially Exists	Occasional fragmentation only.	Minor Decrease
			Grass	Partially Exists	Access tracks and external roads fragments the vegetation to a limited extent.	Minor Decrease

Note 1: Refer to Appendix 2 for additional information.

Note 2: Refer to Figure 5.1 Surrounding landscape – the identified vegetation categories.

Note 3: Refer to Appendix A6.4.2 for the map of classified (AS 3959:2018) bushfire prone vegetation and topography within the 'Subject Land + 150m Extent'. The identified classified vegetation that best corresponds to the categorised vegetation will be specific to the subject land and its surrounds and is identified in this column.

Note 4: Refer to Appendix 5 for a description of the criteria that establish the vegetation categories and their potential threat level range.

Note 5: The modification rating is derived for the identified area of vegetation/land after conducting a qualitative assessment of the existence of the relevant physical factor. It is applied to deriving a 'Potential Threat Level' from the 'Potential Threat Level Range' associated with each vegetation category.

Note there is a base bushfire fuels, terrain and fire weather assumption that has been applied in establishing the 'Potential Threat Level' ranges. It is a scenario of a sufficiently large area of bushfire prone vegetation, with continuous fuels, on flat to undulating terrain with no slopes greater than ten degrees, that can support a fully developed bushfire. It is also assumed to be possible for the most adverse (catastrophic) fire weather to occur. This scenario establishes the midpoint of the 'Potential Threat Level Range'. Refer to Appendix 5 for additional explanatory and supporting information.

Note 6: A physical factor with identified links (from bushfire research) to dynamic bushfire propagation and subsequent development of extreme bushfire events, including the development of pyroconvective, coupled atmosphere events. Refer to Appendix 3 for additional information.

5.1.3.2 VEGETATION FUEL LOAD/ARRANGEMENT/BARK HAZARD FACTORS

THE EXISTENCE OF RELEVANT PHYSICAL FACTORS AND THEIR LIKELY IMPACT ON THE BASE POTENTIAL THREAT LEVEL (FUEL LOAD/ARRANGEMENT/BARK HAZARD OF IDENTIFIED VEGETATION CATEGORIES)						
Relevant Physical Factors [1 & 6]	Vegetation Location Within the Surrounding landscape [2]	Vegetation Classification AS 3959:2018 [3]	Vegetation Category [4]	Existence of Physical Factor	Assessment Comments (As Needed)	Resultant Modification of the Potential Threat Level [4 & 5]
Managed Fuel Loads Evidence that management of fuel loads is planned, conducted regularly and enforced. Includes prescribed burning programs.	The 'Subject Land + 150m Extent'.	A. FOREST	Tree-1	N/A	Not present within the assessment extent.	Major Decrease
		B. WOODLAND				
		A. FOREST	Tree/Shrub	Does Not Exist	Road verges are not managed.	Neutral
		B. WOODLAND				
		D. SCRUB				
		G. GRASSLAND	Grass	Partially Exists	Grassed areas are often grazed or cropped short. This is not a planned or conducted measure.	Minor Decrease
	The Land Surrounding the 'Subject Land + 150m Extent'		Tree-1	Does Not Exist	-	Neutral
			Tree/Shrub	Partially Exists	Many such areas have heavily grazed understory.	Minor Decrease
			Grass	Partially Exists	Grassed areas are often grazed or cropped short. This is not a planned or conducted measure.	Minor Decrease
Adverse Fuel Loads and Arrangement [6] Fuel loads heavier than a normal range for the category or are uncharacteristic for the category; and/or	The 'Subject Land + 150m Extent'.	A. FOREST	Tree-1	N/A	Not present within the assessment extent.	Major Decrease
		B. WOODLAND				
		A. FOREST	Tree/Shrub	Substantially Exists	Road verges are scrub/grass with significant surface, near-surface, and elevated fuels.	Neutral
		B. WOODLAND				
		D. SCRUB				
		G. GRASSLAND	Grass	Limited	Grassed areas are often grazed or cropped short.	Significant Decrease

THE EXISTENCE OF RELEVANT PHYSICAL FACTORS AND THEIR LIKELY IMPACT ON THE BASE POTENTIAL THREAT LEVEL (FUEL LOAD/ARRANGEMENT/BARK HAZARD OF IDENTIFIED VEGETATION CATEGORIES)						
Relevant Physical Factors [1 & 6]	Vegetation Location Within the Surrounding landscape [2]	Vegetation Classification AS 3959:2018 [3]	Vegetation Category [4]	Existence of Physical Factor	Assessment Comments (As Needed)	Resultant Modification of the Potential Threat Level [4 & 5]
Worst case fuel arrangement exists. [Where heavy forest fuel types with loads more than 15-20 t/ha exist, the potential for vorticity-driven lateral spread exists (as a dynamic fire behaviour) if the required terrain characteristics are present].	The Land Surrounding the 'Subject Land + 150m Extent'		Tree-1	Partially Exists	The fuel load arrangements in Tree-1 areas are that of dense scrub/forest, and approximate the expected fuel loads.	Neutral
			Tree/Shrub	Limited	Most areas have reduced available elevated fuels due to grazing.	Significant Decrease
			Grass	Partially Exists	Grassed areas are often grazed or cropped short.	Significant Decrease
Bark Hazard The presence of high threat level bark hazards with potential for high levels of ember/burning debris production (spotting density) and long burnout times (travel distance). Refer to photo evidence in Appendix A6.3.	The 'Subject Land + 150m Extent'.	A. FOREST	Tree-1	Does Not Exist	Not present within the assessment extent.	Major Decrease
		B. WOODLAND				
		A. FOREST	Tree/Shrub	Limited	The limited scrub areas do not contain barks which pose a significant ember hazard.	Significant Decrease
		B. WOODLAND				
		D. SCRUB				
		G. GRASSLAND	Grass	Does Not Exist	-	Significant Decrease
	The Land Surrounding the 'Subject Land + 150m Extent'		Tree-1	Partially Exists	The bark types within Tree-1 have higher ember generation potential (finely fibrous barks) with short distance spotting (shorter burnout times). Flooded gum and casuarina has very short spotting distances, but jarrah bark is both longer distance and substantially more intense.	Significant Decrease
			Tree/Shrub	Limited	The bark types within Tree/Shrub areas is greatly variable, but longer distance spotting is unlikely. Platy, smooth, papery, and fibrous barks are all present.	Significant Decrease

THE EXISTENCE OF RELEVANT PHYSICAL FACTORS AND THEIR LIKELY IMPACT ON THE BASE POTENTIAL THREAT LEVEL (FUEL LOAD/ARRANGEMENT/BARK HAZARD OF IDENTIFIED VEGETATION CATEGORIES)						
Relevant Physical Factors [1 & 6]	Vegetation Location Within the Surrounding landscape [2]	Vegetation Classification AS 3959:2018 [3]	Vegetation Category [4]	Existence of Physical Factor	Assessment Comments (As Needed)	Resultant Modification of the Potential Threat Level [4 & 5]
			Grass	Does Not Exist	-	Significant Decrease

Note 1: Refer to Appendix 2 for additional information.

Note 2: Refer to Figure 5.1 Surrounding landscape – the identified vegetation categories.

Note 3: Refer to Appendix A6.4.2 for the map of classified (AS 3959:2018) bushfire prone vegetation and topography within the 'Subject Land + 150m Extent'. The identified classified vegetation that best corresponds to the categorised vegetation will be specific to the subject land and its surrounds and is identified in this column.

Note 4: Refer to Appendix 5 for a description of the criteria that establish the vegetation categories and their potential threat level range.

Note 5: The modification rating is derived for the identified area of vegetation/land after conducting a qualitative assessment of the existence of the relevant physical factor. It is applied to deriving an 'Potential Threat Level' from the 'Potential Threat Level Range' associated with each vegetation category.

Note there is a base bushfire fuels, terrain and fire weather assumption that has been applied in establishing the 'Potential Threat Level' ranges. It is a scenario of a sufficiently large area of bushfire prone vegetation, with continuous fuels, on flat to undulating terrain with no slopes greater than ten degrees, that can support a fully developed bushfire. It is also assumed to be possible for the most adverse (catastrophic) fire weather to occur. This scenario establishes the midpoint of the 'Potential Threat Level Range'. Refer to Appendix 5 for additional explanatory and supporting information.

Note 6: A physical factor with identified links (from bushfire research) to dynamic bushfire propagation and subsequent development of extreme bushfire events, including the development of pyroconvective, coupled atmosphere events. Refer to Appendix 3 for additional information.

5.1.3.3 TERRAIN FACTORS

<table>
<tr><th colspan="7">THE EXISTENCE OF RELEVANT PHYSICAL FACTORS AND THEIR LIKELY IMPACT ON THE BASE POTENTIAL THREAT LEVEL
(GROUND SLOPE AND SLOPE LENGTH UNDER IDENTIFIED VEGETATION CATEGORIES)</th></tr>
<tr><th>Relevant Physical Factors [1 & 6]</th><th>Vegetation Location Within the Surrounding landscape [2]</th><th>Vegetation Classification AS 3959:2018 [3]</th><th>Vegetation Category [4]</th><th>Existence of Physical Factor</th><th>Assessment Comments (As Needed)</th><th>Resultant Modification of the Potential Threat Level [4 & 5]</th></tr>
<tr><td rowspan="8">Effective Slopes ≥ 10 Degrees
Vegetation exists, at least partially, on terrain of 10 degrees or greater ground slope and of sufficient length (see slope length factor), that will increase fire rates of spread and consequent fire intensity.</td><td rowspan="6">The ‘Subject Land + 150m Extent’.</td><td>A. FOREST</td><td rowspan="2">Tree-1</td><td rowspan="8">Does Not Exist</td><td rowspan="16">Local slopes are largely flat or up to 5 degrees.
See Figure 5.3.</td><td rowspan="6">Minor Decrease</td></tr>
<tr><td>B. WOODLAND</td></tr>
<tr><td>A. FOREST</td><td rowspan="3">Tree/Shrub</td></tr>
<tr><td>B. WOODLAND</td></tr>
<tr><td>D. SCRUB</td></tr>
<tr><td>G. GRASSLAND</td><td>Grass</td></tr>
<tr><td colspan="2" rowspan="3">The Land Surrounding the ‘Subject Land + 150m Extent’</td><td>Tree-1</td><td rowspan="3">Minor Decrease</td></tr>
<tr><td>Tree/Shrub</td></tr>
<tr><td>Grass</td></tr>
<tr><td rowspan="8">Effective Slopes ≥ 20 Degrees [6]
Vegetation exists, at least partially, on steep terrain of 20 degrees or greater ground slope and of sufficient length (see slope length factor).
The presence of ridges able to present steep leeward slopes to exposed elements is an additional</td><td rowspan="6">The ‘Subject Land + 150m Extent’.</td><td>A. FOREST</td><td rowspan="2">Tree-1</td><td rowspan="8">Does Not Exist</td><td rowspan="6">Minor Decrease</td></tr>
<tr><td>B. WOODLAND</td></tr>
<tr><td>A. FOREST</td><td rowspan="3">Tree/Shrub</td></tr>
<tr><td>B. WOODLAND</td></tr>
<tr><td>D. SCRUB</td></tr>
<tr><td>G. GRASSLAND</td><td>Grass</td></tr>
<tr><td colspan="2" rowspan="3">The Land Surrounding the ‘Subject Land + 150m Extent’</td><td>Tree-1</td><td rowspan="3">Grass</td></tr>
<tr><td>Tree/Shrub</td></tr>
</table>

THE EXISTENCE OF RELEVANT PHYSICAL FACTORS AND THEIR LIKELY IMPACT ON THE BASE POTENTIAL THREAT LEVEL (GROUND SLOPE AND SLOPE LENGTH UNDER IDENTIFIED VEGETATION CATEGORIES)						
Relevant Physical Factors [1 & 6]	Vegetation Location Within the Surrounding landscape [2]	Vegetation Classification AS 3959:2018 [3]	Vegetation Category [4]	Existence of Physical Factor	Assessment Comments (As Needed)	Resultant Modification of the Potential Threat Level [4 & 5]
component of this factor.						
Sufficient Length of Steep Slopes The identified 20 degree and greater slopes can support the entire flame depth of a fully developed fire.	The 'Subject Land + 150m Extent'.	A. FOREST	Tree-1	Does Not Exist	No slopes >20 degrees exist for longer slopes to apply.	Minor Decrease
		B. WOODLAND				
		A. FOREST	Tree/Shrub			
		B. WOODLAND				
		D. SCRUB				
		G. GRASSLAND	Grass			
	The Land Surrounding the 'Subject Land + 150m Extent'		Tree-1			
			Tree/Shrub			
			Grass			

Note 1: Refer to Appendix 2 for additional information.

Note 2: Refer to Figure 5.1 Surrounding landscape – the identified vegetation categories.

Note 3: Refer to Appendix A6.4.2 for the map of classified (AS 3959:2018) bushfire prone vegetation and topography within the 'Subject Land + 150m Extent'. The identified classified vegetation that best corresponds to the categorised vegetation will be specific to the subject land and its surrounds and is identified in this column.

Note 4: Refer to Appendix 5 for a description of the criteria that establish the vegetation category and its potential threat level range.

Note 5: The modification rating is derived for the identified area of vegetation/land after conducting a qualitative assessment of the existence of the relevant physical factor. It is applied to deriving an 'Potential Threat Level' from the 'Potential Threat Level Range' associated with each vegetation category.

Note there is a base bushfire fuels, terrain and fire weather assumption that has been applied in establishing the 'Potential Threat Level' ranges. It is a scenario of a sufficiently large area of bushfire prone vegetation, with continuous fuels, on flat to undulating terrain with no slopes greater than ten degrees, that can support a fully developed bushfire. It is also assumed to be possible for the most adverse (catastrophic) fire weather to occur. This scenario establishes the midpoint of the 'Potential Threat Level Range'. Refer to Appendix 5 for additional explanatory and supporting information.

Note 6: A physical factor with identified links (from bushfire research) to dynamic bushfire propagation and subsequent development of extreme bushfire events, including the development of pyroconvective, coupled atmosphere events. Refer to Appendix 3 for additional information.

Note 7: Refer to Figure 5.3: Surrounding landscape - terrain slope map.

Figure 5.2

Surrounding Landscape Terrain Elevation Map

Lot 3194 on Plan 227649, Area : 97.29 ha
Collie-Changerup Road
KOJONUP
SHIRE OF KOJONUP

BELL RD
ALBANY HWY
COLLIE-CHANGERUP RD
LUZ RD
NORRISH DR
TUNNEY RD
MATHER RD

Key

Elevation (m)

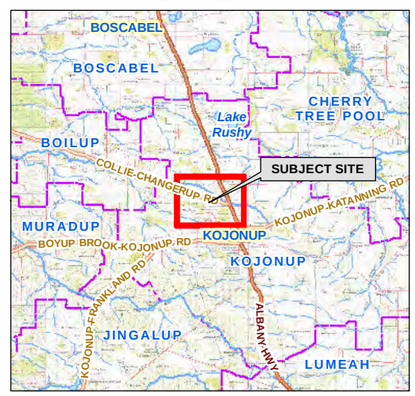
- 270 - 280
- 280 - 290
- 290 - 300
- 300 - 310
- 310 - 320
- 320 - 330
- 330 - 340
- 340 - 350
- 350 - 360
- 360 - 370

------ LEGEND ------

- Development Extent
- 2km from Development

0 250 500 750 1,000
Meters

------ LOCALITY ------



BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 6/01/2026
Map updated by: Neil 6/01/2026
A3 Scale 1:15,800

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.
Map Document Path / Name: K:\Projects\Jobs 2024\241243 - 3680 Collie - Changerup Rd, Kojonup (BRMP)\Mapping\MXD\241243_Fig5-2_DEM.mxd

Figure 5.3

Surrounding Landscape Terrain Slope Map

Lot 3194 on Plan 227649, Area : 97.29 ha
Collie-Changerup Road
KOJONUP
SHIRE OF KOJONUP

BELL RD
ALBANY HWY
COLLIE-CHANGERUP RD
LUZ RD
NORRISH DR
TUNNEY RD
MATHER RD

Key

Slope (Degrees)

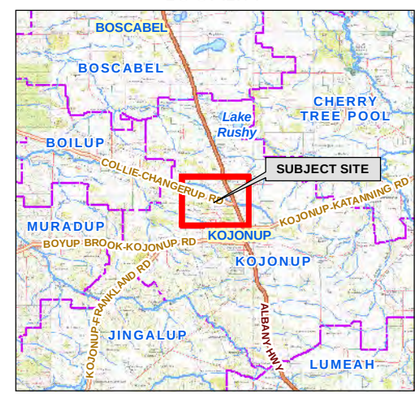
- 0 - 1
- 1 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20+

------ LEGEND ------

- Development Extent
- 2km from Development

0 250 500 750 1,000
Meters

------ LOCALITY ------



N

BUSHFIRE PRONE PLANNING

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Ian Ross 6/01/2026
Map updated by: Neil 6/01/2026
A3 Scale 1:15,800

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.
Map Document Path / Name: K:\Projects\Jobs 2024\241243 - 3680 Collie - Changerup Rd, Kojonup (BRMP)\Mapping\MXD\241243_Fig5-3_SLOPE.mxd

5.1.3.4 FIRE WEATHER FACTORS

The purpose of including consideration of fire weather factors in the surrounding landscape assessment is to be able to account for those scenarios in which the most adverse (catastrophic) fire weather conditions are either (a) cannot occur; or (b) highly unlikely to occur and this can be fully justified. Otherwise, such conditions are accounted for in the 'Potential Threat Level' ranges stated for each category of vegetation in Appendix 5.

THE EXISTENCE OF RELEVANT PHYSICAL FACTORS AND THEIR LIKELY IMPACT ON THE BASE POTENTIAL THREAT LEVEL - FIRE WEATHER CONSIDERATIONS			
Relevant Physical Factor	Existence of Physical Factor	Assessment Comments (As Needed)	Resultant Modification of the Potential Threat Level [1]
Associated with intensification of fire behaviour			
Location has persistent strong synoptic winds (i.e., not fire driven)	Likely to Occur	The nearest weather station is Katanning. The prevailing wind directions are easterly and southerly. Wind speeds are historically gentle to moderate, with speeds exceeding 30kmh being <5% frequency.	Significant Decrease
Very low relative humidity and very high ambient air temperature	Likely to Occur	Common during the bushfire season, with extended periods without rain. The region frequently has very low relative humidity due to the expansive cleared areas and wind action.	Minor Increase
Associated with development of dynamic fire propagation behaviours, intensification of fire behaviour, and development of extreme bushfire events. [2]			
Wind speeds in excess of approximately 20 km/hr and wind direction within 30-40 degrees of ridge/scarp features – increasing the potential for vorticity-driven lateral spread.	N/A	Ridges/scarps are not present within the region.	N/A
Due to weather factors, fuel moisture contents can dry to around 5% or less.	Possible to Occur	Due to the drying climate and increasing temperatures, these factors may be possible. Pasture will often reach 5% fuel moisture and the limited overstory in many areas limits the ability for shading to increase humidity.	Neutral
Atmospheric instability creating opportunity for atmospheric coupling and violent pyroconvection. [3]	Possible to Occur	Atmospheric instability occurs where air higher in the atmosphere is cool relative to the surface (>9.8°C per vertical kilometre differential). This weather condition is always possible to occur.	Neutral
Note 1: The modification rating is derived for the identified area of vegetation/land after conducting a qualitative assessment of the existence of the relevant physical factor. It is applied to deriving an 'Potential Level' from the 'Potential Threat Level Range' associated with each vegetation category.			

Note there is a base bushfire fuels, terrain and fire weather assumption that has been applied in establishing the 'Potential Threat Level' ranges. It is a scenario of a sufficiently large area of bushfire prone vegetation, with continuous fuels, on flat to undulating terrain with no slopes greater than ten degrees, that can support a fully developed bushfire. It is also assumed to be possible for the most adverse (catastrophic) fire weather to occur. This scenario establishes the midpoint of the 'Potential Threat Level Range'. Refer to Appendix 5 for additional explanatory and supporting information.

Note 2: Refer to Appendix 3 for additional information.

Note 3: Regarding the potential for a pyroconvective fire event to occur, the default assumption is that most locations will have the potential for vertical movement of air without any resistance to that movement (e.g. temperature inversion), as one of the typical requirements for such an event to occur.

It is not sufficiently risk averse to assume that atmospheric instability is unlikely to exist. Different temperature air masses can always interact as a consequence of the passage of different weather systems at any location. Justifying a variation to this is outside the scope of this assessment.

5.1.3.5 OUTCOME OF RELEVANT PHYSICAL FACTOR ASSESSMENT – THE BASE POTENTIAL THREAT LEVEL

THE BUSHFIRE HAZARD OF THE SURROUNDING LANDSCAPE – SUMMARY OF HOW THE POTENTIAL THREAT LEVEL IS DERIVED							
Vegetation Location Within the Surrounding Landscape	Identified Vegetation Categories	Potential Threat Level Range	Assessed Potential for the Modification of the Threat Level by Each Stated Physical Factor				The Derived Potential Threat Level of Each Vegetation Category
			Vegetation Extent and Continuity	Fuel Load / Arrangement and Bark Hazard	Terrain - Ground Slope and Slope Length	Fire Weather	
(Section 5.1)	(Figure 5.1 & Appendix 5)	(Appendix 5)	(Section 5.1.3.1)	(Section 5.1.3.2)	(Section 5.1.3.3)	(Section 5.1.3.4)	
The 'Subject Land + 150m Extent'	Tree-1	Moderate to Extreme	Major Decrease	Major Decrease	Minor Decrease	Minor Decrease	N/A
	Tree/Shrub	Moderate to High	Significant Decrease	Minor Decrease			Moderate
	Grass	Low to Moderate	Minor Decrease	Significant Decrease			Low
The Land Surrounding the 'Subject Land + 150m Extent'	Tree-1	Moderate to Extreme	Minor Increase	Minor Decrease			Moderate
	Tree/Shrub	Moderate to High	Minor Decrease	Significant Decrease			Moderate
	Grass	Low to Moderate	Minor Decrease	Significant Decrease			Low

THE BASE BUSHFIRE HAZARD POTENTIAL THREAT LEVEL TO APPLY TO THE SITE [1]	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐

Note 1: Derived qualitatively by considering the assessed potential threat level for each identified category of vegetation and the relative extents of each category. The highest level will be applied unless it is associated with a less significant extent of vegetation.

ASSESSMENT SUMMARY COMMENTS

The immediate bushfire threat is grassland only and the regional threats are 'Moderate' whilst posing a reduced ember hazard. A threat level of 'Low' is appropriate.

5.1.4 THREAT LEVEL ASSESSMENT – BUSHFIRE PROTECTION MEASURE ANALYSIS

For each identified bushfire hazard, an assessment is conducted that considers the effectiveness and application status of all available threat reducing bushfire protection measures that are listed under their applicable bushfire protection mechanism. This information is subsequently applied to deriving threat levels applied to deriving risk levels.

5.1.4.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE THREAT LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
THE PROTECTION MECHANISM – PREVENT BUSHFIRE IGNITION AND/OR SEVERITY BY MANAGING FUEL LOADS: Eliminate or reduce vegetation fuel loads, modify their properties (vegetation types and fuel arrangement). Maintain the measures over time to eliminate bushfire or lower the severity of fire behaviours and the consequent threat levels. Desired and mandatory environmental conservation will likely always be the most significant limitation to applying the mechanism.						
1.1	Remove Offsite Bushfire Fuel: Remove fuel permanently by clearing bushfire prone vegetation - only when permission and relevant agreements for removal have been established with the landowner and relevant authorities.	Very High	N/A	N/A	N/A	N/A
Assessment Comments: Not environmentally acceptable and beyond the control of the proponent. *Recommendation Details:* Not Applicable						
1.2	Reduce Offsite Bushfire Fuel - Prescribed Burning: Planned hazard reduction when permission and relevant agreements to conduct and maintain have been established with the landowner and relevant authorities.	High	N/A	N/A	N/A	N/A
Assessment Comments: Prescribed offsite burning is unlikely to be supported by the management authorities of neighbouring lots in support of the proposed development. *Recommendation Details:* Not Applicable						
1.3	Reduce Offsite Bushfire Fuel - Mechanical: Modify composition of vegetation types and/or the arrangement of fuels and maintain the modification over time e.g. reduce canopy, limit higher threat bark types (e.g. stringy, ribbon), minimise 'ladder' fuels'. Will likely require permission and relevant agreements to conduct and maintain from the landowner and relevant authorities.	High	N/A	N/A	N/A	N/A
Assessment Comments: Not environmentally acceptable and beyond the control of the proponent. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE THREAT LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
1.4	Remove Onsite Bushfire Fuel: Remove fuel permanently by clearing bushfire prone vegetation – only after the necessary approvals from relevant authorities have been obtained.	Very High	Yes	No	Partly	Yes
Assessment Comments: Vegetation clearing will occur for required APZs and development but not to reduce regional bushfire hazard. The groundworks and minimum 'BAL-29 Planning' APZ considered 'Planned' and the APZs applicable to different assets is 'Additionally Recommended.' *Recommendation Details:* See Measure 6.3.						
1.5	Reduce Onsite Bushfire Fuel - Prescribed Burning: Planned hazard reduction only after the necessary approvals from relevant authorities have been obtained.	High	Yes	No	Unknown	No
Assessment Comments: Based on the relative location of non-grassland fuels, the potential reduced fire intensity is not sufficient justification for imposing a prescribed burning schedule. *Recommendation Details:* Not Applicable						
1.6	Reduce Onsite Bushfire Fuel - Mechanical: Modify composition of vegetation types and/or the arrangement of fuels and maintain the modification over time e.g. reduce canopy, limit higher threat bark types (e.g. stringy, ribbon), minimise 'ladder' fuels'. Approvals from relevant authorities regarding environmental considerations may be required.	High	Yes	No	Unknown	Yes
Assessment Comments: Mechanical fuel reduction will not be applied due to the scale and frequency of maintenance required. Vegetation classifications applied are already conservative. *Recommendation Details:* See Measure 1.10.						
1.7	Reduce Road Verge Fuel: Road verges of designated evacuation routes are subject to fuel load reduction, tree management and ongoing maintenance when an authority exists to conduct and maintain.	Medium	No	No	No	No
Assessment Comments: Verge fuel reduction following the local road network would require support from the Local Government Authority (Shire of Kojonup). The site is 97.3ha comprise a very limited proportion of the bushfire hazard. Road verge fuel reduction may be entertained where the verge impacts a specific asset, but not across the entire site or for evacuation safety. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE THREAT LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
1.8	Enforce Compliance with Local Government Property Management Directives: Inform landowners of the high level of enforcement that will be applied by the relevant authority.	High	Yes	Yes	No	No
Assessment Comments: The Firebreak Notice does not require property fuel reduction for the zoning/lot sizes. APZs required under the Firebreak Notice not associated with the development do not impact the bushfire risk from/to the development. The Firebreak Notice is enforceable by law, at the discretion of the Local Government Authority. *Recommendation Details:* Not Applicable						
1.9	Management of Planned Revegetation: Planned revegetation includes environmental offsets, landscape screening, windbreaks, water table management, sprayfields etc. Revegetation works consider potential bushfire and consequential fire hazards, through: • Species selection; • Dimensions and alignment; • Location relative to other vegetation hazards; • Separation between revegetation areas to avoid continuous fire spread, and; • Initial or ongoing management works to limit the bushfire hazard.	Very High	Yes	No	Yes	Yes
Assessment Comments: Renewable energy infrastructure is frequently sited in large vacant allotments or farmland where the necessary infrastructure and sufficient space is available. This results in potential visual and noise amenity impacts. Revegetation to provide vegetation screening is a very common requirement for such proposals. Vegetation screening is required where the existing vegetation is insufficient to block the development from receptors, and so is generally not connected to substantive vegetation. In general, such areas will be continuous with open pasture, windbreaks, or nature strips within road reserves. <u>Exclusion from Classification</u> *AS 3959-2018* appropriately provides for exclusion of isolated, narrow, and/or disconnected vegetation through exclusion clauses 2.2.3.2 (b), (c), and (d), and the clause (f) provision for windbreaks and nature strips. The exclusions attempt to provide for the principle that fire spread will not be continuous between sufficiently separated pockets of vegetation- it will need to spot (through embers or detached flame) and re-develop. Any fire in such a pocket will be a developing fire without presenting significant threat to assets which are sufficiently separated from the vegetation. Vegetation screens are often isolated, narrow pockets which do not meet the prescribed >20m setbacks of clauses 2.2.3.2 (c) and (d), despite the intent being applicable. For example, a pasture fire (modelled flame length <8m) cannot spread uninterrupted across a >12m road carriageway (noting spotting and re-establishment may occur as above). Clauses 2.2.3.2 (c) or (d) cannot be applied to vegetation on the opposing verge due to the <20m separation.					

PROTECTION MEASURES AVAILABLE TO REDUCE THREAT LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Modification of Classification *AS 3959-2018* does not provide for modified classification (e.g. Class A Forest to Class D Scrub) where the same principles as for exclusion apply. This oversight has direct implication on vegetation screening, which must necessarily be sited relatively near the development and at a sufficient depth and height to function as a screen. Within the 'Planning' BMP (*241243 - Kojonup BESS (BMP*) prepared to support the proposal, vegetation must be classified in accordance with AS 3959. For the purposes of this risk assessment, the gaps in this methodology should be considered. A landscape-scale fire running through pasture, windbreaks, and road reserves impacting a <10m wide band of vegetation will increase in intensity. Thus, classification of this vegetation is appropriate. However, in treed vegetation (forest/woodland), it is highly unlikely to develop/establish into a crowning fire- where the canopy is fully involved in the fire. The behaviour would not be a developing fire but would be limited to the elevated fuels only. Further, where the vegetation is surrounded by pasture, wind action is a far more relevant consideration as continuous trees are not present to limit wind impact. A fully established bushfire where elevated (but not canopy) fuels are consumed and placing emphasis on wind action, is the modelling for Shrub, Scrub, and Mallee/Mulga fuel types in Table B4 of *AS 3959-2018* (Catchpole et al. 1998). This is the appropriate fire model to apply. Summary 1. Class A Forest/Class B Woodland classification does not appropriately represent the expected or modelled fire behaviour for narrow bands of vegetation screening vegetation which are either isolated or continuous with pasture. Class D Scrub (Catchpole et al. fire model) is the appropriate classification to apply in these scenarios. 2. It may be appropriate to exclude narrow bands of screening vegetation which are disconnected from continuous fire runs by non-vegetated or low fuel areas (roads, hardstand, APZs etc), in alignment with but not strictly meeting AS 3959 clause 2.2.3.2 (c) or (d). *Recommendation Details:* Where vegetation screening is <10m width and continuous with pasture only, vegetation classification should not exceed Class D Scrub. Where vegetation screening is <10m in width and isolated from significant vegetation, exclusion as a 'nature strip' may be appropriate. This will be reflected within the associated Bushfire Management Plan for the Development Application.						
THE PROTECTION MECHANISM – PREVENT BUSHFIRE IGNITION BY MANAGING HEAT ENERGY SOURCES: The use of measures that control the existence of potential ignition sources. This includes human actions and/or faulty or poorly designed equipment. Natural causes of ignition (lightning) cannot be controlled and will remain an unmanageable limitation.						
1.10	Robust and Effective Site Operational Procedures: Apply fire safe principles to site operation procedures including: • Eliminating or reducing the potential for open air creation of fire, embers or sparks; and • Closing identified high risk operations when a bushfire event exists. • Ensure safe practices are carried out via appropriate guidelines, protocols, signage and education.	Medium	Yes	No	Partly	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE THREAT LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Assessment Comments: Compliance with any Dangerous Goods Licences is a regulatory requirement and will include recommendations for operational procedures. Operating procedures document has not yet been prepared. *Recommendation Details:* The following procedures should be completed prior to the bushfire season (see the Shire of Kojonup Prohibited Burning Period): • Scheduled maintenance to assets, emergency equipment, or fire detection/prevention systems. • The ongoing requirements outlined in the Bushfire Management Plan. • Scheduled housekeeping inspections including: o Hazard identification - ensuring that infrastructure, plant, equipment, vehicles and safety/warning signs show no signs of damage or dilapidation. o Facility access - ensuring all vehicle site access points, including emergency access points, are clear and accessible. o Fire protection systems and equipment – ensuring that all equipment is unobstructed, clearly identifiable, in-service and performing optimally. o Vegetation management - ensuring that any accumulation of combustible materials is cleared from infrastructure, buildings and fire breaks, and removed from the site. o Security measures - ensuring that fences, gates, and security cameras are inspected for damage, and that any damage is immediately actioned (e.g., repaired or replaced). • Ad-hoc or annual invitations extended to the local emergency services through the Local Government's Community Emergency Services Manager to offer a familiarisation visit and explanation of emergency procedures, access, hazards, and fire detection and suppression systems.					
1.11	Develop Planning and Management Procedures for Prescribed Burning: Ensure proper management of hazard reduction burning to prevent ignition of unintended fuels.	Medium	No	No	No	No
Assessment Comments: Local burns by the volunteer Bushfire Brigades will not be undertaken near hazardous or flammable materials (non-vegetation). Burns will not be conducted by development staff. *Recommendation Details:* Not Applicable						
1.12	Design and Construct Equipment to Prevent Airborne Ignition: Apply fire safe design principles to equipment, vehicles, and energy transmission etc. Design to control rate of energy release and eliminate/reduce potential for open air creation of fire, embers or sparks.	Very High	Yes	No	Yes	No
Assessment Comments: All equipment must meet minimum national and state standards and guidelines. Due to the nature of the site, control of ignition sources will be stringent.						

PROTECTION MEASURES AVAILABLE TO REDUCE THREAT LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
A bushfire consultant cannot provide additional design measures to prevent accidental ignition (due to faults/failure of the asset or equipment), so this scenario is assumed in determining bushfire protection measures. Accidental ignition is instead managed through operating procedures (Measure 1.10). *Recommendation Details:* Not Applicable						
1.13	Actively Enforce Activity Restrictions: Impose restrictions on source of ignition operations by enforcing Total Fire Bans (TFB)	Medium	Yes	Yes	No	Yes
Assessment Comments: Total fire bans will be complied with. Total fire ban exemptions will be applied for, if necessary for site functionality. *Recommendation Details:* See Measure 1.10.						
1.14	Monitor and Penalise Illegal Activity: Reduce arson events as sources of ignition by monitoring and publicising enforcement of penalties.	Medium	N/A	N/A	N/A	N/A
Assessment Comments: The subject site is private property. Illegal ignition offsite is not under the control of the proponent /occupier. *Recommendation Details:* Not Applicable						
1.15	**Bushfire Awareness and 'Good Practices' Education:** Educate persons to reduce the occurrence of accidental ignitions in vegetation by persons and/or vehicles, including in road reserves.	Medium	Yes	No	Yes	Yes
Assessment Comments: Activities which may result in fire are prohibited onsite. Contractors and staff are required to complete inductions and/or be escorted and follow the operating procedures per Measure 1.10. *Recommendation Details:* See Measure 1.10.						
THE PROTECTION MECHANISM - PREVENT BUSHFIRE IGNITION BY MANAGING INTERACTIONS OF HEAT ENERGY SOURCES AND FUELS: The use of measures that control the interaction of heat sources and fuels.						
1.16	Barriers (Shielding) between Ignition Sources and Fuels: Utilise physical barriers (shielding) between bushfire fuels and heat energy sources such as electricity generation / transmission, fuel supplies, stored flammable products etc. Examples include appropriate walls, enclosures, and underground transmission of electricity or liquid/gas fuels.	Medium	Yes	No	No	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE THREAT LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Assessment Comments: Site assets will be required to have a sufficient APZ installed to avoid flame contact and excessive radiant heat. This has been addressed in Measure 6.3. Any ignition of offsite vegetation would likely be due to embers or flaming debris/firebrands, which shielding is not effective against. Ember screening of battery cabinets is required through Measure 13.13 which will reduce the capacity for such embers to escape a compromised battery cabinet. *Recommendation Details:* See Measures 6.3 & 13.13.						
1.17	Equipment Design and Construction to Reduce Heat Transfer: Through design (e.g., insulation) and materials, control heat energy transfer via conduction, convection and radiation.	Medium	Yes	No	Yes	Yes
Assessment Comments: All equipment must meet minimum national and state standards and guidelines. Due to the nature of the site, control of ignition sources will be stringent. *Recommendation Details:* See Measure 13.16.						
1.18	Separation Distance Between Ignition Sources and Fuels: Establish sufficient separation distance between bushfire fuels and heat energy sources such as electricity generation / transmission, fuel supplies, stored flammable products etc.	Medium	Yes	No	Yes	Yes
Assessment Comments: Radiant heat flux in battery fires is relatively low; the Victorian Big Battery Fire (July 2021) required only a 20m exclusion zone for personnel (such an exclusion zone would generally be <4kW/m2 radiant heat flux). The <10kW/m2 APZ proposed is 25m. Therefore, in the reasonable worst-case scenario, flame contact and radiant heat flux will be insufficient to ignite a bushfire in the surrounding vegetation. Grasses require approximately 250-degree temperature to ignite with no pilot- thus the setback required to minimise the capacity for flame contact is the relevant concern as compared to heat flux. Embers can travel beyond any applicable APZ. Onsite fine and heavy fuel sources are required to be eliminated in project design and strictly controlled in ongoing operation to prevent the capacity for embers to be generated. This has been addressed in Measure 6.3. *Recommendation Details:* See Measure 6.3.						

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining.

Note 2: Protection Measure Application Status:

- Possible: Protection measures that can potentially be applied to the proposed development/use.
- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Currently Planned: Protection measures that:
    - Are incorporated into the site plans;

PROTECTION MEASURES AVAILABLE TO REDUCE THREAT LEVELS	Effectiveness Rating [1]	Application Status [2]			
		Possible	Exists	Planned	Additionally Recommend

- Exist in an approved Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), alternative solutions and any additional recommended protection measures - for which a responsibility for their implementation has been created and approved; and/or
- Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).

- Additionally Recommend: Protection measures that:
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
  - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.1.4.2 PROTECTION MEASURE ANALYSIS - EFFECTIVENESS AND NUMBER APPLIED

For the identified bushfire hazard, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing threat levels is stated. This information is subsequently applied to assess the ability of applied protection measures to reduce threat levels. Refer to Appendix 1 for explanatory and supporting information.

THREAT REDUCING PROTECTION MEASURE ANALYSIS								
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures						
		Total Available	Application Status [2]					
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend	
Prevent Bushfire Ignition and/or Severity by Managing the Fuels	Very High	3	2			2	2	
	High	5	3	2			1	
	Medium	1						
	Not Relevant							
Prevent Bushfire Ignition by Managing Heat Energy Sources	Very High	1	1			1		
	High							
	Medium	5	3	1		2	3	
	Not Relevant							
Prevent Bushfire Ignition by Managing Interactions of Heat Energy Sources and Fuels	Very High							
	High							
	Medium	3	3			2	3	
	Not Relevant							
Number Analysis	Very High	4	3			3	2	
	High	5	3	2			1	
	Medium	9	6	1		4	6	
	Not Relevant							
	Totals	18	12	3		7	9	

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.1.4.3 PROTECTION MEASURE ANALYSIS - POTENTIAL TO REDUCE THREAT LEVELS

For the identified bushfire hazard, the potential for applied bushfire protection measures to reduce threat levels is assessed as a function of:

- The number of bushfire protection measures that can be applied compared to the number available; and
- The weighting applied to each protection measure that indicates how effective it can be at reducing hazard threat levels.

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE BUSHFIRE HAZARD THREAT LEVELS [1]			
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]			
Bushfire Direct Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind
Significant	Minimal	Moderate	Significant
Moderate			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]			
Bushfire Direct Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind
Significant	Moderate	Moderate	Significant
Significant			

Note 1: Refer to Appendix A1.2 for explanatory and supporting information.

Note 2: This threat reducing potential will be applied to deriving the inherent threat level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This threat reducing potential will be applied to deriving the residual threat level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

5.1.5 OUTCOME OF THE BUSHFIRE HAZARD POTENTIAL THREAT LEVEL ASSESSMENT

Inherent and residual threat levels (each referring to a different stage of bushfire protection measure application), are derived from preceding bushfire hazard assessments of:

1. The bushfire hazard potential threat level that has accounted for the identified vegetation categories in the surrounding landscape and the existence (or otherwise) of relevant physical factors that can intensify bushfire behaviour resulting in increased threat levels; and
2. The assessed potential impact of applied bushfire protection measures in reducing potential threat levels.

The resulting inherent and residual potential threat levels are derived through a qualitative assessment process (refer to Appendices A1.3.1 and A1.3.2 for explanatory and supporting information).

These threat levels, in combination with the corresponding assessed exposure and vulnerability levels for each of the assessed elements at risk, are later applied to deriving the inherent and residual bushfire risk levels (on an 'indicative' basis).

BUSHFIRE HAZARD POTENTIAL THREAT LEVEL ASSESSMENT OUTCOMES [1]					
THE IDENTIFIED BUSHFIRE HAZARD - VEGETATION CATEGORIES AND POTENTIAL THREAT LEVEL RANGES [2]					
Tree-1	Tree-2	Tree/Shrub	Shrub	Grass	No/Low Threat
Moderate to Extreme	Moderate to Extreme	Moderate to Very High	Low to Moderate	Low to Moderate	None to Low
THE BASE BUSHFIRE HAZARD POTENTIAL THREAT LEVEL TO APPLY TO THE SITE [3]					
Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
THE ABILITY FOR APPLIED PROTECTION MEASURES TO REDUCE BASE THREAT LEVELS [4]					
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED			WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED		
Moderate			Significant		
THE ASSESSED BUSHFIRE HAZARD POTENTIAL THREAT LEVELS					
RESULTANT INHERENT THREAT LEVEL [5] (Current State)			RESULTANT RESIDUAL THREAT LEVEL [5] (Potential Future State)		
Low			Low		

Note 1: Refer to Appendix 1 for explanatory information.

Note 2: Assessment detail is presented in Section 5.1.2.

Note 3: After the consideration of the surrounding landscape and existence of relevant physical factors. Assessment detail is in Section 5.1.3.

Note 4: Assessment detail is presented in Section 5.1.4.

Note 5: Refer to A1.3.3 for explanatory information.

Assessment Comments: The existing and planned protection measures are partly considered in the base bushfire hazard threat level (e.g. local grazing intensity). The existing/planned and additional measures are insufficient to reduce the threat level.

5.2 THE IDENTIFIED ELEMENTS AT RISK

THE IDENTIFIED ELEMENTS AT RISK AND SUBJECT TO ASSESSMENT			
Possible Types	Exists on Subject Site and is Exposed to Bushfire Hazard Threats	Bushfire Risk Report Objectives Establish Requirement to Assess	Description
Persons located onsite and temporarily offsite as part of site operations - includes occupants, staff, visitors and persons on day trips offsite (e.g. tourism)	✓		The site is proposed to be unstaffed. Persons on access/egress routes has been assessed for Emergency Services and any staff temporarily onsite for maintenance etc.
Persons on access/egress routes (roads, driveways, access ways) in vehicles:	✓		Internal access roads and driveways are the primary focus to ensure safe movement between asset locations and major external roads. External public roads are considered for Emergency Services, and if full evacuation is required.
Buildings - NCC Classes 1 to 9 - residential, offices, shops (retail/services), warehouses, carparks, factories, workshops, laboratories, public buildings.	✓		Operations and Maintenance Building. The potential for warehouses and workshops are considered.
Buildings or Structures – NCC Class 10 - non-habitable – shed, carport, garage, fence, retaining wall etc.		✓	The assessment considers maintenance and storage sheds which may be present onsite.
Built Infrastructure Assets – structures associated with telecommunications / power generation / transport / water supply etc.	✓		BESS units and Associated Infrastructure.
			Substation.
Materials Stockpiled Outdoors – as part of recycling and/or waste management operations.	✓		Laydown Areas may be temporary or permanent, and contain a range of materials which may be of greater or lesser importance. These areas will not be occupied.

5.3 EXPOSURE LEVEL ASSESSMENT – BUSHFIRE PROTECTION MEASURE ANALYSIS

For each stated element at risk and each relevant bushfire hazard, an assessment is conducted that considers the effectiveness and application status of all available exposure reducing bushfire protection measures that are listed under their applicable bushfire protection mechanism. This information is subsequently applied to deriving exposure levels.

5.3.1 PERSONS ONSITE AND TEMPORARILY OFFSITE

5.3.1.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons Onsite and Temporarily Offsite					
THE PROTECTION MECHANISM – ESTABLISH SUFFICIENT SEPARATION FROM RELEVANT BUSHFIRE HAZARD THREATS: To ensure that the persons are located or re-located at a sufficient distance from the bushfire hazard to ensure the level of exposure to the threats, and the associated risk of persons death or injury, is contained within acceptable parameters.						
2.1	Stay Away from the Subject Site: Prevent access to, occupancy or operation of the subject site (i.e. closure of use) in response to a pre-determined fire danger rating (FDR) or fire behaviour index (FBI) and/or activity restriction (e.g., total fire ban) or a defined period of the year (highest risk). The relevant conditions and the requirement to stay away will be established through relevant site operational documents such as a Bushfire Emergency Plan or Site Emergency Plan/Guide.	Very High	Yes	No	No	No
Assessment Comments: Permanent staffing is not proposed, however intermittent occupation will occur during maintenance, inspections, etc. It is possible this will occur during fire danger periods. Hot works will be restricted during Total Fire Bans. Attendance for other reasons, particularly to investigate potential issues, will occur regardless of (and potentially due to) fire weather conditions. *Recommendation Details:* Not Applicable						
2.2	Remote Tourism Sites - Stay Within the Subject Site: Relevant when tourism operations are moving persons offsite as part of operations e.g., tourism day trips. All associated persons (staff, guests, visitors), in response to a pre-determined fire danger rating (FDR) or fire behaviour index (FBI) and/or activity restriction (e.g., total fire ban), will remain on-site as better communication and sheltering options exist on-site compared to travelling in a remote area – if possible. The relevant conditions and the requirement to stay will be established through relevant site operational documents such as a Bushfire Emergency Plan or Site Emergency Guide.	High	N/A	N/A	N/A	N/A

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons Onsite and Temporarily Offsite					
Assessment Comments: Not Required *Recommendation Details:* Not Applicable						
2.3	Remote Tourism Sites - Relocate to Designated Safer Offsite Location: Relevant when tourism operations are moving persons offsite as part of operations e.g., tourism day trips. A suitable offsite alternative safer location(s) is identified as a destination should the subject site and/or the route back to the subject site, be impacted by a bushfire event during the time away from the site.	High	N/A	N/A	N/A	N/A
Assessment Comments: Not Required *Recommendation Details:* Not Applicable						
2.4	Relocate (Evacuate) to Designated Safer Offsite Location(s): A building, area or general location is identified and accessible from the subject site as an evacuation destination. The offsite location exists at a sufficient distance away ensuring that the destination and the subject site are not likely to be simultaneously impacted by a bushfire event.	High	No	No	Yes	No
Assessment Comments: The site is relatively close to the Kojonup townsite (approx. 4.2 km driving). Any staff onsite will not be vulnerable requiring assistance or facilities at a destination. They will self-evacuate to Kojonup, selecting the appropriate route based on location of the bushfire threat. If all routes to Kojonup are compromised, continuous access in other directions is available. Evacuation procedures and directions will be established within the Emergency Management Plan required prior to commercial operation. *Recommendation Details:* Not Applicable						
2.5	Relocate to Safer Onsite Open Area: Provide an accessible area located in the open (i.e. not in an enclosed building), within the subject site and on which persons can assemble and that will not be subject to radiant heat flux in excess of 2 kW/m^2 (determined using a flame temperature of 1200 K). Consideration must also be given to potential exposure to embers, adverse weather, availability of water / facilities and the relative importance of these to the specific use proposal.	High	No	No	Yes	No
Assessment Comments: Low threat areas subject to >2kw/m2 radiant heat flux will be available within the site. However, open sheltering is not intended as appropriate buildings will be available within the O&M area. See Measure 2.11. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons Onsite and Temporarily Offsite					
2.6	Safer Pathways for Onsite Movement: To ensure lower risk movement (walking) of persons and firefighters on the site, heavy fuels are excluded from areas adjacent to pathways used to access designated safer locations onsite. The required minimum separation distances are [13] [31]: • At least 4m from stored heavy fuels (refer to Appendix 2). • At least 6m from stored and constructed large heavy fuels (refer to Appendix 2). • At least 12m from constructed large heavy fuels that are buildings/structures. Additionally: • The pathway/route is constructed of non-combustible materials; • No gas cylinders are venting towards the pathway/route; and • Shrubs are separated from the pathway/route corresponding to a distance to minimise the threats to persons on foot with consideration of their flammability and height.	Medium	Yes	No	Yes	No
Assessment Comments: There may be fuels with the Operations and Maintenance Building. Stored heavy fuels may be present around the facility, and persons may be moving from any given location within the facility across the hardstand. Fuels are required to be maintained >10m from assets (including buildings) in Measure 6.7. Therefore, a person traversing between areas should not encounter significant stored fuels where the buildings are reasonably adjacent. *Recommendation Details:* Not Applicable						
2.7	Pre-Emptively Relocate to Designated Safer Offsite Location(s): In response to a pre-determined fire danger rating (FDR) or fire behaviour index (FBI) and/or activity restriction (e.g., total fire ban) or other established condition, all persons onsite will pre-emptively relocate offsite for the duration of the existence of the conditions. The relevant conditions and the requirement to pre-emptively relocate will be established through relevant site operational documents such as a Bushfire Emergency Plan or FES-ERG.	High	Yes	No	No	No
Assessment Comments: Permanent staffing is not proposed, however intermittent occupation will occur during maintenance, inspections, etc. It is possible this will occur during fire danger periods. Hot works will be restricted during Total Fire Bans. Attendance for other reasons, particularly to investigate potential issues, will occur regardless of (and potentially due to) fire weather conditions. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons Onsite and Temporarily Offsite					
THE PROTECTION MECHANISM – ESTABLISH SHIELDING FROM RELEVANT BUSHFIRE HAZARD THREATS: To utilise constructed or natural shielding to reduce the exposure of persons to the flame, radiant heat, and ember attack from bushfire and consequential fire.						
2.8	On-site Shelter Building – Community Bushfire Refuge Standard [20]: Applicable to use by 'vulnerable' persons (refer to Glossary). Provide a building which is constructed in accordance with the NCC and the ABCB Design and Construction of Community Bushfire Refuges – Information Handbook [20]. Note: The minimum requirement for floor area per person of 0.75 m^2 may be increased by relevant authorities in specific jurisdictions (e.g., to 1.0 m^2 in WA, Guidelines v1.4 [22]).	High	N/A	N/A	N/A	N/A
Assessment Comments: Not Required *Recommendation Details:* Not Applicable						
2.9	On-site Shelter Building – Limit Radiant Heat Exposure Only: Applicable to use by 'vulnerable' persons (refer to Glossary) where accommodation is not part of the site use. Provide a building that will not be subject to radiant heat flux in excess of 10 kW/m^2 (determined using AS 3959 BAL determination methodology [4] and applying a flame temperature of 1200 K) and constructed to the bushfire standard corresponding to the BAL-29 rating (to provide greater resistance to consequential fire threats).	High	N/A	N/A	N/A	N/A
Assessment Comments: Not Required *Recommendation Details:* Not Applicable						
2.10	On-site Shelter Building – Resilient to Potential Bushfire Impacts to the Degree Necessary: Provide a building that incorporates design and construction protection measures to reduce the building's vulnerability to bushfire and consequential fire threats to the degree necessary. Refer to the section of this report that identifies bushfire protection measures to reduce the vulnerability of buildings/structures). Alternatively, provide a building that will not be subject to radiant heat flux in excess of 10 kW/m^2 (determined using AS 3959 BAL determination methodology [4] and applying a flame temperature of 1200 K) and constructed to the bushfire standard corresponding to the BAL-29 rating (to provide greater resistance to consequential fire threats).	High	N/A	N/A	N/A	N/A
Assessment Comments: Not Required *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons Onsite and Temporarily Offsite					
2.11	On-site Shelter Structure – Class 10c: Provide a private bushfire shelter (Class 10c building) constructed in accordance with the NCC and the *Performance Standard – The design and construction of private bushfire shelter (ABCB 2014).* This is not a standalone measure but an additional measure as a last resort.	High	Yes	No	No	Yes

Assessment Comments: The Operations and Maintenance Building will be nominated as an on-site shelter building. The building is to be constructed to AS 3959 requirements for BAL-29 and have a minimum internal floor area equal to 1m² per proposed person (e.g. 10m² for 10 workers).

The *Performance Standard – The design and construction of private bushfire shelter (ABCB 2014)* (the 'ABCB Handbook') Section 1.2 advises the '*benefits of developing a performance-based Handbook capable of producing a site-specific outcome, rather than developing a prescriptive Handbook that would produce a generic outcome.*'

Section 2.3 "*A community bushfire refuge must be designed and constructed to provide a tenable environment for occupants during the passage of untenable conditions arising from a bushfire even, appropriate to the** –

a) Location of the refuge relative to the fire hazards including-

I. Predominant vegetation; and

II. Adjacent buildings, structures and movable objects; and

III. Car parking area/s and allotment boundaries; and

IV. *Other combustible materials…*"

*(emphasis added)

As discussed in Measure 1.9, vegetation screening proposed at the perimeter of the facility may not meet clause 2.2.3.2 of AS 3959. However, it meets the intent of the isolated vegetation pockets considered- being sufficiently disconnected to prevent continuous fire spread and sufficiently limited to prevent fire fully re-establishing. This vegetation poses a very limited threat to assets sufficiently separated from the pocket (stipulated as 20m per AS 3959 clause 2.2.3.2 c and d).

Screening vegetation must be assessed in accordance with AS 3959 for the purposes of planning documentation. This Risk Assessment recognises that based on predicted fire behaviour, the intent of AS 3959 clause 2.2.3.2 can be applied rather than strict text, in providing risk-based protection measures.

On this basis, the northern screening vegetation is excluded for the purposes of calculating the 10kW/m2 setback for on-site shelter provisions. The Operations and Maintenance Building has been specifically sited to allow installation of the required APZ (<10kW/m2 radiant heat flux calculated at 1200K flame temperature).

Compliance with AS 3959 construction standards for BAL-29 is a suitable level of protection for the bushfire impact and duration on the shelter building.

Moveable objects and combustible materials are managed through Operating Procedures, applied in Measure 6.7.

Car parking areas and adjacent buildings can be sited 10m from the building through layout design, in accordance with the Acceptance Criteria (*ABCB Handbook* Table 1).

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons Onsite and Temporarily Offsite					
Recommendation Details: See Measure 11.1.						
2.12	Constructed Barrier – Shield Persons in the Open: Construct walls / fences / landforms as shielding structures that are not buildings, applying appropriate fire resistant / non-combustible construction materials (e.g. masonry, steel, earthworks). These are to withstand the impact of direct bushfire attack mechanisms for the required period of time and provide the required reduction in threat levels to persons in the open. Construction requirements will correspond, as a minimum, to the BAL-FZ requirements for walls as established by AS 3959:2018 [4] and/or the NASH Standard [33] and additionally informed by the research report 'Research and Investigation into the Performance of Residential Boundary Fencing Systems in Bushfires' [29].	Medium	Yes	No	No	No
Assessment Comments: Structures will be present onsite and will provide a measure of shielding. A calculation is not available to measure the impact of this shielding. *Recommendation Details:* Not Applicable						
2.13	Natural Barrier – Shield Persons in the Open: Utilise natural landforms that have the potential to shield persons from the bushfire and consequential fire threats.	Medium	N/A	N/A	N/A	N/A
Assessment Comments: No landforms exist in appropriate locations. *Recommendation Details:* Not Applicable						
2.14	Constructed/Natural Barrier – Shielding for Persons on Pathways to Safer Onsite Area/Building: Where possible, alongside pathways to an on-site shelter building/area, utilise walls / fences / landforms as shielding structures constructed using fire resistant / non-combustible construction materials (e.g. masonry, steel, earthworks). These are to withstand the impact of direct bushfire attack mechanisms for the required period of time and provide the required reduction in threat levels to persons (including firefighters) traversing the pathway. Construction can be informed by the BAL-FZ requirements for walls as established by AS 3959:2018 [4] and/or the NASH Standard [33] and additionally informed by the research report 'Research and Investigation into the Performance of Residential Boundary Fencing Systems in Bushfires' [29].	Medium	Yes	No	No	No
Assessment Comments: The Operations and Maintenance Building may be used as a shelter of last resort. The BESS units and the building itself will provide some measure of shielding, *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS	Effectiveness Rating [1]	Application Status [2]			
		Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons Onsite and Temporarily Offsite				

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining.

Note 2: Protection Measure Application Status:

- Possible: Protection measures that can potentially be applied to the proposed development/use.
- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Currently Planned: Protection measures that:
    - Are incorporated into the site plans;
    - Exist in an approved Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), alternative solutions and any additional recommended protection measures - for which a responsibility for their implementation has been created and approved; and/or
    - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

  These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Additionally Recommend: Protection measures that:
    - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
    - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

  These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.3.1.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing exposure levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the exposure of the relevant element at risk to bushfire hazard threats.

EXPOSURE REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Persons Onsite and Temporarily Offsite						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Establish Sufficient Separation from Relevant Bushfire Hazard Threats	Very High	1	1				
	High	5	1			2	
	Medium	1	1			1	
	Not Relevant						
Establish Shielding from Relevant Bushfire Hazard Threats	Very High						
	High	4	1				1
	Medium	3	2				
	Not Relevant						
Number Analysis	Very High	1	1				
	High	9	2			2	1
	Medium	4	3			1	
	Not Relevant						
	Totals	14	6			3	1

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.3.1.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE EXPOSURE

From the information presented in the previous section, the exposure reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce exposure (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE EXPOSURE TO BUSHFIRE HAZARD THREATS [1]							
Element at Risk	Persons Onsite and Temporarily Offsite						
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Moderate	Minimal	Minimal	Moderate	Significant	Minimal	Significant	Minimal
Minimal				Moderate			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Significant	Significant	Significant	Significant	Significant	Significant	Significant	Moderate
Significant				Significant			

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This exposure reducing potential will be applied to deriving the inherent exposure level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This exposure reducing potential will be applied to deriving the residual exposure level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

Assessment Comments: Regular staffing is not proposed, and any persons onsite will have vehicles immediately available to move within or away from the site. Pre-emptive closure is not proposed, as inspection/monitoring may be more important during fire danger weather conditions.

The Operations and Maintenance Building may be used as an appropriate On-site Shelter Building. Safe (early) Evacuation remains the primary response procedure.

5.3.1.4 DERIVED EXPOSURE LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual exposure levels.

In combination with the corresponding assessed threat and vulnerability levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL EXPOSURE LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]							
ELEMENT AT RISK		Persons Onsite and Temporarily Offsite					
BUSHFIRE ATTACK MECHANISMS [2]		INHERENT EXPOSURE LEVEL (CURRENT STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	Moderate
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
BUSHFIRE ATTACK MECHANISMS [2]		RESIDUAL EXPOSURE LEVEL (POTENTIAL FUTURE STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	Low
DIRECT	Radiant Heat	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: Refer to Appendix 2 for explanatory and supporting information.

Note 3: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.3.2 PERSONS ON ACCESS/EGRESS ROUTES IN VEHICLES

5.3.2.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS				Effectiveness Rating [1]	Application Status [2]			
					Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons on Access / Egress Routes in Vehicles	Access Route Description	Local road network including internal roads					
THE PROTECTION MECHANISM - ESTABLISH SUFFICIENT SEPARATION FROM RELEVANT BUSHFIRE HAZARD THREATS: To utilise distance away from relevant bushfire hazard threats (primarily flames, radiant heat and tree strike/obstruction) while traversing an access/egress route in a vehicle to lower the exposure of persons for the expected time on the route.								
3.1	Locate Access/Egress Routes Away from Adjacent Hazards: Existing or to be installed vehicular access/egress route components (roads, access ways, and driveways) are positioned to maximise the distance away from any adjacent bushfire prone vegetation where possible.			High	No	Yes	No	No
Assessment Comments: Internal access is separated from major bushfire hazard areas (non-pasture), except where reaching the crossover to public roads. The external routes are generally bounded by pasture. *Recommendation Details:* Not Applicable								
3.2	Egress Routes Located to Ensure Driving Away from Hazard: Existing or to be installed vehicular access/egress route components (roads, access ways, and driveways) are positioned so that the direction of egress is away from the hazard into lower threat areas.			Very High	No	Yes	No	No
Assessment Comments: Collie-Changerup Road provides effective access in opposite directions. Tunney Road provides secondary through access via the secondary access point (eastern gate). *Recommendation Details:* Not Applicable								
3.3	Greater Road Width: Wider roads will allow for a greater separation distance between traversing vehicles and the bushfire hazard. The incorporation of non-vegetated and trafficable road verges/shoulders and adjacent footpaths can also safely increase effective separation for slower moving vehicles.			High	No	Yes	Partly	No
Assessment Comments: Collie-Changerup Road is generally 8m wide, with a non-vegetated clearance of >12m including shoulders. Tunney Road is approximately 6m wide and has vegetated shoulders, so does not provide additional clearance.								

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons on Access / Egress Routes in Vehicles	Access Route Description	Local road network including internal roads			
Recommendation Details: Not Applicable						
3.4	Reduce and Maintain Road Verge Fuel to a Low Threat State: Road verges, or part off, support low threat vegetation or vegetation is removed or reduced and maintained to a minimal fuel condition to increase the separation distance from the bushfire hazard. This is practical when an authority exists to conduct the management and will have greater threat reducing impact as a protection measure, if there is certainty it will be carried out.	Medium	No	Partly	No	No
Assessment Comments: Verges offsite have a reduced fuel (but not low threat) condition. *Recommendation Details:* Not Applicable						
THE PROTECTION MECHANISM – ESTABLISH SHIELDING FROM RELEVANT BUSHFIRE HAZARD THREATS: To utilise constructed or natural shielding to reduce the exposure of persons, traversing the access/egress routes, to relevant bushfire threats (primarily flames, radiant heat and embers). To assist with ensuring the level of exposure to the threats is survivable for the expected time on the route while travelling in a vehicle.						
3.5	Ensure Evacuation Vehicle Types Provide a Degree of Protection: People can only tolerate low levels of radiant heat without some protection. Vehicles provide some protection from low intensity fires (if they stay on cleared area and remain in the vehicle) but they will not protect people in moderate to intense grass fires or in any location where scrub or forest adjoin the road. Protection provided by vehicles with predominantly metal bodies (including roof) and able to be enclosed (glass window), while limited is also still significant. It is particularly significant when compared to other potentially available modes of transport on roads (e.g. open top/backed vehicles, motorbikes, bicycles and being on foot). The availability such vehicles of required capacity can contribute to reduced exposure to the bushfire threats for persons on access/egress routes.	Medium	Yes	Yes	No	No
Assessment Comments: Staff and contractors will have enclosed vehicles for traversing the site. Vehicles accessing the site in a bushfire event will be Emergency Services, with vehicles which provide a measure of protection. *Recommendation Details:* Not Applicable						
Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining. Note 2: Protection Measure Application Status: • Possible: Protection measures that can potentially be applied to the proposed development/use.						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS				Effectiveness Rating [1]	Application Status [2]			
					Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons on Access / Egress Routes in Vehicles	Access Route Description	Local road network including internal roads					

- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Currently Planned: Protection measures that:
  - Are incorporated into the site plans;
  - Exist in an approved Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), alternative solutions and any additional recommended protection measures - for which a responsibility for their implementation has been created and approved; and/or
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

  These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Additionally Recommend: Protection measures that:
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
  - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

  These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.3.2.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing exposure levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the exposure of the relevant element at risk to bushfire hazard threats.

EXPOSURE REDUCING PROTECTION MEASURE ANALYSIS								
Element at Risk	Persons on Access / Egress Routes in Vehicles							
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures						
		Total Available	Application Status [2]					
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend	
Establish Sufficient Separation from Relevant Bushfire Hazard Threats	Very High	1		1				
	High	2		2				
	Medium	1			1			
	Not Relevant							
Establish Shielding from Relevant Bushfire Hazard Threats	Very High							
	High							
	Medium	1	1	1				
	Not Relevant							
Number Analysis	Very High	1		1				
	High	2		2				
	Medium	2	1	1	1			
	Not Relevant							
	Totals	5	1	4	1			

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.3.2.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE EXPOSURE

From the information presented in the previous section, the exposure reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce exposure (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE EXPOSURE TO BUSHFIRE HAZARD THREATS [1]							
Element at Risk	Persons On Access/Egress Routes in Vehicles						
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Significant	Moderate	Moderate	Moderate	N/A	Very Significant	Significant	Very Significant
Moderate				Very Significant			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Significant	Moderate	Moderate	Moderate	N/A	Very Significant	Significant	Very Significant
Moderate				Very Significant			

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This exposure reducing potential will be applied to deriving the inherent exposure level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This exposure reducing potential will be applied to deriving the residual exposure level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

Assessment Comments: No recommendations are applicable. The inherent and residual risk are the same. As the site is intended to be unstaffed, the relevant persons on access routes are Emergency Services.

The site is close to two public roads providing effective access with reduced fuel shoulders and a generally pasture landscape.

5.3.2.4 DERIVED EXPOSURE LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual exposure levels.

In combination with the corresponding assessed threat and vulnerability levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL EXPOSURE LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]							
ELEMENT AT RISK		Persons on Access/Egress Routes in Vehicles					
BUSHFIRE ATTACK MECHANISMS [2]		INHERENT EXPOSURE LEVEL (CURRENT STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	Low
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
BUSHFIRE ATTACK MECHANISMS [2]		RESIDUAL EXPOSURE LEVEL (POTENTIAL FUTURE STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	Low
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: Refer to Appendix 2 for explanatory and supporting information.

Note 3: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.3.3 BUILDINGS AND STRUCTURES - NCC CLASSES 1-10

5.3.3.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Buildings/Structures - NCC Classes 1-10					
THE PROTECTION MECHANISM – ESTABLISH SUFFICIENT SEPARATION FROM RELEVANT BUSHFIRE HAZARD THREATS: To reduce exposure to the relevant direct and indirect attack mechanisms of bushfire by locating buildings and attached/adjacent structures at sufficient distances away from the bushfire hazard and consequential fire fuels. The required distances will be dependent on the assessed threat levels and the degree of bushfire resilience that exists or is planned to be incorporated into the exposed elements through design and construction.						
4.1	Siting of Buildings/Structures Considering Potential High Wind Exposure: Site buildings and attached/adjacent structures in locations that have less exposure to terrain influenced prevailing synoptic winds, and particularly those locations with potential for significant terrain/bushfire threat intensification interactions (refer to Appendix 3). Avoid the top and sides of ridges. Strong winds can directly or indirectly (airborne materials/debris) cause damage to the external building envelope, potentially allowing flame, radiant heat and ember entry.	High	No	Yes	No	No
Assessment Comments: The siting of the proposal considers a number of impacts other than wind. The predominant vegetation (pasture) within 150m of the development area will not generate significant fire-driven winds, and it is thus not a relevant consideration. Road verge and vegetation screening scrub are narrow bands which will not intensify fire behaviour sufficiently to generate fire-driven wind- and are more likely to reduce wind impacts. *Recommendation Details:* Not Applicable						
4.2	Designed Location of Non-Vegetated Areas and/or Managed Open Space: Non-vegetated land uses include footpaths, paved areas, roads, parking, open drainage channels, and major services delivery (power, water, gas) installed in common corridors. Managed open space is land for public or private use on which the vegetation is either low threat due to type or situation or is continually managed in a minimal fuel condition. This can include public open space providing recreation facilities. Use these design elements to create or increase separation from any bushfire prone vegetation by positioning them adjacent to the bushfire hazard.	Very High	Yes	Yes	No	No
Assessment Comments: No managed open spaces exist. The buildings will be positioned on a non-vegetated hardstand.						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Buildings/Structures - NCC Classes 1-10					
Recommendation Details: Not Applicable						
4.3	Landscaping - Asset Protection Zone (APZ): Ensure an APZ is established surrounding the relevant element(s) at risk to create the required separation distance from the bushfire hazard to protect against the direct attack mechanisms of flame contact and radiant heat and reduce exposure to embers. *In addition to providing separation from the direct bushfire attack mechanisms, the nature of the APZ design and management requirements is intended to minimise the potential impact of the indirect bushfire attack mechanisms of surface fire attack, debris production and accumulation, tree strike and consequential fire (refer to Appendix 2).* This is achieved by ensuring the APZ contains low threat vegetation; and/or has potential fire fuels managed in a minimal fuel condition; and/or contains non-vegetated areas (e.g. footpaths, paved areas, driveways, parking, swimming pools etc) and/or limits the presence/location of constructed/stored combustible items. For different States and local government areas, APZ establishment and maintenance guides ideally need to be local environment specific. Some authorities establish general requirements while specific requirements may also be established through site specific management documents (e.g. bushfire management plan). The required dimensions of the APZ will correspond to the maximum level of radiant heat the exposed element is to be exposed to – or a greater distance if it is stipulated by a relevant authority. As a minimum avoid dimensions (separation distances) that correspond to BAL-FZ and BAL-40 ratings for any given site/vegetation combination of relevant parameters. This will also apply to BAL-29 separation distances if flame length modelling indicates potential contact due to specific site and effective slope configurations. The location of an APZ should be entirely within the boundaries of each lot so that landowners can have control and responsibility for its implementation and maintenance. Exceptions exist for instances where adjoining land is not vegetated or it can be justified that the fire fuels will be managed in a minimal fuel, low threat state on an ongoing basis, in perpetuity.	Very High	Yes	No	Yes	Yes
Assessment Comments: No vegetation landscaping (gardens) are proposed within the APZ, and the surface will be either hardstand or slashed grasses only. Vulnerability of buildings is assessed in Section 5.4.3. Buildings will require an APZ. The Operations and Maintenance Building has been designated as an on-site shelter location, and requires an exposure of <10kW/m2 radiant heat flux (calculated at 1200K flame temperature).						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Buildings/Structures - NCC Classes 1-10					

Buildings not associated with the Operations and Maintenance Building may be workshops, storage sheds, etc. A BAL-29 dimensioned APZ is appropriate for these structures to limit the potential for flame contact as their construction will be largely non-combustible.

Some structures may contain flammable/HAZMAT materials, or materials which is otherwise of greater value such as replacement parts. This is not known at planning submission, but the occupier can consider a greater dimensioned APZ to protect these assets. As a 10kW/m2 threshold has been applied to other assets due to vulnerable components, these components can then be assumed in storage, and apply a consistent 10kW/m2 APZ.

Recommendation Details:

An APZ must be installed around all identified assets. The dimensions of the APZ are associated with the maximum acceptable radiant heat flux exposure of that asset. All asset APZs are provided within this measure for application. The assessment for each asset type is provided in Measure 4.3, 5.3, 5.3, and 8.3.

<10kW/m2 (calculated at 1200K flame temperature):

- Operations and Maintenance Buildings (Class 1-9)

<10kW/m2 (calculated at 1090K flame temperature):

- Critical Class 10 Buildings
- BESS units and PCS
    - The 10m portion of the APZ immediately around BESS units must be entirely and permanently non-vegetated (sealed, compacted limestone, gravel, mineral earth etc). BESS units are recommended to be sited on concrete slabs or other sealed, non-combustible surface.

<19kW/m2 (BAL-19):

- Substations

<29kW/m2 (BAL-29):

- Laydown Areas
    - Outdoor material storage areas are recommended to have surfacing applied, extending 2m beyond the storage area.
- Construction Compounds
- Other Class 1-10 Buildings
- Water Tanks

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Buildings/Structures - NCC Classes 1-10					
4.4	Landscaping - Tree Location: Use separation to minimise the potential for debris accumulation and tree strike damage to the building/structures that will allow flame, radiant heat and ember entry to internal spaces. Principles to apply are: • The buildings/structures are separated from trees (or trees from buildings) by a distance of at least 1.5 times the height of the tallest tree; and • Trees that produce significant quantities of debris (fine fuels) during the bushfire season should be located a sufficient distance away from vulnerable exposed elements to ensure debris cannot drop and accumulate within at least 4m of buildings/structures or be likely to be relocated by wind to closer than 4m to buildings / structures. Avoid planting trees with ribbon or stringy bark (ember/firebrand production). • If the minimum distance cannot be achieved with an existing tree either remove the tree or at least ensure tree branches are sufficiently separated from buildings and attached/adjacent structures (at a minimum to not overhang) to ensure branches cannot fall onto or be blown onto the buildings/structures.	Medium	Yes	Yes	Unknown	Yes
Assessment Comments: The development is proposed toward the north-eastern extent of a large rural lot and is expected to require planting of vegetated vegetation screening. Vegetation screening is intended to meet Class D Scrub structure, however some trees may be present within the screen. The vegetation screen is >13.5m from buildings. A maximum tree height of 9m will meet the above specification. This will generally be met- it is possible a single tree will be within the 1.5x height distance. *Recommendation Details:* See Measure 6.4.						
4.5	Separation from Stored Flammable Products - Gas in Cylinders: To reduce the potential for gas flaring or explosion (consequential fire), installation of LPG cylinders is to apply as a minimum, the principles and requirements established in AS 1596 'The Storage and Handling of LP Gas'. Readily available guidance is provided by CSIRO Best Practice Bushfire Guide (https://research.csiro.au/bushfire/new-builds/water-electricity-gas/) and WA Dept. Mines, Industry, Regulation and Safety 'LP Gas cylinder safety in bushfire prone areas' (https://www.commerce.wa.gov.au/publications/lp-gas-cylinder-safety-bushfire-prone-areas). Otherwise, the required separation distance is 6m from any combustible materials. Heat from bushfire or consequential fire can be sufficient to cause cylinder pressure to reach critical levels and the pressure relief valve release large quantities of gas (flare). If the cylinder falls over the pressure relief valve may not function correctly, and the cylinder may rupture (explosion).	Medium	Yes	No	Yes	No
Assessment Comments: Any LPG will be stored in compliance with AS 1596. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Buildings/Structures - NCC Classes 1-10					
4.6	Separation from Stored Flammable Products – Fuels / Other Hazardous Materials (Consequential Fire Fuels): Establish sufficient separation distance between these consequential fire fuels and buildings/structures. The required separation distance will be dependent on the fuel and storage type.	High	Yes	Yes	No	Yes
Assessment Comments: Workshops/warehouses are likely to have various consequential fuels stored inside or around the perimeter. This will be managed by operational and emergency procedures. *Recommendation Details:* See Measure 6.7.						
4.7	Separation from Stored and Constructed Combustible Items (Consequential Fire Fuels): These consequential fire fuels include: • Stored Combustible Items - Heavy Fuels (>6mm diameter) e.g. building materials, packaging materials, firewood, branches, sporting/playground equipment, outdoor furniture, rubbish bins etc; • Stored Combustible Items – Large Heavy Fuels e.g. vehicles, caravans, boats and large quantities of dead vegetation materials stored as part of site use; • Constructed Combustible Items – Heavy Fuels e.g. landscaping structures including fences, screens, walls, plastic water tanks; and • Constructed Combustible Items – Large Heavy Fuels e.g. adjacent buildings/structures including houses, sheds, garages, carports. (Note: If the adjacent structure is constructed to BAL-29 requirements or greater and can implement a significant number of additional bushfire protection measures associated with reducing exposure and vulnerability, these minimum separation distances could be reduced by 30%) [31]. *Apply the rule of thumb [13] "assume flames produced from a consequential fire source will be twice as high as the object itself … where the consequential fire source is a structure, then the maximum eave height is a reasonable measure of maximum height".* Apply the following separation distances from the subject building/structure as a multiple of the height of the consequential fire source and dependent on the bushfire construction standard applied to the building/structure [13 and 31]: • At least six times the height when the building/structure construction incorporates design and materials that is only intended to resist low levels of radiant heat up to 12.5 kW/m^2) and no flame contact;	High	Yes	No	Yes	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Buildings/Structures - NCC Classes 1-10					
	• Between 4 and 6 six times the height when the building/structure construction incorporates design and materials intended to resist radiant heat up to 29 kW/m² and no flame contact. • Between 2 and 4 times the height when the building/structure construction incorporates design and materials intended to resist up to 40kW/m² and potential flame contact. • Less than 2 times the height when the building/structure construction incorporates design and materials intended to resist extreme levels of radiant heat and flame contact. • Zero separation distance is required if the building/structure is separated by a non-combustible FRL 60/60/60 rated wall, or the potential consequential fire source is fully enclosed by the building/structure.					
Assessment Comments: The Operations and Maintenance Building is required to comply with a minimum of BAL-29 construction. Any warehouses/workshops may be unable to comply with AS 3959 but will be composed of non-combustible materials and thus <12.5kW/m² radiant heat level construction is considered. The Operations and Maintenance Building is proposed >12m from BESS units, which are approximately 2.6m tall (thus 4x separation). BAL-29 construction is appropriate. The setback of assets from substations will be informed by the relevant design standard, as substations are an established (known) technology. Vehicles (small buses and 4wds) are approximately 2.5m tall and would require a 10m separation. Greater separation distances would substantially increase the footprint of the development and is not applied. *Recommendation Details:* See Measure 6.7.						
THE PROTECTION MECHANISM – ESTABLISH SHIELDING FROM RELEVANT BUSHFIRE HAZARD THREATS: Reduce exposure the direct bushfire attack mechanisms of flame, radiant heat, surface migration of embers and to a potentially limited extent, fire driven wind - by shielding buildings and attached/adjacent structures or other consequential fire fuels. To also reduce exposure to the indirect attack mechanism of debris accumulation against buildings/structures and other consequential fire fuels.						
4.8	Constructed Barrier – Shielding from Bushfire: Walls, fences and/or landforms to shield the subject building/structure from direct and indirect bushfire attack mechanisms and reduce the potential impact. Must be constructed using appropriate fire resistant / non-combustible construction materials (e.g. masonry, steel, earthworks). These are to withstand the impact of direct bushfire attack mechanisms for the required period of time. Apply the bushfire construction standards for external walls subject to the assessed level of radiant heat or flame contact to which the barrier will be exposed (or otherwise to BAL-FZ requirements). These are established by AS 3959:2018 [4] and/or the NASH Standard [33] and additionally informed by the research report 'Research and Investigation into the Performance of Residential Boundary Fencing Systems in Bushfires.' [29]	High	Yes	No	No	No
Assessment Comments: A greater APZ can be established without environmental impact through appropriate siting.						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Buildings/Structures - NCC Classes 1-10					
Recommendation Details: Not Applicable						
4.9	Constructed Barrier - Shielding from Consequential Fire: Applicable to all consequential fire fuel sources. Install a non-combustible barrier (including complete enclosure when appropriate), of required robustness, that can perform the following as relevant: • Reduce the exposure of the subject building/structure to the threats of consequential fire; and/or • Reduce the exposure of the consequential fire fuels to the bushfire hazard.	High	Yes	No	No	No
Assessment Comments: Consequential fire sources are addressed in Measure 6.7. *Recommendation Details:* Not Applicable						
4.10	Natural Landforms Barrier: Use existing natural landforms to reduce buildings/structures exposure to radiant heat, and lower wind speeds (prevailing synoptic and/or fire driven).	High	No	No	No	No
Assessment Comments: No appropriate landforms exist. *Recommendation Details:* Not Applicable						
4.11	Planted Vegetation Barrier: Use appropriate species (lower flammability) of hedges and trees strategically to reduce (to varying extents) buildings/structures exposure to radiant heat, to filter/trap embers and firebrands, and to lower wind speeds (prevailing synoptic and/or fire driven).	Medium	Yes	No	No	No
Assessment Comments: Landscaped vegetation is not recommended within the APZ to remove the capacity for surface fire and production of debris (leaf litter etc). *Recommendation Details:* Not Applicable						
4.12	Shield Operation Critical Non-Structural Elements: These are vulnerable elements essential to the continued operation of the building/structure which are potentially exposed to the attack mechanisms of both bushfire and consequential fire. These elements include cabling and plumbing associated with power delivery, data transmission, fuel and water transport. When the use of fire rated materials to the degree necessary is not possible or practical, the application of non-combustible shielding can be applied to reduce exposure to the threats. Shielding includes underground installation.	Medium	Yes	No	No	Yes
Assessment Comments: The only critical elements of the buildings are associated with site communications. The site has strong mobile phone reception and this is a minor concern.						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS	Effectiveness Rating [1]	Application Status [2]			
		Possible	Exists	Planned	Additionally Recommend
Element at Risk: Buildings/Structures - NCC Classes 1-10					
Recommendation Details: See Measure 6.12.					

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining.

Note 2: Protection Measure Application Status:

- Possible: Protection measures that can potentially be applied to the proposed development/use.
- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Currently Planned: Protection measures that:
  - Are incorporated into the site plans;
  - Exist in an approved Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), alternative solutions and any additional recommended protection measures - for which a responsibility for their implementation has been created and approved; and/or
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

  These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Additionally Recommend: Protection measures that:
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
  - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

  These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.3.3.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing exposure levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the exposure of the relevant element at risk to bushfire hazard threats.

EXPOSURE REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Establish Sufficient Separation from Relevant Bushfire Hazard Threats	Very High	2	2	1		1	1
	High	3	2	2		1	2
	Medium	2	2	1		1	1
	Not Relevant						
Establish Shielding from Relevant Bushfire Hazard Threats	Very High						
	High	3	2				
	Medium	2	2				1
	Not Relevant						
Number Analysis	Very High	2	2	1		1	1
	High	6	4	2		1	2
	Medium	4	4	1		1	2
	Not Relevant						
	Totals	12	10	4		3	5

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding Section.

5.3.3.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE EXPOSURE

From the information presented in the previous section, the exposure reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce exposure (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE EXPOSURE TO BUSHFIRE HAZARD THREATS [1]							
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.						
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Significant	Moderate	Minimal	Significant	Significant	Minimal	Moderate	Minimal
Moderate				Moderate			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Very Significant	Moderate	Moderate	Very Significant	Very Significant	Moderate	Significant	Significant
Significant				Significant			

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This exposure reducing potential will be applied to deriving the inherent exposure level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This exposure reducing potential will be applied to deriving the residual exposure level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

Assessment Comments: Most measures relate to the size and standard of maintenance of the APZ, and separations from and between hazards. The separation between buildings and stored or constructed consequential fire hazards is applied to a practical extent.

5.3.3.4 DERIVED EXPOSURE LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual exposure levels.

In combination with the corresponding assessed threat and vulnerability levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL EXPOSURE LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]							
ELEMENT AT RISK		Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
BUSHFIRE ATTACK MECHANISMS [2]		INHERENT EXPOSURE LEVEL (CURRENT STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	High
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
BUSHFIRE ATTACK MECHANISMS [2]		RESIDUAL EXPOSURE LEVEL (POTENTIAL FUTURE STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	Low
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: Refer to Appendix 2 for explanatory and supporting information.

Note 3: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.3.4 MATERIALS STOCKPILED OUTDOORS - LAYDOWN AREAS

5.3.4.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas					
THE PROTECTION MECHANISM – ESTABLISH SUFFICIENT SEPARATION FROM RELEVANT BUSHFIRE HAZARD THREATS: To reduce exposure to the relevant direct and indirect attack mechanisms of bushfire by locating buildings and attached/adjacent structures at sufficient distances away from the bushfire hazard and consequential fire fuels. The required distances will be dependent on the assessed threat levels and the degree of bushfire resilience that exists or is planned to be incorporated into the exposed elements through design and construction.						
5.1	Designed Location of Non-Vegetated Areas and/or Managed Open Space: Non-vegetated land uses include footpaths, paved areas, roads, parking, open drainage channels, and major services delivery (power, water, gas) installed in common corridors. Managed open space is land for public or private use on which the vegetation is either low threat due to type or situation or is continually managed in a minimal fuel condition. This can include public open space providing recreation facilities. Use these design elements to create or increase separation from any bushfire prone vegetation by positioning them adjacent to the bushfire hazard.	Very High	Yes	No	No	Yes
Assessment Comments: Laydown areas will be sited on cleared areas beside accessways. They may not be surfaced. *Recommendation Details:* See Measure 4.3.						
5.2	Landscaping - Asset Protection Zone (APZ): Ensure an APZ is established surrounding the relevant element(s) at risk to create the required separation distance from the bushfire hazard to protect against the direct attack mechanisms of flame contact and radiant heat and reduce exposure to embers. *In addition to providing separation from the direct bushfire attack mechanisms, the nature of the APZ design and management requirements is intended to minimise the potential impact of the indirect bushfire attack mechanisms of surface fire attack, debris production and accumulation, tree strike and consequential fire (refer to Appendix 2).* This is achieved by ensuring the APZ contains low threat vegetation; and/or has potential fire fuels managed in a minimal fuel condition; and/or contains non-vegetated areas (e.g. footpaths, paved areas, driveways, parking, swimming pools etc) and/or limits the presence/location of constructed/stored combustible items.	Very High	Yes	No	No	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas					
	For different States and local government areas, APZ establishment and maintenance guides ideally need to be local environment specific. Some authorities establish general requirements while specific requirements may also be established through site specific management documents (e.g. bushfire management plan). The required dimensions of the APZ will correspond to the maximum level of radiant heat the exposed element is to be exposed to – or a greater distance if it is stipulated by a relevant authority. As a minimum avoid dimensions (separation distances) that correspond to BAL-FZ and BAL-40 ratings for any given site/vegetation combination of relevant parameters. This will also apply to BAL-29 separation distances if flame length modelling indicates potential contact due to specific site and effective slope configurations. The location of an APZ should be entirely within the boundaries of each lot so that landowners can have control and responsibility for its implementation and maintenance. Exceptions exist for instances where adjoining land is not vegetated or it can be justified that the fire fuels will be managed in a minimal fuel, low threat state on an ongoing basis, in perpetuity.					
Assessment Comments: Laydown areas will contain a range materials which may be of greater or lesser importance. Some materials may be combustible, flammable, or hazardous. Any materials will have a range of radiant heat flux thresholds for damage; however ignition is the primary concern rather than potential damage to a single material type. Combustible materials require conditions to be met (moisture content and temperature) and a pilot flame for pyrolysis. Flame contact is the most practical condition to avoid. AS 3959 BAL-29 setbacks all exceed the modelled flame lengths for the associated design bushfire- and therefore a BAL-29 dimensioned APZ limits the potential for flame contact. *Recommendation Details:* See Measure 4.3.						
5.3	Separation from Stored Flammable Products – Fuels / Other Hazardous Materials (Consequential Fire Fuels): Establish sufficient separation distance between these consequential fire fuels and the stored materials. The required separation distance will be dependent on the fuel and storage type.	High	No	No	No	No
Assessment Comments: Various fuel sources will be associated with laydown areas, as this is the designated storage location. *Recommendation Details:* Not Applicable.						
5.4	Separation from Stored and Constructed Combustible Items (Consequential Fire Fuels): Apply a separation distance of at least six times the height of the stored and constructed combustible items. These consequential fire fuels include: • Stored Combustible Items - Heavy Fuels e.g. building materials, packaging materials, rubbish bins etc;	High	Yes	No	No	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas					
	• Stored Combustible Items – Large Heavy Fuels e.g. vehicles, caravans etc; • Constructed Combustible Items – Heavy Fuels e.g. landscaping structures including fences, screens, walls, plastic water tanks; and • Constructed Combustible Items – Large Heavy Fuels e.g. adjacent buildings/structures such as sheds and offices. *Apply the rule of thumb [13] "assume flames produced from a consequential fire source will be twice as high as the object itself … where the consequential fire source is a structure, then the maximum eave height is a reasonable measure of maximum height".*					
Assessment Comments: Various fuel sources will be associated with laydown areas, as this is the designated storage location. *Recommendation Details:* Higher flammability or dangerous materials should be positioned toward the centre of storage areas, to limit the exposure to direct bushfire impacts. Note this may include materials such as tarpaulins.						
THE PROTECTION MECHANISM – ESTABLISH SHIELDING FROM RELEVANT BUSHFIRE HAZARD THREATS: To shield buildings and attached/adjacent structures (or other consequential fire fuels) from the direct bushfire attack mechanisms of flame, radiant heat, surface fire and surface migration of embers. To also reduce exposure to the indirect attack mechanism of debris accumulation against buildings/structures and other consequential fire fuels and wind attack.						
5.5	Constructed Barrier – Shielding from Bushfire: Walls, fences and/or landforms to shield the stored materials from direct and indirect bushfire attack mechanisms and reduce the potential impact of these threats. Must be constructed using appropriate fire resistant / non-combustible construction materials (e.g. masonry, steel, earthworks). These are to withstand the impact of direct bushfire attack mechanisms for the required period of time. Apply the bushfire construction standards for external walls subject to the assessed level of radiant heat or flame contact to which the barrier will be exposed (or otherwise to BAL-FZ requirements). These are established by AS 3959:2018 [4] and/or the NASH Standard [33] and additionally informed by the research report 'Research and Investigation into the Performance of Residential Boundary Fencing Systems in Bushfires.' [29]	High	No	No	No	No
Assessment Comments: Shielding is not practical to install around the perimeter of material storage areas. Any material stored outdoors rather than within a building must have some level of resistance to weather exposure (including heat). *Recommendation Details:* Not Applicable						
5.6	Constructed Barrier - Shielding from Consequential Fire: Applicable to all consequential fire fuel sources. Install a non-combustible barrier (including complete enclosure when appropriate), of required robustness, that can perform the following as relevant:	High	No	No	No	No

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas					
	• Reduce the exposure of the stored materials to the threats of consequential fire; and/or • Reduce the exposure of the consequential fire fuels to the bushfire hazard.					
Assessment Comments: Various fuel sources will be associated with laydown areas, as this is the designated storage location. *Recommendation Details:* Not Applicable						
5.7	Natural Landforms Barrier: Use existing natural landforms to reduce stored materials exposure to radiant heat, and lower wind speeds (prevailing synoptic and/or fire driven).	High	No	No	No	No
Assessment Comments: No appropriate landforms exist. *Recommendation Details:* Not Applicable						
5.8	Planted Vegetation Barrier: Use appropriate hedges and trees strategically to reduce (to varying extents) stored materials exposure to radiant heat, to filter/trap embers and firebrands, and to lower wind speeds (prevailing synoptic and/or fire driven).	Medium	Yes	No	No	No
Assessment Comments: Vegetation screening can reduce radiant heat flux impact, however the screen cannot be maintained whilst functioning as a screen. There is the possibility of vegetation screens being involved in fire. *Recommendation Details:* Not Applicable						

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining.

Note 2: Protection Measure Application Status:

- Possible: Protection measures that can potentially be applied to the proposed development/use.
- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Currently Planned: Protection measures that:
  - Are incorporated into the site plans;
  - Exist in an approved Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), alternative solutions and any additional recommended protection measures - for which a responsibility for their implementation has been created and approved; and/or

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas					

- Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).

- Additionally Recommend: Protection measures that:
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
  - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.3.4.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing exposure levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the exposure of the relevant element at risk to bushfire hazard threats.

EXPOSURE REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Materials Stockpiled Outdoors						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Establish Sufficient Separation from Relevant Bushfire Hazard Threats	Very High	2	2				2
	High	2	1				1
	Medium						
	Not Relevant						
Establish Shielding from Relevant Bushfire Hazard Threats	Very High						
	High	3					
	Medium	1					
	Not Relevant						
Number Analysis	Very High	2	2				2
	High	5	1				1
	Medium	1					
	Not Relevant						
	Totals	8	3				3

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.3.4.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE EXPOSURE

From the information presented in the previous section, the exposure reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce exposure (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE EXPOSURE TO BUSHFIRE HAZARD THREATS [1]							
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas						
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
None	None	None	Minimal	Minimal	Minimal	Significant	Minimal
None				Minimal			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Significant	Moderate	Minimal	Moderate	Moderate	Significant	Significant	Significant
Moderate				Significant			

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This exposure reducing potential will be applied to deriving the inherent exposure level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This exposure reducing potential will be applied to deriving the residual exposure level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

Assessment Comments: Management measures are to avoid pilot flame contact on stored materials, through direct flame contact and surface fire. The material itself is the consequential fire source.

5.3.4.4 DERIVED EXPOSURE LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual exposure levels.

In combination with the corresponding assessed threat and vulnerability levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL EXPOSURE LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]							
ELEMENT AT RISK		Materials Stockpiled Outdoors – Laydown Areas					
BUSHFIRE ATTACK MECHANISMS [2]		INHERENT EXPOSURE LEVEL (CURRENT STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	Extreme
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	
INDIRECT	Surface Fire	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	
BUSHFIRE ATTACK MECHANISMS [2]		RESIDUAL EXPOSURE LEVEL (POTENTIAL FUTURE STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	High
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: Refer to Appendix 2 for explanatory and supporting information.

Note 3: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.3.5 BUILT INFRASTRUCTURE ASSETS – BESS UNITS

5.3.5.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
THE PROTECTION MECHANISM – ESTABLISH SUFFICIENT SEPARATION FROM RELEVANT BUSHFIRE HAZARD THREATS: To reduce exposure to the relevant direct and indirect attack mechanisms of bushfire by locating buildings and attached/adjacent structures at sufficient distances away from the bushfire hazard and consequential fire fuels. The required distances will be dependent on the assessed threat levels and the degree of bushfire resilience that exists or is planned to be incorporated into the exposed elements through design and construction.						
6.1	Siting of Buildings/Structures Considering Potential High Wind Exposure: Site buildings and attached/adjacent structures in locations that have less exposure to terrain influenced prevailing synoptic winds, and in particular, those locations with potential for significant terrain/bushfire threat intensification interactions (refer to Appendix 3). Avoid the top and sides of ridges. Strong winds can directly or indirectly (airborne materials/debris) cause damage to the external building envelope, potentially allowing flame, radiant heat and ember entry.	High	No	Yes	No	No
Assessment Comments: The siting of the proposal considers a number of impacts other than wind. The relevant vegetation (pasture) within 150m of the development area will not generate significant fire-driven winds, and it is thus not a relevant consideration. The BESS footprint is within a less vegetated portion of the site, and is required to have a <10kW/m2 APZ installed, which will greatly reduce the exposure to any fire-driven wind. *Recommendation Details:* Not Applicable						
6.2	Designed Location of Non-Vegetated Areas and/or Managed Open Space: Non-vegetated land uses include footpaths, paved areas, roads, parking, open drainage channels, and major services delivery (power, water, gas) installed in common corridors. Managed open space is land for public or private use on which the vegetation is either low threat due to type or situation or is continually managed in a minimal fuel condition. This can include public open space providing recreation facilities. Use these design elements to create or increase separation from any bushfire prone vegetation by positioning them adjacent to the bushfire hazard.	Very High	Yes	No	Yes	Yes
Assessment Comments: There are no such areas existing. The non-vegetated areas will be the internal access roads and carparks, 10m non-vegetated area around the BESS development (applied in Measure 6.3), and surfaced hardstand of the BESS and Substation footprints.						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
Recommendation Details: See Measure 6.3.						
6.3	Landscaping - Asset Protection Zone (APZ): Ensure an APZ is established surrounding the relevant element(s) at risk to create the required separation distance from the bushfire hazard to protect against the direct attack mechanisms of flame contact and radiant heat and reduce exposure to embers. *In addition to providing separation from the direct bushfire attack mechanisms, the nature of the APZ design and management requirements is intended to minimise the potential impact of the indirect bushfire attack mechanisms of surface fire attack, debris production and accumulation, tree strike and consequential fire (refer to Appendix 2).* This is achieved by ensuring the APZ contains low threat vegetation; and/or has potential fire fuels managed in a minimal fuel condition; and/or contains non-vegetated areas (e.g. footpaths, paved areas, driveways, parking, swimming pools etc) and/or limits the presence/location of constructed/stored combustible items. For different States and local government areas, APZ establishment and maintenance guides ideally need to be local environment specific. Some authorities establish general requirements while specific requirements may also be established through site specific management documents (e.g. bushfire management plan). The required dimensions of the APZ will correspond to the maximum level of radiant heat the exposed element is to be exposed to – or a greater distance if it is stipulated by a relevant authority. As a minimum avoid dimensions (separation distances) that correspond to BAL-FZ and BAL-40 ratings for any given site/vegetation combination of relevant parameters. This will also apply to BAL-29 separation distances if flame length modelling indicates potential contact due to specific site and effective slope configurations. The location of an APZ should be entirely within the boundaries of each lot so that landowners can have control and responsibility for its implementation and maintenance. Exceptions exist for instances where adjoining land is not vegetated or it can be justified that the fire fuels will be managed in a minimal fuel, low threat state on an ongoing basis, in perpetuity.	Very High	Yes	No	Yes	Yes
Assessment Comments: The APZ applicable to a development should be commensurate to the vulnerabilities and maximum thresholds of that asset. The *Planning for Bushfire Guidelines* do not require an APZ for assets other than habitable buildings, regardless of asset type, use, construction, and any critical (or possibly sacrificial) nature.						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					

The exterior and structural components of battery cabinets are non-combustible, generally being metal, fibrous cement, mineral wool etc. A Battery Energy Storage System 'unit' is an approximately sea container sized cabinet with a series of battery racks installed. A single battery rack consists of battery cells (each cell connected into a module), and a control box with chiller. Power and computer cabling is associated within and between racks. These are the relevant components regarding potential for fire.

- Individual batteries have been found to be highly resistant to conductive heat. Applied temperatures exceeding 400 degrees Celsius destroyed, but did not ignite, running battery cells. See UL *9540A Test Method for Evaluating Thermal Runaway Fire Propagation in Cell Energy Storage Systems, Third Edition* (UL LLC; 8 July 2020). Other trigger/failure conditions must be met for battery cells to ignite (mechanical rupture, flame contact, product failure etc).
- Control boxes are computers which will apply thermal throttling and thermal shutdown if internal temperatures exceed a determined threshold. Once a computer system is shut down in this scenario, the threshold is expected to be that of the cabling (below).
- Associated cabling (both power transmission and computer). Common electrical cabling reaches its critical point at >12kW/m^2 (Kaczorek-Chrobak et al. 2021) [49]. Electrical cabling and components are expected to exceed this standard, being industrial and high capacity, however the 12kW threshold is adopted for the highest potential vulnerability.

Heat Flux Thresholds

BESS technologies are continuing to develop, and the critical heat flux thresholds of assets may vary between engineering designs.

Heat flux thresholds are not available for any BESS product. Thresholds can occasionally be found for components of various assets other than Class 1-10 buildings. However, these specifications understate the tolerance to high heat fluxes as they test major asset fire, which have far longer residence periods as compared to bushfire.

The following document was found to be relevant in the assessment of proposed substations: *NS187 Passive Fire Mitigation Design of Major Substations - Internal Document No. NW000-S0007* (Ausgrid 2020). Ausgrid Pty Ltd is Australia's largest electricity distributor (in terms of customers and energy load), and the document referenced is an internal network standard. The below table is sourced from Section 12 of the network standard.

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS	Effectiveness Rating [1]	Application Status [2]			
		Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.				

Table 3 – Radiant Heat Exposure Limits for Bushfires

Item	Maximum allowable radiant heat flux (kW/m^2)	Comment
Cable	12.5 20	PVC Cables begin to distort and may ignite. Ignition of XLPE cables between 85 and 550 seconds.
Steel support structure	35	To 60% of yield strength after a maximum duration of 5 minutes. Applies where elastic deflections due to elevated temperatures are not critical.
Porcelain bushing/Insulators	>30	Damage may occur requiring replacement or in extreme case resulting in catastrophic failure. See Note 2.
Polymeric bushing/insulators	>30	Damage may occur requiring replacement or in extreme case resulting in catastrophic failure. See Note 2.
Aluminium busbar	20	Based on 250°C after a maximum duration of 5 minutes. Comparable to withstand temperature under fault conditions.
Copper busbar	25	Busbars may undergo significant distortion and impose significant stresses on rigid insulators.
Transformer tank	>35 (see Note 1)	Refer to above regarding bushings and cables.
Combustibles	12.5	Piloted ignition may occur on timber.

Note 1. Transformers always have some more vulnerable components such as bushings and cables etc. Refer to Clause 7.2.

'Combustibles' in this description are consequential fire hazards for the purposes of the bushfire assessment: packing materials, pallets, waste, and other assorted debris. These should not be present within the immediate siting and where necessary should be positioned away from infrastructure components, applied in Measure 6.7.

This leaves cables as the relevant consideration, with a maximum allowable heat flux comparable to the findings of (Kaczorek-Chrobak et al. 2021) [49], which found common electrical cabling reaches its critical point at >12kW/m^2. Electrical cabling and components may exceed this standard, being industrial and high capacity, however the 12kW threshold is adopted for the highest potential vulnerability.

Associated cabling (both power transmission and computer) will be present both internally and externally connecting to associated infrastructure through to the electricity network.

Control boxes are computers which will apply thermal throttling and thermal shutdown if internal temperatures exceed a determined threshold. Once a computer system is shut down in this scenario, the threshold is expected to be that of the cabling (above).

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					

Exposed cabling (not shielded or buried underground) positioned beyond a <12kW zone may be damaged/destroyed in a bushfire event and require replacement. The manufacturer/ proponent should identify where any such exposed cabling can be sacrificed and replaced, and if de-powering/disconnection from the grid etc is required for this to be appropriate. Critical cabling should be installed within structures, underground, or shielded with appropriate sheaths.

Temperature Thresholds

The thermal insulation of the battery cabinet is not readily available and may be specified within the standards with which the cabinet is compliant (being purchase-only). The construction, cladding, and insulation may meet or exceed the requirements for BAL-29, NASH, or the *ABCB Handbook*.

Radiant heat from a bushfire or other source against the battery cabinet can heat the interior, however direct calculations between radiant heat and ambient temperature within an enclosure are not available. Testing has been conducted, but only directional heat exposure (nearby asset fire or heating elements).

A critical consideration is that the full duration for the passage of a fire front is brief relative to structural fires. AS 3959 assumes a peak heat flux phase of 2 minutes. The pre-heating and flaming phase is generally <10 minutes. Residual heat (through ongoing combustion of heavy fuels) may continue for >1 hour with lower heat fluxes. For grassland vegetation and other fine fuels, the entire exposure duration may be <30 seconds.

The individual batteries have been found to be highly resistant to conductive heat. Applied temperatures exceeding 400 degrees Celsius destroyed, but not ignite, running battery cells. See *UL 9540A Test Method for Evaluating Thermal Runaway Fire Propagation in Cell Energy Storage Systems, Third Edition* (UL LLC; 8 July 2020). Other trigger/failure conditions must be met for battery cells to ignite (mechanical rupture, flame contact, product failure etc).

The maximum storage and design temperatures vary on the manufacturer specifications of the specific product. The lowest maximums found are:

- Switchgear: 105°C
- Transformer: 130°C
- Cables: 130°C
- Liquid cooling rack: 60°C
- Battery cell: 55°C for 12 months / 60°C 24 hours.

The product is required to comply with UN 38.3 under s2.9.4 of the *Australian Code for the Transport of Dangerous Goods by Road & Rail* v7.9 (Australian National Transport Commission 2024). UN 38.3.4.2 *Test T.2: Thermal test* which requires cells and batteries to be tested to 72C ± 2°C for 6 hours, with 10 repeats of the same set of cells or batteries. As shown above, it must be considered that battery cells and associated infrastructure/equipment are tested to be able to withstand an environment of sustained high temperatures beyond human endurance.

- The *ABCB Handbook* requires refuge structures for a tenable human environment be subject to <10kw/m2 radiant heat flux, and a maximum mean internal temperature <39°C for 1 hour (and peak of 45°C).

This 'tenable environment' for battery infrastructure within the BESS units should be adopted as 60°C for a period of 6 hours.

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					

Emergency Response

The *ABCB Handbook* (and referenced through the *Planning for Bushfire Guidelines*) consider that emergency responders with suitable PPE are able to operate within areas subject to <10kW/m^2 radiant heat flux for limited periods. The BESS Infrastructure and the substation will be subject to <10kW/m^2 radiant heat flux, and thus align to these documents.

Note that as the development does not include persons sheltering, the applied flame temperature would be 1090K rather than 1200K.

View Factor Adjustment – Application of a Radiant Heat Barrier

The following is *not* a Method 2 calculation of a View Factor Adjustment.

All assumptions within the View Factor Adjustment are met as the battery cabinet is a full enclosure (e.g. barrier height against the emitting radiant heat panel), or not relevant (e.g. flame deflection, as the APZ applied exceeds BAL-29- which based on modelled solid flame lengths).

A constructed barrier must consist of solid non-combustible materials. The quality of materials and construction (including quantity and quality of fixings) must be able to withstand the expected amount of radiation and its duration (as associated with the type of vegetation present), and any other reasonably expected potential impacts.

Effective barrier materials and construction include barriers that can comply with the requirements established by AS 3959:2018 clause 9.4.1 for walls subject to BAL-FZ (FRL -/60/60 or 60/60/60 if load bearing).

The insulation period is the critical measure (e.g. FRL 60/60/60), as this accounts for the radiant heat on the external element transferring through conduction to the internal panel and thus heating the internal environment- and thus impacting the 'tenability' above.

The barrier (battery enclosure) will not assume flame contact at <10kW/m^2 radiant heat flux exposure, and the duration of pre-heating, flaming phase, and residual heat will be <60 minutes for the associated vegetation. Therefore, the duration applied for BAL-FZ construction can justifiably be reduced.

As a reference of materials and effectiveness, findings from the project '*Research and Investigation into the Performance of Residential Boundary Fencing Systems in Bushfires*' (2006) conducted by BlueScope Steel Limited, CSIRO Bushfire Research and the Bushfire CRC, established the following as a key output:

> *"COLORBOND steel had the best performance as it is a non-combustible material, it maintained structural integrity as a heat barrier under all experimental exposure conditions, and it did not spread flame laterally or contribute to the fire intensity during exposure. The fencing reduced radiation levels within the fencing boundary to below 5 kW/m^2 immediately behind the fencing system during all radiation exposures and reduced the radiant heat exposure on a structure 9 m from the fencing by at least a factor of two".*

This is to provide evidence that effective radiant heat shielding exists and can be applied, however direct calculations do not exist.

The technical report 21-*0010 IHE Safety Distance* (SAFT Engineering Department 14/1/2021) tested a forced fire propagation via thermal runaway of a battery module within a container on an adjoining container. This report is based on older battery chemistry. Flame ignited after 3 hours of abuse, with a duration of approximately 2 hours, and peak flame temperature of approximately 800 degrees (note- bushfire modelling applies a standard flame temperature of 1090 degrees). The impact on the neighbouring cabinet within 3m

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
was to increase the external panel to 55 degrees, with the internal environment increasing by 20 degrees only. The inputs cannot be compared to a bushfire. However, the shielding effect of the cabinet is substantial. The impact of shielding is not applied, as calculations are not available. However, the APZs applied are based on assets being entirely exposed, when in reality a significant measure of shielding will exist and reduce the exposure to the asset. *Recommendation Details:* See Measure 4.3.						
6.4	Landscaping - Tree Location: Use separation to minimise the potential for debris accumulation and tree strike damage to the building envelop potentially allowing flame, radiant heat and ember entry to internal spaces. • The buildings/structures are separated from trees (or trees from buildings) by a distance of at least 1.5 times the height of the tallest tree. • Trees that produce significant quantities of debris (fine fuels) during the bushfire season should be located a sufficient distance away from vulnerable exposed elements to ensure debris cannot drop and accumulate within at least 4m of buildings/structures or be likely to be relocated by wind to closer than 4m to buildings / structures. • If the minimum distances cannot be achieved with an existing tree either remove the tree or at least ensure tree branches are sufficiently separated from buildings and attached/adjacent structures (at a minimum to not overhang) to ensure branches cannot fall onto or be blown onto the buildings/structures.	Medium	Yes	Partly	Yes	Yes
Assessment Comments: The BESS development requires a minimum 10m non-vegetated APZ through Measure 4.3. The development is proposed toward the north-eastern extent of a large rural lot and is expected to require planting of vegetated vegetation screening. Vegetation screening is intended to meet Class D Scrub structure, however some trees may be present within the screen. The vegetation screen is >20m from BESS units. A maximum tree height of 13.3m will meet the above specification. *Recommendation Details:* Any future Landscape Management Plan should be reviewed by the Bushfire Consultant to provide additional advice on vegetation location, demographics, and structure. Trees over 6m tall are not recommended to be planted within 10m of assets to reduce the capacity for ongoing fuel accumulation or tree strike.						
6.5	Separation from Stored Flammable Products - Gas in Cylinders: To reduce the potential for gas flaring or explosion (consequential fire), installation of LPG cylinders is to apply as a minimum, the principles and requirements established in AS 1596 'The Storage and Handling of LP Gas'. Readily available guidance is provided by CSIRO Best Practice Bushfire Guide (https://research.csiro.au/bushfire/new-builds/water-electricity-gas/) and WA Dept. Mines, Industry, Regulation	Medium	N/A	N/A	N/A	N/A

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
	and Safety 'LP Gas cylinder safety in bushfire prone areas' (https://www.commerce.wa.gov.au/publications/lp-gas-cylinder-safety-bushfire-prone-areas). Otherwise, the required separation distance is 6m from any combustible materials. Heat from bushfire or consequential fire can be sufficient to cause cylinder pressure to reach critical levels and the pressure relief valve release large quantities of gas (flare). If the cylinder falls over the pressure relief valve may not function correctly, and the cylinder may rupture (explosion).					
Assessment Comments: Gas storage is not proposed on site. Any LPG will be stored in compliance with AS 1596. *Recommendation Details:* Not Applicable						
6.6	Separation from Stored Flammable Products – Fuels / Other Hazardous Materials (Consequential Fire Fuels): Establish sufficient separation distance between these consequential fire fuels and buildings/structures. The required separation distance will be dependent on the fuel and storage type.	High	Yes	No	Yes	Yes
Assessment Comments: All infrastructure will be installed to manufacturers specification, including separation distances. Fuel and other hazardous material will not be stored on site. Both flammable and combustible materials are required to be positioned and maintained >10m from assets by Measure 6.7. *Recommendation Details:* See Measure 6.7.						
6.7	Separation from Stored and Constructed Combustible Items (Consequential Fire Fuels): These consequential fire fuels include: • Stored Combustible Items - Heavy Fuels e.g. building materials, packaging materials, rubbish bins etc; • Stored Combustible Items – Large Heavy Fuels e.g. vehicles, caravans and large quantities of dead vegetation materials stored as part of site use; • Constructed Combustible Items – Heavy Fuels e.g. landscaping structures including fences, screens, walls, plastic water tanks; and • Constructed Combustible Items – Large Heavy Fuels e.g. adjacent buildings/structures including houses, sheds, garages, carports. (Note: If the adjacent structure is constructed to BAL-29 requirements or greater and can implement a significant number of additional bushfire protection measures associated with reducing exposure and vulnerability, these minimum separation distances could be reduced by 30%) [31].	High	Yes	No	Yes	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS	Effectiveness Rating [1]	Application Status [2]			
		Possible	Exists	Planned	Additionally Recommend
Element at Risk: Built Infrastructure Assets - BESS units and Associated Infrastructure.					
Apply the rule of thumb [13] "assume flames produced from a consequential fire source will be twice as high as the object itself … where the consequential fire source is a structure, then the maximum eave height is a reasonable measure of maximum height". Apply the following separation distances from the subject building/structure as a multiple of the height of the consequential fire source and dependent on the construction standard applied to the building/structure [13 and 31]: • At least six times the height when the building/structure construction incorporates design and materials that is only intended to resist low levels of radiant heat up to 12.5 kW/m^2) and no flame contact; • Between 4 and 6 six times the height when the building/structure construction incorporates design and materials intended to resist radiant heat up to 29 kW/m^2 and no flame contact. • Between 2 and 4 times the height when the building/structure construction incorporates design and materials intended to resist up to 40kW/m^2 and potential flame contact. • Less than 2 times the height when the building/structure construction incorporates design and materials intended to resist extreme levels of radiant heat and flame contact. • Zero separation distance is required if the building/structure is separated by a non-combustible FRL 60/60/60 rated wall, or the potential consequential fire source is fully enclosed by the building/structure.					

Assessment Comments: The design and layout of the facility has been determined by the relevant designer/engineer and are assumed to be appropriate in reducing the risk of structure-to-structure (or asset) fire. Required separation distances are different for each supplier (and equipment model) depending on the results from the large-scale fire test and UL9540. As such, once a supplier has been selected a final layout will be prepared prior to construction. This will be confirmed in the updated Risk Management Plan. The recommended CFA conditions require the updated Risk Management Plan to specify the separation distance, based on radiant heat flux (output) as an ignition source (an output from the large-scale fire test). It is also anticipated that it will be shown on Development Plans to the satisfaction of the Minister for Planning.

The minimum separations within this Bushfire Risk Report should be applied where the selected product does not specify an alternative setback.

These separation distances between assets are based on a >1 hour intervention due to the remoteness of the site.

Recommendation Details: All non-structural combustible materials are to be removed within 10m of assets. This includes but is not limited to; waste, leaf litter, machinery, grasses, vehicles, fuel, furniture, and timber. When storage of flammable items or materials are stored on site temporarily (for maintenance etc), separation distances must be complied with. This requirement is to be included in the Site Operating Procedures document.

The product datasheet or manufacturer is likely to specify a setback between BESS units. Where this is not provided, a setback of >1m on the shorter and >3m on the longer side is recommended.

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
Where the product datasheet or manufacturer specification does not specify a distance between battery containers and other constructed combustible/critical assets, the applied distance should be 15m (based on >1 hour intervention). This does not apply to any constructed asset required to be reasonably adjacent.						
THE PROTECTION MECHANISM – ESTABLISH SHIELDING FROM RELEVANT BUSHFIRE HAZARD THREATS: To shield buildings and attached/adjacent structures (or other consequential fire fuels) from the direct bushfire attack mechanisms of flame, radiant heat, surface fire and surface migration of embers. To also reduce exposure to the indirect attack mechanism of debris accumulation against buildings/structures and other consequential fire fuels and wind attack.						
6.8	Constructed Barrier – Shielding from Bushfire: Walls, fences and/or landforms to shield the subject building/structure from direct and indirect bushfire attack mechanisms and reduce the potential impact of these. Must be constructed using appropriate fire resistant / non-combustible construction materials (e.g. masonry, steel, earthworks). These are to withstand the impact of direct bushfire attack mechanisms for the required period of time. Apply the bushfire construction standards for external walls subject to the assessed level of radiant heat or flame contact to which the barrier will be exposed (or otherwise to BAL-FZ requirements). These are established by AS 3959:2018 [4] and/or the NASH Standard [33] and additionally informed by the research report 'Research and Investigation into the Performance of Residential Boundary Fencing Systems in Bushfires.' [29]	High	Yes	No	No	No
Assessment Comments: A radiant heat barrier could be applied, however a greater APZ can be established without environmental impact due to the pasture vegetation. *Recommendation Details:* Not Applicable						
6.9	Constructed Barrier - Shielding from Consequential Fire: Applicable to all consequential fire fuel sources. Install a non-combustible barrier (including complete enclosure when appropriate), of required robustness, that can perform the following as relevant: • Reduce the exposure of the subject building/structure to the threats of consequential fire; and/or • Reduce the exposure of the consequential fire fuels to the bushfire hazard.	High	Yes	No	No	No
Assessment Comments: Consequential fire sources are addressed in Measure 6.7. *Recommendation Details:* Not Applicable						
6.10	Natural Landforms Barrier: Use existing natural landforms to reduce buildings/structures exposure to radiant heat, and lower wind speeds (prevailing synoptic and/or fire driven).	High	No	No	No	No
Assessment Comments: No appropriate landforms exist.						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
Recommendation Details: Not Applicable						
6.11	Planted Vegetation Barrier: Use appropriate hedges and trees strategically to reduce (to varying extents) buildings/structures exposure to radiant heat, to filter/trap embers and firebrands, and to lower wind speeds (prevailing synoptic and/or fire driven).	Medium	Yes	No	No	No
Assessment Comments: Landscaped vegetation is not recommended within the APZ to remove the capacity for surface fire and production of debris (leaf litter etc). *Recommendation Details:* Not Applicable						
6.12	Shield Operation Critical Non-Structural Elements: These are vulnerable elements essential to the continued operation of the building/structure which are potentially exposed to the attack mechanisms of both bushfire and consequential fire. These elements include cabling and plumbing associated with power delivery, data transmission, fuel and water transport. When the use of fire rated materials to the degree necessary is not possible or practical, the application of non-combustible shielding can be applied to reduce exposure to the threats. Shielding includes underground installation.	Medium	Yes	Unknown	No	Yes
Assessment Comments: All high-risk components will be positioned such that they are subject to a maximum 10kW/m2 radiant heat flux. *Recommendation Details:* Electrical cabling associated with built assets (not transmission lines) which are beyond the >10kW/m^2 setback (thus subject to radiant heat fluxes >10kW/m^2), or beyond footprint of buildings or constructed assets, are recommended to be installed underground, or shielded with non-combustible material (or enclosed) where practical.						

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining.

Note 2: Protection Measure Application Status:

- Possible: Protection measures that can potentially be applied to the proposed development/use.
- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Currently Planned: Protection measures that:
  - Are incorporated into the site plans;
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Planning for Bushfire Guidelines', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					

These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).

- Additionally Recommend: Protection measures that:
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
  - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.3.5.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing exposure levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the exposure of the relevant element at risk to bushfire hazard threats.

EXPOSURE REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Establish Sufficient Separation from Relevant Bushfire Hazard Threats	Very High	2	2			2	2
	High	3	2	1		2	2
	Medium	2	1		1	1	1
	Not Relevant						
Establish Shielding from Relevant Bushfire Hazard Threats	Very High						
	High	3	2				
	Medium	2	2				1
	Not Relevant						
Number Analysis	Very High	2	2			2	2
	High	6	4	1		2	2
	Medium	4	3		1	1	2
	Not Relevant						
	Totals	12	9	1	1	5	6

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.3.5.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE EXPOSURE

From the information presented in the previous section, the exposure reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce exposure (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE EXPOSURE TO BUSHFIRE HAZARD THREATS [1]							
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.						
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Significant	Moderate	Minimal	Significant	Significant	Minimal	Significant	Moderate
Moderate				Moderate			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Very Significant	Very Significant	Moderate	Very Significant	Very Significant	Very Significant	Significant	Significant
Very Significant				Significant			

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This exposure reducing potential will be applied to deriving the inherent exposure level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This exposure reducing potential will be applied to deriving the residual exposure level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

Assessment Comments: Most measures relate to the increased size and standard of maintenance of the APZ, separations from and between hazards, and between assets.

5.3.5.4 DERIVED EXPOSURE LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual exposure levels.

In combination with the corresponding assessed threat and vulnerability levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL EXPOSURE LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]							
ELEMENT AT RISK		Built Infrastructure Assets - BESS units and Associated Infrastructure.					
BUSHFIRE ATTACK MECHANISMS [2]		INHERENT EXPOSURE LEVEL (CURRENT STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	Moderate
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
BUSHFIRE ATTACK MECHANISMS [2]		RESIDUAL EXPOSURE LEVEL (POTENTIAL FUTURE STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	Very Low
DIRECT	Radiant Heat	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: Refer to Appendix 2 for explanatory and supporting information.

Note 3: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.3.6 BUILT INFRASTRUCTURE ASSETS – SUBSTATION

5.3.6.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
THE PROTECTION MECHANISM – ESTABLISH SUFFICIENT SEPARATION FROM RELEVANT BUSHFIRE HAZARD THREATS: To reduce exposure to the relevant direct and indirect attack mechanisms of bushfire by locating buildings and attached/adjacent structures at sufficient distances away from the bushfire hazard and consequential fire fuels. The required distances will be dependent on the assessed threat levels and the degree of bushfire resilience that exists or is planned to be incorporated into the exposed elements through design and construction.						
8.1	Siting of Buildings/Structures Considering Potential High Wind Exposure: Site buildings and attached/adjacent structures in locations that have less exposure to terrain influenced prevailing synoptic winds, and in particular, those locations with potential for significant terrain/bushfire threat intensification interactions (refer to Appendix 3). Avoid the top and sides of ridges. Strong winds can directly or indirectly (airborne materials/debris) cause damage to the external building envelope, potentially allowing flame, radiant heat and ember entry.	High	No	Partly	No	No
Assessment Comments: The siting of the proposal considers a number of impacts other than wind. The relevant vegetation (pasture) within 150m of the development area will not generate significant fire-driven winds, and it is thus not a relevant consideration. The development footprint is within a less vegetated portion of the site, and is required to have a BAL-19 dimensioned APZ installed, which will reduce the exposure to any fire-driven wind. *Recommendation Details:* Not Applicable						
8.2	Designed Location of Non-Vegetated Areas and/or Managed Open Space: Non-vegetated land uses include footpaths, paved areas, roads, parking, open drainage channels, and major services delivery (power, water, gas) installed in common corridors. Managed open space is land for public or private use on which the vegetation is either low threat due to type or situation or is continually managed in a minimal fuel condition. This can include public open space providing recreation facilities. Use these design elements to create or increase separation from any bushfire prone vegetation by positioning them adjacent to the bushfire hazard.	Very High	Yes	Partly	Yes	Yes
Assessment Comments: There are no such areas existing. The non-vegetated areas will be the internal access roads and carparks, 10m non-vegetated area around the BESS development (applied in Measure 6.3), and surfaced hardstand of the BESS and Substation, footprints.						

PROTECTION MEASURES AVAILABLE TO REDUCE EXPOSURE LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
Recommendation Details: See Measure 6.3.						
8.3	Landscaping - Asset Protection Zone (APZ): Ensure an APZ is established surrounding the relevant element(s) at risk to create the required separation distance from the bushfire hazard to protect against the direct attack mechanisms of flame contact and radiant heat and reduce exposure to embers. *In addition to providing separation from the direct bushfire attack mechanisms, the nature of the APZ design and management requirements is intended to minimise the potential impact of the indirect bushfire attack mechanisms of surface fire attack, debris production and accumulation, tree strike and consequential fire (refer to Appendix 2).* This is achieved by ensuring the APZ contains low threat vegetation; and/or has potential fire fuels managed in a minimal fuel condition; and/or contains non-vegetated areas (e.g. footpaths, paved areas, driveways, parking, swimming pools etc) and/or limits the presence/location of constructed/stored combustible items. For different States and local government areas, APZ establishment and maintenance guides ideally need to be local environment specific. Some authorities establish general requirements while specific requirements may also be established through site specific management documents (e.g. bushfire management plan). The required dimensions of the APZ will correspond to the maximum level of radiant heat the exposed element is to be exposed to – or a greater distance if it is stipulated by a relevant authority. As a minimum avoid dimensions (separation distances) that correspond to BAL-FZ and BAL-40 ratings for any given site/vegetation combination of relevant parameters. This will also apply to BAL-29 separation distances if flame length modelling indicates potential contact due to specific site and effective slope configurations. The location of an APZ should be entirely within the boundaries of each lot so that landowners can have control and responsibility for its implementation and maintenance. Exceptions exist for instances where adjoining land is not vegetated or it can be justified that the fire fuels will be managed in a minimal fuel, low threat state on an ongoing basis, in perpetuity.	Very High	Yes	No	Yes	Yes

Assessment Comments:

Substations and Switchyards

AS 2067-2016 *Substations and high voltage installations exceeding 1 kV a.c.* does not provide radiant heat or flame exposure thresholds, nor any general bushfire protection measures. 'Consideration of the area surrounding the installation should also be included, in particular the effect of fire on or from surrounding vegetation.' (AS 2067-2016 s6.7.1.2).

Standard vegetation clearances are provided in *Western Australian Distribution Connections Manual 2015* (Western Power 2015).

The following document was found to be relevant in the assessment of proposed substations: *NS187 Passive Fire Mitigation Design of Major Substations* - Internal Document No. NW000-S0007 (Ausgrid 2020). Ausgrid Pty Ltd is Australia's largest electricity distributor (in terms of customers and energy load), and the document referenced is an internal network standard. The below table is sourced from Section 12 of the network standard.

Table 3 – Radiant Heat Exposure Limits for Bushfires

Item	Maximum allowable radiant heat flux (kW/m^2)	Comment
Cable	12.5	PVC Cables begin to distort and may ignite.
	20	Ignition of XLPE cables between 85 and 550 seconds.
Steel support structure	35	To 60% of yield strength after a maximum duration of 5 minutes. Applies where elastic deflections due to elevated temperatures are not critical.
Porcelain bushing/Insulators	>30	Damage may occur requiring replacement or in extreme case resulting in catastrophic failure. See Note 2.
Polymeric bushing/insulators	>30	Damage may occur requiring replacement or in extreme case resulting in catastrophic failure. See Note 2.
Aluminium busbar	20	Based on 250°C after a maximum duration of 5 minutes. Comparable to withstand temperature under fault conditions.
Copper busbar	25	Busbars may undergo significant distortion and impose significant stresses on rigid insulators.
Transformer tank	>35 (see Note 1)	Refer to above regarding bushings and cables.
Combustibles	12.5	Piloted ignition may occur on timber.

Note 1. Transformers always have some more vulnerable components such as bushings and cables etc. Refer to Clause 7.2.

'Combustibles' in this description are consequential fire hazards for the purposes of the bushfire assessment: packing materials, pallets, waste, and other assorted debris. These should not be present within the substation footprint and where necessary should be positioned away from infrastructure components, applied in Measure 6.7.

The internal network standard aligns with (Suzuki et al 2007)[1]; (Zhenhua et al 2018)[2]; (Ausgrid 2020)[3] in identifying Transformer Oil as being a consequential fire source (within the context of bushfire assessments). This is a flammable material with a low flash point of 135°C, and a radiant heat flux threshold of 4.5-5.8kW/m^2 varying on period of exposure. The network standard considers radiant heat impact from asset fires on transformer oil but not bushfires, which appears to be due to the greatly reduced residence period and the transformer oil being contained within the transformer tank, which provides shielding/insulation to the contents to prevent the flash point being reached. As an appropriate heat flux for the short residence period of a bushfire is not available, the capacity for this risk to be managed is dependent on the proponent recognising the issue and ensuring that the design/procedures that are applied to manage transformer oil fires, also consider the possibility of external bushfire impact igniting the oil (either through piloted ignition from embers or radiant heat only).

[1] Suzuki K, Sugawa O, Yamagishi A, Miyagi K, Kamiya K (2007). Experimental study on ignition and combustion behaviors of insulation fluids for transformer using cone calorimeter. *IEEJ Transactions on Power and Energy*, 127(7), 797-802.

[2] Zhenhua W, You F, Rein G, Juncheng J, Xuefeng H, Junhua H, Wei S (2018). Flammability hazards of typical fuels used in wind turbine nacelle. *Fire and Materials*, 42(2), 1-12.

[3] Ausgrid (2020). NS187 Passive Fire Mitigation Design of Major Substations. *Network Standard NW000-S0007 Amendment 2.*

PVC cables should be either enclosed within structures or installed underground where practical. Any exposed cabling (not shielded or buried underground) subject to >12kW/m^2 radiant heat flux may be damaged/destroyed in a bushfire event and require replacement. Automated isolation and shutdown of affected systems are applied in substation design, to prevent any such fire spread. It may be possible to identify sacrificial cabling for the Substation/Switchyard.

A <10kW/m^2 APZ is ideal, however the requirement for vegetation screening conflicts with the APZ dimension. A BAL-19 APZ can be achieved for the substation which significantly exceeds Western Power vegetation clearances and aligns to the thresholds of busbars and XLPE cables in the table above.

Recommendation Details: See Measures 4.3.

8.4	Landscaping - Tree Location: Use separation to minimise the potential for debris accumulation and tree strike damage to the building envelope potentially allowing flame, radiant heat and ember entry to internal spaces. • The buildings/structures are separated from trees (or trees from buildings) by a distance of at least 1.5 times the height of the tallest tree. • Trees that produce significant quantities of debris (fine fuels) during the bushfire season should be located a sufficient distance away from vulnerable exposed elements to ensure debris cannot drop and accumulate within at least 4m of buildings/structures or be likely to be relocated by wind to closer than 4m to buildings / structures. • If the minimum distances cannot be achieved with an existing tree either remove the tree or at least ensure tree branches are sufficiently separated from buildings and attached/adjacent structures (at a minimum to not overhang) to ensure branches cannot fall onto or be blown onto the buildings/structures.	Medium	Yes	Yes	No	Yes

Assessment Comments: The development is proposed toward the north-eastern extent of a large rural lot and is expected to require planting of vegetated vegetation screening.

Vegetation screening is intended to meet Class D Scrub structure, however some trees may be present within the screen. The vegetation screen is >20m from the substation footprint. A maximum tree height of 13.3m will meet the above specification.

Vegetation clearances will follow *Vegetation Clearances for the Construction of Overhead Powerlines* (Western Power Standard - Internal Document - DM#9288088). *Recommendation Details:* See Measure 6.4.						
8.5	Separation from Stored Flammable Products - Gas in Cylinders: To reduce the potential for gas flaring or explosion (consequential fire), installation of LPG cylinders is to apply as a minimum, the principles and requirements established in AS 1596 'The Storage and Handling of LP Gas'. Readily available guidance is provided by CSIRO Best Practice Bushfire Guide (https://research.csiro.au/bushfire/new-builds/water-electricity-gas/) and WA Dept. Mines, Industry, Regulation and Safety 'LP Gas cylinder safety in bushfire prone areas' (https://www.commerce.wa.gov.au/publications/lp-gas-cylinder-safety-bushfire-prone-areas). Otherwise, the required separation distance is 6m from any combustible materials. Heat from bushfire or consequential fire can be sufficient to cause cylinder pressure to reach critical levels and the pressure relief valve release large quantities of gas (flare). If the cylinder falls over the pressure relief valve may not function correctly, and the cylinder may rupture (explosion).	Medium	N/A	N/A	N/A	N/A
Assessment Comments: Gas storage is not proposed on site. Any LPG will be stored in compliance with AS 1596. *Recommendation Details:* Not Applicable						
8.6	Separation from Stored Flammable Products – Fuels / Other Hazardous Materials (Consequential Fire Fuels): Establish sufficient separation distance between these consequential fire fuels and buildings/structures. The required separation distance will be dependent on the fuel and storage type.	High	Yes	No	Yes	Yes
Assessment Comments: All infrastructure will be installed to manufacturers specification, including separation distances. Fuel and other hazardous material will not be stored on site. Both flammable and combustible materials are required to be positioned and maintained >10m from assets by Measure 6.7. *Recommendation Details:* See Measure 6.7.						
8.7	Separation from Stored and Constructed Combustible Items (Consequential Fire Fuels): These consequential fire fuels include: • Stored Combustible Items - Heavy Fuels e.g. building materials, packaging materials, rubbish bins etc; • Stored Combustible Items – Large Heavy Fuels e.g. vehicles, caravans and large quantities of dead vegetation materials stored as part of site use; • Constructed Combustible Items – Heavy Fuels e.g. landscaping structures including fences, screens, walls, plastic water tanks; and • Constructed Combustible Items – Large Heavy Fuels e.g. adjacent buildings/structures including houses, sheds, garages, carports. (Note: If the adjacent structure is constructed to BAL-29 requirements or greater and can implement a significant number of additional bushfire protection measures associated with reducing exposure and vulnerability, these minimum separation distances could be reduced by 30%) [31].	High	Yes	No	Yes	Yes

	Apply the rule of thumb [13] "assume flames produced from a consequential fire source will be twice as high as the object itself … where the consequential fire source is a structure, then the maximum eave height is a reasonable measure of maximum height". Apply the following separation distances from the subject building/structure as a multiple of the height of the consequential fire source and dependent on the construction standard applied to the building/structure [13 and 31]: • At least six times the height when the building/structure construction incorporates design and materials that is only intended to resist low levels of radiant heat up to 12.5 kW/m²) and no flame contact; • Between 4 and 6 six times the height when the building/structure construction incorporates design and materials intended to resist radiant heat up to 29 kW/m² and no flame contact. • Between 2 and 4 times the height when the building/structure construction incorporates design and materials intended to resist up to 40kW/m² and potential flame contact. • Less than 2 times the height when the building/structure construction incorporates design and materials intended to resist extreme levels of radiant heat and flame contact. • Zero separation distance is required if the building/structure is separated by a non-combustible FRL 60/60/60 rated wall, or the potential consequential fire source is fully enclosed by the building/structure.					
Assessment Comments: Measure 6.7 requires a 10m separation of BESS units from other assets (including the Substation), where another distance is not specified in the BESS product specifications. The separation from buildings will be per *AS 2067 - Substations and high voltage installations exceeding 1 kV a.c* (Standards Australia 2016). *Recommendation Details:* See Measure 6.7.						
THE PROTECTION MECHANISM – ESTABLISH SHIELDING FROM RELEVANT BUSHFIRE HAZARD THREATS: To shield buildings and attached/adjacent structures (or other consequential fire fuels) from the direct bushfire attack mechanisms of flame, radiant heat, surface fire and surface migration of embers. To also reduce exposure to the indirect attack mechanism of debris accumulation against buildings/structures and other consequential fire fuels and wind attack.						
8.8	Constructed Barrier – Shielding from Bushfire: Walls, fences and/or landforms to shield the subject building/structure from direct and indirect bushfire attack mechanisms and reduce the potential impact of these. Must be constructed using appropriate fire resistant / non-combustible construction materials (e.g. masonry, steel, earthworks). These are to withstand the impact of direct bushfire attack mechanisms for the required period of time. Apply the bushfire construction standards for external walls subject to the assessed level of radiant heat or flame contact to which the barrier will be exposed (or otherwise to BAL-FZ requirements). These are established by AS 3959:2018 [4] and/or the NASH Standard [33] and additionally informed by the research report 'Research and Investigation into the Performance of Residential Boundary Fencing Systems in Bushfires.' [29]	High	Yes	No	No	No
Assessment Comments: A radiant heat barrier could be applied, however a greater APZ can be established without environmental impact due to the pasture vegetation. *Recommendation Details:* Not Applicable						

8.9	Constructed Barrier - Shielding from Consequential Fire: Applicable to all consequential fire fuel sources. Install a non-combustible barrier (including complete enclosure when appropriate), of required robustness, that can perform the following as relevant: • Reduce the exposure of the subject building/structure to the threats of consequential fire; and/or • Reduce the exposure of the consequential fire fuels to the bushfire hazard.	High	Yes	No	No	No
Assessment Comments: Consequential fire sources are addressed in Measure 6.7. *Recommendation Details:* Not Applicable						
8.10	Natural Landforms Barrier: Use existing natural landforms to reduce buildings/structures exposure to radiant heat, and lower wind speeds (prevailing synoptic and/or fire driven).	High	No	No	No	No
Assessment Comments: No appropriate landforms exist. *Recommendation Details:* Not Applicable						
8.11	Planted Vegetation Barrier: Use appropriate hedges and trees strategically to reduce (to varying extents) buildings/structures exposure to radiant heat, to filter/trap embers and firebrands, and to lower wind speeds (prevailing synoptic and/or fire driven).	Medium	Yes	No	No	No
Assessment Comments: Landscaped vegetation is not recommended within the APZ to remove the capacity for surface fire and production of debris (leaf litter etc). *Recommendation Details:* Not Applicable						
8.12	Shield Operation Critical Non-Structural Elements: These are vulnerable elements essential to the continued operation of the building/structure which are potentially exposed to the attack mechanisms of both bushfire and consequential fire. These elements include cabling and plumbing associated with power delivery, data transmission, fuel and water transport. When the use of fire rated materials to the degree necessary is not possible or practical, the application of non-combustible shielding can be applied to reduce exposure to the threats. Shielding includes underground installation.	Medium	Yes	No	No	Yes
Assessment Comments: Conductors will be underground. Switches will be within structures or cabinets. *Recommendation Details:* See Measure 6.12.						

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining.

Note 2: Protection Measure Application Status:

- Possible: Protection measures that can potentially be applied to the proposed development/use.
- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).

- Currently Planned: Protection measures that:
  - Are incorporated into the site plans;
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Planning for Bushfire Guidelines', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

  These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Additionally Recommend: Protection measures that:
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
  - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

  These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.3.6.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing exposure levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the exposure of the relevant element at risk to bushfire hazard threats.

EXPOSURE REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Substation						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Establish Sufficient Separation from Relevant Bushfire Hazard Threats	Very High	2	2		1	2	2
	High	3	2		1	2	2
	Medium	2	1	1			1
	Not Relevant						
Establish Shielding from Relevant Bushfire Hazard Threats	Very High						
	High	3	2				
	Medium	2	2				1
	Not Relevant						
Number Analysis	Very High	2	2		1	2	2
	High	6	4		1	2	2
	Medium	4	3	1			2
	Not Relevant						
	Totals	12	9	1	2	4	6

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.3.6.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE EXPOSURE

From the information presented in the previous section, the exposure reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce exposure (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE EXPOSURE TO BUSHFIRE HAZARD THREATS [1]							
Element at Risk	Substation						
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Significant	Moderate	Minimal	Significant	Significant	Minimal	Significant	Moderate
Moderate				Moderate			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Significant	Significant	Moderate	Significant	Significant	Significant	Significant	Very Significant
Significant				Significant			

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This exposure reducing potential will be applied to deriving the inherent exposure level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This exposure reducing potential will be applied to deriving the residual exposure level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

Assessment Comments: The Substation will apply an APZ to limit radiant heat flux exposure to <19kW/m^2 (BAL-19). Separation between consequential fire hazards (including adjacent structures) will be established.

5.3.6.4 DERIVED EXPOSURE LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual exposure levels.

In combination with the corresponding assessed threat and vulnerability levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL EXPOSURE LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]							
ELEMENT AT RISK		Substation					
BUSHFIRE ATTACK MECHANISMS [2]		INHERENT EXPOSURE LEVEL (CURRENT STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	Moderate
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
BUSHFIRE ATTACK MECHANISMS [2]		RESIDUAL EXPOSURE LEVEL (POTENTIAL FUTURE STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	Low
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: Refer to Appendix 2 for explanatory and supporting information.

Note 3: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.4 VULNERABILITY LEVEL ASSESSMENT – BUSHFIRE PROTECTION MEASURE ANALYSIS

For each stated element at risk an assessment is conducted that considers the effectiveness and application status of all available vulnerability reducing bushfire protection measures that are listed under their applicable bushfire protection mechanism. This information is subsequently applied to deriving vulnerability levels.

5.4.1 PERSONS ONSITE AND TEMPORARILY OFFSITE

5.4.1.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Persons Onsite and Temporarily Offsite					
THE PROTECTION MECHANISM – TRANSPORT AND MULTIPLE EVACUATION DESTINATIONS AND ROUTES AVAILABLE						
9.1	Sufficient Evacuation Transport Available: Ensure that all persons likely to be on site have access to transport. This can be through own vehicles, facility vehicles, a formal arrangement with an external provider or a combination of these.	Very High	Yes	Yes	No	No
Assessment Comments: Occupants will have site or personal vehicles available. The site does not have public transport access and is too remote for practical walking access (1 hr walk from Kojonup). Bicycle access is possible, but evacuation would remain possible due to the short distance (15 min travel to Kojonup). *Recommendation Details:* Not Applicable						
9.2	Multiple Safer Offsite Locations Available: Increasing the route and destination options decreases vulnerability of persons as the exposed element. Multiple buildings/areas are accessible from the subject site as evacuation destinations. The offsite locations exist at a sufficient distance from the subject site ensuring that the destination and the subject site are very unlikely to be simultaneously impacted by a bushfire event. For the most robust scenario: • Multiple access/egress route are available to the safer locations from the subject site; • The entirety of at least two routes is unlikely to be simultaneously impacted by a bushfire event; and • The availability of water and amenities corresponding to person numbers increases the effectiveness of the measure.	Very High	No	Yes	No	No
Assessment Comments: The site has immediate access to Collie-Changerup Road and through to Albany Highway. Tunney Road provides alternative access to the south.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Persons Onsite and Temporarily Offsite					
The site is relatively close to the Kojonup townsite (approx. 4.2 km). Staff will self-evacuate to Kojonup, selecting the appropriate route based on location of the bushfire threat. If all routes to Kojonup are compromised, continuous access in other directions is available. Evacuation procedures and directions will be established within the Emergency Management Plan required prior to commercial operation. *Recommendation Details:* Not Applicable						
THE PROTECTION MECHANISM – PROVISION OF BUSHFIRE EMERGENCY INFORMATION AND EDUCATION						
9.3	Develop a Bushfire Emergency Plan: This will provide operational guidance for the implementation of prevention, preparation, response and recovery procedures and their associated actions. The format and content of the plan documents will be aligned with the specific needs of the site and its use. Development of the Plan considers site specific information that includes: • The site's use and the numbers and types of persons who will be on the site at any time; • The physical characteristics of the site and its structures; and • The surrounding topography and bushfire prone vegetation; and • The surrounding human settlement and road networks. It is produced for use by the site owners, managers, operators and occupants (as relevant).	High	Yes	No	Yes	Yes
Assessment Comments: A comprehensive Emergency Management Plan is to be prepared for the facility. This is to outline Prevention, Preparedness, Response, and Recovery (PPRR) procedures for potential emergencies, of which bushfire is one component. *Recommendation Details:* The following details have been identified for inclusion within the Emergency Management Plan (and/or the Site Operating Procedures, as appropriate to the document structure): **Details and Information** • A summary of fire hazards and risks to and from the site, specific to its location, infrastructure, activities and occupancy. • A facility description, including infrastructure details, operations, number of personnel, and operating hours. • A site plan depicting structures/built assets, operational areas, site access points and internal roads, firefighting infrastructure, drainage (as applicable), and neighbouring properties.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS	Effectiveness Rating [1]	Application Status [2]			
		Possible	Exists	Planned	Additionally Recommend
Element at Risk: Persons Onsite and Temporarily Offsite					

- Up-to-date contact details for facility personnel, including for at least two persons who may be able to provide information or support during emergencies (24 hours a day). Update contact information when necessary.
- Details of emergency resources, including fire detection and suppression systems and equipment; gas detection; emergency eye-wash and shower facilities; spill containment systems and equipment; emergency warning systems; communication systems; personal protective equipment; first aid.
- Contact information for 24/7/365 specialist technical support for the battery energy storage system.
- Specifications for safe operating conditions for temperature.
- Schematics and technical data for battery energy storage system containers/enclosures, the number of containers/enclosures on-site, and the number of battery racks or modules within each container/enclosure.
- Details of the hazards for the battery energy storage system, including thermal events/runaway, electrical safety hazards, explosion hazards, dangerous goods hazards (including off-gassing), and the effects of fire on the battery energy storage system (eg., explosion, release of toxic gases).
- Details of all provided battery failure/safety and protective systems, including a description, the activation process/automatic trigger, and any hazards associated with these systems.

Procedures

Prevention

- Smoking restrictions or designated smoking locations.
- Procedures regarding vegetation management and accidental ignition prevention.
- The specifications of Schedule 1 of the *Planning for Bushfire Guidelines* and the Shire of Kojonup Section 33 Notice can be achieved via livestock grazing. The vegetation must continue to be monitored for compliance with Schedule 1, and additional vegetation management works undertaken as required.
- Heavy equipment is not to be operated where long grass (>100mm) or heavy leaf litter is present, particularly during the bushfire season (see the Local Government Prohibited Burning Period).
- Servicing of battery energy storage systems should not take place on days of High, Extreme or Catastrophic Fire Danger Rating, except where the system is experiencing malfunction or abnormal behaviour.
- Bushfire response training should be provided to all permanent staff. Training should be scheduled at appropriate intervals, accounting for staff turnover and the complexity of firefighting equipment.

Preparedness

- Annual emergency exercises should be conducted. Contact the local emergency control agencies; the Shire Emergency Management Coordinator (CBFCO) for input/inclusion. Emergency exercises should include bushfire as a potential emergency scenario.

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS	Effectiveness Rating [1]	Application Status [2]			
		Possible	Exists	Planned	Additionally Recommend
Element at Risk: Persons Onsite and Temporarily Offsite					

- Evacuation and shelter-in-place triggers and procedures, unless included within a Bushfire Emergency Plan.
- Procedures for review of the Emergency Management Plan, including the ongoing effectiveness of control measures.
- An ongoing schedule to contact the local emergency control agencies; Shire of Kojonup Emergency Services Manager and Chief Bush Fire Control Officer (CBFCO) prior to the bushfire season.
- The Emergency Management Plan and any Emergency Response Guide (FES-ERG) should contain procedures for isolation, shut-down, fail safe or management of critical/high-risk plant, equipment, and utilities, and their advised triggers.
- Visitors must provide mobile phone numbers to site management. Within the Emergency Management Plan, a key response will be to contact and advise all persons onsite. Site vehicles are required to have a secondary communication system installed (e.g. two-way radio).
- A bushfire monitoring procedure for the Restricted/Prohibited Burning Period (see Shire of Kojonup Section 33 Notice), including:
    - Nominating a person/role in your Emergency Control Organisation to be responsible for identifying, responding to, and communicating Fire Danger Ratings in advance.
    - Identifying bushfire activity within 10km of the facility.
    - Communicating this information to everyone likely to be present on-site, and relevant off-site personnel.
    - An outline of site activities to be modified or cease as a response (if any).

Response

DFES Comcen should immediately be notified of:

- Any shorts, faults, temperature increases above normal parameters (eg. precursor to thermal events/runaway).
- Equipment failures with the potential to ignite or propagate fire.
- Off-gassing, smoke or fire.
- The monitoring personnel can determine if Emergency Services response is necessary. The notification is for awareness.

Bushfire emergency response procedures must include:

- Evacuation and shelter-in-place triggers and procedures, unless included within a Bushfire Emergency Plan.
- Response procedures by Emergency Services (including Bushfire Brigades) should include the safe distances from asset fire to establish a containment perimeter to monitor and respond to potential bushfire ignition.
- A specific action to notify (or verify notification) the Emergency Services, at the earliest possible stage of the emergency.

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Persons Onsite and Temporarily Offsite					
• The person or role responsible for making or verifying the notification. • The '000' number in the procedure. • Communicating with site personnel and supporting their physical relocation. Bushfire alerts within a 10km radius should be communicated to persons onsite. • Ensuring all buildings and plant are adequately secured. • Initiating any bushfire protection measures such as activating sprinkler or deluge systems or pre-emptive shut-down, prior to the arrival of the fire front. • Liaising with the emergency services where possible. • Consideration of arc flash risk due to bushfire smoke (transmission lines, substations).						
9.4	Operational Documents are to Contain the Bushfire Protection Measures to be Implemented: The documents include the 'planning' or 'operational' Bushfire Management Plan (BMP), the Bushfire Emergency Plan (BEP), the Site Emergency Plan and any relevant documents associated with a projects design phase. The purpose of this measure is to ensure the application of applicable protection measures identified in this Report, will be acted upon through responsibilities created within the operational documents.	High	Yes	No	Yes	Yes
Assessment Comments: A 'planning' Bushfire Management Plan has been prepared alongside this Bushfire Risk Report. Requirements for the Emergency Management Plan are provided in Measure 9.3. *Recommendation Details:* See Measure 13.22						
9.5	Prominent Display of Bushfire Emergency Information: The relevant format and content of the site-specific bushfire emergency response information, taken from the planning developed for a bushfire emergency, is made readily available to all persons on site.	Medium	Yes	No	Yes	No
Assessment Comments: Staff and contractors will move throughout the site but will be contactable through the messaging system in Measure 9.6. Staff within the Operations and Maintenance Building will have access to and training in the Site Emergency Plan. General emergency information will be displayed, not specifically bushfire. *Recommendation Details:* Not Applicable						
9.6	Direct to Persons Emergency Messaging System: Have a process and system (e.g. SMS) for site managers to provide persons onsite and temporarily offsite with emergency information as necessary. Consideration will need to be given to availability and reliability of the infrastructure that is to facilitate this system.	Medium	Yes	Yes	Yes	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Persons Onsite and Temporarily Offsite					
Assessment Comments: Vulnerability and exposure of persons remote from the Operations and Maintenance Building (inspection/maintenance) can be managed through appropriate communication and emergency procedures. Staff, contractors, and visitors must provide mobile phone numbers to site management. Within the Emergency Management Plan, a key response will be to contact and advise all persons onsite. Bushfire alerts within a 10km radius should be communicated to persons onsite. *Recommendation Details:* Site personnel should download the EmergencyWA app, be trained in its use and information provided in the app. The app should be referred to prior to travelling to or from the site.						
9.7	An Alternative Internet and Mobile Phone System is Available: Establish and maintain an appropriate alternative system to ensure the required capabilities for emergency communication and access to emergency information will be retained if there is an outage of the primary communication system. This includes direct to satellite connections for voice and data.	Medium	Yes	No	No	No
Assessment Comments: Measure 9.6 ensures persons onsite will be contactable. *Recommendation Details:* Not Applicable						
9.8	Egress Pathway Signage: Where pathways exist onsite for occupants to relocate to an identified safer onsite location, appropriate signage to guide unfamiliar persons can reduce their vulnerability.	Medium	Yes	No	No	No
Assessment Comments: Any persons onsite will have rapid vehicle access and are likely to be familiar with the site. Persons will proceed to the Operations and Maintenance Building to shelter or site access point to evacuate. *Recommendation Details:* Not Applicable						
9.9	Personnel are Trained to Implement the Bushfire Emergency Plan: Operational persons (staff) are provided with appropriate training, aligned with the subject site's prepared Bushfire Emergency Plan (BEP). The process will also identify specific roles and persons to fill those roles.	High	Yes	No	Yes	No
Assessment Comments: All staff are required to be familiar with the site Emergency Management Plan. The limited staffing does not necessitate specific roles beyond Chief Warden. *Recommendation Details:* Not Applicable						
9.10	Build Community Resilience Through Education: When relevant to the type and scale of proposed development/use, the delivery of effective community education programs, to ensure information is acted upon and packages of protection measures are put in place, will result in lowering the vulnerability of the community to a bushfire event.	High	Yes	No	Unknown	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Persons Onsite and Temporarily Offsite					
	Local government develops an ongoing program of innovative and leading-edge community and landowner education that builds on the information presented within this Report. Implementation of recommended/required protection measures can be encouraged through legislation, education, audits, enforcement, and penalties as appropriate. Examples of such community education programs exist in various jurisdictions. The CSIRO (2020) Climate and Disaster Resilience Overview Report in 'Recommendation No. 5' [18] encourages collaboration with research agencies on the issue of building community resilience.					
Assessment Comments: Community attitudes towards the proposed development may be impacted where the proponent attempts to provide community education on potential emergencies. Additional education will be provided to local Emergency Services in Measure 9.3. *Recommendation Details:* An information package detailing emergency considerations and response should be provided to landowners (lessors) for the Project. The proponent may optionally consider extending this information to neighbouring landowners or the local community.						
9.11	**Encourage 'Property Bushfire Resilience Assessments'**: Local government to promote (and potentially incentivise) the conducting of these assessments and the implementation of any recommendations. These assessments address bushfire hazard threat levels and the level of exposure and vulnerability of specific buildings and persons. It identifies appropriate protection measures that can be implemented to increase bushfire resilience.	High	No	Partly	No	No
Assessment Comments: Not relevant to a commercial operation. Bushfire resilience of private dwellings can be applied through the contents and enforcement of the Shire of Kojonup Section 33 Notice. *Recommendation Details:* Not Applicable						
9.12	Locations of Vulnerable Persons are Registered: Relevant department of local government and their emergency services maintains a register of the location of land uses that are likely to result in a number of 'vulnerable' persons (see Glossary) residing onsite, so that their needs can be addressed as a priority in a bushfire emergency. The subject development/use would exist on that register.	Medium	N/A	N/A	N/A	N/A
Assessment Comments: No 'vulnerable' persons will be onsite. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Persons Onsite and Temporarily Offsite					
THE PROTECTION MECHANISM – ONSITE PERSONS CAPABLE OF MANAGING A BUSHFIRE EMERGENCY ARE AVAILABLE						
9.13	Onsite Persons Available to Manage Bushfire Emergency Procedures: Different categories of persons can perform this role in different scenarios, with potentially varying levels of expertise and effectiveness. These include: • Appropriately trained person(s) will be onsite at all times, or able to be onsite at short notice. They are trained in bushfire emergency procedures in general and have specific knowledge of the site's Bushfire Emergency Plan, and the environment in which the development/use exists. This person(s) may have the official title of fire warden. • An untrained person familiar with the local area will be onsite at all times. They have knowledge and instruction gained from the site's Bushfire Emergency Plan and can implement the required procedures. They can guide and assist persons onsite.	High	Yes	No	Yes	Yes
Assessment Comments: Emergency management arrangements are discussed in Measure 9.3. All staff are required to be familiar with the site Emergency Management Plan. The limited staffing does not necessitate specific roles beyond Chief Warden. *Recommendation Details:* See Measure 9.3.						
9.14	Onsite Persons Can Operate Firefighting Equipment: Such person(s) is suitably capable of maintaining and operating any installed firefighting water supply and associated pumps, hoses/nozzles and sprinklers.	Medium	Yes	No	Yes	No
Assessment Comments: Through the Emergency Management Plan, all facility team members are required to be trained in the use of fire extinguishers and firefighting equipment. *Recommendation Details:* Not Applicable						
9.15	External Emergency Response Services Available: An emergency service with a bushfire response capability is located within a realistic operational distance of the subject development/use. This includes services provided by government (e.g., career fire and rescue services or other agencies) and volunteer services. Note: The services of these limited resources should not be relied upon, as their availability for a given event can be compromised by other obligations at the crucial time. *Bushfire Verification Method – Handbook s6.6 [14] states "During significant bushfires, there will be conflicting demands on fire brigade resources and reliance should not be placed on fire brigade intervention to protect a specific property.* *Prior to the 2009 Black Saturday fires, an early evacuation or stay and defend policy was in place and data from major fires indicated that the presence of occupants significantly increased the probability of house survival (refer Table 7.1). However, in response to the subsequent Royal Commission findings there is now a greater emphasis on early evacuation.*	Medium	Yes	Yes	No	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Persons Onsite and Temporarily Offsite					
	Whilst this is expected to reduce fatalities by reducing the numbers of people at risk, a negative consequence will be an increase in property losses for buildings constructed to similar standards. It should therefore be assumed that there will be no fire brigade or occupant intervention with respect to protecting a specific property."					

Assessment Comments: The site is near Kojonup townsite, and thus local bushfire brigades may attend during an emergency. Career emergency services may not attend due to the distance from career FRS.

Recommendation Details: Contact the local emergency control agencies; Shire of Kojonup Emergency Services Manager and/or Chief Bushfire Control Officer (CBFCO) prior to commissioning and offer a familiarisation visit and explanation of emergency procedures, access, hazards, and fire detection and suppression systems.

Local VFRS and BFB may be invited through the Shire Emergency Management Coordinator (CBFCO). The particular services should be determined by the CBFCO. Establish an ongoing schedule to contact the Shire Emergency Services Manager and/or CBFCO prior to the bushfire season.

Contact DFES Built Environment Branch to determine if an Emergency Response Guide (FES-ERG) is required.

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining.

Note 2: Protection Measure Application Status:

- Possible: Protection measures that can potentially be applied to the proposed development/use.
- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Currently Planned: Protection measures that:
  - Are incorporated into the site plans;
  - Exist in an approved Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), alternative solutions and any additional recommended protection measures - for which a responsibility for their implementation has been created and approved; and/or
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

  These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Additionally Recommend: Protection measures that:
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk:	Persons Onsite and Temporarily Offsite					
• Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP. These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).						

5.4.1.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing vulnerability levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the vulnerability of the relevant element at risk to bushfire hazard threats.

VULNERABILITY REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Persons Onsite and Temporarily Offsite						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Transport and multiple evacuation destinations and routes available	Very High	2	1	2			
	High						
	Medium						
	Not Relevant						
Provision of bushfire emergency information and education	Very High						
	High	5	4		1	3	3
	Medium	5	4	1		2	1
	Not Relevant						
Onsite Persons Capable of Managing a Bushfire Emergency Are Available	Very High						
	High	1	1			1	1
	Medium	2	2	1		1	1
	Not Relevant						
Number Analysis	Very High	2	1	2			
	High	6	5		1	4	4
	Medium	7	6	2		3	2
	Not Relevant						
	Totals	15	12	4	1	7	6

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.4.1.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE VULNERABILITY

From the information presented in the previous section, the vulnerability reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce vulnerability (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE VULNERABILITY TO BUSHFIRE HAZARD THREATS [1]	
Element at Risk	Persons Onsite and Temporarily Offsite
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]	WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]
Significant	Very Significant

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This vulnerability reducing potential will be applied to deriving the inherent vulnerability level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This vulnerability reducing potential will be applied to deriving the residual vulnerability level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Assessment Comments: Persons are vulnerable to radiant heat, flame contact, and smoke exposure only. Staff will be trained in emergency procedures and response as a 'Planned' measure.

The recommended measures include communication and awareness.

5.4.1.4 DERIVED VULNERABILITY LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual vulnerability levels.

In combination with the corresponding assessed threat and exposure levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL VULNERABILITY LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]				
ELEMENT AT RISK	Persons Onsite and Temporarily Offsite			
INHERENT VULNERABILITY LEVEL (CURRENT STATE) [2]				
Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐
THE RESIDUAL VULNERABILITY LEVEL (POTENTIAL FUTURE STATE) [2]				
Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.4.2 PERSONS ON ACCESS/EGRESS ROUTES IN VEHICLES

5.4.2.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons on Access/Egress Routes in Vehicles	Access/Egress Route ID	Local road network including internal roads			
THE PROTECTION MECHANISM – LOWER RISK ROAD CONSTRUCTION (DESIGN AND MATERIALS): The application of as many of the following protection measures as possible ensures a greater level of safety for users and lowers the associated risk when roads need to be used to evacuate to a safer offsite location in potentially high stress situations within a threatening environment. Safety for persons using the route is increased through reducing the likelihood of vehicle/terrain or vehicle/vehicle accidents and the ability to maintain travelling speed.						
10.1	Greater Road Width: Ensure appropriate width roads are installed. Wider roads allow safer passing of the anticipated traffic that can be travelling in both directions (e.g. emergency services travelling towards the emergency event). The effectiveness of road width to reduce vulnerability is also a function of the required carriage capacity - which may be increased by the proposed development/use when it will increase traffic intensity. The incorporation of non-vegetated and trafficable road verges/shoulders and adjacent footpaths can also be considered to increase effective width for slower moving vehicles (providing additional separation from the hazard and passing opportunities).	High	Yes	No	Yes	No
Assessment Comments: Collie-Changerup Road is generally 8m wide, with a with a non-vegetated clearance of >12m including shoulders. Tunney Road is approximately 6m wide and has vegetated shoulders, so does not provide additional clearance. Internal access will be constructed to 4m wide with passing bays installed in compliance with the Planning for Bushfire Guidelines. These roads will be bounded by cleared areas (pasture) and thus the verge will frequently be traversable. Additional width has not been applied due to the limited occupancy of the site. *Recommendation Details:* Not Applicable						
10.2	Lower Road Gradient: Ensure appropriate road gradients are available. Lower gradients help ensure traction and speed can be maintained. Steep gradients can also be associated with driver visibility. Appropriate gradients will depend on the constructed surface materials and the weights and tractive capability of expected vehicle types.	Medium	No	Yes	No	No
Assessment Comments: External public roads and the subject site (with internal roads to be constructed) would rarely exceed 5 degrees, if at all. See Figure 5.3. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons on Access/Egress Routes in Vehicles	Access/Egress Route ID	Local road network including internal roads			
10.3	Greater Road Clearance: Ensure appropriate clearance can exist and is established. Sufficient horizontal and vertical clearances from obstructions ensure unhindered movement of all possible vehicle types;	Medium	Partly	Partly	No	Yes
Assessment Comments: Trees will not bound the internal access except toward the site access point. There are no expected obstructions, and the surrounds is trafficable pasture. The road verge externally has >1m shoulders providing ample carriageway clearance. *Recommendation Details:* See Measure 13.17.						
10.4	Stable Road Surfaces: Ensure that roads are constructed of materials that will provide the necessary traction (also a function of gradient), can support the weight of all expected vehicle types and remain operational in all weather. The required supportive capacity also applies to associated structures such as bridges.	Medium	Yes	Yes	Yes	No
Assessment Comments: Collie-Changeroup Road is sealed major road and Albany Highway is a national highway. Tunney Road is unsealed and maintained in fair condition and with relatively flat surface. Internal roads will be all-weather surfaces, which may not be sealed. The internal roads will be constructed to exceed the 15-tonne weight capacity within the *Planning for Bushfire Guidelines* to support the delivery of site assets. *Recommendation Details:* Not Applicable						
10.5	Driver Visibility and Road Ahead Signage: Ensure that road design provides high levels of visibility ahead (in the absence of smoke and embers) and informative signage indicating relevant 'up ahead' route information (includes information stating distance to turnaround area for narrow roads in more remote locations). Good visibility is associated with the avoidance of 'blind' corners and crests to the greatest extent possible.	Medium	No	Yes	No	No
Assessment Comments: Collie-Changeroup Road and Albany Highway are largely straight with gentle curves. Tunney Road has more curves with straight sections no less than 150m long. Road ahead signage is common. Trees follow roads closely and can obstruct visibility to the periphery. All major roads are sealed. Obscuring dust may be a consideration for Tunney Road, however Collie-Changeroup Road is the primary evacuation route. *Recommendation Details:* Not Applicable						
10.6	Shorter Road Length: Shorter distances to safer locations reduce the length of time persons remain vulnerable to bushfire threats.	High	No	Yes	No	No
Assessment Comments: Collie-Changeroup Road and Albany Highway provide highly effective egress from the immediate area. The Kojonup townsite is approximately 4.2km from the site.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons on Access/Egress Routes in Vehicles	Access/Egress Route ID	Local road network including internal roads			
Recommendation Details: Not Applicable						
10.7	Interconnected Road Network to Provide Route Options: Ensuring that the design of the road network provides through roads and avoids dead-end roads, provides the choice of alternative routes to for minimising close contact with a bushfire event. Otherwise, vehicles and persons can be trapped.	Very High	No	No	Yes	Yes
Assessment Comments: The local road network has alternative access options immediately available. The *CFA Guidelines* Section 4.2 recommends provision of 2 access points into each part of the facility. An access point onto both Collie-Changerup Road (north) and Tunney Road (east) are included within the submitted design. *Recommendation Details:* Access points will be gated but should be openable in the same manner (the same key, keycard, access code, remote etc). Internal roads (driveways) accessing site assets are to comply, at a minimum, with the specifications for Private Driveways within the *Planning for Bushfire Guidelines.*						
THE PROTECTION MECHANISM – EVACUEES ARE SELF-SUFFICIENT AND HAVE LOCAL AWARENESS AND OWN TRANSPORT: The 'type' of persons that will be present on the site of the proposed development/use influences their degree of vulnerability to both bushfire threats and to risk associated with vehicular accidents in a stressful environment. Persons that have local knowledge, are self-supportive, have their own transport and are physically and mentally capable present the lowest degree of vulnerability for this factor. This contrasts with persons who can be considered 'vulnerable' and are likely to be less capable or effective at making the required decisions and carrying out the required actions in the timeframe required. They are likely to be dependent on others for both information and transport and will not have any local knowledge.						
10.8	Self Sufficient Persons with Local Awareness: The site use and location increase the likelihood these are the type of persons that will be present on the site.	High	Yes	Yes	No	No
Assessment Comments: Staff will be familiar with the local area. Contractors or visitors may have limited awareness, however the site access and contextual location are simple and clear. *Recommendation Details:* Not Applicable.						
10.9	Onsite Persons Have Own Transport: There is no need to have arrangements in place for external provision of evacuation vehicles. Transport will always be available.	High	Yes	Yes	No	No
Assessment Comments: Occupants will have site or personal vehicles available. The site does not have public transport access and is too remote for practical walking access (1 hr walk from Kojonup). Bicycle access is possible, but evacuation would remain possible due to the short distance (15 min travel to Kojonup). *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS				Effectiveness Rating [1]	Application Status [2]			
					Possible	Exists	Planned	Additionally Recommend
Element at Risk	Persons on Access/Egress Routes in Vehicles	Access/Egress Route ID	Local road network including internal roads					

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining.

Note 2: Protection Measure Application Status:

- Possible: Protection measures that can potentially be applied to the proposed development/use.
- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Currently Planned: Protection measures that:
    - Are incorporated into the site plans;
    - Exist in an approved Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), alternative solutions and any additional recommended protection measures - for which a responsibility for their implementation has been created and approved; and/or
    - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

  These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Additionally Recommend: Protection measures that:
    - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
    - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

  These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.4.2.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing vulnerability levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the vulnerability of the relevant element at risk to bushfire hazard threats.

VULNERABILITY REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Persons on Access/Egress Routes in Vehicles						
Access/Egress Route ID	Local road network including internal roads						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Lower Risk Road Construction (Design and Materials)	Very High	1		1		2	1
	High	2	1	1			
	Medium	4	2	3	1	1	1
	Not Relevant						
Evacuees are Self-Sufficient and Have Local Awareness and Own Transport	Very High						
	High	2	2	2			
	Medium						
	Not Relevant						
Number Analysis	Very High	1		1		2	1
	High	4	3	3			
	Medium	4	2	3	1	1	1
	Not Relevant						
	Totals	9	5	7	1	3	2

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.
Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.4.2.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE VULNERABILITY

From the information presented in the previous section, the vulnerability reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce vulnerability (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE VULNERABILITY TO BUSHFIRE HAZARD THREATS [1]	
Element at Risk	Persons on Access/Egress Routes in Vehicles
Access/Egress Route ID	Local road network including internal roads
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]	WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]
Significant	Very Significant

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This vulnerability reducing potential will be applied to deriving the inherent vulnerability level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This vulnerability reducing potential will be applied to deriving the residual vulnerability level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Assessment Comments: Persons and vehicle types are of relatively low vulnerability. The road network provides highly effective access/egress options. The Kojonup townsite is close to the site, and alternative options are available by continuing through the public road network.

5.4.2.4 DERIVED VULNERABILITY LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual vulnerability levels.

In combination with the corresponding assessed threat and exposure levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL VULNERABILITY LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]				
ELEMENT AT RISK	Persons on Access/Egress Routes in Vehicles			
Access/Egress Route ID	Local road network including internal roads			
INHERENT VULNERABILITY LEVEL (CURRENT STATE) [2]				
Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐
THE RESIDUAL VULNERABILITY LEVEL (POTENTIAL FUTURE STATE) [2]				
Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐

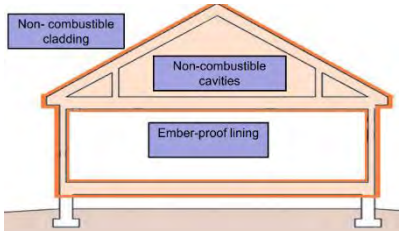
Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.4.3 BUILDINGS AND STRUCTURES (NCC CLASSES 1-10)

5.4.3.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
THE PROTECTION MECHANISM – CONSTRUCTION DESIGN AND MATERIALS: Increase bushfire resilience through the application of beneficial design and construction, including using non-combustible materials and minimising the use of vulnerable materials, to the greatest extent possible. Practicality and cost will be key considerations in determining the viability of applying protection measures in differing scenarios, but this should be determined with due consideration of threat levels and the importance of the elements at risk. The constructed systems should utilise the following properties to the greatest extent possible: reliability (which requires their durability over time, low maintenance and being unlikely to change over time), robustness (which limits damage spread from minor sources, continues to protect when thermally loaded and protects vulnerable elements), resilience (which enables their return to a functional state following an overload) and redundancy (which ensures the fate of the subject building/structure is not reliant on the effective performance of a single element). Refer to the glossary for additional explanation. The mechanism is also applicable to constructed consequential fire fuels.						
11.1	Construct to AS 3959:2018 [4]: Apply the specified requirements to construction. These are intended to reduce the risk of building ignition from bushfire direct attack mechanisms. Note that the indirect attack mechanisms and the threats presented by consequential fire fuels are not specifically considered. *"The standard is primarily concerned with improving the ability of buildings … to better withstand attack from bushfire thus giving a measure of protection to the building occupants (until the fire front passes), as well as to the building itself".* The AS 3959 approach adopts a strategy that relies on the integrity of the building's exterior envelope (i.e., the cladding of roof/wall/eaves, floor supporting structures/flooring and all penetrations) to resist all bushfire exposure conditions and environmental actions thereby protecting all structural construction elements behind it, including allowable combustible materials. It provides protection by: • Using specified materials that provide ignition resistance (tolerance of radiant heat and flames). Higher BAL ratings impose increased construction requirements for these exterior envelope materials; • Specifying precise gap control (applicable to all bushfire attack levels) for the exterior envelope of the building to prevent ember entry); and • Attached and adjacent structures (within 6m) must also comply with the Standard.	High	Yes	No	No	Yes
Assessment Comments: Warehouses/workshops may be unable to comply with AS 3959 construction.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
Class 4-9 buildings are not required to apply bushfire resistant construction via part G5 or H7 of the NCC. However, it is recommended that these buildings comply with AS 3959 or NASH where it is possible for the building type to comply. The provisions for the on-site shelter building is assessed in Measure 2.11. *Recommendation Details:* All permanent Class 1-9 buildings are required to apply bushfire resistant construction following their assessed BAL under AS 3959. The standard of construction may align with AS 3959 (to a minimum of BAL-12.5) or NASH Steel Framed Construction in Bushfire Prone Areas. See Figure 3.2 of the associated Bushfire Management Plan. The Operations and Maintenance Building has been designated as an on-site shelter building and must be constructed to AS 3959 requirements for BAL-29 and have a minimum internal floor area equal to 1m^2 per proposed person (e.g. 24m^2 for 24 workers).						
11.2	Construct to NASH Standard [33]: Apply the specified requirements to construction. The Standard: *"Sets out acceptable construction requirements for residential and low-rise buildings in bushfire prone areas to reduce the risk of ignition from bushfire attack involving embers, radiant heat and direct flame impingement using non-combustible materials. Buildings constructed in accordance with this Standard are intended to provide a sheltering envelope during the passage of a bushfire flame front. They do not constitute 'last resort' private bushfire shelters as defined in the NCC. The Standard is based on achieving ignition resistance through non-combustible construction using conventional building materials and a level of redundancy to provide a high level of performance in extreme bushfire events and an increased probability that unattended buildings will survive such events."* Key attributes of the Standard include: • Materials used anywhere on the building envelope (see shaded part of diagram below), must be non-combustible except for a small amount allowed externally that includes flooring, window frames, doors and external decorative trim. The building envelope is comprised of a framed roof/ceiling system, an external wall system and a floor system;  	Very High	No	No	No	No

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
	• The same construction requirements apply for all BAL ratings up to BAL-40 (except for external doors and windows which apply AS 3959 requirements). An additional benefit of this is the built in resistance to the direct attack mechanisms of consequential fire when lower BAL ratings apply. • It does not rely on eliminating ember entry to the roof space, wall cavities and floor system as these are non-combustible construction. Embers only need to be kept from entering the internal living/operating spaces. • It is ember tolerant without unrealistic workmanship, supervision and maintenance requirements; • The combination of a non-combustible cladding and cavities is a robust solution that enables the building to be configured so that failure or damage to one element does not lead to the inevitable failure of the building or a breach of the habitable envelope; and • Attached and adjacent structures (within 6m) must also comply with the Standard.					
Assessment Comments: NASH may be considered as an alternative standard for steel-framed construction rather than AS 3959. *Recommendation Details:* Not Applicable						
11.3	Construction Materials for External and Internal Cavity Building Elements: Except for internal living or operation spaces, to the degree necessary, utilise materials resistant to fire attack mechanisms of flame and radiant heat (preferably non-combustible) for all relevant building elements, including wall, roof, floor, supporting structures and framing systems.	Very High	Yes	No	Unknown	Yes
Assessment Comments: Any workshops/warehouses will be steel framed and entirely non-combustible (likely masonry, steel, aluminium, and cement sheeting) *Recommendation Details:* For any future Class 1-10 buildings, include non-combustible structural elements where practical. In particular, avoid: polycarbonate (sheeting and skylights), softwoods (<650 kg/m3 density at 12% moisture content), and fibrous materials.						
11.4	Construction Materials for Consequential Fire Fuels: For constructed large consequential fire fuels, use non-combustible materials to the fullest extent possible. Potential fuels include: • Landscaping items – fences, screens, retaining walls, gazebos, plastic water tanks etc; • Attached structures - decks, verandahs, stairs, carports, garages, pergolas, patios, etc; • Adjacent structures – other houses, sheds, garages, carports, etc. Post bushfire event assessments identify structure to structure fire as a common cause of overall building loss [9].	High	Yes	Partly	No	No

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
Assessment Comments: Potential large fuels are not known (other than assets assessed in Report) and are unlikely to be present due to the proposed use. Potential large, constructed fuels are assessed in Measure 4.7. *Recommendation Details:* Not Applicable						
11.5	Construction Design / Materials Resistant To High Wind Damage: Apply construction measures to prevent the type of building damage from wind that will open or create gaps (from the wind itself or carried projectiles) and allow the entry of embers, radiant heat and flames. This type of damage is typically superficial damage. Building codes relating to wind (e.g., cyclones) do not necessarily address this superficial type of impact. Additional fixings for building envelope claddings and protection of the most vulnerable elements, such as glazing, from debris impact, are key considerations. Consider applying the principles of the NASH Standard [33] design solution to construction. "Potential wind effects directly associated with bushfire events have been considered in this Standard. Wind actions may affect buildings subject to a bushfire attack in various ways including: • The intensity of flame front activity may produce locally high wind pressures on parts of the building; • In the post fire phase, some weakened components on the building envelope may be vulnerable to normal design pressures; and • Wind can drive embers into the building envelope." Most applicable when the physical requirements exist for the development of an extreme bushfire event within the surrounding landscape.	Medium	Yes	Partly	No	No
Assessment Comments: Wind is unlikely to cause sufficient damage to create a vulnerability to embers given the setback from vegetation. Increased structural requirements to account for high wind have not been applied, as Class 1-9 buildings are required to comply with the NCC and Class 10 buildings do not have practical measures available to reduce this vulnerability. *Recommendation Details:* Not Applicable						
11.6	Construction of Gas Supply: All gas cylinders are installed and maintained in accordance with AS 1596 (for domestic house supply) as a guide. The requirement of the standard includes: • Safety release valve shall be directed away from the building and persons access/egress routes;	Medium	Yes	No	Yes	No

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
	• Metal piping and fittings shall be used on all piping inside the building's cavities and enclosable occupied spaces and the high-pressure side of any gas regulators; and • Tethers securing cylinders are to be non-combustible. The objective is to reduce the risk of consequential (secondary) fire against a building and reduce the risk of death or injury, from gas flaring or explosion. The rationale is gas cylinders which have either flared or ruptured are commonly found in post bushfire surveys [9]. The heat from the bushfire or consequential (secondary) fire has been sufficient to cause their pressure to reach critical levels beyond which their pressure release valve releases large quantities of LP gas. If these gas cylinders fall over, this pressure release valve may no longer function correctly, meaning that the gas cylinder may continue to increase in pressure with continued heating until the cylinder ruptures. The resulting explosion includes a pressure wave and large ball of flame which can threaten nearby life and buildings. Readily available guidance is provided by CSIRO Best Practice Bushfire Guide (https://research.csiro.au/bushfire/new-builds/water-electricity-gas/) and WA Dept. Mines, Industry, Regulation and Safety 'LP Gas cylinder safety in bushfire prone areas' (https://www.commerce.wa.gov.au/publications/lp-gas-cylinder-safety-bushfire-prone-areas).					
Assessment Comments: Any gas cylinders will be stored in compliance with AS 1596. *Recommendation Details:* Not Applicable						
11.7	Construction of Electricity Supply: Cabling to be shielded (includes installing underground within subject property boundary) from applicable bushfire attack mechanisms. The objective is to assist with continuity of supply for essential site operations and/or electrically driven firefighting pumps. It also reduces the risk of electrocution to any persons onsite and reduces potentially additional sources of fire ignition. It is common in bushfires for power infrastructure to burn and collapse or be impacted by falling trees or branches while power lines are still live. Removing this risk may be appropriate for some sites.	Medium	Yes	Yes	No	No
Assessment Comments: The site is for energy storage for use during power outages- the facility therefore is designed to operate regardless of interruptions to external electricity supply. The failure of external electricity would be due to impacts on transmission lines offsite rather than within the facility APZs. The only critical elements of the buildings are associated with site communications. The site has strong mobile phone reception and this is a minor concern. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
11.8	Minimise Re-entrant Detail to Minimise Debris and Ember Accumulation: Avoid or limit the accumulation of unburnt debris and embers by minimising re-entrant details and/or adopting aerodynamic forms that will self-shed windblown debris and embers. For example: • Simple building/structure footprints that avoid re-entrant corners in access ways, at wall/floor, wall/ground, roof/wall junctions and around doors, vents, windows; and • Simple roof layouts that avoid valleys and minimise the number of ridges that need protection details (e.g. skillion roofs).	Medium	Yes	Yes	No	Yes
Assessment Comments: Buildings will be simple rectangular structures without complex features. The Operations and Maintenance Building is likely to be a transportable building including wall-mounted rather than ground air conditioners. Access ramps may allow for debris accumulation. *Recommendation Details:* See Measure 13.11.						
11.9	Minimise Debris and Ember Trapping Surfaces: Avoid or minimise the use of exposed combustible surfaces that can trap and accumulate debris and embers. These include: • Horizontal, or shallow angle surfaces e.g. exposed wall/roof framework, roofs, decking, verandahs, steps, windowsills; and • Vertical surfaces with rough textured cladding (e.g. sawn timber).	Medium	Yes	Yes	No	No
Assessment Details: Shallow angle surfaces are unlikely to be present on steel-framed class 10a or transportable structures. Where present, these will not be combustible. *Recommendation Details:* Not Applicable						
11.10	Protect Roof Plumbing to Minimise Debris and Ember Accumulation: All roof plumbing (gutters, valleys) is protected from the accumulation of debris and embers that can result in direct fire attack mechanisms immediately adjacent to any combustible elements within the roof cavity.	Medium	N/A	N/A	N/A	N/A
Assessment Comments: Measure 4.4 establishes trees >6m tall should not be retained/planted within 10 of assets. There will be no debris to protect roof plumbing from. *Recommendation Details:* Not Applicable						
11.11	Minimise Construction Cavities to Minimise Debris and Ember Accumulation: Apply designs that lower the potential for accumulation of embers and debris within cavity spaces of buildings/structures. Examples include concrete floor slab on the ground and solid masonry walls.	Medium	Yes	Yes	No	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
Assessment Comments: Buildings will be simple rectangular structures without complex features. *Recommendation Details:* See Measure 13.11						
11.12	Minimise External Openings to Limit Flame/Radiant Heat/Ember/Debris Entry: Limit potential sites for threat entry through the external building envelope to internal spaces containing combustible materials (consequential fire fuels). Examples include reducing windows/doors on elevations facing the bushfire hazard and apply design to limit gaps and penetrations that will require screening.	Medium	Yes	Partly	No	Yes
Assessment Comments: Warehouse/workshop buildings (if required) will likely have numerous entries and roller doors. The Operations and Maintenance Building (transportable building) will likely have 1-3 external doors and numerous windows. *Recommendation Details:* Review the design of warehouse/workshop buildings to ensure they can be fully enclosed.						
11.13	Screen and Seal Gaps and Penetrations: Apply fire rated sealants and/or install metal screening (corrosion resistant steel, bronze, aluminium <2mm aperture). All external construction and penetration gaps with apertures greater than 2mm will allow ember entry (and potentially debris) to internal cavities and combustible materials within (as consequential fire fuels). This includes gaps in roofs, walls, doors, windows and their surrounding trims – including those associated with penetrations, vents, weepholes, poor workmanship and material deterioration and movement over time (maintenance). Internal fire is difficult to see and extinguish.	Medium	Yes	No	Yes	Yes
Assessment Comments: The measure is applied through construction to AS 3959 in Measure 11.1. *Recommendation Details:* Workshop/warehouse buildings (if required) are recommended to have ember screening/sealants installed on any gaps, penetrations, and external glazed elements. Ember screening mesh is to be maximum 2mm aperture and composed of corrosion-resistant steel, bronze, or aluminium.						
11.14	Screen External Doors and Windows: Metal screens (corrosion resistant steel, bronze, aluminium <2mm aperture) installed over non-openable and/or openable parts of windows and doors to prevent ember entry to internal spaces containing combustible materials (consequential fire fuels) and reduce radiant heat load on vulnerable surfaces.	Medium	Yes	No	Yes	No
Assessment Comments: Screening will only be applied where required by AS 3959 construction standards. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
11.15	Shutter External Doors and Windows: Fire rated shutters are installed to significantly increase bushfire resistance of the vulnerable building elements.	Medium	Yes	No	No	No
Assessment Comments: Screening will be applied rather than shutters (BAL-12.5 or 29 construction). *Recommendation Details:* Not Applicable						
THE PROTECTION MECHANISM – AVAILABILITY OF A FIREFIGHTING RESPONSE CAPABILITY: Provide sufficient and reliable dedicated firefighting water supply and delivery capability as necessary for installed active and/or passive systems.						
11.16	Firefighting Water Supply: Have a dedicated static supply of firefighting water for the protection of buildings/structures before and after the passage of a bushfire front. Adequate water supply is critical for any firefighting operation, particularly where property protection is the intent. This is necessary when: • A water supply additional to a reticulated water supply is required to counter the loss of firefighting water as a protection measure, should the reticulated supply be interrupted; and • It is the only source of firefighting water. All tanks shall be non-combustible. Aside from losing water, failure of combustible tank can provide an additional heat or load to a vulnerable building element. Metal piping and fittings shall be used for any above ground components. The limitation to the effectiveness of the measure is the requirement for persons to be present and have the minimum required operational knowledge and/or access to appropriate information.	High	Yes	No	Yes	Yes
Assessment Comments: The Operations and Maintenance Building will require a firefighting water supply calculated following the *Planning for Bushfire Guidelines*, based on number of buildings and floor area. The Operations and Maintenance Building will be supplied through the same water capacity required for the BESS development. *Recommendation Details:* The aggregate water supply requirements for the proposal have been applied within a single measure. See Measure 13.17.						
11.17	Firefighting Equipment Actively Operated: In addition to a dedicated water supply, appropriate mobile firefighting appliances are available quickly and/or fixed firefighting equipment is installed (pumps, hoses, sprinklers etc). Where equipment is installed, this will be resilient to bushfire impact, to the extent necessary, through the application of appropriate equipment materials and protection (shielding or separation from the hazard). The limitation to the effectiveness of the measure is the requirement for persons to be present and have the minimum required operational knowledge and/or access to appropriate information.	High	Yes	No	Yes	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
Assessment Comments: The firefighting operations for the proposal have been assessed and discussed within a single measure. *Recommendation Details:* See Measure 13.18.						
11.18	Fire Fighting Equipment Passively Operated: In addition to a dedicated water supply, appropriate water dispensing apparatus are installed (e.g. pumps, plumbing and sprinklers) that are automatically activated. These will be resilient to bushfire impact, to the extent necessary, through the application of appropriate equipment materials and protection (shielding or separation from the hazard).	High	Yes	No	Unknown	No
Assessment Comments: Passive fire protection is possible; however the Operations and Maintenance Building is required to be constructed to AS 3959 and any workshops/warehouse buildings will be of non-combustible construction, and both require an APZ appropriate to their design/use (BAL-29 or <10kW/m^2). There will be few vulnerable components where passive fire protection would be appropriate. *Recommendation Details:* Not Applicable						
11.19	Fire Fighting Equipment Operability Maintained: Where water pumps, shutters or other active/passive protection measures rely on the continued supply of electricity, establish barriers (shielding) or separation from potential damaging factors (e.g. falling trees/branches, fire, or other impact sources). For example, bury transmission systems to the greatest extent possible.	High	Yes	No	Unknown	Yes
Assessment Comments: DFES Guidance Note: Firefighting Water Supply Considerations for Special Hazard & Dangerous Goods Sites has been considered in the design of the firefighting water supply. The site will have an independent power supply through either the onsite BESS or generators. *Recommendation Details:* See Measure 13.20.						
11.20	Access via Firebreaks Provided: Installation and maintenance of firebreaks to facilitate firefighting access / backburning (and limiting surface fire progression).	Medium	Yes	Yes	Yes	Yes
Assessment Comments: Direct access to classified vegetation areas will be available via the internal access network. Early engagement with DFES recommended fire service access between the western vegetation screen and the power line easement. The Operations and Maintenance Building will have access roads installed, and the BESS and Substation footprint will be a trafficable hardstand. The Operations and Maintenance Building will likely (but is not required) to be installed on a hardstand. Firebreaks are required by the Shire of Kojonup Section 33 Notice. Some firebreaks may be upgraded to function as part of the internal road network.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
Recommendation Details: Not Applicable						
THE PROTECTION MECHANISM – MANAGE AND MAINTAIN EFFECTIVENESS OF APPLIED PROTECTION MEASURES: To ensure the retention of the level of bushfire resilience that has been established through the implementation of appropriate bushfire protection measures, formal and enforceable responsibilities are created.						
11.21	Formal Documents Created to Guide and Enforce Management: Through relevant site operations document(s) and/or an enforceable agreement, regulation or standard, a mechanism is put in place to ensure that: • The required management and maintenance of applied bushfire protection measures is conducted on a regular basis – with the interval dependent on the necessary frequency that will maintain full effectiveness; • The relevant protection measures are known and understood; and • Responsibilities are created.	High	Yes	Partly	Yes	Yes
Assessment Comments: The documents have been or will be produced. Section 6.1 of this Bushfire Risk Report includes the operational documents to include bushfire protection measures. *Recommendation Details:* See Measure 13.22.						
Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining. Note 2: Protection Measure Application Status: • Possible: Protection measures that can potentially be applied to the proposed development/use. • Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary). • Currently Planned: Protection measures that: • Are incorporated into the site plans; • Exist in an approved Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), alternative solutions and any additional recommended protection measures - for which a responsibility for their implementation has been created and approved; and/or • Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP. These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary). • Additionally Recommend: Protection measures that:						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
• Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or • Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP. These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).						

5.4.3.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing vulnerability levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the vulnerability of the relevant element at risk to bushfire hazard threats.

VULNERABILITY REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Construction Design and Materials	Very High	2	1				1
	High	2	2				1
	Medium	11	10	4	2	3	4
	Not Relevant						
Availability of a Firefighting Response Capability	Very High						
	High	4	4			2	4
	Medium	1	1	1		1	
	Not Relevant						
Manage and Maintain Effectiveness of Applied Protection Measures	Very High						
	High	1	1		1	1	1
	Medium						
	Not Relevant						
Number Analysis	Very High	2	1				1
	High	7	7		1	3	6
	Medium	12	11	5	2	4	4
	Not Relevant						
	Totals	21	19	5	3	7	11

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.4.3.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE VULNERABILITY

From the information presented in the previous section, the vulnerability reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce vulnerability (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE VULNERABILITY TO BUSHFIRE HAZARD THREATS [1]							
Element at Risk	Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.						
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Minimal	Minimal	Minimal	Moderate	Moderate	Minimal	Moderate	Significant
Minimal				Moderate			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Significant	Very Significant	Very Significant	Significant	Very Significant	Moderate	Moderate	Very Significant
Very Significant				Significant			

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This vulnerability reducing potential will be applied to deriving the inherent vulnerability level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This vulnerability reducing potential will be applied to deriving the residual vulnerability level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

Assessment Comments: The Operations and Maintenance Building would not be required to construct to AS 3959 through 'Planned' measures and has been established as an additional measure. Enclosing subfloor cavities is a measure which improves the vulnerability against multiple mechanisms. Availability of firefighting water improves the vulnerability against consequential fires, radiant heat, and flame contact.

5.4.3.4 DERIVED VULNERABILITY LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual vulnerability levels.

In combination with the corresponding assessed threat and exposure levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL VULNERABILITY LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]							
ELEMENT AT RISK		Operations and Maintenance Building, Warehouses/Workshops, and standalone Class 10a buildings.					
BUSHFIRE ATTACK MECHANISMS [2]		INHERENT VULNERABILITY LEVEL (CURRENT STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	High
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
BUSHFIRE ATTACK MECHANISMS [2]		RESIDUAL VULNERABILITY LEVEL (POTENTIAL FUTURE STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	Low
DIRECT	Radiant Heat	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: Refer to Appendix 2 for explanatory and supporting information.

Note 3: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.4.4 MATERIALS STOCKPILED OUTDOORS – LAYDOWN AREAS

5.4.4.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas					
THE PROTECTION MECHANISM – CONSTRUCTION DESIGN AND MATERIALS: Increase bushfire resilience through the application of beneficial design and construction, including using non-combustible materials and minimising the use of vulnerable materials, to the greatest extent possible. Practicality and cost will be key considerations in determining the viability of applying protection measures in differing scenarios, but this should be determined with due consideration of threat levels and the importance of the elements at risk. The constructed systems should utilise the following properties to the greatest extent possible: reliability (which requires their durability over time, low maintenance and being unlikely to change over time), robustness (which limits damage spread from minor sources, continue to protect when thermally loaded and protects vulnerable elements), resilience (which enables their return to a functional state following an overload) and redundancy (which ensures the fate of the subject building/structure is not reliant on the effective performance of a single element). Refer to the glossary for additional explanation. The principle is also applicable to constructed consequential fire fuels.						
12.1	Construction Materials for Consequential Fire Fuels: For constructed large consequential fire fuels, use non-combustible materials to the fullest extent possible. Potential fuels include adjacent structures and surrounding landscaping items (fences, screens, retaining walls etc.).	High	N/A	N/A	N/A	N/A
Assessment Comments: Laydown areas do not include constructed features. *Recommendation Details:* Not Applicable						
THE PROTECTION MECHANISM – AVAILABILITY OF A FIREFIGHTING RESPONSE CAPABILITY: Provide sufficient and reliable dedicated firefighting water supply and delivery capability as necessary for installed active and/or passive systems.						
12.2	Firefighting Water Supply: Have a dedicated static supply of firefighting water for the protection of buildings/structures before and after the passage of a bushfire front. Adequate water supply is critical for any firefighting operation, particularly where property protection is the intent. This is necessary when: • A water supply additional to a reticulated water supply is required to counter the loss of firefighting water as a protection measure, should the reticulated supply be interrupted; and • It is the only source of firefighting water. All tanks shall be non-combustible. Aside from losing water, failure of combustible tank can provide an additional heat load to a vulnerable building element. Metal piping and fittings shall be used for any above ground components.	High	Yes	No	No	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas					
	The limitation to the effectiveness of the measure is the requirement for persons to be present and have the minimum required operational knowledge and/or access to appropriate information.					
Assessment Comments: Laydown areas will be supplied through the same water capacity required for the BESS development. *Recommendation Details:* The aggregate water supply requirements for the proposal have been applied within a single measure. See Measure 13.17.						
12.3	Firefighting Equipment Actively Operated: In addition to a dedicated water supply, appropriate mobile firefighting appliances are available quickly and/or fixed firefighting equipment is installed (pumps, hoses, sprinklers etc). Where equipment is installed, this will be resilient to bushfire impact, to the extent necessary, through the application of appropriate equipment materials and protection (shielding or separation from the hazard). The limitation to the effectiveness of the measure is the requirement for persons to be present and have the minimum required operational knowledge and/or access to appropriate information.	High	Yes	No	No	Yes
Assessment Comments: Laydown areas are relatively lower priority assets for active defence. *Recommendation Details:* The firefighting operations have been assessed and discussed within a single measure. See Measure 9.3.						
12.4	Fire Fighting Equipment Passively Operated: In addition to a dedicated water supply, appropriate water dispensing apparatus are installed (e.g. pumps, plumbing and sprinklers) that are automatically activated. These will be resilient to bushfire impact, to the extent necessary, through the application of appropriate equipment materials and protection (shielding or separation from the hazard).	High	Yes	No	No	No
Assessment Comments: Passive firefighting measures are not practical for remote material storage. *Recommendation Details:* Not Applicable						
12.5	Fire Fighting Equipment Operability Maintained: Where water pumps, shutters or other active/passive protection measures rely on the continued supply of electricity, establish barriers (shielding) or separation from potential damaging factors (e.g. falling trees/branches, fire, or other impact sources). For example, bury transmission systems to the greatest extent possible.	High	N/A	N/A	N/A	N/A
Assessment Comments: Active firefighting equipment is not associated with material storage, they are independent of these locations. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas					
12.6	Access via Firebreaks Provided: Installation and maintenance of firebreaks to facilitate firefighting access / backburning (and also limiting surface fire progression).	Medium	Yes	Yes	Yes	No
Assessment Comments: Laydown areas are accessed via the internal access network, which adjoin classified vegetation areas. Laydown areas will be a trafficable hardstand, though with obstructions (the stored material). Firebreaks are required by the Shire of Kojonup Section 33 Notice. Some firebreaks may be upgraded to function as part of the internal road network. *Recommendation Details:* Not Applicable						
THE PROTECTION MECHANISM – MANAGE AND MAINTAIN EFFECTIVENESS OF APPLIED PROTECTION MEASURES: To ensure the retention of the level of bushfire resilience that has been established through the implementation of appropriate bushfire protection measures, formal and enforceable responsibilities are created.						
12.7	Formal Documents Created to Guide and Enforce Management: Through relevant site operations document(s) and/or an enforceable agreement, regulation or standard, a mechanism is put in place to ensure that: • The required management and maintenance of applied bushfire protection measures is conducted on a regular basis – with the interval dependent on the necessary frequency that will maintain full effectiveness; • The relevant protection measures are known and understood; and • Responsibilities are created.	High	Yes	No	Yes	Yes
Assessment Comments: The documents have been or will be produced. Section 6.1 of this Bushfire Risk Report includes the operational documents to include bushfire protection measures. *Recommendation Details:* See Measure 13.22.						
Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining. Note 2: Protection Measure Application Status: • Possible: Protection measures that can potentially be applied to the proposed development/use. • Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary). • Currently Planned: Protection measures that: • Are incorporated into the site plans;						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas					

- Exist in an approved Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), alternative solutions and any additional recommended protection measures - for which a responsibility for their implementation has been created and approved; and/or
- Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).

- Additionally Recommend: Protection measures that:
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
  - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.4.4.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing vulnerability levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the vulnerability of the relevant element at risk to bushfire hazard threats.

VULNERABILITY REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Materials Stockpiled Outdoors						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Construction Design and Materials	Very High						
	High						
	Medium						
	Not Relevant						
Availability of a Firefighting Response Capability	Very High						
	High	4	3				2
	Medium	1	1	1		1	
	Not Relevant						
Manage and Maintain Effectiveness of Applied Protection Measures	Very High						
	High	1	1			1	1
	Medium						
	Not Relevant						
Number Analysis	Very High						
	High	5	4			1	3
	Medium	1	1	1		1	
	Not Relevant						
	Totals	6	5	1		2	3

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.4.4.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE VULNERABILITY

From the information presented in the previous section, the vulnerability reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce vulnerability (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE VULNERABILITY TO BUSHFIRE HAZARD THREATS [1]							
Element at Risk	Materials Stockpiled Outdoors – Laydown Areas						
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Minimal	Moderate	Minimal	Moderate	Minimal	Minimal	Significant	Minimal
Minimal				Minimal			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Moderate	Moderate	Minimal	Moderate	Minimal	Moderate	Significant	Moderate
Moderate				Moderate			

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This vulnerability reducing potential will be applied to deriving the inherent vulnerability level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This vulnerability reducing potential will be applied to deriving the residual vulnerability level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

Assessment Comments: Materials have widely variable vulnerabilities. Firefighting response is possible, but these assets are a lower priority during a larger-scale fire.

5.4.4.4 DERIVED VULNERABILITY LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual vulnerability levels.

In combination with the corresponding assessed threat and exposure levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL VULNERABILITY LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]							
ELEMENT AT RISK		Materials Stockpiled Outdoors – Laydown Areas					
BUSHFIRE ATTACK MECHANISMS [2]		INHERENT VULNERABILITY LEVEL (CURRENT STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	High
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☐	High ☐	Extreme ☒	
BUSHFIRE ATTACK MECHANISMS [2]		RESIDUAL VULNERABILITY LEVEL (POTENTIAL FUTURE STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	Moderate
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	

Note 1: Refer to Appendix 1 for explanatory and supporting information.

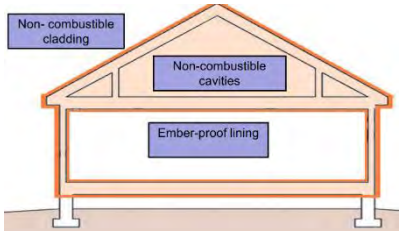
Note 2: Refer to Appendix 2 for explanatory and supporting information.

Note 3: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.4.5 BUILT INFRASTRUCTURE ASSETS – BESS UNITS

5.4.5.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
THE PROTECTION MECHANISM – CONSTRUCTION DESIGN AND MATERIALS: Increase bushfire resilience through the application of beneficial design and construction, including using non-combustible materials and minimising the use of vulnerable materials, to the greatest extent possible. Practicality and cost will be key considerations in determining the viability of applying protection measures in differing scenarios, but this should be determined with due consideration of threat levels and the importance of the elements at risk. The constructed systems should utilise the following properties to the greatest extent possible: reliability (which requires their durability over time, low maintenance and being unlikely to change over time), robustness (which limits damage spread from minor sources, continue to protect when thermally loaded and protects vulnerable elements), resilience (which enables their return to a functional state following an overload) and redundancy (which ensures the fate of the subject building/structure is not reliant on the effective performance of a single element). Refer to the glossary for additional explanation. The principle is also applicable to constructed consequential fire fuels.						
13.1	Construct to AS 3959:2018 [4]: Use the principles and requirements established in the Standard, for buildings in general, and apply to the infrastructure assets where they have merit. These are intended to reduce the risk of building ignition from bushfire direct attack mechanisms. Note that the indirect attack mechanisms and the threats presented by consequential fire fuels are not specifically considered. Key attributes of the Standard that may have relevance to other built assets include: • The AS 3959 strategy that relies on the integrity of the building's exterior envelope (i.e., the cladding of roof/wall/eaves, floor supporting structures/flooring and all penetrations) to resist all bushfire exposure conditions and environmental actions thereby protecting all structural construction elements behind it, including allowable combustible materials. • Using specified materials that provide ignition resistance (tolerance of radiant heat and flames). Higher BAL ratings impose increased construction requirements for these exterior envelope materials; • Specifying precise gap control (applicable to all bushfire attack levels) for the exterior envelope of the building to prevent ember entry); and • Attached and adjacent structures (within 6m) must also comply with the Standard.	High	N/A	N/A	N/A	N/A
13.2	Construct to NASH Standard [33]: Use the principles and requirements established in the Standard, for residential and low-rise buildings, and apply to the infrastructure assets where they have merit. Key attributes of the Standard that may have relevance to other built assets include:	Very High	N/A	N/A	N/A	N/A

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
	• Materials used anywhere on the building envelope (see shaded part of diagram below), must be non-combustible (except for a small number of smaller building elements). The building envelope is comprised of a framed roof/ceiling system, an external wall system and a floor system;  • The same construction requirements apply for all BAL ratings up to BAL-40 (except for external doors and windows which apply AS 3959 requirements). An additional benefit of this is the built in resistance to the direct attack mechanisms of consequential fire when lower BAL ratings apply. • It does not rely on eliminating ember entry to the roof space, wall cavities and floor system as these are non-combustible construction. Embers only need to be kept from entering the internal living/operating spaces. • It is ember tolerant without unrealistic workmanship, supervision and maintenance requirements; • The combination of a non-combustible cladding and cavities is a robust solution that enables the building to be configured so that failure or damage to one element does not lead to the inevitable failure of the building or a breach of the habitable envelope; and • Attached and adjacent structures (within 6m) must also comply with the Standard.					
Assessment Comments: Assets do not have a design to which AS3959 or NASH applies. *Recommendation Details:* Not Applicable.						
13.3	Construction Materials for External and Internal Cavity Building Elements: Except for internal living or operation spaces, to the degree necessary, utilise materials resistant to fire attack mechanisms of flame and radiant heat (preferably non-combustible) for all relevant building elements, including wall, roof, floor, supporting structures and framing systems.	Very High	Yes	Yes	No	Yes
Assessment Comments: Battery modules will be self-contained through highly insulated steel casing used to encapsulate modules. Installation of thermally insulated steel vents within the thermal roof protecting the units from flame impingements and hot gas intrusion. There is no Australian Standard applicable to large-scale BESS installations.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
Recommendation Details: Review compliance against NFPA 855 - Standard for the Installation of Stationary Energy Storage Systems (2023) noting that as a North American planning standard, all requirements may not be applicable.						
13.4	Construction Materials for Consequential Fire Fuels: For constructed large consequential fire fuels, use non-combustible materials to the fullest extent possible. Potential fuels include attached structures, adjacent structures and surrounding landscaping items (fences, screens, retaining walls etc.).	High	Yes	No	Unknown	No
Assessment Comments: No combustible structural elements have been identified. They will likely be primarily masonry, steel, aluminium and cement sheeting. *Recommendation Details:* Not Applicable						
13.5	Construction Design / Materials Resistant To High Wind Damage: Apply construction measures to prevent the type of building damage from wind that will open or create gaps (from the wind itself or carried projectiles) and allow the entry of embers, radiant heat and flames. This type of damage is typically superficial damage. Building codes relating to wind (e.g., cyclones) do not necessarily address this superficial type of impact. Additional fixings for building envelope claddings and protection of the most vulnerable elements, such as glazing, from debris impact, are key considerations. Consider applying the principles of the NASH Standard [33] design solution to construction. "Potential wind effects directly associated with bushfire events have been considered in this Standard. Wind actions may affect buildings subject to a bushfire attack in various ways including: • The intensity of flame front activity may produce locally high wind pressures on parts of the building; • In the post fire phase, some weakened components on the building envelope may be vulnerable to normal design pressures; and • Wind can drive embers into the building envelope." Most applicable when the physical requirements exist for the development of an extreme bushfire event within the surrounding landscape.	Medium	Yes	Yes	No	No
Assessment Comments: Assets will include components installed underground, fixed to the ground (concrete or buried support pillars), and else will be metal and heavily weighted. Wind is unlikely to cause sufficient damage to create a vulnerability to embers. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
13.6	Construction of Gas Supply: All gas cylinders are installed and maintained in accordance with AS 1596 (for domestic house supply) as a guide. The requirement of the standard includes: • Safety release valve shall be directed away from the building and persons access/egress routes; • Metal piping and fittings shall be used on all piping inside the building's cavities and enclosable occupied spaces and the high pressure side of any gas regulators; and • Tethers securing cylinders are to be non-combustible. The objective is to reduce the risk of consequential (secondary) fire against a building and reduce the risk of death or injury, from gas flaring or explosion. The rationale is gas cylinders which have either flared or ruptured are commonly found in post bushfire surveys [9]. The heat from the bushfire or consequential (secondary) fire has been sufficient to cause their pressure to reach critical levels beyond which their pressure release valve releases large quantities of LP gas. If these gas cylinders fall over, this pressure release valve may no longer function correctly, meaning that the gas cylinder may continue to increase in pressure with continued heating until the cylinder ruptures. The resulting explosion includes a pressure wave and large ball of flame which can threaten nearby life and buildings. Readily available guidance is provided by CSIRO Best Practice Bushfire Guide (https://research.csiro.au/bushfire/new-builds/water-electricity-gas/) and WA Dept. Mines, Industry, Regulation and Safety 'LP Gas cylinder safety in bushfire prone areas' (https://www.commerce.wa.gov.au/publications/lp-gas-cylinder-safety-bushfire-prone-areas).	Medium	N/A	N/A	N/A	N/A
Assessment Comments: Gas storage is not proposed on site. Any LPG will be stored in compliance with AS 1596. *Recommendation Details:* Not Applicable						
13.7	Construction of Electricity Supply: Cabling to be shielded (includes installing underground within subject property boundary) from applicable bushfire attack mechanisms. The objective is to assist with continuity of supply for essential site operations and/or electrically driven firefighting pumps. It also reduces the risk of electrocution to any persons onsite and reduces potentially additional sources of fire ignition. It is common in bushfires for power infrastructure to burn and collapse or be impacted by falling trees or branches while power lines are still live. Removing this risk may be appropriate for some sites.	Medium	Yes	No	Yes	Yes
Assessment Comments: Cabling associated with BESS will be enclosed within the cabinet, with some lines potentially running between systems or to the O&M buildings or Substation. The critical threshold for electrical cabling applied in Measure 6.3 is 12kW/m^2, with the APZ being 10kW/m^2 to ensure this threshold is not exceeded.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
Recommendation Details: See Measure 6.12.						
13.8	Minimise Re-entrant Detail to Minimise Debris and Ember Accumulation: Avoid or limit the accumulation of unburnt debris and embers by minimising re-entrant details and/or adopting aerodynamic forms that will self-shed windblown debris and embers. For example: • Simple building/structure footprints that avoid re-entrant corners in access ways, at wall/floor, wall/ground, roof/wall junctions and around doors, vents, windows; and • Simple roof layouts that avoid valleys and minimise the number of ridges that need protection details (e.g. skillion roofs).	Medium	Yes	Yes	Unknown	Yes
Assessment Comments: The structure design and construction allow for little debris accumulation. No trees are proposed to be planted or retained within the 10kW/m^2 APZ and thus accumulation of debris will be unlikely and, where any occurs, will occur slowly. Recommendation Details: Where electrical cabling, or gas or liquid piping, contacts the ground or any arrangement of associated structures creates a 'pocket' for accumulation of debris, this should be rectified by design or filling with non-combustible material such as mineral earth. Consideration should be given to making the arrangement self-cleaning through wind action to the greatest extent possible. These measures will reduce accumulation and/or make the management (clearing) of accumulated debris easier. E.g. cable raking to be 100mm above ground.						
13.9	Minimise Debris/Ember Trapping Surfaces: Avoid or minimise the use of exposed combustible surfaces that can trap and accumulate debris and embers. These include: • Horizontal, or shallow angle surfaces e.g. exposed wall/roof framework, roofs, decking, verandahs, steps, windowsills; and • Vertical surfaces with rough textured cladding (e.g. sawn timber).	Medium	Yes	Yes	Unknown	No
Assessment Comments: BESS units are rectangular and not expected to include the above features. Horizontal surfaces may exist but will be open-air and will be self-clearing through wind. No rough textured vertical surfaces will exist as assets will be metal, concrete, or tilt-up panels. No trees are proposed to be planted or retained within the 10kW/m^2 APZ and thus accumulation of debris will be unlikely and, where any occurs, will occur slowly. *Recommendation Details:* Not Applicable						
13.10	Protect Roof Plumbing to Minimise Debris and Ember Accumulation: All roof plumbing (gutters, valleys) is protected from the accumulation of debris and embers that can result in direct fire attack mechanisms immediately adjacent to any combustible elements within the roof cavity.	Medium	N/A	N/A	N/A	N/A

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
Assessment Comments: BESS units will not have roof plumbing. *Recommendation Details:* Not Applicable						
13.11	Minimise Construction Cavities to Minimise Debris and Ember Accumulation: Apply designs that lower the potential for accumulation of embers and debris within cavity spaces of buildings/structures. Examples include concrete floor slab on the ground and solid masonry walls.	Medium	Yes	Yes	No	Yes
Assessment Comments: The internal spaces of assets will be entirely enclosed. BESS units may have exposed subfloors (as containers placed on the ground). BESS units are recommended to be sited on concrete slabs or other sealed, non-combustible surface in Measure 6.3. *Recommendation Details:* Any subfloor cavities must have exposed subfloor spaces enclosed, sealed with non-combustible material, or be ember screened. Ember screening mesh is to be maximum 2mm aperture and composed of corrosion-resistant steel, bronze, or aluminium.						
13.12	Minimise External Openings to Limit Flame/Radiant Heat/Ember/Debris Entry: Limit potential sites for threat entry to through the external building envelope to internal spaces containing combustible materials (consequential fire fuels). Examples include reducing windows/doors on elevations facing the bushfire hazard and apply design to limit gaps and penetrations that will require screening.	Medium	Yes	Yes	No	Yes
Assessment Comments: BESS units include intake/extraction/air conditioning vents. Assets will otherwise be sealed against weather impacts with an appropriate IP rating. *Recommendation Details:* See Measures 13.11 and 13.13.						
13.13	Screen and Seal Gaps and Penetrations: Apply fire rated sealants and/or install metal screening (corrosion resistant steel, bronze, aluminium <2mm aperture). All external construction and penetration gaps with apertures greater than 2mm will allow ember entry (and potentially debris) to internal cavities and combustible materials within (as consequential fire fuels). This includes gaps in roofs, walls, doors, windows and their surrounding trims – including those associated with penetrations, vents, weepholes, poor workmanship and material deterioration and movement over time (maintenance). Internal fire is difficult to see and extinguish.	Medium	Yes	Yes	No	No
Assessment Comments: Battery Units are designed to eliminate the ingress of dust, spiders and other insects. This will also prevent any embers from fires in the surrounding area entering the Battery Unit. The chosen Battery Unit will have a suitable Ingress Protection (IP) rating. This will be confirmed prior to construction once a battery supplier and model has been selected.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
Recommendation Details: Not Applicable.						
13.14	Screen External Doors and Windows: Metal screens (corrosion resistant steel, bronze, aluminium <2mm aperture) installed over non-openable and/or openable parts of windows and doors to prevent ember entry to internal spaces containing combustible materials (consequential fire fuels) and reduce radiant heat load on vulnerable surfaces.	Medium	N/A	N/A	N/A	N/A
Assessment Comments: Assets will not have windows. Doors will be a solid metal panel. *Recommendation Details:* Not Applicable.						
13.15	Shutter External Doors and Windows: Fire rated shutters are installed to significantly increase bushfire resistance of the vulnerable building elements.	Medium	Yes	Unknown	No	Yes
Assessment Comments: Assets will not have windows. *Recommendation Details:* External doors (if present) should be self-closing.						
13.16	Construction Materials for Critical Non-Structural Elements: Utilise fire/radiant heat rated products (rated to the level determined necessary), for the construction of non-structural elements that are essential to the continued operation of the built asset, and which are potentially exposed to the attack mechanisms of both bushfire and consequential fire. These vulnerable elements include cabling and plumbing associated with power (delivery) inputs and outputs, data transmission, liquid/gas transport (fuel/water) etc.	High	Yes	Yes	Yes	Yes
Assessment Comments: The materials identified as critical are discussed in Measure 6.3 in determining the appropriate APZ. These components are integral to the design and cannot be replaced with materials more resistant to fire attack mechanisms. Asset fire is the major concern for the risks associated with BESS technologies and the engineer/manufacturer is assumed to have applied fire risk reduction in material selection to the maximum practical extent. No constructed assets or infrastructure are expected to include flammable or otherwise vulnerable materials. *Recommendation Details:* Review *FM Global Property Loss Prevention Data Sheet 5-33 (2020) Electrical Energy Storage Systems* for additional measures applicable to the development.						
THE PROTECTION MECHANISM – AVAILABILITY OF A FIREFIGHTING RESPONSE CAPABILITY: Provide sufficient and reliable dedicated firefighting water supply and delivery capability as necessary for installed active and/or passive systems.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
13.17	Firefighting Water Supply: Have a dedicated static supply of firefighting water for the protection of buildings/structures before and after the passage of a bushfire front. Adequate water supply is critical for any firefighting operation, particularly where property protection is the intent. This is necessary when: • A water supply additional to a reticulated water supply is required to counter the loss of firefighting water as a protection measure, should the reticulated supply be interrupted; and • It is the only source of firefighting water. All tanks shall be non-combustible. Aside from losing water, failure of combustible tank can provide an additional heat load to a vulnerable building element. Metal piping and fittings shall be used for any above ground components. The limitation to the effectiveness of the measure is the requirement for persons to be present and have the minimum required operational knowledge and/or access to appropriate information.	High	Yes	No	Yes	Yes

Assessment Comments: The *Planning for Bushfire Guidelines* does not establish a firefighting water supply for non-habitable structures, including large-scale uses such as renewable energies.

The State of Victoria Country Fire Authority *Design Guidelines and Model Requirements – Renewable Energy Facilities* v4 (CFA June 2025) provides guidance for commercial-scale BESS facilities.

The BESS development will require a water supply calculated following AS 2419.1 (Open Yards), to a minimum of 288,000L. Where a firefighting water supply for the BESS development is determined elsewhere, the greater volume is to apply.

A summary of applicable measures to align with the *Design Guidelines*, as well as modifications for bushfire risk outcomes, and to meet the Western Australian planning requirements, are provided below.

Recommendation Details: The firefighting water supply requirements for the proposal are as follows:

Access

- Firefighting water access points (hydrants, hard suction, or drafting) must be clearly identifiable, visible from internal roads, and unobstructed.
- Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest firefighting water access point.
- An all-weather hardstand turnaround area meeting the requirements of the *Planning for Bushfire Guidelines* (Figure 30) must be provided within 4 metres static water storage tank(s) and any independent hard suction points (hydrants).
- Site Operating Procedures must include that access routes must be unobstructed at all times.

Siting and Capacity

- The BESS development requires a minimum 288,000L firefighting water tank. This is to account for both bushfire and asset fire.

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
	o Where another firefighting water supply is determined elsewhere (for asset fire etc), the greater volume is to apply. o The required water supply in compliance with AS 2419.1 will be determined based on the final footprint of the BESS development. A footprint exceeding 9000m2 will require additional water supply. • All BESS units must be wholly within 70m of a water outlet. • Water tanks must be positioned >15m from BESS units and PCUs. • Water tanks should apply a BAL-29 dimensioned APZ at a minimum. <u>Construction</u> • Static water storage tanks must be an above-ground water tank constructed of concrete or steel. • An external water level indicator must be installed on static water storage tanks and be visible from internal roads and the adjoining turnaround area. • Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank. • Couplings at hard suction points are required to be 125mm Storz fittings (*Guidelines B.4.1.2*). DFES Built Environment and the local emergency services should be contacted for input on appropriate couplings and adaptors.					
13.18	Firefighting Equipment Actively Operated: In addition to a dedicated water supply, appropriate mobile firefighting appliances are available quickly and/or fixed firefighting equipment is installed (pumps, hoses, sprinklers etc). Where equipment is installed, this will be resilient to bushfire impact, to the extent necessary, through the application of appropriate equipment materials and protection (shielding or separation from the hazard). The limitation to the effectiveness of the measure is the requirement for persons to be present and have the minimum required operational knowledge and/or access to appropriate information.	High	Yes	No	Unknown	Yes
Assessment Comments: Through the Emergency Management Plan, an Emergency Response Team will be designated and trained in firefighting operation. Ensure the Site Emergency Plan and training for the Emergency Response Team considers bushfire as well as asset fires. See Measure 9.3 *Recommendation Details:* Two suitable fire extinguishers should be provided within 20m of each PCU.						
13.19	Fire Fighting Equipment Passively Operated: In addition to a dedicated water supply, appropriate water dispensing apparatus are installed (e.g. pumps, plumbing and sprinklers) that are automatically activated. These will be resilient to bushfire impact, to the extent necessary, through the application of appropriate equipment materials and protection (shielding or separation from the hazard).	High	Yes	No	Yes	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
Assessment Comments: The BESS units have active monitoring and electrical fault safety devices which ensure the units only remain operational within their intended operating environment, with an automated shut-down system. Fire detection and suppression systems depend on the asset type and its design, there is no 'one size fits all' solution. As BESS units are delivered fully constructed (plug in and play) the detection/suppression systems will be functional immediately. *Recommendation Details:* Automatic fire detection and suppression systems should be installed and maintained, as appropriate to the BESS details and recommended by the manufacturer.						
13.20	Fire Fighting Equipment Operability Maintained: Where water pumps, shutters or other active/passive protection measures rely on the continued supply of electricity, establish barriers (shielding) or separation from potential damaging factors (e.g. falling trees/branches, fire, or other impact sources). For example, bury transmission systems to the greatest extent possible.	High	Yes	No	Unknown	Yes
Assessment Comments: DFES Guidance Note: Firefighting Water Supply Considerations for Special Hazard & Dangerous Goods Sites has been considered in the design of the firefighting water supply. The site will have an independent power supply through either the onsite BESS or generators. Firefighting water tanks must install a BAL-29 dimensioned APZ. The Operations and Maintenance Building and Substation will be reasonably adjacent to the BESS and will be serviced with the same water supply. Model Requirement 4.4.2(e) of the *Design Guidelines* require the water tank to be at the site access point and not aligned to the prevailing wind, which are potentially contradictory. For the proposed layout, the water tanks are proposed to the north of the development, which meets both requirements (the prevailing wind direction being eastern and southerly). *Recommendation Details:* All firefighting water tanks, pumps, connections, couplings, and pipes are to be metal or else non-combustible.						
13.21	Access via Firebreaks Provided: Installation and maintenance of firebreaks to facilitate firefighting access / backburning (and also limiting surface fire progression).	Medium	Yes	Yes	Yes	Yes
Assessment Comments: Direct access to classified vegetation areas (vegetation screening and pasture) will be via the internal access network. The Operations and Maintenance Building will have access roads installed, and the BESS and Substation footprint will be a trafficable hardstand. The Operations and Maintenance Building buildings will likely (but is not required) to be installed on a hardstand. Firebreaks are required by the Shire of Kojonup Section 33 Notice. Some firebreaks may be upgraded to function as part of the internal road network. *Recommendation Details:* Not Applicable						
THE PROTECTION MECHANISM – MANAGE AND MAINTAIN EFFECTIVENESS OF APPLIED PROTECTION MEASURES: To ensure the retention of the level of bushfire resilience that has been established through the implementation of appropriate bushfire protection measures, formal and enforceable responsibilities are created.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					
13.22	Formal Documents Created to Guide and Enforce Management: Through relevant site operations document(s) and/or an enforceable agreement, regulation or standard, a mechanism is put in place to ensure that: • The required management and maintenance of applied bushfire protection measures is conducted on a regular basis – with the interval dependent on the necessary frequency that will maintain full effectiveness; • The relevant protection measures are known and understood; and • Responsibilities are created.	High	Yes	No	Yes	Yes

Assessment Comments: The documents have been or will be produced.

Recommendation Details: There is no Australian Standard applicable to large-scale BESS installations. The absence of consistent guidance is discussed in the *Battery Energy Storage Systems Guidance Report* (GHD March 2023, prepared for the Australian Energy Council). The decision maker may choose to review this report for an overview of context, concerns, and outcomes, for the construction and installation of BESS proposals.

AS/NZS 5139:2019 Electrical installations - Safety of battery systems for use with power conversion equipment provides considerations in a general sense, but largely refers to the manufacturers' information.

Ongoing requirements established in this Risk Assessment, must be included in the relevant ongoing operational documents.

Site Operating Procedures must include the following information:

Maintenance

- Maintenance intervals. Scheduling can be detailed within a supporting document.
- Assigned responsibilities of staff.
- Maintenance procedures and servicing to manufacturer's specifications.
- Testing procedures of the firefighting water supply and equipment.

Inspections

- Inspection intervals. Frequency of inspections are recommended to be increased during the bushfire season (see the Local Government Prohibited Burning Period) where practical.
- Inspection triggers, including extreme weather events or seismic activity.
- Established inspection criteria, including:
    - Accumulation of debris and vegetative material within 10m of battery modules.

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.					

- Mechanical damage to exterior elements.
- Vegetation regrowth within the APZ, particularly immediately prior to and during bushfire season (see the Local Government Prohibited Burning Period).
- Obstruction of access routes including firebreaks.
- Volume of the firefighting water supply.

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining.

Note 2: Protection Measure Application Status:

- Possible: Protection measures that can potentially be applied to the proposed development/use.
- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Currently Planned: Protection measures that:
  - Are incorporated into the site plans;
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Planning for Bushfire Guidelines', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

  These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Additionally Recommend: Protection measures that:
  - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
  - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

  These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.4.5.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing vulnerability levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the vulnerability of the relevant element at risk to bushfire hazard threats.

VULNERABILITY REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Construction Design and Materials	Very High	2	1	1			1
	High	3	2	1		1	2
	Medium	11	8	5		1	6
	Not Relevant						
Availability of a Firefighting Response Capability	Very High						
	High	4	4			2	4
	Medium	1	1	2		1	
	Not Relevant						
Manage and Maintain Effectiveness of Applied Protection Measures	Very High						
	High	1	1			1	1
	Medium						
	Not Relevant						
Number Analysis	Very High	2	1	1			1
	High	8	7	1		4	7
	Medium	12	9	7		2	6
	Not Relevant						
	Totals	22	17	9		6	14

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.4.5.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE VULNERABILITY

From the information presented in the previous section, the vulnerability reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce vulnerability (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE VULNERABILITY TO BUSHFIRE HAZARD THREATS [1]							
Element at Risk	Built Infrastructure Assets - BESS units and Associated Infrastructure.						
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Moderate	Significant	Moderate	Significant	Significant	Very Significant	Moderate	Minimal
Moderate				Moderate			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Very Significant	Very Significant	Significant	Significant	Significant	Very Significant	Significant	Very Significant
Very Significant				Very Significant			

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This vulnerability reducing potential will be applied to deriving the inherent vulnerability level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This vulnerability reducing potential will be applied to deriving the residual vulnerability level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

Assessment Comments: The vulnerability reducing protection measures are associated with:

- Ensuring that the design and construction of the assets can limit locations for accumulation of debris and facilitates self-cleaning by the wind.
- Having firefighting resources available of an appropriate design and capacity to extinguish consequential fires and cool battery cabinets.
- Having the BESS units fitted with active monitoring and electrical fault safety devices which ensure the units only remain operational within their intended operating environment, with an automated shut-down system.

5.4.5.4 DERIVED VULNERABILITY LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual vulnerability levels.

In combination with the corresponding assessed threat and exposure levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL VULNERABILITY LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]							
ELEMENT AT RISK		Built Infrastructure Assets - BESS units and Associated Infrastructure.					
BUSHFIRE ATTACK MECHANISMS [2]		INHERENT VULNERABILITY LEVEL (CURRENT STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	Moderate
DIRECT	Radiant Heat	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
BUSHFIRE ATTACK MECHANISMS [2]		RESIDUAL VULNERABILITY LEVEL (POTENTIAL FUTURE STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	Low
DIRECT	Radiant Heat	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	

Note 1: Refer to Appendix 1 for explanatory and supporting information.

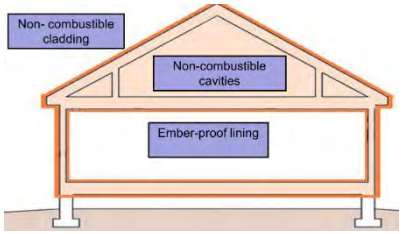
Note 2: Refer to Appendix 2 for explanatory and supporting information.

Note 3: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

5.4.6 BUILT INFRASTRUCTURE ASSETS – SUBSTATION

5.4.6.1 PROTECTION MEASURE ANALYSIS - IDENTIFICATION AND APPLICATION STATUS

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
THE PROTECTION MECHANISM – CONSTRUCTION DESIGN AND MATERIALS: Increase bushfire resilience through the application of beneficial design and construction, including using non-combustible materials and minimising the use of vulnerable materials, to the greatest extent possible. Practicality and cost will be key considerations in determining the viability of applying protection measures in differing scenarios, but this should be determined with due consideration of threat levels and the importance of the elements at risk. The constructed systems should utilise the following properties to the greatest extent possible: reliability (which requires their durability over time, low maintenance and being unlikely to change over time), robustness (which limits damage spread from minor sources, continue to protect when thermally loaded and protects vulnerable elements), resilience (which enables their return to a functional state following an overload) and redundancy (which ensures the fate of the subject building/structure is not reliant on the effective performance of a single element). Refer to the glossary for additional explanation. The principle is also applicable to constructed consequential fire fuels.						
15.1	Construct to AS 3959:2018 [4]: Use the principles and requirements established in the Standard, for buildings in general, and apply to the infrastructure assets where they have merit. These are intended to reduce the risk of building ignition from bushfire direct attack mechanisms. Note that the indirect attack mechanisms and the threats presented by consequential fire fuels are not specifically considered. Key attributes of the Standard that may have relevance to other built assets include: • The AS 3959 strategy that relies on the integrity of the building's exterior envelope (i.e., the cladding of roof/wall/eaves, floor supporting structures/flooring and all penetrations) to resist all bushfire exposure conditions and environmental actions thereby protecting all structural construction elements behind it, including allowable combustible materials. • Using specified materials that provide ignition resistance (tolerance of radiant heat and flames). Higher BAL ratings impose increased construction requirements for these exterior envelope materials; • Specifying precise gap control (applicable to all bushfire attack levels) for the exterior envelope of the building to prevent ember entry); and • Attached and adjacent structures (within 6m) must also comply with the Standard.	High	N/A	N/A	N/A	N/A
15.2	Construct to NASH Standard [33]: Use the principles and requirements established in the Standard, for residential and low-rise buildings, and apply to the infrastructure assets where they have merit. Key attributes of the Standard that may have relevance to other built assets include:	Very High	N/A	N/A	N/A	N/A

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
	• Materials used anywhere on the building envelope (see shaded part of diagram below), must be non-combustible (except for a small number of smaller building elements). The building envelope is comprised of a framed roof/ceiling system, an external wall system and a floor system;  • The same construction requirements apply for all BAL ratings up to BAL-40 (except for external doors and windows which apply AS 3959 requirements). An additional benefit of this is the built in resistance to the direct attack mechanisms of consequential fire when lower BAL ratings apply. • It does not rely on eliminating ember entry to the roof space, wall cavities and floor system as these are non-combustible construction. Embers only need to be kept from entering the internal living/operating spaces. • It is ember tolerant without unrealistic workmanship, supervision and maintenance requirements; • The combination of a non-combustible cladding and cavities is a robust solution that enables the building to be configured so that failure or damage to one element does not lead to the inevitable failure of the building or a breach of the habitable envelope; and • Attached and adjacent structures (within 6m) must also comply with the Standard.					
Assessment Comments: Assets do not have a design to which AS3959 or NASH applies. *Recommendation Details:* Not Applicable.						
15.3	Construction Materials for External and Internal Cavity Building Elements: Except for internal living or operation spaces, to the degree necessary, utilise materials resistant to fire attack mechanisms of flame and radiant heat (preferably non-combustible) for all relevant building elements, including wall, roof, floor, supporting structures and framing systems.	Very High	Yes	Yes	No	No
Assessment Comments: The control room, switch room, and terminal boxes will have internal cavities. The structural components of a substation are entirely non-combustible (generally steel). *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
15.4	Construction Materials for Consequential Fire Fuels: For constructed large consequential fire fuels, use non-combustible materials to the fullest extent possible. Potential fuels include attached structures, adjacent structures and surrounding landscaping items (fences, screens, retaining walls etc.).	High	No	Yes	Yes	No
Assessment Comments: No constructed fuels have been identified except the external electrical components (insulators, conductors etc). The substation will be designed in compliance with the relevant Australian Standards. AS 2067-2016 *Substations and high voltage installations exceeding 1 kV a.c.* and AS/NZS 7000:2016 *Overhead Line Design* consider asset-to-asset fire, or fire spread within the asset, to be a critical issue. Note these Australian Standards only consider bushfire in a general sense, and the measures within this Report intend to limit the interaction between bushfire and energised infrastructure to an appropriate level. *Recommendation Details:* Not Applicable						
15.5	Construction Design / Materials Resistant To High Wind Damage: Apply construction measures to prevent the type of building damage from wind that will open or create gaps (from the wind itself or carried projectiles) and allow the entry of embers, radiant heat and flames. This type of damage is typically superficial damage. Building codes relating to wind (e.g., cyclones) do not necessarily address this superficial type of impact. Additional fixings for building envelope claddings and protection of the most vulnerable elements, such as glazing, from debris impact, are key considerations. Consider applying the principles of the NASH Standard [33] design solution to construction. "Potential wind effects directly associated with bushfire events have been considered in this Standard. Wind actions may affect buildings subject to a bushfire attack in various ways including: • The intensity of flame front activity may produce locally high wind pressures on parts of the building; • In the post fire phase, some weakened components on the building envelope may be vulnerable to normal design pressures; and • Wind can drive embers into the building envelope." Most applicable when the physical requirements exist for the development of an extreme bushfire event within the surrounding landscape.	Medium	Yes	Yes	No	No
Assessment Comments: The reliability of substations against wind damage are a major design consideration internationally due to severe storm events. High wind impacts are assumed to be addressed within the relevant guidance/regulatory material. *Recommendation Details:* Not Applicable						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
15.6	Construction of Gas Supply: All gas cylinders are installed and maintained in accordance with AS 1596 (for domestic house supply) as a guide. The requirement of the standard includes: • Safety release valve shall be directed away from the building and persons access/egress routes; • Metal piping and fittings shall be used on all piping inside the building's cavities and enclosable occupied spaces and the high pressure side of any gas regulators; and • Tethers securing cylinders are to be non-combustible. The objective is to reduce the risk of consequential (secondary) fire against a building and reduce the risk of death or injury, from gas flaring or explosion. The rationale is gas cylinders which have either flared or ruptured are commonly found in post bushfire surveys [9]. The heat from the bushfire or consequential (secondary) fire has been sufficient to cause their pressure to reach critical levels beyond which their pressure release valve releases large quantities of LP gas. If these gas cylinders fall over, this pressure release valve may no longer function correctly, meaning that the gas cylinder may continue to increase in pressure with continued heating until the cylinder ruptures. The resulting explosion includes a pressure wave and large ball of flame which can threaten nearby life and buildings. Readily available guidance is provided by CSIRO Best Practice Bushfire Guide (https://research.csiro.au/bushfire/new-builds/water-electricity-gas/) and WA Dept. Mines, Industry, Regulation and Safety 'LP Gas cylinder safety in bushfire prone areas' (https://www.commerce.wa.gov.au/publications/lp-gas-cylinder-safety-bushfire-prone-areas).	Medium	N/A	N/A	N/A	N/A
Assessment Comments: Gas storage is not proposed on site. Any LPG will be stored in compliance with AS 1596. *Recommendation Details:* Not Applicable						
15.7	Construction of Electricity Supply: Cabling to be shielded (includes installing underground within subject property boundary) from applicable bushfire attack mechanisms. The objective is to assist with continuity of supply for essential site operations and/or electrically driven firefighting pumps. It also reduces the risk of electrocution to any persons onsite and reduces potentially additional sources of fire ignition. It is common in bushfires for power infrastructure to burn and collapse or be impacted by falling trees or branches while power lines are still live. Removing this risk may be appropriate for some sites.	Medium	Yes	Yes	Unknown	Yes
Assessment Comments: The following document was found to be relevant in the assessment of proposed substations: *NS187 Passive Fire Mitigation Design of Major Substations* - Internal Document No. NW000-S0007 (Ausgrid 2020). Ausgrid Pty Ltd is Australia's largest electricity distributor (in terms of customers and energy load), and the document referenced is an internal network standard. The below table is sourced from Section 12 of the network standard.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS	Effectiveness Rating [1]	Application Status [2]			
		Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation				

Table 3 – Radiant Heat Exposure Limits for Bushfires

Item	Maximum allowable radiant heat flux (kW/m^2)	Comment
Cable	12.5	PVC Cables begin to distort and may ignite.
	20	Ignition of XLPE cables between 85 and 550 seconds.
Steel support structure	35	To 60% of yield strength after a maximum duration of 5 minutes. Applies where elastic deflections due to elevated temperatures are not critical.
Porcelain bushing/Insulators	>30	Damage may occur requiring replacement or in extreme case resulting in catastrophic failure. See Note 2.
Polymeric bushing/insulators	>30	Damage may occur requiring replacement or in extreme case resulting in catastrophic failure. See Note 2.
Aluminium busbar	20	Based on 250°C after a maximum duration of 5 minutes. Comparable to withstand temperature under fault conditions.
Copper busbar	25	Busbars may undergo significant distortion and impose significant stresses on rigid insulators.
Transformer tank	>35 (see Note 1)	Refer to above regarding bushings and cables.
Combustibles	12.5	Piloted ignition may occur on timber.

Note 1. Transformers always have some more vulnerable components such as bushings and cables etc. Refer to Clause 7.2.

'Combustibles' in this description are consequential fire hazards for the purposes of the bushfire assessment: packing materials, pallets, waste, and other assorted debris. These should not be present within the substation footprint and where necessary should be positioned away from infrastructure components, applied in Measure 6.7.

The materials identified as critical are discussed in Measure 8.3 in determining the appropriate APZ.

Tree strike is considered in Measures 6.4 and 8.4.

Recommendation Details: See Measure 8.3

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
15.8	Minimise Re-entrant Detail to Minimise Debris and Ember Accumulation: Avoid or limit the accumulation of unburnt debris and embers by minimising re-entrant details and/or adopting aerodynamic forms that will self-shed windblown debris and embers. For example: • Simple building/structure footprints that avoid re-entrant corners in access ways, at wall/floor, wall/ground, roof/wall junctions and around doors, vents, windows; and • Simple roof layouts that avoid valleys and minimise the number of ridges that need protection details (e.g. skillion roofs).	Medium	Yes	Yes	Yes	No
Assessment Comments: All substation components are mounted on concrete slabs and elevated from the ground, with only flat/rounded surfaces with through wind action possible. Features above ground level are more complex but are fully exposed to wind action. Fencing is the only identified feature which can trap significant quantities of debris. Debris (leaf litter) can accumulate against fence lines. Any fence will be set back from the closest substation component by >2m. Debris may be blown from the fence line and distribute the material to be a minor hazard (individual firebrands vs no directly flammable components). The fencing itself will be entirely non-combustible and may be brick, weldmesh, palisade etc. *Recommendation Details:* Not Applicable						
15.9	Minimise Debris/Ember Trapping Surfaces: Avoid or minimise the use of exposed combustible surfaces that can trap and accumulate debris and embers. These include: • Horizontal, or shallow angle surfaces e.g. exposed wall/roof framework, roofs, decking, verandahs, steps, windowsills; and • Vertical surfaces with rough textured cladding (e.g. sawn timber).	Medium	No	Yes	No	No
Assessment Comments: Horizontal surfaces are present but fully exposed to wind action, so debris will not accumulate. Fencing can allow debris to accumulate. Perimeter fencing will be present around the Project but will be set back several metres from infrastructure components. *Recommendation Details:* Not Applicable						
15.10	Protect Roof Plumbing to Minimise Debris and Ember Accumulation: All roof plumbing (gutters, valleys) is protected from the accumulation of debris and embers that can result in direct fire attack mechanisms immediately adjacent to any combustible elements within the roof cavity.	Medium	N/A	N/A	N/A	N/A
Assessment Comments: The substation will not have roof plumbing.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
Recommendation Details: Not Applicable						
15.11	Minimise Construction Cavities to Minimise Debris and Ember Accumulation: Apply designs that lower the potential for accumulation of embers and debris within cavity spaces of buildings/structures. Examples include concrete floor slab on the ground and solid masonry walls.	Medium	No	Yes	No	No
Assessment Comments: The substation will be externally sealed and mounted on concrete slabs, so there will be no construction cavities. *Recommendation Details:* Not Applicable						
15.12	Minimise External Openings to Limit Flame/Radiant Heat/Ember/Debris Entry: Limit potential sites for threat entry to through the external building envelope to internal spaces containing combustible materials (consequential fire fuels). Examples include reducing windows/doors on elevations facing the bushfire hazard and apply design to limit gaps and penetrations that will require screening.	Medium	No	Partly	No	No
Assessment Comments: The control room, switch room, and terminal boxes will have internal cavities. These will have a single door and no windows. Vents will be installed where required, so the design cannot be altered to reduce the capacity for ember intrusion. *Recommendation Details:* Not Applicable						
15.13	Screen and Seal Gaps and Penetrations: Apply fire rated sealants and/or install metal screening (corrosion resistant steel, bronze, aluminium <2mm aperture). All external construction and penetration gaps with apertures greater than 2mm will allow ember entry (and potentially debris) to internal cavities and combustible materials within (as consequential fire fuels). This includes gaps in roofs, walls, doors, windows and their surrounding trims – including those associated with penetrations, vents, weepholes, poor workmanship and material deterioration and movement over time (maintenance). Internal fire is difficult to see and extinguish.	Medium	Yes	No	Unknown	Yes
Assessment Comments: The control room, switch room, and terminal boxes may have external vents. *Recommendation Details:* Consider application of ember screening to the external vent interface of the control room, switch room, terminal boxes etc. The intention is to prevent both ember ingress and debris accumulation. Ember screening mesh is to be maximum 2mm aperture and composed of corrosion-resistant steel, bronze, or aluminium.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
15.14	Screen External Doors and Windows: Metal screens (corrosion resistant steel, bronze, aluminium <2mm aperture) installed over non-openable and/or openable parts of windows and doors to prevent ember entry to internal spaces containing combustible materials (consequential fire fuels) and reduce radiant heat load on vulnerable surfaces.	Medium	No	No	No	No
Assessment Comments: Screening will not be applied to doors. *Recommendation Details:* Not Applicable						
15.15	Shutter External Doors and Windows: Fire rated shutters are installed to significantly increase bushfire resistance of the vulnerable building elements.	Medium	No	No	No	No
Assessment Comments: Assets will not have windows. Shutters are not applied to doors of the same construction as the enclosure. *Recommendation Details:* Not Applicable						
15.16	Construction Materials for Critical Non-Structural Elements: Utilise fire/radiant heat rated products (rated to the level determined necessary), for the construction of non-structural elements that are essential to the continued operation of the built asset, and which are potentially exposed to the attack mechanisms of both bushfire and consequential fire. These vulnerable elements include cabling and plumbing associated with power (delivery) inputs and outputs, data transmission, liquid/gas transport (fuel/water) etc.	High	Yes	Yes	No	Yes
Assessment Comments: The materials identified as critical are discussed in Measure 8.3 in determining the appropriate APZ. These components are integral to the design and cannot be replaced with materials more resistant to fire attack mechanisms. *Recommendation Details:* See Measure 8.3						
THE PROTECTION MECHANISM – AVAILABILITY OF A FIREFIGHTING RESPONSE CAPABILITY: Provide sufficient and reliable dedicated firefighting water supply and delivery capability as necessary for installed active and/or passive systems.						
15.17	Firefighting Water Supply: Have a dedicated static supply of firefighting water for the protection of buildings/structures before and after the passage of a bushfire front. Adequate water supply is critical for any firefighting operation, particularly where property protection is the intent. This is necessary when: • A water supply additional to a reticulated water supply is required to counter the loss of firefighting water as a protection measure, should the reticulated supply be interrupted; and • It is the only source of firefighting water.	High	Yes	No	Yes	Yes

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
	All tanks shall be non-combustible. Aside from losing water, failure of combustible tank can provide an additional heat load to a vulnerable building element. Metal piping and fittings shall be used for any above ground components. The limitation to the effectiveness of the measure is the requirement for persons to be present and have the minimum required operational knowledge and/or access to appropriate information.					
Assessment Comments: The Substation will be reasonably adjacent to the BESS and will be serviced with the same water supply. *Recommendation Details:* See Measure 13.17.						
15.18	Firefighting Equipment Actively Operated: In addition to a dedicated water supply, appropriate mobile firefighting appliances are available quickly and/or fixed firefighting equipment is installed (pumps, hoses, sprinklers etc). Where equipment is installed, this will be resilient to bushfire impact, to the extent necessary, through the application of appropriate equipment materials and protection (shielding or separation from the hazard). The limitation to the effectiveness of the measure is the requirement for persons to be present and have the minimum required operational knowledge and/or access to appropriate information.	High	Yes	No	No	Yes
Assessment Comments: The firefighting operations for the proposal have been assessed and discussed within a single measure. Through the Site Emergency Plan, an Emergency Response Team will be designated and trained in firefighting operation. Ensure the Site Emergency Plan and training for the Emergency Response Team considers bushfire as well as asset fires. *Recommendation Details:* See Measure 9.3.						
15.19	Fire Fighting Equipment Passively Operated: In addition to a dedicated water supply, appropriate water dispensing apparatus are installed (e.g. pumps, plumbing and sprinklers) that are automatically activated. These will be resilient to bushfire impact, to the extent necessary, through the application of appropriate equipment materials and protection (shielding or separation from the hazard).	High	Yes	No	Yes	Yes
Assessment Comments: Automatic monitoring and remote control of transmission lines allows for remote shut down in an emergency. Automatic fire protection systems can rapidly disconnect power (80 to 120 milliseconds from detection). Heavy smoke from a bushfire can increase the chance of an arc flash, thus automatic fire protection systems may be applied even where the substation is otherwise resisting the impacts of bushfire. *Recommendation Details:* See Measure 9.3						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
15.20	Fire Fighting Equipment Operability Maintained: Where water pumps, shutters or other active/passive protection measures rely on the continued supply of electricity, establish barriers (shielding) or separation from potential damaging factors (e.g. falling trees/branches, fire, or other impact sources). For example, bury transmission systems to the greatest extent possible.	High	Yes	No	Unknown	Yes
Assessment Comments: DFES Guidance Note: Firefighting Water Supply Considerations for Special Hazard & Dangerous Goods Sites has been considered in the design of the firefighting water supply. The site will have an independent power supply through either the onsite BESS or generators. *Recommendation Details:* See Measure 13.20.						
15.21	Access via Firebreaks Provided: Installation and maintenance of firebreaks to facilitate firefighting access / backburning (and also limiting surface fire progression).	Medium	Yes	Yes	Yes	No
Assessment Comments: Direct access to classified vegetation areas (vegetation screens and adjacent pasture) will be via the internal access network. The Operations and Maintenance Building will have access roads installed, and the BESS and Substation footprint will be a trafficable hardstand. The Operations and Maintenance Building buildings will likely (but is not required) to be installed on a hardstand. Firebreaks are required by the Shire of Kojonup Section 33 Notice. Some firebreaks may be upgraded to function as part of the internal road network. *Recommendation Details:* Not Applicable						
THE PROTECTION MECHANISM – MANAGE AND MAINTAIN EFFECTIVENESS OF APPLIED PROTECTION MEASURES: To ensure the retention of the level of bushfire resilience that has been established through the implementation of appropriate bushfire protection measures, formal and enforceable responsibilities are created.						
15.22	Formal Documents Created to Guide and Enforce Management: Through relevant site operations document(s) and/or an enforceable agreement, regulation or standard, a mechanism is put in place to ensure that: • The required management and maintenance of applied bushfire protection measures is conducted on a regular basis – with the interval dependent on the necessary frequency that will maintain full effectiveness; • The relevant protection measures are known and understood; and • Responsibilities are created.	High	Yes	No	Yes	Yes
Assessment Comments: The documents have been or will be produced. Section 6.1 of this Bushfire Risk Report includes the operational documents to include bushfire protection measures.						

PROTECTION MEASURES AVAILABLE TO REDUCE VULNERABILITY LEVELS		Effectiveness Rating [1]	Application Status [2]			
			Possible	Exists	Planned	Additionally Recommend
Element at Risk	Substation					
Recommendation Details: See Measure 13.22.						

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.2.4 for explanation and defining.

Note 2: Protection Measure Application Status:

- Possible: Protection measures that can potentially be applied to the proposed development/use.
- Fully or Partly Exists: A current state assessment of protection measures already implemented by existing components of the proposed development/use. The status of current implementation can also be fully or partly. These measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Currently Planned: Protection measures that:
    - Are incorporated into the site plans;
    - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and are comprised of the applicable acceptable solutions (established by the 'Planning for Bushfire Guidelines', DPLH as amended), that can be met and for which a responsibility for their implementation can be created in the BMP.

  These planned measures are accounted for in assessing 'inherent' risk levels (refer to Glossary).
- Additionally Recommend: Protection measures that:
    - Exist in a concurrently produced Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and comprise alternative solutions and/or additional recommended protection measures (that can and should be implemented in the opinion of the bushfire consultant), and for which a responsibility for their implementation can be created in the BMP; and/or
    - Are developed in the process of producing this risk assessment and management report and for which a responsibility for their implementation can be created in the BMP.

  These additionally recommended measures, along with existing and planned measures, are accounted for in assessing 'residual' risk levels (refer to Glossary).

5.4.6.2 PROTECTION MEASURE ANALYSIS – NUMBER SUMMARY

For the stated element at risk, the numbers of both available and potentially applied bushfire protection measures are summarised and the effectiveness of each measure at reducing vulnerability levels is stated (refer to Appendix 1 for explanatory and supporting information).

This information is applied in the following section of this report to the derivation of the potential for applied bushfire protection measures to reduce the vulnerability of the relevant element at risk to bushfire hazard threats.

VULNERABILITY REDUCING PROTECTION MEASURE ANALYSIS							
Element at Risk	Substation						
The Protection Mechanism	Effectiveness Rating [1]	Numbers of Protection Measures					
		Total Available	Application Status [2]				
			Possible	Fully Exists	Partly Exists	Currently Planned	Additionally Recommend
Construction Design and Materials	Very High	2	1	1			
	High	3	1	2		1	1
	Medium	11	4	5	1	1	2
	Not Relevant						
Availability of a Firefighting Response Capability	Very High						
	High	4	4			2	4
	Medium	1	1	1		1	
	Not Relevant						
Manage and Maintain Effectiveness of Applied Protection Measures	Very High						
	High	1	1			1	1
	Medium						
	Not Relevant						
Number Analysis	Very High	2	1	1			
	High	8	6	2		4	6
	Medium	12	5	6	1	2	2
	Not Relevant						
	Totals	22	12	9	1	6	8

Note 1: Protection Measure Effectiveness Rating: Refer to Appendix A1.3.4 for explanation and defining.

Note 2: Protection Measure Application Status: Refer to table footnotes in the preceding section.

5.4.6.3 PROTECTION MEASURE ANALYSIS – POTENTIAL TO REDUCE VULNERABILITY

From the information presented in the previous section, the vulnerability reducing potential of the applied bushfire protection measures is assessed as a function of:

- The number of bushfire protection measures that can be applied to the subject element at risk and the subject site/use, compared to the number available; and
- The effectiveness rating that is given to each applied protection measure that weights the relative ability of the measure to reduce vulnerability (refer to Appendix A1.3.4 for supporting and explanatory information).

ASSESSED POTENTIAL FOR APPLIED PROTECTION MEASURES TO REDUCE VULNERABILITY TO BUSHFIRE HAZARD THREATS [1]							
Element at Risk	Substation						
WHEN EXISTING AND PLANNED PROTECTION MEASURES ARE APPLIED [2]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Moderate	Moderate	Moderate	Significant	Very Significant	Very Significant	Moderate	Significant
Moderate				Significant			
WHEN EXISTING, PLANNED AND RECOMMENDED PROTECTION MEASURES ARE APPLIED [3]							
Direct Attack Mechanisms [4]				Indirect Attack Mechanisms [4]			
Flame Contact	Radiant Heat	Embers / Burning Debris	High / Erratic Fire Driven Wind	Debris Production / Accumulation	Surface Fire	Tree Strike / Obstruction	Consequential (Secondary) Fire
Moderate	Significant	Very Significant	Significant	Very Significant	Very Significant	Moderate	Significant
Significant				Significant			

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: This vulnerability reducing potential will be applied to deriving the inherent vulnerability level (i.e. the current state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 3: This vulnerability reducing potential will be applied to deriving the residual vulnerability level (i.e. the potential future state). Refer to Appendix A1.3.3 for explanatory and supporting information.

Note 4: Refer to Appendix 2 for explanatory and supporting information.

Assessment Comments: Substations already consider fire impacts within their design and both national standards and state regulations apply. Recommendations are for shielding cabling where possible (including within structures/underground), and ensuring embers cannot enter enclosed spaces (control room, switch room, terminal boxes etc).

5.4.6.4 DERIVED VULNERABILITY LEVEL - INHERENT AND RESIDUAL

The preceding bushfire protection measure analysis has, through a mostly qualitative assessment process, enabled the derivation of the inherent and residual vulnerability levels.

In combination with the corresponding assessed threat and exposure levels, they will subsequently be applied to deriving the inherent and residual bushfire risk levels.

DERIVED POTENTIAL VULNERABILITY LEVELS POST APPLICATION OF EXPOSURE REDUCING BUSHFIRE PROTECTION MEASURES [1]							
ELEMENT AT RISK		Substation					
BUSHFIRE ATTACK MECHANISMS [2]		INHERENT VULNERABILITY LEVEL (CURRENT STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	Moderate
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
BUSHFIRE ATTACK MECHANISMS [2]		RESIDUAL VULNERABILITY LEVEL (POTENTIAL FUTURE STATE) [3]					OVERALL
DIRECT	Flame Contact	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	Low
DIRECT	Radiant Heat	Very Low ☐	Low ☐	Moderate ☒	High ☐	Extreme ☐	
DIRECT	Embers / Burning Debris	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
DIRECT	High/Erratic Fire Driven Wind	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Debris Production / Accumulation	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Surface Fire	Very Low ☒	Low ☐	Moderate ☐	High ☐	Extreme ☐	
INDIRECT	Tree Strike / Obstruction	Very Low ☐	Low ☐	Moderate ☐	High ☒	Extreme ☐	
INDIRECT	Consequential (Secondary) Fire	Very Low ☐	Low ☒	Moderate ☐	High ☐	Extreme ☐	

Note 1: Refer to Appendix 1 for explanatory and supporting information.

Note 2: Refer to Appendix 2 for explanatory and supporting information.

Note 3: Refer to Appendix A1.3.3 for explanatory and supporting information. 'Inherent' accounts for all currently implemented bushfire protection measures and those planned to be implemented. 'Residual' additionally accounts for bushfire protection measures recommended to be implemented by the bushfire consultant.

6 BUSHFIRE RISK MANAGEMENT – PROTECTION MEASURE IMPLEMENTATION ASSESSMENTS

BUSHFIRE RISK MANAGEMENT MECHANISMS

Effective bushfire risk management mechanisms are needed to direct the implementation of required and recommended bushfire protection measures and ensure they continue to be maintained as effective measures.

To assist planners and managers to navigate this space, Bushfire Prone Planning divides the risk management mechanisms into:

- Mandatory mechanisms; and
- Informative mechanisms – although there will be some crossover.

Mandatory Mechanisms: Are those developed by relevant government authorities to establish required minimum protection measures and will require compliance. Some apply to both existing and future operations (use of sites), while others are primarily directed at future development. They include:

- Operating Regulations and Standards where part of the content will have direct relevance to a fire event;
- Construction Standards for buildings in bushfire prone areas; and
- Planning guidelines/overlays establishing certain minimum requirements (including producing a 'Planning' Bushfire Management Plan for planning applications).

Informative Mechanisms: Are those documents that detail the recommended and/or required actions and operational responsibilities as bushfire protection measures to be implemented for a specific site and its use. All bushfire protection measures and their detail, are initially identified through the application of the risk assessment process as:

- Currently existing (fully or partly);
- Required to be implemented;
- Recommended to be implemented; and
- Will have a recommended implementation priority rating.

The Bushfire Risk Report can present the required bushfire protection measure information in two formats:

1. As recommendations and advice at various stages of planning and development to assist with initial planning, initial design, construction, extension, change of use, or just improving on existing resilience to bushfire - as relevant to the identified element(s) at risk; and/or
2. As the specific protection measures that are to be incorporated into required site operations documents and possibly co-ordinated by an overarching 'Operational' Bushfire Management Plan (as distinct from a 'Planning' BMP) when applicable.

Each protection measure will be subject to consideration by the persons responsible for the site and its use regarding their decision to implement it, after evaluating their own required operational outcomes and any operational constraints. The key benefit provided by the bushfire risk report being they can now also evaluate the potential impact of their decisions on the residual bushfire risk. The site operations documents will vary according to site use and management requirements and can include:

- A local government's planning scheme.
- Site Operations Procedures.
- Annual Site Works Program.
- Prescribed Burning Guide.
- Site Emergency Plan / Guide / Evacuation Plan / Bushfire Emergency Plan

6.1 INFORMATIVE MECHANISMS – ASSESSMENT AGAINST NON-MANDATORY GUIDANCE

6.1.1 APPLICABLE PLANNING GUIDELINES (PLANNING STANDARDS)

APPLICABLE PLANNING DOCUMENTS
Design Guidelines and Model Requirements for Renewable Energy Facilities v4.4 Victorian Country Fire Authority – Specialist Risk and Fire Safety Unit (June 2025).

6.1.1.1 COMPLIANCE ASSESSMENT

COMPLIANCE WITH THE RELEVANT ACCEPTABLE SOLUTIONS
The Planning Document/s The applicable planning documents establish packages of bushfire protection measures that are to be applied, each with different sets of specifications and requirements to be satisfied and applied to different types of development or use with appropriate variations. The aim of these is to provide for the protection of human life and minimise impacts on property from the threats of bushfire, while having due regard to development potential, site characteristics and protection of the environment. The bushfire protection measures are typically grouped under a common and specific purpose. Each purpose has: 1. A performance outcome, objective, criteria or intent to be met (satisfied); and 2. Provides for two pathways to satisfy the required performance: a) Prescriptive measures and their requirements as acceptable solutions (approved measures); or b) The ability to develop an alternative solution. The Compliance Assessment The assessment will consist of: 1. Identification of the relevant development type/use associated with the subject site. 2. Identify if the Design Advice or Model Requirement criteria is relevant within the context of the Western Australian Planning System. 3. Where a Design Advice or Model Requirement criteria is relevant: a. Determine whether the existing planning or design of the proposed development complies with the criteria or its intent; or b. Provide recommendations for the proposed development to meet the criteria or its intent; or c. Detail why the measure is not or cannot be met. 4. Potential alternative solutions may be provided, but this is applied as a 'Modification' as there is no body or process for consultation/verification that the alternative meets the intent of the criteria.

Following prior requests of DFES Land Use Planning, a separate report provides the assessment of alignment with the *Design Guidelines and Model Requirements for Renewable Energy Facilities v4.4*. See *241243 – Kojonup BESS (CFA) v1.1* (Bushfire Prone Planning, May 2026).

6.2 INFORMATIVE MECHANISMS – GUIDANCE FOR THE APPLICATION OF ALL BUSHFIRE PROTECTION MEASURES

6.2.1 BUSHFIRE HAZARD THREAT REDUCING MEASURES

BUSHFIRE HAZARD THREAT REDUCING PROTECTION MEASURES [1] **All Implemented ('Existing' & 'Planned') and 'Additionally Recommended' Protection Measures**			IDENTIFICATION OF **'ADDITIONALLY RECOMMENDED'** (EXTRA) MEASURES AND THEIR IMPLEMENTATION PRIORITY		APPLICATION GUIDANCE Identification of the Document(s) Recommended to Contain the Applicable Protection Measures							
			EXTRA MEASURE	PRIORITY RATING [2]	DOCUMENTS REQUIRED FOR PLANNING FUTURE DEVELOPMENT AND/OR RETROFIT		OPERATIONAL DOCUMENTS RELEVANT TO SITE USE					
The Protection Mechanism	Ref No	Brief Description [1]			Bushfire Manage. Plan (Planning)	Inform Design & Construct	External Agreement	Site Operations Procedures	Emergency Services Manifest	Site Emergency Plan/Guide	Site Works	Staff Inductions and Training
Prevent bushfire ignition by managing heat energy sources	1.9	Management of Planned Revegetation	✓	Medium	✓	✓						
	1.10	Robust and effective site operational procedures	✓	Medium				✓			✓	✓

[1] The full description of each bushfire protection measure, the detail of the assessment and any recommendation, is presented in Section 5.1.4.
[2] Refer to Appendix A1.2.5 for implementation priority rating explanation.

6.2.2 EXPOSURE REDUCING MEASURES – ALL STRUCTURES

ALL STRUCTURES EXPOSURE REDUCING PROTECTION MEASURES [1] **All Implemented ('Existing' & 'Planned') and 'Additionally Recommended' Protection Measures**			IDENTIFICATION OF **'ADDITIONALLY RECOMMENDED'** MEASURES AND THEIR IMPLEMENTATION PRIORITY		APPLICATION GUIDANCE Identification of the Document(s) Recommended to Contain the Applicable Protection Measures							
					PLANNING FUTURE DEVELOPMENT		OPERATIONAL – AS RELEVANT TO SITE USE					
The Protection Mechanism	Ref No	Brief Description [1]	EXTRA MEASURE	PRIORITY RATING [2]	Bushfire Manage. Plan (Planning)	Inform Design & Construct	External Agreement	Site Operations Procedures	Emergency Services Manifest	Site Emergency Plan/Guide	Site Works	Staff Inductions and Training
Establish sufficient separation from relevant bushfire hazard threats	4.3 5.2 6.3 8.3	Landscaping - asset protection zone (APZ)	✓	Highest	✓	✓		✓			✓	
	4.4 6.4 8.4	Landscaping - tree location	✓	Lowest		✓					✓	
	4.7 5.3 6.7 8.7	Separation from stored and constructed combustible items	✓	High				✓				✓
Establish shielding from relevant bushfire hazard threats	4.12 6.12 8.12	Shield operation critical non-structural elements	✓	Medium		✓						

[1] The full description of each bushfire protection measure, the detail of the assessment and any recommendation, is presented in Sections 5.3.3 & 5.3.4 & 5.3.5 & 5.3.6.
[2] Refer to Appendix A1.2.5 for implementation priority rating explanation.

6.2.3 VULNERABILITY REDUCING MEASURES – PERSONS

PERSONS VULNERABILITY REDUCING PROTECTION MEASURES [1] **All Implemented ('Existing' & 'Planned') and 'Additionally Recommended' Protection Measures**			IDENTIFICATION OF **'ADDITIONALLY RECOMMENDED'** MEASURES AND THEIR IMPLEMENTATION PRIORITY		APPLICATION GUIDANCE Identification of the Document(s) Recommended to Contain the Applicable Protection Measures							
					PLANNING FUTURE DEVELOPMENT		OPERATIONAL – AS RELEVANT TO SITE USE					
The Protection Mechanism	Ref No	Brief Description [1]	EXTRA MEASURE	PRIORITY RATING [2]	Bushfire Manage. Plan (Planning)	Inform Design & Construct	External Agreement	Site Operations Procedures	Emergency Services Manifest	Site Emergency Plan/Guide	Site Works	Staff Inductions and Training
Provision of bushfire emergency information and education	9.3	Develop a bushfire emergency plan	✓	High					✓	✓		✓
	9.6	Direct to persons emergency messaging system	✓	Medium								✓
	9.10	Build community resilience through education	✓	Medium								
Lower risk road construction (design and materials)	Persons on Access / Egress Routes in Vehicles											
	10.7	Interconnected road network to provide route options	✓	Medium		✓				✓		

[1] The full description of each bushfire protection measure, the detail of the assessment and any recommendation, is presented in s5.4.1 and s5.4.2.
[2] Refer to Appendix A1.2.5 for implementation priority rating explanation.

6.2.4 VULNERABILITY REDUCING MEASURES – ALL STRUCTURES

ALL STRUCTURES VULNERABILITY REDUCING PROTECTION MEASURES [1] **All Implemented ('Existing' & 'Planned') and 'Additionally Recommended' Protection Measures**			IDENTIFICATION OF **'ADDITIONALLY RECOMMENDED'** MEASURES AND THEIR IMPLEMENTATION PRIORITY		APPLICATION GUIDANCE Identification of the Document(s) Recommended to Contain the Applicable Protection Measures							
					PLANNING FUTURE DEVELOPMENT		OPERATIONAL – AS RELEVANT TO SITE USE					
The Protection Mechanism	Ref No	Brief Description [1]	EXTRA MEASURE	PRIORITY RATING [2]	Bushfire Manage. Plan (Planning)	Inform Design & Construct	External Agreement	Site Operations Procedures	Emergency Services Manifest	Site Emergency Plan/Guide	Site Works	Staff Inductions and Training
Construction design and materials	11.1	Construct to AS 3959:2018	✓	High		✓						
	11.3 13.3 15.3	Construction materials for external and internal cavity building elements	✓	Lowest		✓						
	11.5 13.5 15.5	Construction design/materials resistant to high wind damage	✓	Lowest		✓						
	11.11 13.11 15.11	Minimise construction cavities to minimise debris and ember accumulation	✓	Highest		✓						
	11.12 13.12 15.12	Minimise external openings to limit flame / radiant heat / ember / debris entry	✓	Medium		✓						
	11.13 13.13 15.13	Screen and seal gaps and penetrations	✓	Medium		✓						
	11.14 13.14 15.14	Screen external doors and windows	✓	Lowest		✓						

ALL STRUCTURES VULNERABILITY REDUCING PROTECTION MEASURES [1] **All Implemented ('Existing' & 'Planned') and 'Additionally Recommended' Protection Measures**			IDENTIFICATION OF **'ADDITIONALLY RECOMMENDED'** MEASURES AND THEIR IMPLEMENTATION PRIORITY		APPLICATION GUIDANCE Identification of the Document(s) Recommended to Contain the Applicable Protection Measures							
					PLANNING FUTURE DEVELOPMENT		OPERATIONAL – AS RELEVANT TO SITE USE					
The Protection Mechanism	Ref No	Brief Description [1]	EXTRA MEASURE	PRIORITY RATING [2]	Bushfire Manage. Plan (Planning)	Inform Design & Construct	External Agreement	Site Operations Procedures	Emergency Services Manifest	Site Emergency Plan/Guide	Site Works	Staff Inductions and Training
	13.16 15.16	Construction materials for critical non-structural elements	✓	Lowest								
Availability of a firefighting response capability	11.16 12.2 13.17 15.17	Firefighting water supply	✓	Highest	✓	✓			✓	✓	✓	
	11.17 12.3 13.18 15.18	Firefighting equipment actively operated	✓	Medium		✓				✓		✓
	11.18 13.19 15.19	Firefighting equipment passively operated	✓	Highest		✓			✓			✓
	11.19 13.20 15.20	Firefighting equipment operability maintained	✓	High		✓						
Manage and maintain effectiveness of applied protection measures	11.21 12.7 13.22 15.22	Formal documents created to guide and enforce management	✓	Medium				✓				✓
[1] The full description of each bushfire protection measure, the detail of the assessment and any recommendation, is presented in Sections 5.4.3 & 5.4.4 & 5.4.5 & 5.4.6.												

ALL STRUCTURES VULNERABILITY REDUCING PROTECTION MEASURES [1] **All Implemented ('Existing' & 'Planned') and 'Additionally Recommended' Protection Measures**			IDENTIFICATION OF **'ADDITIONALLY RECOMMENDED'** MEASURES AND THEIR IMPLEMENTATION PRIORITY		APPLICATION GUIDANCE Identification of the Document(s) Recommended to Contain the Applicable Protection Measures							
					PLANNING FUTURE DEVELOPMENT		OPERATIONAL – AS RELEVANT TO SITE USE					
The Protection Mechanism	Ref No	Brief Description [1]	EXTRA MEASURE	PRIORITY RATING [2]	Bushfire Manage. Plan (Planning)	Inform Design & Construct	External Agreement	Site Operations Procedures	Emergency Services Manifest	Site Emergency Plan/Guide	Site Works	Staff Inductions and Training
[2] Refer to Appendix A1.2.5 for implementation priority rating explanation.												

APPENDIX 1: THE APPLIED RISK ASSESSMENT PROCESS

A1.1 THE RELEVANT RISK

For this Bushfire Risk Report, the relevant risk is associated with a bushfire event and is the potential for loss of life, injury, or destroyed or damaged assets. The potential outcomes of this risk are personal loss and/or the economic loss associated with the disruption of services and/or the necessary repair or replacement of buildings and infrastructure.

While this risk can be captured by the generic term of 'Bushfire Risk", this term is typically also used to refer to the chance (probability) of a bushfire event occurring and for which consideration of the likelihood of the ignition of vegetation fuels would be required.

However, the risk assessment process adopted in this report does not consider the likelihood of bushfire ignition. Instead, in applying a largely subjective assessment approach, the pragmatic assumption that a bushfire will occur is made. The rationale for this approach is explained in Appendix A1.3.7.

Consequently, in this risk report, the relevant risk will be referred to as the risk associated with a bushfire event.

A1.2 THE RISK ASSESSMENT FRAMEWORK

To conduct the risk assessment, Bushfire Prone Planning (BPP) has adapted the concept for 'Understanding Disaster Risk' as recognised by the United Nations Office for Disaster Risk Reduction [46] and presented in Figure A1.1. This concept is also applied by CSIRO within their Bushfire Best Practice Guide [48].

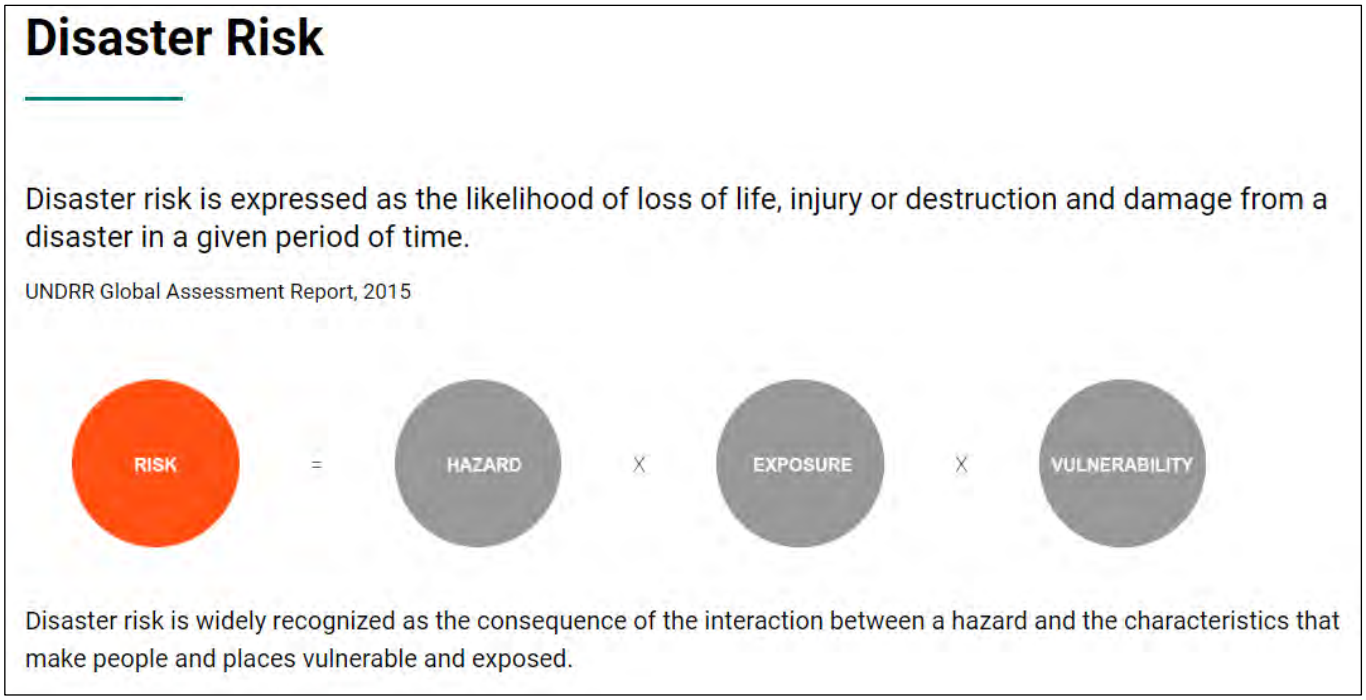


Figure A1.1: Concept for 'Understanding Disaster Risk' as recognised by the UN Office for Disaster Risk Reduction.

In applying this concept, bushfire risk can be considered a consequence of the interaction of bushfire hazard threats and the exposure and vulnerability of the elements at risk from those threats (i.e., the 'exposed elements' which can include various classes of persons and/or property).

The application of available bushfire protection measures will lower the level of risk associated with a bushfire by either:

1. Reducing the number and/or level of hazard threats; and/or
2. Reducing the level of exposure and/or vulnerability of the identified elements at risk.

Additional detail of the application of the risk assessment framework is presented in Figure A1.2 and Figure A1.3 on the following pages. Refer to the glossary for terminology information.

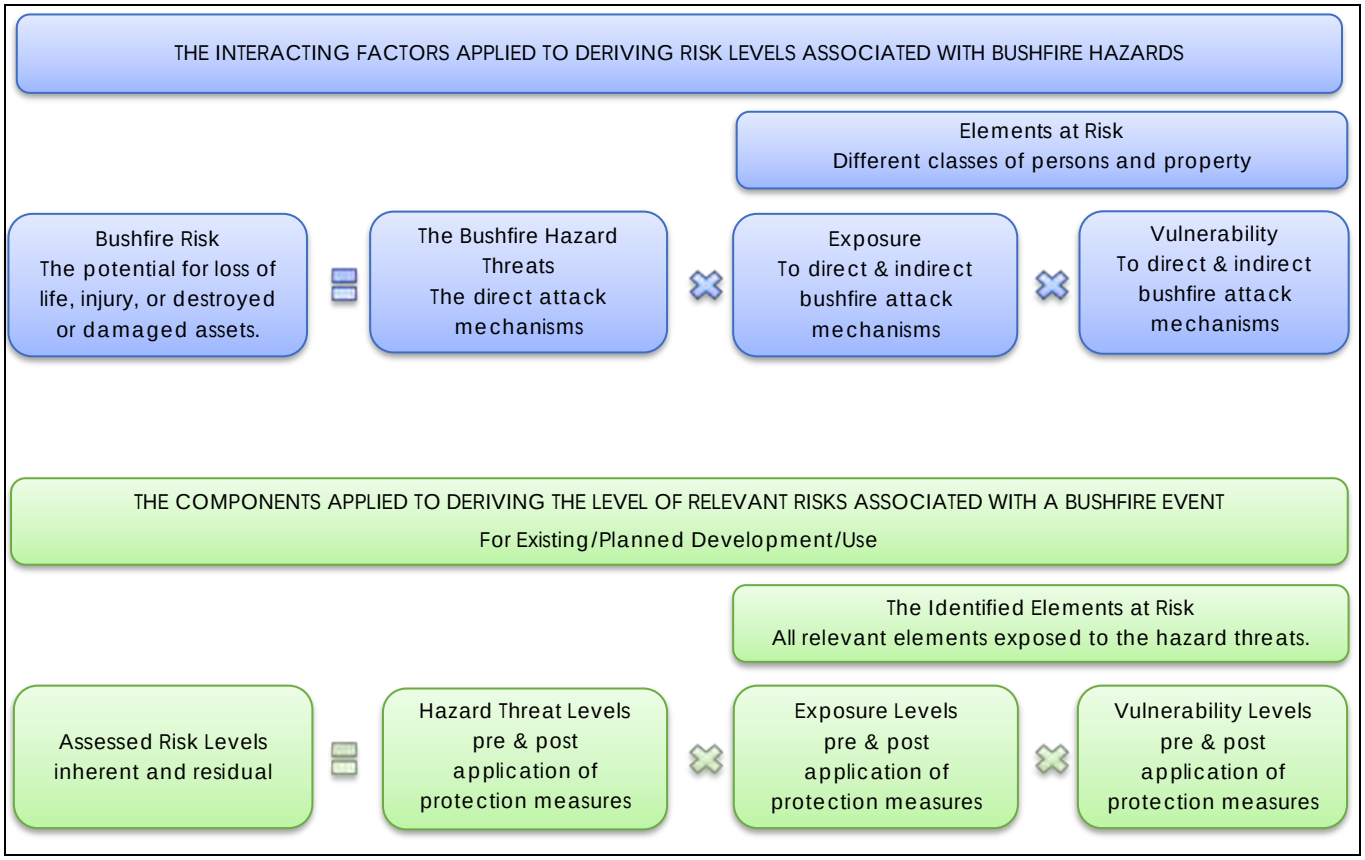


Figure A1.2: The framework of the applied bushfire risk assessment process.

Identify the Bushfire Hazard	Bushfire is a natural hazard and the common term for forest, scrub, shrub, and grass fire. It can exist in any vegetation (identified as the 'hazard') that establishes an ongoing source of readily combustible materials within and surrounding subject land, The bushfire hazard presents threats. These are the direct attack mechanisms (flame contact, radiant heat transfer, ember/burning debris attack, high/erratic fire driven wind) and indirect attack mechanisms (debris production/accumulation, surface fire, tree strike/obstruction, consequential fire). Identify and categorise surrounding vegetation based on a defined set of physical criteria. Each category has an associated 'Potential Threat Level' range.
Assess Hazard Threat Levels	Assess the existence of relevant physical factors in the surrounding landscape that can significantly change bushfire behaviour, intensity and the levels of each bushfire hazard threat and consequently the threat level for each identified category of vegetation. This assessment identifies how the threat level should be 'modified' (i.e., increased or decreased) within its potential range and derives a threat level that is to apply as the 'base' threat level, prior to application of any bushfire protection measures. Conduct a qualitative protection measure analysis that considers how many of all available bushfire protection measures - that can reduce threat levels - are and can be applied. The effectiveness of each measure at reducing threat levels is considered as part of the analysis. Apply the outcome to the derivation of 'Inherent' and 'Residual' threat levels.
Identify the Elements at Risk	Identify all relevant site specific elements 'exposed' to the bushfire hazard. These can include persons in different settings, buildings, structures, temporary accommodation, infrastructure and other physical assets.
Assess Exposure Levels	Conduct a qualitative protection measure analysis that considers how many of all bushfire protection measures available to reduce exposure levels (of an element at risk to bushfire threats), are and can be applied. Consideration of the effectiveness of each measure at reducing exposure levels is part of the analysis. Apply the outcome to the derivation of 'Inherent' and 'Residual" exposure levels.
Assess Vulnerability Levels	Conduct a qualitative protection measure analysis that considers how many of all bushfire protection measures available to reduce vulnerability levels (of an element at risk to bushfire threats), are and can be applied. Consideration of the effectiveness of each measure at reducing vulnerability levels is part of the analysis. Apply the outcome to the derivation of 'Inherent' and 'Residual' vulnerability levels.
Derive the Bushfire Risk Levels	There are potential risks associated with a bushfire hazard and a bushfire event. These include the loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Derive 'Inherent' and 'Residual' risk levels (for each element at risk) from the derived threat, exposure and vulnerability levels by reference to the risk matrix.
State the Risk Tolerability	Derive the tolerability rating by applying the risk tolerance scale. The tolerability scale is based on the 'As Low as Reasonably Practical' (ALARP) principle.

Figure A1.3: Detail of applied bushfire risk assessment process.

A1.3 RISK ANALYSIS EXPLANATORY GUIDANCE

The risk analysis will derive risk levels as the outcome of the assessment. The risk level analysis can be conducted for either each element at risk separately and/or the proposed or existing development/use overall.

Different labels are applied to reported risk levels to indicate how they have been derived and what they refer to. These labels are:

1. The labels **'Indicative Risk Level'** and **'Determined Risk Level'** are used to identify what methodology has been applied in conducting the risk analysis. (Note: This Bushfire Risk Report does not derive 'determined' risk levels (but information is included to explain why this is not possible); and
2. The labels **'Inherent Risk'** and **'Residual Risk'** are used to identify the point in time for which the risk level is being reported i.e., the existing state or a future state.

Additional detail is provided in the following sections and in the Glossary.

A1.3.1 INDICATIVE RISK – APPLICATION JUSTIFICATION AND DERIVATION

Deriving 'Indicative Risk Levels' requires conducting a qualitative assessment. This establishes a subjective understanding of the level of risk that potentially exists and is intended to inform and assist with making planning and operational decisions.

The indicative risk level is derived from a mostly qualitative assessment of the site (some components of the assessment are quantitative in nature), the existing or planned development/use, the assessment of observable physical facts and the knowledge and relevant experience of the bushfire practitioner. The outcome is the provision of an informed and justifiable opinion regarding the levels of risk associated with a bushfire event.

This is an applicable and valuable process when the quantitative information required to derive a 'determined' risk level is either not available or is not possible to generate for practical or economic reasons. Refer to Appendix A1.3.2 for explanatory information.

JUSTIFICATION OF QUALITATIVE ANALYSIS APPROACH

Justification for deriving 'indicative' risk levels is based on the following assumptions:

1. There is a limited number of 'bushfire protection mechanisms' that can be applied to reducing hazard threats and the exposure and vulnerability of at risk elements.
2. There will be a range of individual bushfire protection measures associated with each 'protection mechanism'. The number of available protection measures for each 'protection mechanism' will vary dependent on the specifics of the site and its use, including scale, but effectively these will also have a practical limit.
3. Individual bushfire protection measures will vary in their standalone effectiveness at reducing hazard threat levels and reducing the exposure and vulnerability levels of elements at risk (refer to A1.2.4).
4. The greater the number of effective bushfire protection mechanisms and associated measures that can be applied, the lower the indicative risk level will be.

DERIVATION OF THE INDICATIVE RISK LEVEL

For a given site/development/use, an indication of the level of risk associated with a bushfire event and its tolerability is derived by:

1. Assessing the 'indicative' hazard threat levels and the 'indicative' exposure and vulnerability levels of elements at risk by:
    a) Assessing the potential levels of threat presented by the direct and indirect bushfire attack mechanisms of the identified bushfire hazard;
    b) Assessing how many bushfire protection mechanisms and their associated protection measures are applicable and can be applied, compared to the total available; and
    c) Applying an effectiveness weighting to each protection measure.
2. Derive the indicative risk level by applying the risk matrix presented in Table A1.1;

3. Establish the tolerability of the risk by applying the 'As Low as Reasonably Practicable' (ALARP) principle and associated risk tolerance scale (refer to Appendix A1.2.5).

Table A1.1: Risk matrix for deriving indicative risk levels from the assessed potential hazard threats levels, and the potential exposure and vulnerability levels of elements at risk.

INDICATIVE RISK LEVEL MATRIX						
Potential Threat Level (a)	Potential Exposure Level (b)	Potential Vulnerability Level (c)				
		Very Low (1)	Low (2)	Moderate (3)	High (4)	Extreme (5)
Very Low (1)	Very Low (1)	VL1	VL2	VL3	L4	L5
	Low (2)	VL2	VL3	L4	L5	L6
	Moderate (3)	VL3	L4	L5	L6	M7
	High (4)	L4	L5	L6	M7	M8
	Extreme (5)	L5	L6	M7	M8	H9
Low (2)	Very Low (1)	VL2	VL3	L4	L5	6
	Low (2)	VL3	L4	L5	L6	M7
	Moderate (3)	L4	L5	L6	M7	M8
	High (4)	L5	L6	M7	M8	H9
	Extreme (5)	L6	M7	M8	H9	H10
Moderate (3)	Very Low (1)	VL3	L4	L5	L6	M7
	Low (2)	L4	L5	L6	M7	M8
	Moderate (3)	L5	L6	M7	M8	H9
	High (4)	L6	M7	M8	H9	H10
	Extreme (5)	M7	M8	H9	H10	H11
High (4)	Very Low (1)	L4	L5	L6	M7	M8
	Low (2)	L5	L6	M7	M8	H9
	Moderate (3)	L6	M7	M8	H9	H10
	High (4)	M7	M8	H9	H10	H11
	Extreme (5)	M8	H9	H10	H11	E12
Extreme (5)	Very Low (1)	L5	L6	M7	M8	H9
	Low (2)	L6	M7	8M	H9	H10
	Moderate (3)	M7	M8	H9	H10	H11
	High (4)	M8	H9	H10	H11	E12
	Extreme (5)	H9	H10	H11	E12	E13

Risk level key: VL = very low, L = low, M = moderate, H = high, E = extreme.
The qualitative relative levels are assigned a numerical value.
The risk value is calculated as = (a + b + c) – 2 and range from 1 (lowest) to 13 (greatest).
The irisk levels are derived from an assigned a numerical range: very low = 1-3, low = 4-6, moderate = 7-8, high = 9-11, extreme = 12-13.

A1.3.2 DETERMINED RISK – APPLICATION LIMITATIONS

IMPORTANT: THIS BUSHFIRE RISK REPORT DOES NOT DERIVE DETERMINED BUSHFIRE RISK LEVELS.

Deriving 'determined' risk levels requires conducting a quantitative assessment. This establishes an objective understanding of the level of risk that potentially exists and is intended to inform and assist with making planning and operational decisions.

The key difference from an 'indicative' risk level assessment is the requirement to apply a quantitative set of risk factor criteria against which hazard threat levels and the exposure and vulnerability levels of identified elements at risk to these threats can be objectively assessed.

These risk factor criteria would be developed and supported by a relevant government authority (exercising their responsibility), accepted by persons relying on the assessment and be available for the assessor to use. In addition, the corresponding risk level matrix and the risk tolerability scale are required.

It is necessary that:

1. The risk factor criteria reflect society's and/or community's expectations and preparedness/capacity to tolerate risk;
2. The information is standardised to the greatest extent possible so that it provides an accepted basis from which the determined risk level can be derived and be relied upon in making decisions;
3. The corresponding risk level matrix and the risk tolerability scale are developed to derive a risk level and tolerance level from the derived threat, exposure, and vulnerability levels; and
4. Responsibility for development of the reference information is not left to individual assessors who have varied expertise, qualification, and no approved responsibility to provide such information. Such an approach would not result in consistent and reliable assessment outcomes.

Limitations: Where the required reference information (that is researched, effective, functional and acceptable) has not been established and provided by the responsible authorities, determined risk levels cannot be derived.

RISK FACTOR CRITERIA

The required risk factor criteria would need to establish:

- What factors are to define the different 'determined' levels of hazard threats;
- What factors are to define the different 'determined' levels of exposure of elements at risk; and
- What factors are to define the different 'determined' levels of vulnerability of elements at risk.

RISK LEVEL MATRIX

The matrix would need to establish how the 'determined' levels of threat, exposure and vulnerability are to be applied in deriving the 'determined' risk level. Different sets of matrices to account for different development types, uses and scales would likely be required.

Different development types, uses and scales are potentially capable of tolerating different levels of risk and still be considered by the relevant authority (who are reflecting the understood society/community position), to remain acceptable or at least tolerable.

RISK TOLERANCE SCALE

After the 'determined' risk level has been derived after an assessment applying the risk factor criteria and the risk level matrix, a methodology is required to classify the risk level as either unacceptable, tolerable or acceptable.

A1.3.3 INHERENT AND RESIDUAL RISK

In this Bushfire Risk Report, inherent risk is current situation risk after accounting for bushfire protection measures that are either already in place (for existing development/use) and/or are currently planned to be incorporated into the proposed development/use.

Inherent risk levels are derived before the application of any additional protection measures that have been identified and recommended by the bushfire consultant, and which subsequently determines the residual risk. If there are none, the residual risk is the same as the inherent risk. Refer to the Glossary for additional supporting information.

A1.3.4 PROTECTION MEASURE EFFECTIVENESS RATINGS

DERIVING AN EFFECTIVENESS RATING

As part of the qualitative risk assessment process, an effectiveness rating, established by the application of this table, is applied to each bushfire protection measure. The rating weights each bushfire protection measure's ability to reduce a hazard's threat levels or reduce the exposure and/or vulnerability levels of the elements at risk.

The greater the effectiveness the greater the contribution of a protection measure to the reduction in levels of risks associated with a bushfire event. It is also an important factor applied to the determination of the bushfire protection measure's implementation priority.

The effectiveness ratings incorporate the qualities of:

1. Independent/Dependent: A qualitative assessment of the extent to which a protection measure can reduce threat, exposure and vulnerability levels as a standalone measure as opposed to only providing an additive reduction by being a part of a package of protection measures; and
2. Risk Reduction Potential: A qualitative assessment of a protection measure's capacity to reduce the levels of risks associated with a bushfire event as a standalone risk measure.

The rating methodology assumes the greater the independence and risk reduction potential of a bushfire protection measure, the greater its effectiveness.

DERIVING EFFECTIVENESS RATINGS FOR BUSHFIRE PROTECTION MEASURES	
Rating	Protection Measure Characteristics and Capability
Very High	Very significant risk reduction as an independent (standalone) measure. Impact on risk reduction is immediate and persistent in all scenarios. A priority measure to be implemented wherever possible.
High	Material risk reduction as an independent (standalone) measure;
Medium	Alone the measure will have limited impact on risk reduction. It is dependent on providing additive value when combined with other protection measures to create a 'package' of bushfire protection measures.
Not Relevant	The measure is not relevant to the type of development/use. This is different to not being able to be applied – it is just not relevant to any configuration of the subject development/use.

A1.3.5 PROTECTION MEASURE IMPLEMENTATION PRIORITY RATINGS

The effectiveness of a bushfire protection measure at reducing 'relative' threat, exposure and vulnerability levels, is the primary determinant of the implementation priority rating (refer to Section A1.2.3 for effectiveness rating explanation).

However, the implementation priority rating, corresponding to each effectiveness rating, can be modified with appropriate consideration of factors that may constrain the implementation and ongoing management of the measure. A justifiable weighting for each of the factors may be incorporated into the assessment for differing scenarios, either by the consultant or applied later by the landowner/operator with their greater knowledge of specific factors.

The matrix is applied qualitatively to the determination of the implementation priority rating that will apply to a recommended bushfire protection measure in this Bushfire Risk Report.

DERIVING THE IMPLEMENTATION PRIORITY FOR BUSHFIRE PROTECTION MEASURES									
Derived Implementation Priority Rating	Primary Determinant Effectiveness Rating	Secondary Determinants - Constraints to Implementation and Management [less constraints = potentially higher implementation priority and vice versa]							
		Restrictions from Government / Regulations	Owner / Operator Acceptance	Community Acceptance	Control of Land Restrictions	Financial Cost / Affordability	Knowledge and Ability to Apply Protection Measure	Practicality and Ease of Implementation	Requirement for Ongoing Implementation and Management
Highest	Very High	No Constraints	Likely Alignment with Management Intent & Values	Likely Majority Accept	No Constraints	Likely Within Current Resource Capacity	Past / Current Application Experience	Well Within Existing Capabilities	None - Passive
High	High								
Medium	Medium	Significant Constraints	Likely Strong Conflict with Management Intent & Values	Likely Majority Do Not Accept	Significant Constraints	Unlikely to be Affordable	None – Extensive Education / Training Required	Not Practical	Necessary - Active
Lowest									

A1.3.6 DETERMINATION OF BUSHFIRE RISK LEVEL TOLERANCE

The application of a risk tolerance scale is necessary to:

1. Identify which exposed elements must be given priority for the development and application of bushfire protection measures; and
2. When planning approval is being sought, to identify if the residual risk levels can be considered as tolerable or acceptable and therefore potentially be approved for this factor.

THE APPLIED TOLERANCE SCALE

The risk tolerance scale applied in this Bushfire Risk Report is presented in Table A1.2. It incorporates the application of the 'As Low as Reasonably Practicable' (ALARP) Principle. An overview of this principle and justification for its application is presented on the following pages.

Table A1.2: The applied risk tolerance scale

<table>
<tr><th colspan="4">THE APPLIED RISK TOLERANCE SCALE - INCORPORATING THE ALARP PRINCIPLE</th></tr>
<tr><th>Risk Level</th><th colspan="2">Tolerability Description and Action Required</th><th>Risk Tolerance Level[1]</th></tr>
<tr><td>Extreme</td><td colspan="2">The risks are unacceptable and require immediate implementation of risk management measures to eliminate or reduce risk to tolerable or acceptable levels.
Proposed development giving rise to risks in this region would not be approved unless there are exceptional reasons for the development to proceed.</td><td>Unacceptable</td></tr>
<tr><td>High</td><td>The risks are the most severe that can be tolerated but not unduly high. They require monitoring in the short term as risk management measures are likely to be needed in the short term given the intent should be to drive residual risk lower down the tolerable range where possible.</td><td rowspan="3">Tolerance Regions Subject to ALARP Principle</td><td>Intolerable
- if not ALARP-</td></tr>
<tr><td rowspan="2">Moderate</td><td rowspan="2">The risk is approaching an acceptable level. It can be tolerated and requires monitoring in the short to medium term. Need to consider potential changes over time in the risk and/or techniques for reducing/eliminating risk.
Risk management measures may be needed to reduce risk to more acceptable levels where possible – or accept the risk.</td><td>Tolerable
- if ALARP -</td></tr>
<tr><td>Tolerable
- if not ALARP -</td></tr>
<tr><td>Low</td><td colspan="2" rowspan="2">The risk is accepted as it is generally regarded as insignificant or adequately controlled by existing measures. No additional risk management measures will be required in the short to medium term other than monitoring.</td><td rowspan="2">Acceptable
- if ALARP -</td></tr>
<tr><td>Very Low</td></tr>
<tr><td colspan="4">[1] Refer to the glossary for definitions of the tolerance levels.</td></tr>
</table>

THE ADJUSTMENT OF RESIDUAL BUSHFIRE RISK LEVEL TOLERABILITY

Development/use scenarios can exist where a higher level of residual risk might be considered as tolerable or acceptable. Such a situation may exist when the exposed element is not persons and the economic cost due to the loss or damage of assets and/or disruption of services, is a risk that is retained by the owners as an informed decision.

Consideration of the knock-on risk implications to persons who might be associated with these elements, or other nearby elements at risk, will be part of the tolerability adjustment assessment.

There may also be isolated scenarios where the limits for tolerability of risk need to be established at lower residual risk levels i.e. an additional margin of safety is required. The rationale for any residual risk tolerance adjustment is presented below.

RATIONALE FOR THE ADJUSTMENT OF RISK TOLERANCE FOR PRPOSED DEVELOPMENT	
Relevant Element at Risk [Section 5.2]	Adjustment Rationale
Persons on access/egress routes in vehicles Internal access roads and driveways are the primary focus to ensure safe movement between asset locations and major external roads.	Persons onsite during a bushfire emergency will be Staff, Contractors, and Emergency Services, who will be aware of the local area and have their vehicles immediately available. A designated On-Site Shelter Building will be available, established in Measure 2.11 and 11.1. Evacuation is the primary emergency procedure and recommended, but an appropriate shelter location will exist. The tolerability for the residual risk will be adjusted for access/egress as evacuation may not be required.

THE ALARP PRINCIPLE

The 'As Low as Reasonably Practicable' (ALARP) Principle is based on the belief it is not possible to completely eliminate all risk involved, there will always be a certain level of risk remaining known as residual risk. The term is used to express the expected level of residual risk within a system, activity or, relevant to this document, within a proposed development/use, when good practice, judgement and duty of care are applied to decisions and operations.

The origins of the ALARP (As Low as Reasonably Practicable) principle are from United Kingdom case law and their regulatory framework. It is applied by their Health and Safety Executive (HSE) and is used by regulators and companies around the world as it provides a logical basis for managing risks.

The ALARP principle has been defined by the United Kingdom Health and Safety Executive (HSE-UK, 2001) to depict the concept that efforts to reduce risk should be continued until the incremental cost in doing so is grossly disproportionate to the value of the incremental risk reduction achieved (see figure). Incremental cost is defined in terms of time, effort, finance or other expenditure of resources – including loss of natural resources. Usually, each incremental reduction in risk will require a greater expenditure of resources.

This concept is depicted in Figure A3.1 where the triangle represents the decreasing risk and the diminishing proportional benefit as risk is reduced. There are also three regions shown in the figure into which general levels of residual risk can fall. The residual risk should fall either in the broadly acceptable region, or near the bottom of the tolerable region. This approach allows higher levels of safety to be provided where it is feasible.

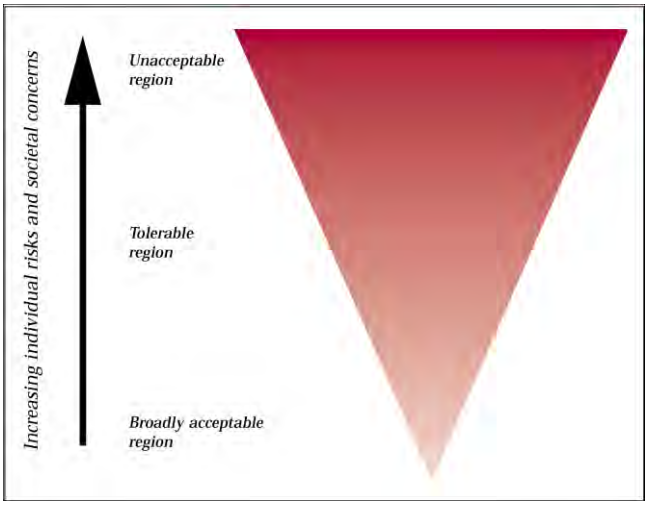


Figure A1.2: HSE framework for the tolerability of risk (source: HSE-UK, 2001)

Moving up the triangle from the region considered broadly acceptable, through a tolerable region (for which a greater range of risk can be considered), to an unacceptable region, represents increasing levels of 'risk' for a particular hazard or hazardous activity (determined through relevant risk analysis). Table A3.1 describes the risks that define each region.

Table A1.3: The risks associated with the risk tolerance regions (adapted from HSE-UK, 2001)

THE ALARP PRINCIPLE – DEFINING THE REGIONS OF RISK TOLERANCE	
Unacceptable Region	For practical purposes, a particular risk falling into this region is regarded as unacceptable whatever the level of benefits associated with the activity. Any activity, practice or use of land giving rise to risks falling in this region would, as a matter of principle, be not approved unless the activity or practice can be modified to reduce the degree of risk so that it falls in one of the regions below, or there are exceptional reasons for the activity, practice or use to be retained.
Tolerable Region	Risks in this region are typical of the risks from activities that people are prepared to tolerate in order to secure benefits, in the expectation that: • The nature and level of the risks are properly assessed, and the results used properly to determine control measures. The assessment of the risks needs to be based on the best available scientific evidence and, where evidence is lacking, on the best available scientific advice; • The residual risks are not unduly high and kept as low as reasonably practicable. This is the region to which the ALARP principle applies; and • The risks are periodically reviewed to ensure that they still meet the ALARP criteria, for example, by ascertaining whether further or new control measures need to be introduced to take into account changes over time, such as new knowledge about the risk or the availability of new techniques for reducing or eliminating risks. • In practice and where possible, the intent should be that residual risk continues to be driven down the tolerable range so that it falls either in the broadly acceptable region or is near the bottom of the tolerable region, in keeping with the duty to ensure health, safety and welfare so far as is reasonably practicable as per the ALARP principal.
Broadly Acceptable Region	Risks falling into this region are generally regarded as insignificant and adequately controlled. Regulators would not usually require further action to reduce risks unless reasonably practicable measures are available. The levels of risk characterising this region are comparable to those that people regard as insignificant or trivial in their daily lives. They are typical of the risk from activities that are inherently

	not very hazardous or from hazardous activities that can be, and are, readily controlled to produce very low risks.
Note: The risk tolerability framework is a conceptual model. The factors and processes that ultimately decide whether a risk is unacceptable, tolerable or broadly acceptable are dynamic in nature and are sometimes governed by the circumstances, time and environment in which the activity, practice or use occurs or is proposed. Standards change and public expectations vary between societies and change with time.	

APPLICATION OF THE ALARP PRINCIPLE IN AUSTRALIA

To contribute to justification for the use of the principle in this bushfire risk report, it is noted that the following Australian guidelines also apply adaptations of the principle:

- Australian Institute for Disaster Resilience, 2020; Land use Planning for Disaster Resilient Communities;
- WA Department of Mines, Industry Regulation and Safety, 2020; Petroleum safety and major hazard facility – guide. ALARP demonstration;
- NOPSEMA (Australia's offshore energy regulator), 2020; ALARP and risk assessment guidance notes;
- Department of Planning Lands and Heritage (DPLH), 2019; Coastal hazard risk management and adaptation planning guidelines;
- Planning Institute of Australia, 2015; National Land Use Planning Guidelines for Disaster Resilient Communities; and
- NERAG 2010, an earlier version of NERAG 2020, applied the ALARP Principle.

The following is taken from the 'National Land Use Planning Guidelines for Disaster Resilient Communities' (Planning Institute of Australia, 2015) and is also referred to in the document 'Land use Planning for Disaster Resilient Communities' (Australian Institute for Disaster Resilience, 2020).

> *Of relevance to planners in the NERAG is the ALARP principle and how it is used in evaluating risks. According to NERAG, the ALARP principle is applied to define boundaries between risks that are generally intolerable, tolerable or broadly acceptable. The ALARP principle will help to prioritise a risk hierarchy and determine which risks require action and which do not. Those that are broadly acceptable naturally require little, if any, action while risks that are at an intolerable level require attention to bring them to a tolerable level.*
>
> *According to NERAG, it is entirely appropriate and accepted practice that risks may be tolerated, provided that the risks are known and managed.*
>
> *The ALARP principle is particularly relevant to planners and other built environment professionals as it provides the means to categorise risks according to their severity, and to assign risk treatment options accordingly.*
>
> *It is important to note that the effect each hazard has on a community and its settlement is different, and therefore land use planning and building responses may not always be appropriate to treat the risk borne by a particular hazard. Equally, the effectiveness or strength of response provided by land use planning or building may not be sufficient to fully address the risk.*
>
> *In addition, it is likely that through a normal natural hazard management process a range of treatment measures will be proposed, tested and implemented to provide a comprehensive approach to risk treatment that may involve other measures working in concert with land use planning or building responses.*
>
> *The manner in which land use planning and building responses are deployed to treat specific instances of natural hazard risk will vary depending on location, information availability, community views, broader development intent for the settlement under analysis and the effect of complementary risk treatment measures.*
>
> *However, the ALARP principle provides a good reference for demonstrating the land use responses for the various ALARP risk categories. Generally speaking, in areas of intolerable risk the strongest land use*

planning and building responses should apply. Conversely, in areas of acceptable risk only minimal controls should apply, if at all.

The most complex risk category for which to prescribe treatment from a land use and building perspective is those areas of tolerable risk. Such risks in existing settlements may not be sufficiently concerning to warrant severe use restrictions or relocation, however they will need treatment over time to ensure the risk does not increase. Treatment options in this instance may include limiting vulnerable uses in this area, restricting significant intensification of development, and promoting resilient urban design. Such areas of tolerable risk are also best avoided from a greenfield perspective to limit increases in future risk and costs associated with infrastructure failure in these locations that could otherwise been avoided.

***

A1.3.7 ADDRESSING THE LIKELIHOOD OF A BUSHFIRE EVENT OCCURRING

USING THE QUALITATIVE RISK ASSESSMENT APPROACH (NOTE: APPLIED IN THIS BUSHFIRE RISK REPORT)

In applying a largely subjective approach, the pragmatic assumption that a bushfire will occur is made. It is assumed a bushfire can occur within any timeframe and could result in loss or life or injury, or unacceptable damage to property and or unacceptable disruption to services.

This approach acknowledges that the requirements for fire of fuel, ignition source and oxygen will always exist. That is:

- The fire fuels being considered will always be there unless physically removed permanently;
- A potential ignition source will always exist through lightning and/or human activities; and
- The potential for adverse fire weather conditions to exist at some point within each year will always be present.

Additionally, the subjective assessment of the site specific potential threat levels of the direct and indirect bushfire attack mechanisms associated with the bushfire hazard, by default and indirectly, effectively incorporate a likelihood component.

Also, consider scenarios when the costs of implementing the required bushfire protection measures to lower indicative risk to acceptable or tolerable levels is not excessive. In such cases a justifiably pragmatic approach is to implement these measures rather than just reduce the assessed and reported risk levels by accounting for a lower likelihood of a bushfire event occurring.

USING THE QUANTITATIVE RISK ASSESSMENT APPROACH (NOTE: NOT APPLIED IN THIS BUSHFIRE RISK REPORT)

A quantitative approach will necessarily be based on the historical record of past bushfire events and determining the mathematical probability of a future event. This approach is problematic to achieving increased bushfire resilience at all stages of existing or proposed development/use for these reasons:

- Historical data may not be available or have enough data sets to be accurate;
- Historical data does not account for future changes in climate that may result in a different occurrence period. Consequently, further assumptions need to be made;
- Siting, design and construction of development to resist bushfire threats is easier, more practical (and likely economical), to incorporate at initial planning stages, rather than the retro-implementation of protection measures, when the considered likelihood of events increases over time for various reasons or tolerance of risk decreases;
- Time spent conducting historical research, performing statistical calculations and modifying risk levels, apart from being costly, is likely better spent assessing potential threat, exposure and vulnerability levels and developing appropriate protection measures; and
- The likelihood of occurrence cannot modify the levels of hazard threats, exposure or vulnerability. It can only be applied to reduce the overall risk level. That is, it would be applied as a modifying factor via the established risk level matrix and not the established risk factor criteria.

  The validity of incorporating such a factor may be indicated when, despite the existence of vegetation that can burn, there are other mitigating physical conditions that exist at the specific site that make the likelihood of ignition and severity of bushfire behaviour very low. How this is applied would need to be established by the authority establishing the relevant risk level matrix.

***

DEFINING THE BUSHFIRE HAZARD AND ITS THREATS

THE BUSHFIRE

For this assessment, a bushfire is the unplanned burning of a fire in vegetation of any type and structure. It is applied as a generic term to refer to forest fires, scrub/shrub fires and grass fires, which have differences of behaviour (dependant on a range of variables), both within and between the vegetation types. Key fire behaviours include residence time, fireline intensities, rates of spread, flame lengths, and spotting i.e., ignition ahead of the fire front by embers/burning debris.

Note that grass fires are significantly different from fire in other vegetation types. This is recognised in the applied threat level assessment.

Compared to the behaviour of bushfires, grass fires are fast moving, have a much shorter duration, the embers produced are smaller and fewer in number (especially compared to forest fires), have a short duration time and consequently are mostly consumed within the grass fire's flame front.

Radiant heat flux levels drop more quickly with distance from the grass fuels. This can be observed in the application of AS 3959:2018 BAL determination methodology where 'Grassland' achieves a BAL-LOW rating at half the separation distance of all other classified vegetation (50m vs 100m).

The following statement encapsulates the different fire behaviours in grass fuels and their impact on threat levels compared to other vegetation types:

> *While pastures, crops and native grasslands often experience fast moving fires, their intensity is usually insufficient to justify a land use planning response (Justin Leonard et al, 2014: A new methodology for State-wide mapping of bushfire prone areas in Queensland, CSIRO, Australia)*

THE BUSHFIRE HAZARD

A bushfire hazard is the natural process/phenomenon of a bushfire event that gives rise to the associated risks of loss of life or injury or destroyed or damaged assets, which results in personal loss and economic loss.

The term bushfire hazard is necessarily applied to both the relevant vegetation as the source of the hazard and the bushfire event itself. This approach is aligned with the definition applied by the United Nations Office for Disaster Risk Reduction.

LAND USE PLANNING AND THE BUSHFIRE HAZARD THREATS TO BE ASSESSED

The bushfire hazard is a potential source of direct and indirect bushfire attack mechanisms (refer to A2.3 for additional information), that present threats to persons and property and give rise to the associated risks of loss of life or injury or destroyed or damaged assets.

Direct Attack Mechanisms: Of most relevance to land use planning are the bushfire threat levels generated by the direct attack mechanisms of:

- Flame contact;
- Radiant heat transfer; and
- Ember/burning debris attack.

Consequently, these are the bushfire hazard threats that are to be considered when assessing the potential bushfire hazard threat levels. Due consideration of winds generated by fire/terrain interactions, is applied when the physical requirements exist for development of landscape scale fire and extreme bushfire events.

Indirect Attack Mechanisms: The indirect attack mechanisms are considered within a risk assessment section of a Bushfire Risk Report when this is required, as the threat levels from these mechanisms is determined by the degree to which available bushfire protection measures are or will be implemented in mitigating risk.

FACTORS INFLUENCING BUSHFIRE BEHAVIOUR

There are three primary factors that influence the intensity, speed and spread of a bushfire. Any increase in these behaviours will result in greater threat levels, to exposed elements, from the bushfire attack mechanisms.

1. VEGETATION AND OTHER FUELS

Key characteristics that will influence fire behaviour include:

- Fuel size and shape – anything less than 6mm diameter/thickness is considered a fine fuel and will ignite and burn quickly. Larger/heavier fuels take longer to ignite but burn for longer, so the threat exists for longer;
- Fuel load – the quantity of available fuel (t/ha) will influence the size of the fire. In particular it is the fine fuel load that determines the intensity of the bushfire and the flame sizes. Vegetation type and period over which it can accumulate will determine fuel loads;
- Vegetation type – this influences the size, shape and quantity of available fuels. For bushfire purposes vegetation types include the classifications of forest, woodland, scrub, shrubland and grassland (with total fuel loads typically decreasing in that order);
- Fuel arrangement – will influence two factors of fire behaviour (1) the speed and intensity of burning and (2) how much of the total fuels are likely to be involved in the fire simultaneously. The first factor is a function of how densely packed or aerated the fuels are with the more available arrangement burning with greater intensity. The second factor is a function of the availability of 'ladder' fuels (i.e. near surface, elevated and bark fuels) to carry fire up the vegetation profile, and the continuity of fuels to carry the fuel across the land; and
- Fuel moisture content – drier fuels will ignite easily and burn quickly. The inherent moisture content of the vegetative fuels is a function of the vegetation type and arrangement and/or the positioning of the vegetation complex near readily available sources of moisture.

Greater quantities of finer, dryer, aerated and connected fuels will result in more severe behaviours and elevated bushfire threat levels. Large extents of vegetation (surrounding landscape scale) can have additional implications for the development of extreme bushfire events and the consequent increase in bushfire threat levels (refer to Appendix 3 for additional information).

2. WEATHER

Adverse fire weather that results in more severe behaviours and elevated threat levels includes strong winds, high temperatures, low relative humidity and extended periods of these factors.

Weather events at the surrounding landscape scale can have implications for the development of extreme bushfire events and consequent increase in bushfire threat levels (refer to Appendix 3 for additional information).

3. TOPOGRAPHY

The physical terrain can influence the severity of fire behaviour. At a local scale, it is the influence of ground slope on the rate a fire spreads, that is most relevant. Fire travels faster up slopes (rule of thumb is a doubling of speed for every 10 degrees increase in slope). Greater rates of spread increase fire intensity and the resultant threat levels.

At the surrounding landscape scale, the impact of topography can be significant and includes establishing the potential for development of certain dynamic fire behaviours that can lead to extreme bushfire events and elevated threat levels (refer to Appendix 3 for additional information).

BUSHFIRE THREATS - DIRECT ATTACK MECHANISMS
ORIGINATING FROM THE BUSHFIRE PRONE VEGETATION

FLAME CONTACT

When flames contact buildings/structures they can flow over, under and around – impacting surfaces not directly facing the bushfire. Flames can enter small gaps and crevices resulting in a significant threat to combustible internal parts of buildings/structures.

Flames will be longer when fine fuel loads are higher and will move faster up slopes and generally, slower down slopes.

Flame temperatures are highest in the lower parts of the flame and decrease towards the tip. The flame has two distinct regions - the lower solid body flame and the upper part that is a transitory flame (intermittently present). Both flame regions can damage structures.

Note: AS 3959:2018 *Construction of buildings in bushfire prone areas*, establishes both the construction requirements corresponding to each Bushfire Attack Level (BAL) and the methodology for determining a BAL. For a bushfire modelled using this methodology, the derived flame length only provides an estimate of the solid body flame length.

RADIANT HEAT TRANSFER

This heat is produced from combustion of a fuel source, radiates in all directions from the fire and can potentially be felt from hundreds of meters away.

The amount of heat that a fire can transfer to other objects, through radiation, is influenced by its flame size and flame temperature. These are a function of the characteristics of the fuels being burnt including fuel size, dryness, structure, arrangement and quantity. The bushfire is additionally influenced by weather and topography factors that can intensify fire behaviour (described at start of this section with additional detail provided in Appendix 3).

The radiant heat:

- Can ignite combustible materials such as timber (doors, cladding, external framework), some plastics (which if not ignited will melt and distort (cladding, pipes, gutters, tanks). This breaches the building's envelope allowing flames and embers to enter, increasing the likelihood of damage or destruction;
- Can dry and heat vegetation and other fuels (combustible materials such as timber) to a temperature at which they ignite or are more easily ignited by existing flames or embers; and
- Is an extremely significant threat to persons (occupants, firefighters) when they are not physically shielded. Protective clothing can provide only limited protection.

EMBER / BURNING DEBRIS ATTACK

Note: The importance of establishing protection measures to mitigate the potential impact of consequential fire ignited by the ember attack mechanism, cannot be overstated.

An ember is a small particle of burning material that is transported in the winds that accompany a bushfire (larger particles can exist as firebrands from certain vegetation types). Typically, these consist of plant materials such as bark, leaves and twigs that exist as part of the standing vegetation or have accumulated on the ground. Experimental scientific work has shown that that embers greater than 2mm are effective at igniting combustible materials.

Ember attack is the most common way for buildings/structures to ignite in a bushfire:

Scientific research indicates that at least 80% of building losses from past Australian bushfires can be attributed to ember/firebrand attack (mostly in isolation but also in combination with radiant heat), and the resultant consequential fires. (Leonard J.E. et.al; 2004 – Blanchi R. et.al. 2005 - Blanchi R. et.al. 2006).

Embers are the primary ignition source for consequential fire:

- They accumulate around and on vulnerable parts of structures such as low angle surfaces windows and wherever re-entrant corners exist (e.g., roofs, gutters, doors, windows etc);
- They enter gaps in structure envelopes to vulnerable materials within internal cavities and spaces (e.g., roof, sub-floor, living areas); and

- They ignite surface materials such as walls and decks and any accumulated vegetative debris.

Embers can attack structures for a significant length of time before and after the passage of the fire front, as well as during. This potential length of exposure is an important factor in the consideration of the level of threat embers present.

The importance of bark as an ember source:

(Sources: CSIRO Climate and Disaster Resilience Report 2020 and Overall Fuel Hazard Assessment Guide 4th edition July 2010, Victoria DSE and Cruz, MG (2021) The Vesta Mk 2 rate of fire spread model: a user's guide. CSIRO).

Bark is the primary source of embers and spotting in Australian eucalypt forests due to the key attributes of ease of ignition, extended burnout time and the favourable size to weight ratio and aerodynamic properties. Differences in these attributes strongly influence the spotting potential from different forest types – and therefore the potential hazard rating of the bark.

The type of tree bark will determine the size, shape and number of embers/firebrands which, along with the prevailing fire behaviour and weather conditions will dictate the spotting distances and density of ignitions.

Fine fibrous barks - including stringybarks (e.g. jarrah), have loosely attached fibrous flakes and can produce massive quantities of embers (prolific spotting) for shorter (up to 0.75 km) and medium distances (up to 5 km).

Short distance spotting (including ember showers) are generally the result of embers and firebrands blown directly ahead of the fire with little or no lofting. Density tends to decrease with distance from the fire front.

Medium distance spotting results from embers and firebrands that are lofted briefly in a convection column or blown from an elevated position (e.g., from treetops on ridges). With sufficient density and coalescing spot fires, this can rapidly increase the size of a fire (deep flaming) leading to dynamic fire behaviours and extreme fire events.

Ribbon/candle type barks - have longer burnout time, extended flight paths and are more likely to be responsible for longer distance spotting > 5 km (with up to 30 km having been authenticated). This results from significant lofting of large firebrands (e.g. curled hollow tubes of bark that can burn for 40 minutes) in well-developed convection columns. These develop as separate, independent fires. Very long distance spotting requires Intense fire, maintenance of a strong convection column (to lift firebrands aloft) and strong winds aloft (to transport the firebrands).

Other bark types - that include coarsely fibrous (e.g. marri) / slab or smooth / platy and papery barks - produce lower quantities of embers and shorter distance spotting. Their highest bark hazard ratings are lower than fine fibrous or ribbon barks.

HIGH / ERRATIC FIRE DRIVEN WIND ATTACK

High winds resulting from bushfire / vegetation / terrain / fire weather interactions, can directly damage the external envelope of a building or structure by:

- Positive and negative pressure dislodging building parts; and/or;
- Causing solid materials (e.g., branches or parts of other structures) to break loose and be transported to impact and damage the building's envelope. This provides openings for other bushfire attack mechanisms to enter and ignite internal cavities.

Strong winds are common during serious bushfire events as they are a necessary requirement for bushfires to develop higher intensities and greater severity levels.

Increased wind speeds can be the result of:

1. General weather patterns that will present as strong prevailing winds; and
2. The more complex interactions of prevailing winds along with vegetation types and structures, terrain factors and fire weather factors - that can lead to the development of dynamic fire behaviours resulting in intensification of fire behaviour and generation of local and erratic high winds.

   For highest risk scenarios, the bushfire can couple with the atmosphere as a pyro-convective event resulting in extreme bushfire events and gusty, severe windspeeds (refer to Appendix 3 for more detail).

It is the potential for the interactions and outcomes of the latter that will be considered as a direct bushfire attack mechanism for the relevant bushfire hazard threat level assessment in this report.

BUSHFIRE THREATS - INDIRECT ATTACK MECHANISMS

PRIMARILY ORIGINATING FROM WITHIN AN ASSET PROTECTION ZONE (APZ)

For the following indirect bushfire attack mechanisms to impact relevant exposed elements, certain requirements need to exist within an APZ (i.e., the area immediately surrounding a subject building/structure).

Where these requirements exist, they increase the exposure of the subject building/structure to the indirect bushfire attack mechanisms.

In this Report, it is the exposure component of the risk assessment that will assess the potential impact from the bushfire threat indirect attack mechanisms.

DEBRIS PRODUCTION AND ACCUMULATION

The relevant debris are combustible fine fuels that can accumulate, by falling and/or being windblown to be close to or against buildings, surrounding structures and other heavy fuels.

This makes the ignition of these structures/heavy fuels more likely through flame contact and radiant heat generated by the accumulated debris that has been ignited by embers and/or surface fire attack (i.e. a consequential fire).

This debris can accumulate over long time periods (years) in locations such as:

- On horizontal or close to horizontal surfaces and rough timber surfaces;
- Within re-entrant corners and roof gutters/valleys;
- Against vertical surfaces; and
- Within internal spaces /cavities and under sub-floors when gaps are present.

The threat level of this attack mechanism will be determined by:

- The presence of vegetation types that produce significant quantities of combustible debris and produce this in the driest and hottest part of the year; and
- The extent of the vegetation producing this threat.

SURFACE FIRE

These are low intensity fires with short flames that burn along the ground and are not considered to be part of the 'bushfire' in identified bushfire prone vegetation. They are typically patchy and erratic in their direction, consuming low-lying vegetation, ground litter, mulch and other debris and are short lived (<40 seconds) when burning in the absence of heavier fuels.

Surface fires occur on the land immediately surrounding buildings, associated structures and other heavy consequential fire fuels. Surface fires bring the threats of direct flame contact, higher radiant heat and embers closer to the relevant elements at risk than the bushfire itself can.

To reduce the exposure of relevant elements at risk to this indirect bushfire threat, the area of land typically recognised as an APZ, should be maintained in a minimal fuel / low threat state.

TREE STRIKE/OBSTRUCTION

Branches or trees, subject to strong winds and/or tree burnout, can:

- Damage the envelope of a structure creating openings for direct attack mechanisms of bushfire (or consequential fire) to ignite internal cavities or living space; and/or
- Fall and obstruct access to or egress from, a structure or site being impacted by bushfire.

The threat level of this attack mechanism is determined by the location of relevant trees and their susceptibility to wind damage and/or burnout.

CONSEQUENTIAL (SECONDARY) FIRE

Note: The importance of establishing protection measures to mitigate the potential impact of consequential fire cannot be overstated.

Consequential fire Is the burning of vulnerable (combustible/flammable) materials, items and structures that exist within the area surrounding the subject building or structure. These vulnerable surrounding elements can also include adjacent buildings/structures.

The burning of these surrounding vulnerable elements can result in the subject building/ structure being exposed to the direct fire attack mechanisms (threats) of flame, radiant heat, embers and surface fire from a close distance.

These consequential fire threats are separate from and additional to the threats generated by the bushfire front itself - which can be and often is, a considerable distance away.

Consequential Fire Fine fuels:

- Dead plant material such as leaves grass, bark and twigs thinner than 6mm (or live material less than 3mm thick that can be consumed in a fire involving dead material); and
- Originate from the indirect bushfire attack mechanism of 'debris accumulation' and potentially from other areas of landscaped vegetation.

Consequential Fire Heavy and Large Heavy Fuels:

- Stored combustible / flammable items:
    - Building materials, packaging materials, firewood, sporting/playground equipment, outdoor furniture, matting, rubbish bins etc;
    - Large quantities of dead vegetation materials stored as part of site use;
    - Liquids and gases; and
    - Vehicles, caravans and boats, etc.
- Constructed combustible items:
    - Surrounding landscaping items - fences/screens, retaining walls, gazebos, plastic water tanks etc;
    - Attached structures - decks, verandahs, stairs, carports, garages, pergolas, patios, etc; and
    - Adjacent structures - houses, sheds, garages, carports, etc. Structure to structure fire is a common cause of overall building loss in post bushfire event assessments [9].

The threat level of this attack mechanism is determined by the existence, type and proximity of these fuels.

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APPENDIX 3: DYNAMIC FIRE BEHAVIOURS AND EXTREME BUSHFIRE EVENTS

The content of this appendix is an overview of information that supports the assessment approach of section 5.2 of this report. It considers the risk implications arising from what is being learnt from the latest research work within the bushfire science of dynamic fire propagation and extreme fire development.

Any potential for extreme fire events to develop in the surrounding landscape surrounding the subject site, will result in increased in bushfire hazard threat levels to exposed elements and must be accounted for in the risk assessment.

The selected compilation of information is taken from various sources including peer reviewed research papers [references 1-3, 12, 15, 21, 27, 28, 41, 42].

RECENT BUSHFIRE RESEARCH

Traditionally, bushfire modelling conducted to determine rates of spread, intensity, flame lengths, radiant heat etc and provide measurements of threat levels, has been based on the quasi-steady fire state (i.e. a fire propagating under constant and uniform fuel, weather and topography – after it has finished its growth phase).

More recent research has provided important insights into the dynamic nature of fire spread in the landscape and identified local drivers of bushfire risk and highlighted the role of environmental factors that are significant for large and extreme fire development.

These environmental factors include aspects of the vertical structure of the atmosphere, meso-scale fire weather processes (e.g., sea breezes, cold fronts, squall lines, convective complexes), interactions between the fire and the atmosphere, and the modification of fire weather and fire behaviour due to the local topography.

From this work, several processes that can contribute significantly to the level of risk posed by a bushfire have been identified. These include:

- Extreme fire weather processes;
- Dynamic fire propagation; and
- Violent pyroconvection and pyrogenic winds.

Of relevance to this risk assessment are the topographic aspects of the surrounding landscape surrounding the subject site and the potential it might present for dynamic fire propagation, development of extreme fire events and therefore increased bushfire hazard threat levels and consequent risk.

DYNAMIC FIRE BEHAVIOURS

Dynamic fire behaviours (DFBs) result from interactions between the physical factors of fuel, terrain, fire weather conditions, atmosphere and different parts of the bushfire itself. They are physical phenomenon that involve rapid changes of fire behaviour and occur under specific conditions.

Certain DFBs occur at various scales and time frames (e.g. spotting), others only at large scales (e.g., conflagrations and pyroconvective events) and others at small scales and short time spans (e.g. junction fires, fire whirls). The following fire behaviours are considered DFBs:

Severe Spotting

The production of embers/firebrands, carried by the wind/convective currents that ignite spot fires ahead of the bushfire front. Under extreme conditions, with the necessary fuels, mass spotting events can occur. Dependent on fuel types, winds and convective currents, embers can be consumed by the fire front itself or travel tens of kilometres. Spot fire occurrence can be so prevalent that spotting becomes the dominant propagation mechanism – with the fire spreading as a cascade of spot fires forming a 'pseudo' front.

Fire Whirl / Tornado

Various sized (<1m - >150m) spinning vortices of ascending hot air and gases that carry smoke, debris, and flame. The intensity of larger whirls compares to tornados. Can induce fire spread contrary to prevailing wind and ignite spot fires away from the fire front.

Junction Fire

Is associated with merging fire fronts that produces very high rates of spread and have the potential to generate fire whirls / tornadoes.

Crown Fire

Types of tree crown fires have been categorised according to their degree of dependence on the surface fire phase - passive, active, independent - with the last two being considered dynamic fire behaviour.

Active crown fire is "a fire in which a solid flame develops in the crowns of trees, but the surface and crown phases advance as a linked unit dependent on each other."

Independent crown fires "advance in the tree crowns alone, not requiring any energy from the surface fire to sustain combustion or movement."

For a crown fire to start, a surface fire of sufficient intensity is first necessary. The distance between the heat source at the ground surface and the canopy-fuel layer will determine how much of the surface fire's energy is dissipated before reaching the fuels at the base of the canopy. The higher the canopy base, the lower the chance of crowning.

The existence of trees themselves, separated from surface fuels, can offer a degree of protection by absorbing radiant heat, trapping embers and shielding from winds. Necessary considerations include:

- Eliminating understorey fuels;
- Species Issue: Understanding the extent to which the trees will contribute to fuels (leaves/bark/twigs etc) that accumulate on the ground and when moved (wind) become involved in consequential fire away from the tree during the fire season. This needs to be considered against the maintenance capability (regular removal of material) of the responsible entity; and
- Species / Positioning Issue: Requirements include not being highly flammable, no loose stringy bark, less able to trap embers, not being prone to branches breaking in high winds potentially causing structural damage to buildings (allowing ember entry) and keeping crowns separated as an additional measure of safety and allow wind to permeate rather than be totally blocked.

Eruptive Fire

Behaviour where the head fire accelerates rapidly on sufficiently steep terrain with sufficiently strong wind – because of fire plume attachment to the surface, bathing it in flames ahead of the front (pre-heating).

Fire Channelling / VLS (vorticity-driven lateral spread)

Behaviour where rapid lateral fire spread, in generated vortices, occurs across a sufficiently steep leeward slope in a direction approximately transverse to the prevailing winds. This results in the rapid increase in width of the fire front. VLS are highly effective at producing mass spotting events.

Conflagrations

These are large, intense, destructive fires. They have a moving front as distinguished from a fire storm (blow up / pyroconvective fire). With sufficient vegetation extent, fuel loads and the development of dynamic fire behaviours, the large amounts of heat and moisture released can cause its plume to rise into the atmosphere and develop large cumulus or cumulonimbus flammagenitus cloud (pyrocumulus or pyrocumulonimbus). Where the extent of vertical development is limited (e.g. a stable atmosphere, or insufficient flaming zone), the fire is likely to remain a surface-based event.

Downbursts

These are strong wind downdrafts associated with convective columns of heated air (and associated cloud forms). The consequent falling columns of cooled air induce an outburst of strong winds on or near the ground that radially spread causing fire spread in directions contrary to the prevailing wind.

Pyroconvective Event

A pyro-convective event is an extreme manifestation of a conflagration that develops in an unstable atmosphere and can transition into a towering pyrocumulus or a pyrocumulonimbus (pyroCb's) that can extend to the upper troposphere or lower stratosphere. With the fire/atmosphere coupling, it has evolved beyond a purely surface based fire into dynamic fire propagation rather than quasi-steady propagation. In the violent pyroconvective system:

- As a fire's plume reaches higher into the atmosphere, larger scale mixing can cause drier and higher-momentum upper air to be transferred back to the surface, thereby further exacerbating the potential for more intense fire behaviour, including fire spread contrary to the prevailing wind direction;
- Pyrogenic winds can cause considerable damage to structures, directly or indirectly, increasing their vulnerability to bushfire attack mechanisms; and

- The pyroCb's carry dense ember loads, fire and other burning debris and generate lightning, all with very little rain or hail that would typically occur with an ordinary thunderstorm.

DRIVERS OF DEEP FLAMING

Deep flaming is the fire condition when the active flaming zone is unusually large and flame-front intensity is simultaneously great, resulting in large quasi-instantaneous energy release.

Deep flaming can be produced by numbers of mechanisms on varying terrain (flat, undulating of rugged) when a large enough area of sufficiently heavy fuels is present. These mechanisms include:

- Very strong winds – so the head fire advances more rapidly than the back of the flaming zone;
- Change in wind direction – so the long flank of a fire is transformed into a fast running head fire;
- Eruptive fire behaviour – where steep slopes can cause a fire to accelerate rapidly;
- Vorticity-driven lateral spread (wind channelling) – where strong winds and steep terrain interact to rapidly drive a fire laterally, accompanied by downwind mass spotting and consequent coalescing of spot fires forming large areas of flame (can include the DFB of 'junction fire').

Research has identified strong links between:

- Eruptive fire behaviour, VLS and the occurrence of deep flaming; and
- The development of deep flaming and extreme bushfire events.

EXTREME BUSHFIRE EVENTS

Extreme bushfire events create disproportionate risks to human and environmental. Their development is affected by dynamic feedback processes that result in unpredictable behaviour, and the worsening of rates of spread and intensities - even when environmental conditions are consistent.

The term 'extreme bushfire' is applied in the recent bushfire science literature in two ways:

1. Where it refers to large, intense bushfires in which one or more DFBs are simultaneously involved; and
2. Where it more specifically refers to a fire that exhibits deep or widespread flaming in an atmospheric environment conducive to the development of violent pyroconvection, often manifesting as towering pyrocumulus (pyroCu) or pyrocumulonimbus (pyroCb) storm(s) – also referred to as blow-up fire event(s).

   A distinguishing feature of these types of fires is that they involve a coupling of the fire with an unstable atmosphere to a much greater vertical extent, well above the mixed layer, which modifies or maintains the fire's propagation (e.g. through mass spotting, blustering winds and lightning);

Relevance to Risk Assessment: Given that this risk assessment is concerned with identifying the potential for the landscape surrounding the subject site to increase bushfire risk, the following common aspects of the two above descriptions are relevant:

- An extreme fire is a large intense fire, so it requires a sufficient area and sufficient fuels in which to develop; and
- An extreme fire of scale requires the formation of deep flaming to develop.

Consequently, the risk assessment is primarily focused on the extent and fuel types/loads of bushfire prone vegetation and the existence of terrain (topography) properties necessary for the relevant dynamic fire behaviours - rather than the potential for adverse fire weather / atmospheric conditions - whose likely occurrence can be assumed as possible.

Note also that the second description requires an unstable atmosphere - to enable deep/violent pyroconvection and subsequent significant cloud formation and latent heat release. This is not essential for the first. Consequently, this identifies a potential difference between the two defined extreme bushfire events to be considered when assessing risk:

- Large, intense bushfires can occur without deep convective column development. These fires remain as surface fires (essentially wind-driven fires), with a greater predictability of behaviour; and
- Large, intense bushfire that couple with an unstable atmosphere are no longer surface based. They are associated with a higher level of energy, chaos, and nonlinearity due to the enhanced (fire-induced)

interaction between the boundary layer and the free troposphere, which may introduce factors that act to maintain or enhance widespread flaming. The fire behaviour is much more unpredictable.

PHYSICAL REQUIREMENTS OF TERRAIN, FUEL LOAD (AND WINDSPEED) FOR DEEP FLAMING

The dynamic fire behaviours of eruptive fire and VLS with associated mass spotting, along with potential for topographically modified winds to develop, are strongly linked with the development of deep flaming, which is a prerequisite for extreme bushfire events.

There are certain environmental thresholds that are required to be met for these dynamic fire behaviours to occur. These are described below and form part of the assessment of the bushfire hazard in Section 5.3.

Eruptive Fire Behaviour

Eruptive fires are characterised by a rapid acceleration of the head fire rate of spread (exponential increases in rate of spread have been observed). It results in a rapid deepening of the flaming zone (larger area of active flame), from which heat is released into the atmosphere.

Eruptive fire results from the interaction between the slope of the terrain and the fire's plume. In the absence of wind, plume attachment can be expected on terrain that is inclined at roughly 24° or more and the effects of wind could cause plume attachment on slopes inclined at angles of 24° or lower. Consequently, the primary topographic requirement for eruptive fire is sufficiently steep terrain and sufficiently strong wind.

"This mode of fire propagation is completely contrary to that expected under the quasi- steady fire spread paradigm … eruptive fire behaviour poses a serious threat to the successful containment of a bushfire and provides a mechanism that can substantially elevate the risk posed by a bushfire in areas that are prone to its occurrence".

Rugged terrain (areas with local topographic relief >300m), is particularly prone to eruptive fire (and dynamic fire behaviours in general).

Fire Channelling (Vorticity-Driven Lateral Spread)

Fire channelling (VLS) exists when a fire exhibits rapid spread in a direction transverse to the synoptic winds as well as in the usual downwind direction. It is characterised by intense lateral and downwind spotting and production of extensive flaming zones.

VLS is highly effective at producing mass spotting events. A link between deep flaming events caused by VLS and the formation of pyroCb has been demonstrated. Under extreme conditions, spot fire occurrence can be so prevalent that spotting becomes the dominant propagation mechanism.

VLS can only be expected to occur on parts of the landscape, and under certain fire weather conditions. VLS occurrence depends critically on the following:

- Leeward slopes greater than 20-25° are required;
- Wind direction must be within 30-40° of the topographic aspect;
- Wind speed in excess of about 20 km h-1 are required;
- Generally, VLS is only observed in heavy forest fuel types with load in excess of 15-20 t ha; and
- Fuel moisture content – dense spotting and downwind extension of the flaming zone are far more likely when fuel moisture contents are around 5% or less.

Topographically Modified Surface Winds - Downslope Winds

In WA the scarp winds are the well-known local occurrence of downslope winds. Similar meteorological phenomena (typically as foehn winds) occur in the lee of mountain ranges in many parts of the world, particularly on ranges with gentle windward and steep leeward slopes.

Scarp winds are nocturnal, strong and gusty winds that develop near the base of the scarp through summer months. The local mechanism is for a synoptic easterly flow, causing air to rise to the top of the scarp from further inland, at which point it is cooler and denser than the surrounding airmass. This produces an unstable situation and consequently the air flows down the scarp as a turbulent density current.

There are implications for enhanced fire activity for a fire located in a region of downslope winds, as they provide a clear mechanism for rapid, irregular direction of fire spread as well as turbulent transport of firebrands and plume development. If a 'hydraulic jump' is also present, the strong vertical motion in the jump region is a mechanism for lofting and dispersal of firebrands further ahead of the bushfire front.

APPENDIX 4: EXPLAINING BUSHFIRE ATTACK LEVEL (BAL)

Bushfire attack levels are determined using the methodology established by AS 3959:2018 Construction of buildings in bushfire prone areas. The Standard defines a bushfire attack level (BAL) as a "means of measuring the severity of a building's exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kW/m^2."

Each BAL rating represents a set range of radiant heat flux (see table below). The amount of radiant heat and flame lengths generated by a bushfire is dependent on many factors that are modelled using the Standard's fire behaviour and flame length models. Key factors include vegetation type, terrain and a range of fire weather factors. The variation that can exist in these factors will result in varying separation distances, away from bushfire prone vegetation, corresponding to a given BAL rating. These distances can be presented as data in a table or illustrated by mapping – the 'BAL Contour Map'.

The different BAL ratings effectively incorporate the threat levels of flame contact, radiant heat transfer and ember/firebrand attack:

- The highest ratings of BAL-FZ and BAL-40 indicate direct or likely exposure to the flame contact threat;
- Each BAL rating represents a defined range (in kW/m^2), of the radiant heat transfer threat, with the threat level increasing from BAL-LOW to BAL-FZ; and
- Each higher BAL rating assumes an increased exposure to the ember/burning debris attack threat. This is based on the practical acknowledgement that the closer the element at risk is to the source of ember production the greater the likely exposure level. In practice, this strong correlation does not exist for all bushfire event scenarios. However, AS 3959 is only intending to apply the same construction response to ember/firebrand attack for each BAL rating above BAL-LOW as consequential fire from any source other than from within the subject structure itself is not being considered by the Standard.

Bushfire Attack Level	Explanation [Source AS3959:2018]
BAL – LOW	There is insufficient risk to warrant specific construction requirements but there is still some risk. *Important Note: For AS3959:2018 purposes, BAL-LOW will exist at 100m from classified vegetation (50m for Grassland).* *However, embers/firebrands from certain vegetation types can ignite spot fires ahead of the fire front for significant distances – short range spotting up to 740m, medium range spotting up to 5km and long range spotting has been authenticated up to 30km.*
BAL – 12.5	There is a risk of ember attack. Construction elements are expected to be exposed to heat flux not greater than 12.5 kW/m^2
BAL – 19	There is a risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m^2.
BAL – 29	There is an increased risk of ember attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 29 kW/m^2.
BAL – 40	There is a much increased risk of ember attack and burning debris ignited by windborne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux not greater than 40kW/m^2.
BAL – FZ (Flame Zone)	There is an extremely high risk of ember attack and burning debris ignited by windborne embers, and a likelihood of exposure to an extreme level of radiant heat and direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux greater than 40 kW/m^2.

APPENDIX 5: THE SURROUNDING LANDSCAPE - VEGETATION CATEGORY AND THREAT LEVEL DETERMINATION CRITERIA

DETERMINATION OF VEGETATION CATEGORIES AND THEIR RANGE OF POTENTIAL THREAT LEVELS

The following criteria are applied to the categorisation of vegetation on the surrounding landscape and deriving potential bushfire threat level ranges from the bushfire hazards present. The assessed threat levels are subsequently applied in the determination of the levels of the risks associated with a bushfire event.

Vegetation Categories

Categories are established to enable a comprehensive assessment of the type and severity of the bushfire attack mechanisms (i.e., the bushfire threats), potentially generated by bushfire prone vegetation on surrounding land. This enables variations in vegetation composition and structure to be more appropriately accounted for in the determination of the levels of the relevant risks.

The variations in the potential threat level ranges assigned to each vegetation category in the table below are the result of these variations in vegetation composition.

The vegetation 'Categories' applied are necessarily different to the vegetation 'Classifications' applied in the BAL determination methodology of AS 3959:2018. This building Standard primarily considers the flame contact and radiant heat attack mechanisms to inform construction requirements to resist the bushfire itself.

The BAL determination methodology does not fully address ember/firebrand attack with respect to spotting range and density associated with the types of available fuel (or any other threats from direct or indirect attack mechanisms).

Higher levels of ember/firebrand threat have implications for the initiation of consequential fire as a very significant bushfire indirect attack mechanism that can subject elements at risk to flame contact and high levels of radiant heat, even though the bushfire itself is not close and could be kilometres away. It is important not to overlook this threat.

Landscape, Fuel Continuity and Fire Weather Factors Applied to Establishing the Mid-Point of Potential Threat Levels

1. The terrain on which the category of vegetation is supported is flat to undulating with no vegetated slopes greater than ten degrees.
2. The fire fuels are continuous.
3. The extent of bushfire prone vegetation is sufficiently large such that a fully developed fire can be supported.

   The parameters applied to the design fire within AS 3959:2018 BAL determination methodology is applied. Specifically:

   - A head fire width of at least 100 metres is physically possible;
   - Sufficient fire run length exists to allow a quasi-steady rate of spread (after the initial growth phase) to be attained and a head fire width of 100 metres to develop from a single point of ignition.
   - Typically, but not in every scenario, this will equate to areas of vegetation greater than 3ha and within which fire runs directly at an element at risk will be greater than 50 -100 metres in length; and
4. It is assumed to be possible for the most adverse fire weather to occur at the subject locality.

The Range of Potential Threat Levels for Each Vegetation Category

The potential threat level range for each category of vegetation is derived from consideration of the degree to which each of the described physical vegetation factors are relevant and present within that category. The assessed threat level will fall within this range and be dependent on the existence of threat modifying physical factors that are presented in Section 5.1.4 of this report.

The Assessed Threat Level Applied

The assessed existence of site specific variations to the threat modifying physical factors described above, will determine the assessed threat level to be applied, within the range applicable to each vegetation category. These variations and their outcome are presented in Section 5.1.4 of this report.

SURROUNDING LANDSCAPE VEGETATION MAPPING - CATEGORY DETERMINATION CRITERIA					
Category Code	Category Description				
	Total Fuel Loads	Most Relevant Fuel [1]	Spotting Range [2]	Spotting Density [2]	Potential Threat Level Range (Property) [3]
Tree-1	Moderate to High	Fine, fibrous, long strand bark	Short to Medium	Very High	Moderate to Extreme
	Trees and Bark Hazard: Tree dominated vegetation including tall species. At least 10% of the trees present have fine, longer strand fibrous barks (stringybarks). "These barks are easily dislodged from the trunk, allowing simultaneously for vertical fire propagation into the overstorey and profuse short to medium range spot fire ignitions." Spotting Threat: The fine, longer strand fibrous barks (stringybarks) have the potential to produce the highest short range (up to 500-750 metres) spotting density (quantity) and can spot out to medium ranges (up to 5 km) under conducive fuel, terrain and fire weather conditions. Potential spotting (ember / firebrand attack) threat levels range from moderate to extreme. Fuel Loads: Surface and near surface fuel loads (t/ha) range from moderate to very high (note: the worst potential fuel load for the location is applied, regardless of time since last burnt). Example Eucalyptus Species: Includes jarrah, messmate stringybark and brown/red stringybark. Marri can be included in this category due to the potential high-density spotting but will be limited to the shorter spotting range.				
Tree-2	Moderate to Very High	Ribbon, candle bark	Short to Long	Moderate	Moderate to Extreme
	Trees and Bark Hazard: Tree dominated vegetation including tall species. Less than 10% of trees present will have fine, longer strand fibrous barks (stringybarks). The predominant trees are smooth bark species where the bark sheds in long ribbons (ribbon/candle barks), and often hangs on the branches. "These bark types provide aerodynamically efficient, firebrand material that can remain alight for long periods and be transported over considerable distances." Spotting Threat: These bark types have the longest distance spotting potential (greater than 5 km) due to the long burnout time of the firebrands. However, the potential ember/firebrand density (quantity) will be lower than for fine, longer strand fibrous barks. Potential spotting (ember / firebrand attack) threat levels range from moderate to very high. Fuel Loads: Surface and near surface fuel loads (t/ha) range from moderate to very high (note: the worst potential fuel load for the location is applied, regardless of time since last burnt). Example Eucalyptus Species: Includes manna gum, blue gum, alpine ash and woollybutt, mallee species. Karri can be included in this category on the basis that while spotting distance is unlikely to be long range (as the bark is shed in short ribbons/small polygonal flakes), the potential for extreme fuel loads is relevant to the categorisation.				
Tree/Shrub	Moderate to High	Smooth, platy, papery, coarsely fibrous bark and/or Shrub fuels	Short	Low to Moderate	Moderate to High
	This category can have the most variation in vegetation types that are present. It can consist of predominantly trees with the stated bark types or be predominately shrub type vegetation or any combination. Can include areas of grass. Trees and Bark Hazard: Trees can be of any height. Bark types are more varied and have the characteristics of being tightly held onto the trunk, producing short strands, or producing chunks or				

<table>
<tr><td></td><td>small flakes which fall to the ground. These bark types are described as smooth, platy, papery and coarsely fibrous.

Shrub Fuels: Scrub, shrub, heath type fuels of vertically oriented, well aerated, with live and dead vegetation extending from the surface to the top of the vegetation complex and up to 6 metres high.

Spotting Threat: Trees with the stated bark types can produce limited quantities of embers and shorter spotting distances (up to 500-750 metres). Shrub fuels can produce moderate to high quantities of smaller and shorter burn duration embers, resulting in mostly short distance spotting.

Fuel Loads: Surface, near surface and elevated fuel loads (t/ha) range from moderate to high (note: the worst potential fuel load for the location is applied, regardless of time since last burnt).</td></tr>
<tr><td rowspan="2">Shrub</td><td><table><tr><td>Low to High</td><td>Shrub fuels</td><td>Short</td><td>Low</td><td>Low to Moderate</td></tr></table></td></tr>
<tr><td>Shrub Fuels: Scrub, shrub, heath type fuels of smaller sized, vertically oriented, well aerated fuels, with continuous live and dead vegetation extending from the surface to the top of the vegetation complex and up to 2 metres high. Can include areas of grass.

Spotting Threat: Shrub fuels can produce limited quantities of small and short burn duration embers resulting in low density short distance spotting (up to 500-750 metres).

Fuel Loads: Surface, near surface and elevated fuel loads (t/ha) range from moderate to high (note: the worst potential fuel load for the location is applied, regardless of time since last burnt).</td></tr>
<tr><td rowspan="2">Grass</td><td><table><tr><td>Low to Moderate</td><td>Fine grass fuels</td><td>Very Short</td><td>Low</td><td>Low to Moderate</td></tr></table></td></tr>
<tr><td>Fuel Types: Will be varied and includes the following groups that each have similar structural characteristics - tropical grasslands, tussock grasslands, hummock grasslands, and improved pastures / crop lands comprised of species that cure. These fuels are typically much finer than other vegetation types with a low bulk density. Where trees are present, they make up no more than 10% of canopy cover and will have no influence on fire behaviour.

Fuel Loads: Are much lower than other types of vegetation complexes. For example, default total fuel loads applied in AS 3959:2018 BAL determination methodology for Grassland range from 43% to 85% less than other vegetation classifications.

Fire Behaviour: Combustion rates are faster in grasslands than forest fuels due to the finer materials and more aerated structure. This gives rise to the main cause of differences in fire behaviour between grassfires and fires in other fuel types - the residence time is much shorter. This is the period during which flames remain burning over one spot on the ground. Using pastures as an example, the residence time is in the order of 5 seconds in fine light pastures and 10-15 seconds in heavy pastures. This results in grassfires spreading more quickly, reacting very quickly to changes in wind direction and speed and being a shorter duration threat to a specific exposed element.

Spotting Threat: Embers produced by grass fires are smaller and fewer in number than those produced from forest fires and burn for shorter durations. Typically, spotting in grassfires occurs over very short distances and are generally not noticed as they are quickly overrun by the main fire. Potential spotting (ember / firebrand attack) threat levels are low.</td></tr>
<tr><td rowspan="2">No/Low Threat</td><td><table><tr><td></td><td>No Threat to Low</td></tr></table></td></tr>
<tr><td>Areas of land will satisfy this category when the following factors apply:
Low threat vegetation characteristics including low flammability, high moisture content (including non-curing crops) and minimal fuel load. Low threat examples established in AS 3959:2018 include: managed grassland, mangroves/saline wetlands, maintained lawns, golf courses, public reserves/parklands, sporting fields, vineyards, orchards, banana plantations, market gardens, commercial nurseries, nature strips and windbreaks; and
Areas permanently cleared of vegetation, including natural features such as rocky outcrops and manmade infrastructure.</td></tr>
<tr><td colspan="2">Note 1: The fuel type/s that are most relevant for the categorisation of area of vegetation are stated. These have relevance when certain bark types and quantity are a significant component of total fuel loads, resulting in higher</td></tr>
</table>

threat levels for the ember/firebrand direct attack mechanism. Bark fuels are the primary source of fuel for the ember/firebrand attack threat (refer to Appendix 2 for additional information).

Note 2: Understanding and assessing the threat level generated by the ember/firebrand direct attack mechanism (spotting) is important to the management of risks associated with any bushfire hazard. With respect to categorising surrounding landscape vegetation, based on threat levels, the following points identify why the assessment of the spotting threat is important:

- At distances beyond 100 metres from a subject land the direct attack mechanisms of flame contact and radiant heat transfer cannot significantly and directly impact the building elements at risk within that site;
- However, embers/firebrands can impact subject land through the ignition of consequential fire (as an indirect attack mechanism of bushfire), in fuels and structures surrounding, upon and within the relevant elements at risk (e.g., habitable buildings). Consequential fires bring the direct attack mechanisms of flame and radiant heat much closer than the bushfire itself can. Assessments of past bushfire events indicate that ember attack and consequential fire be the cause of 80% or greater of property losses; and
- Spotting can significantly influence the increase scale of the bushfire event and its consequent intensity, both within the surrounding landscape and within the 100 metres surrounding a subject land. From *Cruz M.G. et al (2015): A Guide to Rate of Fire Spread Models for Australian Vegetation. CSIRO, AFAC*). "Spotting is an important, at times dominant, fire propagation process in high intensity fires in eucalypt forests. The type of tree bark will determine the size, shape, and number of firebrands, which the prevailing weather conditions will dictate the spotting distances and density of ignitions." Refer to Appendix 2 for additional information.

Note 3: The stated potential threat levels identify the threat level range that is associated with the stated vegetation category as it applies to constructed property, as opposed to persons in the open or travelling access routes in vehicles, which will be separately assessed.

Subsequent assessment of vegetation, terrain and fire weather factors associated with the surrounding landscape that can increase or decrease the bushfire hazard threat levels, will complete the surrounding landscape assessment for the subject land.

APPENDIX 6: THE IDENTIFIED BUSHFIRE HAZARDS

A6.1 LOCATION OF SUBJECT LAND RELATIVE TO DESIGNATED AREAS OF BUSHFIRE PRONE LAND

A 'Planning' Bushfire Management Plan (BMP) has been prepared alongside this Bushfire Risk Report.

The BMP includes the required assessments following *State Planning Policy 3.7 Bushfire* (WAPC 2024) and the *Planning for Bushfire Guidelines* (WAPC 2024).

This includes a vegetation assessment following *AS 3959:2018* (Standards Australia 2018).

GLOSSARY

APPLIED TERMINOLOGY	
Consequence	The outcome of an event or situation expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain. In the emergency risk management context, consequences are generally described as the effects on persons, society, the environment and the economy. *(Source: DPLH 2019)* An impact on the natural, economic, built or social environments as a result of the hazard. The consequences are influenced by the vulnerability of elements at risk, by the exposure of elements at risk to the hazard, and by the characteristics of the hazard. *(Source: PIA, 2015).* The outcome of an event that affects objectives. Can be a range of consequences; can be certain or uncertain; can have positive or negative effects; can be expressed qualitatively or quantitatively; can escalate through knock-on effects. *(Source: ISO Guide 73:2009)*
Controls	A measure that maintains and/or modifies risk. Controls include, but are not limited to, any process, policy, device, practice, or other conditions and/or actions which maintain and/or modify risk. *(Source: AIDR Knowledge Hub; Glossary)* A control is any measure or action that modifies or regulates risk. Controls include any policy, procedure, practice, process, technology, technique, method, or device that modifies or regulates risk. Risk treatments become controls, or modify existing controls, once they are implemented. *(Source: Praxiom)* *Note: 'Protection Measures' and 'Risk Treatments' will be alternative terms used in this risk assessment report.*
Decision Maker	The Minister for Planning, State Administrative Tribunal, Western Australian Planning Commission, Development Assessment Panel, any other State decision-making authorities, and/or the relevant local government and their delegates that make decisions regarding the application of this Policy. *(Source: SPP 3.7)* For proposed development or use that is not subject to planning approval, the relevant decision makers are those tasked with the development and management of a development or use. Typically this might be an existing development/use for which an improved bushfire performance is being sought.
Elements At Risk	The population, buildings and civil engineering works economic activities, public services and infrastructure, etc. exposed to hazards. (Australian Institute for Disaster Resilience, 2019)
Exposure	Refers to the people and things in the path of potential hazards. *(Source: AIDR* LUPDRC*, 2020)* The elements within a given area that have been, or could be, subject to the impact of a particular hazard. Bushfire exposure can refer to property that may be endangered by a fire burning in another structure or by a bushfire. *(Source: AIDR Knowledge Hub; Glossary)* The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard prone areas. Measures of exposure can include the number of people or types of assets in an area. These can be combined with the specific vulnerability and capacity of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest. *(Source: UNDRR, 2017)*

Hazard	A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Hazards may be natural, anthropogenic or socionatural in origin. • Natural hazards are predominantly associated with natural processes and phenomena (note: disasters often follow natural hazards, but there is no such thing a natural disaster); • Anthropogenic hazards are human-induced – being induced entirely or predominantly by human activities and choices; • Socionatural hazards are associated with a combination of natural and anthropogenic factors, including environmental degradation and climate change. Hazards may be single, sequential or combined in their origin and effects. Each hazard is characterized by its location, intensity or magnitude, frequency and probability. *(Source: UNDRR Terminology 2017)* A source of potential harm or a situation with a potential to cause loss. A potential or existing condition that may cause harm to people, or damage to property or the environment. A source of risk. *(Source: AIDR Knowledge Hub; Glossary)*
Hazardous Event	The manifestation of a hazard in a particular place during a particular period of time. [Severe hazardous events can lead to a disaster as a result of the combination of hazard occurrence and other risk factors.] (Source: *United Nations Office for Disaster Risk Reduction, 2017)*
Hazard Identification	The process of recognising that a hazard exists and defining its characteristics. *(Australian Institute for Disaster Resilience, 2019)*
Hazard - Bushfire	A fuel complex, defined by amount, type condition, arrangement, and location, that determines the degree of hazard. *(Source: AIDR Knowledge Hub; Glossary)* The term 'bushfire hazard' in this assessment report is intended to refer to both bushfire prone vegetation and the associated potential bushfire event itself. The term 'bushfire' is being applied as the common term for forest, scrub, shrub, and grass fire events.
Hazard - Urban Fire	1. Susceptibility of a material to burn. 2. The presence of combustible materials. 3. A process or activity posing a fire risk if not adequately controlled. *(Source: AIDR Knowledge Hub; Glossary)*
Hazardous Material	A substance or material which has been determined by an appropriate authority to be capable of posing an unreasonable risk to health, safety and property. *(Source: AIDR Knowledge Hub; Glossary)*
Impact	Describes as a quantitative or qualitative measure, the relative potential ability of a threat to adversely affect an exposed element or of a protection measure to reduce threat, exposure or vulnerability levels and consequently, risk levels.
Likelihood	Chance of something happening. The likelihood level reflects the probability of both the emergency event and the estimated consequences occurring as a result of the event. *(Source: AIDR NERAG, 2020)* In risk management terminology, the word 'likelihood' is used to refer to the chance of something happening, whether defined, measured or determined objectively or subjectively, qualitatively or quantitatively, and described using general terms or mathematically - such as a probability or a frequency over a given time period. *(Source: ISO Guide 73:2009)*

	The chance of an event occurring. Likelihood may be represented as a statistical probability (such as Annual Exceedance Probability), or where this is not possible, it can be represented qualitatively using such measures as 'likely', 'possible', and 'rare'. *(Source: PIA, 2015).*
Mitigation	The lessening or minimizing of the adverse impacts of a hazardous event. The adverse impacts of hazards, in particular natural hazards, often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures include engineering techniques and hazard-resistant construction as well as improved environmental and social policies and public awareness. *(Source: UNDRR, 2017)*
Reliability	Refers to the expected reliability of a designed solution (protection measure). Over time it will be a function of: • Its Initial likely reliability; • Its durability which may or may not be a function of maintenance; • The level of maintenance required; • The likelihood of solution being modified over time; and • The influence of other adjoining/adjacent structures or stored materials that may be installed after the initial construction. (Adapted from Kelly M. et al; *Structural Design Options for Residential Buildings in Bushfire Areas,* Australasian Structural Engineering Conference November 2016)
Resilience	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management. (*United Nations Office for Disaster Risk Reduction, 2017)* Is that property of a building, system, or community that facilitates its return to a functional state following an overload. In the context of bushfire damage, resilience will be maximised when: • There is a high probability of an attacked building remaining fit for purpose; and • There is a low time and cost to make badly damaged buildings fit for purpose. (Adapted from Kelly M. et al; *Structural Design Options for Residential Buildings in Bushfire Areas,* Australasian Structural Engineering Conference November 2016)
Robustness	Refers to that property of structural systems that seeks to achieve proportionality of damage to the severity of an overloading event. It will be maximised when bushfire design solutions: • Have few 'weak links' that allow progressive spread of damage from minor sources; • Consist of materials and assemblies that retain physical properties when thermally loaded beyond their design capacity; and • Include protection of inherently vulnerable and brittle elements. Such as openings to internal parts of structures (including doors and windows) and essential services that maintain required functioning (e.g. cabling and plumbing). (Adapted from Kelly M. et al; *Structural Design Options for Residential Buildings in Bushfire Areas,* Australasian Structural Engineering Conference November 2016) As a design principle it means that the design and materials are not easily damaged or compromised, and do not require manual operation or intervention to work (Source: State Government of Queensland, CSIRO, 2020)

Redundancy	Refers to design that ensures the fate of the subject building/structure is not reliant on the effective performance of a single element. (State Government of Queensland, CSIRO, 2020) An example is a roof system that does not rely solely on the roof cladding to resist bushfire threats. It has additional layers of resistance including non-combustible roof/ceiling framing, insulation and ceiling lining, and the sealing/screening of gaps into internal operating spaces.
Risk	Disaster risk is the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period of time, determined probabilistically as a function of hazard, exposure, vulnerability and capacity. *(Source: UNDRR, 2017)* Disaster risk is a product of a hazard (a sudden event or shock), exposure (the people and things in the path of potential hazards), vulnerability (the potential for those people and things to be adversely impacted by a hazard) and the capacity (the ability for those people and assets and systems to survive and adapt). *(Source: AIDR LUPDRC, 2020)* Risk is the chance of something happening that will have an impact upon objectives. It is measured in terms of consequences and likelihood. In emergency management it is a concept used to describe the likelihood of harmful consequences arising from the interaction of hazards, communities and the environment. *(Source: PIA, 2015)*
Risk Management	Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses. *(Source: UNDRR, 2017)* Coordinated activities of an organisation or a government to direct and control risk. The risk management process includes the activities of: • Communication and consultation; • Establishing the context; • Risk Assessment (risk identification, risk analysis, risk evaluation); • Risk Treatment; and • Monitoring and Review. *(Source: AIDR NERAG, 2020)* Risk management vs. risk mitigation: Though risk management and risk mitigation are often used interchangeably, the two terms refer to slightly different things. Risk mitigation involves limiting the effect that risks can have (i.e. making less severe). It is a single component of the larger risk management process. Risk management refers to the overall practice of assessing and addressing the relevant risk. (*an explanation of the use of these terms as applied by Bushfire Prone Planning*)
Risk Identification	Process of finding, recognising and describing sources of risks, their causes and their potential consequences. *(Source: ISO Guide 73:2009)* It is a process used to find, recognise, and describe the risks that could affect the achievement of objectives. *(Source: Praxiom)*
Risk Source	An element which, alone or in combination, has the intrinsic potential to give rise to risk. *(Source: ISO Guide 73:2009)*
Risk Assessment	Disaster risk assessment is a qualitative or quantitative approach to determine the nature and extent of disaster risk by analysing potential hazards and evaluating existing conditions of exposure and vulnerability that together could harm people property, services and livelihoods and the environment on which they depend. Assessments include the identification of hazards; a review of the technical characteristics of hazards such as their location, intensity, frequency, and probability; the analysis of exposure and

	vulnerability, including the physical, social, health, environmental and economic dimensions; and the evaluation of the effectiveness of prevailing and alternative coping capacities with respect to likely risk scenarios. *(Source: UNDRR, 2017)* The overall process of risk identification, risk analysis and risk evaluation. *(Source: ISO Guide 73:2009)*
Risk Analysis	The process to comprehend the nature of risk and determine the level of risk. Provides the basis for risk evaluation and decisions about risk treatment. *(Source: ISO Guide 73:2009)* Is a process that is used to understand the nature, sources, and causes of the risks that you have identified and to estimate the level of risk. It is also used to study impacts and consequences and to examine the controls that currently exist. How detailed your risk analysis ought to be will depend upon the risk, the purpose of the analysis, the information you have, and the resources available. *(Source: Praxiom)* In this risk assessment report, risk analysis is the part of the risk assessment process that assesses the hazard threat levels, identifies the protection measures (and their effectiveness) that can be applied and derives the levels of exposure and vulnerability of the identified elements at risk, based on the ability to apply protection measures. From this information indicative risk levels can be derived. Where relevant sets of risk factor criteria and a risk level matrix have been established by the relevant authorities, a determined risk level can be derived. The required risk level analysis can be conducted for either each exposed element separately and/or the proposed or existing development/use overall.
Risk Evaluation	The process used to determine risk management priorities by evaluating and comparing the level of risk against predetermined standards, target risk levels or other criteria. *(Source: PIA, 2015)* In this risk assessment report, it is the process of classifying the acceptability of the levels of risk, derived from the risk analysis, by reference to an established risk tolerance scale. The relevant tolerance scale will be that derived from the application of the 'as low as reasonably practicable' principle – 'ALARP' (refer to Appendix 1 for further information). This process can only be conducted when determined risk levels have been derived.
Risk Factor Criteria	In this risk assessment report, the risk factor criteria establish the parameters that will define the different hazard threat levels, the different levels of exposure of elements at risk and the different levels of vulnerability of elements at risk. Different sets of risk factor criteria can exist corresponding to different development types, uses and scale. They are applied as part of the risk analysis. These criteria are established by the relevant authorities as they must reflect societies preparedness to tolerate risk and be determined by those authorities exercising their responsibilities.
Risk Level Matrix	In this risk assessment report, the risk level matrix establishes how the assessed levels of hazard threats, exposure and vulnerability are to be analysed in deriving a determined risk level. It is applied as part of the risk analysis. The matrix is established by the relevant authorities as they must reflect societies preparedness to tolerate risk and be determined by those authorities exercising their responsibilities.
Risk Tolerance Scale	In this risk assessment report the applied risk tolerance scale defines the acceptability of determined risk levels based on the 'as low as reasonably practical' principle (ALARP). The risk tolerance scale can be applied within the risk assessment report when the required risk factor criteria and risk level matrix are available.

Risk - Inherent	In this risk assessment report, inherent risk is considered to be current risk after accounting for existing and any 'planned' protection measures (controls / risk treatments) but before the application of any additional protection measures that have been identified and recommended by the bushfire consultant – and which subsequently determines the residual risk (this approach is supported by the relevant information sourced from the two references below). 'Planned' protection measures are those that are incorporated into the site development plans and those that exist in an approved Bushfire Management Plan (BMP) and/or Bushfire Emergency Plan (BEP) and for which a responsibility for their implementation has been created. If a BMP or BEP is yet to be developed or is being developed concurrently, the additional protection measures it contains (including any that are part of relevant 'acceptable solutions' established by the 'Guidelines for planning in bushfire prone areas', DPLH as amended), are considered to be additionally recommended protection measures. 1. *Source: www.fairinstitute.org* *"Confusion exists between Inherent Risk and Residual Risk … Here are the standard definitions of the two concepts:* • *Inherent risk represents the amount of risk that exists in the absence of controls.* • *Residual risk is the amount of risk that remains after controls are accounted for.* *Sounds straightforward. But these two terms seem to fall apart when put into practice. Applying the above definitions to the clients' scenario uncovered the fact that the 'inherent' risk being described was not a 'no controls' environment, but rather, one that only excluded some controls.* *The flaw with inherent risk is that in most cases, when used in practice, it does not explicitly consider which controls are being included or excluded. A truly inherent risk state, in our example, would assume no employee background checks or interviews are conducted and that no locks exist on any doors. This could lead to almost any risk scenario being evaluated as inherently high. Treating inherent risk therefore can be quite arbitrary. According to Jack Jones, author of Measuring and Managing Information Risk: A FAIR Approach and creator of the FAIR model, much more realistic and useful definitions would be:* • *Inherent risk is current risk level given the existing set of controls rather than the hypothetical notion of an absence of any controls; and* • *Residual risk would then be whatever risk level remain after additional controls are applied."* 2. *Source: Wikipedia:* *Inherent risk, in risk management is:* • *an assessed level of raw or untreated risk; that is, the natural level of risk inherent in a process or activity without doing anything to reduce the likelihood or mitigate the severity of a mishap, or the amount of risk before the application of the risk reduction effects of controls; or* • *Another definition is that inherent risk is the current risk level given the existing set of controls, which may be incomplete or less than ideal, rather than an absence of any controls.*
Risk - Residual	In this risk assessment report, residual risk is that which remains after the application of protection measures that are additional to those that already exist or are 'planned' and that establish the inherent risk (see Risk – Inherent in glossary) It is the disaster risk that remains in unmanaged form, even when effective disaster risk reduction measures are in place, and for which emergency response and recovery

	capacities must be maintained. The presence of residual risk implies a continuing need to develop and support effective capacities for emergency services, preparedness, response and recovery, together with socioeconomic policies such as safety nets and risk transfer mechanisms, as part of a holistic approach. *(Source: UNDRR, 2017)* It is the risk left over after you've implemented a risk treatment option. It's the risk remaining after you've reduced the risk, removed the source of the risk, modified the consequences, changed the probabilities, transferred the risk, or retained the risk. *(Source: Praxiom)* It is the risk remaining after any risk treatment has been applied to reduce its potential likelihood and/or its potential consequences. Residual risk can also be any risk that is chosen to be retained rather than treated *(Source: AIDR* LUPDRC*, 2020)* Residual risk can contain unidentified risk. Residual risk can also be known as retained risk. *(Source: ISO Guide 73:2009)*
Risk Level - Determined	Magnitude of a risk or a combination of risks. In this risk assessment report, as an outcome of the risk analysis, a determined risk level is derived from: 1. The determination of threat, exposure and vulnerability levels by reference to an established set of risk factor criteria that corresponds to each risk level (for each factor); and 2. The determination of the risk level by reference to an established risk level matrix that incorporates threat, exposure and vulnerability levels.
Risk Level - Indicative	Magnitude of a risk or a combination of risks. In this risk assessment report, as an outcome of the risk analysis, an indicative risk level is derived from analysis of the number of bushfire protection measures able to be implemented compared to the number of measures available, and the relative effectiveness of each at reducing threat, exposure and/or vulnerability levels. Overall, more applicable and applied measures is better and the measures with a higher effectiveness rating have greater weighting in the analysis.
Risk - Acceptable	Risks that do not need further treatment. The expression acceptable level of risk refers to the level at which it is decided that further restricting or otherwise altering the activity is not worthwhile e.g. additional effort will not result in significant reductions in risk levels. *(Source: DPLH, 2019)* That level of risk that is sufficiently low that society is comfortable with it. Society does not generally consider expenditure in further reducing such risks justifiable. *(Source: AIDR Knowledge Hub)* An acceptable risk is a risk that is sufficiently low to require no new treatments or actions to reduce the risk as communities can live with this level of risk without further action. *(Source: Queensland Government 2019: Natural hazards, risk and resilience – Bushfire: State Planning Policy – state interest guidance material)* Acceptable risk or tolerable risk is an important sub-term (of disaster risk). The extent to which a disaster risk is deemed acceptable or tolerable depends on existing social, economic, political, cultural, technical and environmental conditions. *(Source: UNDRR, 2017)* *Note: It is generally accepted that nothing can be absolutely free of risk, everything under some circumstance can cause harm. There are differing levels of risk and consequently levels of safety. In practice, attaining zero risk is not possible. Nevertheless, after risk avoidance, reduction/mitigation, transfer or acceptance - the residual risk may be determined as acceptable, as judged by the participants in an activity and decision makers (who apply societies expectations). For certain land uses, the residual risk may exist at higher levels but still be judged by to be acceptable (or tolerable) on this basis.*

Risk - Tolerable	The willingness to live with a risk to secure benefits and achieve objectives, on the understanding that it is being properly controlled. 'Tolerability' does not mean 'acceptability'. Tolerating a risk does not mean that it is regarded as negligible, or something we may ignore, but rather as something that needs to be kept under review and reduced further. *(Source: DPLH, Guidelines v1.4)* Certain levels of risk may be tolerated, provided that the risks are known and managed. *(Source: AIDR LUPDRC, 2020)* A tolerable risk is a risk that is low enough to allow the exposure to a natural hazard to continue while at the same time high enough to require new treatments or actions to reduce risk. Communities can live with level of risk but as much as is reasonably practical should be done to further reduce the risk. *(Source: Queensland Government 2019: Natural hazards, risk and resilience – Bushfire: State Planning Policy – state interest guidance material)* Risk tolerance is defined as the organisations or stakeholder's readiness to bear the risk, after risk treatment, in order to achieve its objectives. Risk tolerance can be influenced by legal or regulatory requirements. *(Source: ISO Guide 73:2009)* A level of risk that defines the ALARP region, as risks that should be driven to the broadly acceptable region. *(Source: PIA, 2015)*
Risk - Intolerable	A level of risk that is so high that require risk treatment measures whatever their cost, or the elimination of the risk. *(Source: PIA, 2015)* Risk that is unacceptable in any circumstances or at any level. *(Source: DPLH, 2019)*
Risk Treatment	Risk treatment options available as part of the risk management process are generally categorised as follows: • Risk Avoidance: Measures taken to avoid risks from natural hazards. Can include avoiding development in hazardous areas, relocating people or assets away from hazardous areas, or developing buffer zones to the hazard; • Risk reduction/mitigation: Measures undertaken to reduce the risks from natural hazards. Includes building control and development controls; • Risk Transfer: Measures taken to transfer the risk from natural hazards from one party to another; and • Risk Acceptance: The acceptance of risk from a natural hazard. Any realised losses will be borne by those parties exposed to the hazard. This is not specifically a treatment option as no action is taken, but it is an option for addressing risk. *(Source: AIDR LUPDRC, 2020)*
Retrofitting	Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards. Retrofitting requires consideration of the design and function of the structure, the stresses that the structure may be subject to from particular hazards or hazard scenarios and the practicality and costs of different retrofitting options. *(Source: UNDRR, 2017)*
Structural and Non-Structural Measures	Structural measures are any physical construction to reduce or avoid possible impacts of hazards, or the application of engineering techniques or technology to achieve hazard resistance and resilience in structures or systems. Non-structural measures are measures not involving physical construction which use knowledge, practice or agreement to reduce disaster risks and impacts, in particular through policies and laws, public awareness raising, training and education.

	Common non-structural measures include building codes, land-use planning laws and their enforcement, research and assessment, information resources and public awareness programmes. *(Source: UNDRR, 2017)*
Threats	The mechanisms by which hazards can impact exposed elements.
Vulnerability	The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards. (*United Nations Office for Disaster Risk Reduction, 2017)* The characteristic or property of a community, system or object that makes it susceptible to the damaging effects of a specific hazard. Can be defined according to the responses of people, houses and assets in mitigating the impacts of a hazard. Specifically, it refers to the extent to which a community, building, services or location is likely to be damaged or disrupted by the impacts of a hazard, such as a bushfire. Building vulnerability refers to weak points in a building caused by its design, construction, use of materials and management (including maintenance). These weak points are identified in the context that they are not able to withstand the level of hazard they are exposed to. Climate and weather may directly influence the buildings vulnerability through several processes including (i) moisture content of combustible elements around and within buildings (ii) gaps between materials that may shrink and expand due to changes in moisture content and temperature (iii) wind action causing damage or dislocation of elements. *(Source: State Government of Queensland, CSIRO, 2020; Bushfire Resilient Building Guidance for Queensland Homes)*
'Vulnerable' Persons	These are persons who are considered to be at-risk members of the community and may be more susceptible to the impacts of bushfire. These persons are likely to present relocation (including evacuation) challenges in the event of a bushfire. Attributes of this group of persons includes: • Less physically or mentally able to relocate themselves; and/or • Are unfamiliar with their surroundings; and/or • Large numbers of persons in a building(s) or in the open, on a single site, such that the numbers present practical challenges.

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Bushfire Management Plan Coversheet

Site address:	3680 Collie-Changerup Road, Kojonup						
Site visit / date:	Yes	✓	No		20 March 2025		
Report author or reviewer:	Kathy Nastov						
Not accredited		Level 1 BAL assessor		Level 2 practitioner		Level 3 practitioner	✓
BPAD accreditation number:	27794	Accreditation expiry – month / year		August		2026	
Bushfire Management Plan - version / date:	V1.2	11 May 2026					

If one or more of the following responses are yes, then these should be automatically referred to DFES.	Yes	No
Strategic planning is required to address SPP 3.7 and the Guidelines		✓
The application is a vulnerable land use		✓

If one or more of the following responses are yes, and the decision-maker requires input from DFES, then the application can be referred.	Yes	No
The BAL rating has been calculated by a method other than Method 1 as prescribed by AS 3959	✓	
An outcomes-based approach has been submitted to demonstrate compliance with the bushfire protection criteria		✓

Note: If a subdivision or development application meets all the acceptable solutions and does not otherwise trigger a referral as listed above, seeking advice from DFES on SPP 3.7 or other matters is at the discretion of the decision-maker.

The information provided within this bushfire management plan, to the best of my knowledge, is true and correct:

Dated signature of report author or reviewer:		11 May 2026

BUSHFIRE PRONE PLANNING

Kojonup BESS

Bushfire Management Plan

(PREPARED FOR PLANNING APPLICATION ASSESSMENT PURPOSES)



Compiled in accordance with State Planning Policy 3.7 Bushfire and the Planning for Bushfire Guidelines

3680 Collie-Changerup Road, Kojonup

Shire of Kojonup

Development Application - Commercial/Industrial Development

11 May 2026

Job Reference No: 241243

BPP GROUP PTY LTD T/A BUSHFIRE PRONE PLANNING

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LIMITATIONS AND DISCLAIMER

Management of Risks Associated with Bushfire

For the subject planning proposal, the protection measures to be implemented based on information presented in this Bushfire Management Plan, prepared for land-use planning purposes, are the minimum requirements for management of the relevant risks.

The applied protection measures do not guarantee that during a bushfire event, no buildings or infrastructure will be damaged, persons injured, or fatalities occur - either on the subject site or off the site when evacuating.

This is substantially due to the unpredictable nature of fire weather conditions, bushfire behaviour and the actions of landowners and/or operators – including the correct implementation and ongoing maintenance of required and recommended protection measures (including bushfire resistant construction) and complying with public bushfire warnings and directions from emergency services - over which Bushfire Prone Planning has no control.

Provision of Mapping Data

All maps included herein are indicative in nature and are not to be used for accurate calculations. This data has been prepared for bushfire risk management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey.

Bushfire Prone Planning does not guarantee that this data is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.

When the separate provision of Digital Geographic Data (GIS Files) is an agreed project deliverable, these should be used in conjunction with the relevant information presented in the associated report. Areas and/or Dimensions specified in the report will have priority over digital data transmitted and must correspond to the final 'as-built' location of the applicable buildings, other structures or boundaries.

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All surveys, forecasts, projections and recommendations made in this report, associated with the subject planning proposal, are made in good faith based on information available to Bushfire Prone Planning at the time.

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EXPLANATORY INFORMATION

SITE/USE PLANNING

This BMP is produced to present the information necessary for a planning proposal's assessment against the State's bushfire planning requirements. Where a proposal is subject to revisions after planning approval, an approved BMP may require an updated version. The developed information is to inform and assist decision-making authorities, planners, landowners/proponents and referral agencies in their implementation of WA's State Planning Policy 3.7 Bushfire – and where relevant, any supplementary provisions of a local planning scheme or policy.

Policy Document Versions Applied in This BMP	State Planning Policy 3.7 Bushfire (SPP 3.7)	November 2024	Planning for Bushfire Guidelines (supporting SPP 3.7)	November 2024

> The Stated Intent of SPP 3.7 is to *implement effective, risk based land use planning and development which in the first instance avoids bushfire risk, but where unavoidable, manages and/or mitigates the risk to people, property and infrastructure to an acceptable level. The preservation of life and the management of bushfire impact are paramount.*

SITE OPERATIONS

This BMP is not an 'operational' BMP for property and operations management. Such a BMP would apply additional and more specific bushfire protection measures to more comprehensively reduce the level of risks associated with a bushfire event. These being the potential loss of life, injury, or destroyed or damaged assets which results in personal loss and economic loss.

However, this 'planning' BMP does establish certain responsibilities for the implementation and maintenance of the bushfire protection measures that are considered the minimum for bushfire planning decision making.

BUSHFIRE RESISTENT CONSTRUCTION

This 'planning' BMP is not required to consider the requirement to construct certain buildings, in designated bushfire prone areas, to the standard corresponding to the Bushfire Attack Level (BAL) they are subject to. This requirement is dealt with under the State Building Act 2011/Building Regulations 2012 and the referenced Building Code of Australia.

DETERMINED BUSHFIRE ATTACK LEVEL (BAL) RATINGS AND CONSTRUCTION – CAUTION!

For construction purposes a determined (not indicative) BAL rating is required to be known and a BAL Certificate produced for submission with a building application. This establishes the construction design and materials that are to be complied with in accordance with AS 3959 Construction in bushfire prone areas (as amended) and/or NS 300 NASH Standard Steel Framed Construction in Bushfire Areas (as amended).

This 'planning' BMP cannot necessarily determine a BAL rating that will apply to a future building. All variables required for that calculation may not be known at the assessed stage of planning. For example, actual location of a building footprint on a lot and/or any classified vegetation that will remain, at the time of construction, within the lot or on neighbouring lots.

This 'planning' BMP is only required to identify if a viable sized building can be located on a lot and be subject to a BAL rating not exceeding BAL-29, based on certain allowable assumptions. This is a planning requirement not a building requirement and a BAL contour map can be used to illustrate this information as an 'indicative' BAL rating.

Be aware that typically you cannot derive the determined BAL rating for a future building(s) on a specific lot from a BAL contour map (when presented in a BMP prepared for planning approval purposes). This is only possible in limited circumstances.

Planning assessment requirements are different to building assessment requirements. Refer to explanatory information above and Appendix B1 and B2 for additional information.

1 THE PLANNING PROPOSAL

1.1 Details, Plans and Maps

SUBJECT LAND AND PROPONENT (LANDOWNER)	
Address Details	3680 Collie-Changerup Road, Kojonup
Applicable Local Government	Shire of Kojonup
Proponent	Mint Renewables
Entity Commissioning Production of the BMP	Mint Renewables

THE PLANNING PROPOSAL STAGE AND TYPE		
Strategic Planning Document	☐	N/A
Structure Plan	☐	N/A
Subdivision Application	☐	N/A
Development Application	☑	Construction of a habitable building that is subject to bushfire planning requirements.

DESCRIPTION

This Bushfire Management Plan (BMP) will outline bushfire management requirements for a Battery Energy Storage System (BESS) and grid connection proposed at 3680 (L3194) Collie-Changerup Road, Kojonup. The BMP assesses the proposal against *State Planning Policy 3.7 Bushfire* and associated Guidelines and Position Statements corresponding to the specific land use and planning stage.

The Mint Renewables Project Layout (Item_10_KBESS_MINT_CP_1.0_E December 2025) and resulting 2-D footprint has been used as the basis for assessing the potential bushfire impact to the subject site.

Should the design detail or project location change, a revised BMP or BMP Addendum may be required to confirm the specific layout and how the development will meet the required APZ, access, and water supply.

<u>The Project</u>

The Project is situated on private land (3680 Collie-Changerup Road, Kojonup) with a planned connection into the existing Kojonup Substation (262 Tunney Road, Kojonup). The Project Investigation Area also includes Collie-Changerup and Tunney Road reserves. The dominant land is generalised agriculture, with sparse areas of native vegetation present.

The subject site is bounded in the north by Collie-Changerup Road and Tunney Road in the east. Land within and adjacent to the Project site is predominantly associated with agricultural practices, primarily used for dryland mixed farming of livestock and cropping.

The Project involves a battery energy storage facility and underground transmission line to connect the Project to the electricity network, and includes (but is not limited to):

- Onsite electrical substation
- A 330 kV underground transmission line connecting the Project from the onsite substation into the electricity network.
- Battery Energy Storge System (BESS) with an indicative storage capacity of 800MWh
- Internal site access tracks
- Operations and maintenance facilities
- Detention basin - to collect stormwater and contaminated fire water.

The proposed development area is contained within the lease area, within a north-eastern section of the subject lot.

Primary Proposed or Intended Construction		
EXPLANATORY INFORMATION Note: A habitable building is defined in the WA *Planning and Development (LPS) Regulations 2015* to mean: A permanent or temporary structure on land that: (a) Is fully or partially enclosed; and (b) Has at least one wall of solid material and a roof of solid material; and (c) Is used for a purpose that involves the use of the interior of the structure by people for living, working, studying or being entertained.		
Primary Type(s)	Battery energy storage system	New Building(s)
BCA Classification	N/A	Class 7b (warehouse/storage/wholesale)
Development Type - Establishing the Applicable Bushfire Protection Criteria		
Commercial and Industrial	Construction of or addition to, a habitable building for commercial or industrial uses. *[Guidelines s7]*	
Assessment Supporting Details: As discussed within Section 1.2, the proposal includes numerous asset and structure types which are not 'Habitable Buildings.' However, only 'Habitable Buildings' are subject to SPP 3.7 and have Acceptable Solutions provided within the *Guidelines for Planning in Bushfire Prone Areas*. Constructed assets other than the Detention Pond and Access Roads have all been considered 'Habitable Buildings' for the purposes of the assessment against the Bushfire Protection Criteria, and allowing for application of SPP 3.7.		



LEGEND

	SITE ACCESS GATE		PROPOSED SECURITY FENCE
	PROPOSED NEW ACCESS TRACK		EXISTING SUBSTATION
	BATTERY CONTAINER		PROPOSED LANDSCAPE SCREENING (APPROX. 5m WIDE)
	POWER CONVERSION SYSTEM UNIT (PCS)		PROPOSED LANDSCAPE SCREENING (APPROX. 3m WIDE)
	EXISTING OVERHEAD LINE		INTERNAL ACCESS TRACK
	EXISTING OVERHEAD LINE EASEMENT		PROPOSED SUBSTATION AREA
	PROPERTY BOUNDARY		PROPOSED WATER DETENTION BASIN AREA
	PROPOSED NEW CONNECTION ROUTE		
	PROPOSED WATER TANK		
	PROPOSED O&M BUILDING AND CAR PARK AREA		

REVISIONS

REV	STATUS	DESCRIPTION	DATE	D.B.	C.B.
A	DA	INITIAL ISSUE	10/02/26	X.Z	S.Y
B	DA	DETAIL AMENDED	19/02/26	X.Z	S.Y
C	DA	DETAIL AMENDED	03/03/26	X.Z	S.Y
D	DA	DETAIL AMENDED	10/03/26	X.Z	S.Y
E	DA	DETAILS INFORMATION AMENDED	23/03/26	X.Z	S.Y
F	DA	NOTES AMENDED	25/03/26	X.Z	S.Y

PROJECT DETAILS:

KOJONUP BESS

Collie-Changerup Rd, Kojonup WA 6395
-33.804452, 117.136471

PROJECT DEVELOPER:

MINT RENEWABLES

DRAWING TITLE:

INDICATIVE SITE LAYOUT

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DA-2.0_F_KOJONUP

DRAWN BY :	APPROVED BY :	PROJECT MANAGER :
X.Z	S.Y	K.D
SCALE : NOT SCALED	ISSUE : CONCEPT PLAN	ISSUE DATE : 25/03/2026
SHEET SIZE: A3	CONCEPT ONLY NOT FOR CONSTRUCTION PURPOSE	REV. NO: F

Mint



Figure 1.3

Bushfire Prone Area

Lot 3194 on Plan 227649, Area : 97.29 ha
Collie-Changerup Road
KOJONUP
SHIRE OF KOJONUP

------ LEGEND ------

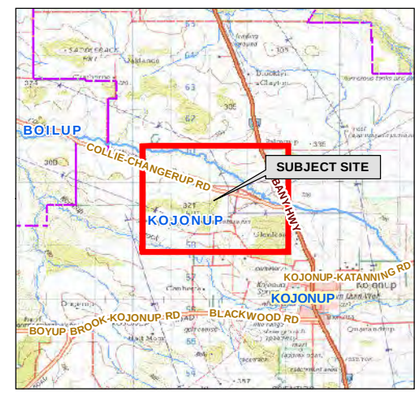
- Subject Site
- Other Lots

Bushfire Prone Area OBRM-023

- Bushfire Prone Area 2

0 250 500 750
Meters

------ LOCALITY ------



N

Aerial Imagery : Landgate/SLIP
Image Date : Nov 2024

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Neil Stoney 18/12/2025
Map updated by: Neil Stoney 18/12/2025
A3 Scale 1:12,000

BUSHFIRE PRONE PLANNING

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Map Document Path / Name: K:\Projects\Jobs 2024\241243 - 3680 Collie - Changerup Rd, Kojonup (BRMP)\Mapping\MXD\241243_Fig1-4_BPA.mxd

1.2 The Planning Proposal and its Requirement to Address Bushfire Risk

EXPLANATORY INFORMATION

For the subject planning proposal, the intent of this section is to:

- Identify the relevant statutory bushfire planning provisions that have established its requirement to address bushfire risk;
- Identify the relevant policy/guideline 'triggers' to apply SPP 3.7 Bushfire;
- Identify when a local government, as the decision maker, has established additional 'triggers' to apply defined bushfire planning assessments; and
- Identify the consideration of any relevant exemptions from application of SPP 3.7 Bushfire.

Relevant Terms

Development means the development or use of any land, including (a) any demolition, erection, construction, alteration of or addition to any building or structure on the land (b) the carrying out on the land of any excavation or other works (Planning and Development Act 2005, Part1, s.4; and

Habitable building means a permanent or temporary structure on land that:

(a) is fully or partially enclosed; and

(b) has at least one wall of solid material and a roof of solid material; and

(c) is used for a purpose that involves the use of the interior of the structure by people for living, working, studying or being entertained;

Specified building means a structure of a kind specified in this Scheme as a kind of structure to which this Part applies in addition to its application to habitable buildings.

Development site means that part of a lot on which a building that is the subject of development stands or is to be constructed - Planning and Development (LPS) Regulations 2015, s.78A.

Construction of a building includes the erection, assembly or placement of a building but does not include the renovation, alteration, extension, improvement or repair of a building;

1.2.1 Applied Statutory Bushfire Provisions Requiring a Planning Application

A PLANNING APPLICATION IS TO BE SUBMITTED TO WAPC FOR DETERMINATION

The proposed development (construction and/or use) is a category for which WAPC is the decision maker rather than the local government.

Determination will be made under the Planning and Development Act 2005, its relevant subsidiary legislation and associated State Planning Policies.

Assessment Supporting Details:

The subject Development Application does not technically trigger any bushfire assessment under the current *State Planning Policy 3.7 Bushfire* (WAPC November 2024).

The *Planning and Development (Local Planning Schemes) Regulations 2015* Section 78B describes the development types within a Bushfire Prone Area subject to the *Regulations* Part 10A – Bushfire risk management. These are:

- Single houses or ancillary dwellings on lots with an area of >1,100m2;
- Habitable buildings other than a single house or ancillary dwelling, or;
- Specified buildings.

State Planning Policy 3.7 Bushfire (WAPC November 2024) and the associated *Planning for Bushfire Guidelines* (WAPC November 2024) aligns with these definitions and reference 'Habitable Buildings' and 'Specified Buildings' requiring application of the Policy.

The subject Development Application does not propose to locate any 'Habitable Buildings' within a Bushfire Prone Area.

'Specified Buildings' are those which are specifically designated in the Local Government's Local Planning Scheme as being subject to Part 10A of the *Planning and Development (Local Planning Schemes) Regulations 2015*. To date, no Local Planning Schemes have identified a 'Specified Building.'

The *Planning and Development (Local Planning Schemes) Regulations 2015* Clause 67.2 requires due regard be given to:

> "*(q) the suitability of the land for the development taking into account the possible risk of flooding, tidal inundation, subsidence, landslip, bush fire, soil erosion, land degradation or any other risk;*
>
> *(r) the suitability of the land for the development taking into account the possible risk to human health or safety;"*

The proposal is for a major infrastructure asset in a bushfire prone area, and the potential may exist for the site to either instigate or have hazardous interactions with a bushfire. The decision maker must have due regard to Subclauses q) and r) despite the limited scope of SPP 3.7.

Policy can never fully capture appropriate bushfire protection measures for all development types. This is particularly in the case of very large proposals, complex sites, emerging technologies, or complex/hazardous uses. BPP note this development is technically exempt from SPP3.7 and the Guidelines; but there are still relevant parameters contained within these documents that can inform the project and the planning determination.

To assist the decision maker of all the necessary considerations to make an informed, robust decision regarding bushfire risks, BPP's approach is to:

a) Apply a precautionary approach and assess relevant assets (as identified by the Bushfire Planning Practitioner) to be 'Habitable Buildings' for the purposes of initial assessment;

b) Conduct a Risk Assessment (provided in a separate report) to comprehensively assess the proposal and determine appropriate bushfire protection measures applicable to the specific development, and;

c) Produce a Bushfire Management Plan (this document) for planning consideration, which establishes the specific bushfire protection measures for this particular proposal.

In aligning with SPP 3.7 and the Guidelines, the outcome is to meet the intent of the Bushfire Protection Criteria by establishing relevant bespoke Criteria applicable to the development.

1.2.2 Applied Triggers to Apply State Planning Policy 3.7 Bushfire

EXPLANATORY INFORMATION

State Planning Policy 3.7 Bushfire (SPP 3.7) provides broad objectives and high-level guidance for how planning proposals and development applications within bushfire prone areas should be considered. Implementation is supported by more detailed instructions within the *Planning for Bushfire Guidelines*.

The following table identifies the guidance that has resulted in the planning proposal being required to apply SPP 3.7.

Inconsistent Information (as of December 2024):

- There are inconsistences between the provisions of the applicable legislation (Planning and Development (LPS) Regulations 2015), the clauses of the associated policy (SPP 3.7 Bushfire) and its associated guidance (Planning for Bushfire Guidelines Nov. 2024).
- This has resulted in inconsistencies in the establishment of the 'triggers' to lodge proposals, plans and applications for planning approval sourced from these documents.

Until legislation/policy/guideline amendments are completed, the advice from WAPC/DPLH is that the decision maker should apply SPP 3.7 and the Guidelines as they deem necessary. *(Source: Explanatory Note SPP 3.7, DPLH, 25/11/24)*

B**ushfire Prone Planning's** Current Approach:

- To apply the 'triggers' for application of SPP 3.7/Guidelines in accordance with the current version of the Guidelines (Planning for Bushfire Guidelines, November 2024), in Sections 6, 7 and 8 - as this is best aligned with the current version (3 Nov 2024) of the LPS Regulations 2015; unless
- The relevant decision maker has determined, and confirmed in writing to the proponent, that SPP 3.7/Guidelines is to be applied.

	SPP 3.7 AND THE GUIDELINES - ESTABLISHING THE NEED TO GIVE DUE REGARD TO SPP 3.7	APPLICABLE
1	THE LAND SUBJECT TO THE PLANNING PROPOSAL IS:	
	Designated bushfire prone and 'Area 1 (Urban)' on the Map of Bushfire Prone Areas (refer to Figure 1.4); or	No
	Designated bushfire prone and 'Area 2' on the Map of Bushfire Prone Areas (refer to Figure 1.4).	No
	AND	
2	THE PLANNING PROPOSAL WILL:	
	Result in the intensification of development (or land use); or	Yes
	Result in an increase of visitors, residents or employees; or	Yes
	Adversely impact or increase the bushfire risk to the subject or surrounding site(s).	Yes
	AND	
3	THE PLANNING PROPOSAL IS A:	
	(Source: Guidelines s.7) A development application for construction of or additions to a habitable building for commercial or industrial uses in an area subject to a pre-development radiant heat impact exceeding 29kW/m² (BAL-40 or BAL-FZ) and designated as Area 1 (Urban) or Area 2 on the Map of BPA.	
	Note: An application for additions to a habitable building to which SPP 3.7 and these Guidelines apply, is required to address the bushfire protection criteria for the entire site. It should be noted that there are no requirements under SPP 3.7 or the Guidelines to retrofit existing buildings to the appropriate bushfire construction standard, or any requirement for these existing buildings to be located within an area with a radiant heat impact not exceeding 29 kW/m² (BAL-29).	

1.2.3 Identified Exemptions

EXPLANATORY INFORMATION

The following situations provide for an exemption from the application of SPP 3.7/Guidelines. They are established by the stated sources and are presented below as:

- Evidence they have been considered when relevant; and
- Justification for the application of SPP 3.7/Guidelines despite a relevant exemption applying to part or all of the planning proposal.

EXEMPTION SCENARIOS	APPLICABLE
(Source: LPS Regulations 2015 Part 10A - Bushfire risk management) Does not apply to land where there is no existing local planning scheme or where a local planning scheme has ceased to have legal effect.	No
(Source: Guidelines s1.2.1) For a structure plan or subdivision application, for proposed lot(s) that: • Are not designated as bushfire prone; • Or where there is no increase in the development potential and therefore no intensification of land use or bushfire risk, such as a boundary realignment, that does not restrict the ability to establish or maintain an APZ; and • does not restrict vehicular access to any existing or future habitable building.	No
(Source: Guidelines s1.2.1) - For incidental non- habitable buildings or structures located not less than six metres from the habitable building, including but not limited to private garages, carports, patios, storage sheds, outbuildings, swimming pools, spa pools and fences.	No
(Source: Guidelines s1.2.1) - For a change of use, minor renovations, extensions, alterations, improvements or repair of an existing habitable building where: • The application does not result in an increase of occupants onsite; and/or • There is no increase in the bushfire risk, such as an extension being further away from the bushfire hazard, or the extension does not restrict vehicular access or the provision of water for the development.	No

Assessment Supporting Details:

None Required.



Figure 1.3

Bushfire Prone Area

Lot 3194 on Plan 227649, Area : 97.29 ha
Collie-Changerup Road
KOJONUP
SHIRE OF KOJONUP

------ LEGEND ------

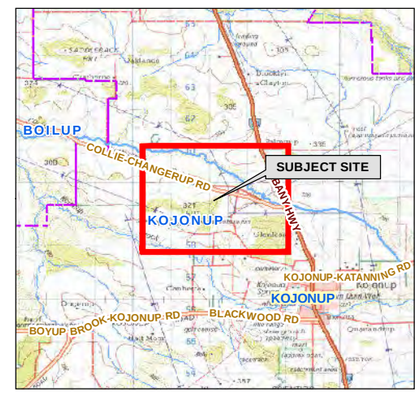
- Subject Site
- Other Lots

Bushfire Prone Area OBRM-023

- Bushfire Prone Area 2

0 250 500 750
Meters

------ LOCALITY ------



N

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1.3 Required '**Bushfire Planning**' Assessments and Documents

INFORMATION **PRESENTED IN THIS 'PLANNING' BMP (OR THE BEP)** - PROVIDED TO ACCOMPANY **THE PROPONENT'S** PLANNING SUBMISSION						
The requirements are established by SPP 3.7 Part 4, Guidelines Section 1.2, 4.4, 5.5, 6.4, 7.2, 8.3 and A1.2. The green highlighted column identifies the required information for the subject planning proposal.		Strategic Planning Document		Structure Plan / Subdivision Application		Development Application
Required Information	Details	Map of Bushfire Prone Areas Designation				
		Area 1 (Urban)	Area 2	Area 1 (Urban)	Area 2	Areas 1 & 2
Environment - Identification of environmental, biodiversity or conservation values on subject site(s)	Presented in the BMP. Identifies how proposal siting and design avoids and/or minimises clearing of native vegetation in applying required bushfire protection measures.	BUSHFIRE PLANNING ASSESSMENTS ARE NOT REQUIRED	✓	✓	✓	✓
BLA - Broader Landscape Assessment (see note below)	Presented in the BMP. Considers subject site suitability based on exposure to bushfire hazards, potential for landscape scale bushfire, road network and suitable evacuation destinations.		✓	-	✓	-
BHL - Bushfire Hazard Level Assessment (pre-development)	Presented in the BMP. Can include detail of treatments required to achieve BHL of moderate and/or low.		✓	-	-	-
BAL - Bushfire Attack Level Assessment	Presented in the BMP in BAL contour map format as a requirement and in table format as an additional option.		-	✓	✓	-
	Presented in the BMP in table format and/or BAL contour map format – dependant on which is more efficient and effective at presenting the results (e.g. BAL contour map for multiple buildings).		-	-	-	✓
BPC - Assessment against the relevant Elements (E1 – E4) of the Bushfire Protection Criteria	Presented in the BMP. Strategic planning will necessarily focus on Element 1: Location. Can demonstrate compliance using acceptable solutions and/or an outcomes-based approach.		✓	✓ Excluding E1	✓	✓ Excluding E1
BEP - Bushfire Emergency Plan	For vulnerable land uses only. Provided as a separate document or an addition / modification to an existing BEP or site Emergency Management Plan.		-	-	-	-
LMP – Landscape Management Plan	For vulnerable land uses only. Provided as a separate document or an addendum to the BMP.					
Note: Where a relevant planning proposal (e.g. subdivision) was previously assessed and approved under the SPP 3.7/Guidelines 2015, it is likely that a BLA will not be required. Also, if an application (e.g. subdivision) is compliant with a structure plan and/or a local planning scheme amendment, which were assessed and approved under the 2015 SPP/Guidelines, it is likely that a BLA will not be required. Confirmation from a relevant DPLH officer may be required (DPLH advice to BPP 20/2/2025).						

1.4 Other Documents Relevant to Preparing the BMP

EXPLANATORY INFORMATION

This section identifies any known assessments, reports or plans that have been conducted and prepared previously, or are being prepared concurrently, and are relevant to the subject planning proposal.

They may have implications for the assessment of bushfire hazard threats and the identification and implementation of the bushfire protection measures that are established by this BMP.

RELEVANT DOCUMENTS				
Document	Relevant	Exists	To Be Concurrently Developed	Title
Preliminary bushfire advice	Yes	Yes	N/A	241243 – Kojonup BESS (BAB) v1.0 (Bushfire Prone Planning, March 2025)
Implications for the BMP: A Bushfire Advice Brief (BAB) has been previously produced to provide bushfire planning advice for the proposal. The submitted layout is based on the advice provided within the BAB.				
Bushfire Risk Report	Yes	No	Yes	241243 – Kojonup BESS (BRR) v1.2 (Bushfire Prone Planning, May 2026).
Implications for the BMP: The Bushfire Risk Report prepared alongside this BMP identifies the appropriate measures to reduce the risk of onsite and/or offsite ignition, asset damage, and harm to persons, environment, and community. Additional Bushfire Protection Measures to meet or exceed the intent of the Acceptable Solutions of Elements 2-4 of the Bushfire Protection Criteria have been provided within the Section 5.3 Assessment Statements. These are measures which are considered relevant to the planning process.				
Revegetation Plan	Yes	No	No	TBA
Implications for the BMP: Revegetation is proposed to improve visual amenity through vegetation screens. A landscaping (revegetation) plan will be produced prior to construction. The indicative location of the proposed vegetation screening is shown within the project layout and included within this BMP. Refer to Section 2.3 for details.				

2 ENVIRONMENTAL CONSIDERATIONS – NATIVE VEGETATION

EXPLANATORY INFORMATION

Some bushfire prone areas also have high biodiversity values. SPP3.7 objective 5.4 prioritises the retention of native vegetation for biodiversity conservation, environmental protection and landscape amenity.

Clearing or modification of native vegetation for the purpose of land use or development is assessed under State Planning Policy 2: Environment (SPP 2), State Planning Policy 2.8: Bushland policy for the Perth Metropolitan Region (SPP 2.8) and relevant environmental legislation. A key objective of these polices is to avoid development that may result in unacceptable environmental damage.

Any 'modification' or 'clearing' of vegetation to reduce bushfire risk is considered 'clearing' under the *Environmental Protection Act 1986* (EP Act) and requires a clearing permit under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations) – unless for an exempt purpose.

Clearing native vegetation is an offence, unless done under a clearing permit or the clearing is for an exempt purpose. Exemptions are contained in the EP Act or are prescribed in the Clearing Regulations (note: these exemptions do not apply in environmentally sensitive areas).

The *Department of Water and Environmental Regulation* (DWER) is responsible for issuing 'clearing' permits and the framework for the regulation of clearing. Approvals under other legislation, from other agencies, may also be required, dependent on the type of flora or fauna present.

Local Planning Policy or Local Biodiversity Strategy: Natural areas that are not protected by the above Act and Regulation (or any other National or State Acts) may be protected by a local planning policy or local biodiversity strategy. Permission from the local government will be required for any modification or removal of native vegetation in these Local Natural Areas (LNA's). Refer to the relevant local government for detail.

For further Information refer to Native vegetation clearing permits | Western Australian Government, the Planning for Bushfire Guidelines (as amended) and the Bushfire and Vegetation Factsheet - WAPC, Dec 2021.

2.1 Biodiversity or Conservation Values Identified

EXPLANATORY INFORMATION

The required information, relevant to bushfire planning and informing the production of this BMP, is sourced and presented as indicated below.

Note that where a 'desktop' assessment has been conducted, this should not be considered a replacement for a full Environmental Impact Assessment. It is a summary of potential biodiversity or conservation values at the subject site, inferred from information contained in public available datasets and/or reports, which are only current to the date of last modification.

The information provided in the BMP should be considered indicative where the subject site has not previously been subject to a site-specific environmental assessment by an appropriate professional.

The required information is sourced from the environmental/planning consultant report developed for the subject site and provided to the bushfire consultant (details below when applicable). The information it contains is not repeated in this BMP as it will accompany the planning submission. The implications for the subject planning proposal and this BMP are stated below when relevant.	No Report Available / Provided
The required information is sourced by the bushfire consultant as a 'desktop' assessment from publicly available data bases and/or a local government's local biodiversity strategy or local planning strategy. When applicable, this information is presented on the following pages of this BMP.	Yes - Fully

IDENTIFICATION OF RELEVANT BIODIVERSITY OR CONSERVATION VALUES							
Dataset	Relevant to Subject Planning Proposal	Influence on Bushfire Threat Levels and / or Application of Bushfire Protection Measures	Information Source(s) Applied				Further Action Required by Proponent
			WA Govt. Agency Dataset (ID)		Landowner or Developer Statements	Environmental Asset or Vegetation Survey Report	
Department of Biodiversity, Conservation and Attractions (DBCA) Datasets							
Conservation Category Wetlands and Buffer (geomorphic wetlands – relevant area)	No	-	☒	DBCA-021	☐	☐	None
RAMSAR Sites (wetlands of international importance)	No	-	☒	DBCA-010	☐	☐	None
Threatened and Priority Flora	No	-	Restricted Scale of Data Available (security)	DBCA-036	☐	☐	None
Threatened Ecological Communities	No	-		DBCA-038	☐	☐	None
Legislated Lands and Waters (national/conservation parks, nature/crown reserves, state forest)	No	-	☒	DBCA-011	☐	☐	None
Department of Planning, Lands and Heritage (DPLH) Datasets							
Bush Forever Areas 2000	No	-	☒	DPLH-019, 022 and MRS Bush Forever	☐	☐	None
Department of Water and Environmental Resources (DWER) Datasets							
Clearing Regulations – Environmentally Sensitive Areas	No	-	☒	DWER-046	☐	☐	None
Swan Bioplan Regionally Significant Natural Areas 2010	No	-	☒	DWER-070	☐	☐	None

2.2 Response of the Planning Proposal to Protection of Native Vegetation

The protection of native vegetation is to be prioritised by avoiding areas that would require clearing or modification of native vegetation, specifically for the purpose of bushfire mitigation (BMP Manual, November 2024 DPLH).

SOLUTIONS APPLIED TO MINIMISE NATIVE VEGETATION REMOVAL / MODIFICATION	
Clearing and/or modification of native vegetation is proposed and necessary.	Likely
Proposed Clearing: Land within and adjacent to the Project site is predominantly associated with agricultural practices, primarily used for dryland mixed farming of livestock and cropping. The BESS located within open grassland. No clearing of native vegetation is required, except: • within road reserves to install driveway crossovers to Collie-Changerup Road and Tunney Road, and • if the underground transmission line crosses native vegetation. The alignment of the transmission line connection is subject to confirmation with Western Power. Appropriate permits of approvals for vegetation modification will be sought if required.	
Conservation Response	
The proposal reserves native vegetation for conservation, recreation or environmental protection purpose. These can include ecological linkage, local natural area, waterway, or foreshore area or wetland buffer.	Not required
Siting / Design / Construction Responses	
Reduction in the proposed intensification of land use or development potential.	Not required
Containing or clustering areas of intensification of land use to reduce clearing requirements.	Not required
Consideration of locating proposed development to have greater initial vegetation separation distances from bushfire hazards by utilising non-vegetated interfaces.	Not required
Modification or redesign of the proposed areas of intensification of land use to avoid areas with high environmental, biodiversity or conservation values.	N/A
The proposal has applied a reduction in the intensification of land use or development potential (e.g. reduced lot yield or smaller building footprints), to ensure the retention of greater areas of native vegetation while achieving the required vegetation separation distances to limit exposure to unacceptable levels of potential bushfire impact.	N/A
The proposal situates required non-vegetated elements (e.g. footpaths, paved areas, roads, parking, open drainage channels, and major services delivery installed in common corridors), between bushfire hazards and elements at risk – to effectively achieve required vegetation separation distances with less vegetation clearing and/or modification.	N/A
The proposal applies building envelopes, and these have located to minimise the requirement to clear and/or modify native vegetation.	N/A
The proposal utilises the clustering habitable buildings to reduce requirements for native vegetation clearing and/or modification.	N/A
The proposal aligns roads and pathways to work around trees and other vegetation, preserving their ecological values.	N/A

The proposal establishes requirements for the construction of building(s) to satisfy the requirements corresponding to higher BAL ratings to ensure a reduced vegetation separation distance requirement.	N/A

2.3 Vegetation Management Plans with Implications for the BMP

EXPLANATORY INFORMATION

This section identifies the area(s) of land (supporting vegetation), within or near the subject site (i.e. onsite or offsite) to which one or more of the following scenarios and their corresponding management actions applies.

If none of these scenarios is relevant to the subject planning proposal, this is stated.

1. Area(s) subject to a LANDSCAPE PLAN THAT RESULTS IN RELEVANT ELEMENTS AT RISK BEING EXPOSED TO A LOW BUSHFIRE THREAT LEVEL from existing or planned area(s) of vegetation and establishes the following management actions:

    (a) To apply landscaping design (including the modification and/or establishment of plants/shrubs/trees), that will enable the area(s) to be excluded from classification under AS 3959 BAL determination methodology;

    (b) To actively manage the area(s) to maintain the low bushfire threat level in perpetuity. Thereby ensuring the applicable bushfire protection measures, applied in accordance with the BMP, remain effective;

    (c) To achieve and maintain the low threat state through using a combination of mechanisms including:

        (i) Minimising vegetation fuel loads through design and ongoing management;

        (ii) Using low flammability and/or higher moisture content species;

        (iii) Incorporating non-vegetated elements; and

    (d) To identify the entity responsible for ensuring the landscape plan is complied with in perpetuity and when required, will contain written confirmation of their acceptance of the responsibility.

2. Area(s) subject to a LANDSCAPE PLAN THAT RESULTS IN RELEVANT ELEMENTS AT RISK BEING EXPOSED TO A REDUCED BUSHFIRE THREAT LEVEL from existing or planned area(s) of vegetation and establishes the following management actions:

    (a) To apply landscaping design involving the removal and/or modification of existing vegetation that will enable the area(s) to be classified as a lower threat class under AS 3959:2018 BAL determination methodology;

    (b) To actively manage the area(s) to maintain the reduced bushfire threat level in perpetuity. Thereby ensuring the applicable bushfire protection measures, applied in accordance with the BMP, remain effective;

    (c) To identify the entity responsible for ensuring the landscape plan is complied with in perpetuity and when required, will contain written confirmation of their acceptance of the responsibility.

3. Area(s) subject to a REVEGETATION PLAN THAT MAY RESULT IN RELEVANT ELEMENTS AT RISK BEING EXPOSED TO AN ADDITIONAL BUSHFIRE HAZARD AND/OR AN INCREASED BUSHFIRE THREAT LEVEL from an existing area(s) of vegetation and establishes the following information:

    (a) The location of the areas to be revegetated (as distinct from natural regeneration which is accounted for in the vegetation classification under AS 3959 BAL determination methodology); and

    (b) A description of the planned design regarding density and species of plants/shrubs/trees to inform the bushfire consultant's classification of the vegetation under AS 3959:2018 BAL determination methodology.

Relevance of the Stated Scenarios to the Subject Planning Proposal	Only Scenario 3 is relevant.

2.3.1 Revegetation Plan – Additional Bushfire Hazard

PLANNED REVEGETATION – ADDITIONAL BUSHFIRE HAZARD	
Assessment Details	Relevant
The area of land that is to be subject to a revegetation plan is within the subject site (onsite).	Yes
The area of land that is to be subject to a revegetation plan is outside the subject site (offsite).	No
The revegetation plan will introduce a bushfire hazard that doesn't currently exist.	No
The area of land subject to the revegetation plan will introduce a bushfire hazard with a greater bushfire threat level than currently exists. its classification under AS 3959 (as amended) BAL determination methodology will be changed to a higher threat level classification.	Yes
Identification of the Area(s) of Land Subject to a Revegetation Plan	
The submitted layout includes planted vegetation screening around the perimeter of the facility. The vegetation screens proposed are 5m wide- see Figure 1.1. This is a common measure applied, either as a condition of approval, through public consultation, or as a voluntary measure to improve visual amenity.	
Implications for the BMP	
The northern, southern, and eastern vegetation screens have been classified as Class D Scrub (Vegetation Area 8). These areas are continuous with classifiable vegetation (pasture only). The western vegetation screen has been excluded from classification (Vegetation Area 10). This area is bounded by low threat vegetation or non-vegetated areas, thus any impacting bushfire will not transfer directly into the vegetation (spotting or surface fire rather than flame contact).	

3.1 Bushfire Attack Level (BAL) Assessment Summary (Contour Map Format)

EXPLANATORY INFORMATION

Future building works require a 'determined' BAL rating for building permit applications. When a BAL contour map is being used for planning assessment purposes, (as opposed to a building assessment purpose), the required 'determined' BAL rating typically is not able to be derived from the map (there are only limited scenarios where this is possible).

The BAL ratings identified from the map will more likely be only 'indicative' of what can be achieved – with planning compliance for this factor being achieved when BAL-29 is indicated.

Otherwise, an additional assessment of the site data for building application purposes is required, and potentially approval will need to be obtained for native vegetation modification and/or removal from the relevant authority.

Refer to Appendix B2 for additional information and guidance regarding interpretation of the BAL Contour Map.

3.1.1 BAL Determination Methodology and Location of Data and Results

<table>
<tr><th colspan="6">LOCATION OF DATA & RESULTS</th></tr>
<tr><th colspan="2" rowspan="2">BAL Determination Methodology</th><th colspan="3">Location of the Site Assessment Data</th><th>Location of the Results</th></tr>
<tr><th rowspan="2">AS 3959:2018</th><th rowspan="2">Applied to Assessment</th><th rowspan="2">Classified Vegetation and Topography Map(s)</th><th>Calculation Input Variables</th><th rowspan="2">Assessed Bushfire Attack Levels and/or Radiant Heat Levels</th></tr>
<tr><th>Summary Data</th><th>Detailed Data with Explanatory and Supporting Information</th></tr>
<tr><td>Method 1 (Simplified)</td><td>Yes</td><td rowspan="2">Figure 3.1</td><td rowspan="2">Table 3.2</td><td>Appendix A1</td><td rowspan="2">Table 3.1
Table 3.3 / BAL Contour Map</td></tr>
<tr><td>Method 2 (Detailed)</td><td>Yes</td><td>Appendix A2</td></tr>
<tr><td colspan="6">Reasons for the Application of the Method 2 Procedure</td></tr>
<tr><td>1.</td><td colspan="5">A more specific result is sought.</td></tr>
<tr><td colspan="6">Identification of the specific issues associated with the site and/or proposed development that have necessitated the use of the Method 2 procedure:
A 10kW/m2 APZ (calculated at 1090K Flame Temperature) has been applied as an appropriate maximum acceptable heat flux exposure for BESS / PCS area and control building for secondary systems.</td></tr>
</table>

3.1.2 BAL Ratings Derived from the Contour Map

Table 3.1: Indicative and determined BAL(s) for existing and/or proposed building works.

BUSHFIRE ATTACK LEVEL FOR EXISTING/PLANNED BUILDINGS/STRUCTURE [1]		
Building/Structure Description	Indicative BAL [2]	Determined BAL [2]
BESS / PCS and associated infrastructure	BAL-12.5	BAL-FZ
On-site Substation	BAL-19	BAL-FZ
Class 1-10 Buildings	BAL-19	BAL-FZ
Firefighting Water Tanks	BAL-19	BAL-FZ
[1] The assessment data used to derive the BAL ratings is sourced from Table 3.1 and Figure 3.2 'BAL Contour Map'. [2] Refer to the start of Section 3 for an explanation of indicative versus determined BAL ratings.		

3.1.3 Site Assessment Data Applied to Construction of the BAL Contour Map(s)

RELEVANT CLASSIFIED VEGETATION	
Identification of Classified Vegetation that is Relevant to the Production of the BAL Contour Map(s)	Relevant Vegetation Map
The relevant vegetation for the post-development BAL contour map will be any area of classified vegetation - both within the subject site (onsite) and external to the subject site (offsite) - that will remain at the intended end state of the subject development once earthworks, any clearing and/or landscaping and re-vegetation have been completed.	Figure No. 3.2
Supporting Assessment Details: Vegetation management and/or installation of hardstands throughout the development area will reduce much of the development to low threat. Vegetation screening for visual amenity are additionally applied- See Section 2.	

Table 3.2: Calculation inputs applied to deriving the vegetation separation distances corresponding to different levels of potential radiant heat transfer.

DATA APPLIED TO CALCULATE THE SITE SPECIFIC VEGETATION SEPARATION DISTANCES CORRESPONDING TO POTENTIAL RADIANT HEAT TRANSFER LEVELS [1]												
Applied BAL Determination Method		METHOD 1 - SIMPLIFIED PROCEDURE (AS 3959:2018 CLAUSE 2.2) AND METHOD 2 - DETAILED PROCEDURE (AS 3959:2018 APPENDIX B)										
The Calculation Input Variables - Corresponding to the Applied BAL Determination Method [2]												
Methods 1 and 2		Method 1			Method 2							
Vegetation Classification		FDI	Effective Slope		Site Slope	FFDI or GFDI	Flame Temp.	Elevation of Receiver	Flame Width	Fireline Intensity	Flame Length	Modified View Factor
			Applied Range	Measured								
Area	Class		degree range	degrees	degrees		K	metres	metres	kW/m	metres	% Reduction
1	(A) Forest	80	Upslope or flat 0	flat 0	flat 0	80	1090	Default	Default	Default	Default	Default
2	(A) Forest	80	Downslope >0-5	d/slope 5	upslope 5	80						
3	(B) Woodland	80	Upslope or flat 0	flat 0	flat 0	80						
4	(B) Woodland	80	Downslope >0-5	d/slope 5	upslope 5	80						
5	(D) Scrub	80	Upslope or flat 0	flat 0	flat 0	80						
6	(G) Grassland	80	Upslope or flat 0	flat 0	flat 0	110						
7	(G) Grassland	80	Downslope >0-5	d/slope 5	upslope 5	110						
8	(D) Scrub	80	Upslope or flat 0	flat 0	flat 0	80						
9	Excluded cl 2.2.3.2(e)	-	-	-	-	-	-	-	-	-	-	-
10	Excluded cl 2.2.3.2(f)	-	-	-	-	-	-	-	-	-	-	-

Note 1: The values used to indicate levels of potential radiant heat transfer (from fire in bushfire prone vegetation to exposed elements at risk), will be stated in subsequent tables as either as a bushfire attack level (BAL) and/or as kilowatts per square metre (kW/m2), as relevant to the application of the value and the type and use of the element at risk.

Note 2: All data and information supporting the determination of the classifications and values stated in this table is presented in Appendix A. Where the values are stated as 'default' these are either the values stated in AS 3959:2018, Table B1 or the values calculated as intermediate or final outputs through application of the equations of the AS 3959:2018 BAL determination methodology. They are not values derived by the assessor.

Table 3.3: Vegetation separation distances corresponding to the stated levels of potential radiant heat transfer.

THE CALCULATED (SITE SPECIFIC) VEGETATION SEPARATION DISTANCES CORRESPONDING TO THE STATED LEVEL OF POTENTIAL RADIANT HEAT TRANSFER (METRES) [1]								
Vegetation Classification		Maximum Radiant Heat Transfer (Flux)						
		>40 kW/m²	40 kW/m²	29 kW/m²	19 kW/m²	12.5 kW/m²	N/A [2]	10 kW/m²
		Bushfire Attack Levels						
Area	Class	BAL-FZ	BAL-40	BAL-29	BAL-19	BAL12.5	BAL-LOW	
1	(A) Forest	<16	16-<21	21-<31	31-<42	42-<100	>100	48.9
2	(A) Forest	<20	20-<27	27-<37	37-<50	50-<100	>100	60.4
3	(B) Woodland	<10	10-<14	14-<20	20-<29	29-<100	>100	34.5
4	(B) Woodland	<13	13-<17	17-<25	25-<35	35-<100	>100	43.2
5	(D) Scrub	<10	10-<13	13-<19	19-<27	27-<100	>100	32.9
6	(G) Grassland	<6	6-<8	8-<12	12-<17	17-<50	>50	21.2
7	(G) Grassland	<7	7-<9	9-<14	14-<20	20-<50	>50	25
8	(D) Scrub	<10	10-<13	13-<19	19-<27	27-<100	>100	32.9
9	Excluded cl 2.2.3.2(e)	-	-	-	-	-	-	-
10	Excluded cl 2.2.3.2(f)	-	-	-	-	-	-	-

Note 1: The calculated results are illustrated in Figure 3.2 as a BAL Contour Map and/ or additional defining lines as necessary. All applied calculation input variables are presented in Table 3.2. A copy of the radiant heat calculator output for each area of classified vegetation is presented in Appendix A3.

Note 2: The BAL-LOW rating does not represent a maximum level of radiant heat transfer. The rating is applied when the separation distance is at least 100m from all classified vegetation except Grassland, for which 50m applies.

Figure 3.1

Classified Vegetation & Topography

Lot 3194 on Plan 227649, Area ; 97.29 ha
Collie-Changerup Road
KOJONUP
SHIRE OF KOJONUP

AREA : 2 Class (A) Forest Effective slope: >0° to 5°
AREA : 7 Class (G) Grassland Effective slope: >0° to 5°
AREA : 1 Class (A) Forest Effective slope: 0°
AREA : 3 Class (B) Woodland Effective slope: 0°
AREA : 6 Class (G) Grassland Effective slope: 0°
AREA : 9 Excluded
AREA : 4 Class (B) Woodland Effective slope: >0° to 5°
COLLIE-CHANGERUP RD
TUNNEY RD
Lot 3194
292 m
294 m
296 m
298 m
300 m
302 m
304 m
306 m
308 m
310 m
312 m
314 m
316 m
318 m
320 m
322 m
324 m
326 m
328 m
330 m

------ LEGEND ------

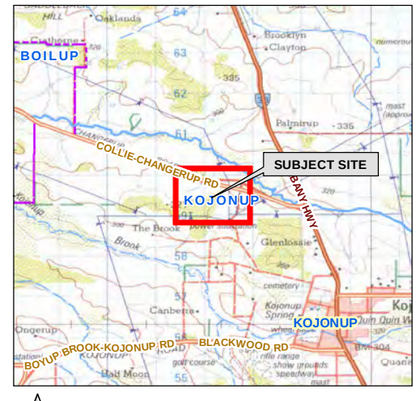
- Subject Site
- Other Lots
- 150m from Subject Site
- Photo & Direction

Classified Vegetation

- Class (A) Forest
- Class (B) Woodland
- Class (D) Scrub
- Class (G) Grassland
- Excluded 2.2.3.2 (e)

0 50 100 150 200 250
Metres

------ LOCALITY ------



Aerial Imagery : Landgate/SLIP

Coordinate System: GDA2020 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Neil Stoney 16/04/2026
Map updated by: Neil Stoney 16/04/2026
A3 Scale 1:4,800

BUSHFIRE PRONE PLANNING

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.
Map Document Path / Name: C:\Users\Neil\OneDrive - Bushfire Prone\Desktop\241243 - Client review and updates - Apr 2026\Mapping\mxd2020\241243_Fig3-1_VEG.mxd

Figure 3.1.1

Classified Vegetation & Topography (Post Development)

Lot 3194 on Plan 227649, Area ; 97.29 ha
Collie-Changerup Road
KOJONUP
SHIRE OF KOJONUP

AREA : 7
Class (G) Grassland
Effective slope: >0° to 5°

AREA : 2
Class (A) Forest
Effective slope: >0° to 5°

AREA : 1
Class (A) Forest
Effective slope: 0°

AREA : 3
Class (B) Woodland
Effective slope: 0°

AREA : 6
Class (G) Grassland
Effective slope: 0°

AREA : 8
Class (D) Scrub
Effective slope: 0°

AREA : 9
Excluded

AREA : 10
Excluded

Lot 3194

COLLIE-CHANGERUP RD

TUNNEY RD

296 m
298 m
290 m
292 m
294 m
296 m
298 m
300 m
302 m
304 m
306 m
308 m
310 m
312 m
314 m
316 m
318 m
320 m
322 m
324 m
326 m
328 m
330 m
308 m
314 m
312 m
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316 m
314 m
314 m
306 m
308 m
310 m
312 m
314 m
315 m
318 m

------ LEGEND ------

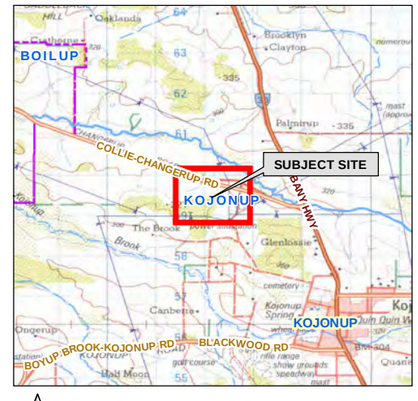
- Subject Site
- Other Lots
- 150m from Subject Site
- Access Roads
- BESS
- On-Site Substation
- PCS
- Detention Pond
- Operations & Maintenance
- Water Tank

Classified Vegetation

- Class (A) Forest
- Class (B) Woodland
- Class (D) Scrub
- Class (G) Grassland
- Excluded 2.2.3.2 (e)
- Excluded 2.2.3.2 {f)

0 50 100 150 200 250
Metres

------ LOCALITY ------



Aerial Imagery : Landgate/SLIP

Coordinate System: GDA2020 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Neil Stoney 16/04/2026
Map updated by: Neil Stoney 16/04/2026
A3 Scale 1:4,800

BUSHFIRE PRONE PLANNING

Disclaimer and Limitation: This map has been prepared for bushfire management planning purposes only. All depicted areas, contours and any dimensions shown are subject to survey. Bushfire Prone Planning does not guarantee that this map is without flaw of any kind and disclaims all liability for any errors, loss or other consequence arising from relying on any information depicted.
Map Document Path / Name: C:\Users\Neil\OneDrive - Bushfire Prone\Desktop\241243 - Client review and updates - Apr 2026\Mapping\mxd2020\241243_Fig3-1-1_VEG-PD.mxd

Figure 3.2

BAL Contour Map

Lot 3194 on Plan 227649, Area ; 97.29 ha
Collie-Changerup Road
KOJONUP
SHIRE OF KOJONUP



------ LEGEND ------

- Subject Site
- Other Lots
- 100m from Subject Site
- Access Roads
- BESS
- On-Site Substation
- PCS
- Detention Pond
- Operations & Maintenance
- Water Tank

Indicative Bushfire Attack Levels

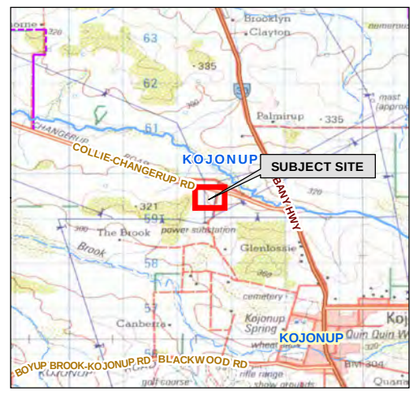
- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL LOW
- Classified Vegetation Boundary

Radiant Heat Flux

- <10kw Zone (Within Subject Site)

0 25 50 75 100
Metres

------ LOCALITY ------



Aerial Imagery : Landgate/SLIP

Coordinate System: GDA2020 MGA Zone 50
Projection: Universal Transverse Mercator Units: Metre
Map compiled by: Neil Stoney 17/04/2026
Map updated by: Neil Stoney 17/04/2026
A3 Scale 1:1,700

BUSHFIRE PRONE PLANNING

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4 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

EXPLANATORY INFORMATION

Section Content Guidance (DPLH/WAPC)

'Bushfire Hazard Issues' is a section of the Bushfire Management Plan (BMP) in accordance with guidance presented in the BMP Manual (DPLH/WAPC, November 2024).

The Manual indicates the intent of applying its guidance with the following statement:

> *"The standardisation of BMP's improves efficiencies in decision making at local and state government level by promoting the clear and succinct presentation of information required under SPP 3.7 and the Guidelines."*

Bushfire Prone Planning's Approach

In complying more broadly with the above efficiency intentions, Bushfire Prone Planning (BPP) will also seek to:

- Improve the efficiency of BMP development by its consultants; and
- Ensure the readability and understanding of the BMP by persons who will need to read the document.

Key to achieving these efficiency and comprehension outcomes is the design and quality of the explanatory and assessment content of the BMP. This includes the effective use of Section 4 by not repeating content and assessment summaries that are presented in other sections of the BMP.

Typically, bushfire hazard issues will be appropriately addressed in Sections 2 and 3 of the BMP which identify:

- The required environmental considerations; and
- The assessment of potential levels of bushfire impact and their justification.

Limitation on Section 4 Content

As a consequence of the above considerations, content in this section will be limited to raising decision maker awareness regarding additional site specific matters that otherwise may not be a component of the standard BMP bushfire hazard assessment.

Additional information is provided on an 'as necessary' basis for the following scenarios:

1. When local governments have provided jurisdiction specific bushfire hazard assessment and/or management guidance that needs to be addressed. How these have been considered by the bushfire consultant in conducting their bushfire hazard assessments will be discussed.
2. When, due to difficult site conditions, additional explanation and justification of the bushfire hazard assessment process undertaken by the bushfire consultant would assist decision making.
3. Matters are identified when they are either not considered or are only partially considered, under the bushfire hazard assessments conducted in accordance with SPP 3.7/Guidelines. These include matters that would potentially reflect poorly on the bushfire consultant's professional integrity if ignored.

For the subject planning proposal, has the bushfire practitioner determined (in accordance with the explanatory information above), that presenting additional information in this section is necessary?	No
Additional bushfire hazard information is provided below for the relevant scenarios.	N/A

5 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA (BPC)

EXPLANATORY INFORMATION

State Planning Policy 3.7 Bushfire (SPP 3.7) establishes policy outcomes (cl. 6) that "specify the role of planning and development in contributing to the overall objectives" of the policy.

The policy outcomes are incorporated into the four elements of the bushfire protection criteria established in the Planning for Bushfire Guidelines (Guidelines).

CONSEQUENTLY, TO SATISFY THE OBJECTIVES AND POLICY OUTCOMES OF SPP 3.7, A PLANNING PROPOSAL IN A DESIGNATED BUSHFIRE PRONE AREA IS REQUIRED TO DEMONSTRATE THAT COMPLIANCE WITH THE BUSHFIRE PROTECTION CRITERIA CAN BE ACHIEVED.

The Guidelines in Section 2.2.1 establish two pathways to demonstrate compliance:

1. The deemed to comply pathway - in which compliance is able to be demonstrated with all relevant acceptable solutions associated with each Element, for a specific planning stage or use; or
2. An alternative pathway when all relevant acceptable solutions cannot be fully achieved, which utilises either:
   (a) The outcomes-based approach (established in SPP 3.7 cl. 6) alone; or
   (b) A combination of the outcomes-based approach and the acceptable solutions.

For the subject planning proposal:

- The assessment applying the deemed to comply pathway assessment is presented in Section 5.3.
- When an assessment applying the alternative pathway is necessary, the required additional information is presented in Section 5.4.

5.1 Local Government Variations to Apply

EXPLANATORY INFORMATION

1. Local governments may add to or modify the acceptable solutions contained within the Guidelines to recognise special local or regional circumstances that reinforce the SPP 3.7 objectives and outcomes. This is achieved through regional or local variations that form part of a local planning strategy and/or local planning scheme via a scheme amendment or special control area.

   This could include acceptable solutions that address topography, vegetation or climate to the satisfaction of the Western Australian Planning Commission (WAPC) that the modifications comply with the corresponding SPP 3.7 objectives and outcomes. (Planning for Bushfire Guidelines, s. 3.4, 2024).
2. Under the relevant state legislation (LPS Regulations 2015), SPP 3.7 does not apply to hosted or unhosted short-term rental accommodation. However, the local government under its Local Planning framework (i.e. Strategy / Scheme and Policy as applicable), may require that certain bushfire protection measures or variations to the measures (the bushfire protection criteria), established by SPP 3.7 and the Guidelines, are to be applied.

Endorsed regional or local variations to the acceptable solutions apply to the assessments against the Bushfire Protection Criteria for the planning proposal?	No
The proposed land use for hosted or unhosted short-term rental accommodation, and the local government requires certain bushfire protection measures, contained within the BPC, to be applied, that under the LPS Regulations 2015, would otherwise not be required?	No

5.2 Assessment Summary

PATHWAY APPLIED TO DEMONSTRATE ACHIEVING POLICY OUTCOMES OF SPP 3.7 BUSHFIRE [1] **INCLUDES SUMMARY OF THE PROPOSAL'S ASSESSMENT AGAINST THE BPC ACCEPTABLE SOLUTIONS**			
DEVELOPMENT – COMMERCIAL AND INDUSTRIAL			
The Acceptable Solutions Corresponding to the Policy Outcomes of SPP 3.7 Bushfire as Incorporated into the Elements of the Bushfire Protection Criteria (Guidelines)	Acceptable Solutions Pathway Compliance Status	Alternative Pathway [2] Outcomes-Based Approach Only	Alternative Pathway [2] Combination of Pathways
ELEMENT 2: SITING AND DESIGN:	Fully Compliant	-	-
A2.1a Siting and design	Fully Compliant		
A2.1b Siting in an area with a radiant heat impact exceeding 29 kW/m² (BAL-40 or BAL-FZ)	Not Applicable		
A2.2 Asset Protection Zone (APZ)	Fully Compliant		
A2.3 Clearing of native vegetation	Fully Compliant		
A2.4 Storage of hazardous, flammable and/or combustible materials	Fully Compliant		
ELEMENT 3: VEHICULAR ACCESS:	Fully Compliant	-	-
A3.1 Private Driveways	Fully Compliant		
ELEMENT 4: WATER SUPPLY:	Fully Compliant	-	-
A4.1 Water supply	Fully Compliant		
Note 1: Achieving the objectives and policy outcomes of SPP 3.7 Bushfire can be demonstrated through either the acceptable solutions pathway, the outcomes- based approach only, or a combination of both pathways (refer to Guidelines s 2.2.1). Note 2: When applied, the required additional assessment details are provided in Section 5.4 of this BMP. The content and comprehensiveness of the assessment will vary dependant on the specific conditions of the broader landscape, the development site, its use and the degree to which any relevant acceptable solutions cannot be complied with.			

5.3 BPC 7: Development – Commercial and Industrial - Acceptable Solutions Assessment

5.3.1 Element 2: Siting and Design

ELEMENT 2: SITING AND DESIGN (DEVELOPMENT - COMMERCIAL/INDUSTRIAL)
EXPLANATORY INFORMATION Refer to Appendices B1 and B3 of this BMP for additional information and to *the bushfire protection measure implementation checklist in Section 6 for the APZ dimensions applicable to this planning proposal.* The Planning Assessment and the APZ This assessment is a 'planning assessment' being conducted for planning approval purposes only. All details of acceptable solution requirements are established in the Planning for Bushfire Guidelines (Guidelines) – WA Department of Planning, Lands and Heritage (DPLH, as amended). *Note the assessment is not conducted for building approval purposes. The derivation of 'determined' BAL ratings for building permit applications is not the intended outcome of this planning assessment. However, in limited situations, the presented indicative BAL rating might also be considered as 'determined'.* To comply with the relevant acceptable solutions contained in the 'Bushfire Planning Guidelines', the subject planning proposal must demonstrate that the required minimum sized asset protection zone (APZ) - subject to location constraints and allowances established by the Guidelines - can be installed surrounding a habitable or specified building. **Approved BMP's and the APZ Dimensions to be Implemented** An approved BMP, unless stated otherwise, is only approving the installation of an APZ comprised of: • The minimum dimensions that ensure the radiant heat impact of a bushfire (on building works) does not exceed 29 kW/m² (BAL-29); or • For specific 'vulnerable' land uses, the minimum dimensions that ensures the radiant heat impact of a bushfire (on building works) does not exceed the level of radiant heat exposure stated in the applicable acceptable solution; or • The specific minimum dimensions that may be applied through the application of an outcomes-based approach. Consequently, the 'minimum' dimensions of the approved APZ are also the 'maximum' approved dimensions when installation of the APZ will require the modification/removal of native vegetation. Installing a larger dimensioned APZ, to lower the determined BAL rating of specific building works, will need additional approval from the relevant planning authority. The following bushfire planning policy and guidance potentially limit installed APZ dimensions: • SPP 3.7 Bushfire, Policy Objectives, cl. 5.5 states – "Prioritise the retention of native vegetation for biodiversity conservation, environmental protection and landscape amenity. • SPP 3.7 Bushfire, Policy Outcomes, cl. 6.2 - establishes that clearing of native vegetation is to be avoided or minimised in managing or mitigating bushfire risk. • The Guidelines, Appendix B2, B.2.1 states - "clearing or modification of native vegetation to reduce the radiant heat impact below 29 kW/m² is generally not supported."

	The Outcome of State Planning Policy 3.7 Bushfire (and the BPC) to be Achieved
O2	Ensure siting and design solutions: • Manage or mitigate the bushfire risk to people, property and infrastructure; and • Avoid, or where unavoidable, minimises the clearing of native vegetation. (SPP 3.7, 6.2)
	Acceptable Solutions Pathway - Compliance Statement
E2	The planning proposal is fully compliant with all applicable acceptable solutions and therefore achieves the required outcomes of this element.
	Alternative Pathway Applied to Demonstrate Ability to Achieve SPP 3.7 Outcomes
	N/A

ACCEPTABLE SOLUTIONS - ASSESSMENT STATEMENTS				
Check Box Legend:	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant	
A2.1a Siting and design	Applicable:	Yes	Compliant:	Yes
☑ ☐ ☐	Every habitable building achieves a radiant heat impact not exceeding 29 kW/m² (BAL-29).			
☐ ☐ ⃠	A2.1a is not applicable to the subject planning proposal as it cannot be complied with and an alternative acceptable solution A2.1b (dealing with the same protection measure), is provided and establishes a higher level of radiant heat impact that will be considered for planning approval, if it can be satisfactorily demonstrated that the allowable constraints apply to the subject development site.			
Assessment Supporting Details: The installation of an APZ is required for structures to be subject to a radiant heat impact not exceeding 29 kW/m² (BAL-29). Acceptable Solution A2.2 applies.				
A2.1b Siting in an area with a radiant heat impact exceeding 29 kW/m² (BAL-40 or BAL-FZ)	Applicable:	No	Compliant:	-
☑ ☐ ☐	A2.1b is not applicable to the subject planning proposal because A2.1a can be complied with.			
A2.2 Asset Protection Zone (APZ)	Applicable:	Yes	Compliant:	Yes
☑ ☐ ☐	A2.2 is not applicable to the subject planning proposal because it is a requirement associated with the compliant application of A2.1a. Given A2.1a is not applicable to the subject planning proposal, A2.2 is also not applicable.			
Where a habitable building(s) cannot be wholly within an area with a radiant heat impact not exceeding 29 kW/m² (BAL-29) in its pre-development state, an indicative APZ is to be provided and meet the following requirements for width, location and management:				
☑ ☐ ☐	APZ Width: The APZ, when measured from any external wall or supporting post or column, is of sufficient size to ensure the radiant heat impact of a bushfire does not exceed 29 kW/m² (BAL-29) to any part of the building, in all circumstances.			
☑ ☐ ☐	APZ Location – Option 1: The indicative 'Planning BAL-29' APZ can be contained solely within the boundaries of the lot.			

☐ ☐ ⊘ APZ Location – Option 2: The indicative 'Planning BAL-29' APZ cannot be contained solely within the boundaries of the lot. However, the relevant vegetation on the adjoining land / lot(s) is, and will continue to be, on an ongoing basis in perpetuity, low threat as per:

- Clause 2.2.3.2 of AS 3959 (including non-vegetated land such as a sealed or unsealed road, or a water body); or
- The requirements of the Guidelines Appendix B.2, Table 9 – APZ technical requirements; or
- The alternative standard in the local planning scheme (when it exists).

☑ ☐ ☐ APZ Management: The APZ is (or can and will be) managed in accordance with the requirements established in the Guidelines, Appendix B.2 or the alternative standard in the gazetted local planning scheme (when it exists).

Assessment Supporting Details:

The APZ will be contained wholly within the subject lot for the Development Application and therefore will be enforceable in perpetuity. APZs will be managed in accordance with Appendix B of the Guidelines.

The associated Bushfire Risk Report has identified the appropriate APZ dimensions, associated with the maximum acceptable radiant heat flux exposure of the asset. The following setback requirements have been applied:

BESS / PCS and associated infrastructure Critical Class 10 Buildings	<10kW/m2 Calculated using AS 3959 Method 2 (1090K Flame Temperature)
On-Site Substation	<19kW/m2 (BAL-19)
Class 1-10 Buildings Laydown Yards (extent of storage only) Firefighting Water Tanks	<29kW/m2 (BAL-29)

A2.3 Clearing of native vegetation	Applicable:	Yes	Compliant:	Yes

☑ ☐ ☐ The development avoids, or where unavoidable, minimises the clearing of native vegetation.

Assessment Supporting Details: Development areas (including foundations), associated APZs, construction laydowns, and internal access roads have been sited to avoid unnecessary clearing of native vegetation.

The only non-pasture vegetation noted to be impacted are to establish crossovers through road reserves, and if the underground transmission line crosses native vegetation. The alignment of the transmission line connection is subject to confirmation with Western Power.

A2.4 Storage of hazardous, flammable and/or combustible materials	Applicable:	Yes	Compliant:	Yes

☐ ☐ ⊘ The proposed land use does not include the storage of hazardous, flammable and/or combustible materials as part of its ongoing day to day operations. Therefore, A2.6 is not applicable to the subject planning proposal.

☐ ☐ ⊘ The proposed land use will include the storage of hazardous, flammable and/or combustible materials as part of its ongoing day to day operations. These will be a quantity that trigger the requirement for a licence under the *Dangerous Goods Safety Act 2004* or the *Environmental Protection Act 1986*.

Consequently, the requirements under the above legislation will establish the storage requirements and therefore A2.6 is not applicable to the subject planning proposal.

☑ ☐ ☐	The proposed development will include the storage of hazardous, flammable and/or combustible materials as part of its ongoing day to day operations. These are not at a quantity that trigger the requirement for a licence under the *Dangerous Goods Safety Act 2004* or the *Environmental Protection Act 1986*. Consequently, the following established storage area requirements can and will be applied:
☑ ☐ ☐	• The storage area is subject to a radiant heat impact not exceeding 29 kW/m² (BAL-29); and
☑ ☐ ☐	• The construction of the storage area is non-combustible and shields the materials to reduce their exposure to radiant heat from the bushfire to levels significantly lower than 29 kW/m² and prevents the entry of debris and embers; and
☑ ☐ ☐	• The construction of the storage area limits to the degree necessary and practical, the escape of sources of ignition from the stored materials into bushfire prone vegetation.

Assessment Supporting Details:

Lithium-ion batteries are classified as dangerous good under the *Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007,* when they are in transport and temporary (transit) storage.

Section 7.1.1 of the *Planning for Bushfire Guidelines* states the Acceptable Solution is not applicable due to the requirement for a dangerous goods licence.

When installed and connected to a consuming device (the grid) the batteries are not considered as dangerous goods under the *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007,* therefore the following acceptable solution applies:

- As discussed in A2.2 above, all assets will be subject to no greater than 29kW/m² radiant heat flux (BAL-29).
- Shielding of the storage area is achieved by the external battery cabinet itself, being an insulated and climate-controlled steel enclosure. These materials are potentially exposed '*to radiant heat from the bushfire to levels significantly lower than 29 kW/m²*'due to the <10kW/m² @ 1090K APZ applied.

The BESS units will be sited on a non-combustible hardstand, with minimum 10m additional non-vegetated area to prevent surface fire interactions to/from the unit. These are measures established through the associated Bushfire Risk Report *241243 – Kojonup BESS (BRR)* v1.2 (Bushfire Prone Planning May 2026).

5.3.2 Element 3: Vehicular Access

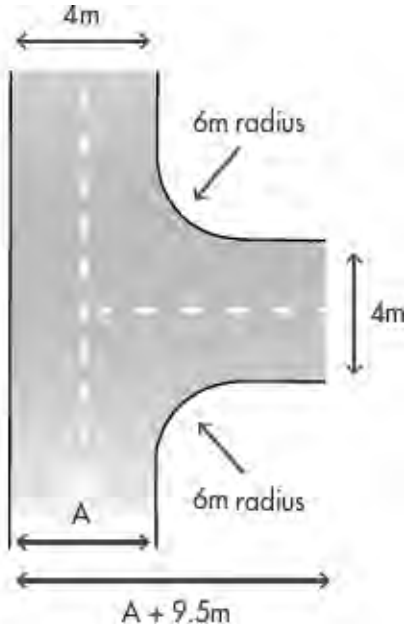
ELEMENT 3: VEHICULAR ACCESS (DEVELOPMENT - COMMERCIAL/INDUSTRIAL)					
All details of acceptable solution requirements are established in the Planning for Bushfire Guidelines (Guidelines) – WA Department of Planning, Lands and Heritage (DPLH, as amended). When relevant, the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (DPLH, 2021 Rev B), is also referenced. The technical construction requirements for access types and components are established in the Guidelines Appendix B.3, Table 10 (certain information is copied and presented in Appendix C of this BMP). The local government will advise the proponent where different requirements are to apply and when any additional specifications such as those for signage and gates are to apply. These are included as an appendix if requested by the local government. *Note:* *The following understanding of what constitutes a 'road', and the stated definitions can be important considerations for assessments against an acceptable solution for Element 3.* • *Guidelines Appendix B3: Vehicular Access, identifies a 'road' as being either a public road (that includes a no-through road) or a perimeter road. All other access types (i.e. emergency access ways, fire service access routes, battle-axes and private driveways) are considered a different class of access i.e. they are not 'roads'.* • *SPP 3.7 defines 'no-through road' as "a cul-de-sac or dead end road".* • *SPP 3.7 defines 'two-way access' as "vehicular access from a site in two different directions to at least two different suitable destinations". This allows for required access to potentially be provided by an emergency access way.*					
O3	The Outcome of State Planning Policy 3.7 Bushfire (and the BPC) to be Achieved				
	Ensure the design and capacity of vehicular access and egress provide: • For efficient and effective evacuation to a suitable destination(s); and/or • As a contingency measure for vulnerable land uses, an on-site shelter, where demonstrated appropriate, as a last resort option. (SPP 3.7, 6.3)				
E3	Acceptable Solutions Pathway - Compliance Statement				
	The planning proposal is fully compliant with all applicable acceptable solutions and therefore achieves the required outcomes of this element.				
	Alternative Pathway Applied to Demonstrate Ability to Achieve SPP 3.7 Outcomes				
	N/A				
ACCEPTABLE SOLUTIONS - ASSESSMENT STATEMENTS					
Check Box Legend:	☑ Relevant & met	☒ Relevant & not met	⃠ Not relevant		
A3.1 Private driveways		Applicable:	Yes	Compliant:	Yes
☐ ☐ ⃠	The subject lot is serviced by reticulated water, and the private driveway is no greater than 70 metres in length between the most distant external part of the habitable building and the public road. For these conditions, no private driveway technical requirements are prescribed by the Guidelines.				
☑ ☐ ☐	In circumstances where the above conditions are not met, the private driveway is to meet the following requirements:				

	• The private driveway meets (or can and will meet) the technical requirements (Guidelines Appendix B3, Table 10) for minimum horizontal clearance (6 metres) or where not required to comply with the Guidelines width, it meets (or can and will meet) the requirements of the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision; and
☑ ☐ ☐	• The private driveway meets (or can and will meet) the technical requirements (Guidelines Appendix B3, Table 10) for minimum vertical clearance (4.5 metres), minimum weight capacity (15 tonnes - includes bridges, culverts) and minimum inner radius of road curves (8.5 metres); and
☑ ☐ ☐	• The private driveway meets (or can and will meet) the technical requirements (Guidelines Appendix B3, Table 10) for the gradients of different surfaces and dips; and
☑ ☐ ☐	• Passing bays are (or can and will be) installed every 200 metres with a minimum length of 20 metres and a minimum additional carriageway width of 2 metres i.e. the combined carriageway width of the passing bay and constructed private driveway will be a minimum 6 metres; and
☑ ☐ ☐	• The turnaround area/head meets (or can and will meet) the design and location (within 30m of main habitable building) requirements established by the Guidelines (refer to Figures 30 and 38).

Assessment Supporting Details:

The subject site is bounded by Collie-Changerup Road to the north and Tunney Road to the east. The submitted layout includes a crossover onto each road. Permission from the Shire of Kojonup will be required for the additional road crossover.

Multiple turnaround areas will be present within the site. At a minimum, the internal junctions within the submitted layout meet the requirements provided in Figure 30 of the Guidelines. See below.



The internal roads form a loop design, meeting the required turnaround area through a '*circular and loop driveway design*' (Guidelines B3.8).

Internal access roads will be constructed to 6m trafficable width. All internal roads will meet or exceed the technical construction requirements as outlined in Table 10 of the Guidelines and Appendix C of this document. Access roads will be constructed to allow for the delivery of heavy equipment to the project site, which exceeds the 15t weight capacity specified in Table 10.

There are no constraints to all components of the project meeting the required access.

5.3.3 Element 4: Water Supply

ELEMENT 4: WATER SUPPLY (DEVELOPMENT - COMMERCIAL/INDUSTRIAL)					
All details of acceptable solution requirements are established in the Planning for Bushfire Guidelines (Guidelines) – WA Department of Planning, Lands and Heritage (DPLH, as amended). When relevant, the 'Bushfire Management Plan Guidance for the Dampier Peninsula' (DPLH, 2021 Rev B), is also referenced.					
O4	The Outcome of State Planning Policy 3.7 Bushfire (and the BPC) to be Achieved				
	Ensure that sufficient water is available and accessible for emergency services, to enable people, property and infrastructure to be defended from bushfire. (SPP 3.7, 6.4)				
E4	Acceptable Solutions Pathway - Compliance Statement				
	The planning proposal is fully compliant with all applicable acceptable solutions and therefore achieves the required outcomes of this element.				
	Alternative Pathway Applied to Demonstrate Ability to Achieve SPP 3.7 Outcomes				
	N/A				
ACCEPTABLE SOLUTIONS - ASSESSMENT STATEMENTS					
Check Box Legend:	☑ Relevant & met		☒ Relevant & not met		⃠ Not relevant
A4.1 Water supply		Applicable:	Yes	Compliant:	Yes
☐ ☐ ⃠	Evidence is provided that a reticulated water supply, available for firefighting purposes, exists or can be provided. Hydrant connection(s) will be provided in accordance with the specifications established by the relevant water supply authority (refer also to hydrant location information in Appendix D of this BMP).				
☑ ☐ ☐	The provision of or the specifications of a reticulated water supply cannot be met. Evidence is provided that a sufficient, sustainable and accessible non-reticulated water supply, dedicated to firefighting purposes, can and will be provided in accordance with the specifications established in the Guidelines, Appendix B4: Water Supply:				
☑ ☐ ☐	• The planning proposal is for commercial/industrial development. For each habitable building a water supply, dedicated to firefighting purposes, will be stored in tanks at 10,000 litres of water per 1,500 m^2 of floor area up to 50,000 litres in total; and				
☑ ☐ ☐	• The above ground water supply tank(s), dedicated to firefighting purposes (and tank stand(s) when applicable), will be constructed of non-combustible material and as necessary, will comply with AS/NZS 3500.1(as amended). This includes not using the same water supply for both domestic use and firefighting purposes. If a combined use tank(s) is to be used, it will separate the storage compartments in accordance with the provisions of the standard (i.e. internal installation of double partition walls); and				
☑ ☐ ☐	• The planning proposal is for a commercial/industrial land use. The tank(s) water outlet connection fitting will be 125 mm Storz; and				
☑ ☐ ☐	• All above-ground, exposed water supply pipes and fittings will be metal and positioned facing away from the source of bushfire hazard and/or shielded against potential bushfire impact – to allow access by emergency services; and				

☑ ☐ ☐	• The planned provision of the water supply tank(s) will consider locations relative to the bushfire hazard. Location of the tank(s) and management of vegetation will ensure vegetation will not exist over or against the tank(s) and that sufficient separation exists to limit the potential bushfire impact. Due consideration will also be given to the provision of sufficient separation from vegetation and/or shielding for the protection of firefighters accessing the water supply; and
☑ ☐ ☐	• An unobstructed, hardened ground surface, for emergency services vehicle access, can and will be installed within 4 metres of the water supply outlet (refer to Figure 39, Guidelines); and
☐ ☐ ⊘	• It is proposed for a water supply tank outlet(s) is to be remote from the tank, the local government and DFES will have been consulted regarding the application and location. The determined requirements are presented as an Addendum in this BMP; and
☐ ☐ ⊘	• Planned below ground water supply tank(s), dedicated to firefighting purposes, will have at least a 200 mm diameter access hole – or a suitable inspection opening - to allow tankers or emergency services vehicles to refill direct from the tank, with the outlet location clearly marked on the surface. As necessary, the tanks(s) will comply with AS/NZS 3500.1 (as amended).
☐ ☐ ⊘	The planning proposal intends that a suitable static water supply is to be provided by a dam or river that complies with the DFES guidelines for acceptable sources of water for firefighting purposes. Evidence is provided that: • Demonstrates that the water level will be maintained above the top of the highest fire brigade suction point; and • Approval has been obtained from the decision maker in consultation with the emergency services and is presented as an Addendum in this BMP.
☐ ☐ ⊘	The BPC Explanatory Notes in Appendix B.4: Water Supply introduce additional measures as best practice but voluntary. The following measure is adopted by the planning proposal: The subject site is in a non-reticulated area. Pumping equipment is installed and will be powered by means other than the electricity network such as an appropriately powered and capacity petrol/diesel or onsite generator/electricity, driven pump, and be shielded against potential bushfire impact.
☐ ☐ ⊘	The BPC Explanatory Notes in Appendix B.4: Water Supply introduce additional measure as best practice but voluntary. The following measure is adopted by the planning proposal: The subject site will have a reticulated water supply but is in an area designated as Area 2 on the Map of BPA and/or the local government area has known issues with water supply or pressure. Water supply tank(s) and fittings dedicated to firefighting purposes (noting that combining drinking and firefighting uses of water is not recommended and may be contrary to relevant provisions), that satisfy the construction and design requirements established in the Guidelines, Appendix B4: Water Supply, will be provided.
☐ ☐ ⊘	The BPC Explanatory Notes in Appendix B.4: Water Supply introduce additional measure as best practice but voluntary. The following measure is adopted by the planning proposal: The subject site is serviced by reticulated water. However, the distance from the public road (along which the fire hydrant is located) to the farthest part of the habitable building is greater than 70 metres, exceeding the reach of a hose reel. A water supply tank will be installed within the lot.

Assessment Supporting Details:

The *Planning for Bushfire Guidelines* do not establish a firefighting water requirement for uses other than Class 1-9 buildings. The associated Bushfire Risk Report has identified the aggregate firefighting water requirements, exceeding

the requirements of the Guidelines. The water supply applied aligns with the Victorian Country Fire Authority's *Design Guidelines and Model Requirements – Renewable Energy Facilities* v4.4.

Access

- Firefighting water access points (hydrants, hard suction, or drafting) must be clearly identifiable, visible from internal roads, and unobstructed.
- Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest firefighting water access point.
- An all-weather hardstand turnaround area meeting the requirements of the *Planning for Bushfire Guidelines* (Figure 30) must be provided within 4 metres static water storage tank(s) and any independent hard suction points (hydrants).
- Site Operating Procedures must include that access routes must be unobstructed at all times.

Siting and Capacity

- The BESS development area will be required to install a static firefighting water supply. The volume will be calculated following AS 2419.1 based on the footprint of the BESS development. The estimated area footprint of 9000>27,000m2 (approximately) would require a supply of 432,000L. This number may be revised where the final layout of the BESS development is determined.
    - Where another firefighting water supply is determined elsewhere (for asset fire etc), the greater volume is to apply.
- All BESS cabinets must be wholly within 70m of a water outlet.
- Water tanks must be positioned >15m from BESS cabinets, PCS, and other structures.
- Water tanks should apply a BAL-29 dimensioned APZ at a minimum.

Construction

- Static water storage tanks must be an above-ground water tank constructed of concrete or steel.
- An external water level indicator must be installed on static water storage tanks and be visible from internal roads and the adjoining turnaround area.
- Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank.
- Couplings at hard suction points are required to be 125mm Storz fittings (*Guidelines B.4.1.2.* The local emergency services should be contacted for input on appropriate couplings and adaptors.

The Class 1-9 buildings within the Operations and Maintenance area will require a firefighting water supply calculated as 10,000 litres of water per 1,500 m^2 of floor area up to 50,000 litres in total. This will be provided through installation of hydrants connected to the water supply requirement of the BESS development above, and therefore the (estimated) 432,000L supply provided. There are no constraints to meeting the required water supply.

5.4 Required Additional Bushfire Protection Measures

EXPLANATORY INFORMATION

The following bushfire protection measures are additional to, or a variation of, those established by the relevant acceptable solutions of the bushfire protection criteria and applied to the planning proposal within Section 5.3 of this BMP.

The intent of their application is to improve the bushfire performance of the future development/use and reduce, for persons and property, the residual levels of the risks associated with a bushfire event.

The development of these additional and/or varied bushfire protection measures can originate from the following sources (not exhaustive). Their application to the subject planning proposal is indicated below and detailed within this section.

The implementation and maintenance responsibility for these additional protection measures is established in Section 6: Responsibility Checklists.

Source of the Required Additional Bushfire Protection Measures	Applicable to the Subject Planning Proposal
1. When the assessments within the BMP have applied an outcomes-based approach and established additional protection measures.	No
2. When the subject planning proposal is to be assessed against BPC 7: Development – Commercial and Industrial but it is also considered a vulnerable land use.	No
3. The operational documents generated through the process of developing a Bushfire Risk Report (Assessment and Management).	Yes
Section 4.2 of the associated Bushfire Risk Report includes a full list of Additional Bushfire Protection Measures identified by the Risk Assessment process. Many of these measures relate to operating procedures, emergency planning, or detailed design/construction which do not form part of the planning assessment process. Additional Bushfire Protection Measures to meet or exceed the intent of the Acceptable Solutions of Elements 2-4 of the Bushfire Protection Criteria have been provided within the Section 5.3 Assessment Statements. These are measures which are relevant to the planning process.	
4. The operational documents generated through the process of developing a Bushfire Emergency Plan.	No
5. From a local government including: a) Variations to acceptable solutions; and/or b) Additional protection measures to be implemented, including through 'Conditions' which may be applied to a 'Planning Approval' or a 'Notice of Determination.	No
6. Any additional bushfire planning guidance documents or position statements issued by the WA Department of Planning, Lands and Heritage.	No
7. The application of a radiant heat barrier.	No

6 RESPONSIBILITY CHECKLISTS

EXPLANATORY INFORMATION

This section of the BMP sets out the responsibilities of the relevant entity or person for:

- The initial implementation of the required bushfire protection measures and their timing; and
- The ongoing maintenance of the required bushfire protection measures to ensure their continued effectiveness.

Note: Protection measures that may be recommended by the bushfire consultant in the BMP section titled "Additional Recommended Bushfire Protection Measures' are not included in the Responsibility Checklists (at least initially).

The reason for this is the additional measure(s) are either:

- Provided as additional risk management advice to the proponent and it is up to them to choose to apply; or
- Part of an outcomes-based approach being applied to satisfy the required outcomes of SPP 3.7. Consequently, the need for their application (which would create a responsibility) is currently subject to assessment and approval by the decision maker.

  When their application is established by planning approval, the responsibility checklists in this BMP will be required to be updated.

6.1 Protection Measure Implementation Checklist

TABLE 6.1
PROPONENT/LANDOWNER RESPONSIBILITIES PRIOR TO SALE/OCCUPANCY/OPERATION

No.	IMPLEMENTATION OF BUSHFIRE PROTECTION MEASURES Measures Established Under SPP 3.7 / Guidelines
1	Install an Asset Protection Zone (APZ) surrounding assessed assets. The APZ must establish the minimum separation distances detailed below between the asset and each vegetation area. The APZ must: 1. Consist of non-vegetated areas and low bushfire threat vegetation, able to be maintained in perpetuity in a low threat state, by complying with the established APZ technical requirements (refer to the Guidelines Appendix B2 and Appendix B3 of this BMP); and 2. Be located within the boundaries of the lot except for any allowable variances allowed and discussed in the assessment against the bushfire protection criteria in Section 5, Element 2: Siting and design, and the relevant APZ acceptable solution. (Refer also to the illustrated APZ on the Property Bushfire Management Statement in Section 6.3); and 3. Establish the minimum separation distances between the relevant asset and each vegetation area, as shown in the insert table below.

THE MINIMUM (SITE SPECIFIC) VEGETATION SEPARATION DISTANCES ESTABLISHING APZ DIMENSIONS [1]

Building / Structure	Vegetation Classification [2]		Potential Bushfire Impact	Minimum Distances (metres)
BESS / PCS and associated infrastructure Critical Class 10 Buildings	1	(A) Forest	10kW/m² 1090K Flame Temperature	48.9
	2	(A) Forest		60.4
	3	(B) Woodland		34.5
	4	(B) Woodland		43.2
	5	(D) Scrub		32.9
	6	(G) Grassland		21.2
	7	(G) Grassland		25
	8	(D) Scrub		32.9
On-site Substation	1	(A) Forest	BAL-19	31
	2	(A) Forest		37
	3	(B) Woodland		20
	4	(B) Woodland		25
	5	(D) Scrub		19
	6	(G) Grassland		12
	7	(G) Grassland		14
	8	(D) Scrub		19
Class 1-10 Buildings Laydown Yards (extent of storage only)	1	(A) Forest	BAL-29	21
	2	(A) Forest		27

	Firefighting Water Tanks	3	(B) Woodland		14
		4	(B) Woodland		17
		5	(D) Scrub		13
		6	(G) Grassland		8
		7	(G) Grassland		9
		8	(D) Scrub		13
	Note 1: Will include the application of the radiant heat barrier when applicable to the proposal. Note 2: Refer to the Vegetation and Topography Map in Section 3.1 Note 3: The Shire of Kojonup Fire Break Order imposes a minimum 20m APZ dimension. This exceeds the APZ dimensions for some vegetation classes and BALs.				

2	Construct the private driveways / internal vehicular access to comply with the technical requirements stated and/or referenced in Section 5.3 of the BMP at Element 3: Vehicular access, A3.1 Private driveways.
3	Install the firefighting water supplies, including fittings and the required hardstand/access, to comply with the technical requirements stated and/or referenced in Section 5.3 of the BMP at Element 4: Water supply.
4	A purchaser, occupier and/or operator of the site must be made aware of the existence of this approved BMP and provided with access to a copy and be informed of their ongoing responsibilities it contains.
5	The advice of an accredited Bushfire Planning Practitioner must be sought where revegetation within the lease area is proposed. Revegetation may require a Landscape Management Plan, and update to this Bushfire Management Plan, or Addendum to this Bushfire Management Plan.
	IMPLEMENTATION OF BUSHFIRE PROTECTION MEASURES Measures Established by this BMP as a Required Additional Measure in Section 5.5
6	Prior to operation, review and implement the 'Required or Recommended Additional Bushfire Protection Measures' discussed in Section 5.4 of this BMP. The Measures are detailed in Section 4.2 of the associated Bushfire Risk Report *241243 – Kojonup BESS (BRR)v1.2* (Bushfire Prone Planning May 2025).
	IMPLEMENTATION OF BUSHFIRE PROTECTION MEASURES Measures Established by a Local Government's Section 33 Notice Under the Bush Fires Act 1954
7	Install the required firebreaks, providing emergency access within the lot, to the stated specifications established by the Shire of Kojonup Fire Break Order.
	IMPLEMENTATION OF BUSHFIRE PROTECTION MEASURES Measures Established by the Building Code of Australia (Vol. 1 and 2 of the National Construction Code)

8	Inform builders engaged to construct dwellings/additions and/or other relevant structures on the subject lot of the existence of this approved Bushfire Management Plan (BMP). The BMP identifies that the development site is within a designated bushfire prone area and states the indicative (or determined) BAL rating(s) that will be applied to buildings/structures. A BAL assessment report may be required to confirm determined ratings and will be required when stated ratings are only indicative. BAL certificates will need to be produced to accompany building applications. The associated Bushfire Risk Report establishes that permanent Class 1-9 buildings are required to construct to their assessed BAL under AS 3959. Compliance with the current Building Code of Australia (Volumes 1 and 2 of the National Construction Code), will require certain bushfire resistant construction requirements be applied to residential buildings in bushfire prone areas (i.e., Class 1, 2 and 3 and associated Class 10a buildings and decks) and certain Class 9 buildings. Other classes of buildings may also be required to comply with these when established by the relevant authority or if identified as a 'Required Additional Bushfire Protection Measure' bushfire protection measure within the BMP. The deemed to satisfy solutions that will meet the relevant bushfire performance requirements are found in AS 3959 – Construction of Building in Bushfire Prone Areas (as amended) and the NASH Standard - Steel Framed Construction in Bushfire Areas (as amended).

6.2 Protection Measure Maintenance Checklist

TABLE 6.2 LANDOWNER/OCCUPIER – MAINTENANCE OF BUSHFIRE PROTECTION MEASURES	
No.	MAINTENANCE OF BUSHFIRE PROTECTION MEASURES Measures Established Under SPP 3.7 / Guidelines
1	Annually review and enact the following maintenance responsibilities established in this approved BMP for the development site prior to the bushfire season.
2	Maintain the Asset Protection Zone (APZ) around habitable buildings (and other structures as required) that consists of: 1. Non-vegetated areas and low bushfire threat vegetation maintained in perpetuity in a low threat state by complying with established APZ technical requirements; and 2. The required zone dimensions that are established by the required separation distances from any areas classified vegetation. These distances should in most situations correspond to either: • The determined BAL rating for a relevant building(s) / structure(s); or • The maximum acceptable level of radiant heat transfer that is to apply. These distances will account for the specific site conditions. This ensures the building's/structure's constructed bushfire resistance continues to align with its calculated potential exposure to flame and radiant heat. IMPORTANT: 1. REFER TO THE APPLICABLE APZ DIMENSIONS IN TABLE 6.1. 2. REFER TO APPENDICES B3, B4 AND B5 FOR APZ TECHNICAL REQUIREMENTS AND DIMENSION GUIDANCE.
3	Maintain the private driveways / internal vehicular access to comply with the technical requirements stated and/or referenced in Section 5.3 of the BMP at Element 3: Vehicular access, A3.1 Private driveways.
4	Maintain the fighting water supplies, including fittings and the required hardstand/access, in good working condition. Ensure the tanks are maintained at full capacity.
5	When the property changes ownership or occupancy, to assist with the ongoing maintenance of the implemented bushfire protection measures, ensure that the relevant person(s) is aware of the BMP, and the responsibilities it contains. Provide access to a copy of the BMP and Bushfire Risk Report (BRR).
MAINTENANCE OF BUSHFIRE PROTECTION MEASURES Measures Established by this BMP as a Required Additional Measure in Section 5.5	
6	Maintain the 'Required or Recommended Additional Bushfire Protection Measures' discussed in Section 5.4 of this BMP. The Measures are detailed in Section 4.2 of the associated Bushfire Risk Report *241243 – Kojonup BESS (BRR)v1.2* (Bushfire Prone Planning May 2025).

MAINTENANCE OF BUSHFIRE PROTECTION MEASURES Measures Established by a Local Government's Section 33 Notice Under the Bush Fires Act 1954	
7	Maintain the required firebreaks, providing emergency access within the lot, to the stated specifications established by the Shire of Kojonup Fire Break Order.
MAINTENANCE OF BUSHFIRE PROTECTION MEASURES Measures Established by the Building Code of Australia (Vol. 1 and 2 of the National Construction Code)	
8	Prior to any future building work, inform the builder of the existence of this approved Bushfire Management Plan (BMP). The BMP identifies that the development site is within a designated bushfire prone area and states the indicative (or determined) BAL rating(s) that may (or will) be applied to buildings/structures. A BAL assessment report may be required to confirm determined ratings and will be required when stated ratings are only indicative. BAL certificates will need to be produced to accompany building applications. The BMP may also establish, as a 'Required Additional Bushfire Protection Measure', that bushfire construction requirements to be applied must be those corresponding to a specified higher BAL rating. Compliance with the current Building Code of Australia (Volumes 1 and 2 of the National Construction Code), will require certain bushfire resistant construction requirements be applied to residential buildings in bushfire prone areas (i.e., Class 1, 2 and 3 and associated Class 10a buildings and decks) and certain Class 9 buildings. Other classes of buildings may also be required to comply with this construction when established by the relevant authority or if identified as a 'Required Additional Bushfire Protection Measure' bushfire protection measure within the BMP. The deemed to satisfy solutions that will meet the relevant bushfire performance requirements are found in AS 3959 – Construction of Building in Bushfire Prone Areas (as amended) and the NASH Standard - Steel Framed Construction in Bushfire Areas (as amended).

APPENDIX A: DETAILED BAL ASSESSMENT DATA AND SUPPORTING INFORMATION

A1: BAL Assessment Inputs Common to the Method 1 and Method 2 Procedures

A1.1: FIRE DANGER INDICES (FDI/FDI/GFDI)

When using Method 1 the relevant FDI value required to be applied for each state and region is established by AS 3959:2018, Table 2.1. Each FDI value applied in Tables 2.4 – 2.7 represents both the Forest Fire Danger Index (FFDI) and a deemed equivalent for the Grassland Fire Danger Index (GFDI), as per Table B2 in Appendix B. When using Method 2, the relevant FFDI and GFDI are applied.

The values may be able to be refined within a jurisdiction, where sufficient climatological data is available and in consultation with the relevant authority.

Relevant Jurisdiction:	WA	Region:	Whole State	Method 1	Applied FDI:	80
				Method 2	Applied FFDI:	80
					Applied GFDI:	110

A1.2: VEGETATION ASSESSMENT AND CLASSIFICATION

Vegetation Types and Classification

In accordance with AS 3959:2018 Clauses 2.2.3 and C2.2.3.1, all vegetation types within 100 metres of the 'site' (defined as "the part of the allotment of land on which a building stands or is to be erected"), are identified and classified. Any vegetation more than 100 metres from the site that has influenced the classification of vegetation within 100 metres of the site, is identified and noted. The maximum excess distance is established by AS 3959: 2018 Clause 2.2.3.2 and is an additional 100 metres.

Classification is also guided by the Visual Guide for Bushfire Risk Assessment in WA (WA Department of Planning February 2016) and any relevant FPA Australia practice notes.

Modified Vegetation

The vegetation types have been assessed as they will be in their natural mature states, rather than what might be observed on the day. Vegetation destroyed or damaged by a bushfire or other natural disaster has been assessed on its expected re-generated mature state. Modified areas of vegetation can be excluded from classification if they consist of low threat vegetation (refer to Appendix B) and that any required active management can be expected to continue in perpetuity, and this can be adequately justified.

The Influence of Ground Slope

Where significant variation in effective slope exists under a consistent vegetation type, these will be delineated as separate vegetation areas to account for the difference in potential bushfire behaviour, in accordance with AS 3959:2018 Clauses 2.2.5 and C2.2.5.

THE INFLUENCE OF VEGETATION GREATER THAN 100 METRES FROM THE SUBJECT SITE	
Vegetation area(s) within 100m of the site whose classification has been influenced by the existence of bushfire prone vegetation from 100m – 200m from the site:	None
Assessment Statement:	No vegetation types exist close enough, or to a sufficient extent, within the relevant area to influence classification of vegetation within 100 metres of the subject site.

VEGETATION AREA 1						
Classification	A. FOREST					
Types Identified	Open forest A-03					
Effective Slope	Measured	flat 0 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover (all layers)	>30%	Shrub/Heath Height	Up to 6m	Tree Height	Up to 30m	
Justification Comments:	Forests with variable tree composition, frequently with plantation species. Understory varies from absent or sparse grasses, to denser assemblages including Grasstrees, Parrotbush, sedges and grasses. The designation as Class A Forest is based on >30% canopy cover at maturity. Some areas are currently Class B Woodland structure but have potential for revegetation. Photos 8 and 9 show an area subject to revegetation.					
Post Development Assumptions:	Areas are expected to maintain their mature condition.					



PHOTO ID: 1



PHOTO ID: 2



PHOTO ID: 3



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PHOTO ID: 5



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PHOTO ID: 7



PHOTO ID: 8



PHOTO ID: 9



PHOTO ID: 10

VEGETATION AREA 2						
Classification	A. FOREST					
Types Identified	Open forest A-03					
Effective Slope	Measured	d/slope 5 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover (all layers)	>30%	Shrub/Heath Height	Up to 6m	Tree Height	Up to 30m	
Justification Comments:	Forests with variable tree composition, frequently with plantation species. Understory varies from absent or sparse grasses, to denser assemblages including Grasstrees, Parrotbush, sedges and grasses. The designation as Class A Forest is based on >30% canopy cover at maturity. Some areas are currently Class B Woodland structure but have potential for revegetation.					
Post Development Assumptions:	Areas are expected to maintain their mature condition.					



PHOTO ID: 11



PHOTO ID: 12



PHOTO ID: 13



PHOTO ID: 14

VEGETATION AREA 3						
Classification	B. WOODLAND					
Types Identified	Woodland B-05					
Effective Slope	Measured	flat 0 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover (all layers)	<30%	Shrub/Heath Height	<2m	Tree Height	Up to 30m	
Justification Comments:	Treed areas with sparse or grassy understory, inconsistent canopy, and limited extent. Joined canopies are present but with overall cover <30%.					
Post Development Assumptions:	Areas are expected to maintain their current condition.					



PHOTO ID: 15



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PHOTO ID: 19



PHOTO ID: 20



PHOTO ID: 21

VEGETATION AREA 4						
Classification	B. WOODLAND					
Types Identified	Woodland B-05					
Effective Slope	Measured	d/slope 5 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover (all layers)	<30%	Shrub/Heath Height	<2m	Tree Height	Up to 30m	
Justification Comments:	Treed areas with sparse or grassy understory, inconsistent canopy, and limited extent. Joined canopies are present but with overall cover <30%.					
Post Development Assumptions:	Areas are expected to maintain their current condition.					



PHOTO ID: 22



PHOTO ID: 23

VEGETATION AREA 5						
Classification	D. SCRUB					
Types Identified	Open scrub D-14					
Effective Slope	Measured	flat 0 degrees		Applied Range (Method 1)	Upslope or flat 0 degrees	
Foliage Cover (all layers)	>30%		Shrub/Heath Height	Up to 6m	Tree Height	Up to 30m
Justification Comments:	Tall shrubs and short trees, generally contained within road reserves. The vegetation has a mature height of 2-6m. Taller trees may be present with <10% canopy cover.					
Post Development Assumptions:	Areas are expected to maintain their current condition.					



PHOTO ID: 24



PHOTO ID: 25



PHOTO ID: 26



PHOTO ID: 27

VEGETATION AREA 6						
Classification	G. GRASSLAND					
Types Identified	Tussock grassland G-22 Sown pasture G-26					
Effective Slope	Measured	flat 0 degrees	Applied Range (Method 1)	Upslope or flat 0 degrees		
Foliage Cover (all layers)	>30%	Shrub/Heath Height	N/A	Tree Height	N/A	
Justification Comments:	Pasture or cropland consistent with the region. Pasture areas display regular grazing.					
Post Development Assumptions:	Areas are expected to maintain their current condition.					



PHOTO ID: 28



PHOTO ID: 29



PHOTO ID: 30



PHOTO ID: 31

	
PHOTO ID: 32	PHOTO ID: 33
	
PHOTO ID: 34	PHOTO ID: 35

VEGETATION AREA 7						
Classification	G. GRASSLAND					
Types Identified	Tussock grassland G-22 Sown pasture G-26					
Effective Slope	Measured	d/slope 5 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover (all layers)	>30%	Shrub/Heath Height	N/A	Tree Height	N/A	
Justification Comments:	Pasture or cropland consistent with the region. Pasture areas display regular grazing.					
Post Development Assumptions:	Areas are expected to maintain their current condition.					



PHOTO ID: 36



PHOTO ID: 37

VEGETATION AREA 8						
Classification	D. SCRUB					
Types Identified	Closed scrub D-13					
Effective Slope	Measured	d/slope 5 degrees	Applied Range (Method 1)	Downslope >0-5 degrees		
Foliage Cover (all layers)	>30%	Shrub/Heath Height	Up to 6m	Tree Height	Up to 30m	
Justification Comments:	Vegetation Area 8 identifies a portion of Area 6 (pasture) which may be revegetated to provide a visual buffer.					
Post Development Assumptions:	The northern, southern, and eastern vegetation screens shown on the submitted layout have been assigned Class D Scrub classification as a precautionary approach and as evidence that the bushfire protection measures can be applied regardless of vegetation screening.					
No photos are provided as the vegetation does not yet exist.						

VEGETATION AREA 9	
Exclusion Clause	2.2.3.2 (e) Non-vegetated area
Justification Comments:	Area 8 includes non-vegetated areas including buildings, roads, and dams.
Post Development Assumptions:	Areas are expected to be maintained in their current condition.



PHOTO ID: 38



PHOTO ID: 39



PHOTO ID: 40

VEGETATION AREA 10	
Exclusion Clause	2.2.3.2 (f) Low threat vegetation - reduced flammability.
Justification Comments:	Vegetation Area 10 identifies a portion of Area 6 (pasture) which may be revegetated to provide a visual buffer.
Post Development Assumptions:	The western vegetation screen shown on the submitted layout is disconnected from other classifiable vegetation and 5m wide. The vegetation would be subject to spotting or surface fire only and would be a developing fire, meeting the intent of AS 3959 exclusion clauses 2.2.3.2 (c) and (d).

No photos are provided as the vegetation does not yet exist.

A1.3: EFFECTIVE SLOPE

EXPLAINING THE ASSESSMENT METHODOLOGY APPLIED BY BUSHFIRE PRONE PLANNING

DEFINITION: Effective slope is "the slope under that classified vegetation which most influences the bushfire attack" (AS 3959:2018, Clause 1.5.11).

"The effective slope under the classified vegetation is not the same as the average slope for the land surrounding the site of the proposed building. The effective slope is that slope which most significantly influences bushfire behaviour" (AS 3959:2018, Clause CB4).

The slope is described as upslope, flat or downslope when viewed from an exposed element (e.g., building) and looking towards the vegetation. It is measured in degrees.

[Note: Additional relevant guidance provided by AS 3959:2018 and NSW RFS, Planning for Bushfire Protection (2019) is incorporated into the applied assessment methodology and is presented at the end of this explanation.]

COMPOUND SLOPES UNDER VEGETATION AND DETERMINING SLOPE SIGNIFICANCE

Non-Linear Slopes: When the slope of ground under the vegetation out to the distance to be assessed (100 m or further if necessary), is not a straight line or nearly straight line slope, then it is made up of several different slopes i.e., it is a compound slope. The different slope angles and lengths must be factored into the determination of the effective slope value to be applied. Different slopes will potentially influence the bushfire rate of spread and intensity, both increasing and decreasing it.

Significant Slope: The AS 3959:2018 bushfire attack level determination methodology, with default inputs, models a fully developed bushfire. Therefore, a 'significant' slope is one that will significantly influence bushfire behaviour. To be 'significant' the length of the slope must be 'sufficient' to support a fully developed fire on that slope. The angle of a significant slope could be the determined effective slope for the area of classified vegetation if it is the one that 'most influences the bushfire attack'.

Sufficient Slope Length: Is a slope that will, as a minimum, allow the entire flame depth (flaming zone) of a fully developed fire (100m flame width) to exist on that slope.

The expected flame depth of a fully developed bushfire is a function of the length of time the flaming phase will exist on a section of the fuel bed (the 'residence time') and the bushfire's 'rate of spread'. For a given rate of spread, longer residence times result in greater flame depths. Greater flame depths are correlated with greater flame temperatures and greater flows of radiant heat.

The primary factors that will increase the residence time are:

- Heavier fine fuel loads of grass, leaf litter, twigs, bark etc less than 6mm in width and existing within the surface and near surface layers (and elevated fuel layers when contiguous with the base layers); and
- A greater percentage of larger fine fuels within the fuel load.

The primary factors that increase the rate of spread (apart from fire weather factors), include finer fuels, drier fuels, horizonal continuity of fuel and steeper upward ground slope in the direction of fire travel.

Example values:

- Residence Time: Grassfire 5 – 15 seconds, Forest fire 25 -50 seconds.
- Rate of Spread: Grassfires of a few km/hr are considered fast moving, 5-10 km/hr is common and fastest in the order of 25km/hr. Forest fire typically recorded in metres/hour with 1-1.5 km/hr being considered fast moving and fastest in the order of 3–4 km/hr.
- Flame Depth: More typically, a few metres for grasses to tens of metres for forest fires.

An Isolated Slope: For scenarios where there is a single significant slope (based on the above criteria) additional consideration would need to be given to the time and distance consumed by a bushfire still in its 'developing' phase. This will require due consideration be given to how it is potentially ignited i.e., from a single or multiple points, as this will influence the time and distance required to fully develop. For such scenarios, a normally significant slope

may not be sufficiently long. It may be necessary to determine the potential bushfire impact more accurately by justifying the application of a lesser effective slope, or a lower threat vegetation classification, or calculating a reduced head fire width (using short fire run modelling).

Determined Effective Slope: Only a 'significant' slope can potentially be the effective slope by itself. In which case, for a defined area of classified vegetation area, the worst significant slope under that vegetation is to apply.

The table below presents Bushfire Prone Planning's considerations applied to assessing short and/or compound slopes in determining the effective slope.

Slope Length (m)	Considered a Significant Slope	Considerations in Determining the Effective Slope
< 5	No	Where these short slopes exist as part of a compound slope under an area of classified vegetation, they can be ignored as they will not influence the fire behaviour in that vegetation.
5-20	Will Vary	These slopes will have a range of influence on fire behaviour from very little to a degree of influence that must be accounted for to some extent by the effective slope value that is applied (i.e., with a greater length - apply to a greater extent). But the actual slope of these shorter slopes is less likely to be applied as it is not a 'significant' length.
20-30	Possibly - Likely	The same considerations applied to the 5-20m slope lengths should be applied here. However, more justification would need to be presented to support an assessment of not 'significant'. For these slope lengths, consideration must be given more broadly to the potential level of risks associated with a bushfire event in this location. The risk level will be a function of the bushfire hazard threat levels (direct attack mechanisms) within the immediate and broader assessment area as influenced by local topography, vegetation extents and types and the exposure and vulnerability of persons and/or buildings/structures to these threats. Higher consequent risk levels require greater precaution meaning these length slopes should be considered 'significant', and vice versa. Consider the potential for a bushfire on adjoining or nearby land be a source of ignition and/or pre-heating to vegetation on the subject slope. Consider if vegetation on the slope is likely be ignited by a single ignition point or is multipoint ignition possible from bushfire an adjoining slopes or the surrounding area. Single point ignition will require a fire to travel further before being fully developed (DFES considers less than 100m fire runs may be considered a short fire run for forest, woodland and scrub vegetation classifications, RFS NSW applies 150m). Isolated slopes of this length are less likely to be considered significant as compared to when part of a compound slope.
>30	Yes	Likely to always be a significant slope unless isolated (i.e., exists alone) – in which case, justifying the application of a lesser effective slope, or a lower threat vegetation classification, or calculating a reduced head fire width, are approaches that may justifiably be applied.

BPP Approach - Slope Variation Within Areas of Vegetation

When multiple 'significant' slope lengths with large differences in degrees of effective slope (or different applicable slope ranges when AS 3959:2018 Method 1 is applied), exists under a single vegetation classification, these will be delineated as separate vegetation areas of classified vegetation to account for the difference in potential bushfire behaviour and impact, in accordance with AS 3959:2018 clauses 2.2.5 and C2.2.5.

Effective Slope Variation Due to Multiple Development Sites

When the effective slope, under a single area of bushfire prone vegetation, will vary significantly relative to multiple proposed development sites (exposed elements), then the effective slopes corresponding to each of the different locations, are separately identified. The relevant (worst case) effective slope is determined in the direction corresponding to the potential directions of fire spread towards the subject building(s).

AS 3959:2018 EFFECTIVE SLOPE DETERMINATION - GUIDANCE

The Standard presents a broad set of guidance statements that indicate the intent of deriving an effective slope value for use in calculations, rather than detailing the 'in the field' determination process. These include:

- Highlighting the importance of the value by stating "The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the severity of the fire and the ultimate level of radiant heat flux" (Clause C2.2.5). [Note: A common rule of thumb is that for every 10 degrees of upslope, a fire will double its rate of spread if moving in the direction of the prevailing wind].
- "It may be necessary to consider the slope under the classified vegetation for distances greater than 100 m in order to determine the effective slope for that vegetation classification) ... (i.e. the vegetation within 100 m) (Clause C2.2.5).
- "Where there is more than one slope within the classified vegetation, each slope shall be individually assessed, and the worst case Bushfire Attack Level shall apply" (Clause 2.2.5).

NSW RFS 2019, PLANNING FOR BUSHFIRE PROTECTION - APPENDIX A1.5 - ADDITIONAL DETERMINATION GUIDANCE

- "In identifying the effective slope - it may be found that there are a variety of slopes covering different distances within the vegetation. The effective slope is considered to be the slope under the vegetation which will most significantly influence the bushfire behaviour for each aspect. This is usually the steepest slope. In situations where this is not the case, the proposed approach must be justified".
- "Vegetation located closest to an asset may not necessarily be located on the effective slope".

SITE ASSESSMENT DETAILS - EXPLANATION & JUSTIFICATION

The effective slopes determined from the site assessment are recorded in Table 3.2 of this Bushfire Management Plan.

Explanation and justification of their determination is presented below.

A1.4: SEPARATION DISTANCE

Measuring

The separation distance is the distance in the horizontal plane between the receiver (building/structure or area of land being considered) and the edge of the classified vegetation (AS 3959:2018, clause 2.2.4)

The relevant parts of a building/structure from which the measurement is taken is the nearest part of an external wall or where a wall does not exist, the supporting posts or columns. Certain parts of buildings are excluded including eaves and roof overhangs.

The edge of the vegetation, for forests and woodlands, will be determined by the unmanaged understorey rather than either the canopy (drip line) or the trunk (AS 3959:2018, clause C2.2.5).

Measured Separation Distance as a Calculation Input

If a separation distance can be measured because the location of the building/structure relative to the edge of the relevant classified vegetation is known, this figure can be entered into the BAL calculation. The result is a determined BAL rating.

Assumed Separation Distance as a Calculation Input

When the building/structure location within the lot is not known, an assumed building location may be applied that would establish the closest positioning of the building/structure relative to the relevant area of vegetation.

The assumed location would be based on a factor that puts a restriction on a building location such as:

- An established setback from the boundary of a lot, such as a residential design code setback or a restrictive covenant; or
- Within an established building envelope.

The resultant BAL rating would be indicative and require later confirmation (via a Compliance Report) of the building/structure actual location relative to the vegetation to establish the determined BAL rating.

Separation Distance as a Calculation Output

With the necessary site specific assessment inputs and using the AS 3959:2018 bushfire modelling equations, the range of separation distances that will correspond to each BAL rating (each of which represents a range of radiant heat flux), can be calculated. This has application for bushfire planning scenarios such as:

- When the separation distance cannot be measured because the exact location of the exposed element (i.e., the building, structure or area), relative to classified vegetation, is yet to be determined.

  In this scenario, the required information is the identification of building locations onsite that will correspond to each BAL rating. That is, indicative BAL ratings can be derived for a variety of potential building/structure locations; or

- The separation distance is known for a given building, structure or area (and a determined BAL rating can be derived), but additional information is required regarding the exposure levels (to the transfer of radiant heat from a bushfire), of buildings or persons, that will exist at different points within the subject site.

The calculated range of separation distances corresponding to each BAL rating can be presented in a table and/or illustrated as a BAL Contour Map – whichever is determined to best fit the purpose of the assessment.

For additional information refer to the information boxes in Section 3 'Bushfire Attack Levels (BAL) - Understanding the Results and Section 3.2. 'Interpretation of the BAL Contour Map'.

SITE ASSESSMENT DETAILS - EXPLANATION & JUSTIFICATION

For the subject development/use the applicable separation distances values are derived from calculations applying the assessed site data. They are an output value, not an input value and therefore are not presented or justified in this appendix.

The derived values are presented in Section 3, Table 3.1 and illustrated as a BAL contour map in Figure 3.2.

A2: BAL Assessment Inputs Applied Using the Method 2 Procedure

STATING AND JUSTIFYING THE METHOD 2 CALCULATION INPUT VARIABLES APPLIED

As 3959:2018 Bal Determination Procedures: AS 3959:2018 establishes the official methodology to determine the radiant heat flux (RHF) a receiver (e.g., a building, structure, person or specified location), will potentially be exposed to from a fully developed bushfire within any adjacent classified vegetation. The methodology accounts for the configuration of a specific site and its surrounds.

The model calculations are complex. Consequently, AS 3959:2018 establishes two pathways to apply the methodology - a simplified procedure (Method 1) and a detailed procedure (Method 2).

Method 1: This procedure has limitations to both its scope and the degree to which site specific conditions can be applied. However, it requires minimal site assessment inputs and provides a standardised output that is satisfactory for many situations.

A moderate level of justification for some of the assessed inputs applied is required. This will demonstrate how the procedure detailed within AS 3959:2018 for Method 1(Section 2) has been followed.

Method 2: This procedure is used when the site conditions are out of the scope of Method 1 or when it is necessary to produce a more specific result. Higher levels of justification will be required for many of the input variables that are able to be modified using Method 2 (AS 3959:2018 Appendix B).

Section A2.1 below identifies the input variables that have been assessed for the proposed development and indicates the level of justification required for their application. The information contained within this Appendix will provide this justification information to the degree necessary.

A2.1: SUMMARY OF CALCULATION INPUTS APPLIED AND THE LEVEL OF JUSTIFICATION REQUIRED

AS 3959:2018 BUSHFIRE ATTACK LEVEL (BAL) DETERMINATION PROCEDURES INPUT VARIABLES FOR THE FIRE BEHAVIOUR AND RADIATION MODELS						
✓	Indicates which site specific variables have been assessed and applied to the assessment of the proposed development/use.	IDENTIFICATION OF THE CALCULATION INPUT VARIABLES ASSESSED AND/OR MODIFIED FOR THE PROPOSED DEVELOPMENT/USE				
	Indicates an AS 3959 methodology or jurisdiction default variable (or a methodology calculated variable in the case of EOR or flame angle). No justification required.					
	Indicates a variable that either must or can have an assessor value applied. Requires justification.					
	Indicates a variable that can have an assessor value applied. Requires detailed justification.	Using Method 1		Using Method 2		
ASSESSOR QUALIFICATION REQUIRED [1]		BPAD Level 1		BPAD Level 3		
LEVEL OF JUSTIFICATION REQUIRED TO APPLY [2]		None	Moderate	None	Moderate	High
Fire weather	Fire danger index (FDI/FFDI/GFDI)			✓		
	Wind speed					
	Ambient temperature					
	Relative humidity					
Bushfire Prone Vegetation and slope of the land it grows on	Vegetation classification [3]				✓	
	Effective slope				✓	
	Understorey and total fuel loads [4]					
	Vegetation height					
	Fuel age					
	Fuel moisture					
Receiver (building) positioning parameters	Site slope				✓	
	Separation distance				✓	
	Elevation of the receiver (EOR).					
Bushfire flame parameters	Flame temperature [5]					
	Flame width					
	Flame angle					
	Flame emissivity					
	Heat of combustion					
INTERMEDIATE OUTPUT FROM THE FIRE BEHAVIOUR AND RADIATION MODELS						
Rate of Spread - derived from fuel loads, fuel type, fuel height, FDI, effective slope and wind speed.						
Fire Intensity – derived from fuel loads, rate of spread and heat of combustion [6]						
Path Length – derived from flame angle and separation distance.						
Transmittance – derived from ambient temperature and relative humidity.						
View Factor – derived from flame length, flame width, flame angle, separation distance, elevation of receiver and site slope.						
FINAL OUTPUT OF THE FIRE BEHAVIOUR AND RADIATION MODELS						
Flame Length – derived from fuel loads, ROS (for Forest, Woodland) and fire intensity (for Scrub, Shrubland, Grassland) [6]						
Radiant Heat Flux and the Corresponding Bushfire Attack Level (BAL) – derived from view factor, flame emissivity, flame temperature, transmittance and corresponding to the worst possible flame angle.						
TABLE NOTES (see next page)						

[1] Authority to Use Method 2: Within WA, use of this procedure is restricted to bushfire practitioners who hold the BPAD Level 3 accreditation as issued by the Fire Protection Association Australia (FPAA) through their Bushfire Planning and Design Accreditation Scheme (BPAD Scheme) that complies with the Western Australian Bushfire Accreditation Framework.

[2] Level of Justification Required in Applying Method 2: AS 3959:2018 Appendix B establishes the detailed procedure for the Method 2 determination of BAL(s) as consisting of 10 steps. When justification is required for an assessed variable value to be applied, the required level of justification can vary. The level definitions used in this table are:

Moderate: Requires the provision of readily available and understood argument and evidence such as when:

1. The methodology step requires or allows for an input variable to be a site assessed value; or
2. A methodology step requires a jurisdictionally determined value which the relevant authority may change for different land use scenarios; or

High: Requires a detailed argument, appropriate evidence and justification when:

1. The variable is derived from the methodology step that applies an AS 3959:2018 default value or determines an intermediate output value (i.e. the result of applying a step's equations).

[3] Applying a Different Vegetation Classification: This approach may be justified when certain characteristics of the site's local vegetation complex align with the broad based descriptions of AS 3959:2018, but expert knowledge identifies characteristics that would result in the applied AS 3959 bushfire behaviour model not being properly representative of a fire in the local vegetation. This potential outcome is in part due to the ecological classification of vegetation that is used in AS 3959 rather than a classification more aligned with fuel structure/fire behaviour.

The justification of using a different classification is predicated on the fact that the intent of classifying vegetation in the BAL determination methodology of AS 3959:2018, is to identify the most appropriate fire behaviour model equations to apply.

For example, with respect to contribution to potential fire behaviour, it is often more important to consider vegetation structure rather than canopy cover, yet canopy cover is a key classification factor applied in AS 3959:2018.

Also findings from more recent bushfire behaviour research is not yet incorporated into the current version of the Standard. Certain currently applied bushfire behaviour models within As 3959:2018 are outdated and may under or over predict radiant heat flux and flame length.

[4] Modifying Fuel Loads: Potential steady state maximum fuel loads at a specific site for a given vegetation classification may vary significantly (above and below) from those that are to be applied as the default values in AS 3959:2018.

The Standard only provides the single set of ecological descriptors and corresponding fuel loads that are to be applied to vegetation complexes across Australia, hence its accuracy for all situations will be questionable. The relevant authority for a jurisdiction can establish different fuel loads to be applied.

However, fuel loads for the purposes of determining expected fire behaviour have not currently been determined to the degree necessary in WA, which results in the default values both over and underestimating fuel loads for WA vegetation types. WA DFES in providing advice to decision makers, will currently not accept any assessment and subsequent variation of the default fuel loads. If any variation was to be applied in an assessment, it would need to be argued for based on appropriate evidence and the development of a merit based case to the satisfaction of the decision maker.

The one circumstance where Bushfire Prone Planning will reduce fuel loads is in the calculations associated with a short fire run in forest type vegetation – in which the developing fire will not crown. Therefore, most bark and all canopy fuels can justifiably be excluded from total fuel load.

Note [5] - Flame Temperature: The Guidelines (DPLH, November 2024) establish the requirement to apply 1200 K as the flame temperature to determine an on-site shelter's maximum exposure to radiant heat flux and the corresponding vegetation separation distance, when an on-site shelter is required for vulnerable land use proposals (refer to Guidelines, Appendix B5.2.3 and BPC 8, A2.5). The requirement refers to the guidance presented in the ABCB Design and Construction of Community Bushfire Refuges Handbook 2014 to support the requirement.

Note [6] – Fireline Intensity and Flame Length: These values are determined as intermediate and final outputs of the AS 3959:2018 modelling. Changing these values would not be a valid use of the methodology for a fully developed fire. However, for the circumstance of a developing fire in small patches or corridors of vegetation, there may be justification when an authoritative source is identified to provide an override value.

A2.3: SITE SLOPE

SITE SLOPE
DETERMINING
Site slope is the 'line of sight' slope between the 'site' and the edge of the relevant area of classified vegetation (AS 3959:2018 clause B5). The 'site' being "the part of the allotment of land on which a building stands or is to be erected" (AS 3959:2018 clause 1.5.30). That is, it is the straight line slope that ignores any changes in slope or any other physical obstructions between these two points. The slope direction is considered from the receiver to the vegetation with upslope entered as negative degrees and downslope as positive degrees.
PURPOSE
Site slope is applied to position the potential receiver of radiant heat (typically a structure) relative to the modelled bushfire (the radiant heat panel as a black body of evenly distributed heat) at the edge of the vegetation. This enables the use of the view factor radiant heat model in the AS 3959:2018 BAL determination methodology, to calculate of the level of radiant heat that will potentially flow from the bushfire to the structure.
SLOPE LIMITS
AS 3959:2018 clause B1 limits site slope to 20^0 but explains that this limitation due to the considered impracticality of maintaining relevant vegetation in a low threat state in perpetuity on steeper slopes. This is likely to result in an inability to maintain the assessed separation distance between the building and the classified vegetation. Consequently, where the maintenance of vegetation is not a limiting factor, the application of a greater site slope can be justified to position the building relative to the bushfire more accurately.
AS 3959:2018 METHOD 1 AND METHOD 2 – DIFFERENCES IN APPLYING SITE SLOPE
Method 2 allows for the input of the site slope as the actual measured or calculated slope (not a range or the highest value of a range), that exists for the subject site. The slope can be upslope (entered as negative degrees), flat or downslope (entered as positive degrees). This differs from the Method 1 procedure for which site slope is not independent of effective slope and assumes the site slope to be the same as the effective slope that is applied (i.e., zero, 5, 10, 15 or 20 degrees, as applicable).

A site slope inverse to the effective slope has been applied. For example, a 5 degree downslope effective slope applies a -5 degree site slope.

This results in the worst-case scenario modelling applying the Method 2 procedure.

A3: BAL Calculator – Copy of Input/Output Values

DETERMINING 10 kW/m^2 SEPARATION DISTANCES

Vegetation Classification	A. FOREST

0 Degrees (Flat)

FLAMESOL FPA AUSTRALIA

Calculated August 13, 2025, 3:59 pm (MDc v.4.9)

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	80	Rate of spread	2.4 km/h
Vegetation Classification	Forest	Flame length	19.8 m
Understorey fuel load	25 t/ha	Flame angle	52 °, 61 °, 69 °, 73 °, 74 ° & 81 °
Total fuel load	35 t/ha	Elevation of receiver	7.8 m, 8.65 m, 9.24 m, 9.460000000000001 m, 9.51 m & 9.77 m
Vegetation height	n/a	Fire intensity	43,400 kW/m
Effective slope	0 °	Transmissivity	0.863, 0.841, 0.8110000000000001, 0.786, 0.773 & 0.716
Site slope	0 °	Viewfactor	0.6085, 0.4531, 0.3066, 0.2086, 0.1696 & 0.0458
Flame width	100 m	Minimum distance to < 40 kW/m²	16.1 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	21.5 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	30.6 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	41.9 m
		Minimum distance to < 10 kW/m²	48.9 m

5 Degrees Downslope

FLAMESOL FPA AUSTRALIA

Calculated July 1, 2024, 6:40 pm (MDc v.4.9)

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	80	Rate of spread	3.38 km/h
Vegetation classification	Forest	Flame length	26.22 m
Understorey fuel load	25 t/ha	Flame angle	48 °, 56 °, 62 °, 66 °, 67 ° & 75 °
Total fuel load	35 t/ha	Elevation of receiver	11.66 m, 13.38 m, 15.03 m, 16.57 m, 17.35 m & 24.03 m
Vegetation height	n/a	Fire intensity	61,280 kW/m
Effective slope	5 °	Transmissivity	0.852, 0.827, 0.797, 0.772, 0.76 & 0.705
Site slope	-5 °	Viewfactor	0.6165, 0.46, 0.3127, 0.2125, 0.1727 & 0.0465
Flame width	100 m	Minimum distance to < 40 kW/m²	22 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	28.7 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	39.5 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	52.5 m
		Minimum distance to < 10 kW/m²	60.4 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980
Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980
Elevation of receiver - Douglas & Tan, 2005
Flame angle - Douglas & Tan, 2005
Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Vegetation Classification	B. WOODLAND

0 Degrees (Flat)

FLAMESOL FPA AUSTRALIA

Calculated August 13, 2025, 4:01 pm (MDc v.4.9)

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	80	Rate of spread	1.43 km/h
Vegetation Classification	Woodland	Flame length	12.35 m
Understorey fuel load	15 t/ha	Flame angle	53 °, 63 °, 71 °, 76 °, 78 ° & 83 °
Total fuel load	25 t/ha	Elevation of receiver	4.93 m, 5.5 m, 5.84 m, 5.99 m, 6.04 m & 6.13 m
Vegetation height	n/a	Fire intensity	18,599 kW/m
Effective slope	0 °	Transmissivity	0.876, 0.859, 0.836, 0.8110000000000001, 0.797 & 0.732
Site slope	0 °	Viewfactor	0.5992, 0.4424, 0.2986, 0.2026, 0.1645 & 0.0448
Flame width	100 m	Minimum distance to < 40 kW/m²	10.2 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	13.8 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	20.3 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	28.9 m
		Minimum distance to < 10 kW/m²	34.5 m

5 Degrees Downslope

FLAMESOL FPA AUSTRALIA

Calculated September 13, 2024, 11:37 am (MDc v.4.9)

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	80	Rate of spread	2.03 km/h
Vegetation classification	Woodland	Flame length	16.21 m
Understorey fuel load	15 t/ha	Flame angle	49 °, 58 °, 66 °, 70 °, 71 ° & 77 °
Total fuel load	25 t/ha	Elevation of receiver	7.34 m, 8.5 m, 9.720000000000001 m, 10.82 m, 11.44 m & 16.66 m
Vegetation height	n/a	Fire intensity	26,263 kW/m
Effective slope	5 °	Transmissivity	0.868, 0.848, 0.821, 0.796, 0.783 & 0.723
Site slope	-5 °	Viewfactor	0.6027, 0.4476, 0.3037, 0.2064, 0.1674 & 0.0454
Flame width	100 m	Minimum distance to < 40 kW/m²	13.9 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	18.5 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	26.5 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	36.7 m
		Minimum distance to < 10 kW/m²	43.2 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980
Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980
Elevation of receiver - Douglas & Tan, 2005
Flame angle - Douglas & Tan, 2005
Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Vegetation Classification	D. SCRUB

0 Degrees (Flat)

FLAMESOL
FPA AUSTRALIA

Calculated August 13, 2025, 4:02 pm (MDc v.4.9)

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	80	Rate of spread	4.16 km/h
Vegetation Classification	Scrub	Flame length	11.62 m
Understorey fuel load	25 t/ha	Flame angle	53 °, 63 °, 72 °, 76 °, 78 ° & 83 °
Total fuel load	25 t/ha	Elevation of receiver	4.64 m, 5.18 m, 5.52 m, 5.64 m, 5.68 m & 5.77 m
Vegetation height	m	Fire intensity	53,815 kW/m
Effective slope	0 °	Transmissivity	0.878, 0.862, 0.838, 0.8139999999999999, 0.8 & 0.735
Site slope	0 °	Viewfactor	0.5988, 0.4419, 0.2962, 0.2016, 0.1638 & 0.0446
Flame width	100 m	Minimum distance to < 40 kW/m²	9.6 m
Windspeed	45 km/h	Minimum distance to < 29 kW/m²	13 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	19.3 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	27.5 m
		Minimum distance to < 10 kW/m²	32.9 m

Vegetation Classification	G. GRASSLAND

0 Degrees (Flat)

FLAMESOL
FPA AUSTRALIA

Calculated August 13, 2025, 4:04 pm (MDc v.4.9)

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Grassland Fire Danger Index	110	Rate of spread	14.3 km/h
Vegetation Classification	Grassland	Flame length	6.87 m
Understorey fuel load	4.5 t/ha	Flame angle	54 °, 64 °, 73 °, 78 °, 80 ° & 85 °
Total fuel load	4.5 t/ha	Elevation of receiver	2.78 m, 3.08 m, 3.28 m, 3.36 m, 3.38 m & 3.42 m
Vegetation height	n/a	Fire intensity	33,247 kW/m
Effective slope	0 °	Transmissivity	0.887, 0.877, 0.861, 0.841, 0.829 & 0.755
Site slope	0 °	Viewfactor	0.5823, 0.4291, 0.29, 0.1946, 0.158 & 0.0434
Flame width	100 m	Minimum distance to < 40 kW/m²	5.8 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	7.9 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	11.7 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	17.3 m
		Minimum distance to < 10 kW/m²	21.2 m

5 Degrees Downslope

FLAMESOL
FPA AUSTRALIA

Calculated July 1, 2024, 6:21 pm (MDc v.4.9)

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Grassland Fire Danger Index	110	Rate of spread	20.19 km/h
Vegetation classification	Grassland	Flame length	8.16 m
Understorey fuel load	4.5 t/ha	Flame angle	51 °, 60 °, 68 °, 73 °, 75 ° & 80 °
Total fuel load	4.5 t/ha	Elevation of receiver	3.8 m, 4.38 m, 5.03 m, 5.71 m, 6.13 m & 9.9 m
Vegetation height	n/a	Fire intensity	46,945 kW/m
Effective slope	5 °	Transmissivity	0.884, 0.872, 0.854, 0.832, 0.819 & 0.748
Site slope	-5 °	Viewfactor	0.5914, 0.4357, 0.2914, 0.1969, 0.1601 & 0.0438
Flame width	100 m	Minimum distance to < 40 kW/m²	7.1 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	9.6 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	14.2 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	20.7 m
		Minimum distance to < 10 kW/m²	25 m

Rate of Spread - Noble et al. 1980
Flame length - Purton, 1982
Elevation of receiver - Douglas & Tan, 2005
Flame angle - Douglas & Tan, 2005
Radiant heat flux - Dryodale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

B1: Understanding Bushfire Attack Level (BAL) Ratings

BUSHFIRE ATTACK LEVEL

IMPORTANT

It is not the purpose of this 'planning' BMP to derive a 'determined' BAL rating (and associated minimum APZ dimensions), that will apply to an existing or future habitable or specified building, for the purpose of establishing its bushfire resistant construction requirements in accordance with the Building Code of Australia (contained in the NCC).

However, in limited situations a 'determined' BAL can be an incidental outcome of the planning assessment.

BUSHFIRE ATTACK LEVEL (BAL)

The potential transfer (flux/flow) of radiant heat from a bushfire to a receiving object is measured in kW/m^2. The AS 3959:2018 Bushfire Attack Level (BAL) determination methodology establishes the ranges of radiant heat flux that correspond to each bushfire attack level.

These ranges of radiant heat transfer are titled BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ.

For certain classes of building/structure the bushfire performance requirements and the associated deemed to satisfy solutions are established by the Building Code of Australia (Vol. 1 & 2 of the NCC). For most jurisdictions the relevant building classes are 1, 2, 3, 9 and associated 10a.

The assessed BAL rating that applies to a specific building/structure determines the bushfire resistant construction requirements for those works in accordance with AS 3959:2018 - *Construction of buildings in bushfire prone areas,* or for Class 1 buildings, the NASH Standard – *Steel framed construction in bushfire areas (NS 300 2021),* as the recognised deemed to satisfy solutions.

DETERMINED BAL RATINGS

A BAL can only be classed as 'determined' and therefore apply to an existing or future building/structure when:

1. The building/structure final design and position on the lot are known and the stated separation distance from classified bushfire prone vegetation exists and can justifiably be expected to remain in perpetuity; or
2. The building/structure will always remain subject to the same BAL regardless of:
    (a) The retention of all existing classified vegetation either onsite or offsite; and
    (b) Its design or position on the lot - including, as relevant and necessary, accounting for any regulatory or enforceable building setbacks from lot boundaries (i.e. R-codes, restrictive covenants and defined building envelopes).

Consequently, a BAL Certificate may be able to be issued for a BAL stated in the BMP when it can be considered 'determined'. However, this is not the typical outcome but an incidental one.

If the BMP can derive determined BAL(s), the BAL Certificate(s) required for submission with building applications could potentially be provided, using the BMP as the supporting assessment data.

INDICATIVE AND CONDITIONAL BAL RATINGS

An 'Indicative BAL' indicates the highest BAL rating that exists for the applied set of parameters that have been applied to the site's assessment. Because the potential remains for these parameters to be varied, they are unable to be considered a 'determined' BAL.

A 'Conditional BAL' establishes the BAL rating that will be considered as a 'Determined BAL' once the stated requirements (i.e. the conditions), which may require approval by the relevant authority, are implemented and subsequently confirmed as being met.

Relevant conditions that may need to be met include:

- The location of future development sites being identified accurately and/or modified; and/or
- Classified vegetation being modified or removed (after obtaining any required approvals from the relevant authority), to establish the required vegetation separation distances.

A BAL Certificate cannot be issued for an indicative or conditional BAL rating – only for a 'Determined BAL'.

BAL RATINGS FOR BUILDING VERSUS PLANNING PURPOSES – ASSESSMENT & REPORTING REQUIREMENTS ARE DIFFERENT

Building Permit Applications

The relevant requirements are established in accordance with the WA Building Act 2011 and Building Regulations 2012 which reference the application of the Building Code of Australia (within the National Construction Code).

The required BAL rating is a 'determined' BAL rating (stated on a BAL Certificate) and supported by the requisite assessment details. Typically, this will be a Bushfire Attack Level (BAL) Report produced specifically for this purpose.

The required supporting assessment information may be derived from a Bushfire Management Plan (BMP) when a 'determined' BAL can be derived for a planning proposal. This is possible when the specific conditions discussed under 'Determined BAL Ratings' above, can be met, as an incidental outcome.

Planning Proposal Applications

The relevant requirements are established in accordance with the Planning and Development Act 2005, LPS Regulations 2015, SPP 3.7 Bushfire and the associated Guidelines.

To comply with the relevant acceptable solutions contained in the Guidelines, the subject planning proposal must demonstrate that the required minimum sized asset protection zone (APZ) - subject to location constraints and allowances established by the Guidelines - can be installed surrounding a habitable or specified building.

The minimum dimensions are those that ensure the potential radiant heat impact on the relevant buildings does not exceed 29 kW/m^2 from fire in any surrounding types of classified vegetation. This is the upper limit of the range of radiant heat flux corresponding to the BAL-29 rating.

Consequently, the BAL ratings identified in a Bushfire Management Plan (BMP) only need to be 'indicative' - although 'determined' ratings may be derived as an incidental outcome when relevant conditions are met (discussed under 'Determined BAL Ratings' above).

The indicative BAL-29 dimensioned APZ is not necessarily the APZ that will be required to be implemented and maintained surrounding any subject building/structure that exists as per an approved planning proposal. Refer to Appendix B3 in this BMP for additional information.

B2: BAL Contour Map Interpretation

THE BAL CONTOUR MAP
The Bushfire Attack Level (BAL) contour map is a diagrammatic representation of the outcome of the bushfire attack level assessment that has been conducted. The map presents six shaded radiant heat contours extending out from each area of classified vegetation. Each coloured contour represents a different BAL rating (BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ) and corresponds to a set range of potential radiant heat transfer (kW/m^2), in accordance with AS 3959:2018 BAL determination methodology. The highest BAL rating contour that an exposed element (building, person or other defined element), is partly or fully located within, is the BAL rating that will apply to that element. The width of each BAL contour: • Will vary dependent on the BAL rating it represents; and • The assessed potential bushfire behaviour that considers site specific vegetation types, fuel loads, ground slopes and fire weather; and • Represents the minimum and maximum vegetation separation distances corresponding to the BAL rating it represents. For 'post development' BAL contour maps, the areas of classified vegetation applied to the production of the BAL contours, are those that will remain at the intended end state of the subject development once earthworks, clearing and/or landscaping and/or re-vegetation have been completed.

B3: The Asset Protection Zone (APZ)

THE APZ – DESCRIPTION, TECHNICAL REQUIREMENTS AND DIMENSIONS

DESCRIPTION AND PURPOSE

An asset protection zone (APZ) is an area surrounding a habitable or specified building that is:

- Not vegetated; and/or
- Supports retained or planted vegetation that can be considered to present a low bushfire threat as a result of;
    - Low flammability and/or higher moisture content characteristics; and/or
    - Minimal fuel loads (either naturally or as a result of continual maintenance).

The primary objectives of establishing an APZ are:

1. To ensure a reduction in the exposure of the building/structure to the bushfire direct attack mechanisms (threats) of flame contact, radiant heat transfer and ember attack, by establishing appropriate separation distances from each identified area of classified vegetation.

   These distances are measured from the nearest part of an external wall and/or the supporting posts of building parts without external walls; and
2. To ensure a reduction in the exposure of the building/structure to bushfire indirect attack mechanisms (threats) by:
    - Preventing surface fire spreading to the building/structure;
    - Minimising the potential for tree strike that can decrease building/structure resilience to bushfire direct attack mechanisms; and
    - Limiting the potential for consequential fires to impact the building/structure by eliminating, reducing, moving away and/or shielding consequential fire fuels.

      These fuels include accumulated debris, stored combustible/flammable items and constructed combustible items. Note that consequential fire, typically ignited by embers, is the primary cause of building loss in a bushfire event; and
3. To provide a defendable space for firefighting activities.

TECHNICAL REQUIREMENTS

Established by the Guidelines

The relevant technical requirements for an APZ are established in the Planning for Bushfire Guidelines (DPLH/WAPC) (as amended), Appendix B2: Siting and design and available online at Planning WA - SPP 3.7 Bushfire

Established by the Relevant Local Government

Certain LGA may state technical requirements to be complied with that vary from and/or are additional to those established by the Guidelines.

Refer to the notice issued annually by the relevant local government under s33 of the Bushfires Act 1954 (e.g. Bushfire Risk Reduction Notice or Firebreak and Hazard Reduction Notice etc). These technical requirements may also be established by their gazetted local planning scheme. Refer to the ratepayer notice and/or the local government's website for the current version.

Information Published by the Bushfire Centre of Excellence (DFES)

The book titled Firewise Gardening in Western Australia (2024), is a good source of relevant information and is available online at https://dfes.wa.gov.au/hazard-information/bushfire/bcoe#bushfire-resources.

DIMENSIONS

The dimensions of the APZ that will be the responsibility of a landowner to implement and/or maintain around a habitable or specified building/structure, are stated as the separation distances between these buildings and each identified area of classified vegetation. These distances will be site specific and dependant on variables which include:

- The potential bushfire behaviour in the identified vegetation which is dependent on factors including vegetation types, fuel loads, ground slopes and fire weather;
- The intended use of the site, with vulnerable uses requiring greater safety margins; and
- The constructed bushfire resistance of the subject building/structure (typically corresponding to a BAL rating or kW/m² level of radiant heat exposure).

Dimensions Established by the BAL Rating of the Subject Building/Structure

These minimum separation distances, to be installed and maintained, correspond to a 'determined' BAL rating and align the building's applied level of bushfire resistant construction to its potential level of exposure to flames, radiant heat and embers from the bushfire (note: this will not account for any exposure from significant consequential fires closer to the building).

The dimensions should be stated within a Bushfire Attack Level Report (BAL Report) produced for building application purposes. They may also be identified in an associated Bushfire Management Plan (BMP) produced for planning application purposes.

Dimensions Established by the Guidelines, DPLH/WAPC for an On-site Shelter for a Vulnerable Tourism Land Use

For the stated specific use, the Guidelines specify the maximum level of radiant heat exposure allowed. Consequently, the BMP produced for planning application purposes will state the minimum distances that are to be installed and maintained.

> *Note: Other than for the above use, the Guidelines do not establish the dimensions of the APZ for other buildings/structures that must be installed. They only establish that at least a BAL-29 dimensioned APZ should be the minimum that is installed and ensures that this is possible for the subject planning proposal. Consequently, the BMP can only indicate the separation distances corresponding to different levels of radiant heat exposure. Refer also to Appendix B1 in this BMP.*

Dimensions Established by this BMP

The required dimensions may be identified in this BMP when specific increased separation distances have been applied through the application of an outcomes-based assessment that requires this as an additional protection measure.

Dimensions Established by the BCA (NCC 2022) for Certain Class 9 Vulnerable Use Buildings

These separation distances are stated in the BCA in Specification 43 as either:

- Not less than the minimum distances specified in Table S43C2; or
- Those corresponding to radiant heat flux on exposed building elements not exceeding 10kW/m² from a justified design bushfire analysis; or
- Those justified as an outcome of a building performance solution.

The separation distances may be included in the BMP by the bushfire practitioner as additional information to inform proponents and decision makers. They are not addressed by the Guidelines and therefore not a required part of the bushfire assessments presented within a BMP for planning application purposes.

Dimensions Established by a Local Government

To satisfy certain local government requirements, required APZ dimensions may be stated in the notice issued annually by the relevant local government under s.33 of the Bushfires Act 1954. These may be greater than the dimensions applied by the above mechanisms. A maximum APZ dimension could also be applied by the LGA.

These separation distances may be included in the BMP for informative purposes, but they are not a requirement for a BMP submitted for planning application purposes in accordance with the Guidelines.

B4: Vegetation Excluded from Classification – Ensure Continued Low Threat Status

MAINTAINING THE LOW THREAT STATUS OF EXCLUDED VEGETATION

When applying AS 3959:2018 BAL determination methodology, vegetation adjoining or adjacent to the subject site can be excluded from classification based on being a 'low bushfire threat'. To maintain this status, certain requirements must continue to be met in accordance with the below extract from AS3959:2018. Refer to the Figures 3.1 and 3.1.1 (Existing and Post-Development Classified Vegetation and Topography Maps) for the relevant low threat areas associated with the subject site.

Determination of 'low threat' vegetation is based on factors such as - proximity to the subject site / small areas of vegetation / low flammability / higher moisture content / low fuel load.

Aside from a naturally occurring low fuel load, vegetation maintained in a minimal fuel condition through active management can be excluded. The associated key requisite is that the active management can be expected to continue in perpetuity, and this can be adequately justified.

Acceptable forms of justification typically involve supportable evidence or the existence of an enforceable mechanism. Examples of enforceable mechanisms include:

- Requirements established by a Section 33 (Bush Fires Act 1954) notice issued by a local government;
- An appropriate and enforceable agreement between relevant parties (which may involve additions to land titles); and
- For public open space or crown land, written evidence that the land manager e.g. local government or a State Government department, agrees to maintain the designated area of land in a low threat state in perpetuity.

2.2.3.2 *Exclusions—Low threat vegetation and non-vegetated areas*

The following vegetation shall be excluded from a BAL assessment:

(a) Vegetation of any type that is more than 100 m from the site.

(b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified vegetation.

(c) Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other or of other areas of vegetation being classified vegetation.

(d) Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified vegetation.

(e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.

(f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.

NOTES:

1 Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm).

2 A windbreak is considered a single row of trees used as a screen or to reduce the effect of wind on the leeward side of the trees.

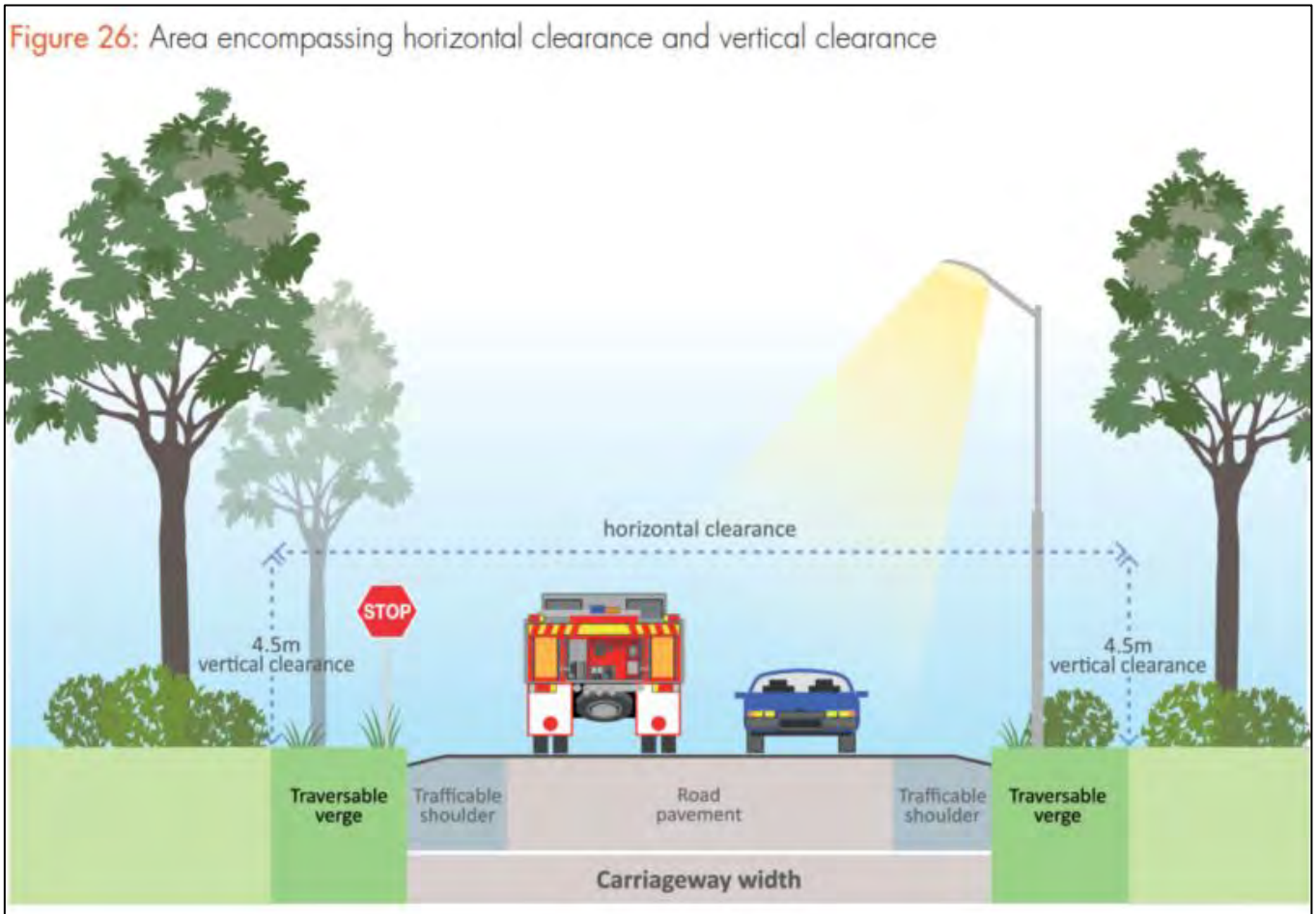
APPENDIX C: GUIDANCE - TECHNICAL REQUIREMENTS FOR VEHICULAR ACCESS

The relevant technical requirements are established in the Planning for Bushfire Guidelines (DPLH/WAPC) (as amended), Appendix B3: Vehicular access and available online at Planning WA - SPP 3.7 Bushfire

The following excerpts are presented here as a quick reference to applicable terminology and design requirements applied in the assessment against the bushfire protection criteria, Element 3: Vehicular access in this BMP.

C1: Road Component Terminology

Figure 26: Area encompassing horizontal clearance and vertical clearance



Horizontal clearance: The carriageway width (including the road pavement and trafficable shoulder) and traversable verge that provides for the movement and parking of vehicles and area required by emergency services to operate. Infrastructure and vegetation within the traversable verge should be frangible, however, non-frangible items can occur providing they do not restrict vehicular movement in the event of an emergency.

C2: Vehicular Access Technical Requirements

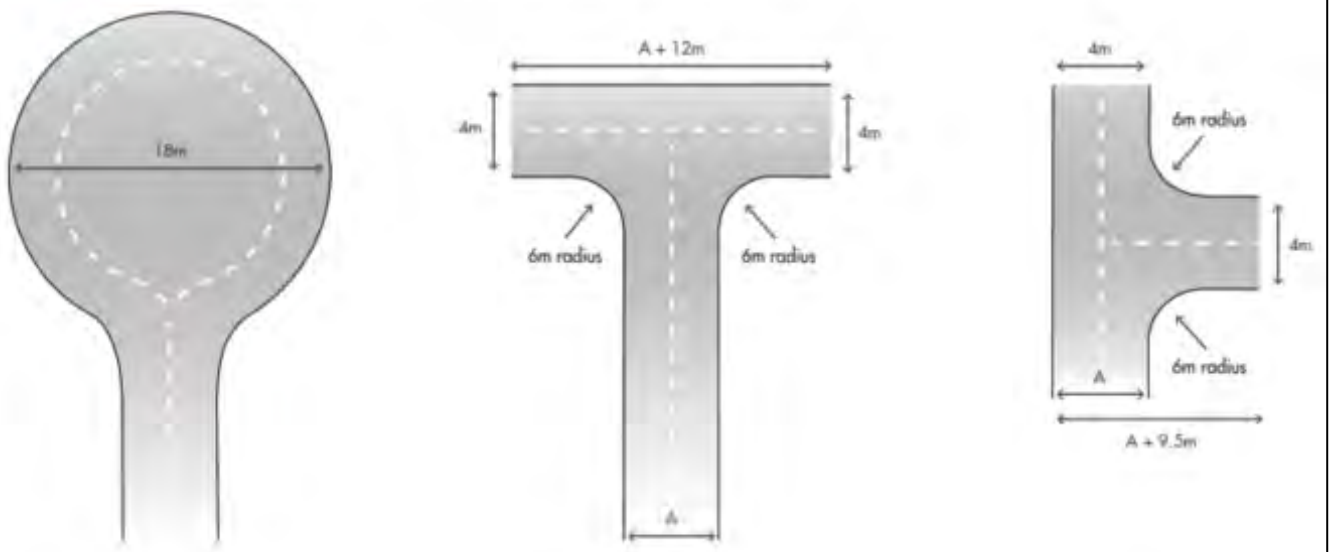
Table 10: Vehicular access technical requirements

	1		2		3		4		5	
TECHNICAL REQUIREMENTS	**PERIMETER ROADS**		**PUBLIC ROADS**		**EMERGENCY ACCESS WAY[3]**		**FIRE SERVICE ACCESS ROUTE[3]**		**BATTLE-AXE & PRIVATE DRIVEWAYS[1]**	
MAP OF BUSH FIRE PRONE AREAS DESIGNATION	**Area 2**	**Area 1**	**Area 2**	**Area 1**	**Area 2**	**Area 1**	**Area 2**	**Area 1**	**Area 2**	**Area 1**
Minimum horizontal clearance (metres)	12	8	See note 5		10	6	10	6	6	
Minimum vertical clearance (metres)	4.5									
Minimum weight capacity (tonnes)	15									
Maximum grade unsealed road[2]	See note 5		See note 5		1:10 (10% or 6°)					
Maximum grade sealed road[2,4]					1:7 (14.3% or 8°)					
Maximum average grade sealed road					1:10 (10% or 6°)					
Minimum inner radius of road curves (metres)					8.5					

Notes:

1. Driveways and battle-axe legs to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision where not required to comply with the widths in this Appendix or the Guidelines.
2. Dips must have no more than a 1 in 8 (12.5% - 7.1 degrees) entry and exit angle.
3. To have crossfalls between 3 per cent and 6 per cent.
4. For sealed roads only the maximum grade of no more than 1 in 5 (20 per cent) (11.3 degrees) for no more than 50 metres is permissible, except for short constrictions to 3.5 metres for no more than 30 metres in length where an obstruction cannot be reasonably avoided or removed.
5. As outlined in the Institute of **Public Works Engineering Australasia (IPWEA) subdivision guidelines, Liveable Neighbourhoods, Austroads Standards** Main Roads standard, supplement, policy or guideline and/or any applicable or relevant local government standard or policy.

Figure 30: Design requirements for a turn-around area



The relevant technical requirements are established in the Planning for Bushfire Guidelines (DPLH/WAPC) (as amended), Appendix B4: Water supply and available online at Planning WA - SPP 3.7 Bushfire

The information provided in this appendix is additional to that provided in the Guidelines. It includes:

- For reticulated water supply, the hydrant location specifications established by the WA Water Corporation (Design Standard DS 63), as dependant on land use type and relevant to bushfire planning assessments (highlighted). Note: the maximum distance from a hydrant to the rear of a lot/building is generally interpreted as not applicable to large lot sizes where the maximum distance becomes an impractical limitation i.e., typically rural residential areas; and
- Images of example installations of acceptable water supply tanks and outlet fittings.

D1: Hydrant Location in Reticulated Areas

Design Standard DS 63
Water Reticulation Standard

WATER

2.2.1.5 Appurtenances

c. Hydrants

Hydrants shall be screw-down hydrant with built-in isolation valve and installed only on DN100 or larger pipes. Hydrants shall be located:

- so that the maximum distance between a hydrant and the rear of a building envelope, (or in the absence of a building envelope the rear of the lot) shall be 120m;
- so that spacing (as measured by hose-run) between hydrants in non-residential or mixed use areas shall be maximized and no greater than 100m;
- so that spacing (as measured by hose-run)between hydrants in residential areas with lots per dwelling <10,000m^2 shall be maximized and no greater than 200m;
- so that spacing between hydrants (as measured by hose-run) in rural residential areas where minimum lots per dwelling is >10,000 m^2 (1ha) shall be maximized and no greater than 400m;
- centrally along the frontage of a lot to avoid being under driveways, unless the lot features a frontage 6m or less, in which case it shall be placed to the side opposite the driveway;
- at lots that have the widest frontage in the local area;
- where appropriate at the truncation of road junctions or intersections so that they can serve more than one street and can be readily located;
- on both sides of the major roads at staggered intervals where there are mains on both sides of the road;
- at major intersections on dual multi-lane roads, where two hydrants are to be sited on diagonally opposite corners;
- hydrants should be located at least 20m from traffic calming devices i.e. median slow points or chokers, chicanes, mini traffic circles, and intersection 'pop-outs' to ensure traffic is not impeded;
- in a position not less than 10m from any high voltage main electrical distribution equipment such as transformers and distribution boards, liquefied petroleum gas or other combustible storage
- directly on top of the main using a tee unless proved to be impractical

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Bushfire Centre of Excellence
TRAINING / KNOWLEDGE / ENGAGEMENT

Water tank connections for bushfire-prone areas (domestic and commercial)

Information Sheet, January 2025

This fact sheet provides information on how to best set up water supplies to assist firefighters on properties in bushfire-prone areas. It includes information on the siting, capacity, access and appropriate fittings needed for firefighters to access and use water supplies during an emergency.

Please note: if you are establishing water supplies to comply with planning requirements, you should read this fact sheet in conjunction with the *Planning for Bushfire Guidelines*, as well as relevant planning schemes or policies from your local government.



What fittings should I fit the water tank with?

All tanks for firefighting should be fitted with a 50 millimetres or 100 millimetres male camlock fitting. This fitting is readily available from most hardware and rural supply shops. DFES recommends a male camlock fitting, as it means there are no perishable washers or working parts to maintain.

The fitting should be controlled by a butterfly, ball or gate valve, as these can easily control flow.



Why do I need a water tank for bushfires on my property?

You may have a water tank dedicated to bushfires to make your property as resilient as possible, or it may be a formal requirement under relevant planning or building regulations.

A water tank dedicated to firefighting supports firefighters attempting to protect your property and other assets from bushfires. You should consider a dedicated water tank alongside other bushfire prevention and preparedness activities, such as managing bushfire fuels and having a bushfire plan.

Where should I site a water tank?

You should site water tanks on clear, level ground compacted to take the maximum weight of the tank when full.

The tank should also be in a low-fuel area with at least 3 metres cleared around it to prevent direct contact with flames.

The water tank must be accessible to firefighting appliances and include a suitable area for these to turn around. You can find more information on recommended minimum standards for access in the *firebreak construction guidelines*.

What capacity should the tank be?

The recommended minimum capacity for a firefighting water supply is 10,000 litres.

You may be using the tank for other purposes besides bushfire fighting, such as water for livestock or other rural purposes. However, it is recommended that a minimum of 10,000 litres is always available for firefighting.







Example Strategic 47,000 Litre Concrete Tank & Protected Fittings



Example 10,000 Litre Concrete Tank



Example Storz and Camlock Couplings

NON-MANDATORY GUIDANCE ASSESSMENT

APPLICABLE BUSHFIRE PLANNING GUIDELINES/OVERLAYS

APPLICABLE PLANNING DOCUMENTS
"Design Guidelines and Model Requirements for Renewable Energy Facilities v4.4" - Victorian Country Fire Authority – Specialist Risk and Fire Safety Unit (June 2025).

COMPLIANCE ASSESSMENT

COMPLIANCE WITH THE RELEVANT ACCEPTABLE SOLUTIONS (APPROVED MEASURES)

The Planning Document/s

The applicable planning documents establish packages of bushfire protection measures that are to be applied, each with different sets of specifications and requirements to be satisfied and applied to different types of development or use with appropriate variations.

The aim of these is to provide for the protection of human life and minimise impacts on property from the threats of bushfire, while having due regard to development potential, site characteristics and protection of the environment.

The bushfire protection measures are typically grouped under a common and specific purpose. Each purpose has:

1. A performance outcome, objective, criteria or intent to be met (satisfied); and
2. Provides for two pathways to satisfy the required performance:
    a) Prescriptive measures and their requirements as acceptable solutions (approved measures); or
    b) The ability to develop an alternative solution.

The Compliance Assessment

The assessment will consist of:

1. Identification of the relevant development type/use associated with the subject site.
2. Identify if the Design Advice or Model Requirement criteria is relevant within the context of the Western Australian Planning System.
3. Where a Design Advice or Model Requirement criteria is relevant:
    a. Determine whether the existing planning or design of the proposed development complies with the criteria or its intent; or
    b. Provide recommendations for the proposed development to meet the criteria or its intent; or
    c. Detail why the measure is not or cannot be met.
4. Potential alternative solutions may be provided, but this is applied as a 'Modification' as there is no body or process for consultation/verification that the alternative meets the intent of the criteria.

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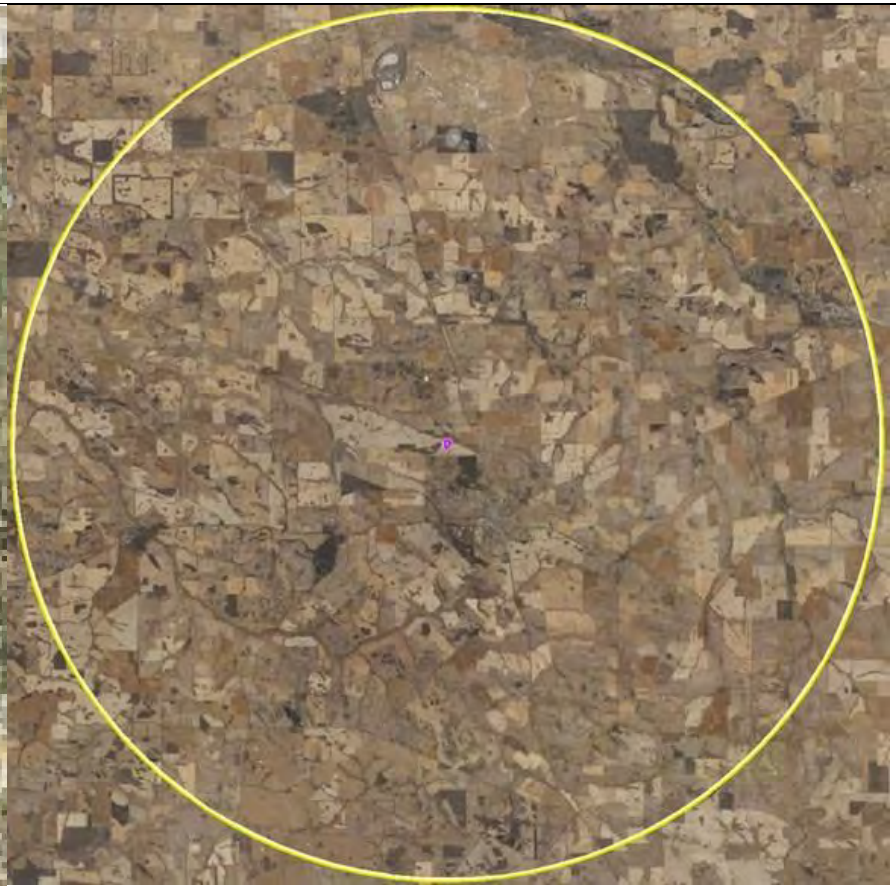
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APPLICABLE DEVELOPMENT	
Type	Applicable
All Facilities *Definition (Renewable Energy Facility):* A site or installation dedicated to the generation and/or capture of renewable energy. Stand-alone battery energy storage systems are considered renewable energy facilities for the purposes of this guideline.	✓
Wind Energy Facilities *Definition:* A facility where wind turbines use the energy of the wind to spin an electric generator which produces electricity, then power conversion equipment (inverters) convert the power into alternating current (AC). The facility may include grid connection infrastructure to feed power into the electricity grid.	
Solar Energy Facilities *Definition:* A facility where solar panels convert sunlight into direct current (DC) electricity; then power conversion equipment (inverters) convert the power into alternating current (AC). The facility may include grid connection infrastructure to feed power into the electricity grid. Solar energy facilities may utilise either solar photovoltaic or solar thermal technologies. • Large-scale solar: >5MW • Micro solar: ≤5MW	
Battery Energy Storage Systems *Definition:* A system comprising one or more cells, modules or batteries, power conversion equipment (PCE) and isolation and protection devices. Battery energy storage systems convert energy into electrical energy and stores the energy internally. For the purposes of this guideline: • Large-scale battery systems: >1MWh • Small-scale battery systems: ≤1MWh	✓

Assessment Criteria
The *Design Guidelines and Model Requirements for Renewable Energy Facilities v4.4* provides Design Advice and Model Requirements for each use type. Design Advice whilst not requirements, are factors to consider in planning of the proposal. These items should be considered and applied where feasible. Model Requirements are '*CFA's minimum requirements for renewable energy facilities in low-risk environments, and must be reflected in the RMP*.' Despite the references to Low-Risk or High-Risk Environments, the *CFA Guidelines* provide no distinction in requirements. Therefore, the Model Requirements are assessed regardless of the environment. Alternatives can be considered as '*Modifications to Model Requirements must be in consultation with CFA.*' As consultation is not available, variations/modifications to Model Requirements are justified either to meet the intent of the Model Requirement, or to justify why the Model Requirement should not be applied. This is the 'alternative solution' pathway applicable. The measures within the *Design Guidelines and Model Requirements for Renewable Energy Facilities v4.4* are not applied independently of the associated Bushfire Risk Report (BRR). The criteria are instead applied under the Applicable Protection Measure in the body of the BRR. The intent is to produce a single 'package' of protection measures recommended/required to be applied to the proposal (regardless of their source), for clarity of the proponent and decision maker(s).

SECTION 2: CFA INVOLVEMENT WITH RENEWABLE ENERGY FACILITIES			
Subsection 2.2.1: Pre-Planning			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	a) Where located within a Bushfire Prone Area, bushfire risk is addressed according to the Victoria Planning Provisions, Clause 13.02-1S (Bushfire Planning), through bushfire hazard identification and assessment (including a bushfire hazard site and landscape assessment). This assessment must include risks to the proposed technologies from the landscape (bushfire/grassfire).	Complies with Intent	5.1.3
	Assessment Comment: Additional protection measures are applied through this document regardless of the bushfire hazard type. The Project is assessed under the Western Australian Planning Provisions, being *State Planning Policy 3.7 Bushfire* and the associated *Planning for Bushfire Guidelines* (September 2024). The WA provisions also require landscape assessments (per Appendix A.1 of the *Guidelines*) but not for development applications. Victorian and Western Australian methodologies vary considerably, and neither consider the topography, nor the ember generation potential of vegetation. These are two of the most critical factors influencing the threat posed by the specific regional vegetation. A 'broader landscape' assessment has been provided within Section 5.1 of the associated Bushfire Risk Report. The methodology differs from that required under WA and Victorian Planning Provisions, as: • BPP considers topography and ember hazard to be critical factors which cannot be overlooked. • The Victorian planning framework does not apply. • Supplementary technical information is required to assess the inherent threat from the broader landscape. From *Applying the Bushfire Hazard Landscape Assessment in a Bushfire Management Overlay* v4.0 (CFA March 2022): '*Where 'buildings and works' are proposed in landscape types Three or Four, it may be necessary to further enhance safety through additional bushfire protection measures.*' The methodology within *Planning Permit Applications Bushfire Management Overlay – Technical Guide* pp13-16 (DELWP September 2017) considers urban/forest interfaces only- it does not consider pasture or mosaic (rural) landscapes, except to describe as 'little vegetation.' This is because such a landscape would not be within the Bushfire Management Overlay to trigger application of the *Technical Guide* the first instance. The subject site appears to meet Type 1 (the lowest tier), being primarily pasture. An example from p13 of *Planning Permit Applications Bushfire Management Overlay – Technical Guide* is provided below, as well as a comparison with the subject proposal (20km extent). Note the image below is poor quality- this is drawn directly from the *Technical Guide* and the resolution cannot be improved.		





b) Address risks from proposed technologies through a comprehensive risk management process, documented in a Risk Management Plan.	Complies with Intent	5.1.4
Assessment Comment: Bushfire risks for the Project are considered within the associated Bushfire Risk Report.		
c) Indicate where the exact specifications of elements within the renewable energy facilities will be determined during the detailed design phase, such as solar panel model/manufacturer and battery chemistry.	Fully Complies	N/A
Assessment Comment: Product specifications have not been determined/finalised and datasheets are not available. This information is intended to be provided during procurement after planning approval.		
d) Explicitly state that the following documentation will be prepared in accordance with this guideline, in consultation with CFA, before development starts:	Complies with Intent	N/A

	• Risk Management Plan • Fire Management Plan • Emergency Plan		
	Assessment Comment: Fire and Emergency Planning documentation required per WA regulations will be produced. Titles and content will be in accordance with WA provisions rather than the Victorian CFA guideline.		

SECTION 3: FIRE RISK MANAGEMENT			
Intent: Fire risk must be identified and measures to eliminate or reduce its occurrence and consequences must be incorporated into facility design and operations.			
Subsection 3.3: Risk Management Plan			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	A Risk Management Plan must be developed all renewable energy facilities. The Risk Management Plan must:		
	a) Describe the infrastructure (natural and built), landscape, nature of operations and occupancy of the facility.	Fully Complies	2.1, 5.1.3; 5.2
	Assessment Comment: The proposal details are provided in Section 2.1 of the Bushfire Risk Report. Section 5.2 provides the Identified Elements at Risk.		
	b) Describe the risks and hazards at the facility to and from the renewable energy infrastructure (including battery energy storage systems).	Fully Complies	Section 5
	Assessment Comment: See item (c) below.		
	c) Specify and justify, in accordance with Section 4.2 of this guideline: • The location of the facility in the landscape, and the proposed infrastructure on-site. • Emergency vehicle access to and within the facility that: o Includes site access points of a number suitable to the size and hazard of the facility (a minimum of two). o Provides access to renewable energy infrastructure, substations and fire service infrastructure. • Firefighting water supply for the facility. • A fire break width of 10m or greater, based on radiant heat flux (output) as an ignition source: o Around the perimeter of the facility. o Between any landscape buffer/vegetation screening and infrastructure. • The separation distance, based on radiant heat flux (output) as an ignition source, between: o Adjacent renewable energy infrastructure (e.g. between adjacent battery containers/enclosures). o Battery containers/enclosures and related battery infrastructure, buildings/structures, and vegetation. • All other controls for the management of on-and off-site hazards and risks at the facility (including all proposed battery energy storage system safety and protective systems).	Complies with Intent	Section 5

	Assessment Comment: The Bushfire Risk Report addresses the requirements for mitigation of bushfire-related hazards. Threats, exposures and vulnerabilities, to and from the Project are addressed and, where necessary, treatments recommended. This forms the bulk of the Bushfire Risk Report. Non-bushfire hazards, including fires due to asset failure, should be addressed through product design or the appropriate regulation.		
	d) Provide an evidence-based determination of the effectiveness of the risk controls against the identified hazards, including justification for the omission of any battery safety and protective system/s.	Not Applied	N/A
	Assessment Comment: The associated Bushfire Risk Report comprehensively assesses bushfire risk reduction measures. The effectiveness of each measure is based on experience and logic as evidence is not available for the quantitative impact of a single measure. Fully established bushfires cannot be tested in vitro. See Appendix 1.2 of the Bushfire Risk Report for the risk assessment framework. The BESS installation will include a Thermal Management System and Fire Suppression System, as required.		
	e) Form the basis for the design of the facility.	Fully Complies	N/A
	Assessment Comment: A comprehensive Bushfire Advice Brief was produced during initial site selection to inform potential constraints and inform the design. The submitted design includes the recommendations drawn from the initial Bushfire Advice Brief, and therefore has 'formed the basis of design.' The associated Bushfire Risk Report details the justification for these measures.		

SECTION 4: FACILITY LOCATION AND DESIGN		
Subsection 4.1: Facility Location		
Intent: Renewable energy facilities must be located in low-risk environments wherever possible, to reduce the risk of external fire impacting the facility and its consequences.		
Item 4.1.1: High-Risk Environments		
Note: The Site is within a Low-Risk Environment, following the methodology within *Planning Permit Applications Bushfire Management Overlay – Technical Guide.* The section has been addressed regardless.		
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	Planning applications for all renewable energy facilities proposed in high-risk environments must address the following:		
	a) An assessment against policy at *Clause 13.02-1S (Bushfire Planning)* where the facility is located in a Bushfire Prone Area (BPA).	Not Applicable	N/A
	Assessment Comment: Not applicable to Western Australian planning system. The Project is not within a Bushfire Prone Area.		
	b) The impact of any ignitions arising from the infrastructure (solar panels, wind turbines, battery energy storage systems, electrical infrastructure) on nearby communities, infrastructure and assets.	Fully Complies	Section 5
	Assessment Comment: BESS: Radiant heat flux in battery fires is relatively low, the Victorian Big Battery Fire (July 2021) required only a 20m exclusion zone for personnel (such an exclusion zone would generally be <4kW/m2 radiant heat flux). The closest vegetation of significance is approximately 210m away from BESS units, with the vegetation screening and inconsistent road verge scrub being >20m away. Therefore, in the reasonable worst case scenario, flame contact would not be possible, and radiant heat flux would be insufficient to ignite a bushfire in the surrounding vegetation. Embers can travel beyond any applicable APZ. Substations and Switchyards: (Not necessarily connected to the renewable energy facilities) Ignitions arising from substations are a known factor and are managed through state and national regulation, and organisational operating procedures.		
	c) The impact of bushfire on the infrastructure (e.g. ember attack, radiant heat impact, flame contact).	Fully Complies	5.3.5, 5.3.6
	Assessment Comment: BESS:		

BESS technologies are continuing to develop and the critical heat flux thresholds of assets may vary slightly between engineering designs. The exterior and structural components of battery cabinets are non-combustible, generally being metal, fibrous cement, mineral wool etc. A single battery rack consists of battery cells (each cell connected into a module), a fire suppression system and a control box with chiller. Power and computer cabling is associated within and between racks. These are the relevant components regarding potential for fire.

- The individual batteries have been found to be highly resistant to conductive heat. Applied temperatures exceeding 400 degrees Celsius destroyed, but not ignite, running battery cells. See UL 9540A Test Method for Evaluating Thermal Runaway Fire Propagation in Cell Energy Storage Systems, Third Edition (UL LLC; 8 July 2020). Other trigger/failure conditions must be met for battery cells to ignite (mechanical rupture, flame contact, product failure etc).
- The product is tested in accordance with UN 38.3. UN 38.3.4.2 *Test T.2: Thermal test* requires cells and batteries to be tested to 72C ± 2°C for 6 hours, with 10 repeats of the same set of cells or batteries. Radiant heat from a bushfire or other source against the battery cabinet can heat the interior, however direct calculations between ambient temperature and radiant heat are not available. It must be considered that battery cells are tested to be able to withstand sustained high temperatures beyond human endurance.
    - The ABCB Handbook requires refuge structures for a tenable human environment be subject to <10kw/m2 radiant heat flux, and a maximum mean internal temperature <39°C for 1 hour (and peak of 45°C).
    - The thermal insulation of the battery cabinet is not readily available.
- Control boxes are computers which will apply thermal throttling and thermal shutdown if internal temperatures exceed a determined threshold. Once a computer system is shut down in this scenario, the threshold is expected to be that of the cabling (below).
- Associated cabling (both power transmission and computer). Common electrical cabling reaches its critical point at >12kWm2 (Kaczorek-Chrobak et al. 2021) [49]. Electrical cabling and components are expected to exceed this standard, being industrial and high capacity, however the 12kW threshold is adopted for the highest potential vulnerability.

The Project is sited on flat ground and not within a Bushfire Prone Area (impacted by pasture only). The APZ to be installed will ensure exposure to the bushfire hazard threat of radiant heat will be limited to a maximum radiant heat flux of 10 kW/m2 (calculated with an assumed flame temperature of 1090K).

Substations/Switchyards: (Not necessarily connected to the renewable energy facilities)

AS 2067-2016 *Substations and high voltage installations exceeding 1 kV a.c.* does not provide radiant heat or flame exposure thresholds, nor any general bushfire protection measures. 'Consideration of the area surrounding the installation should also be included, in particular the effect of fire on or from surrounding vegetation.' (AS 2067-2016 s6.7.1.2).

Standard vegetation clearances are provided in *Western Australian Distribution Connections Manual 2015* (Western Power 2015).

The following document was found to be relevant in the assessment of proposed substations: *NS187 Passive Fire Mitigation Design of Major Substations* - Internal Document No. NW000-S0007 (Ausgrid 2020). Ausgrid Pty Ltd is Australia's largest electricity distributor (in terms of customers and energy load), and the document referenced is an internal network standard. The below table is sourced from Section 12 of the network standard.

Table 3 – Radiant Heat Exposure Limits for Bushfires

Item	Maximum allowable radiant heat flux (kW/m^2)	Comment
Cable	12.5 20	PVC Cables begin to distort and may ignite. Ignition of XLPE cables between 85 and 550 seconds.
Steel support structure	35	To 60% of yield strength after a maximum duration of 5 minutes. Applies where elastic deflections due to elevated temperatures are not critical.
Porcelain bushing/Insulators	>30	Damage may occur requiring replacement or in extreme case resulting in catastrophic failure. See Note 2.
Polymeric bushing/insulators	>30	Damage may occur requiring replacement or in extreme case resulting in catastrophic failure. See Note 2.
Aluminium busbar	20	Based on 250°C after a maximum duration of 5 minutes. Comparable to withstand temperature under fault conditions.
Copper busbar	25	Busbars may undergo significant distortion and impose significant stresses on rigid insulators.
Transformer tank	>35 (see Note 1)	Refer to above regarding bushings and cables.
Combustibles	12.5	Piloted ignition may occur on timber.

Note 1. Transformers always have some more vulnerable components such as bushings and cables etc. Refer to Clause 7.2.

'Combustibles' in this description are consequential fire hazards for the purposes of the bushfire assessment: packing materials, pallets, waste, and other assorted debris. These should not be present within the substation footprint and where necessary should be positioned away from infrastructure components, applied in Measure 6.7.

The internal network standard and the *Asset Management System Distribution Substation Plant Manual 2019:* Chapter 5 – Substation Fire Risk (Western Power March 2021) align in identifying Transformer Oil as being a consequential fire source (within the context of bushfire assessments). This is a flammable material with a low flash point of 135°C, and a radiant heat flux threshold dependent on the period of exposure: 3-4 hours at 4.5kW/m2 (the residence period of a bushfire is <10 minutes). The network standard considers radiant heat impact from asset fires on transformer oil but not bushfires, which appears to be due to the greatly reduced residence period and the transformer oil being contained within the transformer tank, which provides shielding/insulation to the contents to prevent the flash point being reached. As an appropriate heat flux for the short residence period of a bushfire is not available, the capacity for this risk to be managed is dependent on the developer recognising the issue and ensuring that the design/procedures that are applied to manage transformer oil fires, also consider the possibility of external bushfire impact igniting the oil (either through piloted ignition from embers or radiant heat only).

PVC cables should be either enclosed within structures or installed underground where practical. Exposed cabling (not shielded or buried underground) positioned subject to >12kW heat flux may be damaged/destroyed in a bushfire event and require replacement.

d) Assessment of whether the proposal will lead to an increase in risk to adjacent land and how the proposal will reduce risks at the site to an acceptable level.	Complies with Intent	Section 5

	Assessment Comment: Refer to b).
	Recommendations
	An APZ to ensure radiant heat flux does not exceed 10kW/m2 is to be installed around BESS and PCUs. The 10m portion of the APZ immediately around BESS units must be entirely and permanently non-vegetated (sealed, compacted limestone, gravel, mineral earth etc). Onsite fine and heavy fuel sources are required to be eliminated in project design and strictly controlled in ongoing operation to prevent the capacity for embers to be generated. The product datasheet or manufacturer is likely to specify a setback between BESS units. Where this is not provided, a setback of >1m on the shorter and >3m on the longer side is recommended. Where the product datasheet or manufacturer specification does not specify a distance between battery containers and other combustible/critical assets, the applied distance should be 15m (based on >1 hour intervention). Switchyard footprints (within perimeter fence line) should be entirely and permanently non-vegetated (sealed, compacted limestone, gravel, mineral earth etc).

SECTION 4: FACILITY LOCATION AND DESIGN			
Subsection 4.2: Facility Design			
Intent: Renewable energy facilities must be designed to eliminate or reduce the risk of fire occurring and if it does occur, its consequences.			
Item 4.2.1: Emergency Vehicle (Fire Truck) Access			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	a) Construction of a four (4) metre perimeter road within the perimeter fire break.	Fully Complies	5.4.2
	Assessment Comment: The Project includes a perimeter access road. See the submitted *Concept plans and elevation drawings* (Mint Renewables, March 2026).		
	b) Roads must be of all-weather construction and capable of accommodating a vehicle of fifteen (15) tonnes (e. g. no compacted earth).	Fully Complies	5.4.2
	c) Constructed roads should be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for the width of the formed road surface. Ensure any fencing along access routes allows for width of fire vehicles.	Fully Complies	5.4.2
	d) The average grade should be no more than 1 in 7 (14.4% or 8.1°) with a maximum of no more than 1 in 5 (20% or 11.3°) for no more than fifty (50) metres.	Fully Complies	5.4.2
	e) Dips in the road should have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle.	Fully Complies	5.4.2
	f) Roads must incorporate passing bays at least every 600 metres, which must be at least twenty (20) metres long and have a minimum trafficable width of six (6) metres. At least one passing bay must be incorporated where roads are less than 600 metres long.	Fully Complies	5.4.2
	Assessment Comment: Items b) to f) are met or exceeded through compliance with the Western Australian *Planning for Bushfire Guidelines* (WAPC 2024).		
	g) Road networks must enable responding emergency services to access all areas of the facility, including fire service infrastructure, buildings, and battery energy storage systems and related infrastructure, substations and grid connection areas.	Fully Complies	5.4.2
	Assessment Comment: The submitted layout provides vehicular access to all areas of the Project. Internal roads will be installed to access all operational areas and renewable energy infrastructure. These roads will be required for delivery and operations vehicle access, which are larger/heavier than Emergency Services vehicles.		

	Recommendation: Contact the local emergency control agencies; Shire of Kojonup Emergency Services Manager and/or Chief Bushfire Control Officer (CBFCO) prior to commissioning and offer a familiarisation visit and explanation of emergency procedures, access, hazards, and fire detection and suppression systems. Local Volunteer Fire and Rescue Service (VFRS) and Bush Fire Brigade (BFB) may be invited through the Shire Emergency Management Coordinator (CBFCO). The particular services should be determined by the CBFCO. Establish an ongoing schedule to contact the Shire Emergency Services Manager and/or CBFCO prior to the bushfire season.		
	h) The provision of at least two (2) but preferably more access points to each part of the facility. The number of access points must be informed through a risk management process, in consultation with the CFA.	Fully Complies	5.4.2
	Assessment Comment: Two site access points are provided, as shown on the submitted site plan. These connect to different through-roads (Tunney Road and Collie-Changerup Road).		
BATTERY ENERGY STORAGE SYSTEMS	At least two access points are to be provided into each section where battery energy storage systems are located. The number and location of vehicle access points must be determined in consultation with CFA.	Fully Complies	5.4.2
	Assessment Comment: Two access points are provided, as above.		

Item 4.2.2: Firefighting Water Supply			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	a) Water access points must be clearly identifiable and unobstructed to ensure efficient access.	Fully Complies	5.4.4, 5.4.5, 5.4.6
	b) Static water storage tank installations must comply with AS 2419.1-2021: Fire hydrant installations – System design, installation and commissioning.	Fully Complies	5.4.4, 5.4.5, 5.4.6
	c) The static water storage tank(s) must be an above-ground water tank constructed of concrete or steel.	Fully Complies	5.4.4, 5.4.5, 5.4.6
	d) The static water storage tank(s) must be capable of being completely refilled automatically or manually within 24 hours.	Not Applied	N/A
	Assessment Comment: The measure is possible. The requirement has not been applied as it must be confirmed (with the local CESM/CFO) during the Recovery phase after the initial bushfire emergency.		

	e) The static water storage tanks must be located at vehicle access points to the facility and must be positioned at least ten (10) metres from any infrastructure (solar panels, wind turbines, battery energy storage systems, etc.).	Fully Complies	5.4.4, 5.4.5, 5.4.6
	f) The hard-suction point must be provided, with a 150mm full bore isolation valve equipped with a Storz connection, sized to comply with the required suction hydraulic performance. Adapters that may be required to match the connection are: 125mm, 100mm, 90mm, 75mm, 65mm Storz tree adapters with a matching blank end cap to be provided.	Complies with Intent	5.4.4, 5.4.5, 5.4.6
	Assessment Comment: This is a specification for Victorian firefighting operations- connections at the hard suction point will be as determined by the requirements of the *Planning for Bushfire Guidelines* and in consultation with local services.		
	g) The hard-suction point must be positioned within four (4) metres to a hardstand area and provide a clear access for emergency services personnel.	Fully Complies	5.4.4, 5.4.5, 5.4.6
	h) An all-weather road access and hardstand must be provided to the hard-suction point. The hardstand must be maintained to a minimum of 15 tonne GVM, eight (8) metres long and six (6) metres wide or to the satisfaction of the CFA.	Fully Complies	5.4.4, 5.4.5, 5.4.6
	i) The road access and hardstand must be kept clear at all times.	Fully Complies	5.4.4, 5.4.5, 5.4.6
	j) The hard-suction point must be protected from mechanical damage (eg. bollards) where necessary.	Not Applied	N/A
	Assessment Comment: Not been applied as the location of tanks will not have public access, and they will be set back from carriageways. The necessity will be determined by the developer.		
	k) Where the access road has one entrance, an eight (8) metre radius turning circle must be provided at the tank.	Complies with Intent	5.4.4, 5.4.5, 5.4.6
	Assessment Comment: Turnaround area requirements within the *Planning for Bushfire Guidelines* will be applied.		
	l) An external water level indicator must be provided to the tank and be visible from the hardstand area.	Fully Complies	5.4.4, 5.4.5, 5.4.6
	m) Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank.	Fully Complies	5.4.4, 5.4.5, 5.4.6
	n) Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest static water tank(s).	Fully Complies	5.4.4, 5.4.5, 5.4.6
	Assessment Comment: The Project's BESS development will require a water supply calculated following AS 2419.1 (Open Yard Protection). Where a firefighting water supply for the BESS development is determined elsewhere, the greater volume is to apply. The Substation will be reasonably adjacent to the BESS and will be serviced with the same water supply. Recommendation: The following requirements apply to the firefighting water supply, via Measure 13.17 in the associated Bushfire Risk Report. The specifications will be confirmed at the detailed design stage.		

	Access • Firefighting water access points (hydrants, hard suction, or drafting) must be clearly identifiable, visible from internal roads, and unobstructed. • Signage must be provided at each vehicle entrance to the facility, indicating the direction to the nearest firefighting water access point. • An all-weather hardstand turnaround area meeting the requirements of the *Planning for Bushfire Guidelines* (Figure 30) must be provided within 4 metres static water storage tank(s) and any independent hard suction points (hydrants). • Site Operating Procedures must include that access routes must be unobstructed at all times. Siting and Capacity • The BESS development requires a minimum 288,000L firefighting water tank. This is to account for both bushfire and asset fire. o The required water supply in compliance with AS 2419.1 will be determined based on the final footprint of the BESS development. A footprint exceeding 9000m2 will require additional water supply. o Where another firefighting water supply is determined elsewhere, the greater volume is to apply. • All BESS units must be wholly within 70m of a water outlet. • Water tanks must be positioned >15m from BESS units, PCUs, etc. • Water tanks should apply a BAL-29 dimensioned APZ at a minimum. Construction • Static water storage tanks must be an above-ground water tank constructed of concrete or steel. • An external water level indicator must be installed on static water storage tanks and be visible from internal roads and the adjoining turnaround area. • Signage indicating 'FIRE WATER' and the tank capacity must be fixed to each tank. Couplings at hard suction points are required to be 125mm Storz fittings (*Guidelines B.4.1.2*). DFES Built Environment and the local emergency services should be contacted for input on appropriate couplings and adaptors.		
BATTERY ENERGY STORAGE SYSTEMS	1. Centralised or Stand-Alone Facilities The fire protection system must apply requirement a) OR b) below.		
	a) Where reticulated water is available, a fire hydrant system that meets the requirements of AS 2419.1-2021: Fire hydrant installations, Section 3.9: Open Yard Protection, and Table 2.2.5(d): Number of Fire Hydrants Required to Flow Simultaneously - Open Yards. Except, that fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet.	Not Applicable	N/A
	b) Where no reticulated water is available, a fire hydrant system that complies with AS 2419.1-2021 must be provided: i. The fire water supply must be of a quantity no less than 288,000L or as per the provisions of AS 2419.1-2021: Fire Hydrant installations, Table 2.2.5(D) for open yards flowing for a period of no less than four hours at 20L/s, whichever is the greater. ii. The quantity of static fire water storage is to be calculated from the number of hydrants required to flow from AS 2419.1-2021: Fire hydrant installations, Table 2.2.5(D). iii. Fire hydrants must be provided and located so that every part of the battery energy storage system is within reach of a 10m hose stream issuing from a nozzle at the end of a 60m length of hose connected to a fire hydrant outlet. iv. The fire water supply must be located at vehicle entrances to the facility, at least 10m from any infrastructure (electrical substations, inverters, battery energy storage systems, buildings).	Fully Complies	5.4.5

	v. The fire water supply must be reasonably adjacent to the battery energy storage system and shall be accessible without undue danger in an emergency. (Eg., Fire water tanks are to be located closer to the site entrance that the battery energy storage system). vi. The fire water supply must comply with AS 2419.1-2021: Fire hydrant installations - Section 5: Water storage tanks.		
	Assessment Comment: The detailed requirements of the hydrant system are outside the field of a Bushfire Consultant and must be confirmed by an appropriate Fire Engineer. Recommendation: During the detailed design stage, the entity designing the firefighting water supply should provide information on compliance with AS2419.1-2021 (Open Yard Protection) and what variations are applied (if any).		
	2. Decentralised Facilities The fire protection system must apply requirement a) OR b) below.		
	a) Where reticulated water is available, a fire protection system as per Model Requirement (1a) under 'Centralised Battery Energy Storage Systems'.	Not Applicable	N/A
	b) Where no reticulated water is available, a fire water supply in static storage tanks, where a minimum 45,000L static water tank is provided within 120m of each battery container. The aggregate quantity of fire water supply at the facility must be no less than 288,000L to the satisfaction of CFA.	Not Applicable	N/A
	Assessment Comment: The facility is a centralised system.		
Item 4.2.3: Fire Detection and Suppression Equipment			
Assessment Criteria Detail (summarised)		Assessment Status	Applicable Protection Measure (BRR)

ALL FACILITIES	Suitable fire detection and suppression equipment must be provided:		
	a) For on-site buildings and structures, according to the requirements of the National Construction Code.	Fully Complies	N/A
	Assessment Comment: Compliance with the NCC is a regulatory requirement.		
	b) For storages of dangerous goods, according to the requirements of any Australian Standards for storing and handling of dangerous goods.	Not Applicable	N/A
	Assessment Comment: The Project does not trigger a Dangerous Goods Licence.		
	c) For electrical installations, a minimum of two (2) suitable fire extinguishers must be provided within 3m-20m of each PCU.	Fully Complies	5.4.5
	Assessment Comment: N/A Recommendation: Two suitable fire extinguishers should be provided within 20m of each PCU/PCS.		
	d) In all vehicles and heavy equipment, each vehicle must carry at least a nine (9)-litre water stored-pressure fire extinguisher with a minimum rating of 3A, or other firefighting equipment as a minimum when on-site during the Fire Danger Period.	Fully Complies	N/A
	Assessment Comment: Fire extinguishers will be provided in operational vehicles as an OSH requirement. The type of fire extinguisher will be as applicable to the facility hazards (e.g. chemical, electrical fires).		
Item 4.2.5: Fire Breaks			
Note: The Victorian and Western Australian definition of 'Fire Break' differ. In Western Australia, a 'Fire Break' is a trafficable perimeter used primarily for Emergency Services access. It is not expected to impact bushfire spread.			

In Victoria, a 'Fire Break' is a gap in fuel intended to restrict bushfire spread, which ***may*** also be used for Emergency Services access. A Victorian 'Fire Break' is therefore wider than in Western Australia, and need not be trafficable. A 'Fire Break' may even follow a road.			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	The width of fire breaks must be a minimum of 10m, and at least the distance where radiant heat flux (output) from the vegetation does not create the potential for ignition of on-site infrastructure.	Fully Complies	5.3.5, 5.3.6
	Assessment Comment: See Item 4.1.1.		
	a) A fire break must be established and maintained around the perimeter of the facility, commencing from the boundary of the facility or from the vegetation screening inside the property boundary.	Fully Complies	5.4.5, 5.4.6.
	Assessment Comment: See Item 4.1.1.		
	b) A fire break must be established and maintained around the perimeter of control rooms, electricity compounds, substations and all other buildings on-site.	Fully Complies	5.4.5, 5.4.6
	Assessment Comment: See Item 4.1.1. The 'perimeter fire break' refers to a non-vegetated portion of the APZ around the assets, as 'fire break' has different definitions between Victoria and WA.		
BATTERY ENERGY STORAGE SYSTEMS	A fire break must be established and maintained around battery energy storage systems and related infrastructure.	Fully Complies	5.3.5
	Assessment Comment: The criterion can be summarised as a permanently non-vegetated buffer around the asset (the first 10m of the APZ). Recommendation: The 10m portion of the APZ immediately around BESS units must be entirely and permanently non-vegetated (sealed, compacted limestone, gravel, mineral earth etc). Site Operating Procedures should include that no items (plant or equipment) can be stored on access roads or on the 10m non-vegetated buffer.		
Item 4.2.6: Design Specific to Facility Type			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
BATTERY	1) The design of the facility must incorporate:		

	a) A separation distance that prevents fire spread between battery containers/enclosures and: • Other battery containers/enclosures. • On-site buildings. • Substations. • The site boundary. • Any other site buildings. • Vegetation. *Separation must be at least the distance where the radiant heat flux (output) from a battery energy storage system container/enclosure fully involved in fire does not create the potential for ignition of these site elements.*	Complies with Intent	5.3.5
	Assessment Comment: The design and layout of the facility has been determined by the relevant designer/engineer and are assumed to be appropriate in reducing the risk of structure-to-structure (or asset) fire. Setbacks between assets and vegetation is considered within Item 4.1.1. Recommendation: The product datasheet or manufacturer is likely to specify a setback between BESS units. Where this is not provided, a setback of >1m on the shorter and >3m on the longer side is recommended. Where the product datasheet or manufacturer specification does not specify a distance between battery containers and other combustible/critical assets, the applied distance should be 15m (based on >1 hour intervention).		
	b) A fire break around the battery energy storage system and related infrastructure, of a width of no less than 10m, or greater where determined in the Risk Management Plan. Fire breaks must be non-combustible, constructed of concrete, mineral earth or non-combustible mulch such as crushed rock. *The width must be calculated based on the ignition source being radiant heat of surrounding vegetation, including landscaping.*	Fully Complies	5.3.5
	Assessment Comment: See Item 4.2.5.		
	c) A layout of site infrastructure that: i. Considers the safety of emergency responders. ii. Minimises the potential for grassfire and/or bushfire to impact the battery energy storage system. iii. Minimises the potential for fires in battery containers/enclosures to impact on-site and off- site infrastructure.	Fully Complies	5.3.5
	Assessment Comment: i) Emergency services have been consulted in layout and design, particularly the provision of multiple access options and a firebreak at western boundary of the lease area. ii) and iii) The BESS are sited centrally within the Project and separated from vegetation and infrastructure by perimeter internal roads.		

	2) Battery energy storage systems must be:		
	a) Located so as to be reasonably adjacent to a site vehicle entrance (suitable for emergency vehicles).	Fully Complies	5.4.5
	Assessment Comment: Grid-scale BESS developments must be reasonably adjacent to major transmission lines and have various location restrictions due to noise and visual impact, vegetation (bushfire), floodplains, topography etc. This Model Requirement may not be within the control of the developer. The recommendation is met as the Project is sited in the north-eastern corner of the property at the intersection of two through roads where the transmission line bisects the property.		
	b) Located so that the site entrance and any fire water tanks are not aligned to the prevailing wind direction (therefore least likely to be impacted by smoke in the event of fire at the battery energy storage system.)	Fully Complies	N/A
	Assessment Comment: The prevailing wind directions are easterly and southerly. The Model Requirement 4.4.2(e) requires the water tank to be at the site access point, which is the most appropriate location for emergency water. This is to the north of the Project and thus not aligned to the prevailing wind. Note: • In complying with AS 2419.1 the Project will include multiple remote outlets (hydrants). The main water tank does not need to be accessed to draft water. • Wind can occur from non 'prevailing' directions, and large bushfires often experience unusual weather conditions.		
	c) Provided with in-built detection and suppression systems. Where these systems are not provided, measures to effectively detect fires within containers must be detailed within the Risk Management Plan.	Unable to Verify	5.4.5
	d) Provided with explosion prevention via sensing and venting, or explosion mitigation through deflagration panels.	Unable to Verify	5.4.5
	Assessment Comment: Automatic fire detection and suppression systems, and explosion prevention/mitigation, are design components applied via national/international safety standards. The product has not yet been selected and so compliance cannot be confirmed.		
	e) Provided with suitable ember protection to prevent embers from penetrating battery containers/enclosures.	Fully Complies	5.4.5
	Assessment Comment: Battery Units are designed to eliminate the ingress of dust, spiders and other insects. This will also prevent any embers from fires in the surrounding area entering the Battery Unit. The chosen Battery Unit will have a suitable Ingress Protection (IP) rating. This will be confirmed prior to construction once a battery supplier and model has been selected.		
	f) Provided with suitable access roads for emergency services vehicles, to and within the site, including to battery energy storage system(s) and fire service infrastructure.	Fully Complies	5.4.5
	Assessment Comment: See Item 4.2.1.		
	g) Installed on a non-combustible surface such as concrete.	Fully Complies	5.3.5

	Assessment Comment: See Item 4.1.1.		
	h) Provided with suitable ventilation.	Not Applicable	N/A
	Assessment Comment: The criteria likely refers to ventilation around BESS units where contained within a structure. The units will be open-air.		
	i) Provided with impact protection to at least the equivalent of a W guardrail-type barrier, to prevent mechanical damage to battery containers/enclosures.	Not Applied	N/A
	Assessment Comment: Not been applied as the BESS locations will not have public access, and they will be set back from carriageways. BESS will be within a secured compound with >2m tall security fencing.		
	j) Provided with enclosed wiring and buried cabling, except where required to be above-ground for grid connection.	Fully Complies	5.3.5
	Assessment Comment: N/A Recommendation: Cabling and plumbing subject to >10kW/m2 (not within the <10kW/m2 setback), or beyond footprint of buildings or constructed assets, are recommended to be installed underground, or shielded with non-combustible material (or enclosed) where practical.		
	k) Provided with spill containment that includes provision for management of fire water runoff.	Fully Complies	N/A
	Assessment Comment: A detention basin is included within the submitted design, to the east of the Project. The dimensions and capacity of the basins will be confirmed within the civil engineering design.		

SECTION 5: FACILITY CONSTRUCTION AND COMMISSIONING			
Intent: Fire risks must be identified and effectively managed during the construction and commissioning of renewable energy facilities.			
Subsection 5.1: Recommended Risk Controls			
Item 5.1.4: Emergency Management			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	An Emergency Plan must be developed for the construction and commissioning phase, before development starts.	Unable to Verify	5.4.1
	Assessment Comment: It is expected that an Emergency Management Plan for the construction and commissioning phase will be prepared in line with safety requirements/codes. Contractors and visitors will attend at different times, and hazards and resources will change. The requirements for Total Fire Bans and/or Harvest and Vehicle Movement Bans would restrict operations during construction and commissioning. Recommendation: Ensure bushfire response is included in the construction Emergency Management Plan, or produced as a separate document.		

SECTION 6: FACILITY OPERATION			
Intent: Fire risks must be effectively managed for the duration of the operational life of renewable energy facilities.			
Subsection 6.1: Fire Management Plan			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	A Fire Management Plan must be developed for the facility, in conjunction with CFA, before development starts.	Complies with Intent	5.1.4
	Assessment Comment: A 'Fire Management Plan' does not have an analogue in Western Australia. The contents are generally contained within the Project's Emergency Management Plan (e.g. as a Fire and Emergency Management Plan). Recommendation: The Project's Emergency Management Plan should contain fire prevention and response, including: • A summary of fire hazards and risks to and from the Project, specific to its location, infrastructure, activities and occupancy. • Description of control measures to prevent fire occurring and limit the consequences of fire at the facility. • Description of control measures to prevent and reduce the consequences of external fire impacting the facility. • Details of equipment and resources to manage fire at the facility. • Policies and procedures that ensure all control measures are appropriate and effective, and remain so. • Procedures for review of the Plan.		

SECTION 6: FACILITY OPERATION			
Subsection 6.2: Fire Hazards and Risk Controls			
Item 6.2.1: Bushfire and Grassfire			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	If your facility is at-risk of bushfire, prevention and preparedness activities must be detailed in the Fire Management Plan.	Complies with Intent	5.1.4
	Recommendations: See Item 6.1 above.		
Item 6.2.2: Vegetation Management			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	Facility operators must undertake the following measures during the Fire Danger Period: a) Grass must be maintained at or below 100mm in height during the declared Fire Danger Period. b) Long grass and/or deep leaf litter must not be present in areas where heavy equipment will be working, during construction or operation. c) Restrictions and guidance must be adhered to during the Fire Danger Period, days of High (and above) fire danger and Total Fire Ban days (refer to www.cfa.vic.gov.au).	Complies with Intent	5.1.4
	Assessment Comment: The above requirements broadly align to those within a Local Government Firebreak Notice (Bush Fires Act 1954). Harvest and Vehicle Movement Bans restrict vehicle movements in fire risk areas. Site Operating Procedures will expand on management of hot works. Recommendation: Site Operating Procedures should include procedures to ensure heavy equipment is not operated where long grass (>100mm) or heavy leaf litter is present, particularly during the bushfire season (see the Local Government Prohibited Burning Period).		
Item 6.2.4: Facility and System Monitoring			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)

ALL FACILITIES	Appropriate monitoring for facility infrastructure must be provided, to ensure that any shorts, faults or equipment failures with the potential to ignite or propagate fire are rapidly identified and controlled. Any fire must be notified to 000 immediately.	Complies with Intent	N/A
	Assessment Comment: Appropriate equipment monitoring systems will be applied. However, the exact nature (and thus compliance) cannot be confirmed until the product has been selected. The product has not yet been selected and so compliance cannot be confirmed. Recommendations: Ensure the Project includes appropriate equipment monitoring systems.		
Item 6.2.5: Maintenance			
Assessment Criteria Detail (summarised)		Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	Inspection, maintenance and any required repair activities must be conducted for all infrastructure, equipment and vehicles at the facility. Maintenance must be in line with any relevant Australian Standards and the manufacturer's requirements.	Fully Complies	N/A
	Assessment Comment: Compliance with relevant Australian Standards is a regulatory requirement. Ongoing maintenance is not related to bushfire. Scheduled ongoing maintenance will be included in the appropriate ongoing operational documents.		

SECTION 7: EMERGENCY PLANNING			
Intent: Emergencies at renewable energy facilities must be planned for and effectively managed.			
Subsection 7.1: Emergency Plans			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	An Emergency Management Plan must be developed specific to the facility, in conjunction with CFA, before development starts.	Complies with Intent	N/A
	Assessment Comment: The production of an Emergency Management Plan is a requirement for the application. However, these are required prior to operation/occupancy in Western Australia.		

SECTION 8: PROVISION OF EMERGENCY INFORMATION			
Subsection 8.1: Developing and Emergency Information Book			
	Assessment Criteria Detail (summarised)	Assessment Status	Applicable Protection Measure (BRR)
ALL FACILITIES	An Emergency Information Book must be developed and available to emergency responders. Emergency Information Books must be located in Emergency Information Containers, provided at each vehicle entrance the facility.	Not Applicable	N/A
	Assessment Comment: DFES Emergency Response Guide (FES-ERG) is required for some sites which store or handle dangerous goods above 10-times the manifest quantity under *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007*. The FES-ERG is equivalent to a CFA Emergency Information Book, including the required location within a signed weatherproof container at site entry. Lithium-ion batteries are classified as dangerous good under the *Dangerous Goods Safety (Road and Rail Transport of Non-explosives) Regulations 2007*, when they are in transport and temporary (transit) storage. When installed and connected to a consuming device (the grid) the batteries are currently <u>not</u> considered as dangerous goods under the *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007.*		

SECTION 9: BATTERY ENERGY STORAGE SYSTEMS AT COMMERCIAL AND INDUSTRIAL FACILITIES
Increasingly, small-scale battery energy storage systems (<1MW) are being installed at commercial and industrial buildings to supplement power requirements for business operations.
Assessment Comment: The Project is >1MW and thus the section is not applicable. The Section outlines guidance to be applied *instead* of Sections 2-8.

SECTION 10: NEIGHBOURHOOD BATTERY ENERGY STORAGE SYSTEMS
Community or neighbourhood-scale battery energy storage systems range from approximately 100kW to 5MW, and where connected to a section of the electricity distribution network operating with a nominal voltage not exceeding 66,000 volts may be exempt from planning permit requirements in most planning zones.
Assessment Comment: The Project is not a neighbourhood system. The Section outlines guidance to be applied *instead* of Sections 2-8.

Schedule of Submissions (Public)

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
21/07/2026	Public Submitter 1	<u>Noise</u> Potential operational noise from cooling systems, transformers and other electrical equipment, particularly at night, affecting nearby residents' quality of life. The submitters request independent acoustic modelling demonstrating compliance with noise standards under worst-case conditions. <u>Fire Risk & Management</u> Concerns regarding battery fires, toxic smoke, emergency response capability, and public safety. Requests detail fire risk assessments, emergency management plans, and	<u>Noise</u> An Environmental Noise Assessment was undertaken by Sonus (2026), an independent, suitably qualified acoustic consultancy. The assessment modelled worst-case meteorological conditions and applied a 5 dB(A) tonal penalty based on the noise characteristics of the specific equipment that was assessed in accordance with the Environmental Protection (Noise) Regulations 1997, covering cumulative noise from the proposed BESS (228 battery units, 40 inverters with noise reduction kits, and the 120 MVA transformer) together with the adjacent existing Kojonup Substation. The assessment concluded that predicted noise levels will comply with the applicable regulatory criteria at all surrounding dwellings, across all time periods including night. A pre-construction noise assessment using final selected equipment will also be undertaken to confirm compliance prior to construction. <u>Fire Risk & Management</u> A Bushfire Management Plan (BMP) and Bushfire Risk Report (BRR) were prepared to support the submission of the DA (Bushfire Prone Planning, 2026). These	No implication or change required. Some matters will be addressed through conditions and advice notes in the development approval. The community consultation exceeded statutory timeframes.

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		consultation with fire authorities prior to approval.	have been reviewed by DFES as the relevant Hazard Management Agency, with the BMP to be updated prior to construction to address DFES's comments. A detailed Emergency Management Plan will be prepared in consultation with the Department of Fire and Emergency Services (DFES) and the local fire brigades prior to construction, to the satisfaction of the Shire. Mint has also committed to undertake site familiarisation with the local fire brigades.	
		<u>Additional Setbacks</u> Concern that the Project is close to existing homes and that greater separation distances may be required to avoid impacts relating to noise, safety, visual amenity and enjoyment of properties	<u>Additional Setbacks</u> The nearest existing dwelling to the Project Area is located approximately 210 meters to the south (Environmental Assessment Report, 2026). The Project has been assessed against this separation distance through the Environmental Noise Assessment (Sonus, 2026) and Landscape and Visual Impact Assessment (UDLA, 2026), both of which conclude that impacts to nearby dwellings, including this nearest receptor, are expected to be low and compliant with applicable standards. On this basis, Mint does not consider additional separation distances are warranted beyond those already assessed.	

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		Transparency Desire for a transparent assessment process and clear information about environmental, health and safety impacts. Requests residents have the opportunity to review technical reports and have concerns considered.	Transparency Mint has undertaken a number of consultation activities to date for the proposed Kojonup BESS. This has involved door knocks, letters and one-on-one meetings offered to neighbours across multiple instances. The Project has had a dedicated website and 1800 phone line established, a pop-up early in the Project, as well as three community drop-in sessions at Kojonup RSL Hall. An online and hard copy survey was also conducted. See the Consultation Summary (Mint Renewables, 2026) for more details. Through the assessment process of the DA, all relevant technical assessments have been published on the Shire's website. This has been communicated through the formal council process. Additionally, Mint communicated through a number of other methods, such as letters to neighbours, advertisement in the local newspaper, signs in the local area, community pop-up at the local Kojonup IGA during the formal public notice period. Public submissions have been considered by Mint and the Shire, with responses provided to the Shire to consider in their assessment. Mint considers the consultation undertaken prior to lodgement of the application, the formal public exhibition process and additional Mint	

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			communication during this period as having provided the community with meaningful opportunity to review technical information and raise concerns. Mint remains committed to ongoing engagement.	
		<u>Alternative Site</u> Requests the Shire consider whether additional setbacks, conditions, or an alternative site should be required to minimise impacts.	<u>Alternative Site</u> The Project has been sited adjacent to the existing Kojonup Substation specifically to minimise new infrastructure impacts and take advantage of the existing electrical connection point, avoiding the need for new transmission infrastructure elsewhere. Site selection considered the existing substation location, land availability, and environmental constraints, as detailed in the DA. Mint does not consider relocation to an alternative site is necessary or appropriate.	
21/07/2026	Public Submitter 2	<u>Position</u> Objects to the DA, requesting it be rejected by the Shire and the Regional Development Assessment Panel (RDAP). If approved, requests stronger conditions on setbacks, noise/lighting limits, and fire safety/emergency response requirements.	<u>Position</u> Mint notes this position and reasons for objection.	No implication or change required.

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		<u>Impacts to Amenity</u> Home is approximately 500m from the site. Concerned about loss of view, noise emitted from the cooling fans and construction/maintenance vehicles. These concerns are raised particularly in relation to the possibility of the Project being expanded in the future.	<u>Impacts to Amenity</u> The Project has been strategically sited in a position where impacts can be minimised to the maximum extent possible, and in line with the relevant legislation and guidelines regarding setbacks. Mint has undertaken stringent assessments utilising technical experts for landscape and visual (UDLA, 2026), noise (Sonus, 2026) and traffic (Flyt, 2026). The assessments concluded that the Project can comply with relevant legislation, and impacts can be effectively managed. It is expected that the findings of these assessments will help inform any conditions of approval. Construction noise requirements are set out in project approvals and guided by state or territory legislation, to ensure local residents are not unreasonably impacted. Mitigation measures are put in place to ensure these requirements are complied with. This may include scheduling work so that noisier activities occur at times when they will have the least impact. Some of the measures used to reduce noise from our sites include: • Using well maintained equipment and machinery. • Minimising noise from vehicle reversing beepers. • Turning off machinery that is not in use.	

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			• Putting speed limits in place to minimise engine noise. Regarding potential expansion, Mint confirms that there is no expansion proposed.	
		<u>Fire Risk and Emergency Response</u> Background as a former RAAF Avionics Technician with experience in battery maintenance. Notes lithium battery fires burn hot, self-oxygenate, and are hard to extinguish; questions water supply availability in the area given no town supply, and is concerned the facility will be unmanned, delaying emergency response. Also raised concern around risk of fire, explosion and toxic smoke with little warning or time to escape.	<u>Fire Risk and Emergency Response</u> As part of the DA, onsite water storage including dedicated firefighting water supply and fire water runoff containment is proposed as part of the Project. Mint commits to preparing a Water Balance/Water Source Strategy prior to construction, in consultation with DWER. Detailed construction water demand and source arrangements will be confirmed during detailed design and construction planning. Any relevant water licensing requirements required will be sought and complied with. Community safety and fire risk is an important consideration in the design of a BESS. A Bushfire Management Plan (BPP, 2026) has been prepared to inform the development application, having regard to State Planning Policy 3.7, the Planning for Bushfire Guidelines, and, in the absence of WA-specific guidance for renewable energy facilities, comparable interstate reference material.	

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			This document has been reviewed by the Department of Fire and Emergency Services (DFES) as the relevant Hazard Management Agency, with specific refinements identified through that process. The Proponent has engaged its bushfire consultant to address DFES's comments, and commits to updating the Bushfire Management Plan prior to construction, in consultation with DFES, to confirm the Project's siting, design and management measures appropriately address fire risk. A detailed Emergency Management Plan will be prepared in consultation with DFES and the local fire brigades prior to construction, to the satisfaction of the Shire, and Mint has committed to undertake site familiarisation with the local fire brigades so responding crews understand facility-specific hazards. Regarding fire risk associated with the technology of BESS components (lithium batteries), like all electrical equipment, batteries require careful design and management to ensure fire risk is managed and controlled. BESS are designed to include multiple systems that prevent a fire from occurring. This includes Battery Management Systems (BMS) that protects battery cells from damage caused by overcharging or overdischarging. It plays a critical role in fire prevention by shutting down battery	

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			modules or racks if monitored conditions fall outside the safe operating range. If the BMS becomes damaged or malfunctions, the battery can become unstable, causing temperature and pressure inside the cell to rise and potentially produce carbon monoxide. A gas detection system will intervene by shutting down power to the affected cell, activating the ventilation system within the BESS enclosure, triggering alarms, and providing early warning to operations. If the gas detection system fails and smoke is detected in the BESS module, some BESS are equipped with fire suppression systems that will activate, releasing a fire suppression agent to prevent and/or distinguish a fire. In other instances, some BESS are designed to resist thermal runaway and in the unlikely event of a fire, the fire will be contained to a single BESS module. If a fire is detected at the BESS facility, the emergency response set out in an in an Emergency Management Plan will be actioned.	
		<u>Visual Impacts</u> Notes that he and his partner are stargazers who have invested resources into telescopes and photography equipment. Concern that site lighting for maintenance or security would	<u>Visual Impacts</u> The screening proposed as part of the DA, supported by an assessment undertaken by landscape and visual technical experts (UDLA, 2026), has assessed potential visual impacts, and has proposed	Conditions are recommended to control lighting and adopt 'Dark Sky Principles'.

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		impact dark-sky conditions that were a reason for choosing to purchase the property.	mitigation to minimise these impacts. This involves landscape screening around the perimeter of the Project. In regard to lighting, Mint will continue conversations with the neighbouring landholder to communicate the final lighting mitigation measures prior to construction.	
		<u>Road Damage</u> States that Tunney Road is already in poor condition. Concerned that increased heavy traffic during construction and ongoing maintenance on Tunney Road would worsen the condition. Asks who would fund it, should Tunney Road be damaged.	<u>Road Damage</u> Peak traffic movements associated with a BESS will occur during construction. A Traffic Management Plan (TMP) is developed in consultation with the relevant road authority to ensure that construction traffic is appropriately managed. Major highways and main roads will be used where possible and local roads only where necessary. The condition of Tunney Road has been considered to date, reinforcing the location of the main access point for construction being located along Collie-Changerup Road to ensure safety is maintained.	The Shire recommends a condition regarding upgrading (sealing and draining) of Tunney Road between the intersection of Collie-Changerup Road/Tunney Road and the proposed crossover on Tunney Road.
		<u>Property Values</u> Concerned about financial loss on their land/home investment if the Project proceeds.	<u>Property Values</u> Studies show that large-scale renewable energy projects generally have minimal and temporary effects on nearby property values, mostly during the construction phase. Any short-term impacts typically recover within 3–5 years after operations	Property values are not a planning consideration based on the Planning Regulations.

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			begin, and some areas even experience increased property values due to improved local infrastructure and economic growth.	
27/07/2026	Public Submitter 3	<u>Position</u> Objects the proposal, and urges RDAP to also oppose the development, primarily on fire risk grounds, within a broader submission raising community, financial, and precedent concerns. <u>Community Precedent and Trust in Process</u> Points to the Flat Rocks Wind Farm as having created lasting division within the Kojonup community and suggests the more recent Jingalup Wind Farm approval has deepened that division. Argues the Shire and RDAP should learn from Flat Rocks before approving further projects, to reduce conflict between landholders, neighbours, investors and the wider community. Suggests the RDAP is under pressure from State Government to approve renewable developments without properly weighing impacts on affected communities or long-term liveability.	<u>Position</u> Mint notes the objection to the proposal. <u>Community Precedent and Trust in Process</u> The submitter's concerns regarding community division and prior development experience are acknowledged. Each development application is assessed on its individual merits against the applicable planning framework, the Shire of Kojonup Town Planning Scheme No. 3, State Planning Policy 3.7, and relevant state planning guidance for renewable energy facilities. The Proponent's community engagement program commenced ahead of lodgement and has included a number of consultation activities to date for the proposed Kojonup BESS. This has involved door knocks, letters and one-on-one meetings offered to neighbours across multiple instances. The Project has had a dedicated website and 1800 phone line established, a pop-up early in the Project,	No implication or change required.

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			as well as three community drop-in sessions. Public submissions have been considered by Mint and the Shire, with responses provided to the Shire to consider in their assessment. Mint considers the consultation undertaken prior to lodgement of the application, the formal public exhibition process and additional Mint communication during this period as having provided the community with meaningful opportunity to review technical information and raise concerns. Mint remains committed to ongoing engagement. Mint cannot comment on matters relating to the RDAP's assessment processes and State Government policy settings.	
		<u>Financial Compensation and Community Benefit</u> States the Shire should be properly compensated for hosting such developments but should not be using renewable energy projects to patch existing shire financial problems. Believes any community benefit needs to be substantial and long-lasting to justify approval, and that the community should not come out worse off.	<u>Financial Compensation and Community Benefit</u> Financial arrangements between the Shire and the Proponent, and rating decisions for host properties, are matters for Council to determine separately from this development application and fall outside the scope of the planning assessment. Mint has committed to establishing a community benefit fund of a minimum amount of $150 per megawatt from commencement of operations, in line with the *Community Benefits Guideline for*	

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		Asks specifically what compensation, if any, is paid to the Shire toward road maintenance funding, given the extra heavy vehicle traffic expected during construction. Calls for higher rates to be charged on properties that host these developments, as a way of returning value to the community. Calls on the Shire to be transparent with ratepayers about any financial arrangements or benefits agreed with developers. <u>Workforce Accommodation</u> Notes Kojonup already has a shortage of rental housing and rising rents, and that local businesses struggle to house staff. Asks how and where the construction workforce will be housed and argues this should be answered publicly before any approval is granted. Uses Flat Rocks Wind Farm as a comparison, claiming most of their workforce came from outside Kojonup, and that local businesses which took on extra casual staff during construction didn't retain them afterward, with most of those workers no longer living locally. Questioned whether claimed local economic benefits are overstated or only temporary.	*Large-scale Renewable Energy Projects in the South West Interconnected System (SWIS)*, released by PoweringWA / Department of Energy and Economic Diversification (DEED). The governance and structure of this fund is to be finalised through further community engagement and discussions with Council and other relevant regional authorities in the post-approval phase of development, prior to construction. Mint will continue engagement with the community. <u>Workforce Accommodation</u> As discussed in the development application, the Project involves an average construction workforce of ~37 personnel, peaking at ~87 during the 55-week construction program. The Proponent acknowledges local accommodation availability is limited, and construction can increase short-term demand if not managed. Rather than a purpose-built accommodation camp, the approach is to manage and minimise impacts through construction planning and workforce scheduling, given the temporary and relatively short-duration nature of peak demand. Prior to construction, the Proponent will assess local/regional accommodation availability as part of detailed planning, with regard to avoiding	

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			unnecessary pressure during peak periods. The final accommodation approach will be confirmed during detailed construction planning, in ongoing consultation with the Shire and other relevant authorities. Mint has committed to employing local people and buying local where possible and has established a *Goods and Services Register* for local businesses to register interest in supplying the Project.	
		<u>Neighbour Amenity</u> Considers it unfair to neighbours when project infrastructure is sited close to property boundaries, and argues noise, lighting and visual impacts need proper consideration in every approval. Asks whether the high-voltage cooling fans needed to run the BESS will meet noise regulations. Points to Flat Rocks Wind Farm, saying noise became a significant ongoing problem for neighbours after construction, despite the Project having been assessed as meeting relevant guidelines beforehand. Suggests the RDAP should give more weight to residents lived experience than to developer-supplied projections and modelling.	<u>Neighbour Amenity</u> The Project has been strategically sited in a position where impacts can be minimised to the maximum extent possible, and in line with the relevant legislation and guidelines regarding setbacks. Mint has undertaken stringent assessments utilising technical experts, including landscape and visual (UDLA, 2026), noise (Sonus, 2026) and traffic (Flyt, 2026). The assessments concluded that the Project can comply with relevant legislation, and impacts can be effectively managed. It is expected that the findings of these assessments will help inform any conditions of approval.	

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		<u>Property values</u> Believes these developments reduce neighbouring property values without any compensation being offered. <u>Process</u> Frames the situation as a small number of landholders benefiting financially while showing little regard for neighbours and states the RDAP overlooks neighbours' concerns and rights. <u>Fire Risk</u> Considers the proposed buffer zones inadequate given nearby fuel loads. States the	<u>Property values</u> Studies show that large-scale renewable energy projects generally have minimal and temporary effects on nearby property values, mostly during the construction phase. Any short-term impacts typically recover within 3–5 years after operations begin, and some areas even experience increased property values due to improved local infrastructure and economic growth. <u>Process</u> The Project has been strategically sited in a position where impacts can be minimised to the maximum extent possible, and in line with the relevant legislation and guidelines regarding setbacks. Mint has undertaken stringent assessments utilising technical experts for landscape and visual (UDLA, 2026), noise (Sonus, 2026) and traffic (Flyt, 2026). The assessments concluded that the Project can comply with relevant legislation, and impacts can be effectively managed. It is expected that the findings of these assessments will help inform any conditions of approval. <u>Fire Risk</u> A Bushfire Management Plan and supporting Bushfire Risk Report were prepared by an accredited bushfire	

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		host property is a large broadacre cropping farm, so during fire season (roughly October–April/May) the site will be surrounded by standing crop or post-harvest stubble. Notes the site's ~3km proximity to Kojonup townsite, within which also sit the local waste recycling facility and the Myrtle Benn Sanctuary, both carrying heavy fuel loads over summer. The submitter states this raises risk to the town itself, potential loss of significant Aboriginal heritage sites in the sanctuary, and potential loss of recycling facility infrastructure. Asks who would be responsible for such losses. States the local bushfire brigade has raised concerns for several years about high, poorly managed fuel load specifically within the sanctuary. States the proposed landscape screening (trees and understory shrubs) would itself become a fire hazard in summer, undermining rather than supporting fire safety. Notes Kojonup is ~150km from professional firefighters trained/equipped for a battery fire, considers that response time excessive, and believes local emergency services lack capability for a lithium battery fire at this scale. Asks the RDAP to refuse the development on fire risk grounds, specifically in protection of human lives, infrastructure, and Aboriginal cultural heritage.	consultant to inform the development application, having regard to State Planning Policy 3.7, the Planning for Bushfire Guidelines, and, in the absence of WA-specific guidance for renewable energy facilities, comparable interstate reference material. These documents have been referred to and reviewed by the Department of Fire and Emergency Services (DFES) as the relevant Hazard Management Agency, with specific refinements identified through that process. The Proponent has engaged its bushfire consultant to address DFES's comments, and commits to updating the Bushfire Management Plan, together with a detailed Risk Management Plan addressing supplier-specific fire safety parameters, prior to construction, as a condition of approval and in consultation with DFES. This process is intended to ensure the Project's bushfire and fire risk management approach appropriately addresses potential on-site and off-site impacts.	

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		<u>Economic Benefits</u> Accepts some short-term benefits for local accommodation, hospitality and small businesses, but considers these are outweighed by longer-term community harm (as outlined in the submission). <u>Future and Cumulative Development</u> Raises concern that existing powerlines may need upgrading to higher voltages to support additional generation capacity in future and asks how this would affect the town and current landholders. Worries that approving this BESS (to support wind farm output) will make the Shire more attractive to further similar proposals, compounding cumulative impacts on liveability over time.	<u>Economic Benefits</u> The Project will support the local and regional economy through employment and spending during construction, including roles such as general labourers, BESS installers, concrete workers, and demand for local accommodation, food, and service providers. The Proponent is committed to employing local people and buying local wherever possible, supported by a *Goods and Services Register* enabling local businesses to register interest in supplying the Project. <u>Future and Cumulative Development</u> The Kojonup BESS is strategically positioned in the SWIS to enhance the reliability and stability of the power system in the Great Southern Region while benefiting from its close proximity to the existing Kojonup Substation. This location also reduces the need for additional transmission infrastructure. This application can only be assessed on the merits and impacts of the Project as proposed. The extent of development is limited to what is proposed within the DA. Matters relating to transmission network capacity and future augmentation are the responsibility of Western Power as network operator.	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
27/07/2026	Public Submitter 4	<u>Impacts to Future Developments on Other Properties</u> States the DA and associated documents fail to mention what impacts the Battery System will have on surrounding properties in relation to future developments or building approvals. Seeks assurance that the proposed battery storage facility will in no way have any negative effect or cause any additional requirements for any future works that may be constructed on Lots 248, 249 and 177 Mather Road given these fall within an 850-meter radius of the proposed site. <u>Cumulative Impact</u> States that various companies have had numerous enquiries to construct BESS on property given its location to the substation and transmission lines.	<u>Impacts to Future Developments on Other Properties</u> This application is assessed against the Shire of Kojonup Town Planning Scheme No. 3 (the Scheme) and applicable state planning policy. Approval of this Project does not, of itself, impose any additional planning restriction, exclusion zone, or building approval requirement on the land listed in the submitter's response. Any future development application on nearby land would be assessed on its own merits, against the Scheme and any planning policy applicable at the time that application is lodged, independent of this approval. <u>Cumulative Impact</u> Mint notes that the general locational advantages of this area (proximity to the existing Kojonup Substation and existing transmission infrastructure) may make surrounding land attractive for similar future energy infrastructure proposals. Any future proposals would be a separate development application assessed independently on its own planning and technical merits.	No implication or change required.

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		Exclusion Zone and Impacts on Property Value States that there is an exclusion zone for new residential construction. States this would have a significant impact on the value of own property.	Exclusion Zone and Impacts on Property Value There is currently no general exclusion zone applying to BESS development. The Project has been strategically sited in a position where impacts can be minimised to the maximum extent possible, and in line with the relevant legislation and guidelines regarding setbacks. Mint has undertaken stringent assessments utilising technical experts for landscape and visual (UDLA, 2026), noise (Sonus, 2026) and traffic (Flyt, 2026). The assessments concluded that the Project can comply with relevant legislation, and impacts can be effectively managed, demonstrating that the Project can comply with relevant requirements. Property Values Studies show that large-scale renewable energy projects generally have minimal and temporary effects on nearby property values, mostly during the construction phase. Any short-term impacts typically recover within 3–5 years after operations begin, and some areas even experience increased property values due to improved local infrastructure and economic growth.	
17/07/2026	Public Submitter 5	Position	Position Mint notes the objection to the proposal.	No implication or change required.

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		Requests the Shire and RDAP refuse the application. In the alternative, if approved, requests significantly greater setback distances, stricter noise limits, and comprehensive fire safety and emergency response requirements be imposed as conditions of approval. <u>Inadequate buffer distances</u> States the submitter's home sits at a specific distance from the BESS site boundary, and considers this an inadequate setback for an industrial battery installation of this scale, raising concerns about noise, visual intrusion, and exposure to smoke, fumes or toxic emissions in a fire or thermal runaway event.	<u>Inadequate buffer distances</u> The Project's separation from surrounding dwellings has been assessed through the Landscape and Visual Impact Assessment (LVIA), which found low to negligible visual impact at the nearest assessed dwellings, given the Project's co-location with existing Kojonup Substation infrastructure and proposed landscape screening. Separately, in relation to health and safety risk from fire or thermal runaway events, there is currently no adopted Western Australian legislation, planning policy, or state guidance establishing mandatory separation distances for utility-scale BESS specific to this scenario. Consistent with standard industry practice, the Project will be constructed using a BESS supplier and battery chemistry to be selected following key planning approvals, and a detailed Risk Management Plan, incorporating supplier-specific large-scale fire test data and confirming appropriate separation distances on that basis, will be provided	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
			prior to construction, as a condition of approval and in consultation with DFES.	
		<u>Noise pollution and vibrations</u> States BESS facilities rely on continuous cooling systems, inverters and HVAC equipment producing persistent operational noise, and is concerned this would affect existing rural quietness and interfere with the family's ability to rest and enjoy a healthy living environment.	<u>Noise pollution and vibrations</u> An Environmental Noise Assessment was undertaken by Sonus (2026), an independent, suitably qualified acoustic consultancy, modelling worst-case meteorological conditions and applying a 5 dB(A) tonal penalty in accordance with the *Environmental Protection (Noise) Regulations 1997*. A pre-construction noise assessment using the final selected equipment will also be undertaken to confirm compliance prior to construction.	
		<u>Fire and safety risks</u> Raises the inherent risks of lithium-ion battery installations, including thermal runaway, fire, explosion, toxic off-gassing (specifically naming hydrogen fluoride), and contaminated runoff. Expresses concern the proposed setback may be insufficient to protect residents, and that the site being unmanned/remotely operated may delay detection and response to a critical incident. Asks the Shire to consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and local volunteer fire service capacity.	<u>Fire and safety risks</u> Community safety and fire risk are important considerations in the design of a BESS. A Bushfire Management Plan (BMP) and supporting Bushfire Risk Report (BRR) were prepared by an accredited bushfire consultant to inform the application, having regard to State Planning Policy 3.7, the Planning for Bushfire Guidelines, and comparable interstate reference material in the absence of WA-specific guidance for renewable energy facilities. These have been reviewed by the Department of Fire and Emergency Services (DFES) as the relevant Hazard Management Agency, with specific refinements identified	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
			through that process and being incorporated into an updated Bushfire Management Plan (BMP). A detailed Risk Management Plan (RMP), addressing battery chemistry, fire/smoke/heat and toxic off-gassing detection systems (including what triggers internal operator response versus emergency service notification), explosion prevention and venting, battery management and monitoring (including thermal runaway intervention capability), water ingress protection, and alarm systems, will be provided prior to construction, as a condition of approval and in consultation with DFES. The Project's onsite water storage includes dedicated firefighting water supply and fire water runoff containment/stormwater detention basin, meaning the Project is not reliant on town water supply for fire response and provides for containment of firefighting runoff. A detailed Emergency Management Plan (EMP), addressing community notification, smoke management, exclusion zones, agency coordination, and public communication, will be prepared in consultation with DFES and the local fire brigades prior to construction, to the satisfaction of the Shire. Mint has also committed to undertake site familiarisation with the local fire brigades,	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
			so responding crews understand facility-specific hazards ahead of any incident.	
		<u>Visual impact</u> Considers a BESS of this scale, with its height, reflective materials, and footprint of up to four hectares, would introduce an unacceptable industrial presence into the rural landscape, detracting from the area's natural character and visual amenity.	<u>Visual impact</u> The Landscape and Visual Impact Assessment (LVIA) has assessed the Project's visual impact from surrounding roads and dwellings, finding low to negligible impact given co-location with existing substation infrastructure, with landscape screening proposed to further reduce visibility over time.	
		<u>Ongoing heavy vehicle traffic, road safety, and road degradation</u> States traffic impact should not be treated as a temporary construction-only issue, given ongoing servicing, equipment replacement, emergency response and maintenance access over the facility's operating life. States Collie-Changerup Road and surrounding rural routes are not designed for frequent heavy axle loads, and increased use is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation, creating safety risks for residents, school traffic, farm machinery and emergency services. Considers the cost of resulting road damage should not fall on ratepayers, and calls for a detailed traffic impact assessment, confirmation that heavy vehicle routes are suitable and approved, and	<u>Ongoing heavy vehicle traffic, road safety, and road degradation</u> The Transport Impact Assessment (TIA) addresses both construction and operational stages of the Project. Construction traffic volumes have been assessed as low impact relative to road capacity, with crossovers and access points designed to Main Roads WA and Shire standards, and a Traffic Management Plan to be developed in consultation with the relevant road authority. During operations, vehicle movements are expected to be minimal, generally limited to scheduled maintenance. Matters relating to road maintenance funding, cost-recovery arrangements, or rating decisions for developments of this kind are matters for Council to determine	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		enforceable road maintenance, upgrade and cost-recovery arrangements with the Shire. <u>Property values</u> Considers the proximity of a large-scale industrial facility has the potential to adversely affect local property values and reduce marketability of nearby rural residential properties, due to perceived or actual impacts from noise, visual intrusion, fire risk, and changed rural character. <u>Proximity to personal airstrip and aviation safety</u> States the proposed BESS is close to a personal airstrip used for private, agricultural and occasional emergency movements. Considers thermal events, smoke or toxic off-gassing could create hazards for low-flying aircraft and impair pilot visibility, and that construction activity or incident-related restrictions could conflict with airstrip access. Requests the Shire assess aviation safety implications, consult the Civil Aviation Safety Authority and relevant aircraft operators, and require written evidence that private flight operations and emergency aviation access will not be compromised before approval.	separately from this development application and fall outside the scope of the planning assessment. <u>Property values</u> Property value impacts are generally not a matter directly assessed within a standard planning application and are not something the Shire's assessment process has a mechanism to compensate for absent a specific statutory basis. <u>Proximity to personal airstrip and aviation safety</u> There is currently no Western Australian legislation, state planning policy, or provision within the Shire of Kojonup Town Planning Scheme No. 3 that establishes an aviation safety assessment requirement for BESS development, or that requires consultation with the Civil Aviation Safety Authority (CASA) as part of a standard development application of this kind. The Project's tallest components (lightning protection rods, approximately 20m) are consistent with typical rural infrastructure already present in the surrounding area, including the adjacent Kojonup Substation.	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		<u>Impacts on native wildlife</u> States the BESS site is in an area where carpet pythons are regularly observed and known to breed, forming part of the local ecosystem. Considers construction activities, vegetation clearing, increased traffic, fencing and ongoing maintenance could disturb or fragment this habitat, potentially affecting local breeding populations. Requests a comprehensive ecological assessment to identify breeding habitat and ensure appropriate measures are implemented to avoid or minimise impacts on native wildlife, including carpet pythons.	<u>Impacts to native wildlife</u> A terrestrial fauna assessment was undertaken as part of the Environmental Assessment Report, informed by desktop and field survey methods, and addressing species and habitat values relevant under the *Biodiversity Conservation Act 2016* and the *Environment Protection and Biodiversity Conservation Act 1999*. The assessment confirmed the Project Area comprises a highly modified agricultural landscape with limited fauna habitat value, and concluded potential impacts to terrestrial fauna are expected to be low. General fauna management measures, including confining construction to defined work areas, undertaking clearing progressively, and inspecting excavations prior to daily works, have been committed to reduce disturbance to fauna generally, including common, non-listed species.	
17/07/2026	Public Submitter 6	Please refer to summary contained in 'Public Submitter 5'.	Please refer to responses as addressed within response to Public Submitter 5.	No implication or change required.
17/07/2026	Public Submitter 7	Please refer to summary contained in 'Public Submitter 5'.	Please refer to responses as addressed within response to Public Submitter 5.	No implication or change required.
17/07/2026	Public Submitter 8	Please refer to summary contained in 'Public Submitter 5'.	Please refer to responses as addressed within response to Public Submitter 5.	No implication or change required.
17/07/2026	Public Submitter 9	Please refer to summary contained in 'Public Submitter 5'.	Please refer to responses as addressed within response to Public Submitter 5.	No implication or change required.

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
17/07/2026	Public Submitter 10	Please refer to summary contained in 'Public Submitter 5'.	Please refer to responses as addressed within response to Public Submitter 5.	No implication or change required.
17/07/2026	Public Submitter 11	Please refer to summary contained in 'Public Submitter 5'.	Please refer to responses as addressed within response to Public Submitter 5.	No implication or change required.
17/07/2026	Public Submitter 12	Please refer to summary contained in 'Public Submitter 5'.	Please refer to responses as addressed within response to Public Submitter 5.	No implication or change required.
17/07/2026	Public Submitter 13	Please refer to summary contained in 'Public Submitter 5'.	Please refer to responses as addressed within response to Public Submitter 5.	No implication or change required.
17/07/2026	Public Submitter 14	Please refer to summary contained in 'Public Submitter 5'.	Please refer to responses as addressed within response to Public Submitter 5.	No implication or change required.

[redacted]
Kojonup WA 6395

27th July 2026

The Regional Development Assessment Panel
Shire of Kojonup

Dear Sir or Madam,

Re: PROPOSED KOJONUP BATTERY ENERGY STORAGE SYSTEM (BESS) PROJECT

I am writing to express my concerns about the proposed BESS development application. Past developments in our Kojonup shire have proven not to have been well planned and managed.

As the whole Kojonup community is aware, Flat Rocks Wind Farm caused a massive divide in our local community, and continues to do so. The recent approval of the Jingalup Wind Farm has continued to fuel this divide. We need to learn from the issues that have arisen from the Flat Rocks Wind Farm development, and move forward with this in mind, to ensure minimal disharmony between landholders, neighbours, investors and the general community, before approving any future developments.

The Shire of Kojonup, along with the Regional Development Assessment Panel, needs to stand up and take a firm stance when considering approving major projects in our local shire. It seems that The Regional Development Assessment Panel is being encouraged by our state government to approve all of these developments without taking into consideration the communities affected, and what a future living in these towns will look like.

The Shire of Kojonup must be fairly compensated for hosting these developments in our shire, but not rely on these renewable energy developments to solve current financial issues within our shire, which seems to be the case. The benefit back to the community must be significant, and long-term, enough to warrant the shire considering these applications for approval. The community must not be disadvantaged. The increased traffic, particularly heavy vehicles, during the construction phase, greatly affects our local roads. What dollar value is the Shire of Kojonup paid as compensation to go into our roads maintenance budget?

Like all small country towns we have a shortage of houses to rent, which in turn significantly increases the rental prices. Established Kojonup businesses are struggling to house employees and have been for years. Where, and how are these companies proposing to house employees during the construction phase? This should be clearly addressed to the Shire of Kojonup and the local community prior to the Regional Development Assessment Panel approving this BESS development application.

Consideration needs to be given to significantly increasing the rates for the properties hosting these developments to contribute back to the community and local shire.

The developments must be considerate to neighbouring property owners. Approving developments whereby the infrastructure is placed close to property boundaries is very inconsiderate to neighbours. Noise, lights and visual impact on neighbours must be taken into consideration for all approvals. Will the high voltage fans required to operate consistently on this BESS project meet noise regulations? These developments are significantly devaluing neighbouring properties and no compensation is being provided. Unfortunately the minority off landholders benefiting financially from these projects have no consideration for their neighbours, and neither does The Regional Development Assessment Panel, as they are continuing to approve these projects, totally ignoring the concerns and basic rights of the neighbours to live on, and farm their properties as they see fit. The approval of these projects has a long term effect on our shires finances and community liveability.

I have a major concern regarding fire suppression around this BESS development. The buffer zones around the proposed BESS project are totally inadequate considering the significant fuel load within close proximity to the development site. The landholder that proposes to lease/sell land for the project is operating a large broad acre cropping farm. This means that during the dangerous fire season months of October – April/May (depending on the season) the project will be surrounded by a large fuel load of flammable crop awaiting to be harvested or stubble post-harvest. The proposed development is only 3km from our Kojonup town site, and within that distance is our local waste recycling facility and our local Myrtle Benn Sanctuary. Both of these carry an extremely large fuel load over the hot summer months, during peak fire season, and could put our whole town at risk should a fire start, not to mention the loss of significant Aboriginal heritage sites within the sanctuary and infrastructure at the recycling facility. Who will be responsible for these losses? The local bush fire brigade for several years has been concerned about the dangerously high fuel load which has not been controlled and maintained in the sanctuary. This will put lives at risk.

We all know that these BESS projects pose a high fire risk. The inadequate buffer zone, combined with the proposed landscape buffer of trees and an understory of shrubs (highly flammable in the summer months) means the development is unsuitable for this location and its proximity to the town, sanctuary and recycle station.

Kojonup is located 150km from the nearest professional fire fighters who would be suitably equipped and trained to fight a battery fire at this site. That response time is just too long and significant losses could occur whilst waiting for them to arrive. Our local emergency services are not equipped to fight a lithium battery fire of this size. This project poses too much of a fire threat to our community, and I urge the panel to oppose this development based on this fire risk to lives, infrastructure and Aboriginal cultural heritage sites.

I acknowledge some short-term benefits to accommodation providers and eating venues in our town, as well as some other small businesses, however these are only short-term, and the long-term effects on our community is of far greater concern. In the past development of the Flat Rocks Wind Farm, most of the workforce engaged for the construction phase were not local Kojonup residents. Those local businesses that employed extra casual staff during the construction phase no longer continue to employ those staff and the majority of them no longer reside in Kojonup.

Existing power lines may need to be upgraded to higher voltage lines in the future, when these extra power sources come online. How will this affect the town and current landholders in the future? I am concerned that once we have more Wind Farms approved in our shire and this planned BESS infrastructure to back it up, our local shire will become attractive to other developers seeking approvals for similar projects in our shire. The liveability of our future rate payers must be considered in these approvals. The Regional Development Assessment Panel and the Shire of Kojonup must not approve, and allow these developments based purely on a short-term budget fixes. The Shire of Kojonup must be transparent to ratepayers and community members on financial gains and arrangements with these developers.

Although the Regional Development Assessment Panel are convinced that these developments meet the guidelines for noise, fire suppression and visual impact etc based on numbers on a page, graphs and projections provided by the developers, history has shown in the Flat Rocks Wind Farm project case, that once the project is complete, the noise is a major issue for the neighbours. Future liveability must be assessed more fairly. Constant noise pollution is unhealthy. I urge the panel to assess on the reality of existing projects, the concerns and feedback from people who are suffering the consequences of these projects daily, not on the projected information from the developer’s consultants who do not need to live alongside the projects.

Please consider the above concerns I have, and the concerns other ratepayers have when considering this development which will have a significant long term impact on our local community.

Kind regards

[redacted]

RECEIVED
06 JUL 2026
SHIRE OF KOJONUP

30/06/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email:council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No. 3680) Collie-Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road

My home is located approximately five hundred meters (as the crow flies) from the boundary of the proposed BESS site.

As a nearby resident, I am deeply concerned about the impacts of this industrial development on my property, my family's health, and the surrounding area.

My objections are based on the following material planning considerations:

1) Inadequate buffer distances: The proposed facility would be approximately five hundred metres from my home. In my view, this is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on residential amenity, including operational noise, visual intrusion, and exposure to smoke, fumes, or toxic emissions in the event of a fire or thermal runaway.

2) Noise pollution and vibration: BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. At approximately five hundred metres from my home, this noise has the potential to affect the existing rural quietness and my family's quality of life. As a registered nurse working rotating shifts in the Emergency Department at Kojonup Hospital, I rely on a quiet home environment for rest and recovery. I am concerned that ongoing industrial noise and vibration from the proposed facility would unreasonably interfere with that amenity.

3) Fire and safety risks: Lithium-ion battery installations carry inherent risks, including thermal runaway, fire, explosion, toxic off-gassing, and contaminated runoff. Given the site's proximity to my home, I am concerned that the proposed setback may be insufficient to protect nearby residents from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical incident. The Shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4) Visual impact: A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries and associated electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5) Ongoing heavy vehicle traffic, road safety, and road degradation: The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie-Changerup Road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting, and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency vehicles, and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

6) Property value and marketability: The proximity of a large-scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchasers may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety concerns, and changes to the rural character of the area.

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that significantly greater setback distances, stricter noise limits, and comprehensive fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

Sincerely,

[redacted]

[redacted]

Estelle Lottering

[redacted]

From: Shire of Kojonup Council <council@kojonup.wa.gov.au>
Sent: Friday, 31 July 2026 9:56 AM
To: Estelle Lottering <estelle.lottering@kojonup.wa.gov.au>
Cc: Steve Thompson <steve@edgeplanning.com.au>
Subject: FW: Att. Grant Thompson - Re Kojonup BESS-Mint-Development Application

Estelle

For your action

Regards

Grant Thompson
Chief Executive Officer
SHIRE OF KOJONUP

93 Albany Highway Kojonup WA 6395 | PO Box 163 Kojonup WA 6395

Tel: 9831 2400 | Mob: 0419 903 363 | Fax: 9831 1566 | www.kojonup.wa.gov.au

COLLECTION NOTICE - The Shire of Kojonup may collect and use your personal information to administer its services and functions and to respond to your enquiry or request.

Information may be disclosed where authorised or required by law. For more information on how your personal information is managed, please visit the Shire's website.

FOR RECIPIENTS EXTERNAL TO THE SHIRE OF KOJONUP
The information contained in this email (including any attachments) is intended for the named recipient only. It may contain privileged and confidential information. If you are not the intended recipient, you must not copy, distribute, take any action or reliance on it, or disclose any details of the email or attachments to any other person, firm, or corporation. If you have received this email in error, please notify the sender as soon as possible by return email and then delete.

[redacted]

Sent: Monday, 27 July 2026 2:44 PM

To: Shire of Kojonup Council <council@kojonup.wa.gov.au>
Subject: Att. Grant Thompson - Re Kojonup BESS-Mint-Development Application

Hi Grant,

Please accept the below email as a written submission regarding the BESS – Mint Development Application for the proposed Kojonup Battery Storage System.

The Development Application and associated documents fail to mention what impacts the Battery System will have on surrounding property's in relation to future developments or building approvals. I am seeking assurance that the proposed battery storage facility will in no way have any negative effect, or cause any additional requirements for any future works that may be constructed on Lots 248, 249 and 177 Mather Road given these fall within a 850 meter radius of the proposed site.
I have had numerous enquires by various companies looking to construct battery storage facility's on my property given its location to the substation and transmission lines. All outlined that there is an exclusion zone for new residential construction. This would have a significant impact on the value of my property should it fall with in this zone.

Please feel free to contact me on the below details if you should need any further information of a particular format for this submission.

[redacted]

[redacted]
Project Engineer

[redacted]

[redacted]

[redacted]

17/7/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email: council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No, 3680) Collie – Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road.

My home is located approximately 2 300 meters (as the crow flies) from the boundary of the proposed BESS site.

As a nearby resident, I am deeply concerned about the impacts of this industrial development on my property, my family's health, and the surrounding area.

My objections are based on the following material planning considerations:

1. **Inadequate buffer distances:** The proposed facility would be approximately 2300 meters from my home. In my view, this is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on residential amenities including operational noise, visual intrusion, and expose to smoke, fumes or toxic emissions in the event of a fire or thermal runaway.

2. **Noise pollution and vibrations:** BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. At approximately 2300 meters from my home, this noise has the potential to affect the existing rural quietness and my family's quality of life. My family and I rely on the peace and quiet of our homes to rest, recover, and enjoy a safe and healthy living environment. I am concerned that ongoing industrial noise and vibration from the proposed facility would unreasonably interfere with that amenity.

3. **Fire and safety risks:** Lithium-ion batteries installations carry inherent risks, including thermal runaway, fire explosion, toxic off – gassing, and contaminated runoff. Given the site's proximity to my home, I am concerned that the proposed setback may be insufficient to protect nearby residents from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical incident. The shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4. **Visual impact:** A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries associated and electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5. **Ongoing heavy vehicle traffic, road safety, and road degradation:** The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie – Changerup road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency services and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

6. **Property value and marketability**: The proximity of the large- scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchases may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety concerns, and changed to the rural character of the area.

7. **Proximity to personal airstrip and aviation safety:** The proposed BESS is close to my personal airstrip used for private, agricultural, and occasional emergency movements. Thermal events, smoke, or toxic off-gassing from a battery fire could create serious hazards for low-flying aircraft, impair pilot visibility, and endanger operations from my airstrip. Increased heavy vehicle movements, construction activity, and potential restrictions during incidents could also conflict with airstrip access and safe aircraft operations. The Shire should assess aviation safety implications, consult the Civil Aviation Safety Authority and relevant aero operators, and require written evidence that private flight operations and emergency aviation access will not be compromised before any approval is granted

8. **Impacts on native wildlife**: The proposed BESS site is in an area where carpet pythons (commonly known as carpet snakes) are regularly observed and are known to breed. These snakes form part of the local ecosystem and rely on suitable habitat for shelter, nesting and movement. Construction activities, vegetation clearing, increased traffic, fencing and ongoing maintenance have the potential to disturb or fragment this habitat, potentially affecting local breeding populations. I request that Shire require a comprehensive ecological assessment to identify any breeding habitat and ensure appropriate measures are implemented to avoid or minimize impacts on native wildlife, including carpet pythons

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that the significantly greater setback distance, stricter noise limits, and comprehend fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

Sincerely,



17/7/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email: council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No, 3680) Collie – Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road.

As a long standing Kojonup resident, I am deeply concerned about the impacts of this industrial development on properties, close surrounding health of residents and the impact on the Myrtle Benn Flora and Fauna Sanctuary.

My objections are based on the following material planning considerations:

1. **Inadequate buffer distances:**

   The proposed facility, in my view, is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on the Flora and Fauna in the Myrtle Benn Sanctuary. Residential amenities include operational noise, visual intrusion, and exposure to smoke, fumes or toxic emissions in the event of a fire or thermal runaway.

2. **Noise pollution and vibrations:** BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. The noise has the potential to affect the existing rural quietness and family's living in a close proximity's quality of life.

3. **Fire and safety risks:** Lithium-ion batteries installations carry inherent risks, including thermal runaway, fire explosion, toxic off – gassing, and contaminated runoff. Given the site's proximity to the Myrtle Benn Sanctuary, I am concerned that the proposed setback may be insufficient to protect nearby residents and the Flora and Fauna from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical

incident. The shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4. **Visual impact:** A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries associated and electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5. **Ongoing heavy vehicle traffic, road safety, and road degradation:** The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie – Changerup road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency services and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

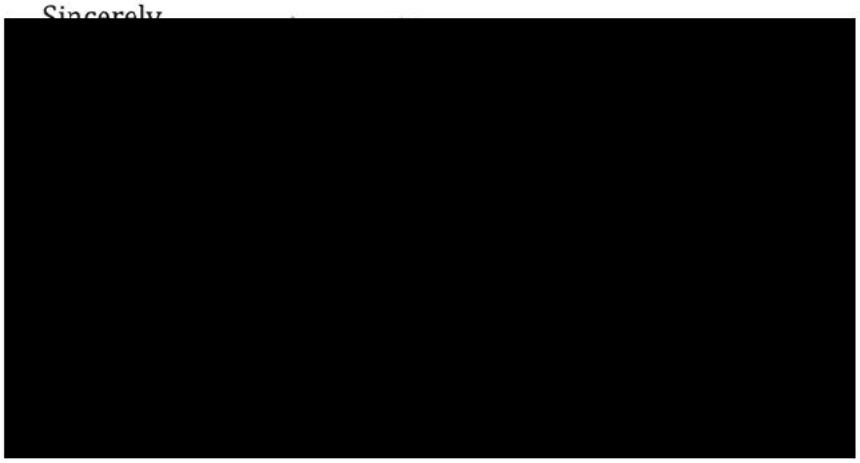
6. **Property value and marketability**: The proximity of the large- scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchases may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety

7. **Impacts on native wildlife**: The proposed BESS site is in an area where carpet pythons (commonly known as carpet snakes) are regularly observed and are known to breed. These snakes form part of the local ecosystem and rely on suitable habitat for shelter, nesting and movement. Construction activities, vegetation clearing, increased traffic, fencing and ongoing maintenance have the potential to disturb or fragment this habitat, potentially affecting local breeding populations. I request that Shire require a comprehensive ecological assessment to identify any breeding habitat and ensure appropriate measures are implemented to avoid or minimize impacts on native wildlife, including carpet pythons.

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that the significantly greater setback distance, stricter noise limits, and comprehend fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

Sincerely,



17/7/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email: council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No, 3680) Collie – Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road.

My home is located approximately 975 meters (as the crow flies) from the boundary of the proposed BESS site.

As a nearby resident, I am deeply concerned about the impacts of this industrial development on my property, my family's health, and the surrounding area.

My objections are based on the following material planning considerations:

1. **Inadequate buffer distances:** The proposed facility would be approximately 975 meters from my home. In my view, this is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on residential amenities including operational noise, visual intrusion, and expose to smoke, fumes or toxic emissions in the event of a fire or thermal runaway.

2. **Noise pollution and vibrations:** BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. At approximately 975 meters from my home, this noise has the potential to affect the existing rural quietness and my family's quality of life. My family and I rely on the peace and quiet of our homes to rest, recover, and enjoy a safe and healthy living environment. I am concerned that ongoing industrial noise and vibration from the proposed facility would unreasonably interfere with that amenity.

3. **Fire and safety risks:** Lithium-ion batteries installations carry inherent risks, including thermal runaway, fire explosion, toxic off – gassing, and contaminated runoff. Given the site's proximity to my home, I am concerned that the proposed setback may be insufficient to protect nearby residents from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical incident. The shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4. **Visual impact:** A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries associated and electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5. **Ongoing heavy vehicle traffic, road safety, and road degradation:** The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie – Changerup road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency services and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

6. **Property value and marketability**: The proximity of the large- scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchases may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety concerns, and changed to the rural character of the area.

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that significantly greater setback distances, stricter noise limits, and comprehensive fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

Sincerely,



17/7/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email: council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No, 3680) Collie – Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road.

My home is located approximately 1150 meters (as the crow flies) from the boundary of the proposed BESS site.

As a nearby resident, I am deeply concerned about the impacts of this industrial development on my property, my family's health, and the surrounding area.

My objections are based on the following material planning considerations:

1. **Inadequate buffer distances:** The proposed facility would be approximately 1150 meters from my home. In my view, this is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on residential amenities including operational noise, visual intrusion, and expose to smoke, fumes or toxic emissions in the event of a fire or thermal runaway.

2. **Noise pollution and vibrations:** BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. At approximately 1150 meters from my home, this noise has the potential to affect the existing rural quietness and my family's quality of life. My family and I rely on the peace and quiet of our homes to rest, recover, and enjoy a safe and healthy living environment. I am concerned that ongoing industrial noise and vibration from the proposed facility would unreasonably interfere with that amenity.

3. **Fire and safety risks:** Lithium-ion batteries installations carry inherent risks, including thermal runaway, fire explosion, toxic off – gassing, and contaminated runoff. Given the site's proximity to my home, I am concerned that the proposed setback may be insufficient to protect nearby residents from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical incident. The shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4. **Visual impact:** A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries associated and electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5. **Ongoing heavy vehicle traffic, road safety, and road degradation:** The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie – Changerup road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency services and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

6. **Property value and marketability**: The proximity of the large- scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchases may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety concerns, and changed to the rural character of the area.

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that significantly greater setback distances, stricter noise limits, and comprehensive fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

Sincerely,



17/7/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email: council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No, 3680) Collie – Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road.

My home is located approximately 980 meters (as the crow flies) from the boundary of the proposed BESS site.

As a nearby resident, I am deeply concerned about the impacts of this industrial development on my property, my family's health, and the surrounding area.

My objections are based on the following material planning considerations:

1. **Inadequate buffer distances:** The proposed facility would be approximately 980 meters from my home. In my view, this is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on residential amenities including operational noise, visual intrusion, and expose to smoke, fumes or toxic emissions in the event of a fire or thermal runaway.

2. **Noise pollution and vibrations:** BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. At approximately 980 meters from my home, this noise has the potential to affect the existing rural quietness and my family's quality of life. My family and I rely on the peace and quiet of our homes to rest, recover, and enjoy a safe and healthy living environment. I am concerned that ongoing industrial noise and vibration from the proposed facility would unreasonably interfere with that amenity.

3. **Fire and safety risks:** Lithium-ion batteries installations carry inherent risks, including thermal runaway, fire explosion, toxic off – gassing, and contaminated runoff. Given the site's proximity to my home, I am concerned that the proposed setback may be insufficient to protect nearby residents from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical incident. The shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4. **Visual impact:** A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries associated and electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5. **Ongoing heavy vehicle traffic, road safety, and road degradation:** The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie – Changerup road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency services and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

6. **Property value and marketability**: The proximity of the large- scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchases may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety concerns, and changed to the rural character of the area.

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that significantly greater setback distances, stricter noise limits, and comprehensive fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

Sincerely,



17/7/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email: council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No, 3680) Collie – Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road.

My home is located approximately 1300 meters (as the crow flies) from the boundary of the proposed BESS site.

As a nearby resident, I am deeply concerned about the impacts of this industrial development on my property, my family's health, and the surrounding area.

My objections are based on the following material planning considerations:

1. **Inadequate buffer distances:** The proposed facility would be approximately 1300 meters from my home. In my view, this is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on residential amenities including operational noise, visual intrusion, and expose to smoke, fumes or toxic emissions in the event of a fire or thermal runaway.

2. **Noise pollution and vibrations:** BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. At approximately 1300 meters from my home, this noise has the potential to affect the existing rural quietness and my family's quality of life. My family and I rely on the peace and quiet of our homes to rest, recover, and enjoy a safe and healthy living environment. I am concerned that ongoing industrial noise and vibration from the proposed facility would unreasonably interfere with that amenity.

3. **Fire and safety risks:** Lithium-ion batteries installations carry inherent risks, including thermal runaway, fire explosion, toxic off – gassing, and contaminated runoff. Given the site's proximity to my home, I am concerned that the proposed setback may be insufficient to protect nearby residents from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical incident. The shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4. **Visual impact:** A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries associated and electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5. **Ongoing heavy vehicle traffic, road safety, and road degradation:** The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie – Changerup road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency services and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

6. **Property value and marketability**: The proximity of the large- scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchases may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety concerns, and changed to the rural character of the area.

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that significantly greater setback distances, stricter noise limits, and comprehensive fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

Sincerely,



17/7/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email: council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No, 3680) Collie – Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road.

My home is located approximately 1030 meters (as the crow flies) from the boundary of the proposed BESS site.

As a nearby resident, I am deeply concerned about the impacts of this industrial development on my property, my family's health, and the surrounding area.

My objections are based on the following material planning considerations:

1. **Inadequate buffer distances:** The proposed facility would be approximately 1030 meters from my home. In my view, this is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on residential amenities including operational noise, visual intrusion, and expose to smoke, fumes or toxic emissions in the event of a fire or thermal runaway.

2. **Noise pollution and vibrations:** BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. At approximately 1030 meters from my home, this noise has the potential to affect the existing rural quietness and my family's quality of life. My family and I rely on the peace and quiet of our homes to rest, recover, and enjoy a safe and healthy living environment. I am concerned that ongoing industrial noise and vibration from the proposed facility would unreasonably interfere with that amenity.

3. **Fire and safety risks:** Lithium-ion batteries installations carry inherent risks, including thermal runaway, fire explosion, toxic off – gassing, and contaminated runoff. Given the site's proximity to my home, I am concerned that the proposed setback may be insufficient to protect nearby residents from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical incident. The shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4. **Visual impact:** A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries associated and electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5. **Ongoing heavy vehicle traffic, road safety, and road degradation:** The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie – Changerup road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency services and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

6. **Property value and marketability**: The proximity of the large- scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchases may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety concerns, and changed to the rural character of the area.

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that significantly greater setback distances, stricter noise limits, and comprehensive fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

Sincerely,

[redacted]

17/7/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email: council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No, 3680) Collie – Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road.

My home is located approximately 1020 meters (as the crow flies) from the boundary of the proposed BESS site.

As a nearby resident, I am deeply concerned about the impacts of this industrial development on my property, my family's health, and the surrounding area.

My objections are based on the following material planning considerations:

1. **Inadequate buffer distances:** The proposed facility would be approximately 1020 meters from my home. In my view, this is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on residential amenities including operational noise, visual intrusion, and expose to smoke, fumes or toxic emissions in the event of a fire or thermal runaway.

2. **Noise pollution and vibrations:** BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. At approximately 1020 meters from my home, this noise has the potential to affect the existing rural quietness and my family's quality of life. My family and I rely on the peace and quiet of our homes to rest, recover, and enjoy a safe and healthy living environment. I am concerned that ongoing industrial noise and vibration from the proposed facility would unreasonably interfere with that amenity.

3. **Fire and safety risks:** Lithium-ion batteries installations carry inherent risks, including thermal runaway, fire explosion, toxic off – gassing, and contaminated runoff. Given the site's proximity to my home, I am concerned that the proposed setback may be insufficient to protect nearby residents from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical incident. The shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4. **Visual impact:** A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries associated and electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5. **Ongoing heavy vehicle traffic, road safety, and road degradation:** The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie – Changerup road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency services and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

6. **Property value and marketability**: The proximity of the large- scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchases may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety concerns, and changed to the rural character of the area.

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that significantly greater setback distances, stricter noise limits, and comprehensive fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

Sincerely,



17/7/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email: council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No, 3680) Collie – Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road.

My home is located approximately 1600 meters (as the crow flies) from the boundary of the proposed BESS site.

As a nearby resident, I am deeply concerned about the impacts of this industrial development on my property, my family's health, and the surrounding area.

My objections are based on the following material planning considerations:

1. **Inadequate buffer distances:** The proposed facility would be approximately 1600 meters from my home. In my view, this is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on residential amenities including operational noise, visual intrusion, and expose to smoke, fumes or toxic emissions in the event of a fire or thermal runaway.

2. **Noise pollution and vibrations:** BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. At approximately 1600 meters from my home, this noise has the potential to affect the existing rural quietness and my family's quality of life. My family and I rely on the peace and quiet of our homes to rest, recover, and enjoy a safe and healthy living environment. I am concerned that ongoing industrial noise and vibration from the proposed facility would unreasonably interfere with that amenity.

3. **Fire and safety risks:** Lithium-ion batteries installations carry inherent risks, including thermal runaway, fire explosion, toxic off – gassing, and contaminated runoff. Given the site's proximity to my home, I am concerned that the proposed setback may be insufficient to protect nearby residents from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical incident. The shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4. **Visual impact:** A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries associated and electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5. **Ongoing heavy vehicle traffic, road safety, and road degradation:** The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie – Changerup road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency services and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

6. **Property value and marketability**: The proximity of the large- scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchases may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety concerns, and changed to the rural character of the area.

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that the significantly greater setback distance, stricter noise limits, and comprehend fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

Sincerely,



17/7/2026

Chief Executive Officer

Shire of Kojonup

PO Box 163

Kojonup WA 6395

Email: council@kojonup.wa.gov.au

Subject: Objection to Development Application – Proposed Kojonup BESS, Lot 3194 (No, 3680) Collie – Changerup Road.

Dear Mr. Thompson and Councillors,

I am writing to formally object to the Development Application submitted by Mint Renewables PTY LTD for the proposed Battery Energy Storage System (BESS) located at Lot 3194, Collie-Changerup Road.

My home is located approximately 2060 meters (as the crow flies) from the boundary of the proposed BESS site.

As a nearby resident, I am deeply concerned about the impacts of this industrial development on my property, my family's health, and the surrounding area.

My objections are based on the following material planning considerations:

1. **Inadequate buffer distances:** The proposed facility would be approximately 2060 meters from my home. In my view, this is an inadequate setback for a major industrial battery installation of this scale. Its proximity raises serious concerns about impacts on residential amenities including operational noise, visual intrusion, and expose to smoke, fumes or toxic emissions in the event of a fire or thermal runaway.

2. **Noise pollution and vibrations:** BESS facilities commonly rely on continuous cooling systems, inverters, and HVAC equipment, which can produce persistent operational noise. At approximately 2060 meters from my home, this noise has the potential to affect the existing rural quietness and my family's quality of life. My family and I rely on the peace and quiet of our homes to rest, recover, and enjoy a safe and healthy living environment. I am concerned that ongoing industrial noise and vibration from the proposed facility would unreasonably interfere with that amenity.

3. **Fire and safety risks:** Lithium-ion batteries installations carry inherent risks, including thermal runaway, fire explosion, toxic off – gassing, and contaminated runoff. Given the site's proximity to my home, I am concerned that the proposed setback may be insufficient to protect nearby residents from smoke, fumes, toxic emissions such as hydrogen fluoride, or potential evacuation impacts. I am also concerned that the site will be unmanned and operated remotely, which may delay early detection and response in the event of a critical incident. The shire should consider the adequacy of emergency response protocols, evacuation planning, toxic runoff management, and the capacity of local volunteer fire services to manage a hazardous industrial fire.

4. **Visual impact:** A BESS of this scale would introduce a significant industrial presence into the existing rural landscape. The height, reflective materials, and large-scale footprint of up to four hectares of batteries associated and electrical equipment would detract from the area's natural character and visual amenity. In an agricultural and rural setting, this development would have an unacceptable visual impact on the surrounding community.

5. **Ongoing heavy vehicle traffic, road safety, and road degradation:** The traffic impact of this proposal should not be treated as a temporary construction issue. A facility of this nature would require heavy vehicle access for construction, servicing, equipment replacement, emergency response, and ongoing maintenance over its operating life. Collie – Changerup road and surrounding rural routes are not designed for frequent heavy axle loads or oversized movements, and increased use by heavy vehicles is likely to accelerate pavement failure, shoulder damage, rutting and pothole formation. These defects would create direct safety risks for residents, school traffic, farm machinery, emergency services and everyday passenger vehicles using narrow rural roads. The burden of repairing damage caused by a private industrial development should not fall on local ratepayers. Before any approval is contemplated, the applicant should be required to provide a detailed traffic impact assessment, confirm that all proposed heavy vehicle routes are suitable and approved for such use, and enter enforceable road maintenance, upgrade, and cost-recovery arrangements with the Shire.

6. **Property value and marketability**: The proximity of the large- scale industrial facility has the potential to adversely affect local property values and reduce the marketability of nearby rural residential properties. Prospective purchases may be deterred by perceived or actual impacts associated with noise, visual intrusion, fire risk, health and safety concerns, and changed to the rural character of the area.

I respectfully request that the Shire of Kojonup and the Regional Development Assessment Panel refuse this application. In the alternative, should the application be considered for approval, I request that the significantly greater setback distance, stricter noise limits, and comprehend fire safety and emergency response requirements be imposed as conditions of approval.

Please keep me informed of this application's progress, including any council or assessment panel meetings where the proposal will be considered.

[redacted]

RECEIVED
21 JUL 2026
SHIRE OF KOJONUP

Chief Executive Officer and Councillors
Shire of Kojonup

Subject: Concerns Regarding the Proposed 4-Hectare Battery Energy Storage System (BESS) in Kojonup

Dear Chief Executive Officer and Councillors,

I am writing to express my concerns regarding the proposed 4-hectare Battery Energy Storage System (BESS) development in Kojonup.

Any large-scale infrastructure is appropriately located and designed to protect the wellbeing, safety, and amenity of nearby residents.

My primary concerns are as follows:

Noise Impacts

Battery energy storage facilities rely on cooling systems, transformers, and other electrical equipment that can generate continuous operational noise. I am concerned that this noise, particularly during evening and night-time hours, could adversely affect nearby residents' quality of life. I request that independent acoustic modelling be undertaken and made publicly available, demonstrating compliance with all applicable noise standards under worst-case operating conditions.

Fire Risk and Emergency Response

Battery fires can be difficult to extinguish and may burn for extended periods. Such incidents can produce toxic smoke and require specialised emergency response procedures. Given the proposed site's proximity to residential properties, I am concerned about the potential risks to public safety and the capacity of local emergency services to respond effectively. I request that detailed fire risk assessments, emergency management plans, and consultation with the relevant fire authorities be completed before any approval is granted.

Proximity to Residential Properties

The proposed location appears to be close to existing homes. I believe greater consideration should be given to establishing adequate separation distances between the facility and residential areas. Residents should not be subjected to avoidable impacts relating to noise, safety concerns, visual amenity, or reduced enjoyment of their properties.

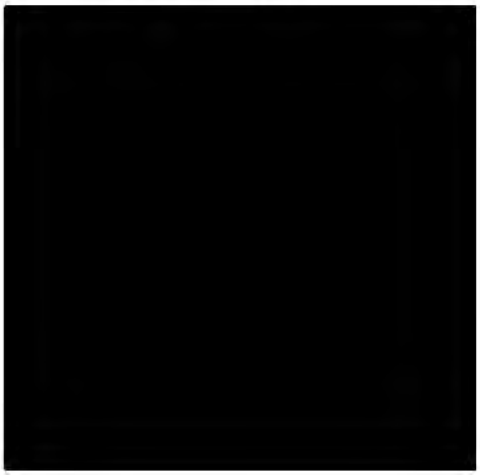
Planning and Community Consultation

I encourage the Shire to ensure that the assessment process is transparent and that the community is provided with clear information regarding potential environmental, health, and safety impacts. Residents should have a genuine opportunity to review technical reports and have their concerns properly considered before any final decision is made.

In light of these concerns, I request that the Shire carefully considers whether the proposed site is appropriate and whether additional conditions, greater setbacks, or an alternative location should be required to minimise impacts on nearby residents.

Thank you for considering my submission. I appreciate the opportunity to provide feedback and trust that the Shire will give due consideration to the concerns of local residents when assessing this proposal.

Yours sincerely,



Schedule of Submissions (Agencies)

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
1. 22/06/2026	Department of Mines, Petroleum and Exploration (DMPE)	DMPE lodges no objections to the DA. The Department of Mines, Petroleum and Exploration (DMPE) has determined that this proposal raises no significant issues with respect to mineral and petroleum resources, geothermal energy, and basic raw materials.	Mint Renewables (Mint) notes DMPE's position and notes no objections.	No implication or change required.
2. 25/06/2026	Main Roads Western Australia (MRWA)	<u>Position</u> Main Roads advises that it has no preliminary objection to the proposed development. The agency acknowledges the submitted Transport Impact Assessment (TIA) (Flyt, 2026) and notes that the anticipated impacts on the road network are minor. <u>Responsibility</u> Main Roads reiterates its standard position that where development impacts the road network, any required upgrades or mitigation measures are to be delivered by the developer under the "user pays" principle supported by the Western Australian Planning Commission. The TIA incorrectly identifies Main Roads as being responsible for installation of advance warning signage. It is clarified that the provision and maintenance of advance warning signs on Local Government roads is not a Main Roads responsibility. Main Roads notes that: • A TIA was prepared and submitted.	<u>Position</u> Mint notes that Main Roads raises no objection to the proposal and generally accepts the findings of the TIA (Flyt, 2026). Transport-related matters will continue to be addressed through detailed design and construction planning. <u>Responsibility</u> Mint acknowledges this position, and any road upgrades or transport-related works required as a result of the Project will be addressed through the Project delivery process where applicable, in accordance with the "user pays" principle. Mint acknowledges the correction of responsibility and notes that the provision and maintenance of advance warning signs on Local Government roads is not a Main Roads responsibility. Mint acknowledges advance warning signage, where required, will be a matter for the Shire of Kojonup rather than Main Roads	Include conditions and advice notes in the development approval.

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		• The TIA concludes the Project will have a minor impact on the surrounding road network. • The TIA correctly identifies that Collie-Changerup Road and Tunney Road are under the management of the Shire of Kojonup.	WA, and will coordinate with the Shire on this during detailed design	
		<u>Road alignment</u> It is noted that the current road formation does not fully align with the formal road reserve due to previous realignment works undertaken by the Shire.	<u>Road alignment</u> Mint acknowledges Main Roads' comment and notes this is consistent with the TIA, which identifies that Collie-Changerup Road has previously been realigned by the Shire and the carriageway now sits partly outside the gazetted road reserve. This is a pre-existing legacy matter unrelated to the Project's access design, which has been developed having regard to the current, on-ground road formation.	There is a separate need to dedicate the Collie-Changerup Road reserve to reflect on-the-ground construction. To be addressed via advice note.
		<u>Main Access</u> Main Roads advises that where a development has access to a lower-order road, the preferred approach is generally to locate the primary access on that lower-order road to: • Improve road safety. • Improve network efficiency. • Reduce impacts on higher-speed and higher-volume roads. Main Roads suggests that:	<u>Main Access</u> Mint have considered the suggestion regarding the relocation of the main access to Tunney Road – minimising new access onto a high-speed road and take the concern seriously. However, Mint would like to retain the proposed arrangement (Main Access on Collie-Changerup Road, Secondary Access on Tunney Road) for the following reasons:	The Local Government raises no objection to the main crossover from Collie-Changerup Road. Following construction, there will be low traffic generation to the BESS.

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		• Tunney Road may be better suited as the primary access. • The use of the existing Tunney Road intersection, or an upgraded intersection with Collie-Changerup Road, should be considered for construction and/or operational access. <u>Over Size Over Mass (OSOM)</u> More detailed planning for OSOM movements will be required and will require approval through Main Roads Heavy Vehicle Services.	• Tunney Road is unsealed, narrow, and rated RAV4 vs. RAV7 on Collie-Changerup Road. The Shire has indicated to Mint directly that its condition would not suit main access. • The TIA (Flyt, 2026) includes swept path analysis confirming the Collie-Changerup Road crossover safely accommodates the design vehicles for both construction and operation. • Both roads sit under the Shire's care and control, so Mint's preference is to proceed on the Shire's assessment of what it is appropriate for its network and understand that is consistent with the Shire of Kojonup's own view. Given this, Mint asks that the Shire weigh Main Roads WA's comments against the Shire's own road knowledge and confirm whether it is supportive of the access as proposed. If there is residual concern, Mint welcomes the opportunity to discuss additional traffic management measures that may be able to be implemented, rather than relocating the main access outright. <u>OSOM</u> Detailed OSOM transport planning will occur during the detailed design and construction planning phase.	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
			All required OSOM permits will be obtained prior to transport of oversized loads.	
3. 2/07/2026	Department of Water and Environmental Regulation (DWER)	<u>Position</u> The Department has identified that the proposal has the potential for impact on environment and/or water resource values and/or management. Key issues and recommendations are provided. <u>Water Sourcing Requirements</u> DWER considers that insufficient information has been provided regarding construction and operational water requirements and water sourcing. They note the DA refers to water supply for the construction compound but does not quantify demand or identify water sources. They also clarify that some groundwater abstraction scenarios may still require licensing. <u>Hydrological Assessment</u> The Hydrological Assessment (Water Technology, 2026) was reviewed and considered it fit for purpose. The modelling approach is supported, including the conservative flood blockage assumptions and conclusion that the site is not subject to riverine flooding. DWER note that some drainage infrastructure assumptions (particularly culvert	<u>Position</u> Mint notes DWER's position and provides responses to the issues and recommendations put forward. <u>Water Sourcing Requirements</u> Mint commits to preparing a Water Balance/Water Source Strategy prior to construction, in consultation with DWER. Detailed construction water demand and source arrangements will be confirmed during detailed design and construction planning. Any relevant water licensing requirements required will be sought and complied with. <u>Hydrological Assessment</u> It is acknowledged that specifications, such as culvert designs, are to be confirmed during detailed design. Prior to any ground disturbing activities, a Stormwater Management Plan will be prepared and implemented in accordance with the Hydrological Assessment (Water	Include conditions and advice notes in the development approval.

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		designs) remain to be confirmed during detailed design. <u>Construction Environmental Management Plan (CEMP)</u> DWER notes the EAR (Umwelt, 2026) already relies on a future CEMP to manage several construction-related impacts, including: • Erosion and sediment control; • Surface water management; • Water quality protection; • Acid sulfate soil risks; • Contaminated material management; • Hazardous substances storage; • Weed management; • Dust management; • Native vegetation protection. <u>Clearing Permit</u> DWER states that, based on the information provided, the proposed clearing is not exempt, and a clearing permit is required, unless assessment through the referral pathway determines otherwise. It is noted that the Environmental Noise Branch has not been requested to undertake a technical review of the Noise Assessment (Sonus, 2026).	Technology, 2026) and detailed design outcomes, to the satisfaction of the Shire. <u>Construction Environmental Management Plan (CEMP)</u> A CEMP will be prepared prior to construction, to the satisfaction of relevant authorities. The CEMP will incorporate the management measures identified in the EAR (Umwelt, 2026). Any relevant permits, such as native vegetation permits, will be sought if required, in liaison with DWER. <u>Clearing Permit</u> DWER's advice regarding native vegetation clearing permits is noted and is something the proponent is aware of. A clearing permit will be sought for the 0.09 ha identified in the EAR (Umwelt, 2026). This will be confirmed during detailed design. The exact connection configuration remains unclear and will be confirmed in consultation with Western Power during detailed design. All required clearing	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
			permits will be sought prior to undertaking any native vegetation clearing. Mint notes that the Environmental Noise Branch has not been requested to undertake a technical review. <u>Accommodation Camp</u> Mint notes that an accommodation camp is not proposed under this DA. Mint will engage with DWER on water supply/wastewater/buffer matters should one be required in the future.	
		<u>Accommodation Camp</u> DWER notes that whilst an accommodation camp is not proposed as part of this DA, should a future proposal for accommodation camp be lodged, DWER may provide advice regarding water supply, wastewater treatment, and water resource buffers.		
4. 22/07/2026	Department of Health (DoH)	<u>Position</u> No objection - with comments and/or recommended conditions States support for State Government renewable energy objectives and recognise BESS's role in improving electricity reliability and enabling renewable generation. Frames utility-scale BESS as an emerging technology with evolving regulatory guidance, requiring appropriate identification/management of public and environmental health risks through planning and operational lifecycle. Specifically flags that assessment of potential off-site public health impacts from credible emergency scenarios is relevant to compatibility of the development with its setting and surrounding land uses.	<u>Position</u> Mint notes that DoH raise no objection, providing comments and recommendations on the application. Mint notes the acknowledgement of the role utility-scale BESS play in the State Government's renewable energy objectives, and the regularly evolving regulatory environment in which utility-scale BESS operate in. Mint notes DoH's position that assessment of potential off-site public health impacts from credible emergency scenarios is relevant to compatibility of development with surrounding setting ad land uses. The Project has, according to legislation and guidelines, assessed potential impacts of the proposed development. These assessments,	Include conditions and advice notes in the development approval.

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
			submitted as part of the DA, have concluded that potential impacts can be managed appropriately without adverse impacts on the surrounding land uses and setting in which the development will reside. This includes updating the BMP to address DFES comments, as outlined in BPP's response.	
		<u>Water Supply and Wastewater Disposal</u> Notes the proposal appears to have drainage issues. Requires a site-specific Site and Soil Evaluation (SSE) by a qualified consultant, conducted during the wettest seasonal period (mid-July/August), per AS/NZS 1547:2012, to appropriately locate and size the land application area. Wastewater disposals must comply with the *Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974*. All drinking water on site must meet the health-related requirements of the Australian Drinking Water Quality Guidelines 2011. Non-drinking water must be managed so it cannot be confused with or contaminate drinking water supply, requires satisfactory labelling of non-drinking water taps and backflow prevention per AS3500 (Plumbing and Drainage), depending on system configuration.	<u>Water Supply and Wastewater Disposal</u> Should, during the detailed design phase, it be determined that the proposal requires an on-site wastewater disposal system Mint will engage with and lodge the necessary application(s) with the Shire in the first instance, acknowledging that the application may be referred to the Western Australian DoH for assessment. Mint will undertake all investigations and design activities required to ensure the on-site wastewater treatment and disposal system complies with the Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974. Drinking water quality comments are noted. Any potable water supplied on site will meet the Australian Drinking Water Quality Guidelines 2011. Regarding non-drinking water labelling/backflow prevention, this is noted. This will be addressed at detailed design in accordance with AS3500, with	

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		Public Health and Hazard Management Acknowledges application has adequately addressed routine matters (noise, traffic, drainage, visual amenity, bushfire planning). States application provides comparatively limited consideration of public health risks from credible emergency events involving utility-scale BESS. Specifically flags Lithium Iron Phosphate (LFP) battery emergency incidents may generate: • Flammable gases • Electrolyte leakage from damaged, failing, or corroding batteries • Explosions • Release of smoke and other combustion products • Recommends the Emergency Management Plan should explicitly address public health protection measures for credible battery failure scenarios, including: • Community notification • Smoke management • Emergency exclusion arrangements • Agency coordination • Public communication	appropriate tap labelling and backflow prevention specified for the O&M facility's plumbing. Public Health and Hazard Management The application's Project Description confirms onsite water storage including dedicated firefighting water supply and fire water runoff containment/stormwater detention basin is provided as part of the permanent infrastructure. The Project is not reliant on town water supply for fire response. Mint supports DoH's request for the Emergency Management Plan to explicitly address community notification, smoke management, exclusion zones, agency coordination, and public communication. Mint are happy for these requirements to be included as a condition of approval.	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		<u>Separation Distances</u> Notes the Australian Energy Council Guideline (GHD, September 2024) identifies the absence of nationally recognised default separation distances for BESS as a significant knowledge gap. In the absence of these, DoH supports application of the EPA's Separation Distances between Industrial and Sensitive Land Uses (2005) Guidance, which recommends site-specific technical assessment where there is potential for off-site impacts States that while normal-operation emissions are expected to be negligible, thermal runaway, equipment failure, or bushfire involvement could give rise to significant public health impacts beyond the site boundary Recommends that the Shire should be satisfied that sufficient technical information has been provided demonstrating the proposed separation distances appropriately protect surrounding land uses from credible off-site emergency impacts.	<u>Separation Distances</u> The Department's comments regarding separation distances are noted. There is currently no adopted Western Australian legislation, planning policy, or state guidance establishing mandatory separation distances for utility-scale BESS specific to fire or thermal runaway scenarios. The EPA's Guidance Statement 3 (2005) referenced by the Department predates grid-scale battery storage and addresses generic amenity impacts (odour, dust, noise) rather than battery-specific emergency hazard scenarios; the Department's own advice acknowledges this guidance is offered only in the absence of an established BESS-specific standard. In the absence of a WA-specific instrument, the Project has had regard to the Victorian Country Fire Authority's Design Guidelines and Model Requirements - Renewable Energy Facilities (REF Guidelines) - consistent with DFES's own referral advice, which similarly applies the REF Guidelines as the current best-practice reference for renewable energy facilities in the absence of WA guidance (see BPP's response). Rather than prescribing a fixed default separation distance, the REF Guidelines link separation distances between battery containers and other assets to supplier-	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
			specific large-scale fire test data. Where product-specific test data supports a reduced separation distance, that distance may be applied; where no such data is available, a conservative default distance is adopted instead. This approach is consistent with how comparable BESS developments in Western Australia have addressed separation distance. As set out in the DA, the Project will be constructed using a BESS supplier and battery chemistry to be selected following key planning approvals. This is standard industry practice for utility-scale BESS in Australia and reflects the reality that the specific technical data needed to confirm appropriate separation distances, including large-scale fire test results, thermal runaway behaviour, and off-gas composition - is supplier-specific and cannot be meaningfully assessed in the abstract ahead of that selection. Consistent with standard practice for this class of development, and as set out above, a detailed Risk Management Plan incorporating this supplier-specific test data and confirming appropriate separation distances on that basis will be provided prior to construction, as a condition of approval and in consultation with DFES.	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		<u>Ongoing Agency Consultation</u> Recommends continued consultation with: • Department of Fire and Emergency Services (DFES) • Department of Local Government, Industry Regulation and Safety - Building and Energy Division (Dangerous Goods) • Department of Energy and Economic Diversification - Energy Policy WA • Department of Water and Environmental Regulation (DWER) The purpose being to ensure emergency response planning and risk management arrangements are appropriately coordinated across agencies.	<u>Ongoing Agency Consultation</u> Noted and accepted. Consultation will continue with DFES, the Department of Local Government, Industry Regulation and Safety (Building and Energy Division - Dangerous Goods), the Department of Energy and Economic Diversification (Energy Policy WA), and the Department of Water and Environmental Regulation.	
5. 27/07/2026	Department of Fire and Emergency Services (DFES)	<u>General Comment</u> **Recommendation:** Compliance with acceptable solutions not demonstrated. Suggest modifications required. DFES acknowledges that the site is currently vacant and confirms Project details. Notes that the current version of SPP 3.7 and the Guidelines no longer refers to 'high risk land use'. Confirms referral to DFES is discretionary. DFES states the BMP has not demonstrated compliance with the Element 2: Siting and Design requirements of SPP 3.7 and the Guidelines, and recommends the BMP be modified per the assessment advice in Tables 1–3 to ensure bushfire risk mitigation measures	<u>General Comment</u> Mint notes DFES's recommendations and has engaged Bushfire Prone Planning (BPP), the Project's bushfire consultant, to respond to each item raised. BPP's detailed response (Ref: 241243, 17 August 2026) is provided as a supporting document to this Schedule (in a separate document) and should be read in conjunction with this entry.	Include conditions and advice notes in the development approval.

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		are accurate and can be effectively implemented in perpetuity. DFES states that SPP 3.7 and the Guidelines do not adequately address high risk and use such as renewable energy facilities from an HMA perspective. Given the temperature sensitive nature of the infrastructure, DFES note it is critical to ensure the proposed design adequately responds to facility fire and bushfire risks to protect life, property and infrastructure. DFES notes that they have assessed the application against *CFA Design Guidelines and Model Requirements – Renewable Energy Facilities* as amended (REF Guidelines). DFES acknowledge submission of Bushfire Risk Report as part of the application. DFES state that REF guidelines require the submission of a Risk Management Report which informs fire risk in design and operation of the facility. It is stated that bushfire risk should be covered by the BMP. An additional Bushfire Risk Report (BRR) does not appear to add any value to the proposal. DFES states that the BMP has not demonstrated that the proposed development complies with the Element 2: Siting and Design requirements of SPP 3.7 and the Guidelines. DFES recommends the BMP be modified as per the Assessment advice to ensure it is accurate and bushfire risk management/mitigation measures are effective and can be implemented in perpetuity to manage/mitigate the bushfire risk to people, property and infrastructure to an acceptable level and appropriate to the land use		

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		and location. Specificities of comments are provided in Table 1-3 at the end of DFES submission, summarised below. <u>Table 1 - Vegetation Classification</u> **Areas 3 and 4** (Class B Woodland vs Class A Forest). DFES states foliage cover appears to exceed 30%, suggesting Class A Forest rather than Class B Woodland based on the limited information/photographic evidence provided. DFES confirms this would not affect the BAL rating - flagged for accuracy only. **Area 5** (Class D Scrub). DFES states this area is not labelled on the vegetation classification map at all; BMP states trees up to 30m height, exceeding AS 3959's 6m maximum for Scrub. BAL rating cannot be validated without further evidence. **Area 8** (screening vegetation). DFES notes the same height/classification issue (30m trees vs 6m Scrub maximum). States this is post-development screening vegetation, with no species confirmed to substantiate Class D Scrub at maturity (Method 2 relies on this classification holding). Also notes report is internally inconsistent on slope: 0° per Figure 2.1.1/Table 3.2 vs 5° per Section A1.2. DFES concludes BAL rating cannot be validated. **Method 2** - DFES state this method cannot be validated, directly flowing from the Area 8 issues above. States separation distances would be inaccurate if slope is actually 5°, and outputs	<u>Vegetation Classification (Table 1)</u> BPP has provided technical justification addressing the classification of Vegetation Areas 3, 4, 5 and 8, including correction of an identified slope inconsistency. The updated BMP will incorporate this justification, along with an explicit label for Area 5 on the vegetation classification map. Refer to BPP's separate response for full technical detail. <u>Method 2 (Table 1)</u> Method 2 outputs will be confirmed once the vegetation classification and slope corrections above are accepted and	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		rely on the unconfirmed Class D Scrub classification holding in perpetuity. <u>Table 2 — Siting and Design</u> DFES state BAL ratings are unvalidated per Table 1. Notes an additional plan inconsistency: BMP shows a grey unvegetated hardstand around the facility extending to the screening vegetation, but development plans do not show this hardstand/paved area. DFES states if grassland vegetation remains within that area instead, it should be factored into Method 2. Suggests modification required. <u>Table 3 – DFES role as Hazard Management Authority</u> **Emergency Management Plan** – DFES state that given the "high-risk land use," recommends an EMP be prepared having regard to the WAPC's Bushfire Emergency Plan Manual and Section 7 of the REF Guidelines, to ensure appropriate content when finalised to the Shire of Kojonup's satisfaction. **Risk Management Plan** – DFES states the submitted Bushfire Risk Report does not meet requirements of REF Guidelines. DFES considers a detailed RMP a critical requirement, addressing all site risks (not just bushfire), including:	incorporated into the updated BMP. Refer to BPP's response for detail. <u>Siting and Design / APZ (Table 2)</u> The BMP will be updated to clarify the Asset Protection Zone (APZ) extent, confirming all land between designated assets and the landscape screening will be maintained as an APZ. Refer to BPP's response for detail. <u>Emergency Management Plan</u> Noted and accepted. An EMP will be prepared having regard to the WAPC's Bushfire Emergency Plan Manual and Section 7 of the REF Guidelines, finalised to the Shire's satisfaction. <u>Risk Management Plan</u> Mint acknowledges DFES's request for a detailed Risk Management Plan addressing the model requirements listed. Consistent with standard industry practice for BESS developments, several of these elements are supplier-specific and cannot be finalised until a BESS supplier is	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
		• Site plans (access points, roads, battery containers, substations, buildings, fire water supplies) • Exact battery chemistry, specifications and technical data sheets • Fire/smoke/heat/toxic off-gassing detection system, specifying internal-response vs. 000-call triggers • Explosion prevention/venting system • Battery management/monitoring system, including thermal runaway intervention capability • Water ingress prevention system and container IP rating • Warning/alarm system, specifying the meaning of each signal <u>Consultation</u> DFES recommends DFES District Officer and local fire/emergency services be consulted through development, construction and commissioning, given implications for crew safety and optimal water supply numbers/locations. <u>DFES Bushfire Technical Services / Land Use Planning</u> Action required, per Method 2 comments in Table 1. DFES states proponent remains responsible for all other required approvals.	selected following planning approval. A detailed Risk Management Plan addressing each of DFES's model requirements will be provided prior to construction, as a condition of approval, in consultation with DFES. Refer to BPP's response (Table 3) for further detail on the basis for this approach. <u>Consultation</u> Noted and accepted. The Proponent will consult with the local DFES District Officer and local fire and emergency services through development, construction, and prior to commissioning. <u>DFES Bushfire Technical Services / Land Use Planning</u> Mint acknowledges responsibility regarding other required approvals. These changes will be reflected and confirmed through design plans, prepared to the	

Date Submission Received	Respondent	Summary of Respondent's Submission	Proponent's Response to Submission	Shire Recommendation
			satisfaction of the Shire, prior to construction.	

Estelle Lottering

From: Environmental Health Officer
Sent: Thursday, 13 August 2026 11:33 AM
To: Steve Thompson
Cc: Estelle Lottering
Subject: RE: Mint Battery Energy Storage System - Shire of Kojonup

Hey Steve,

From the acoustic report, would it be possible to have conditions:

1. Within 6 months of approval being granted, prepare a noise monitoring plan to the satisfaction of the Shire on advice from the Department of Water Environmental Regulation (DWER). The noise monitoring plan is to address / have regard to the following:
   a) Selection of at least 2 monitoring locations representative of the nearest noise sensitive receiver (distance from source, ground cover, etc.)
   b) assess the operation of the Battery Energy Storage System under worst-case operating conditions, including periods where battery cooling systems, ventilation systems and associated fans are operating at maximum or near maximum capacity;
   c) include monitoring during summer or other meteorological conditions that are conducive to the operation of cooling systems during the night-time period;
   d) **specifically verify the acoustic modelling assumptions relating to the operation of battery cooling and ventilation systems during night-time periods, including summer conditions where cooling demand is expected to be greatest;**
   e) assess compliance with the *Environmental Protection (Noise) Regulations 1997* (as amended); and
2. provide a report to the local government detailing:
   a. the operating status of the facility at the time of monitoring;
   b. the operational status and utilisation of all cooling, ventilation and fan systems;
   c. prevailing meteorological conditions during the monitoring events;
   d. measured noise levels and applicable assigned levels;
   e. an assessment of compliance with the *Environmental Protection (Noise) Regulations 1997*; and
   f. any mitigation measures required to achieve compliance where non-compliance is identified.
   g. *Comparison of broadband and spectral measured noise levels against predicted levels at the monitoring locations. and*

3. Within 12 months of the noise monitoring plan being approved by the Shire, implement the plan.

Not totally across the DAP process….

Cheers,
Paul C.

From: Steve Thompson <steve@edgeplanning.com.au>
Sent: Wednesday, 12 August 2026 9:00 AM
To: Environmental Health Officer <eho@kojonup.wa.gov.au>
Cc: Estelle Lottering <estelle.lottering@kojonup.wa.gov.au>
Subject: RE: Mint Battery Energy Storage System - Shire of Kojonup

Thanks Paul for the helpful advice.

Regards

Steve

From: Environmental Health Officer <eho@kojonup.wa.gov.au>
Sent: Monday, 10 August 2026 3:25 PM
To: Steve Thompson <steve@edgeplanning.com.au>
Cc: Estelle Lottering <estelle.lottering@kojonup.wa.gov.au>
Subject: Mint Battery Energy Storage System - Shire of Kojonup

Hi Steve,

Assessment of the acoustic report for the Mint Bess project.

I've sent it through to DWER also for comment, we are working on a condition for monitoring to demonstrate compliance with the Regs, lots of assumptions and one property is right on the limit of noise being received at certain times of the day.

Cheers,
Paul C.

Paul Clifton
Environmental Health Officer
SHIRE OF KOJONUP

93 Albany Highway Kojonup WA 6395 | PO Box 163 Kojonup WA 6395
Tel: 9831 2424 or 0407 332 144 | www.kojonup.wa.gov.au

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Estelle Lottering

From: Olivier Mallie <Olivier.Mallie@dwer.wa.gov.au>
Sent: Tuesday, 11 August 2026 10:17 AM
To: Environmental Health Officer
Cc: Estelle Lottering
Subject: RE: Mint Battery Energy Storage System - Shire of Kojonup

OFFICIAL

Hi Paul

I think these look great and capture what we need. But to be a bit cynical, I have seen too many of these monitoring reports that kind of miss the point and so don't necessarily trust a noise consultant to "see it through our own eyes".

So, I'm wondering whether the Shire would consider two over-arching conditions; 1. Prepare a monitoring plan (to satisfaction of Shire on advice from DWER), then 2. Implement. The conditions you have written below could be included in the first condition, for example:

1. Within XX days/months of approval being granted, prepare a noise monitoring plan to the satisfaction of the Shire on advice from DWER. The noise monitoring plan is to address / have regard to the following:
   a. *Selection of at least X monitoring locations representative of the nearest noise sensitive receiver (distance from source, ground cover, etc.)*
   b. *Your conditions…*
   xx. *Comparison of broadband and spectral measured noise levels against predicted levels at the monitoring locations*.
2. Within 12 months of the noise monitoring plan being approved by the Shire, implement the plan.

I noted the use of 'a location' in your condition a) – I'm thinking it wouldn't be too onerous to request at least 2 concurrent noise monitoring locations.

The idea is that it gives everyone an opportunity to sit down and review what will be done (choosing locations, noise loggers setup, how data will be analysed, etc.) to ensure the monitoring results are fit for purpose. It does introduce additional steps of review & approve but it shouldn't be too onerous?

Happy to discuss…

Regards

Olivier Mallié
Senior Environmental Officer (Noise)
Approvals Portfolio, Environmental Noise Branch

Department of Water and Environmental Regulation
Prime House, 8 Davidson Terrace, JOONDALUP WA 6027
Locked Bag 10, Joondalup DC, WA 6919

T: (08) 6364 6692
E: olivier.mallie@dwer.wa.gov.au | www.dwer.wa.gov.au

From: Environmental Health Officer <eho@kojonup.wa.gov.au>
Sent: Monday, 10 August 2026 14:46
To: Olivier Mallie <Olivier.Mallie@dwer.wa.gov.au>
Cc: Estelle Lottering <estelle.lottering@kojonup.wa.gov.au>
Subject: RE: Mint Battery Energy Storage System - Shire of Kojonup

Hey Olivier,

So as a condition (or maybe a suggested condition!) for this one....

Within 12 (Twelve) months of commissioning the Battery Energy Storage System, or at another time approved by the local government, the proponent shall engage a suitably qualified acoustic consultant to undertake attended noise monitoring and assessment of the facility.

The monitoring shall:
a) be undertaken at a location representative of the nearest noise-sensitive premises, or another location approved by the local government that is demonstrably representative of the nearest noise sensitive premises;
b) assess the operation of the Battery Energy Storage System under worst-case operating conditions, including periods where battery cooling systems, ventilation systems and associated fans are operating at maximum or near-maximum capacity;
c) include monitoring during summer or other meteorological conditions that are conducive to the operation of cooling systems during the night-time period;
d) **specifically verify the acoustic modelling assumptions relating to the operation of battery cooling and ventilation systems during night-time periods, including summer conditions where cooling demand is expected to be greatest;**
e) assess compliance with the *Environmental Protection (Noise) Regulations 1997* (as amended); and
f) provide a report to the local government detailing:

- the operating status of the facility at the time of monitoring;
- the operational status and utilisation of all cooling, ventilation and fan systems;
- prevailing meteorological conditions during the monitoring events;
- measured noise levels and applicable assigned levels;
- an assessment of compliance with the *Environmental Protection (Noise) Regulations 1997*; and
- any mitigation measures required to achieve compliance where non-compliance is identified.

Where the assessment identifies non-compliance with the *Environmental Protection (Noise) Regulations 1997*, the proponent shall implement the recommended mitigation measures and undertake further monitoring to demonstrate compliance, to the satisfaction of the local government

Thoughts?

Cheers,
Paul C.

Our Ref: 2026/1387

Estelle Lottering
Shire of Kojonup
estelle.lottering@kojonup.wa.gov.au

Dear Ms Lottering

LOT 3194 (3680) COLLIE-CHANGERUP ROAD, KOJONUP – RENEWABLE ENERGY FACILITY WITH BATTERY ENERGY STORAGE SYSTEM (BESS) AND SUBSTATION - DEVELOPMENT APPLICATION

I refer to your email dated 15 June 2026 regarding the submission of a Bushfire Management Plan (BMP) (Version 1.2), prepared by Bushfire Prone Planning and dated 11 May 2026, for the above proposed development. The BMP is accompanied by a Bushfire Risk Report from the proponent dated 11 May 2026 in relation to the proposal.

This advice relates to the *State Planning Policy 3.7 Bushfire* (SPP 3.7) and supporting *Planning for Bushfire Guidelines* (Guidelines), as well as DFES' role and responsibilities as Hazard Management Agency (HMA) for Fire in Western Australia.

General Comment

- DFES acknowledges that the site is currently vacant, and the proposed development proposes a renewable energy facility with a BESS (100Mw capacity) and associated substation and infrastructure.
- DFES notes that the current version of SPP 3.7 and the Guidelines no longer makes reference to 'high risk land use'. The decision maker has referred this proposal to DFES as a discretionary referral. DFES considers that SPP 3.7 and the Guidelines do not adequately address high risk land use such as renewable energy facilities from a HMA perspective. Given the temperature sensitive nature of the infrastructure, it is critical to ensure that the proposed design adequately responds to facility fire risks and bushfire risks in order to protect life, property and infrastructure.
- Accordingly, DFES has also assessed the proposal against the *CFA Design Guidelines and Model Requirements – Renewable Energy Facilities* as amended (REF Guidelines) which is currently considered best practice for the development of renewable energy facilities.
- It is noted that a Bushfire Risk Report has been provided. The REF Guidelines requires the submission of a Risk Management Report which informs fire risk in design and operation of the facility. Bushfire risk should be covered by the BMP, and it is considered that an additional Bushfire Risk Report does not appear to add any value to the proposal.

- Specific requirements of SPP 3.7 and the supporting Guidelines and the REF Guidelines are to be further addressed in the BMP as outlined in the below assessment. The assessment comments relating to the REF Guidelines have been incorporated into the below overall assessment comments for the respective issue/element.

Recommendation: Compliance with acceptable solutions not demonstrated – modifications required

DFES advises that the BMP has not demonstrated that the proposed development complies with the Element 2: Siting and Design requirements of SPP 3.7 and the Guidelines.

DFES recommends the BMP be modified as per the Assessment advice provided in Tables 1-3 to ensure it is accurate and the bushfire risk management/mitigation measures are effective and can be implemented in perpetuity to manage/mitigate the bushfire risk to people, property and infrastructure to an acceptable level and appropriate to the land use and location. The required modifications are listed in the table(s) below. Should the modified BMP affect the design of the proposal, the proposal should be amended to reflect these modifications.

Further information should also be submitted to demonstrate compliance with the Victorian Country Fire Authority REF Guidelines.

Could you please forward notification of the application determination to DFES for our records.

If you require any clarification or further information regarding the below assessment, please do not hesitate to contact Senior Land Use Planning Officer – Sasha De Brito on telephone number 9395 9703.

Yours sincerely



DESMOND ABEL
DIRECTOR LAND USE PLANNING

27 July 2026

Table 1: Assessment – Policy Measure 7.1 ii. c. Compliant Preparation of a Bushfire Attack Level (BAL) Contour Map

Vegetation Classification or Exclusions	BMP Modification Required
Classified Area 8 – not demonstrated Vegetation Area 8 cannot be substantiated as Class D Scrub. A number of inconsistencies have been identified, including: • Area 8 is a post-development vegetation classification as the vegetation will be planted to screen the facility from the surrounding road network. Section A1.2 of the BMP states that Area 8 will have trees up to 30 metres in height, however AS 3959 states a maximum height for Scrub of 6 metres. • The Landscape Visual Impact Assessment Report states that the screening vegetation '*may comprise a double row of trees and an understory shrub layer*.' No confirmation of the species has been provided to confirm the Class D Scrub classification at maturity. The Method 2 calculation relies on the vegetation around the BESS being no greater than Class D Scrub. • Figure 2.1.1 and Table 3.2 in the BMP states that Area 8 will have a site slope and effective slope of 0 degrees. However, Section A1.2 states that Area 8 will have a site slope and effective slope of 5 degrees. The BMP should detail specifically how the Class D Scrub classification was derived. If unsubstantiated, the vegetation classification should be revised to consider the vegetation as per AS 3959, or the resultant BAL ratings may be inaccurate.	**BAL Rating cannot be validated.** Further evidence to support the vegetation classification of Area 8 is required.
Classified Area 5 – not demonstrated Vegetation Area 5 cannot be substantiated as Class D Scrub. A number of inconsistencies have been identified, including: • Area 5 is not labelled on the vegetation classification map. • Section A1.2 of the BMP states that Area 5 will have trees up to 30 metres in height, however AS 3959 states a maximum height for Scrub of 6 metres. The BMP should detail specifically how the Class D Scrub classification was derived. If unsubstantiated, the vegetation classification should be revised to consider the vegetation as per AS 3959, or the resultant BAL ratings may be inaccurate.	**BAL Rating cannot be validated.** Further evidence to support the vegetation classification of Area 5 is required.
Classified Areas 3 and 4 – not demonstrated	**BMP to be modified for accuracy purposes only.**

Vegetation Areas 3 and 4 cannot be substantiated as Class B Woodland with the limited information and photographic evidence provided. The foliage cover appears to exceed 30%. The BMP should detail specifically how the Class B Woodland classification was derived as opposed to Class A Forest. If unsubstantiated, the vegetation classification should be revised to consider the vegetation as per AS 3959. It is acknowledged the classification of these Areas as Class A Forest is for accuracy purposes only and would not impact the BAL rating for the facility.	Further evidence to support the vegetation classification of Areas 3 and 4 is required.
SPP 3.7 Appendix A - Bushfire Assessment Methodologies	**BMP Modification Required**
Method 2 Due to the inconsistencies identified with vegetation Area 8 the Method 2 cannot be validated. The separation distances provided in the Method 2 calculation for Area 8 would be inaccurate if the site slope is 5 degrees. In addition, the species and management of the screening vegetation is not provided and may constitute a Class A Forest rather than Class D Scrub classification if not managed in perpetuity. Accordingly, DFES considers that the Method 2 outputs cannot be validated.	**BAL Rating cannot be validated.** Method 2 outputs cannot be validated.

Table 2: Policy Measure 7.1 ii. e. Compliance with the Bushfire Protection Criteria 7: Development – Commercial and Industrial

Element	Assessment	Action
Siting and Design	**A2.1a – not demonstrated** The BAL ratings cannot be validated for the reason(s) outlined in Table 1. Furthermore, the development plans appear to be inconsistent with the plan shown in the BMP. The BMP shows a grey unvegetated hardstand around the facility which meets the screening vegetation. The development plans do not show this hardstand/ paved area. If there is grassland vegetation remaining inside the screening area, it should be considered in the Method 2 calculation.	**BAL Rating cannot be validated.** Modification to the BMP is required to address the Assessment advice in Table 1.

Table 3: Policy Measure 7.1 iv. and Section 9.4.2 of the Guidelines: DFES Role as Hazard Management Agency (HMA)

DFES wishes to provide the below additional advice in its role and responsibilities of HMA for Fire in Western Australia.

Emergency Management Plan (EMP)		**Action**
Emergency Management Plan (EMP)	Given the high-risk land use at this location, it is considered appropriate that an 'Emergency Management Plan' be prepared. Consideration should be given to the Bushfire Emergency Plan (BEP) Manual (as published by the Western Australian Planning Commission), Section 7 of the REF Guidelines. These contain details of information that should be included in an EMP and will ensure the appropriate content is detailed when finalising the EMP to the satisfaction of the Shire.	**Comment only.**
Renewable Energy Facilities		**Action**
Risk Management Plan	It is noted that a Bushfire Risk Report has been provided, however, as per the REF Guidelines, a Risk Management Plan (RMP) should describe the risk management process and its outcomes, including the specific site hazards/risks and their analysis, control measures, and the monitoring and review process for all site risks, not just bushfire. A RMP is considered to be a critical requirement of planning and informing fire risk management in the design and operation of renewable energy facilities. An appropriate RMP for the proposal has not been provided. A detailed RMP should be provided that demonstrates compliance with the REF Guidelines, including addressing the following model requirements of the REF Guidelines: • Detailed site plans showing the location of site vehicle access points, internal roads, battery containers, substations, buildings and fire water supplies. • The exact specifications of the elements within the renewable energy facility, such as the battery chemistry, relevant specifications and technical data sheets on the BESS facility. • Details of the fire, smoke, heat, and toxic off-gassing detection system for the BESS facility. The system should specify what triggers an internal operator response and what triggers a 000 call. • Details of the explosion prevention and venting system for the BESS facility. • Details of the battery management and monitoring system. The system should enable the operator to intervene for the prevention of thermal runaway. • Details of the system to prevent water ingress to battery containers and appropriate ingress protection rating for containers.	**A detailed Risk Management Plan is required to be provided.**

	• Details of the warning and alarm system within battery containers and/or the facility. The system should specify what each alarm signal means.	
Consultation	In the event that an approval is granted, the DFES District Officer responsible for this region and the local fire and emergency services should be consulted during the development, construction, and leading up to the commissioning of the facility. It is considered critical for the local fire and emergency services to understand the hazards present in the facility and the measures required to ensure the safety of firefighting personnel when working in or around different parts of the facility. This may impact on how crews respond to a fire within the facility, which may in turn have ramifications regarding the optimal number and location of water supplies.	**Comment only.**
DFES Other Technical Advice		**Action**
DFES Bushfire Technical Services	See Table 1 for Method 2 comments.	**Modification to the BMP is required to address the Assessment advice.**
DFES Land Use Planning	It is the responsibility of the proponent to ensure the proposal complies with relevant planning and building requirements. This advice does not exempt the applicant/proponent from obtaining approvals that apply to the proposal including planning, building, environmental health or any other approvals required by a relevant authority under written laws.	**Comment only.**

Estelle Lottering

From: Shire of Kojonup Council
Sent: Thursday, 2 July 2026 4:19 PM
To: Estelle Lottering; Steve Thompson
Subject: FW: Main Roads Comments Proposed Kojonup Battery Energy Storage System - Lot 3194 Collie-Changerup Road - Shire of Kojonup
Attachments: Appendix_C_EAR_Transport_Impact_Assessment_April_2026.pdf

Este

FYI please record and act accordingly for the RAR

Regards

Grant Thompson
Chief Executive Officer
SHIRE OF KOJONUP

93 Albany Highway Kojonup WA 6395 | PO Box 163 Kojonup WA 6395

Tel: 9831 2400 | Mob: 0419 903 363 | Fax: 9831 1566 | www.kojonup.wa.gov.au

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From: WEB Great Southern Region <gsreg@mainroads.wa.gov.au>
Sent: Thursday, 25 June 2026 3:25 PM
To: Shire of Kojonup Council <council@kojonup.wa.gov.au>
Subject: Main Roads Comments Proposed Kojonup Battery Energy Storage System - Lot 3194 Collie-Changerup Road - Shire of Kojonup

OFFICIAL

Dear Grant

RE: PROPOSED KOJONUP BATTERY ENERGY STORAGE SYSTEM – LOT 3194 (N0. 3680) COLLIE CHANGERUP ROAD KOJONUP

I refer to your letter dated 15 June 2026 seeking Main Roads comment concerning the application to develop a battery energy storage device system (BESS) on rural property within the Shire of Kojonup.

Thank you for providing Main Roads with the opportunity to comment on the proposed development and its possible impact on the State classified road network, Main Roads raises no preliminary objection to this proposed development.

I can offer the following preliminary comments:

- Main Roads ensures that where development may affect the Main Roads managed road network and its road reserves that these effects are to be addressed by the developer as part of the development process. This is in line with the user pays policy now supported by Western Australian Planning Commission.

- The applicant has submitted a Transport Impact Assessment (TIA) which concludes these works are anticipated to have a minor impact on the Main Roads managed road network.

- The TIA correctly identifies the adjacent roads to the project site are the Collie-Changerup and Tunney Roads as being managed by the Shire of Kojonup, I note the current road formation here is not yet formalised on the current road alignment due to previous realignment works by the Shire.

- The TIA incorrectly identifies Main Roads being responsible for the installation of Warning Signage on approach to the project site on these roads, the provision and maintenance of Advance Warning Signs on Local Government Roads is not a Main Roads responsibility.

- The TIA identifies two proposed access locations to the project site, the Main Access off the Collie – Changerup Rd and a Secondary Access off the Tunney Rd. Main Roads considers where development has access to a secondary road that the development should have its Main Access point on the lower classification road, if possible. This strategy has road safety and network efficiency benefits on the higher classification and higher speed/trafficked road. In this instance Tunney Rd may be better suited as the Main Access to the facility, utilising the existing intersection infrastructure/or an upgraded intersection of Tunney Rd with the Collie Changerup Rd should be further considered for the construction and/or the permanent project site access.

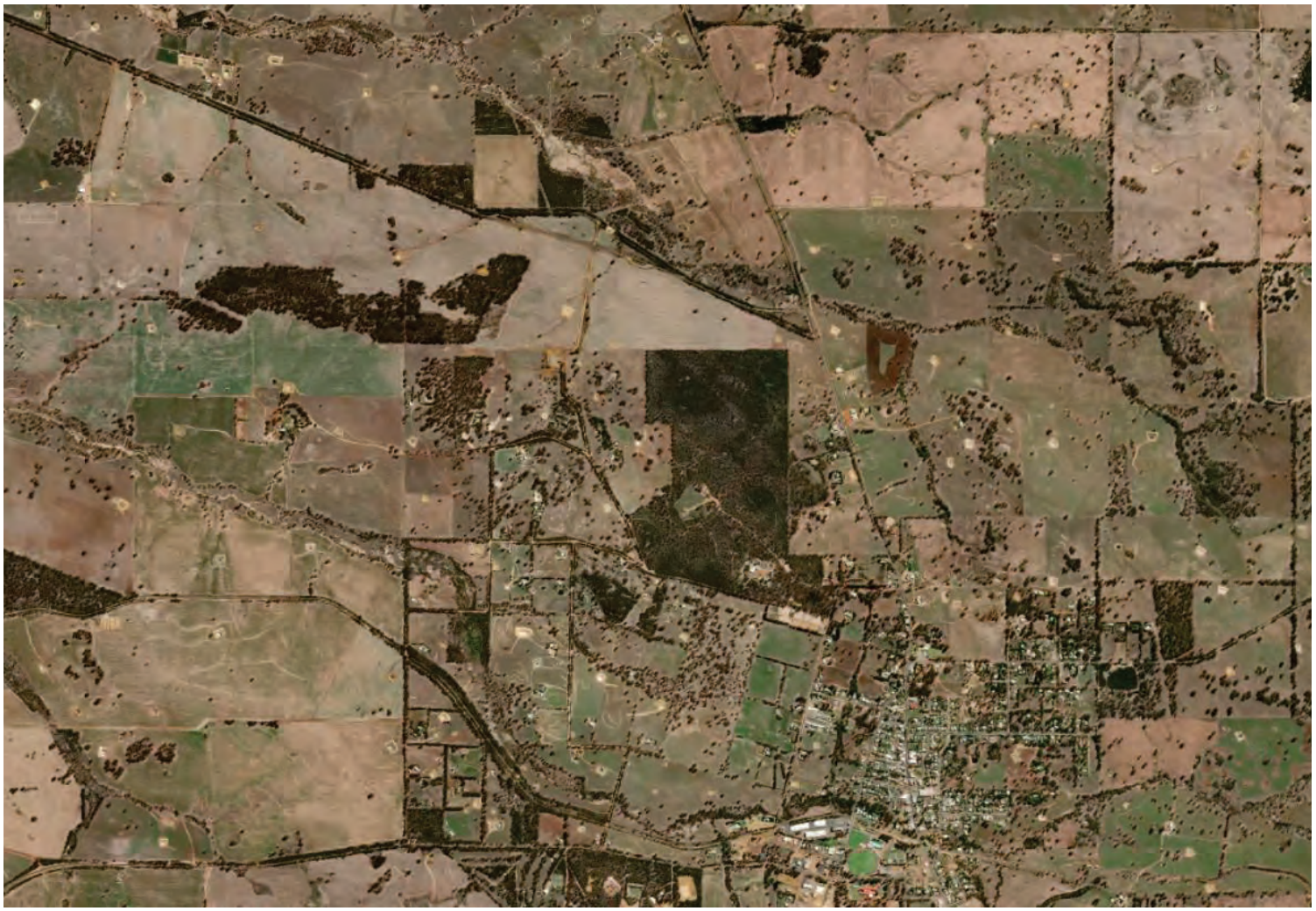
- The TIA identifies there are limited OSOM vehicle movements required for the project. These movements relate to the delivery of the transformer and the operations building to the project site however the proposed route these OSOM will take or their relevant size is not defined. The proposed transport of OSOM (Over Size Over Mass) loads does require more specific planning.

- The applicant will be required to obtain a permit that authorises the movement of all OSOM loads to the satisfaction of Heavy Vehicle Services – Main Roads WA.

If you require any further information, please contact Steven PICKIN on (08) 9892 0555

In reply please quote file reference 21/722

Yours sincerely



Kojonup BESS Project - Collie Changerup Road

TRANSPORT IMPACT ASSESSMENT

81113-948-FLYT-TIA-0005 Rev3

PROJECT	81113-948-FLYT-TIA-0005 Rev3			
TITLE	Kojonup BESS Project - Collie Changerup Road			
Revision	Description	Originator	Review	Date
0	Draft	CAS	CXS/Project	24/10/25
1	Issued	CAS	CXS/Project	12/12/25
2	Reviewed	CAS	CXS/Project	23/03/26
3	Final	CAS	CXS	02/04/26

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1. SUMMARY

Item	Response
Local Government	Shire of Kojonup
Indigenous Land Use Area (ILUA)	Gnaala Karla Booja Aboriginal Corporation (GKB AC) and Wagyl Kaip Southern Noongar Aboriginal Corporation (WKSN AC)
Site Lot(s)	Lots 3194 & 8869 on Deposited Plan 227649
Street Frontage	Collie-Changerup Road and Tunney Road
Development Type(s)	Battery Energy Storage System (BESS) Facility
Local Planning Scheme	Shire of Kojonup Local Planning Scheme No. 3
Access Crossovers	One crossover on Collie-Changerup Road and Tunney Road for inbound and outbound movements
Parking Provision	The final number and location of parking spaces for the operations phase will be determined through detailed design
Vehicle Trips Generated	The daily movement of vehicles to and from Project Area would vary depending on the areas where works would be taking place and the timing of those movements would also vary depending on a range of factors. Some movements may be once a week – for example a skip delivery truck or fuel truck, whereas others may be more frequent such as water trucks (estimated five per day for dust suppression and construction water) or concrete trucks (multiple movements per day depending on stage of construction). For the maximum number of staff on the Project Area during concurrent stages, that is estimated at being 87 therefore daily volumes for light vehicle trips associated with this would be 174 trips if all were single occupancy trips. Truck movements for construction activities would be additional trips to and from the Project Area based on the delivery program. Volume of trips estimated for the construction activities would be catered for on the existing network.

2. INTRODUCTION

2.1 Development Introduction

This Transport Impact Assessment (TIA) has been prepared by Flyt in support of the Development Application (DA) submitted for the proposed Kojonup Battery Energy Storage System (BESS) (the Project) facility off Collie-Changerup Road (official signposted name although some mapping refers to it as the Darkan-Kojonup Road). The general location of the Project Area, north of Kojonup, is shown in Figure 1.



Figure 1 Location of the Project Area (source: Metromap)

2.2 Transport Impact Assessment

This TIA has been prepared in accordance with the WA Planning Commission's (WAPC) Transport Impact Assessment Guidelines (Volume 4 – Individual Developments). The Guidelines promote a three level assessment process, where the required level of assessment is dependent on the likely level of impact, as follows (and as shown in Figure 2):

- Low impact – less than 10 peak hour trips, no assessment required.
- Moderate impact – between 10 and 100 peak hour trips, Transport Impact Statement required.
- High impact – more than 100 peak hour trips, full Transport Impact Assessment required.

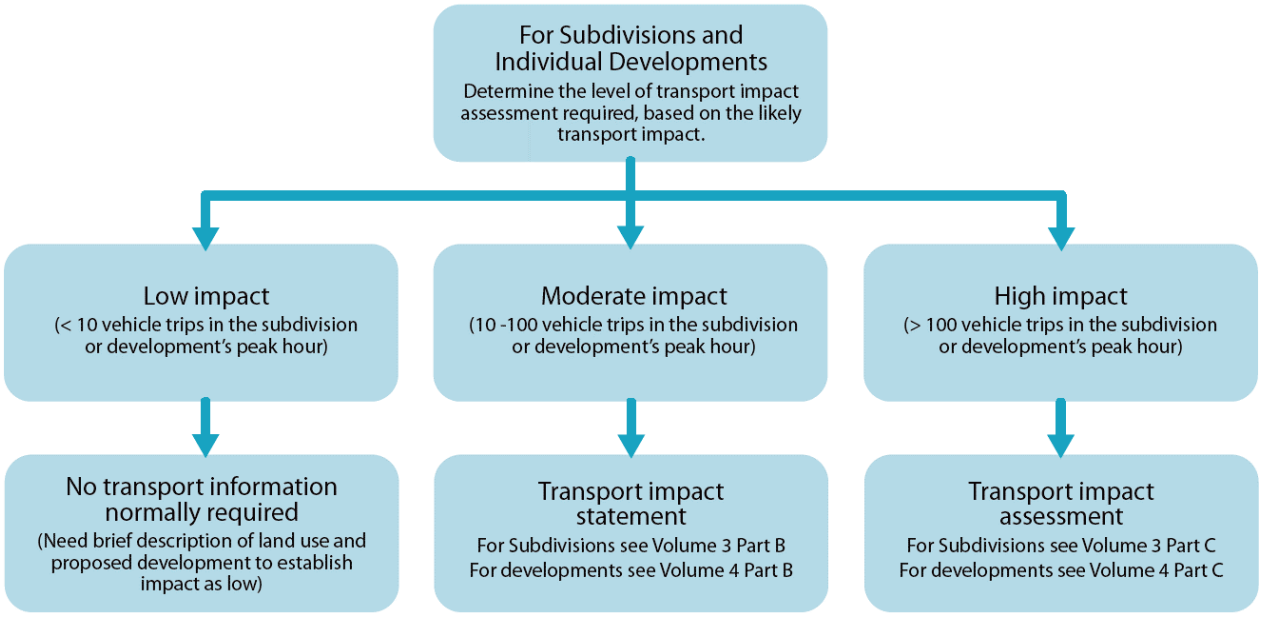


Figure 2 Level of transport impact assessment required (source: WAPC Transport Impact Assessment Guidelines, 2016)

As set out in section 6, the proposed development is a BESS facility which will have a limited volume of vehicle trips associated with its operation however there would be additional traffic volumes associated with the construction stage of the Project.

Traffic volumes attributable to the proposed development has been determined to have a low impact with less than 100 vehicle trips generated by the proposed Project Area even during construction, therefore the required level of assessment is realistically a Transport Impact Statement (TIS). Due to the nature of the development being proposed, specific additional reporting and information has been provided in the assessment whereas other elements of a "typical" TIS have not been addressed as they have no relevance to the development.

2.3 Report Structure

The report is structured as required by the WA Planning Commission's (WAPC) Transport Impact Assessment Guidelines (Volume 4 – Individual Developments), with the following items addressed:

- Development proposals and site context (Section 3)
- Vehicle access and parking (Section 4)
- Provision for service vehicles (Section 5)
- Traffic volumes and vehicle types (Section 6)
- Site specific issues (Section 7)
- Summary (Section 8).

Given the nature of the development and its location within a rural setting, there has been no coverage of elements that are not relevant to this application which includes pedestrian networks, bicycling networks and public transport accessibility.

3. PROPOSED DEVELOPMENT AND SITE CONTEXT

3.1 Development Site Context (Project Area)

The Project Area is located at the intersection of Tunney Road and Collie-Changerup Road in the Shire of Kojonup and as indicated by the South West Aboriginal Land and Sea Council website; it sits on the boundary of the Gnaala Karla Booja Land Use Agreement Area and the Wagyl Kaip Ilua Land Use Agreement Area.

The Project Area, and works associated with the proposed development, is within a Rural zone as set out in the Shire of Kojonup Local Planning Scheme No.3. The Project Area is shown on the LPS map in Figure 3.

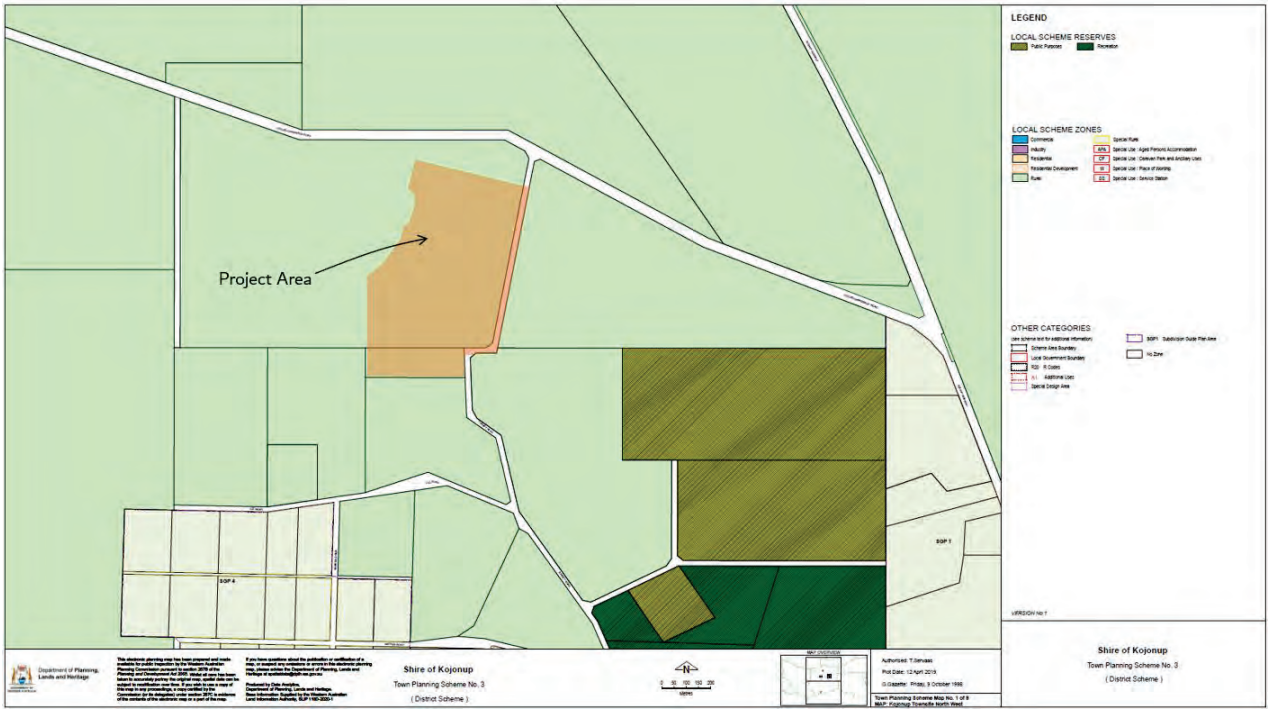


Figure 3 Planning map extract from Shire of Kojonup Local Planning Scheme No.3 (source: WAPC)

The existing site is predominantly used for broadacre agricultural purposes and there is no formed development on the site, with a rural dam sitting to the south of the site. There are existing formed rural crossovers into the paddock on both Collie-Changerup Road and Tunney Road that provide existing access.

The context of the existing site and its surrounds adjacent to Collie-Changerup Road is shown in Figure 4.



Figure 4 Aerial image of site area (source: Metromap)

3.2 Proposed Development

The Project is a BESS, with an indicative installed capacity of up to 800MWh (100 MW x 8 hours), with an indicative permanent disturbance footprint of approximately 3.6 ha.

The Project will include:

- BESS units, inverters and transformers
- Civil and structural works including laying of crushed rock
- Internal access roads and access (and egress) points
- Underground cabling (33 kV) to provide a connection between the battery units and inverters and on-site substation
- On-site substation including transformer to step up from 33 kV to the connection voltage at 132 kV, reactive power support equipment, protection and control devices
- Underground cabling (132 kV) to connect the onsite substation to the existing Kojonup Substation
- Permanent Operations and Maintenance (O&M) Facility
- Water storage (including firefighting water supply and fire water runoff containment / stormwater detention basin)
- A new access point off Collie-Changerup Road (Main Access), and a new access point off Tunney Road (Secondary Access)

- Security fencing
- Car parking
- Landscape mitigation screening, as required
- Business identification signage, at the Main Access point
- Temporary disturbance for construction compound and laydown and work areas.

Additionally, augmentation works will likely be required within the Kojonup Substation site, including installation of high voltage electrical equipment and associated permanent and temporary buildings and works. The orientation of the underground cabling (connecting the onsite substation and the existing Kojonup substation) is not fixed. There are multiple options being considered to connect into the existing substation. This will be confirmed in consultation with Western Power..

The indicative layout of the Project and its proximity to the existing Kojonup Substation is shown in Figure 5. The Project Area is proposed to be accessed via a new access point off Collie-Changerup Road (Main Access), with a secondary access and egress proposed off Tunney Road (Secondary Access).

During construction, the Project Area will be accessed via both the Main Access and Secondary Access. Crossovers would be designed to the relevant Main Roads WA Driveways policy standards and to cater for the turning movements of the design vehicle for the construction stage of the Project.

The final location of the Project infrastructure will be determined once a BESS supplier has been selected and will be in accordance with commitments made within this development application.

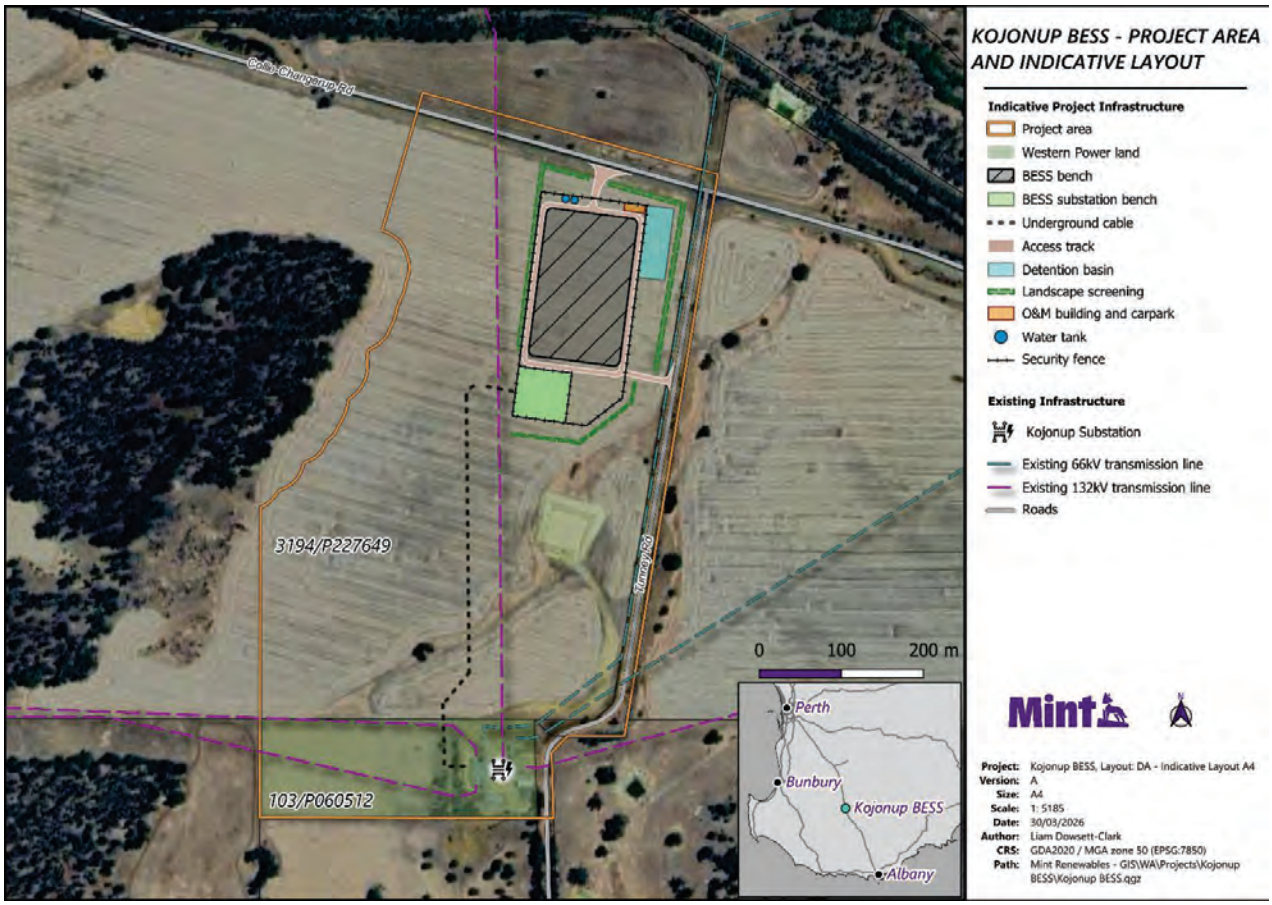


Figure 5 Project Area and Indicative Layout (source: MINT)

4. VEHICLE ACCESS AND PARKING

4.1 Existing Road Network

The road hierarchy surrounding the Project Area is shown in Figure 6 and posted speed limits are shown in Figure 7. The Project Area will have direct access the Collie-Changerup Road, which is classified as a Regional Distributor and Tunney Road which is classified as an Access Road.

Albany Highway is the main north-south Primary Distributor and State Road through the region which lies to the east of the Project Area. That corridor provides access to Kojonup and Albany, with Tunney Road also providing a more local road route through to the Kojonup townsite.



Figure 6 Road hierarchy surrounding the Project Area (source: Planwisely / Main Roads WA)

Collie-Changerup Road is a posted 110km/h highway, as shown in Figure 7. Tunney Road is not posted as a speed limit, therefore given it is outside of an urban area adjacent to the Project Area would have a maximum speed permissible of 110km/h as well.

Given the nature of Tunney Road, being an unsealed rural road with sharp bends and narrowing reserve it would be unlikely that the median speed profile of this section of Tunney Road would approach that limit. Both frontage roads are managed and controlled by the Shire of Kojonup, as shown in Figure 8.



Figure 7 Speed zoning surrounding the Project Area (source: Main Roads WA)



Figure 8 Designation of roads adjacent to Project Area (source: Planwisely / Main Roads WA)

4.2 Street Frontage

The Project Area has direct frontage to both Collie-Changerup Road and Tunney Road. The characteristics of these two roads are set out in the following sections.

4.2.1 Collie-Changerup Road

Collie-Changerup Road runs along the northern boundary of the Project Area and will provide the location of the main crossover associated with the life of the Project. It is classified as a Regional Distributor in the Main Roads WA road hierarchy. The intersection of Albany Highway is approximately 1.6km east of the proposed access point into the Project Area and the Tunney Road intersection is approximately 135m to the east.

The general configuration of Collie-Changerup Road within the road reserve is a minimum of 7m sealed width for the carriageway with unsealed shoulders. There is no kerbing present with drainage being included at the bottom of the batters from the carriageway. There are culverts over crossovers that intersect with Collie-Changerup Road. As shown in Figure 7, it is posted as a 110km/hr road.

The configuration of Collie-Changerup Road corridor adjacent to the Project Area is shown in Figure 9. This illustrates that the road reserve has been realigned to the south, with the historical road reserve of 20m width being replaced with an ungazetted reserve that has allowed for the straightening of the carriageway prior to the intersection of Albany Highway.

This has also meant that the newer alignment of Collie-Changerup Road is not within a reserve that includes any bends or road side vegetation.

The view of Collie-Changerup Road by cross-section near the proposed Project Area access point looking west is shown in Figure 10. The view looking east towards the intersection of Tunney Road is shown in Figure 11.



Figure 9 Collie-Changerup Road reserve and alignment (source: Metromap)



Figure 10 Collie-Changerup Road near Project Area access crossover location looking west (source: Google)



Figure 11 Collie-Changerup Road near Project Area access crossover location looking east (source: Google)

4.2.2 Tunney Road

Tunney Road runs along the eastern boundary of the Project Area. The Project will include a crossover associated with the construction and operational phases of the development which will act as the secondary access point behind the crossover on Collie-Changerup Road. It is classified as an Access Road in the Main Roads WA road hierarchy. Tunney Road intersection is approximately 200m to the east.

The general configuration of Tunney Road within the road reserve is a minimum of 7m unsealed surface for the carriageway with unsealed shoulders. As shown in Figure 7, it is posted as a 110km/hr road outside of urban areas. The configuration of Tunney Road corridor adjacent to the Project Area is shown in Figure 12. The view of Tunney Road by cross-section near the proposed secondary Project Area access point looking north is shown in Figure 13. The view looking east towards the intersection of Tunney Road is shown in Figure 14.

To the south of the Project Area, Tunney Road provides access to the existing electrical sub-station and it ultimately connects to the intersection of Mather Road where it becomes a bituminised surface and provides access through to the Kojonup townsite. The existing access point for the substation may also be used for some traffic purposes during construction however that use would be limited.



Figure 12 Tunney Road alignment (source: Metromap)



Figure 13 Tunney Road near Project Area access crossover location looking north (source: Google)



Figure 14 Tunney Road near Project Area access crossover location looking south (source: Google)

4.3 Restricted Access Vehicle Network

Access to and from the Project Area is provided for both Restricted Access Vehicle (RAV) RAV4 and RAV7 classified vehicles. The highest potential classification for heavy vehicles on the network adjacent to the Project Area is RAV7 along Collie-Changerup Road and RAV4 via Tunney Road, with combinations of trailers and weight shown in Figure 15. The RAV network is shown in Figure 16.

As noted in this assessment, the Project Area is proposed to be accessed via a new access point off Collie-Changerup Road (Main Access), with a secondary access and egress proposed off Tunney Road (Secondary Access). During construction, the Project Area will be access via both the Main Access and Secondary Access. Some limited movements would also be expected during construction via the existing crossover into the Kojonup substation.

Crossovers have been designed by the Project team to the relevant Main Roads WA Driveways policy standards and to cater for the turning movements of the design vehicle for the construction stage of the Project.

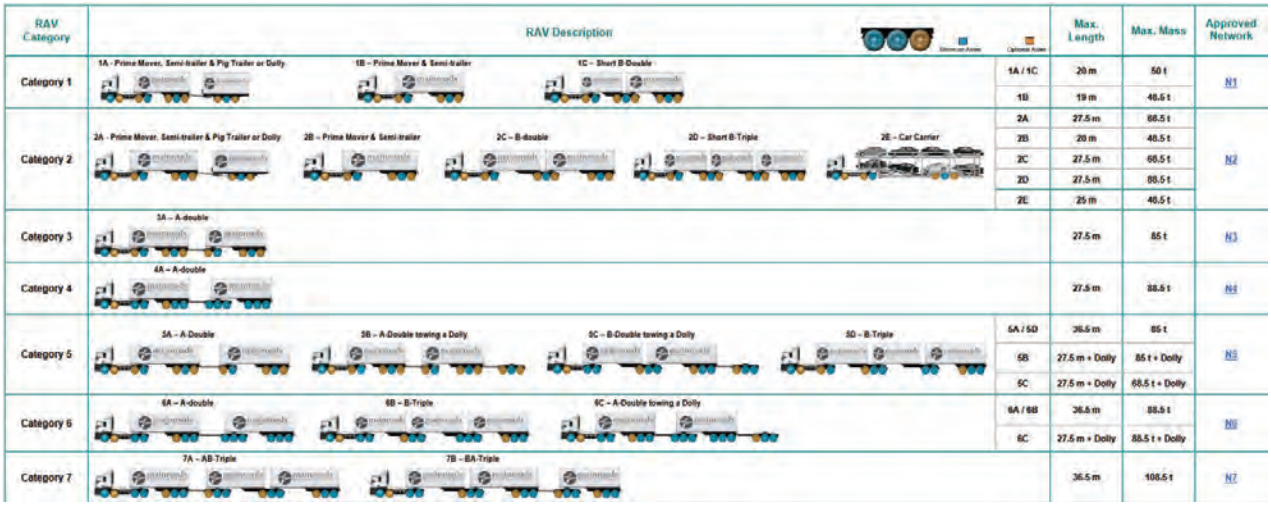


Figure 15 Tandem Drive Prime Mover Combinations (source: Main Roads WA)

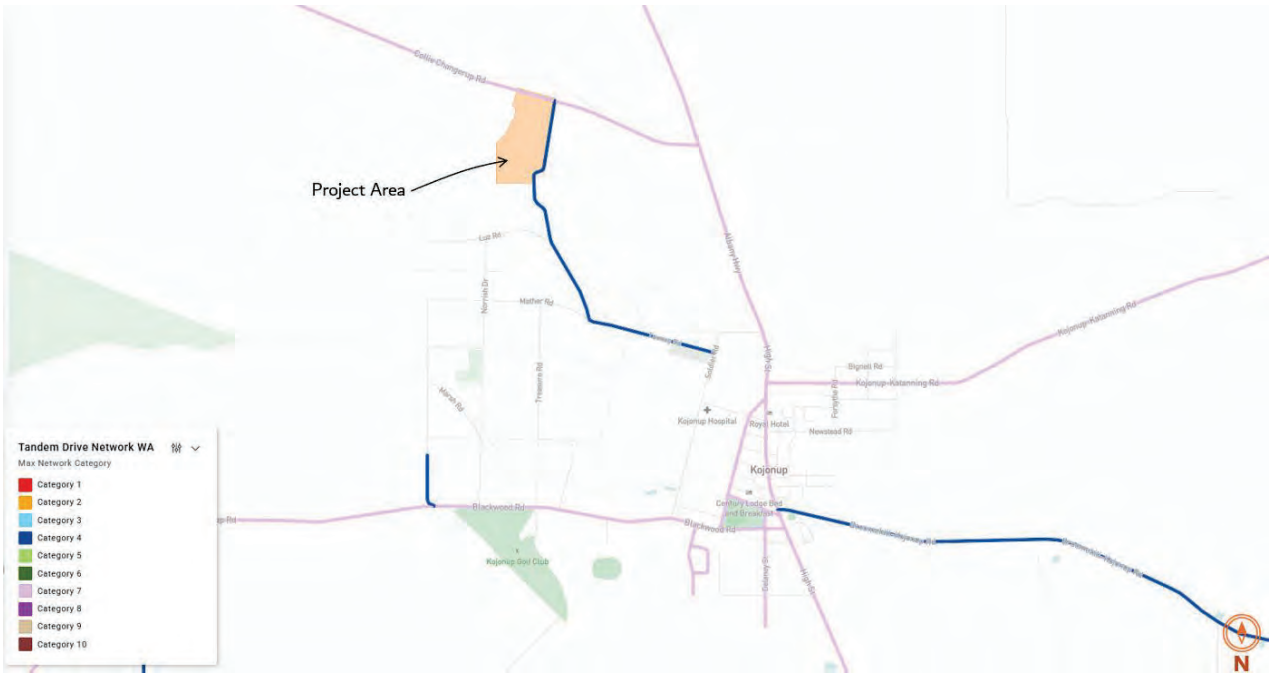


Figure 16 RAV7 network around Project Area (source: Main Roads WA)

The Project will be able to utilise wider RAV network roads to provide access for transportation of equipment and components to the Project Area. The majority of vehicles involved in the Project construction would be restricted to 19m semi-trailers.

Vehicles such as regular length semi-trailers and single unit trucks are as-of-right vehicles that can travel on any part of the WA road network. These vehicles do not require permits and can select any route of travel to and from a construction site.

Deliveries of Project infrastructure (e.g. construction compound and fencing etc. gravel, concrete, crane support equipment, miscellaneous electrical equipment, earthworks import/export and waste disposal) will also occur via as of right vehicles with potential use of B-Double on permitted routes.

The use of low loader vehicles to transport components to the Project is a key consideration. As with other heavy vehicle movements, Main Roads WA classifies each road for use by 8TPA trucks. These are shown in Figure 17. Routes from port being considered for the Project are Network 6 for 8TPA trucks. The last section of all routes into the Project Area along the Collie-Changerup Road is not classified, requiring permits by Main Roads WA to undertake the final 1.6km section into the Project Area.



Figure 17 8TPA Network 6 classified roads (source: Main Roads WA)

Throughout the construction stage, there will be a range of heavy vehicle movements associated with different stages of construction and different tasks. These are summarised within Table 1.

The majority of heavy vehicle movements associated with the Project will be As of Right vehicles and B-Double trucks, with some Low Loader movements likely requiring a Class 1 RAV Low Loader Overmass Permit and two Over Sized, Over Mass (OSOM) loads associated with the transformer and Operations Building being classified as OSOM also requiring a permit. They would require submission of a full Traffic Management Plan by the Transport Operator associated with the Project.

Table 1 Types of vehicles used for movements (source: MINT)

Purpose	Truck Configuration	As of Right / RAV / OSOM
Water / Fuel	Truck tanker	As of Right
Skip / Portaloo	Flat bed	As of Right
Office and Site Equipment	Low Loader	RAV / Permit
Earthworks and Materials	Truck and Dog	RAV
Concrete Foundations	6m^3 Agitator Truck	As of Right
BESS Units / Inverters	Flat bed	As of Right
Lifting Equipment/ Machinery	Low Loader	RAV / Permit
Transformer	OSOM Low Loader	OSOM
Transformer Equipment	Low Loader / Flat Bed	As of Right / RAV
Operations Building	OSOM Low Loader	OSOM

4.4 Traffic Volumes

Main Roads WA collects traffic count information at all signalised intersections and also collects and collates count information along streets and at non-signalised intersections with current and historical data being made available through https://trafficmap.mainroads.wa.gov.au/map.

There are no Main Roads WA counts sites immediately proximate to the Project Area and there are no counts on any of the surrounding road network. The nearest count site on Albany Highway is South of Robinson Road West and is a 24 hour count site.

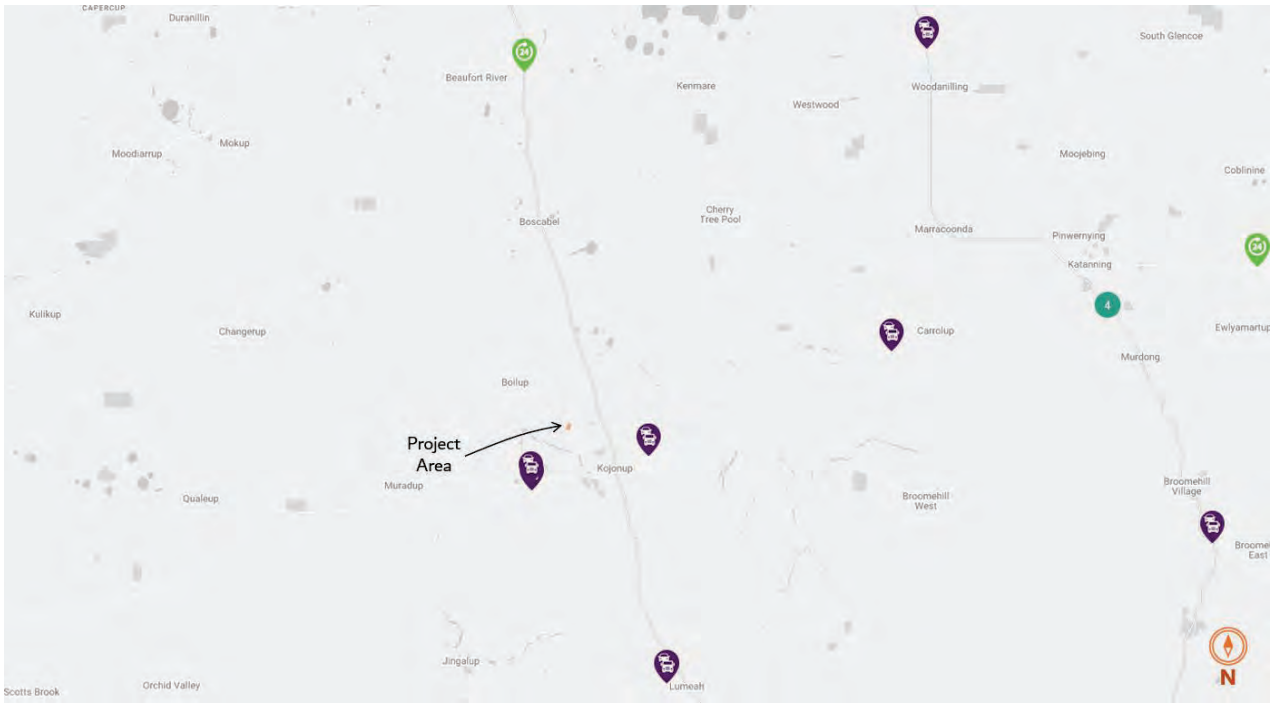


Figure 18 TrafficMap count resources (source: Main Roads WA)

For the purposes of network assessment, the Shire of Kojonup provided the latest traffic count information they had for Collie-Changerup Road which were conducted in November – December in 2020 at a site near the Balloch Road turnoff which is approximately 20km to the west of the Project Area.

The volumetric day counts for light vehicle (LV), heavy vehicle (HV) (Class 3-9) and RAV vehicle (Classes 10-12) movements is set out in Table 2. This shows a median volume of 160 LV, 45 HV and 24 RAV per day for all movements. In general, directional movements could be reflected as 50% of the total based on other nearby volume counts south of Kojonup.

To check these values, hourly count information was examined for the Boyanup Brook – Kojonup Rd site south of Kojonup with the Monday – Friday peak hour movements on that corridor being:

- AM Peak – total 55 vehicles in both directions. The peak volume represented 10.7% of all day recorded movements towards Kojonup and 6.9% of all day recorded movements away from Kojonup
- PM Peak – total 49 vehicles in both directions. The peak volume represented 7.1% of all day recorded movements towards Kojonup and 9.1% of all day recorded movements away from Kojonup.

These patterns reflect movement of people moving towards Kojonup for school and employment or shopping in the morning and then a return trip in the afternoon.

There are no counts available for Tunney Road, with the volumes expected to be extremely low at all times given the rural nature of the road after the intersection of Mather Road.

Table 2 Shire of Kojonup traffic counts - Darkan Road near Balloch Road 2020 (source: Shire of Kojonup)

		LV	HV	RAV	Total	%HV	%RAV
26/11/2020	Thursday	150	53	24	562	9.4%	4.3%
27/11/2020	Friday	247	60	28	566	10.6%	4.9%
28/11/2020	Saturday	181	38	12	477	8.0%	2.5%
29/11/2020	Sunday	201	32	13	485	6.6%	2.7%
30/11/2020	Monday	178	40	21	465	8.6%	4.5%
1/12/2020	Tuesday	135	58	33	581	10.0%	5.7%
2/12/2020	Wednesday	193	131	31	661	19.8%	4.7%
3/12/2020	Thursday	210	57	39	585	9.7%	6.7%
4/12/2020	Friday	184	56	39	485	11.5%	8.0%
5/12/2020	Saturday	158	30	18	408	7.4%	4.4%
6/12/2020	Sunday	151	35	16	202	17.3%	7.9%
7/12/2020	Monday	157	46	26	229	20.1%	11.4%
8/12/2020	Tuesday	130	27	25	182	14.8%	13.7%
9/12/2020	Wednesday	165	49	32	246	19.9%	13.0%
10/12/2020	Thursday	159	55	32	246	22.4%	13.0%
11/12/2020	Friday	200	56	22	278	20.1%	7.9%
12/12/2020	Saturday	147	33	10	190	17.4%	5.3%
13/12/2020	Sunday	190	33	16	239	13.8%	6.7%
14/12/2020	Monday	136	47	19	406	11.6%	4.7%
15/12/2020	Tuesday	143	31	30	410	7.6%	7.3%
16/12/2020	Wednesday	162	26	18	410	6.3%	4.4%
17/12/2020	Thursday	135	44	25	204	1.7%	1.0%
Medians (All Days)		161	45	24	409	11.1%	5.5%
Medians (Weekday)		161	51	27	410	11.1%	6.2%

4.5 Existing Parking and On-Site Vehicle Access

There is no parking on the Project Area. The area has two existing farm gate access points, one to Collie-Changerup Road and the other to Tunney Road. The location of these access points relative to the intersection of the two frontage roads is set out in Figure 19.



Figure 19 Existing access to Project Area (source: Metromap)

4.6 Proposed Vehicle Access

Crossover locations to be constructed for the Project have been designed to allow for ease of access during the construction stage as well as provide for general operational functionality. This will be achieved through the development of a crossover on Collie-Changerup Road that will allow for turning movements into the Project Area to be set back from the intersection of Tunney Road by around 135m as shown in Figure 20 and the retention of the existing crossover from Tunney Road.

Both crossovers would be fully formed and constructed specific to the requirements of the Shire of Kojonup and Main Roads WA given that both frontage roads are local roads, as shown in Figure 8. The crossover from Collie-Changerup Road would see the construction of a 44m long access track, with the crossover from Tunney Road including an access track of at least 49m in length. Both have clear line of sight to provide for approach sight distances.

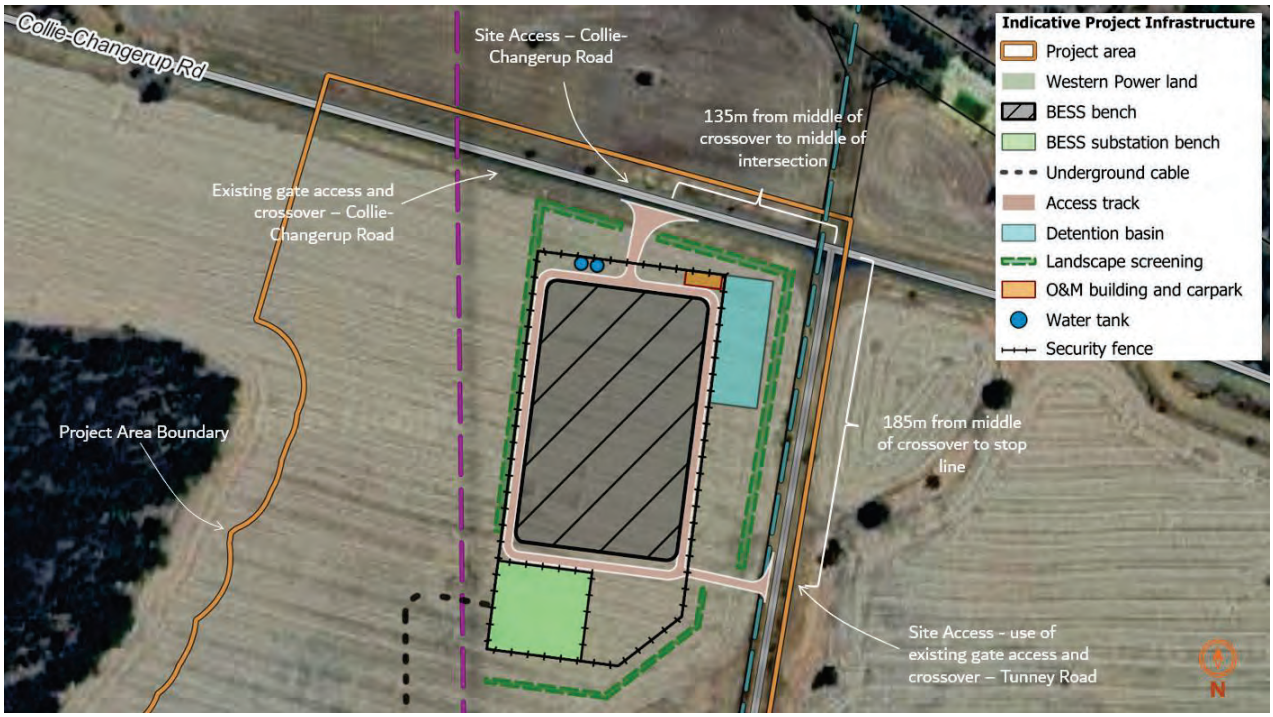


Figure 20 Vehicle access for Project Area (source: MINT)

To inform the application, swept path analysis was completed for the crossover on Collie-Changerup Road for the following vehicle configurations:

- 19m semi-trailer as of right vehicle from both directions
- 27.5m B-Double truck from both directions (largest design vehicle for standard movements).

These are set out in Figure 21 to Figure 23 with the proposed designs of the crossovers shown in Figure 24 and Figure 25. The swept paths have informed the design of the development access points. Movements of OSOM components of the Project – which would be the transformer and on-site operations building – would be completed under a Class 1 RAV Low Loader Overmass Permit and a Traffic Management Plan that would be submitted through the transport operator for the Project.

As set out in this assessment, routes for deliveries via heavy vehicles do exist in the area and between relevant ports. The final route used for this Project will be determined by the proponent, with relevant permits and requirements covered through Main Roads WA Heavy Vehicle Services.



Figure 21 Swept path - 19m semi-trailer as of right vehicle from Collie-Changerup Road (source: Autoturn)

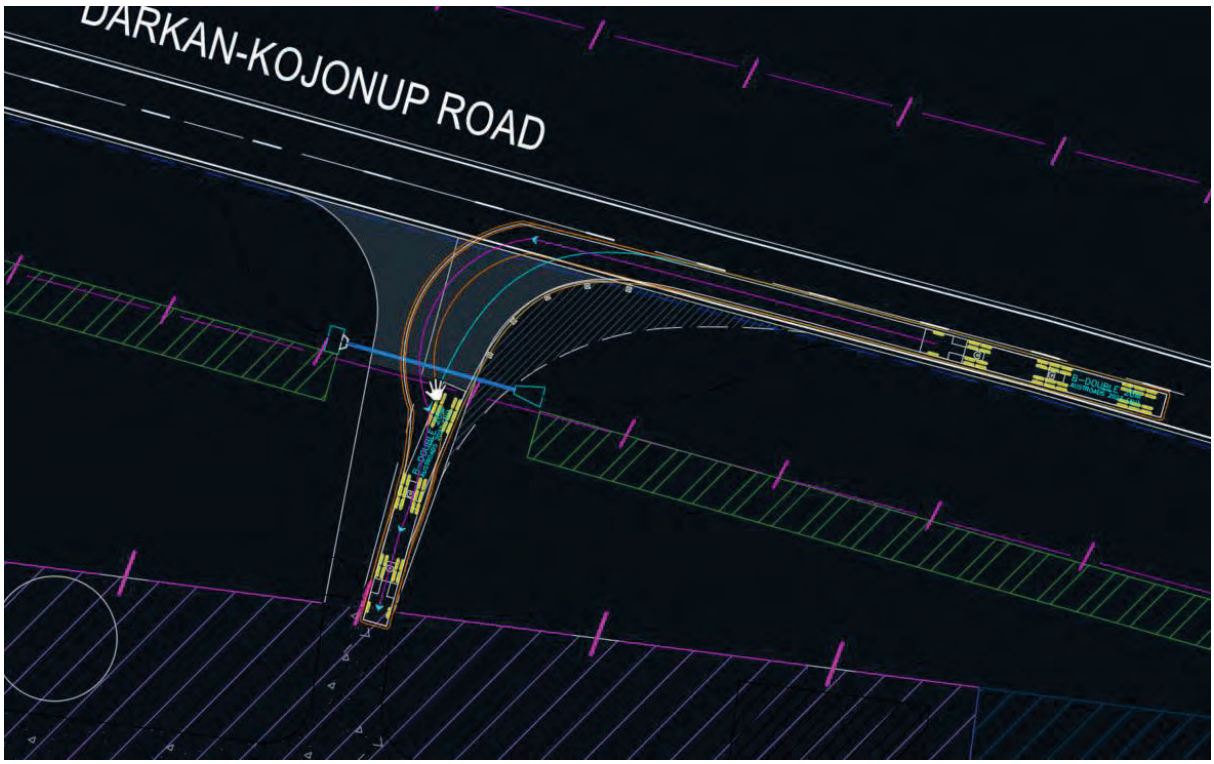


Figure 22 Swept path – 27.5m B-Double vehicle from east along Collie-Changerup Road (source: Autoturn)

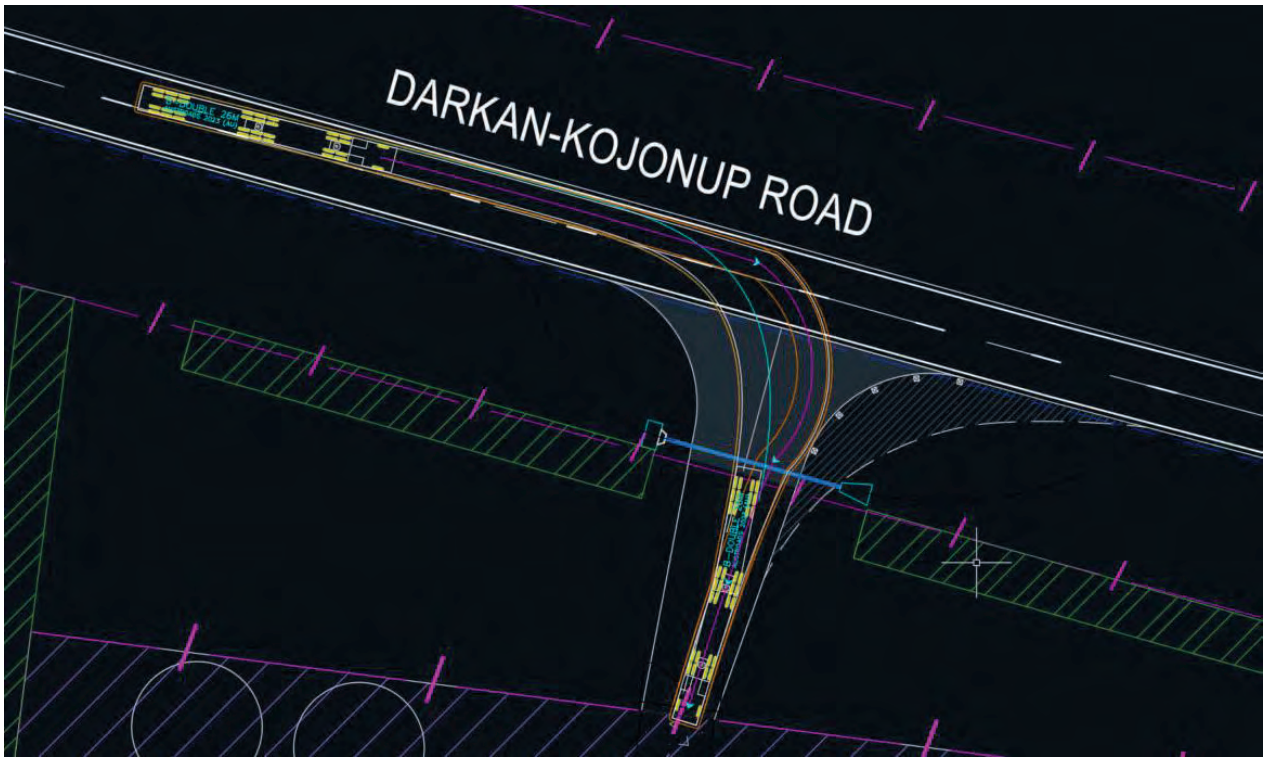


Figure 23 Swept path – 27.5m B-Double vehicle from west along Collie-Changerup Road (source: Autoturn)

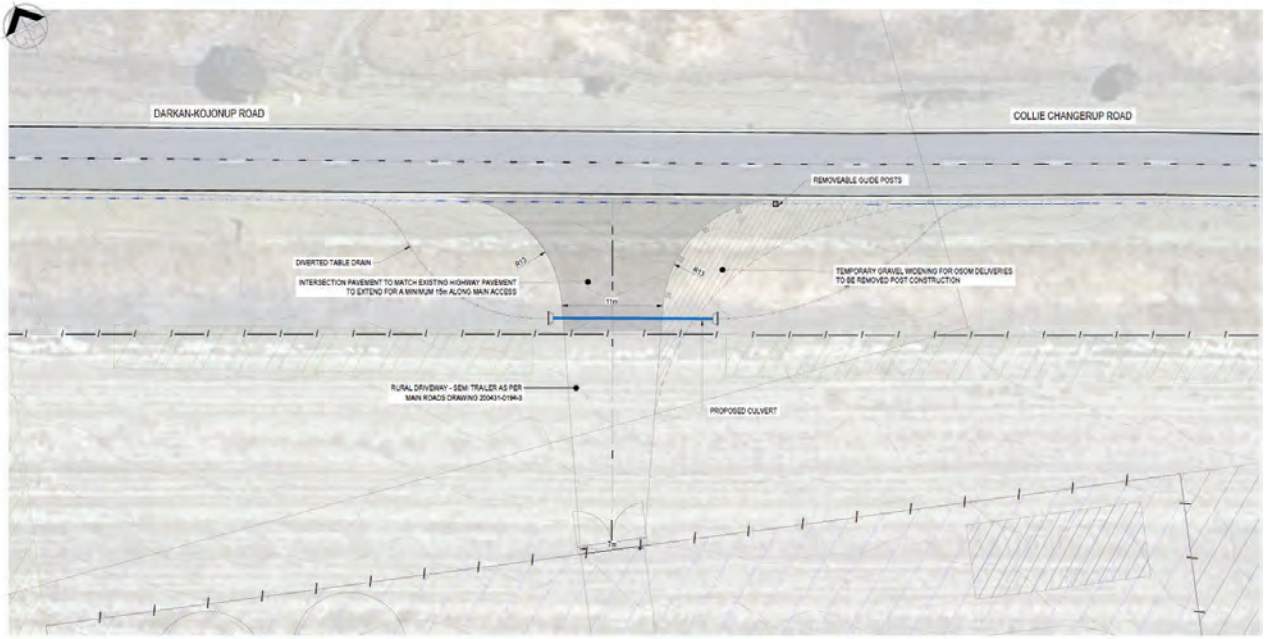


Figure 24 Proposed crossover design for Project Area and Collie-Changerup Road (source: icubed consulting)

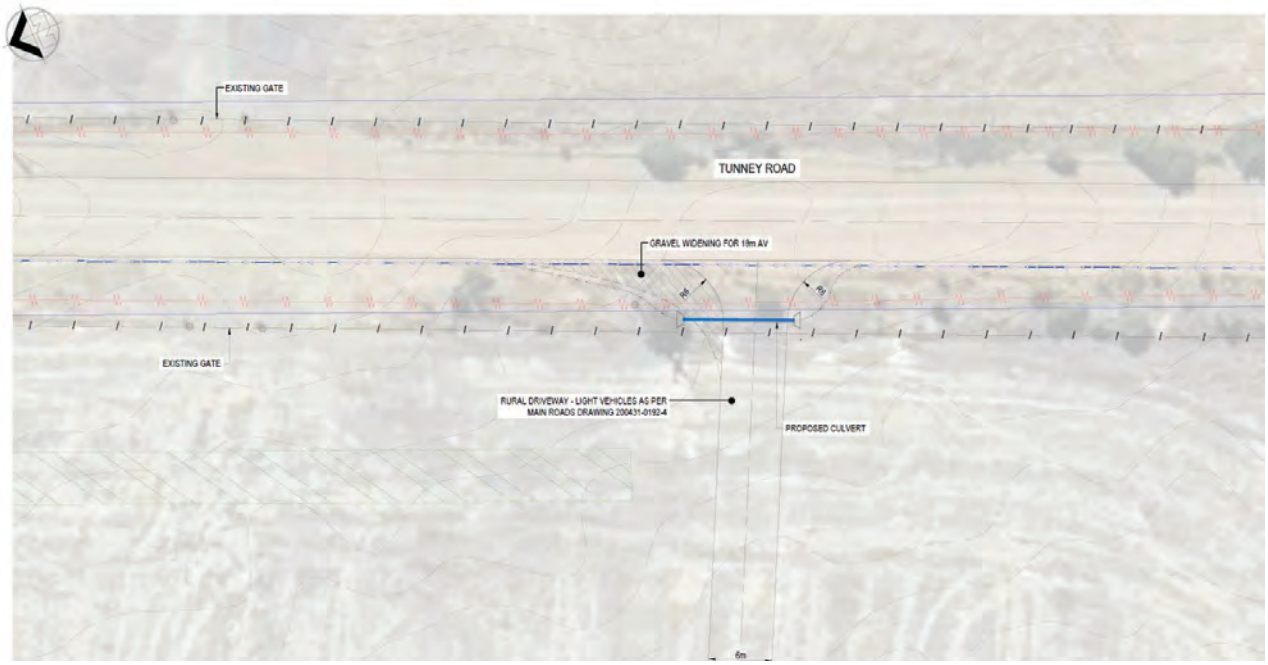


Figure 25 Proposed crossover design for Project Area and Tunney Road (source: icubed consulting)

4.7 Sight Line Analysis

An assessment of the sight lines required for the primary access off Collie-Changerup Road was undertaken given that location would be subject to most Project activity during the construction stage of the Project. The existing approaches along Collie-Changerup Road from the west are shown in Figure 26 and from the east in Figure 27. The area is open broadacre agriculture and there are no built form obstructions.

There is a slight rise to the west of the proposed Project Area access point as noted by the double white lines on approach which start 270m from the access crossover location for the Project Area. The Safe Intersection Sight Distance (SISD) calculation used was:

$$SISD = \frac{D_T \times V}{3.6} + \frac{V^2}{254 \times (d + 0.01 \times a)} \qquad 2$$

where

SISD	=	safe intersection sight distance (m)
D_T	=	decision time (sec) = observation time (3 sec) + reaction time (sec) – refer to *AGRD Part 3* (Austroads 2016a) for a guide to values
V	=	operating (85th percentile) speed (km/h)
d	=	coefficient of deceleration – refer to Table 3.3 and AGRD Part 3 for a guide to values
a	=	longitudinal grade in % (in direction of travel: positive for uphill grade, negative for downhill grade)



Figure 26 Collie-Changerup Road approach to Project Area from west (source: Google)



Figure 27 Collie-Changerup Road approach to Project Area from east (source: Google)

Based on an operating speed of 110km/h, decision time of 3 seconds, observation time of 2 seconds and a grade calculated at 3% based on available topographical information, the SISD for cars and trucks on approach from the west is 330m and 365m. This is shown in Figure 28. The SISD on approach from the east using the same inputs, with a 0% grade change is 315m for cars and 348m for trucks as set out in Figure 29.

The approach from the east is clear, with no issues in relation to achieving the SISD, even with any potential obstruction at Tunney Road. The access point to the Project Area will be set back from the carriageway, allowing for appropriate approach distance and ability for turning vehicles to see any oncoming vehicles.

From the west, there is a slight rise in the carriageway, with the SISD calculation reflecting the grade change. Based on the Streetview available, Collie-Changerup Road at that point is evident from the Project Area access point, meaning that oncoming vehicles on the crest should be able to see turning vehicles exiting the Project Area on approach. This configuration should be acceptable, with additional signage on Collie-Changerup Road on approach to the Project Area access point noting the presence of trucks turning or site access could be installed by Main Roads WA on the crest.



Figure 28 SISD for trucks approaching from west on Collie-Changerup Road (source: Metromap)



Figure 29 SISD for trucks approaching from east on Collie-Changerup Road (source: Metromap)

4.8 Proposed Parking

Given the nature of the Project and potential ongoing operational staff, required parking would be located on site and designed to relevant standards if formalised. There are no expectations of any issues relating to provision of space for parking of operational vehicles or construction vehicles given the nature of the Project.

Parking areas would be demarcated and located near the administration areas of the Project construction. During operations, it would be expected that vehicles associated with the Project would be accommodated where required.

5. PROVISION FOR SERVICE VEHICLES

5.1 Service Movements

Access crossovers and internal access ways will be designed to accommodate the design vehicle that will cater for flatbed haulage trucks and as-of-right semi-trailers. Given that, any service vehicle movements associated with the Project would be able to be accommodated.

There would be minimal vehicle movements associated with servicing the Project during the operational stage of the BESS as it would generally be limited movements relating to regular scheduled maintenance.

6. TRAFFIC VOLUMES AND VEHICLE TRIPS

6.1 Assessment Introduction

Renewables Projects and those situated within a rural context do not have the same specific or peak based demands as more urban based development or redevelopment Projects. The considerations relating to these sorts of Projects are more focussed on movement of heavy vehicles, road conditions and suitability of the network to cater for the types of movements being considered.

For the final point, the information in this TIA sets out the network classifications, suitability for heavy vehicle movements and nature of the road network and intersections surrounding the Project. The network is suitable to support a Project of this nature, with only a low level of movements requiring permits from Main Roads WA Heavy Vehicle Services. The requirements for this would be covered within conditions of approval.

For the road conditions and movements, the analysis of sight lines and crossovers within section 4 of this TIA set out the location and form of the proposed site access and the relevant issues associated with that.

This section therefore sets out the general expectations for traffic generation associated with the proposed development and focusses on the overall volumes of movements during the course of the Project.

6.2 Traffic Generation

The overall program for delivery of the Project which will result in traffic generation from the site will be spread over the period of a year. There will be six key elements to the Project delivery program:

- Site establishment
- Civil works – construction
- BESS installation
- Electrical works
- Substation works
- Commissioning.

Traffic movements associated with staff on the Project Area for an average weekday throughout the construction and commissioning stage of the Project would be reflective of staff forecast to be on the Project Area per week as shown in Figure 30.

These movements would form the bulk of passenger vehicle movements to or from the Project Area, with additional potential movements associated with maintenance tasks or staff moving to or from Kojonup during lunch periods or for meetings / other commitments also possible during day time hours.

The overall Project program from site access to complete commissioning of the Project Area is estimated at 55 weeks, just over a year. During that period the construction vehicle volume will vary significantly, with the vast majority of the vehicle movements occurring in a four month period where various stages of the Project works overlap.

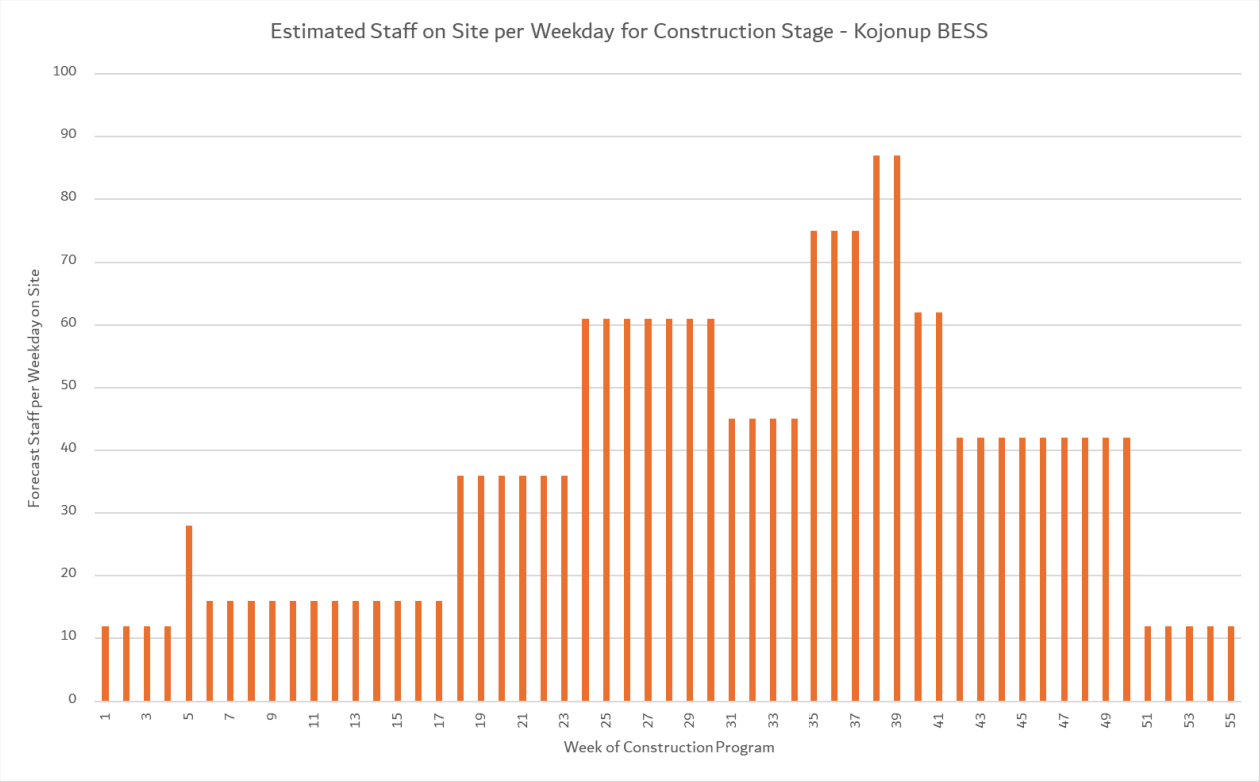


Figure 30 Estimated staff on Project Area per weekday for construction stage - Kojonup BESS (source: MINT)

The Proponent has provided information for each of the Project stages relating to transport, being:

- Site Establishment

Upon appointment of a contractor, there will a period of approximately five weeks where pre construction activities e.g. (like site surveys and visits undertaken by the contractor to establish development protocols). This activity is estimated to have around approximately 12 staff on site with vehicle movements likely limited to light vehicles and less than 20 movements into the area per day.

- Civil Works - construction stages

The initial Project civil works would span a period of approximately 6 months for the Project and overlap the BESS installation and electrical works stages of the Project. Given this overlap, the number of staff on site will fluctuate over the 6 months from approximately 16 to 61 staff on site at any one time.

The initial workforce on site for the first three months is assumed to be approximately 16 personnel, in light vehicles, travelling to and from the Project (towards the site in the AM peak and away from the site in the PM peak). This would then be supplemented with deliveries of equipment and materials that would fluctuate depending on the construction program. This would include:

- Water trucks and skip delivery / removal in tankers or skip truck
- Fuel in a tanker
- Equipment within containers on low loaders
- Earthworks equipment delivery on low loaders
- Materials for construction such as spoil and paving materials in trucks and truck / dog configuration
- Concrete trucks
- Steel delivery on flat bed trucks.

The daily movement of vehicles to and from Project Area would vary depending on the areas where works would be taking place and the timing of those movements would also vary depending on a range of factors.

Some movements may be once a week – for example a skip delivery truck or fuel truck, whereas others may be more frequent such as water trucks (estimated five per day for dust suppression and construction water) or concrete trucks (multiple movements per day depending on stage of construction).

- BESS Installation

The BESS Installation stage is expected to last approximately 4 months and will involve the delivery of materials and installation of the BESS units. This stage would overlap the civil works, electrical works and substation works stages of the Project as there can be sequenced delivery of the BESS units as the civil and preparation works for the slabs associated with the BESS units continues.

This stage includes a total of approximately 168 heavy vehicle trips into and out of the Project Area with flat bed as-of-right trucks to deliver the individual units. In addition, there would be truck movements associated with the inverters, cabling equipment and heavy equipment delivery.

None of these movements would be OSOM and the number of staff on site during this stage would vary between approximately 45 to 87 staff on site – this is the peak of construction and installation activities on site.

- Electrical works

The electrical works stage is forecast to last between approximately 5 and 6 months. Vehicles associated with this stage will reflect the civils stage and largely be made up of LV. With the overlap between the BESS and substation installation stages, the number of staff on site during this six months will fluctuate between approximately 42 and 87 staff.

- Substation works

The substation works will involve wholesale construction of the site required for the substation and transformer ranging from civil and structural works (such as compound construction and electrical installation) through to the delivery of the transformer which would be one of the OSOM movements for this stage. The other OSOM movement would be an operations building for the Project.

Otherwise, overall volumes associated with this task will be lower than other stages of the Project. Given the overlap with the civils, BESS installation and other electrical works on the site, the volume of forecast employees per day during the approximately 6 month period for these works would vary from approximately 36 to 87 per day.

- Commissioning stage

The commissioning stage would be sequentially tied into the completion of the BESS installation and finalisation of works associated with all of the electrical infrastructure and equipment on site.

The volume of staff on site during these works, given overlaps with other stages, would be between approximately 12 and 87. The trips associated with this stage would be LV trips.

In relation to assessments, the WAPC Guidelines notes the following relating to traffic related impacts:

"As a general guide, an increase in traffic of less than 10 percent of capacity would not normally be likely to have a material impact on any particular section of road but increases over 10 percent may. All sections of road with an increase greater than 10 percent of capacity should therefore be included in the analysis. For ease of assessment, an increase of 100 vehicles per hour for any lane can be considered as equating to around 10 percent of capacity. Therefore, any section of road where the development traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis."

Given that the surrounding network is comprised of rural highways with a one-directional flow rate of 1,700 vehicles per hour, the level of existing traffic combined with traffic associated with this Project, would not approach a total of 10% of the capacity, let alone an increase of over 170 vehicles per hour in any direction.

As such, the traffic impact of the Project is not considered significant in terms of volumes, with potential impacts related to traffic movements have been addressed by this TIA.

7. SITE SPECIFIC ISSUES

7.1 Road Safety

The Main Roads WA Crash Reporting system was interrogated for data relating to any road safety or crash issues in the proximity of the Project Area. This can highlight pre-existing or potential issues which need to be addressed specific to the proposed BESS development.

Outputs in the vicinity of the Project Area from the past five years are shown in Figure 31. Within the five year reporting period, there was a single crash proximate to the proposed development, with a driver leaving the road and hitting a tree at 8.00am in the morning.

Given the lack of crashes in the area, this indicates that the network is suitable and that there are no existing safety issues with the interface along Collie-Changerup Road or Tunney Road.



Figure 31 Crash reporting information for network adjacent to Project Area (source: Main Roads WA)

8. SUMMARY

8.1 Proposed Development and Impacts

This Transport Impact Assessment (TIA) has been prepared by Flyt in support of the Development Application (DA) submitted for the proposed Kojonup Battery Energy Storage System (BESS) (the Project) facility off Collie-Changerup Road.

The Project Area is located at the intersection of Tunney Road and Collie-Changerup Road and as indicated by the South West Aboriginal Land and Sea Council website; it sits on the boundary of the Gnaala Karla Booja Land Use Agreement Area and the Wagyl Kaip Ilua Land Use Agreement Area. The Project, and works associated with the proposed development, is within a Rural zone as set out in the Shire of Kojonup Local Planning Scheme No.3.

The BESS will have a limited volume of vehicle trips associated with its operation. Traffic volumes attributable to construction of the Project has been determined to have a low impact with a focus on site access issues being the key consideration given the majority of the equipment associated with the construction stage will be delivered through as-of-right vehicles.

The overall program for delivery of the Project which will result in traffic generation from the Project will be spread over the period of a year. There will be six key elements to the Project delivery program:

- Site establishment
- Civil works – construction
- BESS installation
- Electrical works
- Substation works
- Commissioning.

The Project will have direct frontage to both Collie-Changerup Road and Tunney Road which provide Restricted Access Vehicle (RAV) network 4 and 7 classification access. Both roads are managed by the Shire of Kojonup. The access point on Collie-Changerup Road will be the primary point of access with the Tunney Road crossover the secondary Project access point. Some vehicle movements will also use the existing Kojonup substation crossover for access however those movements will be limited.

Access crossovers on both roads have been designed to allow for turning vehicles into and out of the development. The immediate area is generally flat and sight lines are unencumbered, with the assessment noting the eastbound approach on Collie-Changerup Road has a slight crest to the east of the proposed Project Area

crossover. Warning signage, which could be installed by Main Roads WA, would be proposed for that approach indicating trucks turning ahead.

Traffic volumes associated for the Project would be low in the context of weekday or hourly volumes in this area. No safety issues are evident on the surrounding network immediately adjacent to the Project, with any issues associated with the movement of over size components managed through the design of access into and out of the Project Area, permit controls set out by Main Roads WA and through on-site traffic management.

9. CHECKLIST

ITEM	PROVIDED	COMMENTS/PROPOSALS
Proposed development		
existing land uses	Yes	Agricultural land
proposed land use	Yes	Battery Energy Storage System (BESS)
context with surrounds	Yes	Included
Vehicular access and parking		
access arrangements	Yes	Two crossovers on frontage roads
public, private, disabled parking set down/pick up	Yes	
Service vehicles (non-residential)		
access arrangements	Yes	Discussed, including locations of crossovers
on/off-site loading facilities	Yes	
Service vehicles (residential)		
rubbish collection and emergency vehicle access	Yes	n/a
Hours of operation (non-residential only)		n/a
Traffic volumes		
daily or peak traffic volumes	Yes	Volumes associated with workforce numbers. Overall volumes for some stages will fluctuate
type of vehicles (for example, cars, trucks)	Yes	RAV network issues covered, swept path for access from Collie-Changerup Road shown
Traffic management on frontage streets		Included
Public transport access		
nearest bus/train routes	Yes	n/a
nearest bus stops/train stations	Yes	n/a
pedestrian/cycle links to bus stops/ train station	Yes	n/a

ITEM	PROVIDED	COMMENTS/PROPOSALS
Pedestrian access/facilities		
existing pedestrian facilities within the development (if any)	Yes	n/a
proposed pedestrian facilities within development	Yes	n/a
existing pedestrian facilities on surrounding roads	Yes	n/a
proposals to improve pedestrian access	Yes	n/a
Cycle access/facilities		
existing cycle facilities within the development (if any)	Yes	n/a
proposed cycle facilities within development	Yes	n/a
existing cycle facilities on surrounding roads	Yes	n/a
proposals to improve cycle access	Yes	n/a
Site specific issues		Addressed, including crossover designs
Safety issues		Discussed, crash reporting show no specific issues. Proposed signage for eastbound approach.
identify issues	Yes	Crash reporting examined. No noticeable issues. Safety elements associated with sight lines and vehicle movements discussed.
remedial measures	Yes	Sight lines adequate on straight section of road for crossovers but suggest additional signage or warning signs on approach from west.

Estelle Lottering

From: Krish Seewraj <krish.seewraj@dwer.wa.gov.au>
Sent: Thursday, 2 July 2026 7:11 AM
To: Shire of Kojonup Council
Cc: Estelle Lottering
Subject: Proposed Kojonup Battery Energy Storage System – Lot 3194 (No. 3680) Collie-Changerup Road, Kojonup

OFFICIAL

02 July 2026
Our Reference: REQ-0003830
Your reference: Email dated 15/06/26
To: Shire of Kojonup
From: Department of Water and Environmental Regulation

RE: Proposed Kojonup Battery Energy Storage System – Lot 3194 (No. 3680) Collie-Changerup Road, Kojonup

Thank you for providing the above referenced proposal for the Department of Water and Environmental Regulation (Department) to consider.

The Department has identified that the proposal has the potential for impact on environment and/or water resource values and/or management. Key issues and recommendations are provided below, and these matters should be addressed:

1. Issue: Water supply
   Advice: The following condition is recommended to be applied:

   Condition: Prior to any ground disturbing activities, the proposal water balance and Water Source Strategy is to be prepared to the satisfaction of the Local Government, which considers all construction and on-going site operation water requirements.

2. Issue: Surface water management
   Advice: The following condition is recommended to be applied:

   Condition: Prior to any ground disturbing activities, a Stormwater Management Plan shall be prepared and implemented in accordance with *Kojonup BESS Hydrological Assessment (Water Technology 07/07/26 Ver 3)* and any changes resulting from detailed design outputs, to the satisfaction of the Local Government.

3. Issue: Construction Environmental Management Plan
   Advice: The following condition and advice note are recommended to be applied:

   Condition: Prior to any ground disturbing activities, a Construction Environmental Management Plan is to be prepared and implemented to the satisfaction of the Local Government.

   Advice note: Condition XX refers to a Construction Environmental Management Plan, this management should include consideration of:
   - Temporary and long-term surface water and erosion management, which relates to both catchment flood and localised stormwater management.

- Water quality risks related to ASS, contaminated sites, hazardous substances use and storage, with reference to:
    - WQPN 56: *Tanks for fuel and chemical storage near sensitive water resources*
    - WQPN 65: *Toxic and hazardous substances*
    - WQPN 10: *Contaminant spills – emergency response*
    - *Construction depots near sensitive water resources*
- Pesticides use, which should be in accordance with best management practices. For more information see brochure: Liquid chemicals on agricultural land and the Department of Health's website *Guides on pesticide use for industry and local government* and Circular PSC88: *Use of herbicides in water catchment areas*.
- Cross reference and show consistency with other regulatory permits and approvals, e.g. clearing permits issued under the *Environmental Protection Act 1986*, etc.

4. Issue: Native Vegetation
   Advice: The following advice note is recommended to be applied:

   Based on the information provided the proposed clearing may not be exempt and a clearing permit may need to be obtained under the *Environmental Protection Act 1986*. For more information, please contact the Department of Water and Environmental Regulation's Native Vegetation Regulation staff on 08 6364 7098 or admin.nvp@dwer.wa.gov.au.

More detail pertaining to the above issues are provided in the table below.

Item No.	Reviewer comment/advice
1	**Issue:** Water supply **Advice:** The following condition is recommended to be applied: Condition: Prior to any ground disturbing activities, the proposal water balance and Water Source Strategy is to be prepared to the satisfaction of the Local Government, which considers all construction and on-going site operation water requirements. **Discussion:** Section 3.2.2 of the *Kojonup BESS Development Application (Umwelt 10/04/26 Ver 2)* states 'A temporary construction compound will provide site offices, storage areas, amenities, car parking, access routes, power and water supply, wastewater facilities, and security infrastructure to support construction activities until permanent services are established.' There is however no detail of the water demand nor source for the compound, construction activities, or ongoing needs. Section 4.1.2 of the *Kojonup BESS Environmental Assessment Report (Umwelt 10/04/26 Ver 2)* states 'the site is located within a 'non-proclaimed' area for groundwater and, as such, no water licensing is required under the *Rights in Water and Irrigation Act 1914* for groundwater abstraction.' However, Abstraction of groundwater from artesian aquifers (from which water naturally flows, or has flowed, to the surface without the need for pumping) is subject to licensing from the department. A license is not required for abstraction from non-artesian groundwater resources. For more information contact our water licence staff on 9726 4111 or bunbury.admin@dwer.wa.gov.au.

	The site is in a 'non-proclaimed' area for surface water and as such there is no need for regulation for any interference with water courses, noting the cable route to the substation crosses a waterway, or take of surface water I this was proposed to be used. The Department recommends the preparation of a water balance. This should include details of temporary construction and long-term operational water demands, and evidence of secure water sources to meet the demand. This may include details of landholder agreements, and/or commitment by service providers to service the proposal.
2	**Issue:** Surface water management **Advice:** The following condition is recommended to be applied: Condition: Prior to any ground disturbing activities, a Stormwater Management Plan shall be prepared and implemented in accordance with *Kojonup BESS Hydrological Assessment (Water Technology 07/07/26 Ver 3)* and any changes resulting from detailed design outputs, to the satisfaction of the Local Government. **Discussion:** The Department has assessed the *Kojonup BESS Hydrological Assessment (Water Technology 07/07/26 Ver 3)*, and considerers it as fit for purpose. Several assumptions have been made in relation to culvert locations, detailed in Section 3.9.3. These have been stated as 'design assumptions with exact specifications to be confirmed during detailed design'. These will need to be verified against engineering drawings, noting that this level of detail has not been provided in the Plans included in the referral documentation. The assessment has been identified as being conservative in relation to blockage factors, with Section 4.2.4 stating 'scenario simulates a worst-case 100% blockage condition', which resulted in 'peak depths increase by up to 0.15 m under 100% blocked conditions. This sensitivity scenario was not applied to the baseline modelling as the impacts were localised and have no predicted impact on the potential BESS location within the investigation area.' This is considered appropriate. Furthermore, Section 4.2.5 states 'The investigation area was not shown to be inundated or influenced by out of bank flooding from the Murchison River and as such riverine inflows were not included within the final modelling (Figure 4.2).' As such the site is not affected by riverine flooding and the local stormwater assessment undertaken to size the detention basins and local flows is considered appropriate.
3	**Issue:** Construction Environmental Management Plan **Advice:** The following condition and advice note are recommended to be applied: Condition: Prior to any ground disturbing activities, a Construction Environmental Management Plan is to be prepared and implemented to the satisfaction of the Local Government.

	Advice note: Condition XX refers to a Construction Environmental Management Plan, this management should include consideration of: • Temporary and long-term surface water and erosion management, which relates to both catchment flood and localised stormwater management. • Water quality risks related to ASS, contaminated sites, hazardous substances use and storage, with reference to: o WQPN 56: *Tanks for fuel and chemical storage near sensitive water resources* o WQPN 65: *Toxic and hazardous substances* o WQPN 10: *Contaminant spills – emergency response* o *Construction depots near sensitive water resources* • Pesticides use, which should be in accordance with best management practices. For more information see brochure: Liquid chemicals on agricultural land and the Department of Health's website *Guides on pesticide use for industry and local government* and Circular PSC88: *Use of herbicides in water catchment areas*. • Cross reference and show consistency with other regulatory permits and approvals, e.g. clearing permits issued under the *Environmental Protection Act 1986*, etc. **Discussion:** The *Kojonup BESS Environmental Assessment Report (Umwelt 10/04/26 Ver 2)* makes several references to matters being managed through a Construction Environmental Management Plan, which will be developed and implemented for the Project. These matters include potential soil impacts such as acid sulphate soils and erosion, temporary water quality impacts, localised loss of native flora and vegetation, spread of introduced flora species, dust, etc. The Department supports the development of a Construction Environmental Management Plan.
7	**Issue:** Native Vegetation **Advice:** The following advice note is recommended to be applied: Based on the information provided the proposed clearing may not be exempt and a clearing permit may need to be obtained under the *Environmental Protection Act 1986*. For more information, please contact the Department of Water and Environmental Regulation's Native Vegetation Regulation staff on 08 6364 7098 or admin.nvp@dwer.wa.gov.au. **Discussion:** Section 2.1 of the *Kojonup BESS Environmental Assessment Report (Umwelt 10/04/26 Ver 2)* states 'Under Part V of the EP Act, a Native Vegetation Clearing Permit (NVCP) is required to clear native vegetation unless an exemption applies. Although the Project has been designed to avoid vegetation clearing, a small area of native vegetation (approximately 0.09 ha) may need to be cleared. Appropriate permits will be sought if required.'

	Based on the information provided, the proposed clearing is not exempt, and a clearing permit is required. The Department has not received a clearing permit application for this proposal. Application forms are available from https://www.wa.gov.au/service/environment/environment-information-services/clearing-permit-forms. Additional information on how to apply for a clearing permit is available from https://www.wa.gov.au/service/environment/environment-information-services/native-vegetation-clearing-permits. Information regarding clearing permit fees can be found here: https://www.wa.gov.au/service/environment/environment-information-services/native-vegetation-clearing-permit-fees-frequently-asked-questions. Please note the Department has a referral process where very minor clearing proposals can be referred to the Department to determine whether a clearing permit is required. The decision on whether a clearing permit is required will be made against criteria specified in the EP Act and the *Guideline: Native vegetation referrals* available here: https://www.wa.gov.au/government/publications/guideline-native-vegetation-clearing-referrals It appears that the referral process may be applicable to the clearing proposed. Applicants are encouraged to review the guideline to determine whether the proposed clearing satisfies all the criteria specified under section 51DA of the EP Act. If the clearing does not satisfy all the criteria under section 51DA of the EP Act, a clearing permit is required. If further clearification is required, please contact the Department's Native Vegetation Regulation section by email (admin.nvp@dwer.wa.gov.au) or by telephone (6364 7098).
8	**File Note:** *Kojonup BESS Environmental Noise Assessment (Sonus March 2026)* As advised by the Shire's EHO on 26/06/26 the Department's Environmental Noise Branch has not been requested to undertake a technical assessment of this report.
9	**File Note**: Accommodation camp Section 1.5 of the *Kojonup BESS Development Application (Umwelt 10/04/26 Ver 2)* states 'the establishment of a purpose-built accommodation camp sized to peak demand is not proposed as part of the Development Application.'

	The Department may have comments on this separate Development Application, e.g. water supply and wastewater management. Specifically, if an onsite wastewater system is proposed ensuring that buffers to water resource are achieved as per clause 8.7.8 and 8.7.9 of *State Planning Policy 2.9 Planning for Water Guidelines*.

In the event there are modifications to the proposal that may have implications on aspects of environment and/or water management, the Department should be notified to enable the implications to be assessed.

Should you require any further information on the comments please contact the undersigned.

Yours sincerely,

Krish Seewraj
Planning Advice Program Manager
South West Region
Approvals – Statewide Delivery

Department of Water and Environmental Regulation
71 McCombe Road, BUNBURY, WA 6230
PO Box 261, BUNBURY, WA 6231
T: (08) 9726 4137 | F: (08) 9726 4100 | E: krish.seewraj@dwer.wa.gov.au
www.dwer.wa.gov.au | Twitter: @DWER_WA

From: Estelle Lottering <estelle.lottering@kojonup.wa.gov.au>
Sent: Monday, 15 June 2026 12:03 PM
Subject: Development APPLICATION FOR Proposed KOJONUP BATTERY ENERGY STORAGE SYSTEM – Lot 3194 (NO. 3680) COLLIE-CHANGERUP ROAD, KOJONUP - COMMENT SOUGHT

You don't often get email from estelle.lottering@kojonup.wa.gov.au. Learn why this is important

Dear Stakeholder

Development APPLICATION FOR Proposed KOJONUP BATTERY ENERGY STORAGE SYSTEM – Lot 3194 (NO. 3680) COLLIE-CHANGERUP ROAD, KOJONUP - COMMENT SOUGHT

The purpose of this correspondence is to advise adjacent and nearby landowners, the community and other stakeholders of the Development Application and to provide you with an opportunity to comment on the proposal. You have the opportunity to provide your written comments to the Shire on the above Development Application by 27 July 2026.

By way of background, the Shire has received a Development Application from Mint Renewables Pty Ltd to establish a battery energy storage system (BESS) approximately 3km north-west of the Kojonup townsite. In summary, the application proposes:

- BESS substation;
- BESS units, inverters, transformers and cabling;
- Operations and maintenance facility;
- Water storage including new stormwater detention basin;
- New vehicle access points; and

- Ancillary development.

The Development Application is supported by a number of technical reports. Documentation provided by the applicant is set out at https://www.kojonup.wa.gov.au or is available at the Shire office.

The application will be assessed by the Shire and determined by the Regional Development Assessment Panel.

Should you wish to make a submission on the Development Application, your written comments need to be lodged with the Shire by 27 July 2026. Submissions can be emailed to council@kojonup.wa.gov.au or posted to PO Box 163, Kojonup WA 6395.

If you have any questions or queries regarding this matter, please do not hesitate to contact Este Lottering (Project Manager & Community Services) or Steve Thompson (Consultant Planner) through the Shire Office on (08) 9831 2400.

Regards

Este Lottering
Manager Regulatory Services
Work Health and Safety Representative
SHIRE OF KOJONUP

93 Albany Highway Kojonup WA 6395 | PO Box 163 Kojonup WA 6395
Tel: 9831 2400 | Direct: 9831 2440 | Mobile: 0460 426 416 www.kojonup.wa.gov.au



FOR RECIPIENTS EXTERNAL TO THE SHIRE OF KOJONUP

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Government of Western Australia
Department of Health

Your Ref: BESS – LOT 3194 (No. 3680) COLLIE-CHANGERUP ROAD, KOJONUP
Our Ref: F-AA-90474-1 / EDOC26/263175
Contact: Vic Andrich (9222 2000)

Mr Grant Thompson
Chief Executive Officer
Shire of Kojonup
PO Box 163
KOJONUP WA 6395

Via email: council@kojonup.wa.gov.au

Dear Mr Thompson

KOJONUP BATTERY ENERGY STORAGE SYSTEM (BESS) - LOT 3194 (# 3680) COLLIE-CHANGERUP ROAD, KOJONUP

Thank you for your letter of 15 June 2026, requesting comments from the Department of Health (DoH) on the above proposal. The DoH provides the following comment which is in addition to advice provided by your local environmental health services in relation to this proposal.

Summary

Development is proposed within a project area of approximately 34.5 hectares (ha), with an indicative disturbance footprint of approximately 8.09 ha (including around 3.6 ha of permanent infrastructure). Key infrastructure includes modular battery units, inverters and transformers, internal access tracks, security fencing, an on-site substation, underground cabling to connect to the existing Kojonup Substation, water storage and a stormwater containment basin, and a small operations and maintenance facility.

The DoH supports the State Government's renewable energy objectives and recognises the important role that Battery Energy Storage Systems (BESS) play in improving electricity reliability and facilitating renewable energy generation. However, as utility-scale BESS developments represent an emerging technology with evolving regulatory guidance, it is important that potential public and environmental health risks are appropriately identified and managed. The DoH's comments are intended to ensure that emerging public and environmental health risks associated with these facilities are appropriately identified and managed through the planning and operational lifecycle of the development.

The following comments are provided to assist the Shire in assessing whether the proposal has adequately addressed potential public health impacts associated with the development. In particular, the assessment of potential off-site public health impacts associated with credible emergency scenarios is considered relevant to the compatibility of the development with its setting and surrounding land uses.

DoH position

☐ No objection – no comments or advice to provide.
☒ No objection – with comments and/or recommended conditions provided below.
☐ Do not support – reasons provided below, i.e. additional reports, studies, plans or other information that should be provided to determine public health risk / legislative compliance.

DoH advice and recommended conditions

Infrastructure - Water Supply and Wastewater Disposal
Regarding any future on-site wastewater disposal, the proposed development appears to have drainage issues. A site-specific Site and Soil Evaluation (SSE) will be required to be undertaken by a qualified consultant during the wettest seasonal time of the year (mid-July/August) as per AS/NZS 1547:2012 to ensure the land application area is located and sized appropriately. The disposal of wastewater generated on site is required to comply with the *Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974*.

All drinking water provided on site must meet the health-related requirements of the Australian Drinking Water Quality Guidelines 2011.

Any non-drinking water (i.e., water that is not intended or suitable for drinking) must be managed to ensure it cannot be confused with or contaminate the drinking water supply. This requires satisfactory labelling of non-drinking water taps and, depending on system configuration suitable backflow prevention arrangements in accordance with Australian/New Zealand Standards AS3500 – Plumbing and Drainage.

Public Health & Hazard Management
The proposal has adequately considered a range of routine environmental and planning matters including noise, traffic, drainage, visual amenity and bushfire planning. However, the assessment provides comparatively limited consideration of public health risks associated with credible emergency events involving a utility-scale BESS. Emergency incidents involving lithium iron phosphate (LFP) battery energy storage systems may result in the generation of flammable gases, electrolyte leakage from damaged, failing or corroding batteries, explosions, and the release of smoke and other combustion products. Accordingly, it is recommended that the Emergency Management Plan explicitly address public health protection measures associated with credible battery failure scenarios, including community notification, smoke management, emergency exclusion arrangements, agency coordination and public communication.

It is noted that the Australian Energy Council Guideline (GHD, September 2024) identifies the absence of nationally recognised default separation distances for BESS as a significant knowledge gap. In the absence of established separation distances, the DoH supports application of the Environmental Protection Authority's Separation Distances between Industrial and Sensitive Land Uses (2005) Guidance, which recommends site-specific technical assessment where there is potential for off-site impacts.

While emissions during normal operation are expected to be negligible, utility-scale BESS contain hazardous materials that, if involved in thermal runaway, equipment failure or bushfire, may give rise to significant public health impacts beyond the site boundary. Given there are currently no nationally accepted default separation distances for utility-scale BESS, the Shire should be satisfied that sufficient technical information has been provided to demonstrate that the proposed separation distances appropriately protect surrounding land uses from credible off-site impacts associated with emergency events.

It is further recommended that consultation continue with the relevant State agencies responsible for emergency management, dangerous goods regulation, energy policy and environmental regulation, including the Department of Fire and Emergency Services, the Department of Local Government, Industry Regulation and Safety (Building and Energy Division – Dangerous Goods), the Department of Energy and Economic Diversification (Energy Policy WA), and the Department of Water and Environmental Regulation, to ensure that emergency response planning and risk management arrangements are appropriately coordinated.

Should you have any queries or require further information, please contact System Performance on 9222 2000 or eh.eSubmissions@health.wa.gov.au.

Yours sincerely



Peter Gray
EXECUTIVE DIRECTOR
ENVIRONMENTAL HEALTH DIRECTORATE

22 July 2026

Suite 11, 36 Johnson Street Guildford WA 6055
PO Box 388 Guildford WA 6935
T: 08 6477 1144 | E: admin@bushfireprone.com.au

BPP Ref: 241243
DAP Ref: DAP/26/03135
DFES Ref: 2026/1387

17th August 2026

Estelle Lottering
Shire of Kojonup
estelle.lottering@kojonup.wa.gov.au

Dear Ms Lottering,

Re: Response to DFES comments

Please find my response to the DFES comments, as requested, on the following pages.

If you wish to discuss these further, please do not hesitate to contact this office.

Yours sincerely



Mike Scott

Director

Bushfire Prone Planning



Neil Stoney

Senior Bushfire Consultant – Renewables Lead

Bushfire Prone Planning

BPP RESPONSE TO DFES COMMENTS	
Relevant Authority and Reference Number:	Shire of Kojonup - DAP/26/03135
Relevant Application:	Lot 3194 (3680) Collie-Changerup Road, Kojonup – Renewable Energy Facility with Battery Energy Storage System (BESS) And Substation - Development Application
Relevant Document:	241243 - Kojonup BESS (BMP) v1.2
DFES Comments - Date and Reference Number:	27th July 2026 - *2026/1387*
Bushfire Prone Planning (BPP) – Response Date and Reference Number:	17th August 2026 / 241243

DFES Assessment Note:

General Comment

- DFES acknowledges that the site is currently vacant, and the proposed development proposes a renewable energy facility with a BESS (100Mw capacity) and associated substation and infrastructure.
- DFES notes that the current version of SPP 3.7 and the Guidelines no longer makes reference to 'high risk land use'. The decision maker has referred this proposal to DFES as a discretionary referral. DFES considers that SPP 3.7 and the Guidelines do not adequately address high risk land use such as renewable energy facilities from a HMA perspective. Given the temperature sensitive nature of the infrastructure, it is critical to ensure that the proposed design adequately responds to facility fire risks and bushfire risks in order to protect life, property and infrastructure.
- Accordingly, DFES has also assessed the proposal against the CFA Design Guidelines and Model Requirements – Renewable Energy Facilities as amended (REF Guidelines) which is currently considered best practice for the development of renewable energy facilities.
- It is noted that a Bushfire Risk Report has been provided. The REF Guidelines requires the submission of a Risk Management Report which informs fire risk in design and operation of the facility. Bushfire risk should be covered by the BMP, and it is considered that an additional Bushfire Risk Report does not appear to add any value to the proposal.
- Specific requirements of SPP 3.7 and the supporting Guidelines and the REF Guidelines are to be further addressed in the BMP as outlined in the below assessment. The assessment comments relating to the REF Guidelines have been incorporated into the below overall assessment comments for the respective issue/element.

Recommendation: Compliance with acceptable solutions not demonstrated – modifications required

- DFES advises that the BMP has not demonstrated that the proposed development complies with the Element 2: Siting and Design requirements of SPP 3.7 and the Guidelines.
- DFES recommends the BMP be modified as per the Assessment advice provided in Tables 1-3 to ensure it is accurate and the bushfire risk management/mitigation measures are effective and can be implemented in perpetuity to manage/mitigate the bushfire risk to people, property

and infrastructure to an acceptable level and appropriate to the land use and location. The required modifications are listed in the table(s) below. Should the modified BMP affect the design of the proposal, the proposal should be amended to reflect these modifications.

- Further information should also be submitted to demonstrate compliance with the Victorian Country Fire Authority REF Guidelines.

BPP Comment:

Expectations and assessment practices for renewable energy proposals are continuing to evolve, without necessarily being reflected in formalised State planning policy, guidance or agency position statements. BPP acknowledges the challenges this presents for referral agencies such as DFES, particularly where established State-based guidance does not comprehensively address the particular characteristics of emerging land uses such as BESS facilities.

BPP notes that DFES has, in the absence of specific WA policy for this land use, drawn on the Victorian CFA's Design Guidelines and Model Requirements - Renewable Energy Facilities as an interim reference point. BPP has similarly had regard to comparable guidance in preparing the Bushfire Risk Report, given the current absence of an established WA framework specific to renewable energy facilities.

DFES has raised a number of concerns which are due to shortcomings of the bushfire planning framework rather than non-compliance with SPP 3.7.

All such concerns have been addressed to the extent possible at this planning stage.

BPP considers the BMP's overall approach is consistent with the intent of SPP 3.7 and the Guidelines.

An updated BMP will be provided, which will include a specific assessment description of the landscape screening, and clarifying the APZ extent.

Table 1: Assessment – Policy Measure 7.1 ii. c. Compliant Preparation of a Bushfire Attack Level (BAL) Contour Map

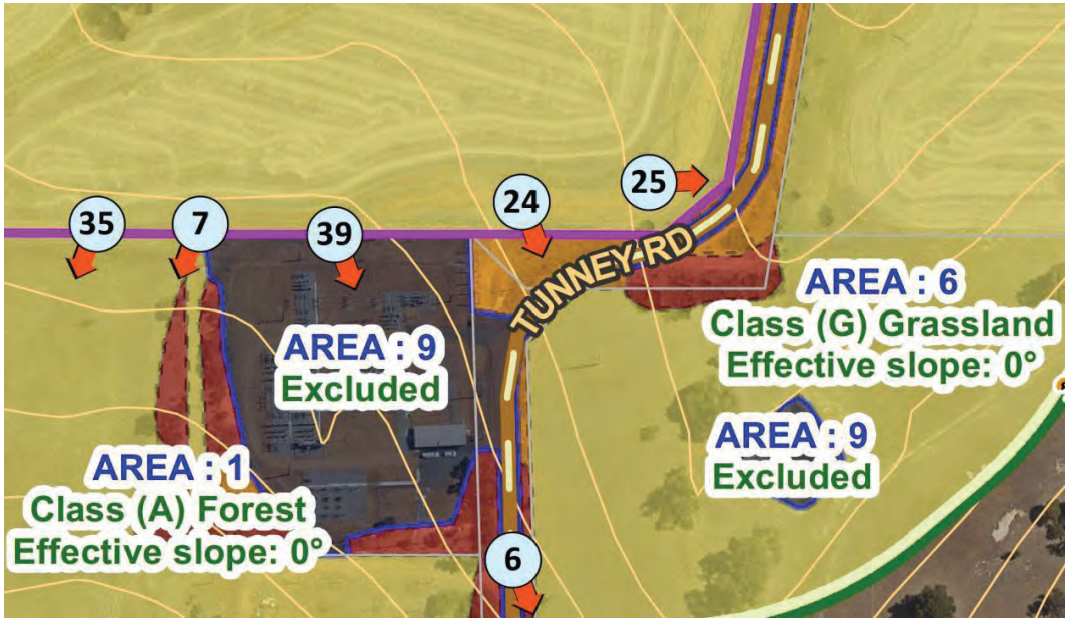
Subject Matter 1	Vegetation Classification or Exclusions		
Issue	Classified Area 8 – not demonstrated	Action	BAL Rating cannot be validated Further evidence to support the vegetation classification of Area 8 is required.
BPP Resolution	BMP will be updated with further justification of classification of Vegetation Area 8.		

Assessment	BPP Response
Vegetation Area 8 cannot be substantiated as Class D Scrub. A number of inconsistencies have been identified, including: • Area 8 is a post-development vegetation classification as the vegetation will be planted to screen the facility from the surrounding road network. Section A1.2 of the BMP states that Area 8 will have trees up to 30 metres in height, however AS 3959 states a maximum height for Scrub of 6 metres. • The Landscape Visual Impact Assessment Report states that the screening vegetation 'may comprise a double row of trees and an understory shrub layer.' No confirmation of the species has been provided to confirm the Class D Scrub classification at maturity. The Method 2 calculation relies on the vegetation around the BESS being no greater than Class D Scrub. • Figure 2.1.1 and Table 3.2 in the BMP states that Area 8 will have a site slope and effective slope of 0 degrees. However, Section A1.2 states that Area 8 will have a site slope and effective slope of 5 degrees. The BMP should detail specifically how the Class D Scrub classification was derived. If unsubstantiated, the vegetation classification should be revised to consider the vegetation as per AS 3959, or the resultant BAL ratings may be inaccurate.	0-degree values in Figure 3.1.1, Table 3.2, and Section A3 are accurate and the effective and site slope values in A1.2 have been updated in. This will be corrected in the updated BMP. The classification of landscape screening vegetation is discussed in Measure 1.9 of the Bushfire Risk Report. On review, it is appropriate for this justification to be included and will be provided within the Section 2.3.1 of the updated BMP. The full justification is provided below for completeness. ***Assessment Comments***: Renewable energy infrastructure is frequently sited in large vacant allotments or farmland where the necessary infrastructure and sufficient space is available. This results in potential visual and noise amenity impacts. Revegetation to provide vegetation screening is a very common requirement for such proposals. Vegetation screening is required where the existing vegetation is insufficient to block the development from receptors, and so is generally not connected to substantive vegetation. In general, such areas will be continuous with open pasture, windbreaks, or nature strips within road reserves. Exclusion from Classification *AS 3959-2018* appropriately provides for exclusion of isolated, narrow, and/or disconnected vegetation through exclusion clauses 2.2.3.2 (b), (c), and (d), and the clause (f) provision for windbreaks and nature strips. The exclusions attempt to provide for the principle that fire spread will not be continuous between sufficiently separated pockets of vegetation- it will need to spot (through embers or detached flame) and re-develop. Any fire in such a pocket will be a developing fire without presenting significant threat to assets which are sufficiently separated from the vegetation. Vegetation screens are often isolated, narrow pockets which do not meet the prescribed >20m setbacks of clauses 2.2.3.2 (c) and (d), despite the intent being applicable. For example, a pasture fire (modelled flame length <8m) cannot spread uninterrupted across a >12m road carriageway (noting spotting and re-

	establishment may occur as above). Clauses 2.2.3.2 (c) or (d) cannot be applied to vegetation on the opposing verge due to the <20m separation. Modification of Classification *AS 3959-2018* does not provide for modified classification (e.g. Class A Forest to Class D Scrub) where the same principles as for exclusion apply. This oversight has direct implication on vegetation screening, which must necessarily be sited relatively near the development and at a sufficient depth and height to function as a screen. Within the 'Planning' BMP (*241243 - Kojonup BESS (BMP*) prepared to support the proposal, vegetation must be classified in accordance with AS 3959. For the purposes of this risk assessment, the gaps in this methodology should be considered. A landscape-scale fire running through pasture, windbreaks, and road reserves impacting a <10m wide band of vegetation will increase in intensity. Thus, classification of this vegetation is appropriate. However, in treed vegetation (forest/woodland), it is highly unlikely to develop/establish into a crowning fire- where the canopy is fully involved in the fire. The behaviour would not be a developing fire but would be limited to the elevated fuels only. Further, where the vegetation is surrounded by pasture, wind action is a far more relevant consideration as continuous trees are not present to limit wind impact. A fully established bushfire where elevated (but not canopy) fuels are consumed and placing emphasis on wind action, is the modelling for Shrub, Scrub, and Mallee/Mulga fuel types in Table B4 of *AS 3959-2018* (Catchpole et al. 1998). This is the appropriate fire model to apply. Summary 1. Class A Forest/Class B Woodland classification does not appropriately represent the expected or modelled fire behaviour for narrow bands of vegetation screening vegetation which are either isolated or continuous with pasture. Class D Scrub (Catchpole et al. fire model) is the appropriate classification to apply in these scenarios. 2. It may be appropriate to exclude narrow bands of screening vegetation which are disconnected from continuous fire runs by non-vegetated or low fuel areas (roads, hardstand, APZs etc), in alignment with but not strictly meeting AS 3959 clause 2.2.3.2 (c) or (d). ***Recommendation Details**:* Where vegetation screening is <10m width and continuous with pasture only, vegetation classification should not exceed Class D Scrub. Where vegetation screening is <10m in width and isolated from significant vegetation, exclusion as a 'nature strip' may be appropriate. This will be reflected within the associated Bushfire Management Plan for the Development Application.

Subject Matter 1	Vegetation Classification or Exclusions		
Issue	Classified Area 5 – not demonstrated	Action	BAL Rating cannot be validated Further evidence to support the vegetation classification of Area 5 is required.
BPP Resolution	No action required.		

Assessment	BPP Response
Vegetation Area 5 cannot be substantiated as Class D Scrub. A number of inconsistencies have been identified, including: • Area 5 is not labelled on the vegetation classification map. • Section A1.2 of the BMP states that Area 5 will have trees up to 30 metres in height, however AS 3959 states a maximum height for Scrub of 6 metres. The BMP should detail specifically how the Class D Scrub classification was derived. If unsubstantiated, the vegetation classification should be revised to consider the vegetation as per AS 3959, or the resultant BAL ratings may be inaccurate.	The assessment comment in A1.2 states 'taller trees may be present with <10% canopy cover.' There were 1-2 taller trees within Area 5. Area 5 is mostly contained under transmission lines. Western Power prunes/removes plants which could contact the conductors. See below. 

	The classified vegetation with a Class A Forest structure near Area 5 at the south-eastern corner of the site were designated as such.  The vegetation classification map will be updated in the revised BMP to explicitly label Area 5, addressing DFES's observation that it does not currently appear on the map.

Subject Matter 1	Vegetation Classification or Exclusions		
Issue	Classified Areas 3 and 4 – not demonstrated	Action	BMP to be modified for accuracy purposes only. Further evidence to support the vegetation classification of Areas 3 and 4 is required.
BPP Resolution	No action required.		

Assessment	BPP Response
Vegetation Areas 3 and 4 cannot be substantiated as Class B Woodland with the limited information and photographic evidence provided. The foliage cover appears to exceed 30%. The BMP should detail specifically how the Class B Woodland classification was derived as opposed to Class A Forest. If unsubstantiated, the vegetation classification should be revised to consider the vegetation as per AS 3959. It is acknowledged the classification of these Areas as Class A Forest is for accuracy purposes only and would not impact the BAL rating for the facility.	The classified vegetation areas meeting Class A Forest and Class B Woodland structure were identified within the BMP. Class B Woodland is typical in the Wheatbelt, with Class A Forest being the exception. Remnant vegetation areas on private allotments in the region are frequently on rocky, poor quality soils which were not cleared for dryland cropping and grazing. Further, wandoo, salmon gum, and gimlet are moderately alleopathic (tannins and lateral root systems) which further suppress understory growth- including juvenile trees and thus mature canopy density. Ecology notwithstanding, Photos 11-21 show a separation of canopies and grassy understory consistent with Class B Woodland. Note some photos are from a distance due to being offsite and the canopy will appear as a single entity, however individual tree boles are visible.

Subject Matter 2	SPP 3.7 Appendix A - Bushfire Assessment Methodologies		
Issue	Method 2	Action	BAL Rating cannot be validated Method 2 outputs cannot be validated.
BPP Resolution	No action required.		

Assessment	BPP Response
Due to the inconsistencies identified with vegetation Area 8 the Method 2 cannot be validated. The separation distances provided in the Method 2 calculation for Area 8 would be inaccurate if the site slope is 5 degrees. In addition, the species and management of the screening vegetation is not provided and may constitute a Class A Forest rather than Class D Scrub classification if not managed in perpetuity. Accordingly, DFES considers that the Method 2 outputs cannot be validated.	Method 2 calculations are directly dependent on the vegetation slope and classification, addressed under Area 8 above. With the slope correction (confirming 0 degrees) and the classification justification provided, BPP is satisfied that the Method 2 outputs are valid.

Table 2: Policy Measure 7.1 ii. e. Compliance with the Bushfire Protection Criteria 7: Development – Commercial and Industrial

Subject Matter 3	Bushfire Protection Criteria		
Issue	Siting and Design	Action	BAL Rating cannot be validated. Modification to the BMP is required to address the Assessment advice in Table 1.
BPP Resolution	BMP will be updated with clarification of APZ extent.		

Assessment	BPP Response
A2.1a – not demonstrated The BAL ratings cannot be validated for the reason(s) outlined in Table 1. Furthermore, the development plans appear to be inconsistent with the plan shown in the BMP. The BMP shows a grey unvegetated hardstand around the facility which meets the screening vegetation. The development plans do not show this hardstand/ paved area. If there is grassland vegetation remaining inside the screening area, it should be considered in the Method 2 calculation.	The general operational area of the facility from the assets to the landscape screening was shown as low threat. This is a more practical management extent in application rather than the specific 21.2m APZ. On review, this is not explicitly stated in the BMP. The updated BMP will include a requirement to clarify that all land between the designated assets and the landscape screening is to be maintained as an APZ.

Table 3: Policy Measure 7.1 iv. and Section 9.4.2 of the Guidelines: DFES Role as Hazard Management Agency (HMA)

Subject Matter 4	Emergency Management Plan (EMP)		
Issue	Emergency Management Plan (EMP)	Action	Comment only.
BPP Resolution	No action required.		
Assessment		BPP Response	
Given the high-risk land use at this location, it is considered appropriate that an '*Emergency Management Plan*' be prepared. Consideration should be given to the Bushfire Emergency Plan (BEP) Manual (as published by the Western Australian Planning Commission), Section 7 of the REF Guidelines. These contain details of information that should be included in an EMP and will ensure the appropriate content is detailed when finalising the EMP to the satisfaction of the Shire.		Emergency management documentation will be prepared prior to commencing site works. Bushfire emergency procedures will be provided within a Bushfire Emergency Plan or integrated into a comprehensive Emergency Management Plan.	

Subject Matter 5	Renewable Energy Facilities		
Issue	Risk Management Plan	Action	A detailed Risk Management Plan is required to be provided.
BPP Resolution	A detailed Risk Management Plan will be provided prior to construction, once a BESS supplier has been selected and final technical specifications are confirmed.		

Assessment	BPP Response
It is noted that a Bushfire Risk Report has been provided, however, as per the REF Guidelines, a Risk Management Plan (RMP) should describe the risk management process and its outcomes, including the specific site hazards/risks and their analysis, control measures, and the monitoring and review process for all site risks, not just bushfire. A RMP is considered to be a critical requirement of planning and informing fire risk management in the design and operation of renewable energy facilities. An appropriate RMP for the proposal has not been provided. A detailed RMP should be provided that demonstrates compliance with the REF Guidelines, including addressing the following model requirements of the REF Guidelines: • Detailed site plans showing the location of site vehicle access points, internal roads, battery containers, substations, buildings and fire water supplies. • The exact specifications of the elements within the renewable energy facility, such as the battery chemistry, relevant specifications and technical data sheets on the BESS facility. • Details of the fire, smoke, heat, and toxic off-gassing detection system for the BESS facility. The system should specify what triggers an internal operator response and what triggers a 000 call. • Details of the explosion prevention and venting system for the BESS facility. • Details of the battery management and monitoring system. The system should enable the operator to intervene for the prevention of thermal runaway.	BPP notes that the REF Guidelines' definition of a "Risk Management Plan" derives from the Victorian planning framework (Clause 13.02-1S of the Victorian Planning Scheme) and has not been formally adopted in Western Australia. BPP has referred to the REF Guidelines as a useful reference point in the absence of WA-specific guidance for renewable energy facilities, rather than as a binding compliance standard. Bushfire is one of several disciplines required to provide input to an overarching Risk Management Plan. Mint Renewables (the proponent) acknowledges DFES's underlying request, that the specific technical parameters relevant to fire and life safety (battery chemistry, detection and off-gassing systems, explosion prevention, battery management and thermal runaway intervention capability, water ingress protection, and alarm systems) be documented and available to inform the Shire's and DFES's satisfaction with the Project's fire safety approach. These parameters are supplier-specific and cannot be meaningfully finalised until a BESS supplier is selected, which will occur following planning approval. Consistent with standard industry practice for utility-scale BESS, it is proposed that a detailed Risk Management Plan be provided prior to construction as a condition of approval.

• Details of the system to prevent water ingress to battery containers and appropriate ingress protection rating for containers. • Details of the warning and alarm system within battery containers and/or the facility. The system should specify what each alarm signal means.	

Subject Matter 5	Renewable Energy Facilities		
Issue	Consultation	Action	Comment only.
BPP Resolution	No action required.		

Assessment	BPP Response
In the event that an approval is granted, the DFES District Officer responsible for this region and the local fire and emergency services should be consulted during the development, construction, and leading up to the commissioning of the facility. It is considered critical for the local fire and emergency services to understand the hazards present in the facility and the measures required to ensure the safety of firefighting personnel when working in or around different parts of the facility. This may impact on how crews respond to a fire within the facility, which may in turn have ramifications regarding the optimal number and location of water supplies.	BPP supports the recommended consultation. This is a recommendation of the Bushfire Risk Report.

Subject Matter 6	DFES Other Technical Advice		
Issue	DFES Bushfire Technical Services	Action	Modification to the BMP is required to address the Assessment advice.
BPP Resolution	No action required.		

Assessment	BPP Response
See Table 1 for Method 2 comments.	Method 2 calculations are based on vegetation slope and classification, discussed above.

Subject Matter 6	DFES Other Technical Advice		
Issue	DFES Land Use Planning	Action	Comment only.
BPP Resolution	No action required.		

Assessment	BPP Response
It is the responsibility of the proponent to ensure the proposal complies with relevant planning and building requirements. This advice does not exempt the applicant/proponent from obtaining approvals that apply to the proposal including planning, building, environmental health or any other approvals required by a relevant authority under written laws.	No comment required.

Table of Commitments

	Commitment	Additional Consultation to be Undertaken
1	Accommodation strategy – assessment of local/regional accommodation availability, workforce scheduling	Shire of Kojonup
2	Non-drinking water labelling/backflow prevention (AS3500) (if required)	-
3	On-site wastewater disposal system design/approval (if required)	-
4	Western Power connection configuration confirmation	Western Power
5	Water Balance / Water Source Strategy	DWER, Shire of Kojonup
6	Stormwater Management Plan *(prior to ground disturbance)*	DWER, Shire of Kojonup
7	Construction Environmental Management Plan	Shire of Kojonup
8	Native vegetation clearing permit (0.09 ha) *(prior to ground disturbance)*	DWER
9	Updated Bushfire Management Plan	DFES, Shire of Kojonup
10	Risk Management Plan	DFES, Shire of Kojonup
11	Emergency Management Plan	DFES, Shire of Kojonup
12	Development Plans	Shire of Kojonup
13	Pre-construction noise assessment	Shire of Kojonup
14	Traffic Management Plan	Main Roads WA, Shire of Kojonup
15	Site familiarisation with local fire brigades (*prior to commissioning)*	Local Fire Brigades

PART E – OTHER BUSINESS

1. State Administrative Tribunal Applications and Supreme Court Appeals

2. Meeting Closure