Metro Outer Development Assessment Panel Agenda

Meeting Date and Time: Thursday, 27 February 2025; 9:30am
Meeting Number: MODAP/66
Meeting Venue: 140 William Street, Perth

A live stream will be available at the time of the meeting, via the following link: MODAP/66 – 27 February 2025 – City of Mandurah – Shire of Mundaring – City of Swan

PART A – INTRODUCTION

1. Opening of Meeting, Welcome and Acknowledgement
2. Apologies
3. Members on Leave of Absence
4. Noting of Minutes

PART B – CITY OF MANDURAH

1. Declarations of Due Consideration
2. Disclosure of Interests
3. Form 1 DAP Applications
   - 3.1 Lot 812 (4) Waardong Court, Halls Head – Residential - Multiple Dwellings – DAP/24/02815
4. Form 2 DAP Applications
5. Section 31 SAT Reconsiderations

PART C – SHIRE OF MUNDARING

1. Declarations of Due Consideration
2. Disclosure of Interests
3. Form 1 DAP Applications
   - 3.1 Lots 1636, 3303 and 9001 (340) Roland Road, Parkerville – Proposed Educational Establishment – DAP/24/02810
4. Form 2 DAP Applications
5. Section 31 SAT Reconsiderations

PART D – CITY OF SWAN

1. Declarations of Due Consideration
2. Disclosure of Interests
3. Form 1 DAP Applications
   - 3.1 Part Lot 900 Chittering Road, Lot 9501 Fairchild Street & Lot 9013 Tigermoth Boulevard, Bullsbrook – Proposed Lifestyle Village (Park Home Park) – DAP/24/02776
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

ATTENDANCE

DAP Members

Dale Page (Presiding Member)
Eugene Koltasz (Deputy Presiding Member)
Francesca Lefante (Specialist Member)

Part B – City of Mandurah
Mayor Caroline Knight (Local Government DAP Member, City of Mandurah)
Cr Peter Rogers (Local Government DAP Member, City of Mandurah)

Part C – Shire of Mundaring
Cr Luke Ellery (Local Government DAP Member, Shire of Mundaring)
Cr Prapti Mehta (Local Government DAP Member, Shire of Mundaring)

Part D – City of Swan
Cr Jennifer Catalano (Local Government DAP Member, City of Swan)
Cr Charlie Zannino (Local Government DAP Member, City of Swan)

Minute Secretary

Claire Ortlepp (DAP Secretariat)

Officers in Attendance

Ashlee Kelly (DAP Secretariat)

PART A – INTRODUCTION

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

PART B – CITY OF MANDURAH

1. Declarations of Due Consideration

2. Disclosure of Interests

3. Form 1 DAP Applications

3.1 Lot 812 (4) Waardong Court, Halls Head – Residential - Multiple Dwellings – DAP/24/02815

4. Form 2 DAP Applications

Nil.

5. Section 31 SAT Reconsiderations

Nil.

Part B – Item 3.1 – Lot 812, No 4 Waardong Court, HALLS HEAD – Residential – Multiple Dwellings

Form 1 – Responsible Authority Report
(Regulation 12)

DAP Name:	Metro Outer
Local Government Area:	City of Mandurah
Applicant:	Yaran Property Group
Owner:	Bordland Pty Ltd
Value of Development:	$10.12 million
Responsible Authority:	City of Mandurah
Authorising Officer:	Casey Mihovilovich Chief Executive Officer
LG Reference:	DA-11324
DAP File No:	DAP/24/02815
Application Received Date:	25 November 2024
Report Due Date:	14 February 2025
Application Statutory Process Timeframe:	60 Days
Attachment(s):	1. Development Plans 2. Illustrations 3. Public Artwork Concept 4. Landscape Plan 5. Stormwater Management Plan 6. Bushfire Management Plan 7. Acoustic Assessment 8. Transport Impact Statement 9. Residential Design Codes Assessment 10. Design Review Panel Report 11. Applicant Response to DRP Report

That the Metro Outer DAP resolves to:

1. **Approve** DAP Application reference DAP/24/02815 and accompanying plans 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 Mandurah Local Planning Scheme No. 12, subject to the following conditions:

Conditions

1. This decision constitutes planning approval only and is valid for a period of 4 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.

2. The development shall be carried out and fully implemented in accordance with the details indicated on the stamped approved plan(s) unless otherwise required or agreed in advance in writing by the City of Mandurah.

Prior to Site Works

3. Prior to the commencement of site works, a detailed landscaping plan for the subject site and road verge(s) must be submitted to, and approved to the satisfaction of the City of Mandurah, and must include the following:

   - The location, number and type of proposed trees and shrubs;
   - Any existing vegetation and/or landscaped areas to be retained;
   - Pedestrian, paving and lighting treatments;
   - Irrigation plan;
   - An implementation schedule; and,
   - Maintenance/management responsibilities.

   The plan, once approved, shall be implemented and maintenance undertaken to the satisfaction of the City of Mandurah.

4. Prior to the commencement of site works, a detailed stormwater plan must be submitted to and approved by the City of Mandurah showing all stormwater from roofed and paved areas being collected and disposed of on-site in landscaped areas in accordance with water sensitive design principles.

5. Prior to the commencement of site works, a Construction Management Plan shall be submitted to and approved by the City of Mandurah. The Plan must detail how the site will be managed during and after works are completed, in order to minimise issues associated with dust/sand, erosion, noise, vibration, traffic and general construction issues. The approved plan must thereafter be implemented to the satisfaction of the City of Mandurah.

6. Prior to the commencement of site works, a schedule of the colour and texture of the building materials, demonstrating that the proposed development complements the surrounding area, must be submitted to and approved by the City of Mandurah and include the following combination of material-

   - Face brick
   - Texture render
   - Cladding
   - Perforated sheeting

   The development must be finished, and thereafter maintained, in accordance with the schedule provided to and approved by the City of Mandurah.

7. Prior to the commencement of site works, the applicant shall submit an amended acoustic assessment certifying that the proposal incorporates sufficient sound attenuation measures to limit the noise impact on adjoining properties to within the requirements specified by the Environmental Protection (Noise) Regulations 1997. In addition the assessment must ensure compliance with State Planning Policy 5.4 Road and Rail Noise and state the following:

   - Use of evaporative cooling is not permitted;
   - Mechanical ventilation is provided to all habitable rooms in accordance with AS 1668.2 - 2012 PART 2 - Mechanical Ventilation in Buildings;
   - Sound transmission and insulation to be provided in accordance with the requirements of the National Construction Code.

- The building is to be maintained in good condition in particular all doors and windows including moving parts and acoustic seals; and
- No roof penetrations are permitted for any ventilation purpose. All ventilation penetration is to be ducted through walls within the dropped ceiling space or bulkheads.

The report must confirm that the building (in terms of design, layout, and/or construction) will comply with the Satisfactory Recommended Design Sound Level for the relevant type of occupancy or activity as specified in Australian Standard 2107-2000. The report shall be approved by the City of Mandurah, and implemented thereafter to the satisfaction of the City of Mandurah.

Prior to Occupancy

8. All clothes drying areas and external fixtures shall be screened from the street and all communal areas, and shall be included in any future Strata Management Agreements, to the satisfaction of the City of Mandurah.

9. All services (e.g. air conditioners, water meters, hot water storage systems etc.) shall be designed to be integrated into the building design and/or screened from surrounding properties/communal areas to the satisfaction of the City of Mandurah.

10. Security, building, signage and carpark lighting must be located, designed and installed to prevent excess light spillage from the development. Reference is to be made to AS4282 “Control of the Obtrusive Effects of Outdoor Lighting” and other relevant lighting standards.

11. The communal driveway shall be adequately lit through the use of bollard lighting to the specification and satisfaction of the City of Mandurah.

12. Prior to the commencement of the development/use, the proposed development shall be connected to sewer to the satisfaction of the City of Mandurah.

13. Prior to the occupation of the development, a vehicle crossover is to be constructed to the specification and satisfaction of the City of Mandurah. Once constructed, the vehicle crossover shall be maintained to the satisfaction of the City of Mandurah. During construction, the existing landscaping, footpaths, infrastructure and associated brick paved areas within the road reserve shall be protected and/or re-instated to the satisfaction of the City of Mandurah.

14. Prior to the commencement of the use, vehicle parking, manoeuvring and circulation areas shall be suitably constructed, sealed, drained, kerbed, marked (including loading and disabled bays), and thereafter maintained to the specification and satisfaction of the City of Mandurah.

15. The area to be used for car parking in connection with the development hereby approved shall not be used for general storage or any other purpose other than the parking of motor vehicles to the satisfaction of the City of Mandurah.

16. The approved Waste Management Plan (Yaran Property Group, dated November 2024) must be constructed, implemented and thereafter maintained to the satisfaction of the City of Mandurah, for the life of the development.

17. The development shall be constructed and maintained in accordance with the updated Environmental Accoustic Assessment by ND Engineering to the satisfaction of the City of Mandurah.

18. The applicant must implement all of the recommendations contained in the Bushfire Management Plan prepared by Nathan Peart – Bushfire Smart dated 18 November 2024 and approved by the City of Mandurah for the duration of the development.

19. Construction hours are limited to 7:00am to 6:00pm Monday to Saturday, unless otherwise agreed in writing with the City of Mandurah. Any construction and/or deliveries outside of these hours may be permitted submitted to the preparation and approval of a Noise Management Plan.

20. Any fences / walls in the front setback of the property must comply with the provisions of the Residential Design Codes, which require front walls and fences to be visually permeable 1.2 metres above natural ground level within the primary street setback area.

Advice Notes

1. In line with the recommendations contained within State Planning Policy 7.0 Design of the Built Environment, it is recommended that the development maximise integration of photovoltaic materials and devices.

Reasons for Responsible Authority Recommendation

N/A

Details: outline of development application

Region Scheme	Peel Region Scheme
Region Scheme - Zone/Reserve	Urban
Local Planning Scheme	City of Mandurah Local Planning Scheme No. 12
Local Planning Scheme - Zone/Reserve	Residential Density- R30 Specific Site Requirements – Multiple Dwellings R80
Use Class and permissibility:	Multiple Dwellings – Permitted Use
Lot Size:	8015m^2
Existing Land Use:	Vacant land
State Heritage Register	No
Local Heritage	☒ N/A ☐ Heritage List ☐ Heritage Area
Design Review	☐ N/A ☒ Local Design Review Panel ☐ State Design Review Panel

	☐ Other
Bushfire Prone Area	Yes Refer to SPP3.7 for further information
Swan River Trust Area	No

Proposal:

The proposal seeks approval for the development of 76 apartments across 5 individual buildings on the subject site. The apartments are proposed to be serviced by 80 residential car bays, 9 visitor bays, 46 bicycle and 10 motorcycle bays.

Proposed Land Use	Residential - Multiple Dwellings
Proposed Net Lettable Area	4841.54m^2
Proposed No. Storeys	2 & 3 storey
Proposed No. Dwellings	76 Units

Background:

The City's Local Planning Scheme 12 (LPS 12) was gazetted in April 2022 which changed the zoning to 'Residential' from 'Special Use' under the previous Town Planning Scheme No. 3. LPS 12 includes specific site requirements for the subject site which include the following:

1. *Development shall be designed to front onto and be orientated to Old Coast Road.*
2. *Multiple dwellings shall be permitted at a Residential Density Code of R80.*
3. *All land adjacent to Mandurah Road shall be provided with a landscape buffer area with a minimum width of 10.0m.*

Superseded Town Planning Scheme No. 3 identified the permitted uses for the subject site, formally identified as Lot 90 Leisure Way, Halls Head, to be consistent with the permitted uses for a residential zone.

The Nerimba Estate Local Development Plan was required as part of the subdivision approval (WAPC ref: 155502) for Lot 90 Leisure Way to address the bushfire attack level assessment and quiet house design requirements.

Surrounding Context

The site is adjoining three public recreation and drainage reserves to the south and south-east, and Old Coast Road to the west. The eastern most reserve is home to a small nature-based playground and footpath connecting Waardong Court to Old Coast Road and Mandurah Road. Directly adjacent the site to the north is land zoned local centre. Land to the north-east is zoned residential R30.



Existing Site

The site is currently vacant, with a relatively flat topography towards the southern boundary. The site has been previously cleared of vegetation with the exception of one tree inside the property boundary to the south.

Previous Applications

Prior to the subject application, development approval was issued in 2020 for a three-storey aged care facility, allied health and café at the subject site (formally Lot 90, 87 Leisure Way). The application was considered and subsequently approved by the Metro South-West JDAP (DAP Ref: DAP/19/01705).

Legislation and Policy:

Legislation

Planning and Development Act 2005
Planning and Development (Local Planning Schemes) Regulations 2015
City of Mandurah Local Planning Scheme 12
City of Mandurah Local Planning Strategy

State Government Policies

State Planning Policy 3.7 – Bushfire
State Planning Policy 5.4 – Road and Rail Noise
State Planning Policy 7.0 – Design of the Built Environment
State Planning Policy 7.3 – Residential Design Codes Volume 2

Structure Plans/Activity Centre Plans

Nerimba Estate Local Development Plan

Local Policies

N/A

Consultation:

Public Consultation

N/A

Referrals/consultation with Government/Service Agencies

Main Roads confirmed no objection to the proposed development.

Design Review Panel Advice

A pre-lodgement review of the proposal was undertaken by the City of South Perth Design Review Panel (DRP) in October 2024 which the City of Mandurah procures services from for DRP purposes.

Following the meeting, the DRP provided a copy of the design review report which included both a substantial list of strengths and a number of items for consideration. With respect to strengths, the DRP noted that the proposal included a high level of streetscape engagement, appropriate built form and scale as well as generous landscaping which is well designed and located. The inclusion of energy efficient components was highly praised in addition to the inclusion of natural landscape features and solar orientation.

In addition to the strengths, the report highlighted several design principles which required further attention or clarification which are summarised as below:

- *Context and character*
  The current design did not look to connect with the broader precinct and amenities due to limited plans and no context/ character analysis.
  The plans limited understandings of the external pedestrian pathways and proposed boundary fencing methods.

- *Functionality and built quality*
  The bin stores are remotely located and require residents to travel large distances from the north of the property.

- *Sustainability*
  The proposal is not clear on how sustainable design is being approached holistically. More detail is required by way of consulting an ESD professional it was recommended that the applicant commits to an all-electric strategy with built form upgrades to the façade to reduce heating and cooling needs.

- *Safety*
  Consideration should be given to increasing the width and opportunities for surveillance to the pathway from Waardong Court to the internal carpark. This pathway would then be considered consistent with the high

streetscape engagement and surveillance of other pathways within the development site.

- *Aesthetics*
  Respecting the affordable development approach, the facades would benefit from a mixture of finishes to create a more attractive and engaging presence in the broader area. Passive solar hoods and depth to the facades can provide articulation, especially to the south facing elevations.

The applicant has provided in ***Attachment 11*** a table outlining their response to the DRP comments and any changes that have been made as a result of this. Officers consider that the amended plans and comments made by the applicant have addressed a majority of the DRP comments, however further review against the above elements has been undertaken in the planning assessment section of this report.

Other Advice

Referred internally to the City's technical sections, with the following notable comments being provided:

Building Services	No specific building related concerns. A review will be undertaken at the time of issue of a Certificate of Design Compliance.
Engineering Services	All stormwater generated on site is to be retained on site in accordance with the City's stormwater design guidelines. 1 in 20 Years event to be considered for Drainage calculation. Driveway should be constructed a minimum of 1.0m from adjacent property boundary. Any variation from this, a prior approval from City's officer is required. Prior to construction of a crossover, an application shall be submitted and approved in writing by City's Technical services department to check City' Crossover guideline has been followed and Met.
Health Services	No concerns raised with the development. The proposal shall be in accordance with the recommendations outlined in the acoustic assessment and comply with SPP 5.4.
Waste Management	The waste management plan provided is considered acceptable. It should be noted that the City of Mandurah does not currently provide a FOGO bin option for organic waste matter.
Landscape Services	The tree size and locations are generally supported, however the species list has not been included in the package. It is advised that a detailed landscape management plan is to be conditioned prior to site works.

Planning Assessment:

The proposal has been assessed against the relevant planning framework, as identified within the Legislation and Policy section of this report and the residential design code assessment is included in the attachments. The following matters have been identified as key considerations:

Aesthetics

The DRP advice obtained raised concerns with the flat, unarticulated facades, especially to the south and east facing elevations as well as the limited use of colours, textures and materials. It was noted that although the development is looking to provide affordable living options, the aesthetic design approach should consider elements beyond a single painted finish.

The City, as per the recommendation made by the DRP, has taken into consideration the elevations within the broader context of the immediate areas and as a result recommended some key design outcomes as provided in ***Attachment 10***. A number of the recommendations are listed below:

- The applicant has considered the recommendations under principle 10 of SPP 7.0 through inclusion of variety in colours and material to the north and internal elevations however has not address those to the south, east and west.

- The western elevation has been provided with a large public art mural in a contrasting colour to the wall, however the design provides no texture or articulation. These three storey walls should consist of elements which soften their appearance to the street, especially from a pedestrian perspective given the location of the site within its broader context.

- The window sizes are considered disproportionate to the scale of the building, with the glazed surface area not achieving the minimum 10% of the room size. A variety in window sizes, inclusion of balconies or solar hoods could help to make the openings appear part of the design, rather than solely addressing cross ventilation requirements.

- The electrical services area to the south-west corner has not been included in the elevation or concept illustration plans. Given the prominence of this elevation to Old Coast Road and internally to the gazebo, the services area should be adequately screened through the inclusion of strategic landscaping and/ or public artwork.

- The elevation to Waardong Court (Building A and C) should consider a level change to demarcate the difference between public (footpath) and private space which can mitigate and avoid the use of high screen walls to provide privacy for the ground level units.

- Building B shares a boundary with a small playground and open space and completely turns its back on to this public space. Consideration should be given to rotating this building 180 degrees with the floor place adapted similar to Building A and C. Building E and F should also consider the adjoining open space and path connections - providing for greater amenity for the residents to face this vegetated space rather than the internal car park.

The applicant acknowledged the above comments, and has investigated the feasibility of rotating buildings B, E & F in relation to State Planning Policy 5.4 Road and Rail Noise (SPP 5.4). The acoustic engineer undertook further review of the proposed changes to building orientation, providing the following key points for consideration:

- Rotation of buildings B, E & F results in a higher proportion of outdoor living areas exceeding noise targets of LAeq(Day) = 55 dB(A) and LAeq(Night) = 50 dB(A).
- Increased costings to apply noise package standards to all outdoor living areas under the revised orientation may render the development unfeasible.

The number of outdoor living areas exceeding the noise targets is currently 12 from 36 total units in lieu of 36 from 36 if the buildings were to be flipped as per the City's original recommendation. Under the final orientation provided by the applicant it is possible for the development to adequately mitigate the noise impacts through attenuation measures.

As part of the assessment process, the City identified the preferred outcome of the development being the provision of more than one outdoor living space being provided.

The outcome provided increased visual interest and connection between the public and private realms to those facades adjacent the reserves and streets. It is recognised that this change resulted in additional noise impacts and cost of development implications.

Overall, the final building layout is considered to provide a suitable design solution which benefits the residential amenity which is contingent on the provision for functional and useable outdoor living spaces. Furthermore, buildings B, E & F are designed to provide one major opening from habitable rooms adjacent to all reserves and roads. The glazed window surfaces have been increased in line with the City's recommendations to be both consistent with the residential design codes and to better proportioned to the scale of the buildings.

Safety and Functionality

As part of the context and character assessment, the DRP noted that the plans were not clear on the impact of boundary fencing. Concern was raised that the fencing may be obtrusive in nature, creating a disconnect between the site and broader district centre.

The fencing and retaining wall plan – reference A-106 within the amended plans dated January 2025 illustrated the location of 1.8m high solid Colorbond® fencing starting at the north-east intersection of Waardong Court and Old Coast Road and finishing at the southern side of Building B. The fencing plan was inconsistent with Principle 8 – Safety of SPP7.0 and the Safer Places by Design Guidelines and as such was amended in line with officers recommendations to be visually permeable.

Landscaping

In relation to the landscaping, the proposals reduced large tree planting is considered to be acceptable given the volume of medium and small trees proposed on the site. Further to this, the development is proposed to dedicate over 25% of the area to landscaping, which is a considerable increase to the minimum 10% required by the Residential Design Codes.

With respect to the verge space, it has been noted that limited planting of this area is proposed. The proposal was referred to the City's Design and Development Services department where it was determined that the verge space adjoining Old Coast Road would not benefit from extensive landscaping or treatments, and instead would require only mulch. The verge space adjoining Old Coast Road is maintained by the City, and all other verge area is either mulch or grassed (see site inspection photos below).

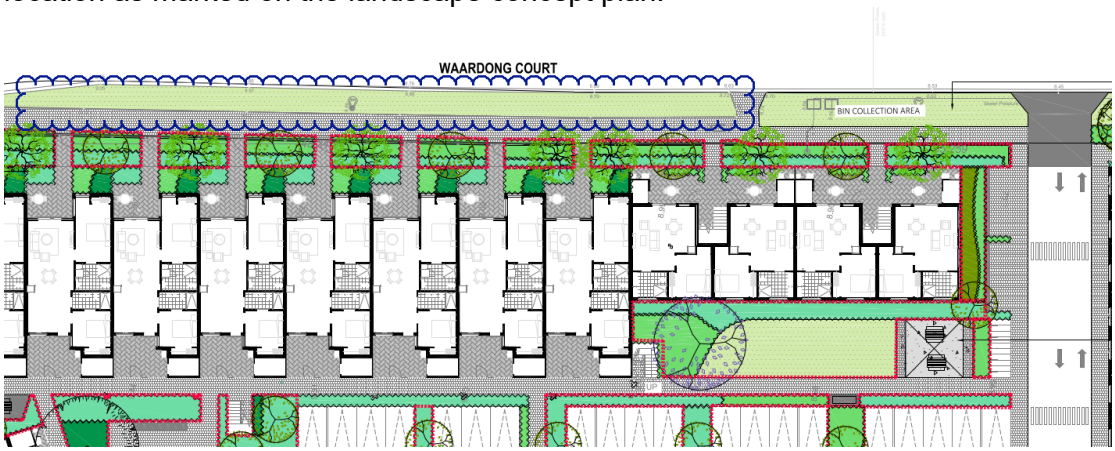


Subject Site - Corner Waardong Court and Old Coast Road



Subject Site - Old Coast Road Verge (facing south)

In relation to the Waardong Court verge area, although this is a narrow section of soil, the area is capable of supporting street trees in line with the City's Street Tree Master Plan. City officers acknowledge a need for unobstructed verge space to facilitate waste collection, and as such recommend that the landscape plan be amended to include the provision of an additional minimum three verge trees west of the bin collection location as marked on the landscape concept plan.



Proposed additional verge tree planting area outlined in blue.

Further to the above, it has been noted that no irrigation plans have been provided. The applicant has advised that this will be reviewed by the builder and as such can be conditioned accordingly.

Noise Management Plan

There are a number of important considerations for the development and ongoing management of the site to ensure it meets the requirements of SPP 5.4 Road and Rail Noise. These include:

- Use of evaporative cooling not being permitted;
- Mechanical ventilation is to be provided to all habitable rooms in accordance with AS 1668.2 - 2012 PART 2 - Mechanical Ventilation in Buildings;
- The building being maintained in good condition in particular all doors and windows including moving parts and acoustic seals; and
- No roof penetrations being permitted for any ventilation purpose. All ventilation penetration ducted through walls within the dropped ceiling space or bulkheads.

Officers recommend that a condition be included which requires the submission of a revised acoustic assessment prior to commencement of site works. Advice notes have been recommended detailing specific built form controls for the site as detailed with the acoustic assessment.

Bushfire Management Plan

The development achieves a BAL 29 or below rating. The ongoing maintenance within the reserves and road verge is undertaken by the City of Mandurah.

The BAL (Bushfire Attack Level) certificate will require the completion of the following:

- Canopy Thinning: Adequate thinning of the canopy to prevent any canopy interconnection, reducing potential fire spread through tree crowns.
- Under-pruning: All trees along the footpath, including Norfolk pine and various Eucalyptus species, should be under-pruned to a minimum height of 2 m. This action helps reduce ladder fuels that can elevate fire to tree canopies.
- Sapling Removal: Complete removal of saplings across the site, minimizing smaller vegetation that can contribute to fire spread.
- Veldt Grass Slashing: Regular slashing of Veldt grass to reduce fuel load, especially in open areas.

These works are committed to be maintained by the City.

Public Art

The City does not currently have any development/ design criteria or Council Policy relating to public art. In the absence of this framework, the City's Arts and Culture team provided general comments on the proposal which are as follows:

- The artwork is both tasteful and relevant to other local artwork.
- The design also forms part of the newly constructed noise walls on the Estuary Bridge duplication, so it is overall cohesive and relevant.

The City considers the inclusion of the public art a welcomed addition to the development which is considered effective in adding contrast and visual interest to the three-storey building adjacent Old Coast Road.

Alternatives

Not Applicable

Reasons for Officer Recommendation

The proposal is the second of significant residential developments to be proposed in this vicinity under the Halls Head Precinct Plan and is considered to be a prominent site in the context of the broader City Centre. A development of this general scale and height is supported in this location. The proposal is considered to satisfy the principles of the Residential Design Codes – the proposal will generate employment and offers a wider housing typology at an affordable price point which is highly sought after in the current market.

Given the significant modifications made, is considered acceptable subject to the inclusion of additional landscaping and amendments to reports (by way of conditions).

Sheet Number	Sheet Name
A-000	COVER PAGE
A-100	GROUND FLOOR LOT PLAN
A-101	FIRST FLOOR LOT PLAN
A-102	SECOND FLOOR LOT PLAN
A-103	GROUND FLOOR SITE PLAN
A-104	FIRST FLOOR SITE PLAN
A-105	SECOND FLOOR SITE PLAN
A-106	RETAINING WALL AND FENCING PLAN
A-107	BIN PRESENTATION PLAN
A-108	EXTERNAL LIGHTING PLAN
A-109	ROOF PLAN
A-110	TYPE A FLOOR PLAN
A-111	TYPE B FLOOR PLAN
A-112	TYPE C FLOOR PLAN
A-113	TYPE D FLOOR PLAN
A-114	TYPE E FLOOR PLAN
A-115	TYPE F FLOOR PLAN
A-116	TYPE K-H2 FLOOR PLAN
A-117	TYPE H-G FLOOR PLAN
A-118	TYPE H2-G2 FLOOR PLAN
A-119	TYPE L-J2 FLOOR PLAN
A-120	TYPE J-I FLOOR PLAN
A-121	TYPE J2-I2 FLOOR PLAN
A-122	TYPE M-N FLOOR PLAN
A-123	SITE ELEVATIONS
A-124	SITE ELEVATIONS
A-125	BUILDING A & B ELEVATIONS
A-126	BUILDING C ELEVATIONS
A-127	BUILDING D & E ELEVATIONS
A-128	BUILDING F ELEVATIONS
A-129	WINDOWS SCHEDULE
A-130	SHADOW DIAGRAM - AUTUMN EQUINOX
A-131	SHADOW DIAGRAM - WINTER SOLSTICE
A-132	SHADOW DIAGRAM - SPRING EQUINOX
A-133	SHADOW DIAGRAM - SUMMER SOLSTICE



PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

COVER PAGE

PLOT DATE: FEBRUARY 2025

DRAWN: PV | JV | NA

SCALE:

A3

ZONING R80

DWG A-000

YARAN

CREATING VALUE SHARING VALUE

NORTH



1
A 100

YARAN PROPERTY GROUP

GROUND FLOOR LOT PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

GROUND FLOOR LOT PLAN

PLOT DATE:	FEBRUARY 2025
DRAWN:	PV | JV
SCALE:	1 : 500

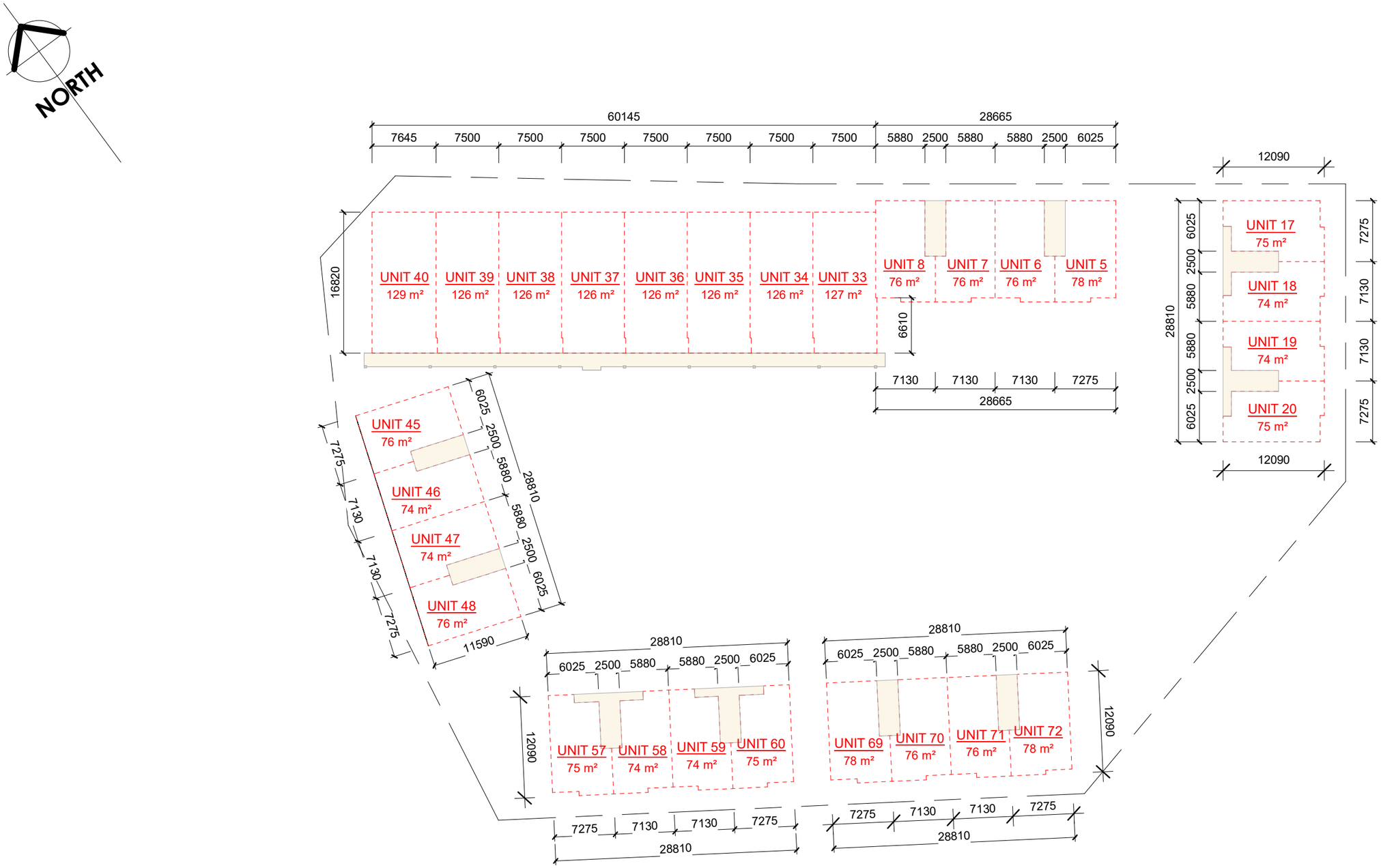
A3

ZONING R80

DWG A-100

YARAN

CREATING VALUE SHAPING VALUE



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YARAN PROPERTY GROUP

FIRST FLOOR LOT PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

FIRST FLOOR LOT PLAN

PLOT DATE:	FEBRUARY 2025
DRAWN:	PV | JV
SCALE:	1 : 500

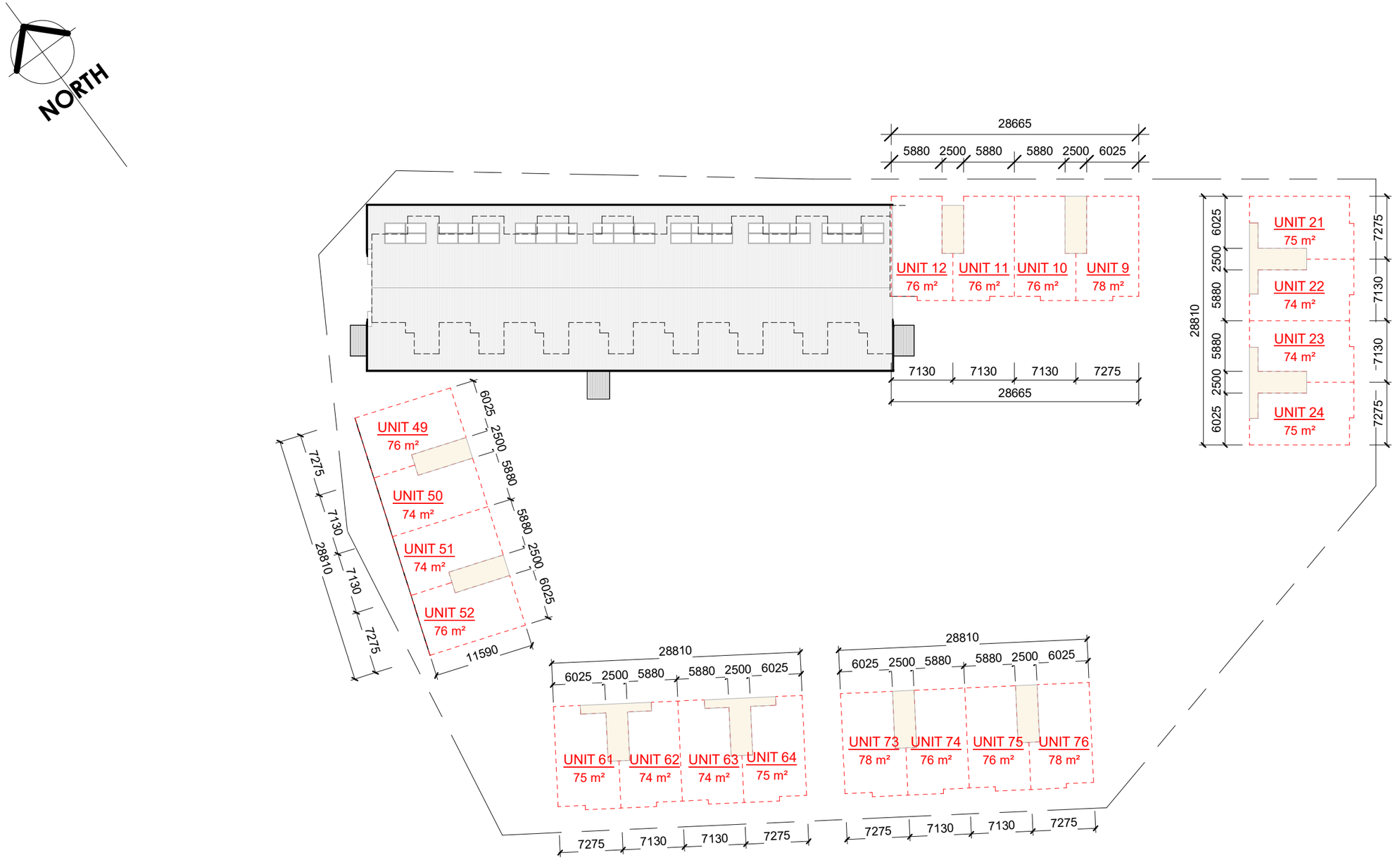
A3

ZONING R80

DWG A-101

YARAN

CREATING VALUE SHARING VALUE



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A 102

YARAN PROPERTY GROUP

SECOND FLOOR LOT PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

SECOND FLOOR LOT PLAN

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV
SCALE: 1 : 500

A3

ZONING R80
DWG A-102

YARAN

CREATING VALUE
SHARING VALUE

NORTH

WAARDONG COURT

OLD COAST ROAD



DWELLING UNITS	
2-STOREY 2x2 STANDARD UNITS	16
3-STOREY STUDIO UNITS (DUAL KEY)	60
TOTAL	76

PARKING BAYS	
CAR PARK (RESIDENTS)	80
CAR PARK (VISITORS)	9
TOTAL CARPARK	89
TOTAL BICYCLE PARKING	46
TOTAL MOTORCYCLE PARKING	10

TOTAL LOT AREA	8,015 SQ.M.

PAVING AREAS		
	1. USE BITUMEN FOR ALL DRIVEWAYS AND PARKING BAYS.	2,521 m^2
	2. USE COLORED CONCRETE FOR FOOTPATHS.	950 m^2
	3. PAVERS FOR COURTYARDS.	558 m^2

1
A | 103

YARAN PROPERTY GROUP

GROUND FLOOR SITE PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT: GROUND FLOOR SITE PLAN

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

ZONING R80
DWG A-103

YARAN

CREATING VALUE
SHARING VALUE



DWELLING UNITS	
2-STOREY 2x2 STANDARD UNITS	16
3-STOREY STUDIO UNITS (DUAL KEY)	60
TOTAL	76

PARKING BAYS	
CAR PARK (RESIDENTS)	80
CAR PARK (VISITORS)	9
TOTAL CARPARK	89
TOTAL BICYCLE PARKING	46
TOTAL MOTORCYCLE PARKING	10

TOTAL LOT AREA	8,015 SQ.M.

PAVING AREAS		
	1. USE BITUMEN FOR ALL DRIVEWAYS AND PARKING BAYS.	2,521 m²
	2. USE COLORED CONCRETE FOR FOOTPATHS.	950 m²
	3. PAVERS FOR COURTYARDS.	558 m²

1 / A 103

YARAN PROPERTY GROUP

GROUND FLOOR SITE PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT: GROUND FLOOR SITE PLAN

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

ZONING R80
DWG A-103

YARAN
CREATING VALUE
SHARING VALUE

NORTH

WAARDONG COURT

OLD COAST ROAD



YARAN PROPERTY GROUP

1 / A 104

FIRST FLOOR SITE PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

FIRST FLOOR SITE PLAN

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: 1 : 500

A3

ZONING R80

DWG A-104

YARAN

CREATING VALUE
SHARING VALUE

NORTH

WAARDONG COURT

110501

SPACE FOR PUBLIC ART

SPACE FOR PUBLIC ART

BUILDING C

BUILDING A

BUILDING B

BUILDING D

BUILDING E

BUILDING F

PV PANELS

32215

35521

48622

39522

69996

OLD COAST ROAD

SPACE FOR PUBLIC ART

1

A | 105

YARAN PROPERTY GROUP

SECOND FLOOR SITE PLAN

1 : 500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

SECOND FLOOR SITE PLAN

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV
SCALE: 1 : 500

A3

ZONING R80
DWG A-105

YARAN

CREATING VALUE
SHARING VALUE

NORTH

WAARDONG COURT

111381



LEGEND/S:

1. 1800mm COLORBOND FENCE
2. 600mm HIGH LIMESTONE BLOCK WALL WITH 1500mm HIGH PIERS AT LOT BOUNDARIES, WITH 600mm VERTICAL METAL RAILING INFILL PANELS AND 1200mm GATES
3. 1200mm HIGH VERTICAL METAL RAILING AND GATS
4. 900mm HIGH VERTICAL METAL RAILINGS AS DIVIDING FENCES TO FRONT COURTYARDS
5. 1800mm HORIZONTAL METAL FENCING
6. SELECTED SCREEN

FEATURE SURVEY

8.00 EXISTING SITE LEVELS

8.00 PROPOSED SITE LEVELS

1
A 106

YARAN PROPERTY GROUP

RETAINING WALL AND FENCING PLAN

1 : 500

0 5 10 20 30 40 50
GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING
4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT
RETAINING WALL AND FENCING PLAN

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV
SCALE: As indicated
A3

ZONING R80
DWG A-106

YARAN
CREATING VALUE
SHARING VALUE

LEGEND		QTY.
	GENERAL WASTE 240 L	31
	RECYCLING WASTE 240 L	16

WAARDONG COURT



YARAN PROPERTY GROUP

BIN PRESENTATION PLAN

1 : 500

1 / A 107

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

BIN PRESENTATION PLAN

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80
DWG A-107

YARAN

CREATING VALUE
SHARING VALUE

NO. OF BOLLARDS	26

NORTH

WAARDONG COURT

OLD COAST ROAD



1
A 108

YARAN PROPERTY GROUP

EXTERNAL LIGHTING PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

EXTERNAL LIGHTING PLAN

PLOT DATE:	FEBRUARY 2025
DRAWN:	PV | JV
SCALE:	1 : 500

A3

ZONING R80

DWG A-108

YARAN

CREATING VALUE
SHARING VALUE

NORTH

WAARDONG COURT

OLD COAST ROAD



YARAN PROPERTY GROUP

1 / A 109

ROOF PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

ROOF PLAN

PLOT DATE:	FEBRUARY 2025
DRAWN:	PV | JV | NA
SCALE:	1 : 500

A3

ZONING R80

DWG A-109

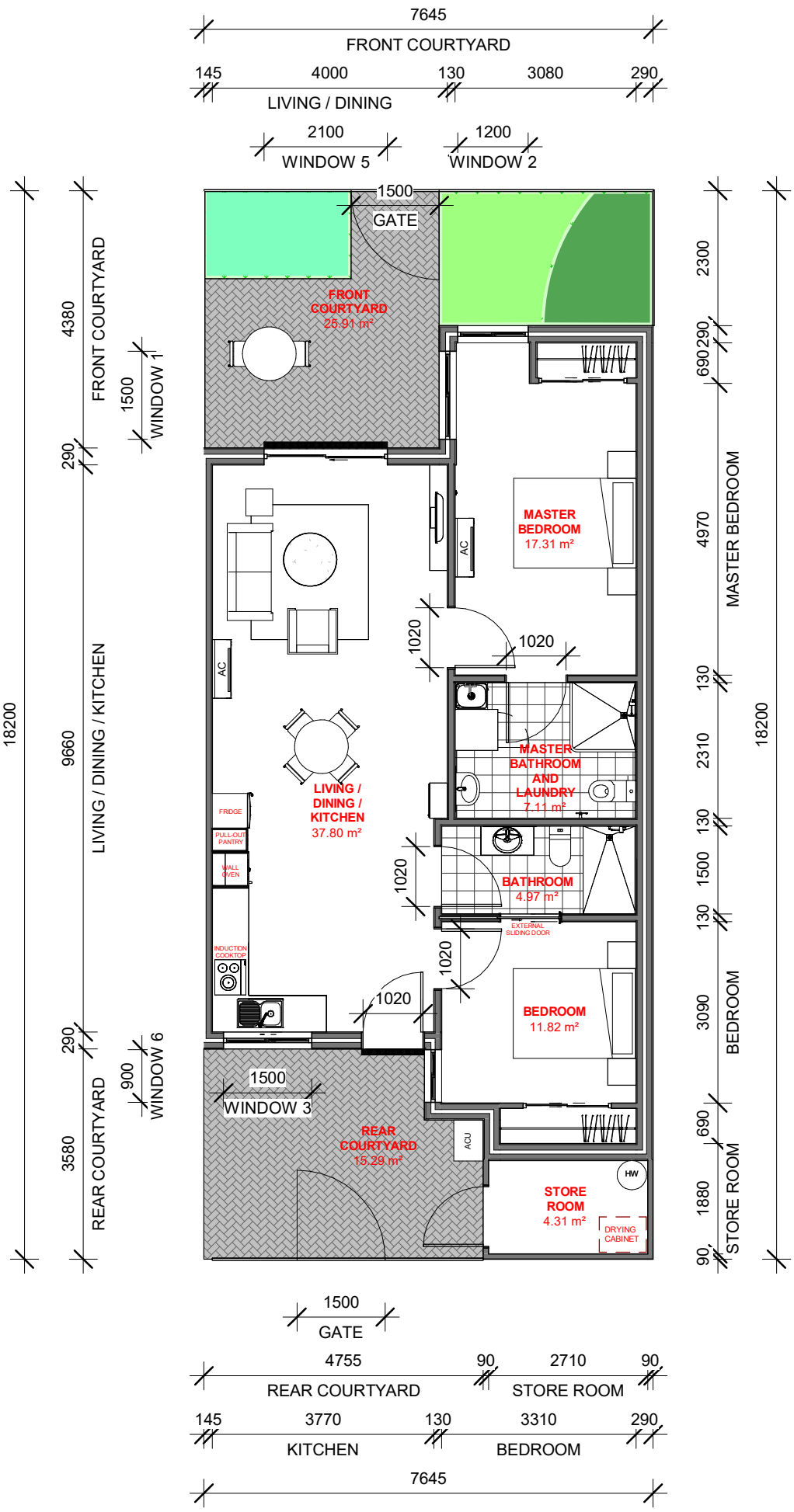
YARAN

CREATING VALUE SHARING VALUE

TYPE A	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.61 m²	12.20%	2.50 m²	6.61%
BEDROOM 1	2.53 m²	14.62%	1.43 m²	8.26%
BEDROOM 2	0.77 m²	4.45%	0.47 m²	3.98%

TYPE A AREA

Name	Area	Name	Area
LIVING / DINING / KITCHEN	37.80 m²	STORE ROOM	4.31 m²
MASTER BEDROOM	17.31 m²	FRONT COURTYARD	25.91 m²
BEDROOM	11.82 m²	REAR COURTYARD	15.29 m²
MASTER BATHROOM AND LAUNDRY	7.11 m²		
BATHROOM	4.97 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**10.95 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**92.56 m²**	**TOTAL AREA**	**139.14 m²**



YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

1 / A 110

TYPE A FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

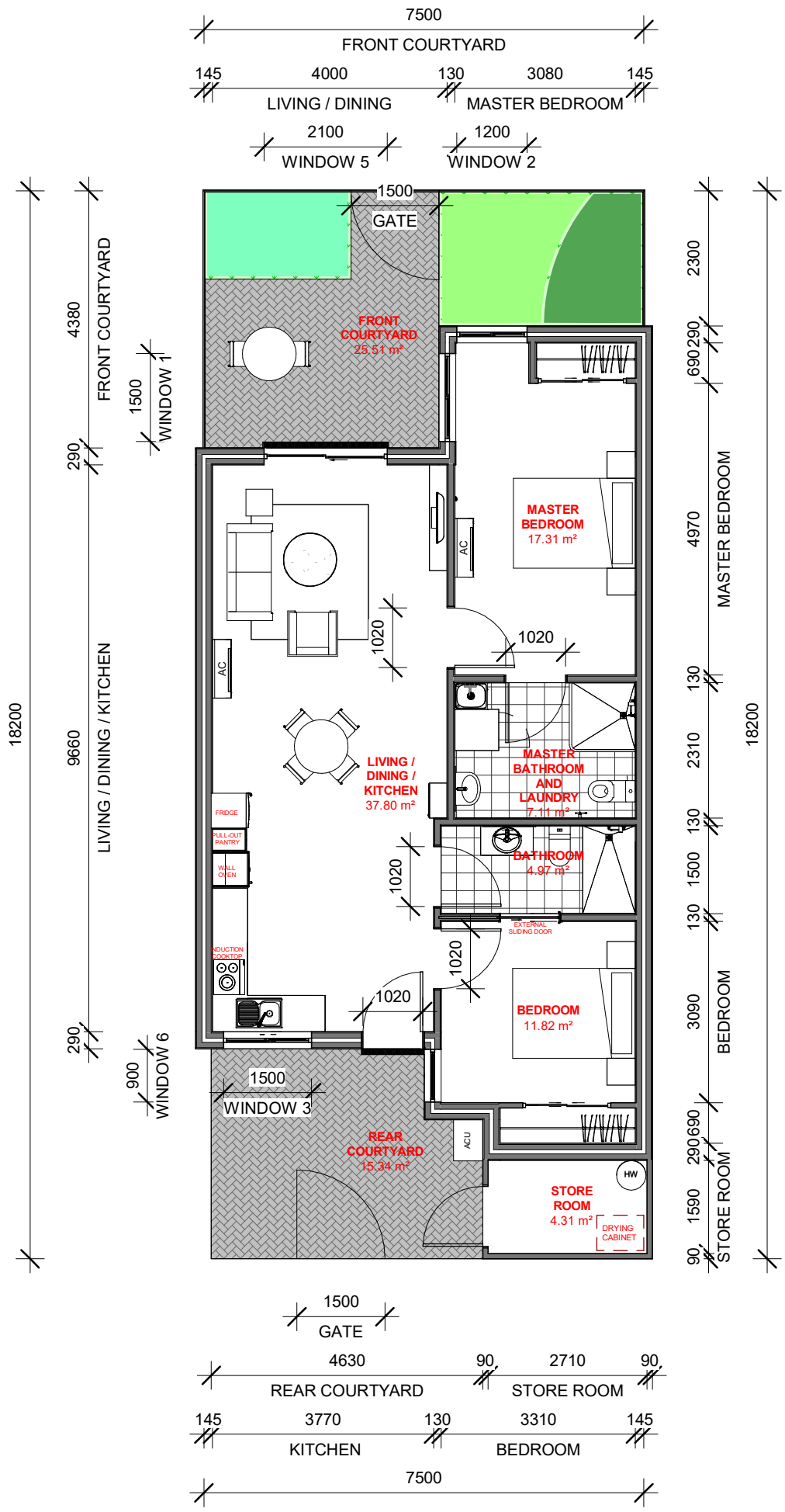
PROPOSED APARTMENT DWELLING 4 WAARDONG COURT, HALLS HEAD, WA 6210	SHEET CONTENT TYPE A FLOOR PLAN	PLOT DATE: JANUARY 2025 DRAWN: PV | JV | NA SCALE: 1 : 100 A3	REV R80 DWG A-110

YARAN — CREATING VALUE SHARING VALUE

TYPE B	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.61 m²	12.20%	2.50 m²	6.61%
BEDROOM 1	2.53 m²	14.62%	1.43 m²	8.26%
BEDROOM 2	0.77 m²	4.45%	0.47 m²	3.98%

TYPE B AREA

Name	Area	Name	Area
MASTER BEDROOM	17.31 m²	STORE ROOM	4.31 m²
BEDROOM	11.82 m²	FRONT COURTYARD	25.51 m²
BATHROOM	4.97 m²	REAR COURTYARD	15.34 m²
LIVING / DINING / KITCHEN	37.80 m²		
MASTER BATHROOM AND LAUNDRY	7.11 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**8.89 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**90.46 m²**	**TOTAL AREA**	**133.86 m²**



YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

1 / A 111

TYPE B FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE B FLOOR PLAN

PLOT DATE: JANUARY 2025
DRAWN: PV | JV
SCALE: 1 : 100

A3

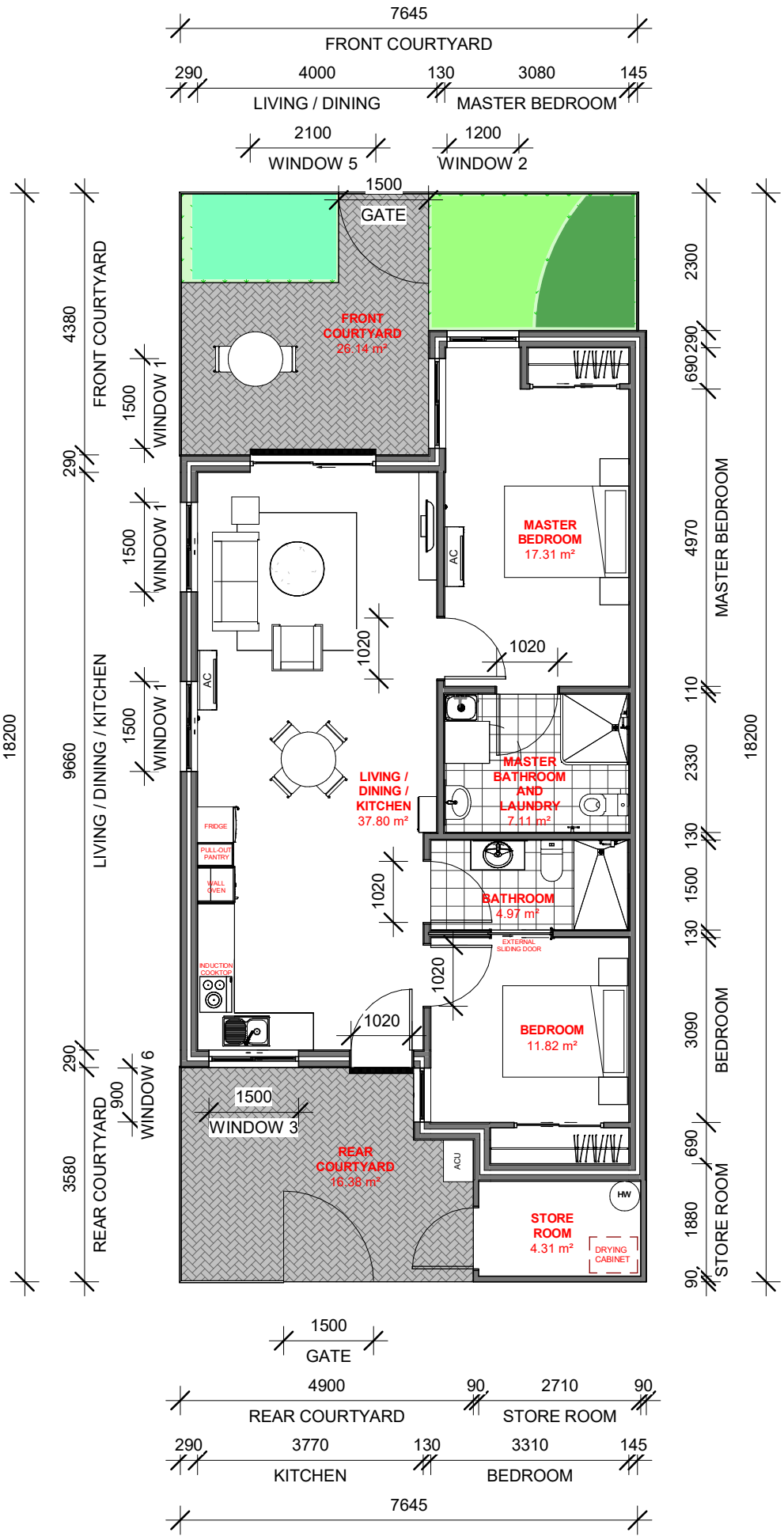
REV R80
DWG A-111

YARAN
CREATING VALUE
SHARING VALUE

TYPE C	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	7.47 m²	19.76%	4.10 m²	10.85%
BEDROOM 1	2.53 m²	14.62%	1.43 m²	8.26%
BEDROOM 2	0.77 m²	4.45%	0.47 m²	3.98%

TYPE C AREA

Name	Area	Name	Area
MASTER BEDROOM	17.31 m²	STORE ROOM	4.31 m²
BEDROOM	11.82 m²	FRONT COURTYARD	26.14 m²
BATHROOM	4.97 m²	REAR COURTYARD	16.38 m²
LIVING / DINING / KITCHEN	37.80 m²		
MASTER BATHROOM AND LAUNDRY	7.11 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**10.37 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**91.98 m²**	**TOTAL AREA**	**139.14 m²**



YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

1 / A 112

TYPE C FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE C FLOOR PLAN

PLOT DATE: JANUARY 2025
DRAWN: PV | JV | NA
SCALE: 1 : 100

A3

REV R80

DWG A-112

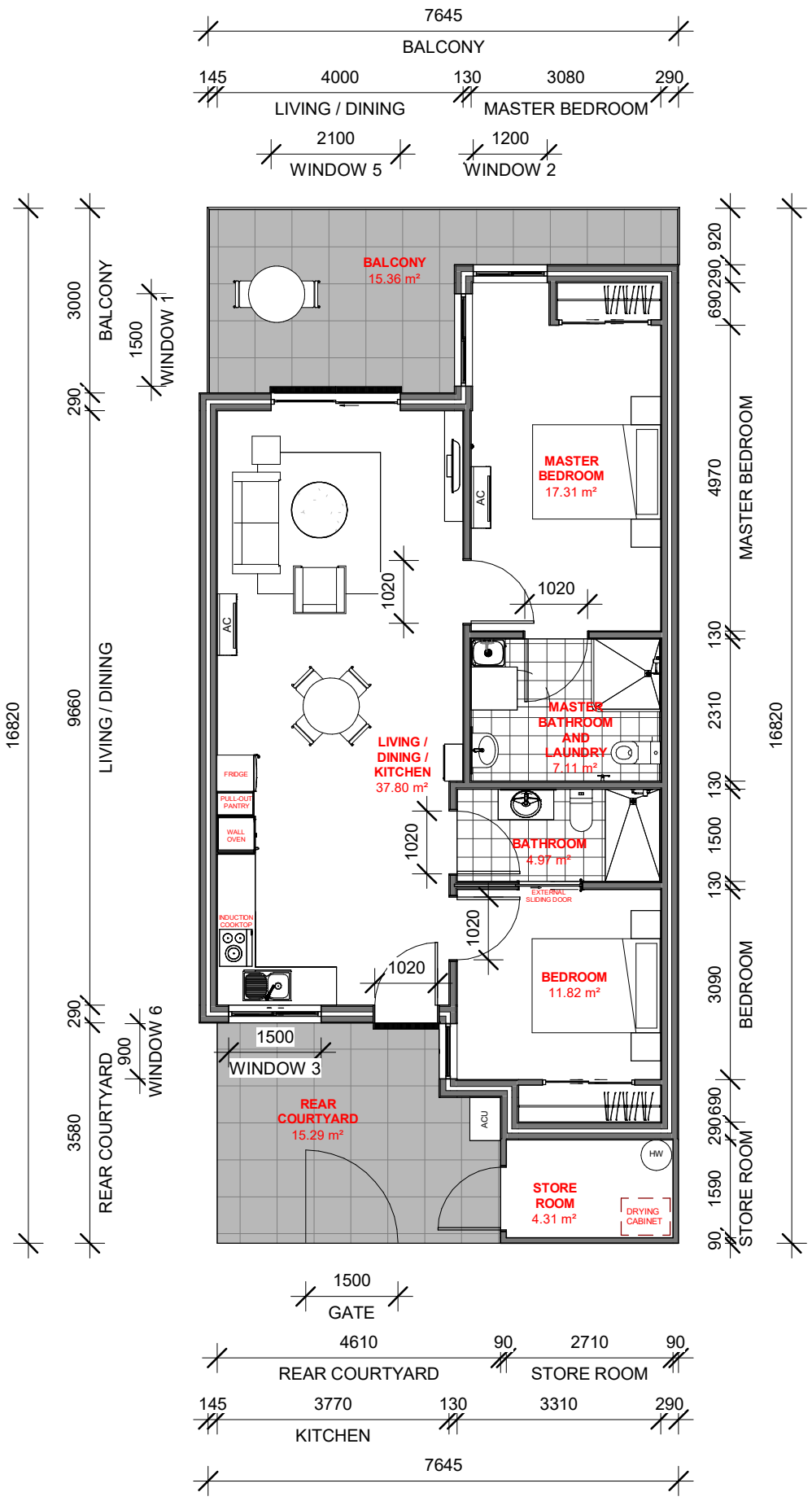
YARAN

CREATING VALUE SHARING VALUE

TYPE D	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.61 m²	12.20%	2.50 m²	6.61%
BEDROOM 1	2.53 m²	14.62%	1.43 m²	8.26%
BEDROOM 2	0.77 m²	4.45%	0.47 m²	3.98%

TYPE D AREA

Name	Area	Name	Area
MASTER BEDROOM	17.31 m²	STORE ROOM	4.31 m²
BEDROOM	11.82 m²	BALCONY	15.36 m²
BATHROOM	4.97 m²	REAR COURTYARD	15.29 m²
LIVING / DINING / KITCHEN	37.80 m²		
MASTER BATHROOM AND LAUNDRY	7.11 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**10.95 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**92.56 m²**	**TOTAL AREA**	**128.59 m²**



1 / A 113

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE D FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE D FLOOR PLAN

PLOT DATE: JANUARY 2025
DRAWN: PV | JV
SCALE: 1 : 100

A3

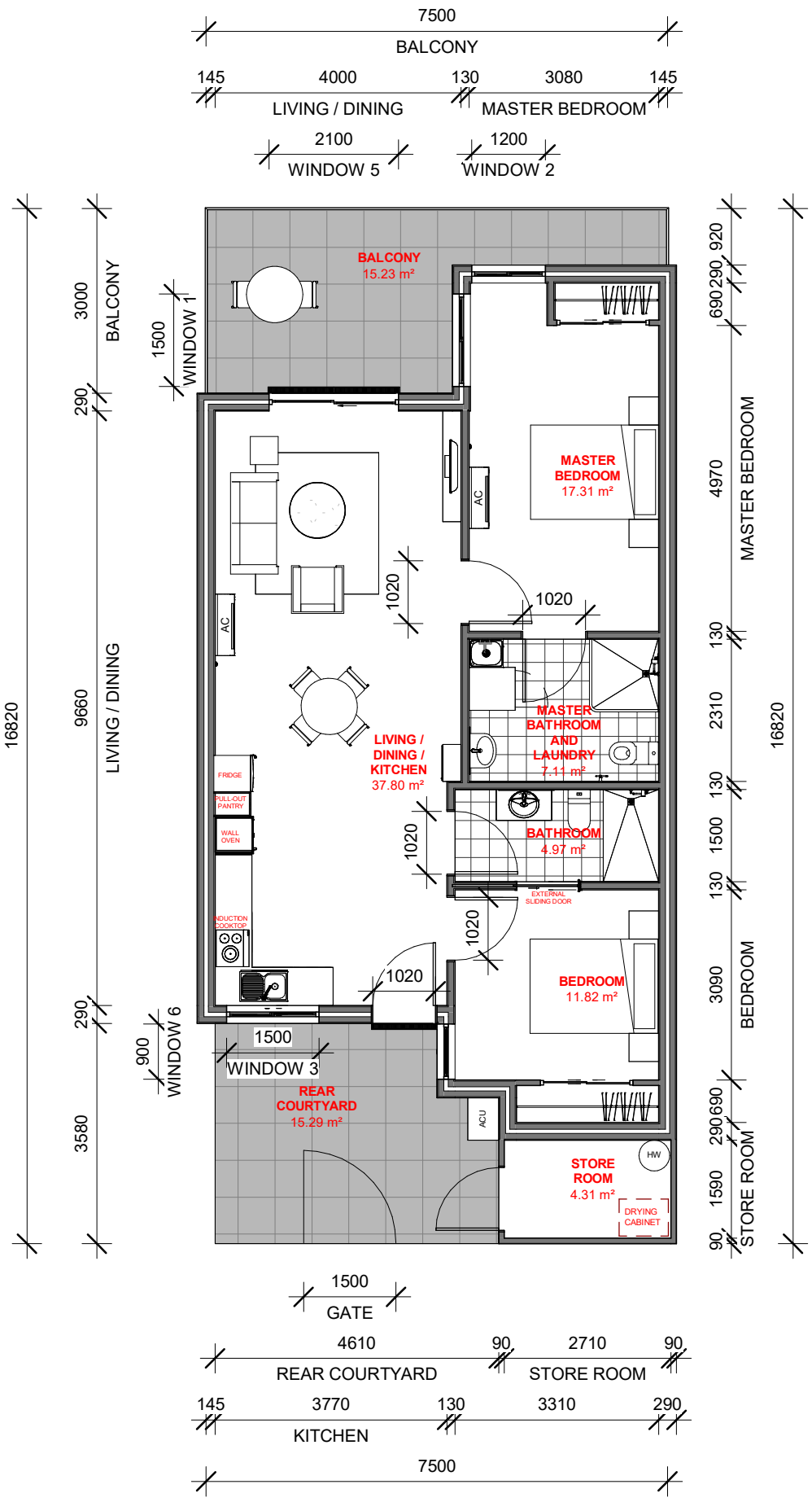
REV R80
DWG A-113

YARAN
CREATING VALUE
SHARING VALUE

TYPE E	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.61 m²	12.20%	2.50 m²	6.61%
BEDROOM 1	2.53 m²	14.62%	1.43 m²	8.26%
BEDROOM 2	0.77 m²	4.45%	0.47 m²	3.98%

TYPE E AREA

Name	Area	Name	Area
MASTER BEDROOM	17.31 m²	STORE ROOM	4.31 m²
BEDROOM	11.82 m²	BALCONY	15.23 m²
BATHROOM	4.97 m²	REAR COURTYARD	15.29 m²
LIVING / DINING / KITCHEN	37.80 m²		
MASTER BATHROOM AND LAUNDRY	7.11 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**8.89 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**90.46 m²**	**TOTAL AREA**	**123.71 m²**



YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

1 / A 114

TYPE E FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE E FLOOR PLAN

PLOT DATE: JANUARY 2025
DRAWN: PV | JV
SCALE: 1 : 100

A3

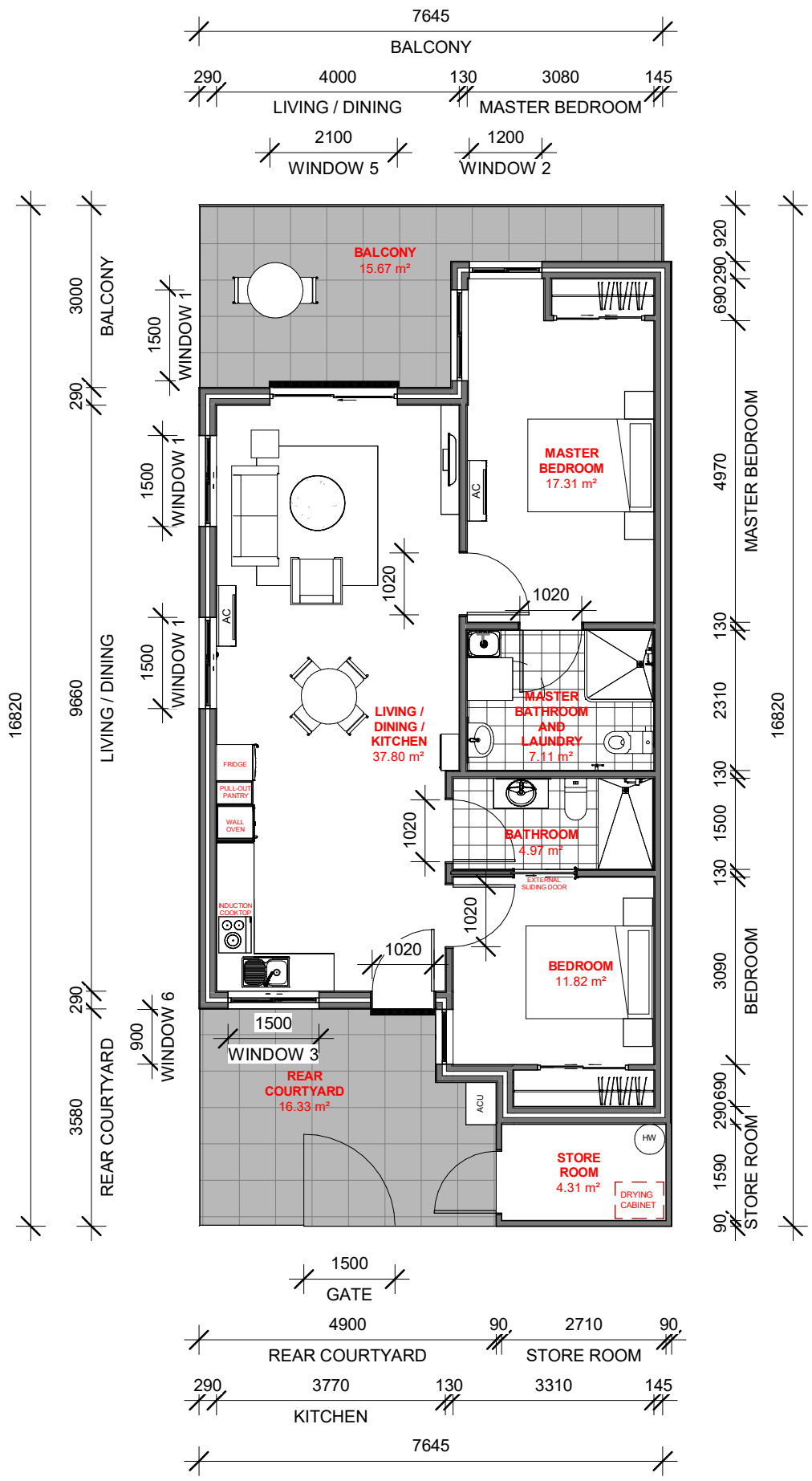
REV R80
DWG A-114

YARAN
CREATING VALUE
SHARING VALUE

TYPE F	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	7.47 m²	19.76%	4.10 m²	10.85%
BEDROOM 1	2.53 m²	14.62%	1.43 m²	8.26%
BEDROOM 2	0.77 m²	4.45%	0.47 m²	3.98%

TYPE F AREA

Name	Area	Name	Area
MASTER BEDROOM	17.31 m²	STORE ROOM	4.31 m²
BEDROOM	11.82 m²	BALCONY	15.67 m²
BATHROOM	4.97 m²	REAR COURTYARD	16.33 m²
LIVING / DINING / KITCHEN	37.80 m²		
MASTER BATHROOM AND LAUNDRY	7.11 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**10.37 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**91.98 m²**	**TOTAL AREA**	**128.59 m²**



YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

1 / A 115

TYPE F FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE F FLOOR PLAN

PLOT DATE: JANUARY 2025
DRAWN: PV | JV
SCALE: 1 : 100

A3

REV R80
DWG A-115

YARAN
CREATING VALUE
SHARING VALUE



TYPE H AREA

Name	Area
BEDROOM	15.34 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.89 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.00 m²
COURTYARD	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.36 m²**

TYPE H	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

TYPE G AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**8.15 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**57.12 m²**

Name	Area
STORE ROOM	3.00 m²
COURTYARD	15.31 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**76.04 m²**

TYPE G	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	7.14 m²	25.91%	3.94 m²	14.30%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

1 / A 117

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE H-G FLOOR PLAN

1 : 100

SCREENING

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE H-G FLOOR PLAN

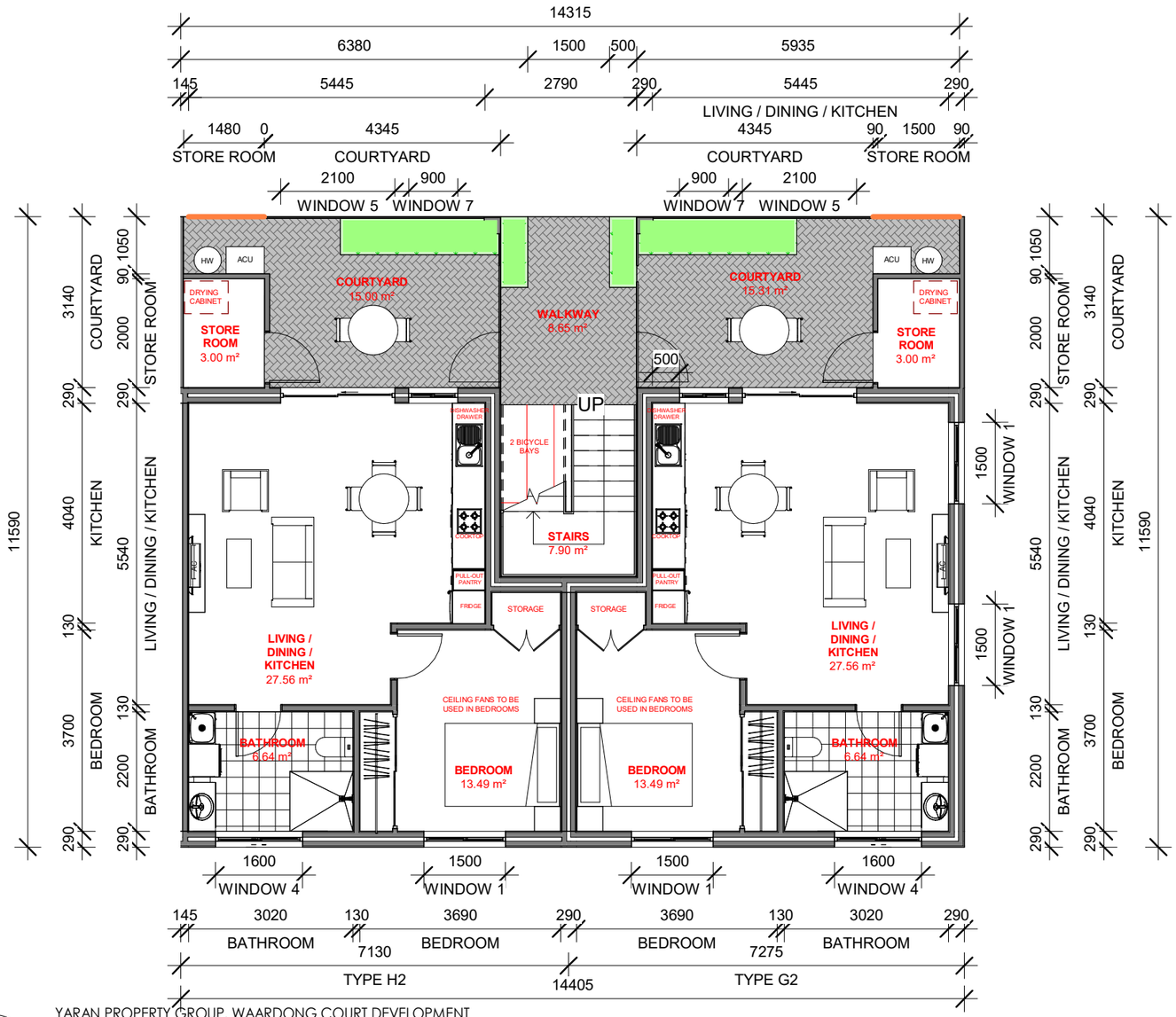
PLOT DATE: JANUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

ZONING R80 DWG A-117

YARAN

CREATING VALUE SHARING VALUE



YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

1
A 118

TYPE H2-G2 FLOOR PLAN

1 : 100

SCREENING

TYPE H2 AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.89 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.00 m²
COURTYARD	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.36 m²**

TYPE H2	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

TYPE G2 AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**8.15 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**57.12 m²**

Name	Area
STORE ROOM	3.00 m²
COURTYARD	15.31 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**76.04 m²**

TYPE G2	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	7.14 m²	25.91%	3.94 m²	14.30%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE H2-G2 FLOOR PLAN

PLOT DATE: JANUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

ZONING R80 DWG A-118

YARAN

CREATING VALUE SHARING VALUE



TYPE K AREA

Name	Area
BATHROOM	6.64 m²
BEDROOM	13.49 m²
LIVING / DINING/ KITCHEN	27.56 m²
INTERIOR WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.92 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.06 m²
COURTYARD	15.10 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.53 m²**

TYPE K	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

TYPE H2 AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.89 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.00 m²
COURTYARD	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.36 m²**

TYPE H2	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

SCREENING

1
A 116

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE K-H2 FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE K-H2 FLOOR PLAN

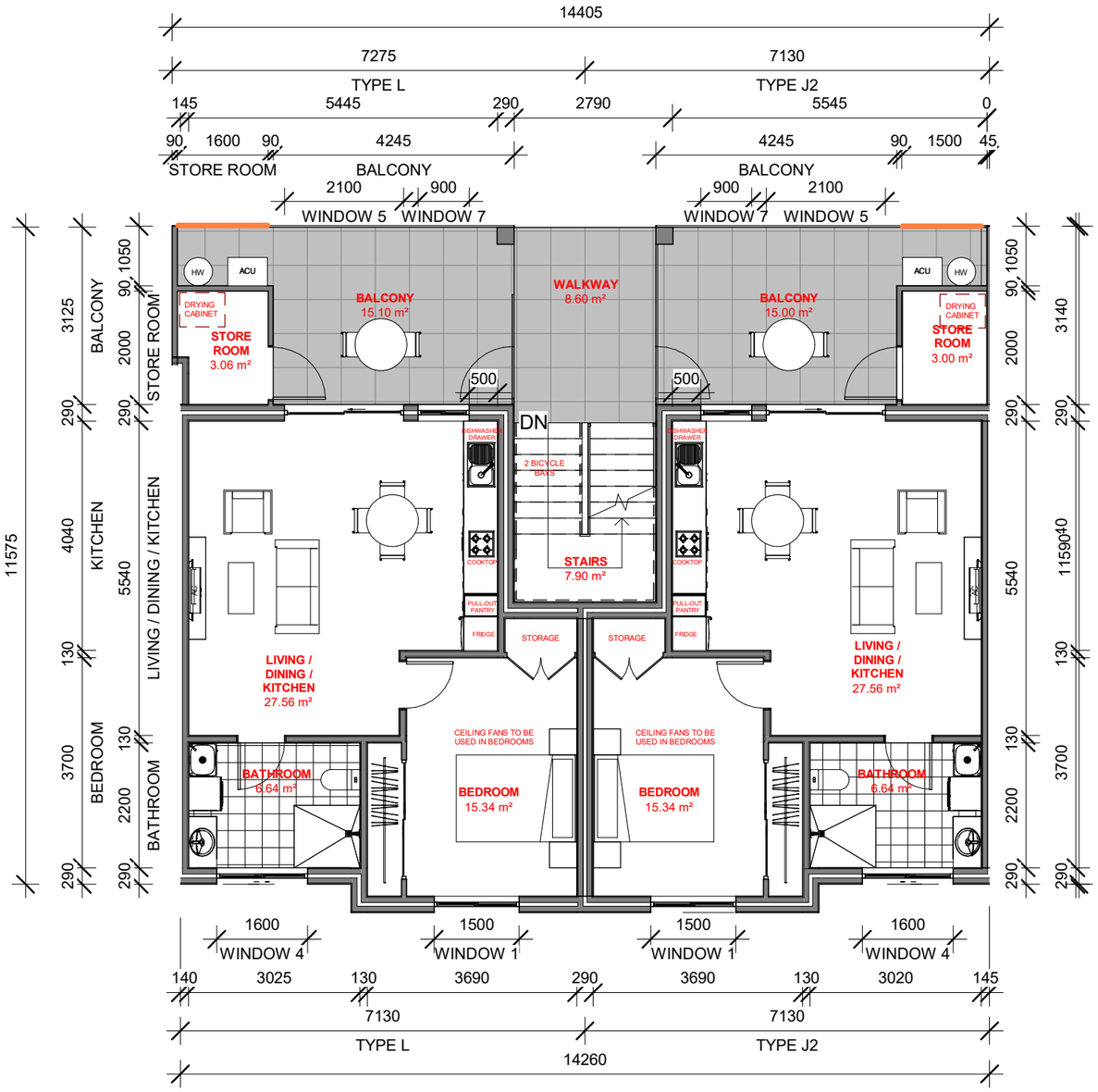
PLOT DATE: JANUARY 2025
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80
DWG A-116

YARAN

CREATING VALUE SHARING VALUE



TYPE L AREA

Name	Area
BEDROOM	15.34 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERIOR WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.92 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.06 m²
BALCONY	15.10 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.53 m²**

TYPE L	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

TYPE J2 AREA

Name	Area
BEDROOM	15.34 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**7.10 m²**
INTERNAL FLOOR AREA	**49.76 m²**
BUILDING FOOTPRINT	**57.96 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**76.59 m²**

TYPE J2	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

1
A 119

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE L-J2 FLOOR PLAN

1 : 100

SCREENING

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE L-J2 FLOOR PLAN

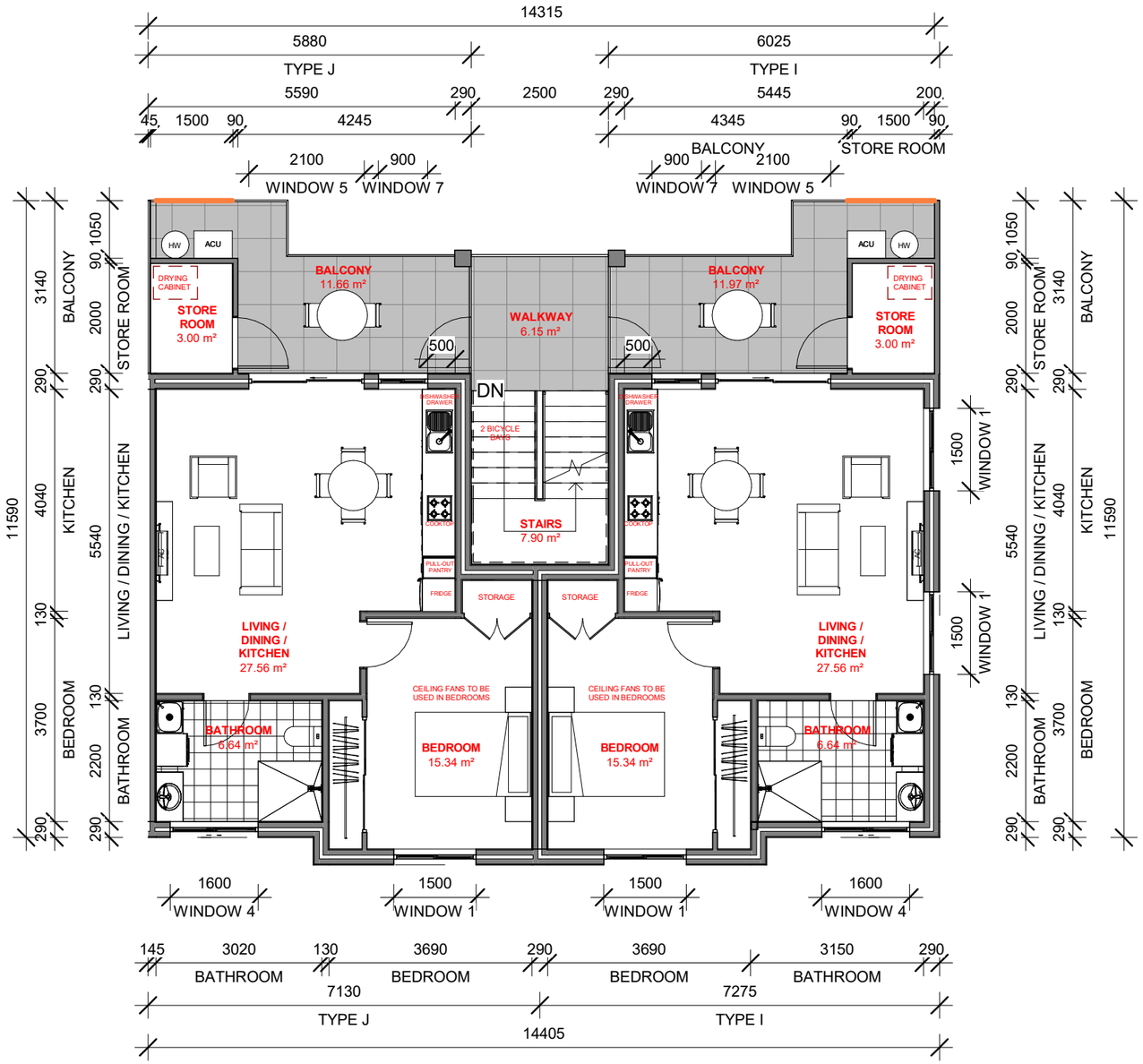
PLOT DATE: JANUARY 2025
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80
DWG A-119

YARAN

CREATING VALUE SHARING VALUE



TYPE J AREA

Name	Area
BEDROOM	15.34 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**7.10 m²**
INTERNAL FLOOR AREA	**49.76 m²**
BUILDING FOOTPRINT	**57.96 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	11.66 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**73.25 m²**

TYPE J	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

TYPE I AREA

Name	Area
BEDROOM	15.34 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**8.37 m²**
INTERNAL FLOOR AREA	**49.76 m²**
BUILDING FOOTPRINT	**59.19 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	11.97 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.76 m²**

TYPE I	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	7.14 m²	25.91%	3.94 m²	14.30%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

SCREENING

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

1 / A 120

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE J-I FLOOR PLAN

1 : 100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE J-I FLOOR PLAN

PLOT DATE: JANUARY 2025
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80
DWG A-120

YARAN

CREATING VALUE SHARING VALUE



TYPE J2 AREA

Name	Area
BEDROOM	15.34 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**7.10 m²**
INTERNAL FLOOR AREA	**49.76 m²**
BUILDING FOOTPRINT	**57.96 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**76.59 m²**

TYPE H2	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

TYPE I2 AREA

Name	Area
BEDROOM	15.34 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**0.32 m²**
EXTERNAL WALL AREA	**8.33 m²**
INTERNAL FLOOR AREA	**27.54 m²**
BUILDING FOOTPRINT	**59.19 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	15.32 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**78.11 m²**

TYPE J2	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

SCREENING

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

1 / A 121

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE J2-I2 FLOOR PLAN

1 : 100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE J2-I2 FLOOR PLAN

PLOT DATE: JANUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

ZONING R80 DWG A-121

YARAN

CREATING VALUE SHARING VALUE



YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

1 / A | 122

TYPE M-N FLOOR PLAN

1 : 100

SCREENING

TYPE N AREA

Name	Area
BEDROOM	15.34 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**7.10 m²**
INTERNAL FLOOR AREA	**49.76 m²**
BUILDING FOOTPRINT	**57.96 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**76.59 m²**

TYPE N	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

TYPE M AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**0.32 m²**
EXTERNAL WALL AREA	**8.33 m²**
INTERNAL FLOOR AREA	**27.54 m²**
BUILDING FOOTPRINT	**59.19 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	15.39 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**78.11 m²**

TYPE M	NATURAL LIGHTING		DUAL ASPECT VENTILATION	
ROOM NAME	AREA	PERCENT	AREA	PERCENT
LIV/ DIN/ KIT	4.28 m²	15.53%	2.34 m²	8.49%
BEDROOM	1.43 m²	10.60%	0.80 m²	5.93%
BATHROOM	0.84 m²	12.65%	0.47 m²	7.08%

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

TYPE M-N FLOOR PLAN

PLOT DATE: JANUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

ZONING R80 DWG A-122

YARAN

CREATING VALUE SHARING VALUE



1 / A 123

YARAN PROPERTY GROUP

SITE SOUTH ELEVATION A

1 : 250

LEGEND/S:

1. SPACE FOR PUBLIC ART

MATERIALS LEGEND/S

PAINT/S

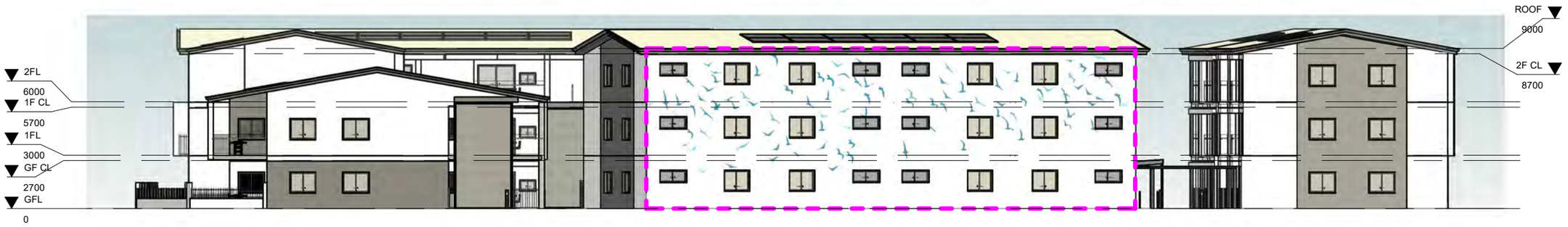
1. WALLS - WHITE POLAR QUARTER
2. GUTTER- WESTERN MYALL
3. ROOF - SURFMIST
4. FASCIA - SURFMIST
5. RENDERED WALL - WESTERN MYALL
6. PERFORATED FENCE - MONUMENT BLACK
7. VERTICAL BATTEN FENCING - MONUMENT BLACK
8. SLAT FENCING FOR BINS - MONUMENT BLACK
9. WALLS - WINDJANA GORGE - DULUX PAINT (RB43)

2 / A 123

YARAN PROPERTY GROUP

SITE SOUTH ELEVATION B

1 : 250



3 / A 123

YARAN PROPERTY GROUP

SITE WEST ELEVATION

1 : 250

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

SITE ELEVATIONS

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

ZONING R80

DWG A-123

YARAN

CREATING VALUE SHARING VALUE



1
A | 124

YARAN PROPERTY GROUP

SITE NORTH ELEVATION A

1 : 250



2
A | 124

YARAN PROPERTY GROUP

SITE NORTH ELEVATION B

1 : 250



3
A | 124

YARAN PROPERTY GROUP

SITE EAST ELEVATION

1 : 250

LEGEND/S:

1. SPACE FOR PUBLIC ART

MATERIALS LEGEND/S

PAINT/S

1. WALLS - WHITE POLAR QUARTER
2. GUTTER- WESTERN MYALL
3. ROOF - SURFMIST
4. FASCIA - SURFMIST
5. RENDERED WALL - WESTERN MYALL
6. PERFORATED FENCE - MONUMENT BLACK
7. VERTICAL BATTEN FENCING - MONUMENT BLACK
8. SLAT FENCING FOR BINS - MONUMENT BLACK
9. WALLS - WINDJANA GORGE - DULUX PAINT (RB43)

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

SITE ELEVATIONS

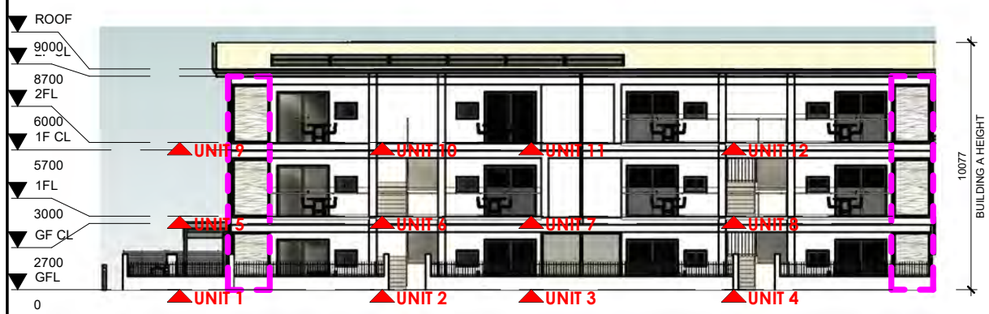
PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

ZONING R80
DWG A-124

YARAN

CREATING VALUE
SHARING VALUE

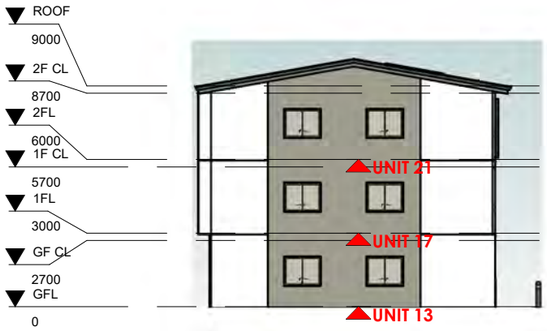


1 A 125

YARAN PROPERTY GROUP

BLDG A - NORTH ELEVATION

1 : 250

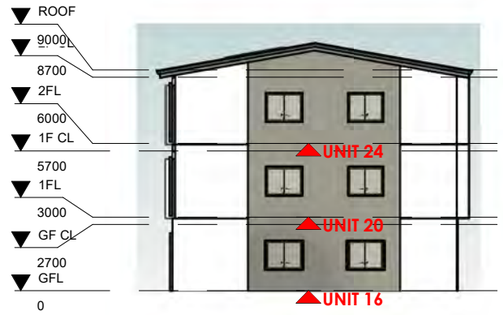


5 A 125

YARAN PROPERTY GROUP

BLDG B - NORTH ELEVATION

1 : 250



6 A 125

YARAN PROPERTY GROUP

BLDG B - SOUTH ELEVATION

1 : 250

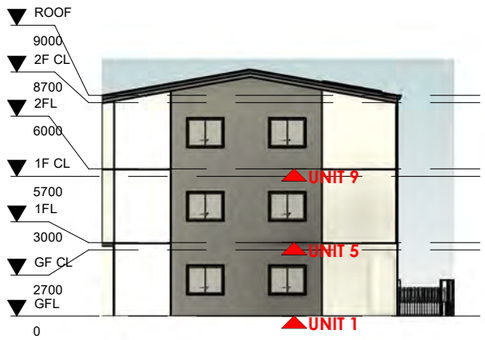
LEGEND/S:

1. SPACE FOR PUBLIC ART

MATERIALS LEGEND/S

PAINT/S

1. WALLS - WHITE POLAR QUARTER
2. GUTTER- WESTERN MYALL
3. ROOF - SURFMIST
4. FASCIA - SURFMIST
5. RENDERED WALL - WESTERN MYALL
6. PERFORATED FENCE - MONUMENT BLACK
7. VERTICAL BATTEN FENCING - MONUMENT BLACK
8. SLAT FENCING FOR BINS - MONUMENT BLACK
9. WALLS - WINDJANA GORGE - DULUX PAINT (RB43)

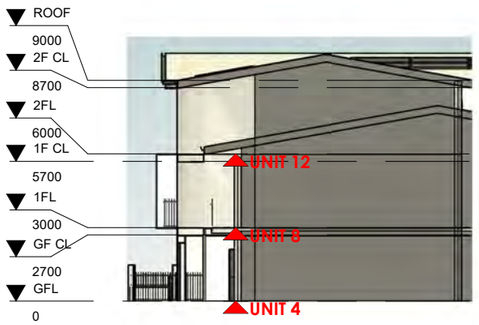


2 A 125

YARAN PROPERTY GROUP

BLDG A - EAST ELEVATION

1 : 250

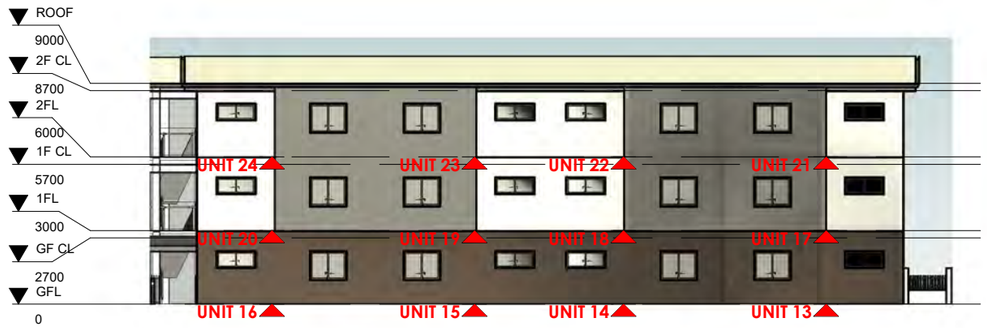


3 A 125

YARAN PROPERTY GROUP

BLDG A - WEST ELEVATION

1 : 250

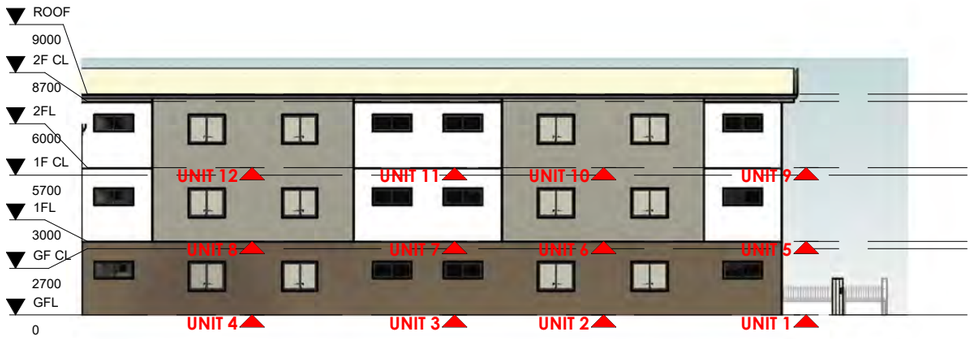


7 A 125

YARAN PROPERTY GROUP

BLDG B - EAST ELEVATION

1 : 250

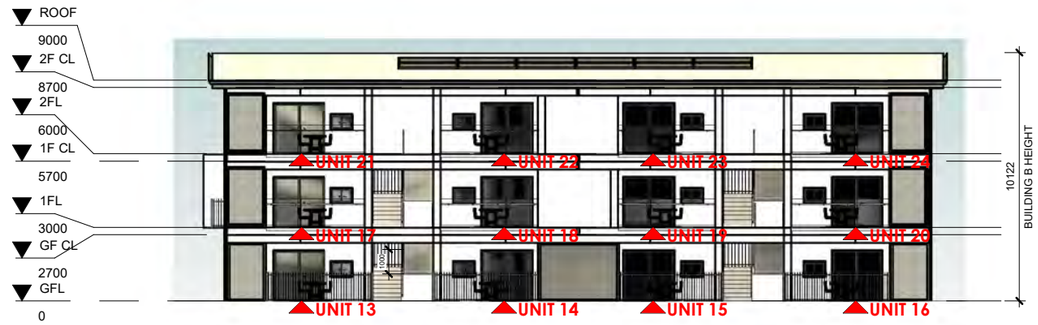


4 A 125

YARAN PROPERTY GROUP

BUILDING A - SOUTH ELEVATION

1 : 250



8 A 125

YARAN PROPERTY GROUP

BLDG B - WEST ELEVATION

1 : 250

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

BUILDING A & B ELEVATIONS

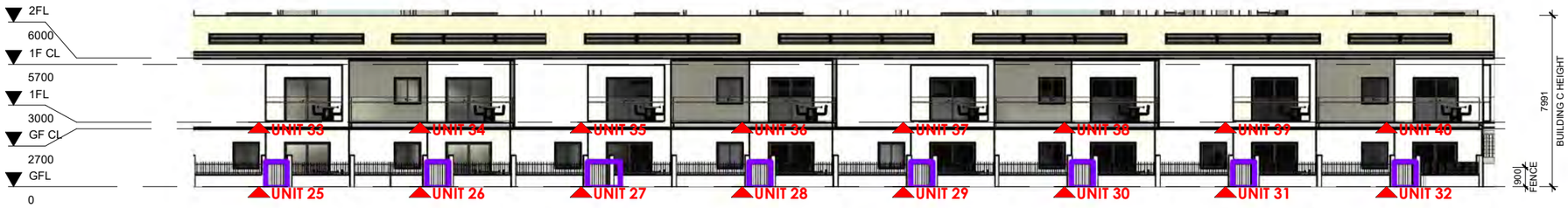
PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

ZONING R80
DWG A-125

YARAN

CREATING VALUE
SHARING VALUE



YARAN PROPERTY GROUP

1 / A 126

BUILDING C - NORTH ELEVATION

1 : 250

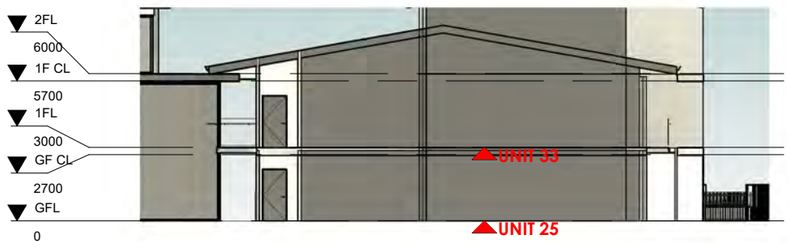
LEGEND/S:

1. GATE LOCATION

MATERIALS LEGEND/S

PAINT/S

1. WALLS - WHITE POLAR QUARTER
2. GUTTER- WESTERN MYALL
3. ROOF - SURFMIST
4. FASCIA - SURFMIST
5. RENDERED WALL - WESTERN MYALL
6. PERFORATED FENCE - MONUMENT BLACK
7. VERTICAL BATTEN FENCING - MONUMENT BLACK
8. SLAT FENCING FOR BINS - MONUMENT BLACK
9. WALLS - WINDJANA GORGE - DULUX PAINT (RB43)



YARAN PROPERTY GROUP

2 / A 126

BUILDING C - EAST ELEVATION

1 : 250

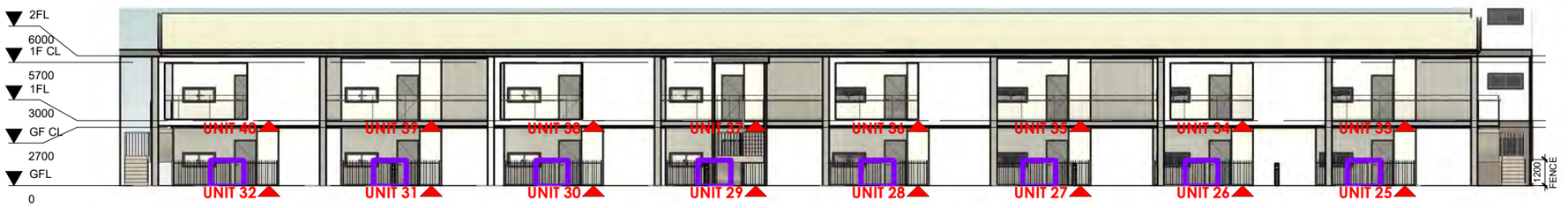


YARAN PROPERTY GROUP

3 / A 126

BUILDING C - WEST ELEVATION

1 : 250



YARAN PROPERTY GROUP

4 / A 126

BUILDING C - SOUTH ELEVATION

1 : 250

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

BUILDING C ELEVATIONS

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

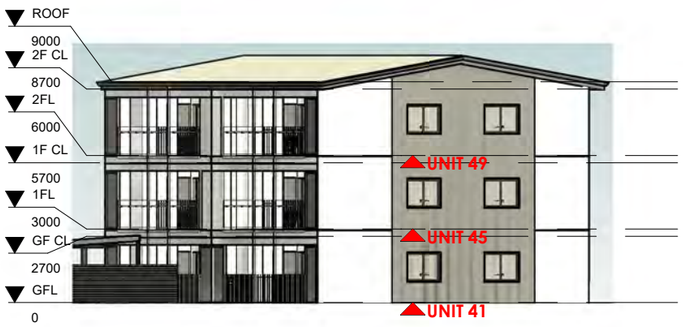
ZONING R80
DWG A-126

YARAN

CREATING VALUE
SHARING VALUE

LEGEND/S:

1. SPACE FOR PUBLIC ART

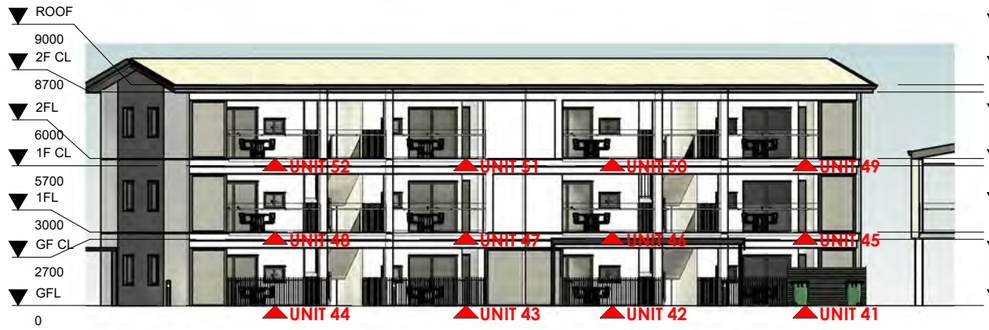


1 / A 127

YARAN PROPERTY GROUP

BUIIDING D - NORTH ELEVATION

1 : 250

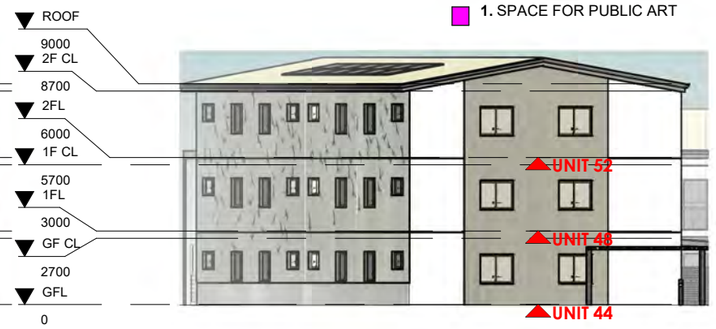


2 / A 127

YARAN PROPERTY GROUP

BUILDING D - EAST ELEVATION

1 : 250

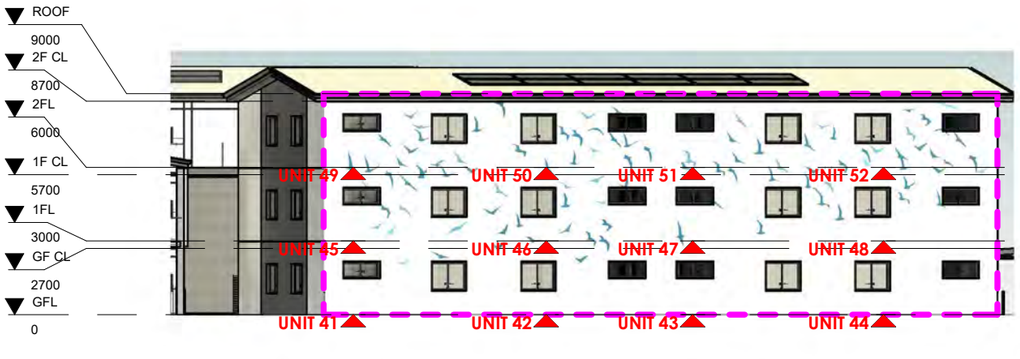


3 / A 127

YARAN PROPERTY GROUP

BUILDING D - SOUTH ELEVATION

1 : 250

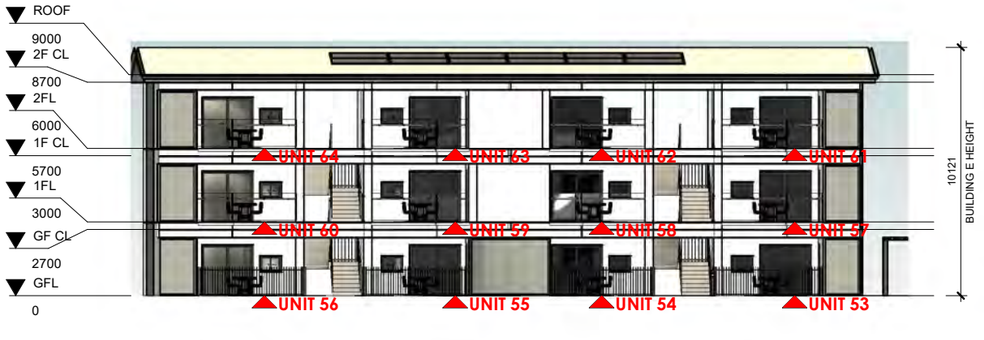


4 / A 127

YARAN PROPERTY GROUP

BUILDING D - WEST ELEVATION

1 : 250



5 / A 127

YARAN PROPERTY GROUP

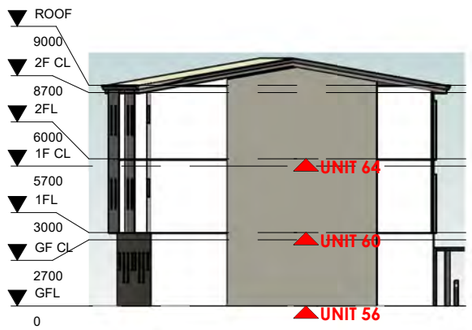
BUILDING E - NORTH ELEVATION

1 : 250

MATERIALS LEGEND/S

PAINT/S

1. WALLS - WHITE POLAR QUARTER
2. GUTTER- WESTERN MYALL
3. ROOF - SURFMIST
4. FASCIA - SURFMIST
5. RENDERED WALL - WESTERN MYALL
6. PERFORATED FENCE - MONUMENT BLACK
7. VERTICAL BATTEN FENCING - MONUMENT BLACK
8. SLAT FENCING FOR BINS - MONUMENT BLACK
9. WALLS - WINDJANA GORGE - DULUX PAINT (RB43)

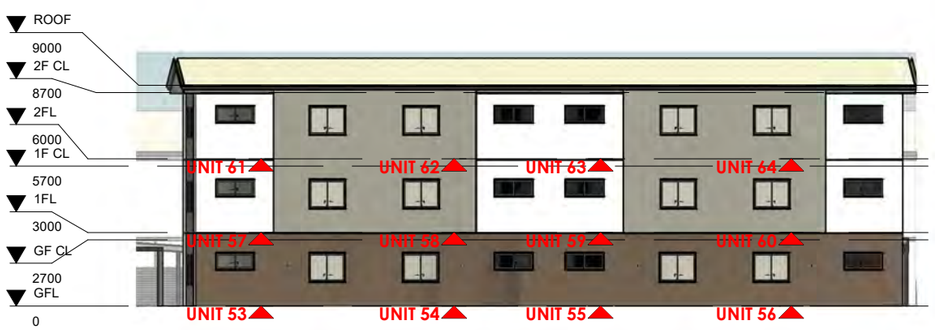


6 / A 127

YARAN PROPERTY GROUP

BUILDING E - EAST ELEVATIONS

1 : 250

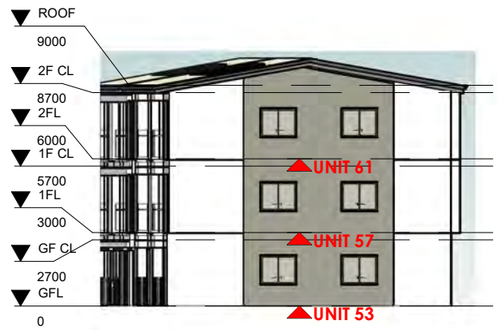


7 / A 127

YARAN PROPERTY GROUP

BUILDING E - SOUTH ELEVATION

1 : 250



8 / A 127

YARAN PROPERTY GROUP

BUILDING E - WEST ELEVATION

1 : 250

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

BUILDING D & E ELEVATIONS

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

A3

ZONING R80
DWG A-127

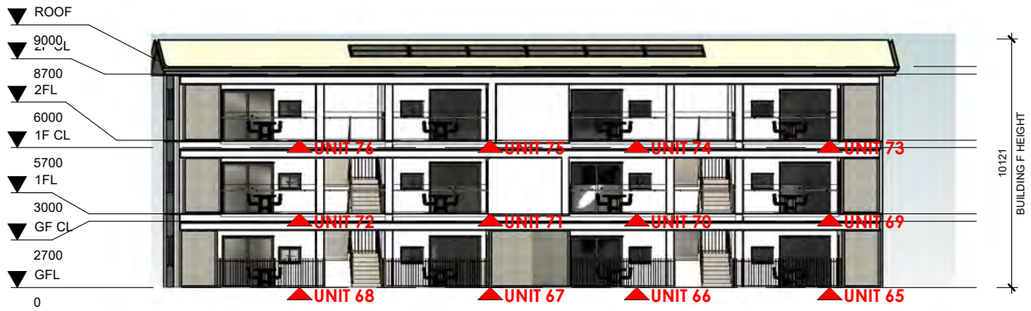
YARAN

CREATING VALUE
SHARING VALUE

MATERIALS LEGEND/S

PAINT/S

1. WALLS - WHITE POLAR QUARTER
2. GUTTER- WESTERN MYALL
3. ROOF - SURFMIST
4. FASCIA - SURFMIST
5. RENDERED WALL - WESTERN MYALL
6. PERFORATED FENCE - MONUMENT BLACK
7. VERTICAL BATTEN FENCING - MONUMENT BLACK
8. SLAT FENCING FOR BINS - MONUMENT BLACK
9. WALLS - WINDJANA GORGE - DULUX PAINT (RB43)

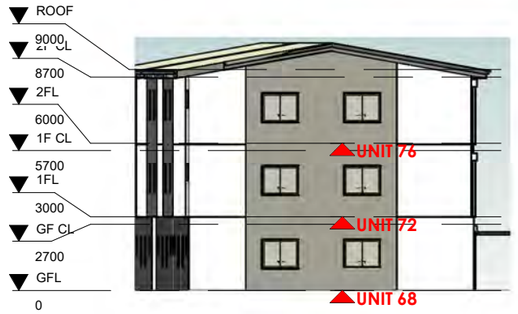


1 / A 128

YARAN PROPERTY GROUP

BUILDING F - NORTH ELEVATION

1 : 250

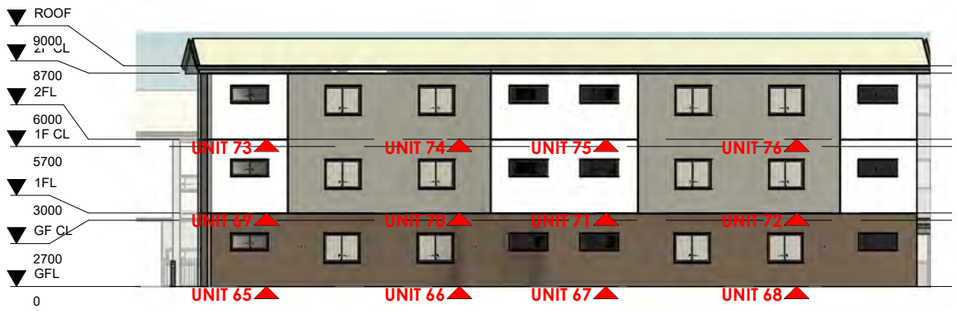


2 / A 128

YARAN PROPERTY GROUP

BUILDING F - EAST ELEVATIONS

1 : 250

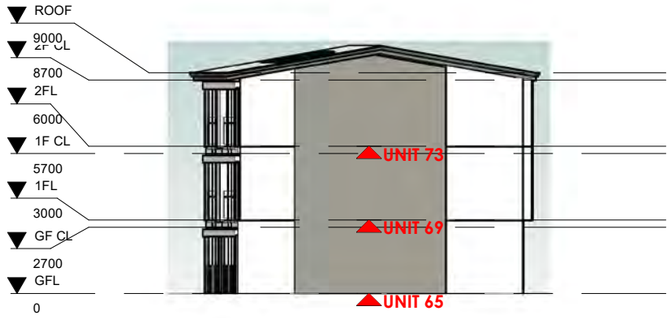


3 / A 128

YARAN PROPERTY GROUP

BUILDING F - SOUTH ELEVATION

1 : 250



4 / A 128

YARAN PROPERTY GROUP

BUILDING F - WEST ELEVATION

1 : 250

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

BUILDING F ELEVATIONS

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: As indicated

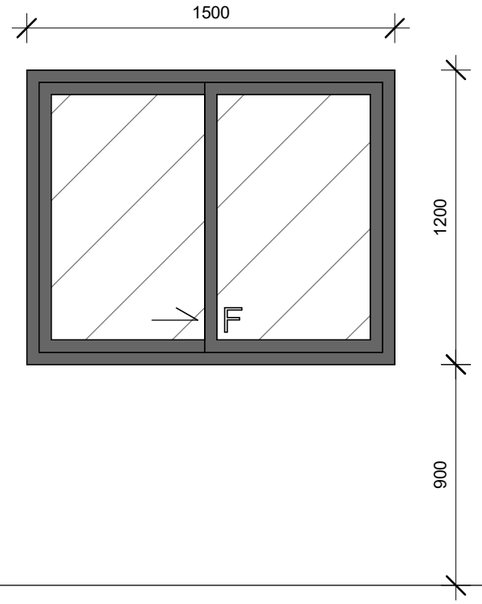
A3

ZONING R80

DWG A-128

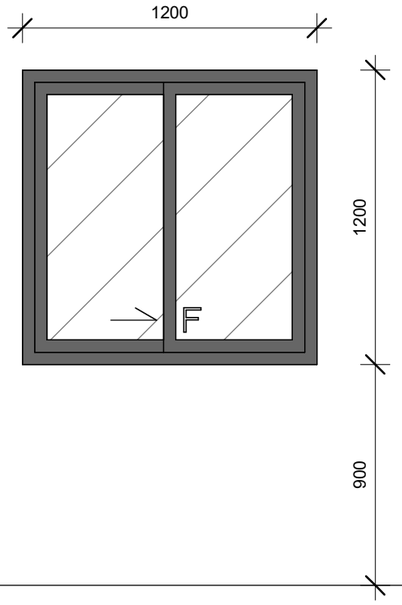
YARAN

CREATING VALUE
SHARING VALUE



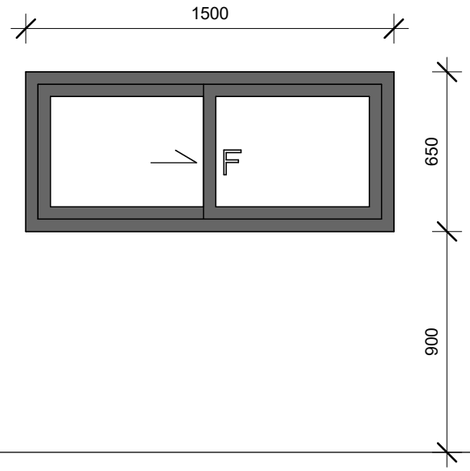
F.F.L.

WINDOW CODE	WINDOW 1
DIMENSION (WxH)	1500mm x 1200mm
LOCATION	LIVING (TYPES A-L), MASTER BEDROOM (TYPES A-L)
QUANTITY	90 SETS



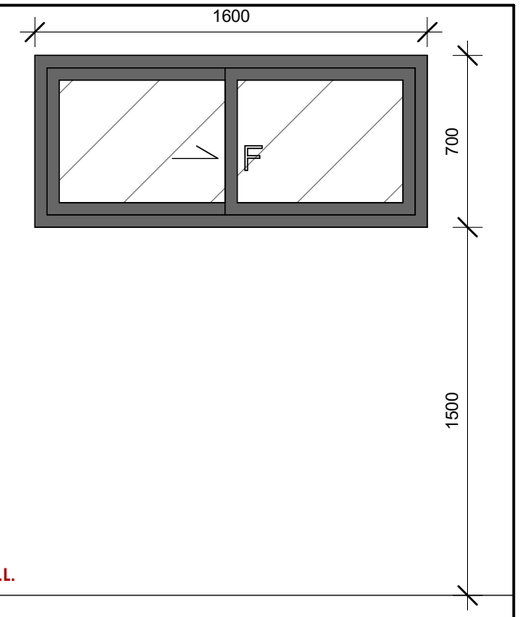
F.F.L.

WINDOW CODE	WINDOW 2
DIMENSION (WxH)	1200mm x 1200mm
LOCATION	BEDROOM (TYPES A-F)
QUANTITY	16 SETS



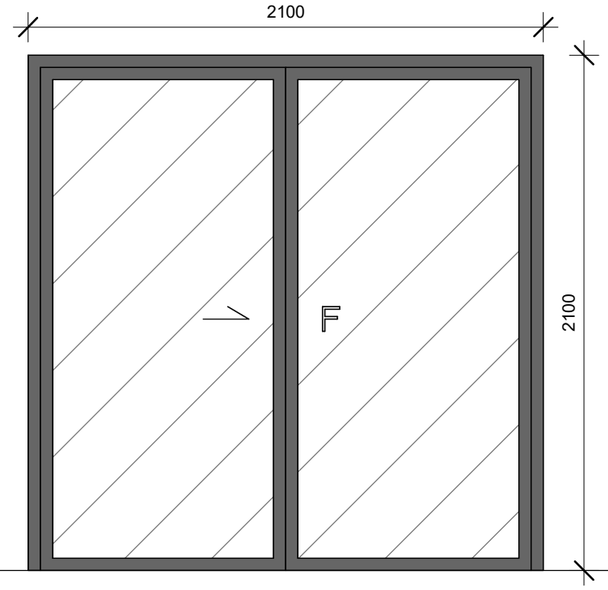
F.F.L.

WINDOW CODE	WINDOW 3
DIMENSION (WxH)	1200mm x 650mm
LOCATION	KITCHEN (TYPES A-F)
QUANTITY	16 SETS



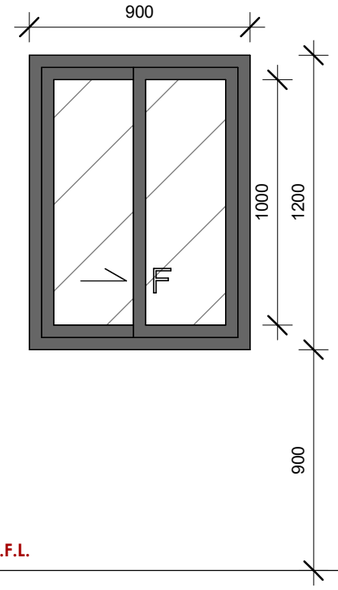
F.F.L.

WINDOW CODE	WINDOW 4
DIMENSION (WxH)	600mm x 1200mm
LOCATION	BATHROOM (TYPES G-L)
QUANTITY	60 SETS



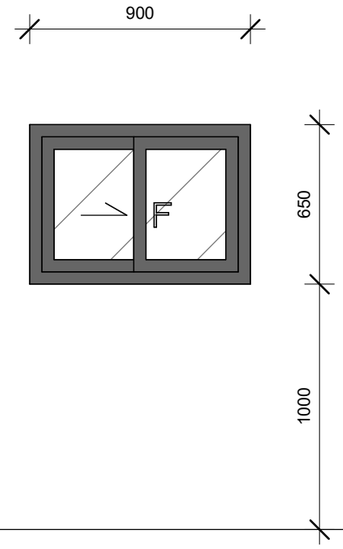
F.F.L.

WINDOW CODE	WINDOW 5
DIMENSION (WxH)	2100mm x 2100mm
LOCATION	LIVING (TYPES A-N)
QUANTITY	76 SETS



F.F.L.

WINDOW CODE	WINDOW 6
DIMENSION (WxH)	900mm x 1200mm
LOCATION	BEDROOM (TYPES A-F)
QUANTITY	16 SETS



F.F.L.

WINDOW CODE	WINDOW 7
DIMENSION (WxH)	900mm x 650mm
LOCATION	KITCHEN (TYPES G-L)
QUANTITY	60 SETS

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

WINDOWS SCHEDULE

PLOT DATE: JANUARY 2025
DRAWN: PV | JV | NA
SCALE: 1 : 25

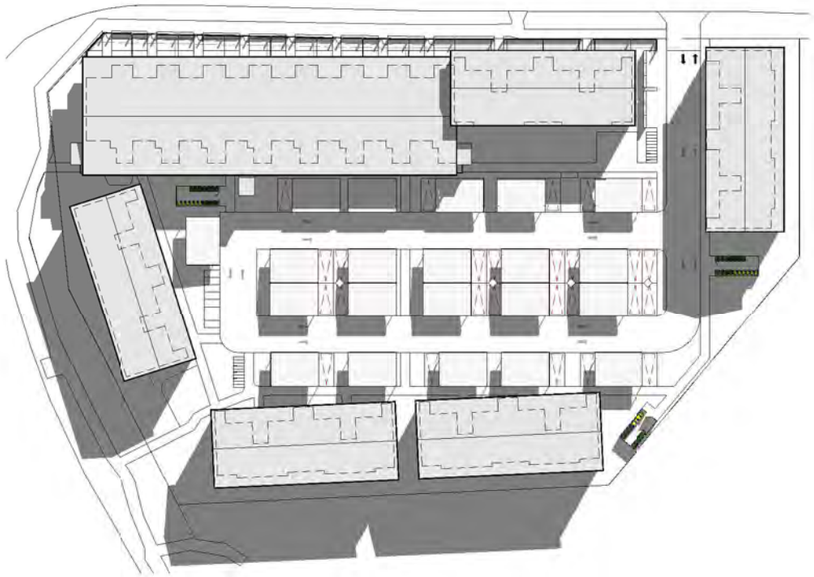
A3

ZONING R80
DWG A-129

YARAN

CREATING VALUE
SHARING VALUE

NORTH

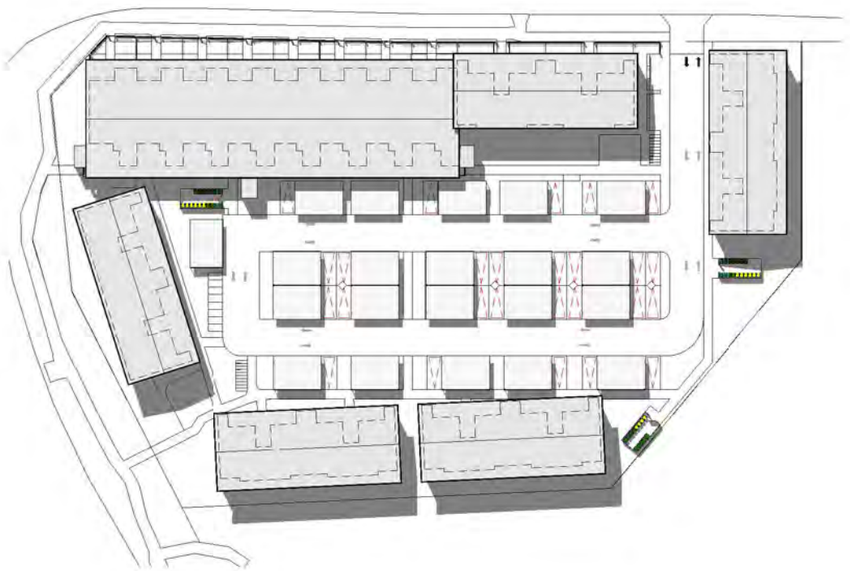


1
A | 130

YARAN PROPERTY GROUP

AUTUMN EQUINOX MAR 21 - 9AM

1 : 1000

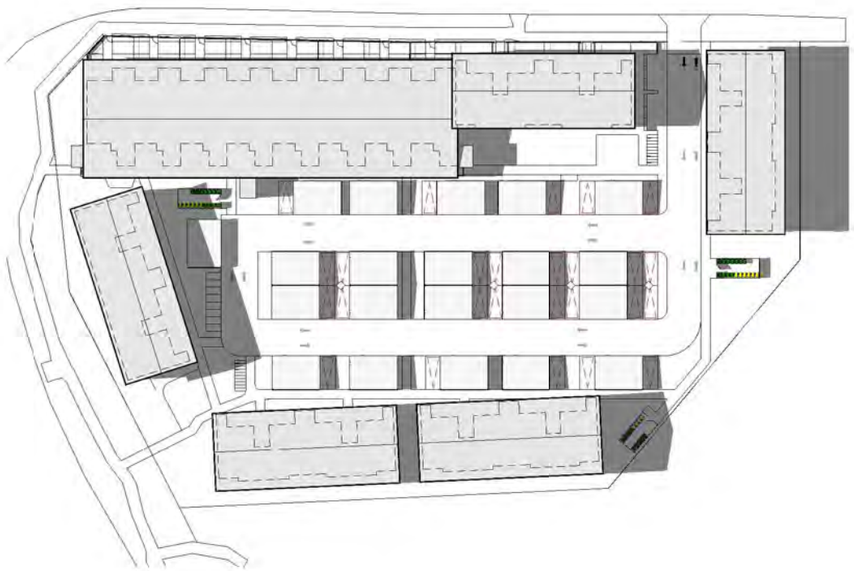


2
A | 130

YARAN PROPERTY GROUP

AUTUMN EQUINOX MAR 21 - 12PM

1 : 1000



3
A | 130

YARAN PROPERTY GROUP

AUTUMN EQUINOX MAR 21 - 3PM

1 : 1000

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

SHADOW DIAGRAM - AUTUMN EQUINOX

PLOT DATE:	FEBRUARY 2025
DRAWN:	PV | JV | NA
SCALE:	1 : 1000

A3

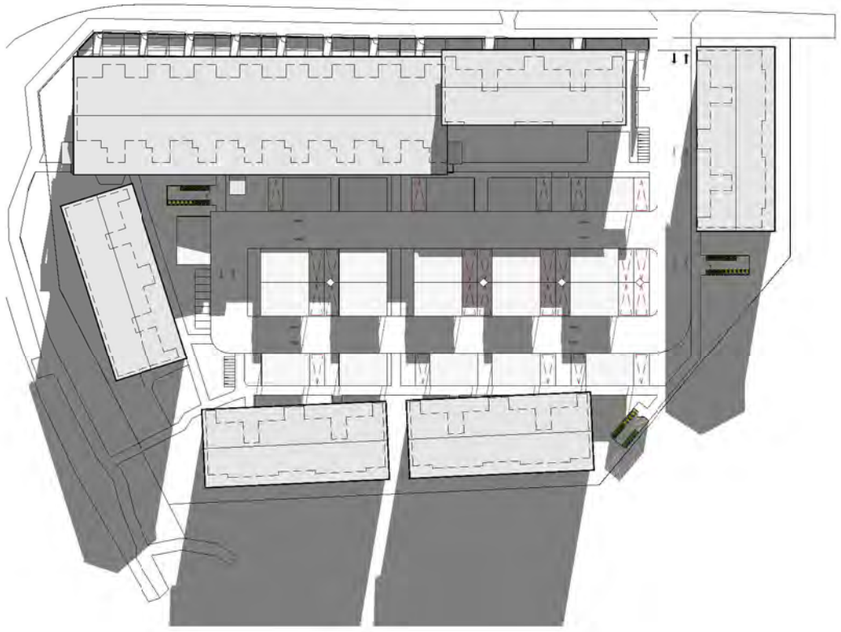
ZONING R80

DWG A-130

YARAN

CREATING VALUE SHARING VALUE

NORTH

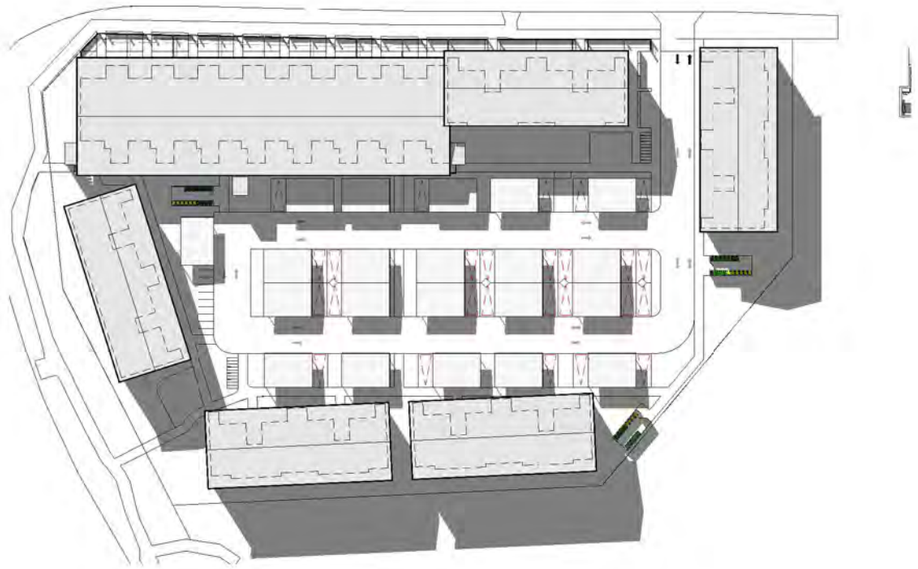


1
A 131

YARAN PROPERTY GROUP

WINTER SOLSTICE JUN 21 - 9AM

1 : 1000

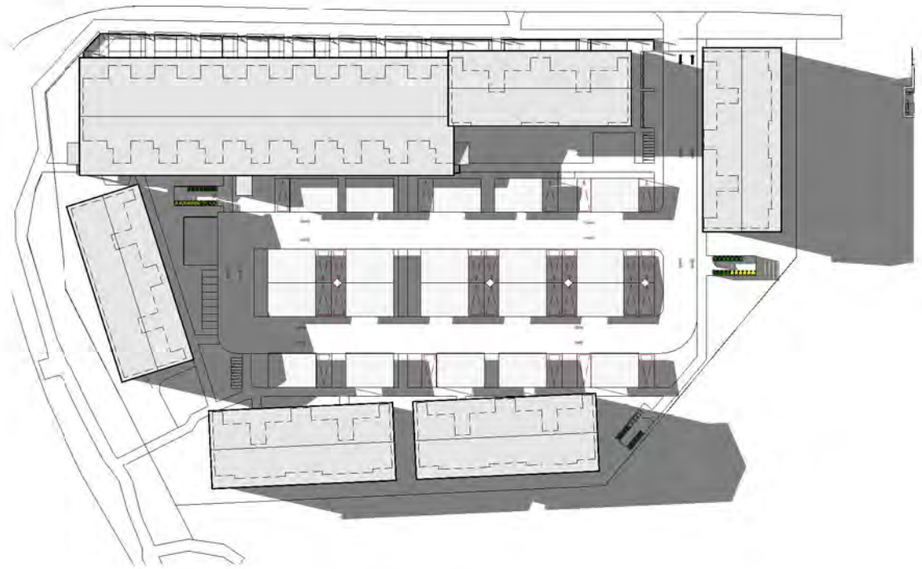


2
A 131

YARAN PROPERTY GROUP

WINTER SOLSTICE JUN 21 - 12PM

1 : 1000



3
A 131

YARAN PROPERTY GROUP

WINTER SOLSTICE JUN 21 - 3PM

1 : 1000

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

SHADOW DIAGRAM - WINTER SOLSTICE

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: 1 : 1000

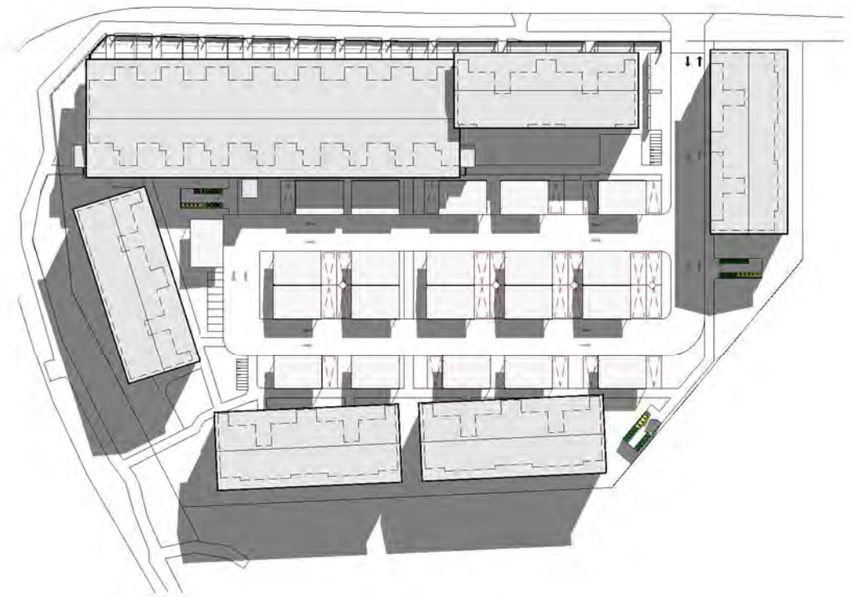
A3

ZONING R80
DWG A-131

YARAN

CREATING VALUE
SHARING VALUE

NORTH



1
A | 132

YARAN PROPERTY GROUP

SPRING EQUINOX SEP 21 - 9AM

1 : 1000

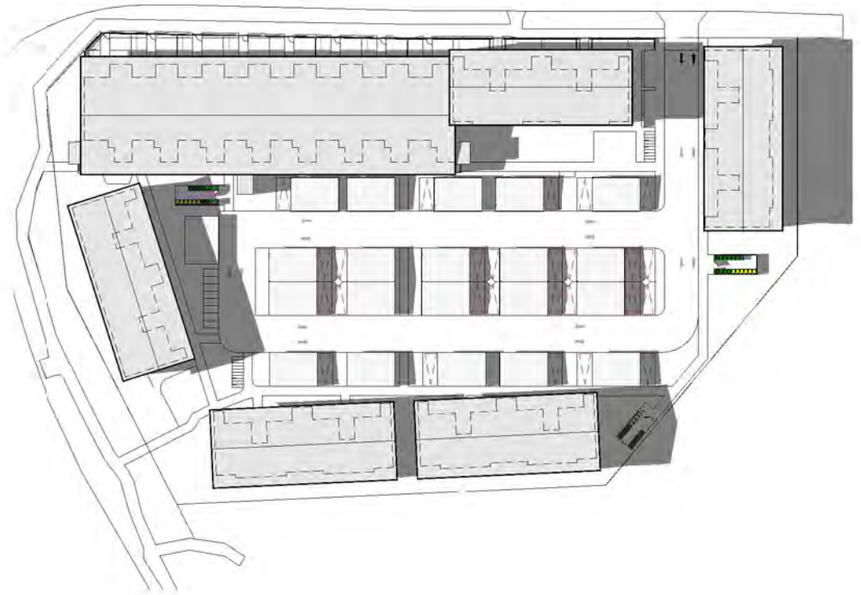


2
A | 132

YARAN PROPERTY GROUP

SPRING EQUINOX SEP 21 - 12PM

1 : 1000



3
A | 132

YARAN PROPERTY GROUP

SPRING EQUINOX SEP 21 - 3PM

1 : 1000

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

SHADOW DIAGRAM - SPRING EQUINOX

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: 1 : 1000

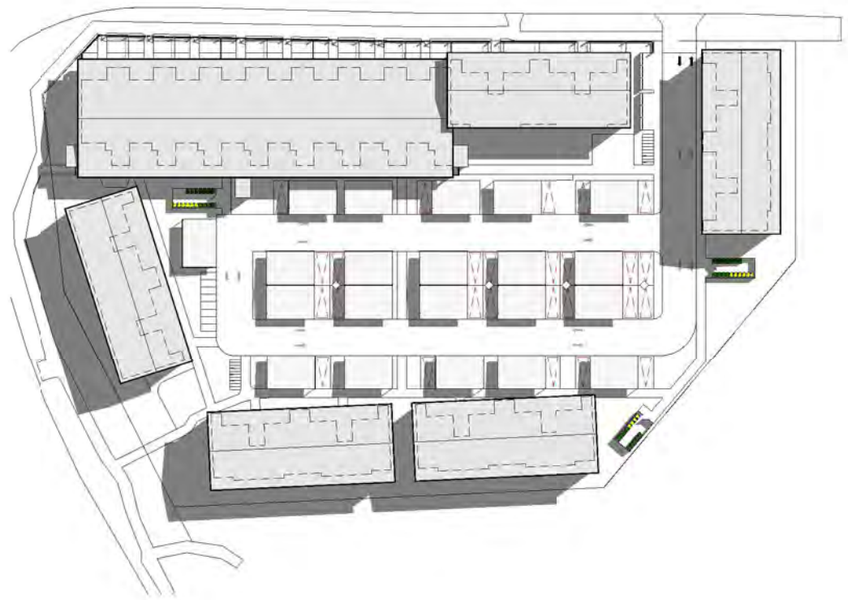
A3

ZONING R80
DWG A-132

YARAN

CREATING VALUE
SHARING VALUE

NORTH



1
A 133

YARAN PROPERTY GROUP

SUMMER SOLSTICE DEC 21 - 9AM

1 : 1000

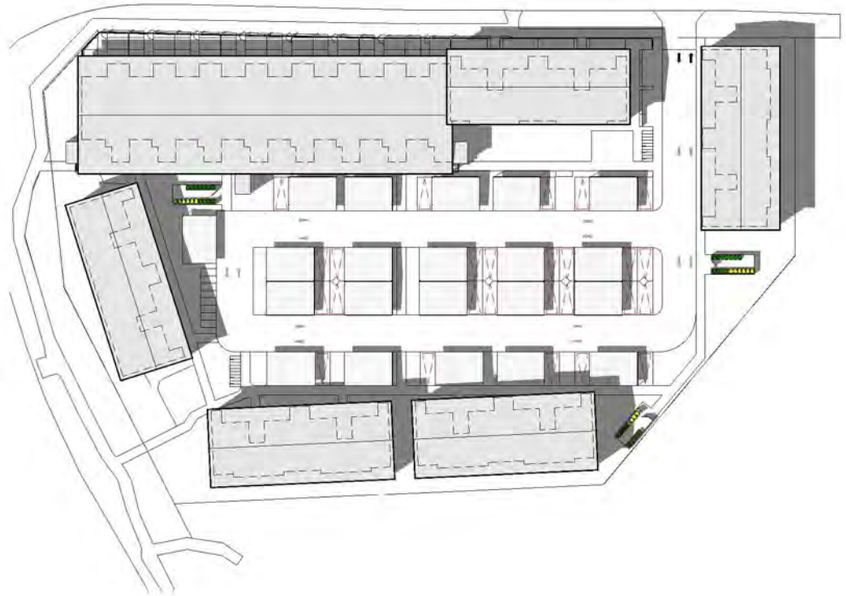


2
A 133

YARAN PROPERTY GROUP

SUMMER SOLSTICE DEC 21 - 12PM

1 : 1000



3
A 133

YARAN PROPERTY GROUP

SUMMER SOLSTICE DEC 21 - 3PM

1 : 1000

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6210

SHEET CONTENT

SHADOW DIAGRAM - SUMMER SOLSTICE

PLOT DATE: FEBRUARY 2025
DRAWN: PV | JV | NA
SCALE: 1 : 1000

A3

ZONING R80
DWG A-133

YARAN

CREATING VALUE
SHARING VALUE








4 WAARDONG COURT


VISITOR
VISITOR
VISITOR


VISITOR
VISITOR






VISITOR



















4 WAARDONG COURT DEVELOPMENT HALLS HEAD

PUBLIC ART COMMISSION

ARTWORK CONCEPT DESIGN PROPOSAL

Artist l Mark Datodi

December 2024

Contents

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Proposed Artwork Location

Artwork Inspiration

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Artist Information 01

Contact details

Artist Name: Mark Datodi

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Email: mdatodi@bigpond.com

Telephone: 0403177025

Postal Address: 12 Harvey Street, Mosman Park WA 6012

Studio Address: Unit 5 / 18 Erceg Road, Yangebup, WA 6164

Response to the Development Site 02

The major contributing factors that have driven my response to the artwork for No.4 Waardong Court, Halls Head Development are:

- Location of the new building – creating artworks that reflect the unique aspects of the site with the significance of the proximity to the Mandurah Estuary and the Creery and Samphire Wetland Nature Reserves.
- The position of the artwork in relation to the height of the buildings and the scale of the artwork designs.
- The critical distance that the artwork will be viewed from - the communities' movements up to and in passing the artwork.
- The view the residents, families and friends will have of the artwork on approaching the new building.
- Material aspects - the choice of materials selected to withstand the elements and the chance of vandalism.
- Safety aspects of all artworks – meet all Australian Safety Standards for the design, construction, installation and maintenance of artwork.

The site-specific artwork for the Waardong Court, Halls Head Development, must make a strong, accessible, and enduring statement. It should be eye-catching, relate to the surrounding context, and be intriguing for residents, visitors, and the wider community.

Artwork Response to the Development Site

My aim for the artwork for Waardong Court, Halls Head Development, is to create an evocative and striking design that is relevant to the site and suburb. The Development is close to the Mandurah Estuary and the Creery and Samphire Wetland Nature Reserves, which are protected conservation areas in the City of Mandurah. The Wetland Nature Reserves of Mandurah have documented over 130 bird species. They host various migratory and resident shorebirds and birds that use the samphire and shrub habitats.

The artwork concepts are inspired by the Estuary Water Patterns and the Migratory and Resident Shorebirds found in the Mandurah Nature Reserves.

Screen Artwork Design - Estuary Water Patterns

The Mandurah waterways' significance has inspired the screen artworks' rhythmic pattern. The perforated hole sizes, which create and reflect the movement of water, are also integral to the design. The Screen artwork's scale will enable it to be seen and appreciated from street vantage points.

Building Artwork Design - Migratory and Resident Shorebirds

The significance of bird movement in the local wetlands and their migration yearly cycle in the Mandurah Nature Reserves has inspired the Birds in-flight pattern. The artwork consists of approximately 98 birds covering the upper length of the building façade facing Old Coast Road. The artwork's variations of a blue colour palette enhance the movement of the design layout. Each bird's fixing detail enables the distance from the wall to produce shadows that are cast over the day. The scale of this artwork will enable it to be seen and appreciated from street vantage points.

Artwork Description - Materials

Artwork

The choices of materials will be carefully considered for their durability against the elements and sustainability against vandalism.

Artwork dimensions TBC.

Depending on confirmation of the final artwork design, options for materials and construction are:

- Artwork Bird elements constructed from router cut 4mm Aluminium plate, painted and 2pk sealer.
- Artwork Screen elements are constructed from Perforated 3mm Aluminium plate, painted and 2pk sealer.

*All dimensions of the artwork, artwork composition and colour palette will be finalised during the design documentation stage of this project.

Screen Artworks Location on the Development Site – Water Ways



Screen Artworks Location on the Development Site – Water Ways



Wall Elevation Artwork Location on the Development Site - Migratory and Resident Shorebirds



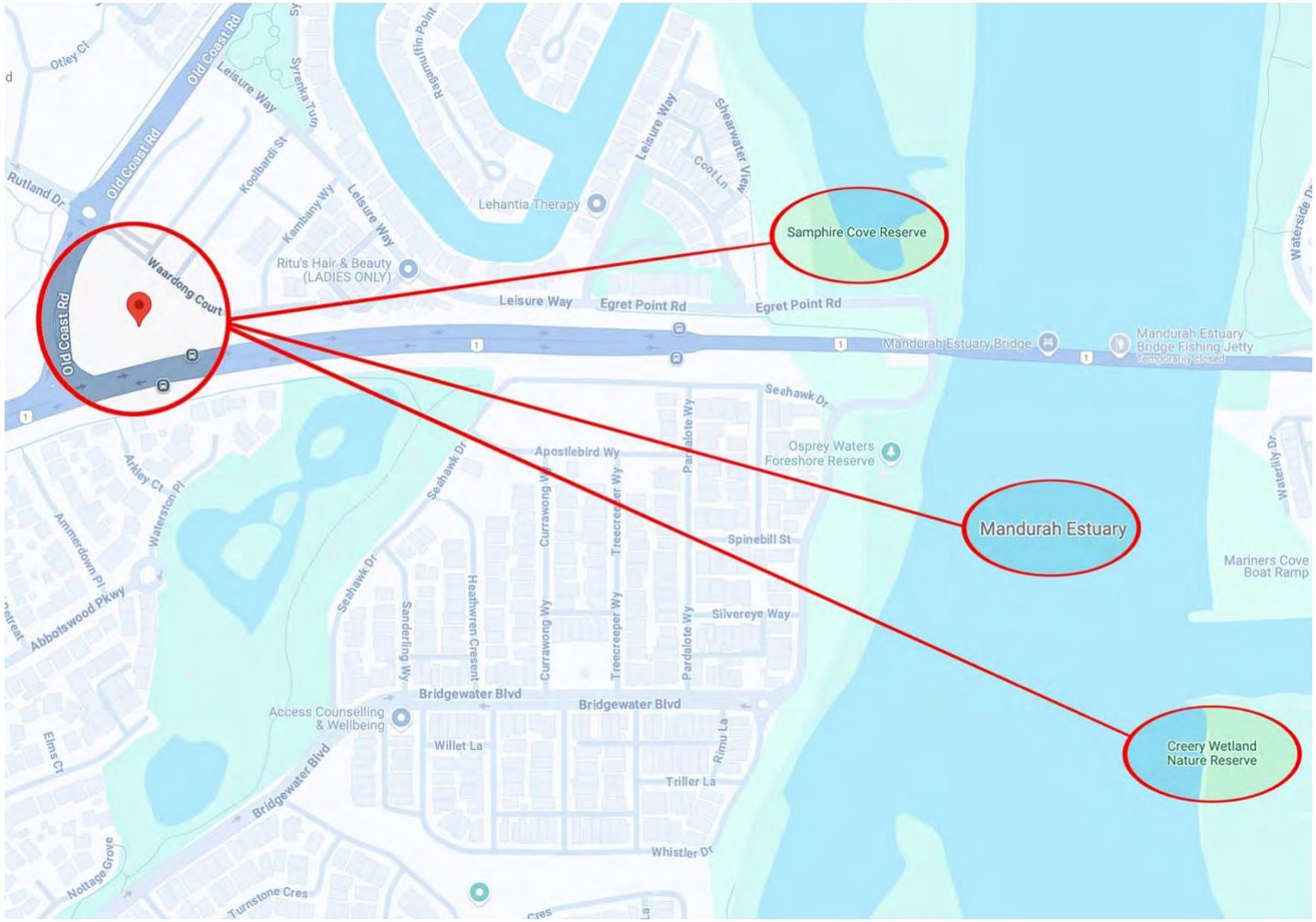
Wall Elevation Artwork Location on the Development Site - Migratory and Resident Shorebirds



SITE WEST ELEVATION

Artwork Location

Artwork Site Location – Artwork Inspiration



Proximity of Site to Creery Wetlands Nature Reserve, Samphire Cove Reserve, and the Mandurah Estuary

Artwork Inspiration Mandurah Estuary – Migratory and Resident Shorebirds



Red-necked Avocet



Sanderling



Marsh Sandpiper



Pied Oystercatcher



Pied Stilt



Red-capped Plover



Grey Plover



Great Knot



Sharp-tailed Sandpiper

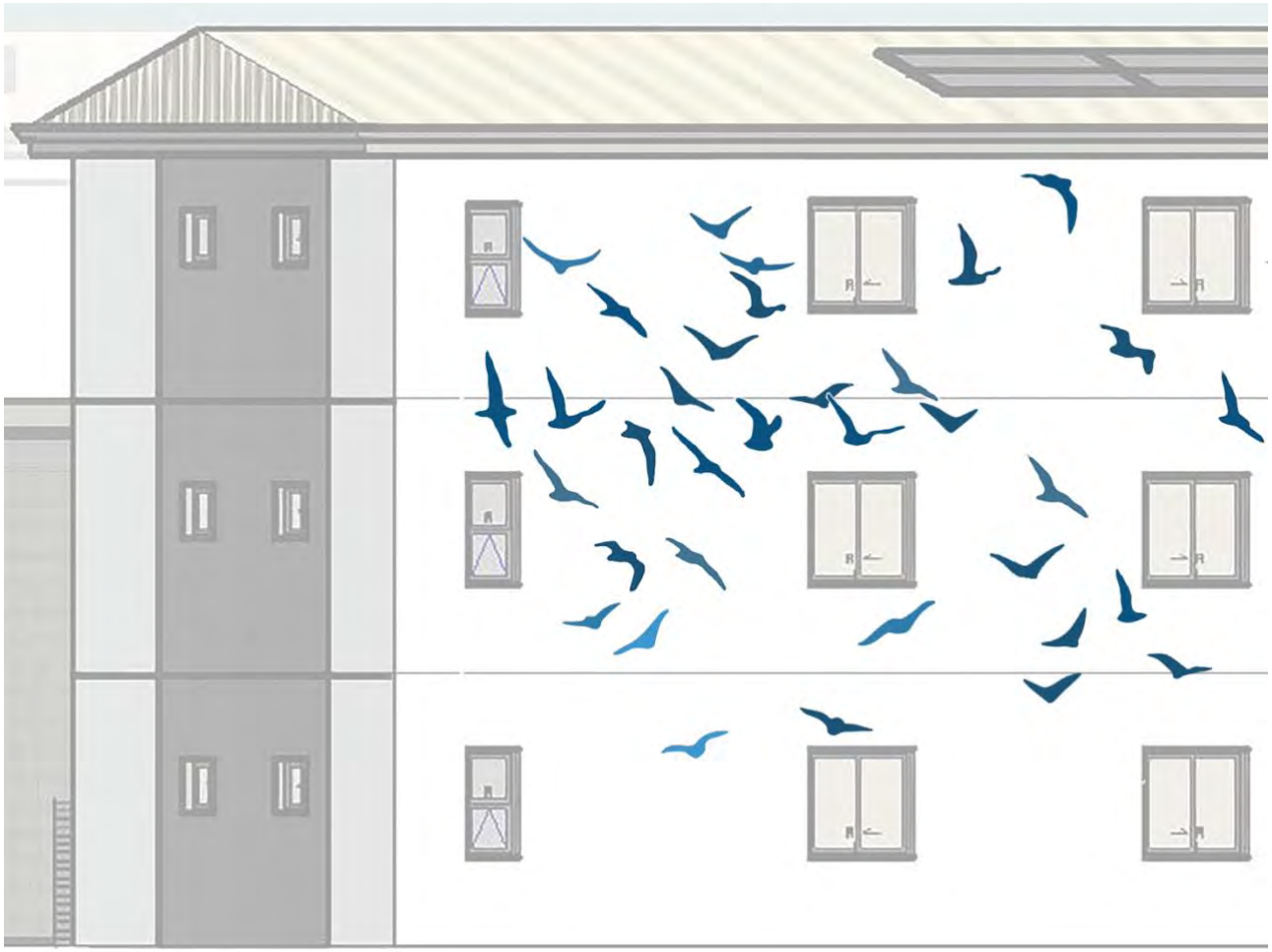
Proposed Artwork - Migratory and Resident Shorebirds



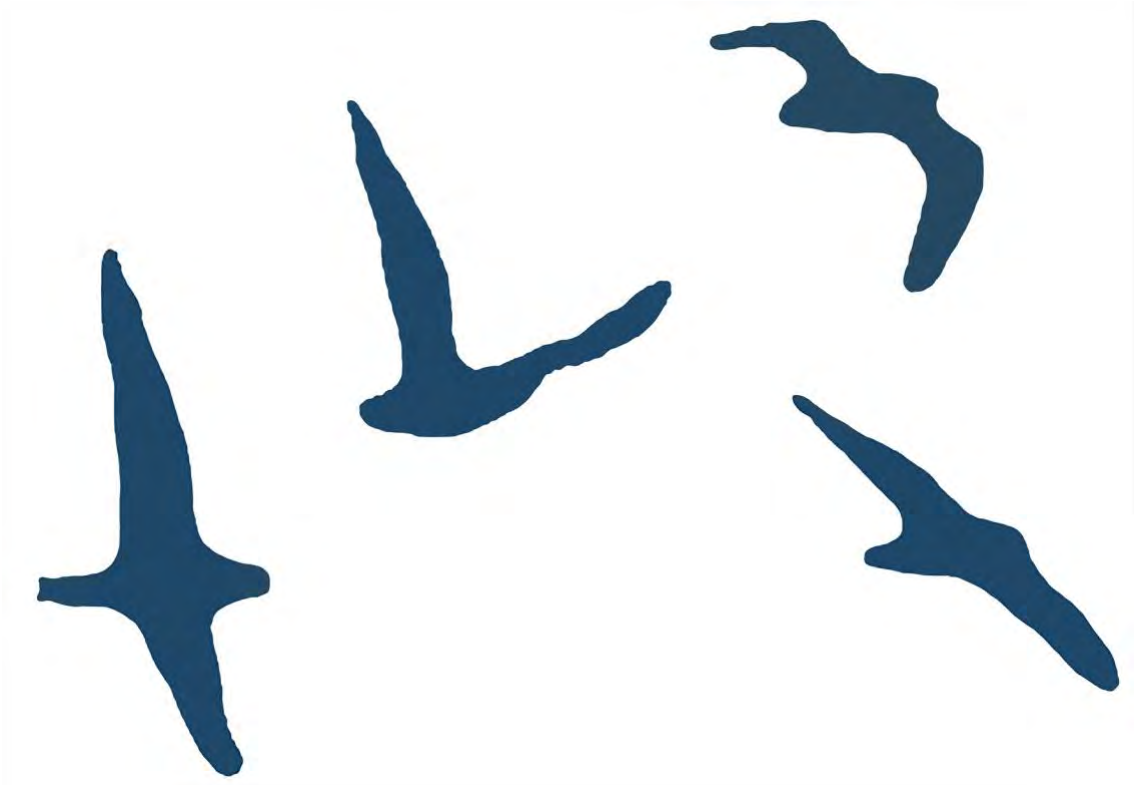
Proposed Artwork – Migratory and Resident Shorebirds Concept Layout



Proposed Artwork – Migratory and Resident Shorebirds Concept Detail



Proposed Artwork – Migratory and Resident Shorebirds Concept Detail



Bird Silhouettes vary in Size approx. 500 x 1000mm

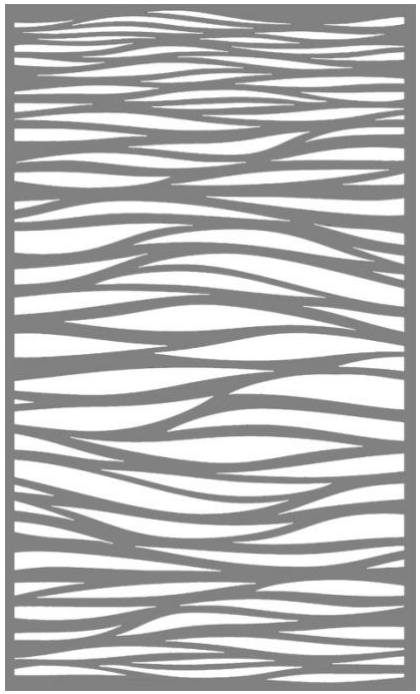
Artwork Inspiration - Mandurah Estuary Waterway Concept

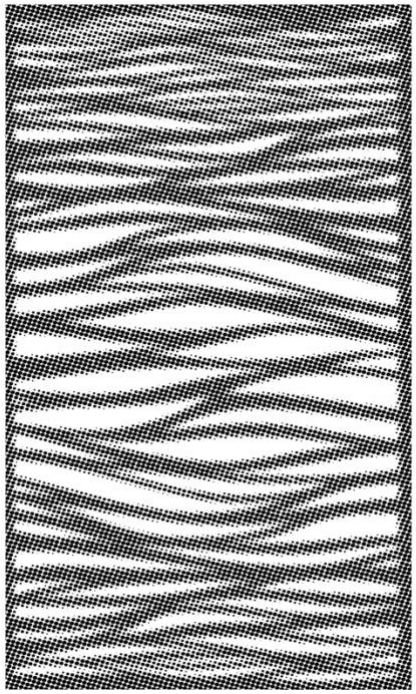


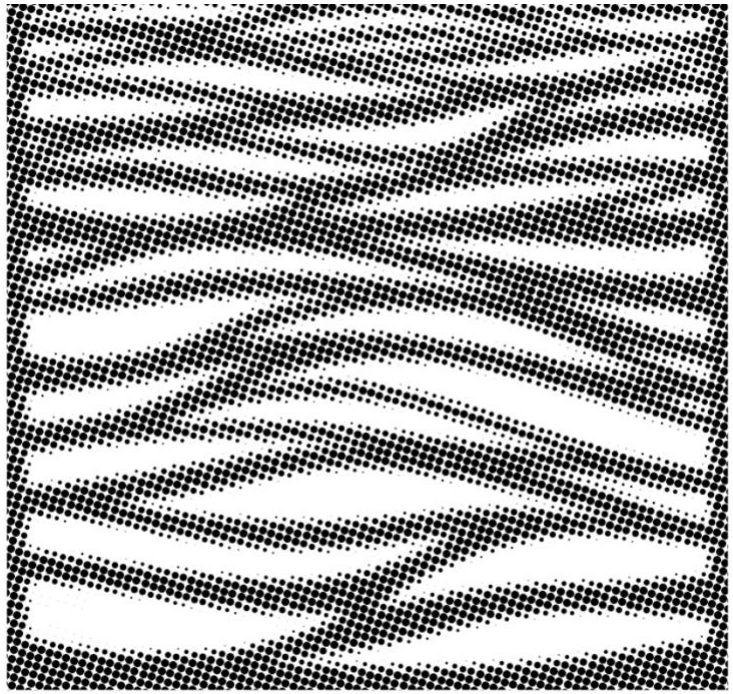





Proposed Artwork Screens – Mandurah Estuary Waterway Concept







Perforated Screens with varied hole sizes

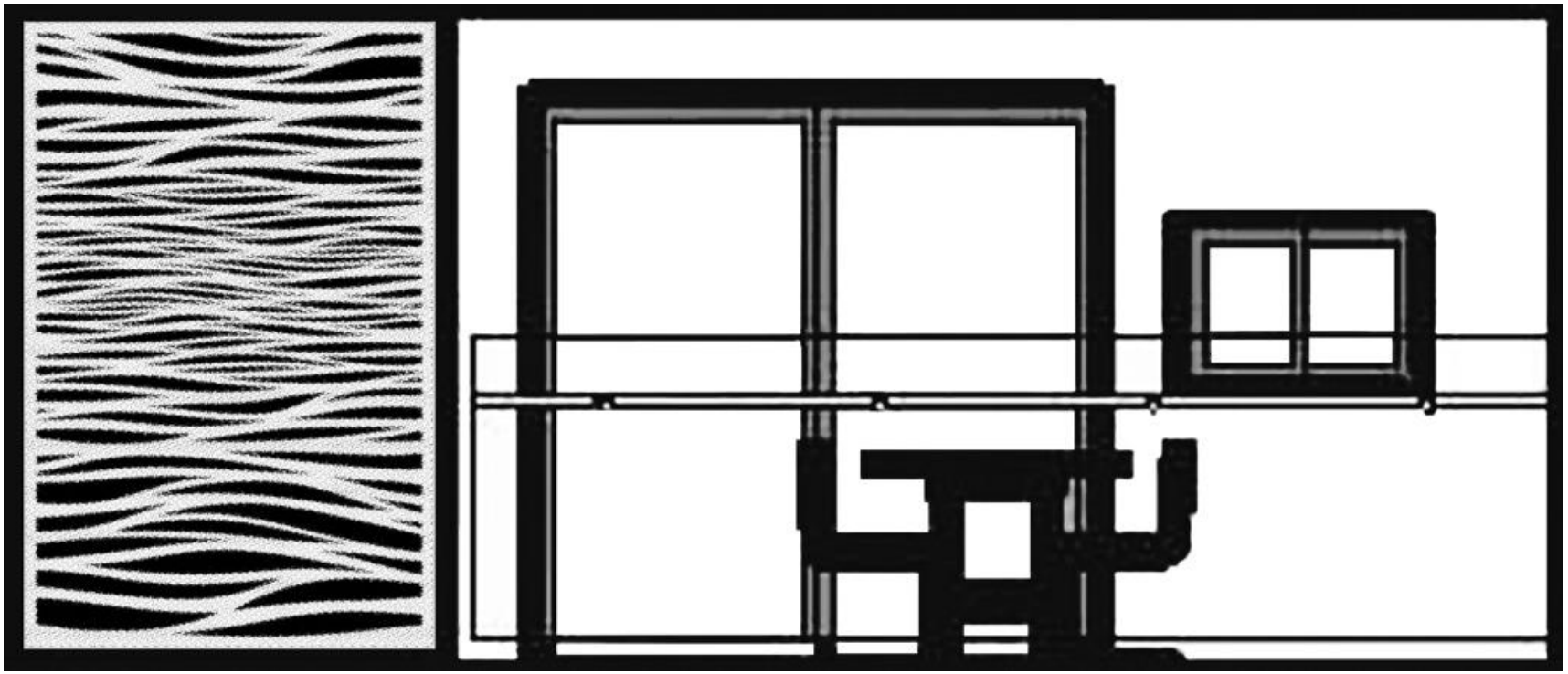
Proposed Artwork - Mandurah Estuary Waterway Concept Screen Layout



Proposed Artwork - Mandurah Estuary Waterway Concept Screen Detail



Proposed Artwork Screens- Mandurah Estuary Waterway Concept



Screen Size approx. 1200 x 2400

Artwork Design, Fabrication and Installation

Completion of Design Development	January 2025
Completion of Design Documentation	March 2025
Commencement of Artwork Fabrication Purchase Materials	June 2025
Completion of Artwork Fabrication	November 2025
Installation of Artwork elements	TBC

Budget

The budget estimates below are based on the fabrication of artworks/designs of a similar nature. They are, at this stage, estimates only to keep within the artwork budget sum of $ 100,000.00 plus GST

Artists Fees

Design development, project management, and collaboration for associated artwork meetings. Artwork documentation	$ 20,000.00
Engineering for artwork fixing detail	$ 2,400.00
Artwork graphics DFX cutting files for sculpture elements and Screen perforated Artwork	$ 3,600.00

Fabrication / Implementation Phase

Material − 4mm marine grade 5083 Aluminium plate Router cutting of patterns/shapes Cutting, sanding and welding Grinding, sanding and surface preparation ready for paint and sealer Includes labour and workshop consumables	$ 28,500.00
Painting and sealer Includes labour and workshop consumables	$ 18,000.00
Screen material, artwork perforation, and painting	$ 15,000.00
Delivery of artwork to site and installation Boom lift hire includes all fixings	$ 12,500.00
Total Cost	$ 100,000.00 (plus GST)

GENERAL NOTES:
1. THIS IS A CONCEPT PLAN ONLY.
2. ALL STRUCTURES SUBJECT TO ENGINEERING AND COUNCIL APPROVAL.
3. ALL MEASUREMENTS TO BE CHECKED PRIOR TO CONSTRUCTION.

REV	DATE	DWN	APP	DESCRIPTION
C	07.11.24	ALC	KD	LANDSCAPE CONCEPT PLAN
D	12.11.24	ALC	KD	LANDSCAPE CONCEPT PLAN
E	21.01.25	ALC	KD	UPDATED LANDSCAPE CONCEPT PLAN
F	22.01.25	ALC	KD	UPDATED LANDSCAPE CONCEPT PLAN
G	07.02.25	ALC	KD	UPDATED LANDSCAPE CONCEPT PLAN



LEGEND

TREES

- EXISTING TREES TO BE RETAINED
- SELECTED LARGE TREES EG. PEPPERMINT TREE CANOPY: 9m
- SELECTED LARGE TREES EG. MARRI CANOPY: 8m
- SELECTED LARGE TREES EG. JACARANDA CANOPY: 8m
- SELECTED MEDIUM TREES EG. WEEPING RED FLOWERING PAPERBARK CANOPY: 6m
- SELECTED SMALL TREES EG. COASTAL BLACKBUTT CANOPY: 5M
- SELECTED SMALL TREES EG. HONG KONG ORCHID TREE CANOPY: 5M
- SELECTED SMALL TREES EG. FUCHSIA GUM CANOPY: 4M
- SELECTED FRUITING TREES EG. CITRUS CANOPY: 3m

PLANTING

- PLANTING TYPE 01 GROUNDCOVERS
- PLANTING TYPE 02 SHRUBS
- PLANTING TYPE 03 STRAPPY/MIXED
- PLANTING TYPE 04 SHADE TOLERANT
- PLANTING TYPE 05 SCREENING PLANTING
- SELECTED LAWN SPECIES EG. SOFT LEAF BUFFALO
- MULCH ONLY AREA
- EXISTING VERGE TREATMENT TO REMAIN

MISC

- DEEP SOIL AREAS (DSA)
- PERGOLAS WITH ACCESSIBLE PICNIC TABLES
- BENCH SEAT
- FEATURE PAVING TO SEATING NODES
- PAVING TYPE TBC

LANDSCAPE AREA CALCULATIONS

SITE AREA
Total site area = 8012.75m2

LANDSCAPE AREAS
Total Landscape areas (all levels) = 2045m2 (25.5% of site)

DEEP SOIL AREAS (DSA)
Ground Floor (into natural earth) = 1945m2 (24% of site)

CANOPY COVER
Proposed Large Trees (9m canopy) x 3 = 190.8m2
Proposed Medium Trees (8m canopy) x 6 = 301.8m2
Proposed Medium Trees (6m canopy) x 8 = 226.4m2
Proposed Medium Trees (5m canopy) x 27 = 529.3m2
Proposed Small Trees (4m canopy) x 29 = 365.4m2
Proposed Small Trees (3m canopy) x 6 = 42m2
Total Canopy Cover = 1655.7m2 (20.6% of site)

REFER PAGE 102 FOR PLANTING PALETTE, IMAGES AND NOTES

kelsie davies
landscape architecture
Karrinyup WA 6018
mob: 0450 965 569
email: kelsie@kdla.com.au

DEVELOPMENT APPROVAL

JOB No. 0474 PAGE 101 REV G

SCALE 1:250 @A1

WAARDONG COURT APARTMENTS
LANDSCAPE CONCEPT PLAN

YARAN GROUP
4 WAARDONG COURT, HALLS HEAD

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PROPOSED CIVIL DESIGN

NO. 4 WAARDONG COURT, HALLS HEAD

DWG No.	DESCRIPTION
C00	COVER SHEET
C01	GENERAL NOTES
C02	PAVEMENT LEVEL PLAN
C03	DRAINAGE LAYOUT PLAN
C04	DRAINAGE DETAILS
C05	DRAINAGE DETAILS
C06	RETAINING WALL PLAN
C07	RETAINING WALL DETAILS

REV.	REMARK/COMMENT	DATE:	APPR.
01	CONSTRUCTION ISSUE	23.01.25	P.R
C	PRELIMINARY ISSUE	06.12.24	P.R
B	PRELIMINARY ISSUE	13.11.24	P.R
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Project:
PROPOSED CIVIL DESIGN
NO. 4 WAARDONG COURT
HALLS HEAD

Drawing:
COVER SHEET

APPROVED BY:
PAUL ROMAGNOLO
BE (Hons)
MIEAUST No. 4637105

SIGNATURE: P. Romagnolo DATE: 23/01/2025

CONSTRUCTION ISSUE

Scale @ A2:	Engineer:	Drawn:	Sheets:
AS SHOWN	P.K.	T.X.	7

Reference No.	Drawing No.	Rev.
224055	C00	01

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GENERAL NOTES

GENERAL DRAINAGE NOTES

1. THE CONTRACTOR SHALL ADEQUATELY DRAIN THE SITE DURING ALL STAGES OF CONSTRUCTION.
2. CONTRACTOR SHALL VERIFY ALL LEVELS DIMENSIONS AND SERVICES PRIOR TO COMMENCEMENT OF WORK.
3. ALL APPROPRIATE PERMITS SHALL BE OBTAINED AND FEES PAID FOR BY THE CONTRACTOR.
4. ANY PAVEMENT OR FEATURES DAMAGED DURING THE COURSE OF THIS CONTRACT SHALL BE REINSTATED TO THEIR FORMER CONDITION.
5. ALL EXISTING PIT COVERS, DOWNPIPE CONNECTIONS AND SIMILAR FEATURES IN CONSTRUCTION AREAS ARE TO BE ADJUSTED TO SUIT AS PART OF THIS CONTRACT.
6. BEFORE COMMENCEMENT OF WORK A TEMPORARY BENCH MARK IS TO BE ESTABLISHED BY THE CONTRACTOR IN A POSITION ON SITE SAFE FROM DISTURBANCE.
7. ALL FILLING SHALL BE UNIFORMITY PLACED IN LAYERS NOT EXCEEDING 200mm LOOSE MEASUREMENT. EACH LAYER SHALL BE WITHIN 85% TO 115% OF OPTIMUM MOISTURE CONTENT AND BE PROPERLY COMPACTED, AS SPECIFIED, BASED ON THE STANDARD COMPACTION TEST AS OUTLINED IN AS 1289-1977.
8. 100mm DIAMETER STORMWATER DRAINS SHALL BE LAID AT A MINIMUM GRADE OF 1:100, UNLESS OTHERWISE SHOWN.
9. 150mm DIAMETER STORMWATER DRAINS SHALL BE LAID AT A MINIMUM GRADE OF 1:100, UNLESS OTHERWISE SHOWN.
10. TRENCH EXCAVATIONS; WHERE ONE OR BOTH SIDES OF ANY TRENCH EXCEED 1.5 M IN DEPTH, THE CONTRACTOR SHALL ENSURE THAT THE PROVISIONS OF MINES ACT 1958 AND THE MINES (TRENCHES) REGULATIONS 1979 ARE COMPLIED WITH.
11. ALL CONNECTIONS INTO EXISTING LOCAL AUTHORITY DRAINAGE SYSTEM ARE TO BE CARRIED OUT BY THE CONTRACTOR ACCORDING TO THE SPECIFICATIONS AND TO THE SATISFACTION OF THE LOCAL AUTHORITY
12. THE CONTRACTOR IS TO VERIFY ALL LOCATIONS AND DEPTH OF SERVICES WITH THE RELEVANT AUTHORITIES FOR THE CONSTRUCTION OF DRAINS AND SERVICES OUTSIDE THE PROPERTY BOUNDARY PRIOR TO THE COMMENCEMENT OF WORK, AND SHALL BE FULLY RESPONSIBLE FOR RECTIFICATION OF ANY DAMAGED SERVICE.
13. AT THE TIME OF THE PREPARATION OF THE DRAINAGE DESIGN, IF THE LANDSCAPING DESIGN WAS NOT SUPPLIED TO THIS OFFICE, THEN THE DRAINAGE SYSTEM MAY BE SUBJECT TO CHANGE. THIS OFFICE OR A QUALIFIED PRACTITIONER SHALL REVIEW THE DRAINAGE DESIGN WHEN LANDSCAPING DESIGN IS FINALISED.

DRAINAGE NOTES:

1. ALL SURFACE DRAINAGE WORKS SHALL BE INSTALLED IN ACCORDANCE WITH CLAUSE 5.6.3 DRAINAGE REQUIREMENTS OF AS 2870-2011, WHEREIN FOR BUILDINGS ON MODERATELY, HIGHLY AND REACTIVE SITES:
- SURFACE DRAINAGE SHALL BE CONTROLLED THROUGHOUT CONSTRUCTION AND BE COMPLETED BY THE FINISH OF CONSTRUCTION.
- THE BASE OF TRENCHES SHALL SLOPE AWAY FROM THE BUILDING.
2. FOR BUILDINGS ON HIGHLY AND REACTIVE SITES, DRAINER SHALL PROVIDE DRAINAGE ARTICULATION TO ALL STORMWATER, SANITARY PLUMBING DRAINS AND DISCHARGE PIPES IN ACCORDANCE WITH CLAUSE 5.6.4 PLUMBING REQUIREMENTS, WHEREIN FLEXIBLE JOINTS IMMEDIATELY OUTSIDE BUILDING AND COMMENCING WITHIN 1m OF THE BUILDING PERIMETER ARE REQUIRED TO ACCOMMODATE THE REQUIRED DIFFERENTIAL MOVEMENT BASE ON THE SOIL CLASSIFICATION, REFER TABLE 'MIN. REQUIREMENTS FOR EXPANSION AND ALLOWABLE IN FITTINGS.
3. SURFACE WATER MUST BE DIVERTED AWAY FROM THE DWELLING AND GRADED AWAY FROM ALL FOUNDATIONS
4. SUBSURFACE DRAINS TO REMOVE GROUND OR TABLE WATER SHALL BE DETAILED BY THE DESIGN ENGINEER. FURTHERMORE, DAMP-PROOF MEMBRANE IN ACCORDANCE WITH 5.3.3 SHALL BE INSTALLED FOR GROUNDWATER OR AGGRESSIVE SOILS.
5. DRAINAGE DESIGN IS IN ACCORDANCE WITH AS3500.

MATERIALS

1. PROPOSED STORMWATER DRAINS SHALL BE FORMED OF POLYVINYL CHLORIDE (PVC) CLASS HD STORMWATER PIPES. WHERE PIPES LOCATED UNDERNEATH ANY STRUCTURES STORMWATER DRAINS SHALL BE FORMED OF PVC SEWER GRADE CLASS SN8

SERVICE

1. PRIOR TO THE COMMENCEMENT OF WORK THE CONTRACTOR SHALL LOCATE EXISTING SERVICES TO BE RETAINED WHERE PROPOSED SERVICES CROSS THEM, AND ASCERTAIN FOR HIMSELF THAT NO CLASHES OF SERVICES WILL OCCUR.
2. WHERE PROPOSED SERVICES TRAVERSE EXISTING ASPHALT AND CONCRETE PAVEMENTS THE PAVEMENT IS TO BE SAW CUT TO FULL DEPTH OF PAVEMENT PRIOR TO EXCAVATION.
3. THE CONTRACTOR SHALL CO-ORDINATE THE LAYING OF ALL SERVICES TO AVOID CLASHES.
4. LAY ALL SERVICES TO NOMINATED LEVELS WHERE GIVEN, OTHER SERVICES SHALL BE LAID TO COMPLY WITH MINIMUM COVER REQUIREMENTS.
5. DIFFERENT PARALLEL SERVICES THAT ARE IN CLOSE PROXIMITY TO EACH OTHER MAY BE LAID IN A COMMON TRENCH, SUBJECT TO THE APPROVAL OF THE RELEVANT AUTHORITY AND THE SUPERINTENDENT.

SITE DRAINAGE REQUIREMENTS - CONSTRUCTION STAGE:

THE GEOTECHNICAL REPORT HAS RECOMMENDED THE USE OF A CERTAIN FOOTING THAT IS APPROPRIATE FOR THIS SITE. WHILE MAKING THIS RECOMMENDATION IT HAS BEEN ASSUMED THAT CERTAIN SITE DRAINAGE REQUIREMENTS AS PER AS2870-2011 & BCA HAS BEEN MET.
DURING THE CONSTRUCTION OF THE FOOTING THE FOLLOWING SITE DRAINAGE REQUIREMENTS ARE LISTED AS BEING PART OF THE FINAL FOOTING DESIGN BY INTRAX CONSULTING ENGINEERS.

1. MUST PREVENT WATER PONDING AGAINST OR NEAR THE FOOTING
2. SURFACE DRAINAGE OF THE SITE SHALL BE CONTROLLED FROM THE START OF THE SITE PREPARATION AND CONSTRUCTION; SURFACE DRAINAGE INCLUDES SURFACE WATER RUN-OFF AND BUILDING WATER (ROOF/FLOOR/CONCRETE) RUN-OFF:
   -ALL WATER RUN-OFF SHALL BE CONTROLLED AT ALL TIMES
   - USE TEMPORARY DOWNPIPES TO COLLECT WATER FROM THE ROOFED BUILDING FRAME;
   - WHEN SILT PITS ARE USED TO GATHER SURFACE WATER FROM AREAS ADJACENT TO THE FOOTINGS, THESE SILT PITS ARE TO BE AT LEAST 1000mm AWAY FROM THE FOOTING AND CONNECTED TO THE STORMWATER SYSTEM WITH SOLID PIPE;
   - STORMWATER DRAINS SHALL BE AT LEAST 90mm AND HAVE A MINIMUM FALL OF 1:100 AND 100mm COVER UNDER THE SOIL AND/OR PAVED AREAS;
   - INSPECTION OPENINGS SHOULD BE PROVIDED AT EACH PIPE CONNECTION POINT AND AT A NOMINAL SPACING OF 25m
   - AVOID UNDERMINING THE FOOTING WITH ANY TRENCHES OR PIPE OR PITS UNLESS THE FOOTING HAS BEEN DESIGNED TO ALLOW FOR SUCH SITUATION.
3. GRATED DRAINS MAY BE UTILISED IN A PAVED AREA (E.G. DRIVERWAY/GARAGE INTERFACE) WHERE THE PAVING NECESSARILY SLOPES TOWARDS THE HOUSE OR GARAGE. SPOON DRAINS MAY ALSO BE USED IN CONJUNCTION WITH A PAVED SURFACE.
4. THE GROUND BENEATH A TIMBER DECK MUST BE GRADED SO THAT THE AREA BENEATH THE DECK IS ABOVE THE ADJACENT FINISHED GROUND LEVEL TO PREVENT PONDING.
5. ALL TRENCHES MUST BE DUG AT A SIMILAR GRADE AS THE PIPES THE TRENCHES HOUSE.
   - ALL TRENCHES MUST GENERALLY SLOPE AWAY FROM THE FOOTINGS
   - TRENCH BACKFILL SHALL BE CLEAN GRANULAR MATERIAL, COMPACTED TO A LEVEL NOT LESS THAN THAT OF THE SURROUNDING UNDISTURBED GROUND, FOR THE FULL DEPTH OF EXCAVATION. BACKFILL UNDER ROADS SHALL BE COMPACTED TO THE REQUIREMENTS OF THE LOCAL AUTHORITY.
   - CONCRETE PAVING IS ADVISED OVER ANY TRENCHES WITHIN 1000mm OF ANY FOOTING.
6. PLUMBING PENETRATING THE FOOTING MUST BE AVOIDED WHERE PRACTICABLE.

ALL UNDERGROUND & SURFACE DRAINAGE WORKS SHALL BE INSTALLED IN ACCORDANCE WITH CLAUSE 5.6.3 DRAINAGE REQUIREMENTS OF AS 2870-2011 & AS 3500.3-2018. SURFACE DRAINAGE SHALL BE CONTROLLED THROUGHOUT CONSTRUCTION AND BE COMPLETED BY THE FINISH OF CONSTRUCTION.

ALL INTERNAL DRAINAGE TO BE CONSTRUCTED AS PER AUSTRALIAN STANDARD AS 3500.3-2018

WARNING
THE BUILDER/CONTRACTOR SHALL PROVE ALL EXISTING SERVICES WITHIN 3 DAYS OF MOBILISATION OR ANY WORKS OCCURRING ON SITE.

THESE PLANS ARE TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL & LANDSCAPE PLANS FOR EXTERNAL WORKS.

IMPORTANT NOTES:
AT NO TIME IS ANY EXISTING OR PROPOSED FOOTING TO BE UNDERMINED DURING CONSTRUCTION. BUILDER TO ENSURE AND CONFIRM PRIOR TO COMMENCEMENT OF CONSTRUCTION. THIS OFFICE TO BE CONTACTED IF ANY DISCPREPANCY

DOWNPIPE ADAPTER NOTES:
- DOWNPIPE ADAPTERS MAY INCLUDE INSPECTION OUTLETS TO ALLOW FOR INSPECTION AND MAINTENANCE;
- THIS OFFICE RECOMMENDS THE USE OF CASTEC DOWNPIPE ADAPTER WITH I.O. OR EQUIVALENT

AUTHORITY APPROVAL REQUIRED PRIOR TO COMMENCEMENT OF CONSTRUCTION

APPROVED BY:
PAUL ROMAGNOLO
BE (Hons)
MIEAUST No. 4637105

SIGNATURE: P. Romagnolo DATE: 23/01/2025

01	CONSTRUCTION ISSUE	23.01.25	P.R
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REV.	REMARK/COMMENT	DATE:	APPR.

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Project:
PROPOSED CIVIL DESIGN
NO. 4 WAARDONG COURT
HALLS HEAD

Drawing:
DRAINAGE NOTES

CONSTRUCTION ISSUE

Scale @ A2: AS SHOWN	Engineer: P.K.	Drawn: T.X.	Sheets: 7

Reference No.	Drawing No.	Rev.
224055	C01	01

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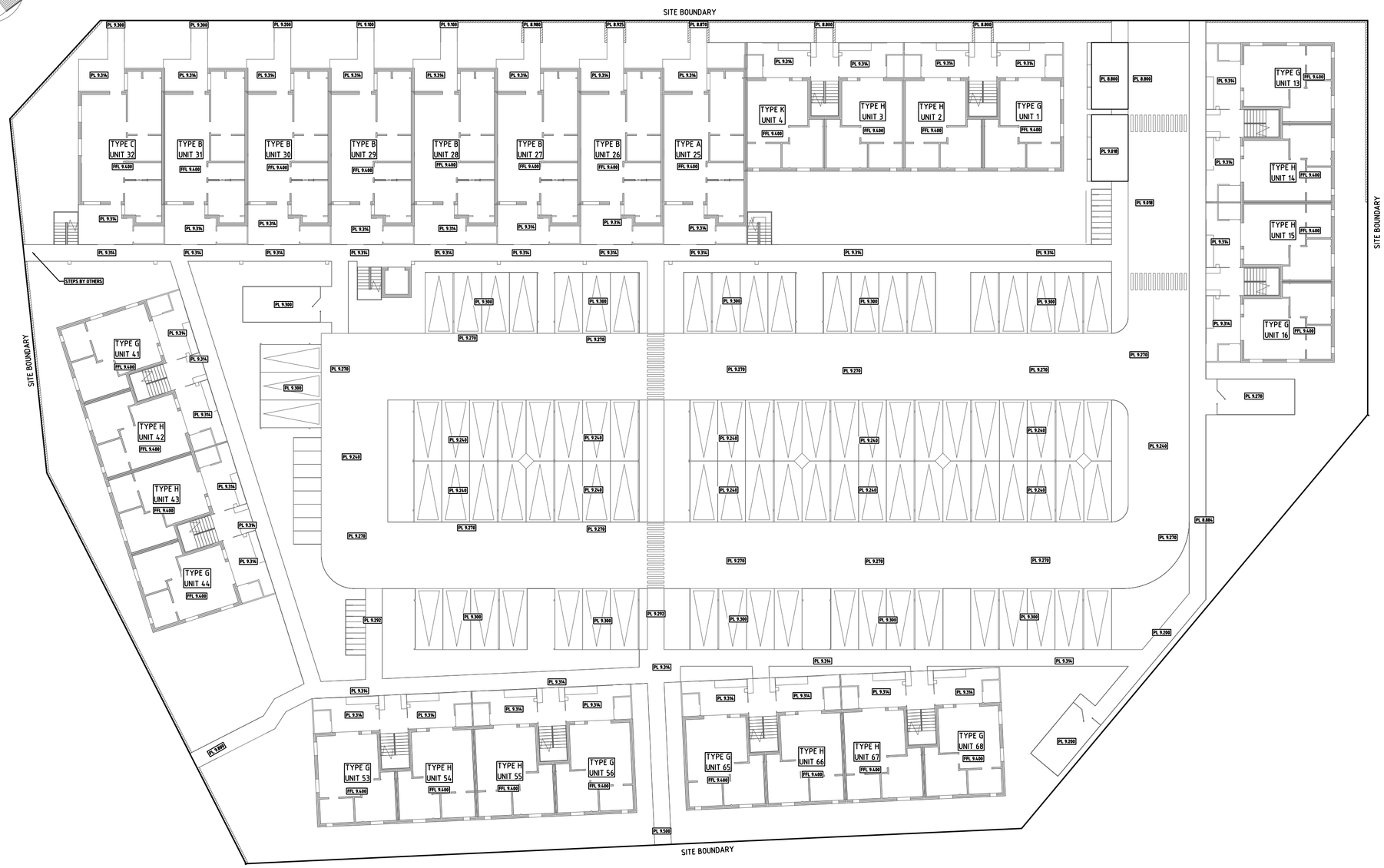
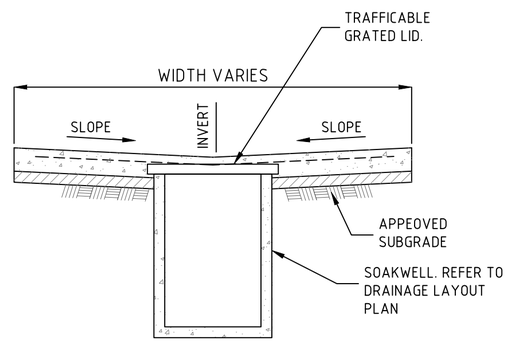


PAVEMENT LEVEL PLAN

SCALE = 1:300



TYPICAL DRIVEWAY CROSS SECTION

(N.T.S)

LEGEND

PL 0.000	PAVEMENT AND DRIVEWAY FLOOR LEVEL
FFL 0.000	FINISHED FLOOR LEVEL
	INDICATES PROPOSED LOCATION OF RETAINING WALL

APPROVED BY:
PAUL ROMAGNOLO
BE (Hons)
MIEAUST No. 4637105

SIGNATURE: P. Romagnolo DATE:08/11/2024

01	CONSTRUCTION ISSUE	23.01.25	P.R
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Drawing:
PAVEMENT LEVEL PLAN

CONSTRUCTION ISSUE

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Reference No. 224055	Drawing No. C02		Rev. 01

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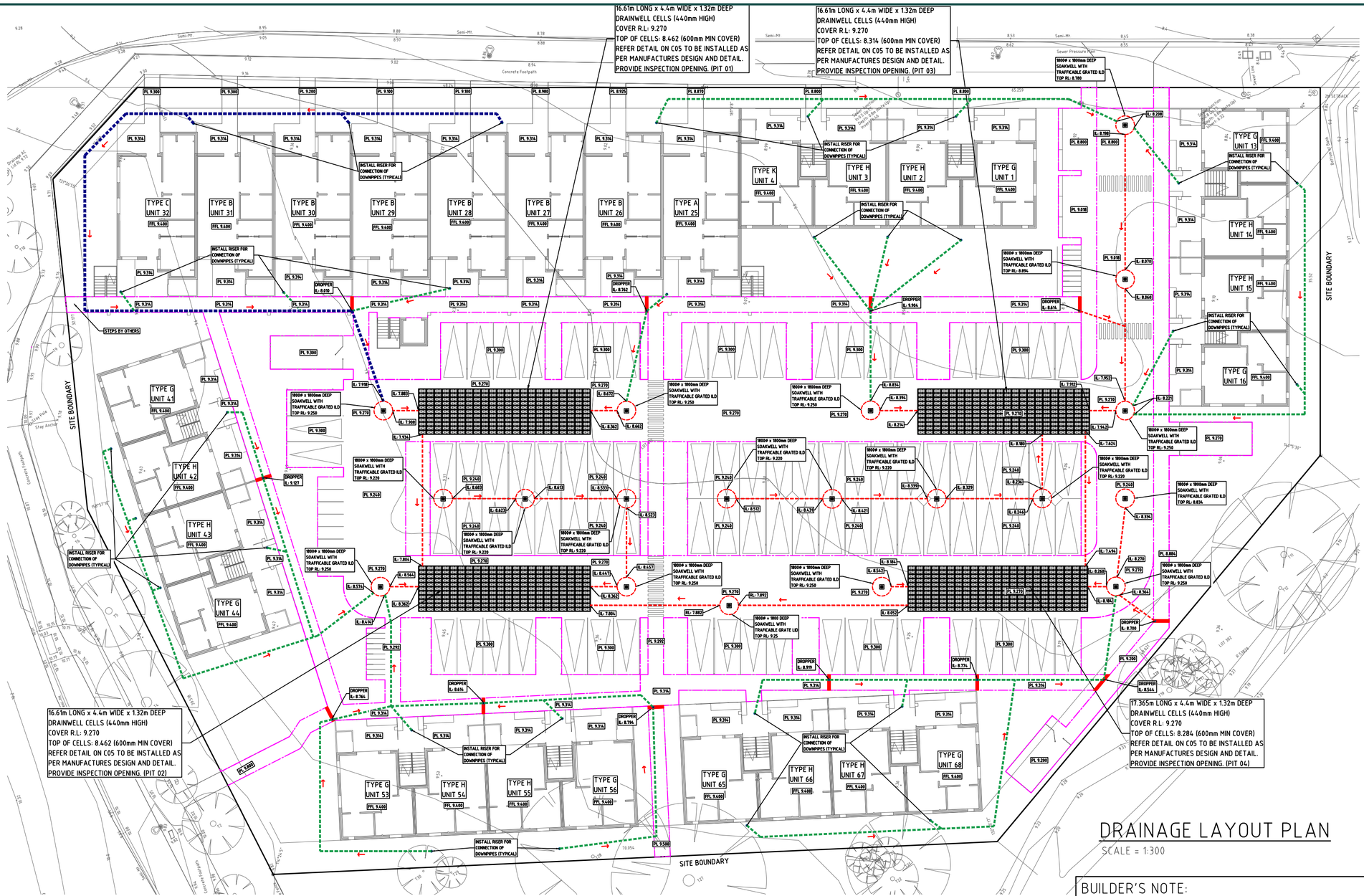

LEGEND

- GL 0.000 — GROUND LEVEL
- PL 0.000 — PAVEMENT LEVEL
- FFL 0.000 — FINISHED FLOOR LEVEL
- RL 0.000 — REDUCED LEVEL
- CONNECTION TO ROOF DOWNPIPE 150Ø @1 IN 100 (MIN)
- CONNECTION TO ROOF DOWNPIPE 225Ø @1 IN 100 (MIN)
- CONNECTION BETWEEN SOAKWELLS 100Ø @1 IN 100 (MIN) 150Wx150D GRATED TRENCH WITH CLASS A GRATED LID
- DRAINWELL SOAKWELL CELL
- SOAKWELLS REFER SHEET C05

DRAINAGE LAYOUT PLAN

SCALE = 1:300

STORMWATER STORAGE CALCULATION (1:100 ARI)
SITE CLASSIFICATION - A
GROUND WATER TABLE > 8m

UNIT NO.	ROOF AREA (m^2)	PAVED AREA (m^2)	CELL BLOCK CAPACITY REQUIRED (m^3)	SOAKWELL/CELL BLOCK CAPACITY PROPOSED (m^3)	NUMBER OF SOAKWELL/CELL BLOCK (755mm x 400mm x 440mm DEEP)
1-12	333.1	73.9	437.6	446.5	19 x 1800mmØ x 1800mm deep 2848 x 755mm x 400mm x 440mm deep
13-24	335.8	67.3			
25-40	1243.8	220.6			
41-52	335.5	67.3			
53-64	335.5	67.3			
65-76	335.5	67.3			
COMMON PROPERTY	905.9	3249.8			

BUILDER'S NOTE:

ANY EXCAVATION IN TREE PROTECTION ZONES TO BE DONE BY NON-INVASIVE MEANS (HAND EXCAVATION, AIR KNIFE OR HYDRO EXCAVATION) UNDER SUPER VISION OF A QUALIFIED ARBORIST.

THE SETBACK FOR SOAKWELLS SHOULD BE A MINIMUM OF THE DEPTH OF THE SOAKWELL AWAY FROM BUILDINGS AND BOUNDARIES.

IMPORTANT NOTES:

CONTRACTOR TO ENSURE DRIVEWAY/PAVEMENT LEVELS ARE SELECTED IN A WAY TO ENSURE SUFFICIENT SLOPE TO APPROPRIATE SOAKWELLS, AS DENOTED ON THESE DRAWINGS.

APPROVED BY:
PAUL ROMAGNOLO
BE (Hons)
MIEAUST No. 4637105

SIGNATURE: P. Romagnolo DATE: 23/01/2025

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Drawing:
DRAINAGE LAYOUT PLAN

CONSTRUCTION ISSUE

Scale @ A2: AS SHOWN	Engineer: P.K.	Drawn: T.X.	Sheets: 7

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224055	C03	01

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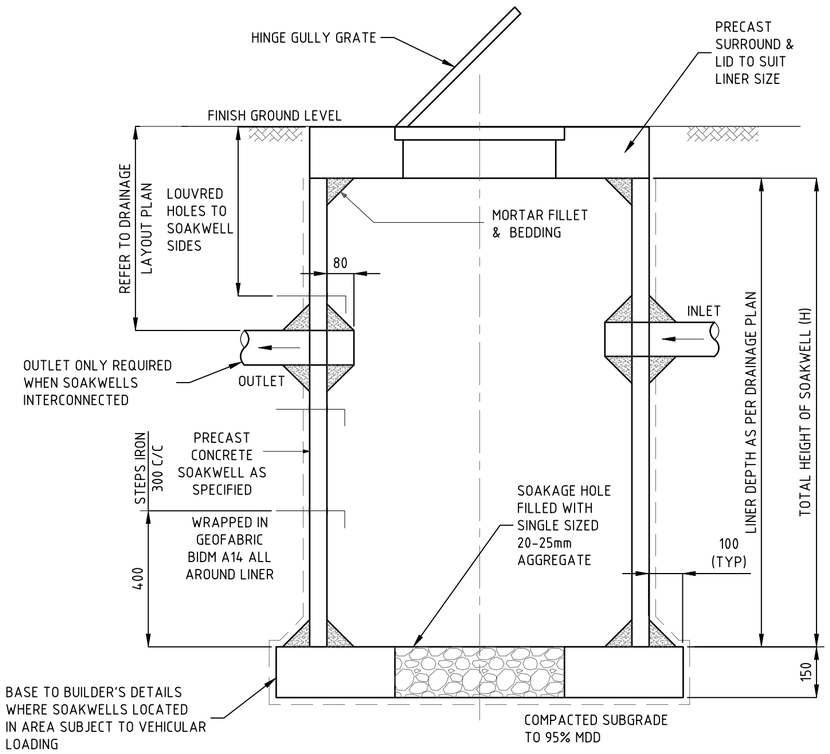

NOTE : STEP IRONS TO BE PROVIDED FOR SOAKWELLS DEEPER THAN 1.2m IN ACCORDANCE WITH AS3500.3-2018

SOAKWELL WITH TRAFFICABLE GRATE

TYPICAL SOAKWELL DETAILS

(N.T.S)

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PAUL ROMAGNOLO
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SIGNATURE: P. Romagnolo DATE: 23/01/2025

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Drawing:
DRAINAGE DETAILS

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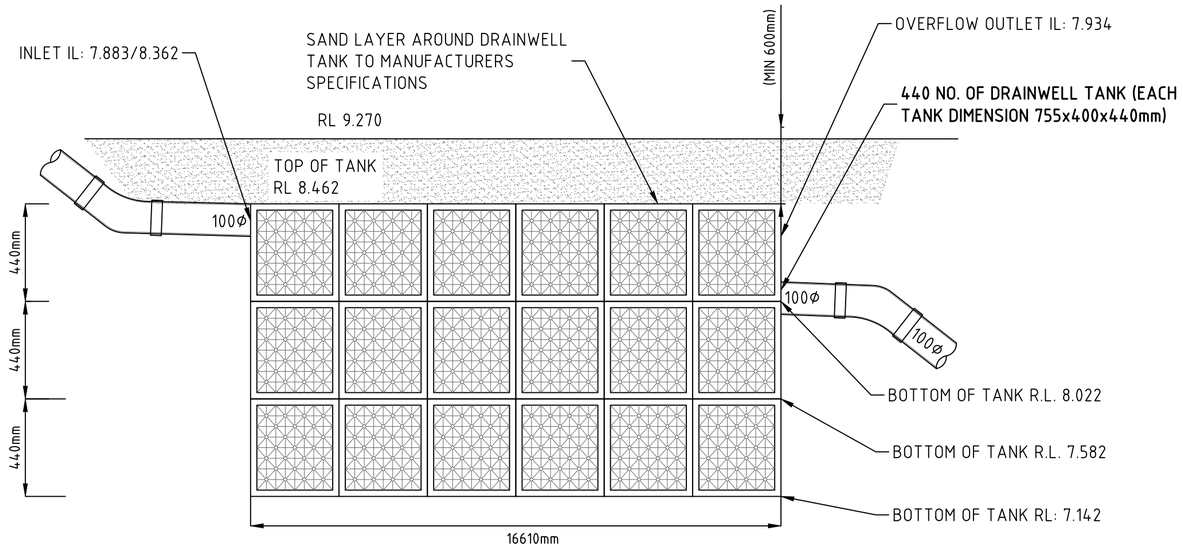
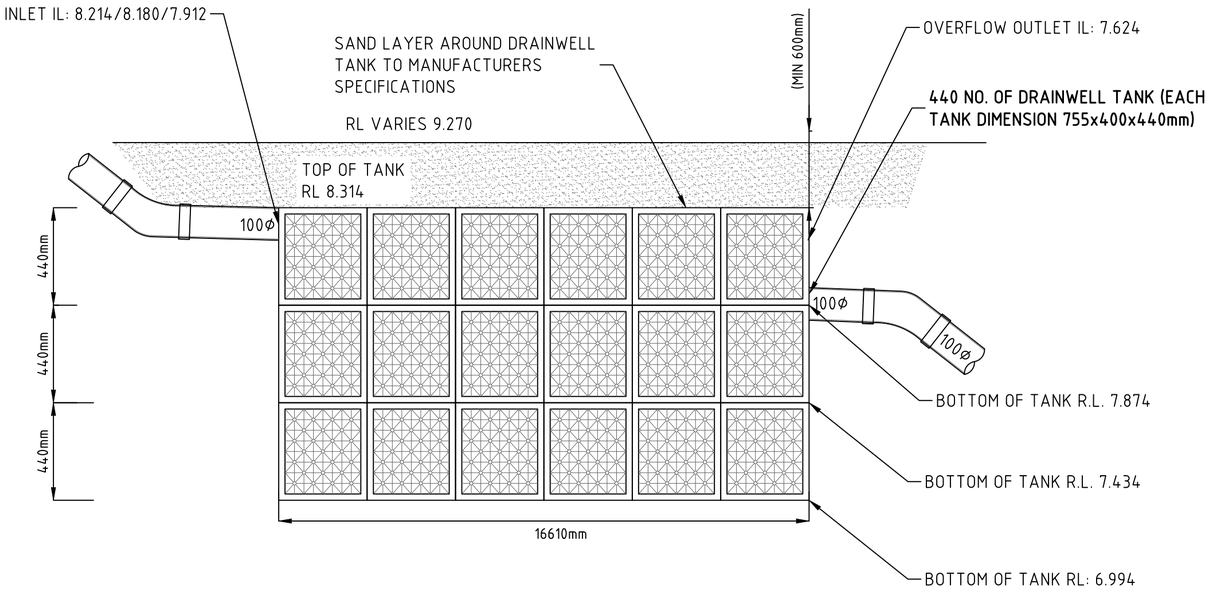


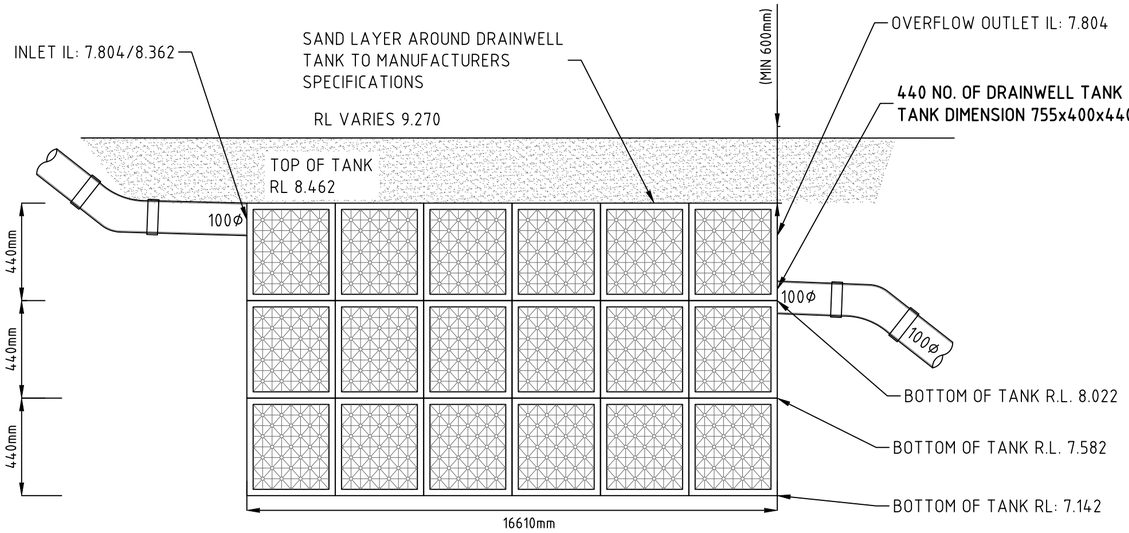
DRAINWELL TANK SOAKAGE PIT CROSS SECTION (PIT 01)

NOT TO SCALE



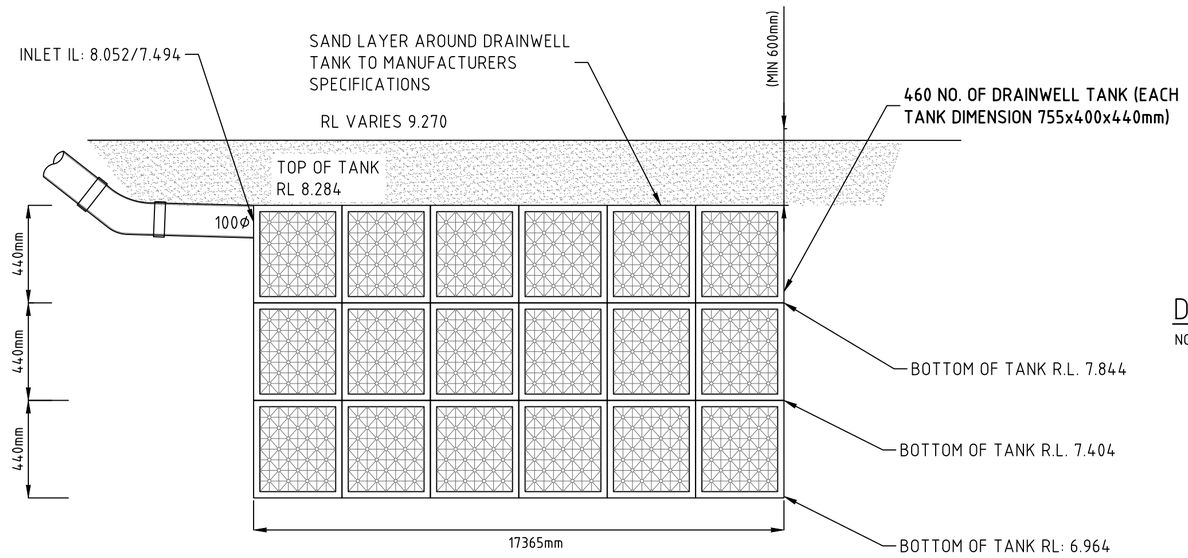
DRAINWELL TANK SOAKAGE PIT CROSS SECTION (PIT 03)

NOT TO SCALE



DRAINWELL TANK SOAKAGE PIT CROSS SECTION (PIT 02)

NOT TO SCALE



DRAINWELL TANK SOAKAGE PIT CROSS SECTION (PIT 04)

NOT TO SCALE

APPROVED BY:
PAUL ROMAGNOLO
BE (Hons)
MIEAUST No. 4637105

SIGNATURE: P. Romagnolo DATE: 23/01/2025

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Project:
PROPOSED CIVIL DESIGN
NO. 4 WAARDONG COURT
HALLS HEAD

Drawing:
DRAINAGE DETAILS

CONSTRUCTION ISSUE

Scale @ A2: AS SHOWN	Engineer: P.K.	Drawn: T.X.	Sheets: 7

Reference No.	Drawing No.	Rev.
224055	C05	01

TEMPLATE:CH-TEMPLATE-WA[A]

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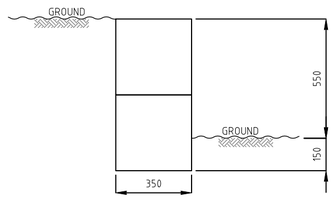
RETAINING WALL PLAN

SCALE = 1:300



550mm MAX HIGH LIMESTONE RETAINING WALL DETAIL

SCALE = 1:20

REV.	REMARK/COMMENT	DATE:	APPR.
01	CONSTRUCTION ISSUE	23.01.25	P.R
C	PRELIMINARY ISSUE	06.12.24	P.R
B	PRELIMINARY ISSUE	13.11.24	P.R
A	PRELIMINARY ISSUE	08.11.24	P.R

Client:
YARAN PROPERTY GROUP

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Project:
PROPOSED CIVIL DESIGN
NO. 4 WAARDONG COURT
HALLS HEAD

Drawing:
RETAINING WALL PLAN

CONSTRUCTION ISSUE

APPROVED BY:
PAUL ROMAGNOLO
BE (Hons)
MIEAUST No. 4637105

SIGNATURE: P. Romagnolo DATE: 23/01/2025

Scale @ A2: AS SHOWN	Engineer: P.K.	Drawn: T.X.	Sheets: 7

Reference No.	Drawing No.	Rev.
224055	C06	01

TEMPLATE:CH-TEMPLATE-WA[A]

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Intrax

SOAKAGE PIT DESIGN

PROJECT NO.	224055
DATE	30/01/2025
ENGINEER	L.M.
DESIGN RAINFALL INTESITY	1 in 100

SITE DETAILS

TOTAL SITE AREA	8015	m^2
IMPERVIOUS AREA	7638.6	m^2
PERVIOUS AREA	376.4	m^2
IMPERVIOUS AREA COEFFICIENT	0.9	
PERVIOUS AREA COEFFICIENT	0.3	
SITE RUNOFF COEFFICIENT	0.87	

SOIL PARAMETERS

HYDRAULIC CONDUCTIVITY (k_h)	5.00E-05	m/s
MODERATING FACTOR (U)	0.5	
INFILTRATION RATE INTO SOIL	8.60	L/s

SOAKAGE PIT SPECIFICATIONS

DIMENSIONS

Soakwell Dimension	Length	Width	Height	
		1.8	1.8	m
	4.58	m^3		
Draincell Dimension	Length	Width	Height	
	0.755	0.4	0.44	
MANUFACTURER NOMINATED VOLUME	0.126236	m^3		

SOAKAGE SYSTEM LAYOUT

TOTAL NO. Soakwell OF MODULES	19	
TOTAL NO. Drainwell OF MODULES	2848	
INFILTRATION SURFACE AREA	343.94	
STORAGE VOLUME PROVIDED	446.54	m^2
		m^3

STORAGE CALCULATION

CRITICAL STORM DURATION	**600**	min	OK
REQUIRED STORAGE	437.663	m^3	OK
STORAGE VOLUME PROVIDED	**446.540**	m^3	
EMPTYING TIME	14.14	hours	

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: Lot 812 (#4) Waardong Court, Halls Head

Site visit: Yes ☒ No ☐

Date of site visit (if applicable): Day 15 Month July Year 2024

Report author or reviewer: Nathan Peart

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☐ Level 3 practitioner ☒

If accredited, please provide the following.

BPAD accreditation number: 38808 Accreditation expiry: Month May Year 2025

Bushfire management plan version number: 2

Bushfire management plan date: Day 18 Month Nov Year 2024

Client/business name: Yaran property Group

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	☐	☒
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?	☐	☒

Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)	☐	☐
Strategic planning proposal (including rezoning applications)	☐	☐
High risk land-use	☐	☐
Vulnerable land-use	☐	☐

None of the above ☒

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer 

Date 18 Nov 2024

Bushfire Management Plan (DA)

Proposed new residence at: Lot 812 (#4) Waardong Court, Halls Head

Client: Yaran Property Group

Report Number: 24-18941

Assessment Date: 15 July 2024

Report Date: 18 November 2024

Prepared by a BPAD Accredited Practitioner

Document Control

Doc name:	Bushfire Management Plan (DA) - Lot 812 (#4) Waardong Court, Halls Head				
Version	Date	Author		Reviewer	
1	14/11/2024	Jess Calcutt	JC	Nathan Peart	NP
	Initial Report Issued				
2	18/11/2024	Jess Calcutt	JC	Nathan Peart	NP
	Updated Site Plan				

Disclaimer and Limitation

This report is prepared solely for the client, any future landowners of the subject lot and is not for the benefit of any other person and may not be relied upon by any other person. Bushfire Smart accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report and its supporting material by any third party.

The mitigation strategies contained in this report are considered to be prudent minimum standards only, based on the writer's experience as well as standards prescribed by relevant authorities. It is expressly stated that Bushfire Smart and the writer do not guarantee that if such standards are complied with or if a property owner exercises prudence, that a building or property will not be damaged or destroyed by bushfire or that lives will not be lost in a bush fire. Fire is an extremely unpredictable force of nature. Changing climatic factors (whether predictable or otherwise) either before or at the time of a fire can also significantly affect the nature of a fire and in a bushfire prone area it is not possible to completely guard against bushfire.

Further, the growth, planting or removal of vegetation; poor maintenance of any fire prevention measures; addition of structures not included in this report; or other activity can and will change the bushfire threat to all properties detailed in the report. Further, the achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which Bushfire Smart has no control.

This report does not negate the need to follow Local government authority requirements for Firebreak and Fuel Hazard Reduction. The client agrees that in submitting this report they approve of and will comply with all requirements detailed.

Insurance Coverage Statement

Bushfire Smart is covered by Professional Indemnity Insurance up to $2,000,000 and Public Liability Insurance valued at $20,000,000. These policies provide comprehensive coverage for bushfire attack level assessments, planning, design, and advisory services, in accordance with the FPA Australia Bushfire Planning and Design Accreditation Scheme for a BPAD-Level 3 practitioner.

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Executive Summary

The proposal is at Lot 812 (#4) Waardong Court, Halls Head regarding a development application for six 2-3 storey residential buildings (apartments) on an existing vacant lot.

The proposal is in an area that has been designated as bushfire prone and must therefore comply with State Planning Policy 3.7 (SPP 3.7). Guidelines for Planning Bushfire Prone Areas Version 1.4 (the Guidelines) has been used to determine the proposals compliance with SPP 3.7.

The proposal is not within an area that has been designated as Native Vegetation by the Department of Primary Industries and Regional Development (DPIRD-005). However, to achieve compliant current offsets, clearing of native vegetation is required outside the bounds of the subject lot. Approvals for this work can be found under Appendix A of this report.

The proposal can achieve a BAL 29 or below rating.

An assessment against the bushfire protection criteria (Appendix Four of the guidelines) is required to be undertaken. The following table summarises the outcome of this assessment.

Table A.1: Summary of assessment against bushfire protection criteria

Element	Acceptable Solution	Compliance Method	Compliance notes.
1: Location	A1.1 Development location	Acceptable Solution	On completion, the application will be in an area subject to a BAL 29 or lower.
2: Siting of development	A2.1 Asset Protection Zone (APZ)	Acceptable Solution	An APZ can be achieved and contained within the lot boundaries. APZ dimensions to be: established and maintained over the entire subject lot for the life of the proposal.
3: Vehicular Access	A3.1 Public Roads	N/A	
	A3.2a Multiple access routes	N/A	
	A3.2b Emergency access ways	N/A	
	A3.3 Through-roads	N/A	
	A3.4a Perimeter roads	N/A	
	A3.4b Fire service access routes	N/A	
	A3.5 Battle axes	N/A	
	A3.6 Private driveways	Acceptable Solution	In a reticulated area, speed limit on the road is <70km/h and all driveways are 70 metres long or less.
4: Water	A4.1 Identification of future water supply	N/A	
	A4.2 Provision of water for firefighting purposes	Acceptable Solution	Hydrants provided to comply with Water Corporation's No. 63 Water Reticulation Standard.

Bushfire hazards identified are:

The subject lot is surrounded by stands of native vegetation in all directions, though separated by dual carriageways in most instances except to the north, where woodland is surround by a firebreak. To the south, vegetation links with parkland that forms a dense canopy connection across the Halls Head and Erskine areas. This network of vegetation poses a potential bushfire risk, especially where canopy continuity could facilitate fire spread and ember attack.

Action Required:

Compliance with this BMP, and therefore SPP 3.7, will require action prior, during and after development. The items requiring implementation include:

- APZ to be established and maintained throughout the life of the proposal.
- Requested and approved clearing must be completed and reinspected to the standard detailed in this report (see Section 2.1 and Appendix A for further details).
- Ongoing compliance with the local government's firebreak notice.

The entire report should be read in conjunction with the guidelines to ensure all requirements are understood.

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1 Proposal and Site Details

1.1 Proposal Details

Lot 812 (#4) Waardong Court, Halls Head (subject lot) is a 8015 m^2 parcel. The proposal is for the construction of six 2-3 storey residential buildings on an existing vacant lot.

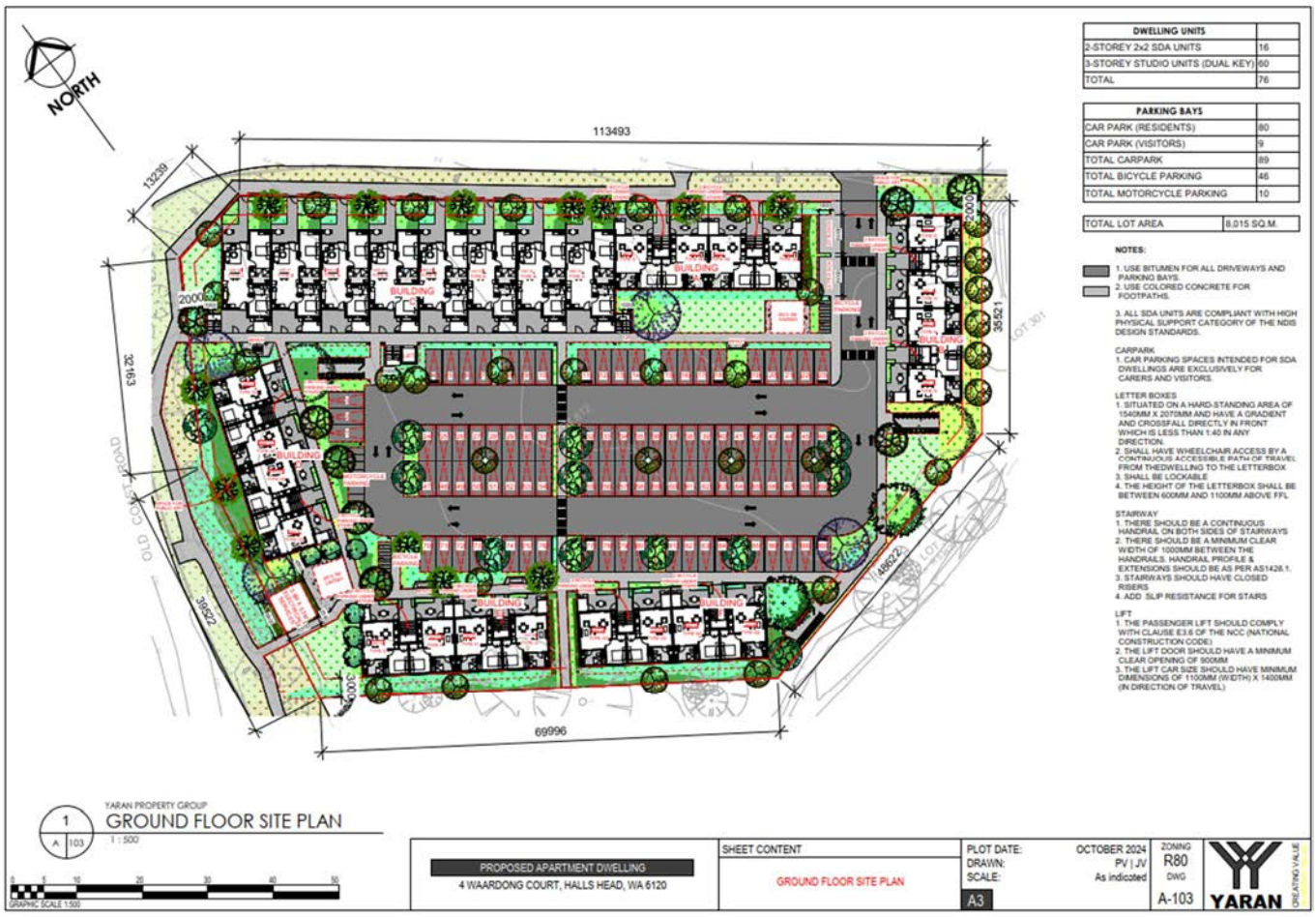

Figure 1: Site Plan



Figure 2: Location Plan



Figure 3: Map of Bushfire Prone Area for Subject Site

2 Environmental Considerations

To identify environmental, biodiversity and conservation values on the subject site, the site has been examined against the following databases as shown in Table 1.

Table 1: Assessment against environmental considerations

Object	Database	Identified	Details
Geomorphic Wetlands: Swan Coastal Plain / Augusta to Walpole	DBCA-019 / DBCA-017	No	Site not identified within database.
Ramsar sites (Wetland areas designated under the Ramsar Convention)	DBCA-010	No	Site not identified within database.
Threatened and Priority Flora	DBCA-036	No	Site not identified within database.
Threatened and Priority Fauna	DBCA-037	No	Site not identified within database.
Threatened Ecological Communities	DBCA-038	Yes	Site identified within area – further action required. 
Bush Forever Areas - 2000	DPLH-019	No	Site not identified within database.
Clearing Regulations – Environmentally Sensitive Areas	DWER-046	No	Site not identified within database.
SWAN Bioplan Regionally Significant Natural Areas 2010	DWER-070	No	Site not identified within database.
Local government biodiversity/planning	-	No	-

The subject site has been identified by the Department of Biodiversity, Conservation and Attractions (DBCA) as being within a threatened ecological community.

The applicant should seek verification from the appropriate authorities regarding any additional requirements, which may include the preparation of reports from suitably qualified consultants, to ensure any clearing is appropriate for the area.

2.1 Native vegetation – modification and clearing

The site has been checked against the Native Vegetation mapping conducted by the Department of Primary Industries and Regional Development (DPIRD-005). This database does not show native vegetation on the site, as seen in the image below.

However, to achieve the desired positioning of the proposed buildings, clearing of the surrounding native vegetation adjacent to the site requires formal approval. The necessary approvals have been sought, and supporting evidence is included in Appendix A.

With approvals granted for essential maintenance and vegetation management, the site visit to issue the BAL (Bushfire Attack Level) certificate will include a thorough inspection to verify the following conditions are met:

- Canopy Thinning: Adequate thinning of the canopy to prevent any canopy interconnection, reducing potential fire spread through tree crowns.
- Under-pruning: All trees along the footpath, including Norfolk pine and various Eucalyptus species, should be under-pruned to a minimum height of 2 m. This action helps reduce ladder fuels that can elevate fire to tree canopies.
- Sapling Removal: Complete removal of saplings across the site, minimizing smaller vegetation that can contribute to fire spread.
- Veldt Grass Slashing: Regular slashing of Veldt grass to reduce fuel load, especially in open areas.



Figure 4: Map of Native vegetation

2.2 Revegetation/landscape plans

Any future landscaping for the site may need to comply with the APZ requirements of this report.

3 Bushfire Assessment

3.1 Site Assessment

The assessment of this site/development was undertaken by a BPAD Accredited Practitioner for the purpose of determining the Bushfire Attack Level in accordance with AS 3959-2018 Simplified Procedure (Method 1).

3.2 Vegetation Classification

All vegetation within 150m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.



Figure 5a: Vegetation Classification	Legend					
Lot 812 (#4) Waardong Court, Halls Head	Building	150m area assessment	A Forest	D Scrub		
Assessment Date: 15 July 2024 Prepared by: Billy Hulands Accreditation Level: 1 Accreditation Number: 59401	Site boundary	Photo point	B Woodland	G Grassland		
	100m area assessment	Plot Label — Plot / Veg Class. & Slope	C Shrubland	Excludable		



Figure 5b: BAL Contours

Lot 812 (#4) Waardong Court, Halls Head

Assessment Date: 15 July 2024
Prepared by: Nathan Peart
Accreditation Level: 3
Accreditation Number: 38808

Legend

Proposed Lot Boundary		150m area assessment	BAL FZ		BAL 19
Site boundary		Photo point	BAL 40		BAL 12.5
100m area assessment	Plot Label	Plot / Veg Class. & Slope	BAL 29		BAL Low

Table 2: BAL Analysis

Plot:	1	Effective Slope (°):	>0-5°	Separation Distance (m):	17.8m
Vegetation Classification or Exclusion Clause:		Class B Woodland - Low open woodland B-08			
Description / Justification for Classification:					
Open woodland with semi-managed grassy understory and isolated scrub (<4m) throughout. Plot has low foliage cover (<30%) with minimal understory fuels and trees ranging from 5-15m. Evidence of past firebreak in place but not currently maintained to acceptable firebreak standard (as at Nov 4).					
					
Photo ID: 1					
					
Photo ID: 2					

Plot:	2	Effective Slope (°):	>10-15°	Separation Distance (m):	3.1m
Vegetation Classification or Exclusion Clause:			Class A Forest - Low open forest A-04		
Description / Justification for Classification:					
Low open forest with ground covers, shrubs, scrub and low trees (<15m) extending between subject lot and Mandurah Road. Vegetation has minimal separation throughout with unmanaged understory and high foliage cover at maturity (<30%).					



Photo ID: 3



Photo ID: 4



Photo ID: 5



Photo ID: 6

Plot:	3	Effective Slope (°):	Flat/Upslope	Separation Distance (m):	60.4m
Vegetation Classification or Exclusion Clause:			Class A Forest - Open forest A-03		
Description / Justification for Classification:					
Thin strip of multi-storied vegetation with interconnecting fuel layers, including shrubs, scrub, and trees ranging from 5-27m. The area has high foliage cover (>30%) and semi-managed grasses and fine fuels.					



Photo ID: 7



Photo ID: 8

Plot:	4	Effective Slope (°):	Flat/Upslope	Separation Distance (m):	39.3m
Vegetation Classification or Exclusion Clause:			Class A Forest - Low open forest A-04		
Description / Justification for Classification:					
Areas adjacent to Old Coast Road have young, revegetated sections with ground covers, shrubs, scrub, and young trees (5-15m). There is minimal separation throughout the plot and interconnecting fuel layers.					



Photo ID: 9



Photo ID: 10



Photo ID: 11



Photo ID: 12

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BAL@bushfiresmart.com.au
Address: 71 Allnutt Street, Mandurah, 6210
Postal: PO Box 4160, Mandurah North, WA, 6210

Plot:	5	Effective Slope (°):	N/A	Separation Distance (m):	N/A
Vegetation Classification or Exclusion Clause:			Excludable - 2.2.3.2 (e/f) Non-Vegetated Areas & Low Threat Vegetation		
Description / Justification for Classification:					
Surrounding developed residential area has large non-vegetated areas including road, walkways, driveways and road verges. Subject lot and neighbouring developed lots have short, cropped grasses, with isolated and under pruned trees and small managed private gardens with insufficient fuels to significantly increase bushfire risk.					

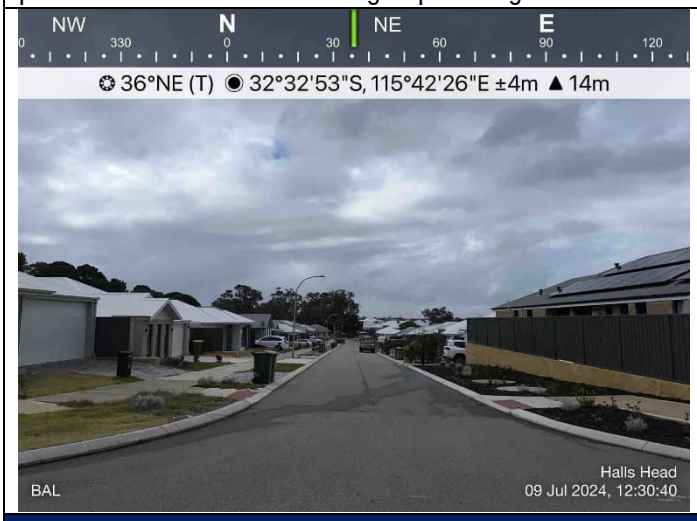


Photo ID: 13



Photo ID: 14



Photo ID: 15



Photo ID: 16

The Fire Danger Index (FDI) – 80-and table 2.4.3 AS3959-2018 applied.

Potential Bushfire Impacts

The potential bushfire impact to the site / proposed development from each of the identified vegetation plots are identified below.

Table 3: BAL Analysis

Plot	Vegetation Classification	Effective Slope
1	Class B Woodland	>0-5°
2	Class A - Forest	>10-15°
3	Class A - Forest	Flat/Upslope
4	Class A - Forest	Flat/Upslope
5	Excludable - 2.2.3.2 (e/f) Non-Vegetated Areas & Low Threat Vegetation	N/A

Building	Vegetation Plot	Vegetation Classification	Effective Slope	Separation (m)	Highest (Determined) BAL Contour
A	1	Class B Woodland	>0-5°	22	BAL – 29
B	1	Class B Woodland	>0-5°	55	BAL – 12.5
C	1	Class B Woodland	>0-5°	18	BAL – 29
D	4	Class A - Forest	Flat/Upslope	54	BAL – 12.5
E	3	Class A - Forest	Flat/Upslope	44	BAL – 12.5
F	3	Class A - Forest	Flat/Upslope	66	BAL – 12.5

4 Bushfire Hazard Issues

The subject lot is surrounded by stands of native vegetation in all directions, though separated by dual carriageways in most instances except to the north, where woodland is surround by a firebreak. To the south, vegetation links with parkland that forms a dense canopy connection across the Halls Head and Erskine areas. This network of vegetation poses a potential bushfire risk, especially where canopy continuity could facilitate fire spread and ember attack.

5 Assessment against the Bushfire Protection Criteria

An assessment against the bushfire protection criteria (Appendix Four of the guidelines) is required to be undertaken for any strategic planning proposal, subdivision and development application for a site that has or will, on completion, have a bushfire hazard level above 'Low' or a BAL rating above BAL LOW. The following section details the measure to be taken so that this proposal complies with these.

Element 1: Location

Intent:

The intent of this element is to ensure the proposal is located in the least possible risk of bushfire to facilitate the protection of people, property and infrastructure. To satisfy the intent, the proposal is required to be located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low, or a BAL–29 or below, and the risk can be managed.

Proposed bushfire management strategies:

Element 1 will be satisfied using Acceptable Solution A1.1.

The proposed development is in an area that, on completion, will achieve a BAL level of 29 or below.

Element 2: Siting and design of development

Intent:

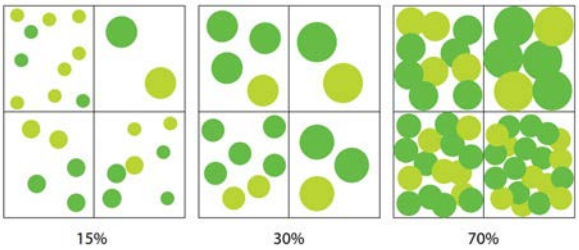
The intent of this element is to ensure that the siting and design of development minimises the level of bushfire impact.

Proposed bushfire management strategies:

Element 2 will be satisfied using Acceptable Solution A2.1 Asset Protection Zone (APZ).

The APZ required for this proposal should be enforced across the entire lot and is to be managed as per Schedule 1 of the guidelines, extract shown below. In addition council land is required to be modified and maintained as per details in Appendix A, For further information, see Appendix B: Spatial Representation of proposed risk management measures of this report.

Extract from Schedule 1: Standards for asset protection zones (WAPC 2021)

Object	Requirement
Fences within the APZ	Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	• Should be managed and removed on a regular basis to maintain a low threat state. • Should be maintained at <2 tonnes per hectare (on average). • Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	• Trunks at maturity should be a minimum distance of six metres from all elevations of the building. • Branches at maturity should not touch or overhang a building or powerline. • Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. • Canopy cover within the APZ should be <15 per cent of the total APZ area. • Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ.  Figure 19: Tree canopy cover – ranging from 15 to 70 per cent at maturity.
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	• Should not be located under trees or within three metres of buildings. • Should not be planted in clumps >5 square metres in area. • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground overs >0.5 metres in height are to be treated as shrubs)	• Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. • Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
Grass	Grass should be maintained at a height of 100 millimetres or less, at all times. Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation
Defendable space	Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	• Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. • The pressure relief valve should point away from the house. • No flammable material within six metres from the front of the valve. • Must sit on a firm, level and non-combustible base and be secured to a solid structure.

Element 3: Vehicular Access

Intent:

To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.

Proposed bushfire management strategies:

Element 3 will be satisfied using Acceptable Solutions:

A3.1 Public Roads – Not Applicable
A3.2a Multiple access routes – Not Applicable
A3.2b Emergency access way – Not Applicable
A3.3 Through-roads – Not Applicable
A3.4a Perimeter Roads – Not Applicable
A3.4b Fire service access route – Not Applicable
A3.5 Battle-axe access legs – Not Applicable

A3.6 Private Driveways

The proposal is within a reticulated area, speed limit on the road is 70km/h or less and all driveways are 70 metres long or less to the most distal part of the development. Therefore the existing road network I suitable for fire access with no further requirments.

TECHNICAL REQUIREMENTS	1 Public roads	2 Emergency access way[1]	3 Fire service access route[1]	4 Battle-axe and private driveways[2]
Minimum trafficable surface (metres)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (metres)	N/A	6	6	6
Minimum vertical clearance (metres)	4.5			
Minimum weight capacity (tonnes)	15			
Maximum grade unsealed road[3]	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%)		
Maximum grade sealed road[3]		1:7 (14.3%)		
Maximum average grade sealed road		1:10 (10%)		
Minimum inner radius of road curves (metres)		8.5		

Notes:

[1] To have crossfalls between 3 and 6%.

[2] Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

[3] Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.

Element 4: Water

Intent:

To ensure that water is available to enable people, property and infrastructure to be defended from bushfire.

Proposed bushfire management strategies:

Element 4 will be satisfied using Acceptable Solutions:

A4.1 Identification of future water supply – Not Applicable

A4.2 Provision of water for firefighting purposes

Water supply is via a reticulated system with hydrant connections provided in accordance with Water Corporation's Design Standard DS 63: Design and Construction Requirements for Water Reticulation Systems up to DN250. The hydrant is located along Waardong Ct, within 120 m from all proposed structures.

6 Implementation

The following tables set out the responsibilities of the developer(s), landowner(s) and local government for the initial implementation and ongoing maintenance associated with this proposal.

Management Action	Timing
Proponent/Landowner	
Establish the Asset Protection Zone (APZ) to the dimensions and standard stated in this BMP	Prior to construction
Modify verge vegetation as prescribed.	Prior to construction
Establish vehicular access routes to the required surface condition and clearances	Prior to occupancy
Occupants	
Maintain vehicular access routes to the required surface condition and clearances	Ongoing
Maintain the Asset Protection Zone (APZ) to the dimensions and standard stated in this BMP	Ongoing
Ongoing compliance with the local government's firebreak notice.	Ongoing
City of Mandurah	
Manage vegetation as described in Appendix A.	Ongoing

6.1 Acknowledgement

Acknowledgement - Proponent

The proponent acknowledges the responsibilities as listed above and the requirement to ensure that should the land transfer to a new owner, that the new owner is aware of the BMP and their ongoing responsibility.

7 General References

Office of Bushfire Risk Management (OBRM). (2020). Bushfire Risk Management (BRM) Plan Guidelines. Retrieved October 2020.

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WA Department of Planning. (2016). Visual Guide for bushfire risk assessment in Western Australia.

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Western Australian Planning Commission. (2021). Guidelines for Planning in Bushfire Prone Areas Version 1.4. Western Australia.

8 Online references

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Landgate. (2024). Map Viewer Plus. Government of Western Australia. Retrieved from https://map-viewer-plus.app.landgate.wa.gov.au/index.html

Office of Bushfire Risk Management (OBRM). (2017). Map of Bush Fire Prone Areas. Retrieved from https://maps.slip.wa.gov.au/landgate/bushfireprone/

WA Local Government Association (WALGA). Environmental Planning Tool. Retrieved from https://pbp.walga.asn.au/Tools/EnvironmentalPlanningTool.html

9 Appendices

Appendix A: Evidence of Clearing Approvals

From: Cherryll Oldham <Cherryll.Oldham@mandurah.wa.gov.au>
Sent: Wednesday, 4 September 2024 4:58 PM
To: Curtis Cox <curtis@yaran.com.au>
Subject: Maintenance Clearing of Reserve 53829 and Mandurah Road for development of 4 Waaradong Ct, Halls Head - BAL rating

Hi Curtis

Our amazing Environment and Works teams have been out on site to look at what can be done to reduce the BAL rating and have identified feasible options to reduce the BAL rating,

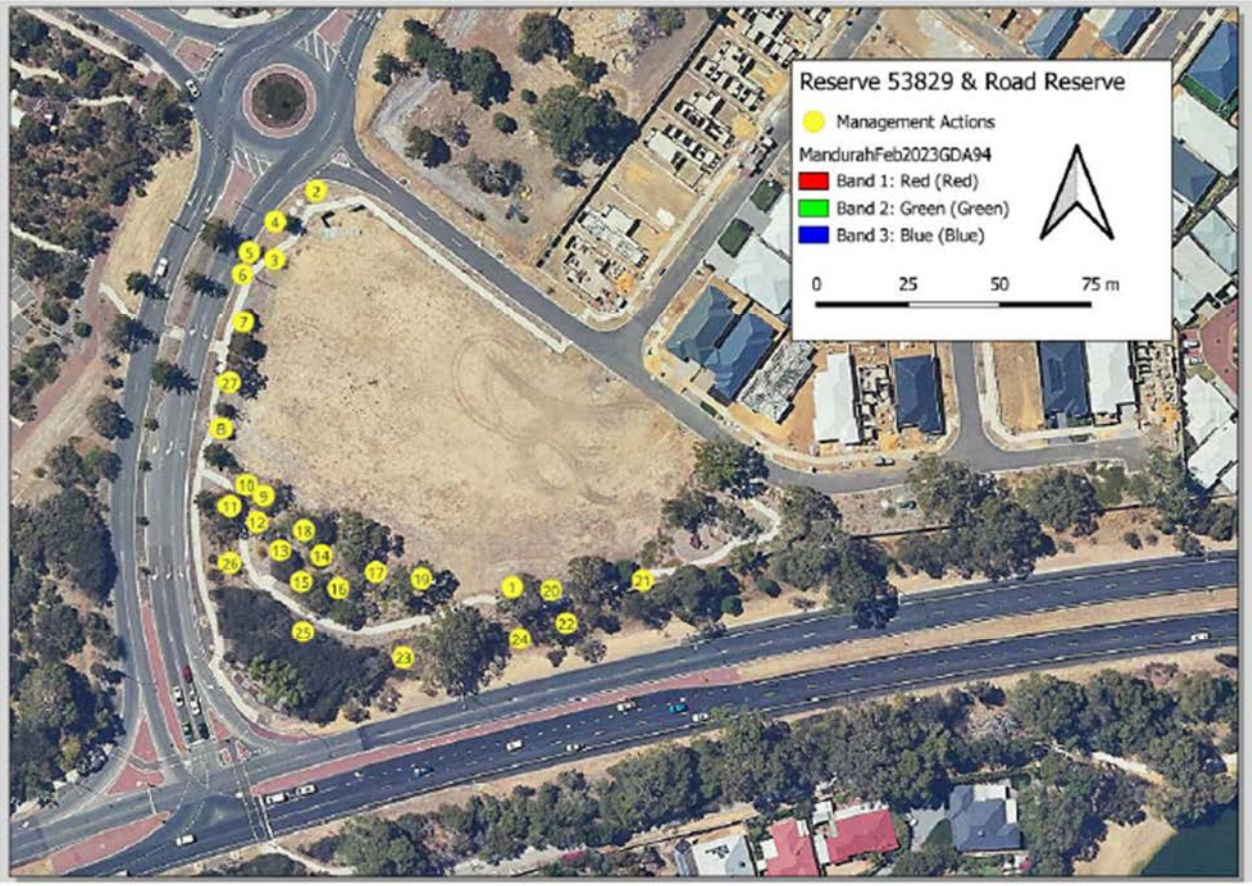
Please see the map and list below and the associated actions.

These are additional works that would not generally be undertaken all at once would require additional funding for the City to engage the City's contractor to under taken the works,

Will you be OK for the City to obtain a quote from our contractor and invoice you for the work?

Cherryll

(Continues on subsequent pages)



1. Remove x3 small Marris *Corymbia calophylla* to achieve 6m canopy gap
2. Remove *Acacia saligna's* on road corner
3. Remove *Acacia saligna*
4. Canopy lift Norfolk to 2m high
5. Canopy lift *Eucalyptus spp.* to 2m high
6. Remove *Agonis flexuosa* sampling-will become a future traffic hazard
7. Remove diseased Mallee
8. Canopy lift all trees along footpath to 2m high
9. Thin out *Jacksonia sternbergiana's*
10. Remove **Acacia iteaphylla* saplings
11. Remove *Olearia axillaris* near pathways to retain the Jarrah *Eucalyptus marginata* and Sheoak *Allocasuarina fraseriana.*
12. Remove **Melaleuca nesophila* sapling
13. Remove **Melaleuca nesophila*
14. Remove large **Acacia iteaphylla*
15. Prune back Jarrah *Eucalyptus marginata*
16. Remove **Melaleuca nesophila*
17. Remove dead Jarrah *Eucalyptus marginata* sapling
18. Remove **Acacia iteaphylla's*
19. Remove *Calothamnus quadrifidus* to retain Jarrah *Eucalyptus marginata*
20. Remove x2 smaller *Corymbia calophylla* to retain the larger trees
21. Remove *Grevillea olivacea*
22. Thin out *Acacia rostellifera*
23. Remove dead saplings and shrubs
24. slash/brushcutt veldt grass along slope to height below 10cm
25. Remove **Melaleuca nesophila* 2.5 off fence line
26. Remove *Eucalyptus spp.* growing on a lean
27. Prune dead wood form *Allocasuarina fraseriana*

Cherryll Oldham
Senior Planner, Statutory Planning & Lands
Web mandurah.wa.gov.au
Email Cherryll.Oldham@mandurah.wa.gov.au
Phone +61 (8) 9550 3826
Address 3 Peel St, Mandurah WA 6210 | **Post** PO BOX 210, Mandurah WA 6210

CITY OF MANDURAH

The City of Mandurah acknowledges the Bindjareb people as traditional custodians of this land. We acknowledge and respect their continuing culture and the unique contribution they make to the life of this community.

Please consider the environment before printing this email



From: Curtis Cox <curtis@yaran.com.au>
Sent: Monday, August 26, 2024 9:15 AM
To: Cherryll Oldham <Cherryll.Oldham@mandurah.wa.gov.au>
Cc: Nadav Strum <nadav@yaran.com.au>; Diane Ronquillo <diane@yaran.com.au>; Rachelle Capiral <Rachelle@yaran.com.au>; Nathan Peart <nathan@ecoform.com.au>; Chris Lillis <Chris@cachethomes.com.au>; Ben Dreckow <Ben.Dreckow@mandurah.wa.gov.au>
Subject: FW: 4 Waaradong Ct, Halls Head - BAL rating

This message was sent from outside of City of Mandurah. Please do not click links or open attachments unless you recognise the source of this email and know the content is safe.

Hi Cherryll,

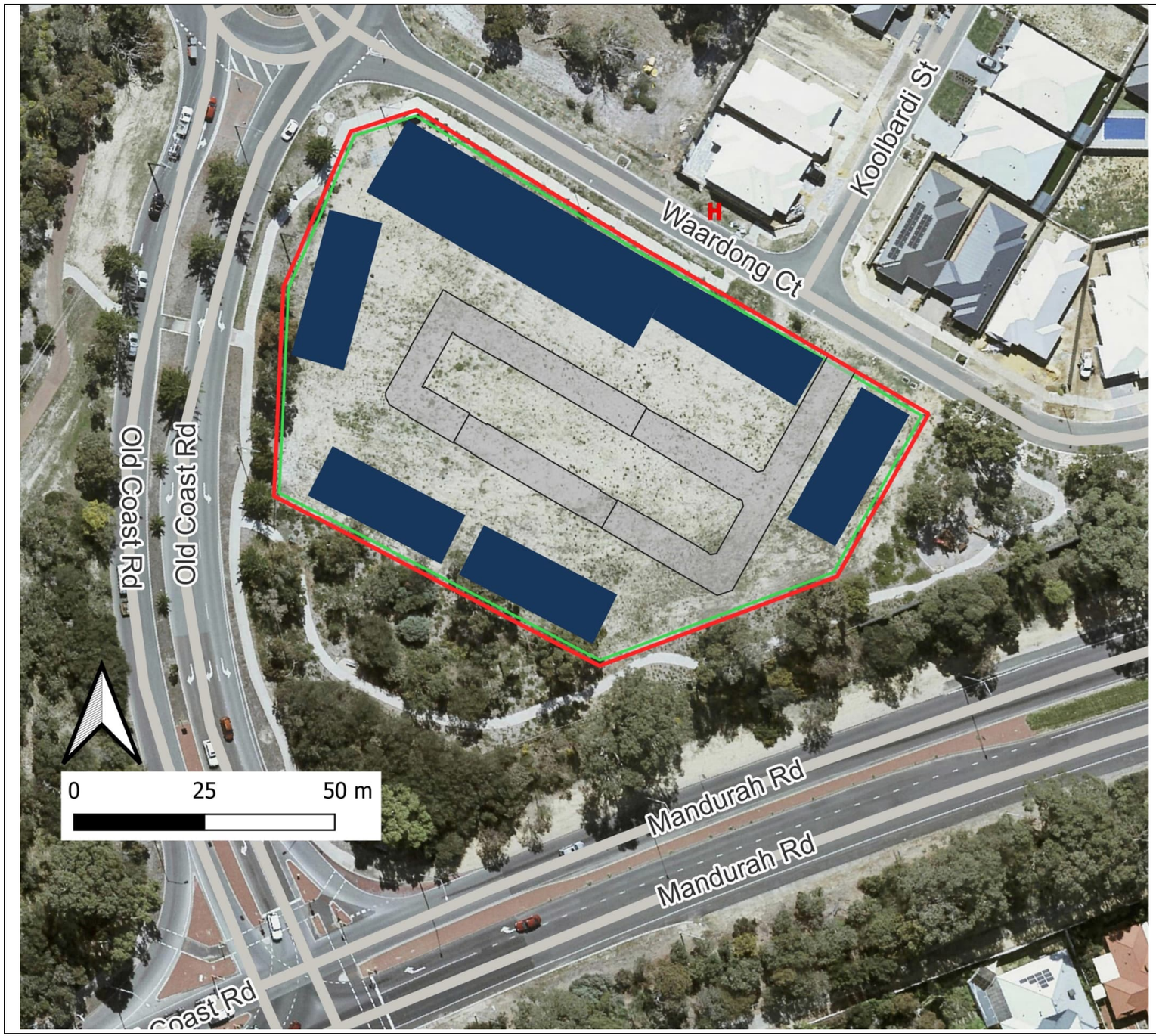
I hope you are well.

I have had a meeting with our Bushfire assessor regarding the 4 Waaradong Ct, Halls Head regarding the BAL rating of the site.

It was discussed that in order to allow the site to be developable for anyone, management of understory and under pruning trees in the purple highlighted sections is required,

Appendix B: Spatial Representation of proposed risk management measures (Next Page)

08 9555 9444
BAL@bushfiresmart.com.au
Address: 71 Allnutt Street, Mandurah, 6210
Postal: PO Box 4160, Mandurah North, WA, 6210



Legend

H	Hydrant
	APZ
	Subject Lot
	Indicative Building
	Indicative Driveway with turn-around bay

Bushfire Protection Criteria

APZ requirements: In place and enforced over entire subject lot in perpetuity. Ibn addition shire areas are to be modified and maintained as per appendix A.

Access requirements:
The proposal is within a reticulated area, speed limit on the road is 70km/h or less and all driveways are 70 metres long or less to the most distal part of the development. Therefore, there are no requirements.

Water Requirements:
Water supply will be through a reticulated water with hydrant connections provided in accordance with Water Corporation's No. 63 Water Reticulation Standard.

Figure 6: Spatial Representation of proposed risk management measures.

Lot 812 (#4) Waardong Court, Halls Head

08 9555 9444
BAL@bushfiresmart.com.au
Address: 71 Allnutt Street, Mandurah, 6210
Postal: PO Box 4160, Mandurah North, WA, 6210

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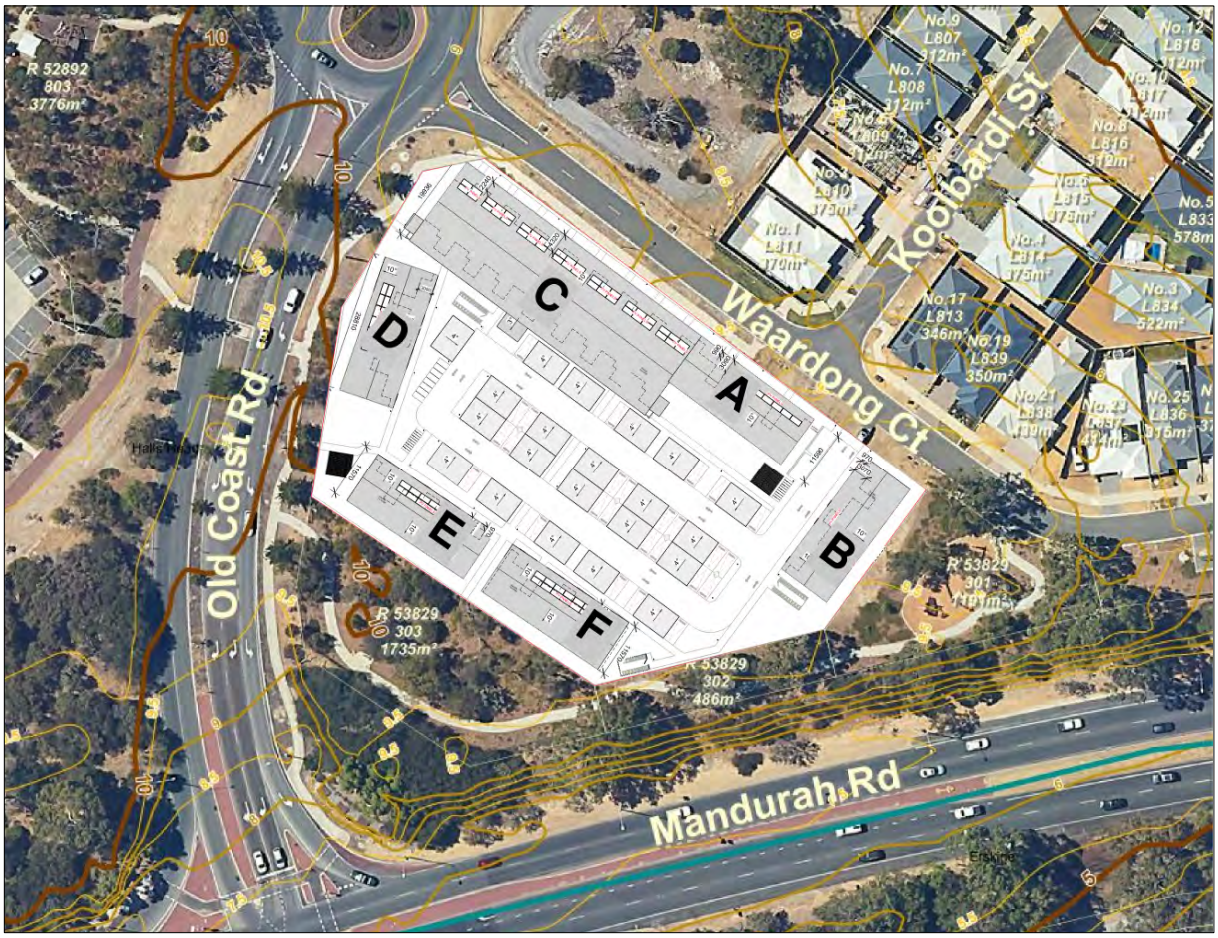
08 9555 9444
BAL@bushfiresmart.com.au
Address: 71 Allnutt Street, Mandurah, 6210
Postal: PO Box 4160, Mandurah North, WA, 6210

ACOUSTIC ASSESSMENT 2410109 Revision 0

SPP 5.4 ROAD AND RAIL NOISE

PROPOSED APARTMENT DWELLINGS
4 WAARDONG COURT, HALLS HEAD WA 6120



prepared for

YARAN PROJECT MANAGEMENT TRUST
23 LYALL STREET, SOUTH PERTH WA 6151

by

PO Box 2124, MALAGA WA 6944
E: ndengine@bigpond.net.au
M: 0412 679 431

ND Engineering
Consulting Engineers
30 Years 1994 - 2024

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Section 4. Assessment.

Section 5. Recommendations.

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- T1. Noise Criteria.
- T2. Traffic Noise.
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- Appendix 0 to ANNEX T – QUIET HOUSE PACKAGES.
- Appendix 1 to ANNEX T – POINT MODELLING.
- Appendix 2 to ANNEX T – DAY MODELLING.
- Appendix 3 to ANNEX T – NIGHT MODELLING.

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AUTHOR

Nicolo (Nick) M. DELLA GATTA
BE (Mech) 1983 UWA
MIEAust



REFERENCES

A.	SPP 5.4 Road and Rail Transport Noise and Freight Considerations In Land Use Planning.
B.	AS 2107-2016 'Acoustics - Recommended design sound levels and reverberation times for building interiors'.
C.	Yaran drawings: 10 sheets 241031; 10 sheets received 241031, 30 sheets received 241029.

REVISIONS

Revisions to the report compared to the previous report, if any, are contained in italics for the paper copy and in red italics text for the PDF copy of the report.

Revision N°:	**Date:**	**Comment**	**Status**
0	**24 NOV 24**	**DEVELOPMENT APPLICATION**	**Current**

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SUMMARY

0.1 The site has traffic noise received from both Mandurah Road and Old Coast Road requiring the implementation of Quiet House Packages and the application of 70A Noise Notifications on some of the Units.

0.2 The following recommendations are made**:**

a. Place a Notification 70A for Noise on the titles where the balcony or courtyard noise levels exceed 55 dB(A). The notification, pursuant to Section 165 of the *Planning and Development Act 2005* is to be placed on the certificates of titles of selected Units(s) advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows:

*This Unit is situated in the vicinity of a **transport corridor** and is currently affected or may in the future be affected by transport noise. Additional planning and building requirements may apply to development on this land to achieve an acceptable level of noise reduction.*
(Western Australian Planning Commission)

b. Implement the Quiet House Packages as per this report to all Units.

INTRODUCTION

1. ND Engineering (NDE) was commissioned to undertake a traffic noise assessment generally as per SPP5.4. This report covers noise ingress to the proposed developments due to Mandurah Road, being within the 300m trigger distance, and to a lesser degree Old Coast Roads.

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ASSUMPTIONS & LIMITATIONS

2. The following general assumptions and known general limitations are made:

a. Validation of noise levels and/or reverberation times shall be carried out in accordance with the relevant Australian Standard or Regulation or Guideline and as further detailed:

(1) Noise levels measured shall be LAeq based on a representative measurement period of:

- 8 hours for Night time from 2200 to 0600 hours; and

- 16 hours for Day time from 0600 to 2200 hours.

(2) Noise levels shall be measured internally in the centre of the room with all windows and doors shut and the room fully furnished for normal occupation. The rooms shall be complete and fitted out for normal use with a reverberation time not greater than 0.3 seconds for bedrooms and 0.5 seconds for all other habitable rooms.

(3) Equipment used for measurements including the sound level meter and calibrator shall comply with the Noise Regulations 1997 including a current certificate of calibration; and

(4) The residence shall have been occupied continuously by the same person for a minimum of three months.

b. External noise generated from sources other than aircraft, traffic and industrial is excluded.

c. The residential buildings are correctly constructed for acoustic purposes in accordance with this report and the NCC Building Code of Australia (BCA) and State Regulations, and that building components are fabricated and installed in accordance with suppliers and/or manufacturer's requirements. This includes the correct installation of windows and doors including acoustic sealing and bedding of frames to walls/floors; and

d. The building is maintained in good condition in particular all doors and windows including moving parts and acoustic seals; and

e. It is impossible to sound proof this development or any other development. There always will be some degree of audibility as inaudibility is not achievable; and

f. Noise emissions/reception assessable under the Noise Regulations 1997 are excluded; and

g. This report does not include a NCC BCA assessment.

h. Use of evaporative cooling is not permitted; and

i. Mechanical ventilation is provided to all habitable rooms in accordance with AS 1668.2 - 2012 PART 2 - Mechanical ventilation in buildings; and

j. No roof penetrations for any ventilation purpose. All ventilation penetration ducted through walls within the dropped ceiling space or bulkheads.

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SITE AND NOISE DESCRIPTION

3.1 The development is as per the drawings at ANNEX D – DRAWINGS.

3.2 The site is affected by Traffic Noise primarily from Mandurah Road and to a lesser degree Old Coast Road. The contribution differences can be seen in Appendix 2 to ANNEX T – DAY MODELLING.

3.3 Traffic noise is based on MRWA modelling and Traffic Map data as noted below;

Location	2021		2041	
	Vehicles per 24 hours	Percentage Heavy Vehicles	Vehicles per 24 hours	Percentage Heavy Vehicles
Mandurah Road	28,800	9.9% Traffic Map 2023/24	40,600	9.9% Traffic Map 2023/24
Old Coast Road	10,500	7.8% Traffic Map 2021/22	15,500	7.8% Traffic Map 2021/22

ASSESSMENT

4. A detailed assessment is carried out in ANNEX T – TRAFFIC NOISE.

RECOMMENDATIONS

5. The following recommendations are made for all of six buildings in outline format only and require

a. Implement the Quiet House Packages as per this report; and;

b. Place a Notification 70A for Noise on the titles. A notification, pursuant to Section 165 of the *Planning and Development Act 2005* is to be placed on the certificates of title of the proposed lot(s) advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows:

> *This lot is situated in the vicinity of a transport corridor and is currently affected or may in the future be affected by transport noise. Additional planning and building requirements may apply to development on this land to achieve an acceptable level of noise reduction.*
> *(Western Australian Planning Commission)*

End of Report

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ANNEXES:

DS. DRAWINGS SITE.

DF. DRAWINGS FLOOR.

M. MEASUREMENTS.

T. TRAFFIC NOISE.

- T0. Assumptions & Limitations.
- T1. Noise Criteria.
- T2. Traffic Noise.
- T3. Outdoor Noise Assessment.
- T4. Indoor Noise Assessment.
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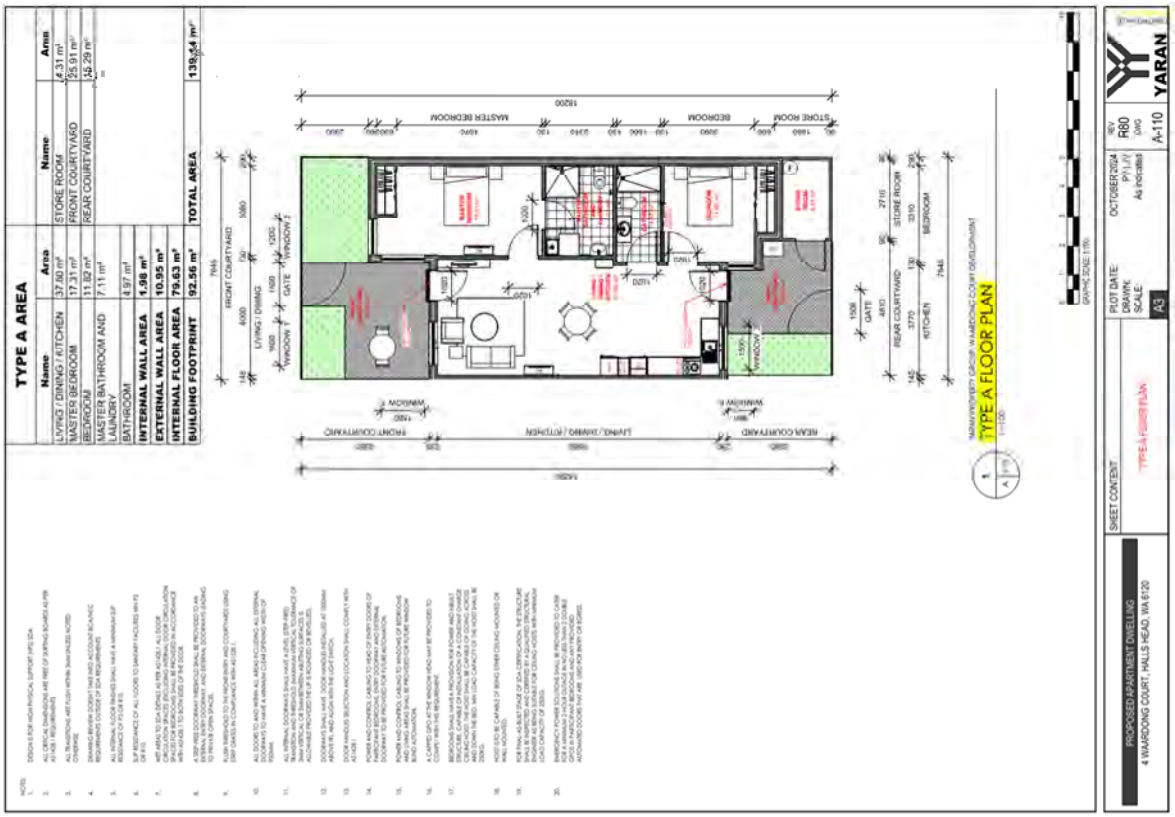
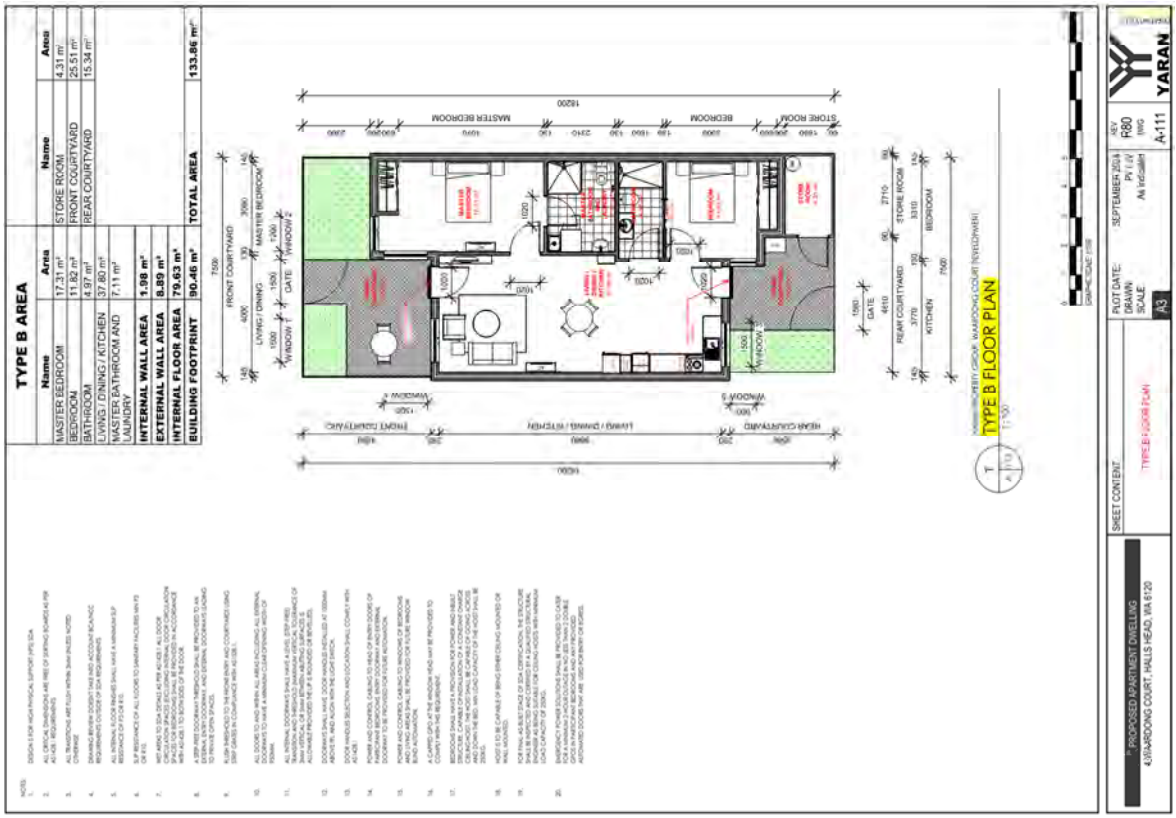
ANNEX DP – DRAWINGS PLANS





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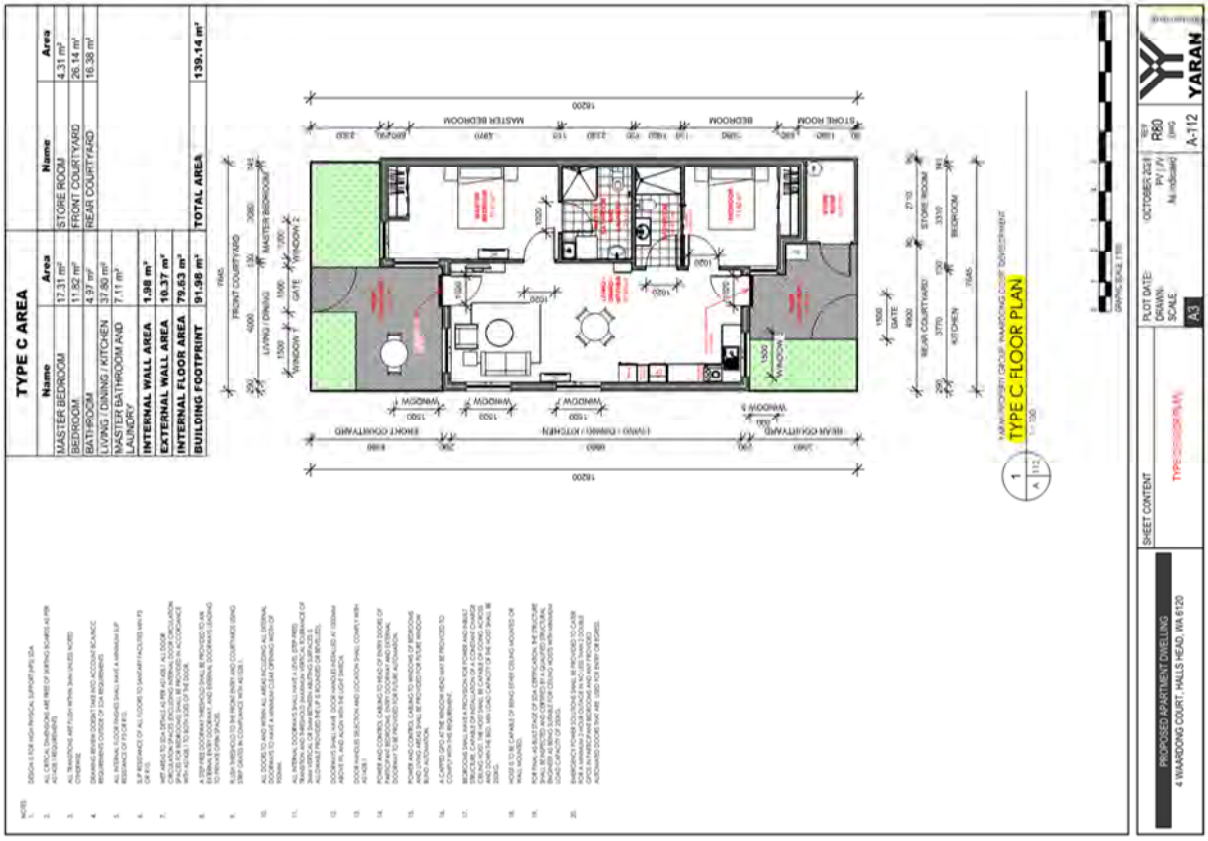

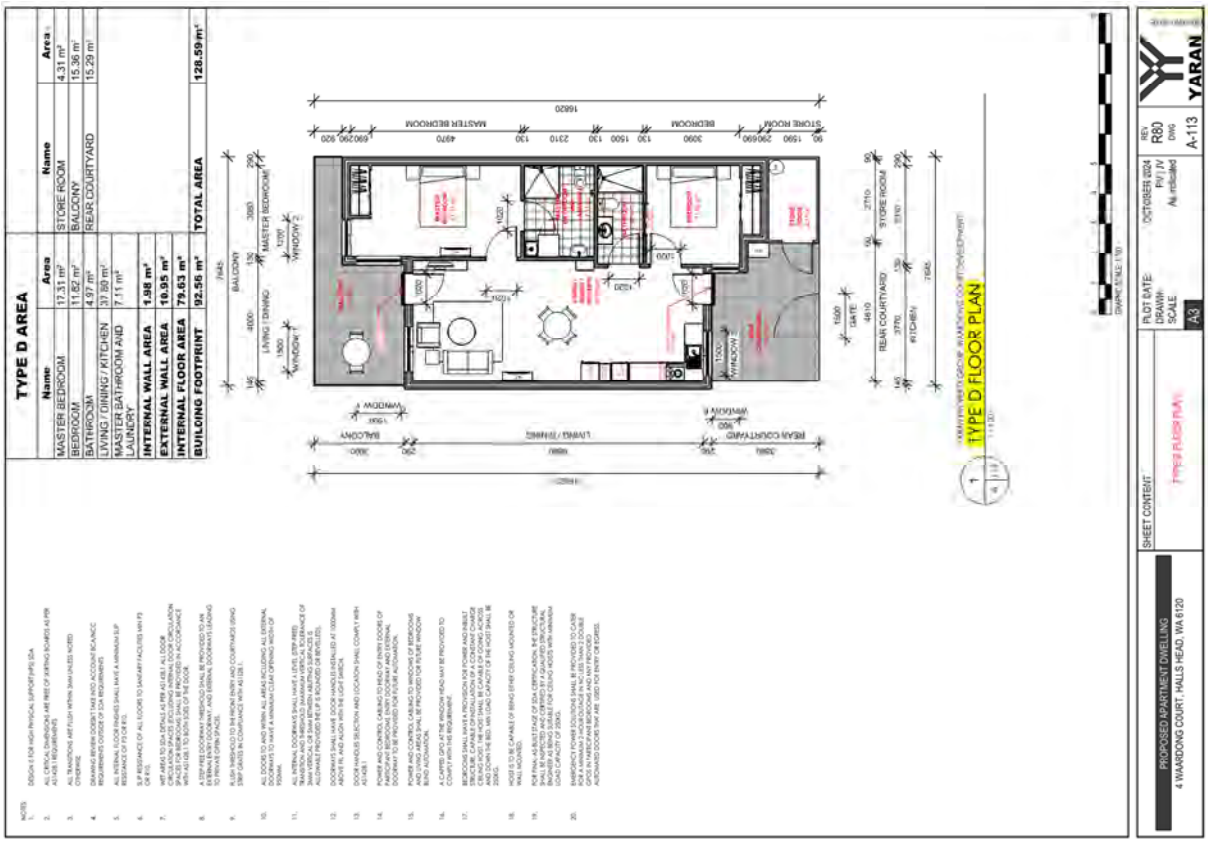

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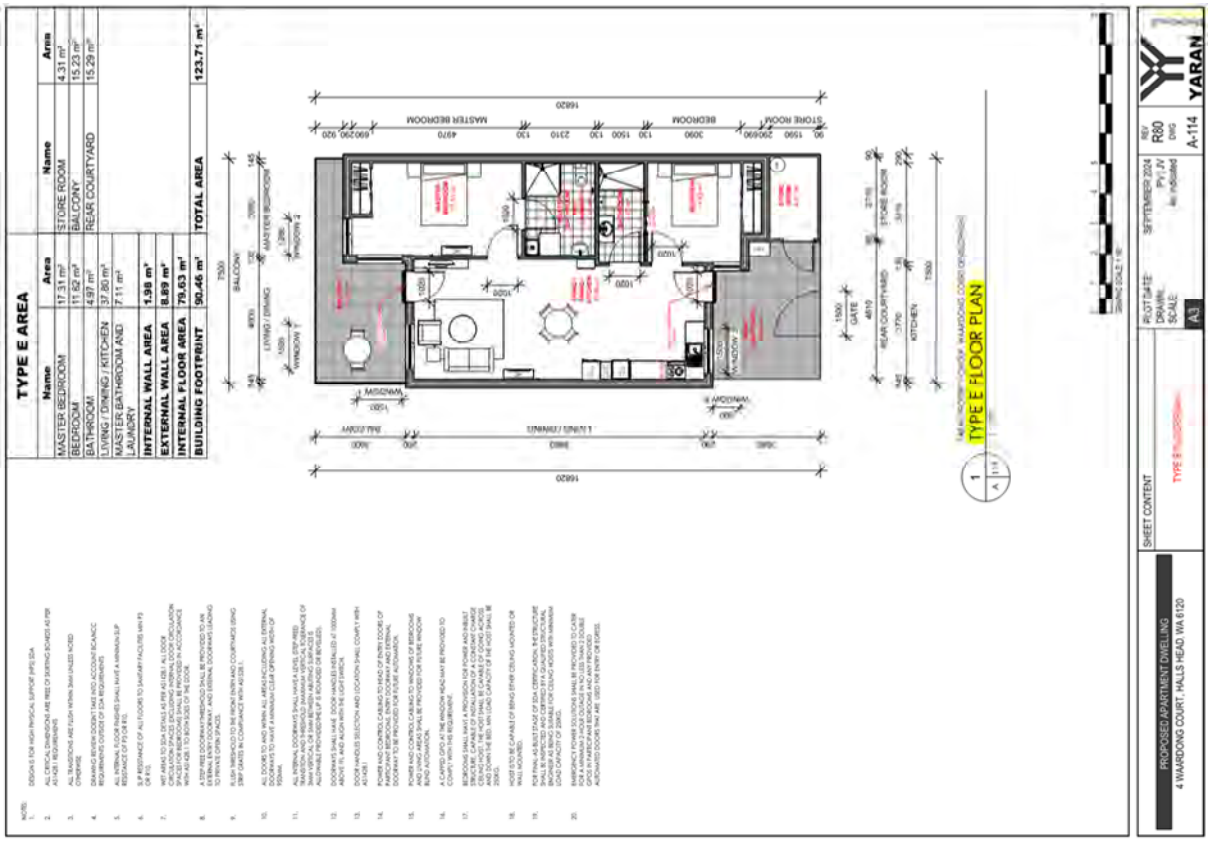

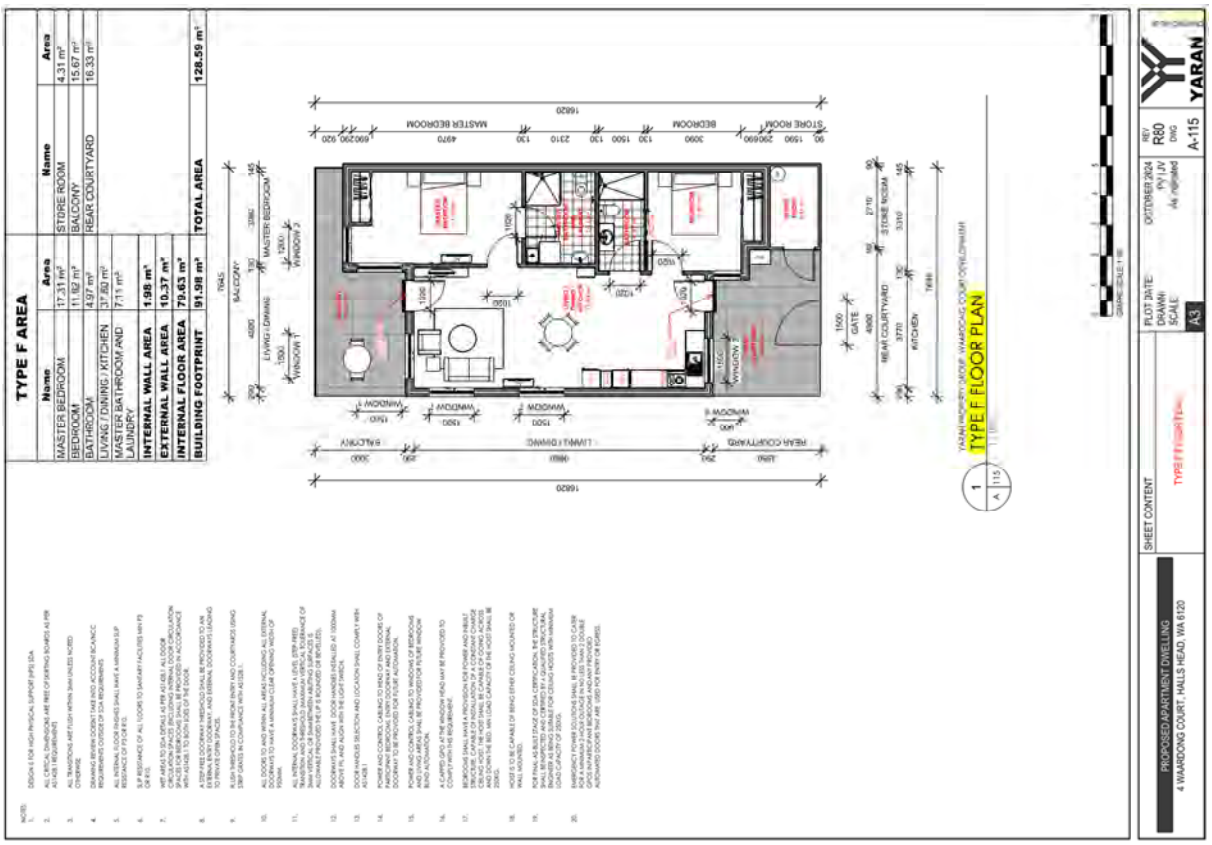

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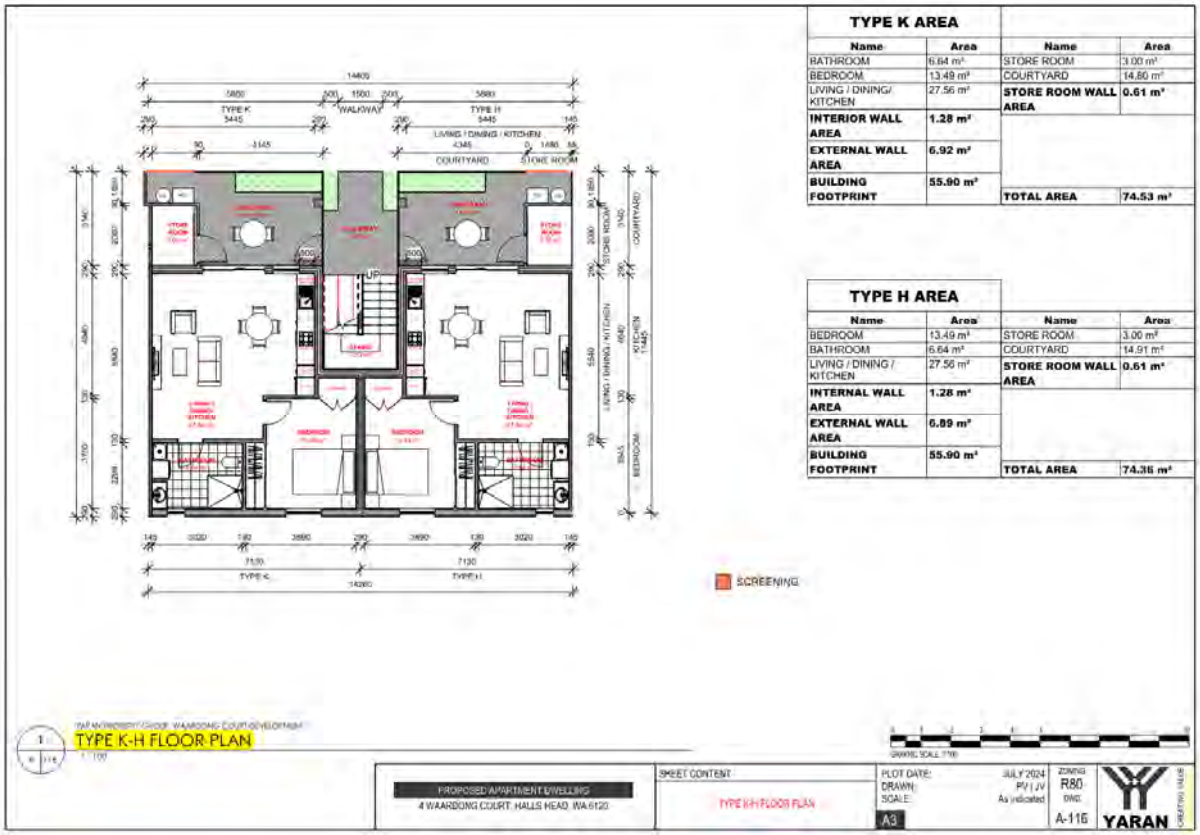

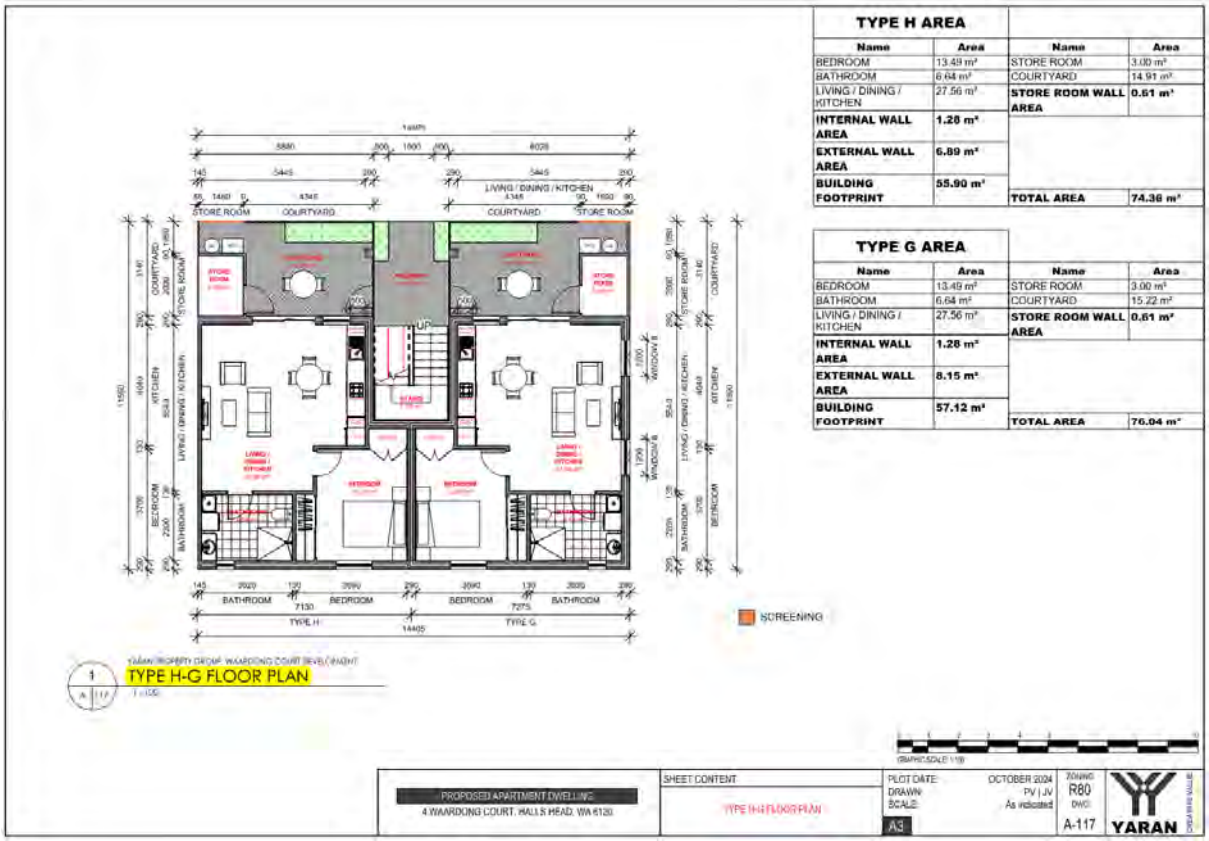

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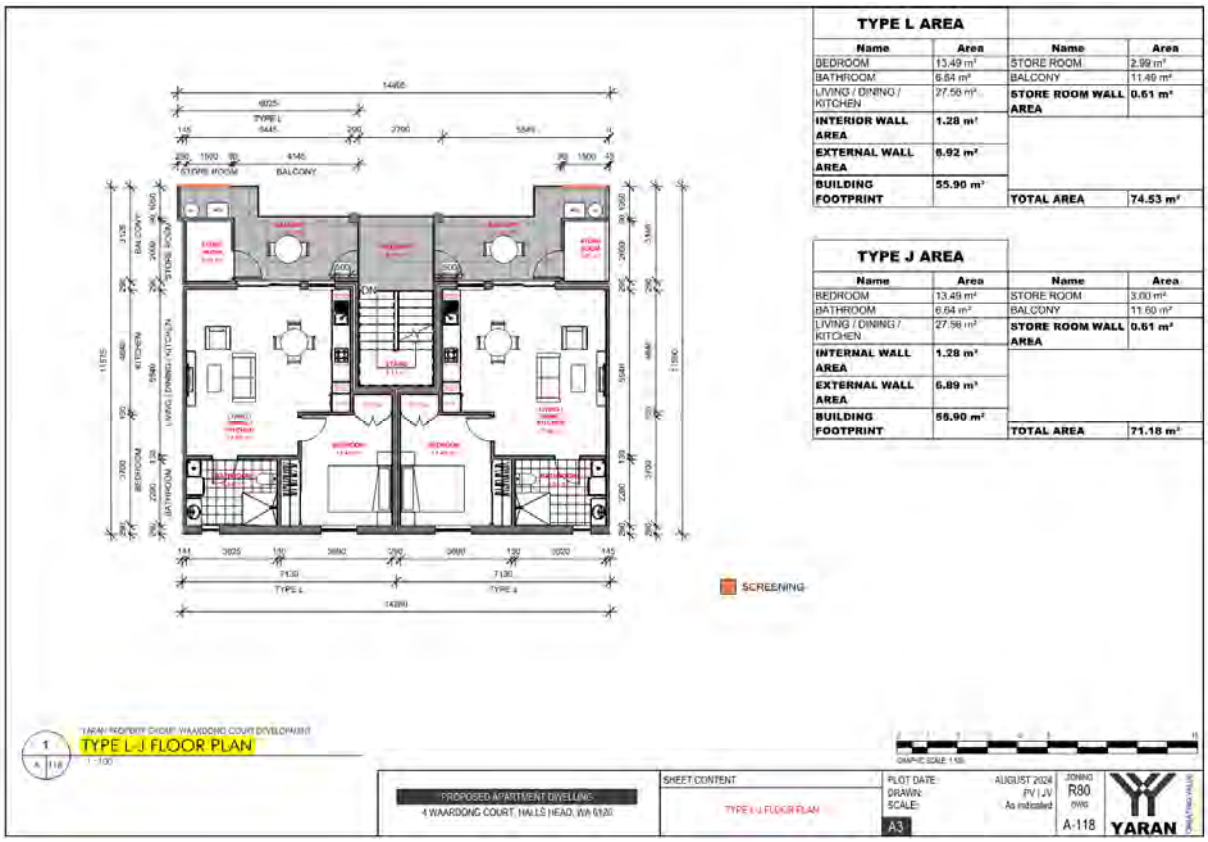

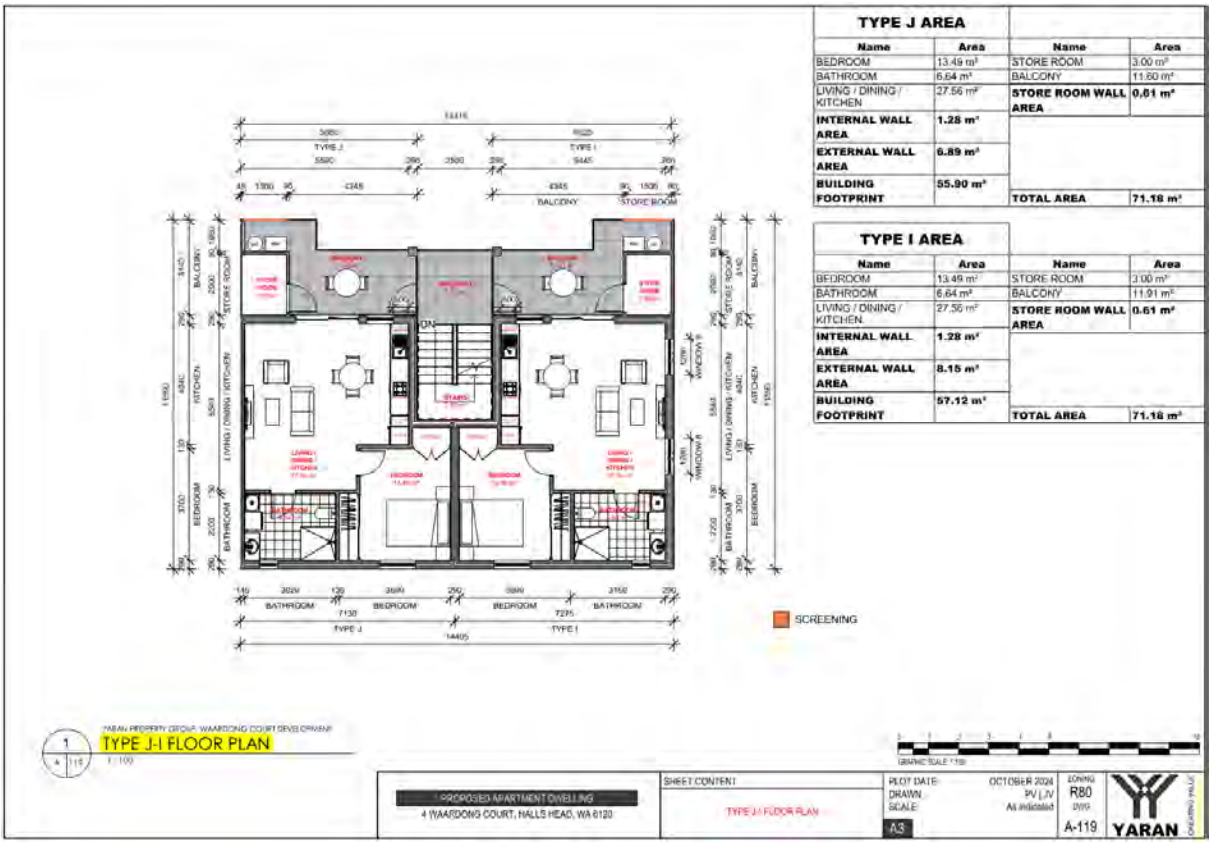

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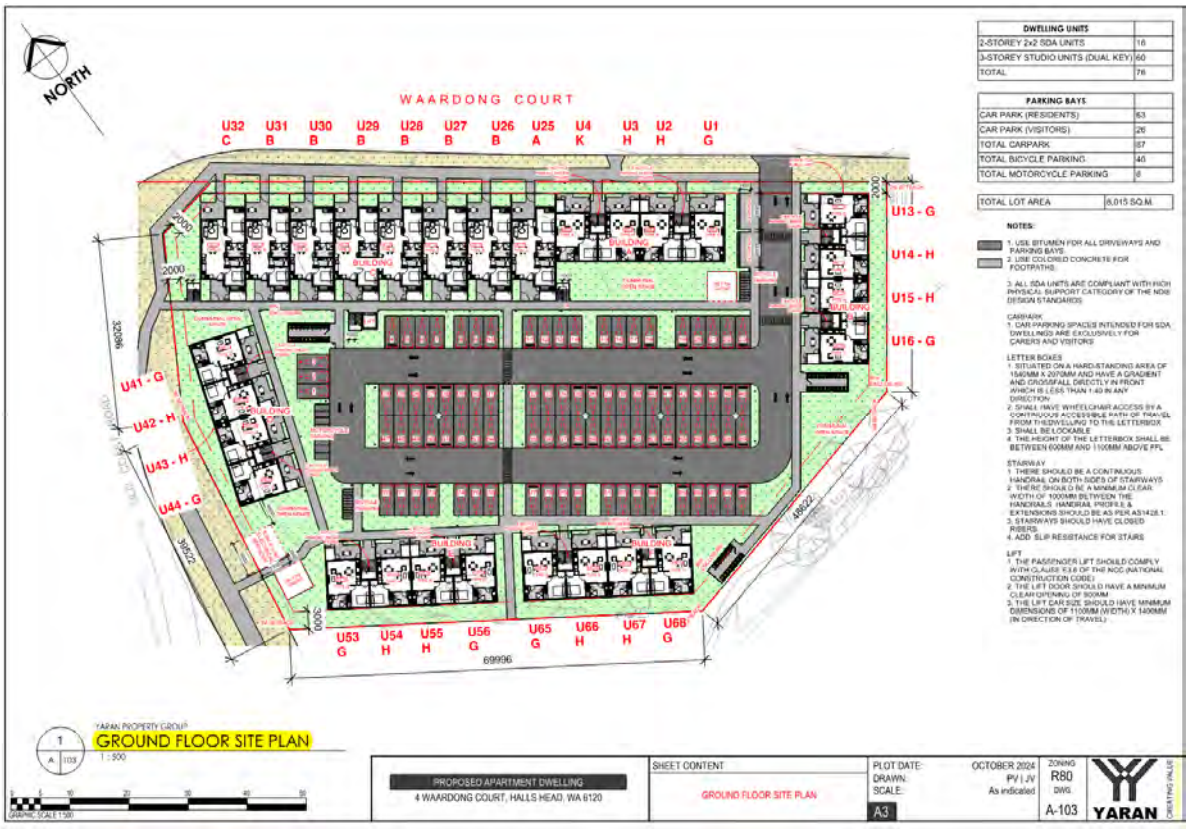
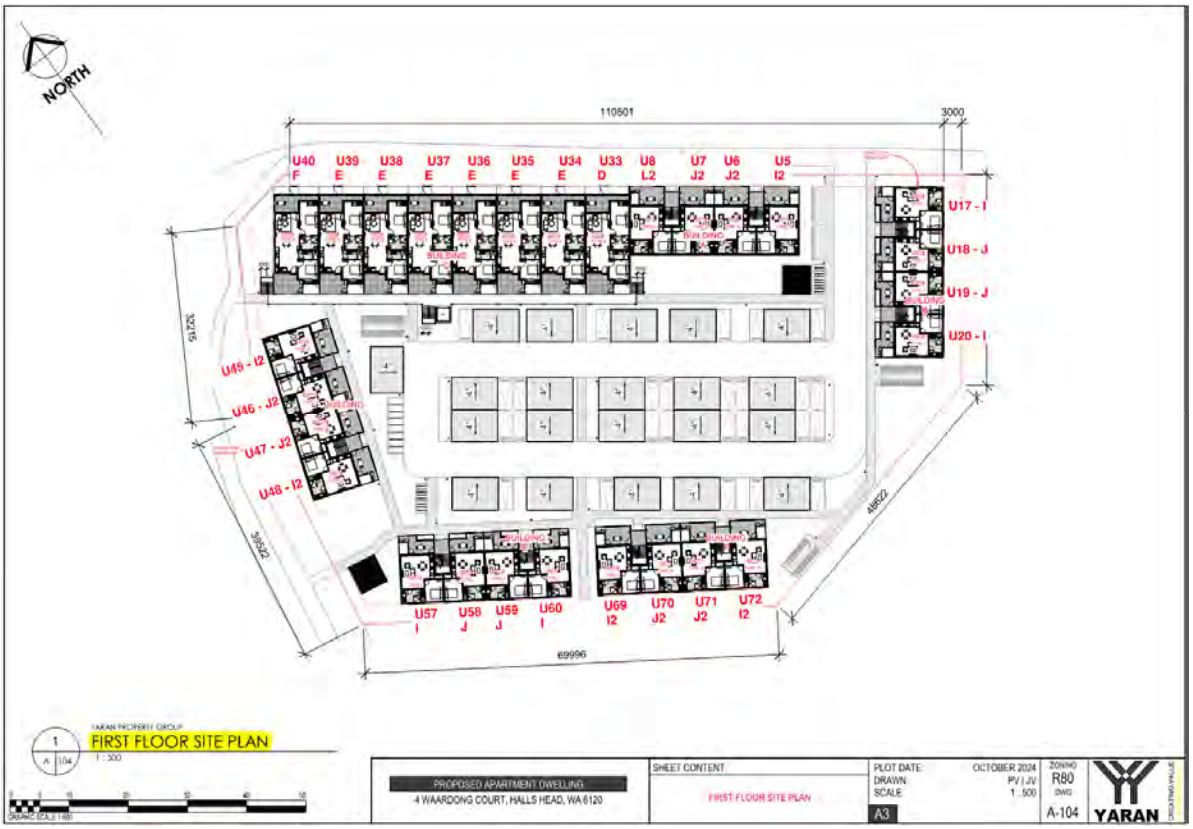
ANNEX DS – DRAWINGS SITE





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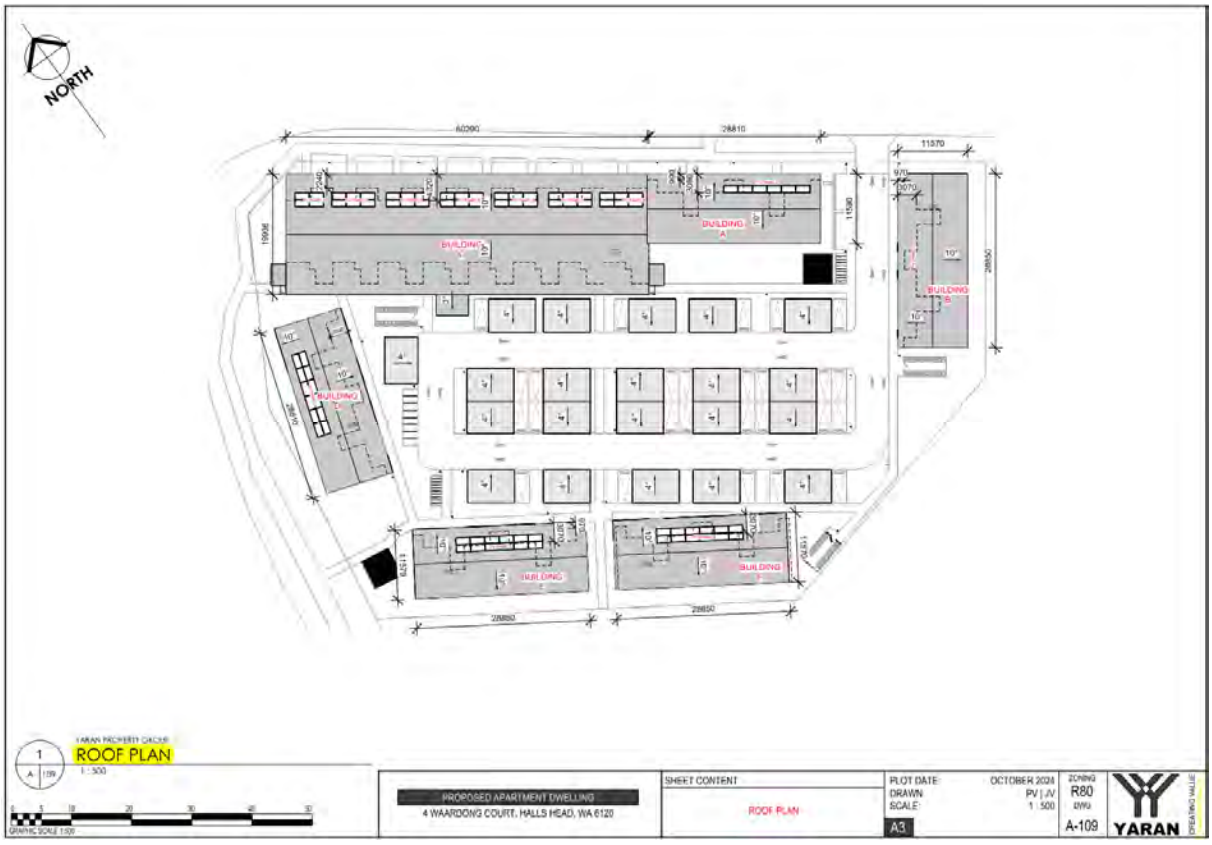

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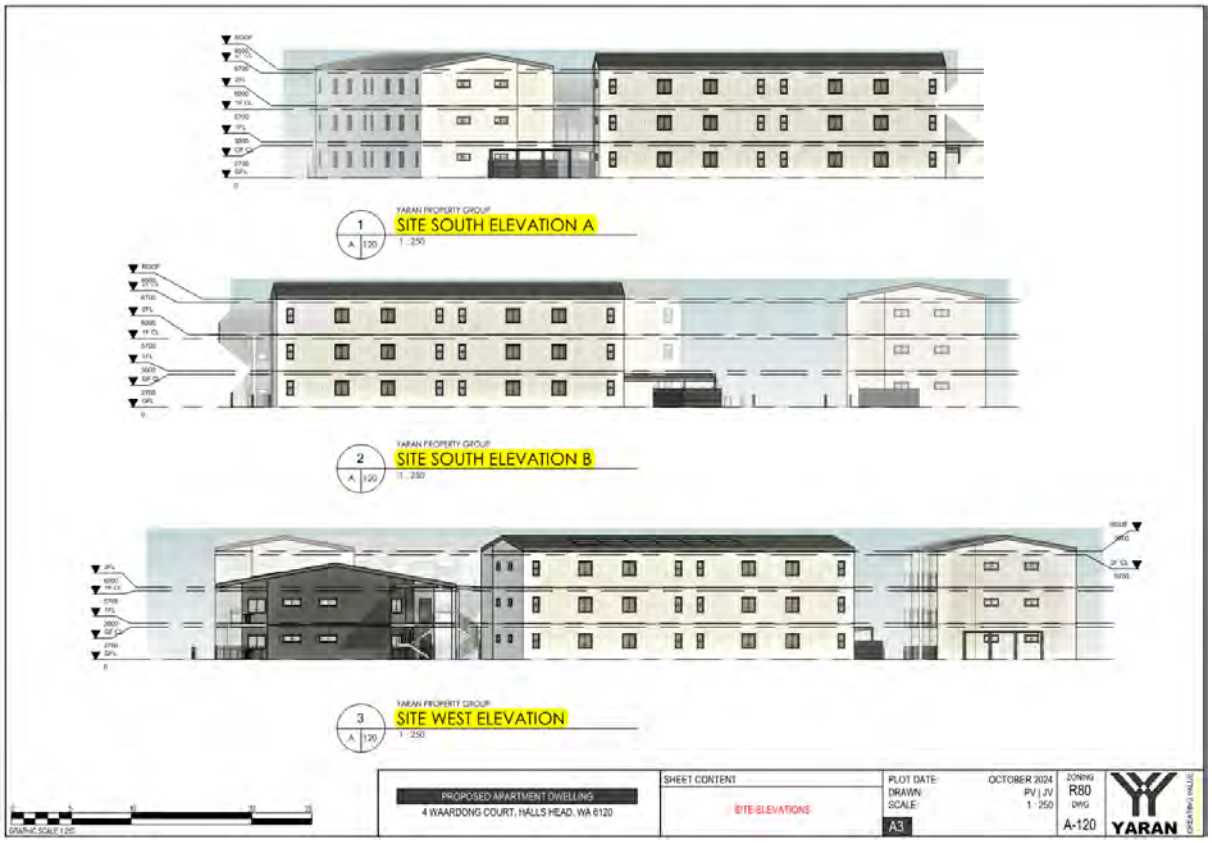



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ANNEX M - MEASUREMENTS

M0.1 SPP5.4 offers two measurement methods being either an attended measurement or an unattended measurement. The attended measurements are not excluded from being used near a major road. If unattended measurements are used then they must comply with Reference A's SPP5.4 Appendix 1 requirements.

M0.2 The attended measurements are always preferable. Unattended measurements require 3x 24 hour weekday periods or longer depending upon conditions usually wind, rain and other extraneous non traffic noise. The unattended measurements require post measurement analysis of the noise data to verify the noise results.

M1.1 The measurement locations are shown in FIGURE M1 - MEASUREMENT LOCATION on the following pages.

M1.2 A review of the MRWA Trafficmap data prior to attending site showed that the traffic pattern was stable as typically associated with well-established traffic routes. Therefore, attended measurement samples were taken as per TABLE M1 – MEASUREMENTS on the following pages.

M1.3 NDE's experience with attended measurements, since 2005, on stable well established traffic routes is that attended measurements at times of peak traffic are suitable for adjustment with the MRWA traffic profile available from the MRWA Trafficmap website.

M2.4 Other consideration for attended measurements for this site are:

a. The site is exposed without any cover to hide a noise logger without a direct line of sight to the main road. This presents a significant security risk to valuable equipment which cannot be insured;

b. The site is subject to wind noise and wind induced vegetation noise. There would be some difficulty in an unattended measurement to discern between traffic noise and wind noise;

c. Observations showed that the dominant noise for this site is the Mandurah Rd and to a lesser extent the Old Coast Road;

d. Attended measurements in this report represent free flowing traffic suitable for 2041 noise modelling purposes as there are no intersection issues causing banking up of traffic.

M2.5 Additional measurement information at the measurement location is contained in TABLE M1.5 on the following page.

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TABLE M1 - Measurements

Term **Date**	School Term 4 Thu. 31 OCT 24			
Weather conditions on the day based on BoM mobile app data from the nearest weather station:	Morning 07:46hrs (7.46am) - Sunny; - Temperature 18ºC (Lo/Hi ~ 14 / 28ºC); - Dewpoint 11ºC & Humidity 66%; - Pressure 1019hPa; - Rain 0mm last 24hrs, Nil next 10days - Roads visually dry; - Wind speed 17 kmh (4.7 m/s) from the EAST, with locally minimal wind.		Afternoon 15:43 hours (3.43pm) - Sunny; - Temperature 26ºC (Lo/Hi ~ 14 / 28ºC); Dewpoint 15ºC & Humidity 51%; - Pressure 1017hPa; - Rain 0mm last 24hrs, Nil next 10days - Roads visually dry; - Wind speed 21 kmh (5.8 m/s) from the SW, with locally minimal wind.	
Location **Speed signed** **Time** **Duration**	Mandurah Rd 70 kph Start 7.41am 37 minutes	Old Coast Rd 70 kph Start 8.23am 27 minutes	Mandurah Rd 70 kph Start 3.08pm 26 minutes	Old Coast Rd 70 kph Start 3.40pm 25 minutes
Raw Results Peak hour attended measurements calibrated before/after measurement.	AM traffic East bound lanes to Mandurah ~20m from measurement location. LAeq 60.9 dB(A) Traffic slowed due to road construction work at Mandurah Rd bridge requires +8.1 dB(A) correction based on PM results so now LAeq 69.0 dB(A)	AM traffic North bound lanes to Mandurah ~22m from measurement location. LAeq 70.1 dB(A) Traffic fast moving and accelerating away from Mandurah Rd T junction	PM traffic West bound lanes from Mandurah ~35m from measurement location. LAeq 64.1 dB(A) Traffic free flowing not affected by road construction work from the Mandurah Rd bridge	PM traffic South bound lanes from Mandurah ~9m from measurement location. LAeq 61.1 dB(A) Traffic slowing down and deaccelerating on approach to Mandurah Rd T junction traffic lights
Raw Results averaged traffic profile adjusted for Day/Night	LAeq,day 69.4 dB(A) 6am to 10pm LAeq,night 56.3 dB(A) 10pm to 6am	LAeq,day 71.0 dB(A) 6am to 10pm LAeq,night 48.6 dB(A) 10pm to 6am	LAeq,day 62.0 dB(A) 6am to 10pm LAeq,night 48.8 dB(A) 10pm to 6am	LAeq,day 59.3 dB(A) 6am to 10pm LAeq,night 40.0 dB(A) 10pm to 6am
	NB: LAeq,day is dominant wrt to LAeq,night as difference >10 dB(A) so LAeq,day is used in modelling calibrations and calculations.			
Traffic Noise raw results adjusted for façade +2.5 dB(A) & 2041 volumes:	LAeq,day 73.4 dB(A) 6am to 10pm. LAeq,night 60.3 dB(A) 10pm to 6am	LAeq,day 75.2 dB(A) 6am to 10pm. LAeq,night 52.8 dB(A) 10pm to 6am	LAeq,day 66.0 dB(A) 6am to 10pm. LAeq,night 52.8 dB(A) 10pm to 6am	LAeq,day 63.4 dB(A) 6am to 10pm. LAeq,night 44.1 dB(A) 10pm to 6am

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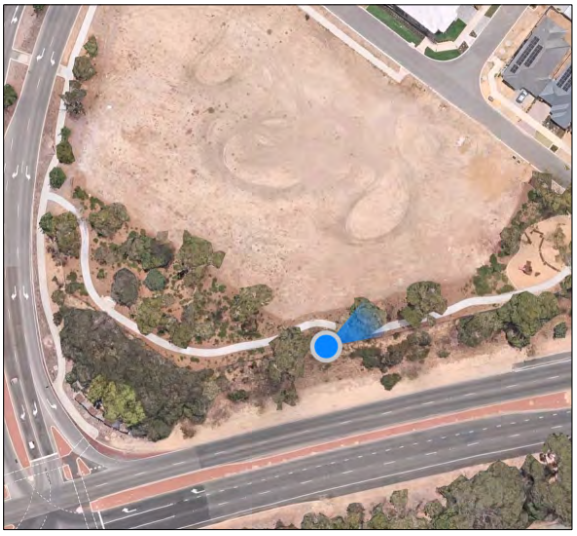
+1.5 dB(A) MR +1.7 dB(A) OCR				
Measurement Equipment	B&K 2270 Type 1 SLM, Sn 3006288, NVMS calibrated 24 NOV 22. ACO 511E calibrator, Sn 021572, NVMS calibrated 01 NOV 22. Calibration certificates can be provided on request.			
Comment	Mandurah Road surface – Asphalt sealed Old Coast Road surface – Asphalt sealed			



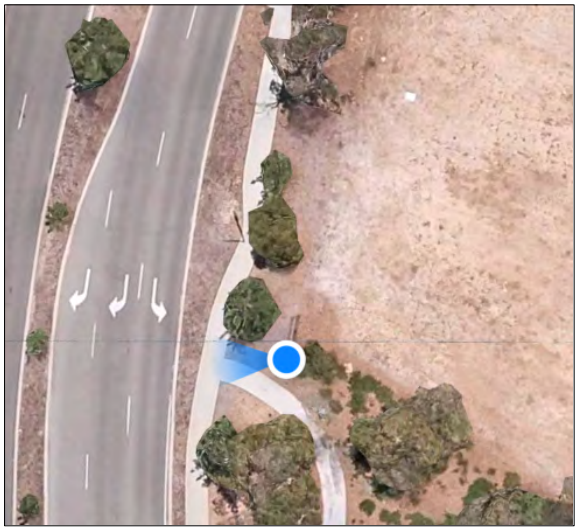
Mandurah Road



Old Coast Road



Measurement location BLUE dot



Measurement location BLUE dot

FIGURE M1 – MEASUREMENT LOCATION

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ANNEX T – TRAFFIC NOISE

T. The following subsections form the detailed traffic noise assessment:

- T0. Assumptions & Limitations.
- T1. Noise Criteria.
- T2. Traffic Noise.
- T3. Outdoor Noise Assessment.
- T4. Indoor Noise Assessment.
- T5. Recommendations
    - Appendix 0 to ANNEX T – QUIET HOUSE PACKAGES.
    - Appendix 1 to ANNEX T – POINT MODELLING.
    - Appendix 2 to ANNEX T – DAY MODELLING.
    - Appendix 3 to ANNEX T – NIGHT MODELLING.

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ASSUMPTIONS & LIMITATIONS

T0. The following assumptions and limitations are made:

a. The speed limit remains at 70 kph on both Mandurah Rd and Old Coast Rd;

b. The traffic volume increases from 2021 to 2041 is based on MRWA modelling predictions;

c. The percentage Heavy Vehicles is based on the 2020/21 MRWA Traffic Map data;

d. The requirements of References A (SPP 5.4 Guidelines) is to comply with Reference A (SPP 5.4 policy Table 2 Noise targets) for the following areas:

(1)	Work	LAeq,Day = 40 dB(A)	from 6 am to 10 pm (total of 16 hours);
(2)	Living	LAeq,Day = 40 dB(A)	from 6 am to 10 pm (total of 16 hours);
(3)	Sleeping	LAeq,Night = 35 dB(A)	from 10 pm to 6 am (total of 8 hours).

e. Traffic noise is a feature for this site with the following tabulation being based on MRWA modelling and MRWA Traffic Map data as noted;

Location	**2021**		**2041**	
	Vehicles per 24 hours	**Percentage Heavy Vehicles**	**Vehicles per 24 hours**	**Percentage Heavy Vehicles**
Mandurah Road	28,800	9.9% Traffic Map 2023/24	40,600	9.9% Traffic Map 2023/24
East Bound to Mandurah West Bound from Mandurah	14,400 14,400		20,300 20,300	
Old Coast Road	10,500	7.8% Traffic Map 2021/22	15,500	7.8% Traffic Map 2021/22
North Bound to Mandurah South Bound from Mandurah	6,100 4,400		8,700 6,800	

b. MRWA modelling advice #43020 supplied 3pm Wednesday 21 August 2024.

- MRWA no longer provides Heavy Vehicle (HV) data as part of their noise modelling so Traffic Map data is used for HV data.
- Discussions with MRWA indicate that Traffic Map HV data is to be utilised for the available years with the data being applied to both 2021 and 2041 years.
- Road surface is Asphalt Open Graded.

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NOISE CRITERIA

T1.1 The assessment for SPP5.4 comprises two parts being:

a. OUTDOOR assessment which determines the outdoor noise levels at potential alfresco areas; and

b. INDOOR assessment which determines the building envelope construction in particular the glazing.

T1.2 SPP 5.4, gives the noise criteria which when used for outdoor assessments includes a +2.5 dB(A) façade correction factor. See TABLE T2.1 on the following page.

T1.3 The guidelines associated with SPP 5.4 provide deemed to comply noise insulation solutions for residential developments.

T1.4 SPP 5.4, gives the following noise criteria which when used for outdoor assessments includes a +2.5 dB(A) façade correction factor.

Table T1 - OUTDOOR NOISE CRITERIA

Time of Day	Noise Target
DAY (Traffic) 6am to 10 pm	$L_{Aeq(Day)}$ = 55 dB(A)
Night (Traffic) 10 pm to 6 am	$L_{Aeq(Night)}$ = 50 dB(A)

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TRAFFIC NOISE

T2. The following table summarises the traffic noise level assessment.

TABLE T2 – TRAFFIC NOISE ASSESSMENT
Average Weekday Vehicles per Day (VPD) based on MRWA data supplied by Mr Scott Hazebroek – Traffic Modelling Analyst – Planning & Technical Services ph: 9323 6194 MRWA Job No #43028 supplied 27 August 2024. Modelling software SoundPlan 8.2 using CoRTN model with the traffic broken down into - Light Vehicle Austroads Classes 1 & 2 with the noise source modelled at 0.5m; - Heavy Vehicles Austroads Class 3 upwards with the appropriate corrections made for the noise sources modelled at 1.5m for engine noise and 3.6m for exhaust noise.
Calibration measurements: See ANNEX M - MEASURMENTS. Correction for Residential Facade Reflection for outdoor assessments +2.5 dB(A). Speed Limits: 70 kph.
Results of the modelling are contained in: - Appendix 1 to ANNEX T – POINT MODELLING. - Appendix 2 to ANNEX T – DAY MODELLING. - Appendix 3 to ANNEX T – NIGHT MODELLING.
Quiet House Packages detail are found in Appendix 0 to ANNEX T – QUIET HOUSE PACKAGES.
Quiet House Package application to the various facades are shown in the figures: - FIGURE T.0 – GND FLOOR RECOMMEDED QUIET HOUSE PACKAGES - FIGURE T.1 – 1ST FLOOR RECOMMEDED QUIET HOUSE PACKAGES - FIGURE T.2 – 2ND FLOOR RECOMMEDED QUIET HOUSE PACKAGES

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OUTDOOR NOISE ASSESSMENT

T3.1 The requirements of SPP 5.4 is that at least one outdoor living area such as a balcony or terrace or courtyard or alfresco meets both the noise target of $LAeq_{(Day)}$ = 55 dB(A) and $LAeq_{(Night)}$ = 50 dB(A).

T3.2 The assessment shows that the outdoor noise targets are exceeded for twenty seven units therefore a Notification 70A for Noise is to be placed on the title as per the recommendations tabulation TABLE T5 – UNITS REQUIRING NOTIFICATION 70A FOR NOISE on the following pages.

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INDOOR NOISE ASSESSMENT

T4.1 The requirements of the SPP 5.4 Guidelines is to comply with the SPP 5.4 policy Table 2 Noise targets for:

(1)	Work	LAeq,Day = 40 dB(A)	from 6 am to 10 pm a total of 16 hours;
(2)	Living	LAeq,Day = 40 dB(A)	from 6 am to 10 pm a total of 16 hours;
(3)	Sleeping	LAeq,Night = 35 dB(A)	from 10 pm to 6 am a total of 8 hours.

T4.2 The predicted 2041 traffic outdoor noise levels in APPENDIX 1 and APPENDIX 2 indicates that a variety of Quiet House packages in APPENDIX 0 are required depending on the highest value of LAeq for each façade. TABLE 4.4 below shows the Quiet House Package (Exposure Category) for the 2041 LAeq. APPENDIX 3 shows that the night data values are significantly lower than the day values therefore they are no longer considered in this report.

Table T4.2 - NOISE CRITERIA

Exposure Category (Quiet House Package)	**Forecast Excess Noise Level dB above Noise Target** Noise Target DAY $L_{Aeq(Day)}$ = 55 dB(A) Noise Target Night $L_{Aeq(Night)}$ = 50 dB(A)	**2041 LAeq**	
		DAY 6am to 10 pm	**NIGHT** 10 pm to 6 am
-	0 or less	Less than 55	Less than 50
A	**+1 to 3**	**56 to 58**	**51 to 53**
B	**+4 to 7**	**59 to 62**	**54 to 57**
C	**+8 to 11**	**63 to 66**	**58 to 61**
D by NDE	**+12 to 15**	**67 to 70**	**62 to 65**
E by NDE	**16+**	**71+**	**66+**

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RECOMMENDATIONS

T5. The following recommendations are made:

a. Implement the Quiet House Packages to the facades as shown in the following figures (found on the following pages)

FIGURE T.0 – GND FLOOR RECOMMEDED QUIET HOUSE PACKAGES

FIGURE T.1 – 1ST FLOOR RECOMMEDED QUIET HOUSE PACKAGES

FIGURE T.2 – 2ND FLOOR RECOMMEDED QUIET HOUSE PACKAGES

The Quiet House Packages details are found in Appendix 0 to ANNEX T – QUIET HOUSE PACKAGES.

b. A Notification 70A for Noise is to be placed on the tile for the following Units:

Table T5 – UNITS REQUIRING NOTIFICATION 70A FOR NOISE

Lvl_Bld_No_Type Lvl – Level; Bld - Building No – Unit No; Type – Unit Type	**ROOM** KLD - Kitchen Living Dining Crt – Court; Yrd -Yard	**FAÇADE** Notional	**2041 LAeq, DAY dB(A) > 55 dB(A)**
1st_B_U19_J	Balcony KLD	North	66
2nd_B_U21_I	Balcony KLD	North	57
2nd_B_U23_J	Balcony KLD	North	59
2nd_B_U24_I	Balcony KLD	North	57
Gnd_C_U29_B	Front Crt Yrd KLD	North	57
Gnd_C_U30_B	Front Crt Yrd KLD	North	59
Gnd_C_U31_B	Front Crt Yrd KLD	North	61
Gnd_C_U32_C	Front Crt Yrd KLD	North	64
1st_C_U36_E	Front Crt Yrd KLD	North	57
1st_C_U37_E	Front Crt Yrd KLD	North	59
1st_C_U38_E	Front Crt Yrd KLD	North	61
1st_C_U39_E	Front Crt Yrd KLD	North	62
1st_C_U40_F	Front Crt Yrd KLD	North	66
1st_D_U47_J2	Balcony KLD	East	56
1st_D_U48_I2	Balcony KLD	East	56
2nd_D_U49_I2	Balcony KLD	East	58
2nd_D_U50_J	Balcony KLD	East	59
2nd_D_U51_J2	Balcony KLD	East	60
2nd_D_U52_I2	Balcony KLD	East	60
1st_E_U58_J	Balcony KLD	North	56
2nd_E_U62_J	Balcony KLD	North	56
2nd_E_U63_J	Balcony KLD	North	56
Gnd_F_U67_H	Balcony KLD	North	56
1st_F_U69_I	Balcony KLD	North	56
1st_F_U71_J2	Balcony KLD	North	58
2nd_F_U73_I2	Balcony KLD	North	58
2nd_F_U75_J2	Balcony KLD	North	59

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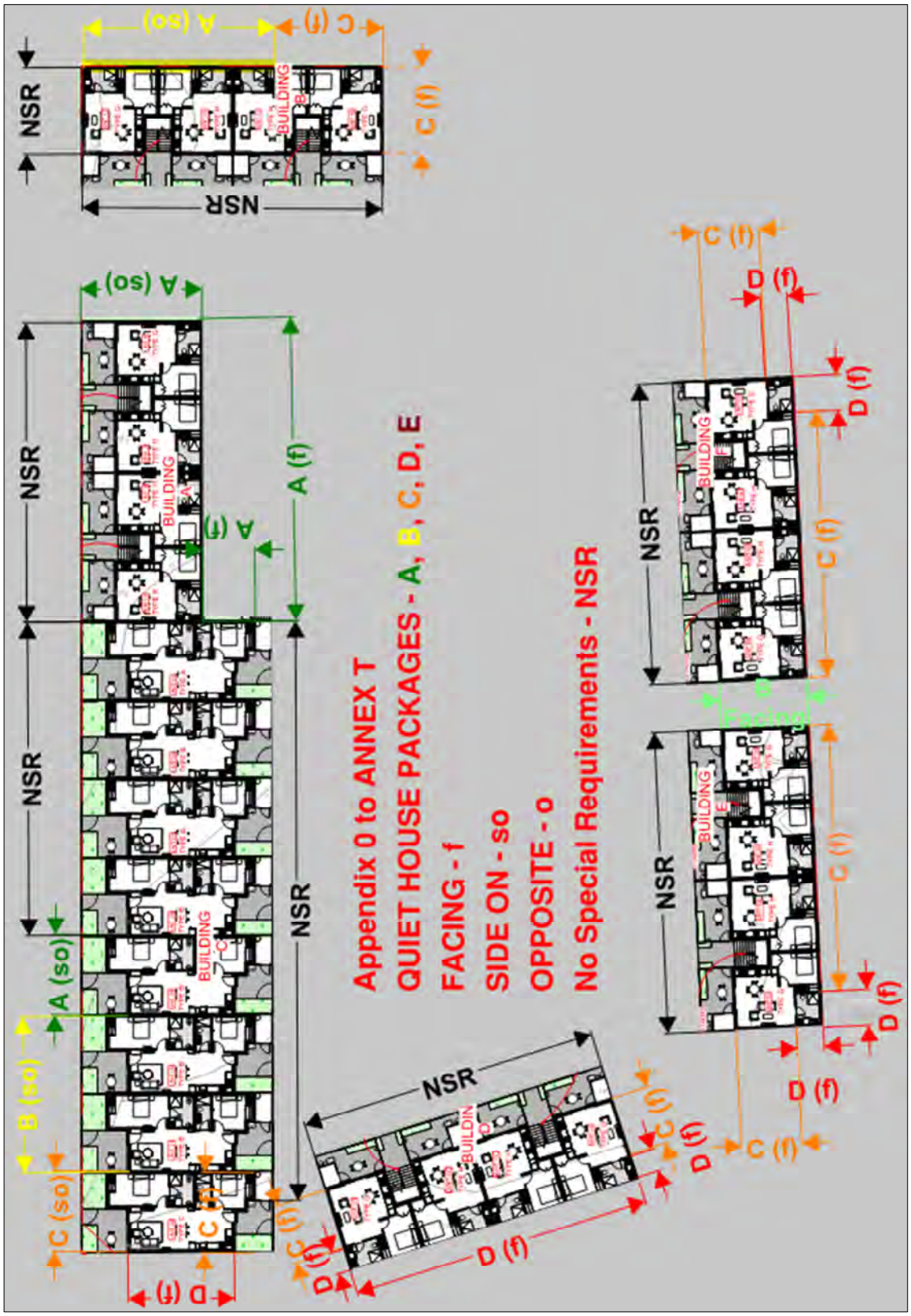

FIGURE T.0 – GROUND FLOOR RECOMMEDED QUIET HOUSE PACKAGES

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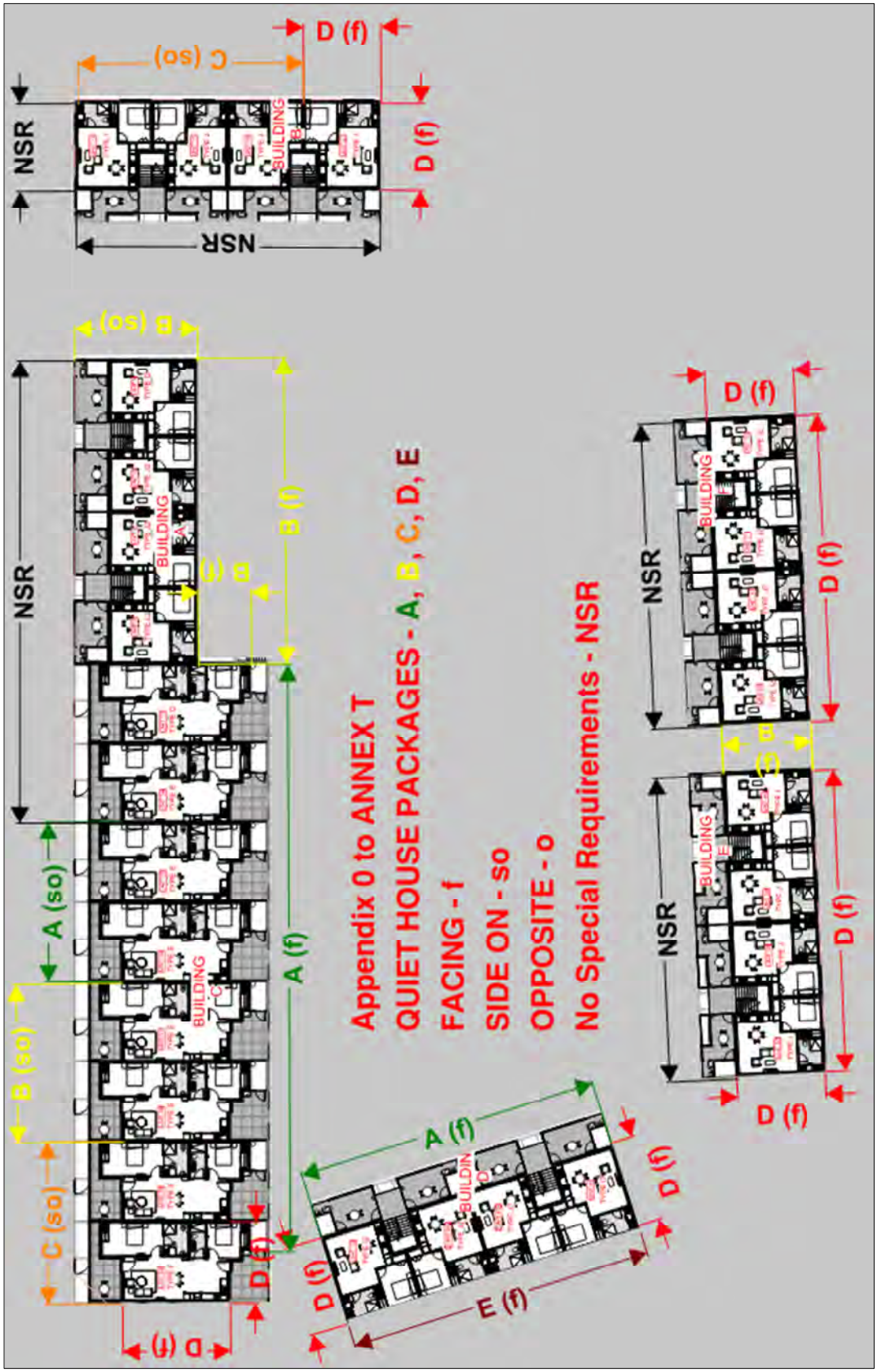

FIGURE T.1 – 1ST FLOOR RECOMMEDED QUIET HOUSE PACKAGES

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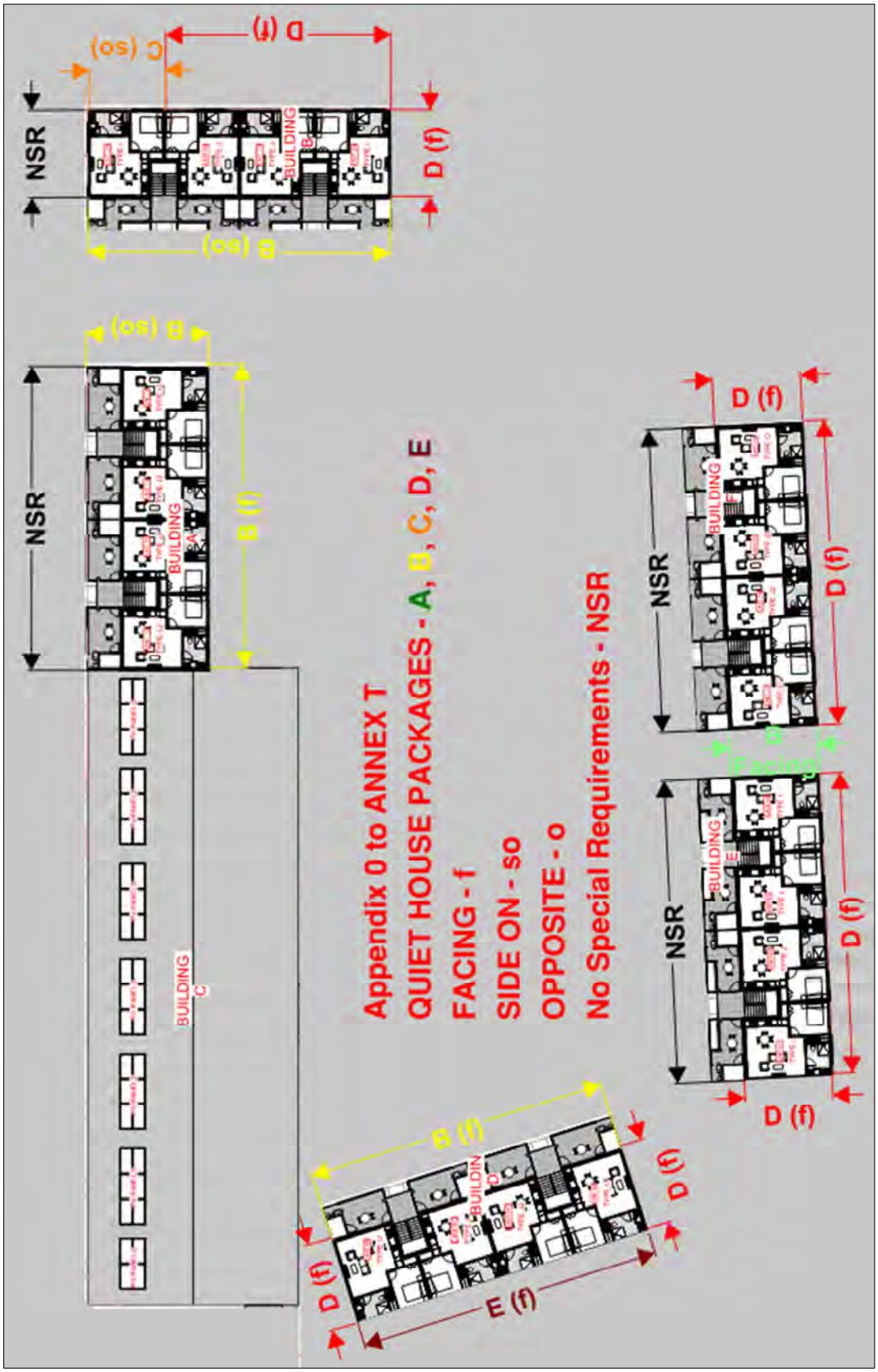

FIGURE T.2 – 2ND FLOOR RECOMMEDED QUIET HOUSE PACKAGES

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Appendix 0 to ANNEX T – QUIET HOUSE PACKAGES

TABLE 3A – QUIET HOUSE 'A' REQUIREMENTS

MODIFIED Extract from SPP5.4 Table 3 – Quiet house requirements

Exposure Category A Quiet House A - Acoustic Ratings (Rw+Ctr) and Example constructions

Orientation to corridor	Walls	External doors	Windows
FACING (f)	**Bedrooms** and **Indoor living & Work areas** to **Rw+Ctr 45 dB** Double brick **Option 1**: - Two leaves of 90mm clay brick masonry Maxibrick 1237 kg/m^3 each with: - A 50mm cavity between leaves; - 15 render internally & **face brick** externally; - Resilient ties where required to connect leaves. Predicted Rw+Ctr 45. Double brick **Option 2**: - Two leaves of 90mm clay brick masonry Maxibrick 1237 kg/m^3 each with: - A 50mm cavity between leaves; - 15 render internally & externally; - Standard ties where required to connect leaves. Predicted Rw+Ctr 47.	**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. **NB: 10mm** glass can be replaced with laminated glass being either: - 6.50 Viridian Hush glass; or - 6.76 Cooling Bros Whisper glass.	**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. **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.** **NB: 10mm** glass can be replaced with laminated glass being either: - 6.50 Viridian Hush glass; or - 6.76 Cooling Bros Whisper glass.
SIDE-ON (so)	**Bedrooms** and **Indoor living & Work areas** to **Rw+Ctr 45 dB** As per FACING above.	**Bedrooms:** **-** Fully glazed hinged door with certified **Rw+Ctr 25dB** rated door and frame including seals and 6mm glass	**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 25 dB.**

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		Other external doors to **Rw+Ctr 22dB**, e.g. - 35mm solid core timber hinged door and frame system certified to **Rw 25dB** including seals; - Glazed sliding door with **10mm** glass and weather seals for bedrooms **NB: 10mm** glass can be replaced with laminated glass being either: - 6.50 Viridian Hush glass; or - 6.76 Cooling Bros Whisper glass.	Sealed awning or casement windows may use 6 mm glazing instead. **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 22dB.** **NB: 10mm** glass can be replaced with laminated glass being either: - 6.50 Viridian Hush glass; or - 6.76 Cooling Bros Whisper glass.
OPPOSITE (o)	**Bedrooms** and **Indoor living & Work areas** to **Rw+Ctr 45 dB** As per FACING above.	**Bedrooms** and **Indoor living & Work areas** **No specific requirements**	**Bedrooms** and **Indoor living & Work areas** **No specific requirements**
Orientation	**Walls**	**External doors**	**Windows**

1 - Roofs and ceilings of highest floors to **Rw+Ctr 35dB**

Concrete or terracotta tile both with sarking or

Metal sheet roof with minimum 50mm anti-condensation insulation under, and

all with at least 10mm plasterboard ceiling, with R3.0+ insulation

2 - Outdoor living areas:

a. At least one outdoor living area located on the opposite side of the building from the corridor; and/or

b. At least one ground level outdoor living area screened using a solid continuous fence or other structure of minimum **2.0 metres** height above ground level.

See TABLE T5 – UNITS REQUIRING NOTIFICATION 70A FOR NOISE.

See TABLE 3G – GENERAL REQUIREMENTS APPLICABLE TO ALL PACKAGES.

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TABLE 3B – QUIET HOUSE 'B' REQUIREMENTS

MODIFIED Extract from SPP5.4 Table 3 – Quiet house requirements

Exposure Category B Quiet House B - Acoustic Ratings (Rw+Ctr) and Example constructions

Orientation to corridor	Walls	External doors	Windows
FACING (f)	**Bedrooms** and **Indoor living & Work areas** to **Rw+Ctr 50 dB** Double brick: - two leaves of 90mm clay brick masonry Maxi One 1260 kg/m^3 each with: - 50mm cavity between leaves; - with or without 15 render on any side; - 50mm cavity insulation AIS ROXUL CWI R1.3 @ minimum density 45 kg/m^3 with moisture migration resistance or equivalent - resilient ties where required to connect leaves. Predicted Rw+Ctr 57 no render; Rw+Ctr 59 render one side; Rw+Ctr 62 render both sides.	**Bedrooms:** - Fully glazed hinged door with certified **Rw+Ctr 31dB** rated door and frame including seals and 10mm glass **Other external doors:** to **Rw+Ctr 28dB**, 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: Fixed sash, awning or casement with minimum 6mm single or 6mm-12mm-**6.38mm** double insulated glazing **Rw+Ctr 31 dB.** **Indoor living & Work areas:** - Up to 40% floor area: Sliding or double hung with minimum 6mm single pane or 6mm-12mm-**6.38mm** double insulated glazing **Rw+Ctr 28 dB**; and - Sealed awning or casement windows may use 6mm glazing instead **Rw+Ctr 28 dB.**
SIDE-ON (so)	**Bedrooms** and **Indoor living & Work areas** **to Rw+Ctr 50 dB** As per FACING above.	**Bedrooms:** - Fully glazed hinged door with certified **Rw+Ctr 25dB** rated door and frame including seals and 6mm glass **Other external doors:** to **Rw+Ctr 22dB**, e.g. - 35mm solid core timber hinged door and frame system certified to **Rw 25dB** including 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 25 dB**. - Sealed awning or casement windows may use 6mm glazing instead. **Indoor living & Work areas:** Up to 40% floor area: Sliding, casement or double

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		- Glazed sliding door with 10mm glass and weather seals.	hung with minimum 6mm single pane or 6mm-12mm-**6.38mm** double insulated glazing **Rw+Ctr 22 dB**.
OPPOSITE (o)	**Bedrooms** and **Indoor living & Work areas to Rw+Ctr 50 dB** As per FACING above.	**Bedrooms:** **-** Fully glazed hinged door with certified **Rw+Ctr 25dB** rated door and frame including seals and 6mm glass **Other external doors** to **Rw+Ctr 22dB**, e.g. - 35mm solid core timber hinged door and frame system certified to **Rw 25dB** including seals; - Glazed sliding door with 10mm glass and weather seals for bedrooms	**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 25 dB.** Sealed awning or casement windows may use 6 mm glazing instead. **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 22dB.**
Orientation	**Walls**	**External doors**	**Windows**

1 - Roofs and ceilings of highest floors to **Rw+Ctr 35dB** - Concrete or terracotta tile or metal sheet roof, sarking and at least 10mm plasterboard ceiling, R3.0+ insulation

2 - Outdoor living areas:

a. At least one outdoor living area located on the opposite side of the building from the traffic corridor; and/or

b. At least one ground level outdoor living area screened using a close solid continuous fence or other close structure of minimum 2.4 metres height above ground level.

See Table T5 – UNITS REQUIRING NOTIFICATION 70A FOR NOISE.

See TABLE 3G – GENERAL REQUIREMENTS APPLICABLE TO ALL PACKAGES.

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TABLE 3C – QUIET HOUSE 'C' REQUIREMENTS

MODIFIED Extract from Table 3 – Quiet house requirements

Exposure Category C Quiet House C - Acoustic ratings (Rw+Ctr) and EXAMPLE constructions

Orientation to corridor	Walls	External doors	Windows
FACING (f)	**Bedrooms** and **Indoor living & Work areas** to **Rw+Ctr 50 dB** **Option 1** Double brick: - two leaves of 90mm clay brick masonry Maxi One 1260 kg/m^3 each with: - 50mm cavity between leaves; - with or without 15 render on any side; - 50mm cavity insulation AIS ROXUL CWI R1.3 @ minimum density 45 kg/m^3; - resilient ties where required to connect leaves. Predicted Rw+Ctr 57 no render; Rw+Ctr 59 render one side; Rw+Ctr 62 render both sides.	**Bedrooms:** External doors to bedrooms facing the corridor are not recommended. **Other external doors:** to **Rw+Ctr 30dB**, e.g. - Fully glazed hinged door with certified **Rw+Ctr 31dB** rated door and frame including seals and 10mm glass - 40 mm solid core timber door frame and door (without glass or with glass inserts not less than 6mm), side hinged with certified **Rw 32dB** acoustically rated door and frame system including seals.	**Bedrooms:** Total external door and window system area up to 20% of room floor area: Fixed sash, awning or casement with minimum 6mm single or 6mm-12mm-**6.38mm** double insulated glazing **Rw+Ctr 31 dB.** Total external door and window system area up to 40% of room floor area: Fixed sash, awning or casement with minimum 10mm single or 6mm-12mm-10mm double insulated glazing **Rw+Ctr 34 dB.** **Indoor living & Work areas:** - Up to 40% floor area: Sliding or double hung with minimum 6mm single pane or 6mm-12mm-**6.38mm** double insulated glazing **Rw+Ctr 31 dB**; and - Sealed awning or casement windows may use 6mm glazing instead **Rw+Ctr 31 dB.**
SIDE-ON (so)	**Bedrooms** and **Indoor living & Work areas** to **Rw+Ctr 50 dB** As per FACING above.	**Bedrooms:** - Fully glazed hinged door with certified **Rw+Ctr 28dB** rated door and frame including seals and 10mm glass **Other external doors:** to **Rw+Ctr 25dB**, e.g.	**Bedrooms:** Total external door and window system area up to 40% of room floor area: Fixed sash, awning or casement with minimum 6mm single or 6mm-12mm-**6.38mm** double insulated glazing **Rw+Ctr 31 dB.**

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		- 35mm solid core timber hinged door and frame system certified to **Rw 25dB** including seals; - Glazed sliding door with 10mm glass and weather seals.	**Indoor living & Work areas:** - Up to 40% floor area: Sliding or double hung with minimum 6mm single pane or 6mm-12mm-**6.38mm** double insulated glazing **Rw+Ctr 28 dB**; and - Sealed awning or casement windows may use 6mm glazing instead **Rw+Ctr 28 dB.**
OPPOSITE (o)			
	Bedrooms and **Indoor living & Work areas** to **Rw+Ctr 50 dB** As per FACING above.	**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 6mm glazing instead **Rw+Ctr 28 dB.** **Indoor living and work areas:** Up to 40% floor area: Sliding, awning, casement or double hung with minimum 6mm single pane or 6mm-12mm-**6.38mm** double insulated glazing **Rw+Ctr 25 dB**.
Orientation	**Walls**	**External doors**	**Windows**

1 - Roofs and ceilings of highest floors (NB: this also applies to Ground Floor Roofs over Bedrooms and Indoor living & Work areas) to **Rw+Ctr 40dB** –

• To all bedrooms, 2 layers of 10mm plaster board, or one layer 13mm high density (minimum surface density of 12.5 kg/m2), affixed using steel furring channels beneath ceiling rafters / supports.

• R3.0+ insulation batts laid in cavity.

• Concrete or terracotta tile roof with sarking, or metal sheet roof with foil backed R2.0+ fibre insulation between steel sheeting and roof battens.

2 - Outdoor living areas:

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a. At least one outdoor living area located on the opposite side of the building from the traffic corridor; and/or

b. At least one ground level outdoor living area screened using a close solid continuous fence or other close structure of minimum 2.4 metres height above ground level.

See Table T5 – UNITS REQUIRING NOTIFICATION 70A FOR NOISE.

See aslo TABLE 3G – GENERAL REQUIREMENTS APPLICABLE TO ALL PACKAGES.

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3D/E – QUIET HOUSE 'D/E' REQUIREMENTS

MODIFIED Extract from Table 3 – Quiet House requirements

Exposure Category D/E Quiet House D/E - Acoustic Ratings (Rw+Ctr) and Example constructions

Orientation to corridor	Walls	External doors	Windows
FACING (f)	**Bedrooms** and **Indoor living & Work areas** to **Rw+Ctr 60 dB** **Option 1a**: - two leaves of 90mm clay brick masonry Maxi 1260 kg/m^3 each with: - 50mm cavity between leaves; - with 15 render on both sides; - minimum 50mm cavity insulation ROXUL CWI blow-in or equivalent of minimum density 11 kg/m^3 with moisture migration resistance across the cavity; - resilient ties where required to connect leaves. Predicted Rw+Ctr 62 render both sides.	**Bedrooms:** As per Table 3C - QH C. **Other external doors:** Generally, as per Table 3C - QH C but all glass shall be single pane laminated glass being either: - 6.50 mm Viridian Hush; or – 6.76 mm Whisper Cooling Brothers. Where double glazing is used for energy efficiency purposes then at least one pane shall be either: - 10.50 mm Viridian Hush; or – 10.76 mm Whisper Cooling Brothers.	**Bedrooms** and: **Indoor living & Work areas:** Generally, as per Table 3C - QH C but all glass shall be single pane laminated glass either: - 6.50 mm Viridian Hush; or – 6.76 mm Whisper Cooling Brothers. Where double glazing is used for energy efficiency purposes then at least one pane shall be either: - 10.50 mm Viridian Hush; or – 10.76 mm Whisper Cooling Brothers.
SIDE-ON (so)	**Bedrooms** and **Indoor living & Work areas** to **Rw+Ctr 60 dB** As per FACING above.	**Bedrooms** and **Other external doors:** Generally, as per QH C but all glass shall be single pane laminated glass either: - 6.50 mm Viridian Hush; or – 6.76 mm Whisper Cooling Brothers. Where double glazing is used for energy efficiency purposes then at least one pane shall be	**Bedrooms** and **Indoor living & Work areas:** Generally, as per QH C but all glass shall be single pane laminated glass either: - 6.50 mm Viridian Hush; or – 6.76 mm Whisper Cooling Brothers. Where double glazing is used for energy efficiency purposes then at least one pane shall be either:

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		either: - 10.50 mm Viridian Hush; or – 10.76 mm Whisper Cooling Brothers.	- 10.50 mm Viridian Hush; or – 10.76 mm Whisper Cooling Brothers.
OPPOSITE (o)			
	Bedrooms and **Indoor living & Work areas to Rw+Ctr 60 dB** As per FACING above.	**Bedrooms** and **Other external doors:** Generally, as per Table 3C - QH C but all glass shall be single pane laminated glass either: - 6.50 mm Viridian Hush; or – 6.76 mm Whisper Cooling Brothers. Where double glazing is used for energy efficiency purposes then at least one pane shall be either: - 10.50 mm Viridian Hush; or – 10.76 mm Whisper Cooling Brothers.	**Bedrooms** and **Indoor living & Work areas:** Generally, as per QH C but all glass shall be single pane laminated glass either: - 6.50 mm Viridian Hush; or – 6.76 mm Whisper Cooling Brothers. Where double glazing is used for energy efficiency purposes then at least one pane shall be either: - 10.50 mm Viridian Hush; or – 10.76 mm Whisper Cooling Brothers.
Orientation to corridor	**Walls**	**External doors**	**Windows**

1 - Roofs and ceilings of highest floors to **Rw+Ctr 40dB:**

• To all bedrooms, 2 layers of 10mm plaster board, or one layer 13mm high density (minimum surface density of 12.5 kg/m2), affixed using steel furring channels beneath ceiling rafters / supports.

• R3.0+ insulation batts laid in cavity.

• Concrete or terracotta tile roof with sarking, or metal sheet roof with foil backed R2.0+ fibre insulation between steel sheeting and roof battens.

(NB: this also applies to Ground Floor Roofs over Bedrooms and Indoor living & Work areas)

2 - Outdoor living areas:

a. At least one outdoor living area located on the opposite side of the building from the corridor; and/or

b. At least one ground level outdoor living area screened using a solid continuous fence or other structure* of minimum 2.4 metres height above ground level.

See Table T5 – UNITS REQUIRING NOTIFICATION 70A FOR NOISE.

See also TABLE 3G – GENERAL REQUIREMENTS APPLICABLE TO ALL PACKAGES.

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TABLE 3G – GENERAL REQUIREMENTS APPLICABLE TO ALL PACKAGES

3 - Mechanical ventilation / air conditioning considerations

- Acoustically rated openings and ductwork to provide a minimum sound reduction performance of Rw 40dB into sensitive spaces

- Evaporative systems require attenuated ceiling air vents to allow closed windows

- Refrigerant-based systems need to be designed to achieve National Construction Code fresh air ventilation requirements

- Openings such as eaves, vents and air inlets must be acoustically treated, closed or relocated to building sides facing away from the corridor where practicable.

4 - The airborne weighted sound reduction index (Rw) and traffic correction term (Ctr) are published by manufacturers/suppliers, can be determined by acoustical consultants or measured in accordance with AS ISO 717.1. Higher Rw+Ctr values infer greater sound insulation. All values are minimum Rw+Ctr (dB)

5 - Example construction for different external wall ratings of Rw+Ctr 45dB and 50dB are provided and are listed within Specification F5.2 in Volume 1 Part F of the National Construction Code.

These values are based on the installation and sealing of joints and penetrations in accordance with Specification F5.2

These construction values are based on the installation and sealing of joints and penetrations being in accordance with NCC 2019 BCA Vol One.

Recommendations specific to this project are contained in the Quiet House tables.

NB1: Use fibreglass insulation requirements being the greater of either the acoustic requirements or energy efficiency requirements.

NB2: The use of polystyrene or any other board product including permicav for acoustic purposes is prohibited. All reference to insulation is to glass wool (GW) insulation.

6 - Window and external door sound reduction values provided are based on the provision of suitable acoustic seals to prevent sound leakage.

To comply with the above ratings, all external glass windows and doors specified must have the following:

- Operable windows and external doors must have a seal to restrict air infiltration fitted to each edge and doors must have a drop seal to provide an airtight seal when closed

- Within doors or fixed framing, glazing must be set and sealed using an airtight arrangement of non-hardening sealant, soft rubber (elastomer) gasket and/or glazing tape, or be verified by manufacturer or approved person that the construction system as to be installed achieves the relevant Rw+Ctr value

- In this context, a seal is foam or silicon-based rubber compressible strip, fibrous seal with vinyl fin interleaf or the like. Brush / pile type seals without this seal included are not allowed.

- Glazing referenced can be monolithic, laminated or toughened safety glass.

7 - Any penetrations in a part of the building envelope must be acoustically treated so as not to degrade the performance of the building elements affected. Most penetrations in external walls such as pipes, cables or ducts can be sealed through caulking gaps with non-hardening mastic or suitable mortar.

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APPENDIX 1 to ANNEX T – POINT MODELLING

TABLE 1T.A – TRAFFIC NOISE ASSESSMENT BUILDING A.
TABLE 1T.B – TRAFFIC NOISE ASSESSMENT BUILDING B.
TABLE 1T.C – TRAFFIC NOISE ASSESSMENT BUILDING C.
TABLE 1T.D – TRAFFIC NOISE ASSESSMENT BUILDING D.
TABLE 1T.E – TRAFFIC NOISE ASSESSMENT BUILDING E.
TABLE 1T.F – TRAFFIC NOISE ASSESSMENT BUILDING F.

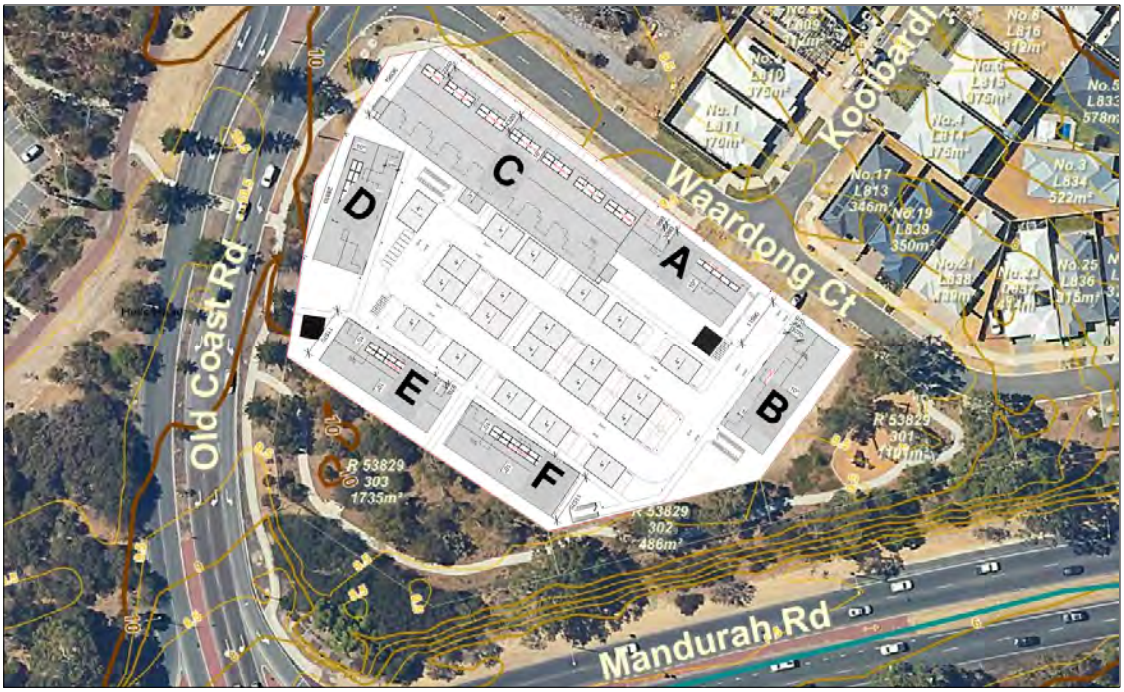

Table 1T - NOISE CRITERIA			
Exposure Category	**Forecast Excess Noise Level dB above Noise Target**	**2041 LAeq**	
(~ Quiet house Packages)	Noise Target DAY $L_{Aeq(Day)}$ = 55 dB(A) Noise Target Night $L_{Aeq(Night)}$ = 50 dB(A)	**DAY** 6am to 10 pm	**NIGHT** 10 pm to 6 am
-	0 or less	Less than 55	Less than 50
A	**+1 to 3**	**56 to 58**	**51 to 53**
B	**+4 to 7**	**59 to 62**	**54 to 57**
C	**+8 to 11**	**63 to 66**	**58 to 61**
D by NDE	**+12 to 15**	**67 to 70**	**62 to 65**
E by NDE	**16+**	**71+**	**66+**

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TABLE 1T.A – TRAFFIC NOISE ASSESSMENT BUILDING A

Lvl_Bld_No_Type	ROOM	FAÇADE	2041 LAeq, DAY	2041 LAeq, NIGHT
Gnd_A_U1_G	Balcony KLD	North	45	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment.
	KLD	East	**56**	
	Bath	East	**57**	
	Bath	South	**58**	
	Bed	South	**58**	
	Stairs		34	
Gnd_A_U2_H	Balcony KLD	North	40	
	Bed	South	**58**	
	Bath	South	**57**	
	Stairs		34	
Gnd_A_U3_H	Balcony KLD	North	46	
	Bed	South	**57**	
	Bath	South	**57**	
	Stairs		34	
Gnd_A_U4_K	Balcony KLD	North	40	
	Bed	South	**56**	
	Bath	South	**56**	
	Stairs		34	
1st_A_U5_I2	Balcony KLD	North	**47**	
	KLD	East	59	
	Bath	East	60	
	Bath	South	60	
	Bed	South	60	
	Stairs		35	
1st_A_U6_J2	Balcony KLD	North	42	
	Bed	South	60	
	Bath	South	60	
	Stairs		35	
1st_A_U7_J2	Balcony KLD	North	48	
	Bed	South	59	
	Bath	South	59	
	Stairs		35	
1st_A_U8_L2	Balcony KLD	North	42	
	Bed	South	59	
	Bath	South	58	
	Stairs		35	
2nd_A_U9_I2	Balcony KLD	North	49	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment.
	KLD	East	60	
	Bath	East	61	
	Bath	South	62	
	Bed	South	62	
	Stairs		39	
2nd_A_U10_J2	Balcony KLD	North	45	

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	Bed	South	62	
	Bath	South	61	
	Stairs	Stairs	39	
2nd_A_U11_J2	Balcony KLD	North	49	
	Bed	South	61	
	Bath	South	61	
	Stairs		38	
2nd_A_U12_L2	Balcony KLD	North	44	
	Bed	South	60	
	Bath	South	60	
	KLD	West	55	
	Stairs	Stairs	38	
Lvl_Bld_No_Type	**ROOM**	**FAÇADE**	**2041 LAeq, DAY**	**2041 LAeq, NIGHT**

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TABLE 1T.B – TRAFFIC NOISE ASSESSMENT BUILDING B

Lvl_Bld_No_Type	ROOM	FAÇADE	2041 LAeq, DAY	2041 LAeq, NIGHT
Gnd_B_U13_G	**Balcony KLD**	West	51	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	KLD	North	50	
	Bath	North	52	
	Bath	East	59	
	Bed	East	60	
	Stairs		48	
Gnd_B_U14_H	**Balcony KLD**	West	48	
	Bed	East	60	
	Bath	East	61	
	Stairs		48	
Gnd_B_U15_H	Balcony KLD	West	53	
	Bath	East	61	
	Bed	East	62	
	Stairs		50	
Gnd_B_U16_G	Balcony KLD	West	49	
	Bed	East	63	
	Bath	East	64	
	Bath	South	65	
	KLD	South	65	
	Stairs		50	
1st_B_U17_I	Balcony KLD	North	53	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	KLD	East	52	
	Bath	East	56	
	Bath	South	63	
	Bed	South	63	
	Stairs		50	
1st_B_U18_J	Balcony KLD	North	50	
	Bed	South	64	
	Bath	South	64	
	Stairs		50	
1st_B_U19_J	Balcony KLD	North	66	
	Bed	South	66	
	Bath	South	65	
	Stairs		52	
1st_B_U20_I	Balcony KLD	North	52	
	Bed	West	66	
	Bath	West	68	
	Bath	South	68	
	KLD	South	67	
	Stairs		52	
2nd_B_U21_I	Balcony KLD	North	57	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and
	KLD	East	56	
	Bath	East	60	

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	Bath	South	65	therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	Bed	South	66	
	Stairs		55	
2nd_B_U22_J	Balcony KLD	North	55	
	Bed	South	66	
	Bath	South	67	
	Stairs		55	
2nd_B_U23_J	Balcony KLD	North	59	
	Bed	South	67	
	Bath	South	68	
	Stairs		56	
2nd_B_U24_I	Balcony KLD	North	57	
	KLD	West	69	
	Bath	West	70	
	Bath	South	69	
	KLD	South	68	
	Stairs		56	
Lvl_Bld_No_Type	**ROOM**	**FAÇADE**	**2041 LAeq, DAY**	**2041 LAeq, NIGHT**

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TABLE 1T.C – TRAFFIC NOISE ASSESSMENT BUILDING C

Lvl_Bld_No_Type	ROOM	FAÇADE	2041 LAeq,DAY	2041 LAeq,NIGHT
Gnd_C_U25_A	Front Crt Yrd KLD	North	51	
	Front Crt Yrd Bed1	West	51	
	Bed1	North	51	
	Bed 2 part Bath	East	56	
	Rear Crt Yrd Bed2	South & West	51	
	Rear Crt Yrd KLD	South	51	
Gnd_C_U26_B	Front Crt Yrd KLD	North	52	
	Front Crt Yrd Bed1	West	52	
	Bed1	North	52	
	Rear Crt Yrd Bed2	South & West	50	
	Rear Crt Yrd KLD	South	50	
Gnd_C_U27_B	Front Crt Yrd KLD	North	45	
	Front Crt Yrd Bed1	West	45	
	Bed1	North	53	
	Rear Crt Yrd Bed2	South & West	50	
	Rear Crt Yrd KLD	South	50	
Gnd_C_U28_B	Front Crt Yrd KLD	North	54	
	Front Crt Yrd Bed1	West	54	
	Bed1	North	54	
	Rear Crt Yrd Bed2	South & West	50	
	Rear Crt Yrd KLD	South	50	
Gnd_C_U29_B	Front Crt Yrd KLD	North	57	
	Front Crt Yrd Bed1	West	57	
	Bed1	North	57	
	Bed1	East	54	
	Rear Crt Yrd Bed2	South & West	52	
	Rear Crt Yrd KLD	South	52	
Gnd_C_U30_B	Front Crt Yrd KLD	North	59	
	Front Crt Yrd Bed1	West	59	
	Bed1	North	59	
	Bed1	East	57	
	Rear Crt Yrd Bed2	South & West	51	
	Rear Crt Yrd KLD	South	51	
Gnd_C_U31_B	Front Crt Yrd KLD	North	61	
	Front Crt Yrd Bed1	West	61	
	Bed1	North	61	
	Bed1	East	59	
	Rear Crt Yrd Bed2	South & West	47	
	Rear Crt Yrd KLD	South	47	
Gnd_C_U32_C	Front Crt Yrd KLD	North	64	
	Front Crt Yrd Bed1	West	64	
	Bed1	North	63	
	Bed1	East	61	
	Rear Crt Yrd Bed2	South & West	65	
	Rear Crt Yrd KLD	South	66	

LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment

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	KLD	West	67	
1st_C_U33_D	Front Crt Yrd KLD	North	54	
	Front Crt Yrd Bed1	West	54	
	Bed1	North	53	
	Bed 2_part Bath	East	59	
	Rear Crt Yrd Bed2	South & West	56	
	Rear Crt Yrd KLD	South	56	
1st_C_U34_E	Front Crt Yrd KLD	North	54	
	Front Crt Yrd Bed1	West	54	
	Bed1	North	54	
	Rear Crt Yrd Bed2	South & West	55	
	Rear Crt Yrd KLD	South	55	
1st_C_U35_E	Front Crt Yrd KLD	North	51	
	Front Crt Yrd Bed1	West	51	
	Bed1	North	55	
	Rear Crt Yrd Bed2	South & West	55	
	Rear Crt Yrd KLD	South	55	
1st_C_U36_E	Front Crt Yrd KLD	North	57	
	Front Crt Yrd Bed1	West	57	
	Bed1	North	56	
	Rear Crt Yrd Bed2	South & West	56	
	Rear Crt Yrd KLD	South	56	
1st_C_U37_E	Front Crt Yrd KLD	North	59	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	Front Crt Yrd Bed1	West	59	
	Bed1	North	59	
	Bed1	East	56	
	Rear Crt Yrd Bed2	South & West	56	
	Rear Crt Yrd KLD	South	56	
1st_C_U38_E	Front Crt Yrd KLD	North	61	
	Front Crt Yrd Bed1	West	61	
	Bed1	North	61	
	Bed1	East	59	
	Rear Crt Yrd Bed2	South & West	56	
	Rear Crt Yrd KLD	South	56	
1st_C_U39_E	Front Crt Yrd KLD	North	62	
	Front Crt Yrd Bed1	West	62	
	Bed1	North	62	
	Bed1	East	61	
	Rear Crt Yrd Bed2	South & West	56	
	Rear Crt Yrd KLD	South	56	
1st_C_U40_F	Front Crt Yrd KLD	North	66	
	Front Crt Yrd Bed1	West	66	
	Bed1	North	64	
	Bed1	East	62	
	Rear Crt Yrd Bed2	South & West	67	
	Rear Crt Yrd KLD	South	67	
	KLD	West	69	
Lvl_Bld_No_Type	**ROOM**	**FAÇADE**	**2041 LAeq, DAY**	**2041 LAeq, NIGHT**

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TABLE 1T.D – TRAFFIC NOISE ASSESSMENT BUILDING D

Lvl_Bld_No_Type	ROOM	FAÇADE	2041 LAeq, DAY	2041 LAeq, NIGHT
Gnd_D_U41_G	Balcony KLD	East	54	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	KLD	North	65	
	Bath	North	65	
	Bath	West	69	
	Bed	West	69	
	Stairs		52	
Gnd_D_U42_H	Balcony KLD	East	54	
	Bed	West	69	
	Bath	West	69	
	Stairs		52	
Gnd_D_U43_H	Balcony KLD	East	55	
	Bed	West	68	
	Bath	West	68	
	Stairs		54	
Gnd_D_U44_G	Balcony KLD	East	54	
	Bed	West	68	
	Bath	West	69	
	Bath	South	67	
	KLD	South	66	
	Stairs		54	
1st_D_U45_I2	Balcony KLD	East	55	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	KLD	North	66	
	Bath	North	68	
	Bath	West	70	
	Bed	West	70	
	Stairs		54	
1st_D_U46_J2	Balcony KLD	East	55	
	Bed	West	70	
	Bath	West	70	
	Stairs		54	
1st_D_U47_J2	Balcony KLD	East	56	
	Bed	West	70	
	Bath	West	70	
	Stairs		56	
1st_D_U48_I2	Balcony KLD	East	56	
	Bed	West	70	
	Bath	West	70	
	Bath	South	68	
	KLD	South	67	
	Stairs		56	
2nd_D_U49_I2	Balcony KLD	East	58	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and
	KLD	North	67	
	Bath	North	69	

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	Bath	West	71	therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	Bed	West	71	
	Stairs		57	
2nd_D_U50_J	Balcony KLD	East	59	
	Bed	West	70	
	Bath	West	70	
	Stairs		57	
2nd_D_U51_J2	Balcony KLD	East	60	
	Bed	West	70	
	Bath	West	70	
	Stairs		60	
2nd_D_U52_I2	Balcony KLD	East	60	
	Bed	West	70	
	Bath	West	71	
	Bath	South	69	
	KLD	South	67	
	Stairs		60	
Lvl_Bld_No_Type	**ROOM**	**FAÇADE**	**2041 LAeq, DAY**	**2041 LAeq, NIGHT**

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TABLE 1T.E – TRAFFIC NOISE ASSESSMENT BUILDING E

Lvl_Bld_No_Type	ROOM	FAÇADE	2041 LAeq, DAY	2041 LAeq, NIGHT
Gnd_E_U53_G	Balcony KLD	North	50	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	KLD	West	66	
	Bath	Wes	66	
	Bath	South	66	
	Bed	South	66	
	Stairs		39	
Gnd_E_U54_H	Balcony KLD	North	55	
	Bed	South	65	
	Bath	South	65	
	Stairs		39	
Gnd_E_U55_H	Balcony KLD	North	52	
	Bed	South	64	
	Bath	South	64	
	Stairs		43	
Gnd_E_U56_G	Balcony KLD	North	52	
	Bed	South	64	
	Bath	South	64	
	Bath	East	62	
	KLD	East	58	
	Stairs		43	
1st_E_U57_I	Balcony KLD	North	52	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	KLD	West	67	
	Bath	West	68	
	Bath	South	68	
	Bed	South	68	
	Stairs		40	
1st_E_U58_J	Balcony KLD	North	56	
	Bed	South	67	
	Bath	South	67	
	Stairs		40	
1st_E_U59_J	Balcony KLD	North	54	
	Bed	South	66	
	Bath	South	66	
	Stairs		43	
1st_E_U60_I	Balcony KLD	North	53	
	Bed	South	66	
	Bath	South	66	
	Bath	East	64	
	KLD	East	60	
	Stairs		43	
2nd_E_U61_I	Balcony KLD	North	54	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and
	KLD	West	68	
	Bath	Wes	69	

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	Bath	South	69	therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	Bed	South	68	
	Stairs		43	
2nd_E_U62_J	Balcony KLD	North	56	
	Bed	South	68	
	Bath	South	68	
	Stairs		43	
2nd_E_U63_J	Balcony KLD	North	56	
	Bed	South	67	
	Bath	South	67	
	Stairs		39	
2nd_E_U64_I	Balcony KLD	North	54	
	Bed	South	67	
	Bath	South	67	
	Bath	East	65	
	KLD	East	62	
	Stairs		39	
Lvl_Bld_No_Type	**ROOM**	**FAÇADE**	**2041 LAeq, DAY**	**2041 LAeq, NIGHT**

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TABLE 1T.F – TRAFFIC NOISE ASSESSMENT BUILDING F

Lvl_Bld_No_Type	ROOM	FAÇADE	2041 LAeq, DAY	2041 LAeq, NIGHT
Gnd_F_U65_G	Balcony KLD	North	53	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	KLD	West	59	
	Bath	Wes	61	
	Bath	South	64	
	Bed	South	64	
	Stairs		37	
Gnd_F_U66_H	Balcony KLD	North	45	
	Bed	South	65	
	Bath	South	65	
	Stairs		37	
Gnd_F_U67_H	Balcony KLD	North	56	
	Bed	South	65	
	Bath	South	65	
	Stairs		39	
Gnd_F_U68_G	Balcony KLD	North	48	
	Bed	South	66	
	Bath	South	67	
	Bath	East	67	
	KLD	East	66	
	Stairs		39	
1st_F_U69_I	Balcony KLD	North	56	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated by LAeq,DAY so it is not relevant for the traffic noise assessment
	KLD	West	60	
	Bath	West	63	
	Bath	South	66	
	Bed	South	67	
	Stairs		37	
1st_F_U70_J2	Balcony KLD	North	47	
	Bed	South	67	
	Bath	South	67	
	Stairs		37	
1st_F_U71_J2	Balcony KLD	North	58	
	Bed	South	67	
	Bath	South	68	
	Stairs		38	
1st_F_U72_I2	Balcony KLD	North	52	
	Bed	South	68	
	Bath	South	69	
	Bath	East	70	
	KLD	East	68	
	Stairs		38	
2nd_F_U73_I2	Balcony KLD	North	58	LAeq,NIGHT is -14 dB(A) lower than LAeq,DAY and therefore is dominated
	KLD	West	62	
	Bath	Wes	64	

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	Bath	South	67	by LAeq,DAY so it is not relevant for the traffic noise assessment
	Bed	South	68	
	Stairs		40	
2nd_F_U74_J2	Balcony KLD	North	49	
	Bed	South	68	
	Bath	South	68	
	Stairs		40	
2nd_F_U75_J2	Balcony KLD	North	59	
	Bed	South	69	
	Bath	South	68	
	Stairs		42	
2nd_F_U76_2I	Balcony KLD	North	54	
	Bed	South	69	
	Bath	South	69	
	Bath	East	70	
	KLD	East	69	
	Stairs		42	
Lvl_Bld_No_Type	**ROOM**	**FAÇADE**	**2041 LAeq, DAY**	**2041 LAeq, NIGHT**

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APPENDIX 2 to ANNEX T – DAY MODELLING

2T.0 This annex contains the outcomes of the day modelling showing the result are significant compared to the night modelling results. The figures 2T.0, 2T.1 and 2T.2 show the combined effects of the two roads which is what is used for determining the Quiet House Packages.

2T.1 Appendix 2 to ANNEX T contains the following figures:

- **FIGURE 2T.0 – DAY MODEL GROUND FLOOR**

- FIGURE 2T.0 (MR) – DAY MODEL GND FLOOR MANDURAH RD CONTRIBUTION

- FIGURE 2T.0 (OCR) – DAY MODEL GND FLOOR OLD COAST RD CONTIBUTION.

- **FIGURE 2T.1 – DAY MODEL 1ST FLOOR**

- FIGURE 2T.1 (MR) – DAY MODEL 1ST FLOOR MANDURAH RD CONTRIBUTION

- FIGURE 2T.1 (OCR) – DAY MODEL 1ST FLOOR OLD COAST RD CONTIBUTION.

- **FIGURE 2T.2 – DAY MODEL 2ND FLOOR**

- FIGURE 2T.2 (MR) – DAY MODEL 2ND FLOOR MANDURAH RD CONTRIBUTION

- FIGURE 2T.2 (OCR) – DAY MODEL 2ND FLOOR OLD COAST RD CONTIBUTION.

2T.2 The following are noted:

a. Noise contours are 1.4m above floor levels as per SPP5.4 requirements.

b. Day time packages are substantially higher than Night time packages therefore daytime packages ‘the higher packages’ are required to be complied with as per the recommendations.

c. The three noise models 2T.0, 2T.1 and 2T.2 are the combined Mandurah Rd and Old Coast Rd. The other six noise models are the individual contributions for Mandurah Rd and the Old Coast.

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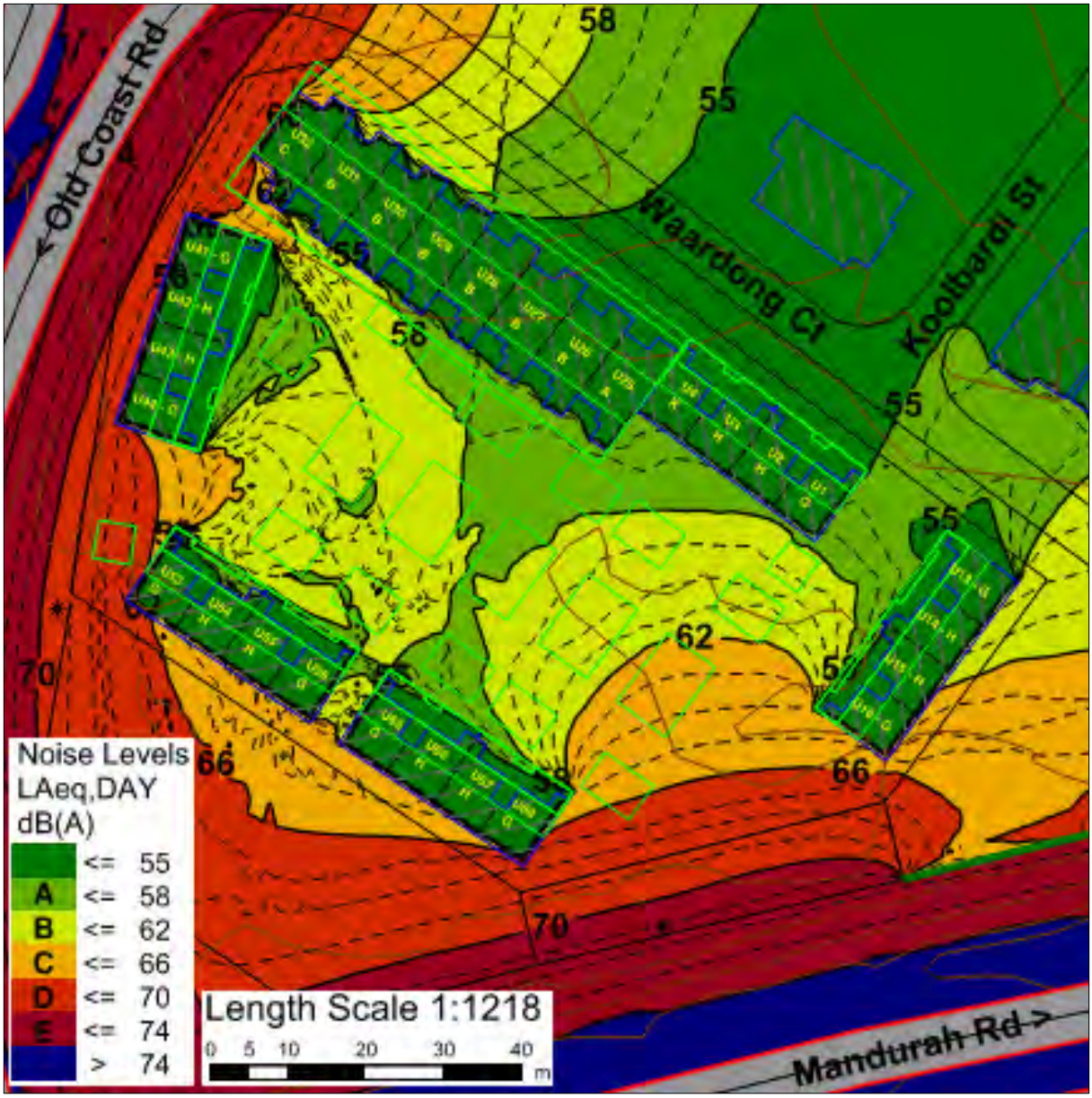

FIGURE 2T.0 – DAY MODEL GND FLOOR

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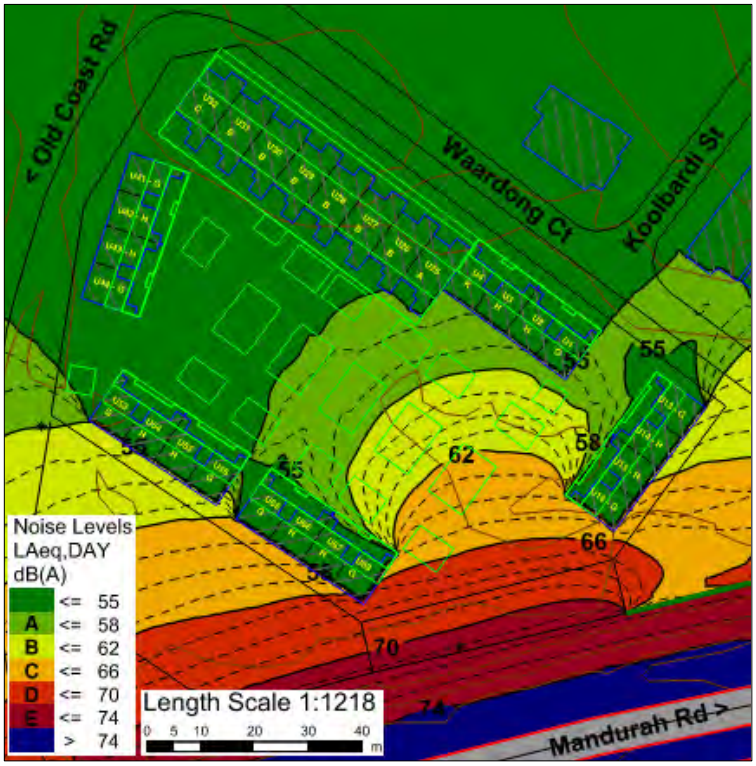

FIGURE 2T.0 (MR) – DAY MODEL GND FLOOR MANDURAH RD CONTRIBUTION

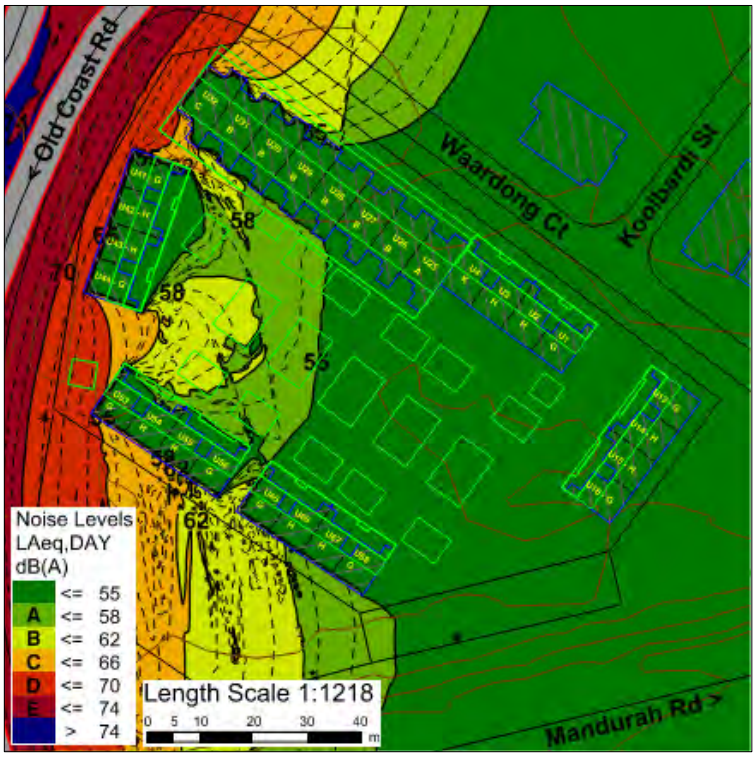

FIGURE 2T.0 (OCR) – DAY MODEL GND FLOOR OLD COAST RD CONTIBUTION

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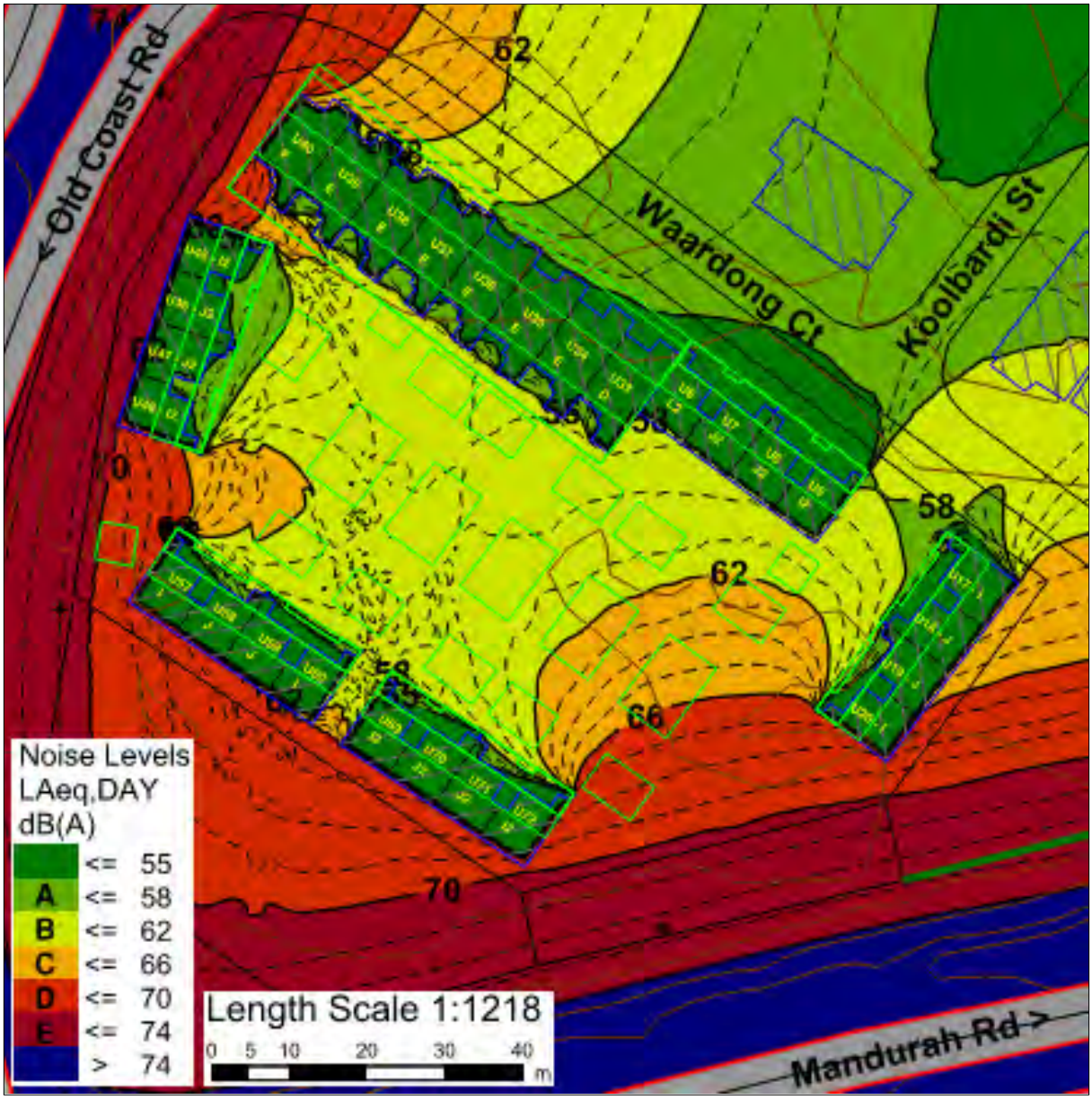

FIGURE 2T.1 – DAY MODEL 1ST FLOOR

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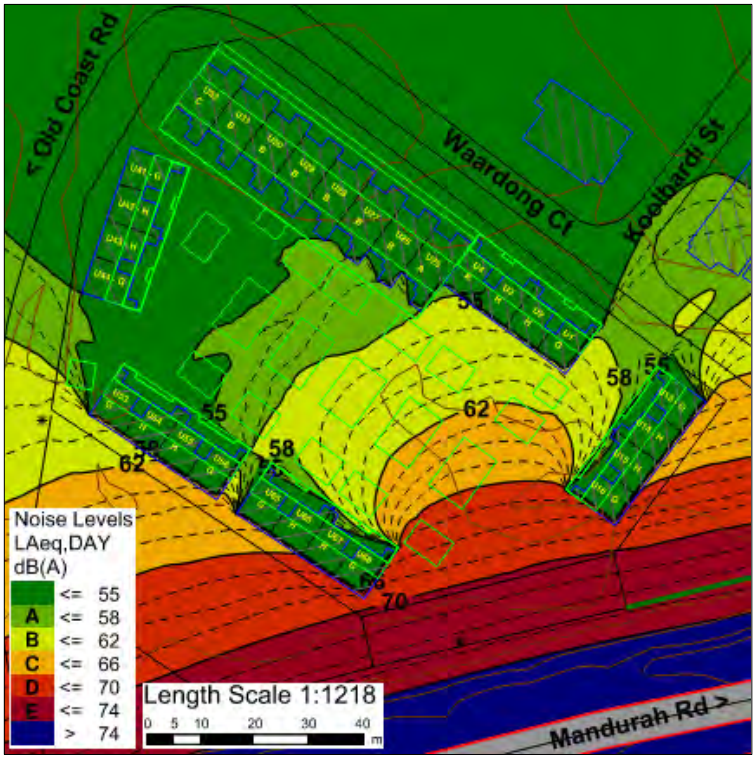

FIGURE 2T.1 (MR) – DAY MODEL 1ST FLOOR MANDURAH RD CONTRIBUTION

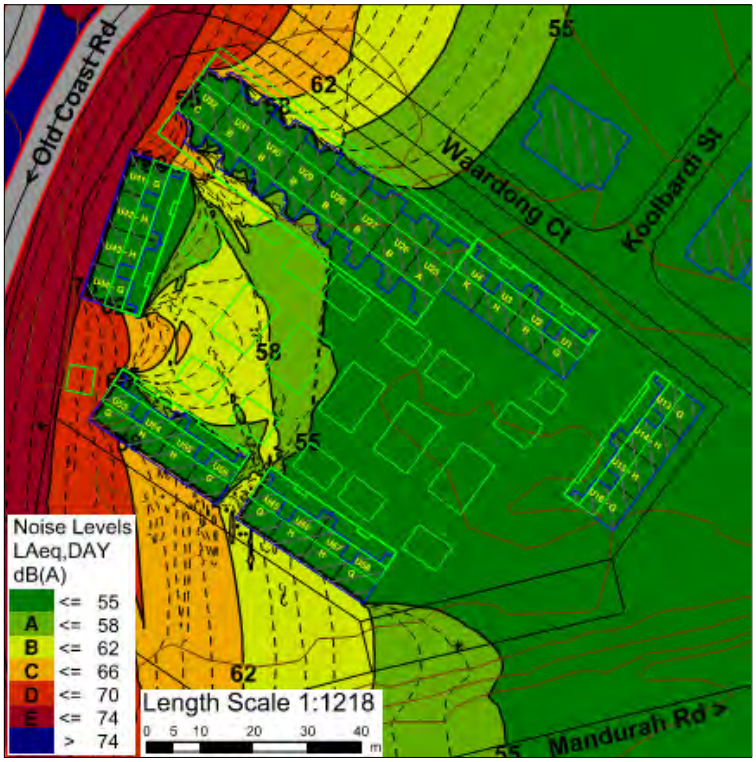

FIGURE 2T.1 (OCR) – DAY MODEL 1ST FLOOR OLD COAST RD CONTIBUTION

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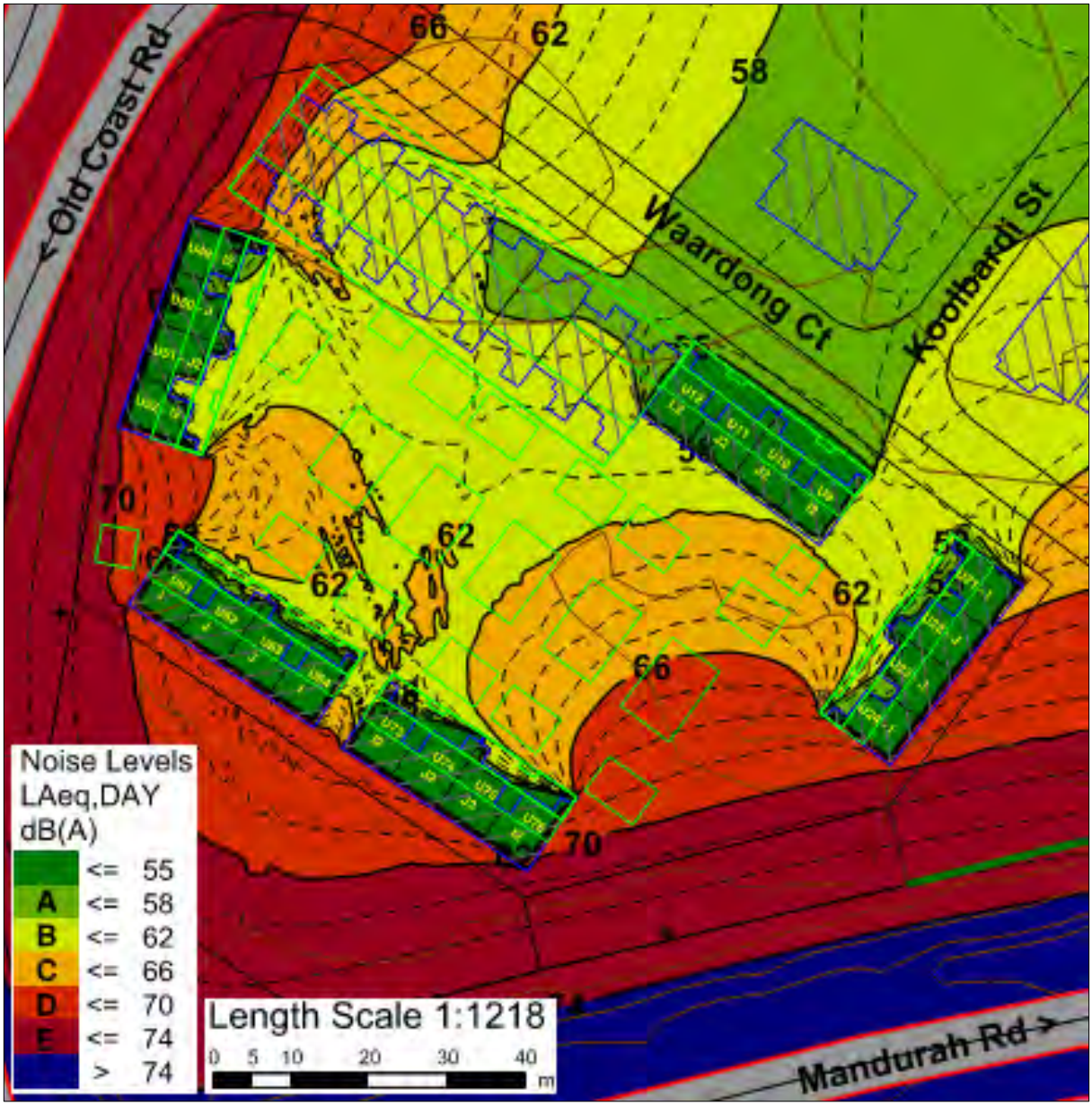

FIGURE 2T.2 – DAY MODEL 2ND FLOOR

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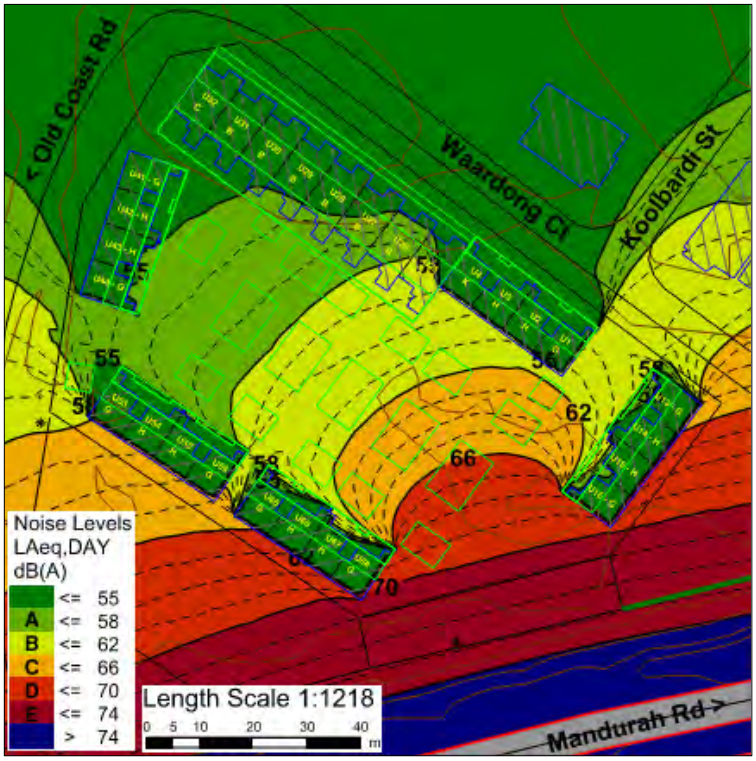

FIGURE 2T.2 (MR) – DAY MODEL 2ND FLOOR MANDURAH RD CONTRIBUTION

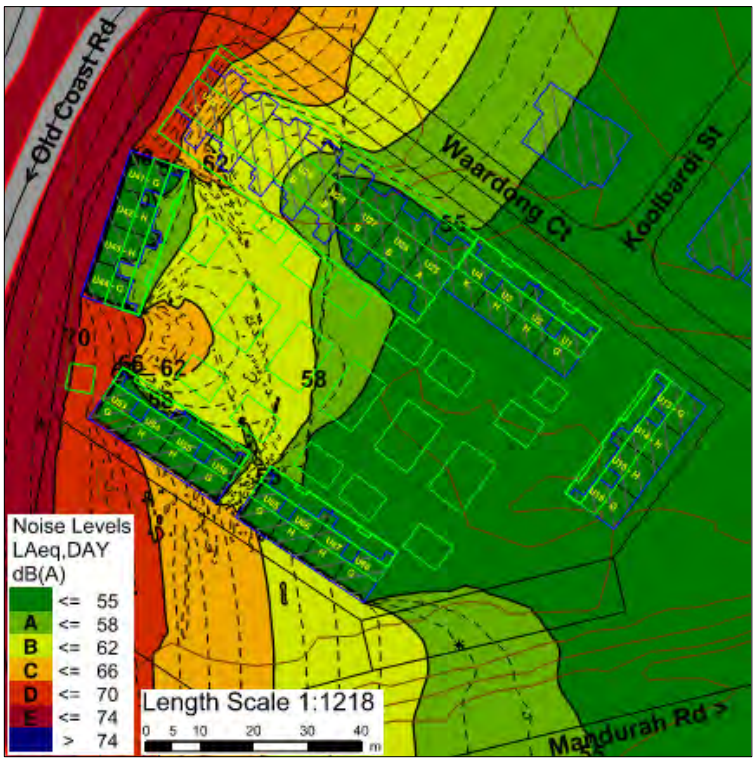

FIGURE 2T.2 (OCR) – DAY MODEL 2ND FLOOR OLD COAST RD CONTIBUTION

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APPENDIX 3 to ANNEX T – NIGHT MODELLING

3T.0 This annex contains the outcomes of the night modelling showing the result are not significant compared to the day modelling results.

3T.1 Appendix 3 to ANNEX T contains the following figures:

- FIGURE 3T.0 – NIGHT MODEL GND FLOOR.

- FIGURE 3T.1 – NIGHT MODEL 1ST FLOOR.

- FIGURE 3T.2 – NIGHT MODEL 2ND FLOOR.

3T.2 The following are noted:

a. Noise contours are 1.4m above floor levels as per SPP5.4 requirements.

b. Night time packages are substantially lower than Day time packages therefore daytime packages 'the higher packages' are required to be complied with as per the recommendations.

c. The three noise models are the combined Mandurah Rd and Old Coast Rd.

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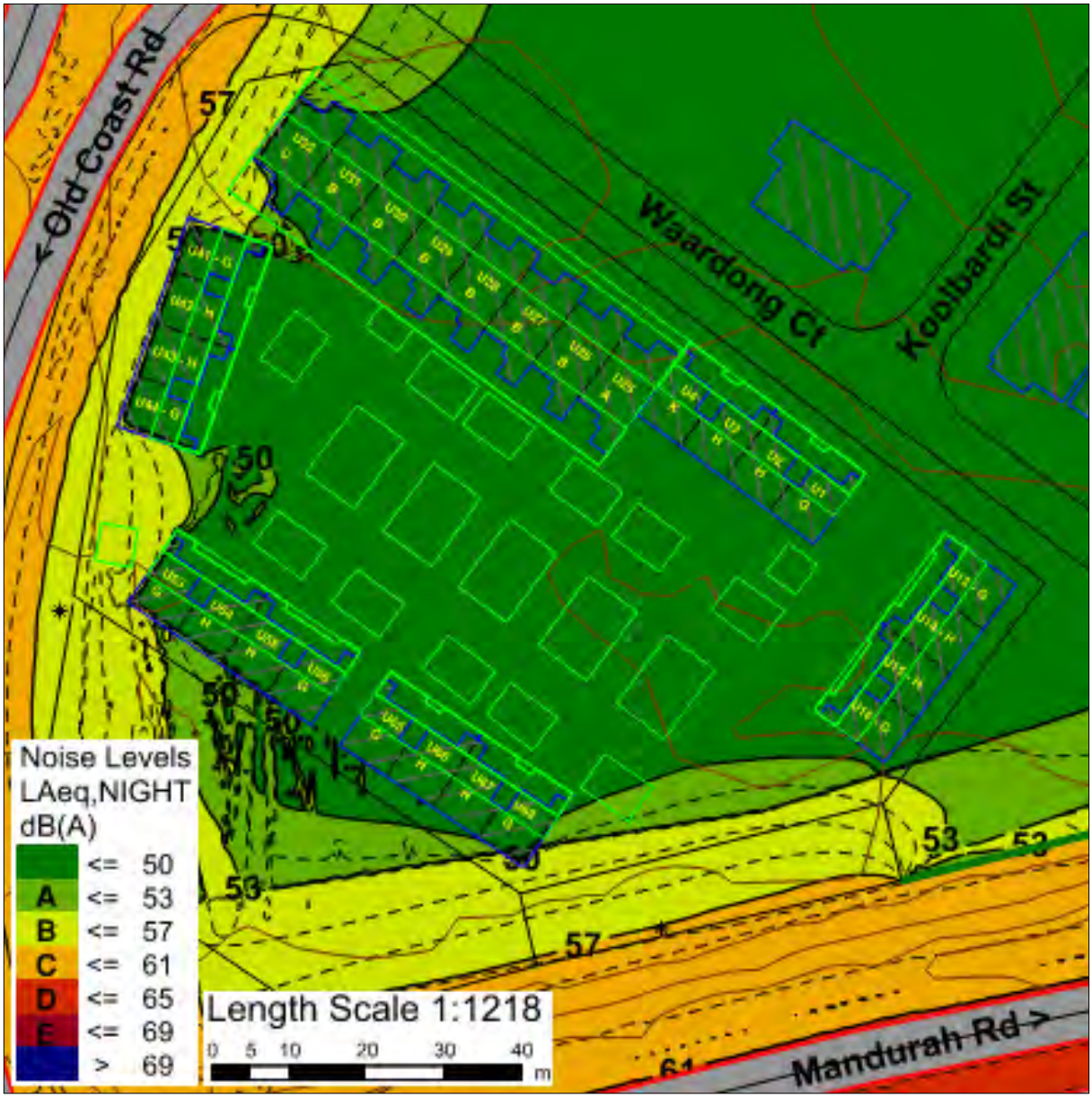

FIGURE 3T.0 – NIGHT MODEL GND FLOOR

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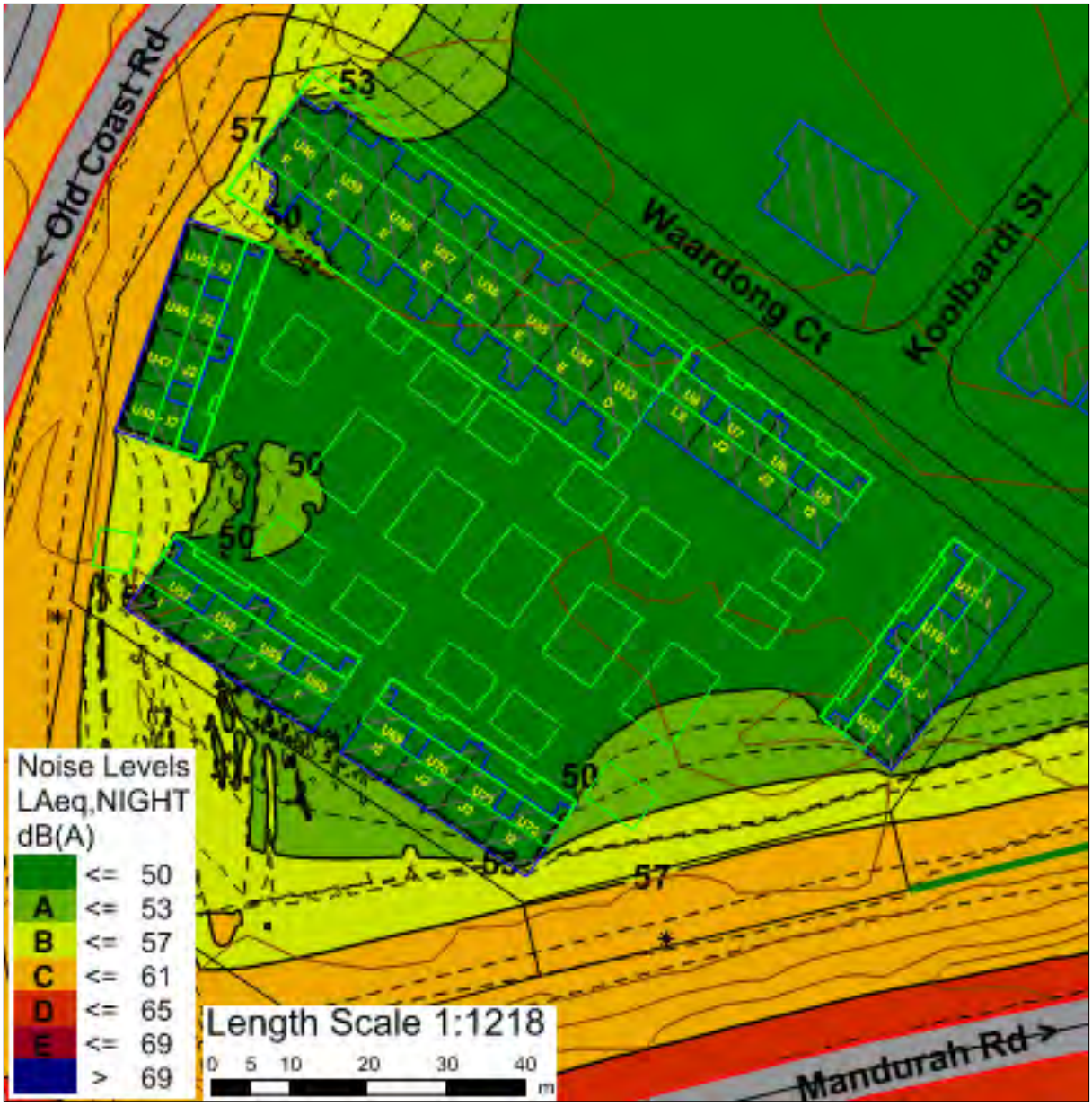

FIGURE 3T.1 – NIGHT MODEL 1ST FLOOR

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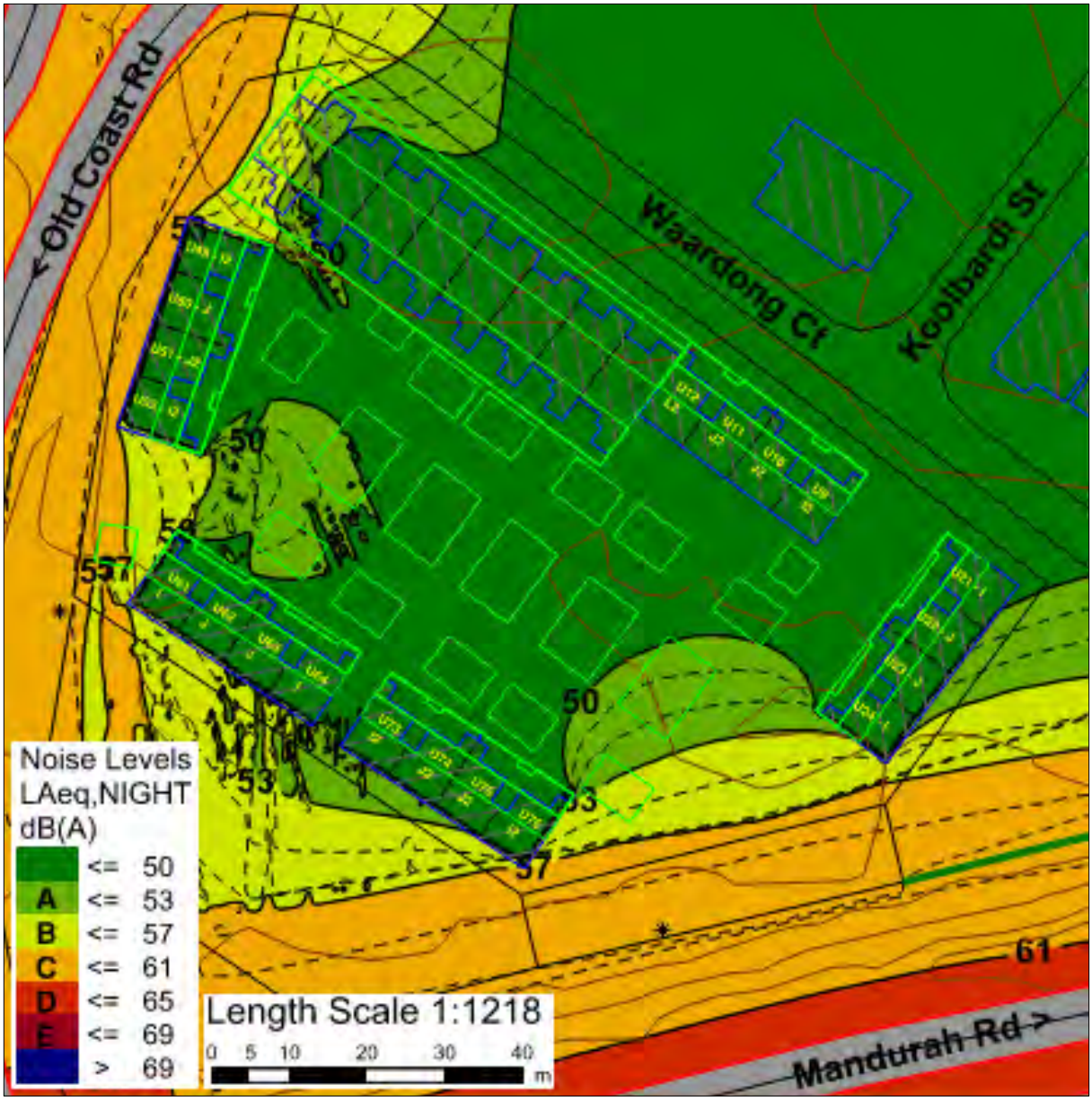

FIGURE 3T.1 – NIGHT MODEL 2ND FLOOR

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TRANSPORT IMPACT STATEMENT

No 4 (Lot 812) Waardong Court,

Halls Head

November 2024

Rev A

kctt

PART OF Premise

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

HISTORY AND STATUS OF THE DOCUMENT

Revision	Date issued	Reviewed by	Approved by	Date approved	Revision type
Rev A Draft	15.11.2024	M Kleyweg	M Kleyweg	15.11.2024	Issued for Review
Rev A	18.11.2024	M Kleyweg	M Kleyweg	15.11.2024	Proposed layout amended

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Revision	Date of issue	Quantity	Issued to
Rev A Draft	15.11.2024	1 (PDF)	Rachelle Capiral (Yaran Property Group)
Rev A	18.11.2024	1 (PDF)	Rachelle Capiral (Yaran Property Group)

Document Printed	18/11/2024 10:58 AM	
File Name	C:\Users\User\Box\KCTT Projects\KC00000 Current Projects\KC01948.000 4 Waardong Court, Halls Head TIS\Outgoing\Report\241118 Rev A\KC01948.000 4 Waardong Court, Halls Head.docx	
Author of the Rev A Draft	Jelena Simic	
Author of the Current Revision	Jelena Simic	
Project Team	/	
Project Director / Project Manager	Marina Kleyweg	
Name of Project	KC01948.000 No 4 (Lot 812) Waardong Court, Halls Head	
Name of the Document	KC01948.000 No 4 (Lot 812) Waardong Court, Halls Head	- Transport Impact Statement
Document Version	KC01948.000_R01_ Rev A	

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Appendices

Appendix 1 - The layout of the proposed development
Appendix 2 - Transport Planning and Traffic Plans
Appendix 3 - Vehicle Turning Circle Plans

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1. Executive Summary

Site Context

- The subject Lot 2 is currently vacant. It is located at the south-east corner of Waardong Court and Old Coast Road in a Residential zone under The City of Mandurah's Interactive Mapping.
- The development proposal is for 76 dwelling units, consisting of 16 two-storey units and 60 three-storey units. Access to the site is via Waardong Court. Proposed development plans are enclosed in Appendix 1.

Technical Findings

- Vehicle swept path analysis has been completed for the B99 (5.2m) passenger vehicle and Ambulance vehicle (6.945m). No departures from the standards nor navigability issues have been identified through the analysis. Please refer to the swept path analysis plans enclosed in Appendix 3.
- Waste removal vehicles servicing the proposed residential area will not require designated parking spaces, given that the garbage truck is not planned to utilise the proposed subject site area.

Relationship with Policies

- The development requires a total of 87 car parking bays, as stipulated by the State Plan. The proposed plans include only 89 car bays, resulting in a nominal surplus of 2 bays. KCTT part of Premise is confident that the proposed parking provision will sufficiently meet the needs of the development. A detailed analysis of this assessment is provided in Section 2.8 of this report.
- Building Code of Australia ACROD Provision – Given there are no accessible units proposed within the development, there is no requirement for provision of ACROD parking.
- KCTT reviewed the proposed development layout and concluded that car parking bays dimensions and aisle width generally comply with the Australian Standard AS/NZS 2890.1/2004.

Conclusion

- Waardong Court is classified as Access Road as per MRWA classification with the maximum desirable volume of 3,000 vehicles per day. Currently the existing traffic volume on this road is unknown; however it is expected to be very low (>1,000 VPD) given that Waardong Court is a cul-de-sac road. The proposed development will generate traffic on daily level equivalent of 12% of the nominal capacity, therefore, it is expected that the impact can be easily accommodated.
- Other surrounding roads would absorb significantly less traffic than Waardong Court, moreover, the traffic would be dispersed so that the impact can be considered negligible. It is anticipated that the traffic from Waardong Court will continue on Old Mandurah Road, which currently carries over 24,000 vehicles per day. The traffic generated by the proposed development will be approximately 1.4% of the existing traffic on Old Mandurah Road.
- In summary, KCTT part of Premise believe that the existing road network can cater to the additional traffic generated by the proposed development.

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2. Transport Impact Statement

2.1 Proposal

KCTT has been engaged by Yaran Property Group to prepare a Transport Impact Statement (TIS) for a proposed Multiple Unit Dwelling (MUD) residential development at 4 Waardong Court, Halls Head. The development application (DA) will be submitted to City of Mandurah.

This report will primarily address the level impact of the proposed development and the requirements for integration of the proposed development with the surroundings, namely the existing and planned immediate road network.

2.2 Location

Lot Number	812
Street Number	4
Road Name	Waardong Court
Suburb	Halls Head
Description of Site	The subject site is located at the south-east corner of Waardong Court and Old Coast Road in a Residential zone under The City of Mandurah's Interactive Mapping. Currently it is an undeveloped (vacant land). The development proposal is for 76 dwelling units, consisting of 16 two-storey units and 60 three-storey units. Access to the site is via Waardong Court.

2.3 Technical Literature Used

Local Government Authority	City of Mandurah
Type of Development	Residential development
Are the R-Codes referenced? *If YES, nominate which*:	YES State Planning Policy 7.3 Residential Design Codes Volume 2 – Apartments – 2024
Is the NSW RTA Guide to Traffic Generating Developments Version 2.2 October 2002 (referenced to determine trip generation / attraction rates for various land uses) referenced?	YES
Which WAPC Transport Impact Assessment Guideline should be referenced?	Volume 4 - Individual Developments
Are there applicable LGA schemes for this type of development? *If YES, Nominate*: Name and Number of Scheme	YES Local Planning Scheme No.12 (Updated to include AMD 1 GG 3/10/2023)
Are Austroads documents referenced?	YES

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2.4 Land Uses

Are there any existing Land Uses	NO
If YES, Nominate:	At present the subject site is vacant.

Proposed Land Uses	
How many types of land uses are proposed?	One - Residential Grouped Dwelling Development
Nominate land use type and yield	• 2- storey 2x2 SDAs - 16 dwellings • 3- storey studio units (dual key) - 60 dwellings Total 76 dwellings
Are the proposed land uses complementary with the surrounding land-uses?	YES. The subject site is Zoned Residential R30/R80 according to the City of Mandurah's Local Planning Scheme No.12. Proponent is applying for R80.

2.5 Local Road Network Information

How many roads front the subject site? 2

Name of Roads Fronting Subject Site / Road Classification and Description:

Road Name	**Waardong Road**
Number of Lanes	two way, one lane each direction, undivided
Road Reservation Width	15.5m
Road Pavement Width	6.5m
Classification	Access Road
Speed Limit	Assumed 50kph as information is currently not available on MRWA site
Bus Route	NO
On-street parking	NO

Road Name	**Old Coast Road (north of Mandurah Road)**
Number of Lanes	two way, one lane per direction, divided; (between Mandurah Road and Leisure Way two lanes per direction)
Road Reservation Width	40m
Road Pavement Width	Varies from 7.5m per direction
Classification	Distributor B
Speed Limit	60kph
Bus Route	NO (not in the vicinity of the proposed development)
On-street parking	NO

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Name of Other Roads within 400m radius of site, or roads likely to take increased traffic due to the development:

Road Name	**Mandurah Road / Old Coast Road (west of Mandurah Road)**
Number of Lanes	two way, two lanes per direction, divided
Road Reservation Width	60.0m
Road Pavement Width	10.5m per direction inclusive of bicycle lanes
Classification	Primary Distributor
Speed Limit	70kph
Bus Route	YES
If YES Nominate Bus Routes	593, 594
On-street parking	NO

2.6 Traffic Volumes

Road Name	Location of Traffic Count	Vehicles Per Day (VPD)	Vehicles per Peak Hour (VPH)		Heavy Vehicle %	Date of Traffic Count	*If older than 3 years multiply with a growth rate*
			AM Peak Time - AM Peak VPH	PM Peak Time - PM Peak VPH	*If HV count is Not Available, are HV likely to be in higher volumes than generally expected?*		
Old Coast Road	North of Mandurah Road*	24,649	09:00 –2,250	16:00 – 1,933	–	Jun 2023	–
	West of Mandurah Road*	34,584	09:00 – 2,753	16:00 – 3,227	–	Jun 2023	–
	West of Mandurah Road (SLK 12.87)	44,119	07:45 – 3,582	15:15 – 3,921	8.2%	2021 /22	–
Mandurah Road	East of Old Coast Road (SLK 12.37)	34,701	11:00 – 2,510	15:00 – 2,857	9.9%	2023 /24	–
	East of Old Coast Road*	31,017	09:00 – 2,351	16:00 – 2,880	–	Jun 2023	–
Pinjarra Road	West of Mandurah Terace (SLK 0.40)	24,573	07:45 – 2,092	15:00 – 2,048	7.8	2021 /22	–

Note - These traffic volumes have been derived from SCATS data obtained through Main Roads for the intersection of Mandurah Road and Old Coast Road. Although SCATS should not be used as a sole source of data it is a good tool to verify fluctuations in flow.*

2.7 Vehicular Crash Information

Is Crash Data Available on Main Roads WA website?	YES
If YES, nominate important survey locations:	
Location 1	Intersection of Old Coast Road & Rutland Drive
Location 2	Intersection of Old Coast Road & Mandurah Road
Period of crash data collection	01/01/2019 - 31/12/2023

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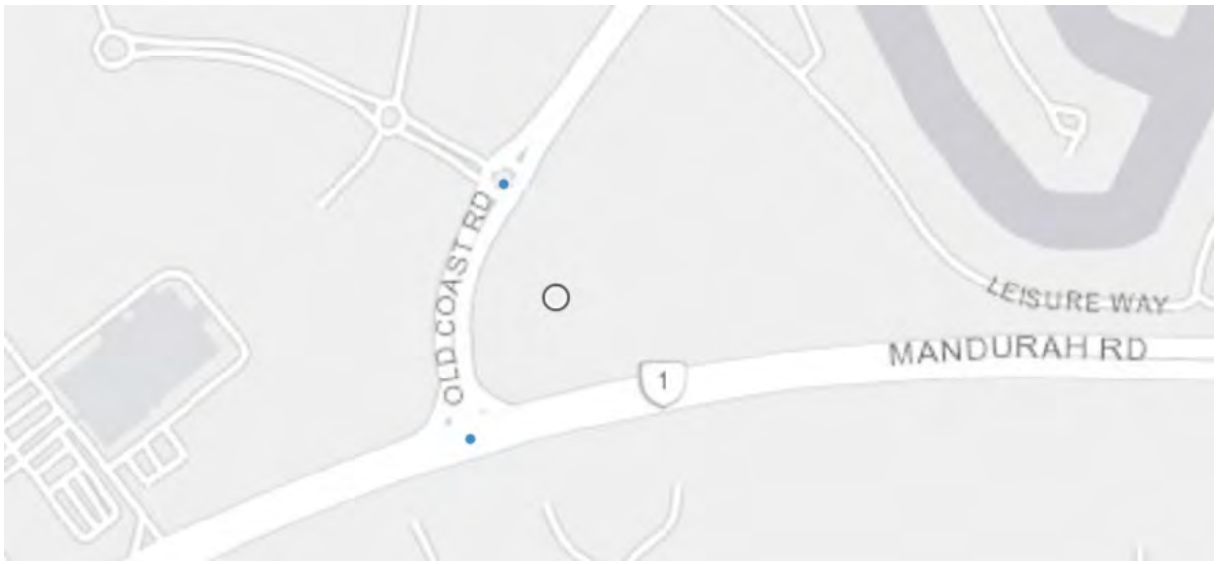

The following tables shows crash rates and crash densities in Perth Metropolitan area on local roads and state roads for the period from 2018 to 2022, as obtained from Main Roads WA on the 31st May 2022 by email request:

Crash Density and Crash Rate on Metropolitan State Roads Network only

	All Crashes		Serious Injury Crashes (Fatal+Hospital)	
	Average Annual Crash Density (All Crashes/KM)	Average Annual Crash Rate (All Crashes/MVKT)	Average Annual Crash Density (Ser. Inj. Crashes/KM)	Average Annual Crash Rate (Ser. Inj. Crashes/MVKT)
Metro State Roads - Midblock	20.12	0.37	0.89	0.02
Metro State Roads - All	46.28	0.85	1.80	0.03

Note: Based on 5-years data for the period 2017 to 2021.

Definitions of acronyms and terms used in this analysis can be found below:

- *PDO Crash - a crash that results in property damage only (major or minor) and does not require hospitalisation or medical treatment, as listed in Main Roads WA's Crash Analysis Reporting System (CARS).*
- *KSI Crashes - Killed and serious injury crash*
- *MVKT - Million Vehicle Kilometres Travelled.*

Intersection Name	Road Hierarchy	Speed Limit	Crash Statistics			
			No of KSI Crashes	No of Medical Attention Crashes	No of PDO Major Crashes	No of PDO Minor Crashes
Old Coast Road & Rutland Drive	Distributor B / Access Road	60kph / 50kph	0	0	5	1
No of MVKT Travelled at Location		App. 27,000 VPD * 365 * 5 years * 0.3 km = 14.78 MVKT				
KSI Crash Rate		0 KSI crashes/MVKT				
All Crash Rate		6 crashes / 14.78 MVKT = 0.41 crashes/MVKT				
Comparison with Crash Density and Crash Rate Statistics		All crashes rate of 0.41 is lower than the network average of 0.85 Crashes per MVKT for Metropolitan State Roads Network				

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Intersection Name	Road Hierarchy	Speed Limit	Crash Statistics			
			No of KSI Crashes	No of Medical Attention Crashes	No of PDO Major Crashes	No of PDO Minor Crashes
Old Coast Road & Mandurah Road	Distributor B / Primary Distributor	60kph / 70kph	0	5	14	3
No of MVKT Travelled at Location		App. 55,000 VPD * 365 * 5 years * 0.3km = 30.11 MVKT				
KSI Crash Rate		0 KSI crashes/MVKT				
All Crash Rate		22 crashes / 30.11 MVKT = 0.73 crashes/MVKT				
Comparison with Crash Density and Crash Rate Statistics		All crashes rate of 0.73 is lower than the network average of 0.85 Crashes per MVKT for Metropolitan State Roads Network				

In order to identify black spots being the locations noted for a high incidence of crashes involving death and injury, it is important to conduct the crash criteria analysis as shown in the table below. If the below crash criteria are met, there is a way to measure the cost-effectiveness of the proposed treatment. It is called BCR and it ensures that the black spot exhibits a significant number of crashes that are correctable by infrastructure treatment.

Table 3.1: Crash criteria for the State Black Spot Program

Crash Criteria	*Highway and Main Roads*		*Local Roads*	
	Metro	*Rural*	*Metro*	*Rural*
Intersection or Mid-block or Short road section (<3km)	*10 crashes over 5 years*	*3 crashes over 5 years*	*5crashes over 5 years*	*3 crashes over 5 years*
Road length (>3km)	*Average of 3 crashes per km over 5 years*	*Average of 1 crash per km over 5 years*	*Average of 2 crashes per km over 5 years*	*Average of 1 crash per km over 5 years*
Benefit-cost ratio (BCR)	*1*			

(Main Roads/ WALGA 2004)

Both analysed intersections do qualify for a State Black Spot program however, none of them is on listed on official 2024-25 Australian Government Black Spot Program.

2.8 Vehicular Parking

Local Government	City of Mandurah
Local Government Document Utilised	• Local Planning Scheme No. 12 • State Planning Policy 7.3 Residential Design Codes Volume 2, 2024

Description of Parking Requirements in accordance with Scheme:
Local Planning Scheme No. 12 – Schedule 2 Parking Requirements:
" As per R-Codes plus 1 bay for Home Business"

Based on the proposed R80 density code of future residential blocks, the parking requirements from the State Planning Policy 7.3 Residential Design Codes Volume 2, should be used in this assessment.

The car parking requirements for Locations B apply, as per the Table 3.9 from page 55, as follows:

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	Parking types	Location A	Location B
Car Parking[1]	*1 bedroom dwelling*	*0.75 per dwelling*	*1 bay per dwelling*
	2+ bedroom dwelling	*1 bay per dwelling*	*1.25 bays per dwelling*
	Visitor	*1 bay per four dwellings up to 12 dwellings*	
		1 bay per eight dwellings for the 13th dwelling and above	
Motorcycle/scooter parking[2]	*Developments exceeding 20 dwellings provide 1 motorcycle/scooter space for every 10 car bays*		

1 Calculations of parking ratios shall be rounded up to the next whole number.
2 For each five motorcycle/scooter parking bays provided in accordance with Table 3.9, car parking bays may be reduced by one bay.

Definitions:
Location A: *includes all land located within*:
— 800m of a train station on a high-frequency rail route, measured in a straight line from the pedestrian entry to the train station platform to any part of a lot;
— 250m of a high-frequency transit route, or multiple transit routes that if combined have timed stops every 15 minutes during weekday peak periods (7 –9am and 5–7pm), measured in a straight line from along any part of the transit route to any part of the lot; and/or
— within the defined boundaries of an activity centre.

Location B: *not within Location A.*

As there are no specified parking requirements for Serviced apartments or SDA units, based on the analysis and previous experience on other projects of similar nature, KCTT part of Premise adopted a rate of 1 bay per 2 units, which was found adequate to accommodate the car parking requirements of guests and staff.

The calculations that follow indicate car parking requirements in accordance with the State Planning Policy 7.3 Residential Design Codes Volume 2 and based on the adopted rates for comparison.

Calculation of Parking (in accordance with the State Planning Policy 7.3 Residential Design Codes Volume 2)

Land Use	Requirements	Yield	Total Parking
Residential Grouped Dwellings	*1 bay per dwelling*	76 dwellings	76
	1 bay per four dwellings up to 12 dwellings	76 dwellings	3
	1 bay per eight dwellings for the 13th dwelling and above		8
		Total car parking requirements for residents:	**76**
		Total car parking requirements for residential visitors:	**11**
		Total car parking requirements	**87**
		Total Volume of Parking Provided by Proponent	**89**

Inclusive of:
- 63 standard bays for residents
- 26 residential visitor bays.

Justification

The proposed development requires a total of 87 car parking bays in accordance with the State Planning Policy 7.3 Residential Design Codes Volume 2. The proposed development plans show a total of 89 car bays, leading to a nominal surplus of 2 car parking bays.

It should be taken into the consideration that State Planning Policy 7.3 does not provides the specified parking requirements for SDA units. And that the calculation above is based on rates specified for standard residential apartments. By definition *' 'Specialist disability accommodation (SDA) is a range of housing designed for people with extreme functional impairment or very high support needs. SDA dwellings have accessible features to help residents live more independently and allow other supports to be delivered better or more safely.''*

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Based on the analysis and previous experience on other projects of similar nature, KCTT part of Premise found a rate of 1 bay per 2 units, as more appropriate for SDA units and found it adequate to accommodate the car parking requirements of residents and staff members also.

Furthermore, proposed development plans indicate 60 dual-key two-bedroom apartments. Having in mind that each of these apartments in a parking requirements aspect would act as separate units, KCTT adopted a rate of 2 bays per pair of dual-key two-bedroom apartments. This rate for dual key units is normally required by the Council.

The following table illustrates the car parking requirements having all previously mentioned into the consideration.

Calculation of Parking (based on the adopted rates)

Land Use	Requirements	Yield	Total Parking
Residential Grouped Dwellings	*1 bay per dual key dwellings*	60 dual key dwellings	60
	1 bay per 2 dwellings	16 SDAs dwellings	8
	1 bay per four dwellings up to 12 dwellings *1 bay per eight dwellings for the 13th dwelling and above*	76 dwellings	3 8
		Total car parking requirements for residents:	**68**
		Total car parking requirements for residential visitors:	**11**
		Total car parking requirements	**79**

In accordance with the above calculation, proposed development requires a total of 79 car parking bays leading to a surplus of 10 car bays.

Given that the proposed development features more than 20 dwellings, the requirement for the provision of Motorcycle/ Scooter parking bays is triggered.

Land Use	Requirements	Yield	Total Parking
Residential Grouped Dwellings	*1 motorcycle/scooter space for every 10 car bays*	76 dwellings	8
	Total Motorcycle/ Scooter Parking Motorcycle/ Scooter Requirement		**8**

Total Volume of Parking Provided by Proponent	**10**

In accordance with the above calculation, proposed development requires a total of 8 Motorcycle/ Scooter parking bays. The proposed development plans show a total of 10 Motorcycle/ Scooter bays.

Have Vehicle Swept Paths been checked for Parking? YES

If YES, provide description of performance:

Vehicle swept path analysis has been completed for the B99(5.2m) passenger vehicle and Ambulance Mercedes Sprinter (6.945m). The designated vehicle can navigate through the entire parking area and analysis did not reveal any major potential issues.

Please refer to the swept path analysis plans enclosed in Appendix 3.

Is the Traffic Management Plan required? NO

The traffic management system is not necessary; however, KCTT believes it would benefit this development.

The traffic management system can comprise line markings and signs. All car bays need to be clearly allocated with appropriate signs to identify the resident's and visitor's car bays.

Additionally, as the proposed internal road is no – through, access needs to be controlled and/or clearly marked to avoid any ambiguity as it could impact the traffic safety on site.

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2.9 Compliance with AS2890 Parking facilities

Which Austroads documents are referenced?	• Australian/New Zealand Standard, Parking facilities, Part 1: Off-street car parking - AS 2890.01 • Australian/New Zealand Standard, Parking facilities, Part 6: Off-street parking for people with disabilities – AS2890.06
Number of Parking Bays on-site	• 89 bays
Proposed development User Class	• 1A - Residential, domestic and employee parking • 2 - Long-term city and town centre parking, sports facilities, entertainment centres, hotels, motels, airport visitors (generally medium-term parking) • 4 - Parking for people with disabilities

Driveway category and dimensions	• Category 1 access driveway
	  · 6m driveway width
	  · 4.3m driveway length

2.9.1 Compliance Overview

FULL COMPLIANCE | PARTIAL DEPARTURE | FULL DEPARTURE | NOT APPLICABLE

Element	Compliance	Comment
Car Bay Class 1A	FULL COMPLIANCE	
Car Bay Class 1	NOT APPLICABLE	
Car Bay Class 2	FULL COMPLIANCE	
Car Bay Class 3	NOT APPLICABLE	
Car Bay Class 3A	NOT APPLICABLE	
Car Bay Class 4 (ACROD)	NOT APPLICABLE	
Aisle width	FULL COMPLIANCE	
Blind Aisle Extension	NOT APPLICABLE	
Single-sided aisle width	NOT APPLICABLE	
Reversing bay	NOT APPLICABLE	
Driveway grade	NOT APPLICABLE	
Parking grade	NOT APPLICABLE	
Ramp grade	NOT APPLICABLE	
Column's location	NOT APPLICABLE	
Vertical Clearance	NOT APPLICABLE	
Location of driveway	FULL DEPARTURE	The proposed is positioned within a restricted zone according to Australian Standards.
Sight distance requirements at access driveways	FULL COMPLIANCE	
Minimum sight lines for pedestrian safety	FULL COMPLIANCE	

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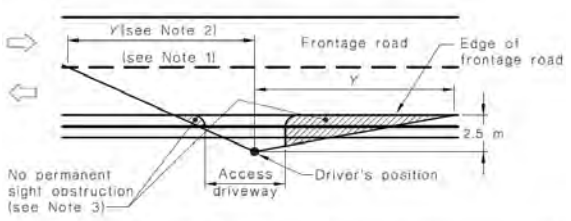
2.9.2 Comparison of proposed layout to AS2890.01 requirements

Parking Bay Type	AS2890.1:2004 Off-street car parking AS2890.6 Off-street parking for people with disabilities					
	Parking Bay Length		Parking Bay Width		Aisle Width	
	Required	Proposed	Required	Proposed	Required	Proposed
All bays at 90° (User Class 1A) **STAFF**	5.4m	5.5m	2.4m	2.5m	5.8m	6.0m
All bays at 90° (User Class 2) **VISITORS**	5.4m	5.5m	2.5m	2.5m	5.8m	6.0m
ACROD Parking	5.4m	n/a*	2.4m–ACROD 2.4m–shared space	n/a*	5.8m	n/a*

Note* - ACROD bays (if required) needs to be designed in accordance with the above requirements and clearly marked on plan.

Name other requirements in the AS2890.1:2004 document.

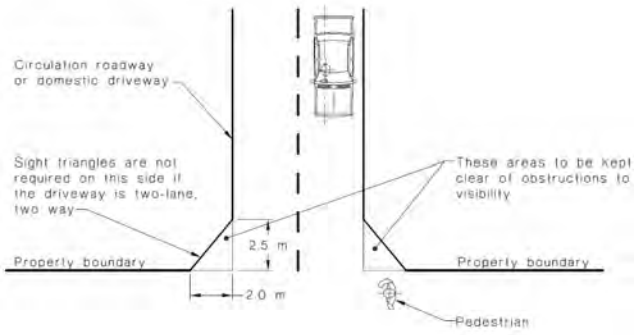
*" **Entering sight distance***
Unsignalized access driveways shall be located so that the intersection sight distance along the frontage road available to drivers leaving the car park or domestic driveway is at least that shown in Figure 3.2."



Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40

Sight distance requirements at access driveways	For a posted speed of 50km/hr, sight distance provision is 45m. This is achieved on both the eastern and western sides of the proposed driveway, measured as per the AS2890.1 specification below.

*" **Sight distance to pedestrians***
Clear sight lines as shown in Figure 3.3 shall be provided at the property line to ensure adequate visibility between vehicles leaving the car park or domestic driveway and pedestrians on the frontage road footpath."



Minimum sight lines for pedestrian safety	Clear pedestrian sightlines provided on both sides

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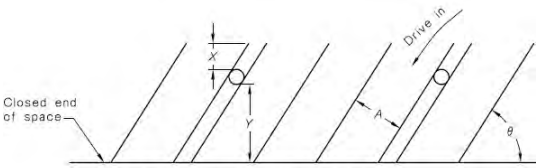
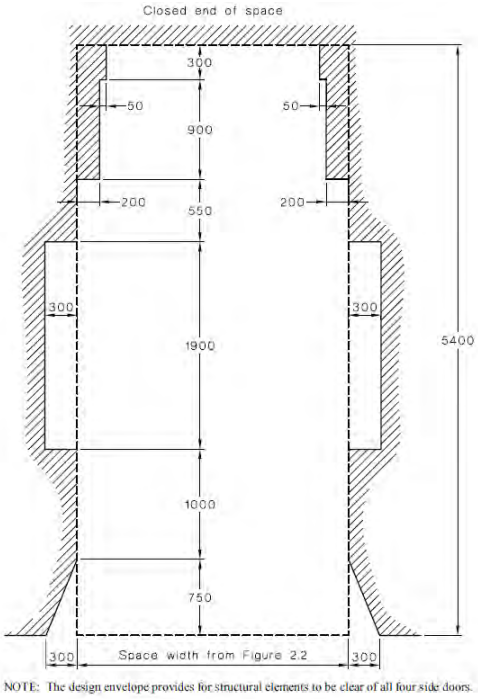
*" **Column Location and Spacing***
The dimensions for locating columns in a short span structure shall be as given in Figure 5.1. The design envelope around a parked vehicle which is to be kept clear of columns, walls or other obstructions, is shown in Figure 5.2. If this requirement is met, the dimensions in Figure 5.1 will also be achieved.
NOTE: Columns should not be located at the edge of a parking aisle. The difficulty of manoeuvring into a parking space is increased by such a location. It is also desirable to avoid locating a column directly opposite a car door."



A = parking space width (see Figure 2.2)

Parking angle, θ, degrees	Dimensions, mm	
	X, min.	*Y*, min.
30	375	1825
45	530	2581
60	650	3161
75	724	3526
90	750	3650

FIGURE 5.1 COLUMN LOCATION



NOTE: The design envelope provides for structural elements to be clear of all four side doors.

DIMENSIONS IN MILLIMETRES

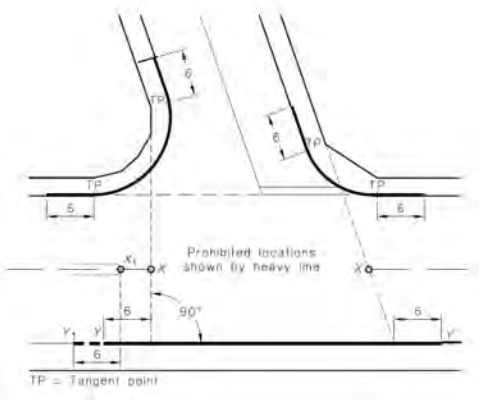
FIGURE 5.2 DESIGN ENVELOPE AROUND PARKED VEHICLE TO BE KEPT CLEAR OF COLUMNS, WALLS AND OBSTRUCTIONS

Column position	All proposed columns, as shown on plans in Appendix 1 are positioned at appropriate locations and in accordance with the AS2890.01 requirement.

*" **Width requirements at low volume (Category 1) access driveways and connecting roadways**:*
Where the circulation roadway leading from a Category 1 access driveway is 30 m or longer, or sight distance from one end to the other is restricted, and the frontage road is an arterial or sub-arterial road, both the access driveway and the circulation roadway for at least the first 6 m from the property boundary shall be a minimum of 5.5 m wide. In other cases subject to consideration of traffic volumes on a case-by-case basis, lesser widths, down to a minimum of 3.0 m at a domestic property, may be provided. As a guide, 30 or more movements in a peak hour (in and out combined) would usually require provision for two vehicles to pass on the driveway, i.e. a minimum width of 5.5 m. On long driveways, passing opportunities should be provided at least every 30 m. Reversing movements to public roads shall be prohibited wherever possible."

Access driveway width	5.5m width access driveway provided

*" **Access driveway location***
Driveway Categories 1 and 2 At unsignalized intersections of sub-arterial, collector or local streets with each other or with an arterial road, access driveways in Categories 1 and 2 (see Table 3.1) shall not be located in the sections of kerb shown by heavy lines in Figure 3.1. This requirement shall not apply to accesses to domestic driveways in the kerb section opposite the entering road at any intersection including signalized intersections. Furthermore, it shall not apply to any access driveway serving a property which would otherwise be denied access due to the physical impossibility of meeting the requirement."



Access driveway location	The proposed is positioned **within a restricted zone** according to Australian Standards.

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2.10 Bicycle Parking

Reference Document Utilised: State Planning Policy 7.3 Residential Design Codes Volume 2, 2024

Bicycle Parking Requirement in accordance with regulatory documents
Bicycle parking is provided on site and in accordance with Table 3.9

Table 3.9 Minimum bicycle parking requirements

		Location A	Location B
Bicycle parking	Resident	0.5 space per dwelling	
	Visitor	1 space per 10 dwellings	

Bicycle Parking Requirement in accordance with regulatory documents

Land Use	Requirements	Parking
Residential Grouped Dwellings	*Resident - 0.5 space per dwelling*	36
	Visitors - 1 space per 10 dwellings	8
	Total car parking requirements	**44**

Total Volume of Bicycle Parking Provided by Proponent	**46 bike racks**

Justification

Proposed development plans indicate a total provision of 46 bike racks. Compared to the requirement of 36 bike racks for residents and 8 for visitors (44 total), there is a surplus of 2 racks.

2.11 ACROD Parking

Class of Building

- Class 1a - a detached house or one of a group of two or more dwelling separated by a fire resisting wall, including a row house, terrace hous town house or villa unit.
- Class 2 – A building containing 2 or more sole-occupancy units each beir a separate dwelling.
- Class 3 – a residential building, other than a building of Class 1 or 2, whic is a common place of long term or transient living for a number of unrelate persons, including… (d) Accommodation for the aged, children or peop with disabilities

Does this building class require specific provision of ACROD Parking? NO

Reference Document Utilised: Building Code of Australia

Description of Parking Requirements:

For each platinum SDA dwelling - accessible units planned 1 ACROD bay needs to be provided

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Parking Requirement in accordance with regulatory documents

Land Use	Requirements	Yield	Total Parking
Residential Grouped Dwellings	For each platinum SDA dwelling - accessible units planned 1 ACROD bay needs to be provided	-	-
		Total Volume of ACROD Parking Required	**-**
		Total Volume of ACROD Parking Provided by Proponent	-

Justification

Given there are no accessible units proposed within the development, there is no requirement for provision of ACROD parking.

2.12 Delivery and Service Vehicles

Guideline Document used as reference: NSW RTA Guide to Traffic Generating Developments

Requirements

Residential flat buildings (< 200 flats or home Units) - 1 space per 50 flats or home units plus 1 space per 1,000 m2 of public area set aside for bar, tavern, lounge and restaurant

Parking Requirement in accordance with regulatory documents

Land Use	Minimum Requirements	Yield	Total Parking
Residential Grouped Dwellings	1 space per 50 flats or home units	76 dwellings	1.52
		Total Volume of Service and Delivery Parking Required	2
		Total Volume of Service and Delivery Parking Provided by Proponent	-

Justification

Waste removal vehicles servicing the proposed residential area will not require designated parking spaces, as waste collection will take place within the road reserve of Waardong Court, without entering the strata lot.

2.13 Calculation of Development Generated / Attracted Trips

What are the likely hours of operation?	For residential land uses, the hours of operation are not applicable.
What are the likely peak hours of operation?	Morning and afternoon peak times are likely to be between 07:30 – 08:30 for the morning and 16:30 - 17:30 in the evening.
Do the development generated peaks coincide with existing road network peaks?	YES
If YES, Which:	AM peak

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Guideline Document Used	**WAPC Transport Assessment Guidelines for Developments**
Rates from above document:	**Residential** – 0.8 vehicle trips per dwelling for the AM and PM peak hours. A 25% IN / 75% OUT split has been adopted for the AM peak and a 67% IN / 33% OUT split for the PM peak hour;

Guideline Document Used	**NSW RTA Guide to Traffic Generating Developments**
Rates from above document:	The NSW RTA Guide to Traffic Generating Developments suggest residential developments of this type in Sydney tend to generate between 4 and 5 vehicular trips per dwelling. In Perth, the Department of Planning and Infrastructure conducted a series of studies in the late 1990's / early 2000's which showed that higher density dwellings tended to average closer to **5.5 vehicle movements per day.** **Housing for aged and disabled persons:** • **1 - 2 vehicular trips per dwelling** • **PM Peak - 0.1 - 0.2 per dwelling.** KCTT suggest the use of the higher end of the bracket rate for the SDA units with assumption that residents are more independent (while the lower rate would be used for the units where the residents are more dependent on external support.)
Base data for trip calculation (daily trips)	5.5 vehicle trips per standard unit per day 2 vehicular trips per SDA apartment per day
Base data for trip calculation (AM/PM peak trips)	0.8 vehicle trips per standard unit per peak hour 0.2 vehicular trips per SDA apartment per peak hour

Land Use Type	Rate above	Yield	Daily Traffic Generation	Peak Hour Traffic Generation (AM/PM)
Residential units	Daily - 5.5 vehicle trips per unit AM/PM Peak - 0.8 vehicle trips per unit	60 dual key dwellings	330	48
	Daily - 2 vehicular trips per apartment AM/PM Peak - 0.2 vehicular trips per unit	16 SDA dwellings	32	3
	Total Traffic Impact of the proposed development:		**362 VPD**	**51 VPH**

Does the site have existing trip generation / attraction? NO

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What is the total impact of the new proposed development?	The proposed development is expected to generate 362 vehicle trips per day and 51 vehicle trips in the peak hour. According to WAPC guidelines, all developments generating between 10 and 100 VPH in the peak hour can be deemed to have a **moderate** impact on the network. This will be discussed in further detail in the following Section.

2.14 Traffic Flow Distribution

How many routes are available for access / egress to the site?	KCTT will analyse only main/ predominant routes for access and egress to the subject development, while there are additional potential routes via low order roads.
Route 1 / Movement 1	
Provide details for Route No 1	From east via Waardong Court into the subject development site and reverse
Percentage of Vehicular Movements via Route No 1	**2%**
Route 2 / Movement 2	
Provide details for Route No 2	From Northeast via Old Coast Road >> Waardong Court into the subject development site and reverse
Percentage of Vehicular Movements via Route No 2	**19%**
Route 3 / Movement 3	
Provide details for Route No 3	From Northwest via Rutland Drive >> Waardong Court into the subject development site and reverse
Percentage of Vehicular Movements via Route No 3	**20%**
Route 4 / Movement 4	
Provide details for Route No 4	From Southwest via Old Coast Road >> Waardong Court into the subject development site and reverse
Percentage of Vehicular Movements via Route No 4	**34%**
Route 5 / Movement 5	
Provide details for Route No 5	From Southeast via Mandurah Road >> Old Coast Road >> Waardong Court into the subject development site and reverse
Percentage of Vehicular Movements via Route No 5	**26%**

Note - For more detailed plans of the estimated vehicular traffic volumes and distribution please refer to the plans provided in Appendix 2.

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2.15 Vehicle Crossover Requirements

Are vehicle crossovers required onto existing road networks?	YES
How many existing crossovers?	
How many proposed crossovers?	One

If there are greater numbers of new crossovers, than existing, provide justification:

-

How close are proposed crossovers to existing intersections?	app. 100m and more
Does this meet existing standards?	YES

Justification

According to AS/NZS 2890.1:2004 Parking facilities Part 1: Off-street car parking the user class of the access point is: Choose an item.

Proposed development plans indicate a total of 87 parking bays and 1 crossover.

This crossover serves between 25 and 100 parking bays from a local road, making it a ''Category 2 driveway''.

Therefore, the following requirements from AS/NZS 2890.1:2004 Parking facilities Part 1: Off-street car parking apply:

TABLE 3.1
SELECTION OF ACCESS FACILITY CATEGORY

Class of parking facility (see Table 1.1)	Frontage road type	Access facility category — Number of parking spaces (Note 1)				
		<25	25 to 100	101 to 300	301 to 600	>600
1,1A	Arterial	1	2	3	4	5
	Local	1	1	2	3	4
2	Arterial	2	2	3	4	5
	Local	1	2	3	4	4
3,3A	Arterial	2	3	4	4	5
	Local	1	2	3	4	4

NOTES:
1 When a car park has multiple access points, each access should be designed for the number of parking spaces effectively served by that access.
2 This Table does not imply that certain types of development are necessarily suitable for location on any particular frontage road type. In particular, access to arterial roads should be limited as far as practicable, and in some circumstances it may be preferable to allow left-turn-only movements into and out of the access driveway.

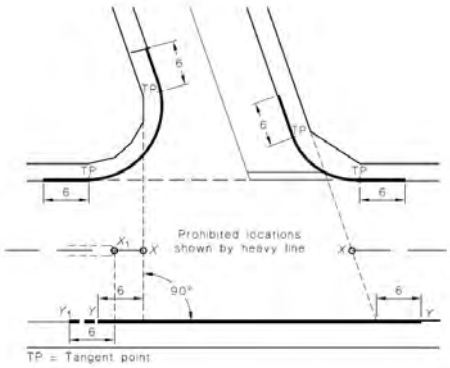
*"(a) **Driveway Categories 1 and 2**: At unsignalized intersections of sub-arterial, collector or local streets with each other or with an arterial road, access driveways in Categories 1 and 2 (see Table 3.1) shall not be located in the sections of kerb shown by heavy lines in Figure 3.1.*

This requirement shall not apply to accesses to domestic driveways in the kerb section opposite the entering road at any intersection including signalized intersections.

Furthermore, it shall not apply to any access driveway serving a property which would otherwise be denied access due to the physical impossibility of meeting the requirement.

At signalized intersections, the minimum distance from the intersection, measured from the property boundary along both legs, shall be increased as necessary to locate access driveways beyond the influence of normal queue lengths at the intersections. If this is not practicable, it may be necessary to provide-

(i) an arrangement which confines traffic to turning left when either entering or leaving the car park;
(ii) a signalized driveway with signals coordinated with the intersection signals; or
(iii) other traffic management means of providing for safe and efficient operation of the driveway."



NOTES:
1 Accesses to domestic driveways are excluded from the prohibition in respect of the kerb section marked Y-Y (see Clause 3.2.3(a)).
2 The points marked X_1 and X are respectively at the median end on a divided road and at the intersection of the main road centre-line and the extensions of the side road property lines shown as dotted lines, on an undivided road. On a divided road, dimension Y-Y extends to Point Y_1.

DIMENSIONS IN METRES

FIGURE 3.1 PROHIBITED LOCATIONS OF ACCESS DRIVEWAYS

The proposed is positioned **within a restricted zone** according to Australian Standards.

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2.16 Public Transport Accessibility

How many bus routes are within 400 metres of the subject site?	3 (three)
How many rail routes are within 800 metres of the subject site?	none

Bus Route	Description	Peak Frequency	Off-Peak Frequency
592	Mandurah Station - Wannanup via Peelwood Parade	20 minutes	120 minutes (Saturday) No Sunday and Public Holiday service
593	Mandurah Station - Dawesville West via Old Coast Road	20 minutes	60 minutes (Saturday) 120 minutes (Sunday and Public Holiday service)
594	Mandurah Station - Dawesville East via Old Coast Road	15 minutes	60 minutes (Saturday) 120 minutes (Sunday and Public Holiday service)

KCTT Comment

Given that the Transperth Network maps are currently being updated, bus routes are listed as there were shown on the Google maps available online. Public transport routes within 800m radius from the subject location are shown on Plan S03 in Appendix 2.

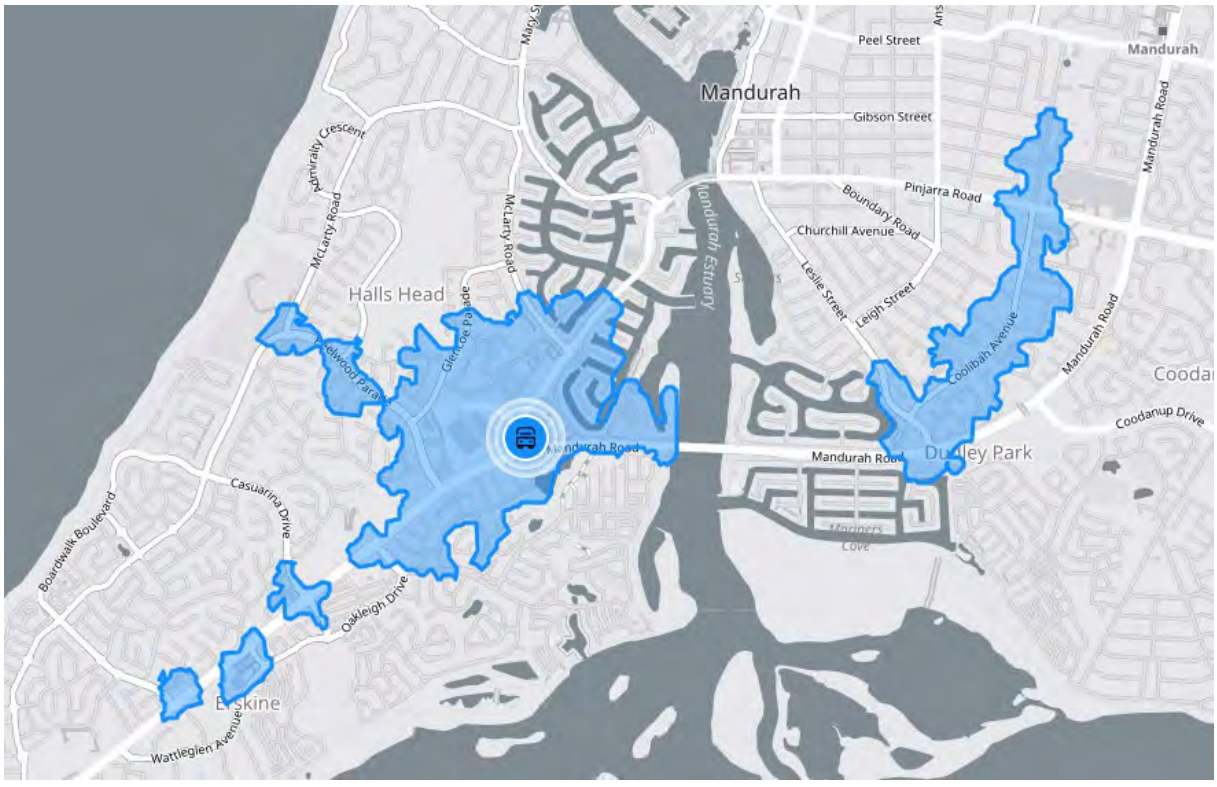

Figure 1 – 15-Minutes Public transport catchment from the subject site

Walk Score Rating for Accessibility to Public Transport	
34	Some Transit. A few nearby public transportation options.

Is the development in a Greenfields area?	YES

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2.17 Pedestrian Infrastructure

Describe existing local pedestrian infrastructure within a 400m radius of the site:

Classification	Road Name
High Quality Shared Path	Old Coast Road
Pedestrian Path	Portion of Old Coast Road, Rutland Drive, etc. (Please refer to the Plan S04 in Appendix 2)

Does the site have existing pedestrian facilities	NO
Does the site propose to improve pedestrian facilities?	YES

If YES, describe the measures proposed.

Proposed pedestrian paths network will cater for the pedestrian needs within the new development, and allow for connections to the external, existing pedestrian paths.

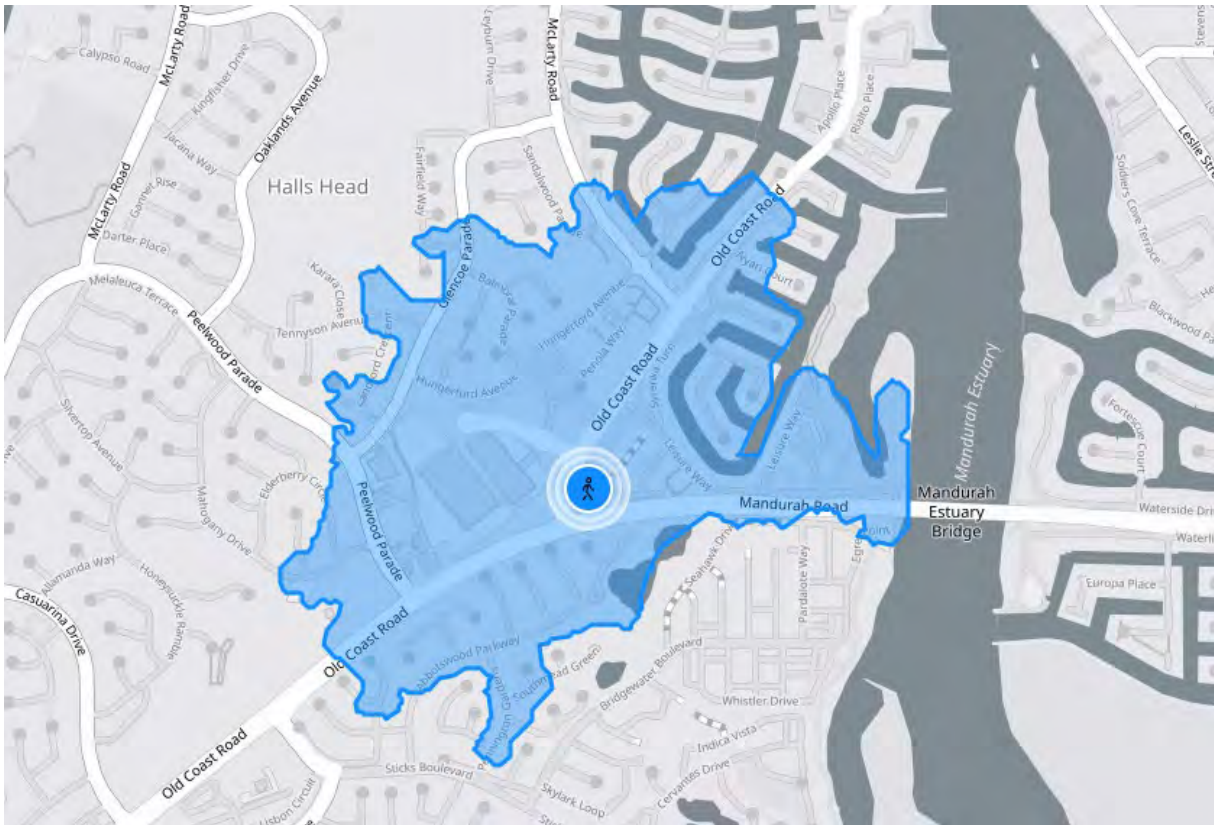

Figure 2 – Pedestrian walking catchment – 15 minutes (source: TravelTime app)

What is the Walk Score Rating?

45 out of 100 -This location is a Car - Dependent neighbourhood, so most errands require a car.

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2.18 Cyclist Infrastructure

Are there any PBN Routes within a 400m radius of the subject site?	YES

If YES, describe:

Classification	Road Name
High Quality Shared Path	Old Coast Road
Good Road Ridding Environment	Leisure Way



Figure 3 – Cycling walking catchment - 15minutes (source: TravelTime app)

Does the site have existing cyclist facilities?	NO
Does the site propose to improve cyclist facilities?	NO, apart from the abundant bicycle parking on site.

2.19 Site-Specific Issues and Proposed Remedial Measures

How many site-specific issues need to be discussed?

Site-Specific Issue No 1	
Remedial Measure / Response	The development requires a total of 87 car parking bays, as stipulated by the State Plan. The proposed plans include only 89 car bays, resulting in a nominal Surplus of 2 bays. KCTT part of Premise is confident that the proposed parking provision will sufficiently meet the needs of the development. A detailed analysis of this assessment is provided in Section 2.8 of this report.

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Appendix 1

The Layout of the Proposed Development

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Sheet Number	Sheet Name
A-000	COVER PAGE
A-100	GROUND FLOOR LOT PLAN
A-101	FIRST FLOOR LOT PLAN
A-102	SECOND FLOOR LOT PLAN
A-103	GROUND FLOOR SITE PLAN
A-104	FIRST FLOOR SITE PLAN
A-105	SECOND FLOOR SITE PLAN
A-106	FENCING PLAN
A-107	BIN PRESENTATION PLAN
A-108	EXTERNAL LIGHTING PLAN
A-109	ROOF PLAN
A-110	TYPE A FLOOR PLAN
A-111	TYPE B FLOOR PLAN
A-112	TYPE C FLOOR PLAN
A-113	TYPE D FLOOR PLAN
A-114	TYPE E FLOOR PLAN
A-115	TYPE F FLOOR PLAN
A-116	TYPE K-H2 FLOOR PLAN
A-117	TYPE H-G FLOOR PLAN
A-118	TYPE H2-G2 FLOOR PLAN
A-119	TYPE L-J2 FLOOR PLAN
A-120	TYPE J-I FLOOR PLAN
A-121	TYPE J2-I2 FLOOR PLAN
A-122	SITE ELEVATIONS
A-123	SITE ELEVATIONS
A-124	BUILDING A & B ELEVATIONS
A-125	BUILDING C ELEVATIONS
A-126	BUILDING D & E ELEVATIONS
A-127	BUILDING F ELEVATIONS
A-128	WINDOWS SCHEDULE
A-129	SHADOW DIAGRAM - AUTUMN EQUINOX
A-130	SHADOW DIAGRAM - WINTER SOLSTICE
A-131	SHADOW DIAGRAM - SPRING EQUINOX
A-132	SHADOW DIAGRAM - SUMMER SOLSTICE



PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

COVER PAGE

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE:
A3

ZONING
R80
DWG
A-000

YARAN
CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024



1

A 100

YARAN PROPERTY GROUP

GROUND FLOOR LOT PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

GROUND FLOOR LOT PLAN

PLOT DATE:	OCTOBER 2024
DRAWN:	PV | JV
SCALE:	1 : 500

A3

ZONING R80

DWG A-100

YARAN

CREATING VALUE SHARING VALUE

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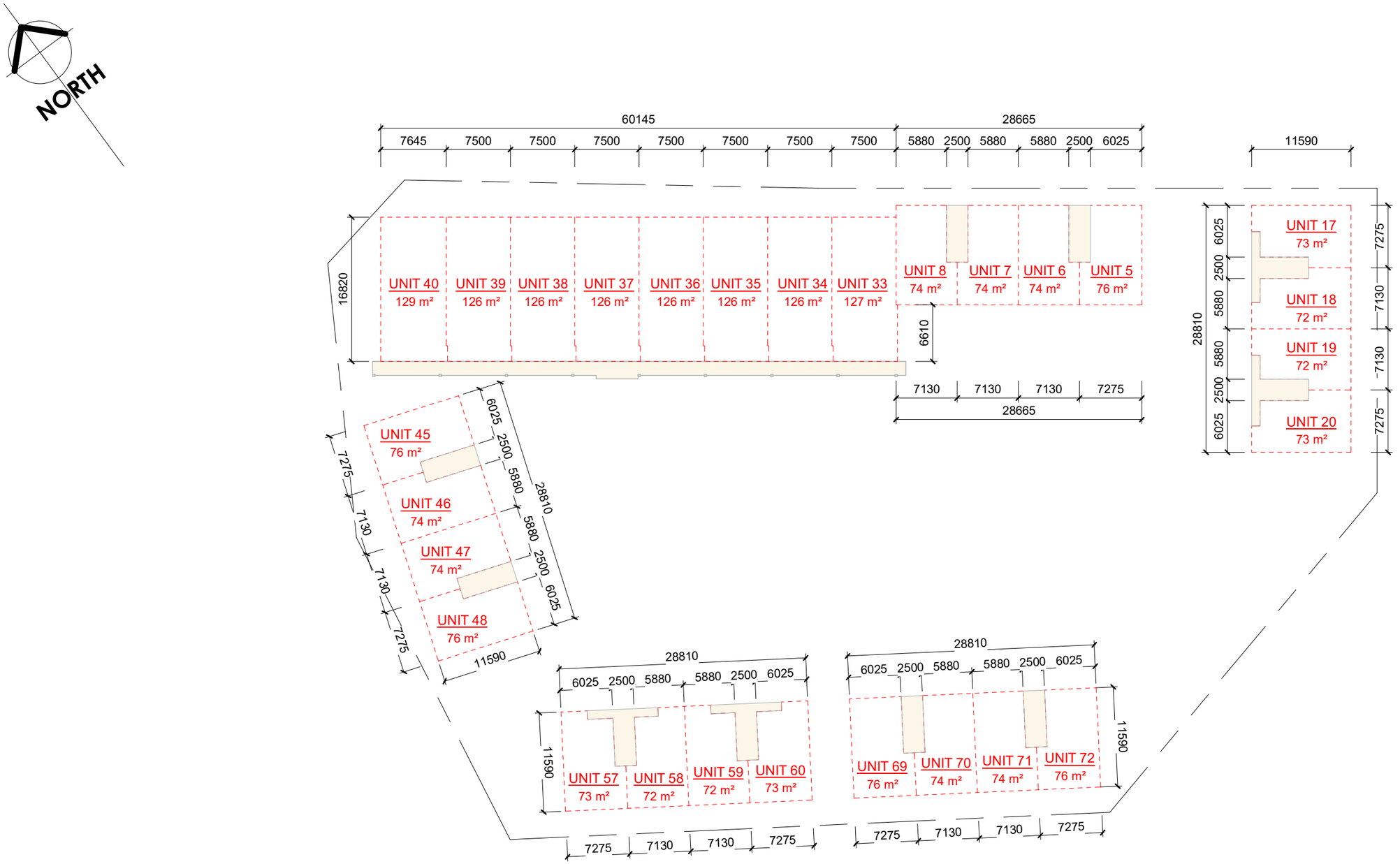
Version: 1, Version Date: 25/11/2024



YARAN PROPERTY GROUP

1
A | 101

FIRST FLOOR LOT PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

FIRST FLOOR LOT PLAN

PLOT DATE:	OCTOBER 2024
DRAWN:	PV | JV
SCALE:	1 : 500

A3

ZONING R80

DWG A-101

YARAN

CREATING VALUE SHARING VALUE

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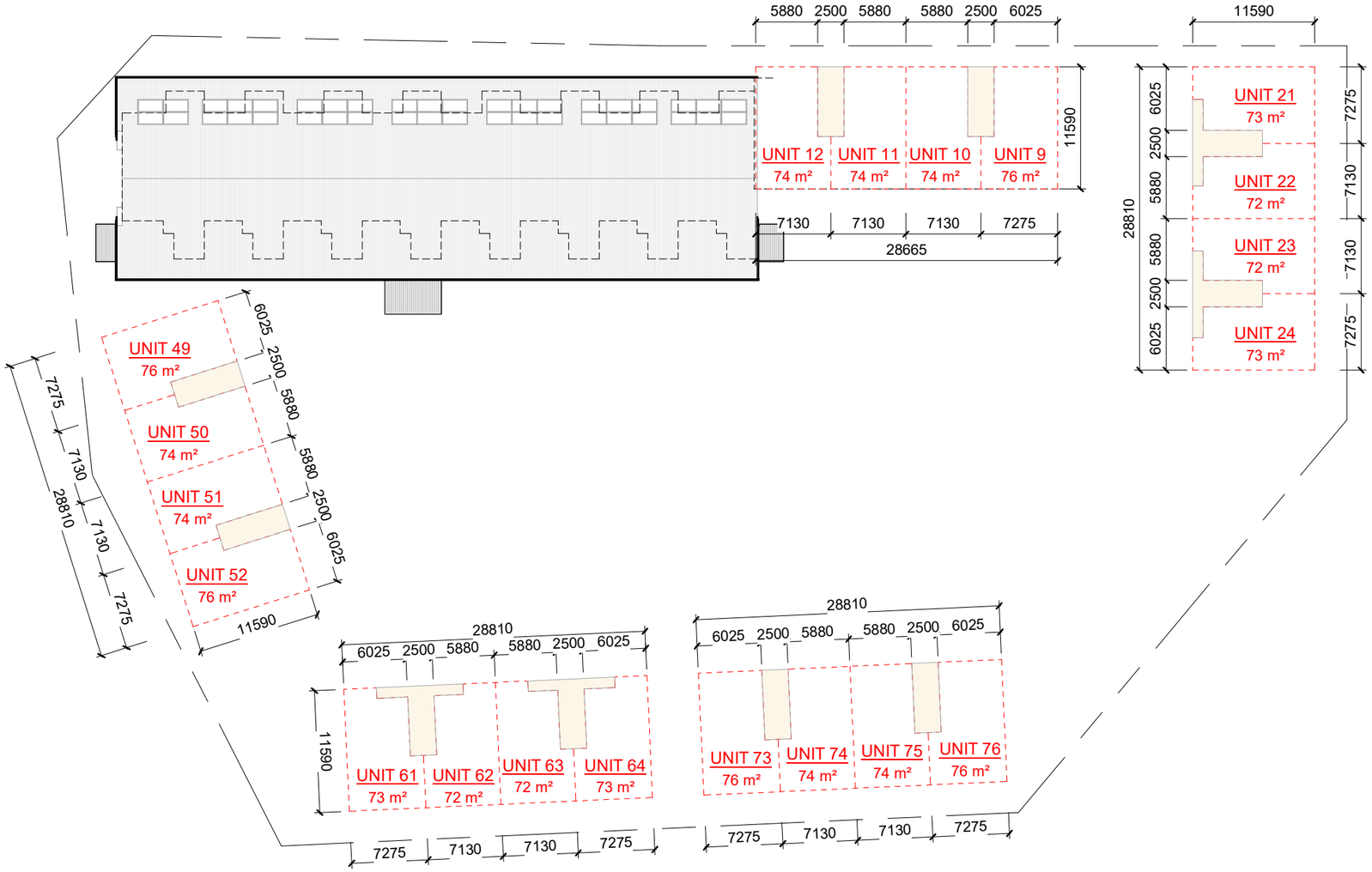
Version: 1, Version Date: 25/11/2024

NORTH



1
A 102

YARAN PROPERTY GROUP

SECOND FLOOR LOT PLAN

1 : 500

0 5 10 20 30 40 50
GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING
4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT
SECOND FLOOR LOT PLAN

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: 1 : 500
A3

ZONING R80
DWG A-102

YARAN
CREATING VALUE
SHARING VALUE

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DWELLING UNITS	
2-STOREY 2x2 SDA UNITS	16
3-STOREY STUDIO UNITS (DUAL KEY)	60
TOTAL	76

PARKING BAYS	
CAR PARK (RESIDENTS)	80
CAR PARK (VISITORS)	9
TOTAL CARPARK	89
TOTAL BICYCLE PARKING	46
TOTAL MOTORCYCLE PARKING	10

TOTAL LOT AREA	8,015 SQ.M.

NOTES:

1. USE BITUMEN FOR ALL DRIVEWAYS AND PARKING BAYS.
2. USE COLORED CONCRETE FOR FOOTPATHS.

3. ALL SDA UNITS ARE COMPLIANT WITH HIGH PHYSICAL SUPPORT CATEGORY OF THE NDIS DESIGN STANDARDS.

CARPARK
1. CAR PARKING SPACES INTENDED FOR SDA DWELLINGS ARE EXCLUSIVELY FOR CARERS AND VISITORS.

LETTER BOXES
1. SITUATED ON A HARD-STANDING AREA OF 1540MM X 2070MM AND HAVE A GRADIENT AND CROSSFALL DIRECTLY IN FRONT WHICH IS LESS THAN 1:40 IN ANY DIRECTION.
2. SHALL HAVE WHEELCHAIR ACCESS BY A CONTINUOUS ACCESSIBLE PATH OF TRAVEL FROM THEDWELLING TO THE LETTERBOX
3. SHALL BE LOCKABLE
4. THE HEIGHT OF THE LETTERBOX SHALL BE BETWEEN 600MM AND 1100MM ABOVE FFL

STAIRWAY
1. THERE SHOULD BE A CONTINUOUS HANDRAIL ON BOTH SIDES OF STAIRWAYS
2. THERE SHOULD BE A MINIMUM CLEAR WIDTH OF 1000MM BETWEEN THE HANDRAILS. HANDRAIL PROFILE & EXTENSIONS SHOULD BE AS PER AS1428.1.
3. STAIRWAYS SHOULD HAVE CLOSED RISERS
4. ADD SLIP RESISTANCE FOR STAIRS

LIFT
1. THE PASSENGER LIFT SHOULD COMPLY WITH CLAUSE E3.6 OF THE NCC (NATIONAL CONSTRUCTION CODE)
2. THE LIFT DOOR SHOULD HAVE A MINIMUM CLEAR OPENING OF 900MM
3. THE LIFT CAR SIZE SHOULD HAVE MINIMUM DIMENSIONS OF 1100MM (WIDTH) X 1400MM (IN DIRECTION OF TRAVEL)

1
A | 103

YARAN PROPERTY GROUP

GROUND FLOOR SITE PLAN

1 : 500

0 5 10 20 30 40 50
GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING
4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT
GROUND FLOOR SITE PLAN

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: As indicated
A3

ZONING R80
DWG A-103

YARAN
CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NORTH



1
A | 104

YARAN PROPERTY GROUP

FIRST FLOOR SITE PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

FIRST FLOOR SITE PLAN

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: 1 : 500

A3

ZONING R80
DWG A-104

YARAN
CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024



1 / A 105

YARAN PROPERTY GROUP

SECOND FLOOR SITE PLAN

1 : 500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

SECOND FLOOR SITE PLAN

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: 1 : 500

A3

ZONING R80
DWG A-105

YARAN
CREATING VALUE
SHARING VALUE

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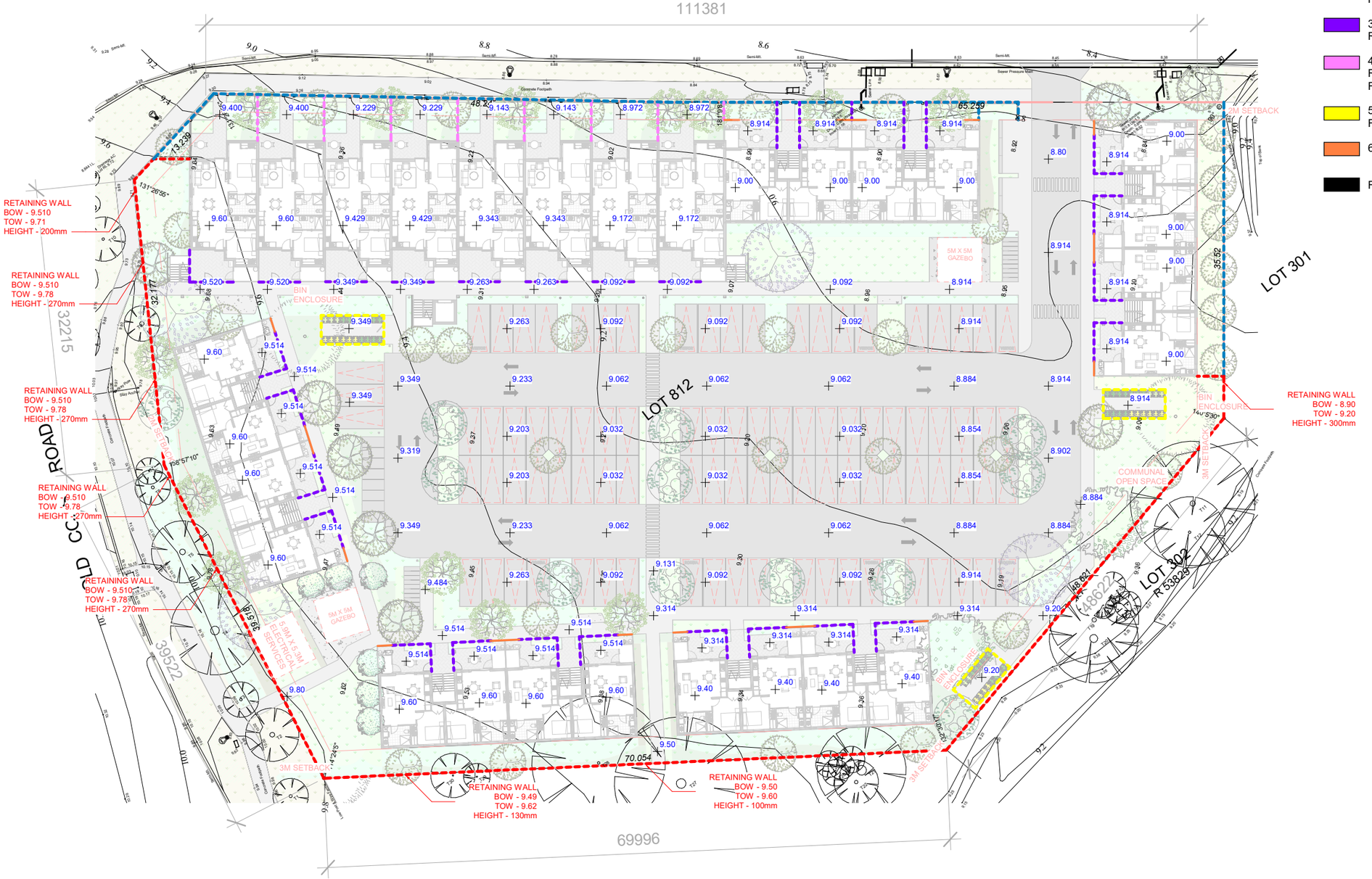
NORTH

WAARDONG COURT

111381



LEGEND/S:

1. 1800mm COLORBOND FENCE
2. 600mm HIGH RENDERED BLOCK WALL WITH 1500mm HIGH PIERS AT LOT BOUNDARIES, WITH 600mm VERTICAL METAL RAILING INFILL PANELS AND 1200mm GATES
3. 1200mm HIGH VERTICAL METAL RAILING AND GATS
4. 900mm HIGH VERTICAL METAL RAILINGS AS DIVIDING FENCES TO FRONT COURTYARDS
5. 1800mm HORIZONTAL METAL FENCING
6. SELECTED SCREEN

FEATURE SURVEY

YARAN PROPERTY GROUP

1 / A 106

RETAINING WALL AND FENCING PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

RETAINING WALL AND FENCING PLAN

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80
DWG A-106

YARAN

CREATING VALUE
SHARING VALUE

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LEGEND		QTY.
	GENERAL WASTE 240 L	31
	RECYCLING WASTE 240 L	16
	GREEN WASTE 240 L	8

WAARDONG COURT



YARAN PROPERTY GROUP

BIN PRESENTATION PLAN

1 / A 107

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

BIN PRESENTATION PLAN

PLOT DATE: NOVEMBER 2024
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80
DWG A-107

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NO. OF BOLLARDS	26

NORTH

WAARDONG COURT



1
A 108

YARAN PROPERTY GROUP

EXTERNAL LIGHTING PLAN

1 : 500

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

EXTERNAL LIGHTING PLAN

PLOT DATE:	OCTOBER 2024
DRAWN:	PV | JV
SCALE:	1 : 500

A3

ZONING R80

DWG A-108

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NORTH



YARAN PROPERTY GROUP

ROOF PLAN

1 : 500

1 / A 109

0 5 10 20 30 40 50

GRAPHIC SCALE 1:500

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

ROOF PLAN

PLOT DATE:	OCTOBER 2024
DRAWN:	PV | JV
SCALE:	1 : 500

A3

ZONING R80

DWG A-109

YARAN

CREATING VALUE SHARING VALUE

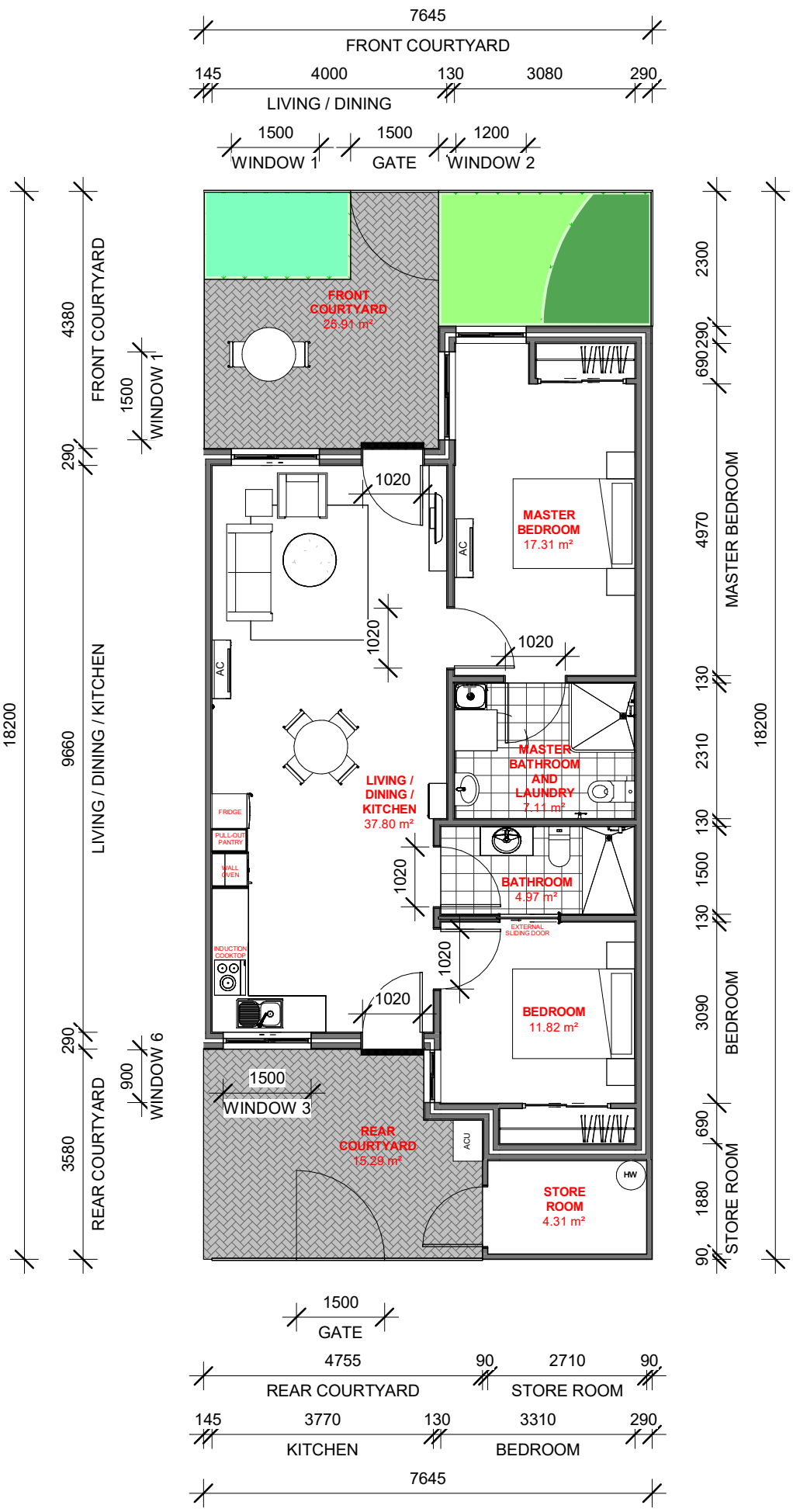
Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NOTES:

1. DESIGN IS FOR HIGH PHYSICAL SUPPORT (HPS) SDA
2. ALL CRITICAL DIMENSIONS ARE FREE OF SKIRTING BOARDS AS PER AS1428.1 REQUIREMENTS
3. ALL TRANSITIONS ARE FLUSH WITHIN 3MM UNLESS NOTED OTHERWISE
4. DRAWING REVIEW DOESN'T TAKE INTO ACCOUNT BCA/NCC REQUIREMENTS OUTSIDE OF SDA REQUIREMENTS
5. ALL INTERNAL FLOOR FINISHES SHALL HAVE A MINIMUM SLIP RESISTANCE OF P3 OR R10.
6. SLIP RESISTANCE OF ALL FLOORS TO SANITARY FACILITIES MIN P3 OR R10.
7. WET AREAS TO SDA DETAILS AS PER AS1428.1 ALL DOOR CIRCULATION SPACES (EXCLUDING INTERNAL DOOR CIRCULATION SPACES FOR BEDROOMS) SHALL BE PROVIDED IN ACCORDANCE WITH AS1428.1 TO BOTH SIDES OF THE DOOR.
8. A STEP-FREE DOORWAY THRESHOLD SHALL BE PROVIDED TO AN EXTERNAL ENTRY DOORWAY, AND EXTERNAL DOORWAYS LEADING TO PRIVATE OPEN SPACES.
9. FLUSH THRESHOLD TO THE FRONT ENTRY AND COURTYARDS USING STRIP GRATES IN COMPLIANCE WITH AS1528.1.
10. ALL DOORS TO AND WITHIN ALL AREAS INCLUDING ALL EXTERNAL DOORWAYS TO HAVE A MINIMUM CLEAR OPENING WIDTH OF 950MM.
11. ALL INTERNAL DOORWAYS SHALL HAVE A LEVEL (STEP-FREE) TRANSITION AND THRESHOLD (MAXIMUM VERTICAL TOLERANCE OF 3MM VERTICAL OR 5MM BETWEEN ABUTTING SURFACES IS ALLOWABLE PROVIDED THE LIP IS ROUNDED OR BEVELLED).
12. DOORWAYS SHALL HAVE DOOR HANDLES INSTALLED AT 1000MM ABOVE FFL AND ALIGN WITH THE LIGHT SWITCH.
13. DOOR HANDLES SELECTION AND LOCATION SHALL COMPLY WITH AS1428.1
14. POWER AND CONTROL CABLING TO HEAD OF ENTRY DOORS OF PARTICIPANT BEDROOMS, ENTRY DOORWAY AND EXTERNAL DOORWAY TO BE PROVIDED FOR FUTURE AUTOMATION.
15. POWER AND CONTROL CABLING TO WINDOWS OF BEDROOMS AND LIVING AREAS SHALL BE PROVIDED FOR FUTURE WINDOW BLIND AUTOMATION.
16. A CAPPED GPO AT THE WINDOW HEAD MAY BE PROVIDED TO COMPLY WITH THIS REQUIREMENT.
17. BEDROOMS SHALL HAVE A PROVISION FOR POWER AND INBUILT STRUCTURE, CAPABLE OF INSTALLATION OF A CONSTANT CHARGE CEILING HOIST. THE HOIST SHALL BE CAPABLE OF GOING ACROSS AND DOWN THE BED. MIN LOAD CAPACITY OF THE HOIST SHALL BE 250KG.
18. HOIST IS TO BE CAPABLE OF BEING EITHER CEILING MOUNTED OR WALL MOUNTED.
19. FOR FINAL-AS-BUILT STAGE OF SDA CERTIFICATION, THE STRUCTURE SHALL BE INSPECTED AND CERTIFIED BY A QUALIFIED STRUCTURAL ENGINEER AS BEING SUITABLE FOR CEILING HOISTS WITH MINIMUM LOAD CAPACITY OF 250KG.
20. EMERGENCY POWER SOLUTIONS SHALL BE PROVIDED TO CATER FOR A MINIMUM 2-HOUR OUTAGE IN NO LESS THAN 2 DOUBLE GPOS IN PARTICIPANT BEDROOMS AND ANY PROVIDED AUTOMATED DOORS THAT ARE USED FOR ENTRY OR EGRESS.

TYPE A AREA

Name	Area	Name	Area
LIVING / DINING / KITCHEN	37.80 m²	STORE ROOM	4.31 m²
MASTER BEDROOM	17.31 m²	FRONT COURTYARD	25.91 m²
BEDROOM	11.82 m²	REAR COURTYARD	15.29 m²
MASTER BATHROOM AND LAUNDRY	7.11 m²		
BATHROOM	4.97 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**10.95 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**92.56 m²**	**TOTAL AREA**	**139.14 m²**



1 / A 110

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE A FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING 4 WAARDONG COURT, HALLS HEAD, WA 6120	SHEET CONTENT TYPE A FLOOR PLAN	PLOT DATE: OCTOBER 2024 DRAWN: PV | JV SCALE: As indicated A3	REV R80 DWG A-110

YARAN — CREATING VALUE SHARING VALUE

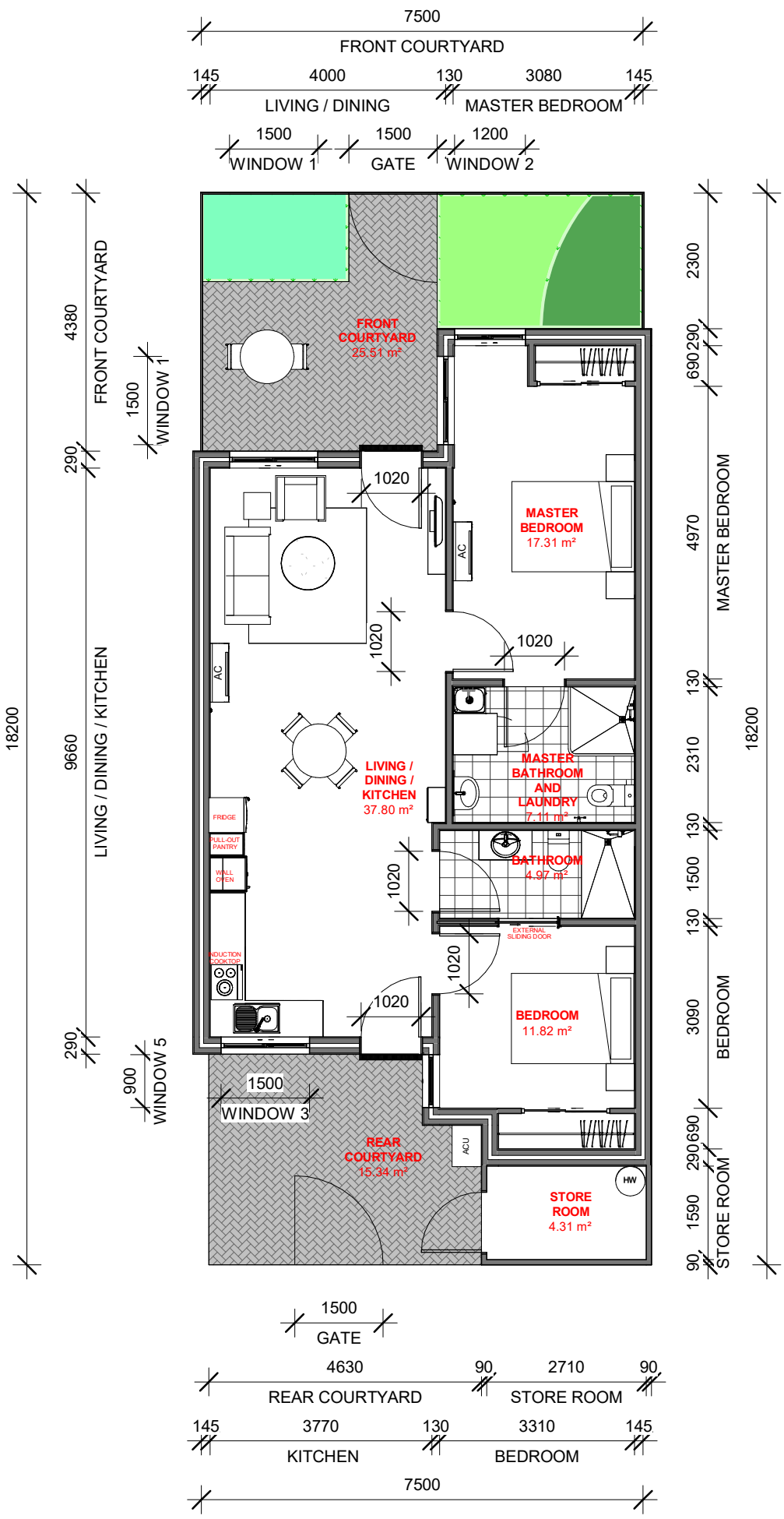
Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NOTES:

1. DESIGN IS FOR HIGH PHYSICAL SUPPORT (HPS) SDA
2. ALL CRITICAL DIMENSIONS ARE FREE OF SKIRTING BOARDS AS PER AS1428.1 REQUIREMENTS
3. ALL TRANSITIONS ARE FLUSH WITHIN 3MM UNLESS NOTED OTHERWISE
4. DRAWING REVIEW DOESN'T TAKE INTO ACCOUNT BCA/NCC REQUIREMENTS OUTSIDE OF SDA REQUIREMENTS
5. ALL INTERNAL FLOOR FINISHES SHALL HAVE A MINIMUM SLIP RESISTANCE OF P3 OR R10.
6. SLIP RESISTANCE OF ALL FLOORS TO SANITARY FACILITIES MIN P3 OR R10.
7. WET AREAS TO SDA DETAILS AS PER AS1428.1 ALL DOOR CIRCULATION SPACES (EXCLUDING INTERNAL DOOR CIRCULATION SPACES FOR BEDROOMS) SHALL BE PROVIDED IN ACCORDANCE WITH AS1428.1 TO BOTH SIDES OF THE DOOR.
8. A STEP-FREE DOORWAY THRESHOLD SHALL BE PROVIDED TO AN EXTERNAL ENTRY DOORWAY, AND EXTERNAL DOORWAYS LEADING TO PRIVATE OPEN SPACES.
9. FLUSH THRESHOLD TO THE FRONT ENTRY AND COURTYARDS USING STRIP GRATES IN COMPLIANCE WITH AS1528.1.
10. ALL DOORS TO AND WITHIN ALL AREAS INCLUDING ALL EXTERNAL DOORWAYS TO HAVE A MINIMUM CLEAR OPENING WIDTH OF 950MM.
11. ALL INTERNAL DOORWAYS SHALL HAVE A LEVEL (STEP-FREE) TRANSITION AND THRESHOLD (MAXIMUM VERTICAL TOLERANCE OF 3MM VERTICAL OR 5MM BETWEEN ABUTTING SURFACES IS ALLOWABLE PROVIDED THE LIP IS ROUNDED OR BEVELLED).
12. DOORWAYS SHALL HAVE DOOR HANDLES INSTALLED AT 1000MM ABOVE FFL AND ALIGN WITH THE LIGHT SWITCH.
13. DOOR HANDLES SELECTION AND LOCATION SHALL COMPLY WITH AS1428.1
14. POWER AND CONTROL CABLING TO HEAD OF ENTRY DOORS OF PARTICIPANT BEDROOMS, ENTRY DOORWAY AND EXTERNAL DOORWAY TO BE PROVIDED FOR FUTURE AUTOMATION.
15. POWER AND CONTROL CABLING TO WINDOWS OF BEDROOMS AND LIVING AREAS SHALL BE PROVIDED FOR FUTURE WINDOW BLIND AUTOMATION.
16. A CAPPED GPO AT THE WINDOW HEAD MAY BE PROVIDED TO COMPLY WITH THIS REQUIREMENT.
17. BEDROOMS SHALL HAVE A PROVISION FOR POWER AND INBUILT STRUCTURE, CAPABLE OF INSTALLATION OF A CONSTANT CHARGE CEILING HOIST. THE HOIST SHALL BE CAPABLE OF GOING ACROSS AND DOWN THE BED. MIN LOAD CAPACITY OF THE HOIST SHALL BE 250KG.
18. HOIST IS TO BE CAPABLE OF BEING EITHER CEILING MOUNTED OR WALL MOUNTED.
19. FOR FINAL-AS-BUILT STAGE OF SDA CERTIFICATION, THE STRUCTURE SHALL BE INSPECTED AND CERTIFIED BY A QUALIFIED STRUCTURAL ENGINEER AS BEING SUITABLE FOR CEILING HOISTS WITH MINIMUM LOAD CAPACITY OF 250KG.
20. EMERGENCY POWER SOLUTIONS SHALL BE PROVIDED TO CATER FOR A MINIMUM 2-HOUR OUTAGE IN NO LESS THAN 2 DOUBLE GPOS IN PARTICIPANT BEDROOMS AND ANY PROVIDED AUTOMATED DOORS THAT ARE USED FOR ENTRY OR EGRESS.

TYPE B AREA

Name	Area	Name	Area
MASTER BEDROOM	17.31 m²	STORE ROOM	4.31 m²
BEDROOM	11.82 m²	FRONT COURTYARD	25.51 m²
BATHROOM	4.97 m²	REAR COURTYARD	15.34 m²
LIVING / DINING / KITCHEN	37.80 m²		
MASTER BATHROOM AND LAUNDRY	7.11 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**8.89 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**90.46 m²**	**TOTAL AREA**	**133.86 m²**



1
A 111

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE B FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING
4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT
TYPE B FLOOR PLAN

PLOT DATE: SEPTEMBER 2024
DRAWN: PV | JV
SCALE: As indicated
A3

REV R80
DWG A-111

YARAN
CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NOTES:

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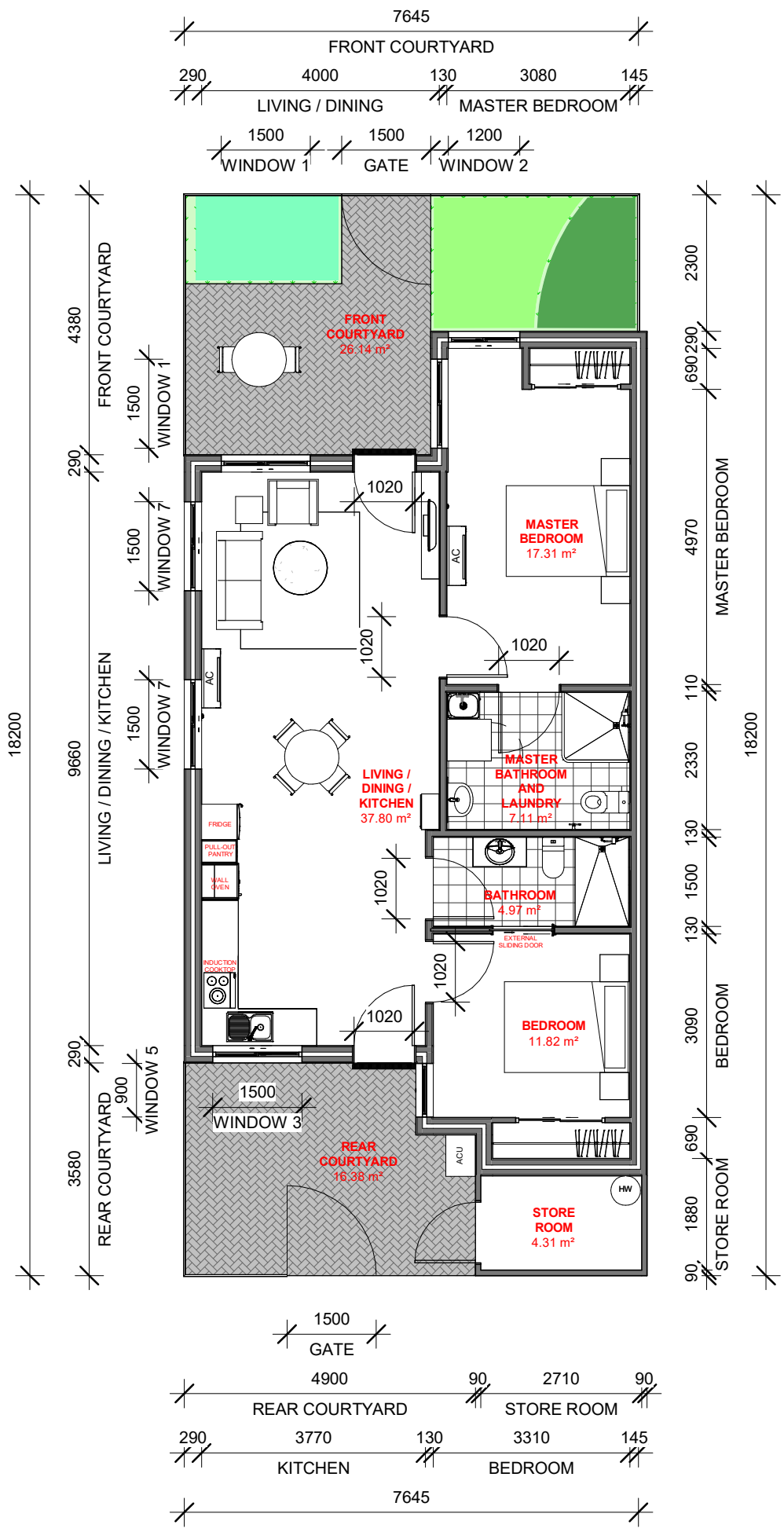
2. ALL CRITICAL DIMENSIONS ARE FREE OF SKIRTING BOARDS AS PER AS1428.1 REQUIREMENTS
3. ALL TRANSITIONS ARE FLUSH WITHIN 3MM UNLESS NOTED OTHERWISE
4. DRAWING REVIEW DOESN'T TAKE INTO ACCOUNT BCA/NCC REQUIREMENTS OUTSIDE OF SDA REQUIREMENTS
5. ALL INTERNAL FLOOR FINISHES SHALL HAVE A MINIMUM SLIP RESISTANCE OF P3 OR R10.
6. SLIP RESISTANCE OF ALL FLOORS TO SANITARY FACILITIES MIN P3 OR R10.
7. WET AREAS TO SDA DETAILS AS PER AS1428.1 ALL DOOR CIRCULATION SPACES (EXCLUDING INTERNAL DOOR CIRCULATION SPACES FOR BEDROOMS) SHALL BE PROVIDED IN ACCORDANCE WITH AS1428.1 TO BOTH SIDES OF THE DOOR.
8. A STEP-FREE DOORWAY THRESHOLD SHALL BE PROVIDED TO AN EXTERNAL ENTRY DOORWAY, AND EXTERNAL DOORWAYS LEADING TO PRIVATE OPEN SPACES.
9. FLUSH THRESHOLD TO THE FRONT ENTRY AND COURTYARDS USING STRIP GRATES IN COMPLIANCE WITH AS1528.1.
10. ALL DOORS TO AND WITHIN ALL AREAS INCLUDING ALL EXTERNAL DOORWAYS TO HAVE A MINIMUM CLEAR OPENING WIDTH OF 950MM.
11. ALL INTERNAL DOORWAYS SHALL HAVE A LEVEL (STEP-FREE) TRANSITION AND THRESHOLD (MAXIMUM VERTICAL TOLERANCE OF 3MM VERTICAL OR 5MM BETWEEN ABUTTING SURFACES IS ALLOWABLE PROVIDED THE LIP IS ROUNDED OR BEVELLED).
12. DOORWAYS SHALL HAVE DOOR HANDLES INSTALLED AT 1000MM ABOVE FFL AND ALIGN WITH THE LIGHT SWITCH.
13. DOOR HANDLES SELECTION AND LOCATION SHALL COMPLY WITH AS1428.1
14. POWER AND CONTROL CABLING TO HEAD OF ENTRY DOORS OF PARTICIPANT BEDROOMS, ENTRY DOORWAY AND EXTERNAL DOORWAY TO BE PROVIDED FOR FUTURE AUTOMATION.
15. POWER AND CONTROL CABLING TO WINDOWS OF BEDROOMS AND LIVING AREAS SHALL BE PROVIDED FOR FUTURE WINDOW BLIND AUTOMATION.
16. A CAPPED GPO AT THE WINDOW HEAD MAY BE PROVIDED TO COMPLY WITH THIS REQUIREMENT.
17. BEDROOMS SHALL HAVE A PROVISION FOR POWER AND INBUILT STRUCTURE, CAPABLE OF INSTALLATION OF A CONSTANT CHARGE CEILING HOIST. THE HOIST SHALL BE CAPABLE OF GOING ACROSS AND DOWN THE BED. MIN LOAD CAPACITY OF THE HOIST SHALL BE 250KG.
18. HOIST IS TO BE CAPABLE OF BEING EITHER CEILING MOUNTED OR WALL MOUNTED.
19. FOR FINAL-AS-BUILT STAGE OF SDA CERTIFICATION, THE STRUCTURE SHALL BE INSPECTED AND CERTIFIED BY A QUALIFIED STRUCTURAL ENGINEER AS BEING SUITABLE FOR CEILING HOISTS WITH MINIMUM LOAD CAPACITY OF 250KG.
20. EMERGENCY POWER SOLUTIONS SHALL BE PROVIDED TO CATER FOR A MINIMUM 2-HOUR OUTAGE IN NO LESS THAN 2 DOUBLE GPOS IN PARTICIPANT BEDROOMS AND ANY PROVIDED AUTOMATED DOORS THAT ARE USED FOR ENTRY OR EGRESS.

TYPE C AREA

Name	Area	Name	Area
MASTER BEDROOM	17.31 m²	STORE ROOM	4.31 m²
BEDROOM	11.82 m²	FRONT COURTYARD	26.14 m²
BATHROOM	4.97 m²	REAR COURTYARD	16.38 m²
LIVING / DINING / KITCHEN	37.80 m²		
MASTER BATHROOM AND LAUNDRY	7.11 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**10.37 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**91.98 m²**	**TOTAL AREA**	**139.14 m²**



YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

1 / A 112

TYPE C FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

TYPE C FLOOR PLAN

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: As indicated

A3

REV R80
DWG A-112

YARAN
CREATING VALUE SHARING VALUE

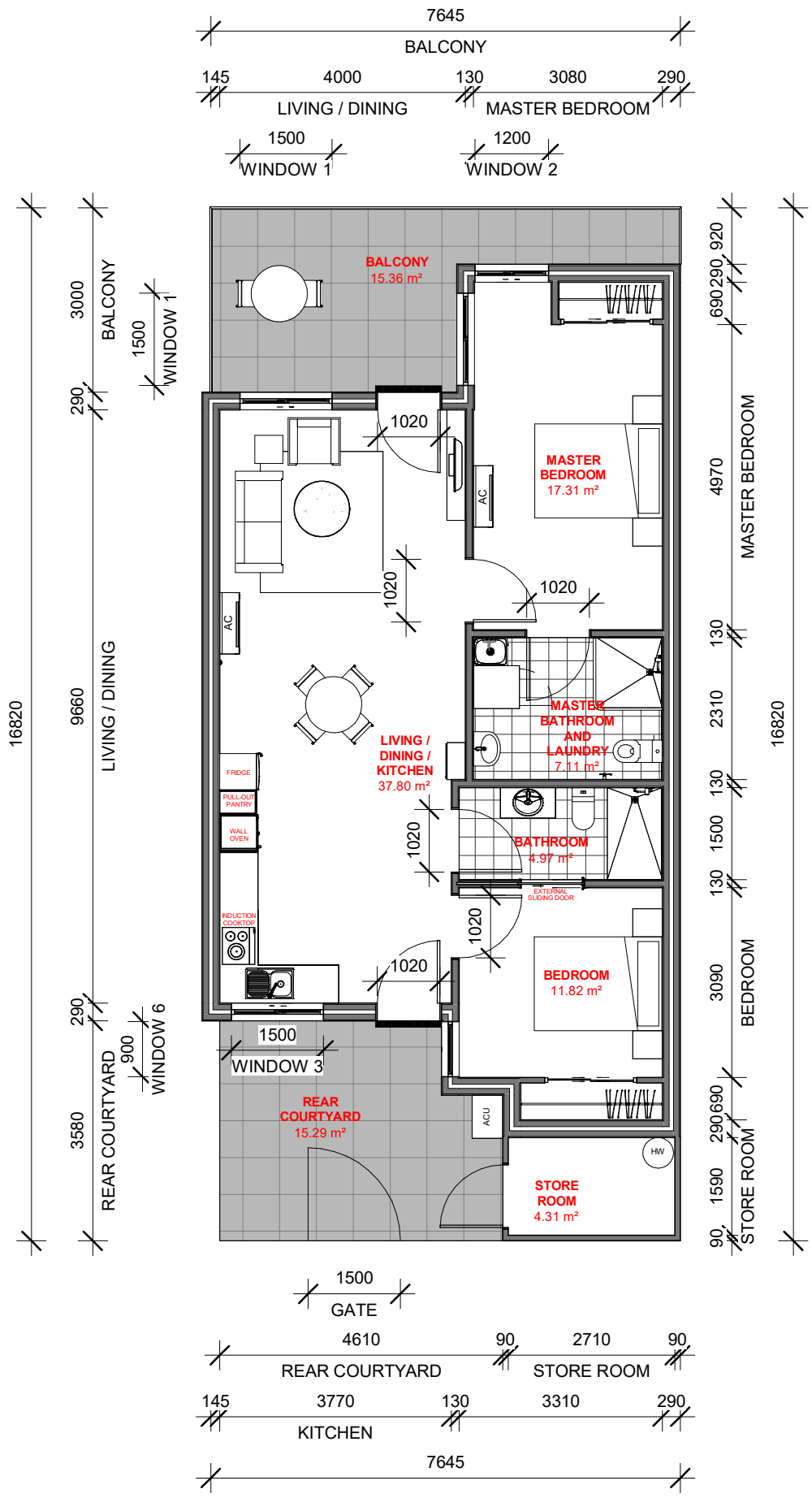
Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NOTES:

1. DESIGN IS FOR HIGH PHYSICAL SUPPORT (HPS) SDA
2. ALL CRITICAL DIMENSIONS ARE FREE OF SKIRTING BOARDS AS PER AS1428.1 REQUIREMENTS
3. ALL TRANSITIONS ARE FLUSH WITHIN 3MM UNLESS NOTED OTHERWISE
4. DRAWING REVIEW DOESN'T TAKE INTO ACCOUNT BCA/NCC REQUIREMENTS OUTSIDE OF SDA REQUIREMENTS
5. ALL INTERNAL FLOOR FINISHES SHALL HAVE A MINIMUM SLIP RESISTANCE OF P3 OR R10.
6. SLIP RESISTANCE OF ALL FLOORS TO SANITARY FACILITIES MIN P3 OR R10.
7. WET AREAS TO SDA DETAILS AS PER AS1428.1 ALL DOOR CIRCULATION SPACES (EXCLUDING INTERNAL DOOR CIRCULATION SPACES FOR BEDROOMS) SHALL BE PROVIDED IN ACCORDANCE WITH AS1428.1 TO BOTH SIDES OF THE DOOR.
8. A STEP-FREE DOORWAY THRESHOLD SHALL BE PROVIDED TO AN EXTERNAL ENTRY DOORWAY, AND EXTERNAL DOORWAYS LEADING TO PRIVATE OPEN SPACES.
9. FLUSH THRESHOLD TO THE FRONT ENTRY AND COURTYARDS USING STRIP GRATES IN COMPLIANCE WITH AS1528.1.
10. ALL DOORS TO AND WITHIN ALL AREAS INCLUDING ALL EXTERNAL DOORWAYS TO HAVE A MINIMUM CLEAR OPENING WIDTH OF 950MM.
11. ALL INTERNAL DOORWAYS SHALL HAVE A LEVEL (STEP-FREE) TRANSITION AND THRESHOLD (MAXIMUM VERTICAL TOLERANCE OF 3MM VERTICAL OR 5MM BETWEEN ABUTTING SURFACES IS ALLOWABLE PROVIDED THE LIP IS ROUNDED OR BEVELLED).
12. DOORWAYS SHALL HAVE DOOR HANDLES INSTALLED AT 1000MM ABOVE FFL AND ALIGN WITH THE LIGHT SWITCH.
13. DOOR HANDLES SELECTION AND LOCATION SHALL COMPLY WITH AS1428.1
14. POWER AND CONTROL CABLING TO HEAD OF ENTRY DOORS OF PARTICIPANT BEDROOMS, ENTRY DOORWAY AND EXTERNAL DOORWAY TO BE PROVIDED FOR FUTURE AUTOMATION.
15. POWER AND CONTROL CABLING TO WINDOWS OF BEDROOMS AND LIVING AREAS SHALL BE PROVIDED FOR FUTURE WINDOW BLIND AUTOMATION.
16. A CAPPED GPO AT THE WINDOW HEAD MAY BE PROVIDED TO COMPLY WITH THIS REQUIREMENT.
17. BEDROOMS SHALL HAVE A PROVISION FOR POWER AND INBUILT STRUCTURE, CAPABLE OF INSTALLATION OF A CONSTANT CHARGE CEILING HOIST. THE HOIST SHALL BE CAPABLE OF GOING ACROSS AND DOWN THE BED. MIN LOAD CAPACITY OF THE HOIST SHALL BE 250KG.
18. HOIST IS TO BE CAPABLE OF BEING EITHER CEILING MOUNTED OR WALL MOUNTED.
19. FOR FINAL-AS-BUILT STAGE OF SDA CERTIFICATION, THE STRUCTURE SHALL BE INSPECTED AND CERTIFIED BY A QUALIFIED STRUCTURAL ENGINEER AS BEING SUITABLE FOR CEILING HOISTS WITH MINIMUM LOAD CAPACITY OF 250KG.
20. EMERGENCY POWER SOLUTIONS SHALL BE PROVIDED TO CATER FOR A MINIMUM 2-HOUR OUTAGE IN NO LESS THAN 2 DOUBLE GPOS IN PARTICIPANT BEDROOMS AND ANY PROVIDED AUTOMATED DOORS THAT ARE USED FOR ENTRY OR EGRESS.

TYPE D AREA

Name	Area	Name	Area
MASTER BEDROOM	17.31 m²	STORE ROOM	4.31 m²
BEDROOM	11.82 m²	BALCONY	15.36 m²
BATHROOM	4.97 m²	REAR COURTYARD	15.29 m²
LIVING / DINING / KITCHEN	37.80 m²		
MASTER BATHROOM AND LAUNDRY	7.11 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**10.95 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**92.56 m²**	**TOTAL AREA**	**128.59 m²**



1 / A 113

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE D FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

TYPE D FLOOR PLAN

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: As indicated

A3

REV R80

DWG A-113

YARAN

CREATING VALUE
SHARING VALUE

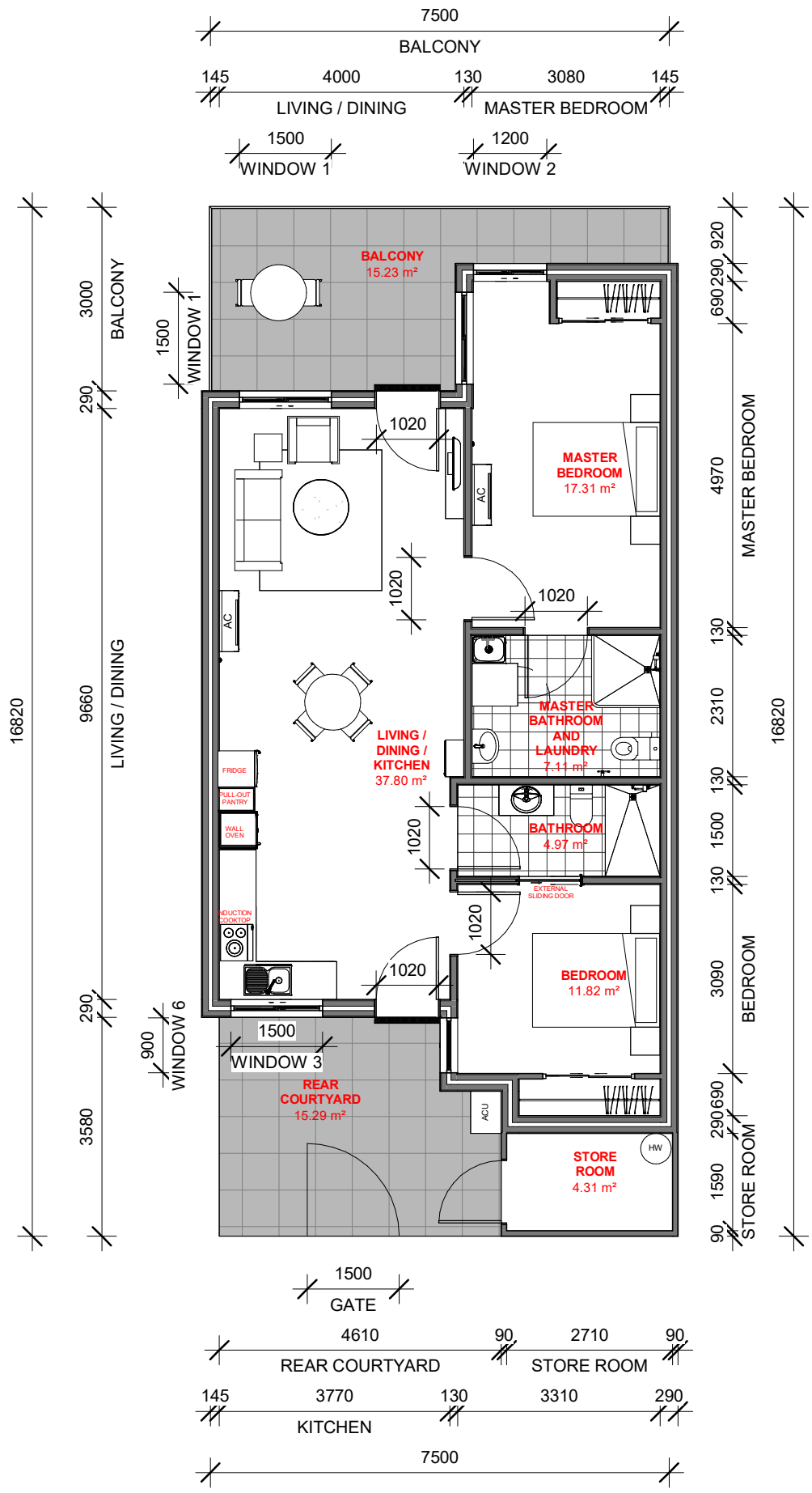
Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NOTES:

1. DESIGN IS FOR HIGH PHYSICAL SUPPORT (HPS) SDA
2. ALL CRITICAL DIMENSIONS ARE FREE OF SKIRTING BOARDS AS PER AS1428.1 REQUIREMENTS
3. ALL TRANSITIONS ARE FLUSH WITHIN 3MM UNLESS NOTED OTHERWISE
4. DRAWING REVIEW DOESN'T TAKE INTO ACCOUNT BCA/NCC REQUIREMENTS OUTSIDE OF SDA REQUIREMENTS
5. ALL INTERNAL FLOOR FINISHES SHALL HAVE A MINIMUM SLIP RESISTANCE OF P3 OR R10.
6. SLIP RESISTANCE OF ALL FLOORS TO SANITARY FACILITIES MIN P3 OR R10.
7. WET AREAS TO SDA DETAILS AS PER AS1428.1 ALL DOOR CIRCULATION SPACES (EXCLUDING INTERNAL DOOR CIRCULATION SPACES FOR BEDROOMS) SHALL BE PROVIDED IN ACCORDANCE WITH AS1428.1 TO BOTH SIDES OF THE DOOR.
8. A STEP-FREE DOORWAY THRESHOLD SHALL BE PROVIDED TO AN EXTERNAL ENTRY DOORWAY, AND EXTERNAL DOORWAYS LEADING TO PRIVATE OPEN SPACES.
9. FLUSH THRESHOLD TO THE FRONT ENTRY AND COURTYARDS USING STRIP GRATES IN COMPLIANCE WITH AS1528.1.
10. ALL DOORS TO AND WITHIN ALL AREAS INCLUDING ALL EXTERNAL DOORWAYS TO HAVE A MINIMUM CLEAR OPENING WIDTH OF 950MM.
11. ALL INTERNAL DOORWAYS SHALL HAVE A LEVEL (STEP-FREE) TRANSITION AND THRESHOLD (MAXIMUM VERTICAL TOLERANCE OF 3MM VERTICAL OR 5MM BETWEEN ABUTTING SURFACES IS ALLOWABLE PROVIDED THE LIP IS ROUNDED OR BEVELLED).
12. DOORWAYS SHALL HAVE DOOR HANDLES INSTALLED AT 1000MM ABOVE FFL AND ALIGN WITH THE LIGHT SWITCH.
13. DOOR HANDLES SELECTION AND LOCATION SHALL COMPLY WITH AS1428.1
14. POWER AND CONTROL CABLING TO HEAD OF ENTRY DOORS OF PARTICIPANT BEDROOMS, ENTRY DOORWAY AND EXTERNAL DOORWAY TO BE PROVIDED FOR FUTURE AUTOMATION.
15. POWER AND CONTROL CABLING TO WINDOWS OF BEDROOMS AND LIVING AREAS SHALL BE PROVIDED FOR FUTURE WINDOW BLIND AUTOMATION.
16. A CAPPED GPO AT THE WINDOW HEAD MAY BE PROVIDED TO COMPLY WITH THIS REQUIREMENT.
17. BEDROOMS SHALL HAVE A PROVISION FOR POWER AND INBUILT STRUCTURE, CAPABLE OF INSTALLATION OF A CONSTANT CHARGE CEILING HOIST. THE HOIST SHALL BE CAPABLE OF GOING ACROSS AND DOWN THE BED. MIN LOAD CAPACITY OF THE HOIST SHALL BE 250KG.
18. HOIST IS TO BE CAPABLE OF BEING EITHER CEILING MOUNTED OR WALL MOUNTED.
19. FOR FINAL-AS-BUILT STAGE OF SDA CERTIFICATION, THE STRUCTURE SHALL BE INSPECTED AND CERTIFIED BY A QUALIFIED STRUCTURAL ENGINEER AS BEING SUITABLE FOR CEILING HOISTS WITH MINIMUM LOAD CAPACITY OF 250KG.
20. EMERGENCY POWER SOLUTIONS SHALL BE PROVIDED TO CATER FOR A MINIMUM 2-HOUR OUTAGE IN NO LESS THAN 2 DOUBLE GPOS IN PARTICIPANT BEDROOMS AND ANY PROVIDED AUTOMATED DOORS THAT ARE USED FOR ENTRY OR EGRESS.

TYPE E AREA

Name	Area	Name	Area
MASTER BEDROOM	17.31 m²	STORE ROOM	4.31 m²
BEDROOM	11.82 m²	BALCONY	15.23 m²
BATHROOM	4.97 m²	REAR COURTYARD	15.29 m²
LIVING / DINING / KITCHEN	37.80 m²		
MASTER BATHROOM AND LAUNDRY	7.11 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**8.89 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**90.46 m²**	**TOTAL AREA**	**123.71 m²**



1 / A 114

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE E FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

TYPE E FLOOR PLAN

PLOT DATE: SEPTEMBER 2024
DRAWN: PV | JV
SCALE: As indicated

A3

REV R80
DWG A-114

YARAN
CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NOTES:

1. DESIGN IS FOR HIGH PHYSICAL SUPPORT (HPS) SDA
2. ALL CRITICAL DIMENSIONS ARE FREE OF SKIRTING BOARDS AS PER AS1428.1 REQUIREMENTS
3. ALL TRANSITIONS ARE FLUSH WITHIN 3MM UNLESS NOTED OTHERWISE
4. DRAWING REVIEW DOESN'T TAKE INTO ACCOUNT BCA/NCC REQUIREMENTS OUTSIDE OF SDA REQUIREMENTS
5. ALL INTERNAL FLOOR FINISHES SHALL HAVE A MINIMUM SLIP RESISTANCE OF P3 OR R10.
6. SLIP RESISTANCE OF ALL FLOORS TO SANITARY FACILITIES MIN P3 OR R10.
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8. A STEP-FREE DOORWAY THRESHOLD SHALL BE PROVIDED TO AN EXTERNAL ENTRY DOORWAY, AND EXTERNAL DOORWAYS LEADING TO PRIVATE OPEN SPACES.
9. FLUSH THRESHOLD TO THE FRONT ENTRY AND COURTYARDS USING STRIP GRATES IN COMPLIANCE WITH AS1528.1.
10. ALL DOORS TO AND WITHIN ALL AREAS INCLUDING ALL EXTERNAL DOORWAYS TO HAVE A MINIMUM CLEAR OPENING WIDTH OF 950MM.
11. ALL INTERNAL DOORWAYS SHALL HAVE A LEVEL (STEP-FREE) TRANSITION AND THRESHOLD (MAXIMUM VERTICAL TOLERANCE OF 3MM VERTICAL OR 5MM BETWEEN ABUTTING SURFACES IS ALLOWABLE PROVIDED THE LIP IS ROUNDED OR BEVELLED).
12. DOORWAYS SHALL HAVE DOOR HANDLES INSTALLED AT 1000MM ABOVE FFL AND ALIGN WITH THE LIGHT SWITCH.
13. DOOR HANDLES SELECTION AND LOCATION SHALL COMPLY WITH AS1428.1
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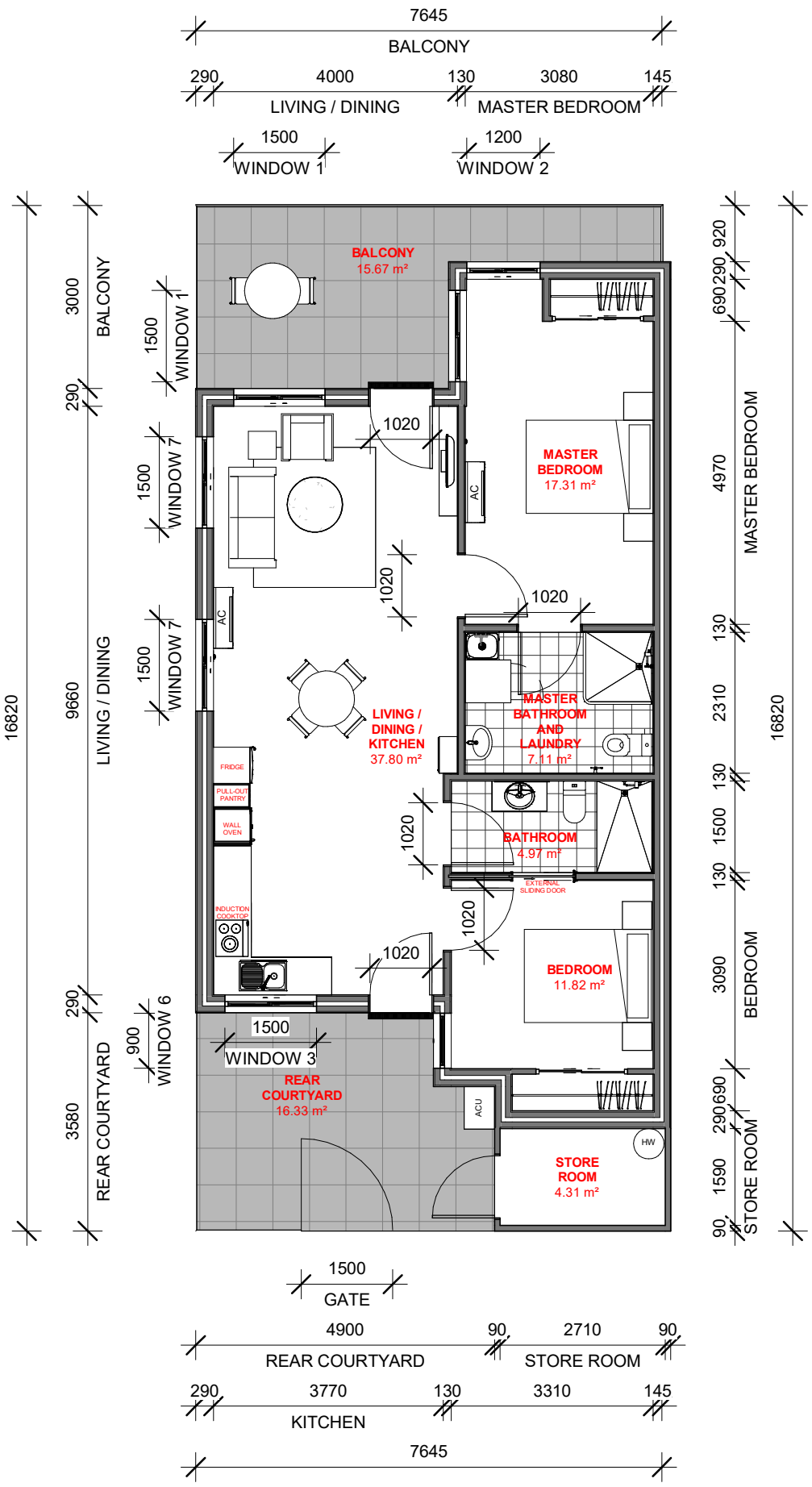
15. POWER AND CONTROL CABLING TO WINDOWS OF BEDROOMS AND LIVING AREAS SHALL BE PROVIDED FOR FUTURE WINDOW BLIND AUTOMATION.
16. A CAPPED GPO AT THE WINDOW HEAD MAY BE PROVIDED TO COMPLY WITH THIS REQUIREMENT.
17. BEDROOMS SHALL HAVE A PROVISION FOR POWER AND INBUILT STRUCTURE, CAPABLE OF INSTALLATION OF A CONSTANT CHARGE CEILING HOIST. THE HOIST SHALL BE CAPABLE OF GOING ACROSS AND DOWN THE BED. MIN LOAD CAPACITY OF THE HOIST SHALL BE 250KG.
18. HOIST IS TO BE CAPABLE OF BEING EITHER CEILING MOUNTED OR WALL MOUNTED.
19. FOR FINAL-AS-BUILT STAGE OF SDA CERTIFICATION, THE STRUCTURE SHALL BE INSPECTED AND CERTIFIED BY A QUALIFIED STRUCTURAL ENGINEER AS BEING SUITABLE FOR CEILING HOISTS WITH MINIMUM LOAD CAPACITY OF 250KG.
20. EMERGENCY POWER SOLUTIONS SHALL BE PROVIDED TO CATER FOR A MINIMUM 2-HOUR OUTAGE IN NO LESS THAN 2 DOUBLE GPOS IN PARTICIPANT BEDROOMS AND ANY PROVIDED AUTOMATED DOORS THAT ARE USED FOR ENTRY OR EGRESS.

TYPE F AREA

Name	Area	Name	Area
MASTER BEDROOM	17.31 m²	STORE ROOM	4.31 m²
BEDROOM	11.82 m²	BALCONY	15.67 m²
BATHROOM	4.97 m²	REAR COURTYARD	16.33 m²
LIVING / DINING / KITCHEN	37.80 m²		
MASTER BATHROOM AND LAUNDRY	7.11 m²		
INTERNAL WALL AREA	**1.98 m²**		
EXTERNAL WALL AREA	**10.37 m²**		
INTERNAL FLOOR AREA	**79.63 m²**		
BUILDING FOOTPRINT	**91.98 m²**	**TOTAL AREA**	**128.59 m²**



1 / A 115

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE F FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING
4 WAARDONG COURT, HALLS HEAD, WA 6120

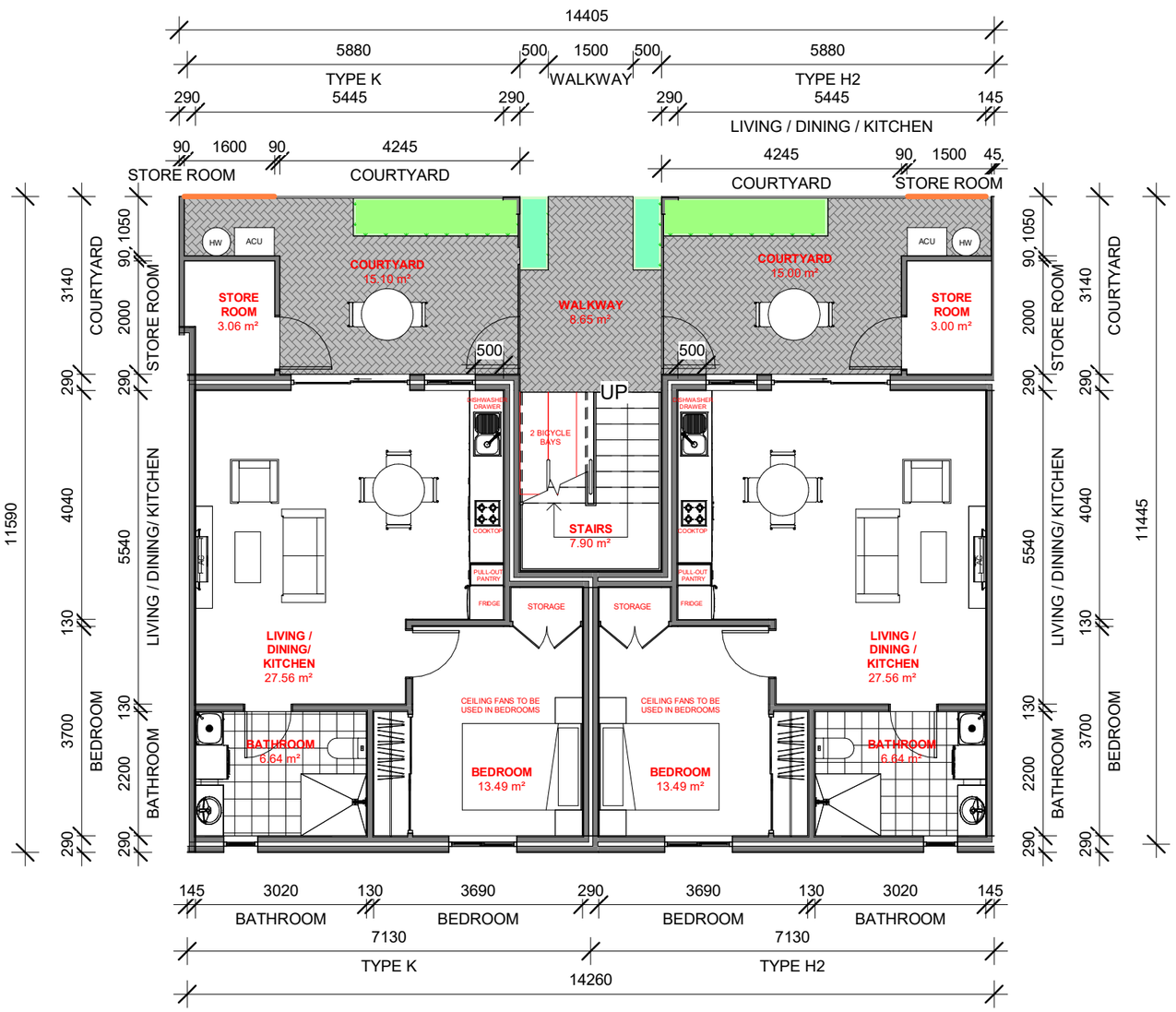
SHEET CONTENT
TYPE F FLOOR PLAN

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: As indicated
A3

REV R80
DWG A-115

YARAN
CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024



TYPE K AREA

Name	Area
BATHROOM	6.64 m²
BEDROOM	13.49 m²
LIVING / DINING/ KITCHEN	27.56 m²
INTERIOR WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.92 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.06 m²
COURTYARD	15.10 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.53 m²**

TYPE H2 AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.89 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.00 m²
COURTYARD	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.36 m²**

SCREENING

1
A | 116

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE K-H FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

TYPE K-H2 FLOOR PLAN

PLOT DATE: NOVEMBER 2024
DRAWN: PV | JV
SCALE: As indicated

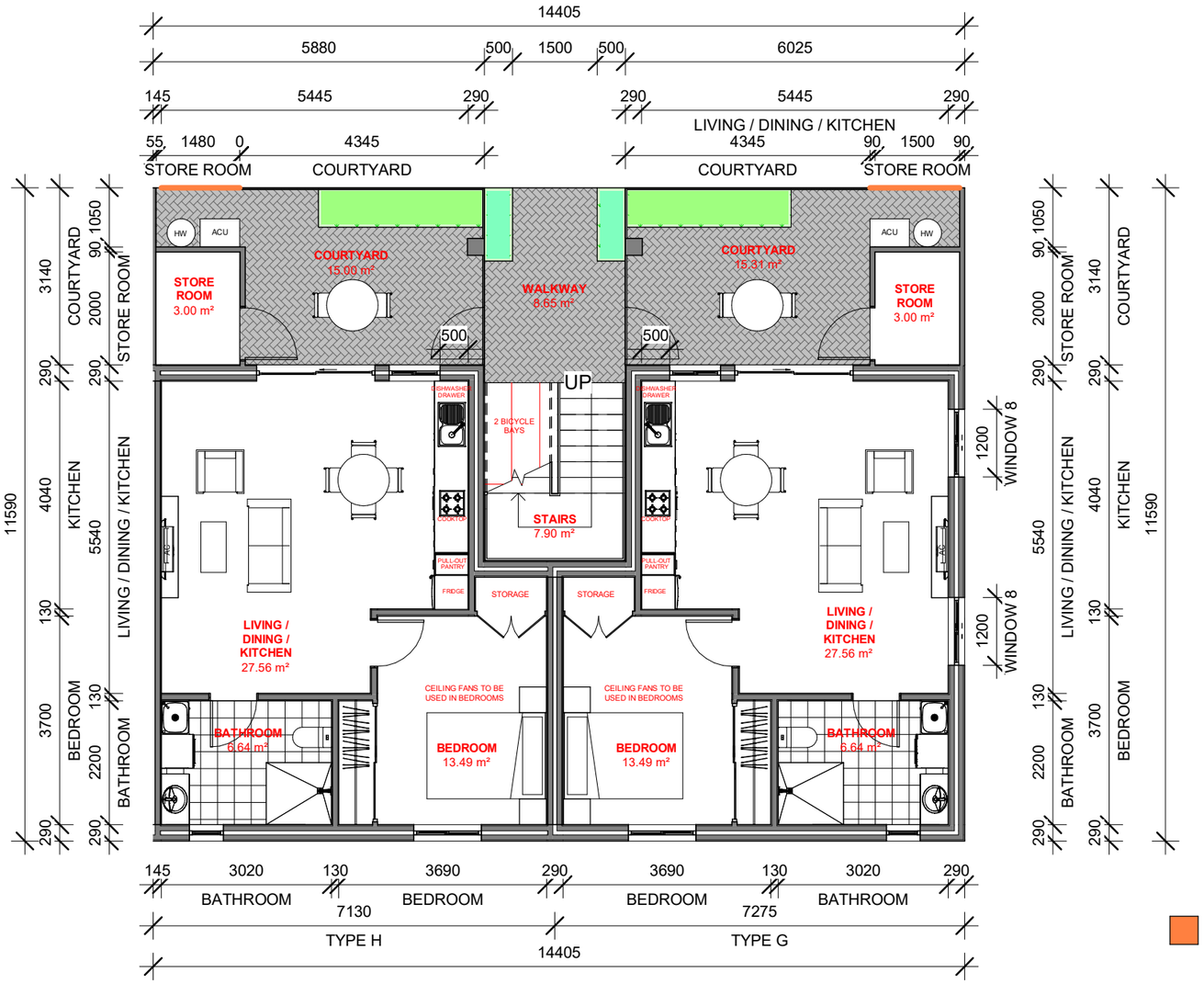
A3

ZONING R80
DWG A-116

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024



TYPE H AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.89 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.00 m²
COURTYARD	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.36 m²**

TYPE G AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**8.15 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**57.12 m²**

Name	Area
STORE ROOM	3.00 m²
COURTYARD	15.31 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**76.04 m²**

SCREENING

1
A | 117

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE H-G FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

TYPE H-G FLOOR PLAN

PLOT DATE: NOVEMBER 2024
DRAWN: PV | JV
SCALE: As indicated

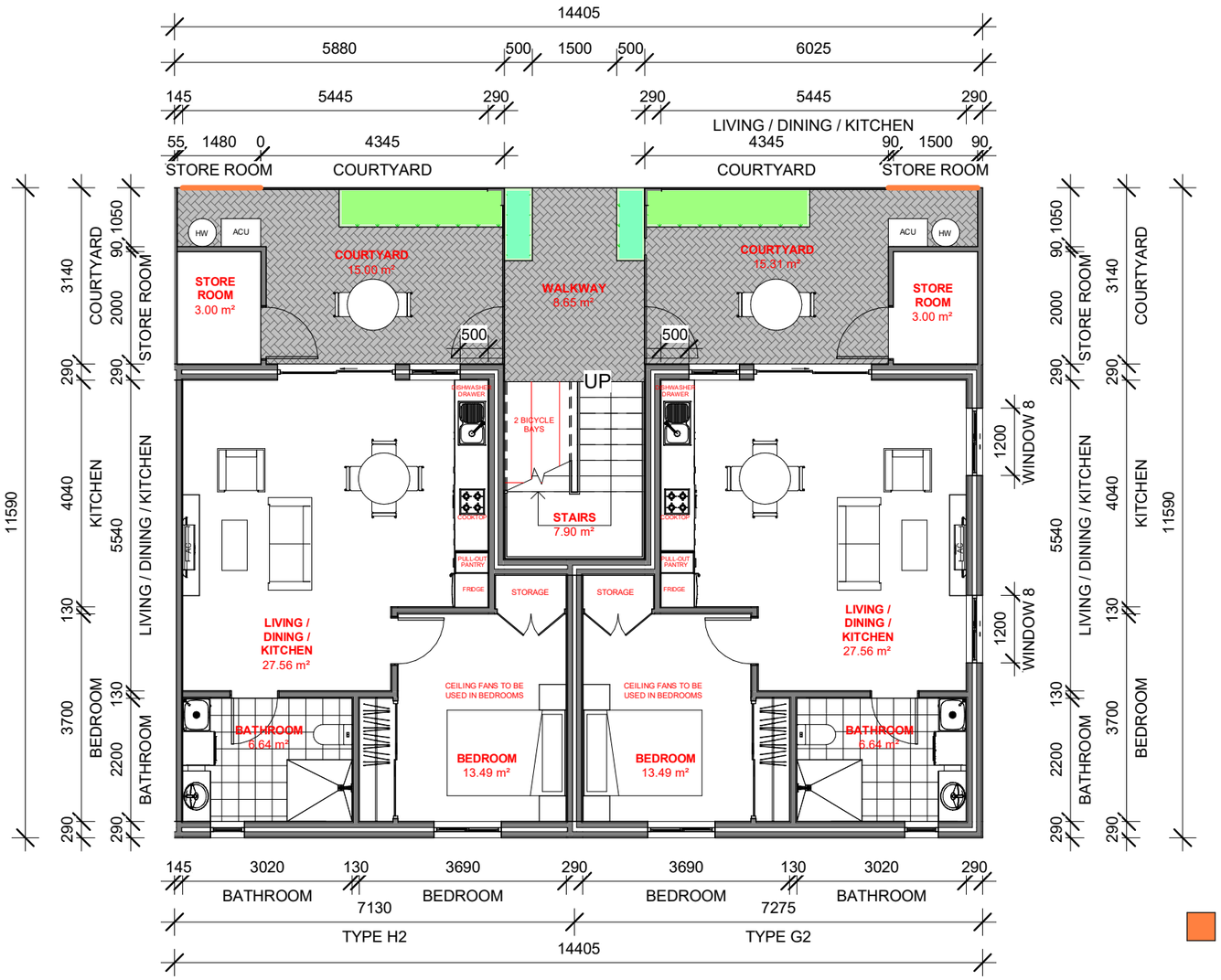
A3

ZONING R80
DWG A-117

YARAN

CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024



TYPE H2 AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.89 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.00 m²
COURTYARD	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.36 m²**

TYPE G2 AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**8.15 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**57.12 m²**

Name	Area
STORE ROOM	3.00 m²
COURTYARD	15.31 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**76.04 m²**

SCREENING

1
A 118

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE H2-G2 FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

TYPE H2-G2 FLOOR PLAN

PLOT DATE: NOVEMBER 2024 2024
DRAWN: PV | JV
SCALE: As indicated

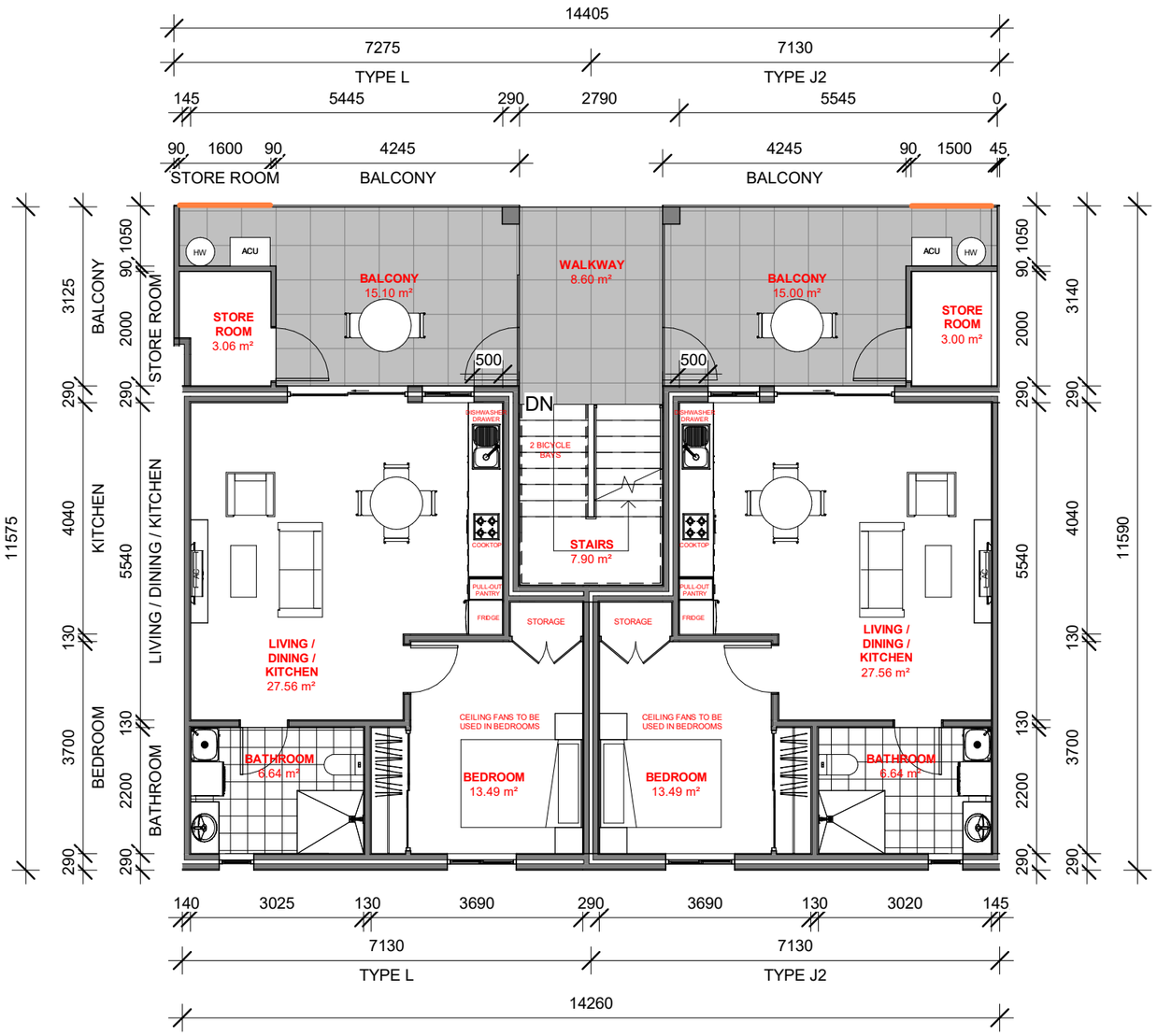
A3

ZONING R80
DWG A-118

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024



SCREENING

TYPE L AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERIOR WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.92 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.06 m²
BALCONY	15.10 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.53 m²**

TYPE J2 AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.89 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.53 m²**

1
A 119

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE L2-J2 FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

TYPE L-J2 FLOOR PLAN

PLOT DATE: NOVEMBER 2024 2024
DRAWN: PV | JV
SCALE: As indicated

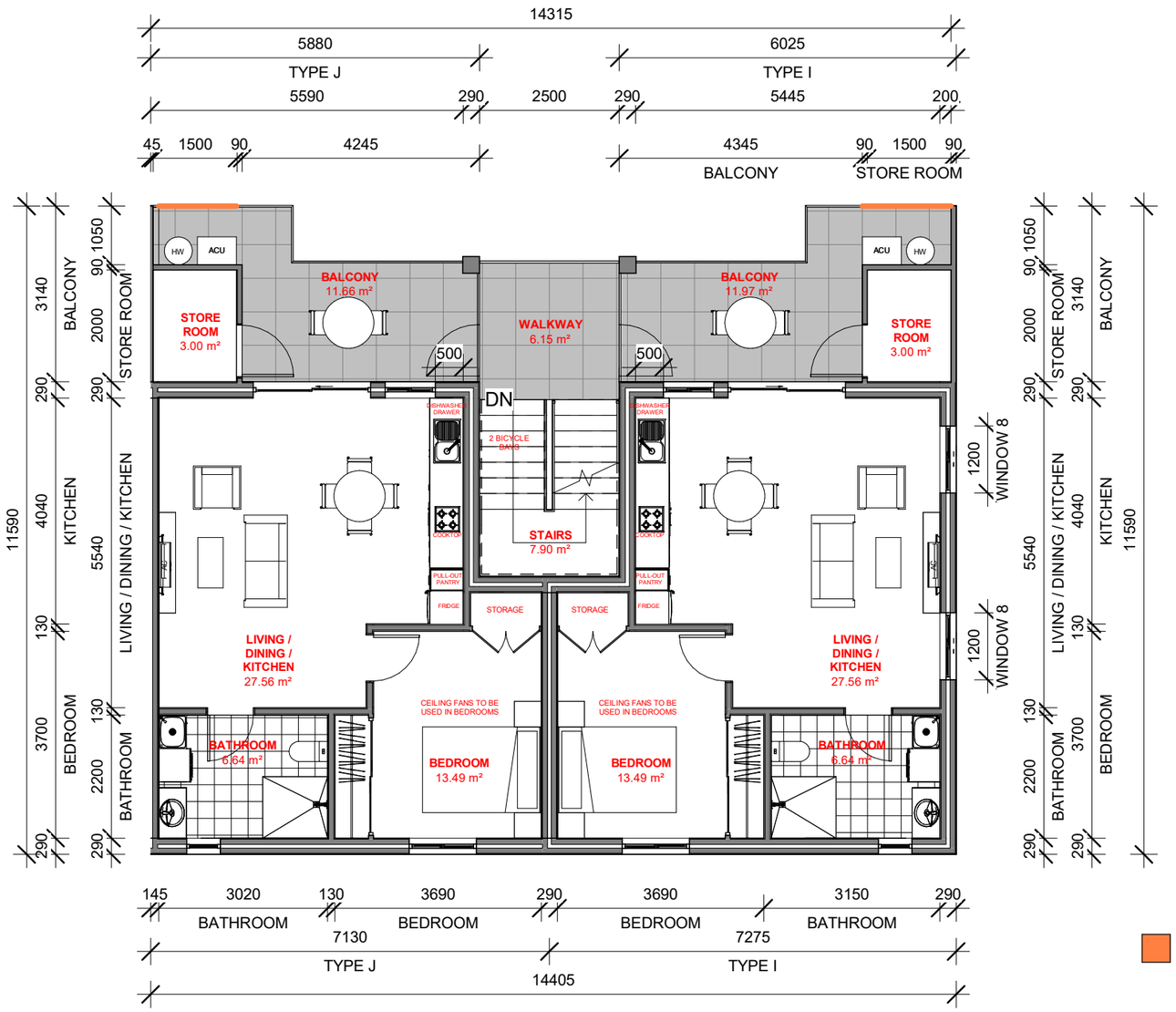
A3

ZONING R80
DWG A-119

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024



TYPE J AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.89 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	11.66 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**71.18 m²**

TYPE I AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**8.15 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**57.12 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	11.97 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**72.70 m²**

SCREENING

1
A 120

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE J-I FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

TYPE J-I FLOOR PLAN

PLOT DATE: NOVEMBER 2024 2024
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80
DWG A-120

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024



TYPE J2 AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**6.89 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**55.90 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	15.00 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**74.53 m²**

TYPE I2 AREA

Name	Area
BEDROOM	13.49 m²
BATHROOM	6.64 m²
LIVING / DINING / KITCHEN	27.56 m²
INTERNAL WALL AREA	**1.28 m²**
EXTERNAL WALL AREA	**8.15 m²**
INTERNAL FLOOR AREA	**47.91 m²**
BUILDING FOOTPRINT	**57.12 m²**

Name	Area
STORE ROOM	3.00 m²
BALCONY	15.32 m²
STORE ROOM WALL AREA	**0.61 m²**
TOTAL AREA	**76.04 m²**

SCREENING

1
A 121

YARAN PROPERTY GROUP, WAARDONG COURT DEVELOPMENT

TYPE J2-I2 FLOOR PLAN

1 : 100

0 1 2 3 4 5 10

GRAPHIC SCALE: 1:100

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

TYPE J2-I2 FLOOR PLAN

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80
DWG A-121

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

LEGEND/S:

1. SPACE FOR PUBLIC ART



1 / A 122

YARAN PROPERTY GROUP

SITE SOUTH ELEVATION A

1 : 250

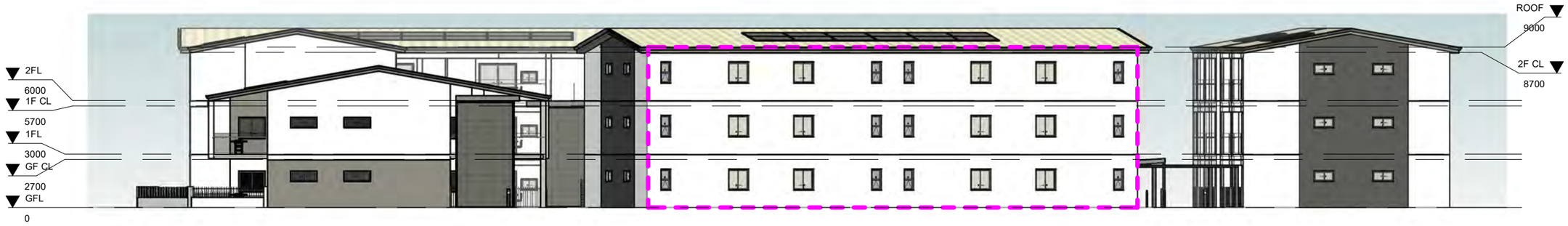


2 / A 122

YARAN PROPERTY GROUP

SITE SOUTH ELEVATION B

1 : 250



3 / A 122

YARAN PROPERTY GROUP

SITE WEST ELEVATION

1 : 250

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

SITE ELEVATIONS

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80

DWG A-122

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

LEGEND/S:

1. SPACE FOR PUBLIC ART

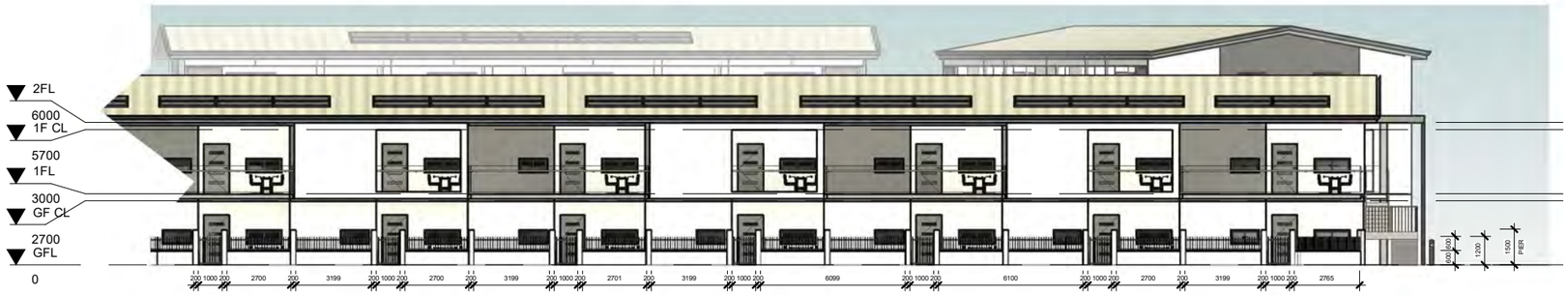


1 / A 123

YARAN PROPERTY GROUP

SITE NORTH ELEVATION A

1 : 250



2 / A 123

YARAN PROPERTY GROUP

SITE NORTH ELEVATION B

1 : 250



3 / A 123

YARAN PROPERTY GROUP

SITE EAST ELEVATION

1 : 250

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

SITE ELEVATIONS

PLOT DATE: NOVEMBER 2024
DRAWN: PV | JV
SCALE: As indicated

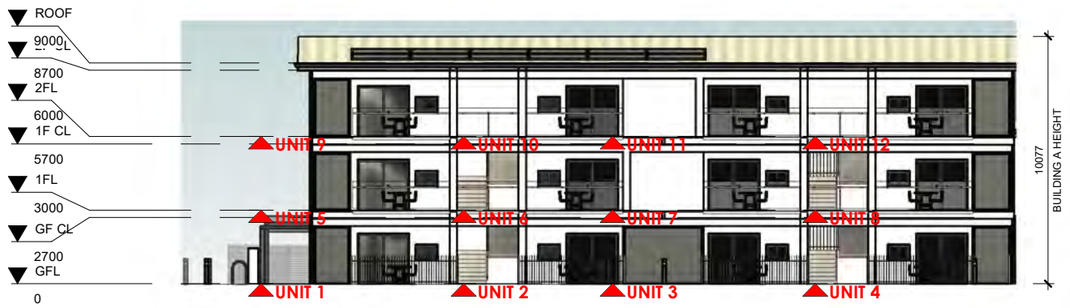
A3

ZONING R80
DWG A-123

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

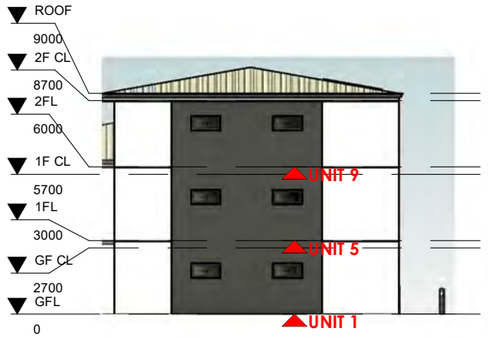


1 / A 124

YARAN PROPERTY GROUP

BLDG A - NORTH ELEVATION

1 : 250

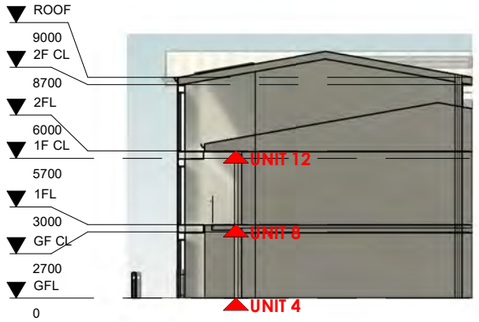


2 / A 124

YARAN PROPERTY GROUP

BLDG A - EAST ELEVATION

1 : 250

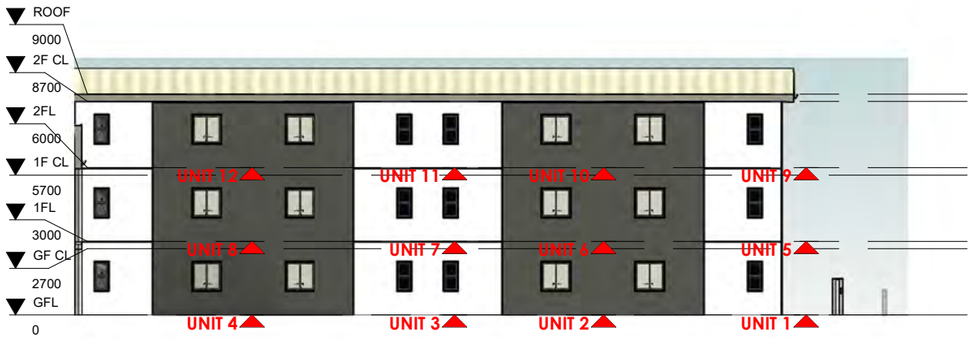


3 / A 124

YARAN PROPERTY GROUP

BLDG A - WEST ELEVATION

1 : 250

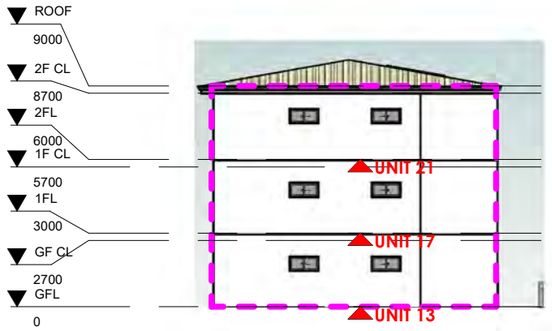


4 / A 124

YARAN PROPERTY GROUP

BUILDING A - SOUTH ELEVATION

1 : 250

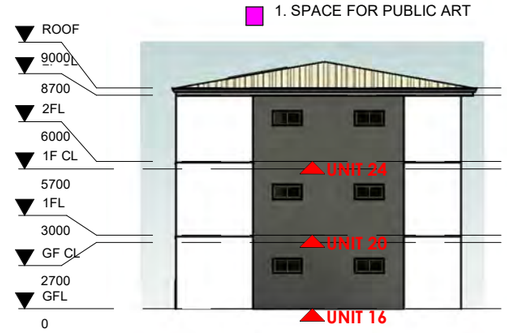


5 / A 124

YARAN PROPERTY GROUP

BLDG B - NORTH ELEVATION

1 : 250

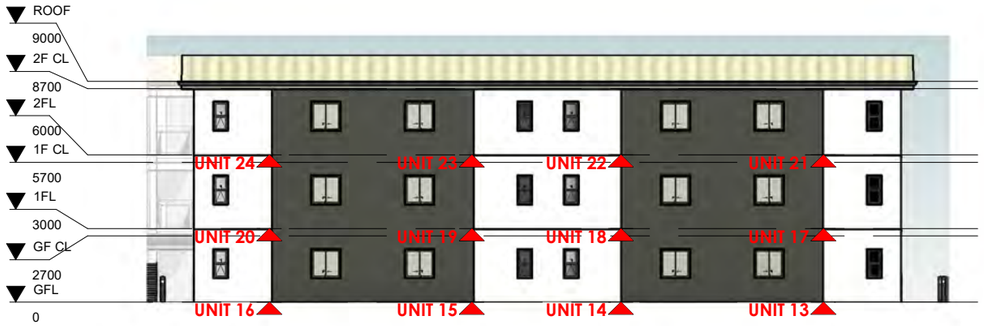


6 / A 124

YARAN PROPERTY GROUP

BLDG B - SOUTH ELEVATION

1 : 250

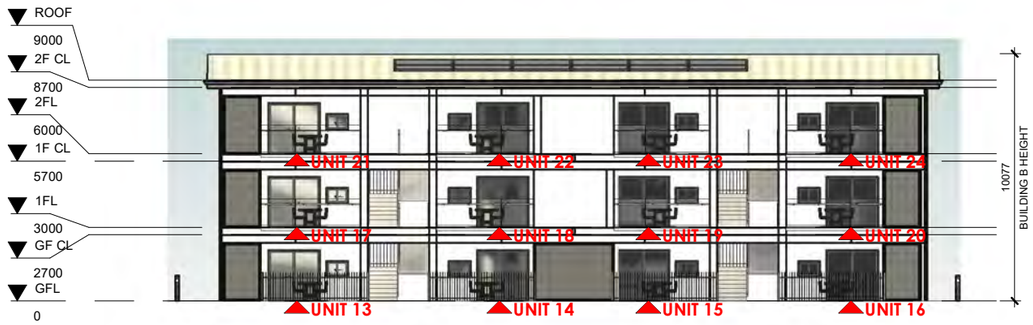


7 / A 124

YARAN PROPERTY GROUP

BLDG B - EAST ELEVATION

1 : 250



8 / A 124

YARAN PROPERTY GROUP

BLDG B - WEST ELEVATION

1 : 250

LEGEND/S:

1. SPACE FOR PUBLIC ART

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

BUILDING A & B ELEVATIONS

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80
DWG A-124

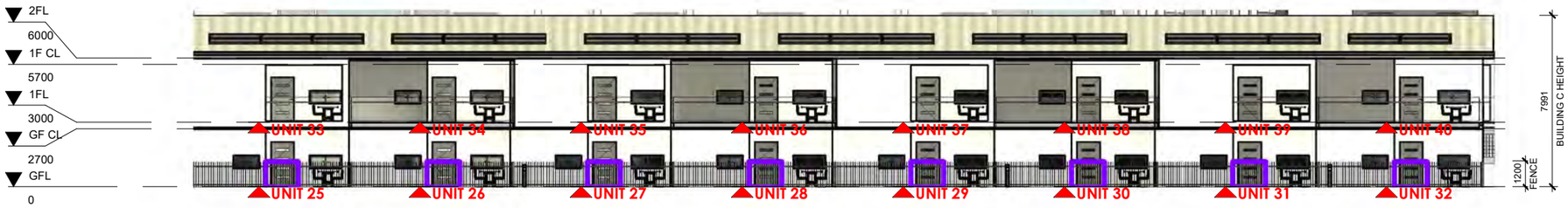
YARAN

CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

LEGEND/S:

1. GATE LOCATION

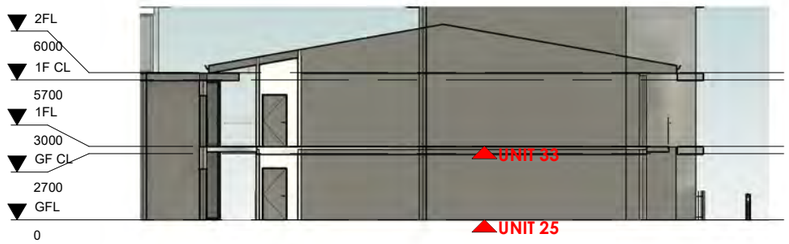


1 / A 125

YARAN PROPERTY GROUP

BUILDING C - NORTH ELEVATION

1 : 250

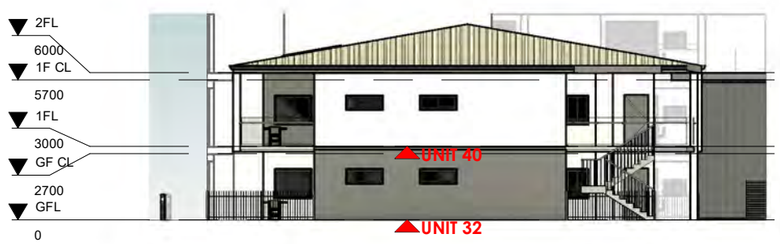


2 / A 125

YARAN PROPERTY GROUP

BUILDING C - EAST ELEVATION

1 : 250

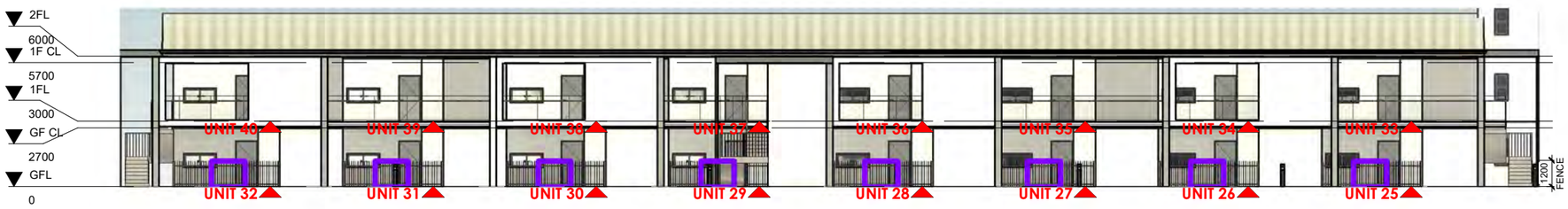


3 / A 125

YARAN PROPERTY GROUP

BUILDING C - WEST ELEVATION

1 : 250



4 / A 125

YARAN PROPERTY GROUP

BUILDING C - SOUTH ELEVATION

1 : 250

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

BUILDING C ELEVATIONS

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: As indicated

A3

ZONING R80

DWG A-125

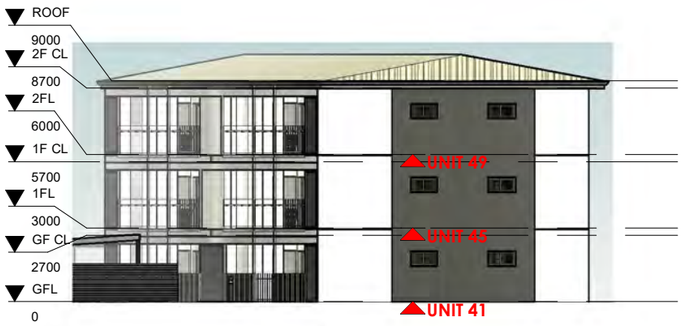
YARAN

CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

LEGEND/S:

1. SPACE FOR PUBLIC ART

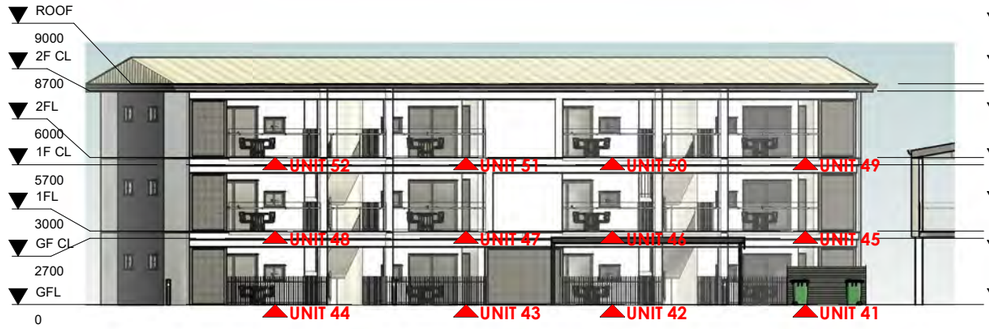


1 / A 126

YARAN PROPERTY GROUP

BUIIDING D - NORTH ELEVATION

1 : 250

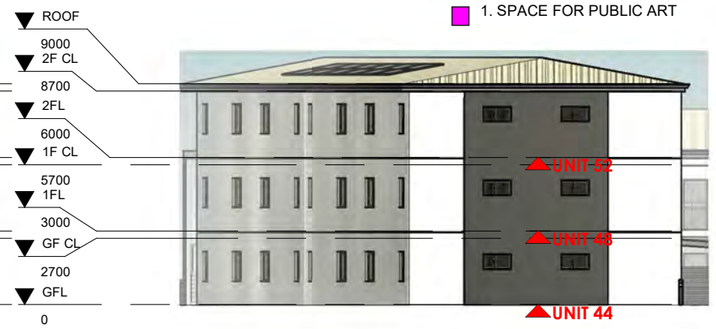


2 / A 126

YARAN PROPERTY GROUP

BUILDING D - EAST ELEVATION

1 : 250

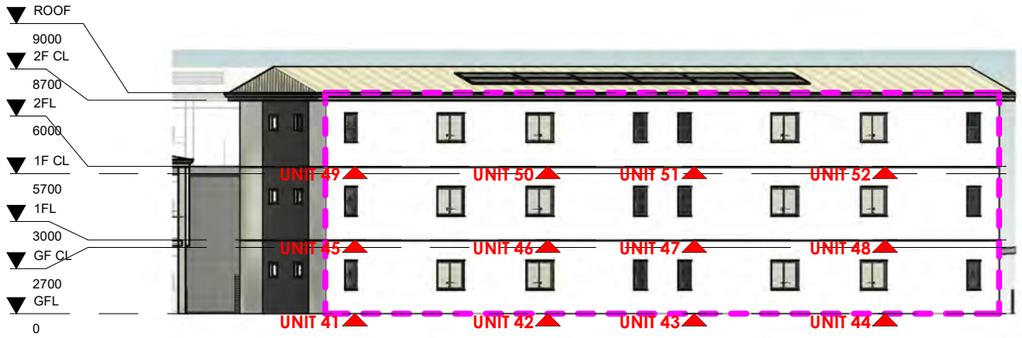


3 / A 126

YARAN PROPERTY GROUP

BUILDING D - SOUTH ELEVATION

1 : 250

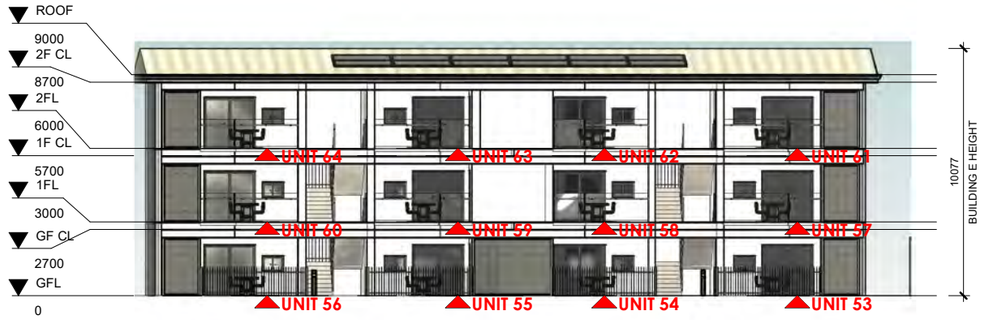


4 / A 126

YARAN PROPERTY GROUP

BUILDING D - WEST ELEVATION

1 : 250

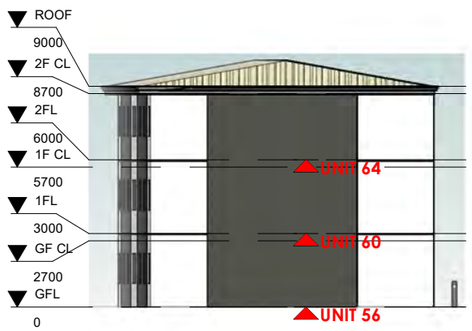


5 / A 126

YARAN PROPERTY GROUP

BUILDING E - NORTH ELEVATION

1 : 250

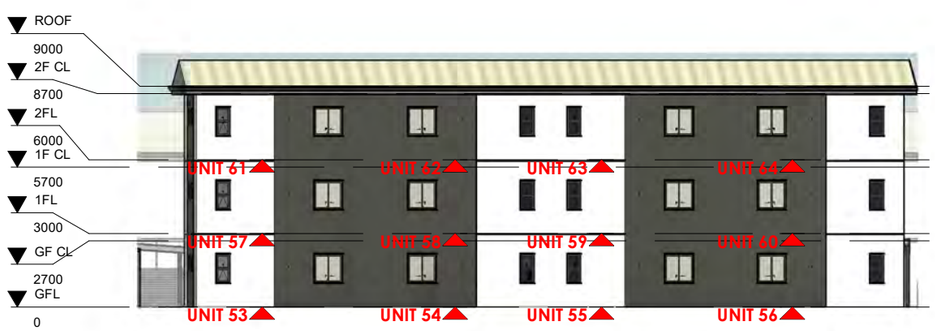


6 / A 126

YARAN PROPERTY GROUP

BUILDING E - EAST ELEVATIONS

1 : 250

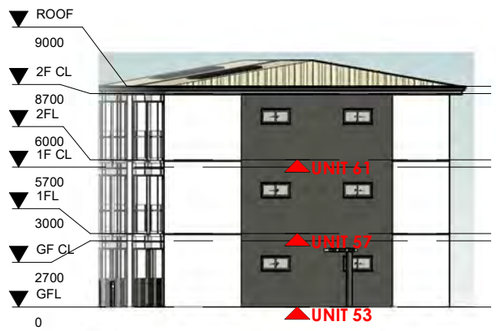


7 / A 126

YARAN PROPERTY GROUP

BUILDING E - SOUTH ELEVATION

1 : 250



8 / A 126

YARAN PROPERTY GROUP

BUILDING E - WEST ELEVATION

1 : 250

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

BUILDING D & E ELEVATIONS

PLOT DATE: OCTOBER 2024
DRAWN: NA | JV
SCALE: As indicated

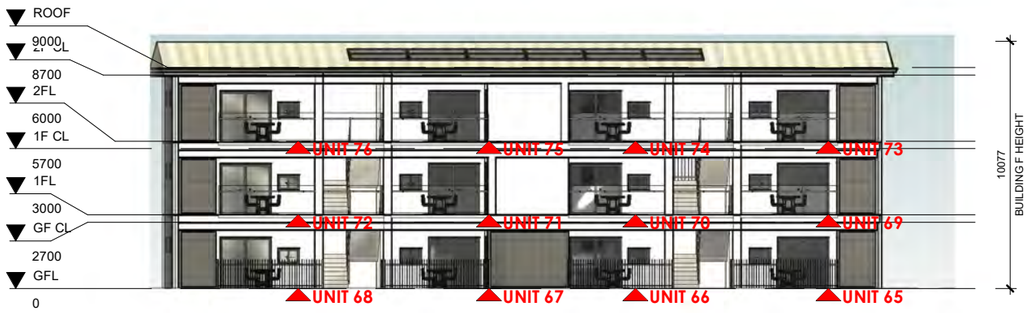
A3

ZONING R80
DWG A-126

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

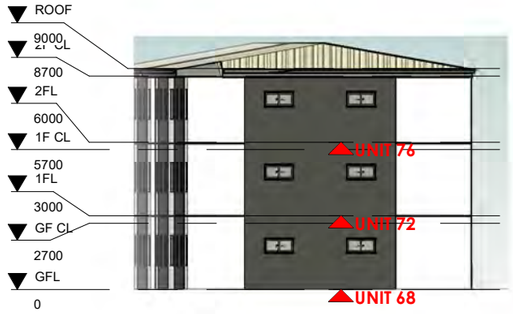


1
A | 127

YARAN PROPERTY GROUP

BUILDING F - NORTH ELEVATION

1 : 250

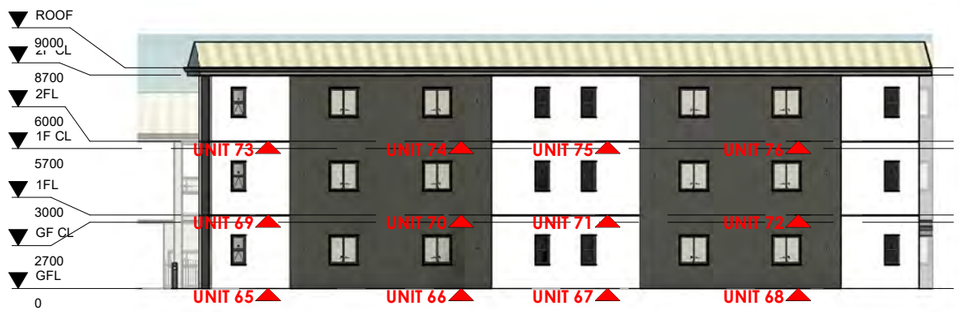


2
A | 127

YARAN PROPERTY GROUP

BUILDING F - EAST ELEVATIONS

1 : 250

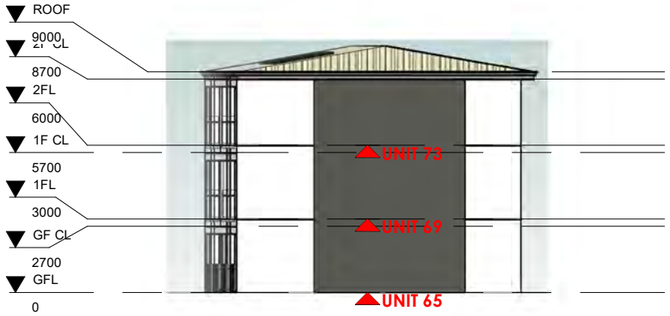


3
A | 127

YARAN PROPERTY GROUP

BUILDING F - SOUTH ELEVATION

1 : 250



4
A | 127

YARAN PROPERTY GROUP

BUILDING F - WEST ELEVATION

1 : 250

0 5 10 20 25

GRAPHIC SCALE 1:250

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

BUILDING F ELEVATIONS

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: 1 : 250

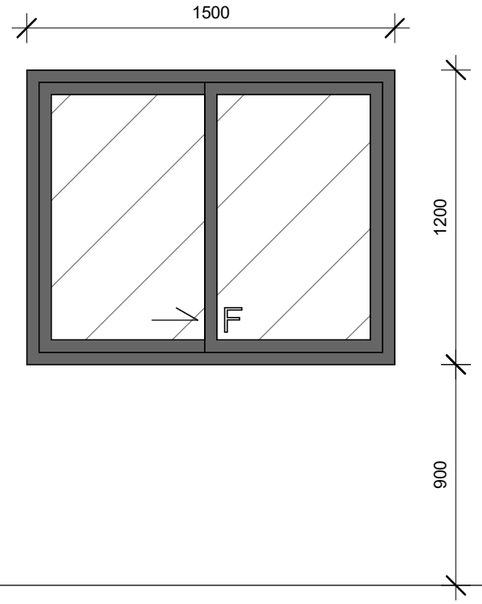
A3

ZONING R80
DWG A-127

YARAN

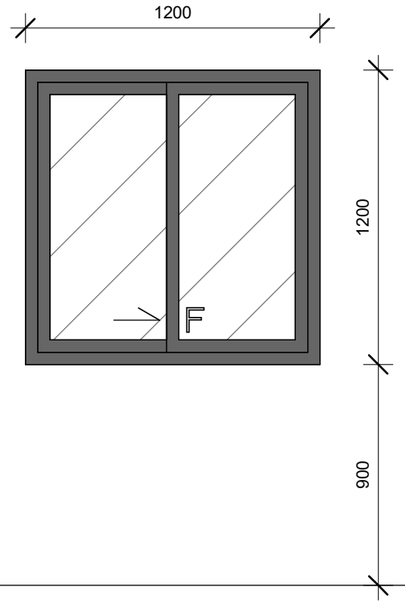
CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024



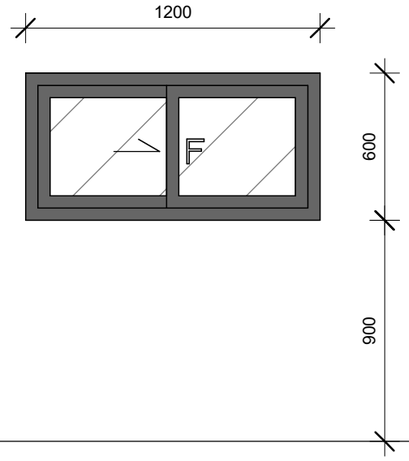
F.F.L.

WINDOW CODE	WINDOW 1
DIMENSION (WxH)	1500mm x 1200mm
LOCATION	LIVING (TYPES A-F), MASTER BEDROOM (TYPES A-F)
QUANTITY	32 SETS



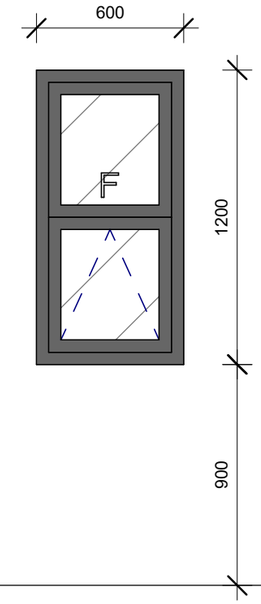
F.F.L.

WINDOW CODE	WINDOW 2
DIMENSION (WxH)	1200mm x 1200mm
LOCATION	BEDROOM (TYPES A-J)
QUANTITY	103 SETS



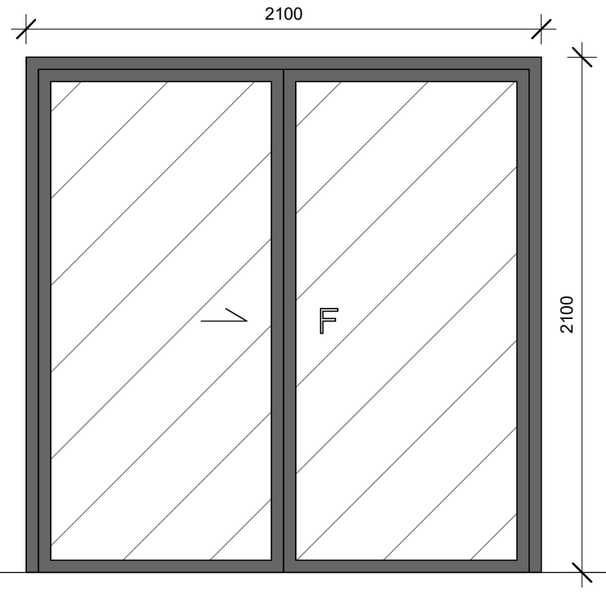
F.F.L.

WINDOW CODE	WINDOW 3
DIMENSION (WxH)	1200mm x 650mm
LOCATION	KITCHEN (TYPES A-J)
QUANTITY	76 SETS



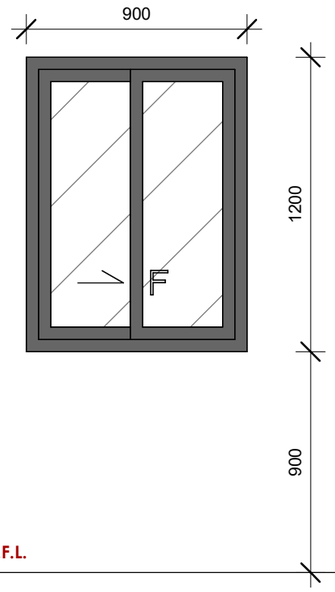
F.F.L.

WINDOW CODE	WINDOW 4
DIMENSION (WxH)	600mm x 1200mm
LOCATION	LIVING (TYPES G-J), KITCHEN (TYPES A-F), BATHROOM (TYPES G-J)
QUANTITY	114 SETS



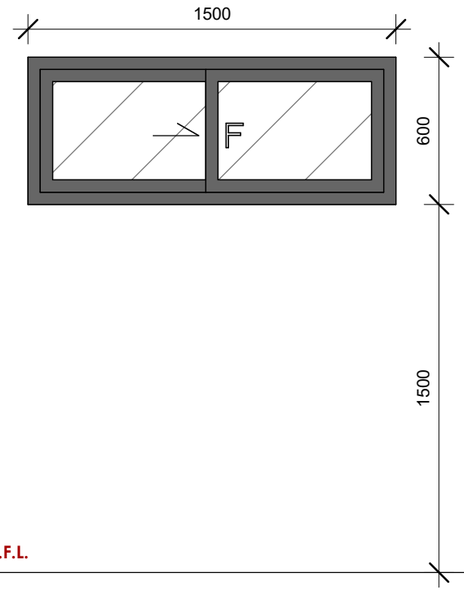
F.F.L.

WINDOW CODE	WINDOW 5
DIMENSION (WxH)	2100mm x 2100mm
LOCATION	LIVING (TYPES G-J)
QUANTITY	60 SETS



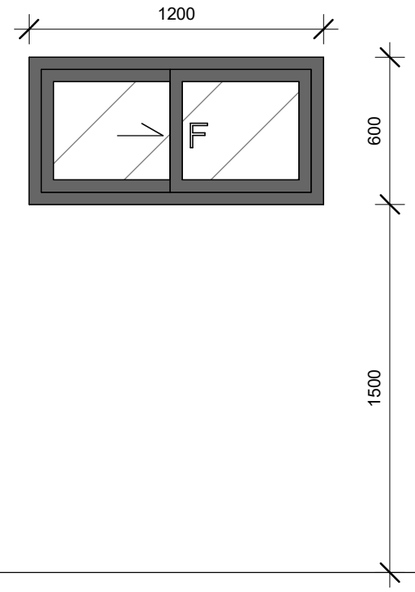
F.F.L.

WINDOW CODE	WINDOW 6
DIMENSION (WxH)	900mm x 1200mm
LOCATION	BEDROOM (TYPES A-F)
QUANTITY	16 SETS



F.F.L.

WINDOW CODE	WINDOW 7
DIMENSION (WxH)	1500mm x 600mm
LOCATION	LIVING (TYPES C)
QUANTITY	4 SETS



F.F.L.

WINDOW CODE	WINDOW 8
DIMENSION (WxH)	1200mm x 600mm
LOCATION	LIVING (TYPES G)
QUANTITY	21 SETS

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

WINDOWS SCHEDULE

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: 1 : 25

A3

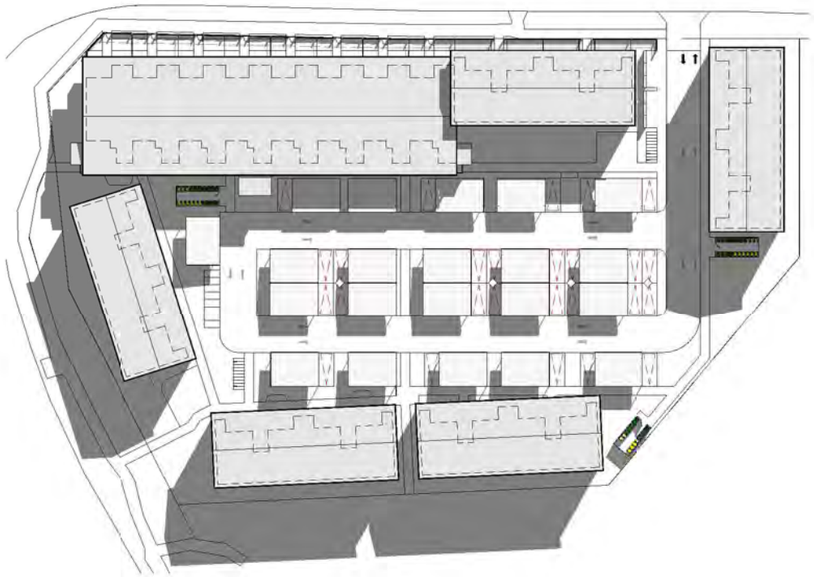
ZONING R80
DWG A-128

YARAN

CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NORTH

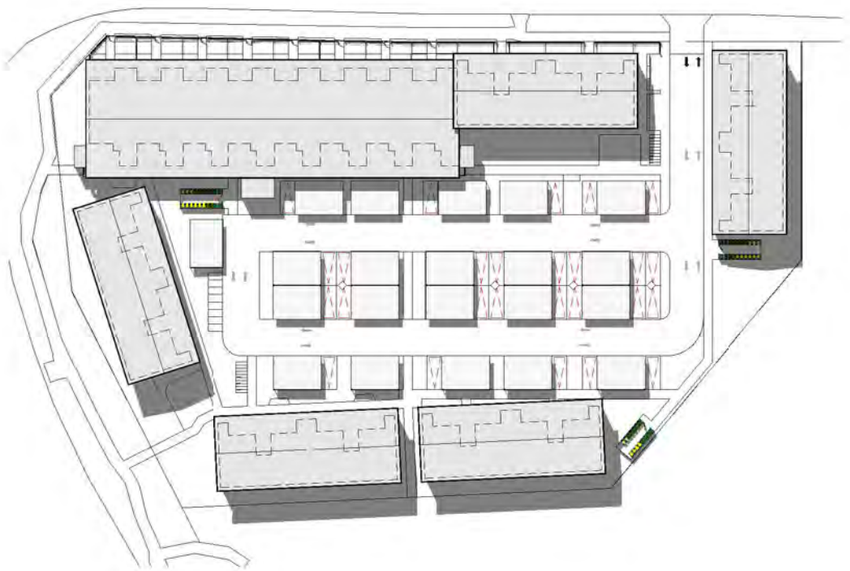


1
A | 129

YARAN PROPERTY GROUP

AUTUMN EQUINOX MAR 21 - 9AM

1 : 1000

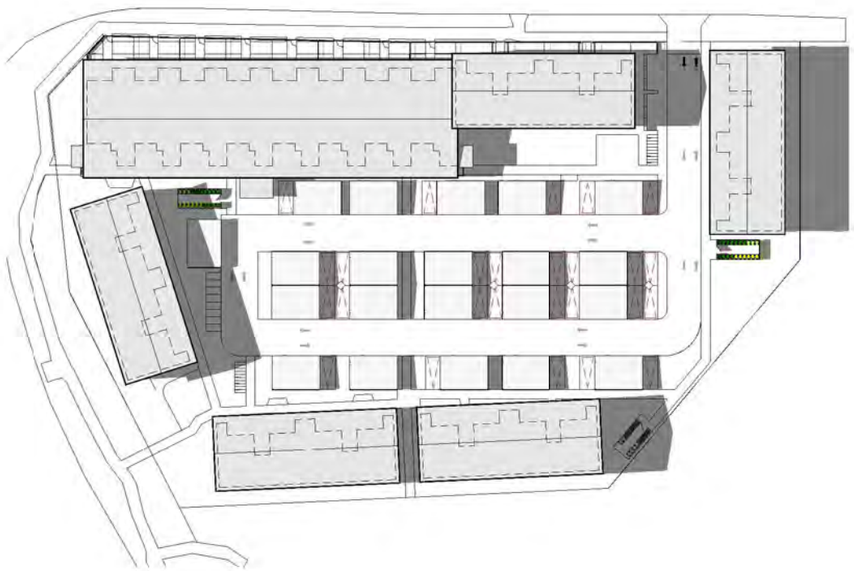


2
A | 129

YARAN PROPERTY GROUP

AUTUMN EQUINOX MAR 21 - 12PM

1 : 1000



3
A | 129

YARAN PROPERTY GROUP

AUTUMN EQUINOX MAR 21 - 3PM

1 : 1000

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

SHADOW DIAGRAM - AUTUMN EQUINOX

PLOT DATE:	NOVEMBER 2024
DRAWN:	PV | JV
SCALE:	1 : 1000

A3

ZONING R80

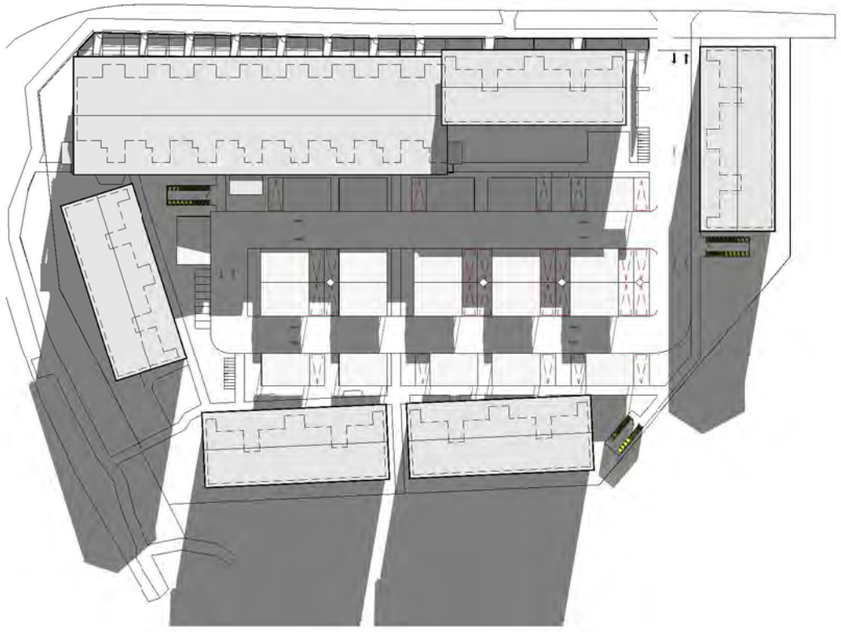
DWG A-129

YARAN

CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NORTH



1
A 130

YARAN PROPERTY GROUP

WINTER SOLSTICE JUN 21 - 9AM

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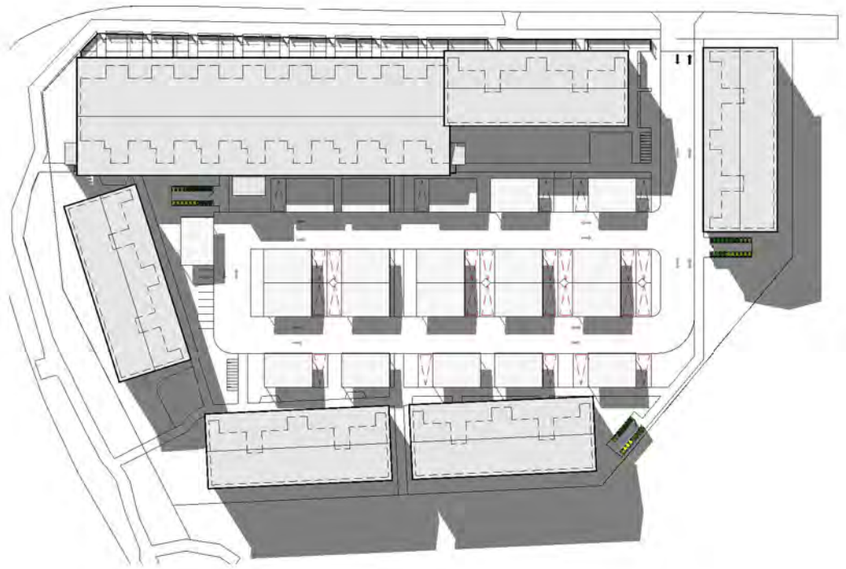

2
A 130

YARAN PROPERTY GROUP

WINTER SOLSTICE JUN 21 - 12PM

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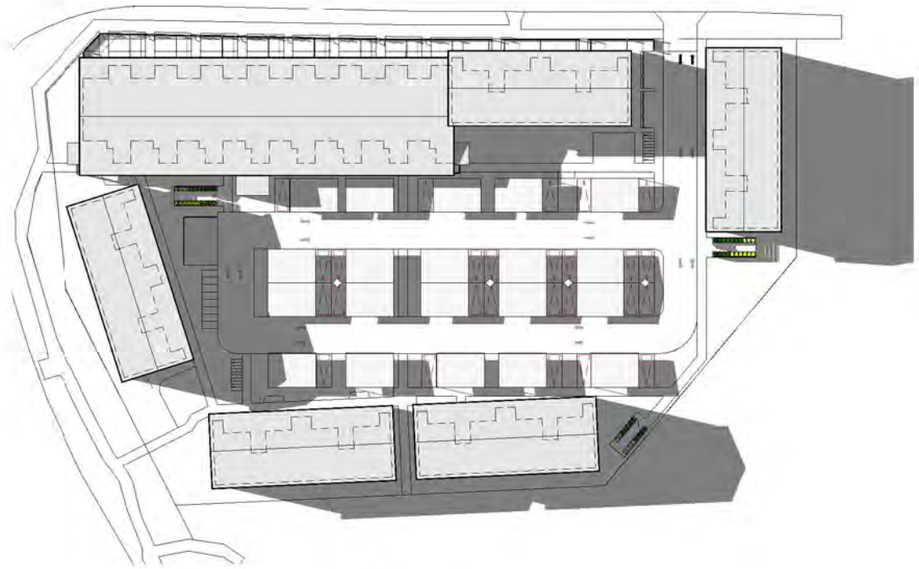


3
A 130

YARAN PROPERTY GROUP

WINTER SOLSTICE JUN 21 - 3PM

1 : 1000

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

SHADOW DIAGRAM - WINTER SOLSTICE

PLOT DATE: OCTOBER 2024
DRAWN: PV | JV
SCALE: 1 : 1000

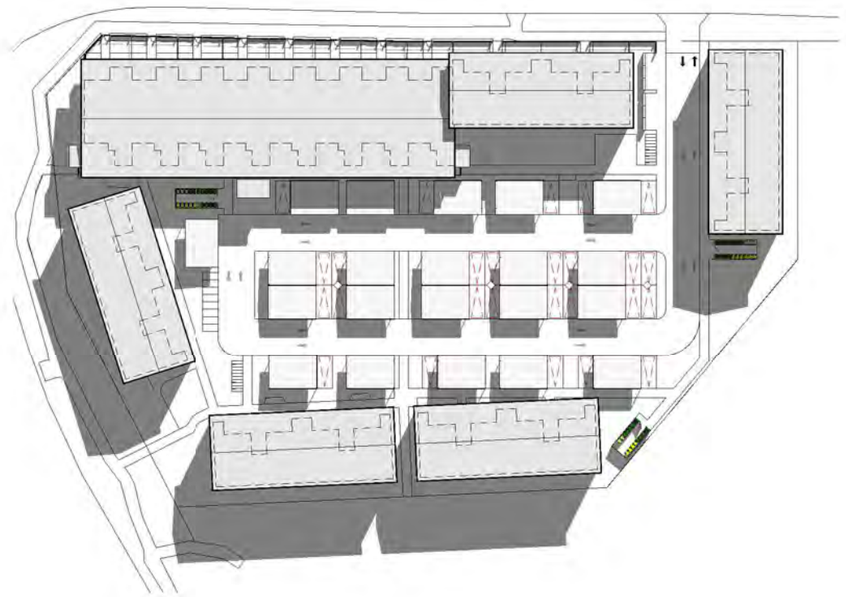
A3

ZONING R80
DWG A-130

YARAN
CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NORTH



1
A | 131

YARAN PROPERTY GROUP

SPRING EQUINOX SEP 21 - 9AM

1 : 1000

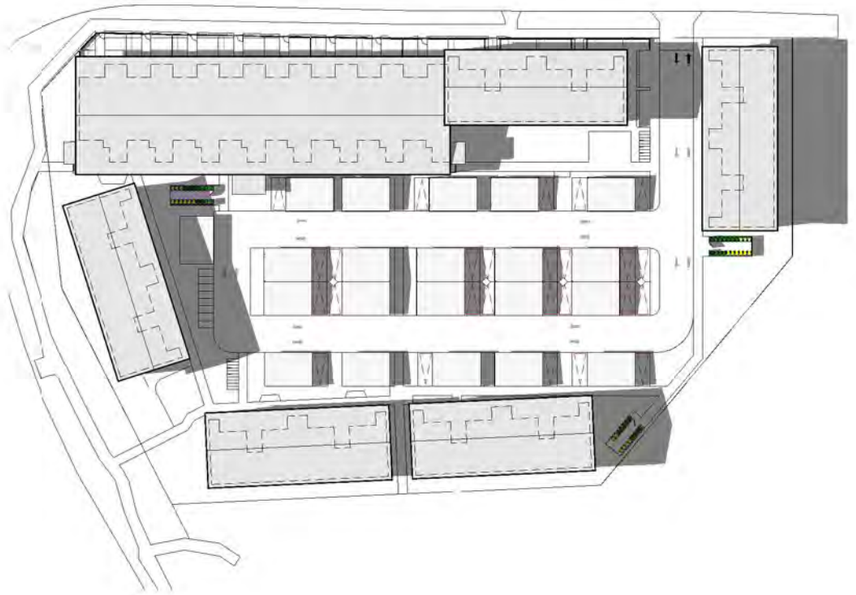


2
A | 131

YARAN PROPERTY GROUP

SPRING EQUINOX SEP 21 - 12PM

1 : 1000



3
A | 131

YARAN PROPERTY GROUP

SPRING EQUINOX SEP 21 - 3PM

1 : 1000

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

SHADOW DIAGRAM - SPRING EQUINOX

PLOT DATE: OCTOBER 2024
DRAWN: NA | JV
SCALE: 1 : 1000

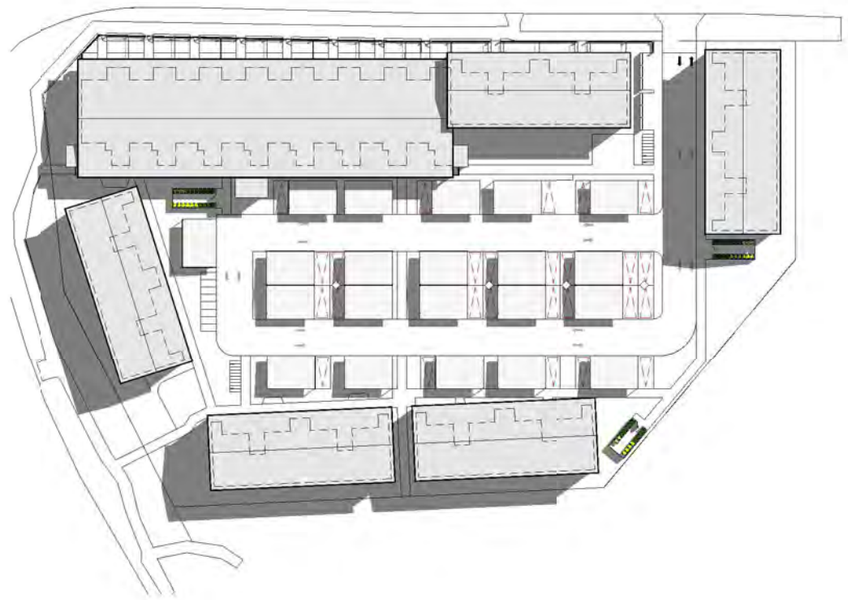
A3

ZONING R80
DWG A-131

YARAN
CREATING VALUE
SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

NORTH

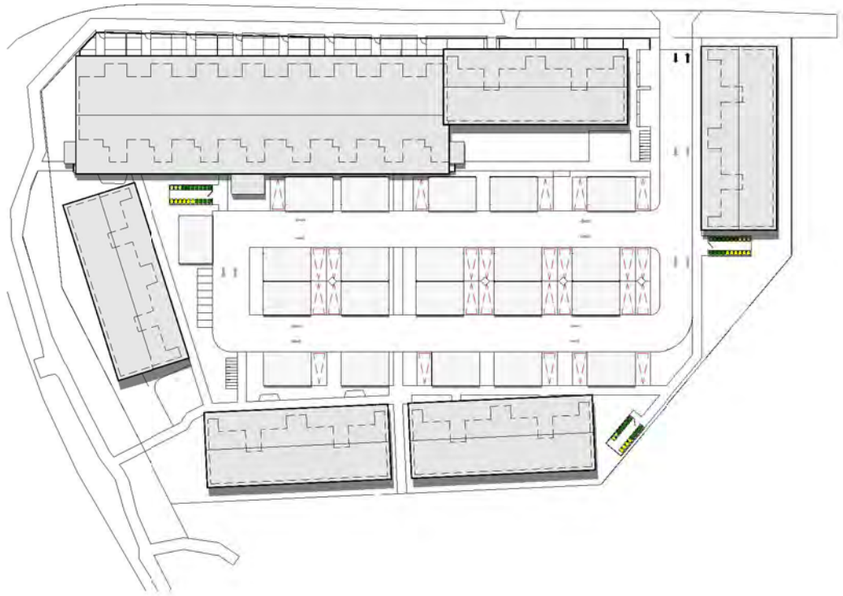


1
A 132

YARAN PROPERTY GROUP

SUMMER SOLSTICE DEC 21 - 9AM

1 : 1000



2
A 132

YARAN PROPERTY GROUP

SUMMER SOLSTICE DEC 21 - 12PM

1 : 1000



3
A 132

YARAN PROPERTY GROUP

SUMMER SOLSTICE DEC 21 - 3PM

1 : 1000

PROPOSED APARTMENT DWELLING

4 WAARDONG COURT, HALLS HEAD, WA 6120

SHEET CONTENT

SHADOW DIAGRAM - SUMMER SOLSTICE

PLOT DATE: NOVEMBER 2024
DRAWN: PV | JV
SCALE: 1 : 1000

A3

ZONING R80
DWG A-132

YARAN

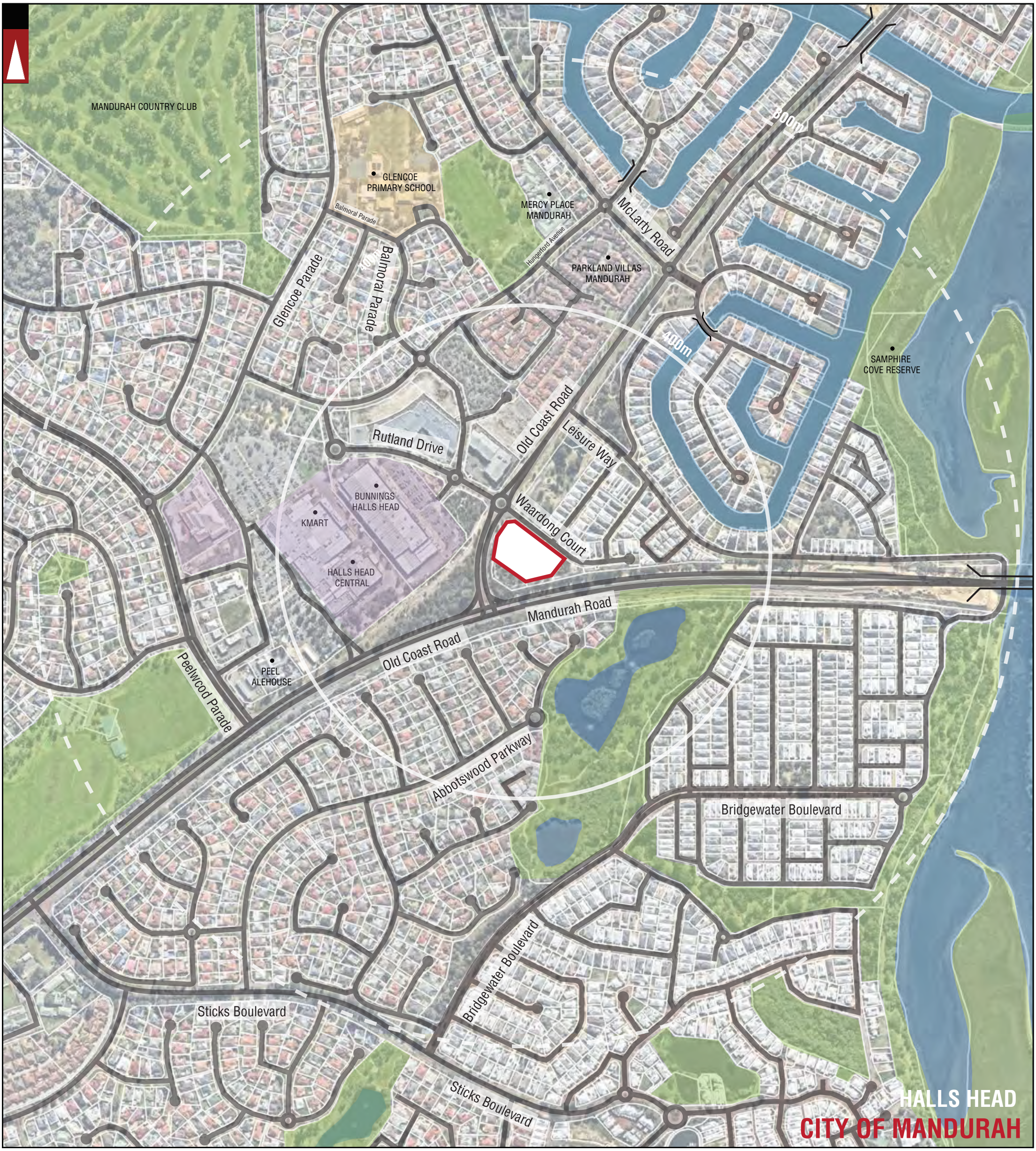
CREATING VALUE SHARING VALUE

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

Appendix 2

Transport Planning and Traffic Plans

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024



PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
SHOPPING AREA

ROAD
Hay Street — STREET NAME
RAILWAY
ROAD BRIDGE

LOCATION BOUNDARY
DISTANCE FROM LOCATION
CITY OF PERTH — LOCAL GOVERNMENT NAME
NORTHBRIDGE — SUBURB NAME
LOCAL AUTHORITY BOUNDARY

LEGEND

No	DATE	AMENDMENT
A	02-09-2024	ISSUED FOR REVIEW

PROJECT: NO 4 (LOT 812) WAARDONG COURT, HALLS HEAD

TITLE: LOCALITY PLAN - 800M RADIUS

DRAWING NUMBER: KC01948.000_ S01

DRAWN BY: J.S.

Civil & Traffic Engineering Consultants
KCTT (Trading as KC Traffic and Transport Pty Ltd)
PO Box 1456 Scarborough WA 6922
PH: 08 9441 2700
WEB: www.kctt.com.au
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PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
SHOPPING AREA
ROAD
Hay Street STREET NAME
RAILWAY
ROAD BRIDGE
LOCATION BOUNDARY
DISTANCE FROM LOCATION
CITY OF PERTH LOCAL GOVERNMENT NAME
NORTHBRIDGE SUBURB NAME
LOCAL AUTHORITY BOUNDARY
HIGH QUALITY SHARED PATH
GOOD ROAD RIDING ENVIRONMENT

LEGEND

A	02-09-2024	ISSUED FOR REVIEW
No	DATE	AMENDMENT

PROJECT: NO 4 (LOT 812) WAARDONG COURT, HALLS HEAD

TITLE: BICYCLE NETWORK PLAN - 400M RADIUS

DRAWING NUMBER: KC01948.000_S02

DRAWN BY: J.S.

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PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
SHOPPING AREA

ROAD
Hay Street STREET NAME
RAILWAY
ROAD BRIDGE

LOCATION BOUNDARY
DISTANCE FROM LOCATION
CITY OF PERTH LOCAL GOVERNMENT NAME
NORTHBRIDGE SUBURB NAME
LOCAL AUTHORITY BOUNDARY

BUS ROUTES
103 BUS ROUTE NUMBER

NOTE : FOR MORE INFORMATION REGARDING THE DESCRIPTION OF BUS ROUTES AND THEIR INDICATIVE PEAK AND OFF-PEAK FREQUENCIES REFER TO THE REPORT.

LEGEND

No	DATE	AMENDMENT
A	02-09-2024	ISSUED FOR REVIEW

PROJECT: NO 4 (LOT 812) WAARDONG COURT, HALLS HEAD

TITLE: PUBLIC TRANSPORT PLAN - 800M RADIUS

DRAWING NUMBER: KC01948.000_S03

DRAWN BY: J.S.

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PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
SHOPPING AREA
ROAD
Hay Street STREET NAME
RAILWAY
ROAD BRIDGE
LOCATION BOUNDARY
DISTANCE FROM LOCATION
CITY OF PERTH LOCAL GOVERNMENT NAME
NORTHBRIDGE SUBURB NAME
LOCAL AUTHORITY BOUNDARY
HIGH QUALITY SHARED PATH
PEDESTRIAN PATH WITHIN 400M RADIOUS FROM THE SUBJECT LOCATION

LEGEND

No	DATE	AMENDMENT
A	02-09-2024	ISSUED FOR REVIEW

PROJECT: NO 4 (LOT 812) WAARDONG COURT, HALLS HEAD

TITLE: PEDESTRIAN PATHS PLAN - 800M RADIUS

DRAWING NUMBER: KC01948.000_ S04

DRAWN BY: J.S.

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PARKS AND RECREATION
WATERWAYS
PUBLIC PURPOSE
SHOPPING AREA
ROAD
Hay Street — STREET NAME
RAILWAY
ROAD BRIDGE
LOCATION BOUNDARY
DISTANCE FROM LOCATION
CITY OF PERTH — LOCAL GOVERNMENT NAME
NORTHBRIDGE — SUBURB NAME
LOCAL AUTHORITY BOUNDARY
5,512 — NUMBER OF VEHICLES PER DAY
AM 1145 – 381 / PM 1630 – 480 — NUMBER OF VEHICLES PER AM PEAK HOUR / NUMBER OF VEHICLES PER PM PEAK HOUR
2014 — YEAR
EAST OF HARLOW ROAD — LOCATION

LEGEND

No	DATE	AMENDMENT
A	02-09-2024	ISSUED FOR REVIEW

PROJECT: NO 4 (LOT 812) WAARDONG COURT, HALLS HEAD

TITLE: EXISTING TRAFFIC COUNTS - 800M RADIUS

DRAWING NUMBER: KC01948.000_ S05

DRAWN BY: J.S.

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LOCATION BOUNDARY

Lewis Road ROAD NAME

1,389 Total Expected Traffic Generation from the proposed development

503 Total Expected Traffic Generation from Subject Site on the specific section of road - **IN and OUT direction**

Traffic Flow IN Direction

Traffic Flow OUT Direction

NOTE: THE PLAN IS COURTEOUSY OF YARAN

LEGEND

No	DATE	AMENDMENT
B	18-11-2024	PROPOSED LAYOUT AMENDED
A	12-11-2024	ISSUED FOR REVIEW

PROJECT: NO 4 (LOT 812) WAARDONG COURT, HALLS HEAD

TITLE: TRAFFIC FLOW DIAGRAM

DRAWING NUMBER: KC01948.000_S06

DRAWN BY: J.S.

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LOCATION BOUNDARY

Lewis Road ROAD NAME

1,389 Total Expected Traffic Generation from the proposed development

503 Total Expected Traffic Generation from Subject Site on the specific section of road - **IN and OUT direction**

Traffic Flow IN Direction

Traffic Flow OUT Direction

NOTE: THE PLAN IS COURTEOUSY OF YARAN

LEGEND

No	DATE	AMENDMENT
B	18-11-2024	PROPOSED LAYOUT AMENDED
A	12-11-2024	ISSUED FOR REVIEW

PROJECT: NO 4 (LOT 812) WAARDONG COURT, HALLS HEAD

TITLE: TRAFFIC FLOW DIAGRAM - PEAK HOUR

DRAWING NUMBER: KC01948.000_S07

DRAWN BY: J.S.

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Appendix 3

Vehicle Turning Circle Plan

Document Set ID: 6945972
Version: 1, Version Date: 25/11/2024

113493

35521

LOT 812

LOT 302
R 53829

48622

BUILDING A

BUILDING B

BUILDING C

BUILDING D

2 BICYCLE PARKING UNDER STAIRS

BICYCLE PARKING

MOTORCYCLE PARKING

SPACE FOR PUBLIC ART

5M X 5M GAZEBO

LETTER BOX

BENCH

LIFT

UP

1800

2000

1000

6000

4500

Semi-Mt.

Sewer Pressure Main

Sewer Line

Stay Anchor

Power Pole

Drainage Pit

Kerb Inlet Pit

Telstra Pit

Water Valve

Water Meter

Gas Valve

Fire Hydrant

Bollard

Light Pole

Sign

Tree

Contour

Boundary of Reserve

Lot Boundary

Road Centre Line

Edge of Bitumen

Edge of Concrete

Edge of Gravel

Edge of Grass

Edge of Dirt

Edge of Paving

Edge of Brick Paving

Edge of Limestone Wall

Edge of Retaining Wall

Edge of Timber Retaining Wall

Edge of Timber Wall

Edge of Timber Fence

Edge of Wire Fence

Edge of Metal Fence

Edge of Post and Rail Fence

Edge of Post and Wire Fence

Edge of Post and Mesh Fence

Edge of Post and Chain Fence

Edge of Post and Cable Fence

Edge of Post and Rail and Wire Fence

Edge of Post and Rail and Mesh Fence

Edge of Post and Rail and Chain Fence

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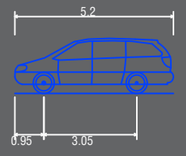

Passenger vehicle (5.2 m)
Overall Length 5.200m
Overall Width 1.940m
Overall Body Height 1.804m
Min Body Ground Clearance 0.295m
Track Width 1.840m
Lock to Lock Time 4.00s
Kerb to Kerb Turning Radius 6.300m

Lot boundary
Wheel Path (Forward Vehicle Motion)
Vehicle Chasis Envelope (Forward Vehicle Motion)
Wheel Path (Reverse Vehicle Motion)
Vehicle Chasis Envelope (Reverse Vehicle Motion)

NO	DATE	AMENDMENT
REV A	18-11-2024	PROPOSED LAYOUT AMENDED
DRAFT	15-11-2024	ISSUED FOR REVIEW
DRAFT	12-11-2024	ISSUED FOR REVIEW

PROJECT:
No 4 (Lot 812) Waardong Court, Halls Head

TITLE:
Vehicle Turning Circle Plan - B99 Passenger Vehicle (5.2m)

DRAWING NUMBER:
KC01948.000_S10

DRAWN BY:
J.S.

LEGEND

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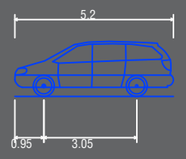

Passenger vehicle (5.2 m)	
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.804m
Min Body Ground Clearance	0.295m
Track Width	1.840m
Lock to Lock Time	4.00s
Kerb to Kerb Turning Radius	6.300m

- Lot boundary
- Wheel Path (Forward Vehicle Motion)
- Vehicle Chasis Envelope (Forward Vehicle Motion)
- Wheel Path (Reverse Vehicle Motion)
- Vehicle Chasis Envelope (Reverse Vehicle Motion)

NO	DATE	AMENDMENT
REV A	18-11-2024	PROPOSED LAYOUT AMENDED
DRAFT	15-11-2024	ISSUED FOR REVIEW
DRAFT	12-11-2024	ISSUED FOR REVIEW

PROJECT:
No 4 (Lot 812) Waardong Court, Halls Head

TITLE:
Vehicle Turning Circle Plan - B99 Passenger Vehicle (5.2m)

DRAWING NUMBER:
KC01948.000_S11

DRAWN BY:
J.S.

LEGEND

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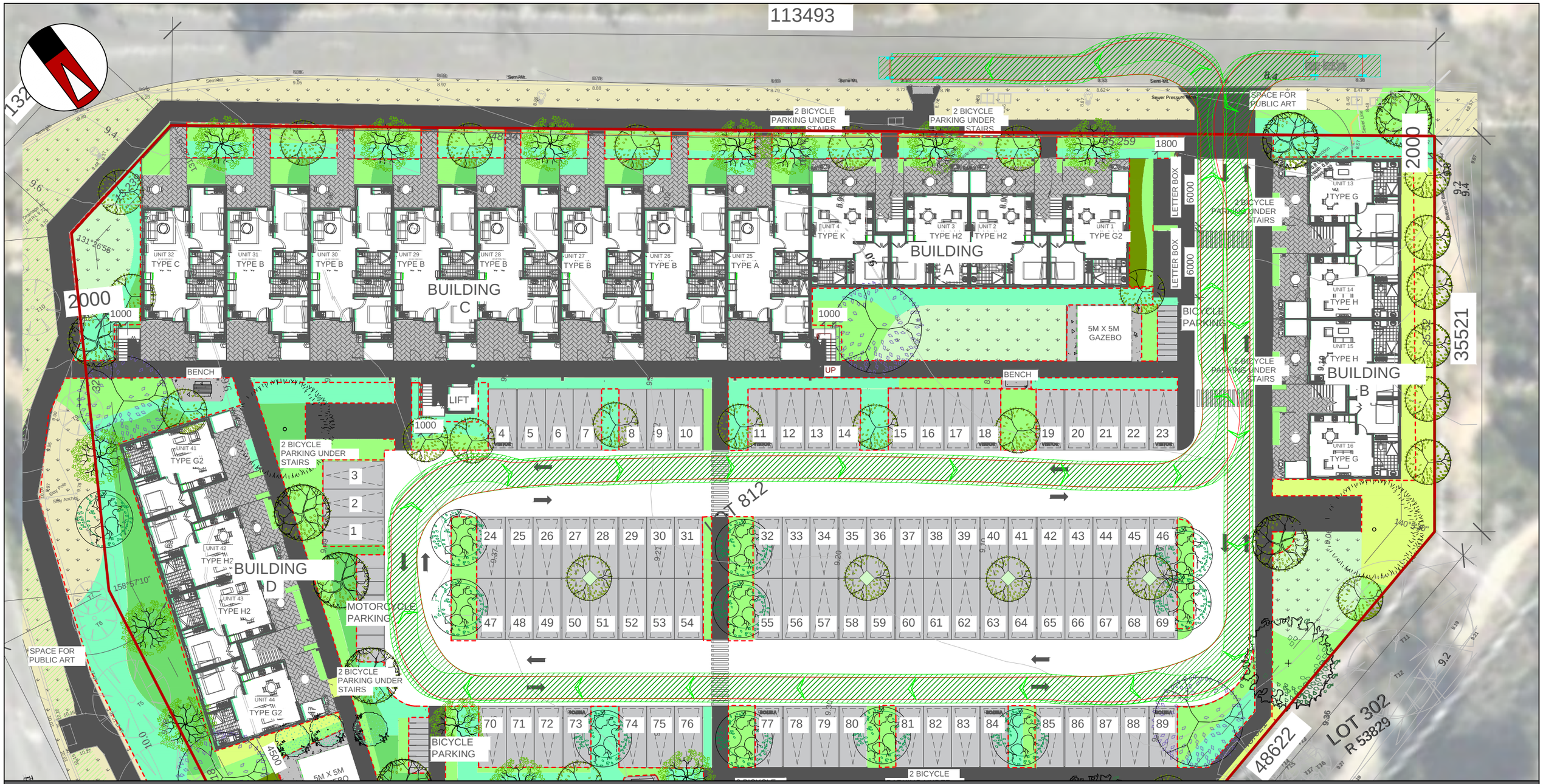

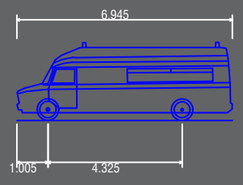

Ambulance - Mercedes Sprinter
Overall Length 6.945m
Overall Width 2.000m
Overall Body Height 2.518m
Min Body Ground Clearance 0.246m
Max Track Width 1.993m
Lock-to-lock time 4.00s
Curb to Curb Turning Radius 7.700m

Lot boundary
Wheel Path (Forward Vehicle Motion)
Vehicle Chasis Envelope (Forward Vehicle Motion)
Wheel Path (Reverse Vehicle Motion)
Vehicle Chasis Envelope (Reverse Vehicle Motion)

NO	DATE	AMENDMENT
REV A	18-11-2024	PROPOSED LAYOUT AMENDED
DRAFT	15-11-2024	ISSUED FOR REVIEW
DRAFT	12-11-2024	ISSUED FOR REVIEW

PROJECT:
No 4 (Lot 812) Waardong Court, Halls Head

TITLE:
Vehicle Turning Circle Plan - Ambulance Mercedes Sprinter (6.945m)

DRAWING NUMBER:
KC01948.000_S20

DRAWN BY:
J.S.

LEGEND

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SPP7.3 R-CODES VOLUME 2 - APARTMENTS

ASSESSMENT TEMPLATE

DESIGN WA For a Better Built Environment

Disclaimer: This assessment template is not intended to replace R -Codes Volume 2. Applicants and assessors should refer to the R-Codes Volume 2 for information on the relevant provisions that are applicable to a development.

Document Set ID: 6945947
Version: 1, Version Date: 25/11/2024

ELEMENT 2.2	BUILDING HEIGHT	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O2.2.1 – The height of development responds to the desired future scale and character of the street and local area, including existing buildings that are unlikely to change.	The character of the existing building stock is made up of predominately two storey and three-storey residential properties. The area is comprised of R30/80 zoned sites which means the desired future scale and character of the local area are apartment typology buildings. Development proposal has a 2-storey & 3-storey apartment typology all throughout the development.	Agreed. The special zone requirements within Local Planning Scheme 12 stipulate R80 density for multiple dwelling development.
O2.2.2 – The height of buildings within a development responds to changes in topography.	The development is built on a nearly flat site so there are no changes in topography to respond to.	Agreed.
O2.2.3 – Development incorporates articulated roof design and/or roof top communal open space where appropriate.	The building has a pitched-roof design which does not provide roof top communal open space but the design allows accommodation for north-facing PV on the roof. The development provides informal meeting places surrounded with landscaping which facilitate organic community engagement. Because of these elements, a rooftop communal area was not considered necessary.	The roof design is plain in nature, providing no visual interest or articulation. The lower pitch does allow for solar panel installation which will not impact on the visual street amenity.
O2.2.4 – The height of development recognises the need for daylight and solar access to adjoining and nearby residential development, communal open space and in some cases, public spaces.	The building height does not affect the provision of good access to light, sun, and ventilation. The development also provides spacious balconies which meets the need for daylight and solar access.	Agreed.
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		

A2.2.1 – Development complies with the building height limit (storeys) set out in Table 2.1, except where modified by the local planning framework, in which case development complies with the building height limit set out in the applicable local planning instrument.

(Excerpt from table 2.1)

	Applies to R-Code areas, default settings apply unless alternative provisions defined in local planning instruments			Applicable where designated by local government in local planning scheme, precinct structure plan, local development plan, local planning policy				
Streetscape contexts and character *refer A2*	Medium-rise	Higher density residential		Neighbourhood centre	Mid-rise urban centres	High density urban centres		Planned areas
Site R-Coding	R80	R100	R160	R-AC4	R-AC3	R-AC2	R-AC1	R-AC0
Building height (storeys) *refer 2.2*	4	4	5	3	6	7	9	

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	**Yes. Local Development Plan 82 – Lot 90 Leisure Way**

ELEMENT 2.3 STREET SETBACKS

ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	APPLICANT COMMENT	ASSESSOR COMMENT
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O2.3.1 – The setback of the development from the street reinforces and/or complements the existing or proposed landscape character of the street.	The proposed development has a street setback of 2.0 m from Waardong Court, the primary road. Aside from the street setback, the development also considers parameters for articulation of building frontage through landscaping.	Agreed. Consistent with acceptable outcomes.

O2.3.2 – The street setback provides a clear transition between the public and private realm.	The street setback gives a clear transition between the public and private realm through landscaping and deep soil areas in between the property and the public footpath.	Agreed.
O2.3.3 – The street setback assists in achieving visual privacy to apartments from the street.	The setback achieves visual privacy through provisions of tree canopies and deep soil areas so that residents in the apartments do not feel exposed by their neighbours or passers-by.	Waardong Court façade achieves privacy to outdoor living areas.
O2.3.4 – The setback of the development enables passive surveillance and outlook to the street.	The setback and provision for landscaping still considers passive surveillance, does not block views and still provides sightlines from the inside of the development to the public street.	Agreed.

ACCEPTABLE OUTCOMES

Acceptable Outcome pathway may not be applicable where a performance solution is provided

A3.2.1 – Development complies with the street setback set out in Table 2.1, except where modified by the local planning framework, in which case development complies with the street setback set out in the applicable local planning instrument

(Excerpt from table 2.1)

Streetscape contexts and character *refer A2*	Medium-rise	Higher density residential		Neighbourhood centre	Mid-rise urban centres	High density urban centres		Planned areas
Site R-Coding	R80	R100	R160	R-AC4	R-AC3	R-AC2	R-AC1	R-AC0

Minimum primary and secondary street setbacks *refer 2.3*	2m	2m	2m or Nil [5]	2m or Nil [5]	2m or Nil [5]	**Refer to local planning scheme.**

[3] Boundary wall only permitted on one boundary, and shall not exceed 2/3 length.

[4] Minimum **secondary street setback** 1.5m

[5] Nil **setback** applicable if commercial use at ground floor

[6] Boundary **setbacks** will also be determined by provisions for **building** separation and visual privacy within this SPP and building separation provisions of the **NCC.**

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 2.4	SIDE AND REAR SETBACKS	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O2.4.1 – Building boundary setbacks provide for adequate separation between neighbouring properties.	The buildings do not abut lot boundaries of the subject site.	n/a
O2.4.2 – Building boundary setbacks are consistent with the existing streetscape pattern or the desired streetscape character**.**	The boundary setbacks of the building are in line with the streetscape pattern because the development provides typical front yard setbacks and landscaping which enhances common circulation areas with on-structure planting.	Consistent with acceptable outcomes.
O2.4.3 – The setback of development from side and rear boundaries enables retention of existing trees and provision of deep soil areas that reinforce the landscape character of the area, support tree canopy and assist with stormwater management.	The landscape strategy principles optimise the extent of deep soil planting and create opportunities for small medium tree planting which can assist with stormwater management.	Agreed.
O2.4.4 –The setback of development from side and rear boundaries provides a transition between sites with different land uses or intensity of development.	All adjacent developments are zoned residential and is within the same land use. Therefore, there is no requirement to accommodate transition between sites with different land uses or intensity of development.	The site can be considered stand-alone. All setbacks are consistent with the acceptable outcomes.
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		
A2.4.1 - Development complies with the side and rear setbacks set out in Table 2.1, except where: **a)** modified by the local planning framework, in which case development complies with the side and rear setbacks set out in the applicable local planning instrument **AND /OR** **b)** a greater setback is required to address *3.5 Visual privacy*. *(Excerpt from table 2.1)*		

Streetscape contexts and character *refer A2*	Medium-rise	Higher density residential		Neighbourhood centre	Mid-rise urban centres	High density urban centres		Planned areas
Site R-Coding	**R80**	**R100**	**R160**	**R-AC4**	**R-AC3**	**R-AC2**	**R-AC1**	**R-AC0**
Building height (storeys) *refer 2.2*	4	4	5	3	6	7	9	**Refer to local planning scheme, local dev plan and/or precinct controls as applicable**
Boundary wall height (storeys)[1,2] *refer 2.4*	2 [3]	2 [3]		2	3	4		
Minimum primary and secondary street setbacks *refer 2.3*	2m	2m		2m or Nil [5]	2m or Nil [5]	2m or Nil [5]		
Minimum side setbacks[6] *refer 2.4*	3m	3m		Nil				
Minimum rear setback *refer 2.4*	3m	6m		6m	Nil	Nil		
Average side setback where building length exceeds 16m *refer 2.4*	3.5m	3.5m	4.0m	NA	NA	NA		

Notes

1. Wall may be built up to a **lot boundary**, where it abuts an existing or simultaneously constructed wall of equal or greater proportions
2. Where the subject **site** and an affected adjoining site are subject to different density codes, the length and height of any boundary wall on the boundary between them is determined by reference to the lower density code
3. Boundary wall only permitted on one boundary, and shall not exceed 2/3 length.
4. Minimum **secondary street setback** 1.5m
5. Nil **setback** applicable if commercial use at ground floor
6. Boundary **setbacks** will also be determined by provisions for **building** separation and visual privacy within this SPP and building separation provisions of the **NCC.**
7. Refer to Definitions for calculation of **plot ratio**

A2.4.2 – Development is setback from the boundary in order to achieve the Objectives outlined in *2.7 Building separation*, *3.3 Tree canopy and deep soil areas*, *3.5 Visual privacy* and *4.1 Solar and daylight access*.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 2.5	PLOT RATIO	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O2.5.1 – The overall bulk and scale of development is appropriate for the existing or planned character of the area.	A plot ratio floor area of approximately 4,841.54m^2 is proposed. The lot has a total area of approximately 8,015 m^2. This equates to a plot ratio of 0.604 which is within the permissible 1.0 plot ratio under the R80 density code. The development is compliant with other measures of bulk and scale such as building height as stated in Element 2.2.	Agreed.

ACCEPTABLE OUTCOMES
Acceptable Outcome pathway may not be applicable where a performance solution is provided

A2.5.1 – Development complies with the plot ratio requirements set out in Table 2.1, except where modified by the local planning framework, in which case development complies with the plot ratio set out in the applicable local planning instrument.

(Excerpt from table 2.1)

Streetscape contexts and character *refer A2*	Medium-rise	Higher density residential		Neighbourhood centre	Mid-rise urban centres	High density urban centres		Planned areas
Site R-Coding	R80	R100	R160	R-AC4	R-AC3	R-AC2	R-AC1	R-AC0
Plot ratio [7] *refer 2.5*	1.0	1.3	2.0	1.2	2.0	2.5	3.0	

[7] Refer to Definitions for calculation of **plot ratio**

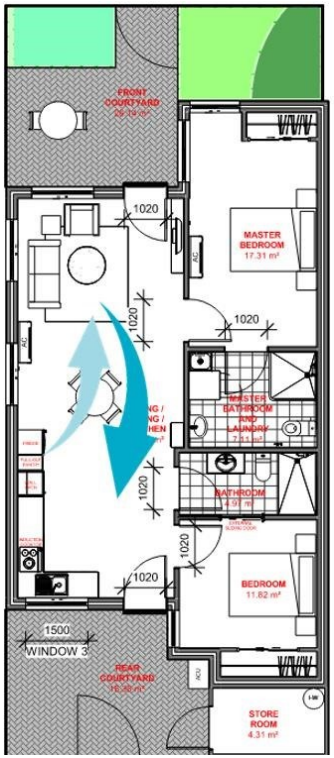
Plot ratio - the ratio of the gross **plot ratio area** of **buildings** on a **development site** to the area of land in the site boundaries.

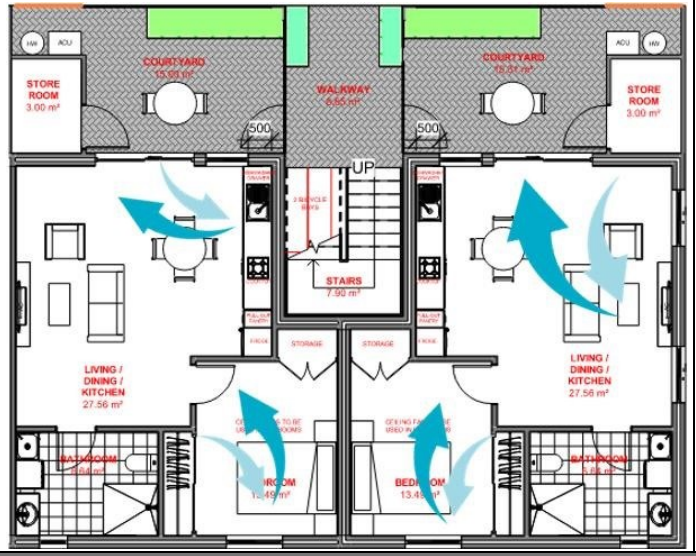
Plot ratio area - the gross total area of all floors of **buildings** on a **development site**, including the area of any internal and external walls but not including:

- the areas of any lift shafts
- stairs or stair landings common to two or more **dwellings**
- machinery, air conditioning and equipment rooms
- space that is wholly below **natural ground level**
- areas used exclusively for the parking of wheeled vehicles at or below natural ground level;
- storerooms
- lobbies, bin storage areas, passageways to bin storage areas or amenities areas common to more than one dwelling; and
- **balconies**, eaves, verandahs, **courtyards** and roof **terraces**.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 2.6	BUILDING DEPTH	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O2.6.1 – Building depth supports apartment layouts that optimise daylight and solar access and natural ventilation.	The development has a building depth of less than 20 metres. The building depth allows for sufficient solar access and ventilation with standard ceiling heights.	Agreed.

O2.6.2 – Articulation of building form to allow adequate access to daylight and natural ventilation where greater building depths are proposed.	Living spaces (kitchen, dining, living) are designed as a single room without partition, with dual aspect where available.	
O2.6.3 – Room depths and / or ceiling heights optimise daylight and solar access and natural ventilation.	The design of the apartments achieves natural crossventilation with doors and windows on opposite sides of the apartment. 	

ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*
A2.6.1 – Developments that comprise single aspect apartments on each side of a central circulation corridor shall have a maximum building depth of 20m. All other proposals will be assessed on their merits with particular consideration to *4.1 Solar and daylight access* and *4.2 Natural ventilation*.

LOCAL PLANNING FRAMEWORK	**REQUIREMENT**
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 2.7	BUILDING SEPARATION	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O2.7.1 – New development supports the desired future streetscape character with spaces between buildings.	The proposed development fronts Waardong Court. The front setback area is landscaped and composed of screening shrubs to improve the streetscape along the primary Street (Waardong Court).	The proposal meets the setback provisions as well as building separation between facades with no major openings.
O2.7.2 – Building separation is in proportion to building height.	The development follows the requirements set out on Table 2.7 for boundaries of an adjoining property for two storey and 3-storey buildings as it is compliant with the side and rear setbacks.	Agreed.
O2.7.3 – Buildings are separated sufficiently to provide for residential amenity including visual and acoustic privacy, natural ventilation, sunlight and daylight access and outlook.	The buildings allow good access to light, sun, and ventilation through tall doors and windows on each dwelling that open to a courtyard or a balcony but are articulated to restrict direct overlooking from outside. The design also provides good amenity through covered parking and pedestrian circulation. 	Northern units of Building D are separated by less than 10m from the southern side of building C. The impact can be considered minimal given the primary outdoor living space for Building C would be that adjacent the primary street to the north. All units have been designed to achieve an element of sunlight and daylight access.

O2.7.4 – Suitable areas are provided for communal and private open space, deep soil areas and landscaping between buildings	Deep soil areas are provided in private open spaces, such as courtyards and balconies. Pedestrian footpath and other informal meeting places of the development are also surrounded with a generous amount of landscaping areas.	Agreed.

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ACCEPTABLE OUTCOMES

Acceptable Outcome pathway may not be applicable where a performance solution is provided

A2.7.1 – Development complies with the separation requirements set out in Table 2.7.

Table 2.7 Building separation

	Separation between:	Building height		
		≤ 4 storeys (up to 15m)	**5-8 storeys** (up to 28m)	**≥ 9 storeys** (over 28m)
Within site boundary	Habitable rooms/balconies	12m	18m	24m
	Habitable and non-habitable rooms	7.5m	12m	18m
	Non-habitable rooms	4.5m	6m	9m
To adjoining property boundaries	Habitable rooms/balconies and boundary	Refer *2.4 Side and rear setbacks* (Table 2.1) and *3.5 Visual privacy* (Table 3.5)	9m	12m
Distances apply from major openings of rooms, or the inside of balustrading of balconies. Average dimensions may be applied subject to major openings meeting other requirements for privacy, daylight and the like.				

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 3.2	ORIENTATION	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O3.2.1 – Building layouts respond to the streetscape, topography and site attributes while optimising solar and daylight access within the development.	The dwellings are oriented to face the North/ Northeast to optimise the solar and daylight access into the outdoor living areas and the habitable rooms of the dwellings.	Agreed.
O3.2.2 – Building form and orientation minimises overshadowing of the habitable rooms, open space and solar collectors of neighbouring properties during mid-winter.	Open spaces of the development have access to direct sunlight as there are no structures blocking light from reaching the internal areas of the development. The shadow cast on the adjoining property is in compliance with the requirements set out in A3.2.3: adjoining properties coded R80 – Nil requirements.	Agreed.

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ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*
A3.2.1 – Buildings on street or public realm frontages are oriented to face the public realm and incorporate direct access from the street.
A3.2.2 – Buildings that do not have frontages to streets or public realm are oriented to maximise northern solar access to living areas.
A3.2.3 – Development in climate zones 4, 5 and 6 shall be designed such that the shadow cast at midday on 21st June onto any adjoining property does not exceed: – adjoining properties coded R25 and lower – 25% of the site area[1] – adjoining properties coded R30 – R40 - 35% of the site area[1] – adjoining properties coded R50 – R60 – 50% of the site area[1] – adjoining properties coded R80 or higher – Nil requirements. (1) Where a development site shares its southern boundary with a lot, and that lot is bound to the north by other lot(s), the limit of shading at A3.2.3 shall be reduced proportionally to the percentage of the affected properties northern boundary that abuts the development site. (Refer to Figure A7.2 in Appendix 7)
A3.2.4– Where adjoining sites are coded R40 or less, buildings are oriented to maintain 4 hours per day solar access on 21 June for existing solar collectors on neighbouring sites.

LOCAL PLANNING FRAMEWORK	**REQUIREMENT**
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

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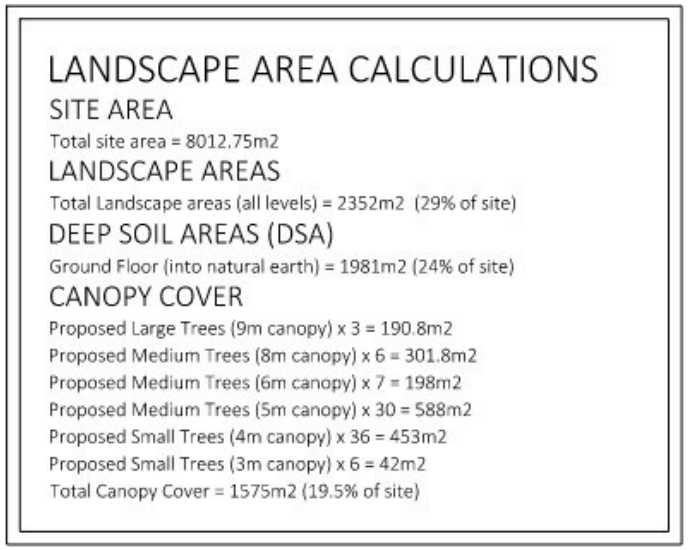
ELEMENT 3.3	TREE CANOPY AND DEEP SOIL AREAS	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O3.3.1 – Site planning maximises retention of existing healthy and appropriate trees and protects the viability of adjoining trees.	The development has high levels of landscape provision which optimises the extent of deep soil planting, create opportunities for small-medium tree planting on both the dwelling areas and the common spaces of the proposed development. The provided landscaping and greenery will make up for a few existing trees on site that will not be retained. The proposed development includes approximately 2352 m^2 of green areas, which equates to 29% of the site area, including dwelling garden areas and landscaping on common spaces. Therefore, it is compliant and is in excess of the minimum requirement of 10% set out in Table 3.3a.  LANDSCAPE AREA CALCULATIONS SITE AREA Total site area = 8012.75m2 LANDSCAPE AREAS Total Landscape areas (all levels) = 2352m2 (29% of site) DEEP SOIL AREAS (DSA) Ground Floor (into natural earth) = 1981m2 (24% of site) CANOPY COVER Proposed Large Trees (9m canopy) x 3 = 190.8m2 Proposed Medium Trees (8m canopy) x 6 = 301.8m2 Proposed Medium Trees (6m canopy) x 7 = 198m2 Proposed Medium Trees (5m canopy) x 30 = 588m2 Proposed Small Trees (4m canopy) x 36 = 453m2 Proposed Small Trees (3m canopy) x 6 = 42m2 Total Canopy Cover = 1575m2 (19.5% of site)	The proposed landscaping plan includes retention of a tree within the site to the south and incorporates existing verge trees into the landscape design to the western boundary along Old Coast Road.
O3.3.2 – Adequate measures are taken to improve tree canopy (long term) or to offset reduction of tree canopy from pre-development condition.		Agree considering no extensive tree canopy currently.
O3.3.3 – Development includes deep soil areas, or other infrastructure to support planting on structures, with sufficient area and volume to sustain healthy plant and tree growth.		Deep soil and proposed trees consistent with element objectives. The proposal does include a reduced number of larger tree species however this is considered to be balanced through the 30+ medium trees proposed on the site.
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		

A3.3.1 – Retention of existing trees on the site that meet the following criteria: –
healthy specimens with ongoing viability **AND**

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- species is not included on a State or local area weed register **AND**
- height of at least 4m **AND/OR**
- trunk diameter of at least 160mm, measured 1m from the ground **AND/OR** – average canopy diameter of at least 4m.

A3.3.2 – The removal of existing trees that meet any of the criteria at A3.3.1 is supported by an arboriculture report.

A3.3.3 – The development is sited and planned to have no detrimental impacts on, and to minimise canopy loss of adjoining trees.

A3.3.4 – Deep soil areas are provided in accordance with Table 3.3a. Deep soil areas are to be co-located with existing trees for retention and/or adjoining trees, or alternatively provided in a location that is conducive to tree growth and suitable for communal open space.

Table 3.3a Minimum deep soil area and tree provision requirements

Site Area	Minimum deep soil area	Minimum requirement for trees [1]
Less than 700m²	10% **OR** 7% if existing tree(s) retained on site (% site area)	1 medium tree and small trees to suit area
700 – 1,000m²		2 medium trees **OR** 1 large tree and small trees to suit area
› 1,000m²		1 large tree and 1 medium tree for each additional 400m² in excess of 1000m² **OR** 1 large tree for each additional 900m² in excess of 1000m² and small trees to suit area

[1] Minimum requirement for trees includes retained or new trees
Refer Table 3.3b for tree sizes

A3.3.5 – Landscaping includes existing and new trees with shade producing canopies in accordance with Tables 3.3a and 3.3b.

Table 3.3b Tree sizes

Tree size	Indicative canopy diameter at maturity	Nominal height at maturity	Required DSA per tree	Recommended minimum DSA width	Minimum DSA width where additional rootable soil zone (RSZ) width provided[1] (min 1m depth)	Indicative pot size at planting
Small	4-6m	4-8m	$9m^2$	2m	1m (DSA) + 1m (RSZ)	100L
Medium	6-9m	8-12m	$36m^2$	3m	2m (DSA) + 1m (RSZ)	200L
Large	›9m	›12m	$64m^2$	6m	4.5m (DSA) + 1.5m (RSZ)	500L

[1] Rootable areas are for the purposes of determining minimum width only and do not have the effect of reducing the required DSA.

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A3.3.6 – The extent of permeable paving or decking within a deep soil area does not exceed 20 per cent of its area and does not inhibit the planting and growth of trees.
A3.3.7 – Where the required deep soil areas cannot be provided due to site restrictions, planting on structure with an area equivalent to two times the shortfall in deep soil area provision is provided.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 3.4	COMMUNAL OPEN SPACE	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O3.4.1 – Provision of quality communal open space that enhances resident amenity and provides opportunities for landscaping, tree retention and deep soil areas.	The layout of the development enhances common circulation areas with on-structure planting and landscaping along the entrances of the dwellings. The communal open space follows the requirement in Table 3.4 with a minimum of 6 m^2 of communal open space for each dwelling (76 dwellings), totalling 456 m^2. The development has provided approximately 468.08 m^2 of communal open space which includes the informal meeting places throughout the development and landscaping of common spaces, providing additional amenity to residents.	Although the communal open space is spread out well across the site, the main gazebo areas are shaded by more than 50% during the winter solstice. The level of landscaping and deep soil planting areas are adequate as per the above section.
O3.4.2 – Communal open space is safe, universally accessible and provides a high level of amenity for residents.	Communal open space achieves safety through passive surveillance from adjacent streets and open space, and passive surveillance of the common walkway.	The communal areas are not visible from adjacent streets and open space due to 1.8m high Colourbond fences. The design could have incorporated communal space with connections to the existing reserve and associated playground to the east.
O3.4.3 – Communal open space is designed and oriented to minimise impacts on the habitable rooms and private open space within the site and of neighbouring properties.	The design of the development prevents overlooking into private spaces from communal open spaces and minimises the impact on the habitable rooms of the dwellings through use of fencing and/or trees and vegetation on the courtyards.	Communal spaces are not directly orientated to private opens spaces. Soft landscaping acts as buffers between these spaces.
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		
A3.4.1 – Developments include communal open space in accordance with Table 3.4		

Table 3.4 Provision of communal open space

Development size	Overall communal open space requirement	Minimum accessible / hard landscape area (included in overall area requirement)	Minimum open space dimension
Up to 10 dwellings	Informal seating associated with deep soil or other landscaped areas	NA	NA
More than 10 dwellings	Total: 6m² per dwelling up to maximum 300m²	At least 2m² per dwelling up to 100m²	4m

A3.4.2 – Communal open space located on the ground floor or on floors serviced by lifts must be accessible from the primary street entry of the development.

A3.4.3 – There is 50 per cent direct sunlight to at least one communal open space area for a minimum of two hours between 9am and 3pm on 21 June.

A3.4.4– Communal open space is co-located with deep soil areas and/or planting on structure areas and/ or co-indoor communal spaces.

A3.4.5 – Communal open space is separated or screened from adverse amenity impacts such as bins, vents, condenser units, noise sources and vehicle circulation areas.

A3.4.6 – Communal open space is well-lit, minimises places for concealment and is open to passive surveillance from adjoining dwellings and/or the public realm.

A3.4.7 – Communal open space is designed and oriented to minimise the impacts of noise, odour, light-spill and overlooking on the habitable rooms and private open spaces within the site and of neighbouring properties.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 3.5	VISUAL PRIVACY	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT**	**ASSESSOR COMMENT**
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	

Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:		
O3.5.1 – The orientation and design of buildings, windows and balconies minimises direct overlooking of habitable rooms and private outdoor living areas within the site and of neighbouring properties, while maintaining daylight and solar access, ventilation and the external outlook of habitable rooms.	Visual privacy is not an issue regarding adjoining properties as all dwellings are oriented towards the common properties of the site. Fences and landscaping are provided all over the site to minimise direct overlooking of habitable rooms and the outdoor living areas. Balustrading are also provided for the balconies to achieve visual privacy. Fences and balustrading provided does not affect daylight and solar access, and ventilation of the dwellings.	Buildings are well separated and have no direct overlooking impacts other than those noted in the building separation section. The development site does not share a boundary with another developable lot.

ACCEPTABLE OUTCOMES

Acceptable Outcome pathway may not be applicable where a performance solution is provided

A3.5.1 – Visual privacy setbacks to side and rear boundaries are provided in accordance with Table 3.5.

Table 3.5 Required privacy setback to adjoining sites

Cone of vision from unscreened:	First 4 storeys		5th storey and above
	Adjoining sites coded R50 or lower	Adjoining sites coded higher than R50	
Major opening to bedroom, study and open access walkways	4.5m	3m	Refer Table 2.7
Major openings to habitable rooms other than bedrooms and studies	6m	4.5m	
Unenclosed private outdoor spaces	7.5m	6m	

A3.5.2 – Balconies are unscreened for at least 25 per cent of their perimeter (including edges abutting a building).

A3.5.3 - Living rooms have an external outlook from at least one major opening that is not obscured by a screen.

A3.5.4 – Windows and balconies are sited, oriented, offset or articulated to restrict direct overlooking, without excessive reliance on high sill levels or permanent screening of windows and balconies.

LOCAL PLANNING FRAMEWORK	REQUIREMENT

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ELEMENT 3.6	PUBLIC DOMAIN INTERFACE	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O3.6.1 – The transition between the private and public domain enhances the privacy and safety of residents.	Safety of residents is considered in the proposed development as the pedestrian entrance is located separately from the vehicular access of the development. Windows and private open spaces are provided for the ground floor units and upper floor units so that residents can overlook the street allowing for passive surveillance of the public domain. Fencing and balcony balustrading will be visually permeable to maintain privacy without sacrificing casual surveillance and the residents' ability to observe the street scape. Resident bins are not located within the primary setback and are not visible from the primary street as they are hidden inside bin enclosures. The car-parking is not located on the street setback and is hidden from the public realm by the development through provision of screening shrubs.	The primary street interface between buildings A & C is well articulated with individual privacy access, major openings and balconies. The western interface between Buildings C & D is considered to lack connection due to no direct access from the buildings and no noticeable useable outdoor space. The windows to these western elevations are small in proportion to the building size, and although allowing some surveillance, it is considered minimum.

O3.6.2 – Street facing development and landscape design retains and enhances the amenity and safety of the adjoining public domain, including the provision of shade.	The two-storey and three-storey buildings facing the street front is provided with a grand elevation at the front of the development in order to enhance the streetscape. 	Agreed for the primary street. The eastern elevation of Building B is lacking in design features which increase options for passive surveillance of the public open space/ playground area. again, the small windows are disproportionate to the bulk of the building and provide minimum opportunities for consistent surveillance. January 2025 – Amended Plans The window sizes have been increased to a minimum 10% glazed surface. Window size is now DTC.
	Tree canopies of plants that are placed along the front setback area provides shade.	

ACCEPTABLE OUTCOMES

Acceptable Outcome pathway may not be applicable where a performance solution is provided

A3.6.1 – The majority of ground floor dwellings fronting onto a street or public open space have direct access by way of a private terrace, balcony or courtyard.
A3.6.2 – Car-parking is not located within the primary street setback; and where car parking is located at ground level behind the street setback it is designed to integrate with landscaping and the building façade (where part of the building).
A3.6.3 – Upper level balconies and/or windows overlook the street and public domain areas.
A3.6.4 – Balustrading includes a mix of visually opaque and visually permeable materials to provide residents with privacy while maintaining casual surveillance of adjoining public domain areas.
A3.6.5 – Changes in level between private terraces, front gardens and the ground floor level of the building and the street level average less than 1m and do not exceed 1.2m.
A3.6.6 – Front fencing includes visually permeable materials above 1.2m and the average height of solid walls or fences to the street does not exceed 1.2m.
A3.6.7 – Fencing, landscaping and other elements on the frontage are designed to eliminate opportunities for concealment.
A3.6.8 – Bins are not located within the primary street setback or in locations visible from the primary street.
A3.6.9 – Services and utilities that are located in the primary street setback are integrated into the design of the development and do not detract from the amenity and visual appearance of the street frontage.[1] (1) Firefighting and access to services such as power and water meters require careful consideration in the design of the front façade. Consult early with relevant authorities to resolve functional requirements in an integrated design solution.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 3.7	PEDESTRIAN ACCESS AND ENTRIES	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT**	**ASSESSOR COMMENT**
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O3.7.1 – Entries and pathways are universally accessible, easy to identify and safe for residents and visitors.	The design of the development enhances its safety features in the pedestrian access and entries through passive surveillance of the common walkways, change in materials, break-in landscaping, and the vehicular access separated from the pedestrian entry.	Agreed. The pathways provide a continuous network to all service areas and communal spaces whilst maintaining vehicle and pedestrian safety.

O3.7.2 – Entries to the development connect to and address the public domain with an attractive street presence.	There is also a clearly articulated main entrance accessed directly from the street.  Other matters to note regarding the Acceptable Outcomes: • Pedestrian access not shared with vehicles • Bollard lights are provided along the pedestrian entryways Service and utilities are not located along the pedestrian entry	

ACCEPTABLE OUTCOMES

Acceptable Outcome pathway may not be applicable where a performance solution is provided

A3.7.1 – Pedestrian entries are connected via a legible, well-defined, continuous path of travel to building access areas such as lift lobbies, stairs, accessways and individual dwelling entries.
A3.7.2 – Pedestrian entries are protected from the weather.
A3.7.3 – Pedestrian entries are well-lit for safety and amenity, visible from the public domain without opportunity for concealment, and designed to enable casual surveillance of the entry from within the site.
A3.7.4 – Where pedestrian access is via a shared zone with vehicles, the pedestrian path is clearly delineated and/or measures are incorporated to prioritise the pedestrian and constrain vehicle speed.
A3.7.5 – Services and utilities that are located at the pedestrian entry are integrated into the design and do not detract from the amenity of the entry.

A3.7.6 – Bins are not located at the primary pedestrian entry.	
LOCAL PLANNING FRAMEWORK	**REQUIREMENT**
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 3.8	VEHICLE ACCESS	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT**	**ASSESSOR COMMENT**
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O3.8.1 – Vehicle access points are designed and located to provide safe access and egress for vehicles and to avoid conflict with pedestrians, cyclists and other vehicles.	The location, landscaping and changes in material provides a strong differentiation between pedestrian and vehicle access.	Agreed.

O3.8.2 – Vehicle access points are designed and located to reduce visual impact on the streetscape.	 The proposed driveway allows all vehicles to exit the property in a forward gear. The driveway is designed for two-way access. The car parking spaces is located separately from the dwellings which provides a strong differentiation between pedestrian and vehicle access and ensures safety of pedestrians and drivers. Lot is truncated to increase driver visibility. The design selected materials and colours that are articulated to clearly identify the access point of the vehicles while still integrating with the built form and streetscape. There are no vehicle standing areas within the 1 metre street setback.	

ACCEPTABLE OUTCOMES

Acceptable Outcome pathway may not be applicable where a performance solution is provided

A3.8.1 – Vehicle access is limited to one opening per 20m street frontage that is visible from the street.

A3.8.2 – Vehicle entries are identifiable from the street, while being integrated with the overall façade design and/ or located behind the primary building line.

A3.8.3 – Vehicle entries have adequate separation from street intersections.

A3.8.4 – Vehicle circulation areas avoid headlights shining into habitable rooms within the development and adjoining properties.

A3.8.5 – Driveway width is kept to a functional minimum, relative to the traffic volumes and entry/egress requirements.

A3.8.6 – Driveways designed for two way access to allow for vehicles to enter the street in forward gear where:

- the driveway serves more than 10 dwellings
- the distance from an on-site car parking to the street is 15m or more **OR**
- the public street to which it connects is designated as a primary distributor, district distributor or integrated arterial road.

A3.8.7 – Walls, fences and other structures truncated or reduced to no higher than 0.75m within 1.5m of where walls, fences, other structures adjoin vehicle access points where a driveway meets a public street and where two streets intersect (refer Figure 3.8a).

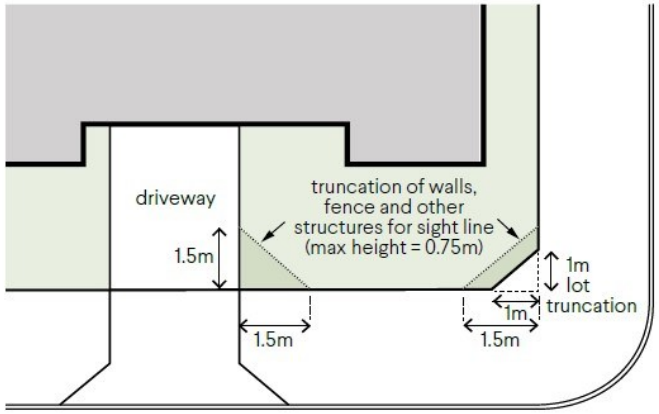

Figure 3.8a Truncation at street corner to provide sightlines (refer A3.8.7).

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 3.9 CAR AND BICYCLE PARKING

ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	APPLICANT COMMENT	ASSESSOR COMMENT
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O3.9.1 – Parking and facilities are provided for cyclists and other modes of transport.	The subject site falls within Location A. Therefore, only one bay per dwelling is required for the development. A total of 89 bays are provided for all 76 dwellings. The development also provided 9 Visitor bays, 46 bicycle bays, and 9 motorcycle parking bays.	Agreed.
O3.9.2 – Car parking provision is appropriate to the location, with reduced provision possible in areas that are highly walkable and/or have good public transport or cycle networks and/or are close to employment centres.	 Other matters to note regarding the Acceptable Outcomes: • The visitor bays are marked and it is clear that they will be intended for the use of visitors • Carports will be used for the 76 parking bays and its design will complement with the aesthetic of the proposed development	
O3.9.3 – Car parking is designed to be safe and accessible.	The design enhances safety through maintenance of adequate sightlines for vehicles, a clear path of driveway for vehicles and separation between pedestrian walkways.	SDA compliance has been removed in the revised plans otherwise consideration for ACROB bays should be given. Building D has no direct pedestrian access to the carpark. It is expected that the shortest path, through the

		landscaping will be taken. Consideration should be given to walkable treatments in this area.

O3.9.4 – The design and location of car parking minimises negative visual and environmental impacts on amenity and the streetscape.	The design of the car parking areas is not located within the 1 metre street setback and are not visually prominent from the street. Carparking is hidden behind the buildings to enhance the streetscape of the development.	

ACCEPTABLE OUTCOMES

Acceptable Outcome pathway may not be applicable where a performance solution is provided

A3.9.1 – Secure, undercover bicycle parking is provided in accordance with Table 3.9 and accessed via a continuous path of travel from the vehicle or cycle entry point.

Table 3.9 Parking ratio

Parking types		Location A	Location B
Car parking[1]	1 bedroom dwellings	0.75 bay per dwelling	1 bay per dwelling
	2+ bedroom dwellings	1 bay per dwelling	1.25 bays per dwelling
	Visitor	1 bay per four dwellings up to 12 dwellings 1 bay per eight dwellings for the 13th dwelling and above	
Bicycle parking[1]	Resident	0.5 space per dwelling	
	Visitor	1 space per 10 dwellings	
Motorcycle/ Scooter parking[2]	Developments exceeding 20 dwellings provide 1 motorcycle/scooter space for every 10 car bays		

[1] Calculations of parking ratios shall be rounded up to the next whole number.
[2] For each five motorcycle/scooter parking bays provided in accordance with Table 3.9, car parking bays may be reduced by one bay.

Definitions:
Location A: within 800m walkable catchment of a train station and/or 250m of a transit stop (bus or light rail) of a high-frequency route and/or within the defined boundaries of an activity centre.
Location B: not within Location A.

A3.9.2 – Parking is provided for cars and motorcycles in accordance with Table 3.9.

A3.9.3 – Maximum parking provision does not exceed double the minimum number of bays specified in Table 3.9

A3.9.4 – Car parking and vehicle circulation areas are designed in accordance with AS2890.1 (as amended) or the requirements of applicable local planning instruments.

A3.9.5 – Car parking areas are not located within the street setback and are not visually prominent from the street.

A3.9.6 – Car parking is designed, landscaped or screened to mitigate visual impacts when viewed from dwellings and private outdoor spaces.

A3.9.7 – Visitor parking is clearly visible from the driveway, is signed ‘Visitor Parking’ and is accessible from the primary entry or entries.

A3.9.8 – Parking shade structures, where used, integrate with and complement the overall building design and site aesthetics and have a low reflectance to avoid glare into apartments.

A3.9.9 – Uncovered at-grade parking is planted with trees at a minimum rate of one tree per four bays.

A3.9.10 – Basement parking does not protrude more than 1m above ground, and where it protrudes above ground is designed or screened to prevent negative visual impact on the streetscape.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

Document Set ID: 6945947

ELEMENT 4.1 SOLAR AND DAYLIGHT ACCESS

ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	APPLICANT COMMENT	ASSESSOR COMMENT
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance-based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O4.1.1 – In climate zones 4, 5 and 6: the development is sited and designed to optimise the number of dwellings receiving winter sunlight to private open space and via windows to habitable rooms.	The courtyards and balconies of the dwellings are oriented to face the Northeast so that balconies and courtyards will receive winter morning sunlight as well as the habitable rooms. See Overshadowing Diagram as part of the DA set.	Agreed.
O4.1.2 – Windows are designed and positioned to optimise daylight access for habitable rooms.	There is provision for windows/doors that open to a balcony or a courtyard which optimises daylight access to the living rooms.	Amended Plans – January 2025 Glazed surface area of windows meets a minimum 10% of the floor area.
O4.1.3 – The development incorporates shading and glare control to minimise heat gain and glare: – from mid-spring to autumn in climate zones 4, 5 and 6 **AND** – year-round in climate zones 1 and 3.	Shading and glare control measures are provided in the development through covered outdoor living areas and covered front entryway of each dwelling which will prevent direct sunlight penetrating the dwellings during summer. Roof overhang provides shading for each building.	Agreed.

ACCEPTABLE OUTCOMES
Acceptable Outcome pathway may not be applicable where a performance solution is provided

A4.1.1 – In climate zones 4, 5 and 6 only:

a) Dwellings with a northern aspect are maximised, with a minimum of 70 per cent of dwellings having living rooms and private open space that obtain at least 2 hours direct sunlight between 9am and 3pm on 21 June **AND**

b) A maximum of 15 per cent of dwellings in a building receiving no direct sunlight between 9am and 3pm on 21 June.

A4.1.2 – Every habitable room has at least one window in an external wall, visible from all parts of the room, with a glazed area not less than 10 per cent of the floor area and comprising a minimum of 50 per cent of clear glazing.

A4.1.3 – Lightwells and/or skylights do not form the primary source of daylight to any habitable room.

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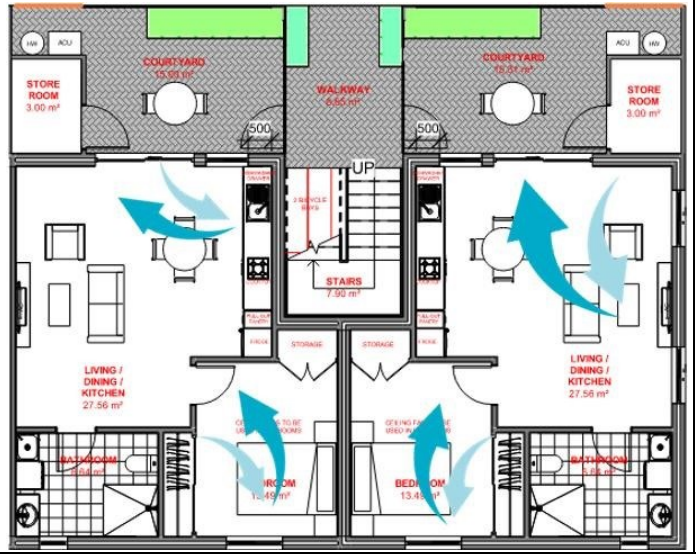
A4.1.4 – The building is oriented and incorporates external shading devices in order to:

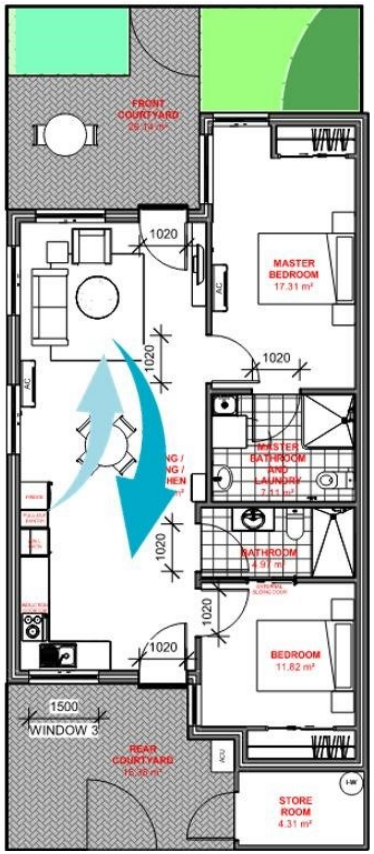
- minimise direct sunlight to habitable rooms:
  - between late September and early March in climate zones 4, 5 and 6 only
  - **AND** in all seasons in climate zones 1 and 3
- permit winter sun to habitable rooms in accordance with A 4.1.1 (a).

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.2 NATURAL VENTILATION

ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	APPLICANT COMMENT	ASSESSOR COMMENT
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O4.2.1 – Development maximises the number of apartments with natural ventilation.	All proposed dwellings have a dual aspect design, providing cross natural ventilation into the habitable rooms of the dwellings.	Agreed.
O4.2.2 – Individual dwellings are designed to optimise natural ventilation of habitable rooms.		The noise management plan refers to compliance solutions which may render the major openings inoperable. This has the capacity to impact on the cross-ventilation requirements of the Codes.

O4.2.3 – Single aspect apartments are designed to maximise and benefit from natural ventilation.		



Further points in relation to the Acceptable Outcomes:

- No habitable room relies on lightwells as primary source of fresh air

Straight line distance between opening of greater than 2.1m

ACCEPTABLE OUTCOMES

Acceptable Outcome pathway may not be applicable where a performance solution is provided

A4.2.1 – Habitable rooms have openings on at least two walls with a straight line distance between the centre of the openings of at least 2.1m.

A4.2.2 –

(a) A minimum 60 per cent of dwellings are, or are capable of, being naturally cross ventilated in the first nine storeys of the building **(b)** Single aspect apartments included within the 60 per cent minimum at (a) above must have:

- ventilation openings oriented between 45º – 90º of the prevailing cooling wind direction

AND room depth no greater than 3 × ceiling height

(c) For dwellings located at the 10th storey or above, balconies incorporate high and low level ventilation openings.

A4.2.4 – No habitable room relies on lightwells as the primary source of fresh-air.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

A4.2.3 – The depth of cross-over and cross-through apartments with openings at either end and no openings on side walls does not exceed 20m.

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ELEMENT 4.3	SIZE AND LAYOUT OF DWELLINGS	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O4.3.1 – The internal size and layout of dwellings is functional with the ability to flexibly accommodate furniture settings and personal goods, appropriate to the expected household size.	All dwellings have been designed with generous living space dimensions and areas for liveability of residents, an accordance with tables 4.3a and 4.3b of the R-Codes. See floor plans as part of the DA Drawing set. The design drawings for each unit shows potential furniture layouts and can accommodate a variety of furniture arrangements.	Reviewed and agree.
O4.3.2 – Ceiling heights and room dimensions provide for well-proportioned spaces that facilitate good natural ventilation and daylight access.	The dwelling units have a floor-to-ceiling height that is in accordance with the acceptable outcome A4.3.3 with at least 2.7m for all habitable spaces which allows for good natural ventilation and daylight access.	

ACCEPTABLE OUTCOMES
Acceptable Outcome pathway may not be applicable where a performance solution is provided

A4.3.1 – Dwellings have a minimum internal floor area in accordance with Table 4.3a.

Table 4.3a Minimum floor areas for dwelling types

Dwelling type	Minimum internal floor area
Studio	37m²
1 bed	47m²
2 bed × 1 bath[1]	67m²
3 bed × 1 bath[1]	90m²

[1]An additional 3m² shall be provided for designs that include a second or separate toilet, and 5m² for designs that include a second bathroom.

A4.3.2 – Habitable rooms have minimum floor areas and dimensions in accordance with Table 4.3b.

Table 4.3b Minimum floor areas and dimensions for habitable rooms

Habitable room type	Minimum internal floor area	Minimum internal dimension
Master bedroom	10m²	3m[1]
Other bedrooms	9m²	3m[1]
Living room – studio and 1 bed apartments	N/A	3.6m
Living room – other dwelling types	N/A	4m

[1] Excluding robes

A4.3.3 – Measured from the finished floor level to finished ceiling level, minimum ceiling heights are:

- Habitable rooms – 2.7m
- Non-habitable rooms – 2.4m
- All other ceilings meet or exceed the requirements of the NCC.

A4.3.4 – The length of a single aspect open plan living area is equal to or less than 3 x the ceiling height. An additional 1.8m length may be provided for a kitchen, where the kitchen is the furthest point from the window in an open plan living area provided that the maximum length does not exceed 9m.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.4	PRIVATE OPEN SPACE AND BALCONIES	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT**	**ASSESSOR COMMENT**
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	

O4.4.1 – Dwellings have good access to appropriately sized private open space that enhances residential amenity.	Each dwelling is provided with a private open space through a balcony and a courtyard, having an area that ranges from 11 m^2 to 26 m^2 which meets the minimum area set out in Table 4.4. Most private open spaces are provided with landscaping to enhance the space.	Agreed.
O4.4.2 – Private open space is sited, oriented and designed to enhance liveability for residents.	The private open spaces act as an alternative secondary living space as they can be accessed directly from the main living space.	Agreed.
O4.4.3 – Private open space and balconies are integrated into the overall architectural form and detail of the building.	The balconies of the Apartment buildings have balustrading and the courtyards of the ground floor units are provided with fences to achieve visual privacy. They are integrated into the overall aesthetic of the development and complements the materiality of the building. 	Agreed.
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		
A4.4.1 – Each dwelling has private open space accessed directly from a habitable room with dimensions in accordance with Table 4.4.		

Table 4.4 Private open space requirements

Dwelling type	Minimum Area[1]	Minimum Dimension[1]
Studio apartment + 1 bedroom	8m²	2.0m
2 bedroom	10m²	2.4m
3 bedroom	12m²	2.4m
Ground floor / apartment with a terrace	15m²	3m

[1] Services and fixtures located within private open space, including but not limited to air-conditioner units and clothes drying, are not visible from the street and/or are integrated into the building design.

A4.4.2 – Where private open space requires screening to achieve visual privacy requirements, the entire open space is not screened and any screening is designed such that it does not obscure the outlook from adjacent living rooms.

A4.4.3 – Design detailing, materiality and landscaping of the private open space is integrated with or complements the overall building design.

A4.4.4 – Services and fixtures located within private open space, including but not limited to air-conditioner units and clothes drying, are not visible from the street and/or are integrated into the building design.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.5 CIRCULATION AND COMMON SPACES

ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	APPLICANT COMMENT *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	ASSESSOR COMMENT
O4.5.1 – Circulation spaces have adequate size and capacity to provide safe and convenient access for all residents and visitors.	There are no circulation corridors provided in the development. The common spaces in the development have a minimum width of 1.5 m which are designed for universal access.	Agreed.

		
O4.5.2 – Circulation and common spaces are attractive, have good amenity and support opportunities for social interaction between residents.	Circulation pathways are positioned adjacent landscaping to make outdoor areas integral to resident experience. Social interaction is enhanced through the common spaces such as walkways, and other informal landscaped areas within the development.	The circulation/common spaces are accessible however the western most common area (gazebo) is concealed in the corner and has no external passive surveillance.

ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*
A4.5.1 – Circulation corridors are a minimum 1.5m in width.
A4.5.2 – Circulation and common spaces are designed for universal access.
A4.5.3 – Circulation and common spaces are capable of passive surveillance, include good sightlines and avoid opportunities for concealment.
A4.5.4 – Circulation and common spaces can be illuminated at night without creating light spill into the habitable rooms of adjacent dwellings.
A4.5.5 – Bedroom windows and major openings to living rooms do not open directly onto circulation or common spaces and are designed to ensure visual privacy and manage noise intrusion.

LOCAL PLANNING FRAMEWORK	**REQUIREMENT**
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.6	STORAGE	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O4.6.1 – Well-designed, functional and conveniently located storage is provided for each dwelling.	Each dwelling unit is provided with a storage unit that has an area of: • 3 m^2 for the 1-bedroom units • 4 m^2 for the 2-bedroom units Storerooms have a minimum dimension of 1.5 m which is in accordance with the minimum size requirement. All storerooms are located within each lot of the dwelling. The location and placement of the storage units ensures that it is well-ventilated, protected from the weather and free from moisture so it provides a dry and mould-free storage.	Agreed.

ACCEPTABLE OUTCOMES
Acceptable Outcome pathway may not be applicable where a performance solution is provided

A4.6.1 – Each dwelling has exclusive use of a separate, ventilated, weatherproof, bulky goods storage area. This can be located either internally or externally to the dwelling with dimensions in accordance with Table 4.6.

Table 4.6 Storage requirements

Dwelling type	Storage area[1]	Minimum dimension[1]	Minimum height[1]
Studio dwelling	3m^2	1.5m	2.1m
1 bedroom dwelling	3m^2		
2 bedroom dwellings	4m^2		
3 bedroom dwellings	5m^2		
[1] Dimensions exclusive of services and plant.			

A4.6.2 – Bulky good stores that are not directly accessible from the dwelling/private open space are located in areas that are convenient, safe, well-lit, secure and subject to passive surveillance.
A4.6.3 – Storage provided separately from dwellings or within or adjacent to private open space[1], is integrated into the design of the building or open space and is not readily visible from the public domain. (1) Storage on/adjacent to private open space is additional to required open space area and dimensions.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.7	MANAGING THE IMPACT OF NOISE	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT**	**ASSESSOR COMMENT**
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O4.7.1 – The siting and layout of development minimises the impact of external noise sources and provides appropriate acoustic privacy to dwellings and on-site open space.	The layout of the development is designed in a way that potential noise sources such as driveways, service areas, and refuse bins are not located adjacent to the external wall of habitable rooms.	Agreed. A review of the solid fencing to reserve and road frontages will be reconsidered.
O4.7.2 – Acoustic treatments are used to reduce sound transfer within and between dwellings and to reduce noise transmission from external noise sources.	All Apartment buildings are separated by dividing walls that minimises the transfer of direct noise from one dwelling to another.	Acoustic measures undertaken at building permit stage.
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		
A4.7.1 – Dwellings exceed the minimum requirements of the NCC, such as a rating under the AAAC Guideline for Apartment and Townhouse Acoustic Rating (or equivalent).		
A4.7.2 – Potential noise sources such as garage doors, driveways, service areas, plant rooms, building services, mechanical equipment, active communal open space and refuse bins are not located adjacent to the external wall of habitable rooms or within 3m of a window to a bedroom.		
A4.7.3 – Major openings to habitable rooms are oriented away or shielded from external noise sources.		

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.8	DWELLING MIX	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O4.8.1 – A range of dwelling types, sizes and configurations is provided that caters for diverse household types and changing community demographics.	The development is design to provide Build to Rent Apartment buildings for low-income individuals. In this way the development contributes to the diversity of the community and reflect the needs and desires of the residents. The development provides multiple-use communal area for resident functions, care services, etc. There are 76 dwelling units in the proposed development which is composed of the following: • 16 x 2-bedroom apartments (15 of which are SDAs) • 60 x 1-bedroom apartments	Although not a wide diversity of apartment typologies for the site, a broader analysis indicates that the 1 and 2 bedroom units proposed would aid in diversifying housing stock within Halls Head and the immediate suburbs.
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		
A4.8.1 – **a)** Dwelling mix is provided in accordance with the objectives, proportions or targets specified in a local housing strategy or relevant local planning instrument **OR** **b)** Where there is no local housing strategy, developments of greater than 10 dwellings include at least 20 per cent of apartments of differing bedroom numbers.		
A4.8.2 – Different dwelling types are well distributed throughout the development, including a mix of dwelling types on each floor.		

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.9 UNIVERSAL DESIGN

ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	APPLICANT COMMENT	ASSESSOR COMMENT
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O4.9.1 – Development includes dwellings with universal design features providing dwelling options for people living with disabilities or limited mobility and/or to facilitate ageing in place.	The proposed development achieves universal design standards through design elements such as a step-free threshold and other features that meet Platinum Level standard for LHA Design Guidelines. The building also provides generous door and passage widths and generous circulation spaces,	Agreed.

ACCEPTABLE OUTCOMES
Acceptable Outcome pathway may not be applicable where a performance solution is provided

A4.9.1 –

a) 20 per cent of all dwellings, across a range of dwelling sizes, meet Silver Level requirements as defined in the Liveable Housing Design Guidelines (Liveable Housing Australia) **OR**

b) 5 per cent of dwellings are designed to Platinum Level as defined in the Liveable Housing Design Guidelines (Liveable Housing Australia).

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.10	FAÇADE DESIGN	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O4.10.1 – Building façades incorporate proportions, materials and design elements that respect and reference the character of the local area.	The building facade includes a contemporary residential aesthetic, with balustrading on the balcony, and a robust pallet of warm materials and colours that impart a sense of 'homeliness'.	The design statement and context analysis provided by the applicant consider and adapt elements to the proposal.
O4.10.2 – Building façades express internal functions and provide visual interest when viewed from the public realm.	 The rhythm and visual interest are achieved by a combination of building articulation, landscaping, generous use of face brick to provide texture and well proportioned openings and architectural elements.	The external facades to the roads and reserves are unarticulated, resulting in the two material types providing no benefit other than a breakup of colour. A variety in window sizes, articulation of the building and additional treatment could assist in better street presence, like those facades central to the site. Amended plans – January 2025 The amended plans are considered to address some points above through the inclusion of public art screens and minor articulation to the grey rendered portions of the facades.

ACCEPTABLE OUTCOMES
Acceptable Outcome pathway may not be applicable where a performance solution is provided

A4.10.1 – Façade design includes:

- scaling, articulation, materiality and detailing at lower levels that reflect the scale, character and function of the public realm
- rhythm and visual interest achieved by a combination of building articulation, the composition of different elements and changes in texture, material and colour.

A4.10.2 – In buildings with height greater than four storeys, façades include a defined base, middle and top for the building.

A4.10.3 – The façade includes design elements that relate to key datum lines of adjacent buildings through upper level setbacks, parapets, cornices, awnings or colonnade heights.

A4.10.4 – Building services fixtures are integrated in the design of the façade and are not visually intrusive from the public realm.

A4.10.5 – Development with a primary setback of 1m or less to the street includes awnings that: –
define and provide weather protection to entries

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- are integrated into the façade design
- are consistent with the streetscape character.

A4.10.6 – Where provided, signage is integrated into the façade design and is consistent with the desired streetscape character.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.11	ROOF DESIGN	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O4.11.1 – Roof forms are well integrated into the building design and respond positively to the street.	The buildings have a pitched roof design which complements the façade design. There is no provision for a rooftop communal open space, but the roof design allows provision for solar energy generation through North-facing Photovoltaic collector panels on the roof at the optimum solar collection angle. The proposed development assimilates into streetscape character by implementing a modern roof form that is similar to the surrounding developments.	Agreed.
O4.11.2 – Where possible, roof spaces are utilised to add open space, amenity, solar energy generation or other benefits to the development.		Agreed.
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		
A4.11.1 – The roof form or top of building complements the façade design and desired streetscape character.		
A4.11.2 – Building services located on the roof are not visually obtrusive when viewed from the street.		
A4.11.3 – Useable roof space is safe for users and minimises overlooking and noise impacts on private open space and habitable rooms within the development and on adjoining sites.		
LOCAL PLANNING FRAMEWORK	**REQUIREMENT**	
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:		

ELEMENT 4.12	LANDSCAPE DESIGN	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT**	**ASSESSOR COMMENT**

	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O4.12.1 – Landscape design enhances streetscape and pedestrian amenity; improves the visual appeal and comfort of open space areas; and provides an attractive outlook for habitable rooms.	The development establishes a landscaped street interface to both streets, optimises the extent of deep soil planting, create opportunities for small-medium tree planting in between dwellings and the public footpath which provides a soft and attractive interface.	Agreed.
O4.12.2 – Plant selection is appropriate to the orientation, exposure and site conditions and is suitable for the adjoining uses.	For plant selection, see landscaping plan.	Agreed.
O4.12.3 – Landscape design includes water efficient irrigation systems and where appropriate incorporates water harvesting or water re-use technologies.	The proposed development also enhances common circulation areas through on-structure planting and planting beds on the ground floor that provide areas of greenery and create a lush landscaped environment.	Agreed.
O4.12.4 – Landscape design is integrated with the design intent of the architecture including its built form, materiality, key functional areas and sustainability strategies.	The courtyards are provided with landscaping areas as well as the entrances of the dwellings to make the units attractive and inviting. 	Agreed.

ACCEPTABLE OUTCOMES
Acceptable Outcome pathway may not be applicable where a performance solution is provided

A4.12.1 – Submission of a landscape plan prepared by a competent landscape designer. This is to include a species list and irrigation plan demonstrating achievement of Waterwise design principles.

A4.12.2 – Landscaped areas are located and designed to support mature, shade-providing trees to open space and the public realm, and to improve the outlook and amenity to habitable rooms and open space areas.

A4.12.3 – Planting on building structures meets the requirements of Table 4.12.

Table 4.12 Planting on structure: minimum soil standards for plant types and sizes

Plant type	Definition	Soil volume	Soil depth	Soil area
Large tree	Over 12m high, crown spread at maturity	76.8m³	1,200mm	64m² with minimum dimension 7m
Medium tree	8-12m high, crown spread at maturity	36m³	1,000mm	36m² with minimum dimension 5m
Small tree	4-8m high, crown spread at maturity	7.2m³	800mm	3m × 3m
Small ornamentals	3-4m high, crown spread at maturity	3.2m³	800mm	2m × 2m
Shrubs	--	--	500-600mm	--
Ground cover	--	--	300-450mm	--
Turf	--	--	200mm	--

A4.12.4 – Building services fixtures are integrated in the design of the landscaping and are not visually intrusive.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.13	ADAPTIVE REUSE	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT**	**ASSESSOR COMMENT**
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O4.13.1 – New additions to existing buildings are contemporary and complementary and do not detract from the character and scale of the existing building.	**NA**	
O4.13.2 – Residential dwellings within an adapted building provide good amenity for residents, generally in accordance with the requirements of this policy.	**NA**	
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		
A4.13.1 – New additions to buildings that have heritage value do not mimic the existing form and are clearly identifiable from the original building.		
A4.13.2 – New additions complement the existing building by referencing and interpreting the scale, rhythm and materiality of the building.		
LOCAL PLANNING FRAMEWORK	**REQUIREMENT**	
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:		

ELEMENT 4.14	MIXED USE	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT**	**ASSESSOR COMMENT**

	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O4.14.1 – Mixed use development enhances the streetscape and activates the street.	Element not applicable. The subject site is zoned Residential.	Agreed.
O4.14.2 – A safe and secure living environment for residents is maintained through the design and management of the impacts of non-residential uses such as noise, light, odour, traffic and waste.		
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		
A4.14.1 – Where development is located within a mixed use area designated within the local planning framework, ground floor units are designed for future adaption to non-residential uses.		
A4.14.2 – Ground floor uses including non-commercial uses, such as communal open space, habitable rooms, verandahs and courtyards associated with ground floor dwellings, address, enhance and activate the street.		
A4.14.3 – Non-residential space in mixed use development is accessed via the street frontage and/or primary entry as applicable.		
A4.14.4 – Non-residential floor areas provided in mixed use development has sufficient provision for parking, waste management, and amenities to accommodate a range of retail and commercial uses in accordance with the requirements		
A4.14.5 – Mixed use development is designed to mitigate the impacts of non-residential uses on residential dwellings, and to maintain a secure environment for residents.		
LOCAL PLANNING FRAMEWORK	**REQUIREMENT**	
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:		

ELEMENT 4.15	**ENERGY EFFICIENCY**

ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	APPLICANT COMMENT	ASSESSOR COMMENT
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O4.15.1 – Reduce energy consumption and greenhouse gas emissions from the development.	The proposed development provides energy efficient initiatives through the following: • Cross-flow ventilation – provision of openings such as windows and doors that are on opposite sides which allow natural flow of air to come in • Renewable energy – provision of Photovoltaic arrays on the rooftop and water and energy efficient appliances • Use of energy efficient appliances	Agreed.

ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*
A4.15.1 – **a)** Incorporate at least one significant energy efficiency initiative within the development that exceeds minimum practice (refer Design Guidance) **OR b)** All dwellings exceed the minimum NATHERS requirement for apartments by 0.5 stars.[1] (1) Compliance with the NCC requires that development shall achieve an average star-rating across all dwellings that meets or exceeds a nominated benchmark, and that each unit meets or exceeds a slightly lower benchmark. Compliance with this Acceptable Outcome requires that each unit exceeds that lower benchmark by at least half a star.

LOCAL PLANNING FRAMEWORK	REQUIREMENT
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.16 WATER MANAGEMENT AND CONSERVATION

ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	APPLICANT COMMENT	ASSESSOR COMMENT

	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O4.16.1 – Minimise potable water consumption throughout the development.	All dwelling units minimise potable water consumption through provisions of water and energy efficient appliances and through climate-appropriate planting to achieve waterwise landscaping.	Agreed.
O4.16.2 – Stormwater runoff from small rainfall events is managed on-site, wherever practical.	The landscape public domain of the development has provision for tree canopy and deep soil areas which maximises the use of permeable surfaces at ground level to enable groundwater recharge and minimise the impervious areas which will help with managing the stormwater runoff on-site.	Agreed.
O4.16.3 – Reduce the risk of flooding so that the likely impacts of major rainfall events will be minimal.	The landscape of the proposed development designed in such a way that slows down overland flows and minimise opportunities for scouring. In addition, the pedestrian footpaths and the driveway slopes towards the primary road in order to avoid flooding within the development.	Agreed.

ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*
A4.16.1 – Dwellings are individually metered for water usage.
A4.16.2 – Stormwater runoff generated from small rainfall events is managed on-site.
A4.16.3 – Provision of an overland flow path for safe conveyance of runoff from major rainfall events to the local stormwater drainage system.

LOCAL PLANNING FRAMEWORK	**REQUIREMENT**
Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.17	WASTE MANAGEMENT	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT**	**ASSESSOR COMMENT**
	Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.	
O4.17.1 – Waste storage facilities minimise negative impacts on the streetscape, building entries and the amenity of residents.	The bins are placed inside bin enclosures so it is concealed from the streets, open spaces and from the habitable rooms of the apartment. It is located on the ground floor and near the street front so that it is easily accessible for the caretaker when presenting the bins along the verge area. Residents will be advised of appropriate bin usage and collection.	Waste management plan considered acceptable by the City's Waste Department.
O4.17.2 – Waste to landfill is minimised by providing safe and convenient bins and information for the separation and recycling of waste.		
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		
A4.17.1 – Waste storage facilities are provided in accordance with the Better Practice considerations of the *WALGA Multiple Dwelling Waste Management Plan Guidelines* (or local government requirements where applicable).		
A4.17.2 – A Level 1 Waste Management Plan (Design Phase) is provided in accordance with the *WALGA Multiple Dwelling Waste Management Plan Guidelines* - Appendix 4A (or equivalent local government requirements).		
A4.17.3 – Sufficient area is provided to accommodate the required number of bins for the separate storage of green waste, recycling and general waste in accordance with the *WALGA Multiple Dwelling Waste Management Plan Guidelines* - Level 1 Waste Management Plan (Design Phase) (or local government requirements where applicable).		
A4.17.4 – Communal waste storage is sited and designed to be screened from view from the street, open space and private dwellings.		
LOCAL PLANNING FRAMEWORK	**REQUIREMENT**	

Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

ELEMENT 4.18	UTILITIES	
ELEMENT OBJECTIVES *Development is to achieve the following Element Objectives*	**APPLICANT COMMENT** *Outline the rationale demonstrating that the proposal has met the Element Objectives, through either a performance based solution or using the Acceptable Outcomes. The Design Guidance provided in the policy may be of assistance.*	**ASSESSOR COMMENT**
O4.18.1 –The site is serviced with power, water, gas (where available), wastewater, fire services and telecommunications/broadband services that are fit for purpose and meet current performance and access requirements of service providers.	The utilities of the development are well-provided through necessary urban services such as water, sewer, electrical services, fire services and telecommunications/broadband services that are fit for purpose and meets the needs of residents.	Agreed.
O4.18.2 – All utilities are located such that they are accessible for maintenance and do not restrict safe movement of vehicles or pedestrians.	The location of the utilities in the development is placed along the courtyards of the dwellings so that is easily accessible for maintenance. Its location does not restrict the flow of vehicles in the site and is safe for pedestrians.	Agreed.
O4.18.3 – Utilities, such as distribution boxes, power and water meters are integrated into design of buildings and landscape so that they are not visually obtrusive from the street or open space within the development.	The location of the service facilities will not conflict with existing trees or impact built-form outcomes. Meters and distribution boxes will be provided for each block at the detailed design stage.	Agreed.
O4.18.4 – Utilities within individual dwellings are of a functional size and layout and located to minimise noise or air quality impacts on habitable rooms and balconies.	Each dwelling unit has provisions for laundry located near the bathroom and the air-conditioning units are placed within the rear courtyard or within a screened area to reduce noise and air quality impacts within the habitable rooms of the dwellings.	How will washing be dried? Communal clothes lines? Concealed areas of balconies were clothes line are not visible? Condition included to require the screening of all washing/ clothes drying areas.
ACCEPTABLE OUTCOMES *Acceptable Outcome pathway may not be applicable where a performance solution is provided*		
A4.18.1 – Utilities that must be located within the front setback, adjacent to the building entry or on visible parts of the roof are integrated into the design of the building, landscape and/or fencing such that they are accessible for servicing requirements but not visually obtrusive.		
A4.18.2 – Developments are fibre-to-premises ready, including provision for installation of fibre throughout the site and to every dwelling.		
A4.18.3 – Hot water units, air-conditioning condenser units and clotheslines are located such that they can be safely maintained, are not visually obtrusive from the street and do not impact on functionality of outdoor living areas or internal storage.		
A4.18.4 – Laundries are designed and located to be convenient to use, secure, weather-protected and well-vented; and are of an overall size and dimension that is appropriate to the size of the dwelling.		
LOCAL PLANNING FRAMEWORK	**REQUIREMENT**	

Does the local planning framework amend or replace the above stated controls? If yes, state the applicable requirement:	

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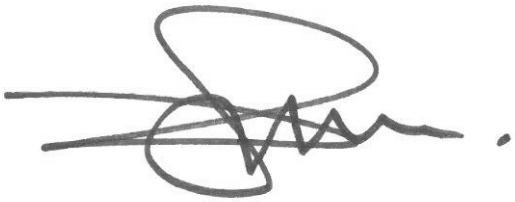
Design Review Report

4 Waardong Court Halls Head DR01

01 October 2024

Design Review Report		
Subject	**4 Waardong Court Halls Head – Design Review 01**	
Date	01.10.2024	
Time	9.30am	
Location	City of South Perth	
Design Reviewers	Name Simon Venturi Dominic Snellgrove Denise Morgan	 Panel Member Chair Panel Member
Proponent		Yaran Property Group
Project Team	Curtis Cox Malcolm MacKay	
Planning Authority	Aaron Lucas	City of Mandurah
Stakeholders	N/A	
Declarations	None	
Briefings		
Relevant Authorities Project Team		
Design Review Report endorsement		
Reviewer's signature	 (Name) Dominic Snellgrove	

Introductory Comments		
Design quality evaluation		
		Supported
		Pending further attention
		Not yet supported
		Yet to be addressed
Strengths of the Proposal		• Car parking sleeved from the public realm • Predominantly north facing solar indoor and outdoor private space • High levels of streetscape engagement and public domain passive surveillance • Much needed, diverse and community focused use including build to rent, NDIS Specialist Disability Accommodation (SDA) and affordable housing. • Site entry legibility and permeability • Appropriate built form and scale • 100% Cross ventilation • Zero percent solely south facing units • Natural light and ventilation to bathrooms • Pedestrian car park access ways promoting safe residents and visitor movement. • Roof top PV panels proposed • Tree canopy to car park • Distributed communal amenities • Generous balcony areas • Landscape professional and landscape concept provided • Landscape distributed throughout the car park • Generous deep soil planting • Predominantly native species selection
Principle 1 **Context and character**		*Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.*
		a) Whilst the development incorporates high levels of pedestrian access and permeability, it is not clear how the project connects to and with the broader precinct and adjoining amenities b) Whilst the Panel supports the overall form, scale and appearance of the project it is not clear how the design has drawn on its immediate and broader context for design cues. c) The absence of streetscape elevations and site edge condition sections makes it difficult to assess the immediate relationship between the built form and its adjoining context. d) It is not clear if the proposal is seeking to incorporate invasive boundary fencing.
Recommendations		**1. Illustrate the master plan within its broader context to illustrate its connectivity with adjoining amenity.** **2. Consider undertaking a context and character study of the immediate and broader area to establish a narrative and relationship between the proposed built form and its context. How has the architecture been derived from the**

		unique character of the immediate and broader context? **3. Provide site cross sections and edge condition sections to illustrate the relationship between the front of the units and the adjoining public realm. Low fencing or walls with a balance of permeability and privacy are preferred where adjacent to the public realm.**
Principle 2 **Landscape quality**		*Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.*
		a) The Landscape concept promises to offer important opportunities and amenity for the project. b) The Proponent is commended for engaging a landscape professional for the early design work. c) It is not clear if tree canopy has been fully maximised throughout the development including the car park area.
Recommendations		**1. Explore opportunities for maximizing tree canopy further.**
Principle 3 **Built form and scale**		*Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.*
		a) The built form and scale are appropriate and supported.
Recommendations		**1. None**
Principle 4 **Functionality and build quality**		*Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.*
		a) The planning is functional and well arranged. b) Planning may benefit from some further areas of consideration c) The bin stores are remotely located and concentrated at the south end of the site requiring a large distance to be travelled for residents living at the north of the development.
Recommendations		**1. Ensure that all HVAC equipment, including AC condensers, is fully screened from the public and private realm. This may include incorporating purpose-built visual screens around AC condenser units where they are visible from private outdoor spaces or front courtyards.** **2. Review the size of the proposed accessible bathrooms as they appear to be over-sized. If they are, consider allocating excess space to living areas.** **3. Consider substituting sliding door entries for swing door entries which are more functional in the context of disability access.** **4. Consider locating one of the bin stores more equitably. This may result in a more equitable distribution of communal amenity as well.** **5. Consider car park access security**
Principle 5 **Sustainability**		*Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.*
		a) An ESD professional has not yet been appointed b) The ESD design and narrative is at an early stage and was not discussed in detail c) Whilst the project offers the opportunity for enhanced passive design principles , such as cross ventilation it is not clear how sustainable design is being approached wholistically.
Recommendations		**1. Appoint an ESD professional and produce a comprehensive and wholistic sustainable design narrative for the project** **2. Commit to a PV performance target for each dwelling** **3. Consider EV-charging**

		4. Continue to develop passive design strategies in relation to the façade, including passive shade elements **5. Commit to an all-electric energy strategy** **6. Consider embodied energy in construction methodology and material selection.** **7. Consider waste management and recycling**
Principle 6 **Amenity**		*Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.*
		a) The project has the capacity to offer high levels of visitor, service provider and resident amenity
Recommendations		**1. Consider a more equitable distribution of communal landscape space.**
Principle 7 **Legibility**		*Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.*
		a. Entry legibility is well considered including the arrangement of north-south access ways between built form and a pedestrian pathway across the car park
Recommendations		**1. Consider making the pedestrian link from Waardong Court to the internal car park more generous and better surveilled.** **2. Consider aligning the north access way from Waardong Court with the car park pedestrian pathway and the south accessway between built form to create a more generous and legible site-wide gesture.** **3. See commentary under Principle 1 in relation to demonstrating pedestrian connectivity with the broad local.**
Principle 8 **Safety**		*Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.*
		a. The project offers high levels of streetscape engagement and passive surveillance as well as passive surveillance over and through the internalised car park.
Recommendations		**1. Consider making the pedestrian link from Waardong Court to the internal car park more generous and better surveilled.**
Principle 9 **Community**		*Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.*
		a) In a project of this scope and scale the most important outcome for the community is an active, engaged and passively surveilled ground plane and public domain. b) The design incorporates high levels of streetscape engagement and public domain passive surveillance c) The project is seeking to deliver much needed, diverse and community focused use including build to rent, NDIS Specialist Disability Accommodation (SDA) and affordable housing.
Recommendations		**1. None**
Principle 10 **Aesthetics**		*Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.*
		a) Whilst the Panel supports the need to provide affordable dwelling diversity with an emphasis on economic construction methodologies, the facades and aesthetic design approach would benefit from further consideration beyond a painted finish. b) The south facing elevations are particularly flat and unarticulated.
Recommendations		**1. Consider the introduction of a judicious quantity of quality materials in strategic locations through the façade arrangement.**

		2. Consider passive solar hoods to add layering and depth to the facades as well as enhance passive shade outcomes. **3. Consider the elevations within the context of a broader dive into the character of the immediate and broader area.**

Concluding Remarks

The Panel supports the proposal subject to consideration of and a response to commentary above.

Design Review progress.

		Supported
		Pending further attention
		Not yet supported
		Yet to be addressed

	DR1	*DR2*	*DR3*		
Principle 1 - **Context and character**					
Principle 2 - **Landscape quality**					
Principle 3 - **Built form and scale**					
Principle 4 - **Functionality and build quality**					
Principle 5 - **Sustainability**					
Principle 6 - **Amenity**					
Principle 7 - **Legibility**					
Principle 8 - **Safety**					
Principle 9 - **Community**					
Principle 10 - **Aesthetics**					

4 Waardong Court, Halls Head - DRP comments and Applicant responses (MUD suggestions)		
The following table outlines the commentary provided by the DRP meeting, along with the Applicant's responses.		
	DRP Comments (DR1)	**Applicant's response**
Principle 1 – Context and Character		
1	*Illustrate the master plan within its broader context to illustrate its connectivity with adjoining amenity.*	Please see the aerial photo showing the local pedestrian network as part of the context and character study.
2	*Consider undertaking a context and character study of the immediate and broader area to establish a narrative and relationship between the proposed built form and its context. How has the architecture been derived from the unique character of the immediate and broader context?*	Please see the context and character study (Appendix 14 of the DA submission requirements) prepared by our Urban Design Architect, Malcolm Mackay.
3	*Provide site cross sections and edge condition sections to illustrate the relationship between the front of the units and the adjoining public realm. Low fencing or walls with a balance of permeability and privacy are preferred where adjacent to the public realm.*	**Addressed.** Please see the fencing plan with annotations of height and type of fencing as part of the DA drawing set. The elevations also show the relationship of the front of the units with the adjoining public realm.
Principle 2 – Landscape quality		
1	*Explore opportunities for maximizing tree canopy further.*	**Addressed.** Please see the amended landscaping plan.
Principle 3 – Built form and scale		
1	*None.*	Nothing more to be done.
Principle 4 – Functional and build quality		
1	*Ensure that all HVAC equipment, including AC condensers, is fully screened from the public and private realm. This may include incorporating purpose-built visual screens around AC condenser units where they are visible from private outdoor spaces or front courtyards.*	**Already considered** – please see the elevations of the drawing set.
2	*Review the size of the proposed accessible bathrooms as they appear to be over-sized. If they are, consider allocating excess space to living areas.*	The 2x2 units are SDA dwellings which are designed to be compliant with the High Physical Support category. For the 1-bedroom units, the design has been reviewed and changed to a more efficient layout. Please see the drawing set.
3	*Consider substituting sliding door entries for swing door entries which are more functional in the context of*	The 1-bed units are not SDA units, so disability access is not an issue.

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	disability access.	
4	*Consider locating one of the bin stores more equitably. This may result in a more equitable distribution of communal amenity as well.*	**Addressed.** The bin stores have been redistributed across the site to address this comment.
5	*Consider car park access security.*	**Noted.** We will look into adding security gates post-DA stage.
Principle 5 – Sustainability		
1	*Commit to a PV performance target for each dwelling*	**Noted.** The PV panels shown on the roof plan are indicative. Further details regarding this will be provided at building stage.
2	*Consider EV-charging*	**Noted.** We will look at providing EV conduits at a later stage.
4	*Continue to develop passive design strategies in relation to the façade, including passive shade elements*	**Addressed.** All major windows facing North or Northeast have been provided shade through generous eaves width for the upper floors and trees adjacent to the ground floor units.
5	*Commit to an all-electric energy strategy*	**Addressed.** Induction stoves and electric hot water units will be provided.
6	*Consider waste management and recycling*	**Addressed.** There are 3 communal bin areas provided on site. All bins will be via verge collection. Please see the Bin Presentation Plan as part of the drawing set and the Waste Management Plan as part of the DA submission requirements.
Principle 6 – Amenity		
1	*Consider a more equitable distribution of communal landscape space.*	**Addressed.** Communal open spaces have been distributed across the site.
Principle 7 – Legibility		
1	*Consider making the pedestrian link from Waardong Court to the internal car park more generous and better surveilled.*	We have moved the pedestrian footpath from Waardong Court adjacent to the driveway for a more legible entryway into the development. This also adds more landscaped space within the entrance.
2	*Consider aligning the north access way from Waardong Court with the car park pedestrian pathway and the south accessway between built form to create a more generous and legible site-wide gesture.*	As per the above response, we have moved the pedestrian footpath from Waardong Court adjacent to the driveway for a more legible entryway. However, the footpath within the carpark has been connected to the south accessway.

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3	*See commentary under Principle 1 in relation to demonstrating pedestrian connectivity with the broad local.*	Refer to Principle 1.
Principle 8 – Safety		
1	*Consider making the pedestrian link from Waardong Court to the internal car park more generous and better surveilled.*	We have moved the pedestrian footpath from Waardong Court adjacent to the driveway for a more legible entryway into the development. This also adds more landscaped space within the entrance.
Principle 9 - Community		
1	*None*	Nothing to be done.
Principle 10 - Aesthetics		
1	*Consider the introduction of a judicious quantity of quality materials in strategic locations through the façade arrangement.*	**Addressed.** A new façade arrangement has been proposed. It has been designed to incorporate quality materials such as face bricks, weatherboards, and perforated metal screening.
2	*Consider passive solar hoods to add layering and depth to the facades as well as enhance passive shade outcomes.*	**Addressed.** All major windows facing North or Northeast have been provided shade through generous eaves width for the upper floors and trees adjacent to the ground floor units.
3	*Consider the elevations within the context of a broader dive into the character of the immediate and broader area.*	Refer Principle 1 – identifying precedents.

Document Set ID: 6945983
Version: 1, Version Date: 25/11/2024

PART C – SHIRE OF MUNDARING

1. Declarations of Due Consideration

2. Disclosure of Interests

3. Form 1 DAP Applications

3.1 Lots 1636, 3303 and 9001 (340) Roland Road, Parkerville – Proposed Educational Establishment – DAP/24/02810

4. Form 2 DAP Applications

Nil.

5. Section 31 SAT Reconsiderations

Nil.

Part C – Item 3.1 – LOTS 1636, 3303 and 9001 (#340) ROLAND ROAD, PARKERVILLE – PROPOSED EDUCATIONAL ESTABLISHMENT

Form 1 – Responsible Authority Report
(Regulation 12)

DAP Name:	Metro Outer DAP
Local Government Area:	Shire of Mundaring
Applicant:	PTS Town Planning Pty Ltd
Owner:	Parkerville Children's Home Inc of Parkerville
Value of Development:	$13 million
Responsible Authority:	Shire of Mundaring
Authorising Officer:	Mark Luzi
LG Reference:	Ro 6.340
DAP File No:	DAP/24/02810
Application Received Date:	28 November 2025
Report Due Date:	14 February 2025
Application Statutory Process Timeframe:	90 Days
Attachment(s):	1. Aerial Plan – Site 2. Aerial Plan – Locality 3. Development application report 4. Development Concept Plan 5. Schedule of submissions 6. Bushfire Management Plan and Evacuation Plan 7. Bushfire consultant response to DFES comments 8. Site and Soil Evaluation 9. Traffic Impact Statement (revised) 10. Acoustic report 11. Heritage Impact Statement 12. Environmental Assessment Report 13. Landscaping Concept Report 14. Architectural Overview

Responsible Authority Recommendation

That the Metro Outer DAP resolves to:

1. **Accept** that the DAP Application reference DAP/24/02810 is appropriate for consideration as a "Educational Establishment" land use and compatible with the objectives of the zoning table in accordance with Clause 4.7 of the Shire of Mundaring Local Planning Scheme No. 4;

2. **Approve** DAP Application reference DAP/24/02810 and accompanying plans 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 Shire of Mundaring Local Planning Scheme No. 4 subject to the following conditions:

Conditions

1. Pursuant to clause 26 of the Metropolitan Region Scheme, this approval is deemed to be an approval under clause 24(1) of the Metropolitan Region Scheme.

2. This decision constitutes planning approval only and is valid for a period of two 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. The development shall comply with the approved plans (including any amendments marked in red) unless approval is granted by the Planning Service for any minor variation made necessary by detailed design

4. Prior to commencement of use or obtaining an occupancy permit, information is to be provided that demonstrates measures contained in Section 6 of; the bushfire management plan [v.3] have been implemented and shall include a completed 'Certification by Bushfire Consultant' from the bushfire management plan.

5. The applicant / landowner shall ensure the site is managed pursuant to Section 6; of the bushfire management plan [v.3 at all times.

6. Before commencement of use or occupation of each building, the crossover/s shall be located and installed to specifications and satisfaction of the Shire of Mundaring

7. Prior to applying for a building permit, engineering drawings and specifications detailing the construction and drainage of the car park and vehicle access shall be submitted to the satisfaction of the Shire. The carpark and vehicle access shall thereafter be constructed in accordance with the approved plans.

8. Prior to commencement of use or occupation, all car parking bays and manoeuvring/circulation areas shown on the approved plans shall be sealed/paved, surface marked in accordance with Australian Standard 2890 and to the satisfaction of the Shire of Mundaring

9. Prior to commencing site works, the landowner/applicant shall submit a construction management plan to the satisfaction of the Shire of Mundaring

   The construction management plan shall detail:

   a) Measures to minimise nuisance to neighbours (including dust, noise, waste and vehicle parking); and

b) Measures to minimise soil erosion and stormwater runoff from the site during site works and construction. Works shall thereafter be completed in accordance with the approved construction management plan.

10. The landowner(s) shall either:

    (i) Provide public art on the subject site, with a minimum value of $130,000 [Option 1]; OR

    (ii) Pay $130,000, which equates to 1% of the construction cost for the overall development, in lieu of providing public art on the subject site [Option 2].

    If Option 1 is elected, the public art design shall be submitted to, and approved by the Shire prior to lodgement of the Building Permit application.

    The public art shall be installed prior to commencement of use/occupation of any part of the development and thereafter maintained for the life of the development to the satisfaction of the Shire of Mundaring.

    If Option 2 is elected, the cash-in-lieu amount shall be paid in full to the Shire prior to lodgement of the Building Permit application.

11. All stormwater must be managed onsite to prevent erosion and transportation of water borne pollutants, to the satisfaction of the Shire. Stormwater drainage plans must be submitted with the application for a building permit.

12. Prior to applying for a building permit, an application to construct or install an apparatus for the treatment of sewage shall be submitted to Shire of Mundaring Environmental Health Services. The Shire of Mundaring will forward the application to the Department of Health for final approval. The system(s) shall thereafter be installed to the satisfaction of Shire of Mundaring and Department of Health approvals.

13. Satisfactory arrangements being made with the Shire of Mundaring for the upgrading and/or construction Beacon Road.

14. The approved landscape plan shall be implemented and thereafter maintained in perpetuity, to the satisfaction of the Shire of Mundaring.

15. Prior to any works commencing, a revised Environmental Acoustics report shall be submitted to, and approved by the Shire of Mundaring.

16. Prior to any works commencing, a revised Site and Soil Evaluation shall be submitted to, and approved by the Shire of Mundaring.

17. Any damage or alteration to significant fabric is to be made good, in profile and materials, to match the original/existing. Precautionary measures are to be taken to ensure significant detailing is not damaged or removed during works.

18. If the cleaning or removal of paint and glue from significant masonry surfaces is required, non-abrasive methods such as low-pressure water washing, and soft brushing are to be used to ensure no damage of the surface occurs.

19. Unpainted original surfaces are to remain unpainted.

20. To avoid future damp issues, paints are to demonstrate breathability and porosity characteristics that will allow moisture to escape.

21. All visible conduit is to be surface mounted and be colour matched to the adjacent surface and installed in a discrete/sensitive manner that minimises impact to the original fabric and setting. Where possible existing penetrations/conduits/utilities are to be used.

22. New fixings for installations (internal partitioning, floor finishes, internal fixtures etc.) are to avoid significant fabric where possible. Where fixing to significant fabric is required, they are to be unobtrusive and reversible. Where possible, existing penetrations are to be reused and fixings to brickwork are to be done within mortar joints to minimise irreversible damage to heritage fabric.

23. Measures are to be taken to ensure that any archaeological material uncovered during works is dealt with appropriately.

24. Airconditioning units are to be carefully installed under verandahs to ensure that minimal irreversible damage occurs to original building fabric. Where alternative placement is required, this is to be submitted to the satisfaction of Director of Historic Heritage prior to the application for a Building Permit.

25. The following detailed construction documentation is to be submitted to the satisfaction of the Director, Historic Heritage Conservation, prior to the application for a Building Permit:
    a. Mechanical.
    b. Electrical.
    c. Fire.
    d. Hydraulic.
    e. Waste.
    f. Junctions between old and new.
    g. Landscape.
    h. Conservation works.
    I. Schedule of works.
    i. Door and window schedule (identifying which are to be retained and
    j. removed).
    k. Identification of storage/salvage elements and reuse management
    l. strategy of significant fabric.

26. Any salvageable significant materials (including timber and brickwork) are to be retained and repurposed.

27. A photographic archival record of the Blue Cottage is to be prepared in accordance with the Guide to Preparing an Archival Record. A copy is to be provided to the satisfaction of Director of Historic Heritage prior to demolition

28. A suitably qualified and experienced Arborist is to guide works to ensure root and canopy impact is minimised. Proposed development is to be guided by an ‘Arborist Impact Assessment’ and an ‘Arborist Method Statement’, which is to be produced to the satisfaction of Director of Historic Heritage prior to the application for a Building Permit.

29. Any reconstruction work should be undertaken strictly in accordance with documentary evidence and documented as a separate works package to be considered by the Director Historic Heritage Conservation prior to the application for a Building Permit.

30. Where materials are to be replaced, these are to be like-for-like and match the original/existing in profile and materials. Where variations in materials and/or finishes are required, a material, colour and finishes schedule is to be submitted to the satisfaction of Director of Historic Heritage prior to the application for a Building Permit.

31. Prior to installation of the effluent disposal system the subject sites (Lots 1636, 3303 and 9001 Roland Road) are to be amalgamated on to a single certificate of title.

Advice Notes

1. The applicant/landowner(s) are advised they are responsible to ensure all relevant environmental approvals under state and federal legislation are in place, prior to undertaking any works to remove native vegetation.

2. The applicant is advised that conditions 15 and 16 are imposed to address anomalies in the respective submitted supporting documents.

3. The applicant is advised that conditions 17-30 are imposed based on requirements and advice received from the Department of Planning, Lands and Heritage.

4. The applicant is advised that condition 31 is imposed due to Section 7 of the *Government Sewerage Policy 2019* which requires an effluent disposal system to be on the same site as the development it is serving.

5. The Department of Health advise that the applicant will have to have due regard to the following matters:

    - The proposal is required to comply with the requirements of the Government Sewerage Policy 2019.
    - Due to the potential presence of asbestos, it is recommended that the applicant take all necessary precautions to ensure that it is handled in accordance with relevant legislation and guidelines.
    - All food handling intended for sale will need to comply with relevant legislation and guidelines.
    - All public access areas are to comply with the provisions of the Act. The proponent is required to develop a Disaster Management and Emergency Response Plan
    - The subject site is in an area that experiences occasional problems with nuisance and disease carrying mosquitoes. The applicant will need to ensure that proposed infrastructure and site works do not create additional mosquito breeding habitat.

Reasons for Responsible Authority Recommendation

N/A

Details: outline of development application

Region Scheme	Metropolitan Region Scheme
Region Scheme - Zone/Reserve	Rural
Local Planning Scheme	Local Planning Scheme No. 4
Local Planning Scheme - Zone/Reserve	Special Use
Structure Plan/Precinct Plan	Parkerville Village Centre Precinct Plan
Structure Plan/Precinct Plan - Land Use Designation	POS (includes Special Purpose and Public Purpose)
Use Class and permissibility:	Educational Establishment – refer to permissibility under Legislation and Policy.
Lot Size:	13.6328 ha (Lots 1636, 3303 and 9001 combined)
Existing Land Use:	Children's home
State Heritage Register	Yes
Local Heritage	☐ N/A ☒ Heritage List ☐ Heritage Area
Design Review	☒ N/A ☐ Local Design Review Panel ☐ State Design Review Panel ☐ Other
Bushfire Prone Area	Yes
Swan River Trust Area	No

Proposal:

This application seeks approval for the demolition adaption of existing buildings, and the construction of new buildings, on the subject site to be used as an educational establishment. Attachment 3 – Development Application Report and Attachment 4 – Development Concept Plan.

The school will be for high school aged children and is proposed to have 50 students and 10-12 staff in the first year of operation in 2026 and increasing to approximately 90 students and 17-20 staff by 2030.

The proposed development includes the following key components:

- A high school with approximately 12-15 students in each year

- The adaptive use of the existing buildings into different learning precincts to provide for the following:
  -Administration and Reception – Rosemary Cottage.
  -Years 7/8, 9/10 Learning Communities – St Gabriel's and Padbury Cottages.
  -Arts and Manual Arts – two workshops.
  -Home Economics – George Turner Cottage.
  -Year 11 – Wattle Cottage.
  -Year 12 – Former Kindergarten.

- An assembly Hall and a bushfire shelter.

- Provision of recreation and play areas including a connecting pathway circuit. A new hardcourt is being constructed and an existing court refurbished

- Consolidation of the road network to cater for DFES requirements.

- New parking areas being located to align with the land gradient.

The design concepts for each building have been established with the following principles in mind:

- Retain as much of the existing built form as possible, even if materials are required to be replaced for conservation reasons.
- Apply recommendations from the Conservation Management Plan and where demolition and/or new extensions are required, only propose these elements where the existing has little to no significance and does not compromise the original heritage of the structures
- .Retain the existing external fabric to establish new, compliant bathroom facilities in each building
- .Ensure the levels of the verandahs are adjusted to suit universal access into each building, including the addition of lightweight access decks to avoid any steps.
- Maintain the internal volumes of the rooms, including the ceiling linings wherever possible, and enhance the integrity of the spaces by avoiding major work to existing walls in the major spaces.

The works upgrade the buildings to current buildings standards addressing structural issues and BCA requirements, bushfire protection and servicing.

Background:

The site operates as the Parkerville Children's Home and has been in existence since 1903. The Home is a not-for-profit that has been supporting vulnerable children, young people and their families with specialist advocacy, therapeutic services, education and employment training, and out of home care.

The site contains many structures of heritage significance, which will be discussed further in the report.

The surrounding area is characterized by rural residential and residential development at a density of R5. To the west and south of the site are established residential properties on lots of approximately 2000m2. To the east of the site are residential properties on lots ranging from 2000m2 to 4000m2.

A Structure Plan has been approved to the north-east of the site that proposes lots averaging 2,000m2.

To the north of the site is rural residential zoned land and the Silver Tree Steiner School and Mundaring Christian College.

Legislation and Policy:

Legislation

- *Planning and Development Act 2005*
- *Planning and Development (Local Planning Schemes) Regulations 2015* (LPS Regulations)
- *Environmental Protection (Noise) Regulations 1997*
- *Heritage Act 2018*
- Metropolitan Region Scheme
- Shire of Mundaring Local Planning Scheme No.4

State Government Policies

- State Planning Policy 3.5 Historic Heritage Conservation
- State Planning Policy 3.7 Planning in Bush Fire Prone Areas
- State Planning Policy (SPP) 7.0 Design of the Built Environment

Structure Plans/Activity Centre Plans

Parkerville Village Centre Precinct Plan – 2002 (The Precinct Plan)

Under the Planning and Development (Local Planning Scheme) Regulations 2015, there are no references to 'precinct plans', meaning the power and function of adopted precinct plan, is a matter that cannot be afforded any weight in the decision-making process. Notwithstanding the above, given the Precinct Plan is mentioned under clause 5.7.1 of Local Planning Scheme No.4, albeit 23 years old and outdated, it is a position of Council and therefore the plan has been considered by the Shire

The Precinct Plan identifies the site as "Public Purpose"

The relevant considerations such as heritage assessment, traffic, environment and fire safety have been taken into account and the assessing officer considers the proposed development is not inconsistent with the relevant strategies and guidance of the adopted precinct plan.

Local Policies

Local Planning Policy PS – 01 – Advertising Planning Applications

- The proposal was advertised in accordance with this policy. Refer to the Public Consultation section for further details

Local Planning Policy 3.1 - Public Art.

- As the proposal is above $2 million, it attracts a public art contribution of 1%, which has been recommended as a condition of approval. A contribution of $130,00 represents 1% of the total development cost ($13 million). Alternatively, the applicant may elect to provide public art on site.

If approved, a condition will be recommended requiring the applicant to choose one of the above options.

Local Planning Policy 3.3 – Heritage Requirements for Planning Proposals

- The Policy sets out assessment criteria, including, but not limited to:

    - Avoiding demolition unless unavoidable, and if demolition is to occur measures taken to document the building;
    - Minimising disturbance to structures and landscape;
    - Internal modifications are to minimise disturbance to the original structure and fabric';
    - Public buildings shall provide modern facilities to improve access for people with disabilities.
    - Due regard is to be given to advice received from the State Heritage Office.

These matters will be further addressed under the **Planning assessment**.

Consultation:

Public Consultation

Shire of Mundaring undertook consultation between 02 December 2024 to 17 January 2025.

The consultation process included:

- letters being sent to owners/occupants within 200m of the site.
- hard copy plans were made available at the Shire administration office,
- the plans and supporting documents were uploaded to the Shires website, and
- Signs (2) placed in front of the property on Roland Road and Beacon Road.

During the consultation period, 15 submissions were received by the Shire. The concerns received generally relate to traffic, noise and the potential behaviour of students. – Attachment 5 Schedule of Submissions

Issue Raised	**Officer comments**
Traffic Concern with traffic impacting on the local street network at drop off and pick up time. Noise Concern with the methodology and findings of the Acoustic report Social concerns	Refer to comments under **Planning assessment** Refer to comments under Other Advice Environmental Health Services – Shire of Mundaring

Concerns that the issues experienced by students may manifest itself into anti-social behaviour impacting on nearby residents. <u>Impact on watercourse</u> Development will impact on the integrity and quality of the watercourse (Clutterbuck Creek)	Refer to comments under **Planning assessment** The application includes an Environmental Repot. The Shire's Environmental Services are supportive of the proposal and advise that there will not be any negative impacts on the watercourse.

<u>Referrals/consultation with Government/Service Agencies</u>

- Department of Planning, Lands and Heritage (DPLH)

  The site is entered on the State Heritage list (place number P8546).

  The place forms a significant cultural environment in a natural setting and is highly valued by those associated with it

  The DPLH advise that the proposal will have a "moderate positive benefit to the site". The proposal is supported subject to conditions, which have been included in Responsible Authority Recommendation

These matters will be further addressed under the Planning assessment section.

- Department of Fire and Emergency Service (DFES)

  The site is designated an extreme bushfire prone area and an Educational Establishment is considered a 'vulnerable' land use.

  DFES provided a submission and requested clarification of certain aspects of the Bushfire Management Plan.

  The DFES response was forwarded to the applicant's bushfire practitioner (envision bushfire protection) for a response (Attachment 7 – DFES Submission with envision bushfire protection responses). Bushfire considerations are discussed under the planning assessment section of this report

These matters will be further addressed under the Planning Assessment section.

- Department of Education (DoE)

  No submission received.

- Department of Health (DoH)

1. Water supply and Waste Water Disposal

    - The proposal is required to comply with the requirements of the *Government Sewerage Policy 2019.* An application for the treatment of sewage is to be made to the Local Authority. The application is to be forwarded to the DoH for assessment and approval.

      All drinking water provided on site must meet Australian Drinking Water Guidelines.

` 2. Chemical Hazards – asbestos.

    - Due to the potential presence of asbestos, it is recommended that the applicant take all necessary precautions to ensure that it is handled in accordance with relevant legislation and guidelines.

3. Food Act Requirements

    - All food handling intended for sale will need to comply with relevant legislation and guidelines.

4 Health (Miscellaneous Provisions) Act Requirements

    - All public access areas are to comply with the provisions of the Act. The proponent is required to develop a Disaster Management and Emergency Response Plan

5 Medical Entomology

    - The subject site is in an area that experiences occasional problems with nuisance and disease carrying mosquitoes. The applicant will need to ensure that proposed infrastructure and site works do not create additional mosquito breeding habitat.

If approved, the above matters will be included as conditions or advice.

Design Review Panel Advice

Not applicable

Other Advice

Infrastructure Service | Shire of Mundaring

The plan submitted initially indicated access on Roland Road opposite Kilburn Road, which would have created a four-way intersection. The applicant was requested to relocate the access further south on Roland Road and a revised plan was provided.

The applicant was further advised that there would be a requirement that Beacon Road would need to be upgraded.

The findings of the Traffic Impact Statement were accepted and there were no other concerns with the proposal. Refer to **Traffic** section under **Planning Assessment.**

Environmental Health Services | Shire of Mundaring

Effluent disposal

The proposal is currently proposed over three sites. Section 7 of the *Government Sewerage Policy 2019* defines an onsite sewerage system as follows, *"A sewage treatment and disposal system that receives treats and applies sewage to a land application area located within the boundaries of the freehold lot or survey strata within which sewage was generated".* The three lots will first need to be amalgamated for the proposed effluent disposal system.

A condition is recommended that the sites be amalgamated.

Concern was raised with the distance of the effluent disposal system to a water course (Clutterbuck Creek in that the 100m separation did not appear to be achieved as required under the Government Sewerage Policy. Additionally, the SSE did not provide details of earthworks associated with the effluent disposal system.

Having regard to this, it is recommended that the Site and Soil Evalation is revised to the satisfaction of the Shire of Mundaring. Attachment 8 – Site and Soil Evaluation.

Noise

Noise emissions generated by the use of the proposed facilities must comply with the Environmental Protection (Noise) Regulations, 1997 (as amended Dec 2013).

The applicant has provided an Environmental Acoustics report. Attachment 10- Acoustic Report.

The Shire's Environmental Health Services have advised that there are some assumptions in the report in respect to generators and fire pumps used in emergency situations. Also, the methodology employed in respect to internal vehicle access has been questioned.

From a planning perspective these issues are not considered fatal, however it is recommended that the Environmental Acoustics report be revised to the satisfaction of the Shire of Mundaring.

The matters contained in the Department of Health comments were reiterated.

Planning Assessment:

In accordance with the Regulations, regard must be given to the potential impact the proposal may have, in terms of the area's amenity, character, traffic, car parking, noise, and its relationship to development on adjoining land in the locality**.**

Traffic

A Transport Impact Statement (TIS) has been provided as supporting documentation. Attachment 9 – Traffic Impact Statement (revised).

The TIS concluded:

The traffic modelling undertaken in this report shows that the traffic generation of the proposed development is estimated to be in order of about 90 morning and afternoon peak hour trips (both inbound and outbound).The traffic analysis undertaken in this report demonstrates that the estimated development-generated traffic will have moderate and acceptable level of impact on the surrounding road network .The subject site has no formal accessibility by the existing pedestrian and cyclist networks ,which is often the case with rural areas. The site has access to public transport services (i.e., buses service) which operates along Richardson Road. The total on-site parking supply exceeds the formal parking requirement for the proposed school. In conclusion, the findings of this Transport Impact Statement are supportive of the proposed development.

Bushfire

A Bushfire Management Plan (BMP) and Bushfire Evacuation Plan (BEP) were provided in support of the application. Attachment 6 – Bushfire Management and Evacuation Plan.

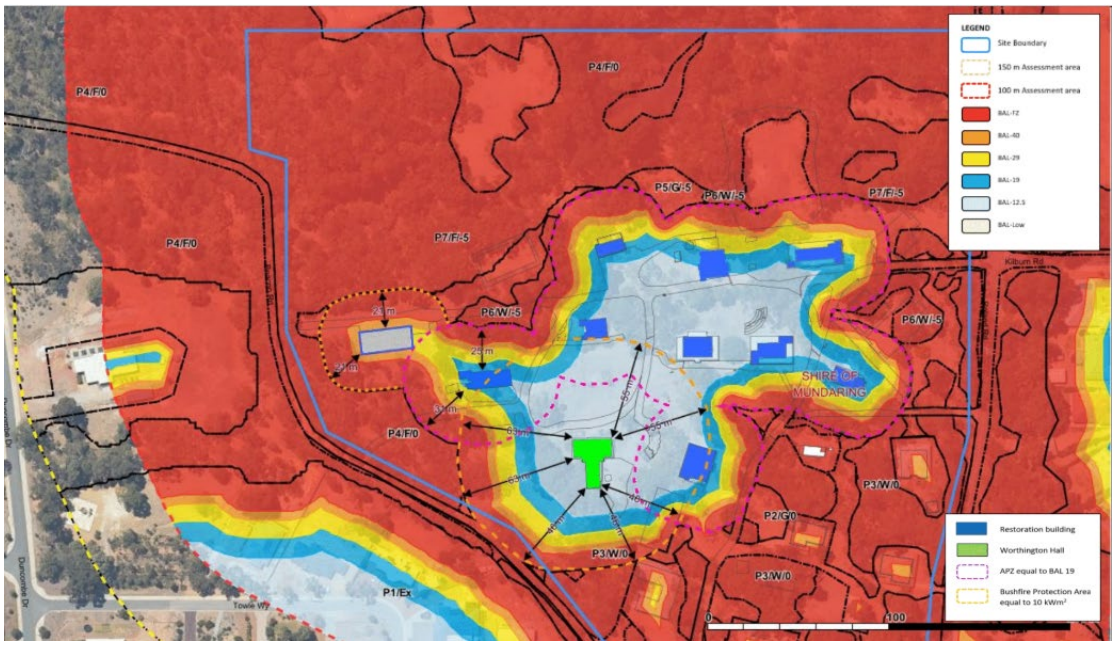
The BMP indicates that the proposal is a vulnerable use and meets the acceptable solutions of the Guidelines for Planning in Bushfire Prone Areas [V1.4] (bushfire guidelines).

The BEP provides protocols for evacuation as well as provision of sheltering in place (Worthington Hall)

It is noted that the land use has effectively been a vulnerable land use since the early 1900's and can continue to operate as such. It is seen as a benefit that the bushfire issues are revisited in a contemporary context.

The BMP and BMP have been reviewed by the Shire's Emergency Management Services. It also reviewed the applicant's response to the DFES comments. Emergency Services are satisfied with the methodology and requirements of the bushfire documentation.

Below image - BAL contour map. Footprint of building in green is Worthington Hall to be used for shelter in place.



Environmental Impacts

An Environmental Assessment report has been submitted addressing various matters including impact on flora, fauna and hydrology. Attachment 12 - Environmental Assessment Report.

The report concluded:

The proposed development of the site has been designed to avoid key potential environmental impact through minimisation of vegetation removal and associated fauna habitat disturbance. Water management has been designed to reflect existing and natural hydrological conditions. Hazardous materials management has been identified to ensure human health is protected. In summary, development of the site as proposed has not been identified as likely to result in any unacceptable environmental impacts. Any potential direct or indirect impacts associated with its implementation can be appropriately managed and mitigated, as development progresses.

State and Local Heritage Significance

The subject site is recognised on the State Heritage List, and the Shire's Heritage List and Local Heritage Survey.

A Heritage Impact Statement (HIS) has been prepared. Attachment 11 – Heritage Impact Statement.

The proposal includes Design Principles that have been established on the following basis:

a. Retain as much of the existing built form as possible, even if materials are required to be replaced for conservation reasons.
b. Apply recommendations from the Conservation Management Plan and where demolition and/or new extensions are required, only propose these elements where the existing has little to no significance and does not compromise the original heritage of the structures
c. Retain the existing external fabric to establish new, compliant bathroom facilities in each building.
d. Ensure the levels of the verandahs are adjusted to suit universal access into each building, including the addition of lightweight access decks to avoid any steps
e. Maintain the internal volumes of the rooms, including the ceiling linings wherever possible, and enhance the integrity of the spaces by avoiding major work to existing walls in the major spaces

Aboriginal Heritage

Clutterbuck Creek which runs east-west through the northern portion of Lot 1636 is identified on the Aboriginal Cultural Heritage Register (40579). The proposed development does not intersect Clutterbuck Creek, and no earth-disturbing works are proposed in proximity to the creek and therefore it is not anticipated that any impacts on known aboriginal heritage values will occur

Social Issues

Based on the planning report, the student body will consist of: *"high school aged children who have experienced trauma and adverse childhood experiences, and where mainstream schooling environments are not supportive of their emotional ,social, and psychological needs to support their educational development".*

The use is consistent with the definition in *The Regulations*:

educational establishment *means premises used for the purposes of providing education including premises used for a school, higher education institution, business college, academy or other educational institution;*

The applicant has provided the following comments in respect to raised concerns:

"A Trauma-Informed Approach

The school will be trauma-informed at every level, meaning that:

- *All staff, including teachers, education assistants, and specialist staff, will be highly trained in trauma-responsive education.*
- *Staff will use relationship-based approaches to help students feel safe, understood, and supported in their learning.*
- *Policies and procedures will be designed to avoid re-traumatisation, ensuring that discipline and behaviour support strategies prioritise restorative, compassionate responses over punitive measures.*

A Highly Structured and Safe Environment

- *Children with trauma histories often struggle with uncertainty and unpredictability, which can make mainstream schooling overwhelming.*
- *The CARE school will provide a structured, predictable, and nurturing environment, where students know what to expect and feel safe enough to engage in learning.*
- *Class sizes will be small, with a high teacher-to-student ratio, ensuring that each child receives the individualised support they need.*

Integrated Therapeutic Support

- *In addition to teachers, the school will employ specialist staff, such as psychologists, social workers, and youth workers, who will provide therapeutic interventions alongside education.*
- *Students will have access to emotional regulation strategies, mindfulness programs, and sensory-friendly spaces to help them manage stress and engage in learning.*
- *The school will use evidence-based trauma recovery approaches, such as:*
    - *Attachment-focused practices to build trusting relationships.*
    - *Self-regulation and coping skill development to help students manage stress and emotions.*
    - *Strength-based learning, which focuses on what students can do, rather than what they struggle with.*

There have been concerns from the community about the type of students attending the school and fears around increased crime in their community. It is important to clarify the following:

- *These children are not from Banksia Hill Youth Detention Centre,*
- *They are from our own communities, even local ones, and have endured experiences that no child should have to face.*
- *There is no one socio economic group that they will come from. They might have nuclear families who earn a lot, and they may also include single parent families, grandparent carer families and other family types.*
- *They are not 'bad kids'—they are children who have been let down by circumstances beyond their control and who now require specialised support to heal.*
- *Mainstream schools have not worked for them, not because they are inherently disruptive or violent, but because their needs have not been met in traditional classrooms.*
- *The school will be a highly structured, well-supervised environment, with staff trained to provide positive behaviour support and intervention strategies that prioritise safety, wellbeing, and learning.*

The Parkerville CARE school is not about managing problem behaviour, it is about providing children with the support they need to recover from trauma and develop into confident, capable young people who can go on to live their best lives back in our community. The school is an investment in the wellbeing of children who have experienced significant traumatic events. With the right support, they can flourish—and this school will give them that opportunity for both them and the wider community in which we all belong."

From a planning perspective the proposal is consistent with definition under the Regulations. It would be inappropriate for the use to be refused on the hypothetical actions of students. As mentioned by the applicant, this is a matter for the school to manage.

The following table is a summary of the proposal assessed against Local Planning Scheme No.4 provisions:

Provision	Requirement	Proposal	Assessment
4.7 Special Use zones	4.7.1 Special Use zones are set out in Schedule 4 and are in addition to the zones in the Zoning Table 4.7.2 A person must not use any land, or any structure or buildings on land, in a Special Use zone except for the purpose or purposes set out against that land in Schedule 4 and subject to compliance with any conditions set out in Schedule 4 with respect to that land.	The proposal is for an Educational Establishment	The applicable uses for the stie are: • residential building • educational establishment • office • uses incidental to the above with all development being at the discretion of the Shire. The proposal is consistent with the definition of Educational Establishment in the Scheme.
5.7.5 Watercourse protection	5.7.5.1 The minimum setback for all buildings and earthworks (including landfill) from the top of the bank of any watercourse shall be: (a) the setback specified for a particular watercourse in a watercourse hierarchy and protection strategy adopted by the	A small portion of a driveway and a basketball court are proposed within 30m of the top of the bank of Clutterbuck Creek.	It is considered that these works will not impact on the quality of the creek.

	Shire; (b) in the absence of a specific setback for a particular watercourse in a watercourse hierarchy and protection strategy adopted by the Shire, 20 metres in the Residential zone and 30 metres in all other zones, or such greater distance as may be required by the Shire in the case of watercourses within the Middle Helena Catchment Area or the Mundaring Weir Catchment Area.		
5.7.7 Effluent disposal	Where access to a reticulated sewerage system is not available, on-site effluent disposal facilities are to be provided to treat and dispose of any effluent generated on the site	A Site and Soil Evaluation has been provided. However, a revision to this is recommended.	Disposal of effluent will need to be to the satisfaction of the Shire and Department of Health.
5.7.8.1 Landscaping requirements	.Unless otherwise approved by the Shire, landscaping shall be provided as a component of all commercial and	A landscape master plan has been provided and supported by the Shire's	A condition requiring implementation of the landscape master plan is recommended.

	industrial development.	Environmental Services.	
5.7.9 – Management of construction sites	In addition to any requirements which may be imposed as conditions of planning approval, construction sites are to be managed so as to minimise soil erosion, sedimentation and/or the degradation of any water resource due to the action of wind or water and protect as far as practicable, the natural resource values of the site and of the adjacent area	Construction site proposed in close proximity to a residential area	A condition requiring a Construction Management Plan has been recommended
5.7.16 building Height	Maximum building height: 10m	One outbuilding is proposed with a height of 5.1m.	Complies
5.7.20 Vehicle Parking	Secondary School: 7 drop-off spaces per 100 students, plus 1 space per employee or staff member	The application states that 17-20 staff members will be employed by 2030.	65 parking bays are proposed, with contingency for additional bays if needed. Proposed on-site parking is considered sufficient.

5.7.21 Bicycle facilities.	Unless otherwise approved by the Shire, end of trip bicycle facilities are to be provided for new development in accordance with the standards for respective uses detailed in Austroads Guide to Traffic Management	Formal end of trip facilities have not been proved, however it is noted that there are shower and toilet facilities on site. Typically, schools provide bike racks for students	Noted.
5.7.24 Set down areas	5.7.24 Set down areas A designated set down area designed for the purpose of setting down and picking up passengers, to the satisfaction and requirements of the Shire, shall be provided on or adjacent to the site of any of the following uses, but not within a public road reserve:; (b) Educational Establishment;	A designated set down area has not been provided.	Given the large nature of the site and sufficient parking, it is not necessary to provide a dedicated set down area.

7.4 Heritage assessment	Despite any existing assessment on record, the Shire may require a heritage assessment to be carried out prior to the approval of any development proposed in a heritage area or in respect of a heritage place listed on the Heritage List	The application includes a Heritage Impact Statement	The DPLH has advised that the proposal is acceptable subject to conditions.

Conclusion:

Educational establishments are considered to be an essential community service. In this case, the proposal will not result in building bulk having any significant impact on the local amenity and character, and will not have a significant impact on the local natural environment and the heritage significance of the site.

The proposal aligns with the considerations expressed within the Shire's Local Planning Scheme No.4 and the *Planning and Development (Local Planning Schemes) Regulations 2015* (Schedule 2 – Deemed Provisions).

The proposal is a continuation of a community purpose which has been ongoing for over 120 years.

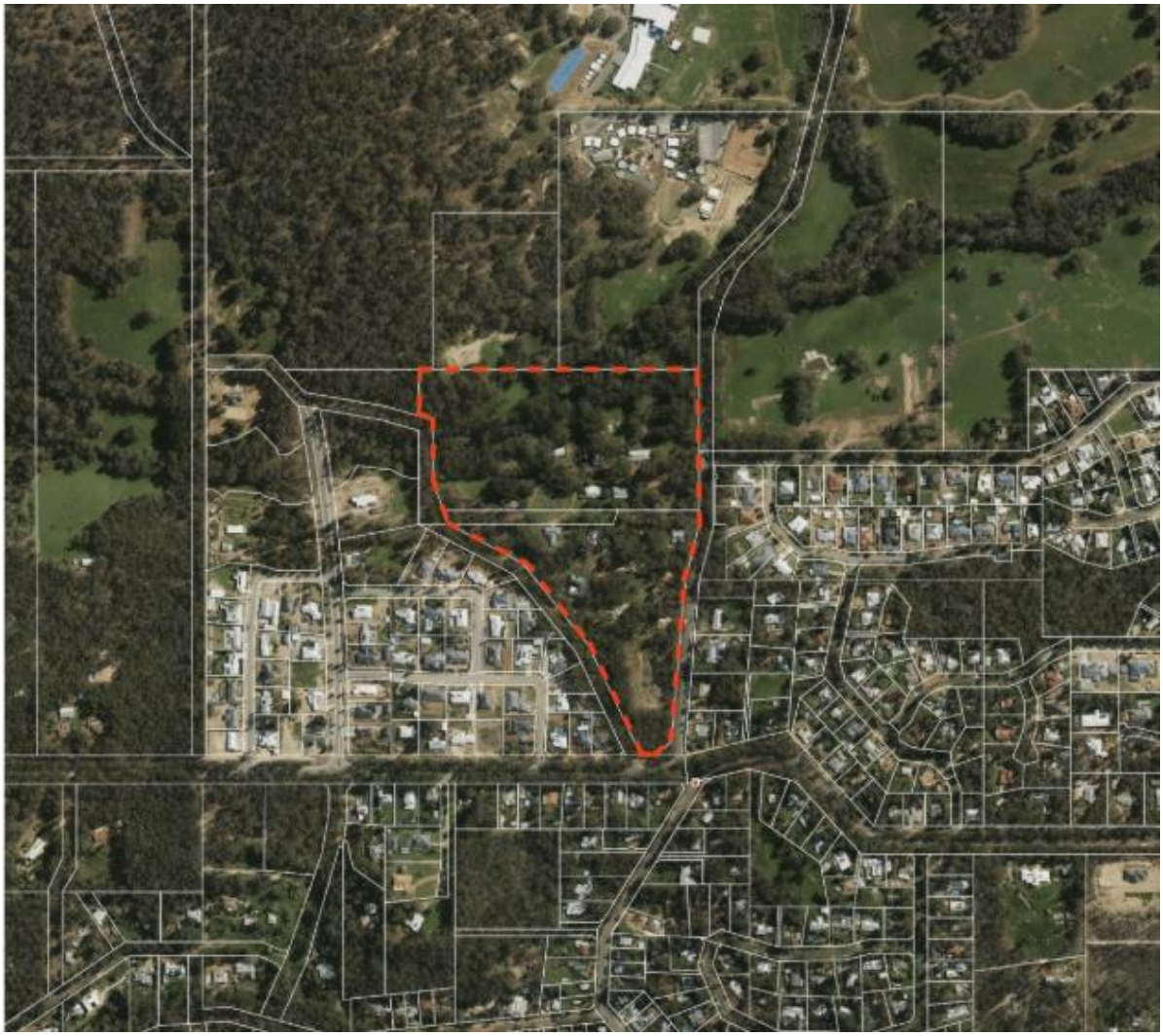
The proposal will also be beneficial in terms of the sustainability of the heritage place through building upgrades and contemporary bushfire considerations.

On balance, the location of the proposal is considered to be appropriate.

It is recommended that the application be approved.



Attachment 1 – Aerial image



Attachment 2 – Aerial Plan - Locality

340 (LOTS 1636, 3303 AND 9001) ROLAND ROAD, PARKERVILLE

ADAPTIVE USE OF EXISTING BUILDINGS FOR AN EDUCATIONAL ESTABLISHMENT

4 NOVEMBER 2024







PARKERVILLE CHILDREN AND YOUTH CARE







PTS TOWN PLANNING

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Introduction

This Development Application Report has been prepared for Parkerville Children and Youth Care in support of an application for the adaptive use of the existing buildings at 340 (Lots 1636, 3303 and 9001) Roland Road, Parkerville for an educational establishment.

The educational establishment is for high school aged children who have experienced trauma and adverse childhood experiences, and where mainstream schooling environments are not supportive of their emotional, social, and psychological needs to support their educational development.

The school is proposed to have 50 students and 10-12 staff in the first year of operation in 2026 increasing to approximately 90 students and 17-20 staff by 2030.

The buildings located on site are listed by the Heritage Council of Western Australia.

The proposed development will achieve a number of important outcomes for the community and the site including:

- The significant community educational land use including facilities and recreation needs for the students.
- The upgrade of the buildings to current buildings standards addressing structural issues, access and BCA requirements.
- Addressing matters such as bushfire protection.
- Addressing servicing and access associated with the site and use.
- A heritage outcome for the site.

The subject site includes four foster care homes located on Lot 9001, which are currently being used and are to be retained. The four foster care homes do not form part of this application.

This report will address the relevant matters pertinent to the proposal, including:

- The site details.
- The planning framework.
- The proposed development.
- An assessment under the planning framework.
- Consideration of other factors including, but not limited to acoustic, landscaping, traffic and waste.

Planning Approvals Required

The proposed development has an estimated cost of $13 million and the Applicant has elected for the application to be determined by the Development Assessment Panel (DAP). This application requires the determination of the Metro Outer Development Assessment Panel.

Key Project Parameters

Address	340 (Lots 1636, 3303 and 9001) Roland Road, Parkerville
Area	13.6328 hectares
Land Use	Educational Establishment
Zone - MRS	Rural
Zone - LPS4	Special Use 16 and Rural Residential 4
Construction Value	$13 million

Project Team

Discipline	Company
Landowner	Parkerville Children and Youth Care
Development Manager/Builder	McCorkell Constructions
Architect	EIW Architects
Landscape Architect	Plan E
Heritage	Heritage Intelligence
Arboricultural	Arboribus Consulting
Environmental	Coterra Environment
Archaeological	Archae-Aus
Structure	Atelier/JV
Hazardous Material	SERS - Site Environmental and Remediation Services
Structural Investigations	AJ Atelier
Bushfire	Envision Bushfire Protection
Fire Fighting	Northpoint Consulting
Town Planning	PTS Town Planning Pty Ltd
Surveyor	MNG
Traffic	Transcore
Geotechnical Investigations	Galt
Site Soil Investigation	Galt
Waste Water Management	Ionic
Waste Management	Encycle
Stormwater Management	Olsen Engineering WA
Acoustic	Gabriels Hearne Farrell

Parkerville Children and Youth Care

Parkerville is values-based organisation, dedicated to an ongoing journey of self-awareness, learning and improvement in everything they do because the children and young people with whom they work deserve nothing less.

Parkerville Children and Youth Care is a not-for-profit that has been supporting vulnerable children, young people and their families with specialist advocacy, therapeutic services, education and employment training, and out of home care for over a century.

Founded as the Parkerville Children's Home in 1903, the Parkerville team includes more than 175 skilled and experienced staff including psychologists, social workers, teachers, occupational therapists, professional and respite carers, administrative and corporate personnel.

Parkerville provides:

- Highly specialised child advocacy teams.
- Safe, nurturing and healing homes for children and young people.
- Supported accommodation and specialist supports/services for young people.
- Support to help families.
- Education and early intervention so that children develop their full potential and stay safe.
- Education, employment and training opportunities for young people.
- High-quality education for professionals on the prevention, impacts and treatment of trauma from abuse.

Parkerville operates the following facilities:

- Stan and Jean Perron Child, Youth and Family Centre in Midland.
- George Jones Child, Youth and Family Centre in Armadale
- Rockingham Child, Youth and Family Centre
- Parkerville Children and Youth Care Campus (subject site)
- Parkerville Head Office in Burswood
- Mirrabooka PACTS
- Northam TFS
- Ruby's

Subject Site

Site Location and Property Description

The subject site consists of Lots 1636, 3303 and 9001 Roland Road, Parkerville. The certificate of title details are identified in the table below.

Lot	Address	DP/Plan	CT	Landowner	Notifications
1636	340 Roland Road	102407	1009/768	Parkerville Children's Home Inc	Memorial Heritage
3304	No street address	231301	1047/894	Parkerville Children's Home Inc	Memorial Heritage
9001	No street address	405422	2883/732	Parkerville Children and Youth Care Inc	Memorial Heritage

The site has a total land area of 13.6328 hectares and maintains street frontages to Roland Road to the east, Beacon Road to the west and Richardson Road to the south.

The site ranges from 243 metres AHD in the south to 299 metres AHD along Clutterbuck Creek.

A copy of the current Certificates of Title is included in Appendix A.

Site Improvements

Clutterbuck Creek runs east-west through the northern portion of Lot 1636.

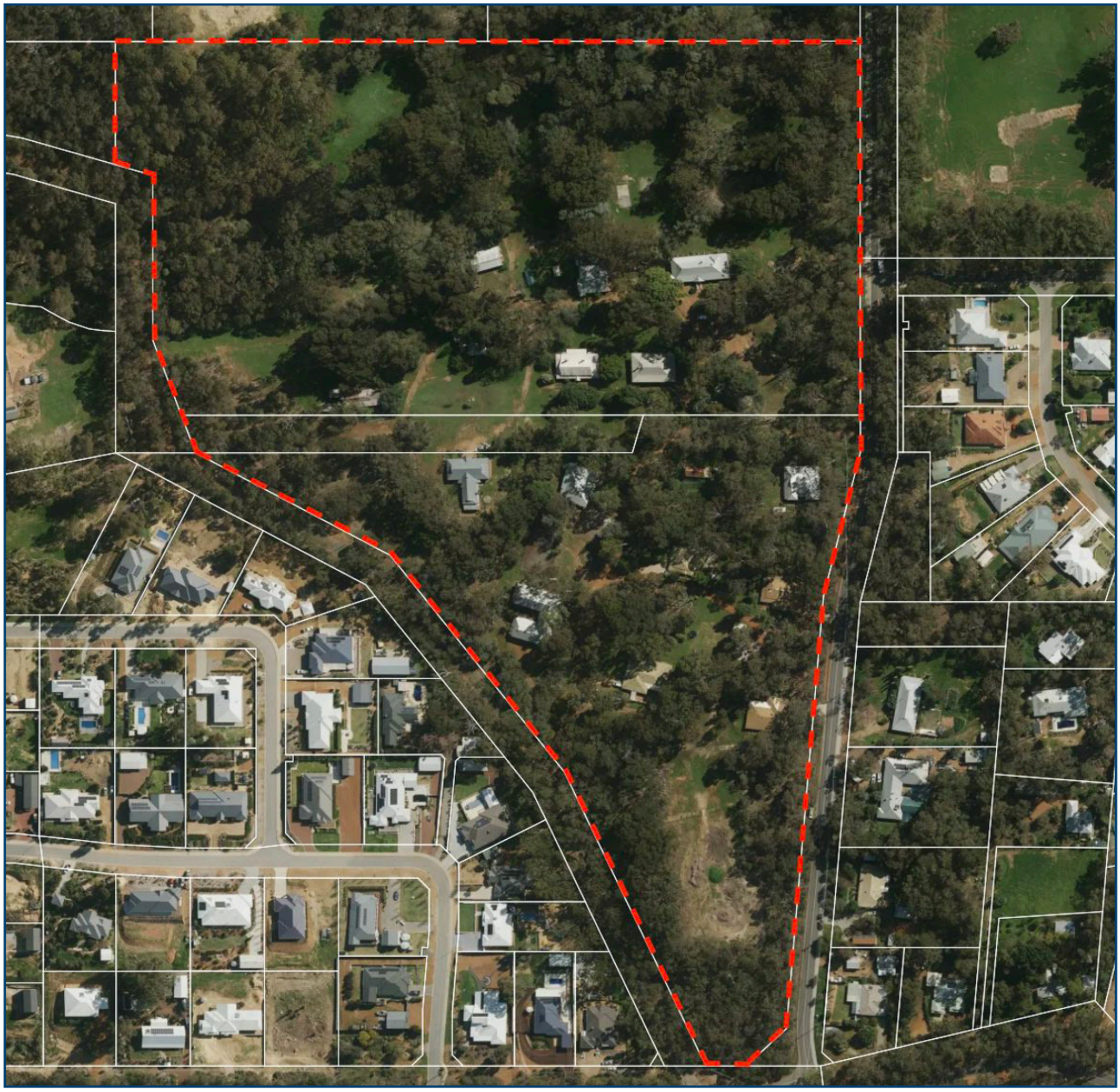
Four foster care homes are located on the southern portion of Lot 9001, which are currently being used and are to be retained. The four foster care homes do not form part of this application.

The central part of the site was the first residential child care facility in Western Australia to break from institutionalisation and introduce the 'cottage' system of care for orphans and needy children. The site includes 13 buildings as follows. (The numbers reference the buildings on the development plans):

1. Rosemary Cottage
2. Padbury Cottage
3. St Gabriel's Cottage
4. Wattle Cottage
5. Kindergarten (former)
6. Workshop
7. Workshop
8. George Turner House
9. Worthington Hall
10. Blue Cottage
11. Chapel
12. Carinya
13. Wearne

The balance of the site is vegetated. Vehicle Access is provided from both Roland Road and Beacon Road.

A copy of the current Feature Survey is included in Appendix B.



European Heritage

The subject site is listed on the State Heritage Register and is listed as a Heritage Place under the Shire of Mundaring Local Planning Scheme No. 4 (LPS4).

Aboriginal Heritage

Clutterbuck Creek which runs east-west through the northern portion of Lot 1636 is identified on the Aboriginal Cultural Heritage Register (40579). The proposed development does not intersect Clutterbuck Creek, and no earth-disturbing works are proposed in proximity to the creek and therefore it is not anticipated that any impacts on known aboriginal heritage values will occur.

Bushfire Prone Area

The subject site is located within a bushfire prone area.

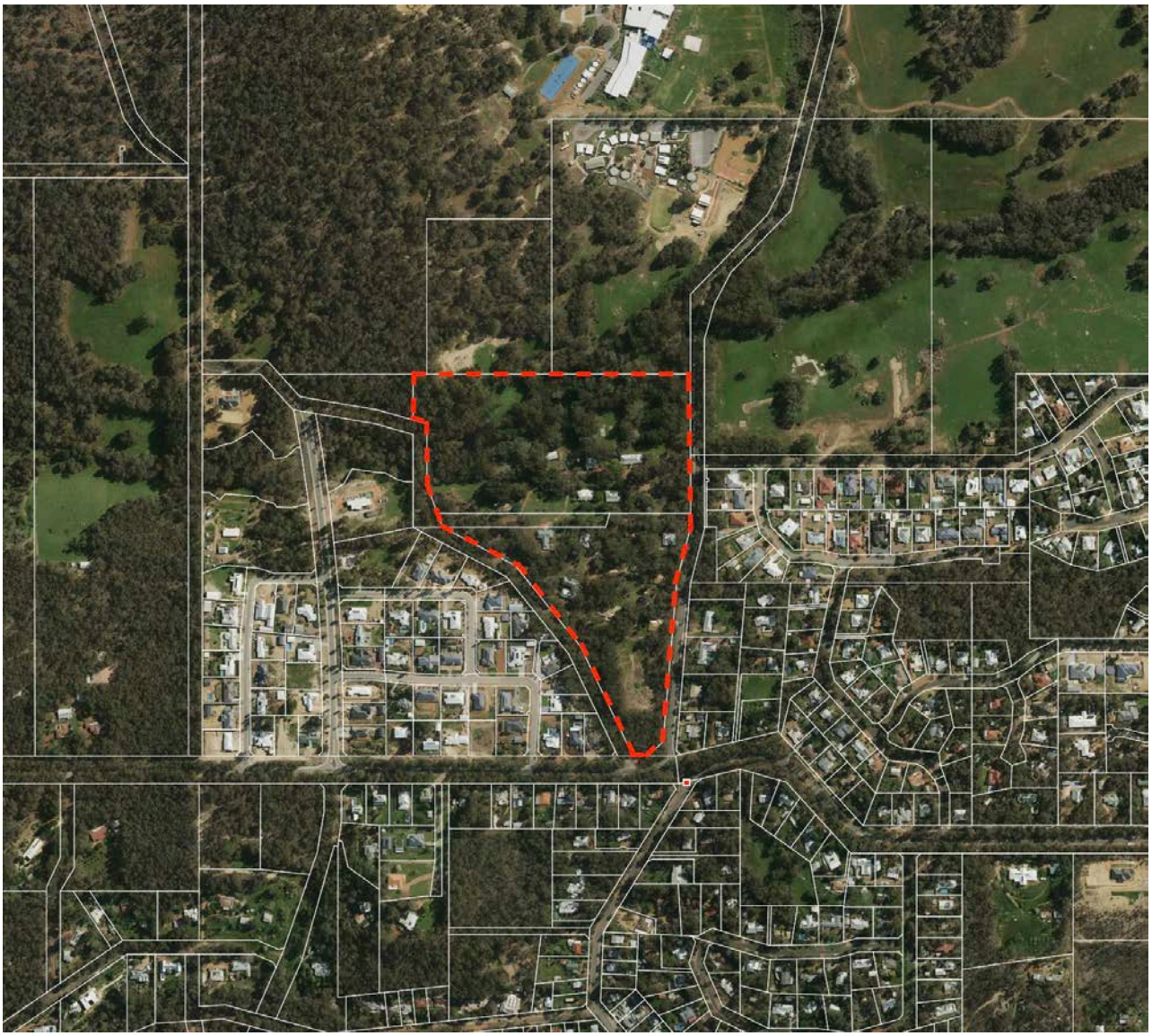
Contamination

A search of the contaminated database does not identify the site as a contaminated site.

Surrounding Development

The surrounding area is characterized by rural residential and residential development at a density of R5.

To the west and south of the site are established residential properties on lots of approximately 2000m^2. To the east of the site are residential properties on lots ranging from 2000m^2 to 4000m^2. To the north of the site is rural residential zone land and the Silver Tree Steiner School and Mundaring Christian College.



Planning Framework

Planning and Development (Local Planning Schemes) Regulations 2015 (Regs)

Clause 67 of Schedule 2 of the Planning Regulations outlines the matters to which the determining authority is to have due regard when considering an application for development approval.

Heritage Act 2018

The subject site and buildings are listed on the State Register of Heritage Places.

Metropolitan Region Scheme

The subject site is zoned 'Rural' under the Metropolitan Region Scheme (MRS).

State Planning Policy 2.9 Planning for Water and Draft State Planning Policy 2.9

SPP 2.9 is currently being reviewed with a draft proposed. The intent of the policy is to ensure that planning and development considers water resource management and includes appropriate water management measures to achieve optimal water resource outcomes.

State Planning Policy 3.5 Historic Heritage Conservation

The policy sets out the principles of sound and responsible planning for the conservation and protection of Western Australia's historic heritage.

State Planning Policy 3.7 Planning in Bush Fire Prone Areas

SPP3.7 provides the basis for land use planning to address bushfire risk management in Western Australia. It is used to inform and guide decision-makers, referral agencies and landowners/ proponents to help achieve acceptable bushfire protection outcomes. The subject site is located within a bushfire prone area.

State Planning Policy 7.0 Design of the Built Environment

The policy identifies the principles to address design quality and built form outcomes. The principles include: Context and character, Landscape quality, Built form and scale, Functionality and build quality, Sustainability, Amenity, Legibility, Safety, Community and Aesthetics.

Shire of Mundaring Local Planning Scheme No. 4

The subject site is zoned Special Use and Rural Residential 4 under LPS4. The Rural Residential 4 Zone is located in the northwest corner of Lot 1636, north of Clutterbuck Creek, and no development is proposed on this portion of land. The Special Use zone applies to the balance of the land being the southern portion of Lot 1636, Lot 3304 and Lot 9001 and enables residential buildings, educational establishment, office and incidental uses on the site. All development is at the Shire's discretion.

Roland Road is identified as a Local Scheme Reserve for Important Local Roads.

Shire of Mundaring Local Planning Policies

The following policies are relevant to the assessment of the development application:

- LPP 3.3 – Heritage Requirements for Planning Proposals
- LPP 3.1 – Public Art.

Proposed Development

This application seeks approval for the demolition, adaption, and new structures on the subject site to accommodate an educational establishment. The school is for high school aged children and is proposed to have 50 students and 10-12 staff in the first year of operation in 2026 and increasing to approximately 90 students and 17-20 staff by 2030.

The proposed development includes the following key components:

- A high school with approximately 12-15 students in each year.
- The adaptive use of the existing buildings into different learning precincts to provide for the following:
  - Administration and Reception – Rosemary Cottage.
  - Years 7/8, 9/10 Learning Communities – St Gabriel's and Padbury Cottages.
  - Arts and Manual Arts – two workshops.
  - Home Economics – George Turner Cottage.
  - Year 11 – Wattle Cottage.
  - Year 12 – Former Kindergarten.
  - Assembly Hall + Bushfire Shelter – Worthington Hall.
- Provision of recreation and play areas including a connecting pathway circuit. A new hardcourt is being constructed and an existing court refurbished.
- Consolidation of the road network to cater for DFES requirements.
- New parking areas being located to align with the land gradient.

The design concepts for each building have been established with the following principles in mind:

- Retain as much of the existing built form as possible, even if materials are required to be replaced for conservation reasons.
- Apply recommendations from the Conservation Management Plan and where demolition and/or new extensions are required, only propose these elements where the existing has little to no significance and does not compromise the original heritage of the structures.
- Retain the existing external fabric to establish new, compliant bathroom facilities in each building.
- Ensure the levels of the verandahs are adjusted to suit universal access into each building, including the addition of lightweight access decks to avoid any steps.
- Maintain the internal volumes of the rooms, including the ceiling linings wherever possible, and enhance the integrity of the spaces by avoiding major work to existing walls in the major spaces.

The works upgrade the buildings to current buildings standards addressing structural issues and BCA requirements, bushfire protection and servicing.

The only building that requires complete demolition is the Blue Cottage (10). Structural investigations undertaken identify that the primary structure is in critical condition with some areas showing major defects such as imminent structural collapse and severe termite damage. It is proposed that the Blue Cottage be demolished as it is unable to be retained.

The following works are proposed

Building No.	Building Name	Use	Works
1.	Rosemary Cottage	Administration function of the school	• Internal wall demolition. • Structural rectification works. • Heritage refurbishment. • Update toilet facilities. • Steel mesh screening to enclose under verandahs • Glazing and doors replaced.

Building No.	Building Name	Use	Works
2.	Padbury Cottage	Classrooms for years 7 and 8	• Internal wall demolition. • Structural rectification works. • Heritage refurbishment. • Incorporate toilet facilities. • Steel mesh screening to enclose under verandahs. • New balustrade. • Glazing and doors replaced.
3.	St Gabriel's Cottage	Classrooms for years 9 and 10	• Internal wall demolition. • Structural rectification works. • Heritage refurbishment. • Incorporate toilet facilities. • Glazing and doors replaced.
4.	Wattle Cottage	Classroom for year 11	• Internal wall demolition • Structural rectification works. • Heritage refurbishment. • Incorporate toilet facilities. • Steel mesh screening to enclose under verandahs • Glazing and doors replaced.
5.	Kindergarten	Classroom for year 12	• Internal and external demolition. • New extension. • Heritage refurbishment. • Incorporate toilet facilities.
6.	Workshop	Manual arts workshop.	• Internal and external demolition. • New extension. • Heritage refurbishment.
7.	Workshop	Art studio.	• Internal demolition. • Heritage refurbishment.
8.	George Turner House	Home economics.	• Internal and external demolition. • Verandah reconstruction • Heritage refurbishment.
9.	Worthington Hall	Assembly Hall and fire shelter.	• Internal and external demolition. • Heritage refurbishment. • Incorporate toilet facilities. • Bushfire protection works including fire shutters.
10.	Blue Cottage		To be demolished.
11.	Chapel		No work proposed.
12.	Carinya		Conservation works only in accordance with the CMS.
13.	Wearne		Conservation works only in accordance with the CMS.
14.	New maintenance shed	Maintenance	Prefabricated shed and retaining
			Fire Pumps and Tanks adjacent to Car Park A

The works include the consolidation of the road network to cater for DFES requirements. As indicated on the plans, part of the road network will be red bitumen paving and part will be compact gravel track. Access is provided from the existing access points on Roland Road and Beacon Road.

The works also include the provision of formalized car parking including:

- 15 bays (plus 1 accessible bay) to the north of the main entrance from Roland Road
- 39 bays to the south of the main entrance from Roland Road
- 9 bays (plus 1 accessible bay) to the south of building 5. The plans include a future car parking area adjacent to the car parking (if required in the future).

The development includes the removal of 10 trees that either displayed poor health, were confirmed dead or were considered unsuitable for incorporation into the development. Additionally, 1-2 trees will be required to be removed for the leach drains. There maybe trees around the buildings which may require approval for bushfire considerations.

Refer to Appendix C – Development Plans.

A Landscape Design Report is included in Appendix D.

Planning Assessment

Heritage Act 2018

Appendix I contains the Heritage Impact Statement.

Metropolitan Region Scheme (MRS)

The subject site is zoned Rural under the MRS and is considered appropriate for the proposed use. It is noted that the Silver Tree Steiner school and Mundaring Christian College are also located within the Rural zone. The proposed development and use recognises the historical use of the site.

SPP 2.9 Planning for Water (and Draft)

Appendix G contains the Environmental Assessment Report which considers the water management actions to be undertaken on site.

Appendix K contains the Geotechnical Study, Site Soil Evaluation and Waste Water Management Plan.

Appendix L contains the Stormwater Management Overview.

SPP 3.5 Historic Heritage Conservation

Appendix I contains the Heritage Impact Statement.

SPP 3.7 Planning in Bush Fire Prone Areas

Appendix H contains the BAL Assessment and Bushfire Management Plan.

SPP 7.0 - Design of the Built Environment (SPP7.0)

The following provides an assessment of the proposed development against the principles of SPP7.0.

Design Principle	Comments
1. Context and character Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place	The development and use recognises the historical use of the site and the development seeks to adapt and refurbish the existing heritage listed buildings on site, other than the Blue Cottage which structurally cannot be retained. The development retains its natural bushland setting.
2. Landscape quality Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.	The development seeks to retain the majority of trees on site. 10 of the 451 trees surveyed are required to be removed as a result of poor health, were confirmed dead or were considered unsuitable for incorporation into the development. A Landscape Concept is provided in Appendix D.
3. Built form and scale Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.	The existing and proposed development is single storey, setback from the road frontages and retained within its current setting.

Design Principle	Comments
4. Functionality and build quality Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.	The design retains the original 'cottage' concept on the site, however, has been adapted for the high school use.
5. Sustainability Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes	The development retains and refurbishes the existing buildings on the site. Adaption of existing buildings is a significant sustainable outcome. The development retains the natural bushland setting of the site.
6. Amenity Good design provides successful places that offer a variety of uses and activities while optimising internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy	The internal amenity is significantly improved as a result of the use, the adaptive works and landscape outcome. There is minimal external amenity impact given the minimal new built form, the setbacks from street frontages and the retention of the natural setting in which the site is located.
7. Legibility Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around	The design adapts existing buildings and links the site through the vehicle and pedestrian circulation with the landscape concept tying the development together.
8. Safety Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.	The proposed development has considered in detail the safety of the occupants through the use of the various buildings, access and bushfire considerations.
9. Community Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.	The site has for over a century been used as an important community outcome caring for the needs of those less fortunate. The high school will continue this legacy supporting children who have experienced trauma and adverse childhood experiences, and where mainstream schooling environments are not supportive of their emotional, social, and psychological needs.
10. Aesthetics Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.	The development is a very significant heritage outcome on the site. The development retains its natural bushland setting.

Shire of Mundaring Local Planning Scheme No. 4

Aims of the Scheme

The proposed development meets the aims of the scheme in that:

- The development preserves and enhances the amenity site through the heritage restoration and retention of the natural setting, while also reducing amenity impacts given the size of the site and the limited nature of the land use.
- Assists achieving ecological and social sustainability through the land use and natural setting.
- Preserves the Shire's biodiversity and environmental values through minimal intervention on the subject site.
- Retains and refurbishes existing buildings minimise greenhouse gas emissions associated with new development.
- Does not impact the water sources, river systems and other water-bodies on the site.
- Is an established community facility.
- Refurbishes places of cultural heritage significance.

Land Use

The proposed use is appropriately defined as an educational establishment which means premises used for the purposes of education and includes a school, tertiary institution, business college, academy, riding school or other educational centre.

Schedule 4 of LPS4 identifies that educational establishment and uses incidental to an educational establishment are appropriate uses for Special Use Zone 16.

Special Use Zone No. 16 identifies that development is to be at the Shire's Discretion.

Watercourse Protection

The proposed maintenance shed in the only new building in the northern portion of the site and is setback from the top of bank approximately 35 metres, which exceeds the 30 metre minimum. The native vegetation between the building and Clutterbuck Creek is to be retained.

The driveway which is partially existing is 30 metres from the top of the bank. The only works within the setback is the basketball court.

The proposed development does not impact the natural flow of water within Clutterbuck Creek.

Stormwater Drainage

Refer to Appendix M for the Stormwater Management Overview. It is noted that the only new building is the maintenance shed with the only other works being the driveways, car parking and recreation facilities.

Effluent Disposal

Reticulated sewerage is not available to the site.

Appendix L includes the Geotechnical Study, Site Soil Evaluation and Waste Water Management Plan.

The setback to Clutterbuck Creek is 56 metres.

Landscaping Requirements

The site maintains its natural bushland setting with only minor tree removal. The development includes the removal of 10 of the 451 trees assessed on the site. The 10 trees either displayed poor health, were confirmed dead or were considered unsuitable for incorporation into the development.

Appendix D includes the landscape concept for the site.

Management of Construction Sites

A construction management plan will be prepared prior to development commencing. We understand that this will be a condition of approval.

Dieback Management

Subject to the Shire's consideration, however, the work are not substantial on the site.

Preservation of Amenity

The proposed heritage work reflect both the heritage requirements of the site and the existing materials and finishes.

The only new building, being the maintenance shed, is setback approximately 30 metres from Beacon Road.

Vegetation Protection

An Arboricultural Report which is included in Appendix E has been prepared for the site. The report includes the assessment of approximately 451 trees located on the site. As indicated 10 of the trees either displayed poor health, were confirmed dead or were considered unsuitable for incorporation into the development.

The report outlines the tree protection zones and the methodology for works within the tree protection zones.

Local Natural Areas

The subject site is identified as a Special Purpose Zone which is to be determined/negotiated and is identified as a Category 2 Conservation Priority. The proposed works involve minimal intervention to the natural setting of the site with minimal tree removal as indicated above.

Building Height

The buildings located on site are existing. The only new building is the maintenance shed which has a height of 5 metres.

Vehicle Parking

LPS4 requires 7 drop-off spaces per 100 students, plus 1 space per employee or staff member for a secondary school. Based on the maximum number of 90 students and 20 staff by 2030, the car parking requirement is 7 drop-off space and 20 staff bays (total 27 bays). The proposed development provides a total of 65 bays.

Bicycle Facilities

The LPS provides for bicycle parking based on Ausroads Guide to Traffic Management. Given the location of the site and the nature of the land use, the teachers and students are not likely to come from the local area and therefore it is considered that bicycle parking and end of trip facilities would not be used and are therefore not proposed. We note, however, that there are a number of shower facilities on site including within Worthington Hall and Rosemary Cottage.

Vehicular access to major roads

Roland Road is identified as a Local Scheme Reserve for Important Local Roads. The proposed development uses the existing access points Roland Road.

Appendix K contains the Traffic Impact Assessment.

Set down areas

The development provides car parking within the site to act as a setdown area. Given the large nature of the site and the distance within the site to the buildings it is proposed to use the car parking as the setdown area.

Shire of Mundaring Local Planning Policies

LPP 3.3 – Heritage Requirements for Planning Proposals

The proposed works seek to refurbish the heritage buildings on site, with the exception of the Blue Cottage which is proposed to be demolished.

The works retain the heritage setting on the site and historical uses with minimal new intervention. The works involve the important use of the buildings both in terms of its historical use as well as the adaption of the buildings for the use under current building requirements.

Appendix I contains the Heritage Impact Statement.

Appendix F contains the Archaeological Management Plan.

Appendix J contains the Structural Investigation Report.

LPP 3.1 – Public Art

The Policy requires a contribution of 1% of the cost of development where the development exceeds $2 million. As the development is $13 million, the public art requirement is $130,000. The applicant elects to provide the public art on site. We understand that this will be condition of approval.

Planning and Development (Local Planning Schemes) Regulations 2015 (Regs)

Clause 67 of Schedule 2 of the Planning Regulations outlines the matters to which the determining authority is to have due regard when considering an application for development approval. In considering the relevant considerations:

(a) The application has considered the aims and provisions of LPS4 and meets the aims of the scheme and is generally compliant with the development standards.
(b) The development is orderly and proper planning given the adaptive use of the existing buildings and the site which is reflective of the historical use of the site. The new works are minimal.
(c) The development has considered SPP 2.9, SPP 3.5, SPP 3.7 and SPP 7.0 (Environmental Assessment, Bushfire Management Plan and Heritage Impact Statement).
(g) The development has considered and is consistent with the Local Planning Policies.
(k) The proposed development considers in detail the built cultural heritage of the site and will be a positive heritage outcome (Heritage Impact Statement, Archaeological Management Plan and Structural Report).
(m) The development has considered in detail its context and is compatible with the character of the locality and development on adjoining land, noting the minimal new works and the historical use of the site.
(n) The development has considered the amenity of the locality including environmental impacts, built form and social impacts. As previously indicated the works maintain the natural setting of the site and the use is historic to the site (Environmental Assessment, Bushfire Management Plan, Heritage Impact Statement and Acoustic Report).
(o) The development has considered the impact of the development on the natural environment of the site. (Arboricultural Report and Environmental Assessment)
(p) The provision of landscaping has been well considered (Landscape Concept Plan).
(q) The development has considered the bushfire risk (Bushfire Management Plan).
(s) The access has been considered as identified in the Transport Impact Assessment in terms of access to and egress from the site, manoeuvring and parking of vehicles.
(t) The Traffic Impact Assessment considers the amount of traffic likely to be generated by the development.
(u) The development has considered the storage and collection of waste (Waste Management Plan).
(v) There is community service benefit resulting from the development through educational services.
(w) The proposed development is reflective of the historical use of the site.
(x) The development will have a positive impact on the community through the provision of educational facilities and heritage restoration.

Given the above considerations, the proposed development warrants approval.

Conclusion

The proposed development seeks approval for the demolition, adaption, and new structures on the subject site to accommodate an educational establishment.

The school is for high school aged children and is proposed to have 50 students and 10-12 staff in the first year of operation in 2026 and increasing to approximately 90 students and 17-20 staff by 2030.

The proposed development involves the restoration of the majority of heritage buildings on the site, with the only demolition being the Blue Cottage. The proposed development, through the use, is a positive heritage outcome for the site.

The proposed development through the minimal intervention and new buildings retains the natural setting of the site.

The proposed development is an important community outcome for the site and the proposed students who will use the site.

The proposed development is consistent with the planning framework.

We respectfully request approval from the Metro Outer JDAP.

Appendix A
Certificate of Title

Appendix B
Feature Survey

Appendix C
Architectural Overview and Development Plans

Appendix D
Landscape Concept

Appendix E
Arboricultural Report

Appendix F
Archaeological Management Plan

Appendix G
Environmental Assessment Report

Appendix H
Bushfire Management and Evacuation Plan

Appendix I
Heritage Impact Statement

Appendix J
Structural Investigation Report

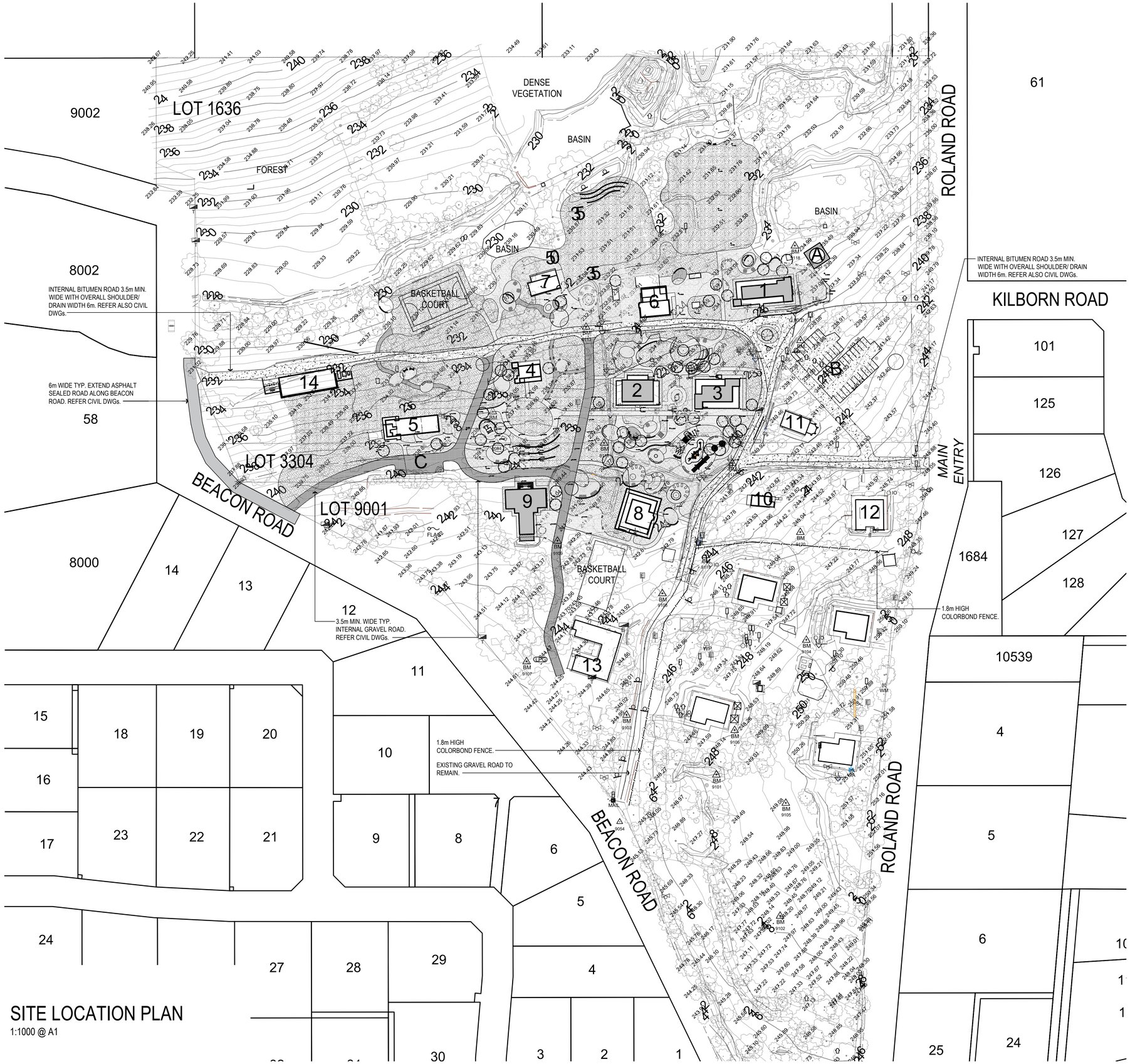
Appendix K
Transport Impact Statement

Appendix L
Geotechnical Study
Site Soil Evaluation
Waste Water Management Plan

Appendix M
Stormwater Management Overview

Appendix N
Waste Management Plan

Appendix O
Acoustics Report



SITE LOCATION PLAN
1:1000 @ A1

LEGEND:

1	ROSEMARY COTTAGE
2	PADBURY COTTAGE
3	ST. GABRIEL'S COTTAGE
4	WATTLE COTTAGE
5	KINDERGARTEN
6	WORKSHOP
7	WORKSHOP
8	GEORGE TURNER COTTAGE
9	WORTHINGTON HALL
10	BLUE COTTAGE
11	CHAPEL
12	CARINYA
13	WEARNE
14	SHED BUILDING (Green Waste)
A	NEW 100,000L WATER TANK
B	NEW CARPARK
C	NEW CARPARK
-	REFER TO LANDSCAPE DWGs FOR FULL EXTENT OF NEW LANDSCAPE WORKS.

SITE LOCATION PLAN LEGEND:

- SETOUT POINT.
- 246.00 — EXISTING GROUND SPOT LEVEL.
- 246 — EXISTING GROUND CONTOUR LINE.
- RL 240.5 — PROPOSED LEVEL.
- BM — BENCHMARK.
- EXISTING TREE TO REMAIN.
- NEW TREE. REFER LANDSCAPE DRAWINGS.
- STRUCTURE TO BE DEMOLISHED.
- BUILDING TO BE REFURBISHED.
- NEW GRAVEL ROAD. REFER CIVIL DRAWINGS.
- NEW BITUMENT ROAD. REFER CIVIL DRAWINGS.
- NEW 6m ASPHALT SEALED ROAD. REFER CIVIL DRAWINGS.

PRELIMINARY
NOT FOR CONSTRUCTION

DATE	ISSUE	REVISION	ISSUE
29/01/25	P2	PRELIMINARY	
23/01/25	P1	PRELIMINARY	
			P2

building ideas
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T +61 8 9484 4700 E eiwarch@eiwarch.com.au
W www.eiwarch.com.au

PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
SITE LOCATION PLAN

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.00.01
JOB DATE: 02/09/24	SCALE: 1:1000@A1	JOB No: 2406	
FILE PATH: --------			

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SITE PLAN

1:500 @ A1

SITE LOCATION PLAN LEGEND:

- SETOUT POINT.
- 246.00 — EXISTING GROUND SPOT LEVEL.
- 246 — EXISTING GROUND CONTOUR LINE.
- RL 240.5 — PROPOSED LEVEL.
- BM — BENCHMARK.
- EXISTING TREE TO REMAIN.
- NEW TREE. REFER LANDSCAPE DRAWINGS.
- NEW 1.8m HIGH COLORBOND FENCING.
- STRUCTURE TO BE DEMOLISHED.
- BUILDING TO BE REFURBISHED.
- NEW GRAVEL ROAD. REFER CIVIL DRAWINGS.
- NEW BITUMEN ROAD. REFER CIVIL DRAWINGS.
- NEW 6m ASPHALT SEALED ROAD. REFER CIVIL DRAWINGS.

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PROJECT:

PARKERVILLE CARE SCHOOL

PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:

SITE PLAN

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
EIW	EIW		A.00.02
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Comment
My main concern is the intersection between Roland Road and Richardson road. Since Mundaring Christian moved and Parkerville Steiner college opened we have a big traffic flow issue out of harmony estate during school hours (8-8:45 and again 3-330), making it almost impossible to get in and out of our estate and a lot of the residence are using the back road to get out which adds to our travel time. If they are going to add another school can they please look at changing this intersection to ease traffic congestion.
I don't agree with the development of an educational establishment next to Parkerville Steiner College (PSC). I am afraid the traffic would be even worse at drop-off and pickup times as PSC already has two schools next to it (Silver Tree and MCC). Secondly, evacuation in the event of a bushfire is going to be more difficult, this is already hard as not many roads lead to a highway, etc Wr experienced a big fright last year for this reason. Going ahead with this can put in risk the children at these schools.
I write for further information and clarity regarding the proposed educational establishment on the Parkerville Children's Home site. There is no information other than I think, a statement to the effect that the students are not suitable for mainstream education; this raises concerns with the number of teenagers / adolescents growing to 90. PCH have gone to a lot of effort to address the building side of this project, but have not given any information at all about the adolescents who they are catering to. There has been zero community engagement with this project. Consulting with the community, making their business plan available for comment provides transparency for the Shire and community. We would also learn who the stakeholders are and

only then can an informed decision be made around how it will impact the community.

Having worked in Juvenile Justice for some 15 years, the absence of no information is concerning. The recent publicity of kids being detained as being an issue of human rights etc leads one to question who is driving this initiative and for what purpose. Having worked in Banksia Hill Detention Centre through a violent escape and several riots, I have seen firsthand what 'kids' are capable of. We also know the media portrays these teens as 'victims' 'traumatised' and generational trauma victims. Meanwhile the victims of their behaviour and violence are ignored and brushed aside. Families of these teens invariably come out and say they were good kids and its everyone else's fault. I would hope these issues are put under a microscope; simply moving a problem is nothing short of a political exercise and government pushing a problem onto an unsuspecting community.

When looking at the history of Parkerville Children's Home and having family involved as house parents in the 50's, it is easy to see that it has gone from a complete welfare base of helping children (waifs) to recent times of more political focus included in welfare of young residents. Given the escalation of crime with youth and offending being categorised as 'mental health' or these youth being labelled as 'victims', the community should expect complete transparency before such approvals are given.

- Why are these kids not suitable for mainstream school. Given children with serious behavioural and learning challenges have been integrated into mainstream schools with support staff successfully, why is facility required? – behavioural, mental health, physical - (Fit for purpose) All children benefit from the integration of 'special needs' classmates, learning kindness, patience and this also helps young people learn skills that support them in their adult life.

- Is this a diversionary exercise to keep youth out of custody – if so, what protections are in place for residents in close proximity

- Have any of the youth come into contact with the criminal / justice / detention system and residents of Stoneville secure facility?
- Assurances these adolescents are not custodial / have not been custodial and pose no threat to residents' property or person
- Confirmation that this is not politically motivated move to free up youth justice detention and the State Government has no input or interest in the project.
- A transparent account of the stakeholders – we need to know who is driving this and who is paying for this?

I acknowledge the Shire has the infrastructure, fire risk, emergency egress and environmental consideration, but I believe social factors are important.

Other things for consideration for residents whose properties are in the immediate zone, including ours are:

- The dirt road running from the entrance of Parkerville Children's home to the intersecting Duncombe Drive. This is a dust bowl at the best of times and a race track for hooning, dirt bikes and 4WDs. Will there be a requirement to seal this section of road, given the increase in traffic?
- The increase in traffic generally, as there are already two schools in this immediate area and the increased traffic of teachers x 12 – 20, parents of pupils x 50 -90 put significant stress on a small area and intersection close by.
- Will the school operate as a live in (boarding) or will there be drop off and pick up (non-residential)
- The ratio of students to teachers. This is excessive within the education environment and has red flags
- Has consideration been given to the Clutterbuck Creek and the waterway welfare. Last year water testing in Clutterbuck Creek showed it was healthy, with some species of water life considered fragile, being in this creek. Our own property along the creek has long neck turtle visiting each year and coming up onto our

block to lay eggs. A few weeks ago, another look and test of the water had shown a decline in water life, water health and an oily film on top. Has development that commenced in the east of Roland Road impacted on the creek? Who will monitor this and how can it be protected? The landscaping plan is close to the creek line and has the potential to impact.

Whilst I have no issues with the project of restoring this property and buildings for use, it's the use I'm questioning. There are already three schools in the area, both primary and secondary.

- Does the number of school aged residents exceed the capacity of those schools to accommodate 50 – 90 children over the next 6 years?

I believe PCH has an obligation to be upfront to residents and the community about who will attend and why is this needed. Who the stakeholders are, who is funding it and if the State Government is involved and why / how and if this is a political point scoring game to move a problem

PCH was not upfront with people buying land from them, the amount of asbestos contamination was not declared. My understanding is submissions made to the shire did disclose the asbestos, but we as buyers were not told. I see this as deceptive; as such I am wary of this project and what we aren't being told. PCH are aware properties contain asbestos but have only been forced to do remediation work on two properties. This asbestos issue needs to be declared and addressed prior to earthworks of any kind, as a public health measure. The asbestos testing needs to be complete as samples taken for the Harmony estate development were so broad, the real problem was not exposed until individual residents substantiated the extent of contamination.

Now that information is trickling through to residents, there are grave concerns regarding

the school and its appropriateness for a residential area. Given DAP is a government agency and the labour party has a vested interest in the issue of youth offenders, what assurances do we have that community concerns are even going to be considered? Labour party have a reputation of ramming through approvals without community consolation I don’t think any residents have an issue with the building application, but there is a lot of anxiety around the use of this facility
No objections from me
The only comment I would make is the absolute dire need of a public high school in the area. I and many other parents in the area I talk to are often torn on which high school to send their children. Eastern hills is too far up the hill and Swan view is too far down the hill. Private schools in the area are unaffordable. It seems like the ratio between public primary schools and high schools is way out of proportion. There's plenty of primary schools to pick from that are local but no high schools. I'm certainly for this development if it becomes a public school.
Further information needs to submitted for residence to understand the use & purpose of this school. We have multiple high schools on the area and am concerned what the need for this school is. Questions that need to be answered. - Who will be attending this school. - reason why the school is needed? - what are the reasons why these teens can not attend regular schools. Our house will directly face the school and will be highly impacted. Concerns raised with noise impact, negative effect on the area with increases traffic and potential crime.
I'm writing in reference to the above proposal of an Education Establishment at the Parkerville Children's Home located at Lot 340 Roland Rd Parkerville.

As there are already two more educational institutions within one kilometre north of Lot 340 Roland Rd (Steiner School and Mundaring Christian College) the traffic gridlock at peak times along Roland Rd is horrendous and trying to exit from Kilburn Rd either north or south is very difficult.

This is not to mention that across the road on Kilburn Rd is a proposed 52 Lot subdivision which has already commenced and will cause even further traffic congestion.

I'm not against the school going ahead but would ask you to consider the main entry and exit coming of Beacon Rd and leaving the entry of Roland Rd as an emergency exit only to alleviate some of the already traffic congestion or possibly construct a round-a-bout to slow traffic down as there is a designated footpath and pedestrian crossing on the corner of Roland and Kilburn which will be used more once homes are established within the new subdivision.

Please have DAP consider all proposals before approving as the speed limit is 50kph along this part of Roland Rd but very few drivers adhere to it.

I write in relation to the proposed secondary school for the lot.
On face value I do not have an objection to the concept of a school on the lot, it would be pleasing to see these historical buildings rescued from dilapidation. However, there are a number of deficiencies in the proposal that need to be considered and addressed.
It is observed that the school is proposed to be a Curriculum and Reengagement in Education (CARE) School (CARE Schools | AISWA). A review of the website indicates almost universally other CARE schools are either located within existing commercial-zoned land uses or remote from population centres. However in this case it is proposed to have establish a school in a semi-rural area immediately adjacent to residential development to the south, west and east. Concern is held that

given the collective backgrounds of the students, that behaviours may be exhibited that are detrimental to the amenity of the area. I am not trying to suggest that the students may bring criminal elements. The lack of information about the nature of the students such that such an educational program is warranted is nonetheless cause for some curiosity at least, and fear in the extreme.
It is acknowledged that the Parkerville Children's Home site has in the past provided educational functions. However it is the case that this ceased many years ago and certainly at a time well before any of the nearby residential development had been constructed (and I note interestingly to the financial benefit of the Parkerville Children's Home). Therefore any historical land use cannot be considered a relevant supportive aspect for the development proposal at hand.
I am reliably informed that the school has been operating for some 12+ months in a low key format at the site. This is disturbing from the fact that this then creates a situation where development is taking place without appropriate planning approval being in place. I am not suggesting that the Shire should initiate an investigation or legal proceedings upon CARE for operating without planning approval; however current operations should not in any way be seen as justification to support the proposal in front of the Shire/DAP.

Effluent
It is observed that the site consists of three lots, namely lots 1636, 3304 and 9001 with elements of the proposal on all three lots. It is further observed that it is proposed that all the school buildings are proposed to be linked to a communal on-site effluent disposal system. In so doing, it proposes that effluent will need to cross cadastral boundaries. I wish to alert the decision making authority that Section 7 of the Government Sewerage Policy 2019 defines an onsite sewerage system as follows, "A sewage treatment and disposal system that receives treats and applies sewage to a land application area located within the boundaries of the freehold lot or survey strata within which sewage was generated". Therefore if there is any way that this proposal can go ahead, it is clear that the three lots will first need to be amalgamated. It appears that if this is not undertaken that the Department of Health will

refuse to approve any application for onsite effluent disposal in the future.
Additional to the above matter, the matter of existing and legacy on-site effluent disposal systems on the lots will need to be addressed as part of this proposal.

It is not identified if the 100m setback from Clutterbuck Creek has been established as required by the Government Sewerage Policy. Reviewing the plans for the flatbed leach drain system, it is clear that a large area will need to be flattened to accommodate said drains. Having regard to the grade of the land, one would then expect that a significant amount of fill will be required to establish a flat base. Consequently there will be large scale changes in ground levels, that could be as much as 2-4 metres given that the plans do not indicate any sort of terracing of the flatbed drains. It is unclear therefore if the site can realistically accommodate the necessary arrangements, or indeed if there are any subsequent planning considerations or impacts on the Shed or Kindergarten Buildings.

Traffic
It is not identified what the traffic movements are to consist of. Teachers no doubt. What about the students? Where are they coming from?
It is clear Transcore are not familiar with the area, nor have they been on site. There is no mention of three existing schools in the local vicinity and the traffic congestion that occurs at school drop off/pick up time, especially at the intersection of Roland Rd, Byfield Rd and Richardson Rd West. Certainly the “impacts on nearby roads” do not even mention this.
Access from Roland Rd should not be considered. Access to Roland Rd for MCC was prohibited. Additionally, the footpath along Roland Rd is well patronised.
It is observed that the proponent intends to make use of an existing road crossing that equates to opposite lot 13 Towle Way. Being a regular dog walker along that section of Beacon Rd I can confirm that this is situated immediately adjacent to a blind bend on a road with a gravel surface. Those pulling out of the proposed school site will be presented with a poor sight lines to their right, creating a poor traffic safety outcome. I therefore encourage the Shire to insist that this crossover be closed and if one is in need in this general area that it be

moved more to the east where Beacon Road flattens out and sight lines improve.

Noise
Section 3 of the GHF report calculates the Influencing Factor (IF) for a single lot (however this IF would also be applicable for all lots around the development site), however has then undertaken no modelling or assessments for compliance, instead relying on assumptions or noting aspects may need to be reviewed in the future. Therefore the GHF report has not demonstrated in any way that compliance can been achieved. It is unclear why the GHF report has not undertaken any modelling. One can only presume that the proponents did not want to spend the money to do a proper assessment and instead presented something that at best only gives the illusion that compliance will be achieved.
The GHF report is correct in the application of r16. Notwithstanding this, Town Planning can consider matters of amenity, irrespective of the development indicating compliance with the Noise Regulations. I urge the Shire to consider noise in amenity considerations, noting that the locality is otherwise very quiet – and any activation and intensification of the land will be noticeable.
The GHF report has made an error of law in relation to fire pumps and generator noise in relation to use in times of emergency. Whilst s75 of the Environmental Protection Act 1986 contains provisions for discharges or emissions in emergencies, it would not be appropriate to apply such provisions in this case, nor is there any default exemption. The appropriate position is that if it is reasonably foreseeable that equipment such as fire pumps and generators are required, there then exists both an opportunity and an expectation to “design to comply”. Therefore it would be quite reasonable to expect that any fire pumps and generators are designed and installed in such a manner that compliance can be achieved, no matter the type of use.
The GHF report speaks of the need to regularly test the fire pump and that if the test runs for less than 24 minutes then only the LA1 parameter is applicable. This however would only be the case if a Representative Assessment Period (RAP) of four hours is applied. However, if the Shire’s Authorised Person and Inspector (appointed under s87 and 88 of the EP Act) were to stipulate a shorter

RAP – which can be as short as just 15 minutes, then if a test were to exceed just 90 seconds, then the more conservative LA10 would apply. It is noted that the authority to determine the duration of a RAP rests solely with the Authorised Person and Inspector, not the acoustic consultant. In relation to vehicle movements, GHF has again made an error of law. The internal vehicle access roads for the site cannot be considered roads for the purposes of the Noise Regulations. It is the case that the public does not have any reasonable access to the site, in fact given the learning needs of the students, access by the public will I dare say be frowned upon. Access therefore will only likely be made by staff, students being dropped off and picked up (by means that have not been established) or service vehicles (deliveries, rubbish collection etc). This being the case, the Noise Regulations would apply to vehicle movements. Additionally, the impulse noise from car doors closing is a relevant consideration and is applicable no matter whether or not there is an exemption as a road as car doors closing does not form part of the propulsion or braking system. The GHF report identifies that the school siren is required to comply. It identifies some aspects that may be considered to assist with establishing compliance, but has not undertaken any work to determine if compliance can be achieved. On the basis of the above comments, I urge the Shire to reject the findings of the GHF report and prepare a proper report, with correct legal interpretations.
I am writing to you to express concerns regarding the proposed development and change of purpose at Parkerville CARE School. Recent community discussions have raised apprehensions that the school may be used to educate students who are not suited to other facilities due to having criminal records or being moved from detention centres and the danger they may pose. While we respect the importance of supporting all young people through education, the vague nature of the proposal has left us deeply

concerned about the potential impacts of this proposal, particularly given its proximity to:

• Three nearby schools, Parkerville Steiner College, Silver Tree Steiner School, and Mundaring Christian College.

• The Harmony Estate, chosen for its quiet, safe, and community-friendly environment as many families include young children.

Our key concerns include:

1. Impact on Community Safety and Wellbeing: Families in Harmony Estate and surrounding areas chose Parkerville for its tranquil and family-friendly atmosphere. Introducing a student demographic with potentially complex needs could raise safety concerns and disrupt the harmony of the area. We seek assurance that proper measures will be taken to protect the wellbeing of the broader community as any additional security measures around the perimeter of the school have not been mentioned.

2. Proximity to Schools and Residential Areas: The school's location near other educational institutions and residential neighbourhoods raises concerns about how behavioural issues may affect nearby students and families. What measures will be implemented to address these potential risks?

3. Transparency and Communication: There has been limited information about this proposal, leading to uncertainty and speculation within the community. We respectfully request clarity on:

• The specific demographic of students the school intends to enrol. The generic language used that this school is aimed at students that are not suited for general education facilities due to trauma and children experiences does not give any clarification about these issues, and how they have affected the children, emotionally or physically or socially.

• Policies and procedures that the school will have in place to ensure the safety of local residents and students at neighbouring schools.

• Additional resources, staffing, and infrastructure planned to support the proposed changes.

We urge the Shire to engage in open and transparent communication with all stakeholders, including local residents, parents, and nearby schools, to address these concerns. A thorough consultation process is essential to maintaining trust and ensuring the best outcomes for the entire community.

Thank you for considering our concerns. We welcome the opportunity to discuss this matter further and collaborate on solutions that uphold the safety and character of Parkerville.

The main concerns are:

1. Traffic increase - I understand that Roland Rd will be the main point of access, which will cause congestion at an already peak school drop off and pick up times, especially at Richardson West/Roland Rd/ Richardson East/ Byfield intersection, which is atrocious at these peak times, with this intersection servicing multiple primary and senior schools in the area. If these students are strictly being bussed in then maybe it would be less of a problem.

2. Increased vehicle and foot traffic interactions on Beacon Rd - While the school claims Beacon Road will only be used 5% of the total, that is difficult to quantify. This road is used regularly by locals as a walking track, as half of it is unsealed, which indicates it should not be a heavily used road. I observe many families with young children and dogs, as well as joggers and cyclists using this "road". The concern is with increased traffic to the school and potential pedestrian collisions.

3. Beacon Road is regularly used by drivers going in and out of the PCYC as a place to stop and idle, and I have no idea why. It happens every single day, frequently people stopping to have a smoke, which makes me nervous in the Summer especially. If there is adequate parking

at the site, why do they need to stop on the road?

I appreciate that this "school" has been here a long time and as yet have not had any negative outcomes, and we hope it stays that way. In terms of goodwill, it would be nice if the applicant would send out information about what they do, and who they help and how. Everything I've been able to find online is very vague. (I know this is not the shire's responsibility but maybe you could pass this message on).

My family (2 adults, 2 teenagers) are residents of Harmony Estate and our children attend the schools on Roland Rd. We have concerns regarding the changes which are proposed at the above site.

The area is already congested at school drop off and pick up time. It is very difficult to get in and out of the estate currently at these times. It is also difficult and sometimes dangerous for our children to cross Roland Rd to get to the path to school, they also then have to cross Roland Rd again to get to school as the path changes to the other side. The increase in traffic will make it even more difficult and dangerous.

We have heard from other residents that some of the renovations include things like changing glass in the windows to Perspex so it can’t be broken and used as a weapon, and putting bars in windows and locking doors so students can’t escape. We have heard that the students may come from detention centres or could be known to police and corrective services. This is a concern when our back yards are across from the school and our children walk home alone, from their schools on Roland Rd. We would like to be consulted on what measures are in place to protect our children if this is the case. We understand there is already a program in place there but this will be on a much larger scale and some residents in our community have already experienced some antisocial behaviour from students at the school.

Further information for our community should be provided and allowances for more community consultation.
My concern is who are these children that are enrolled at this facility. I have heard that some of the children who will be attending are children who have previously been in trouble with the law for various reasons. Possibly even sexual misconduct varying in severity. If this is not true and they are only rumours I apologise for writing and I have no issue however if this is true then I am really concerned about my family, my household and my community. There are 3 other schools around this area with primary school students and young, high school students walking home around the same time that this school starts and finishes. Will they be safe? Will they feel safe walking past these students. Will we feel safe from crimes that are non existent in this area now. For the last eight years we've had zero concerns or incidents happen in this neighbourhood or at my home. How do we know this won't start happening. How do we know the students won't be loitering in close proximity to our houses waiting to be picked up after school or before it starts. This information that I've heard makes me feel worried about my family, home and communities safety. Do you have more information available? Where do I find out the truth about where enrolled students are coming from?
I am writing to express my concerns regarding the proposed Educational Establishment at 340 Roland Road, Parkerville. While I understand the value of educational initiatives, I have significant reservations about this particular proposal. Firstly, my primary concern is the potential impact on access in the event of a bushfire. Given the location and surrounding bushland, I

am worried that the access routes to and from the site may not be sufficient or safe in an emergency. This is a serious concern for the residents in the area, including myself, who may need to evacuate quickly. Adding enough cars/buses for up to 90 children plus staff would put immense pressure on already busy roads.

We have 2 more schools that also use Roland Road for access. The Roland Rd x Richardson Rd West C Richardson Rd East x Byfield road area gets extremely backed up during pick up and drop off. To add another school to this area would cause massive issues everyday during pick up and drop off. If we were to add a bushfire to the mix and have 100's of residents also trying to evacuate it is a recipe for disaster.

Secondly, I am troubled by the environmental impact of this development. The presence of black cockatoos in the area is well-known, and I fear that the construction and subsequent operation of this educational facility could harm their habitat. The loss of native trees and disturbances to local wildlife could further jeopardize the already vulnerable species in our community. There is are also other local birds that call this area home as we can see they flying around this area from our house, especially as of late there has been a large eagle/hawk living in this zone. We also have visiting kangaroos in the Harmony Estate that would no doubt frequent this land.

Lastly, the submission does not clearly specify the nature of the Educational Establishment. If this facility is intended to cater for "troubled" youths, I have significant concerns about its proximity to residential homes. The potential impact on the safety and wellbeing of local residents, including families with children, cannot be overlooked. I do not feel comfortable having such an establishment in close proximity to my home and believe that the safety of the community should be a priority in these considerations.

I kindly request that these concerns be taken into account and that further clarification is provided regarding the nature of the Educational Establishment and its impact on the local environment and community.

I am writing to provide my feedback on the proposed educational establishment as outlined for 340 Roland Rd, Parkerville. While I appreciate the importance of educational infrastructure in our community and for disadvantaged youth in particular, without more information having been provided by the proponents, I have concerns about the potential impact of this development, particularly regarding the following issues:

1. Potential Loss of Amenity and Environmental Impact

The proposed development raises concerns about the removal of trees, especially those along avenues and property boundaries. These trees are not only vital for the environmental health of the area but also contribute significantly to local fauna, and the visual and social amenity of the community. The removal of further trees would:

Reduce biodiversity and negatively impact local wildlife.

Diminish the aesthetic appeal of the neighbourhood for locals and for tourists, and degrade the character of the local area.

I urge the council to ensure that any plans for tree removal are minimised and that clear, enforceable conditions for replanting or compensatory green initiatives are included in the approval process. The preservation of mature trees, in particular, should be prioritized wherever possible.

2. Lack of Clarity on the Target Student Demographic and Community Safety

The proposal lacks sufficient detail on the demographic profile of the students who will be utilising the new educational facilities. It is unclear whether the institution will cater to disadvantaged welfare students or those within the juvenile justice system. If the latter, I am particularly concerned about:

- The measures that will be implemented to meet the specific needs of these students.
- The strategies in place to ensure the safety and security of both the students and the broader local community.

This lack of information from the proponents and lack of clarity raises questions about the potential social impact of the development. Transparency regarding the target demographic and the operational plans for the facility is essential to address these concerns. I request that the council requires the proponents to provide detailed information about:

The type of students the facility will accommodate.

The programs and support structures in place to cater to their specific needs.

Specific measures to ensure that the presence of the facility will not compromise community safety.

Recommendations:

To address these concerns, I respectfully request the council consider the following actions:

Ensure the planning process includes tree preservation and the broader ecological implications of the development.

Require the proponents to provide comprehensive details about the student demographic and operational strategies, ensuring transparency and community confidence.

Establish conditions of approval that prioritise environmental sustainability and community safety.

Thank you for considering my submission. I trust that the council will carefully evaluate the potential impacts of this development and work to address the concerns raised by local residents.

My feedback on this development application is not directly regarding the physical redevelopment of the Parkerville Children's Home. I do however have significant concerns over community safety given what I have managed to glean from the scant and seemingly deliberately deceptive information available on this development. Having a significantly better than layman's understanding in this field, I can decipher what certain "Building work" activities are and the reasoning for them.

I have a strong concern over "replacing glazing" which amounts to changing windows from glass to Perspex as a safety measure as well as a need to cage in classrooms and administration areas with steel mesh for the same reason. Given this is not the norm at other specialised education support schools, it leads to the conclusion that the students at this school will be those with a history of significant psychosocial issues and likely violence. Not dissimilar to those who are residents of Banksia Hill.

If there is a need to lock these students in classrooms and remove objects that can be used as weapons from a safety aspect, it would pose the question as to why there isn't significant fencing of the property included in the development application, security plans and risk mitigation strategies. These students would also be much more likely to abscond given their significant challenges, which poses the question of how this is likely to be managed, particularly once you have almost 100 of them in the one place.

Whilst I understand the absolute requirement for more access to childhood support through both these educational institutions and other services, the lack of transparency and evident attempt at deception by the Parkerville Children's Home in this regard needs to be raised and challenged. Lodging an application such as this whilst deliberately misleading the residents living nearby as to the true intent and purpose raises significant questions as to the ethical standards under which PCH operates.

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: 1 Beacon Road Parkerville

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 11 Month AUGUST Year 2024

Report author or reviewer: ANTHONY ROWE

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☐ Level 3 practitioner X

If accredited, please provide the following.

BPAD accreditation number: 36690 Accreditation expiry: Month DECEMBER Year 2024

Bushfire management plan version number: V3

Bushfire management plan date: Day 14 Month October Year 2024

Client/business name: Parkerville Children and Youth Care

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		X
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?		X

Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		X
Strategic planning proposal (including rezoning applications)		X
High risk land-use		X
Vulnerable land-use	X	

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Education Facility for people under the age of 18

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer 

Date 14 October 2024

Bushfire Management Plan

Parkerville Care School

1 Beacon Road Parkerville

October 2024

envision
bushfire protection

LIMITATIONS STATEMENT

This Bushfire Management Plan has been solely prepared for the Parkerville Care School 1 Beacon Road Parkerville. It has been prepared to support a development application for two transportable classroom buildings.

The BMP is also accompanied by a Bushfire Emergency Evacuation Plan (Standalone Bushfire Plan) following the Department of Education template (for consistency across all schools) and compliant with the content requirement in the Guidelines for Planning in Bushfire Prone Areas (s.5.5.4) v1.4.

Envision Bushfire Protection

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Version Control

Parkerville Care School 1 Beacon Road Parkerville			
Version	**Date**	**Author**	
V1	29 August 2024	Anthony Rowe	Draft
V2	27 September 2024	Anthony Rowe	BAL 19 separation (APZ) provided to buildings other than Worthington Hall
V3	14 October 2024	Anthony Rowe	Amended additional driveways and shed inclusion.

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Disclaimer

In undertaking this work, the authors have made every effort to accurately apply the available information at the time of writing following the instructions of the regulatory authorities and applying best practice as described by the Fire Protection Association Australia. Any conclusions drawn or recommendations made in the report are made in good faith, and the consultants take no responsibility for how this information and the report are subsequently used.

Envision Bushfire Protection accepts no liability for a third party's use of, or reliance upon, this specific report.

Envision Bushfire Protection accepts no liability for the inaction of the owner to provide or maintain the bushfire protection measures identified in this report. Vegetation is dynamic, building materials may distort, and the accumulation and the location of flammable materials near the building may affect the potential for damage or loss of a building to occur.

Failure to maintain the property and/or building to these standards may compromise an insurance policy if currently covering any of your assets or those of any third party that may be consequentially affected due such failure. If not insured, and if you are seeking insurance, this report may not influence the decision of any insurer not to offer cover.

Importantly the measures contained in this report cannot guarantee human safety or an absence of harm or that the building will not be damaged or would survive a bushfire event on every occasion. This is due to the unpredictable nature of fire behaviour (knowledge in this field continues to develop) and the unpredictable nature of extreme weather conditions.

Scope of this report

Envision Bushfire Protection has been engaged to provide expert bushfire safety and planning advice to support a development application.

The scope is to assess the proposal for compliance with the policy measures described in State Planning Policy 3.7 and identify appropriate mitigation measures (risk treatments – Bushfire Protection Criteria) to be considered by the determining authority in making it decision.

This Bushfire Management Plan followed the required investigations and been prepared following to the Department of Planning Lands and Heritage template.

The Development application is for a vulnerable land use. The investigations and mitigation measures identified in the Bushfire Management Plan have, form the basis for the preparation of a Bushfire Emergency Evacuation Plan. It provides the options for the actions to be taken in the preparation for or in managing the response, and safety of people, in the event of a bushfire affecting the site.

Client relationship

I was engaged in providing expert bushfire safety and planning advice. My relationship with the client is a standard commercial contract, and no private, personal, or other matter has influenced the content of the Bushfire Management Plan or my findings.

STATEMENT OF CONFORMITY – PLANNING AND DEVELOPMENT ACT 2005



Anthony Rowe Level 3 - BPAD36690

Town Planner I Principal Bushfire Consultant

BPAD Accredited Practioner Level 3

PIA Registered Practicing Planner

The signatory declares that this Bushfire Management Plan meets the requirements of State Planning Policy 3.7 and the Guidelines for Planning in Bushfire Prone Areas V1.4.

SUMMARY

Preface

This Bushfire Management Plan has been prepared for a proposal to rehabilitate existing buildings at the Parkerville Care School at 1 Beacon Road Parkerville ('the site') for use as a car school for years 7-12. The site is located within the Shire of Mundaring (the decision maker).

The site is within a declared bushfire-prone area. Accordingly, the application for development approval is to be assessed for compliance with State Planning Policy 3.7 *Planning in Bushfire Prone Areas* ('**SPP 3.7**') "***to preserve life and reduce the impact of bushfire on property and infrastructure.***"

In accordance with cl.6.5 in SPP 3.7, a development application is to be accompanied by a Bushfire Attack Level (BAL) assessment, prepared in accordance with AS3959:2018, and an assessment against the Bushfire Protection Criteria provided in the *Guidelines for Planning in Bushfire Prone Areas v1.4* (Guidelines v1.4).

This information is to be provided in a Bushfire Management Plan ('BMP') prepared in accordance with SPP 3.7 and Appendix Five in the Guidelines v1.4 *and the* Department of Planning Land and Heritage *BMP Template for a complex development application.*

In accordance with cl.5.5 in the Guidelines v1.4, a school is classed as a vulnerable development, and in turn, following cl.6.5 in SPP 3.7, a Bushfire Emergency Evacuation Plan will accompany the BMP.

A revised bushfire emergency evacuation plan, following the Department of Education Principal's Guide to Bushfire and the Standalone Bushfire Plan Template 2022, is provided in accordance with the requirements of cl. 5.4.4 of the Guidelines v1.4.

1. Proposal details (addressed in Section 1)

The proposal is for the restoration of 11 buildings at 1 Beacon Road Parkerville, for the purpose of youth education, years 7-12. It includes the restoration of Worthington Hall to community bush shelter standard, internal driveways and additional site access and a storage shed.

The site is 11.6 ha and has a 3.0^0 downslope from the south to the north as part of a low gradient valley. The northern portion has a shallow waterway and dam, the land rises north from the waterway and is classified as forest.

The site is at the northern extent of town of Parkerville.

The site is adjoined by contiguous scrubby forest at its north, east and west boundaries.

The site is accessed from both Beacon Road and Roland Road (through road), connecting from the Great Eastern Highway (south) to Toodyay Road (north)

The nearest fire brigade is the Parkerville Volunteer Bush Fire Brigade, 644 Riley Rd, Parkerville.

2. Environmental considerations (addressed in Section 2)

The area within the site around the buildings is primarily Woodland; retained Eucalypts over shorth grass < 100 mm at time of inspection (winter).

Outlying areas within the site and along perimeter boundaries have unmanaged understory and have been classified as Forest.

The site is separated from the residential area south by Beacon Road, but forest is retained within the site perimeter. The site is separated from Rural living lots at the east boundary, but the Roland Road reserve is classified as Forest. The site adjacent has contiguous forest west (leading to the Darling Scarp) and north from the waterway (76 ha).

The buildings to be restored are exempt from both siting requirement and a separation to classified vegetation under the provisions of the *Planning and Development Act 2005 but* are subject to the requirements of the Shire Firebreak notice and the *Bush Fire Risk Treatment Standards 2020.*

Arboribus Consulting has provided a visual tree assessment and arboreal report. It assessed 377+ trees (>greater >300 mm diameter (DBH @ 1.4m)) within the development site. The restoration will retain the majority of the trees identified in the report. A separation of 5 m from the nearest tree trunk is recommended (affecting 5 trees). Modification of trees will be required around Worthington Hall (south west) to achieve shelter standard, to reduce the heat intensity at the building. It is not required to be barren land, enabling the prioritisation of trees to achieve the required distribution of vegetation (9 trees may be affected).

3. Bushfire assessment results (addressed in Section 3)

A Bushfire Attack Level assessment has been undertaken following an inspection of the site and surrounding area to 150 m, conducted on 11 August 2024.

The mapping of identified vegetation classes following the description in AS3959, and the slope recorded at the site (using a Nikon Forestry Pro) is illustrated in Figure 3.

A BAL Contour Plan has been prepared based upon current planning requirements for community shelter; the new requirement to take effect from 1 May 2025.

The Method 2 calculations have been provided based upon current shelter requirement to achieve 10 kwm^2 based on a flame temperature of 1200 K and those for the NCC May 2025 (FDI 1:200 APE and DtS slope requirements).

4. Identification of bushfire hazard issues (addressed in Section 4)

The most intense bushfire is likely to arrive in the afternoon between mid-December and March each year when the Forest Fire Danger Index (FFDI)[1] is at or above 50.

The wind roses for Bickley (nearest hills station 15 km east) illustrate the afternoon wind (highest FFDI) is predominant and strongest from east and west around the southern hemisphere.

Jarrah/Marri forests are prone to ejecting burning embers in advance of a fire front. The school site can be expected to be subject to ember attack from a fire up to 5 km and upwind from the site. Burning embers can potentially reach readily flammable material, i.e. open rubbish bins, or amass against heavier materials to ignite them, which may expose a building to a direct flame contact.

The longest continuity of bushfire forest fuel is from the west, but the fire history is predominantly landscape fires arriving from the east. The area east of the site is predominantly grassland and rural living with isolated pockets of forest.

The site is potentially exposed to a fire front arriving from the west and ember attack igniting flammable vegetation and fuels within the site.

The risk treatment is to maintain the areas adjacent to the buildings in a parkland condition (to retain trees) but restrict the ground fuel continuity between trees and ground to canopy ignition, to avoid direct firefront contact. Buildings to be restored, where practical (balancing the historic attributes) should incorporate the BAL 19 construction standard to provide resistance to ember attack.

The school should be evacuated, on notice of total fire ban conditions or if a fire is likely to reach the school. Wind changes that may place the school in the path of the fire should also be anticipated.

The Worthington Hall has been identified for shelter of last resort and will incorporate community refuge and NCC 2022 capacity and tenability standards.

5. Assessment against the bushfire protection criteria (addressed in Section 5)

The proposal was compared with the four Bushfire Protection Criteria Elements: Location, Siting and Design, Access, and Water.

[1] FFDI is a measure of fire danger weather

5.1 Acceptable Solutions

Element 1 Location

Element 1 is applicable to strategic planning decisions, to avoid areas of Extreme Bushfire Hazard Level (BHL) in planning for a future land use. It is not applicable to the consideration of a development application, and restoration of an existing development.

Element 2: Siting and Design

Element 2 requires that no habitable building should be exposed to a Bushfire Attack Level (BAL) greater than BAL 29 on completion.

Whilst a building restoration is not required to provide an Asset Protection Zone (APZ), in this instance an APZ is around all restoration buildings and is to be maintained to the APZ standard as described (Schedule 1 Element 2) in the Guidelines. The APZ is required to be sufficient to achieve BAL 19 or less, at each restoration building, which enables the retention of historic materials in the restoration.

Given the surrounding area is already managed as parkland (trees over short grass <100 mm, the APZ is effectively a maintenance area.

The restoration of buildings does not compel the requirement for bushfire construction (Building Regulation 31BA), but it is recommended that as far as practical the construction standards for BAL 19 (s.3 and 6 AS3959:2018 – BAL 19) should incorporated.

The proposed shed is required to be sited at BAL 29, and Asset Protection Zone to 'forest' has been identified for the shed.

The proposal has identified Worthington Hall as the shelter of last resort to be either to the Design and Construction of Community Refuges 2014 Handbook (current) or following the performance Requirements for class 9b buildings in the National Construction Code (Part G5) after 1 May 2025.

The NCC requirements have largely applied the standards in the handbook within the NCC, to be determined at building permit. Both require the Shelter is sited at 10kWm^2 but each uses a different method to determine the distance requirement. The required separation distances are shown in Figures 4b and 5b (NCC2022)

Figure 4b is based upon the Handbook method and Figure 5b is based upon the NCC 2022.

The separation areas required for Worthington Hall can be achieved within the site.

Worthington Hall is also a restoration and extension, recommended to be constructed to BAL 29. In addition Worthington Hall will be required to be constructed to maintain the internal tenability, described in the Handbook and followed in Specification 43 NCC 2022.

Element 3 - Vehicle Access

Element 3 requires the site to have public access to two destinations (through road).

The site adjoins Roland Road at its east boundary.

Roland Road is a sealed and line marked public road that is compliant with the technical requirements in Table 6 column 1 of the Guidelines. It has a 5.5 m seal, 1.4 m shoulders and a vertical clearance exceeding 4.5 m.

The private driveways, providing access within the site, will be constructed compliant with Table 6 column 4 of the Guidelines, including a vehicle turnaround compliant with E3.5 (continuous loop).

Two additional driveways will provide connection onto Beacon Road. One is to serve the shed at the north west portion of the development site, and the other provides a direct access from Worthington Hall (shelter) onto Beacon Road. Access to Worthington Hall had been an internal loop accessed from the east of the site. The Worthington Hall Beacon Road access will provide a short direct access to Worthington Hall and a straighter through route (road) connection between Beacon Road and Roland Road.

Element 4 - Water

The site has access to a reticulated water supply. Structural firefighting facilities will be required by the building permit. Compliance with the Building Permit requirements should consider a dual purpose both to address structural fires (internal) and bushfire (external). Fire hoses should be externally accessible and

capable of applying water to all external surfaces for 10 m around buildings, as well as to address any internal requirements.

5.1 Bushfire Management Strategies (addressed in Section 6)

The bushfire management strategies are reflected in the *Responsibilities for implementation and management of the bushfire measures.*

Pursuant to policy measure 6.6 of SPP 3.7, and cl. 5.5.4 in the Guidelines, the BMP has incorporated the considerations of a Bushfire Emergency Evacuation Plan (BEEP) prepared for the school and nominates a shelter, as a place of last resort, if it is not safe to evacuate the site.

The BEEP identifies the preparation and response requirements in a bushfire event. This includes the seasonal preparation of buildings, on site firefighting facilities, first aid, and communications system, including with parents/carers. It also includes the assignment of responsibilities, the training of school personnel to provide primacy for the safety of students, and training in the use of firefighting facilities.

The School is to be closed on days of Extreme FDI 75+.

The School is to be evacuated, in advance of the arrival of a bushfire if time permits and it is safe to do so, with students evacuated preferably to another school facility outside of the fire ground.

Evacuation should be supported by an agreement with a local bus company, the number of vehicles required will be dependent upon the destination, the time to make a round trip, and the available safe egress time.

Should time not permit the safe evacuation of the school, then shelter should be taken on site, at Worthington Hall following the procedures identified in the Bushfire Emergency Evacuation Plan.

6. Responsibilities for Implementation and Management of the Bushfire Measures (addressed in section 6)

The Owner responsibilities (Guidelines 4.6.3) identify the bushfire management measures necessary to achieve compliance with the bushfire protection criteria are provided at **section 6** in this BMP and summarised in Spatial Representation of Bushfire Management Strategies - Figure Ex1. In order to avoid repetition it has not been included in the Summary.

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ATTACHMENT 6 – References

1. PROPOSAL DETAILS

1.1 Introduction

Envision Bushfire Protection has been commissioned to prepare a Bushfire Management Plan, at Parkerville Care School 1 Beacon Road Parkerville. The site location is shown at Plate 1, 42 km north of the Perth CBD.

The site is within a declared bushfire prone area (shown on Plate 2).

In accordance with SPP 3.7, the planning authority in determining an application in a declared bushfire prone area must be satisfied the proposal is consistent with the Policy intent, ***to preserve life and reduce the impact of bushfire on property and infrastructure***.

Purpose of this Plan

The purpose of this BMP is to identify the bushfire hazard affecting the site, the consequences for the occupants and identify the risk treatments that can reduce the risk to a suitable level - ***to preserve life and reduce the impact of bushfire on property and infrastructure***.

A school is described in SPP 3.7 and its Guidelines as a vulnerable class of development.

A school is also a class 9b building for the purpose of the Building Classification (National Construction Code 2019) but because the works in this instance are restorations and additions, the Bushfire Construction requirements do not apply (Building Regulation 31BA)

This document presents an assessment of a proposed vulnerable class of development with the requirements of State Planning Policy 3.7 and *Guidelines for Planning in Bushfire Prone Areas* (WAPC, v1.4 December 2021). It includes a Bushfire Emergency Evacuation Plan, addressing the seasonal preparation of the facility and providing the management procedures and responsibilities to be undertaken in a bushfire emergency.

Site and Proposal Description

Landowner	**Parkerville Children & Youth Care**			
Address	Parkerville Care School 1 Beacon Road Parkerville			
Local Government Area	Shire of Mundaring			
Local Planning Scheme Zone	The land is zoned Special Use in the Shire of Mundaring.			
Bushfire Season	November – May (precise dates vary annually)			
Development proposal	High School for years 7 -12: • Historic building restoration for classroom use. • Restoration of Worthington Hall (shelter standard) • Shed • Internal driveways			
Building class	Class 9b			
Lot size	13.7 ha			
Landscape context	Predominantly rural living and residential			
Land description site	The site is vacant and contains native Scrub (DFES).			
Adjoining Landuses	North	East	South	West
	Forest/zoned Rural residential	Pasture Rural Small Holding	Residential	Forest

Road Access	Access to the site is from Beacon Road and Roland Road Parkerville.
Nearest town centre	Parkerville town centre 0.3 Km south of the site
Water supply	The site has access to a reticulated water supply or a hydrant network.
Tele communications	The site is within the Telstra 4G network
Emergency services	The nearest fire brigade is located at Parkerville Volunteer Bush Fire Brigade, 644 Riley Rd, Parkerville (1.0 km). West Gidgegannup Volunteer Bushfire Station is 6.8 km from the site at 1335 Toodyay Road, Gidgegannup
Minor Development	N/A
Unavoidable development	N/A
Vulnerable Development	Yes
High-risk land use	N/A

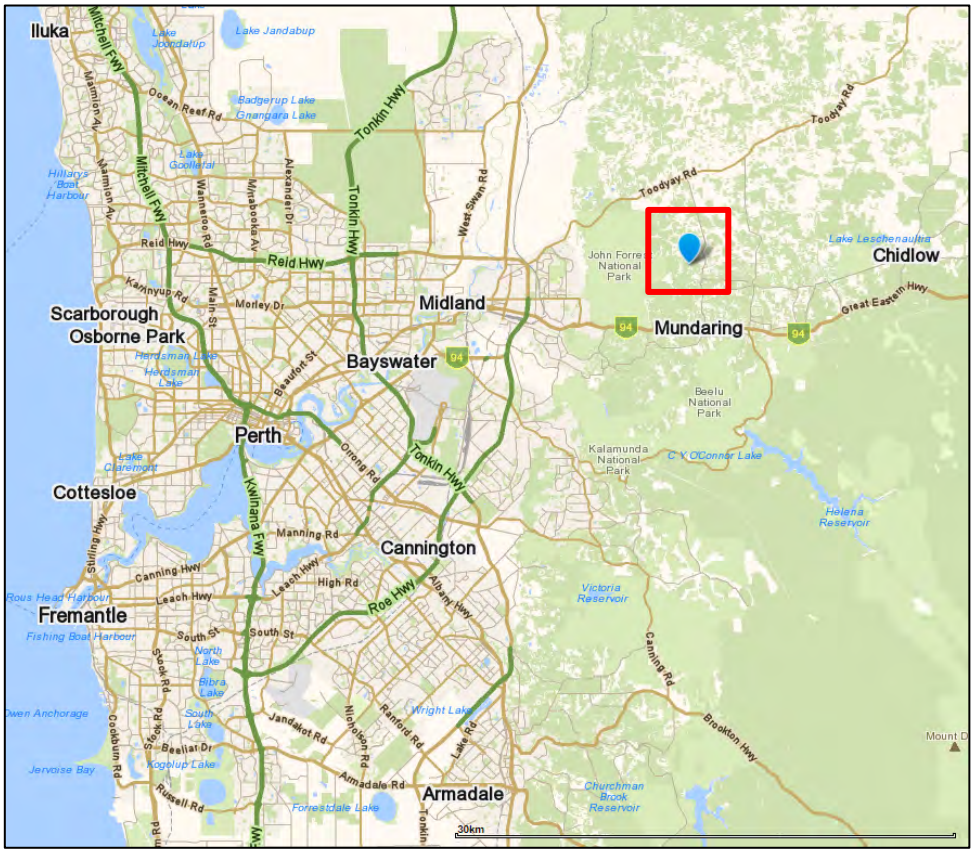

Plate 1: Location (red) identifier: 28 km east of the Perth CBD

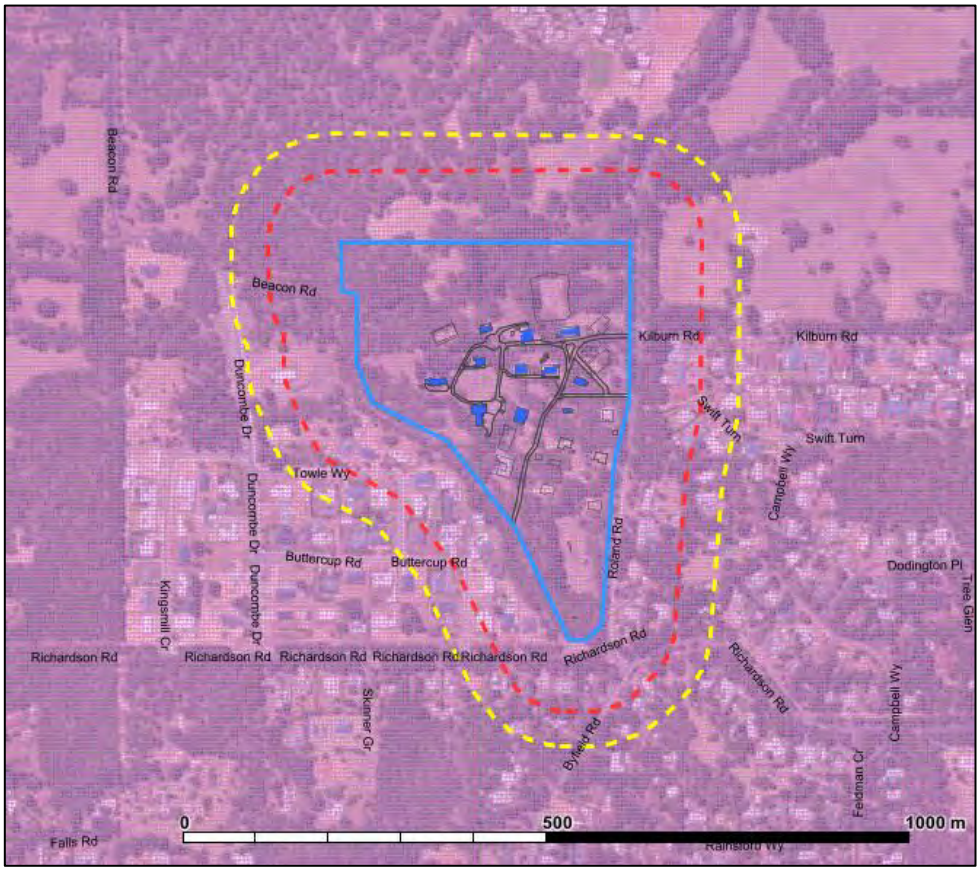

Plate 2: OBRM Bushfire Prone Area (Pink area)

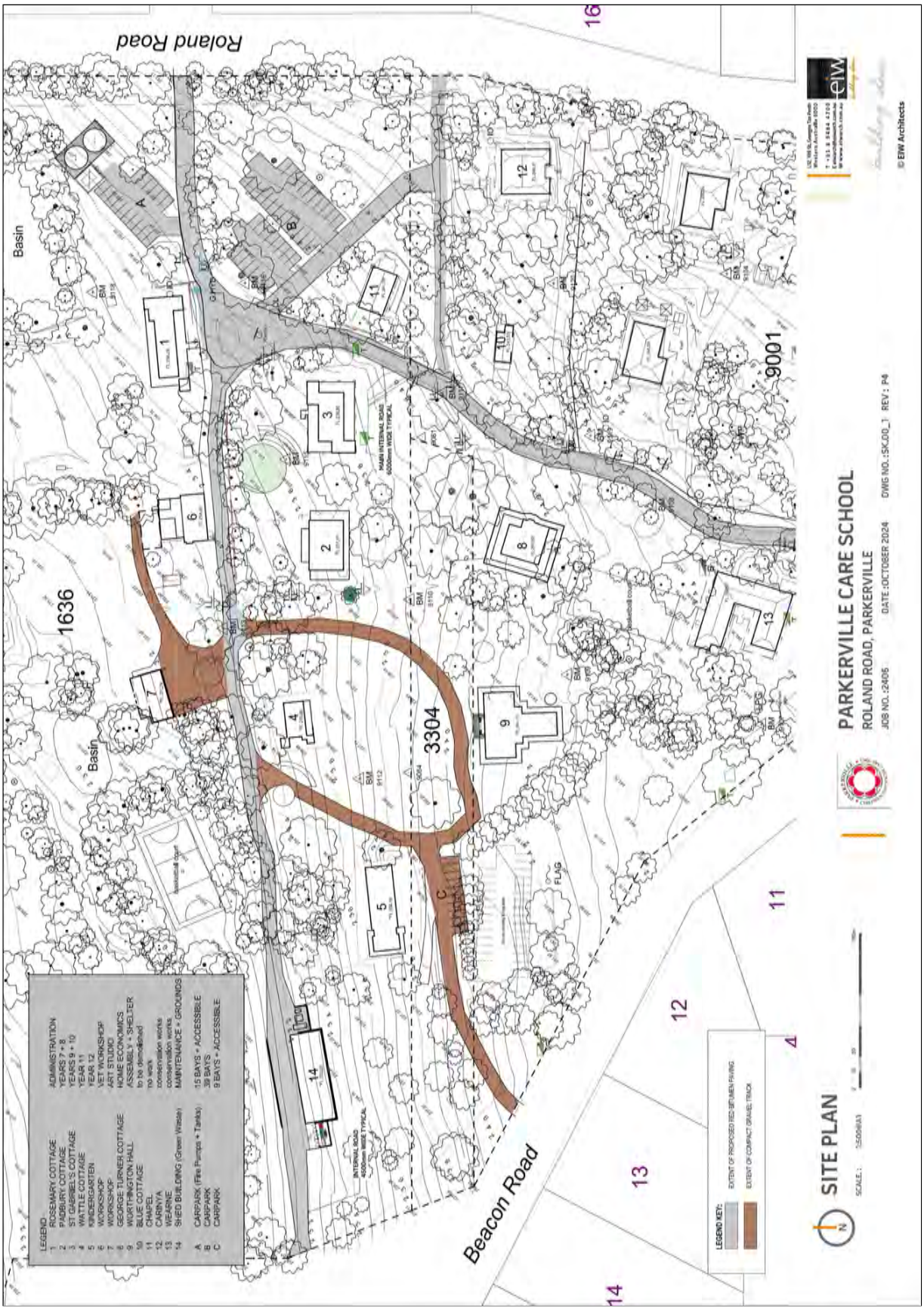

Plate 3: School Concept

	
Rosmary Cottage (east)	Rosmary Cottage (north)
	
St Gabriels Cottage (north)	St Gabriels Cottage (west)
	
Padbury Cottage (west)	Padbury Cottage (south)
	
Wattle Cottage (north)	Wattle Cottage (west)

	
Kindergarten (north)	Kindergarten (west)
	
Workshop (#6) (south)	Workshop (#6) (east)
	
Workshop (#7) (south)	Workshop (#7) (west)
	
George Turner Cottage (east)	George Turner Cottage (north)

	
Worthington Hall (north)	Worthington Hall (east)
	
Worthington Hall (east)	Worthington Hall (west)
	
Blue Cottage (west)	Blue Cottage (north)
	
Chapel (west)	Chapel (south)

	
Carinya (north)	Carinya (east)
	
Wearne (east)	Wearne (south)

1.2 Regulatory Compliance Requirements

Planning and Development Act 2005 - SPP 3.7

On 7 December 2015, the State Government introduced a state map of Bushfire Prone Areas by order under the *Fire and Emergency Services Act 1998* and introduced development controls in Bushfire Prone Areas through the *Planning and Development Act 2005*. These controls were authorised by State Planning Policy 3.7 (Planning in Bushfire Prone Areas) regulations introduced under Part 10A Schedule 2 of the *Planning and Development (Local Planning Scheme) Regulations 2015* and guided by the *Guidelines for Planning in Bushfire Prone Areas*.

The State Planning Policy 3.7 and Guidelines now form the foundation for fire risk management planning in WA at a community and land development level. The Policy Intent of SPP 3.7 is ***to preserve life and reduce the impact of bushfire on property and infrastructure***. SPP 3.77 addresses the siting requirements and an objective to site habitable buildings not exceeding BAL 29. It works in unison with the Building Act 2011 and the National Construction Code requirements which addresses the bushfire construction standard.

State Planning Policy 3.7 Planning in Bushfire prone areas.

Section 4 of SPP 3.7 provides the policy is to be read in conjunction with the Local Planning Schemes Amendment Regulations 2015, supplementary provisions of a scheme (if present), the supporting Guidelines and the Australian Standard AS 3959.

Applicable clause from SPP 3.7, addressing the school development application:

> SPP 6.2: Development Applications: A development application within a bushfire prone area has or will, on completion, have a moderate BHL and/or where BAL-12.5 to BAL-29 applies, may be considered for approval. *In this instance the buildings are able to achieve < BAL 29 by an APZ within the site.*
>
> SPP 6.6: Vulnerable Land Uses: Proposals to be accompanied by an emergency evacuation plan for proposed occupants and/or a risk management plan for any flammable on-site hazards.
>
> *Vulnerable* land uses are those where persons may be less able to respond in a bushfire emergency and include:
>
> *"land uses and associated infrastructure that is designed to accommodate groups of people with reduced physical or mental ability such as the elderly, children (under 18 years of age)"*

Part 10A Schedule 2 of the Planning and Development (Local Planning Scheme) Regulations 2015

Part 10 describes the application of SPP 3.7 where construction applies

> ***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;*

Under the definition of construction additions and extensions are excluded from assessment by the Guidelines.

The nature of Worthington Hall is a change of use requiring consideration of its role to provide shelter.

The Building Act 2011

The *Building Act 2011* and the implementation of the National Construction Code 2019 bushfire construction requirement do not apply bushfire construction requirements to primary or secondary schools (up to 1 May 2025). The construction requirement is presently voluntary, and the *Building Act 201*1 is not retrospective.

Regulation 31 BA Applicable building standards for buildings and incidental structures in bush fire prone areas

> *excluded building work means building work that is the renovation, alteration, extension, improvement or repair of a relevant building if*
>
> *(b) the renovation, alteration, extension, improvement or repair does not increase the risk of ignition from bushfire attack for the relevant building;*

This had excluded all classes affected by the bushfire construction standards, it did not list class 9b buildings because bushfire construction did not apply. The intent of the Building Act is not to be retrospective, but clarification will be required to exclude renovations to Class 9 buildings after 1 May 2025.

NCC 2022 – effective 1 May 2025

The NCC 2022 becomes applicable in WA on 1 May 2025 and will introduce bushfire siting, construction and shelter tenability for class 9b buildings.

The National Construction Code Part G5 is arranged with an objective and functional statement that may be satisfied by a Performance Requirement or by a Deemed to Satisfy Solution (for Part G5 that is Specification 43).

The Performance Requirements (G5P1) require a building must be designed and constructed with an annual probability of exceedance of not more than 1:200 years for a class 9b building. This is a reference to the Fire Danger Index level. In WA an FDI of 80 is assumed across the state. If an annual probability of exceedance of not more than 1:200 years is used the FDI is increased to FDI 100.

NOTE: Part G5 only applies to habitable school buildings (class 9b) constructed is a designated bushfire prone area (within the State (WA) Bushfire Prone Area map OBRM) https://maps.slip.wa.gov.au/landgate/bushfireprone/

The Deemed to Satisfy (DTS) provision (Specification 43) is available as a solution only if the building does not exceed BAL 12.5, determined by a minimum distance prescribed for three separate classifications (Based on an FDI of 100) for:

- upslope and flat - High risk (forest), Medium risk (scrub) and Low risk (Grassland)
- downslope 20 degrees - High risk (forest), Medium risk (scrub) and Low risk (Grassland)

Notwithstanding the DtS is applicable to BAL 12.5 (see note G5D2 (1)) the maximum acceptance, at the face of a building is 10 kWm^2 from the bushfire source and a separation of not less than 12 m from an adjoining building, and 10 m from a vehicle or site boundary. Alternatively the building must be constructed with an FRL 60/60/60.

The acceptance criteria for the DtS also provides the quantitative benchmarks for various aspects affecting the tenability level. This is an iterative design aspect that can be affected by a range of factors including insulation, window area, and air handling systems.

The existing buildings to be restored are more than 12 m from one another but may not be able to achieve 10 kWm2, requiring instead an FRL of 60/60/60, which is not consistent with the heritage/character restoration.

Worthington Hall is proposed as a shelter building but will be assessed as a Performance Solution, under the NCC 2022.

***Bush Fires Act* 1954**

Section 33 of the *Bush Fires Act 1954* recognises the responsibility of all landowners to prevent the spread of bushfire. The Shire issues a Firebreak Notice annually. The Shire can issue a notice upon the landowner to act as and when specified in the notice with respect to anything which is upon the land, and which in the opinion of the local government or its duly authorised officer, is, or is likely, to be conducive to the outbreak of a bushfire or the spread or extension of a bushfire.

An owner who fails to comply with a notice is guilty of an offence (Penalty: $5,000). The local government may in addition carry out the required works of the notice and recover the costs incurred by application to a Court.

Individual lot owners rely upon the reasonable management of the neighbouring land through the Bush Fires Act 1954 and can report non-compliance to the Shire for its consideration.

Bush Fire Risk Treatment Standards 2020

Bushfire Risk treatment Standard 2020 enables the clearing of vegetation out to 20 m from a building (predating 2015) unless it is within an identified Environmentally Sensitive Area (ESA). It is applicable to all class 9 buildings, an ability to establish the 20 m Risk Treatment Area.

2. Environmental Considerations

A fundamental consideration in the assessment of development under SPP 3.7 is to avoid instances where bushfire risk management measures would conflict with the objectives of the separate State and Federal Environment Protection Legislation.

The following comprise 'Regulated Vegetation', which is protected flora, or flora that is essential for the habitat of protected fauna and which requires authorisation prior to modification or removal.

Environment Protection Act 1986 and Environmental Protection (clearing native vegetation) Regulation 2004

It is an offence to clear native vegetation without the authority of a permit or an exemption. The act of clearing native vegetation requires a permit from either the Department of Water and Environmental Regulation (DWER) or the Department of Mines, Industry Regulation and Safety (DMIRS), unless an exemption applies.

Exemptions include:

Environment Protection Act 1986

- Clearing is required by local government Section 33 *Bush Fires Act 1954.*
- **Clearing in accordance with the terms of a subdivision approval.**
- Clearing in accordance with a permit under the *Bush Fires Act 1954* (prescribed burning) and clearing by a bushfire control officer.

Environmental Protection (clearing native vegetation) Regulation 2004 (exemptions do not apply in Environmentally Sensitive Areas, and clearing > than 5 ha)

https://www.der.wa.gov.au/your-environment/environmentally-sensitive-areas

- Clearing to the extent necessary to construct an approved building.
- Clearing that is for fire hazard reduction burning.
- Clearing to maintain an area cleared in the last ten years.

(WA) Biodiversity Conservation Act 2016 and Bio-diversity Conservation Regulations 2018

The *Biodiversity Conservation Act, 2016*, replaces the *Wildlife Conservation Act, 1950*, and the *Sandalwood Act, 1929*, it became operational with the *Bio-diversity Conservation Regulations 2018*, on 1 January 2019.

The Act provides for listing species, threatened ecological communities (TECs), key threatening processes, and critical habitats. It introduces criteria for listing species 'endangered', 'critically endangered' or 'vulnerable,' to align with the Environment Conservation and Biodiversity Conservation Act 1999 (Cth).

The *Biodiversity Conservation Act 2016* recognises that activities approved under the *Environment Protection Act 1986* do not require further approval, include clearing of native vegetation that is either exempt or done under the authority of a clearing permit or done in accordance with an implementation decision under Part IV of the *Environment Protection Act 1986*.

Commonwealth Environment Protection Biodiversity Conservation Act 1999

The Commonwealth Environment Protection Biodiversity Conservation Act 1999 provides for the protection of matters of national environmental significance. National environment law does not generally regulate fire prevention measures taken by state and territory governments, but no specific exemptions are provided.

In accordance with the Department of Planning Lands and Heritage template (BMP template to support a BAL Contour Assessment) a review of the listed databases (Landgate) has been undertaken to identify whether published restrictions or other specific considerations may apply to the proposal that would affect the implementation of any bushfire protection initiatives which involve the removal or modification of regulated native vegetation (flora) and the habitat (for fauna) it supports.

Important Note 1: The published restrictions do not represent some items at a specific location, either because the survey has not been undertaken or because the item may not be identified for reason of its protection. The onus is upon the owner to demonstrate that they have undertaken all reasonable actions to identify any restricted items and seek authorisation for disturbance if required.

A copy of the WAPC *FACTSHEET BUSHFIRE AND VEGETATION Environmental considerations for bushfire mitigation and environmental asset protection* December 2021, is attached (attachment 3).

Important Note 2: The review of the environmental data bases follows the requirement of SPP 3.7 and the required investigations. It does not account for any other environmental policies, either directly or indirectly, including local government policies that may in turn affect the ability to clear or modify vegetation as a risk treatment for this proposal.

Table 1: Ecological database assessment.

Is the land affected by:	**Yes/No/NA**	**If yes - describe**	
Conservation Wetland or buffer (DBCA-019 DBCA-017)	No		
RAMSAR Wetland (DBCA-010)	No		
Threatened and Priority Flora (DBCA-036)	Nearby	Not on the site but within 400 m south east.	
Threatened and Priority Fauna (DBCA-037)	Yes	Barnaby's Black Cockatoo	
Threatened Ecological Communities (DBCA-038)	No		
Bush Forever (COP-071)	No		
Environmentally Sensitive Area (DWER-046)	No		
Regionally Significant Natural Areas (DWER-070)	No		
Conservation Covenant (DPIRD-023)	No		
Does the proposal require the removal of restricted vegetation?		**Yes**	~~No~~

2.1 Native vegetation – modification and clearing

The site is located in an area broadly identified as habitat for the Carnaby's Black Cockatoo. The restoration of the buildings will not require modification of the adjoining vegetation, but it is recommended a risk treatment area equivalent to BAL 19 is established around the buildings; following the APZ standard. Primarily this is the management of understory and is not in conflict with protection Black Cockatoo habitat.

Worthington Hall as a proposed shelter will require management (APZ standard) to achieve 10 kWm^2 (to support unrestricted vehicle evacuation) at the building. Again this will primarily be understorey management.

The APZ standards, are described in Element 2 Schedule 1 of the Guidelines. An APZ is not barren land but a horizontal and vertical separation of classified vegetation.

A shelter protection area is to be established in addition to the APZ. The understorey within forest identified within the shelter protection area is to be maintained at less than 100 mm tall and all tree canopies should be no less than 3 m above the ground. This will minimise disturbance to the trees within the shelter protection area and retain the habitat for the black cockatoo.

All vegetation outside of the site is assumed to remain in its existing condition. No areas of native vegetation outside of the site are proposed to be modified by the proponent as part of the proposed development.

Vegetation along the Roland Road reserve outside the site will be a single row between the shelter protection area and the road surface.

2.2 Revegetation and landscape plans

It is important that landscaping which would increase the risk of a bushfire penetrating the site does not occur within the APZ area of the building or within the shelter protection area dimensions unless it is compliant with the Standards for Asset Protection Zones (Guideline v1.4).

3. BUSHFIRE ASSESSMENT

3.1 Bushfire Attack Level Assessment (Inputs)

Bushfire Behaviour

Bushfire behaviour is the primary determinant of the bushfire risk and the design fire as a basis for identifying appropriate bushfire risk management treatment.

Bushfire behaviour is affected by three factors;

- Climate (drought and season) & weather (temperature, humidity, wind, atmospheric instability) determines the intensity of a fire, the speed and direction, and the potential for advanced spotting. Measured as an FDI in AS3959.
- Topography (slope of the ground, aspect, and wind influences). Fire travels faster uphill, the flame length is increased uphill, and landforms can channel and increase local wind speed and create turbulence. Measured as flat or downslope in 5^0 increments in AS3959 (Method 1).
- Vegetation (horizontal and vertical structure, flammability, mass, and availability). Measured as a vegetation classification, or an exclusion, in AS3959 (Method 1).

Bushfire behaviour is a determinant of radiant heat, and the impact of radiant heat is reduced with distance. Radiant heat measured in kWm2 is expressed as a Bushfire Attack Level (BAL) with the radiant heat number rounded from zero up to one of five categories BAL 12.5, BAL 19, BAL 29, BAL 40, BAL FZ, (and BAL FZ<10 m).

The following assessment has been undertaken in accordance with the methodologies described in AS3959:2018 and in accordance with the Guidelines and the Fire Protection Association accredited practitioner methodology.

All vegetation within 150 m **(context)** of the subject building has been classified (AS 3959:2018 Clause 2.2.3) to determine the Bushfire Hazard Level at the site.

The BAL rating has been determined through site inspection and assessment of the following parameters compared with Table 2.5 AS3959:2018:

- Fire Danger Index (FDI) rating; assumed to be FDI - 80 for Western Australia;
- Separation distance between the building and the classified vegetation source(s) within 100 m (for BAL impact) the separation distance is measured from the wall face (receiver) to the unmanaged understory rather than the canopy edge (dripline) *see plate 4*; and
- Slope of the land under the classified vegetation.

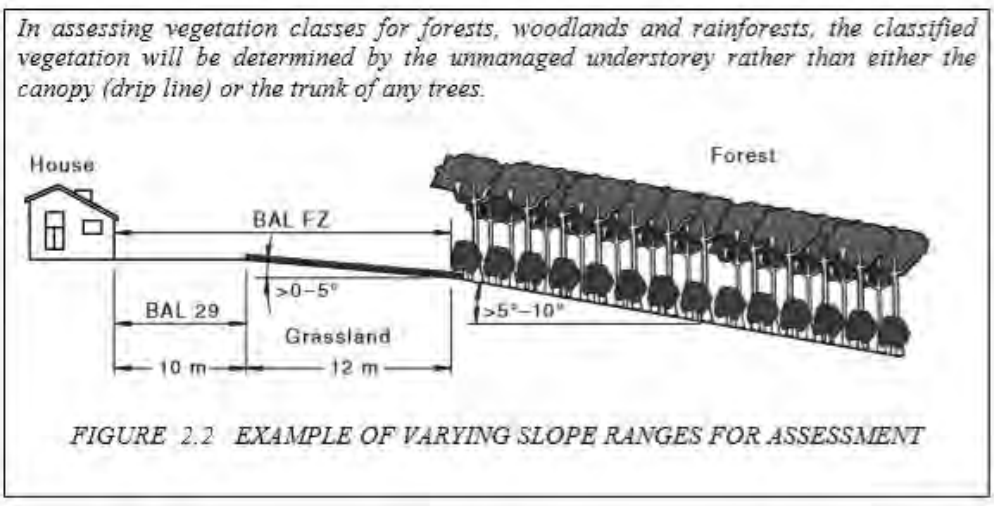

Plate 3: Arrangement of inputs for the determination of a BAL.

A site inspection was undertaken on 11 August 2024 by Anthony Rowe BPAD 36690 and reported (BAL Assessment) in accordance with the Fire Protection Association Australia (FPAA) Guidelines

Determined and Indicative Bushfire Attack Level (Outputs)

The Determined Bushfire Attack Level (highest BAL) for the building location is shown in Figure 4b (Present shelter standard applied to Worthington Hall) and Figure 5b (NCC 2022 DtS slope shelter standard to Worthington Hall)

Grassland has been excluded because it is not restricted, whereas other vegetation classes may have environmental values restricting their clearance and ability to achieve the required Asset Protection Zone.

An Asset Protection Zone that will achieve BAL 19 at each restored building has been identified to enable the use of historic materials in the building restoration.

1200K FDI 80 - Flat

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Calculated September 4, 2024, 9:14 pm (MDc v.4.9)

Forest

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	63 °, 68 °, 73 °, 75 °, 77 ° & 82 °
Total fuel load	35 t/ha	Elevation of receiver	8.82 m, 9.17 m, 9.460000000000001 m, 9.56 m, 9.640000000000001 m & 9.800000000000001 m
Vegetation height	n/a	Fire intensity	43,400 kW/m
Effective slope	0 °	Transmissivity	0.843, 0.822, 0.796, 0.775, 0.764 & 0.712
Site slope	0 °	Viewfactor	0.4235, 0.3149, 0.2132, 0.144, 0.1168 & 0.0313
Flame width	100 m	Minimum distance to < 40 kW/m²	22.9 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	29.9 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	41.2 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	54.9 m
		Minimum distance to < 10 kW/m²	63.2 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

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Calculated September 4, 2024, 9:15 pm (MDc v.4.9)

Woodland

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	65 °, 71 °, 76 °, 79 °, 80 ° & 84 °
Total fuel load	25 t/ha	Elevation of receiver	5.6 m, 5.84 m, 5.99 m, 6.06 m, 6.08 m & 6.14 m
Vegetation height	n/a	Fire intensity	18,599 kW/m
Effective slope	0 °	Transmissivity	0.862, 0.845, 0.821, 0.797, 0.785 & 0.73
Site slope	0 °	Viewfactor	0.412, 0.3066, 0.2067, 0.14, 0.1137 & 0.0306
Flame width	100 m	Minimum distance to < 40 kW/m²	14.8 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	19.8 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	28.4 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	39.3 m
		Minimum distance to < 10 kW/m²	46.1 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

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Calculated September 4, 2024, 9:16 pm (MDc v.4.9)

Grassland

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	66 °, 72 °, 78 °, 81 °, 82 ° & 86 °
Total fuel load	4.5 t/ha	Elevation of receiver	3.13 m, 3.26 m, 3.36 m, 3.39 m, 3.4 m & 3.42 m
Vegetation height	n/a	Fire intensity	33,247 kW/m
Effective slope	0 °	Transmissivity	0.881, 0.869, 0.85, 0.828, 0.8159999999999999 & 0.75
Site slope	0 °	Viewfactor	0.4037, 0.2976, 0.1994, 0.1344, 0.1096 & 0.0297
Flame width	100 m	Minimum distance to < 40 kW/m²	8.4 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	11.4 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	16.9 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	24.6 m
		Minimum distance to < 10 kW/m²	29.5 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 - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

1200K FDI 80 – 0-5

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Calculated September 4, 2024, 9:17 pm (MDc v.4.9)

Forest

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	61 °, 66 °, 70 °, 73 °, 74 ° & 81 °
Total fuel load	35 t/ha	Elevation of receiver	11.46 m, 11.97 m, 12.32 m, 12.54 m, 12.6 m & 12.95 m
Vegetation height	n/a	Fire intensity	61,280 kW/m
Effective slope	5 °	Transmissivity	0.83, 0.8080000000000001, 0.783, 0.763, 0.754 & 0.699
Site slope	0 °	Viewfactor	0.4294, 0.3207, 0.2167, 0.1462, 0.1185 & 0.0319
Flame width	100 m	Minimum distance to < 40 kW/m²	29.4 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	37.6 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	50.6 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	66 m
		Minimum distance to < 10 kW/m²	75.3 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

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Calculated September 4, 2024, 9:19 pm (MDc v.4.9)

Woodland

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	64 °, 70 °, 74 °, 77 °, 78 ° & 83 °
Total fuel load	25 t/ha	Elevation of receiver	7.28 m, 7.61 m, 7.79 m, 7.9 m, 7.93 m & 8.039999999999999 m
Vegetation height	n/a	Fire intensity	26,263 kW/m
Effective slope	5 °	Transmissivity	0.852, 0.832, 0.8070000000000001, 0.784, 0.773 & 0.72
Site slope	0 °	Viewfactor	0.4191, 0.3113, 0.2101, 0.1426, 0.1155 & 0.031
Flame width	100 m	Minimum distance to < 40 kW/m²	19.1 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	25.2 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	35.4 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	47.8 m
		Minimum distance to < 10 kW/m²	55.5 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

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Calculated September 4, 2024, 9:20 pm (MDc v.4.9)

Grassland

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	66 °, 72 °, 77 °, 81 °, 82 ° & 85 °
Total fuel load	4.5 t/ha	Elevation of receiver	3.73 m, 3.88 m, 3.97 m, 4.03 m, 4.04 m & 4.06 m
Vegetation height	n/a	Fire intensity	46,945 kW/m
Effective slope	5 °	Transmissivity	0.876, 0.863, 0.841, 0.819, 0.806 & 0.744
Site slope	0 °	Viewfactor	0.4075, 0.3006, 0.201, 0.1361, 0.1106 & 0.03
Flame width	100 m	Minimum distance to < 40 kW/m²	9.9 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	13.4 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	19.9 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	28.4 m
		Minimum distance to < 10 kW/m²	33.9 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 - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

NCC 2022

APE 1:200 (FDI 100) and Flat

FLAMESOL FPA AUSTRALIA

Calculated September 4, 2024, 9:21 pm (MDc v.4.9)

Forest

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	100	Rate of spread	3 km/h
Vegetation classification	Forest	Flame length	23.7 m
Understorey fuel load	25 t/ha	Flame angle	51 °, 60 °, 67 °, 71 °, 73 ° & 80 °
Total fuel load	35 t/ha	Elevation of receiver	9.199999999999999 m, 10.26 m, 10.9 m, 11.2 m, 11.33 m & 11.66 m
Vegetation height	n/a	Fire intensity	54,250 kW/m
Effective slope	0 °	Transmissivity	0.857, 0.832, 0.803, 0.777, 0.765 & 0.709
Site slope	0 °	Viewfactor	0.6131, 0.4571, 0.3106, 0.2109, 0.1717 & 0.0462
Flame width	100 m	Minimum distance to < 40 kW/m²	19.2 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	25.3 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	35.4 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	47.8 m
		Minimum distance to < 10 kW/m²	55.3 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

FLAMESOL FPA AUSTRALIA

Calculated September 4, 2024, 9:22 pm (MDc v.4.9)

Woodland

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	100	Rate of spread	1.79 km/h
Vegetation classification	Woodland	Flame length	14.7 m
Understorey fuel load	15 t/ha	Flame angle	53 °, 63 °, 71 °, 75 °, 77 ° & 82 °
Total fuel load	25 t/ha	Elevation of receiver	5.86 m, 6.54 m, 6.94 m, 7.09 m, 7.16 m & 7.27 m
Vegetation height	n/a	Fire intensity	23,249 kW/m
Effective slope	0 °	Transmissivity	0.872, 0.853, 0.827, 0.801, 0.788 & 0.727
Site slope	0 °	Viewfactor	0.6012, 0.4446, 0.3013, 0.2047, 0.1664 & 0.0452
Flame width	100 m	Minimum distance to < 40 kW/m²	12.1 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	16.3 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	23.7 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	33.3 m
		Minimum distance to < 10 kW/m²	39.4 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

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FPA AUSTRALIA

Calculated September 4, 2024, 9:22 pm (MDc v.4.9)

Grassland

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	130	Rate of spread	16.9 km/h
Vegetation classification	Grassland	Flame length	7.47 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	3.02 m, 3.35 m, 3.57 m, 3.65 m, 3.67 m & 3.72 m
Vegetation height	n/a	Fire intensity	39,292 kW/m
Effective slope	0 °	Transmissivity	0.887, 0.875, 0.857, 0.837, 0.824 & 0.752
Site slope	0 °	Viewfactor	0.5928, 0.4338, 0.2903, 0.1963, 0.1589 & 0.0436
Flame width	100 m	Minimum distance to < 40 kW/m²	6.2 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	8.5 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	12.7 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	18.6 m
		Minimum distance to < 10 kW/m²	22.8 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 - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

NCC 2022

APE 1:200 (FDI 100) and Flat downslope 20^0

FLAMESOL FPA AUSTRALIA

Calculated September 4, 2024, 9:24 pm (MDc v.4.9)

Forest

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	100	Rate of spread	11.92 km/h
Vegetation classification	Forest	Flame length	81.70999999999999 m
Understorey fuel load	25 t/ha	Flame angle	39 °, 44 °, 50 °, 54 °, 57 ° & 71 °
Total fuel load	35 t/ha	Elevation of receiver	25.71 m, 28.38 m, 31.29 m, 33.05 m, 34.26 m & 38.62 m
Vegetation height	n/a	Fire intensity	215,638 kW/m
Effective slope	20 °	Transmissivity	0.8120000000000001, 0.782, 0.753, 0.733, 0.723 & 0.674
Site slope	0 °	Viewfactor	0.6471, 0.4874, 0.3311, 0.2241, 0.1815 & 0.0487
Flame width	100 m	Minimum distance to < 40 kW/m²	58.7 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	70.5 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	87.8 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	107.9 m
		Minimum distance to < 10 kW/m²	120.2 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

FLAMESOL FPA AUSTRALIA

Calculated September 4, 2024, 9:25 pm (MDc v.4.9)

Woodland

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	100	Rate of spread	7.15 km/h
Vegetation classification	Woodland	Flame length	49.5 m
Understorey fuel load	15 t/ha	Flame angle	45 °, 52 °, 58 °, 62 °, 64 ° & 75 °
Total fuel load	25 t/ha	Elevation of receiver	17.5 m, 19.5 m, 20.99 m, 21.85 m, 22.24 m & 23.9 m
Vegetation height	n/a	Fire intensity	92,416 kW/m
Effective slope	20 °	Transmissivity	0.83, 0.799, 0.769, 0.747, 0.738 & 0.677
Site slope	0 °	Viewfactor	0.6335, 0.4754, 0.3238, 0.2197, 0.1779 & 0.0485
Flame width	100 m	Minimum distance to < 40 kW/m²	37.8 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	47.4 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	61.8 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	78.40000000000001 m
		Minimum distance to < 10 kW/m²	88.59999999999999 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

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Calculated September 4, 2024, 9:26 pm (MDc v.4.9)

Grassland

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Grassland Fire Danger Index	130	Rate of spread	67.17 km/h
Vegetation classification	Grassland	Flame length	14.89 m
Understorey fuel load	4.5 t/ha	Flame angle	53 °, 63 °, 70 °, 75 °, 76 ° & 82 °
Total fuel load	4.5 t/ha	Elevation of receiver	5.94 m, 6.63 m, 6.99 m, 7.19 m, 7.22 m & 7.37 m
Vegetation height	n/a	Fire intensity	156,183 kW/m
Effective slope	20 °	Transmissivity	0.871, 0.852, 0.826, 0.8, 0.787 & 0.726
Site slope	0 °	Viewfactor	0.5994, 0.445, 0.3013, 0.2046, 0.1666 & 0.0452
Flame width	100 m	Minimum distance to < 40 kW/m²	12.3 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	16.5 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	24 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m²	33.7 m
		Minimum distance to < 10 kW/m²	39.8 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 - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005



Figure 1a: Location

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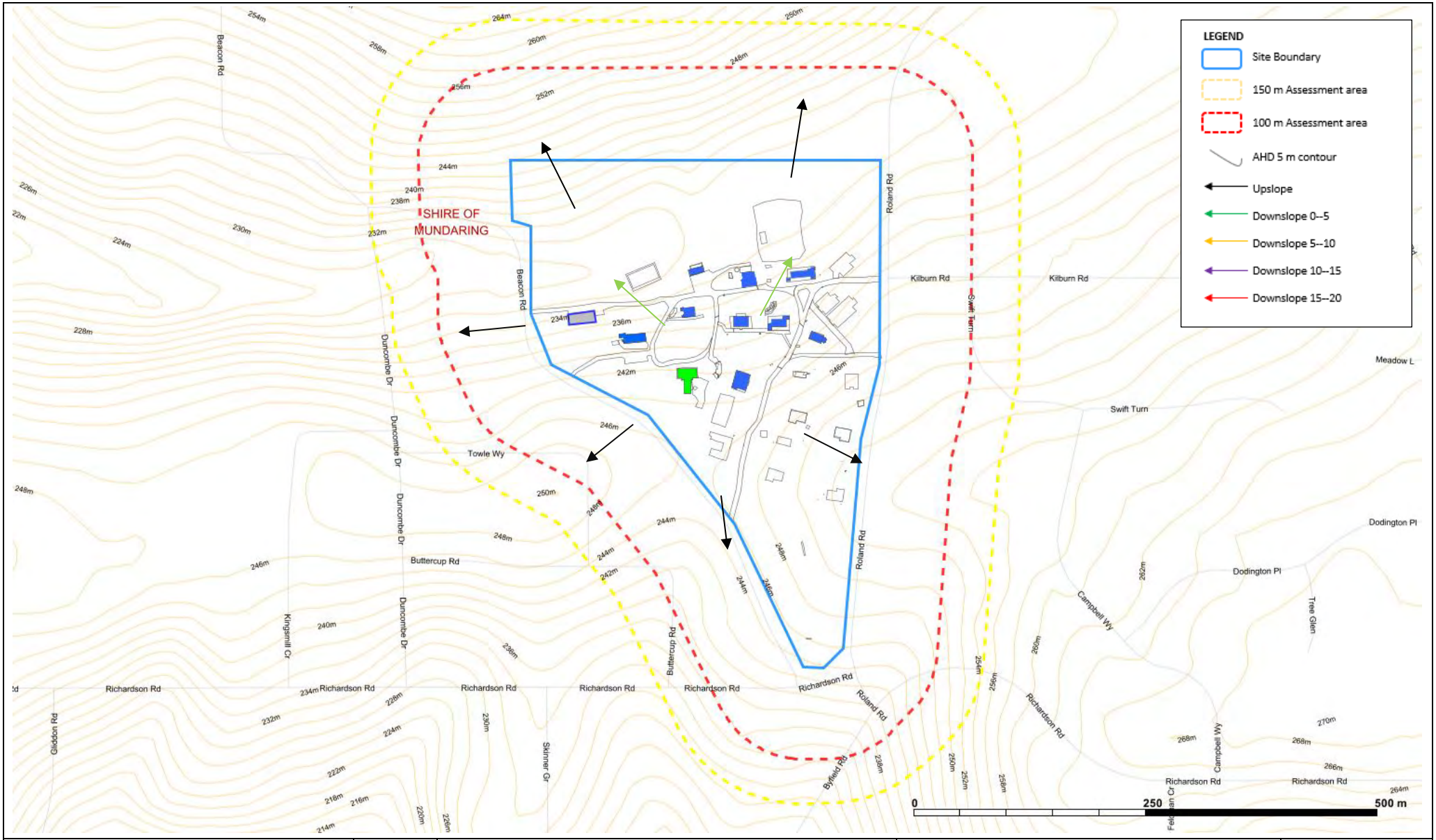

Figure 2: Topography

N

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Figure 3a: Vegetation Classification

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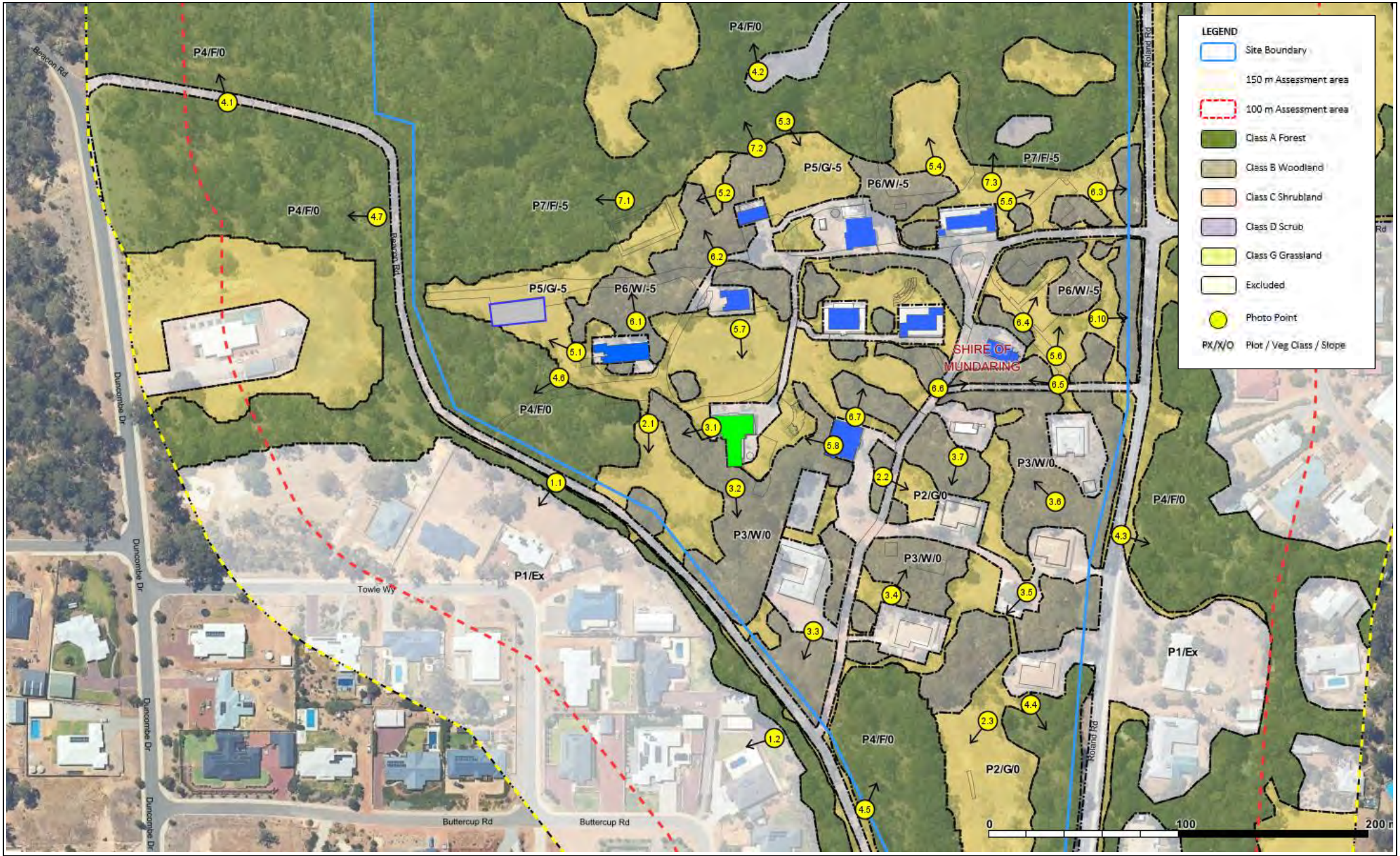

Figure 3b: Vegetation Classification photo positions

N

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<table>
<tr><th colspan="5">PLOT: 1</th></tr>
<tr><th colspan="3">Vegetation Classification</th><th colspan="2">Slope</th></tr>
<tr><td colspan="3">Excludable - 2.2.3.2(e) Non Vegetated Areas</td><td colspan="2">Flat</td></tr>
<tr><th colspan="5">Observation/Justification for classification</th></tr>
<tr><td>Fuel Hazard</td><td>Surface</td><td>Near surface</td><td>Elevated</td><td>Bark</td></tr>
<tr><td>Low</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Moderate</td><td></td><td></td><td></td><td></td></tr>
<tr><td>High</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Very High</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Extreme</td><td></td><td></td><td></td><td></td></tr>
<tr><th colspan="5">Vegetation Description (AS 3959)</th></tr>
<tr><td colspan="5">e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.</td></tr>
<tr><th colspan="5">Post development</th></tr>
<tr><td colspan="5">Low threat</td></tr>
<tr><td colspan="3"> 
</td><td colspan="2"> 
</td></tr>
<tr><td colspan="3">Photo 1.1</td><td colspan="2">Photo 1.2</td></tr>
</table>

PLOT: 2				
Vegetation Classification		**Slope**		
Class G Grassland – Spare open tussock G-24		Flat		
Observation/Justification for classification				
Fuel Hazard	Surface	Near surface	Elevated	Bark
Low		✓	✓	✓
Moderate	✓			
High				
Very High				
Extreme				
Vegetation Description (AS 3959)				
All forms (except tussock moorlands) including situations with shrubs and trees if the overstorey foliage cover is less than 10%. Includes pasture and cropland.				
Post development				
Parkland, understorey grassess are to be maintained non curing and < 100 mm to a distance that will achieve BAL 19 at each restored building to enable the use of historic materials in the building restoration.				



Photo 2.1 grassland within treed perimeter



Photo 2.2



Photo 2.3 playing oval

PLOT: 3				
Vegetation Classification		**Slope**		
Class B Woodland - Woodland B-05		Flat		
Observation/Justification for classification				
Fuel Hazard	Surface	Near surface	Elevated	Bark
Low				
Moderate	✓			
High		✓		✓
Very High			✓	
Extreme				
Vegetation Description (AS 3959)				
Trees 10 m - 30 m high; 10% - 30% foliage cover dominated by eucalypts and/or callistris with a prominent grassy understorey. May contain isolated shrubs. Authors Note: Woodland is classed by its understorey for the purpose of determining the fire intensity.				
Post development				
Parkland, understorey grassess are to be maintained non curing and < 100 mm to a distance that will achieve BAL 19 at each restored building to enable the use of historic materials in the building restoration.				



Photo 3.1



Photo 3.2



Photo 3.3



Photo 3.4

<table>
<tr><th colspan="5">PLOT: 3</th></tr>
<tr><th colspan="3">Vegetation Classification</th><th colspan="2">Slope</th></tr>
<tr><td colspan="3">Class B Woodland - Woodland B-05</td><td colspan="2">Flat</td></tr>
<tr><th colspan="5">Observation/Justification for classification</th></tr>
<tr><td>Fuel Hazard</td><td>Surface</td><td>Near surface</td><td>Elevated</td><td>Bark</td></tr>
<tr><td>Low</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Moderate</td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>High</td><td></td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>Very High</td><td></td><td></td><td>✓</td><td></td></tr>
<tr><td>Extreme</td><td></td><td></td><td></td><td></td></tr>
<tr><th colspan="5">Vegetation Description (AS 3959)</th></tr>
<tr><td colspan="5">Trees 10 m - 30 m high; 10% - 30% foliage cover dominated by eucalypts and/or callistris with a prominent grassy understorey. May contain isolated shrubs.

Authors Note: Woodland is classed by its understorey for the purpose of determining the fire intensity.</td></tr>
<tr><th colspan="5">Post development</th></tr>
<tr><td colspan="5">Parkland, understorey grassess are to be maintained non curing and < 100 mm to a distance that will achieve BAL 19 at each restored building to enable the use of historic materials in the building restoration.</td></tr>
<tr><td colspan="3">  </td><td colspan="2">  </td></tr>
<tr><td colspan="3">Photo 3.5</td><td colspan="2">Photo 3.6</td></tr>
<tr><td colspan="3">  </td><td colspan="2"></td></tr>
<tr><td colspan="3">Photo 3.7</td><td colspan="2"></td></tr>
</table>

PLOT: 4				
Vegetation Classification		**Slope**		
Class A Forest - Open forest A-03		Downslope 5-10		
Observation/Justification for classification				
Fuel Hazard	Surface	Near surface	Elevated	Bark
Low				
Moderate	✓			
High		✓		✓
Very High			✓	
Extreme				
Vegetation Description (AS 3959)				
Trees up to 30 m high; 30%-70% foliage cover (may include understorey of sclerophyllous low trees or shrubs). Typically dominated by eucalypts, melaleuca or callistemon (may include riverine and wetland environments) and callitris. Includes eucalypt plantations.				
Post development				
Forest				



Photo 4.1



Photo 4.2



Photo 4.3



Photo 4.4

PLOT: 4				
Vegetation Classification		**Slope**		
Class A Forest - Open forest A-03		Downslope 5-10		
Observation/Justification for classification				
Fuel Hazard	Surface	Near surface	Elevated	Bark
Low				
Moderate	✓			
High		✓		✓
Very High			✓	
Extreme				
Vegetation Description (AS 3959)				
Trees up to 30 m high; 30%-70% foliage cover (may include understorey of sclerophyllous low trees or shrubs). Typically dominated by eucalypts, melaleuca or callistemon (may include riverine and wetland environments) and callitris. Includes eucalypt plantations.				
Post development				
Forest				



Photo 4.5



Photo 4.6



Photo 4.7

PLOT: 5				
Vegetation Classification		**Slope**		
Class G Grassland – Spare open tussock G-24		Downslope 0-5		
Observation/Justification for classification				
Fuel Hazard	Surface	Near surface	Elevated	Bark
Low		✓	✓	✓
Moderate	✓			
High				
Very High				
Extreme				
Vegetation Description (AS 3959)				
All forms (except tussock moorlands) including situations with shrubs and trees if the overstorey foliage cover is less than 10%. Includes pasture and cropland.				
Post development				
Parkland, understorey grassess are to be maintained non curing and < 100 mm to a distance that will achieve BAL 19 at each restored building to enable the use of historic materials in the building restoration.				



Photo 5.1



Photo 5.2



Photo 5.3



Photo 5.4

PLOT: 5				
Vegetation Classification		**Slope**		
Class G Grassland – Spare open tussock G-24		Downslope 0-5		
Observation/Justification for classification				
Fuel Hazard	Surface	Near surface	Elevated	Bark
Low		✓	✓	✓
Moderate	✓			
High				
Very High				
Extreme				
Vegetation Description (AS 3959)				
All forms (except tussock moorlands) including situations with shrubs and trees if the overstorey foliage cover is less than 10%. Includes pasture and cropland.				
Post development				
Parkland, understorey grassess are to be maintained non curing and < 100 mm to a distance that will achieve BAL 19 at each restored building to enable the use of historic materials in the building restoration.				



Photo 5.5



Photo 5.6



Photo 5.7

PLOT: 6				
Vegetation Classification		**Slope**		
Class B Woodland - Woodland B-05		Downslope 0-5		
Observation/Justification for classification				
Fuel Hazard	Surface	Near surface	Elevated	Bark
Low				
Moderate	✓			
High		✓		✓
Very High			✓	
Extreme				
Vegetation Description (AS 3959)				
Trees 10 m - 30 m high; 10% - 30% foliage cover dominated by eucalypts and/or callistris with a prominent grassy understorey. May contain isolated shrubs. Authors Note: Woodland is classed by its understorey for the purpose of determining the fire intensity.				
Post development				
Parkland, understorey grassess are to be maintained non curing and < 100 mm to a distance that will achieve BAL 19 at each restored building to enable the use of historic materials in the building restoration.				



Photo 6.1



Photo 6.2



Photo 6.3



Photo 6.4

PLOT: 6				
Vegetation Classification		**Slope**		
Class B Woodland - Woodland B-05		Downslope 0-5		
Observation/Justification for classification				
Fuel Hazard	Surface	Near surface	Elevated	Bark
Low				
Moderate	✓			
High		✓		✓
Very High			✓	
Extreme				
Vegetation Description (AS 3959)				
Trees 10 m - 30 m high; 10% - 30% foliage cover dominated by eucalypts and/or callistris with a prominent grassy understorey. May contain isolated shrubs. Authors Note: Woodland is classed by its understorey for the purpose of determining the fire intensity.				
Post development				
Parkland, understorey grassess are to be maintained non curing and < 100 mm to a distance that will achieve BAL 19 at each restored building to enable the use of historic materials in the building restoration.				



Photo 6.5



Photo 6.6



Photo 6.7

PLOT: 7				
Vegetation Classification		**Slope**		
Class A Forest - Open forest A-03		Downslope 5-10		
Observation/Justification for classification				
Fuel Hazard	Surface	Near surface	Elevated	Bark
Low				
Moderate	✓			
High		✓		✓
Very High			✓	
Extreme				
Vegetation Description (AS 3959)				
Trees up to 30 m high; 30%-70% foliage cover (may include understorey of sclerophyllous low trees or shrubs). Typically dominated by eucalypts, melaleuca or callistemon (may include riverine and wetland environments) and callitris. Includes eucalypt plantations.				
Post development				
Forest				



Photo 7.1



Photo 7.2



Photo 7.3

3.2 Bushfire Attack Level Assessment Outputs

The Determined Bushfire Attack Levels are based upon the conditions at the time of inspection and applying the methodology described in AS 3959:2018. The Determined BAL is the highest BAL Level.

The following assessment outputs illustrated in Figure 4b follow the distance and BAL rating for the following vegetation and slope under vegetation (plots). The bands in Figure represent the separation distances, shown at scale.

The Shelter Area separation follows the calculations in Section 3 of this report, to achieve 10 kWm^2 for various vegetation types and slope.

Note Figure 5b has applied the NCC 2022 DtS BAL, vegetation type set either flat or at 20.0^0 for the Shelter Area separation.

Plot	Vegetation classification	Effective slope (degrees)	Separation Distance (AS 3959:2018 Table 2.5)	BAL
4	Forest	Flat/upslope	< 16 m	BAL-FZ
			16- < 21 m	BAL-40
			21 - < 31 m	BAL-29
			31 - < 42 m	BAL-19
			42 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
7	Forest	0-5	< 20 m	BAL-FZ
			20 - < 27 m	BAL-40
			27 - < 37 m	BAL-29
			37 - < 50 m	BAL-19
			50 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
3	Woodland	Flat/upslope	< 10 m	BAL-FZ
			10- < 14 m	BAL-40
			14 - < 20 m	BAL-29
			20 - < 29 m	BAL-19
			29 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
6	Woodland	0-5	< 13m	BAL-FZ
			13 - < 17m	BAL-40
			17 - < 25m	BAL-29
			25- < 35m	BAL-19
			35- < 100 m	BAL-12.5
			> 100 m	BAL-LOW
2	Grassland	Flat/upslope	< 6 m	BAL-FZ

			6- < 8 m	BAL-40
			8 - < 12 m	BAL-29
			12 - < 17 m	BAL-19
			17 - < 50 m	BAL-12.5
			> 50 m	BAL-LOW
5	Grassland	0-5	< 7 m	BAL-FZ
			7 - < 9 m	BAL-40
			9 - < 14 m	BAL-29
			14- < 20 m	BAL-19
			20- < 50 m	BAL-12.5
			> 50 m	BAL-LOW

.

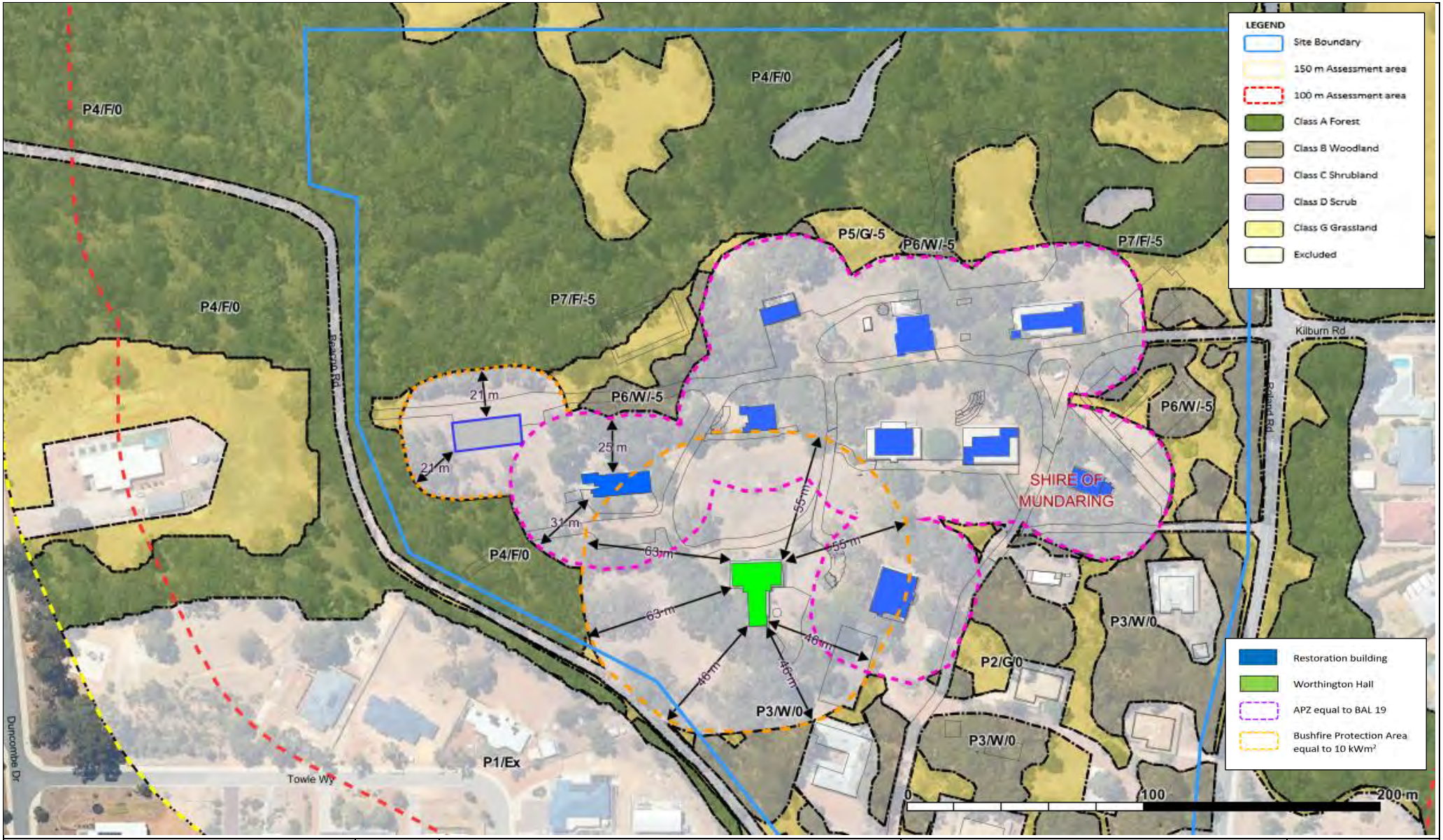

Figure 4a: Vegetation Risk Treatment Area, Shelter 2014 Handbook method

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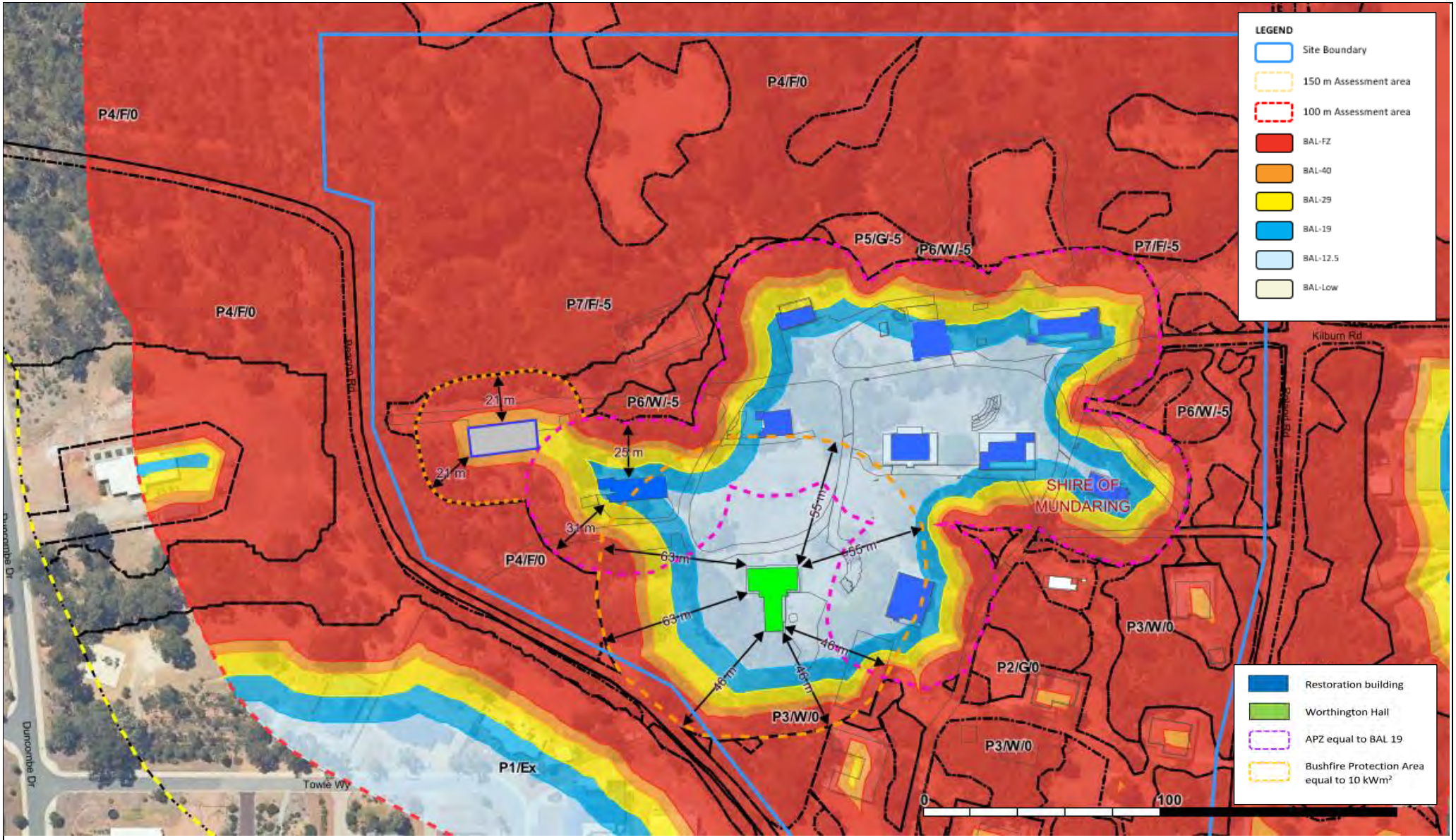

Figure 4b: BAL Contour

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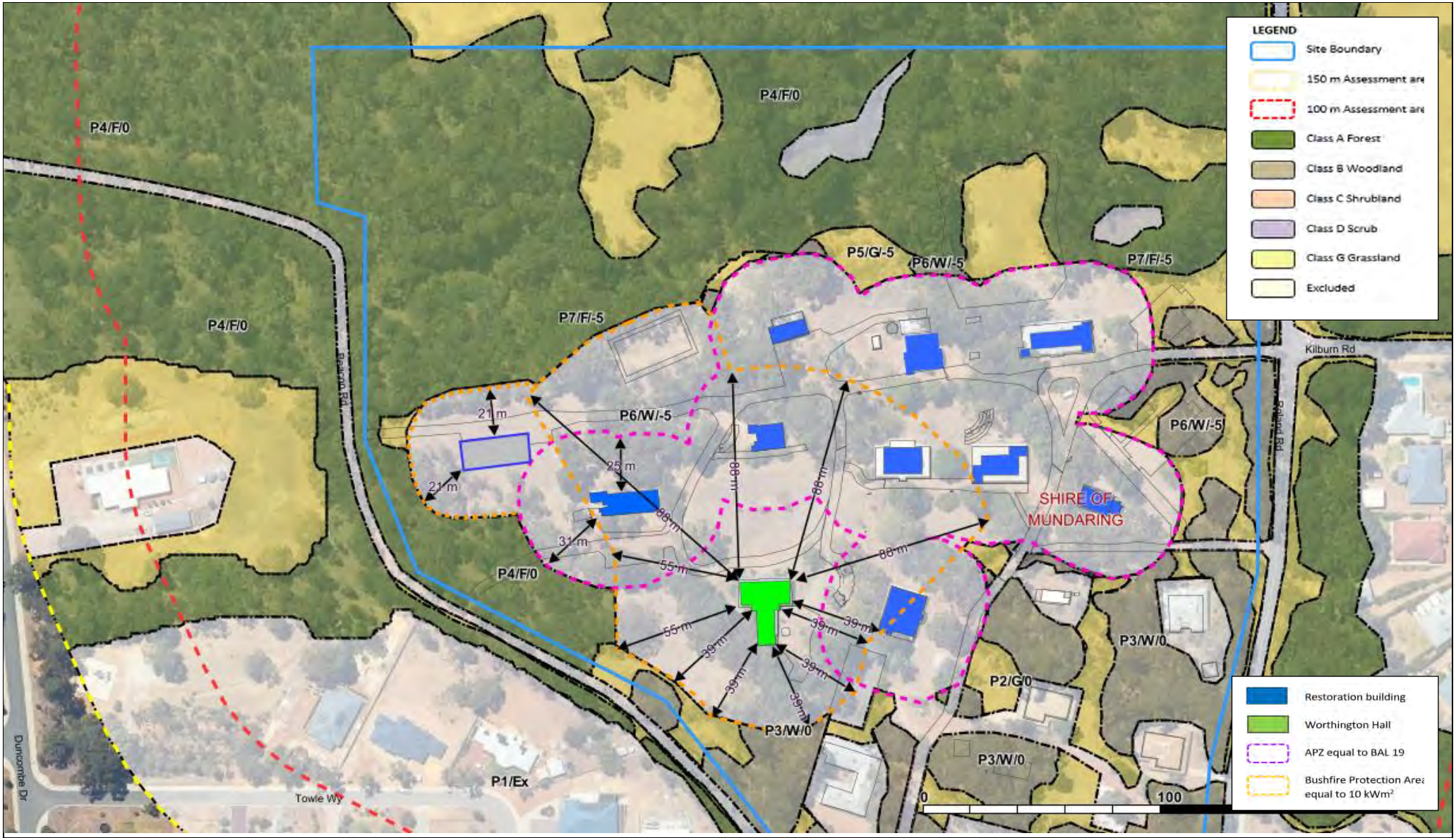

Figure 5a: BAL Contour NCC 2022, Shelter Area DtS

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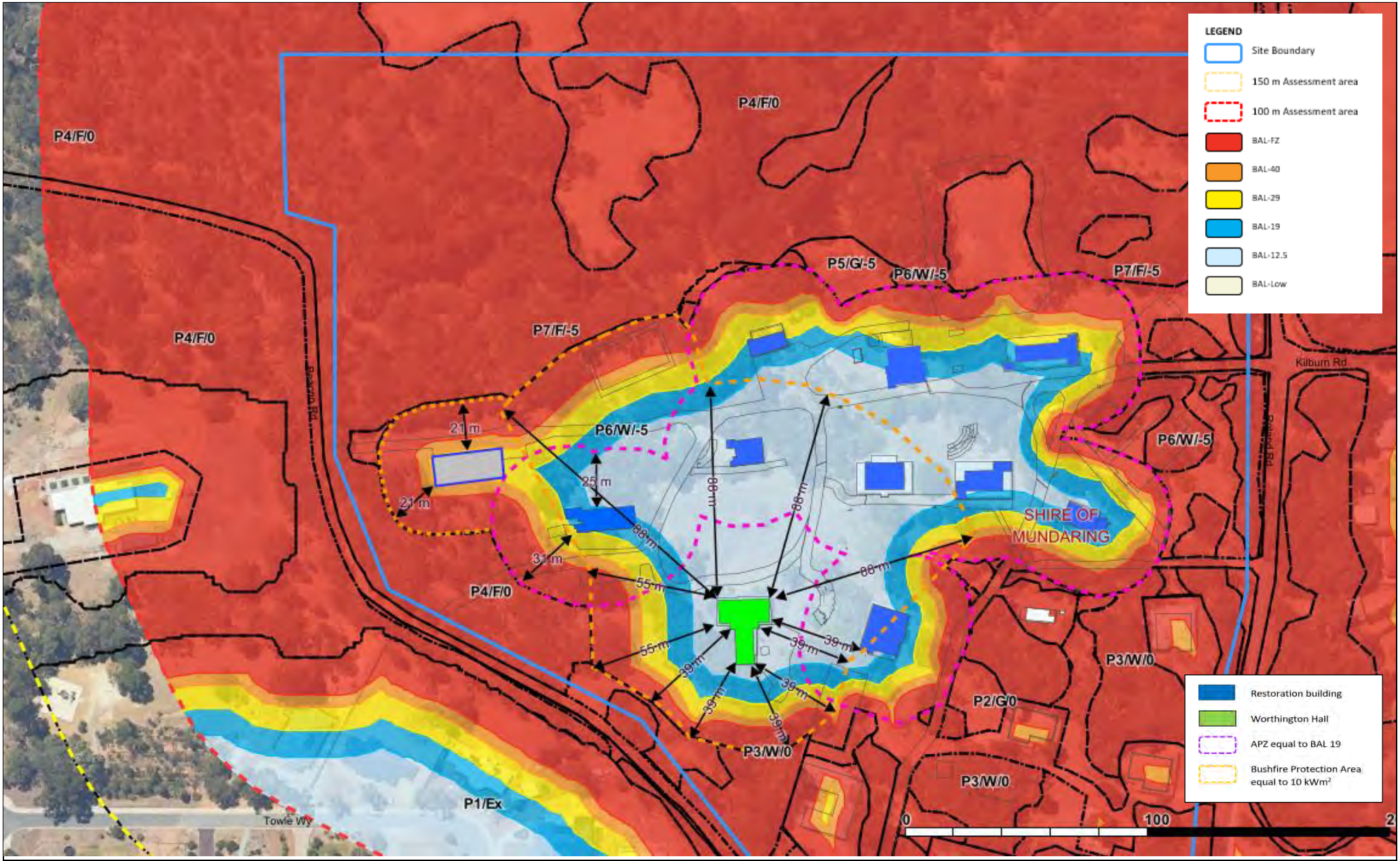

Figure 5b: BAL Contour DtS

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4. IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

The purpose of SPP 3.7 and its policy intent is to preserve life and reduce the impact of bushfire on property and infrastructure through effective risk-based land use planning. Importantly, it is risk-based and not a prohibition; the provisions in SPP3.7 and the Guidelines are not to be applied inflexibly as affirmed by the West Australian Administrative Tribunal (WASAT)

> *SPP 3.7 does not require that there be no increase at all in the threat of bushfire to people property or infrastructure. Rather, as is seen in clause 2 of SPP 3.7, the intention of the policy is to 'implement effective, risk-based land use planning and development to preserve life and* ***reduce the impact of bushfire on property and infrastructure'****.* (emphasis added) [2]

Risk for the purpose of SPP 3.7 (section 4) is determined using the methodologies in AS3959:2018. AS3959 is site specific, the nature of the risk and context consideration that may exacerbate or reduce the risk includes considerations for access to and from the site and water to support active suppression at the site, explicitly by emergency services. This is addressed in the Bushfire Protection Criteria (minimum compliance criteria) which represents the acceptable risk treatment in response to the Bushfire Attack Level at the site, the available access to the site and water for Emergency service fire suppression.

Applicants are encouraged to strive for the lowest practical risk, notwithstanding the achievement of compliance; however, it is only the compliance matters that must be achieved for approval. SPP3.7 is not retrospective; applicants may wish to volunteer improvements to existing buildings or provide additional resources for fire suppression independent to the requirements for Emergency Services.

These should be informed by an As Low as Reasonably Practical (ALARP) approach for the applicants' consideration.

This BMP has used the methodology (applicable principles) from the National Emergency Risk Assessment Guidelines 2020 (NERAG), and a risk treatment approach has been further categorised (as an orderly method) into the National (USA) Fire Protect Association (NFPA) treatment that are also adopted by the Australian Building Construction Board.

The National Emergency Risk Assessment Guidelines 2020 (NERAG) is an adaption of the Australian Standard *AS/NZS ISO 31000:2018 Risk management – principles and guidelines,* making it applicable to all natural disasters.

The following table shows the author's alignment of SPP3.7 with the NERAG methodology.

NERAG	Scale response
Scope and Objective	SPP 3.7 Policy Intent
Risk identification	Bushfire
Risk Analysis	Bushfire Behaviour (contributing attributes) Climate (local) Existing mitigations (controls) relied upon
Risk Evaluation	Cumulative risk: Likelihood (risk of ignition): Inherit fuels, history, external activities. Consequence: Social (human harm - minimising exposure evacuate or shelter)

[2] Harmanis Holdings No. 2 Pty Ltd and Western Australian Planning Commission [2019] WASAT 43 (Harmanis).

	Economic (Asset threat – managing the fire, sources and building resistance)
Risk Treatments	Bushfire Protection Criteria Bushfire Emergency Evacuation Plan (Additional) As Low as reasonably practical measures (ALARP) addressing: – Minimising Ignition – Minimising exposure – Managing (reducing) the fire effects[3].
Communication	Bushfire Management Plan Bushfire Emergency Evacuation Plan

The risk treatments aligning the Policy Intent with the NFPA 550 (2012)[4] and its risk treatment methods is illustrated in the following table.

SPP 3.7	NFPA	Impact Mitigation
	Prevent Ignition	Nullify potential externalities
Preserving life	Manage the exposed	Evacuation
		Shelter
Property and assets	Manage the fire	Vegetation management (APZ)
		Building construction
		Fire suppression

Scope and objective

The intent of this policy is to implement effective, risk-based land use planning and development to preserve life (social) and reduce the impact of bushfire on property and infrastructure (Economic).

Risk Evaluation values Note: Community scale risk measures as used in NERAG 2020, are not applicable for site specific consequence, or operator duty of care and liability, the following objectives have been applied.

Consequence	Social	Economic
Catastrophic	Fatality.	Extensive loss, extended closure until facility is rebuilt.
Major	Major or Multiple injuries resulting in temporary disability or ill health, Extended lost time for recovery.	Partial loss, partial closure until isolated items are rebuilt.
Moderate	Injury or illness requiring medical or psychological treatment, lost injury time.	Disruption only for evaluation, repairs required to a primary building, but not closure.

3

[4] Guide to the fire safety concepts tree. Quincy: National Fire Protection Association, 2012.

Minor	Minor injury, first aid treatment required. No lasting impact.	Disruption only for evaluation, damage to incidental structures.
Insignificant	No treatment.	Disruption only occurred during the fire event.

Risk Identification

The risks associated with a bushfire include:

- extreme heat (flame immersion, accumulated embers, and radiant heat – fatal and property destroying),
- convective heat potentially fatal), strong winds (blown object blunt force injuries, or the opening of the building envelope to expose and ignite flammable materials inside),
- ember attack (particle injuries small burns, eye injury, penetration of gaps to ignite flammable materials inside a building - heavy
- smoke (obscured vision, trips, falls, collision and respiratory impacts (fatal), and
- trauma (bushfires are terrifying).

Risk Analysis

4.3.1 Bushfire Behaviour

Bushfire behaviour, as it increases in intensity and speed of travel, can exceed human control measures and when this occurs the risk increases to humans and property. Bushfire behaviour is a result of climate, topography, and the availability of bushfire fuel (vegetation).

- Climate (drought and season) & weather (temperature, humidity, wind, atmospheric instability).

  Wind

  Bushfires are influenced by the wind direction and the speed. The wind direction generally determines the direction of the fire and wind speed, along with ground slope, generally determines the speed a fire will travel over ground. As wind strength increases it increases the availability of oxygen allowing the fire intensity to increase.
  Atmospheric conditions determine the potential for the uplift of embers and particles that can be distributed by the prevailing wind direction well ahead of the fire, up to 9 km, to create spot fires that can advance the location of the fire front.

  Fire Danger Index FDI

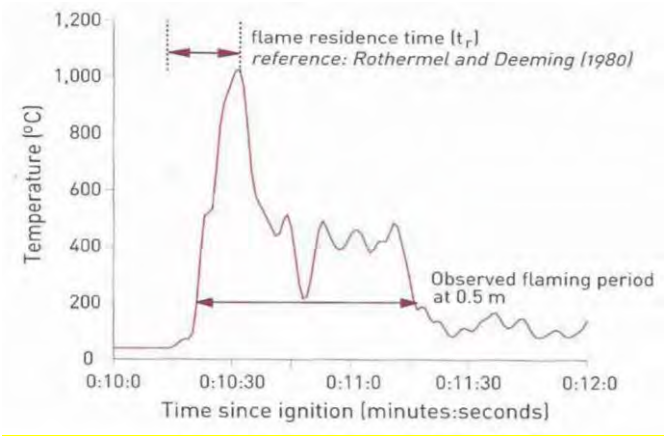
  FDI is an indicator of potential fire intensity and behaviour based upon weather conditions; temperature, humidity, and wind speed, together with climate measures, drought factor representing the dryness of the ground fuels.
  The FDI is an indicator of the potential for house loss and fatalities.
  The FDI is used as a basis for determining the required design performance of a building.

- Topography (slope of the ground, aspect) – fire travels faster uphill, (flame length doubles for every slope increase of 10^0) and in some conditions may determine the direction of the fire. The landform can also channel and increase the windspeed in steeper valleys and create turbulence and erratic behaviour where it crosses valleys and ridge lines, including eddies/vortexes that run a fire up the lee side of a slope.
- Vegetation (horizontal and vertical structure, flammability, mass, and availability). Measured as a vegetation classification, or an exclusion, in AS 3959 (Method 1). The arrangement of fuel has a greater effect upon the intensity of a fire than just its mass; its exposure to oxygen is referred to as its availability in a bushfire.

It is assumed that a bushfire will achieve a steady-state and be fully developed to maximum intensity over a 100 m (minimum) fire run. Grass fires travel faster (GFDI) than a forest canopy fire, but a forest canopy fire can eject a higher level of embers and also eject them over a greater distance. Crown fires occur when the ground fire is intense, and conversely, when ground fuels are managed, the resultant fire intensity may not be sufficient to involve the crown or sustain a fire.

Grass fires are fast moving and influenced by the wind direction. Forest fires are characterised by the high fuel mass and have the highest fire line intensity requiring the largest separations to reduce radiant heat. Forest fires, if of sufficient size, continuity, and intensity can eject embers in advance of the fire front up to 5 km (and greater distances but rare).

A firefront peak (flame) residency and flaming time was identified by project Vesta to be 2 minutes up to 1100c before the temperature quickly decays to 500c before again tapering down to less than 200c and fading.



Project Vesta flame residency temperature profile for forest.[5]

Ember attack is the cause of the highest building loss, either finding gaps and flammable materials within a building or igniting flammable materials near a building that can expose the building to direct flame contact.

Radiant heat is the cause of most fatalities.

Studies by the CSIRO[6] in a review of 260 bushfires between 1901 -2011, has found that 78% of all fatalities (773 civilian fatalities) occur within 30 m of a forest, and 88% of fatalities 'within a structure' occur within 30 m of a forest. It has also found that if a building/ house survives that people will survive. *Generally a house is large enough to maintain tenability, but tenability is a critical factor and is an important consideration in designing spaces for refuge.*

Fuel reduction initiatives such as slashing and controlled burns are intended to reduce the fuel availability to a level where the intensity of the fire remains controllable.

4.3.2 Climate

The most intense bushfire is likely to arrive in the afternoon between mid-December and March each year when the Forest Fire Danger Index [7] (FFDI) is at or above 50. The wind roses for Bickley (nearest hills station - 15 km east) illustrate the afternoon wind (highest FFDI) is predominant and strongest from the southern hemisphere (west through to east).

[5] Australian Building Codes Board 2019, *Handbook: Bushfire Verification Method*, Commonwealth of Australia and States and Territories 2019, published by the Australian Building Codes Board.

[6] Blanchi. R, Leonard. J, Haynes. K, Opie. K, James. M, Kilinc. M, Dimer de Oliveira. F, van den Honert.R, 2012, '*Life and House Loss Database Description and Analysis – Final Report*', CSIRO and Bushfire CRC

[7] FFDI is a measure of fire danger weather 50+ is Severe, 75+ is Extreme and 100+ is Catastrophic



Plate 4: Bickley wind roses.

Site Context

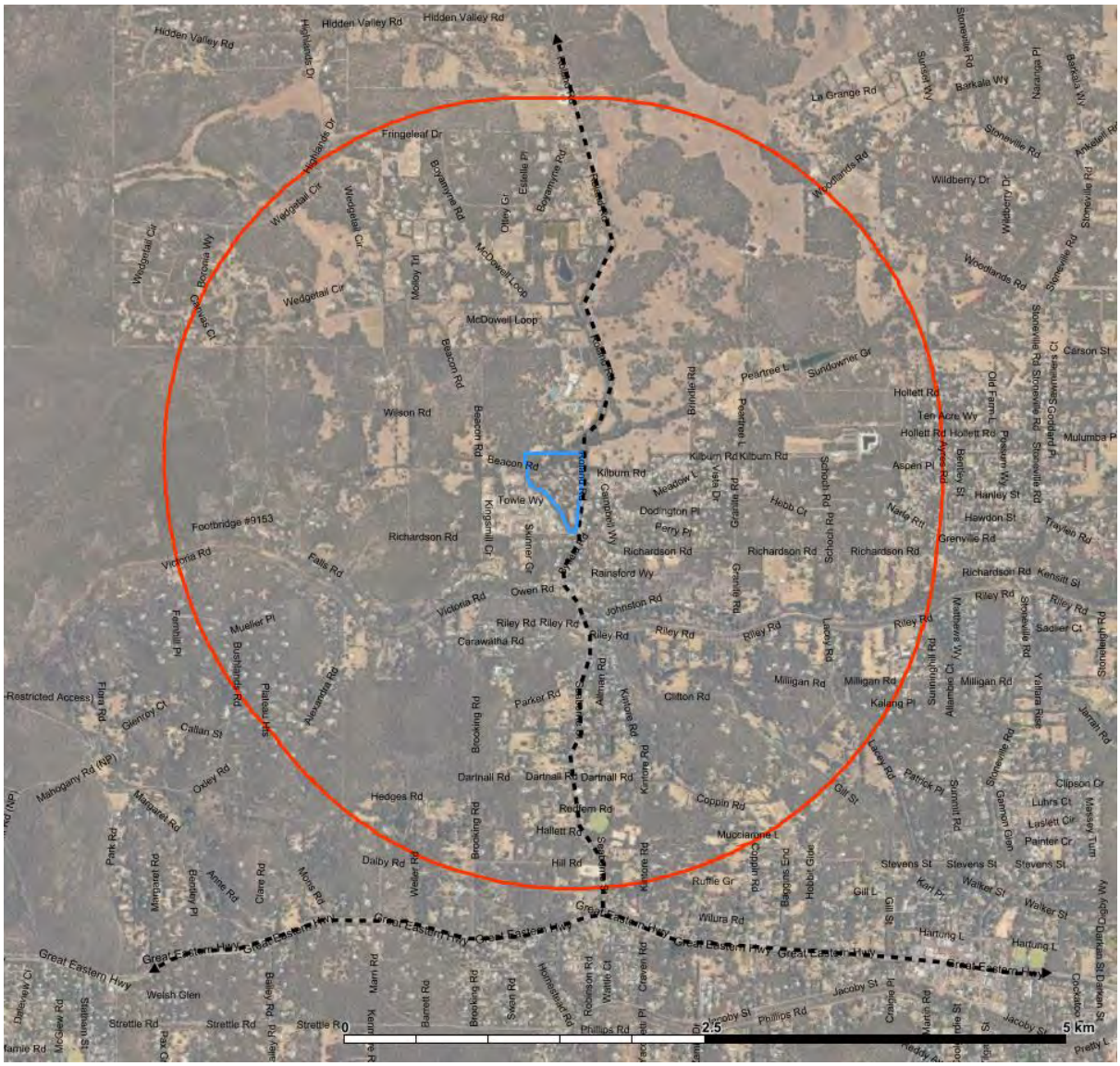


Plate 5: Illustrates the surrounding area, within 2.5 km. The site is within a fragmented landscape of small rural living holdings up to 2ha some largely cleared and others within forested estate. Contiguous forest Darling Scarp is 1 km west of the site and 5km south of the site contiguous forest leads to the Mundaring Weir

Topography

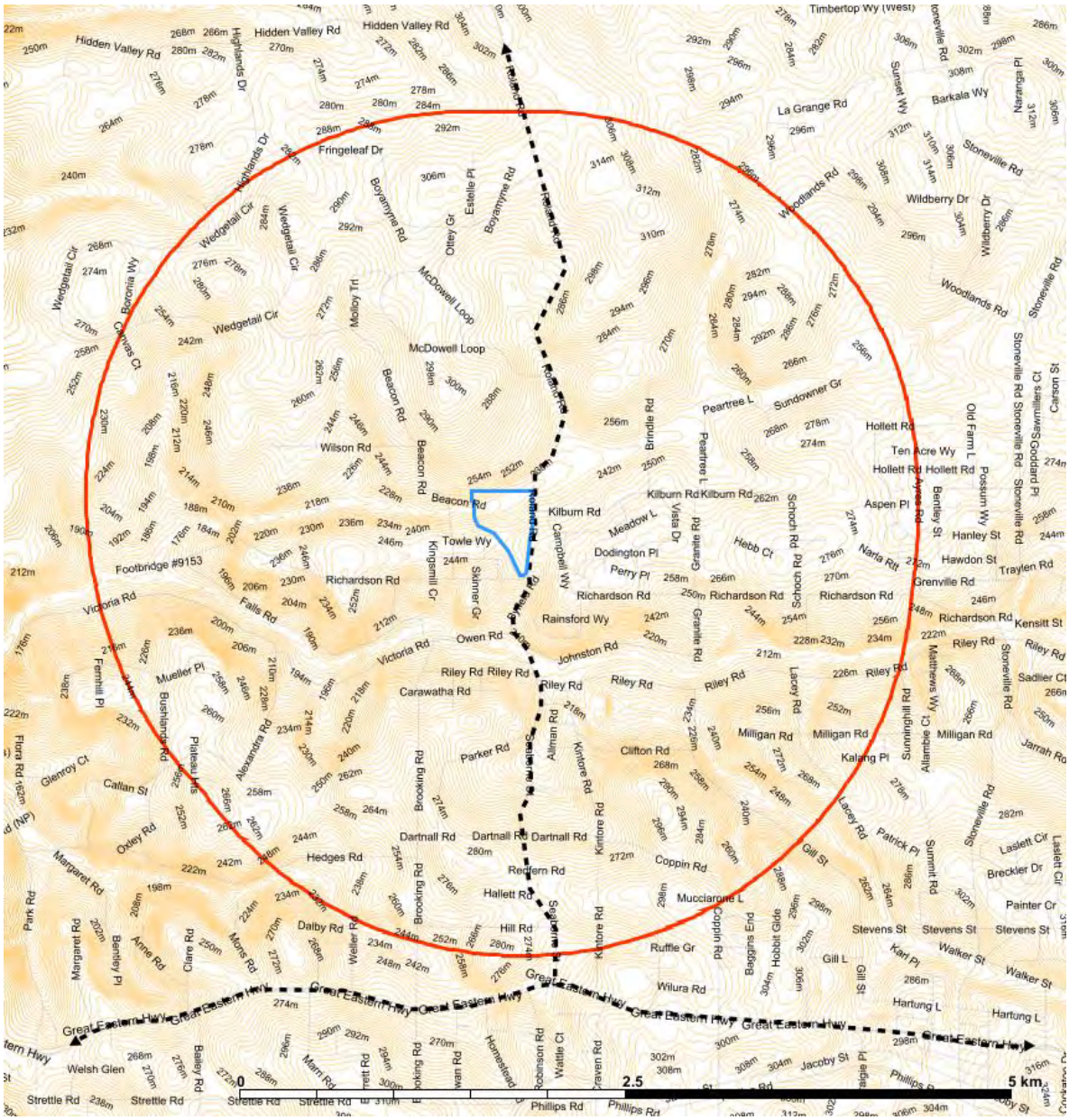


Plate 6: The site is undulating with east to west valley's (Victoria Road Johnson Road) with gradients up to 15.0^0. The site is within a shallow valley, the buildings on a low slope downwards to the north 4.0^0 and to a waterway before a foot of a hill rising at 8.0^0. The sporadic vegetation and complex slopes, some along steep gulleys make the fire behaviour erratic.

Frequency

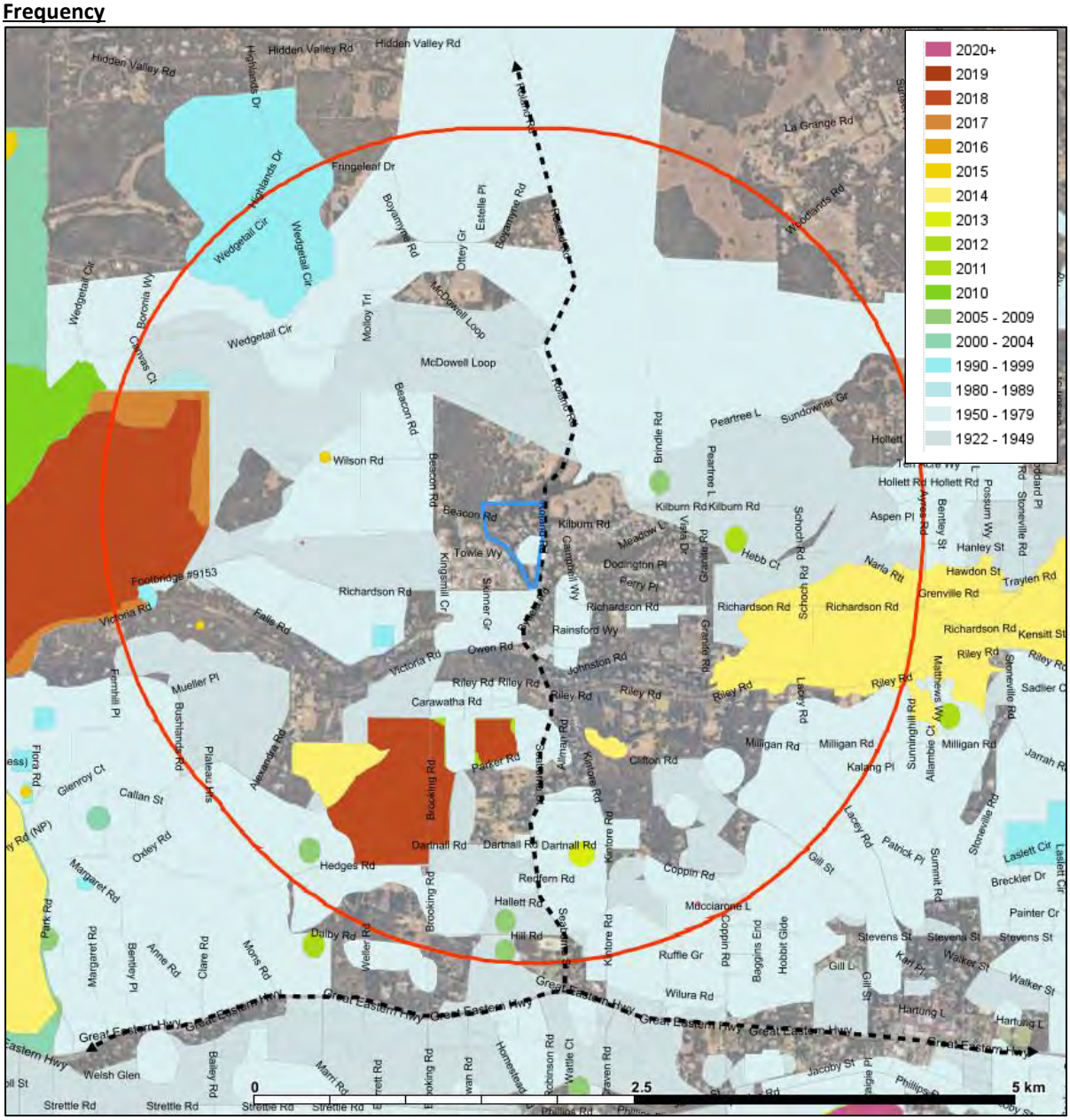


Plate 6: DBCA landscape fire history within a broader landscape 2. 5 km from the site. It is indicative as a level of activity and a possible gauge of fuel age. It does not distinguish between controlled and uncontrolled fires. It does not show the level of incidents and therefore is not indicative of all ignitions. Ignitions quickly responded to may not be recorded.

It is also not a determinant of frequency, notwithstanding an area may not show activity, there is a risk if fuels are present.

It provides an insight about land use patterns and activity in an area. There is often a counter balance between increased ignition potential from human activity, and land management and responsiveness, particularly through rural living areas.

Existing controls (that reduce the risk to life and property)

Existing controls are features and activities that presently reduce the harm to humans and assets.

These include:

- The Local Government Firebreak Notice to maintain all land to limit the spread of bushfire, including within urban areas.
- The Local Government and WAPOL enforcement of total fire ban days (to reduce the potential for ignition) and the Shires enforcement of its annual notice *Bush Fires Act 1954*, to reduce ignition of a bushfire.
- The site is within a 4G network, mobile phones are automatically alerted to fires in the area, supporting an early and safe evacuation.

Risk Evaluation

Jarrah/Marri forests are prone to ejecting burning embers in advance of a fire front. The school site can be expected to be subject to ember attack from a fire up to 5 km distant and upwind from the site. Burning embers can potentially reach readily flammable material, i.e. open rubbish bins, or amass against heavier materials to ignite them, which may expose a building to a direct flame contact.

The longest continuity of bushfire forest fuel is from the west, but the fire history is predominantly landscape fires arriving from the east.

The site is potentially exposed to a fire front arriving from the north and west, and running into the site, which will require separation of forest from the buildings to avoid flame contact. South and east of the site is predominantly low threat or pasture that is separated by Beacon Road and Roland Road (respectively). The site at its south and east perimeter retains areas with trees and unmanaged understorey.

The wind roses suggest a fire from the north is rare, but a fire can come from any direction. A wind driven fire front may reach the site from the west and there is a high frequency of winds from the west in the afternoons through the bushfire season. Easterly landscape fires are however the most frequent having a high frequency in the mornings and afternoons through the bushfire season. A fire arriving at the site from the east is likely to be preceded by spotting and start up within the site, due to the pasture land and Roland Road separation at the east boundary.

The area within the School, around the buildings is predominantly parkland: grass and woodland if grass is curing and >100mm tall. It has been assessed as woodland but capable with maintenance and irrigation of achieving a parkland standard (excluded threat).

The buildings are highly vulnerable to flame and ember attack in their present condition but are capable of achieving a high level of ember resistance whilst maintaining their historic attributes. Combined with parkland management of immediate areas to a distance that will achieve BAL 19 at each restored building, this will enable the use of historic materials in the building restoration and offer a high level of passive resistance.

The school should be evacuated if a fire is likely to reach within a distance of 5 km from the school. Wind changes, that may place the school in the path of the fire, should also be anticipated in determining whether it is safe to evacuate.

Evacuation should be taken south by Beacon Road and Roland Road through to the Great Eastern Highway.

Roland Road offers alternate destination north but is bordered by classified vegetation of an extreme bushfire hazard level. Roadways may become congested which can slow progress and increase the risk of being caught on the road in a bushfire.

Evacuation must be taken early before the road is overtaken by bushfire.

Evacuation is only safe if the evacuation destination can be reached without exposure to bushfire through the journey.

If it is unsafe to leave, shelter should be taken on site in buildings designed to the NCC 2022 for shelter within Class 9b buildings. Worthington Hall is a large masonry building and a gathering space (Hall/Dining). It has capacity for all guests on site and has been identified as the best prospect for shelter as a last resort because of its central position. Worthington Hall will require an expanded area of surrounding parkland (keeping the trees but managing the understorey) to achieve the required rating of 10 kWm^2. The internal driveway vehicle access to Worthington Hall is an internal and indirect arrangement from the east of the site. A direct connection between Beacon Road and Roland Road is provided by the proposal.

Likelihood

The likelihood of a bushfire affecting the site is considered 'likely' (less than 1 in 10 years). Rather than by the historic frequency this is based upon the presence of bushfire fuels and activities in the locality.

Consequence – Present risk

Social/human Do nothing

A do-nothing response may expose guests to fatal levels of heat.

Smoke from forest fires cause respiratory harm for students with respiratory sensitivity.

Bushfire is terrifying and may result in ongoing trauma.

Economic/Assets -Do nothing

A do-nothing response may result in significant damage to the building due to flame contact from grassfire, or from the ignition of materials stored under or near the building that if ignited may expose the building to flame contact.

The buildings may be subject to ember attack from forest fires. Embers penetrating the building through windows/opening or through exterior gaps could ignite flammable materials inside. Embers can also accumulate against flammable object to cause their ignition and in turn the exposure of the building to flame contact.

Smoke may penetrate the building.

Risk treatments

Prevent Ignition

The proposal is not identified as a high-risk land use – potential to ignite or prolong a bushfire.

Preserve Life - Manage the exposed

The site has the opportunity to evacuate in a direction opposite to an approaching fire.

The Bushfire Emergency Evacuation Plan is a risk treatment that describes the procedures to be followed in a bushfire event.

Occupant awareness of an approaching bushfire and clear instruction will maximise the opportunity to evacuate the site.

Evacuation should be taken to destinations identified by emergency services when the instruction to evacuate has been given. The BEEP provides default evacuation destination.

If it is unsafe to leave the site shelter can be taken as a last resort at Worthington Hall.

Reduce the impact of bushfire on property - Manage the Fire

Sustainable fire combustion depends upon the availability of fuel, oxygen, and heat. Removal of any one of the three aspects will extinguish or not sustain a fire. Fuel management (the management of vegetation) is the most practical means of control, to reduce the heat at the building.

An APZ will be provided (Parkland to be maintained) around all restoration buildings and is to be maintained to APZ standard as described (Schedule 1 Element 2) in the Guidelines. The APZ is to achieve BAL 19 or less, at each restoration building. This will enable the use of historic materials in the building restoration.

The adoption of AS3959:2018 (bushfire construction) commensurate to BAL 19, should be incorporated where practical into the building restorations. It can provide a construction that is resistant to the radiant heat level (up to 19 kWm^2). This level enables the use of historic materials but restricts exterior gaps to less than 2mm and by the use of resistant materials at ledges, the base of walls, window frames increase the resistance of the building.

During a bushfire, materials/litter will be blown and accumulate against a building. The ability to attend the building after the passing of the fire front and have access to convenient suppression facilities (fire hoses) is an advantage. Attention will also be provided to the underside of the buildings to prevent the ignition of supporting post and the underside of floors.

Worthington Hall has been identified as a shelter as a last resort option, to incorporate the standard for community refuges and the pending Class 9b Performance Solutions. It is to be sited at $10kWm^2$ based upon the NCC 2022 calculation, have a minimum construction standard BAL 19 (BAL 29 is recommended). It is to have a recommended capacity of 1.2 m^2 per person for shelter and meet the prescribed tenability requirement, no less than those specified in Specification 43. A direct vehicle access to the public roads Beacon Road and Roland Road.

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5. BUSHFIRE PROTECTION MEASURES

5.1 Bushfire Protection Criteria (Appendix 4 of the Guidelines V1.4)

For each of the elements listed within Appendix 4 of the Guidelines for Planning in bushfire-prone areas, the 'intent' must be achieved either by the proposal meeting the acceptable solutions; or where these acceptable solutions cannot be fully met, then by a performance-based solution that can achieve the 'intent.'

Table 2: Bushfire Protection Criteria assessment.

✓	Acceptable solution provided	C	An Acceptable Solution to be conditioned
N/A	Not Applicable	P	Performance Principle solution see 5.2

Bushfire Protection Criteria	Method of Compliance	AS	PP	Proposed Bushfire Management Strategies
Element 1: location To ensure that strategic planning proposals, subdivision, and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property, and infrastructure	**A1.1 Development location** The strategic planning proposal, subdivision, and development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL–29 or below.	✓		In accordance with the WAPC Position Statement: *Planning in bushfire prone areas – Demonstrating Element 1: Location and Element 2: Siting and design*, the consideration of the bushfire hazard level is not relevant to a development application, the emphasis is instead upon achieving BAL 29 at completion. The proposal is a development application (restoration of an existing development). The emphasis is therefore to ameliorate the bushfire impacts at the development site, rather than the general area and on completion, be BAL–29 or lower.

Bushfire Protection Criteria	Method of Compliance	AS	PP	Proposed Bushfire Management Strategies
Element 2: Siting and Design To ensure that the siting and design of development minimises the level of bushfire impact	**A2.1 Asset Protection Zone** Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements: • Width: Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m² (BAL-29) in all circumstances. • Location: the APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity (see explanatory notes). • Management: the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones.' (see Schedule 1).	✓		Figure 4b and 5b (NCC2022) illustrates that each building can achieve a BAL not exceeding BAL 29. An APZ will be established around each restoration building and wholly within the site, which achieves BAL 19 (to permit the use of historic materials available at the level AS3959:2018). The proposed shed is required to be sited at BAL 29, and Asset Protection Zone to 'forest' has been identified for the shed. Worthington Hall has been identified as the shelter building and has been provided (Figure 4b and 5b) (NCC2022) with the required management area to achieve 10kWm^2 at the building. Figure 4b illustrates the present requirement, using a flame temperature increased to 1200K Figure 5b illustrates the NCC2022 method DtS, FDI 100 (APE 1:200) and slopes either flat or 20 degrees. Using either method Worthington Hall can achieve 10kWm^2.

<table>
<tr><th>Bushfire Protection Criteria</th><th>Method of Compliance</th><th>AS</th><th>PP</th><th>Proposed Bushfire Management Strategies</th></tr>
<tr>
<td>Element 3: Vehicular Access (only policies applicable to a development application have been addressed)

P3i

The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.</td>
<td>A3.1 Public roads

The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.

Public roads are to meet the minimum technical requirements in Table 6, Column 1.

The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.</td>
<td>✓</td>
<td></td>
<td>Table 6: Vehicular access technical requirements
<table>
<tr><th>TECHNICAL REQUIREMENTS</th><th>1
Public roads</th><th>2
Emergency access way[1]</th><th>3
Fire service access route[1]</th><th>4
Battle-axe and private driveways[2]</th></tr>
<tr><td>Minimum trafficable surface (metres)</td><td>In accordance with A3.1</td><td>6</td><td>6</td><td>4</td></tr>
<tr><td>Minimum horizontal clearance (metres)</td><td>N/A</td><td>6</td><td>6</td><td>6</td></tr>
<tr><td>Minimum vertical clearance (metres)</td><td colspan="4">4.5</td></tr>
<tr><td>Minimum weight capacity (tonnes)</td><td colspan="4">15</td></tr>
<tr><td>Maximum grade unsealed road[3]</td><td rowspan="4">As outlined in the IPWEA Subdivision Guidelines</td><td colspan="3">1:10 (10%)</td></tr>
<tr><td>Maximum grade sealed road[3]</td><td colspan="3">1:7 (14.3%)</td></tr>
<tr><td>Maximum average grade sealed road</td><td colspan="3">1:10 (10%)</td></tr>
<tr><td>Minimum inner radius of road curves (metres)</td><td colspan="3">8.5</td></tr>
</table>
Notes:
[1] To have crossfalls between 3 and 6%.
[2] Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.
[3] Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.

The site has access (frontage) onto Beacon Road connects to Roland Road which are sealed and line marked public roads compliant with the technical requirements in Table 6 column 1 (Guidelines v1.4). It has a 5.8 m seal, 1.4 m shoulders (compliant with the IPWEA Guidelines for rural roads) and has a consistent vertical clearance exceeding 4.5 m high.</td>
</tr>
</table>

Bushfire Protection Criteria	Method of Compliance	AS	PP	Proposed Bushfire Management Strategies
	A3.2a Multiple access routes Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access). If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.	✓		The site gains access from Roland Road at its east boundary and Beacon Road onto Roland Road from its south boundary. Roland Road runs north south. It connects to Toodyay Road to the north, and the township of Parkerville and the Great Eastern Highway (through Byfield Road and Seaborne Street) south of the site. Roland Road provides the site with access/evacuation options to two different directions to at least two different suitable destinations.
	A3.2b Emergency access way Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution. An emergency access way is to meet all the following requirements: • requirements in Table 6, Column 2; • provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.	N/A		

Bushfire Protection Criteria	Method of Compliance	AS	PP	Proposed Bushfire Management Strategies
	A3.6 Private driveways There are no private driveway technical requirements where the private driveway is: • within a lot serviced by reticulated water; • no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and • accessed by a public road where the road speed limit is not greater than 70 km/h. In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following require: • requirements in Table 6, Column 4; • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and • turn-around area as shown in Figure 28 and within 30 metres of the habitable building.	✓		The private driveways servicing the proposed school are longer than 70 m. Vehicle access to each building is proposed. The private driveway is to be provided compliant with Table 6, Column 4. The areas around the buildings are woodland and open grass, that will enable compliance. The primary driveways will be 6 m wide and others servicing buildings may be 4 m wide with open opportunities (within 200 m) for the passing of vehicles. Two additional driveways from the development site will provide connection onto Beacon Road. One is to serve the shed at the north west portion of the development site, and the other provides a direct access from Worthington Hall (shelter) onto Beacon Road. Access to Worthington Hall had been an internal loop (convoluted) access from the east of the site. The access from Beacon Road to Worthington Hall will provide a direct access to Worthington Hall 134 m from Beacon Road and onto Roland Road 268 m.
Element 4: Water To ensure that water is available to the subdivision, development or land use to enable people, property and	**A4.1 Reticulated areas** The subdivision, development or land use is provided with a reticulated water supply in accordance with the specifications of the relevant water supply authority and Department of Fire and Emergency Services.	✓		.

Bushfire Protection Criteria	Method of Compliance	AS	PP	Proposed Bushfire Management Strategies
infrastructure to be defended from bushfire	**A4.2 Provision of water for firefighting purposes** Where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, then the following applies: • The provision of a water tank(s), in accordance with the requirements of Schedule 2; and • Where the provision of a strategic water tank(s) is applicable, then the following requirements apply: – land to be ceded free of cost to the local government for the placement of the tank(s); – the lot or road reserve where the tank is to be located is identified on the plan of subdivision; – tank capacity, construction, and fittings, provided in accordance with the requirements of Schedule 2; and – a strategic water tank is to be located no more than 10 minutes from the subject site (at legal road speeds). Where a subdivision includes an existing habitable building(s) that is to be retained, a water supply should be provided to this existing habitable building(s), in accordance with the requirements listed above.	C		The site is connected to a reticulated water supply and is compliant with the bushfire requirement. The development proposal is subject to structural fire requires applicable through the Building Act 2011 and the NCC 2022. It is recommended, in the considerations for structural fire requirements, that external fire hoses are provided at each building capable of applying water to all parts of the building, and an area 10 m around it, to attend to any small fires before they can ignite the building following the passing of the fire front.

5.2 Additional management strategies

The BEEP, which forms part of this proposal, follows the Department of Education's *Principal's Guide to Bushfire* and the *Stand-alone Bushfire Plan Template For 2019-2020.*

The proposed BEEP is attached in Attachment 1.

Section 5.5.4 V1.4 in Guidelines for Planning in Bushfire Prone areas lists the matters to be addressed in a BEEP. That list and the content of the attached BEEP have been compared in **Table 3.**

Table 3: Compliance with Cl. 5.5.2 *Guidelines for Planning in Bushfire Prone Areas*

The emergency evacuation plan should be concise and consider:	**Addressed in the Emergency Evacuation Plan**
The number of persons at the facility	TBC
Whether the occupants are permanent or transient	Transient
Whether there is a caretaker on site	The school is under supervision when students are present
Whether there are people with a disability, medically dependant, young children, or the elderly	Years 7 -12
Identification of a safe alternative location if there was a need for evacuation/relocation	A reciprocal arrangement is to be made
A proposed method of movement of occupants to a safe location(s)	Private vehicles, and supplementary bus transport if evacuating the site, and pedestrian access to the proposed refuge building Worthington Hall.
Details of suitable access/egress routes for the expected type/volume of traffic, including alternatives when suitable roads are inaccessible, insufficient or inappropriate	Safe route will be on advice from emergency services. Evacuation is to be taken by Roland Road North and south evacuation destination options have been identified in the BEEP
Transport options for those without access to private vehicles	Supplementary bus transport
Options to shelter in place as a last resort	Evacuation if safe to do so. Shelter Building Worthington Hall is to be provided compliant with the Design and Construction of Community Bushfire Refuges, or the Performance Solutions NCC 2022 (Part G5).
Roles and responsibilities of facility personnel and emergency services.	Roles and responsibilities are Provided in the Stand-Alone bushfire plan for the school. It follows the Department of Education Template to provide consistency for Emergency Services.

The emergency evacuation plan should consider if actions will change based on a series of triggers, such as:	Addressed in the Emergency Evacuation Plan
Effective warning methods appropriate for the occupants (including consideration of at-risk persons and the demographics of the occupants)	Provided in the Stand-Alone template for the school, and the Stand-Alone bushfire plan
Closure of facility and early relocation of occupants appropriate to the fire danger rating (FDR) and bushfire warnings	The School Principal will make the decision to close a school based on Forecast condition > 75+, public warning to evacuation and direct emergency advice. The School Principal should not await external advice to evacuate if concerned the School may be affected by bushfire.
Any local government bushfire requirements (for example, harvest and vehicle movement bans)	N/A
A suitably qualified emergency management professional should prepare the emergency evacuation plan in collaboration with relevant stakeholders including the landowner/developer and the local government (refer to section 6.14 of the Guidelines)	Anthony Rowe Accreditation Level 3 Accreditation Number: 36690

6. RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE MEASURES

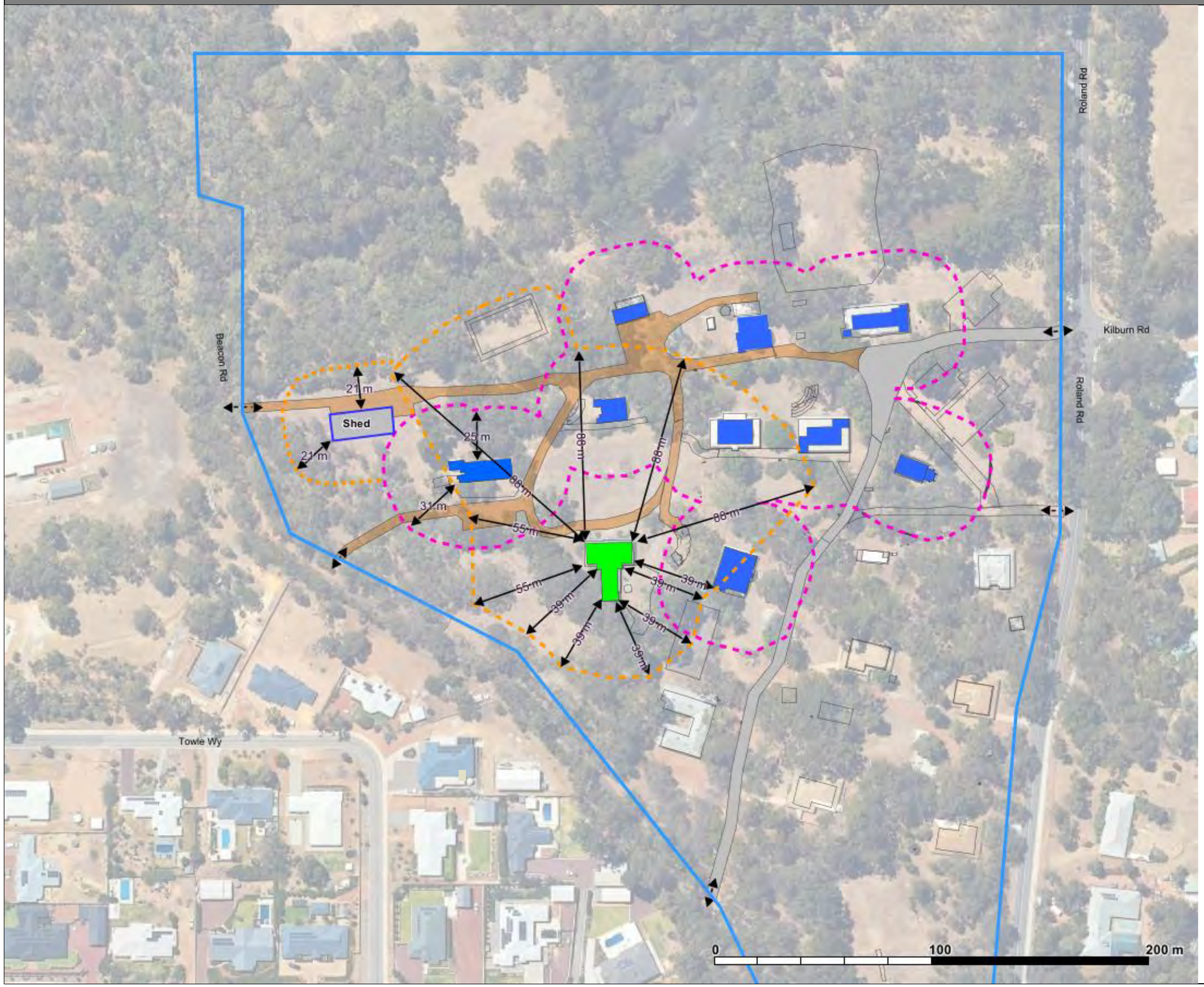
The responsibilities for implementation and management of the bushfire measures, summarises the measures identified to achieve compliance with the bushfire protection measures following SPP 3.7. This has been provided in the Summary. The details contained within the planning application authorised by the responsible decision maker are enforceable under section 214 of the *Planning and Development Act 2005*. The items addressed in the table responsibilities for implementation and management of the bushfire measures form part of the planning authorisation and where there is conflict supersede the detail of the planning application.

Management action	Timing
Proponent	
1. Implement the Bushfire Emergency Evacuation Plan (**Attachment 1**) and maintain its currency.	Details to be completed prior to occupation and in alignment with the overall Emergency in Facilities Plan.
2. The restoration of each building is to be constructed compatible, and as far as practical in maintaining the historic values of the building, in accordance with the construction requirement for BAL 19: at section 3 and 6 in AS3959:2018.	Prior to occupation
3. An Asset Protection Zone is to be established/maintained around each restoration building that achieves BAL 19. The APZ should extend 25 m to Woodland (-5) and 31 m to Forest (Flat). The APZ being irrigated grasses no taller than 100 mm under tree canopies maintained no lower than 3m to the ground).	Ongoing
4. A 10kWm^2 Shelter (Protection Area) is to be established around the Worthington Hall as shown on Figure EX1, It is to be established/maintained with the understorey no taller than 100 mm, and a minimum 3 m clearance of tree canopies from the ground.	Prior to occupation.
5. Worthington Hall is to be constructed in accordance with the Performance Solutions in the National Construction Code 2022 Part G5 and the applicable Deemed to Satisfy - Specification 43.	Prior to occupation.
6. The private driveway shall be constructed/maintained in accordance with the technical requirement Table 6 column 4 (Private Driveway) and the provision of a turnaround area at all dead ends that meets the dimensions described in E3.6; *Guidelines for Planning In Bushfire Prone Areas* V1.4.	Prior to occupation.
7. External fire hoses are to be provided for fire suppression at each building that is capable of applying water on to the external surface of all habitable buildings and a distance of 10 m around the building without reliance on mains power.	Prior to occupation.

Acknowledgment - Proponent

The proponent acknowledges the responsibilities as listed above and the requirement to ensure that should the land transfer to a new owner, that the new owner is aware of the BMP and their ongoing responsibility.

Figure Ex 1 - Spatial representation of the proposed risk management strategies – Parkerville Children & Youth Care 1 Beacon Road Parkerville



Responsibilities for implementation and management of the bushfire measures

1. The restoration of each building is to be constructed compatible, and as far as practical in maintaining the historic values of the building, in accordance with the construction requirement for BAL 19: at section 3 and 6 in AS3959:2018.

2. An Asset Protection Zone is to be established/maintained around each restoration building that achieves BAL 19. The APZ should extend 25 m to Woodland (-5) and 31 m to Forest (Flat). The APZ being irrigated grasses no taller than 100 mm under tree canopies maintained no lower than 3m to the ground)..

3. A 10kWm^2 Shelter (Protection Area) is to be established around the Worthington Hall. It is to be established/maintained with the understorey no taller than 100 mm, and a minimum 3 m clearance of tree canopies from the ground.

4. Worthington Hall is to be constructed in accordance with the Performance Solutions in the National Construction Code 2022 Part G5 and the applicable Deemed to Satisfy - Specification 43.

5. The private driveway shall be constructed/maintained in accordance with the technical requirement Table 6 column 4 (Private Driveway) and the provision of a turnaround area at all dead ends that meets the dimensions described in E3.6; Guidelines for Planning in Bushfire Prone Areas V1.4.

6. External fire hoses are to be provided for fire suppression at each building that is capable of applying water on to the external surface of all habitable buildings and a distance of 10 m around the building without reliance on mains power.

LEGEND

- Site Boundary
- Shelter Protection Area– set to 10 kWm^2 (NCC 2022)
- Shed APZ – 21 m
- Asset Protection Zone BAL 19 to restoration buildings
- Suitable destination (Worthington Hall)
- Restoration buildings

ATTACHMENT 1a - Emergency Evacuation Plan (DPLH checklist)

EMERGENCY EVACUATION PLAN CHECKLIST

ESTABLISH THE CONTEXT		
The site is: • Within close proximity to Extreme vegetation class, and/or access is exposed to extreme conditions. • Within Moderate Bushfire Hazard Level and the route is predominantly through moderate conditions, grassland and isolated forest exposures <200 m to the suitable destination. • Within a Low (urban)/Moderate (Peri Urban) Bushfire Hazard Level and the route is BAL Low excepting isolated forest exposures <200 m to the suitable destination.	Extreme	☐
	Moderate	☒
	Low	☐
Comment: • The site is at the urban interface in a developing urban area facing Scrub vegetation.		
Does the facility have a large or small facility Organisation/management structure? Large - ability to assign emergency roles to many positions. Small - single person - undertakes all emergency roles (Preparation and Response).	Large	☒
	Small	☐
Comment: • The School has a large Organisational management structure, Principal, Administration Officers and teachers		
Is the onsite shelter available.	Build refuge std	☐
	Open shelter std	☐
	Last resort capable	☒
	Last resort not capable	☐
	No required	☐
Comment: • The site is always to be evacuated in a bushfire event, but Worthington Hall will be constructed to shelter standard.		

DETERMINE THE RESPONSE		
Always safe to evacuate.	Evacuate	☒
Safe shelter is available at site (evacuation is still preferred if safe – time permits).	Shelter	☐
Comment: • The site access may be temporarily closed while fire passes. Safe shelter is available at site		

ESTABLISHING THE EMERGENCY MANAGEMENT TEAM		
Is an **Emergency Planning Committee** established	Yes	☒
	No	☐
Comment: • The Emergency Planning Committee will comprise the Principal and the Board.		
Is the **Emergency Control Organisation (Incident Management Team)** established	Yes	☒
	No	☐
Comment: • The Incident Management Team shall comprise The Principal (Chief Warden) The Facilities Warden (groundskeeper) Transport Warden (nominated administration Officer) Communication Warden (principal or delegate) First aid Warden Teachers – to stay with and supervise children		
Are the emergency response triggers identified?	Yes	☒
	No	☐
Comment: **The Trigger to evacuate.** • Pre-emptive closure of components on Extreme 75+ and Catastrophic conditions • If smoke, embers, or a fire is seen nearby • If directly advised to leave by DFES or the police to leave.		
Is the facility prepared before each fire season	Yes	☒
	No	☐
Comment: • Annual review should include: <u>Emergency Evacuation Plan</u> - Confirm that the contacts in the Emergency Response Plan are correct. - Confirm offsite destinations are available and remain the best options. - Confirm that the monitoring system is the best available option for early and accurate warnings; changes may be made to public announcements and communication methods. - Confirm the arrangements for augmented transport. <u>Facility</u> - Asset Protection Zones (risk treatment Areas) around habitable buildings are maintained (Parkland cleared standard) - Buildings are maintained at authorised standard (comparable with BAL-29)		

- Access ways are maintained in a trafficable condition and compliant with technical requirements for Vehicular Access (bushfire). - Fire hoses are in working order.		
Are training procedures established before each bushfire season	Yes	☒
	No	☐
Comment: • The EPC acknowledges the responsibility to maintain awareness of fire danger and incident alerts: - Awareness of monitoring sources. • The EPC will ensure all staff members are aware of the Emergency Evacuation Plan, as well as the alarm and response actions.		

OFFSITE SHELTER ACCEPTABILITY		
Is an offsite shelter outside of the fireground or nearby	Outside	☒
	Nearby	☐
Comment: The nominated offsite facility outside the fire ground is: A reciprocal school to be nominated.		
Are there amenities (toilets, food, water etc.) available at the off-site location? (if applicable)?	Yes	☒
	No	☐
Comment: • The nominated offsite facility has amenities.		
Does the route to the off-site location require transporting through bushfire affected areas or areas that may be affected by an approaching bushfire?	Yes	☒
	No	☐
Comment: • The evacuation routes are exposed to bushfire		
Has the owner of the off-site location advised that they are happy to accommodate occupants if evacuation from a bushfire emergency occurs?	Yes	☐
	No	☐
Comment: • An arrangement with another school outside of the fireground will also be made as an alternative offsite destination. • The emergency evacuation facility is a published nominated facility – other destinations may be publicly announced during the event through Emergency WA.		

EVACUATION REQUIREMENTS		
Do occupants all have their own transport	Yes	☐
	No	☒
Comment: • Augmented transport will be arranged and calibrated.		
Will there be sufficient vehicles to transport all occupants?	Yes	☒
	No	☐
Comment: • Augmented transport will be arranged and calibrated.		
Have occupants with support needs been considered when determining transport types and necessary timing to evacuate?	Yes	☒
	No	☐
Comment: • The evacuation will follow the PEEP for affected students, if safe evacuation is not available shelter will be taken in Worthington Hall.		
Do you require ambulances? **If yes, St John Ambulance Australia needs to be consulted.**	Yes	☐
	No	☒
Comment: • The facility is not intended to be occupied by persons with dependency upon ambulances, unless addressed in a PEEP		
Is a community bus available?	Yes	☐
	No	☒
Comment: • Private vehicle will not be retained on site with sufficient capacity for students. Parent/carers will be advised **not to** attend the school, a collection destination will be identified		
Are other means of transport available?	Yes	☐
	No	☒
Comment: • Augmented bus transport will be arranged.		

SHELTER ONSITE - ACCEPTABILITY		
Is the shelter constructed to refuge standard?	Yes	☒
	No	☐
Comment: • Worthington Hall will be located within an area that can achieve 10 kWm^2 and will be provided with sufficient capacity 1.2 m 2 per person and meet the tenability requirement described in (NCC 2022) Specification 43		
Place of Last resort (Acknowledged by the owner)		
Is the property well maintained and kept free from a build-up of fuel and leaf litter in gutters and around buildings?	Yes	☒
	No	☐
Comment: • The Assembly Building (Worthington Hall) will be inspected annually to avoid the storage or accumulation of fuels near the building; for the purpose of minimising the consequence of secondary fire and damage to the building.		
Is the building sited away from bushland and is unlikely to be impacted by bushfire?	Yes	☐
	No	☒
Comment: • The building is at 10kWm^2 and subject to low heat, dispersed ember attack and smoke (addressed by Specification 43).		
Is the building constructed in a manner that minimises bushfire attack with appropriate Asset Protection Zones?	Yes	☒
	No	☐
Comment: • The building is within BAL-12.5 and 10 KWm^2. • Fire hoses are recommended and will assist the building survival after the passage of the fire by enabling any member of the community in attendance with convenient access to apply water to quickly extinguish any small fires – before it develops into a large one.		
Can the shelter accommodate the number of occupants and visitors?	Yes	☒
	No	☒
Comment: • Worthington Hall can accommodate all students.		
Is there ease of accessibility to the shelter, and is it easily identifiable**?**	Yes	☒
	No	☐
School pathways radiate from Worthington Hall. The route from the classrooms is direct and legible. Event control is to be transferred from the Administration building to Worthington Hall.		

ATTACHMENT 1b - Emergency Evacuation Plan - standalone-bushfire-plan

Formatted to the DoE standalone-bushfire-plan-template-2022-2023.

Parkerville Children & Youth Care

Parkerville Care School, 1 Beacon Road Parkerville

BUSHFIRE EMERGENCY EVACUATION PLAN

(Standalone bushfire plan)

2024-2025

October 2024

Purpose

The Bushfire Emergency Evacuation Plan (*Standalone bushfire plan)* is a detailed plan to prepare and respond to dangerous bushfire conditions or to a bushfire event.

This plan follows the Department of Education *Principal's Guide to Bushfire* and the Department of Education *Standalone Bushfire Plan Template* **for consistency to assist Emergency Services attending both private and public schools.**

All staff, students, contractors and visitors on the school are to follow this completed plan in the event of a bushfire emergency.

Note 1

This Bushfire Emergency Evacuation Plan follows the preparation of a Bushfire Management Plan dated 1 October 2024 (BMP).

It included a risk assessment and the identification of the safest buildings following the Design and Construction of Community Bushire Refuges (ABCB 2014) and the requirements for Class 9b buildings in the National Construction Code 2022.

The school site can be expected to be subject to ember attack from a forest fire up to 5 km distant and upwind from the site. Burning embers can potentially reach flammable material, i.e. open rubbish bins, or amass against heavier materials to ignite them, which may in turn cause an ignition and expose a building to direct flame contact.

The site is potentially exposed to a fire front arriving from the north and west, and running into the site, which will require the separation of forest from the buildings to avoid flame contact.

South of the site is a low threat urban area and west of the site is pasture (a moderate threat) that is separated from the site by Roland Road.

The wind roses suggest a fire from the north is rare, but a fire can come from any direction. A wind driven fire front may reach the site from the west and there is a high frequency of winds from the west in the afternoons through the bushfire season.

Easterly landscape fires are the most frequent (easterly winds are a high frequency in the mornings and have a high occurrence in the afternoons through the bushfire season.

The BMP identified Worthington Hall as the most appropriate 'safer location' due to its masonry construction and enclosed underside and a capability to achieve 10kWm^2 at the building.

The building will be restored and will achieve compliance with BAL 29 AS3959:2018, s.3 and 7.

Note 2

The Department of Education *Standalone Bushfire Plan Template* preferences the identification of two offsite evacuation destinations.

A reciprocal school arrangement is to be determined to be the preferred evacuation destination for the school.
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1 School details 3

2 Emergency response contact list Error! Bookmark not defined.

3 School Response Team 6

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Appendix B - Procedures in event of a sudden bushfire 18

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Appendix D – After hours or school holiday procedures 25

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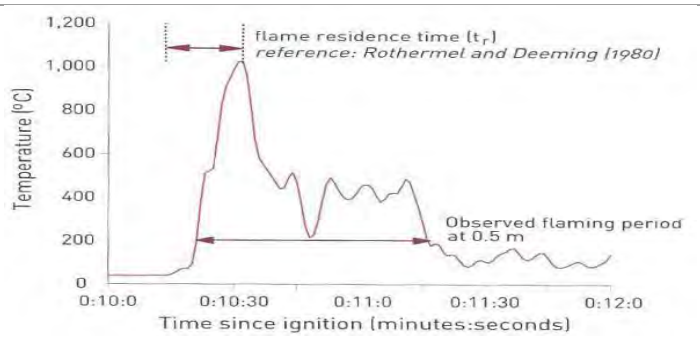
DEFINITIONS

TERM	DEFINITION
Chief Warden (IMT chair)	Principal
Incident Management Team - Bushfire (IMT)	Principal Facilities Manager Transport Warden Communications Warden
Asset Protection Zone	Horizontally and vertically arranged fuels that prevent continuity and the spread of bushfire. Providing a distance that achieves BAL 19 at the restoration buildings.
Shelter Protection Area	Horizontally and vertically arranged fuels that prevent continuity and the spread of bushfire. Providing a distance that achieves 10 kWm^2 at Worthington Hall, as determined by the methodology in NCC 2022 for class 9 b buildings.
BoM	Bureau of Meteorology provides weather forecasts, including the Fire Behaviour Index for determining pre-emptive evacuation or closure of the School. http://www.bom.gov.au/wa/forecasts/fire-danger-ratings.shtml
Bushfire Attack Level (BAL)	Arranged in seven categories representing a maximum radiant heat flux for each category: BAL 19 = up to 19 kWm^2 as determined by the methodology in AS3959:2018. The BAL rating reduces as the separation from heat source increases. BAL 29 and less is outside of flame contact. Safe outside shelter is 2 kWm^2; injury occurs above 3 kWm2 and prolonged exposure > 30 seconds can be fatal at 10 kWm^2; 10 kWm^2 is considered the maximum protection provided by a vehicle.
DFES	Department of Fire and Emergency Services undertakes the community emergency response, may provide specific advice regarding fire location and safety: - 13 33 37 https://www.emergency.wa.gov.au/
Evacuation	The orderly movement of people from a place of danger.
Incident Controller	The DFES officer designated as Controller by DFES in the event of a bushfire.
Prevention	The arrangements made to ensure that should an emergency occur all those resources and services that are needed to cope with the effects can be mobilised and deployed.
Preparedness	The measures taken to eliminate the incidence of emergencies. These include the regulatory and physical measures to ensure that emergencies are prevented.
PEEP	Personal Emergency Evacuation Plan. An individual emergency event plan for a person who requires additional or specific assistance to evacuate
Response	Actions taken immediately prior to, during, and immediately after an emergency or critical incident to ensure that its effects are minimised.
Recovery	Measures that support emergency or critical incident-affected individuals and school communities in the reconstruction of the physical infrastructure and restoration of emotional, economic, environmental and physical wellbeing.
Flame Residence time	Heat builds prior to the arrival of the fire front (peak) and decays quickly after its passing.

	 From *NCC Handbook: Bushfire Verification Method 2021*
RSET - Require Safe Egress/Evacuation Time	The time taken from alarm to the last person leaving the site. This should be determined through practice drills.

1 School details

School name (include name of co-located school or facilities if applicable)	Parkerville Care School
School address	1 Beacon Road Parkerville
Number of students	**Total: TBC**
Number of students requiring extra support if evacuating	TBC
Number of staff	**Total: TBC**
Number of school sides bordered by bush	North (Forest) East (Pasture) South (Urban) West (Forest).
Names of major roads bordering school	Roland Road
School's site-specific alert	Siren/pause x 3
Onsite shelter	Worthington Hall
Offsite shelters	1. Brown Park Community Recreation Centre Salisbury Road Swan View WA 6056 2. Reciprocal/Alternative school TBC

Plan prepared by (principal's name)	TBC
Date prepared	October 2024

2 Emergency response contact list

Organisation	Details	Phone number / Website
Local police (e.g. name of nearest police station)	Mundaring Police Station 7250 Great Eastern Hwy, Mundaring	(08) 9290 1900
Local hospital (e.g. name of nearest hospital or medical emergency facility)	St John of God Midland 1 Clayton St, Midland	(08) 9462 4000
DFES regional contact	TBC	
Local fire brigade (e.g. name of nearest fire station)	Parkerville Volunteer Bush Fire Brigade 644 Riley Rd, Parkerville	
Bus contractors (ready for pre-emptive closure or offsite evacuation)	TBC	
Electricity provider - in the case of a power outage	TBC	
State emergency service (if known)	Mundaring SES 14 Wandeara Cres, Mundaring	132 500
Director of Education – contact name	TBC	

Dial 000 in an EMERGENCY

2.1 Other important emergency sources

1) **Emergency WA website**

   www.emergency.wa.gov.au

2) **Department of Fire and Emergency Services**

   Information line – 13 33 37

3) **Local radio**

   - ABC local radio
   - ABC Emergency

     www.abc.net.au/emergency

4) **Bureau of Meteorology** – Western Australia Fire Danger Ratings

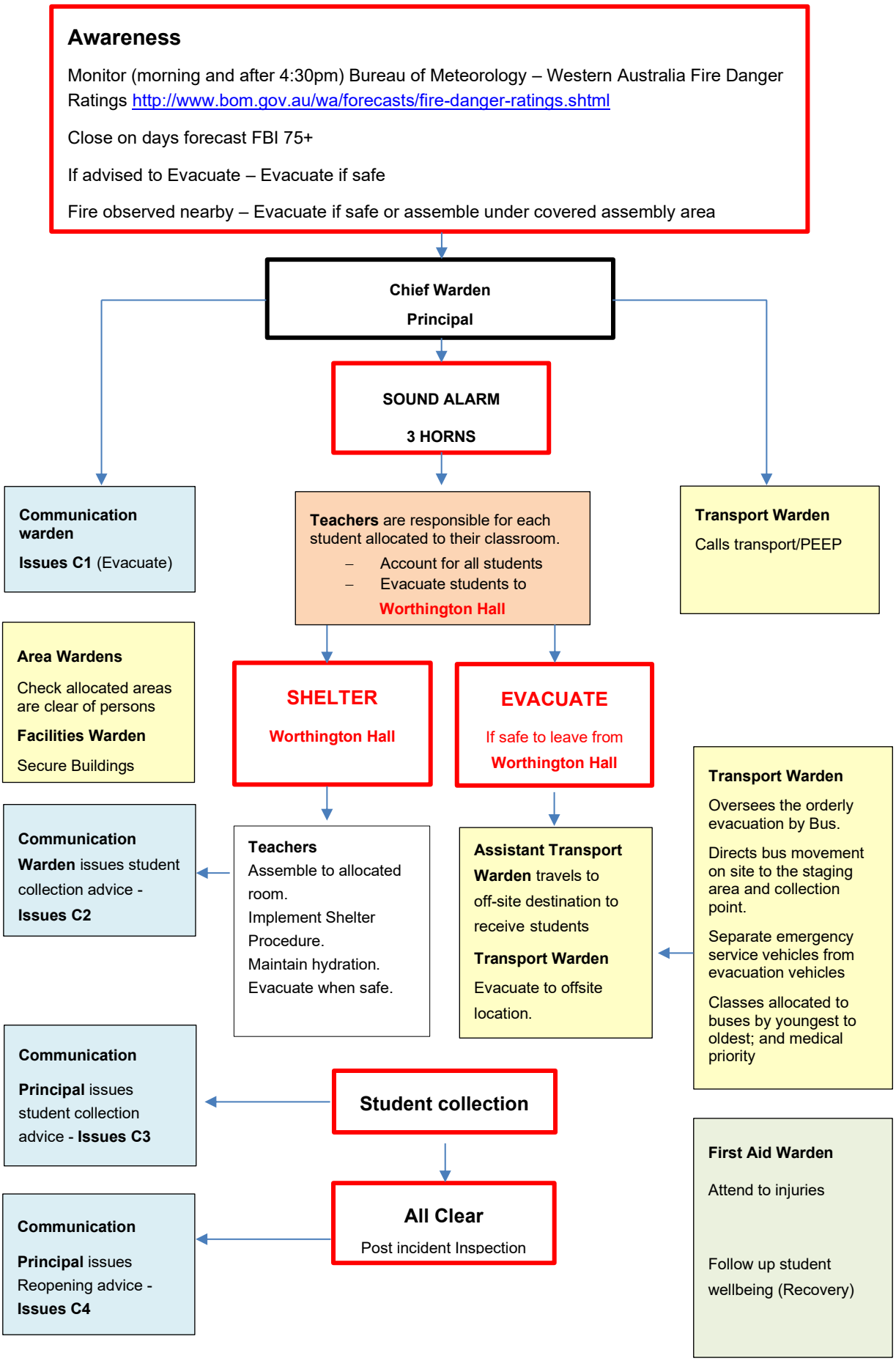
   www.bom.gov.au/wa/forecasts/fire-danger-ratings.shtml

The Shire of Mundaring advises if an area needs to be evacuated, the Shire will notify residents of the appropriate evacuation centre via Emergency WA, ABC Radio Perth (720 AM), the Department of Fire and Emergency Services (DFES) WA website and the Shire website and social media channels.

3 School Bushfire Response Team

Position (Hat colour)	Staff Name	Duties	Mobile number
Principal Chief Warden (IMT Chairperson) (white)	TBC	Determine the evacuation requirement Coordinate Emergency services Enact and coordinate the Bushfire Response Action Plan from 'Alarm' to the completion of 'All Clear' Provide incident control Confirm the All Clear Verify the safety of the facility Determine commencement of evacuation	
Transport Warden (IMT member) (yellow)	To be nominated	Implement the supplementary transport Summon buses and PEEP transport arrangements Oversee the orderly allocation of students onto the transport Maintain a separation of emergency service vehicles and evacuation vehicles	
Communications Warden (IMT member) (yellow)	To be nominated	Oversees communication (external) Oversees student registers Oversees PEEPs	
Facilities Warden (IMT member) (yellow)	Grounds Manager	Oversees the securing of all buildings Oversees the preparation of the grounds Prepare grounds (close bins) and ensure as far as practical that flammable objects have been removed from against the buildings i.e., schoolbags Oversees fire suppression (minor) Inspects grounds and buildings for damage	
Assisting Transport Warden (yellow)	To be nominated	To receive and coordinate students at the offsite destination.	
Area Warden (yellow)	To be nominated	To support the Facilities warden in securing the site and ensuring the assembly of students at Worthington Hall.	
First Aid Warden (green)	To be nominated	Attend to any injuries e.g., burns, eye injury, respiratory distress. Assists teachers to maintain student wellbeing and hydration.	
Teachers (red)	Class teacher	Supervise the movement of students to Worthington Hall for evacuation off site, or shelter. Keep students calm and hydrated Supervise and account for students at the evacuation destination until collected	Mobile Phone Register

4 Bushfire Response Action Plan



5 Emergency equipment

Equipment	Details
Evacuation kit	• Bushfire Emergency Evacuation Plan • Registers • First Aid Kit
First Aid kit(s) – for bushfire	• Worthington Hall
Emergency warning or alert system	• School alarm (hardwired) • School class audio
Emergency communications equipment	• Mobile phones • Hand-operated fire alarm
Registers	• Students • Staff (mobile telephones) • Visitors
Suppression Equipment	
Fire extinguishers	All staff are to be trained to use fire extinguishers.
Personal Protective Clothing (PPE) should be available for all Area Wardens.	Area Wardens under supervision of the Facilities Warden to be trained and available to undertake small fire suppression. *Personal Protective Clothing kits, specifically for bushfire, are available from various suppliers.*

6 Bushfire preparation checklist

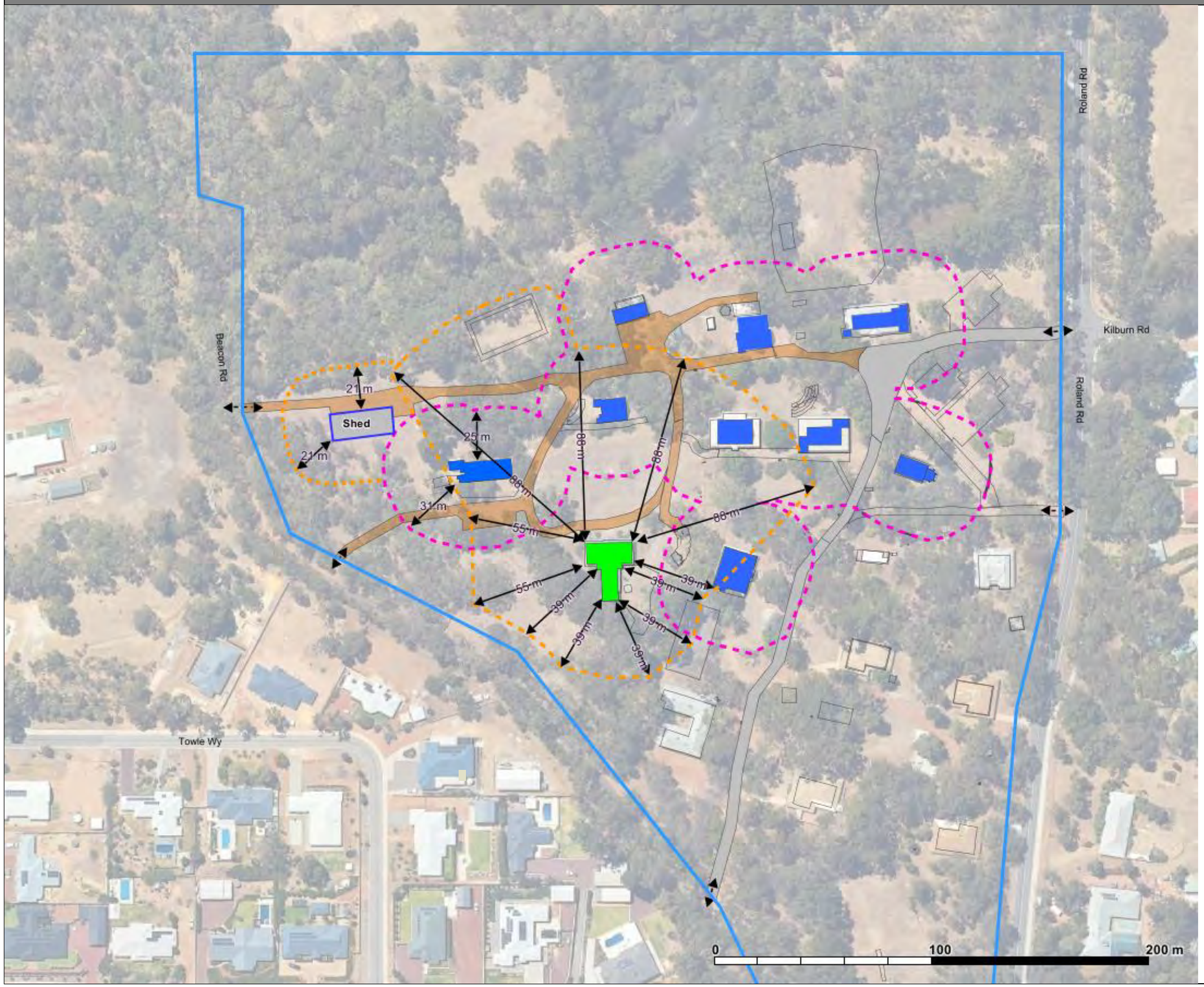
To be undertaken by the Principal.

Management activities	☑ or NA	Evidence
The annual review of the Bushfire Emergency Evacuation Plan has been completed before the start of bushfire season (1 September).		Enter date completed
Consulted and received advice in preparing the annual review of the Bushfire Emergency Evacuation Plan from: • local Emergency Services • local volunteer fire brigade • Shier of Mundaring		[complete section 9]
Augmented transport has been arranged, A transport provider has been identified and arrangements confirmed for the coming fire season. A calibrating run (one bus) should be undertaken to test the arrangement, the time for arrival and time to reach the off-site destination. The required number of buses should allow the site to be evacuated within 30 minutes of arriving. Even if shelter is initially taken at the school it may need to be evacuated quickly to avoid exposure to smoke and until the site can be declared safe.		Enter company name Enter calibrating run date. Enter required number of buses.
Staff have been made aware of the Bushfire Emergency Evacuation Plan through: • A staff meeting has been held prior to the bushfire season (August) and at staff induction that includes: o an overview of the Bushfire Emergency Evacuation Plan o the school alarm system o an assignment and understanding of responsibilities o the types of Bushfire Warnings issued by the Department of Fire and Emergency Services and the Emergency Alert telephone warning system		Enter date of staff meeting
Staff have been trained and are confident to undertake their role as a member of the School Bushfire Response Team		Confer with each staff member and provide awareness and training as required
Students and parents or carers have been made aware of the Bushfire Emergency Evacuation Plan for the applicable season through:		Enter date – verify inclusion in year commencement information to students Enter date - verify location of plan on school website

Management activities	☑ or NA	Evidence
• school information booklet (include actions and procedures) issued at the commencement of the school year • display at the home page on the school website • communication to parents /carers (September) promoting the Bushfire Emergency Evacuation Plan for the coming season, its availability on the school website and communication protocols		Enter date – communication to parent /carer for the coming bushfire season
Communication plans are in place: • 'Emergency Response Contact List' complete and up to date • 'Bushfire Response Team' details are up to date • communication templates, emergency text message, and school notice text are complete and up to date		Enter date to confirm
Emergency equipment available and checked: • emergency warning or alert system is in working order • emergency communications equipment available • First Aid kit(s) complete and available • mobile contact list for all staff is up to date • registers for students, staff and visitors readily accessible for roll call		Enter date to confirm
Evacuation drills practised to your onsite 'safer building location(s)': • before the start of the bushfire season • at least once per term during the bushfire season Note: As a minimum there should be three drills per year, and one should include the calling of a bus to verify arrival and evacuation time.		Enter dates to confirm
Onsite assembly and shelter building is prepared: • the Asset Protection Zone is established • flammable materials are not stored adjacent to the building • emergency equipment is available and accessible • access to the building is clear and unobstructed		Worthington Hall prepared Enter date to confirm
The offsite evacuation locations have been verified to be available for the coming bushfire season. Local government authority (Shire of Mundaring) has provided approval on the use of offsite locations. The off-site evacuation location may be determined by the Incident Controller (Emergency Services) depending upon the bushfire event.		Enter date to confirm arrangement Enter date to verify the accuracy of the *Off-site* evacuation Note parents/carers should be informed if there is any change to the Evacuation location

Management activities	☑ or NA	Evidence
An Asset Protection Zone is to be established/maintained around each restoration building that achieves BAL 19. The APZ should extend 25 m to Woodland (-5) and 31 m to Forest (Flat). The APZ being irrigated grasses no taller than 100 mm under tree canopies maintained no lower than 3m to the ground). • clear of all flammable and combustible materials • ensure materials and/or surplus objects, are not stored externally Note: For further information, refer to section 4.3 in the *Principal's Guide to Bushfire*.		Enter date: to confirm verification
A 10kWm2 Shelter (Protection Area) is to be established around the Worthington Hall as shown on Figure EX1. It is to be established/maintained with the understorey no taller than 100 mm, and a minimum 3 m clearance of tree canopies from the ground.		Enter date: to confirm verification
The use of any machinery or power tools that can generate sparks on *Total Fire Ban* days is not permitted. Any 'hot works' including welding and grinding or the operation of plant, equipment or machinery in bushland areas, can potentially ignite vegetation and cause bushfires. The use of machinery (such as angle grinders, mowers or machines with internal combustion engines) is restricted within 30 m of the perimeter on severe fire danger days.		Enter date: to confirm briefing of relevant staff and students at (i) the beginning of the Bushfire Season, and (ii) the beginning of the school year.

Figure Ex 1 - Spatial representation of the proposed risk management strategies – Parkerville Children & Youth Care 1 Beacon Road Parkerville



Responsibilities for implementation and management of the bushfire measures

1. The restoration of each building is to be constructed compatible, and as far as practical in maintaining the historic values of the building, in accordance with the construction requirement for BAL 19: at section 3 and 6 in AS3959:2018.

2. An Asset Protection Zone is to be established/maintained around each restoration building that achieves BAL 19. The APZ should extend 25 m to Woodland (-5) and 31 m to Forest (Flat). The APZ being irrigated grasses no taller than 100 mm under tree canopies maintained no lower than 3m to the ground)..

3. A 10kWm^2 Shelter (Protection Area) is to be established around the Worthington Hall. It is to be established/maintained with the understorey no taller than 100 mm, and a minimum 3 m clearance of tree canopies from the ground.

4. Worthington Hall is to be constructed in accordance with the Performance Solutions in the National Construction Code 2022 Part G5 and the applicable Deemed to Satisfy - Specification 43.

5. The private driveway shall be constructed/maintained in accordance with the technical requirement Table 6 column 4 (Private Driveway) and the provision of a turnaround area at all dead ends that meets the dimensions described in E3.6; Guidelines for Planning in Bushfire Prone Areas V1.4.

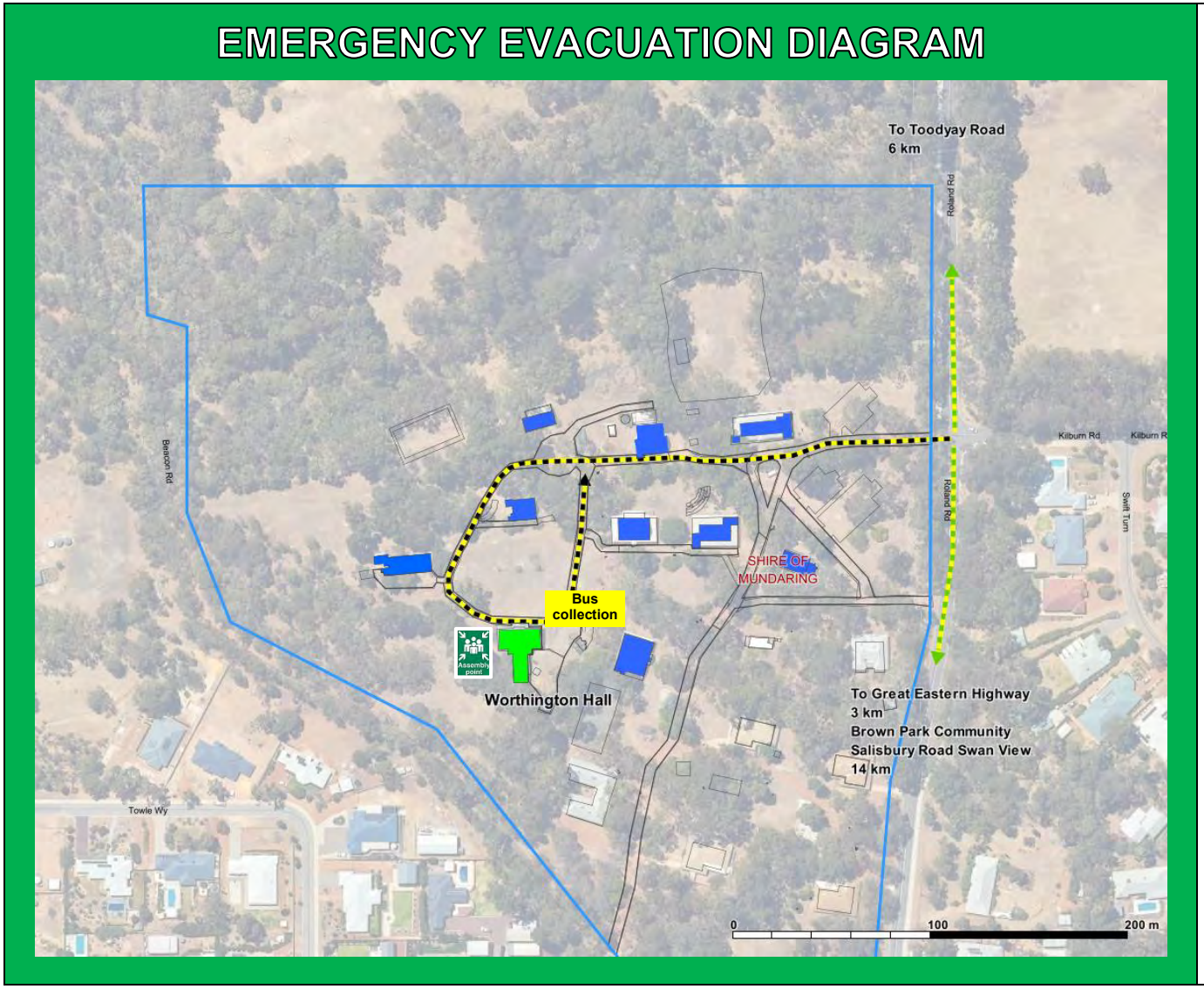
6. External fire hoses are to be provided for fire suppression at each building that is capable of applying water on to the external surface of all habitable buildings and a distance of 10 m around the building without reliance on mains power.

LEGEND

- Site Boundary
- Shelter Protection Area– set to 10 kWm^2 (NCC 2022)
- Shed APZ – 21 m
- Asset Protection Zone BAL 19 to restoration buildings
- Suitable destination (Worthington Hall)
- Restoration buildings

7 Bushfire action plan maps -

7.1 Evacuation Plan(s)



Alarm

Siren/pause x 3

Response

Account for all students

Move class to Worthington Hall

Your Allocated Room is:

Stay in class group for:

Evacuation (by Bus)

or

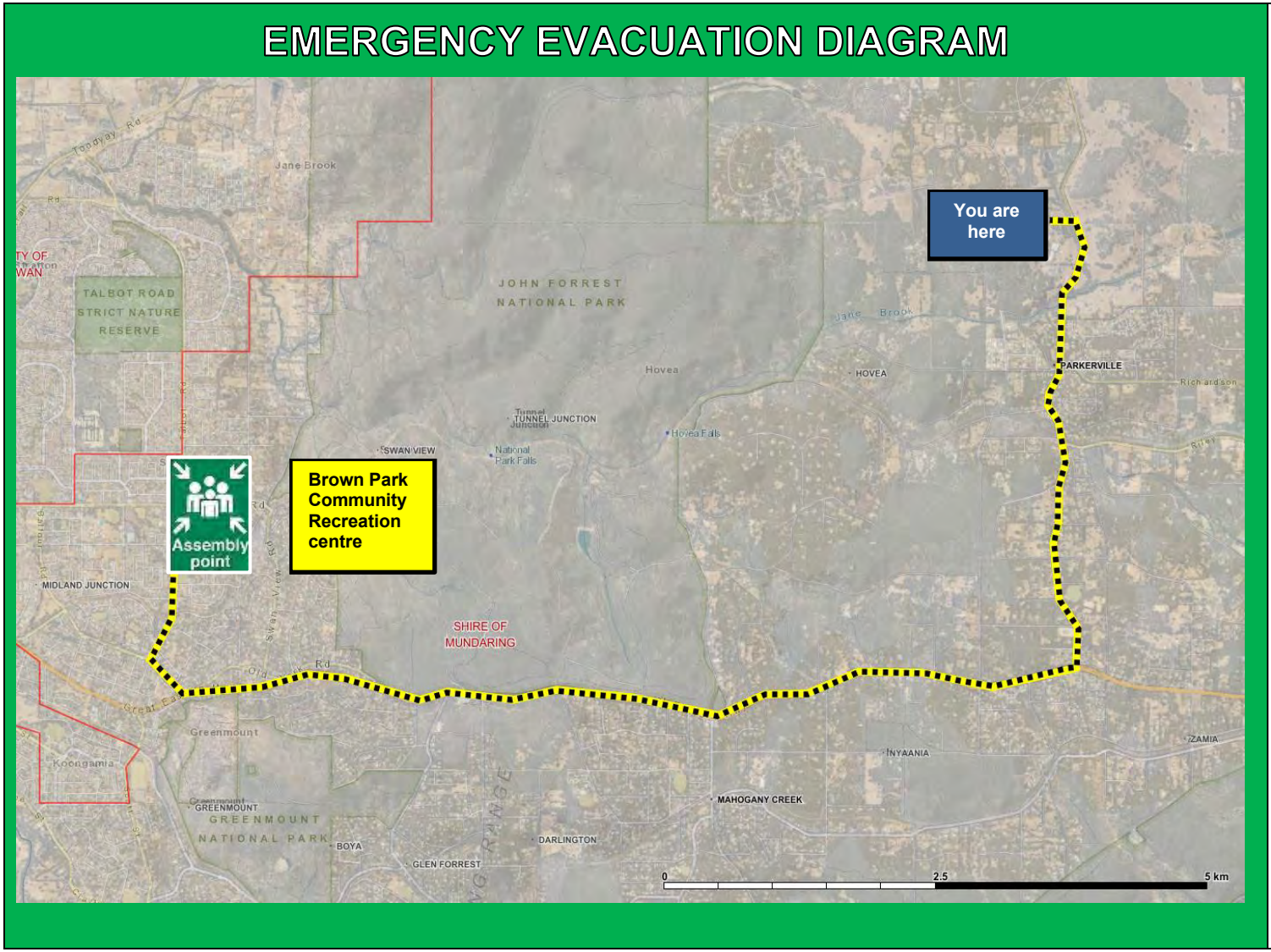
Shelter.

Notes

Close windows, vents, and turn off air conditioning and close door upon leaving classroom.

Any students with medication should bring their medication, but school bags should be left in the secured classroom.

Offsite evacuation locations



Alarm

Siren/pause x 3

Response

Move to Worthington Hall

Board buses for evacuation when directed.

Offsite Shelter

The default Evacuation Centre is the:

Brown Park Community Recreation Centre

Salisbury Road Swan View WA 6056

Emergency Services may nominate the Community Evacuation Centre.

School alternative

If safe, travel to the pre-arranged school alternative.

8 Bushfire mitigation management register

Identified works or actions to reduce risk, these are additional to identified preparations (refer section 3.2 of the *Principal's Guide to Bushfire)*

Bushfire mitigation actions	Target date for completion	Responsible	Source of funds	Notes	Completion date
Treatment strategy / works required	**Date (dd/mm/yyyy)**	**The staff member name who will sign off the action as complete**	**e.g. school or central funding**	**Progress or issues associated with the work (including date of progress or issues)**	**Date (dd/mm/yyyy)**

9 Advice from Department of Fire and Emergency Services and other agencies

Record in the table below any bushfire advice received by the school from:

- local fire brigades and community emergency services
- local government
- external experts.

Identify the date and source of the advice.

Date of advice	**Agency name**	**Advice received**	**Name of officer** (who provided advice)	**Contact number or email address**

Appendix A - Bushfire warnings stages

Issued by the Department of Fire and Emergency Services and Department of Biodiversity, Conservation and Attractions - Parks and Wildlife Service - Emergency WA.

Bushfire warning stages	
ADVICE 	**A fire has started, but there is no known danger.** This is general information to keep principals informed and up to date with developments. Principals must: • turn off **evaporative** air conditioners and ensure roof vents are closed. • check and patrol the school regularly for bushfire activity, paying particular attention to the evaporative air conditioners.
WATCH AND ACT 	**There is a possible threat to lives and property. Conditions are changing.** Principals must prepare to: • evacuate; or • move students, staff and visitors to their pre-determined onsite 'safer building location' (Worthington Hall). Evacuation orders are: • issued by the Incident Controller or Emergency Services if required. • relayed via official sources such as Emergency WA. It is vital that the principal: • accesses bushfire information from official sources • makes an informed decision to stay onsite or evacuate offsite based on advice from the Incident Controller or Emergency Services.
EMERGENCY 	**A school is in danger as its area will be impacted by fire. Take immediate action to survive.** The principal will be advised whether staff, students and visitors can leave the area or if they must shelter where they are as the fire burns through the area. Evacuation orders are: • directed by the Incident Controller or Emergency Services. • relayed via official sources, such as Emergency WA. It is vital that the principal: • accesses bushfire information from official sources • makes an informed decision to stay onsite or evacuate offsite based on the advice.
ALL CLEAR	**The danger has passed, and the fire is under control, but stay alert in case the situation changes.** It may not be safe to return to school yet.

Further information on the bushfire warning system is available in the DFES video, Understand bushfire alerts and warnings.

Appendix B - Procedures in event of a sudden bushfire

Appendix B - Procedures in event of a sudden bushfire

Offsite evacuation procedures

You may be instructed to relocate to your offsite evacuation.

Initiate the below procedure:

Alarm

- The Chief Warden will:
    - Sound the Alarm 3 separate horn soundings.
    - Inform the Facilities Warden
    - Activate the Incident Management Team, each member to wear the hat of the position for identification (teaches to adorn red hats).
    - Inform Emergency Services that evacuation will be taken from the School.

Evacuate

- Teachers will supervise evacuation of students from classrooms to the Worthington Hall.
- The Facilities Warden will ensure Worthington Hall is ready to receive students, the refrigerated air conditioning should be turned to recycle, and the building secured to minimise smoke ingress. Flammable materials, and vehicles are to be clear 10 m from the building, bins are to be closed These actions are to be taken before the Facilities Warden moves to secure the rest of the school.
- Teachers will account for all students and supervise evacuation to the Worthington Hall
- The Area Wardens will ensure all students have moved to Worthington Hall.
- Area Wardens will assist any students with PEEP requirements to be evacuated to Worthington Hall.
- Area Wardens, once students are secure, if time permits, will assist the Facilities Warden to check all buildings are secured air conditioning turned off, vents and windows closed, doors closed, outdoor bins closed.
- The Communications Warden will issue an SMS message and email to student parents and carers to advise the bushfire incident plan has been implemented i.e., “do not attend the School – arrangements for safe student collection will be advised.”
- Transport Warden will call for the transport to evacuate the site; buses, and vehicles required for people with special needs.
- Area Wardens will assist any students with PEEP requirements to be evacuated to Worthington Hall.
- Once students are assembled at Worthington Hall, the Area Wardens will check all rooms are cleared and the buildings have been secured - air conditioning turn off, vents and windows closed, doors closed.
- Teachers will verify to the Chief Warden that all students are accounted for, including those who may have been immediately evacuated due to their PEEP requirement.
- The Facilities Warden will check and remove any flammable items from adjacent the buildings and outdoor bins closed.
- The Transport Warden will allocate students accompanied by a teacher to available buses, prioritising those with disabilities or medical needs (e.g. asthma) then by age group - youngest to oldest.
- The Assistant Transport Warden will attend the evacuation destination with the first bus to coordinate the arrival of students and account for arrival of students at the offsite destination.
- The Chief Warden and Transport Warden will ensure the School is completely evacuated.
- The Chief Warden and Facilities Warden may remain at the Worthington Hall to coordinate with emergency services.

- The Chief Warden will determine from where students may be collected.
- The Communications Warden will issue an SMS message and email to student carers, confirming arrangements for the collection of students.
- Teachers are to remain with their students until the last student has been collected or transported home.

On site shelter procedures

You may be instructed that it is unsafe to leave the site.

Initiate the below procedure:

Alarm

- The Chief Warden will:
    - Sound the Alarm 3 separate horn soundings.
    - Inform the Facilities Warden.
    - Activate the IMT, each member to wear the hat of their position for identification (teaches to adorn red hats).
    - Inform Emergency Services that evacuation will be taken from the School.

Shelter

- The Facilities Warden will ensure Worthington Hall is ready to receive students, the refrigerated air conditioning should be turned to recycle, and the building secured to minimise smoke ingress. Flammable materials, and vehicles are to be clear 10 m from the building, are bins are to be closed These actions are to be taken before proceeding the Facilities Warden moves to secure the rest of the school.
- Teachers will account for all students and supervise evacuation to the Worthington Hall
- The Communications Warden will issue an SMS message and email to student parents and carers to advise the bushfire incident plan has been implemented i.e., “do not attend the School – arrangements for safe student collection will be advised”.
- The Area Wardens will ensure all students have moved to Worthington Hall.
- Area Wardens will assist any students with PEEP requirements to be evacuated to Worthington Hall.
- Area Wardens, once students are secure, if time permits, will assist the Facilities Warden to check all buildings are secured air conditioning turned off, vents and windows closed, doors closed, outdoor bins closed.

Preparation for the arrival of the fire front

- Students may be sheltered in Worthington Hall for up to two hours. Students will need to be kept comfortable and hydrated.
- The arrival of the firefront will be preceded by ember showers, strong winds, and thick smoke that may block day light. The noise and intensity of activity will grow as the fire draws closer. Unless students are prepared about what to expect the conditions can terrifying; teachers should keep children calm and explain it may be noisy and dark, things may bang against the building. Activities should be planned to keep students distracted

Arrival of the Firefront

- The Chief Warden will monitor the passage of the fire.
- The Facilities Warden and Area Wardens will monitor the assembly area and attend to any small fires.
- The Chief Warden will determine if the Assembly Area is to be evacuated or remain in place for evacuation when safe.

After the passing of the fire

- The Chief Warden is to determine access to the School is available or whether evacuation to a collection place is required for student collection. If evacuating to another place the procedures for offsite evacuation should be followed including carer communication and bus transport.
- Access to the School may be limited due to damage in the area. Evacuation under the supervision of emergency services to an offsite destination that is safe for the collection of students, may be required.
- The Facilities Warden should inspect the School when safe to do so.
- The Communications Warden will issue an SMS message and email to student carers, confirming arrangements for the collection of students or their transport home.

Recovery

Staff and student welfare and wellbeing

- Bushfires are terrifying. The potential for trauma will be impacted by whether the School was calmly (orderly) evacuated, whether the School was significantly damaged, whether shelter was taken on site and the preparation of staff and students (see training).
- The Principal as soon as practical will provide a preliminary assessment and immediately enact an appropriate level of counselling.
- Staff and student training is important: knowing what to expect can minimise panic and trauma through the event. Many students will live in the bushfire prone area, they may be familiar, but it is also an opportunity to prepare families for the disruption that bushfire may cause.

Damaged buildings and grounds

- The Principal and Facilities Warden will investigate the Schools grounds and audit any damage observed to buildings and grounds. Damaged buildings should not be entered or disturbed and should be left (invited) for investigation by DFES
- The Principal will advise the School Board on the extent of damage.

Damage other than superficial (requiring the replacement of external building materials, stairs and decks, and where there is evidence of internal damage (including the roof cavity) caused by the bushfire event).

- The Principal will secure the site. Close the School and close any undamaged buildings to secure property. Trespass should be discouraged until the safety of the School and grounds can be evaluated.
- The Principal will invite DFES to inspect the damage.
- The principal and the Facilities Warden, once DFES has satisfied its interest, will arrange for a formal survey/assessment of the building conditions. The School insurance provider should be consulted. There may be an opportunity to act concurrently, but the School needs to proceed quickly.
- The Principal will advise the School Board once the assessment is complete whether the damaged buildings can be safely isolated or removed and the School assessed as safe to commence operation with the remaining buildings. Supplementary building may need to be arranged in order to return the School to capacity whilst the replacement buildings are constructed.
- The Principal will determine when the School is to reopen.
- The Principal will advise carers students and stakeholders when the School will reopen

Replacement of consumed materials

- Bushfires can occur mor than once in a bushfire season, and even effect the same place twice.
- Any materials consumed during a bushfire event, i.e. first aid supplies, discharged extinguishers, should be replaced immediately, or before operation of the School commences.

Enact alternate School arrangements

- The Principal together with the School Board will enact its contingency arrangement to allocate students to other campuses until the School can be reopened, which may include temporary classrooms installed on site (Incorporating bushfire location considerations). The School in a transitional state may still be subject to bushfire attack and any temporary arrangement must give consideration to student safety.
- The contingency arrangement is a predetermined arrangement prepared in consultation with School and a reciprocal or alternate school.
- The Principal will advise carers and students of arrangements.

Debrief

The Principal together with the Incident Management Team will review the incident to objectively identify success and failures, preparations and procedures to be retained and those requiring improvement.

- The Principal and Facilities Manager are to advise the School Board.
- The Bushfire Emergency Evacuation Plan is to be revised to incorporate the learning from the event.
- Capital works and acquisitions recommended are to be considered within the work program and budget.
- Additional training identified in the Debrief should be scheduled prior to the bushfire season.

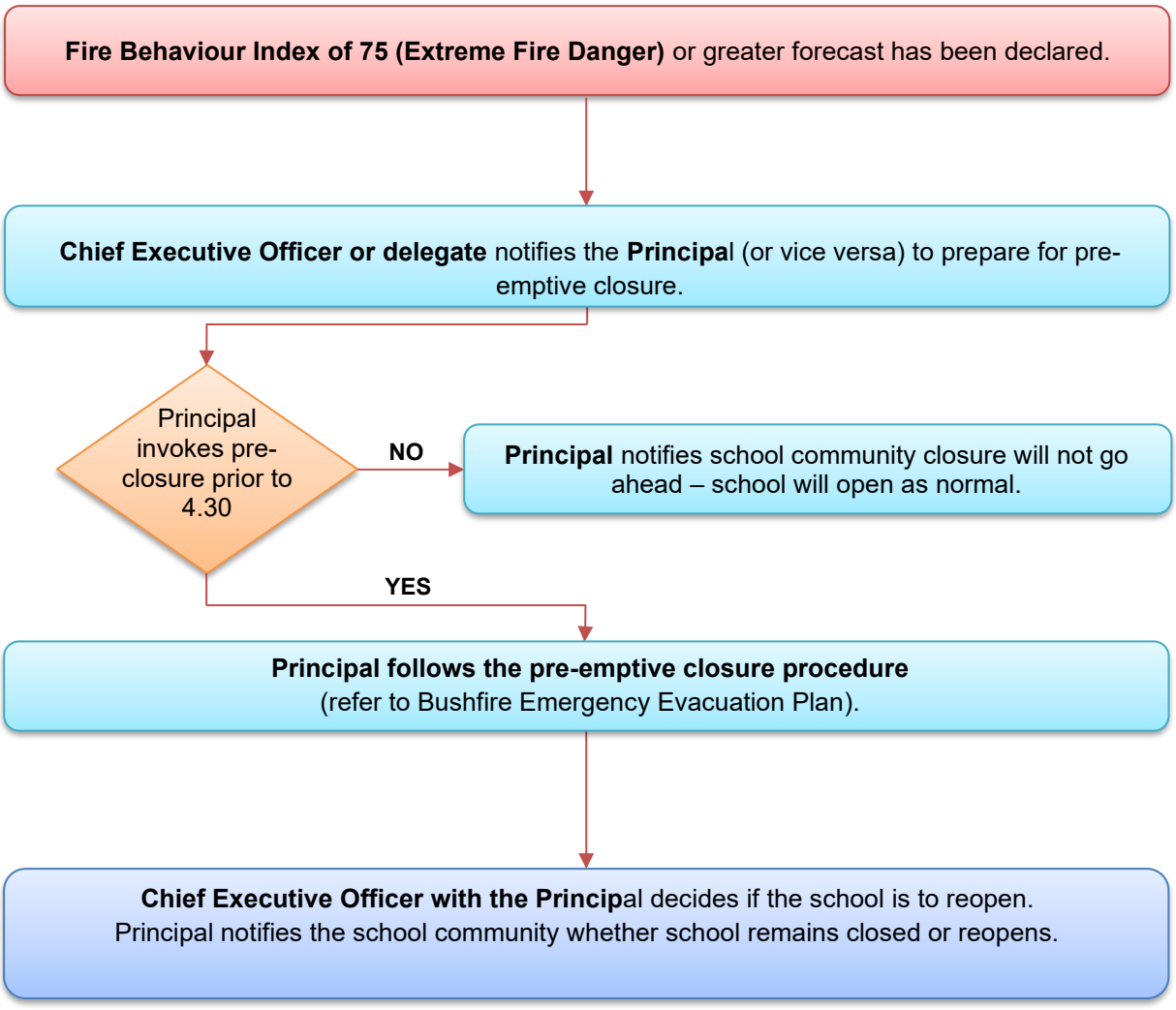
Appendix C - Pre-emptive (planned) closure procedures

The School should be pre-emptively closed when Extreme (FBI 75+) or Catastrophic fire danger rating is predicted

Initiate the procedure below:

- Communicate the pre-emptive closure, continued closure or school reopening:
- If weather conditions improve between the announcement of pre-emptive closure and 4.30 pm on the eve of closure, pre-emptive closure may be cancelled.

Flow chart – Principal's response to Fire Behaviour Index of 75 (Extreme Fire Danger Rating) or greater



Appendix D – After hours or school holiday procedures

You may be instructed to keep your school closed during the school holidays or after hours during a bushfire event.

Follow these procedures if a bushfire starts during the school holidays or after hours.

Action	Notes (if required)
Monitor ‘Watch and Act’ or ‘Emergency Warning’ bushfire warning alert on the Emergency WA website.	
Send parents and staff emergency text message alerts to inform them when school can reopen (refer to emergency text message alert templates).	
The Principal and Facilities Warden should inspect the school when safe to determine whether all or part of the school can reopen.	

Appendix E - Communication templates

Emergency text message alert templates

School to close tomorrow due to dangerous bushfire conditions

The Parkerville Care School will be closed tomorrow [date] due to potentially dangerous bushfire conditions. See emergency.wa.gov.au/#firedangerratings for more information.

There will be no staff on site. Please ensure that you make arrangements for your child.

C1a - Students are safe and still on school site

Students are safe and being supervised at school. We will follow the instructions of emergency services and update you if the situation changes.

Please wait for further instructions before attempting to collect your child. We are working with emergency services and will advise when it is safe to do so.

C1b - Students have been relocated

Students have been relocated for their safety.

Please wait for further instructions before attempting to collect your child. We are working with emergency services and will advise when it is safe to do so.

C1b - Students may be collected

Arrangements have been made to collect your child from [insert location]. Please advise your class teacher when you intend to pick up your child.

If you are unable to collect your child, arrangements may be made to have the child returned to home.

C3 - School to reopen on [day]

The Parkerville Care School will reopen for classes on day [date].

School newsletter sample text

You can use this sample text below to provide the school community with information about a pre-emptive closure.

Pre-emptive (planned) school closure during the bushfire season

The Parkerville Care School is located in a bushfire risk area.

If potentially dangerous bushfire conditions have been declared, the school **MAY** be required to close as a precaution (Pre-emptive Closure).

Parents will receive a text message to inform them of a possible Pre-emptive Closure of the school.

The final decision to pre-emptively close the school will be confirmed by the Principal no later than 4.30pm on the day before the pre-emptive closure. If the forecast changes after the 4.30pm deadline, the school remains closed to limit confusion within the school community.

Parents will receive a text message to either confirm or reverse a Pre-emptive Closure of the school.

Typically, schools will only be required to close for a day at a time. However, this will depend on changing weather conditions. Parents will receive a text message to advise if the school will reopen the day after the pre-emptive closure, or whether it will remain closed.

Parents are encouraged to monitor official bushfire information sources for current information about fire danger ratings:

1) **Emergency WA website**

   www.emergency.wa.gov.au

2) **Department of Fire and Emergency Services**

   Information line – 13 33 37

3) **Local radio**

   - ABC local radio
   - ABC Emergency
     www.abc.net.au/emergency

Please contact the school on [insert number] with any concerns relating to Pre-emptive Closures during the bushfire season.

[Name]

Principal

Sample text for a notice of temporary school closure

The sample text below can be used in a notice to be placed on:

- the school main notice board at front of the school
- main administration entrance doors
- other entry/exit doors throughout the buildings
- early learning, primary and secondary, where relevant.

BUSHFIRE ALERT

NOTICE OF TEMPORARY SCHOOL CLOSURE

As the result of a 'Extreme' 75+ or 'Catastrophic' fire danger rating, this school is temporarily closed.

The school will re-open when the forecast Fire Behaviour Index falls below 75.

http://www.bom.gov.au/wa/forecasts/fire-danger-ratings.shtml

For more information about the bushfire threat:

- call 13 DFES (13 33 37)
- visit Emergency WA
- stay tuned to ABC Radio Perth (720AM)

For more information about the school, contact the school on [insert number]

Thank you.

[Name]

Principal

ATTACHMENT 2 - APZ standard

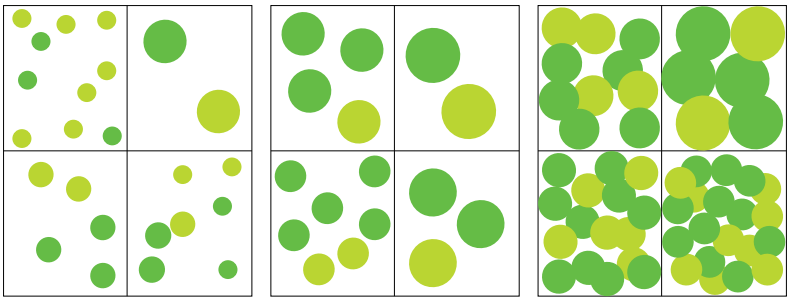


ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Fences within the APZ	• Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	• Should be managed and removed on a regular basis to maintain a low threat state. • Should be maintained at <2 tonnes per hectare (on average). • Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	• Trunks at maturity should be a minimum distance of six metres from all elevations of the building. • Branches at maturity should not touch or overhang a building or powerline. • Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. • Canopy cover within the APZ should be <15 per cent of the total APZ area. • Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ.
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	• Should not be located under trees or within three metres of buildings. • Should not be planted in clumps >5 square metres in area. • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	• Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. • Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.

Figure 19: Tree canopy cover – ranging from 15 to 70 per cent at maturity





ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

OBJECT	REQUIREMENT
Grass	• Grass should be maintained at a height of 100 millimetres or less, at all times. • Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	• Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	• Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. • The pressure relief valve should point away from the house. • No flammable material within six metres from the front of the valve. • Must sit on a firm, level and non-combustible base and be secured to a solid structure.

** Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*

ATTACHMENT 3 - WAPC FACTSHEET BUSHFIRE AND VEGETATION

Department of **Planning, Lands and Heritage**

GOVERNMENT OF WESTERN AUSTRALIA

Western Australian Planning Commission

ACTIVE
IN FORCE

PLANNING IN BUSHFIRE PRONE AREAS
BUSHFIRE POLICY FRAMEWORK



SPP 3.7
Planning in
Bushfire Prone Areas

Guidelines for
Planning in
Bushfire Prone Areas

FACTSHEET

December 2021

BUSHFIRE AND VEGETATION

Environmental considerations for bushfire mitigation and environmental asset protection

DISCLAIMER

This document is intended as a guide only and does not provide comprehensive details on bushfire and vegetation management. Please refer to the relevant legislation or department where noted and seek professional advice for specific circumstances

This fact sheet provides an overview and general advice to landowners, developers, bushfire planning practitioners and decision-makers for bushfire mitigation measures that involve vegetation modification or removal, in accordance with State Planning Policy 3.7 Planning in Bushfire Prone Areas. Particular focus is given to implementing the vegetation management measures set out in Schedule 1 of the Guidelines for Planning in Bushfire Prone Areas.

This fact sheet also includes information about relevant legislative and policy requirements that influence and control vegetation clearing.

VEGETATION MANAGEMENT MEASURES

PRIVATE LAND

The modification or removal of vegetation is an effective way to reduce a bushfire hazard that surrounds any development, particularly for asset protection zones (APZs) on private landholdings on the rural/urban interface and peri-urban development fronts.

Considering the environmental priorities for a site – such as vegetation retention, biodiversity, and wildlife habitat – as early as possible in the planning process can avoid excessive or unnecessary modification or clearing of vegetation.

A vegetation survey of the site may be needed to determine if threatened or protected vegetation and fauna habitats are present, and to inform the siting and design of future development. A bushfire planning practitioner or the relevant local government can advise if an onsite vegetation survey is required.

The results of a vegetation survey should be used to inform any vegetation management identified in a bushfire management plan (BMP). This will help understand potential clearing requirements for a site and define the areas that can be cleared. The survey may also support a proponent's ability to prioritise vegetation modification or removal in areas that will provide the greatest reduction of bushfire risk to the subject site, if that vegetation is able to be cleared.

The BMP should identify vegetation or environmental features such as riparian zones, foreshores and wetlands, and any relevant buffer requirements or areas intended to be revegetated or retained.

More information: Schedule 1 – Standards for Asset Protection Zones of the Guidelines for Planning in Bushfire Prone Areas

RURAL LOTS

Vegetation management for bushfire on rural lots may be subject to additional local government bushfire requirements such as compliance with section 33 firebreak notices and Harvest and Vehicle Movement Bans. It is recommended to check with the relevant local government and the Department of Fire and Emergency Services (DFES) before undertaking any bushfire risk reduction measures.

BUSH FIRE RISK TREATMENT STANDARDS

The Bush Fire Risk Treatment Standards 2020 allows landowners to manage vegetation within a 20-metre radius of a habitable building on their property or adjoining landowners, with the consent of that landowner.

Landowners looking to reduce the bushfire risk of an existing development cannot clear vegetation to create an APZ unless the Bush Fire Risk Treatment Standards 2020 applies, or it is:

- prescribed under a local government's section 33 firebreak notice, or
- part of a proposed extension to the existing habitable building, or
- the APZ is as per a development approval.

The Standards are voluntary and only apply to existing buildings constructed prior to 2015, where there may have been no previous bushfire consideration.
As compliance cannot be enforced, they are generally not relied upon to maintain vegetation for a bushfire attack level (BAL) assessment or BMP.

More information: Guide for applying the Bush Fire Risk Treatment Standards

CLEARING OF VEGETATION

To clear vegetation on private land outside of the above circumstances, the landowner will need to comply with any relevant vegetation clearing legislation and processes, such as clearing permits.

It is important to check that the appropriate clearing approvals are in place, to avoid unauthorised removal or modification of vegetation.

PUBLIC LAND

Greenfield and urban infill proposals should identify vegetation of significance to be retained at the earliest possible planning stage, and plan to retain it within areas of public open space.

Where vegetation removal causes conflict with the landscape or environmental objectives of other state planning policies or a local planning framework, the redesign of a development, structure plan or subdivision, including a reduction in lot yield, is preferred.

Management of these areas can also consider careful plant selection as outlined in the APZ explanatory notes in the Guidelines for Planning in Bushfire Prone Areas.

Where public open space is maintained to a parkland standard, as per the low threat vegetation exclusions in cl.2.2.3.2 of AS 3959, it may be able to be classified as low threat vegetation in a BMP. Written evidence should be provided that the future land manager (for example, the local government or State Government department) agrees to maintain the public open space in a low threat state, in perpetuity.

Land managers are encouraged to consider the bushfire risk of reserves adjacent to development as part of any vegetation management plans or strategies. There may be opportunities to consider the bushfire risk of degraded reserves that are adjacent to existing development, where vegetation management techniques can have a dual purpose of mitigating bushfire risk and improving the quality of native vegetation. For example, the removal of weeds and invasive species and careful revegetation strategies can potentially reduce the bushfire fuel load.

ENVIRONMENTAL APPROVALS AND EXEMPTIONS

It is important to understand the environmental approval requirements for a site before clearing vegetation or identifying vegetation to be modified or removed within a BMP. At both the Commonwealth and State level, modifying or removing vegetation to reduce bushfire risk is subject to approval processes and/or exemptions under various legislation across both jurisdictions.

It should be assumed that vegetation modification or removal will require additional approval.

Proponents, bushfire planning practitioners and decision-makers should clarify approval requirements with the Department of Water and Environmental Regulation (DWER), the Department of Biodiversity Conservation and Attractions (DBCA), an environmental consultant or the relevant local government.

ENVIRONMENTAL LEGISLATION (WESTERN AUSTRALIA)

'Clearing' of vegetation is defined under the *Environmental Protection Act 1986* (EP Act) as causing substantial damage to some or all of the native vegetation in an area, including through:

- the killing or destruction of native vegetation
- removal of native vegetation
- the severing or ringbarking of trunks or stems
- the draining or flooding of land
- the burning of vegetation
- the grazing of stock, or
- any other activity that kills or damages native vegetation.

Therefore, both 'clearing' and 'modification' of vegetation to reduce bushfire risk is considered 'clearing' under the EP Act, and requires a clearing permit under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations) unless considered exempt, as explained below.

DWER is responsible for issuing clearing permits and the framework for the regulation of clearing.

EXEMPTIONS

Removal or modification of native vegetation must be authorised by a clearing permit under Part V, Division 2 of the EP Act, unless the clearing is exempt as prescribed in the Clearing Regulations, or set out in Schedule 6 of the Act.

The most common Schedule 6 exemptions from the need to obtain a clearing permit to reduce bushfire risk to development on private land, are:

- clearing of native vegetation by the landowner in accordance with a notice issued by a local government under section 33 of the *Bush Fires Act 1954*.
- clearing that is fire hazard reduction burning, provided it occurs outside prohibited or restricted burning times declared under the *Bush Fires Act 1954* and is done in a way that minimises long term damage to the environmental values of the vegetation.
- clearing associated with a subdivision or development approval when it is required to satisfy approval conditions, or is in accordance with an approval. Examples may include:
  - construction of roads or common property accessways
  - connection to water, sewer, or electricity services

- where earthworks such as filling or draining the land are required
- clearing within any building envelope described in the approved plan or diagram

If an APZ is not identified within a BMP, with evidence that it can be implemented through a local government's firebreak notice, then any proposed clearing associated with an APZ may not be exempt from the State clearing permit requirements.

Schedule 6 also provides local governments with an exemption from the requirement for a permit to clear vegetation within reserves and road reserves, provided the reserves are vested with the local government and the clearing is to prevent the occurrence or spread of bushfire. This exemption has limitations, and excessive clearing beyond that deemed necessary for bushfire mitigation purposes will require a permit, for which approval is not guaranteed.

OTHER LEGISLATIVE AND STATUTORY PLANNING REQUIREMENTS

ENVIRONMENTALLY SENSITIVE AREAS

Exemptions for prescribed clearing under the Clearing Regulations, do not apply in Environmentally Sensitive Areas declared under section 51B of the EP Act. However, exemptions under Schedule 6 of the EP Act can be used within these areas.

Environmentally Sensitive Areas include, but are not limited to:

- a defined wetland and the area within 50 metres of the wetland (e.g. Ramsar, conservation category and nationally important wetlands)
- a continuous extent of vegetation within 50 metres of rare (threatened) flora
- an area containing a threatened ecological community (TEC)
- a Bush Forever site as identified in State Planning Policy 2.8 – Bushland Policy for the Perth Metropolitan Region and Bush Forever Volume 1
- National and World Heritage areas.

More information: DWER Clearing Permit System Map Viewer to search if a property contains an Environmentally Sensitive Area.

BUSH FOREVER AND LOCALLY SIGNIFICANT CONSERVATION AREAS

Relevant local planning schemes and the Perth Metropolitan Region Scheme identify Bush Forever areas and other locally significant conservation areas. There may also be instances where particular species are identified for protection in local planning frameworks such as a local planning policy or local biodiversity strategy, due to their conservation or heritage values.

DECLARED WATER CATCHMENT AREAS

Clearing of vegetation within land covered by the *Country Areas Water Supply Act 1947*, which applies to certain declared water catchment areas, is not exempt from the requirement to obtain a clearing permit. If clearing is proposed within a *Country Areas Water Supply Act 1947*-controlled catchment, or if compensation has previously been paid to retain the subject vegetation, a *Country Areas Water Supply Act 1947* clearing licence is required to be obtained from the Department of Water and Environmental Regulation.

More information: DWER Map of Clearing Controlled Catchments to search the location and extent of controlled catchment areas.

OTHER APPROVALS

Approvals under other legislation may also be required depending on the type of flora or fauna present on the subject land.

- An environmental survey will determine the presence of any threatened species, threatened ecological communities, environmentally sensitive areas or matters of national environmental significance (MNES) on the land.
- Additional authorisation to modify threatened ecological communities is required under the *Biodiversity Conservation Act 2016* and the *Biodiversity Conservation Regulations 2018*, which are administered at a State level by the DBCA.
- Approval to develop land and impact on MNES pursuant to Environment Protection and *Biodiversity Conservation Act 1999* may also be required. The Act is administered by the Commonwealth Department of Agriculture, Water and the Environment and includes information specific to bushfire management.

- Further state planning policies and publications that may need to be considered when vegetation management or clearing is proposed or when designing an APZ, include:
  - SPP 2 Environment and Natural Resources Policy
  - SPP 2.6 State Coastal Planning Policy
  - SPP 2.8 Bushland Policy for the Perth Metropolitan Region
  - SPP 2.9 Water Resources and draft SPP 2.9 Planning for Water
  - Visual Landscape Planning in Western Australia.

FURTHER RESOURCES

- Bushfire Resilient Building Guidance (QLD Reconstruction Authority)
- Landscaping for Bushfire: Garden Design and Plant Selection (Country Fire Authority, Victoria)
- Landscaping for Bushfire: Garden Design and Plant Selection – Plant Selection Key (Country Fire Authority, Victoria)
- LP Gas cylinder safety in bushfire prone areas (Energy Safety)
- Visual Fuel Load Guides (Department of Fire and Emergency Services)
- Visual Guide for Bushfire Risk Assessment in Western Australia (Department of Planning, Lands and Heritage)
- A guide to the exemptions and regulations for clearing native vegetation (Department of Water and Environmental Regulation)

© Western Australian Planning Commission

Published by the
Western Australian Planning Commission
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140 William Street
Perth WA 6000

Locked Bag 2506
Perth WA 6001

Publication date: 13/12/2021
Operational date: 13/12/2021

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ATTACHMENT 4 – Specification 43

Part G5 Construction in bushfire prone areas

Introduction to this Part

This Part contains additional requirements for the construction of buildings located in *designated bushfire prone areas*, to address the additional risks posed by bushfire attack.

Objectives

VIC G5O1

G5O1 Objective

[2019: GO5]

The Objective of this Part is to—

(a) safeguard occupants from injury from the effects of a bushfire; and

(b) protect buildings from the effects of a bushfire; and

(c) facilitate temporary shelter for building occupants who may be unable to readily evacuate the building prior to a bushfire.

Applications

(1) G5O1(a) and (b) apply in a *designated bushfire prone area* to—

(a) a Class 2 or 3 building; or

(b) a Class 10a building or deck associated with a Class 2 or 3 building.

(2) G5O1(a), (b) and (c) apply in a *designated bushfire prone area* to—

(a) a Class 9a *health-care building*; and

(b) a Class 9b—

(i) *early childhood centre*; and

(ii) primary or secondary *school*; and

(c) a Class 9c *residential care building*; and

(d) a Class 10a building or deck immediately adjacent or connected to a building of a type listed in (2)(a) to (c).

Functional Statements

VIC G5F1

G5F1 Construction in bushfire prone areas

[2019: GF5.1]

A building constructed in a *designated bushfire prone area*—

(a) is to provide a resistance to bushfires in order to reduce the danger to life and minimise the risk of the loss of the building; and

(b) if occupied by people who may be unable to readily evacuate the building prior to a bushfire, is to be constructed so as to provide its occupants shelter from the direct and indirect actions of a bushfire.

Applications

(1) G5F1(a) applies in a *designated bushfire prone area* to—

(a) a Class 2 or 3 building; or

(b) a Class 10a building or deck associated with a Class 2 or 3 building; or

(c) a Class 10a building or deck immediately adjacent or connected to a building of a type listed in (2)(a), (b) or (c)

(2) G5F1(a) and (b) apply in a *designated bushfire prone area* to—

(a) a Class 9a *health-care building*; and

(b) a Class 9b—

(i) *early childhood centre*; and

(ii) primary or secondary *school*; and

(c) a Class 9c *residential care building*.

Performance Requirements

NSW G5P1
QLD G5P1
TAS G5P1
VIC G5P1

G5P1 Bushfire resistance

[2019: GP5.1]

A building that is constructed in a *designated bushfire prone area* must be designed and constructed to—

(a) reduce the risk of ignition from a *design bushfire* with an annual exceedance probability not more than 1:100 years, or 1:200 years for a Class 9 building; and

(b) take account of the assessed duration and intensity of the *fire actions* of the *design bushfire*; and

(c) be designed to prevent internal ignition of the building and its contents; and

(d) maintain the structural integrity of the building for the duration of the *design bushfire*.

Applications

G5P1 applies in a *designated bushfire prone area* to—

(a) a Class 2 or 3 building; and

(b) a Class 9a *health-care building*; and

(c) a Class 9b—

(i) *early childhood centre*; and

(ii) primary or secondary *school*; and

(d) a Class 9c *residential care building*; and

(e) a Class 10a building or deck immediately adjacent or connected to a building of a type listed in (a) to (d).

NSW G5P2
TAS G5P2
VIC G5P2

G5P2 Additional bushfire requirements for certain Class 9 buildings

[New for 2022]

A building that is constructed in a *designated bushfire prone area* and occupied by people who may be unable to readily evacuate the building prior to a bushfire must, to the degree necessary—

(a) reduce the risk of an untenable indoor environment for occupants during a bushfire event, appropriate to the—

(i) location of the building relative to fire hazards, including—

(A) classified vegetation; and

(B) adjacent buildings, structures and movable objects; and

(C) carparking areas and allotment boundaries; and

(D) other *combustible* materials; and

(ii) number of occupants to be accommodated within the building; and

(iii) intensity of bushfire attack on the building; and

(iv) duration of occupancy; and

(v) intensity of potential consequential fires; and

(vi) occupant tenability within the building before, during and after the bushfire event; and

(vii) combined effects of structural, fire exposure and other effects to which the building may reasonably be subjected; and

(viii) provision of fire fighting equipment and water supply to facilitate protection of the building; and

(b) be provided with vehicular access to the *site* to enable firefighting and emergency personnel to defend or evacuate the building; and

(c) have access to a sufficient supply of water for firefighting purposes on the *site*; and

(d) provide safe access within the *site* to the building (including carparking areas), as well as safe egress after the bushfire event.

Applications

G5P2 applies to the following buildings located in a *designated bushfire prone area*—

(a) a Class 9a *health-care building*; and

(b) a Class 9b—

(i) *early childhood centre*; and

(ii) primary or secondary *school*; and

(c) a Class 9c *residential care building*.

Notes

G5P2 does not guarantee the safety of building occupants or the maintenance of tenable conditions within a building during a bushfire event.

Verification Methods

G5V1 Buildings in bushfire prone areas

[2019: GV5]

(1) Compliance with *Performance Requirement* G5P1 is verified if the ignition probability for a building exposed to a *design bushfire* does not exceed 10%.

(2) Bushfire design actions must be determined in consideration of the annual probability of a *design bushfire* derived from—

(a) assigning the building or structure with an Importance Level in accordance with G5V1(3); and

(b) determining the corresponding annual probability of exceedance in accordance with Table G5V1.

(3) A building or structure's Importance Level must be identified as one of the following:

(a) Importance Level 1 — where the building or structure presents a low degree of hazard to life and *other property* in the case of failure.

(b) Importance Level 2 — where the building or structure is not of Importance Level 1, 3 or 4 and is a Class 2 building accommodating 12 people or less.

(c) Importance Level 3 — where the building is designed to contain a large number of people and is a—

(i) Class 2 building accommodating more than 12 people; or

(ii) Class 3 boarding house, guest house, hostel, lodging house or backpackers accommodation; or

(iii) Class 3 residential part of a hotel or motel; or

(iv) Class 3 residential part of a *school*.

(d) Importance Level 4 — where the building or structure is—

(i) essential to emergency management or post-disaster recovery; or

(ii) associated with hazardous facilities; or

(iii) subject to a necessary 'defend in place' strategy and is a—

(A) Class 3 accommodation building for the aged, children or people with disabilities; or

(B) Class 3 residential part of a health-care building which accommodates members of staff; or

(C) Class 3 residential part of a *detention centre*; or

(D) building that operates in the event of a bushfire emergency, such as a public bushfire shelter or a bushfire emergency control centre.

(4) The ignition probability for a building must be assessed by application of the following:

(a) An event tree analysis of relevant bushfire scenarios.

(b) *Design bushfire* conditions that include combinations of the following actions appropriate to the distance between the building and the bushfire hazard:

(i) Direct attack from airborne burning embers.

(ii) Burning debris and accumulated embers adjacent to a building element.

(iii) Radiant heat from a bushfire front.

(iv) Direct flame attack from a bushfire front.

(5) Applied *fire actions* must allow for reasonable variations in—

(a) fire weather; and

(b) vegetation, including fuel load, burning behaviour of vegetation (including the potential for crown fires); and

(c) the distance of the building from vegetation; and

(d) topography, including slopes and features that may shield; and

(e) ignition of adjacent buildings, building elements, plants, mulch and other materials; and

(f) effective size of fire front; and

(g) duration of exposure; and

(h) flame height; and

(i) flame tilt; and

(j) flame adhesion to sloping land; and

(k) the height of the building and its elements.

(6) The assessment process must include consideration of—

(a) the probability of non-complying construction of critical aspects of an approved design; and

(b) the probability of critical aspects of an approved design being fully functional during the life of the building; and

(c) inclusion of safety factors; and

(d) sensitivity analysis of critical aspects of a proposed design.

Limitations

G5V1 does not apply to a Class 9 building.

Notes

For a building that is subject to G5P2, and therefore outside the scope of G5V1, the building would need to comply with either—

(a) *Performance Requirement* G5P2 by means of a *Performance Solution*; or

(b) the *Deemed-to-Satisfy Provisions* of G5D1 if the building is located in an area subject to a Bushfire Attack Level (BAL) not exceeding BAL – 12.5.

Table G5V1: Annual Probability of Exceedance (APE) for design bushfire actions

Importance Level	Complex analysis APE for bushfire exposure	Simple analysis APE for weather conditions (*design bushfire*)
1	No requirement	No requirement
2	1:500	1:50
3	1:1000	1:100
4	1:2000	1:200

Table Notes

Complex analysis must consider the probability of ignition, fire spread to the urban interface and penetration of the urban interface coincident with fire weather conditions.

Deemed-to-Satisfy Provisions

G5D1 Deemed-to-Satisfy Provisions

[2019: G5.0]

SA G5D1(1)

(1) Where a *Deemed-to-Satisfy Solution* is proposed, *Performance Requirements* G5P1 and subject to G5D2, G5P2, are satisfied by complying with G5D3 and G5D4.

(2) Where a *Performance Solution* is proposed, the relevant *Performance Requirements* must be determined in accordance with A2G2(3) and A2G4(3) as applicable.

NSW G5D2

QLD G5D2

VIC G5D2

G5D2 Application of Part

[2019: G5.1]

The *Deemed-to-Satisfy Provisions* of this Part apply in a *designated bushfire prone area* to—

(a) a Class 2 or 3 building; or

(b) a building located in an area subject to a Bushfire Attack Level (BAL) not exceeding BAL—12.5, determined in accordance with AS 3959 that is—

(i) a Class 9a *health-care building*; or

(ii) a Class 9b—

(A) an *early childhood centre*; or

(B) a primary or secondary *school*; or

(iii) a Class 9c *residential care building*; or

(c) a Class 10a building or deck immediately adjacent or connected to a—

(i) Class 2 or 3 building; or

(ii) a building of a type listed in (b).

Notes

(1) If a building of a type listed in (b) or (c)(ii) is subject to a BAL exceeding BAL—12.5, the building would need to comply with *Performance Requirement* G5P2 by means of a *Performance Solution*.

(2) There are no *Deemed-to-Satisfy Provisions* for these buildings.

NSW G5D3

G5D3 Protection — residential buildings

[2019: G5.2]

In a *designated bushfire prone area* the following must comply with AS 3959:

(a) A Class 2 or 3 building.

(b) A Class 10a building or deck immediately adjacent or connected to a Class 2 or 3 building.

NSW G5D4

VIC G5D4

G5D4 Protection — certain Class 9 buildings

[New for 2022]

(1) In a *designated bushfire prone area* the following must comply with Specification 43:

(a) A Class 9a *health-care building*.

(b) A Class 9b—

(i) *early childhood centre*; or

(ii) primary or secondary *school*.

(c) A Class 9c *residential care building*.

(2) In a *designated bushfire prone area*, a Class 10a building or deck immediately adjacent or connected to a building of a type listed in (1) must comply with S43C2 and S43C13.

SA G5D5

ATTACHMENT 5 – Shire Firebreak Notice

FIREBREAK AND FUEL LOAD NOTICE

Bush Fires Act 1954 - Section 33

Notice to all owners and occupiers of land situated within the Shire of Mundaring

Pursuant to *section 33(1) of the Bush Fires Act 1954*, the Shire of Mundaring (the Shire) gives notice that the owners and/or occupiers of the land district are required to undertake the following works on land owned or occupied by them. This must be done by **1 November each year and maintained until 31 March the year following**.

DEFINITIONS WITHIN THIS NOTICE

Authorised Officer **-** means an employee of the Shire appointed as a Bush Fire Control Officer, pursuant to the powers conferred in *section 38* of the *Bush Fires Act 1954*.

Trafficable **-** means to be able to travel from one point to another in an emergency services vehicle on a clear surface, unhindered, without any obstruction that may endanger such vehicles. It must not terminate, lead to a dead end, nor have any pinch points without provision for egress to a safe place, or a cleared turnaround area of not less than an 18-metre diameter.

Vertical Clearance **-** means a continuous, uninterrupted vertical line at a right angle to the horizontal baseline of the firebreak, to a minimum height of 4 metres from the ground.

Firebreak **-** means a strip or area of ground, with a minimum width of 3 metres but no wider than 4 metres, and a vertical clearance of 4 metres, immediately inside all external boundaries of any lot and constructed to a trafficable surface, that is kept and maintained clear of all flammable and combustible material. This includes the pruning and removal of any living or dead trees, scrub, or any other material encroaching onto it or into the vertical clearance of the firebreak area. Firebreaks may be constructed by one or more of the following methods: ploughing, cultivating, scarifying, raking, burning, chemical spraying, blowing, or other methods as approved by an Authorised Officer.

Flammable Material **-** means any substance that will catch fire easily without contact with flames or with a low ignition point, such as but not limited to, petrol or liquefied petroleum gas.

Combustible Material **-** means any fine fuels, plant, tree, grass, substance, object, thing, or material that may or is likely to catch fire and burn or any other thing deemed by an Authorised Officer to be capable of combustion.

Fuel Depot / Fuel Storage Area **-** means an area of land, a building, or a structure where fuel, i.e. (petrol, diesel, kerosene, liquid gas, or any other fossil fuel) is kept in any container or vessel.

Fuel Loads

Fine Fuel Loads - means the leaf litter on the ground, including leaves, twigs (up to 6mm in diameter), and bark.

A fine fuel load depth of 5mm from the top of the layer to the mineral earth beneath indicates approximately 2 tonnes per hectare. A fine fuel load depth of 15mm from the top of the layer to the mineral earth beneath indicates approximately 8 tonnes per hectare.

Coarse Fuel Loads – means twigs, branches (6mm or larger in diameter), logs, etc.

Maintaining Fuel Loads **-** relates to managing fuel loads described in this Notice. Reducing fuel load levels does not necessarily require the removal of existing natural vegetation. A combination of methods can be utilised, including planned burning, raking, weed removal, pruning, and/or removing dead plant material.

Managed Vegetation **-** includes vegetation that is pruned away from buildings, under pruned to minimise contact with ground fuels, and that is kept free of dead suspended matter such as twigs, leaves, and bark.

Habitable Buildings **-** means any building or other dwelling suitable for human residency, occupation, or use within an already existing Asset Protection Zone. This includes attached or adjacent structures such as garages, carports, verandas, or similar roofed structures that are attached to, or within 6 metres, of the dwelling or primary building.

Asset Protection Zone (APZ) **-** is an area of very low fuel levels surrounding a habitable building extending to a minimum of 20 metres out from any external walls of the building, attached structures, or adjacent structures within 6 metres of that building. On sloping ground, it shall increase at 1 metre for every degree in slope on the sides of the habitable building that are exposed to downslope natural vegetation.

1. **The Land owner (or occupier) is required to do the following**

1.1 All land with an area of up to 5,000sqm, with a building on it must

a) Maintain all grass on the land to a height no greater than 5cm.
b) Maintain fuel loads in natural bush areas at less than 8 tonnes per hectare across the land.
c) Maintain an APZ in line with the requirements of section 1.6 of this Notice.

1.2 All land with an area of 5,000sqm up to 50,000sqm (5 Hectares) with a building on it must

a) Maintain all grass on the land to a height no greater than 5cm.
b) Install a firebreak around all structures outside of the APZ and immediately inside all external boundaries of the land.
c) Maintain an APZ in line with the requirements of section 1.6 of this Notice.
d) Maintain fuel loads outside an APZ in natural bush areas at less than 8 tonnes per hectare across the land.

1.3 All land with an area of 50,000sqm or greater, with a building on it must

a) Maintain all grass to a height no greater than 5cm for a distance of 10m from any firebreak.
b) All other grasses within the area must be managed by slashing or effective grazing by livestock or as directed by an Authorised Officer.
c) Install a firebreak around all structures outside of the APZ and immediately inside all external boundaries of the land.
d) Maintain fuel loads in natural bush areas at less than 8 tonnes per hectare across the land.
e) Maintain an APZ in line with the requirements of section 1.6 of this Notice.

1.4 All vacant land with an area of less than 2,000sqm

a) Ensure all grass is maintained on the land to a height no greater than 5cm and that fuel loads in natural bush areas are maintained to less than 8 tonnes per hectare across the land.

1.5 All vacant land with an area greater than 2,000sqm must

a) Install a firebreak immediately inside all external boundaries of the land.
b) All land with an area of less than 50,000sqm (5 Hectares), all grass must be maintained on the land to a height no greater than 5cm.
c) All land with an area of 50,000sqm (5 Hectares) or greater, the grass must be maintained on the land to a height no greater than 5cm for a distance of 10 metres from any firebreak, and all other grasses managed by slashing or effective grazing by livestock or as directed by an Authorised Officer.
d) Maintain fuel loads in natural bush areas to less than 8 tonnes per hectare across the land.

1.6 Asset Protection Zone Specification

a) Maintain all grass on the land to a height no greater than 5cm.
b) Fuel loads maintained at 2 tonnes per hectare or lower.
c) Clear separation between adjoining or nearby tree crowns.
d) Small group/s of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species.

e) No trees/shrubs over 2 metres high are to be within 2 metres of a habitable building.
f) Trees and shrubs must be under-pruned to a minimum height of 2 metres from the ground.
g) Shrubs over 2 metres high must not be planted in groups close to habitable buildings, ensuring there is a gap of at least three times the height (at maturity) of the shrub away from habitable buildings.
h) Ensure no part of a tree overhangs any buildings.
i) Gutters are free of fine fuels and other flammable/combustible materials.
j) Roofs and walls of all buildings within an APZ on the land are free of fine fuels and other flammable/combustible material. Including wood piles against building walls and flammable/combustible materials against that building or stored under pole-framed houses.
k) Ensure paths and non-flammable features immediately adjacent to habitable buildings are installed.
l) Wood piles and flammable materials are stored at a safe distance from habitable buildings.

1.7 Fuel Depot /Storage Area, Haystacks / Stockpiled Flammable Material

a) Remove all flammable/combustible material within 10 metres of where it is stored.

b) Install a firebreak immediately adjacent to any haystacks or stockpiled flammable material.

1.8 Application to vary the above Requirements/Arrangements

An application to vary any of the above requirements can be made to the Shire to implement measures in the case of topographic or environmental obstructions. This will be assessed by an Authorised Officer and will be granted for a time period as decided by the Authorised Officer assessing your application. If approved you must still comply with the other sections of this notice. If not approved, your property is still required to comply with this notice. Bushfire Management Plans, Bushfire Management Statements, or Fuel Load Management Plans, approved by the Shire to reduce and mitigate fire hazards within a particular subdivision, lot, or other area of land anywhere in the district, are also included.

1.9 Additional Works

a) All driveways must be clear of flammable material and accessible to allow for the safe access and egress of emergency services vehicles, as deemed by the Authorised Officer.

b) In addition to the requirements of this Notice, you may be required to carry out further works that are considered necessary by an Authorised Officer and,

specified by way of a separate written notice forwarded to the address of the owner/s, as shown on the Shire rates record for the relevant land.

The Shire advises that its officers, servants, workmen, contractors, vehicles, machinery, and appliances (as the officers deem fit) may carry out the requisitions of this notice that are not complied with by the date specified above. Any costs and expenses incurred may be recovered from you as the owner and/or occupier of the land.

The penalty for failing or neglecting to comply with this Notice is a fine not exceeding $5000, and a person in default is also liable, whether prosecuted or not, to pay the costs of performing the work directed by this Notice if it is not carried out by the owner and/or occupier by the date required by this Notice.

Supplementary requirements to this notice

Section 24F and 24G (Restricted Burning Period)

Burning of Garden Refuse

a) A 1 sqm pile of garden refuse may be burnt at any one time, between 6 pm and 11 pm without a permit and must be fully extinguished by midnight. Fully extinguished means no heat, smoke, steam, or white ash being present where the fire was situated.
b) Have an adequate water supply that can reach the pile and beyond in the event of escape.
c) No more than one pile of garden refuse is to be burnt at any one time.
d) If the Fire Danger Rating for Swan Inland North is HIGH and above, or if winds exceed 15kmp/h NO burning is allowed.
e) One able-bodied adult must be in attendance at all times
f) All other burning before this time requires a Permit to Burn

If the requirements of this Notice are carried out by burning, such burning must be in accordance with the relevant provisions of the *Bush Fires Act 1954*.

By order of the Council.

Jason Whiteaker
CHIEF EXECUTIVE OFFICER

Shire of Mundaring
7000 Great Eastern Highway
MUNDARING WA 6073
Tel: (08) 9290 6666
Email: shire@mundaring.wa.gov.au

For Information on Property and Personal Preparedness scan below

Or visit https://engage.mundaring.wa.gov.au/emergency-response-recovery

ATTACHMENT 6 – References

GENERAL REFERENCES

Australian Institute for Disaster Resilience 2020, *Australian Disaster Resilience Handbook 10: National Emergency Risk Assessment Guidelines (NERAG)*, CC BY-NC

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Western Australian Department of Planning 2016*, Visual Guide for bushfire risk assessment in Western Australia*

Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire Prone Areas*, Western Australian Planning Commission, Perth, Perth

Western Australian Planning Commission and Department of Fire and Emergency Services (WAPC and DFES) 2017, *Guidelines for Planning in Bushfire Prone Areas Version 1.4*, Western Australia

Online references

Office of Bushfire Risk management (OBRM), Map of Bush Fire Prone Areas,
< https://maps.slip.wa.gov.au/landgate/bushfireprone/>

Our Ref: D37343
Your Ref: Ro 6.340

David Tomlinson
Shire of Mundaring
davidtomlinson@mundaring.wa.gov.au

Dear Mr Tomlinson

RE: VULNERABLE LAND USE - 340 ROLAND ROAD, PARKERVILLE – PROPOSED EDUCATIONAL ESTABLISHMENT - DEVELOPMENT APPLICATION

I refer to your email dated 3 December 2024 regarding the submission of a Bushfire Management Plan (BMP) (Version 3), prepared by Envision and dated 14 October 2024, for the above development application (DA). The BMP is accompanied by a planning report from the proponent dated 4 November 2024 for the DA.

The new *State Planning Policy 3.7 Bushfire* and associated *Planning for Bushfire Guidelines* were published on 24 September 2024 and became operational for applications lodged with decision makers from 18 November 2024. Notwithstanding, as this application was submitted to the decision maker prior to 18 November 2024, this advice relates only to the 2015 *State Planning Policy 3.7: Planning in Bushfire Prone Areas* (SPP 3.7) and 2021 *Guidelines for Planning in Bushfire Prone Areas* (version 1.4) (Guidelines).

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, health or any other approvals required by a relevant authority under written laws.

Assessment

- DFES acknowledges that the development application seeks the restoration and adaptive use of existing ‘cottage’ style buildings on the subject site for an educational establishment for secondary school aged children.
- As the four existing foster care homes, the Blue Cottage, the Carinya Cottage and the Wearne Cottage (the ‘excluded buildings’) are not included in the proposed educational establishment use, DFES’ comments on these buildings are limited to vegetation classification or exclusion only.
- The decision maker has confirmed this development to be a vulnerable land use and the application of SPP 3.7 is triggered.
- Further clarification is required within the BMP of the requirements of SPP 3.7, and the supporting Guidelines as outlined in our assessment below.

1. Policy Measure 6.5 a) (ii) Preparation of a BAL contour map

Issue	Assessment	Action
Vegetation Exclusion	Evidence is required to support the exclusion of the ’excluded buildings’ from vegetation classification, as managed to low threat in accordance with AS3959.	Clarification required.

	No photographic evidence has been provided, and aerial image appears to show trees overhanging existing buildings. Further evidence is required to clearly detail the vegetation surrounding these buildings. Alternatively, the vegetation should be classified as per AS3959, or the resultant BAL ratings may be inaccurate.	The decision maker to be satisfied with the vegetation exclusion.
Vegetation Classification	Vegetation Plots 3 and 6 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 at maturity as per AS3959, or the resultant BAL ratings may be inaccurate.	Modification to the BMP is required.
Landscape Management Plan	The BMP has identified that a significant amount of native vegetation will need to be modified to achieve an APZ compliant with Schedule 1: Standards for Asset Protection Zones contained in the Guidelines. As per Policy objective 5.4 and section 2.3 of the Guidelines, where significant clearing of vegetation is the only means of managing bushfire risk, the proposal may not be appropriate. A Landscape Management Plan should be prepared to detail areas of vegetation modification, to remove ambiguity for the landowner and to provide a compliance mechanism for the Shire.	Modification to the BMP is required.
Effective Slope	Portions of Plot 3 to the south of Worthington Hall appear to be subject to downslope based on the land contour information provided, however the overall plot has been classified as flat/upslope.	Modification to the BMP is required.
Method 2	DFES notes that there is some lack of clarity around definitions for inputs to the Method 2 calculations, of particular relevance to this application are those regarding vegetation classification and effective slope. Specifically, • Plots 3 and 6 should be Class A Forest as per comment above.	Modification to the BMP is required.

	• Plot 3 to the South of Worthington Hall appears to be subject to downslope as per comment above. • A site slope input value of '0' is used for the calculation of transects of 0-5 degrees downslope. • The use of separation distance based on Specification 43 of the National Construction Code (NCC) 2022 may not be relevant as this provision has not yet been implemented in Western Australia for the relevant land use. • The method and calculation details to derive the separation distances to Worthington Hall in Figure 5a are not provided. The stated separation distances are less than those provided in Table S43C2 of NCC 2022 (refer to screenshot below), especially for the 39 metres separation distance from Plot 3. Table S43C2 Minimum distance of building to classified vegetation Vegetation classification | Slope | Minimum distance (m) of the building to classified vegetation High risk | Upslope and flat land | 60 High risk | Downslope max 20 degrees | 110 Medium risk | Upslope and flat land | 40 Medium risk | Downslope max 20 degrees | 80 Low risk | Upslope and flat land | 30 Low risk | Downslope max 20 degrees | 50 ▼ Table Notes (1) Table values are based on a Fire Danger Index of 100 in accordance with AS 3959. (2) High risk equates to vegetation classification of forest and woodland in accordance with AS 3959. (3) Medium risk equates to vegetation classification of scrub and rainforest in accordance with AS 3959. (4) Low risk equates to vegetation classification of shrubland, mallee/mulga and grassland in accordance with AS 3959. Accordingly, DFES advises that the Method 2 outputs cannot be validated.	

2. Policy Measure 6.5 c) Compliance with the Bushfire Protection Criteria

Element	Assessment	Action
Location	**Intent – does not comply** The development is on a lot that has, and is surrounded by, an extreme hazard that, in the opinion of DFES, cannot be adequately managed. It is considered that the development of a vulnerable land use at this location does not comply with the intent of Element 1 of the Guidelines.	Does not comply.
Location, and Siting & Design	**A1.1 & A2.1 – not demonstrated** The BAL ratings cannot be validated for the reason(s) outlined in the above table.	Modification to the BMP required.

Vehicular Access	**A3.2a – not demonstrated** The BMP states that Roland Road provides the site with access and evacuation options to two different directions, however, it has not identified two different suitable destinations. The Bushfire Emergency Evacuation Plan shows one evacuation route to the Brown Park Community Recreation Centre. As this evacuation route requires travel through extreme bushfire hazard, DFES recommends an alternative evacuation route in a different direction to a different suitable destination. **A3.6 – not demonstrated** As the private driveways are longer than 70 metres, turn-around areas as per Figure 28 need to be provided within 30 metres of each habitable building.	Modification to the BMP is required.

3. AS3959 construction standards including clause 3.2.3 adjacent structures

Issue	Assessment	Action
Building Construction Standards	Class 9 buildings should be afforded significant protection from the impacts of a bushfire due to being occupied by people who may need assistance, or be unable, to evacuate the building in the event of a bushfire. In response, revised provisions in the National Construction Code will apply in the future. The proposed changes include but are not limited to; minimum separation between buildings, and separation from allotment boundaries, carparking areas and hazards. It is suggested the decision maker consider applying the proposed higher construction and design standards to the proposed development. Further information regarding the proposed changes can be found here: https://consultation.abcb.gov.au/engagement/ncc-2022-public-comment-draft/supporting_documents/NCC2022VolumeOnePCD.pdf	Comment only.

4. Policy Measure 6.6.1 Vulnerable and High-Risk land uses

Issue	Assessment	Action
Bushfire Emergency	The referral has included a *'Bushfire Emergency Evacuation Plan'* for the purposes of addressing the policy requirements. Consideration should be given to	Comment only.

Evacuation Plan (BEEP)	the Guidelines Section 5.5.4 'Developing a Bushfire Emergency Evacuation Plan'. This contains detail regarding what should be included in a BEEP and will ensure the appropriate content is detailed when finalising the BEEP to the satisfaction of the Shire. Furthermore, DFES recommends an alternative evacuation route to a different suitable destination (refer to comment in the table above).	

Internal Referral Comments:

The proposal has been referred to DFES' Built Environment Branch who have provided the following comment.

- As the proposed buildings are Class 9b, plans will need to be provided to DFES Built Environment Branch for assessment, as required by Regulation 18B of the *Building Regulations 2012* (as are amended).

Recommendation – not compliant with intent

The development application is not considered compliant as it does not meet the intent of Element 1: Location. The proposal will locate a vulnerable land use in an area of extreme hazard. The proposal also has not demonstrated compliance with the acceptable solutions for Element 2: Siting and Design and Element 3: Vehicular Access.

If the decision maker is inclined to approve the proposal the above assessment of compliance with SPP 3.7 is provided to assist decision making.

As this planning decision is to be made by the Development Assessment Panel please forward notification of the decision to DFES for our records.

If you require further information, please contact Sean He – Senior Land Use Planning Officer on telephone number 9395 9702.

Yours sincerely



Desmond Abel
DIRECTOR LAND USE PLANNING

13 January 2025

Your Ref: Ro 6.340

20 January 2025

David Tomlinson
Shire of Mundaring
davidtomlinson@mundaring.wa.gov.au

Dear Mr Tomlinson

RE: VULNERABLE LAND USE - 340 ROLAND ROAD, PARKERVILLE – PROPOSED EDUCATIONAL ESTABLISHMENT - DEVELOPMENT APPLICATION

I refer to the Department Fire and Emergency Services comments dated 13 January 2025, regarding the above development.

It is noted that DFES comments have followed SPP 3.7 (2015) and the Guidelines for Planning in Bushfire Prone Areas V1.4, because the application was lodged before the new SPP 3.7 Bushfire (2024) and Guidelines (2024) became operational on 18 November 2024.

It should be noted that the effect of the National Construction Code *Construction in bushfire prone areas* for class 9b buildings has been deferred until 1 May 2028 (Regulation is pending) although it had also been expected to be narrowed to *the degree necessary* by the Department of Energy Mines and Industry (DMIRS).

It should also be noted that the historic use of the site as a children's home/orphanage has continued to provide educational and support services. The proposed development is a reinvestment and a restoration of historic buildings. The site has been historically managed as parkland; dispersed trees over short grass.

Part 10A Schedule 2 of the *Planning and Development (Local Planning Scheme) Regulations 2015* establishes the requirement to apply SPP3.7 and in turn it applies only to a **construction** and construction and use of a development within a bushfire prone area (Fire and Emergency Services Act 1998).

The definition of construction at Part 10A is:

> ***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;

This is consistent with SPP 3.7 not being retrospective.

Similarly Building Regulations 2012 at 31 BA excludes the application of the building standards for certain buildings in bush fire prone areas

> **excluded building wor**k means building work that is the renovation, alteration, extension, improvement or repair of a relevant building if
>
> (b) the renovation, alteration, extension, improvement or repair does not increase the risk of ignition from bushfire attack for the relevant building;

A primary motivator for the applicant, is not mandatory compliance but future resilience and consideration for insurance. The restored buildings are excluded from consideration by the definition of construction, but the applicant has nominated a BAL 19 standard, and the provision for shelter on site, Worthington Hall, has been volunteered by the applicant. The NCC 2022 affecting Class 9b buildings did not apply in WA at time of lodgement and has been further deferred.

SPP3.7 represents a benchmark for insurance purposes and has been followed for context and to provide a contingency for shelter on site.

The NCC 2022 requirements largely follow the Design and Construction of Community Bushfire Refuges 2014, (which remains the relevant reference for planning consideration) where a shelter is proposed. It however envisages a single building.

It should also be noted that the Performance requirement in Part 5 Construction in bushfire prone areas can be satisfied by 'Deemed to satisfy' (specification 43), the additional requirements for certain class 9 buildings (including class 9b) or a combination of both; the verification method does not apply to Class 9 building only the additional requirements for certain class 9 buildings if not DtS. Many of the requirements in Specification 43 are not proportionate to the classification, minimum distance from a building, multiple building sites. Most development is expected to be a combination of specification 43 targets (i.e. tenability benchmarks) but utilise the *additional requirements for certain class 9 buildings as the solutions G5P1 and G5P2.*

Given the shelter is at the applicant's discretion, and the proposal is seeking planning approval, the BMP has had regard to both the Design and Construction of Community Bushfire Refuges and future consideration that may have been taken when the NCC was expected to become operational on 1 May 2025 (now deferred). NCC 2022 G5P1, was considered the most conservative and best graduation for the purpose of establishing an area (for the purpose of planning Approval) to achieve 10 kWm^2 from the Shelter Building - Worthington Hall.

Assessment	Action
Evidence is required to support the exclusion of the 'excluded buildings' from vegetation classification, as managed to low threat in accordance with AS3959. No photographic evidence has been provided, and aerial image appears to show trees overhanging existing buildings. Further evidence is required to clearly detail the vegetation surrounding these buildings. Alternatively, the vegetation should be classified as per AS3959, or the resultant BAL ratings may be inaccurate.	The SPP 3.7 and the Building Regulation 31BA are not retrospective. The buildings are of long standing, historic and dilapidated. The proposal is a historic rejuvenation. The buildings are excluded for planning and building construction requirements. The buildings predate 2015 and are entitled to the Bushfire Risk Treatment Standard 2020. The applicant desires a BAL 19 construction, compatible to the historic nature of the buildings, and the BMP has identified the area within the site required around each building to be maintained to achieve BAL 19 at the building. Figure 5 illustrates the required APZ area around each building (set to forest as a worst case) is within the site and at the applicant's control. The measure of compliance is at completion (applied APZ). DFES is wrong to only consider a predevelopment state rather than that which is proposed, within the applicants control, and is enforceable against the applicant under section 214 of the Planning and Development Act 2005.
Vegetation Plots 3 and 6 cannot be substantiated as Class B Woodland with the limited information and photographic evidence provided. The foliage cover appears to exceed 30%.	DFES has repeatedly been advised that canopy is not the determination of the Woodland because Woodland is distinguished at Table B3 in AS3959 by the understory fuel (tonnage). Both Forest and Woodland have the same canopy tonnage

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 at maturity as per AS3959, or the resultant BAL ratings may be inaccurate.	expectation; the difference is the absence of understorey fuel that may engage the canopy. Photos 3.1-3.7 and 6.2 - 6.4 - 6.7 (targets) for Plots 3 and 6 clearly show an absence of understorey, other than managed grasses. SPP3.7 uses AS3959 as a reference. AS3959 is a National standard to be interpreted by National practice, and not by DFES opinion (WASAT Bunnings). The classifications of Plots 3 and 6 are correct.
The BMP has identified that a significant amount of native vegetation will need to be modified to achieve an APZ compliant with Schedule 1: Standards for Asset Protection Zones contained in the Guidelines. As per Policy objective 5.4 and section 2.3 of the Guidelines, where significant clearing of vegetation is the only means of managing bushfire risk, the proposal may not be appropriate. A Landscape Management Plan should be prepared to detail areas of vegetation modification, to remove ambiguity for the landowner and to provide a compliance mechanism for the Shire.	The buildings exist. SPP 3.7 is not intended to be retrospective. The buildings predate 2015 and have opportunity to utilise the Bushfire Risk Treatment Standard 2020, to clear an area 20m around each building. Exemptions are also provided under the EP Act 1986 where removal is required for bushfire risk reduction See BMP page 11). In this instance the proposal is to follow the Standards for APZ in Schedule 1 Element 3 in the Guidelines. The APZ standard is not barren land but describes a horizontal and vertical separation of vegetation type, and as such provides a default landscape plan. It is additional to (follows) from the classification of vegetation in AS3959. If it is classified vegetation, then the APZ should apply. AS 3959 however classes parkland trees over nominal grass as managed (private cultivated) and excluded from classification. The site is within a Carnaby's Black Cockatoo area. The proposal is not adding buildings that would displace trees and the APZ tree canopies can be largely retained and achieve the managed and the low threat classification around the existing buildings. For the benefit of the Carnaby's Black Cockatoo.
Portions of Plot 3 to the south of Worthington Hall appear to be subject to downslope based on the land contour information provided, however the overall plot has been classified as flat/upslope.	See Figure 2 in BMP, the land south of Worthington Hall is upslope and west to the building it is level to the building? Woodland vegetation to the north of the Worthington Hall Plot 6 has been identified as downslope. Note the BAL Contour has classed all vegetation north of Worthington Hall as downslope, including for shelter purposes requiring management at completion to achieve the Shelter design at Worthington Hall.

DFES notes that there is some lack of clarity around definitions for inputs to the Method 2 calculations, of particular relevance to this application are those regarding vegetation classification and effective slope. Specifically, Plots 3 and 6 should be Class A Forest as per comment above. Modification to the BMP is required. Plot 3 to the South of Worthington Hall appears to be subject to downslope as per comment above. A site slope input value of '0' is used for the calculation of transects of 0-5 degrees downslope. The use of separation distance based on Specification 43 of the National Construction Code (NCC) 2022 may not be relevant as this provision has not yet been implemented in Western Australia for the relevant land use. The method and calculation details to derive the separation distances to Worthington Hall in Figure 5a are not provided. The stated separation distances are less than those provided in Table S43C2 of NCC 2022 (refer to screenshot below), especially for the 39 metres separation distance from Plot 3.	The reason is provided; a correct classification of Woodland is based on understorey by National Practice of AS3959, Plots 3 and 6 have been correctly classified relevant aspect to the Worthington Hall (transect?). DFES has presumed it should be forest and it is wrong. Table S43C2 of NCC 2022 is not applicable at this time, but also the method of vegetation classification for the DtS may favour in any event the *additional requirements for certain class 9 buildings,* to apply a more appropriate graduation better reflective of the bushfire intensity. G5P1 provides the alternative to the DTS method, using an annual probability exceedance not more than 1:200 year for class 9 buildings from vegetation type and slope. An FDI of 100 is equivalent to a 1:200 in the Darling Ranges. As illustrated by DFES the difference between flat and any slope given an extreme value of 20.0^0, flame length doubles for every 10.0^0 is a dramatic overestimation where the slope is only 3.0^0. The approach taken in the BMP, the calculations provided at page 29, provided the dimensions (39 m) to vegetation type and slope. The dimension is shown on Figure 5. For comparison purposes Figure 4 illustrated the Design and Construction Bushfire Refuges handbook 2014. Figure 5 has been used as the recommended approach. It is more conservative than the Handbook but better graduated compared to the DtS. It is noted the title on Figure 5 should refer to G5P1 (BMP has been amended). At the applicant's discretion but no change is proposed to the management area identified in Figure 5 and Figure Ex1.
The development is on a lot that has, and is surrounded by, an extreme hazard that, in the opinion of DFES, cannot be adequately managed. It is considered that the development of a vulnerable land use at this location does not comply with the intent of Element 1 of the Guidelines.	SPP 3.7 is not retrospective, and the development exists. Notwithstanding this, Element 1 only requires that a development application can achieve BAL 29 at completion. "A1.1 Development Application The strategic planning proposal, subdivision and development application is located in an area that is

	or will **on completion**, be subject to either a moderate or low bushfire hazard level **or** BAL 29 or below" (authors bold) The proposal achieves BAL 29. The DFES comment has no standing from the Guidelines and is wrong.
A1.1 & A2.1 – not demonstrated The BAL ratings cannot be validated for the reason(s) outlined in the above table.	For the reasons provided above, the BAL ratings are correct, and no change is required.
A3.2a – not demonstrated The BMP states that Roland Road provides the site with access and evacuation options to two different directions, however, it has not identified two different suitable destinations. The Bushfire Emergency Evacuation Plan shows one evacuation route to the Brown Park Community Recreation Centre. As this evacuation route requires travel through extreme bushfire hazard, DFES recommends an alternative evacuation route in a different direction to a different suitable destination.	There is no requirement to nominate a suitable destination for a through road where a proposal provides multiple destination options. The requirement to avoid travel through extreme bushfire hazard is only applicable to single roads. The route south is initially into the urban area but because it is the Darling Ranges it is unavoidable to travel through extreme bushfire hazard areas, in any direction from the site. The Bushfire Emergency evacuation plan has followed Department of Education Principal's Guide to Bushfire which identifies one default destination, but the evacuation route will be determined by the safest option to a nominated destination depending upon the bushfire event. The role of the Chief Warden is to determine the safest destination, usually with advice from emergency services. (Additional clarification has been provided in the BEEP).
A3.6 – not demonstrated As the private driveways are longer than 70 metres, turn-around areas as per Figure 28 need to be provided within 30 metres of each habitable building.	All buildings are within 30 m of a through way, and accessible to emergency services. Turnarounds, following Figure 28 do not need to be provided
Class 9 buildings should be afforded significant protection from the impacts of a bushfire due to being occupied by people who may need assistance, or be unable, to evacuate the building in the event of a bushfire. In response, revised provisions in the National Construction Code will apply in the future. The proposed changes include but are not limited to; minimum separation between buildings, and separation from allotment boundaries, carparking areas and hazards. It is suggested the decision maker consider applying the proposed higher construction and design standards to the proposed development.	The applicant has volunteered (intent) to follow NCC 2022 G5P1. This is reflected in Figure Ex1. Compliance (volunteered) with the Performance requirement, utilising the Additional bushfire requirements for certain Class 9 buildings and reference to the DtS tenability requirements will be demonstrated at building permit.

Further information regarding the proposed changes can be found here: https://consultation.abcb.gov.au/engagement/ncc-2022-public-comment-draft/supporting_documents/NCC2022VolumeOnePCD.pdf	
The referral has included a 'Bushfire Emergency Evacuation Plan' for the purposes of addressing the policy requirements. Consideration should be given to the Guidelines Section 5.5.4 'Developing a Bushfire Emergency Evacuation Plan'. This contains detail regarding what should be included in a BEEP and will ensure the appropriate content is detailed when finalising the BEEP to the satisfaction of the Shire. Furthermore, DFES recommends an alternative evacuation route to a different suitable destination (refer to comment in the table above).	This is a routine statement provided by DFES for comment only. The BEEP follows the Department of Education Principal's Guide to Bushfire and the Department of Education Standalone Bushfire Plan Template for consistency to assist Emergency Services attending both private and public schools. This has been the recommended procedure (DPLH) and is now acknowledged in the Planning for Bushfire Guidelines at A2.5.

A revised BMP dated 20 January is attached.

Should you have any queries, please contact me on 0428 066 147, or alternatively by email: admin@envisionbp.com.au



Yours sincerely
Anthony Rowe BPAD L3

Principal

Attached Revised: BMP

Galt GEOTECHNICS

Report on:

SITE AND SOIL EVALUATION
PROPOSED PARKERVILLE CARE SCHOOL
1 BEACON DRIVE
PARKERVILLE

WAG240444-01 002 REV0

Submitted to:

McCorkell Constructions WA
273 Stirling Street
PERTH WA 6000

16 October 2024

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Understanding your Report



1. INTRODUCTION

This report presents the outcomes of Galt Geotechnics' (Galt's) general site and soil evaluation (SSE) for the proposed Parkerville Care School Development, at 1 Beacon Drive, Parkerville ("the site", refer Figure 1).

This report is to be read in conjunction with the appended "Requirements and Limitations" found at the back of this report.

2. DEFINITIONS

Site and Soil Evaluation (SSE): an assessment of all relevant constraints and the risks to public health and the environment in accordance with AS1547-2012 "On-site domestic wastewater management". This SSE is a general assessment SSE, with the purpose being to undertake a site suitability assessment for onsite wastewater management and to recommend the type of onsite wastewater system for the proposed development.

A specific assessment is required to support an "application to install" an onsite wastewater system. This is for when a particular type of system/model is proposed, and a detailed design, including management recommendations and operation requirements. This document is not a specific assessment.

Land Application Area (LAA): The unencumbered plan area to which treated sewage from an on-site sewage system is distributed for further in-soil treatment and absorption or evaporation. This area is restricted to the distribution of treated sewage and may not be developed for other purposes.

Land Application System (LAS): The system used to apply effluent from a wastewater treatment unit into or onto the soil for further in-soil treatment and absorption or evaporation.

Effluent: The liquid discharged from a wastewater treatment unit.

Primary Treatment: The separation of suspended material from sewage in septic tanks, primary settling chambers or other structures before discharge to either a LAS or secondary treatment process.

Secondary Treatment: Microbiological digestions and physical settling and filtering processes and decomposition of sewage constituents following primary treatment.

Sewage: Any kind of sewage, faecal matter or urine, and any waste composed wholly or in part of liquid.

Infiltrative Area: Is the area within an LAA that has treated effluent directly discharged onto, and does not include setback areas. I.e., the base of leach drains, evapotranspiration beds etc.

3. GOVERNING STANDARDS, REGULATIONS AND POLICIES

SSEs are governed by various National and State Standards, Regulations and Policies, including:

- AS/NZS 1547:2012, On-site domestic wastewater management.
- Western Australia Government Sewerage Policy (2019)
- Western Australia Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations (1974)
- Western Australia State Planning Policy 2.9, Water Resources (2005)

Other regulatory requirements may become relevant depending on the outcomes of any SSE.

SSEs can be rejected on the basis of not meeting the regulatory requirements of the above. This report is intended to address all these various requirements.

4. SITE DESCRIPTION

Table 1: Summary of Site

Item	Comment
Site Extent	Refer to Figure 1, Site and Location Plan
Site Area	About 5 Ha
Current Site Surface Levels[1]	From about RL 252 m AHD in south east to about RL 230 m AHD in north west. About RL 233 m AHD to RL 243 m AHD in proposed LAA Areas.
Vegetation	Mature trees and grass in landscaped areas.
Existing Development	Senior High School, including 13 existing single-story buildings, with associated landscaped and paved areas
Site History[2]	The existing buildings and structures were built prior to 1961, with several additions and alterations made over the years. Jane Brook is present in the northern part of the site, traversing from east to west. Jane Brook is also connected to two drainage basins in the site.

NOTES:
1. *Site levels based on provided information, presented in Appendix B, Supplied Information.*
2. *Site history based on aerial imagery (Landgate).*

5. PROPOSED DEVELOPMENT

Table 2: Summary of Proposed Development

Item	Comment
Proposed Development	Multiple additions, including staff administration building, 6 classrooms, home economics room, arts room, cycling repair shop, garden shed / greenroom, student lunchroom, sports oval, basketball / netball courts, cultural yarning space, undercover outdoor area, lunch area, amphitheatre and other associated facilities (car parks, access roads, etc). Refurbishment and additions to existing buildings is also proposed.
Cut/Fill	Assumed no more than about ±1 m
Assumed Foundation Type	Shallow footings
Assumed Retaining Walls	Gravity retaining walls up to about 1 m heigh
Assumed Stormwater Disposal	Off-site or into swales/basins
Assumed Sewage Disposal	On-site via effluent disposal in the vicinity of BH17 and BH18 as shown on Figure 1

NOTES: *Site history based on aerial imagery (Landgate).*

6. PRELIMINARY HYDRAULIC LOADING

We understand that the design hydraulic loading will initially be about 3,600 L/day, and the increase to a maximum of 6,000 L/day by 2030.

We have assumed wastewater flow rates have been calculated using Health Regulations 29. A larger hydraulic loading will be possible, subject to the LAA being appropriately sized in accordance with the loading rates discussed in this report.

We have assumed that any industrial liquid waste is to be disposed off site.

7. FIELDWORK

7.1. Summary

Fieldwork was carried out in the presence of a representative from Galt on 17 and 18 September 2024 is summarised below.

Table 3: Summary of Field Data

Type	Results Appendix	Summary	Equipment Used	No. Tests	Depth Range (m)
Site Plan	Figure 1	-	Handheld GPS[1]	-	-
Photographs	A	-	-	-	-
Machine Auger Boreholes (BH)	B	Section 10	EVH Scout on utility	16	0.50 – 3.00
Guelph Permeameter Tests (P)	C	Section 7.2	Guelph permeameter	2	0.50

NOTES:
1. *Hand held GPS is accurate to ±5 m.*
2. *DCP Tests carried out adjacent to boreholes.*

7.2. Guelph Permeameter Test Results

Table 4: Guelph Permeameter Test Results

Test Location	Soil Description	Depth (m)	Minimum Unsaturated Hydraulic Conductivity, k_{unsat} (m/day)
P01 (BH17)	Clayey GRAVEL	0.5	0.17
P02 (BH18)	Gravelly SAND / Sandy GRAVEL	0.5	1.01

NOTES: *Constant head Guelph Permeameter tests were carried out in hand-auger boreholes in accordance with Appendix G of AS 1547 (2012) "On-site domestic wastewater management".*

8. LABORATORY TESTING

Laboratory test results are presented in Appendix D and summarised in Attached Tables 1 and 2.

9. SITE CONDITIONS

9.1. Geology

Table 5: Summary of Geology Mapping

Map Sheet	Map Scale	Mapped Soils	Site Findings
MUNDARING	1: 250,000	(G2) GRAVEL – yellow brown to reddish brown, looses, fine to coarse, ferruginous pisolites, and (LA1) LATERITE – massive hard, cemented, vuggy and pisolithic; Up to 4m thick, overlain by and associate with gravels of residual origin	Granular soils interbedded with and overlying very stiff to hard cohesive soils in some zones; overlying inferred laterite rock or other rock.

NOTE: Thin surficial topsoil layers generally present over the site.

9.2. Groundwater and Surface Water

Table 6: Summary of Groundwater and Surface Water Levels

Item	Date	Depth Range (m)	Elevation Range (m AHD)	Comment
Perth Groundwater Atlas	-	-	-	The Perth Groundwater Atlas does not extend to the site
Site observations	17 and 18 September 2024	-	-	Groundwater was not encountered at investigation locations to the maximum depths investigated of up to 4 m. However, water was ponded to the west of the drainage basin in the northern part of the site. Groundwater could perch on / near surficial soils, and pond in drainage basins in the lower elevation / northern part of site. Water flows in Jane Brook in the winter months.
Design water level at Proposed LAA areas in vicinity of BH7 and BH18 only	-	≥ 0.8	-	**Groundwater in the vicinity of BH17 and BH18 only, where LAA areas are proposed.**

10. GROUND MODEL

The encountered subsurface conditions can be summarised as comprising:

- **Surficial Topsoil** in landscaped areas; over
- **Granular Layers of Sandy GRAVEL / Clayey GRAVEL / Gravel / Gravelly SAND / Clayey SAND (GC/GP/SC/SP)**, fine to medium grained, sub-angular to sub-rounded sand; fine to coarse grained, sub-angular to sub-rounded gravel, grey/brown, trace organics (grass rootlets) near surface, surficially loose to depths of up to about 1 m, and then becomes medium dense to very dense, from surface to depths of around 0.3 m to over 4.0 m; overlying / or interbedded with
- **Cohesive Layer of CLAY / Sandy CLAY / Gravelly CLAY (CI/CH)**, medium to high plasticity, red brown/brown/orange, fine to medium grained, sub-angular to sub-rounded sand; fine to coarse grained, sub-angular to sub-rounded gravel, very stiff to hard, about 0.3 m to 2.4 m thick, encountered in BH01, BH03 to BH05, BH07, BH13 and BH15;
- **Inferred Laterite or bedrock** based on DPSH / borehole refusal depths as shallow as 0.4 m in some areas. Rock not encountered in BH05, BH07, BH10 and BH15.

We note that some surficial fill layers associated with the existing school development are judged to be present.

11. SITE ASSESSMENT

11.1. General

The results of our site assessment are presented in Attached Table 3.

11.2. Horizontal Setbacks

Table 7: Required Horizontal Setback Distances (AS1547)

Feature	Sub-Type	Horizontal Setback Distances (m)
Treatment tanks to buildings, property boundaries, driveways, paths and other tanks	-	1.2
Trenches, beds and soak wells to boundary, building, tanks and other land application systems	-	1.8
Trenches, beds and soak wells to trafficable areas	-	1.2
Any land application system to wells, streams, private bores or underground source of water intended for human consumption	-	30.0
Trenches, beds and soak wells to subsoil drains or open drainage channels	-	6.0
Spray irrigation	Boundaries, buildings, driveways etc.	1.8
	Subsoil and open drains	6.0
	Swimming pools	3.0
	Treatment tanks	1.2
Subsurface Drippers	Boundaries, buildings, driveways etc.	0.5
	Subsoil and open drains	3.0
	Swimming pools	2.0
	Garden bore	10.0
On-site waste system to water resources (river, stream etc.)	-	100.0

11.3. Land Application Areas

11.3.1. Government Sewerage Policy (GSP, 2019)

The minimum LAA size in accordance with the GSP (2019) has been calculated and is shown below. The LAA may need to be resized if the hydraulic loading changes.

Table 8: GSP LAA Calculation

Soil Category (AS1547)	Conversion Factor (Table 2 of GSP)	Hydraulic Loading (L/day, Section 6)	Minimum LAA (m^2)
4	0.286	6,000	1,716

11.3.2. Water Balance

Water balance calculations are presented in Appendix E.

The proposed leach drain configuration must have a greater infiltrative area than the minimum required to meet the infiltrative area requirements (in accordance with the WA Health Regulations Method). The leach drains must be installed to meet the horizontal setback requirements outlined in Section 11.2. The LAA must be clearly shown on drawings including setbacks to meet the required area.

11.3.3. Summary

The minimum leach drain infiltrative area for the proposed loading of 6,000 L/day is 410 m^2, within a minimum 1,716 m^2 total LAA. This may need to be resized if the hydraulic loading changes.

A detailed plan will be required with the application to install that shows that the required setbacks are met.

12. SOIL ASSESSMENT

Details of our soil assessment are presented in Attached Table 4.

13. SITE SUITABILITY AND RECOMMENDATIONS

Based on our assessment, the site is suitable for disposal of wastewater. Wastewater must have secondary treatment (i.e., an ATU). The WA Health Regulations method indicates a minimum LAA of 1,716 m^2 is required for wastewater disposal, with the LAA appropriately set back from drains, driveways, site boundaries, buildings etc.. This will need to be resized if the hydraulic loading changes.

LAA Location and Setbacks

We understand LAAs are proposed generally in the vicinity of BH17 and BH18. A 100 m set back is required from LAAs to Jane Brook in the north of the site. This will require moving of the LAA near BH17 further south.

Any proposed LAA will need to satisfy the setback requirements, including meeting the appropriate distances from site boundaries, buildings, trafficable areas and driveways etc…

Disposal Method

We recommend the use of leach drains for wastewater disposal. Flatbed leach drains are likely to be most suitable given their limited depth, to maintain clearance to groundwater.

Separation to Groundwater and LAA Surface Level

The base of the disposal area (i.e., underside of leach drains) must be minimum 0.6 m above maximum groundwater levels. Based on the information available (refer Table 6) a maximum groundwater level of 0.8 m below ground level is recommended in the vicinity of BH17 and BH18 only (where LAA's are proposed). True groundwater is likely to be deeper, however perched groundwater is possible and governs our recommendations.

Treatment Units

The wastewater may be treated using an ATU (secondary treatment), also known as aerated wastewater treatment systems (AWTS). ATU's use the processes of aeration followed by clarification to achieve biological treatment of wastewater.

ATU's (or any other proposed system) must be certified to AS1546.3 (2008) and require approval by the Chief Health Officer. A list of approved ATU's is presented in Table 2 on the Department of Health website. The selected ATU must meet the hydraulic loading for the site and must treat sewage to achieve the following nutrient targets:

- Phosphorous: <1 mg/L
- Nitrogen: <10 mg/L

Soil Improvement

Insitu soils have adequate PRI and therefore, improvement of the disposal areas is not required.

14. CLOSURE

GALT GEOTECHNICS

Owen Woodland CPEng
Geotechnical Engineer

Tyrone Mardesic CPEng
Geotechnical Engineer

https://galtgeo.sharepoint.com/sites/wag240444/shared documents/01 mccorkell si/03 correspondence/wag240444-01 002 r rev0 sse.docx

Attached Table 1: Summary of Geotechnical Index Test Results

Test Name	Sample Depth (m)	Soil Class (AS1726 2017)	Gravel (%)	Sand (%)	Fines (%)	LL (%)	PI (%)	LS (%)	MMDD (t/m^3)	OMC (%)	CBR (%)	CBR Swell (%)
BH02	0.5 – 1.0	Clayey SAND (SC)	24	44	32	33	15	5.5	-	-	-	-
BH07	1.5 – 2.0	Sandy CLAY (CH)	9	54	37	52	30	9.5	-	-	-	-
BH12	0.1 – 0.3	Gravelly SAND (SP-GP)	44	46	10	NO	NP	1.0	2.19	9.5	45	0
BH14	0.1 – 0.3	Gravelly SAND (SP-GP)	39	50	11	29	8	2.5	1.99	11.5	30	0
BH15	1.8 – 2.0	Sandy CLAY (CH)	11	37	52	62	34	10.5	-	-	-	-

Notes

1. *Particle size distribution (by mass)*
   Gravel: 2.36 mm – 63 mm *Sand: 0.075 mm – 2.36 mm* *Fines: <0.075 mm*
2. *Atterberg Limits*
   LL: Liquid limit *PI: Plasticity index* *LS: Linear shrinkage*
   NO: Not obtainable *NP: Non-plastic*
3. *Modified compaction*
   MMDD: Modified maximum dry density *OMC: Optimum moisture content*
4. *CBR: California bearing ratio*
   Remoulding dry density ratio: 95% MMDD *Surcharge: 4.5 kg* *Soaking: 4-day soaked*
5. *I_{ss} – Shrink-swell index*

Attached Table 2: Summary of Chemical Test Results

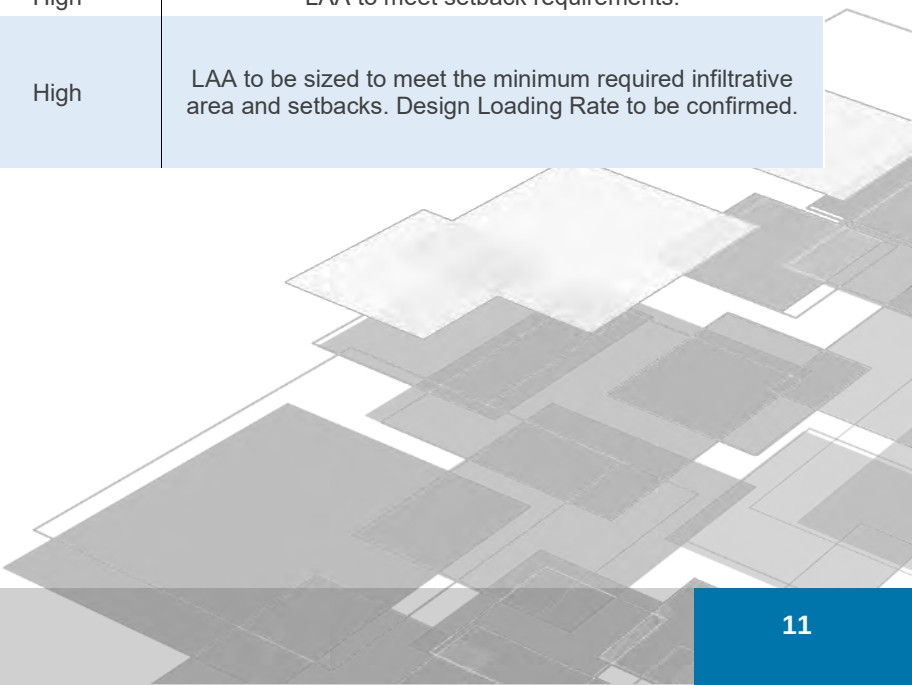
Test Name	Sample Depth (m)	Soil Class (AS1726 2017)	Electric Conductivity (us/cm)	pH	Phosphorus Retention Index	Exchangeable Sodium Percentage (%)
P01 (BH17)	0.5 to 0.7	Clayey GRAVEL	22	6.2	860	Not reportable
P02 (BH18)	0.5 to 0.7	Gravell SAND / Sandy GRAVEL	14	6.9	760	Not reportable

Attached Table 3: Site Assessment

Consideration	Assessment / Discussion	Reference	Level of Constraint	Mitigation Measures
Geology	Described on map as areas of GRAVEL and LATERITE	Mundaring Sheet of the 1:50,000 Environmental Geology Series Map	Nil	-
Climate	To satisfy zero storage requirements, minimum LAA's to be sized as required for hydraulic loading.	Appendix E, Water Balance Calculation	Low	LAA to be greater than area required to meet zero storage requirement.
Exposure	Site will be cleared and broadly levelled - minimal/no tree cover or significant site aspect.	-	Low	-
Vegetation	Assume light grass at surface, no significant vegetation	-	Moderate	LAA designed to accommodate water balance and have nutrient stripping capabilities.
Landform and Drainage	The surrounding site is slopes generally to the north towards Jane Brook. Detention basins present in northern part of site near Jane Brook.	-	Moderate	Civil design to minimise rainfall run-on and run-off (using bunds/curbs etc.).
Slope	The site generally slopes down to the north at a gradient of about 10%.	-	Moderate	Gradient in proposed LAA to be limited to no more than 10%
Fill (Imported)	Possibly some minor fill required to level the LAA.	-	Low	Imported fill must be similar to insitu soil.
PDWSAs	The site is **not** mapped as being within a public drinking water source area.	Department of water (DoW) mapping service	-	-
SSAs	The entire site is not mapped as a Sewage Sensitive Area.	Department of lands and heritage (DPLH) mapping service.	Low	ATU's must be used for effluent treatment (Secondary treatment is required). 0.6 m vertical clearance from base of disposal area to maximum known water level is required.

Attached Table 3: Site Assessment CONTINUED (Page 2 of 2)

Consideration	Assessment / Discussion	Reference	Level of Constraint	Mitigation Measures
Groundwater Level	Encountered groundwater levels are summarised in and Table 6. A maximum groundwater level of 0.8 m below ground level is recommended in the vicinity of BH17 and BH18 only (where LAA's are proposed).	Table 6	Moderate	The underside of any disposal area (i.e. leach drains) must be at least 0.6 m above maximum groundwater levels. A maximum groundwater level of 0.8 m below ground level is recommended in the vicinity of BH17 and BH18 only (where LAA's are proposed).
Groundwater Separation	A minimum separation of 0.6 m is required from the base of the disposal area to the maximum known groundwater level.	Government Sewerage Policy (2019)	Moderate	As above.
Rainfall Run-on/Seepage	The site generally slopes down to the north at a gradient of about 10%. Some rainfall run-on and run-off may occur	-	Moderate	Incident rainfall must be diverted away from LAA's using curbs or diversion bunds. Similarly, any run-off must be prevented by either having a level LAA, or by using retention bunds.
Surface Water/Water Resources	Surface water could occur in the Jane Brook and in detention ponds in the northern part of the site.	-	Moderate	The required minimum setbacks to water resources must be met for the proposed LAA configuration. This will require a 100 m set back from Jane Brook.
Flood Potential	The site is **NOT** mapped as a Floodplain area.	DWER floodplain mapping	-	-
Setbacks	All setbacks to be met.	Section 11.2	High	LAA to meet setback requirements.
LAA	Within the LAA, minimum 410 m^2 is required to meet the minimum infiltrative area for leach drains, based on assumed hydraulic loading. The minimum total LAA area by the GSP 2019 method is 1,716 m^2 and should not be dual use. This will need to be resized as required for the hydraulic loading if a different hydraulic loading applies.	Section 11.3.3	High	LAA to be sized to meet the minimum required infiltrative area and setbacks. Design Loading Rate to be confirmed.



Attached Table 4: Soil Assessment

Consideration	Assessment / Discussion				Reference	Level of Constraint	Mitigation Measures
Subsurface Soil Conditions	In the proposed LAA Areas (near BH17 and BH18), Soil conditions generally comprise Gravelly SAND / Sandy Gravel / Clayey GRAVEL (Category 4 soil).				Appendix B / Section 9	Moderate	-
Acid Sulfate Soils	Site soils are mapped as “no known risk” risk of ASS. No indicators of ASS are noted, and the LAA will be above groundwater.				Department of Environmental Regulation (DER) mapping	Low	-
Soil Category	Existing Gravelly SAND / Sandy Gravel / Clayey GRAVEL soil is Soil Category 4. Any imported fill must have minimum hydraulic conductivity of 0.2 m/day to meet these assumptions (i.e. all fill must be Soil Category 3 or 4).				AS1547-2012	Moderate	Soils with high PRI must be used in the 0.2 m zone below the disposal area to ensure sufficient nutrient stripping capability. Existing soil has an adequate PRI, any fill must also have PRI>20.
Design Loading Rates	20 mm/day				Table L1, AS1547-2012	-	Secondary treated effluent
Laboratory Testing	**Level of Constraint**						-
	Result	**Low**	**Medium**	**High**			
Coarse Fragments[1]	10% to 40%	<10%	10-40%	>40%	-	Low to high	Erosion risk is relatively low and can be controlled around perimeter using geotextile / vegetation / etc.. as per civil design requirements. Reduction of permeability to account for coarse fragments not considered necessary.
Phosphorous Retention Index (PRI)[2]	760 to 860	>20	5-20	<5		Low	Existing soil has suitable PRI and does not require improvement.
pH[1]	6.2 to 6.9	6-8	4.5-6	<4.5,>8		Low	In situ soil not considered to be significantly erodible.
Exchangeable Sodium Percentage[1]	Not Reportable	<10	10-20	<20		Low	
Electric Conductivity (dS/m)[1]	0.022 - 0.014	<0.3	0.3 – 2.0	>2.0		Low	
Emerson Class[1]	NA	> 4	4	1 - 3		-	-

Notes

1. *Level of constraint based on our interpretation of AS1547 description of “non-dispersive soils”.*
2. *Phosphorus retention index requirements are based on our interpretation of The Department of Primary Industries and Regional Development Standards for Land Resource Mapping (2005), as this is not specified in AS1547.*

Figures





Legend

- Site Boundary
- Borehole / Dynamic Probing Super Heavy Test
- Borehole / Dynamic Probing Super Heavy Test / Infiltration Test
- Borehole / Guelph Permeameter

N

0 20 40 60 80 100
Meters

NOTES
Aerial Imagery and Cadastre sourced from Landgate/SLIP



SCALE	1:1,250	(A3)
DRAWN	CED	
DATE DRAWN	10/10/2024	
CHECKED	-	
DATE CHECKED	-	
PROJECTION	GDA 1994 MGA Zone 50	

Galt Geotechnics Pty Ltd
ACN : 138 490 865
Tel : +61 (0)8 6272-0200
Address : 50 Edward Street
Osborne Park WA 6017

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CLIENT	**MCCORKELL CONSTRUCTIONS P/L**
PROJECT	PARKERVILLE CARE SCHOOL UPGRADES
LOCATION	340 ROLAND ROAD PARKERVILLE
TITLE	SITE & LOCATION PLAN

Job No	Fig No	Rev
WAG240444-01	FIGURE 1	**A**

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Appendices

Appendix A: Site Photographs

Photograph 1: Borehole 01.



Photograph 2: Borehole 03.



Photograph 3: Testing at Borehole 16.



Photograph 4: Borehole 13.



Photograph 5: Borehole 02.



Photograph 6: Testing at Borehole 12.



Photograph 7: Testing at borehole 5.



Appendix B: Machine Borehole Logs

METHOD OF SOIL DESCRIPTION
BOREHOLE AND TEST PIT REPORTS

GRAPHIC LOG & SOIL CLASSIFICATION SYMBOLS

Graphic	USCS	Soil Name
		FILL (various types)
		COBBLES / BOULDERS
	GP	GRAVEL (poorly graded)
	GW	GRAVEL (well graded)
	GC	Clayey GRAVEL
	GM	Silty GRAVEL
	SP	SAND (poorly graded)
	SW	SAND (well graded)
	SC	Clayey SAND

Graphic	USCS	Soil Name
	SM	Silty SAND
	ML	SILT (low liquid limit)
	MH	SILT (high liquid limit)
	CL	CLAY (low plasticity)
	CI	CLAY (medium plasticity)
	CH	CLAY (high plasticity)
	OL	Organic SILT (low liquid limit)
	OH	Organic SILT (high liquid limit)
	Pt	PEAT

NOTE: Dual classification given for soils with a fines content between 5% and 12%.

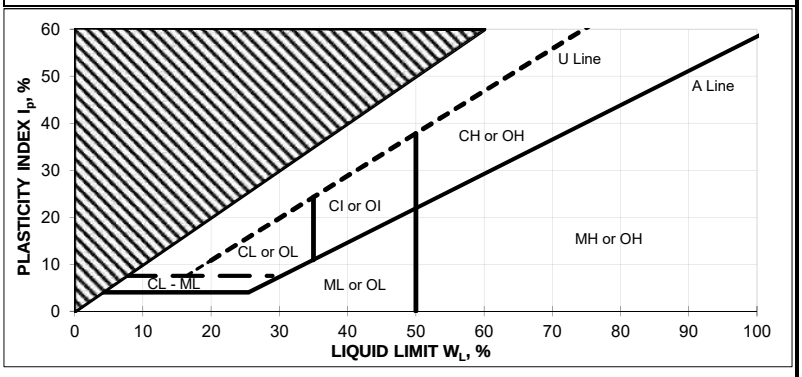
SOIL CLASSIFICATION AND INFERRED STRATIGRAPHY

Soil descriptions are based on AS1726-2017. Material properties are assessed in the field by visual/tactile methods in combination with field and laboratory testing techniques (where used).

NOTE: AS 1726-2017 defines a fine grained soil where the total dry mass of fine fractions (<0.075 mm particle size) exceeds 35%.

PARTICLE SIZE		
Soil Name		**Particle Size (mm)**
BOULDERS		>200
COBBLES		63 to 200
GRAVEL	Coarse	19 to 63
	Medium	6.7 to 19
	Fine	2.3 to 6.7
SAND	Coarse	0.6 to 2.36
	Medium	0.21 to 0.6
	Fine	0.075 to 0.21
FINES	SILT	0.002 to 0.075
	CLAY	<0.002

PLASTICITY - MODIFIED CASAGRANDE CHART - AS1726-2017



RESISTANCE TO EXCAVATION		
Symbol	**Term**	**Description**
VE	Very easy	All resistances are relative to the selected method of excavation
E	Easy	
F	Firm	
H	Hard	
VH	Very hard	

MOISTURE CONDITION	
Symbol	**Term**
D	Dry
M	Moist
W	Wet

CEMENTATION	
Cementation	**Description**
Weakly cemented	Soil may be easily disaggregated by hand in air or water
Moderately cemented	Effort is required to disaggregate the soil by hand in air or water

CONSISTENCY		
Symbol	**Term**	**Undrained Shear Strength (kPa)**
VS	Very Soft	0 to 12
S	Soft	12 to 25
F	Firm	25 to 50
St	Stiff	50 to 100
VSt	Very Stiff	100 to 200
H	Hard	>200

ORGANIC SOILS	
Material	**Organic Content % of dry mass**
Inorganic soil	<2%
Organic soil	2% to 25%
Peat	>25%

DENSITY		
Symbol	**Term**	**Density Index (%)**
VL	Very Loose	<15
L	Loose	15 to 35
MD	Medium Dense	35 to 65
D	Dense	65 to 85
VD	Very Dense	>85

EXPLANATORY NOTES TO BE READ WITH BOREHOLE AND TEST PIT REPORTS

METHOD OF DRILLING OR EXCAVATION

AC	Air Core	E	Excavator	PQ3	PQ3 Core Barrel
AD/T	Auger Drilling with TC-Bit	EH	Excavator with Hammer	PT	Push Tube
AD/V	Auger Drilling with V-Bit	HA	Hand Auger	R	Ripper
AT	Air Track	HE	Hand Excavation	RR	Rock Roller
B	Bulldozer Blade	HQ3	HQ3 Core Barrel	SON	Sonic Rig
BH	Backhoe Bucket	N	Natural Exposure	SPT	Driven SPT
CT	Cable Tool	NMLC	NMLC Core Barrel	WB	Washbore
DT	Diatube	PP	Push Probe	X	Existing Excavation

SUPPORT

T	Timbering

PENETRATION EFFORT (RELATIVE TO THE EQUIPMENT USED)

VE	Very Easy	E	Easy	F	Firm
H	Hard	VH	Very Hard		

WATER

►	Water Inflow	▼	Water Level
◄	Water Loss (complete)		
◁	Water Loss (partial)		

SAMPLING AND TESTING

B	Bulk Disturbed Sample	P	Piston Sample
BLK	Block Sample	PBT	Plate Bearing Test
C	Core Sample	U	Undisturbed Push-in Sample
CBR	CBR Mould Sample		U50: 50 mm diameter
D	Small Disturbed Sample	SPT	Standard Penetration Test
ES	Environmental Soil Sample		Example: 3, 4, 5 N=9
EW	Environmental Water Sample		3,4,5: Blows per 150 mm
G	Gas Sample		N=9: Blows per 300 mm after
HP	Hand Penetrometer		150 mm seating interval
LB	Large Bulk Disturbed Sample	VS	Vane Shear; P = Peak
M	Mazier Type Sample		R = Remoulded (kPa)
MC	Moisture Content Sample	W	Water Sample

ROCK CORE RECOVERY

TCR = Total Core Recovery (%) $= \frac{CRL}{TCL} \times 100$

RQD = Rock Quality Designation (%) $= \frac{ALC>100}{TCL} \times 100$

TCL	Length of Core Run
CRL	Length of Core Recovered
ALC>100	Total Length of Axial Lengths of Core Greater than 100 mm Long

BOREHOLE: BH01

Job Number: WAG240444-01
Client: McCorkell Construction
Project: CARE Upgrades
Location: Parkerville

Contractor: GBI
Drill Rig: Melvelle
Inclination: -90°

Date: 17/09/2024
Logged: KS
Checked Date: 17/09/2024
Checked By: TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: SAND, fine to medium grained, sub-angular to sub-rounded, dark brown/grey, trace fines, trace gravel, trace organics			
								GP-GC	Sandy GRAVEL: fine to coarse grained, sub-angular to sub-rounded, dark brown, fine to coarse grained sand, with fines			
			0.5									
								GC	Clayey GRAVEL: fine to coarse grained, sub-angular to sub-rounded, orange/brown, low to medium plasticity clay, with sand			
			1.0									
			1.5					GC	Gravelly CLAY: low to medium plasticity, orange, fine to coarse grained gravel, with sand			
								GP	GRAVEL: fine to coarse grained, sub-angular to sub-rounded, with sand, trace fines			
			2.0						Hole terminated at 2.00 m Refusal Groundwater not encountered			
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:01 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH02

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: SAND, fine to medium grained, sub-angular to sub-rounded, dark brown, trace to with gravel, trace fines			
								SP	Gravelly SAND: fine to coarse grained, sub-angular to sub-rounded, dark grey, fine to coarse grained sand, trace fines			
			0.5					SC	Clayey SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown, trace fines, mottled red, low to medium plasticity, with gravel			
			1.0									
			1.5						Becoming red at refusal depth			
									Hole terminated at 1.60 m Refusal Groundwater not encountered			
			2.0									
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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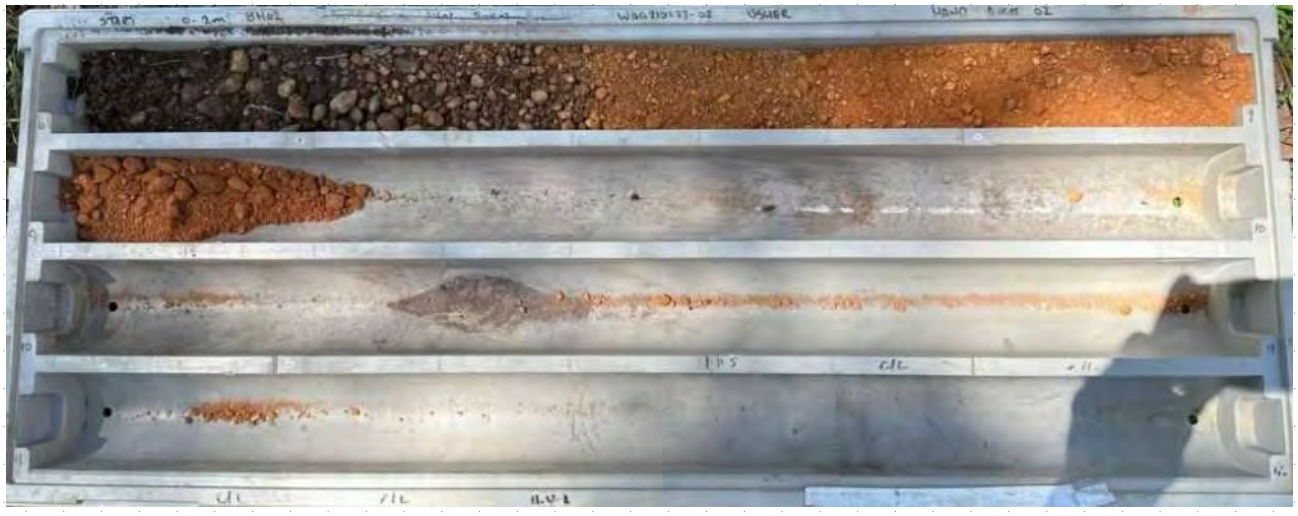
BOREHOLE: BH03

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded, dark brown, fine to coarse grained, sub-angular to sub-rounded, trace fines			
								GP	GRAVEL: fine to coarse grained, sub-angular to sub-rounded, brown, with sand, trace fines			
			0.5					SP-SC	Gravelly SAND: fine to coarse grained, sub-angular to sub-rounded, brown/orange, trace to with fines			
					B(BH03-1)			CL	CLAY: low plasticity, orange, with sand, trace gravel			
			1.0					CL	Gravelly CLAY: low to medium plasticity, orange, weakly cemented nodules, fine to coarse grained gravel, with sand			
									Hole terminated at 1.10 m Refusal Groundwater not encountered			
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

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BOREHOLE: BH04

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: Gravelly SAND, fine to medium grained, sub-angular to sub-rounded, dark brown, fine to coarse grained gravel			
								GC	GRAVEL: fine to coarse grained, sub-angular to sub-rounded, brown, with sand, with fines			
			0.5						Sandy CLAY: low to medium plasticity, orange/brown, fine to coarse grained sand, with gravel			
					B(BH04-1)			CL-CI				
			1.0									
			1.5					CL-CI	CLAY: low to medium plasticity, pale orange mottled red, trace sand, trace gravel			
			2.0						Hole terminated at 1.80 m Refusal Groundwater not encountered			
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:01 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH05

Job Number: WAG240444-01
Client: McCorkell Construction
Project: CARE Upgrades
Location: Parkerville

Contractor: GBI
Drill Rig: Melvelle
Inclination: -90°

Date: 17/09/2024
Logged: KS
Checked Date: 17/09/2024
Checked By: TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: SAND, fine to medium grained, sub-angular to sub-rounded, dark brown, trace fines, trace to with gravel			
								GP	GRAVEL: fine to coarse grained, sub-rounded to sub-angular, brown, with sand, trace fines			
			0.5					CL-CI	Gravelly CLAY: low to medium plasticity, pale red/brown, fine to coarse grained gravel, with sand			
			1.0						Increase in fines content			
			1.5									
			2.0									
			2.5									
			3.0						Hole terminated at 3.00 m Target depth Groundwater not encountered			
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:01 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH06

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					GP	GRAVEL: medium to coarse grained, sub-angular to sub-rounded, brown/pale orange, trace fines, trace sand			
			0.5									
			1.0					GP	GRAVEL: fine to coarse grained, sub-angular to sub-rounded, red/orange, trace fines, trace sand			
			1.5									
			2.0						Gravel becomes medium to coarse grained, sub-angular to sub-rounded			
			2.5						Gravel becoming fine to medium grained, sub-angular to sub-rounded			
			3.0						Hole terminated at 2.70 m Target depth Groundwater not encountered			
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:01 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH07

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: Gravelly SAND: fine to coarse grained, sub-angular to sub-rounded, with fines			
								GP-GC	GRAVEL: fine to coarse grained, sub-angular to sub-rounded, brown, with fines, with sand			
			0.5					GC	Clayey GRAVEL: fine to medium grained, sub-angular to sub-rounded, brown, low plasticity, with sand			
								SC-CH	Clayey SAND/Sandy CLAY: orange/yellow, fine to coarse grained, sub-angular to sub-rounded, medium to high plasticity clay, trace gravel			
			1.0									
			1.5									
			2.0						Pale yellow, weakly cemented nodules			
			2.5									
			3.0						Hole terminated at 2.70 m Target depth Groundwater not encountered			
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:01 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH08

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					GP	GRAVEL: fine to coarse grained, sub-angular to sub-rounded, red/brown, trace to with sand, trace fines			
			0.5									
			1.0						Hole terminated at 0.80 m Refusal Groundwater not encountered			
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:01 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH09

Job Number: WAG240444-01
Client: McCorkell Construction
Project: CARE Upgrades
Location: Parkerville

Contractor: GBI
Drill Rig: Melvelle
Inclination: -90°

Date: 17/09/2024
Logged: KS
Checked Date: 17/09/2024
Checked By: TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					GP	TOPSOIL: Sandy GRAVEL, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace organics			
			0.5					SP	Gravelly SAND: fine to coarse grained, sub-angular to sub-rounded, red/brown, trace fines			
			1.0						Hole terminated at 0.70 m Refusal Groundwater not encountered			
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:01 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH10

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					GP	TOPSOIL: Sandy GRAVEL/Gravelly SAND, fine to coarse grained, sub-angular to sub-rounded sand, brown, fine to coarse grained gravel, trace fines, trace organics			
			0.5					GP	Sandy GRAVEL: fine to coarse grained, sub-angular to sub-rounded, red/brown, fine to coarse grained sand, trace fines			
			1.0									1.20: Weakly cemented nodules
			1.5					CL-CI	CLAY: medium to high plasticity, red mottled white, trace gravel, with sand			
			2.0									
			2.5									
			3.0						Hole terminated at 3.00 m Target depth Groundwater not encountered			
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:01 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH11

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					GP	TOPSOIL: Sandy GRAVEL, fine to coarse grained, sub-angular to sub-rounded, brown, trace fines, trace organics			
			0.5					GP-GC	GRAVEL: fine to coarse grained, sub-rounded to rounded, grey/orange, with sand, with fines			
			1.0					GC	Clayey GRAVEL: fine to coarse grained, sub-angular to sub-rounded, orange, low plasticity clay, with sand			
			1.5					SC	Clayey SAND: fine to coarse grained, sub-angular to sub-rounded, orange, low plasticity clay, trace gravel			1.20: Weakly cemented nodules
			2.0						Hole terminated at 2.00 m Refusal Groundwater not encountered			
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

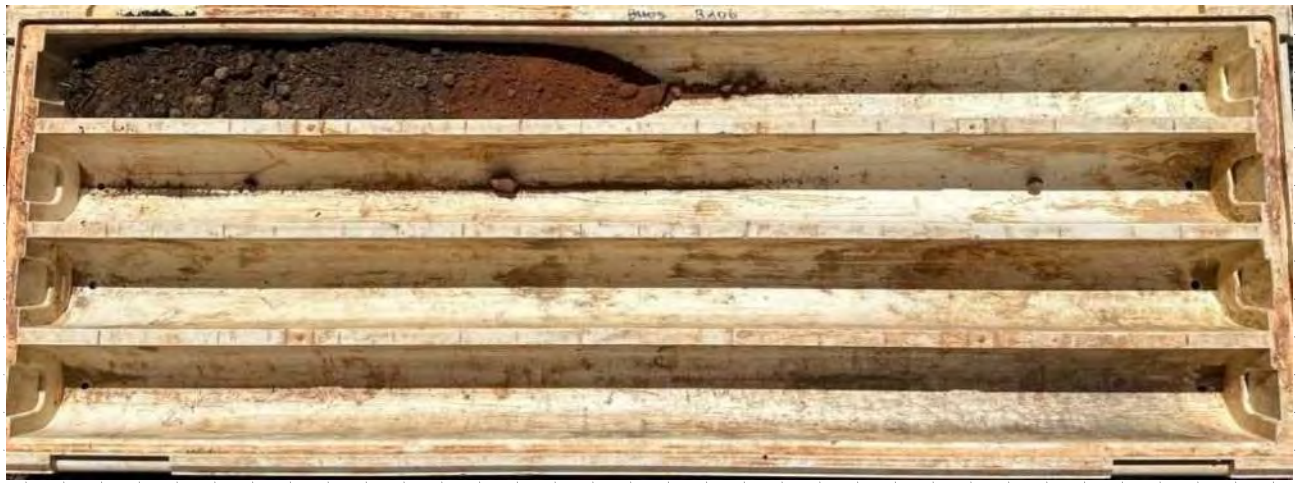
GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:01 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH12

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP-SC	Gravelly SAND: fine to medium grained, sub-angular to sub-rounded, dark brown/grey, with non-plastic fines, trace organics			
			0.5						Becomes red/brown			
									Hole terminated at 0.50 m Refusal Groundwater not encountered			
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:02 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH13

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: SAND, fine to medium grained, sub-angular to sub-rounded, dark brown, trace fines, trace organics			
								GP	Sandy GRAVEL: fine to coarse grained, sub-angular to sub-rounded, dark grey, fine to coarse grained sand, trace fines			
			0.5						Sandy CLAY: low to medium plasticity, orange, fine to coarse grained, sub-angular to sub-rounded, trace gravel			
			1.0									
			1.5					CI-CH	Mottled red/white			
			2.0									
			2.5						Hole terminated at 2.50 m Refusal Groundwater not encountered			
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:02 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH14

Job Number: WAG240444-01
Client: McCorkell Construction
Project: CARE Upgrades
Location: Parkerville

Contractor: GBI
Drill Rig: Melvelle
Inclination: -90°

Date: 17/09/2024
Logged: KS
Checked Date: 17/09/2024
Checked By: TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: SAND, fine to medium grained, sub-angular to sub-rounded, dark brown, trace fines, trace organics			
			0.5					SP-SM	Gravelly SAND: fine to coarse grained, sub-rounded to rounded, red/brown, fine to coarse grained sand, with non-plastic fines			
			1.0					GP-SP	Sandy GRAVEL/Gravelly SAND: fine to coarse grained, sub-angular to sub-rounded gravel, orange/brown, fine to coarse grained sand, with fines			
			1.5					SC	Clayey SAND: fine to coarse grained, sub-angular to sub-rounded, red, low to medium plasticity clay, with gravel			
			2.0						Hole terminated at 1.60 m Refusal Groundwater not encountered			
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:02 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH15

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: SAND, fine to medium grained, sub-angular to sub-rounded, dark brown/grey, trace fines, trace organics			
								SC	Clayey SAND: fine to coarse grained, sub-angular to sub-rounded, dark brown, low to medium plasticity, trace gravel			
			0.5					CI-CH	CLAY: medium to high plasticity, orange/brown, trace to with sand, trace gravel			0.60: Weakly cemented nodules
			1.0						Sandy CLAY: medium to high plasticity, orange/brown, fine to medium grained sand, trace gravel			1.00: Weakly cemented nodules
			1.5									
			2.0					CI-CH	Becomes mottled white and red/brown			2.00: Weakly cemented nodules
			2.5									
			3.0						Hole terminated at 3.00 m Target depth Groundwater not encountered			
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:02 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH16

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					GP	FILL: Sandy GRAVEL, fine to coarse grained, sub-rounded to rounded, orange/brown, fine to medium grained sand, trace fines			
			1.5					SC	Clayey SAND: fine to coarse grained, sub-angular to sub-rounded, brown/pale yellow, with fine grained gravel, trace fines			
			2.5						Hole terminated at 2.60 m Refusal Groundwater not encountered			
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:02 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH17

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: SAND, fine to medium grained, sub-angular to sub-rounded, brown, trace gravel, trace fines			
			0.5					GC	Clayey GRAVEL: fine to coarse grained, sub-angular to sub-rounded, brown mottled orange, trace sand Becomes red/brown			
								SP	SAND: fine to medium grained, sub-angular to sub-rounded, red/brown, with fines, trace gravel			
			1.0						Hole terminated at 0.80 m Refusal Groundwater not encountered			
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:02 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

BOREHOLE: BH18

Job Number:	WAG240444-01	**Contractor:**	GBI	**Date:**	17/09/2024
Client:	McCorkell Construction	**Drill Rig:**	Melvelle	**Logged:**	KS
Project:	CARE Upgrades	**Inclination:**	-90°	**Checked Date:**	17/09/2024
Location:	Parkerville			**Checked By:**	TM

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	*DEPTH* RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	SOIL CLASS	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/V			0.0					SP	TOPSOIL: SAND, fine to medium grained, sub-angular to sub-rounded, dark brown/grey, with gravel, trace fines, trace organics			
			0.5					GP-SP	Gravelly SAND/Sandy GRAVEL: fine to medium grained sand, sub-angular to sub-rounded, dark brown, fine to coarse grained gravel, with fines			
									Hole terminated at 0.70 m Refusal Groundwater not encountered			
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									

Sketch & Other Observations



Comments:

See Explanatory Notes and Method of Soil Description sheets for details of abbreviations and basis of descriptions

GALT LIB 1.01.GLB Log GG_EXCAVATION WAG240444-01.GPJ <<DrawingFile>> 16/10/2024 10:02 10.02.00.04 Datgel DGD, CPT, Photo, Monitoring Tools | Lib: GALT 1.01 2013-02-21 Prj: GALT 1.01 2013-02-21

Appendix C: Guelph Permeameter Test Results

Hydraulic Conductivity Calculation - Constant Head by Permeameter

Galt Geotechnics

Job No:	WAG240444-01
Client:	McCorkell Construct
Project:	CARE upgrades
Location:	Parkerville
Calc by:	KS
Test Name	P01

Spreadsheet author:

REFERENCE: AS1547-2012, "On-site domestic wastewater management" - Appendix G

$$K = \frac{4.4Q[0.5\ \sinh^{-1}\left(\frac{H}{2r}\right) - \sqrt{\left(\frac{r}{H}\right)^2 + 0.25} + \frac{r}{H}]}{2\,\pi H^2}$$

Spreadsheet Legend

	Required input
	Calculated field
	Comment field
	Field not used
	Fixed field

Parameter	Description	Value	Units
K_{sat}	Saturated hydraulic conductivity		cm/min
D	Depth of auger hole	50	cm
H	Head of water above base	21.2	cm
r	Radius of auger hole	5	cm
S	Depth to impermeable stratum	100	cm
Reservoir	Chosen Guelph reservoir (inner or outer)		
Area	Area of chosen reservoir	7.07	cm^2
F	Reading of water level in reservoir		cm

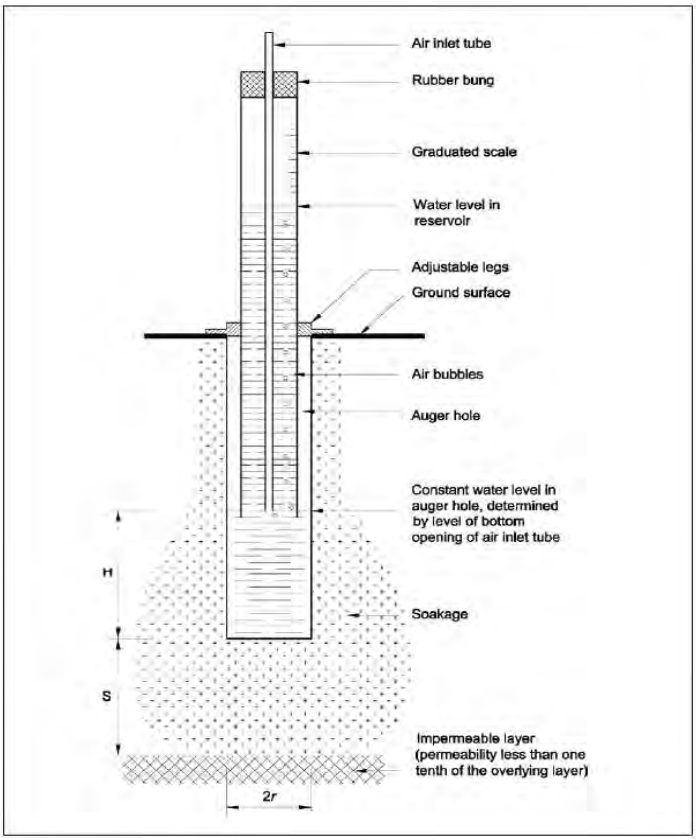
Test Results

Time (min)	F (cm)	ΔF (cm)	ΔF (cm)/min
0	65.5		
2	60	5.50	2.75
4	55.2	4.80	2.40
6	49	6.20	3.10
8	43.7	5.30	2.65
10	38.1	5.60	2.80
12	32.5	5.60	2.80
14	26.1	6.40	3.20
16	22.3	3.80	1.90
18	15.3	7.00	3.50
20	12	3.30	1.65
22	4.8	7.20	3.60
24	1	3.80	1.90
AVERAGE - LAST 5 READINGS			2.51

Calculation

Steady State Flow	2.51	cm/min
Flow from reservoir (Q)	17.75	cm^3/min
K_{sat}	0.012	cm/min
K_{sat}	1.986E-06	m/s
K_{sat}	**0.17**	**m/day**

P01



where:
H = depth of water in test hole
S = the depth to an underlying impermeable layer
r = radius of the test hole

Hydraulic Conductivity Calculation - Constant Head by Permeameter

Galt Geotechnics

Job No:	WAG240444-01
Client:	McCorkell Construct
Project:	CARE upgrades
Location:	Parkerville
Calc by:	KS
Test Name	P02

Spreadsheet author:		

REFERENCE: AS1547-2012, "On-site domestic wastewater management" - Appendix G

$$K = \frac{4.4Q[0.5\ \sinh^{-1}\left(\frac{H}{2r}\right) - \sqrt{\left(\frac{r}{H}\right)^2 + 0.25} + \frac{r}{H}]}{2\,\pi H^2}$$

Spreadsheet Legend

	Required input
	Calculated field
	Comment field
	Field not used
	Fixed field

Parameter	Description	Value	Units
K_{sat}	Saturated hydraulic conductivity		cm/min
D	Depth of auger hole	50	cm
H	Head of water above base	25.5	cm
r	Radius of auger hole	5	cm
S	Depth to impermeable stratum	100	cm
Reservoir	Chosen Guelph reservoir (inner or outer)		
Area	Area of chosen reservoir	7.07	cm^2
F	Reading of water level in reservoir		cm

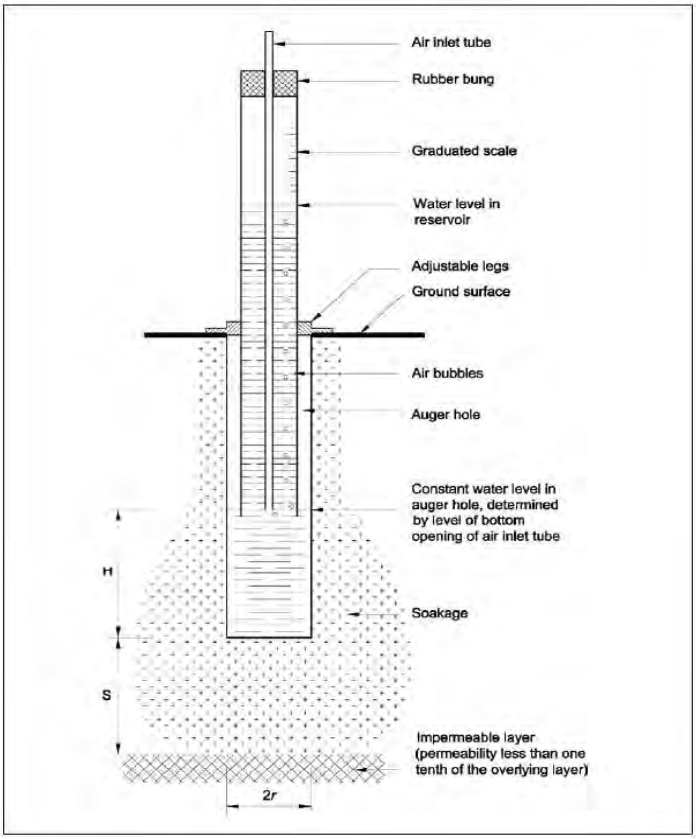
Test Results

Time (min)	F (cm)	ΔF (cm)	ΔF (cm)/min
0	62.7		
0.5	49.9	12.80	25.60
1	41	8.90	17.80
1.5	30.5	10.50	21.00
2	20.8	9.70	19.40
2.5	9.4	11.40	22.80
3	3.1	6.30	12.60
AVERAGE - LAST 5 READINGS			18.72

Calculation

Steady State Flow	18.72	cm/min
Flow from reservoir (Q)	132.35	cm^3/min
K_{sat}	0.070	cm/min
K_{sat}	1.168E-05	m/s
K_{sat}	**1.01**	**m/day**

P01



where:
H = depth of water in test hole
S = the depth to an underlying impermeable layer
r = radius of the test hole

Appendix D: Laboratory Test Results

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
16-18 Hayden Court Myaree WA 6154
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Certificate of Analysis PFI1620

Client Details

Client	Western Geotechnical & Laboratory Services
Contact	Brooke Elliot
Address	235 Bank Street, WELSHPOOL, WA, 6101

Sample Details

Your Reference	S14498 Parkerville Care School Upgrade
Number of Samples	2 Soil
Date Samples Received	20/09/2024
Date Instructions Received	20/09/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	02/10/2024
Date of Issue	02/10/2024

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Authorisation Details

Results Approved By	Ben Carpenter, Metals Technician Michael Mowle, Inorganics Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PFI1620

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PFI1620-01	WG24.14315 P01 (0.5-0.7)m	Soil	20/09/2024	20/09/2024
PFI1620-02	WG24.14316 P02 (0.5-0.7)m	Soil	20/09/2024	20/09/2024

Exchangeable Cations (Soil)

Envirolab ID	Units	PQL	PFI1620-01	PFI1620-02
Your Reference			WG24.14315 P01 (0.5-0.7)m	WG24.14316 P02 (0.5-0.7)m
Date Sampled			20/09/2024	20/09/2024
Calcium	meq/100g	0.10	0.33	1.7
Potassium	meq/100g	0.10	0.11	0.21
Magnesium	meq/100g	0.10	0.10	0.70
Sodium	meq/100g	0.10	<0.10	<0.10
Cation Exchange Capacity (CEC)	meq/100g	0.10	0.57	2.7
Exchangeable Sodium Percentage (ESP)	%	1.0	Not Reportable	Not Reportable

Certificate of Analysis PFI1620

Inorganics - General Physical Parameters (Soil)

Envirolab ID	Units	PQL	PFI1620-01	PFI1620-02
Your Reference			WG24.14315 P01 (0.5-0.7)m	WG24.14316 P02 (0.5-0.7)m
Date Sampled			20/09/2024	20/09/2024
pH	pH units		6.2	6.9
Electrical Conductivity	µS/cm	2.0	22	14

Certificate of Analysis PFI1620

PBI/PRI (Soil)

Envirolab ID	Units	PQL	PFI1620-01	PFI1620-02
Your Reference			WG24.14315 P01 (0.5-0.7)m	WG24.14316 P02 (0.5-0.7)m
Date Sampled			20/09/2024	20/09/2024
Phosphorus Retention Index	-		860	760

Method Summary

Method ID	Methodology Summary
AGRI-003_PRI	Phosphorous Retention index (PRI) is the ratio of adsorbed phosphorus to the equilibrium concentration. Phosphorus is extracted using KCl and determined colourimetrically. Result value is used to calculate PRI as per Allen and Jefferey.
INORG-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis can be completed outside of the recommended holding times. Solids are reported from a 1:5 water extract unless otherwise specified. Alternatively, pH is determined in a 1:5 extract using 0.01M calcium chloride or a solid is extracted at a ratio of 1:2.5 (AS1289.4.3.1), pH is measured in the extract.
INORG-002	Conductivity and Salinity - measured using a conductivity cell at 25°C. Soil results reported from a 1:5 Soil:Water extract unless otherwise specified. Please note Resistivity is estimated by calculation and may not correlate with results otherwise obtained using the Resistivity current method (based on AS 1289.4.4.1), depending on the nature of the soil being analysed.
METALS-020	Determination of various metals by ICP-OES.
METALS-020_008A	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PFI1620

Client Details

Client	Western Geotechnical & Laboratory Services
Your Reference	S14498 Parkerville Care School Upgrade
Date Issued	02/10/2024

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PFI1620

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
CEC | Soil	1-2	20/09/2024	27/09/2024	27/09/2024	Yes
ESP | Soil	1-2	20/09/2024	27/09/2024	27/09/2024	Yes
Exchangeable Cations | Soil	1-2	20/09/2024	27/09/2024	27/09/2024	Yes
EC | Soil	1-2	20/09/2024	02/10/2024	02/10/2024	No
pH | Soil	1-2	20/09/2024	02/10/2024	02/10/2024	No
PRI | Soil	1-2	20/09/2024	25/09/2024	26/09/2024	Yes

Quality Control PFI1620

METALS-020_008A|Exchangeable Cations (Soil) | Batch BFI4934

Analyte	Units	PQL	Blank	DUP1 BFI4934-DUP1# Samp | QC | RPD %	LCS %	Spike % BFI4934-MS1#
Calcium	meq/100g	0.10	<0.10	4.24 | 3.40 | 22.0	116	118
Potassium	meq/100g	0.10	<0.10	0.980 | 0.770 | 24.0	108	104
Magnesium	meq/100g	0.10	<0.10	5.11 | 4.09 | 22.2	106	89.4
Sodium	meq/100g	0.10	<0.10	2.69 | 2.21 | 19.6	111	90.3
Cation Exchange Capacity (CEC)	meq/100g	0.10	<0.10		[NA]	[NA]
Exchangeable Sodium Percentage (ESP)	%	1.0	<1.0		[NA]	[NA]

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

INORG-001|Inorganics - General Physical Parameters (Soil) | Batch BFJ0490

Analyte	Units	PQL	Blank	DUP1 BFJ0490-DUP1# Samp | QC | RPD %	LCS %
pH	pH units		5.9	9.5 | 9.5 | 0.316	101
Electrical Conductivity	µS/cm	2.0	<2.0	288 | 294 | 2.09	105

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

AGRI-003_PRI|PBI/PRI (Soil) | Batch BFI4422

Analyte	Units	PQL	Blank	DUP1 BFI4422-DUP1# Samp | QC | RPD %	LCS %
Phosphorus Retention Index	-		0.00	58.3 | 60.8 | 4.21	116

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

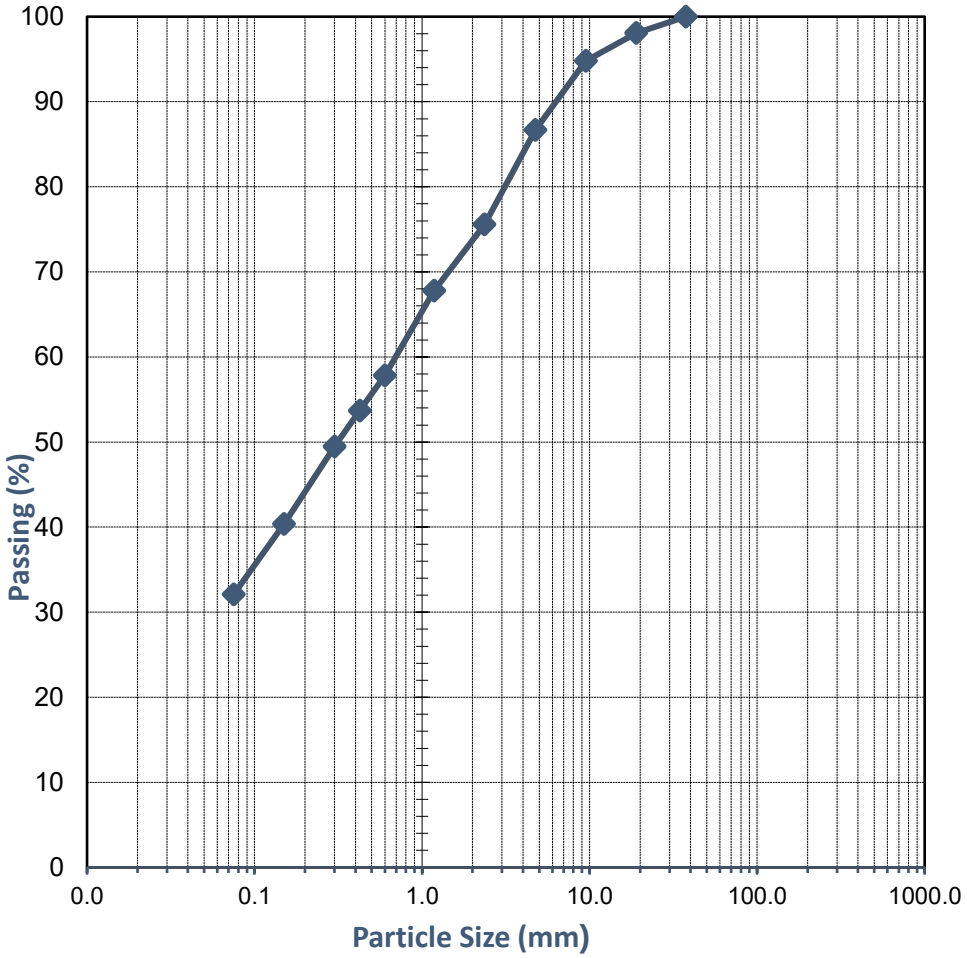
TEST REPORT - AS 1289.3.6.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14320_1_PSD
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14320
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH02 (0.5-1.0)m	*Date Tested:*	24/09 - 25/09/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	100
19.0	98
9.5	95
4.75	87
2.36	76
1.18	68
0.600	58
0.425	54
0.300	49
0.150	40
0.075	32



Comments:

Approved Signatory:

Name: Cody O'Neill

Date: 25/September/2024

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14320_1_PI
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14320
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH02 (0.5-1.0)m	*Date Tested:*	26/09/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**33**
AS 1289.3.2.1	**Plastic Limit (%)**	**18**
AS 1289.3.3.1	**Plasticity Index (%)**	**15**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**5.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:



Name: Madhav Basnet

Date: 27/September/2024

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SOIL | AGGREGATE | CONCRETE | CRUSHING

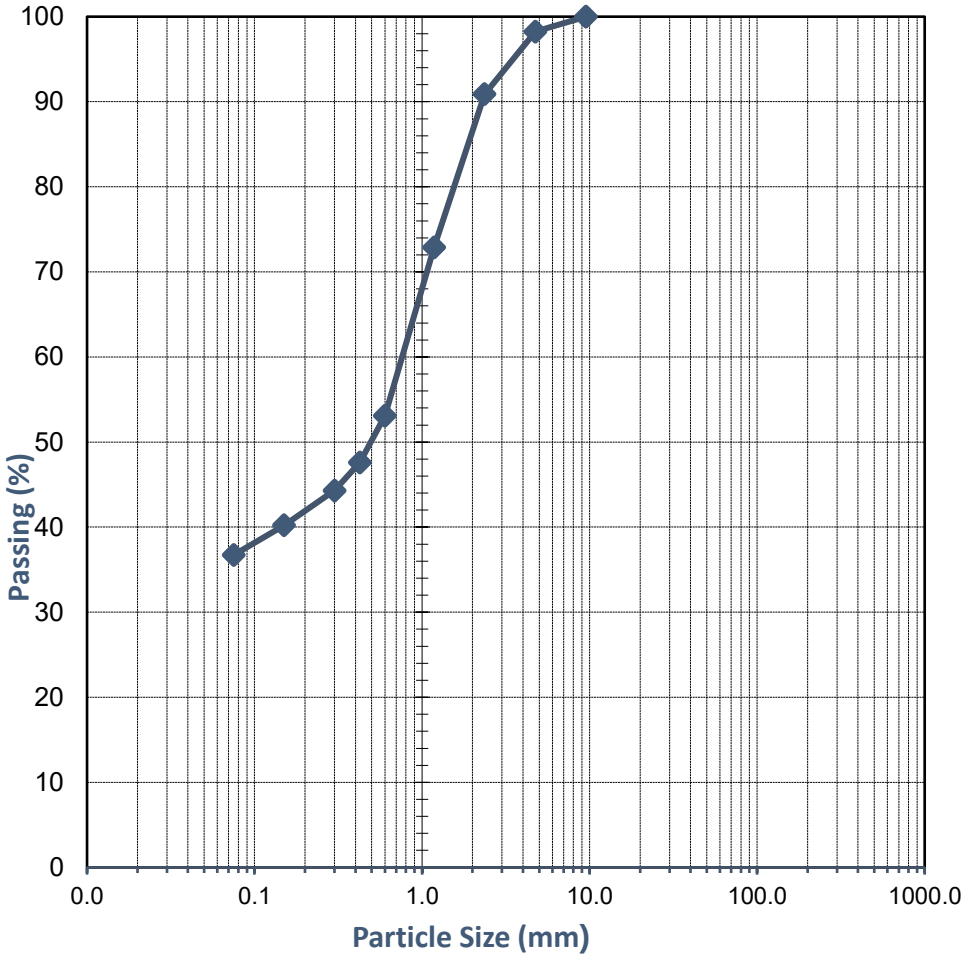
TEST REPORT - AS 1289.3.6.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14321_1_PSD
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14321
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH07 (1.5-2.0)m	*Date Tested:*	24/09 - 25/09/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	100
4.75	98
2.36	91
1.18	73
0.600	53
0.425	48
0.300	44
0.150	40
0.075	37



Comments:

Approved Signatory:

Name: Cody O'Neill

Date: 25/September/2024

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14321_1_PI
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14321
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH07 (1.5-2.0)m	*Date Tested:*	26/09/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**52**
AS 1289.3.2.1	**Plastic Limit (%)**	**22**
AS 1289.3.3.1	**Plasticity Index (%)**	**30**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**9.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Madhav Basnet

Date: 27/September/2024

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

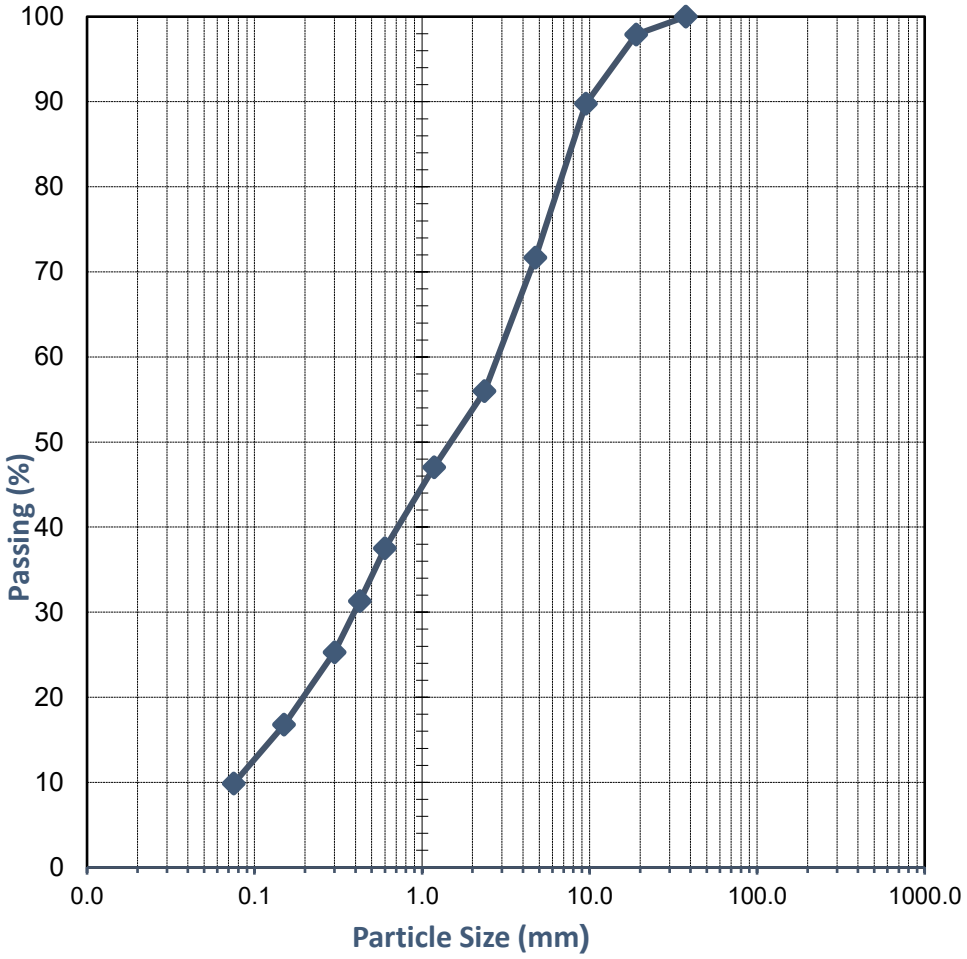
TEST REPORT - AS 1289.3.6.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14318_1_PSD
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14318
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH12 (0.1-0.3)m	*Date Tested:*	24/09 - 25/09/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	100
19.0	98
9.5	90
4.75	72
2.36	56
1.18	47
0.600	38
0.425	31
0.300	25
0.150	17
0.075	10



Comments:

Approved Signatory:

Name: Matthew Lichon

Date: 25/September/2024

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14318_1_PI
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14318
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH12 (0.1-0.3)m	*Date Tested:*	26/09/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**1.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Madhav Basnet

Date: 27/September/2024

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14318_1_MMDD
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14318
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH12 (0.1-0.3)m	*Date Tested:*	24/09/2024

TEST RESULTS - Modified Maximum Dry Density

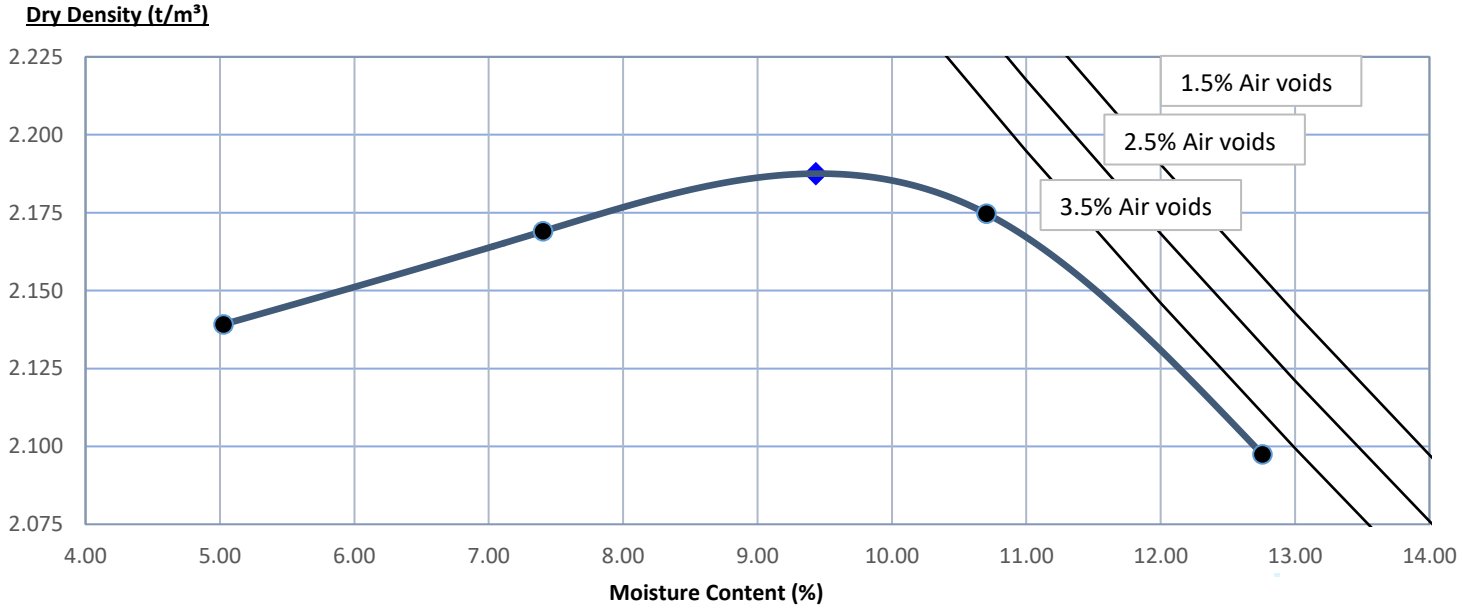
Sampling Method: Sampled by Client, Tested as Received

Sample Curing Time (Hours): 2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	5.0	7.4	10.7	12.8	
Dry Density (t/m³)	2.139	2.169	2.175	2.097	



Modified Maximum Dry Density (t/m³) **2.19**

Optimum Moisture Content (%) **9.5**

Comments: *The above air void lines are derived from a calculated apparent particle density of 3.033 t/m³*

Approved Signatory:

Name: Cody O'Neill

Date: 25/September/2024

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.6.1.1

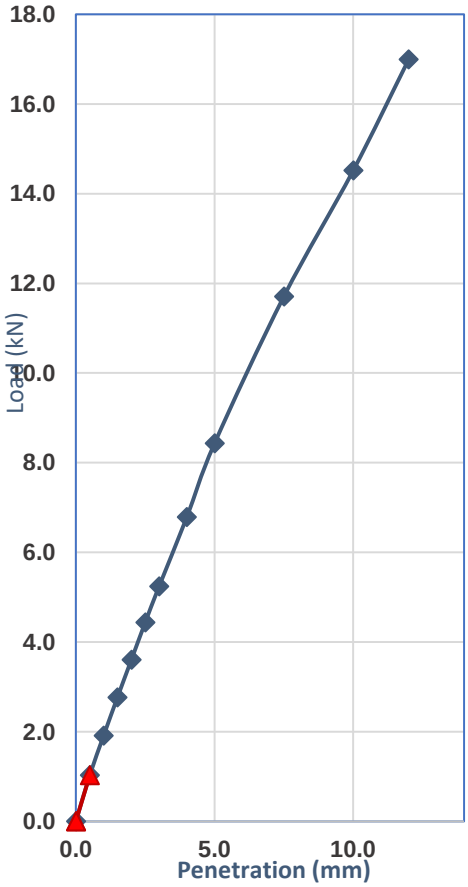
Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14318_1_SCBR
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14318
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH12 (0.1-0.3)m	*Date Tested:*	24/09 - 30/09/2024

TEST RESULTS - CALIFORNIA BEARING RATIO

Sample Description: Silty Gravel

Sampling Method: Sampled by Client, Tested as Received

Load Penetration Curve



Compaction Details			
Compaction Method	AS 1289.5.2.1	Hammer Type	Modified
Plasticity Determined by	Estimated	Curing Time (Hours)	24.0
% Retained 19.0mm	0	Excluded/Replaced	Excluded
Maximum Dry Density (t/m^3)	2.19	Optimum Moisture (%)	9.5
Target Dry Density Ratio (%)	95	Target Moisture Ratio (%)	100

Specimen Conditions At Compaction			
Dry Density (t/m3)	2.08	Moisture Content (%)	9.7
Density Ratio (%)	95.0	Moisture Ratio (%)	103.5

Specimen Conditions After Soak			
Soaked or Unsoaked	Soaked	Soaking Period (days)	4
Surcharges Applied (kg)	4.50	Measured Swell (%)	0.0
Dry Density (t/m³)	2.08	Dry Density Ratio (%)	95.0
Moisture Content (%)	13.7	Moisture Ratio (%)	145.5

Specimen Conditions After Test			
Top 30mm Moisture (%)	11.4	Remaining Depth (%)	12.3

Correction applied to Penetration: 0mm

Determined at a Penetration of: 5.0mm

California Bearing Ratio (CBR): 45%

Comments:

Approved Signatory:

Name: Cody O'Neill

Date: 01/October/2024

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SOIL | AGGREGATE | CONCRETE | CRUSHING

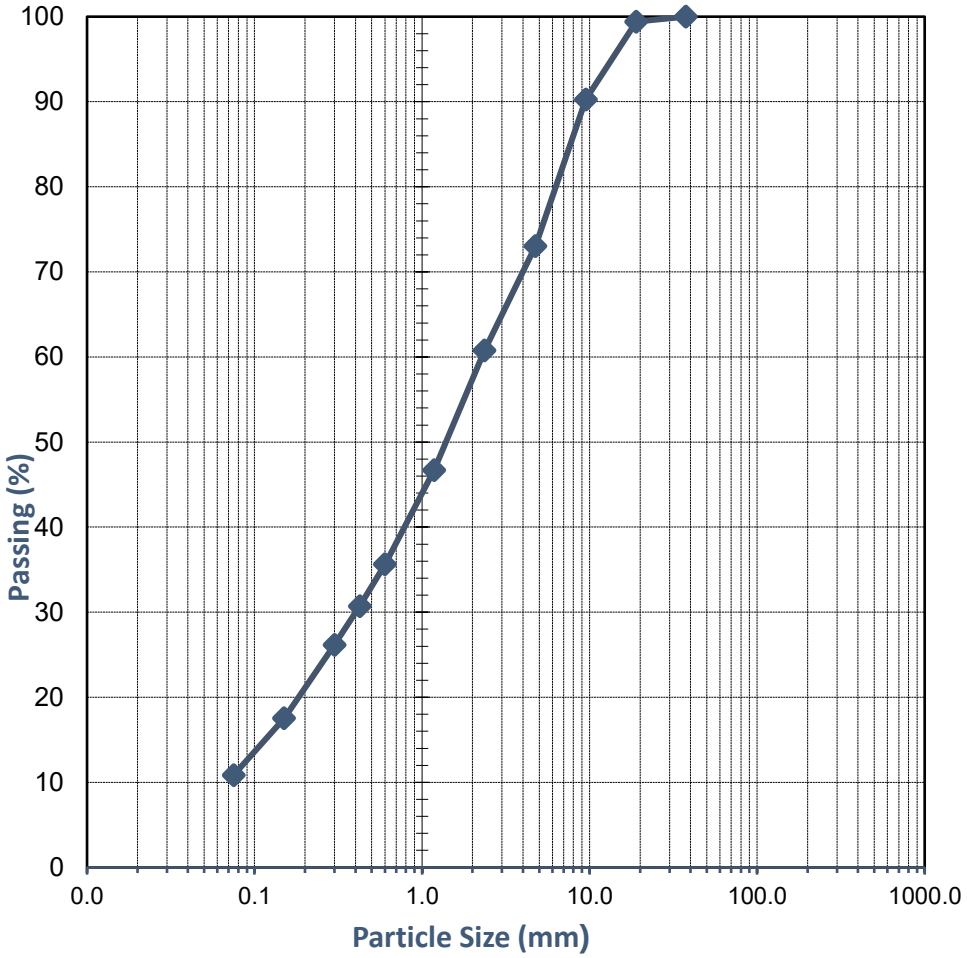
TEST REPORT - AS 1289.3.6.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14317_1_PSD
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14317
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH14 (0.1-0.3)m	*Date Tested:*	24/09 - 25/09/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	100
19.0	99
9.5	90
4.75	73
2.36	61
1.18	47
0.600	36
0.425	31
0.300	26
0.150	18
0.075	11



Comments:

Approved Signatory:

Name: Matthew Lichon

Date: 25/September/2024

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.2, 3.2.1, 3.3.1 & 3.4.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14317_1_PI
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14317
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH14 (0.1-0.3)m	*Date Tested:*	26/09/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.2	**Liquid Limit (%)**	**29**
AS 1289.3.2.1	**Plastic Limit (%)**	**21**
AS 1289.3.3.1	**Plasticity Index (%)**	**8**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**2.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen**	**Cracked**

Comments:

Approved Signatory:

Name: Madhav Basnet

Date: 27/September/2024

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14317_1_MMDD
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14317
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH14 (0.1-0.3)m	*Date Tested:*	24/09/2024

TEST RESULTS - Modified Maximum Dry Density

Sampling Method: Sampled by Client, Tested as Received

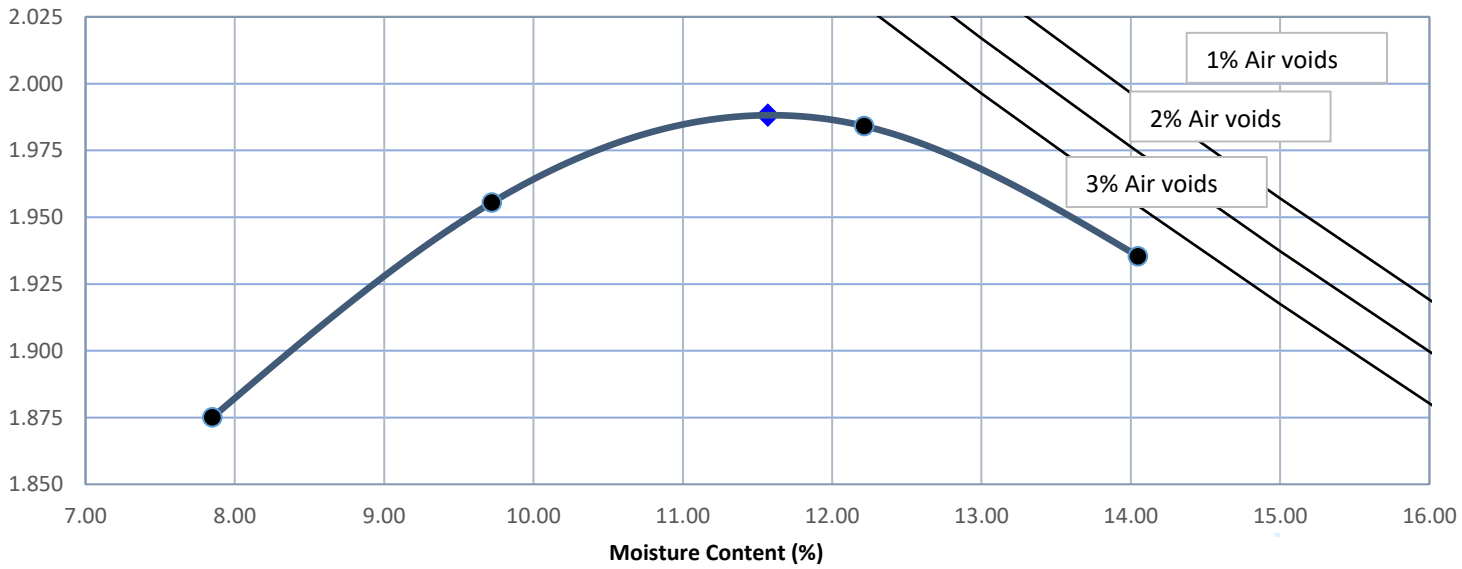
Sample Curing Time (Hours): 2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 2 **Material + 37.5mm (%)** -

Moisture Content (%)	**7.8**	**9.7**	**12.2**	**14.0**	
Dry Density (t/m³)	**1.875**	**1.956**	**1.984**	**1.935**	

Dry Density (t/m³)



Modified Maximum Dry Density (t/m³) **1.99**

Optimum Moisture Content (%) **11.5**

Comments: *The above air void lines are derived from a calculated apparent particle density of 2.81 t/m³*

Approved Signatory:

Name: Cody O'Neill

Date: 25/September/2024

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.6.1.1

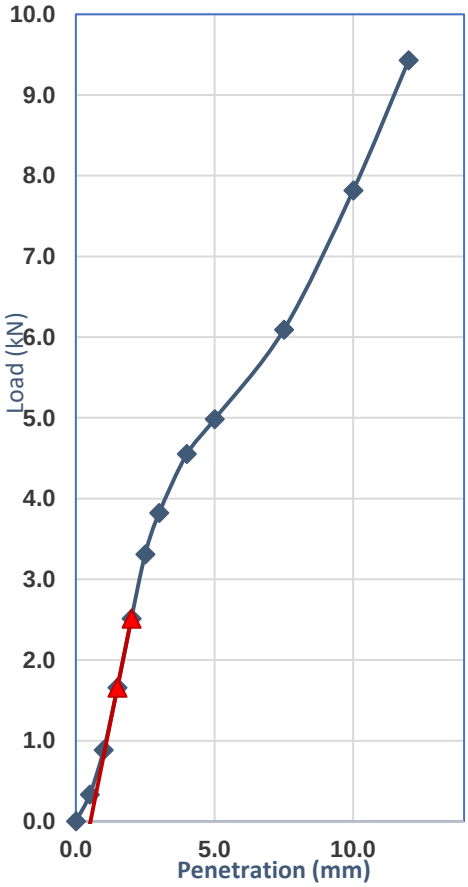
Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14317_1_SCBR
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14317
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH14 (0.1-0.3)m	*Date Tested:*	24/09 - 30/09/2024

TEST RESULTS - CALIFORNIA BEARING RATIO

Sample Description: Silty Sand with Gravel

Sampling Method: Sampled by Client, Tested as Received

Load Penetration Curve



Compaction Details			
Compaction Method	AS 1289.5.2.1	Hammer Type	Modified
Plasticity Determined by	Estimated	Curing Time (Hours)	24.0
% Retained 19.0mm	2	Excluded/Replaced	Excluded
Maximum Dry Density (t/m^3)	1.99	Optimum Moisture (%)	11.5
Target Dry Density Ratio (%)	95	Target Moisture Ratio (%)	100

Specimen Conditions At Compaction			
Dry Density (t/m3)	1.89	Moisture Content (%)	11.7
Density Ratio (%)	95.0	Moisture Ratio (%)	101.0

Specimen Conditions After Soak			
Soaked or Unsoaked	Soaked	Soaking Period (days)	4
Surcharges Applied (kg)	4.50	Measured Swell (%)	0.0
Dry Density (t/m³)	1.89	Dry Density Ratio (%)	95.0
Moisture Content (%)	15.2	Moisture Ratio (%)	131.5

Specimen Conditions After Test			
Top 30mm Moisture (%)	14.3	Remaining Depth (%)	14.2

Correction applied to Penetration: 0.5mm

Determined at a Penetration of: 2.5mm

California Bearing Ratio (CBR): 30%

Comments:

Approved Signatory:

Name: Cody O'Neill

Date: 01/October/2024

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SOIL | AGGREGATE | CONCRETE | CRUSHING

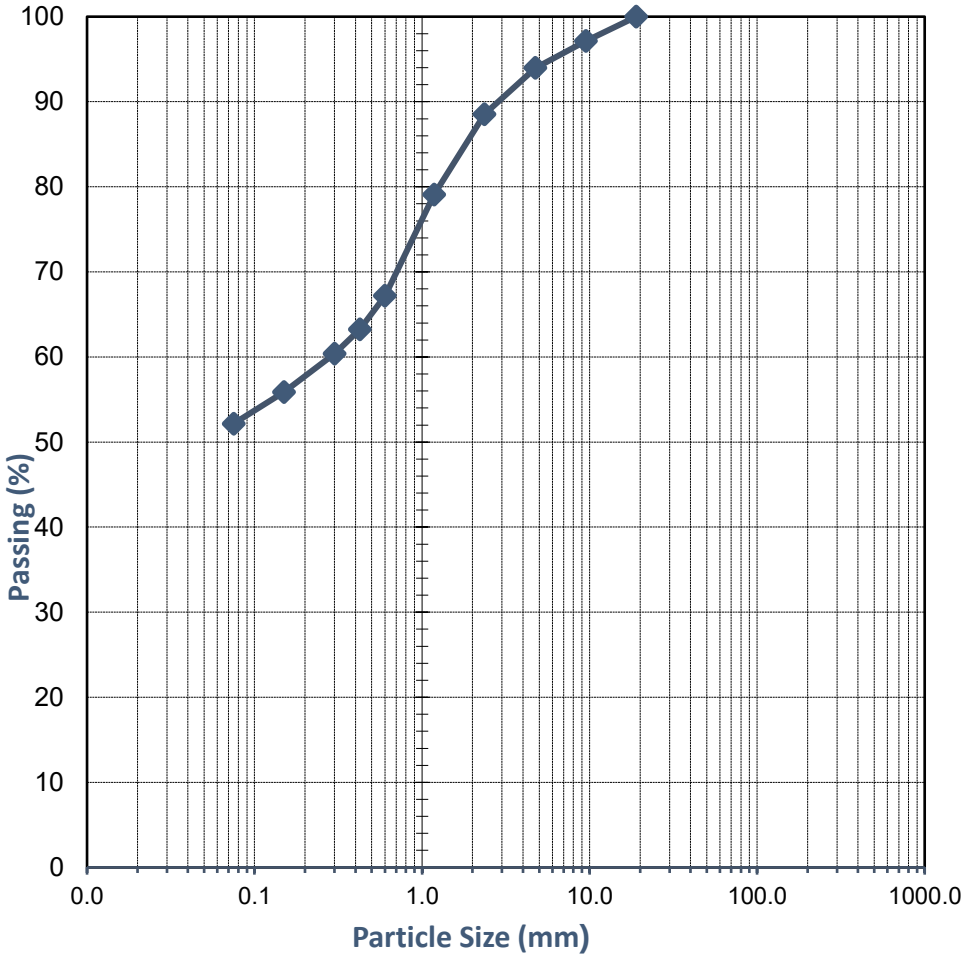
TEST REPORT - AS 1289.3.6.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14319_1_PSD
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14319
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH15 (1.8-2.0)m	*Date Tested:*	24/09 - 25/09/2024

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	100
9.5	97
4.75	94
2.36	89
1.18	79
0.600	67
0.425	63
0.300	60
0.150	56
0.075	52



Comments:

Approved Signatory:

Name: Cody O'Neill

Date: 25/September/2024

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	McCorkell Constructions P/L	*Ticket No.*	S14499
Client Address:	-	*Report No.*	WG24.14319_1_PI
Project:	Parkerville Care School Upgrades	*Sample No.*	WG24.14319
Location:	340 Roland Rd, Parkerville	*Date Sampled:*	Not Specified
Sample Identification:	BH15 (1.8-2.0)m	*Date Tested:*	26/09/2024

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**62**
AS 1289.3.2.1	**Plastic Limit (%)**	**28**
AS 1289.3.3.1	**Plasticity Index (%)**	**34**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**10.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:



Name: Madhav Basnet

Date: 27/September/2024

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Appendix E: Water Balance

WA Site & Soil Evaluation
Irrigation area sizing

Please read the attached notes before using this spreadsheet

Water Balance for Zero Storage

Site Address:	**1 Beacon Drive, Parkerville WA**		
Date:	Wednesday, 9 October 2024	**Assessor:**	Tyrone Mardesic

INPUT DATA

Design Wastewater Flow	Q	6,000	L/day	Based on maximum potential occupancy and derived from the Supplement to Regulation 29 and Schedule 9 - Wastewater system loading rates
Design Irrigation Rate	DIR	20.0	mm/day	Based on soil texture class/permeability and derived from Table L1 of AS/NZS 1547:2012
Nominated Land Application Area	L	409	m^2	[1]
Crop Factor	C	0.8-1.0	unitless	Estimates evapotranspiration as a fraction of pan evaporation; varies with season and crop type[2]
Rainfall Runoff Factor	RF	1.0	untiless	Proportion of rainfall that remains onsite and infiltrates, allowing for any runoff
Mean Monthly Rainfall Data	Mundaring (Station 9030)			BoM Station and number
Mean Monthly Pan Evaporation Data	Upper Swan			BoM Station and number or data from the Evaporation Data for Western Australia Report (https://researchlibrary.agric.wa.gov.au/cgi/viewcontent.cgi?article=1058&context=rmtr

Parameter	Symbol	Formula	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days in month	D		days	31	28	31	30	31	30	31	31	30	31	30	31	**365**
Rainfall	R		mm/month	14.2	17.5	23.6	51.1	132.8	205.2	212.5	171	111.1	68.7	33.1	16.7	**1057.5**
Evaporation	E		mm/month	327	281	241	136	89	63	60	87	110	161	221	303	**2079**
Crop Factor	C		unitless	1.00	1.00	0.90	0.90	0.80	0.80	0.80	0.80	0.90	1.00	1.00	1.00	
OUTPUTS																
Evapotranspiration	ET	ExC	mm/month	327	281	217	122	71	50	48	70	99	161	221	303	**1970.5**
Percolation	B	DIRxD	mm/month	620.0	560	620.0	600.0	620.0	600.0	620.0	620.0	600.0	620.0	600.0	620.0	**7300.0**
Outputs		ET+B	mm/month	947.0	841	836.9	722.4	691.2	650.4	668.0	689.6	699.0	781.0	821.0	923.0	**9270.5**
INPUTS																
Retained Rainfall	RR	RxRF	mm/month	14.2	17.5	23.6	51.1	132.8	205.2	212.5	171	111.1	68.7	33.1	16.7	**1057.5**
Applied Effluent	W	(QxD)/L	mm/month	454.8	410.8	454.8	440.1	454.8	440.1	454.8	454.8	440.1	454.8	440.1	454.8	**5354.5**
Inputs		RR+W	mm/month	469.0	428.3	478.4	491.2	587.6	645.3	667.3	625.8	551.2	523.5	473.2	471.5	**6412.0**
STORAGE CALCULATION																
Storage remaining from previous month			mm/month	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Storage for the month	S	(RR+W)-(ET+B)	mm/month	-478.0	-412.7	-358.5	-231.2	-103.6	-5.1	-0.7	-63.8	-147.8	-257.5	-347.8	-451.5	
Cumulative Storage	M		mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Maximum Storage for Nominated Area	N		mm	0.00												
	V	NxL	L	0												
LAND AREA REQUIRED FOR ZERO STORAGE			m^2	199	204	229	268	333	404	408	359	306	261	228	205	

MINIMUM AREA REQUIRED FOR ZERO STORAGE: 409 m^2

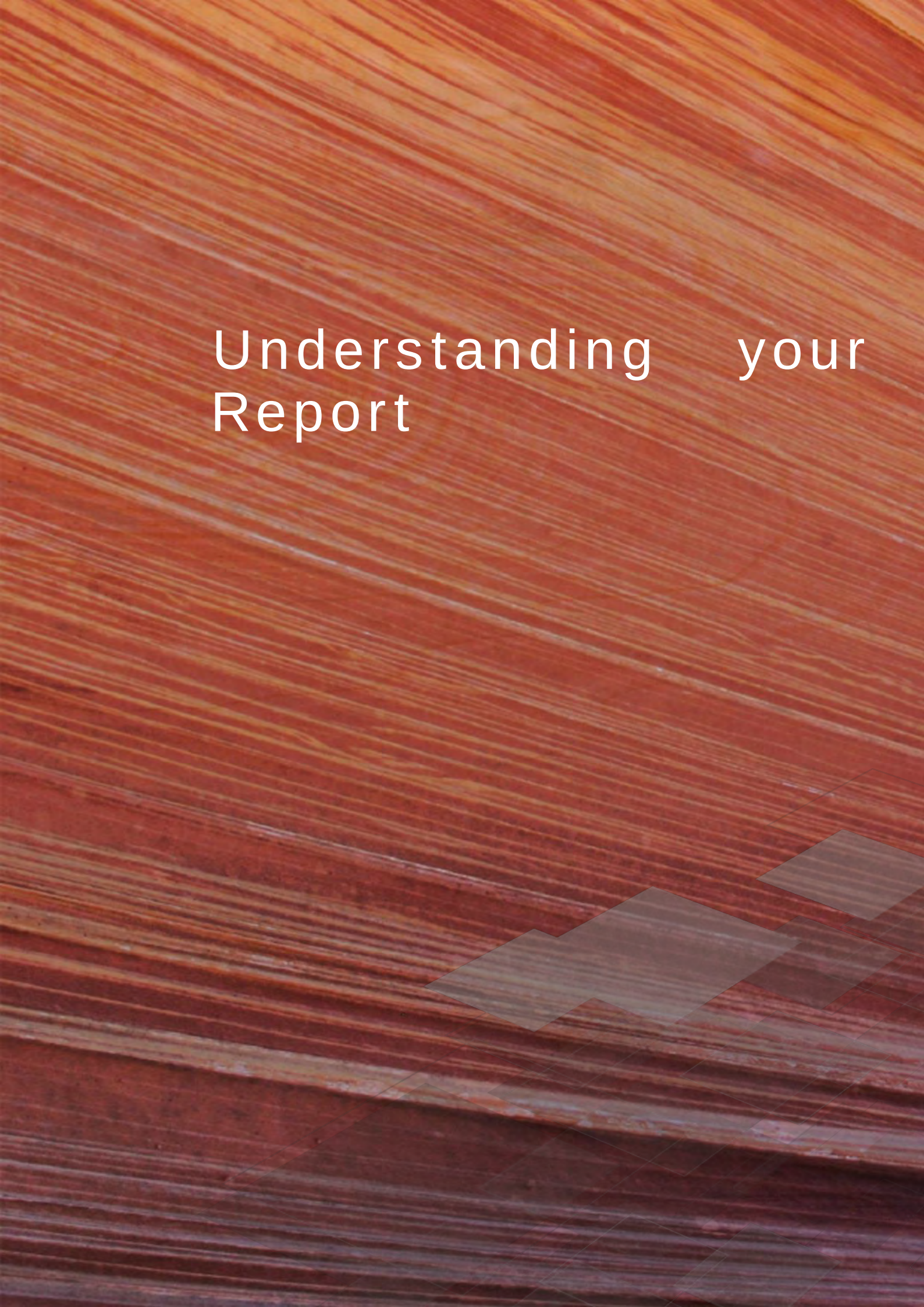
CELLS

	Please enter data in blue cells
XX	Enter available Land Application Area
XX	Data in yellow cells is calculated by the spreadsheet, DO NOT ALTER THESE CELLS

NOTES

[1] This value should be the largest of the following: land application area required based on the most limiting nutrient balance or minimum area required for zero storage

[2] Values selected are suitable for grass in WA



Understanding your Report

1. EXPECTATIONS OF THE REPORT

The following sections have been prepared to clarify what is and is not provided in your report. It is intended to inform you of what your realistic expectations of this report should be and how to manage your risks associated with the conditions on site.

Geotechnical engineering and environmental science are less exact than other engineering and scientific disciplines. We include this information to help you understand where our responsibilities begin and end. You should read and understand this information. Please contact us if you do not understand the report or this explanation. We have extensive experience in a wide variety of projects and we can help you to manage your risk.

2. THIS REPORT RELATES TO PROJECT-SPECIFIC CONDITIONS

This report was developed for a unique set of project-specific conditions to meet the needs of the nominated client. It took into account the following:

- the project objectives as we understood them and as described in this report;
- the specific site mentioned in this report; and
- the current and proposed development at the site.

It should not be used for any purpose other than that indicated in the report. You should not rely on this report if any of the following conditions apply:

- the report was not written for you;
- the report was not written for the site specific to your development;
- the report was not written for your project (including a development at the correct site but other than that listed in the report); or
- the report was written before significant changes occurred at the site (such as a development or a change in ground conditions).

You should always inform us of changes in the proposed project (including minor changes) and request an assessment of their impact.

Where we are not informed of developments relevant to your report, we cannot be held responsible or liable for problems that may arise as a consequence.

Where design is to be carried out by others using information provided by us, we recommend that we be involved in the design process by being engaged for consultation with other members of the project team. Furthermore, we recommend that we be able to review work produced by other members of the project team that relies on information provided in our report.

3. DATA PROVIDED BY THIRD PARTIES

Where data is provided by third parties, it will be identified as such in our reports. We necessarily rely on the completeness and accuracy of data provided by third parties in order to draw conclusions presented in our reports. We are not responsible for omissions, incomplete or inaccurate data associated with third party data, including where we have been requested to provide advice in relation to field investigation data provided by third parties.

4. SOIL LOGS

Our reports often include logs of intrusive and non-intrusive investigation techniques prepared by Galt. These logs are based on our interpretation of field data and laboratory results. The logs should only be read in conjunction with the report they were issued with and should not be re-drawn for inclusion in other documents not prepared by us.

5. THIRD PARTY RELIANCE

We have prepared this report for use by the client. This report must be regarded as confidential to the client and the client's professional advisors. We do not accept any responsibility for contents of this document from any party other than the nominated client. We take no responsibility for any damages suffered by a third party because of any decisions or actions they may make based on this report. Any reliance or decisions made by a third party based on this report are the responsibility of the third party and not of us.

6. CHANGE IN SUBSURFACE CONDITIONS

The recommendations in this report are based on the ground conditions that existed at the time when the study was undertaken. Changes in ground conditions can occur in numerous ways including anthropogenic events (such as construction or contaminating activities on or adjacent to the site) or natural events (such as floods, groundwater fluctuations or earthquakes). We should be consulted prior to use of this report so that we can comment on its reliability. It is important to note that where ground conditions have changed, additional sampling, testing or analysis may be required to fully assess the changed conditions.

7. SUBSURFACE CONDITIONS DURING CONSTRUCTION

Practical constraints mean that we cannot know every minute detail about the subsurface conditions at a particular site. We use professional judgement to form an opinion about the subsurface conditions at the site. Some variation to our evaluated conditions is likely and significant variation is possible. Accordingly, our report should not be considered as final as it is developed from professional judgement and opinion.

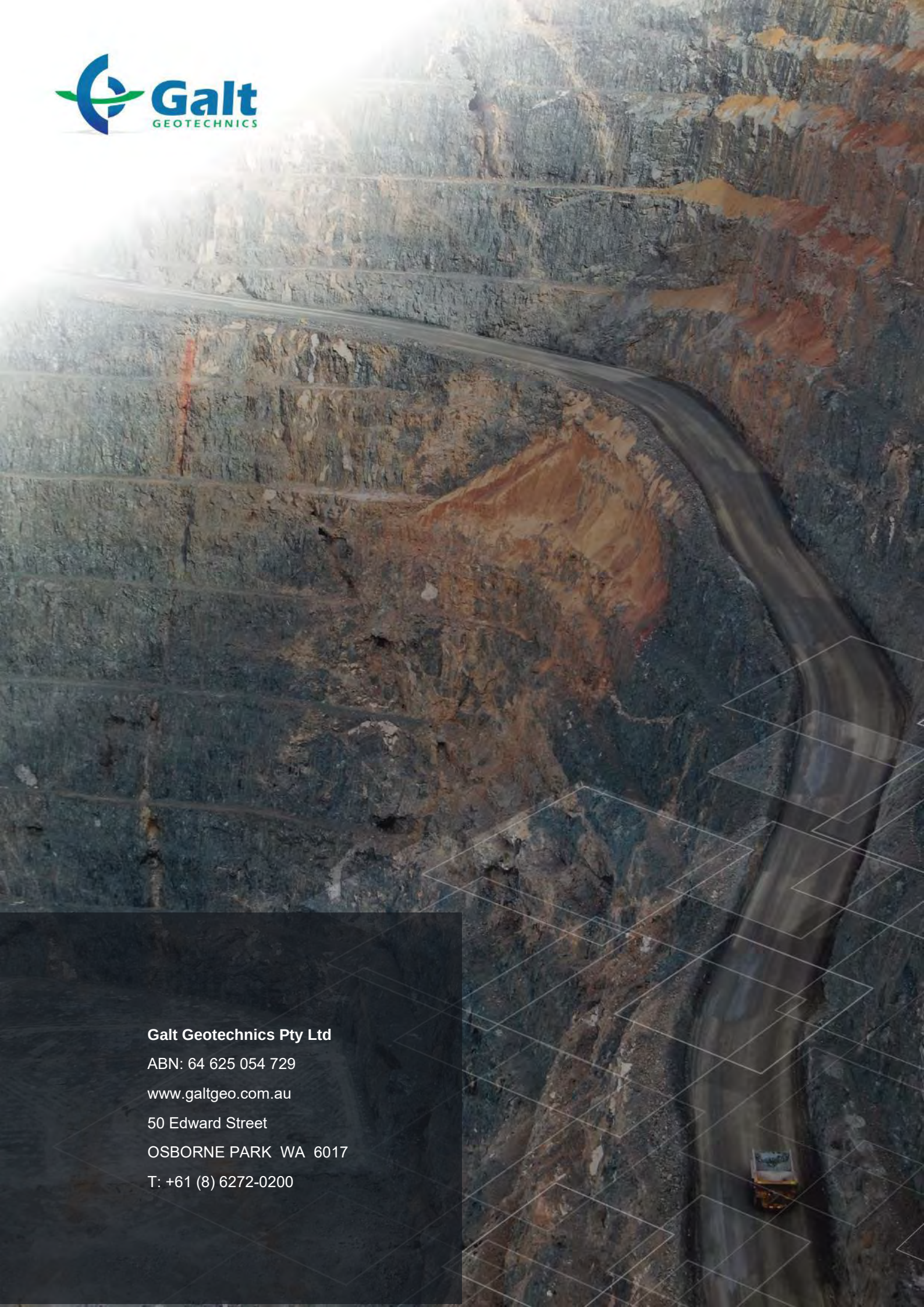
The most effective means of dealing with unanticipated ground conditions is to engage us for construction support. We can only finalise our recommendations by observing actual subsurface conditions encountered during construction. We cannot accept liability for a report's recommendations if we cannot observe construction.

8. ENVIRONMENTAL AND GEOTECHNICAL ISSUES

Unless specifically mentioned otherwise in our report, environmental considerations are not addressed in geotechnical reports. Similarly, geotechnical issues are not addressed in environmental reports. The investigation techniques used for geotechnical investigations can differ from those used for environmental investigations. It is the client's responsibility to satisfy themselves that geotechnical and environmental considerations have been taken into account for the site.

Geotechnical advice presented in a Galt Environmental report has been provided by Galt Geotechnics under a sub-contract agreement. Similarly, environmental advice presented in a Galt Geotechnics report has been provided by Galt Environmental under a sub-contract agreement.

Unless specifically noted otherwise, no parties shall draw any inferences about the applicability of the Western Australian state government landfill levy from the contents of this document.



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transcore 20 years anniversary

transport planning
traffic engineering
modelling

Parkerville Care School

Transport Impact Statement

PREPARED FOR:
McCorkell Constructions (WA) Pty Ltd

January 2025

Document history and status

Author	Revision	Approved by	Date approved	Revision type
Vladimir Baltic	r01	B Bordbar	4/09/2024	1st Draft
Vladimir Baltic	r01a	B Bordbar	9/09/2024	2nd Draft
Vladimir Baltic	r01b	B Bordbar	10/09/2024	Final
Vladimir Baltic	r01c	B Bordbar	8/10/2024	1st Revision
Vladimir Baltic	r01d	B Bordbar	30/10/2024	2nd Revision
Vladimir Baltic	r02	B Bordbar	23/02/2025	3rd Revision

File name: t24.169.vb.r02.docx

Author: Vladimir Baltic

Project manager: Behnam Bordbar

Client: McCorkell Constructions (WA) Pty Ltd

Project: Parkerville Care School

Document revision: r02

Project number: t24.169

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The Client alone shall have a license to use the documents referred to above for the purpose of completing the Project, but the Client shall not use, or make copies of, such documents in connection with any work not included in the Project, unless written approval is obtained from the Consultant or otherwise agreed through a separate contract.

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REPORT TABLES

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1 Introduction

This Transport Impact Statement has been prepared by Transcore on behalf of McCorkell Constructions (WA) Pty Ltd with regard to the proposed Children & Youth Care School to be constructed at Lots 9001, 3304 & 1636 Beacon Road in Parkerville, Shire of Mundaring (hereafter the subject site).

The subject site occupies space between Roland Road and Beacon Road immediately north of Richardson Road, as shown in **Figure 1**.



Figure 1: Location of the subject site

The Transport Impact Assessment Guidelines (WAPC, Vol 4 – Individual Developments, August 2016) states: *"A Transport Impact Statement is required for those developments that would be likely to generate moderate volumes of traffic*[1] *and therefore would have a moderate overall impact on the surrounding land uses and transport networks"*.

Section 6 of Transcore's report provides details of the estimated trip generation for the proposed development. Accordingly, as the total peak hour vehicular trips are

[1] *Between 10 and 100 vehicular trips per hour*

estimated to be less than 100 trips, a *Transport Impact Statement* is deemed appropriate for this development.

Key issues that will be addressed in this report include the traffic generation and distribution of the proposed development, access and egress movement patterns and parking demand and supply.

Section **6.1** of Transcore's report provides details of the estimated trip generation of the proposed development. Accordingly, as the net increase in peak hour vehicular trips is estimated to be less than 100 trips, a *Transport Impact Statement* is deemed appropriate for assessment of the proposal.

The site currently accommodates 13 rural-type buildings including four residential dwellings/cottages which are currently used as foster care homes. The existing property presently entails multiple accesses onto Roland Road and Beacon Road.

The location of the subject site in its regional context within the *Metropolitan Region Scheme (MRS)* is illustrated in **Figure 2**. The subject site, which occupies an area of approximately 13.4ha, is zoned *"Rural"* in Metropolitan Region Scheme (MRS) and *"Special Use"* under the Shire of Mundaring Local Planning Scheme No.4 (LPS 4).

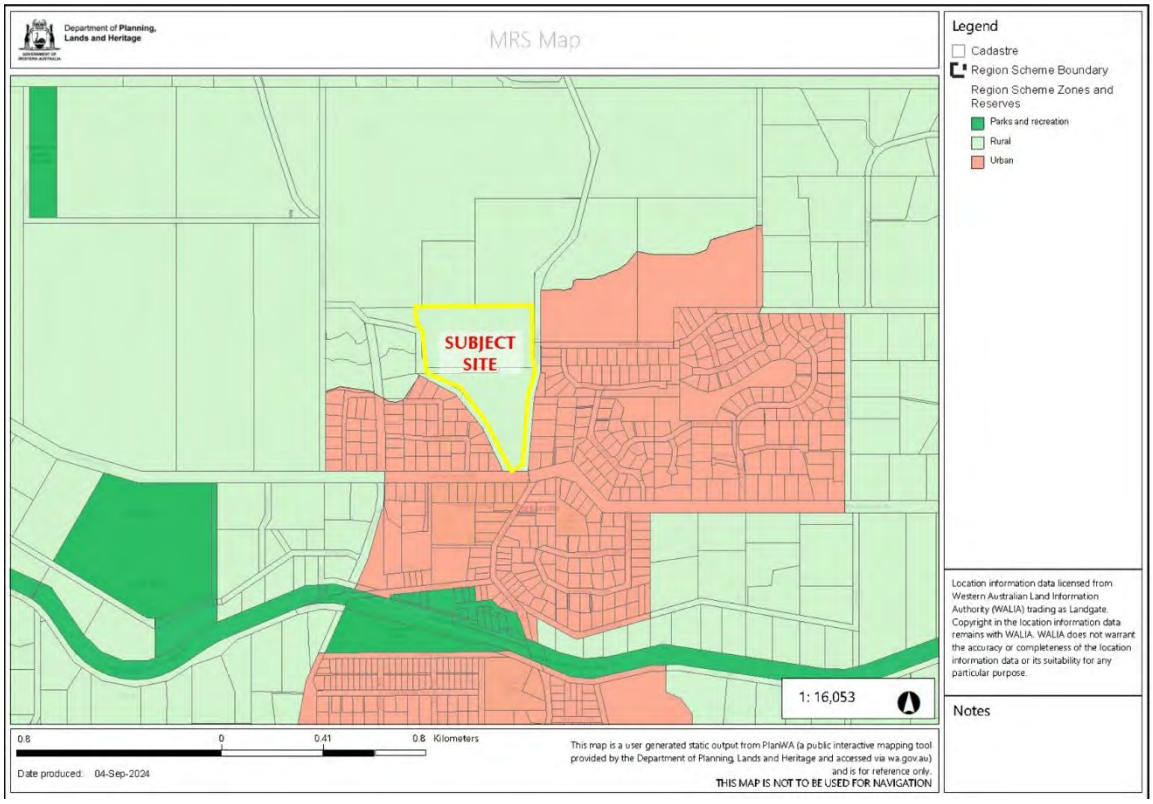


Figure 2: Subject site location within Metropolitan Region Scheme context

The MRS map identifies Roland Road, and other adjacent roads, as local roads under care and control of the Shire of Mundaring.

2 Proposed Development

The development proposal contemplates redevelopment of the existing site into a CARE school for high school aged young people who have experienced trauma and adverse childhood experience.

Specifically, the proposed school campus is intended to comprise the following key elements:

- Administration building;
- Four classrooms (Year 7 – 12 classes);
- Vet workshop;
- Home economics room (kitchen);
- Art studio;
- Assembly + shelter;
- Garden shed and greenroom;
- Outdoor play areas and facilities.

As part of the school campus proposal, the existing access system serving the site is proposed to be modified to comprise the following elements:

- A total of three full-movement accesses on Beacon Road; and,
- One (main) full-movement accesses on Roland Road.

The proposed project is intended to be developed in several stages over the 2026-2030 period. Once fully developed, the school campus will accommodate up to 90 students to be catered by up to 20 staff.

Refer site plan attached in **Appendix A** for more details.

3 Vehicle Access and Parking

As presented in the development plan, the proposed school campus is intended to be served by a four-point access system comprising the following points:

- Southernmost full-movement crossover on Beacon Road, approximately 200m north of Richardson Road intersection;
- Central full-movement crossover on Beacon Road, approximately 450m north of Richardson Road intersection;
- Northernmost full-movement crossover on Beacon Road, approximately 520m north of Richardson Road intersection;
- Full-movement crossover on Roland Road (main entry), approximately 85m south of Kilborn Road intersection.

The school-related traffic is distributed across the campus site via internal system of two-way driveways (compacted gravel and/or red-brown asphalt), which provide access to classrooms, supporting outbuildings, car parks and outdoor areas.

The required car parking for the development will be delivered through two distinct car park areas at the western and eastern end of the site.

The parking spaces will be provided in accordance with the requirements set out in Shire of Mundaring LPS No. 4. Table 2 in the Shire of Mundaring LPS No. 4 states a car parking requirement for the Secondary School of seven drop-off spaces per 100 students plus one space per employee or staff member. Accordingly, based on full development student and staff numbers a total of about 27 parking spaces are required for the subject school.

A total of 49 on-site parking bays will be provided at the subject site. Hence, the parking supply for the CARE school exceeds the formal parking requirement.

4 Provision for Service Vehicles

The waste collection will be carried out by service vehicles accessing the site via the northernmost Beacon Road, collecting rubbish/green waste bins from the bin pad (located adjacent to the maintenance shed at the western end of the site), navigate internal driveways driving east through the site and exit the site via the Roland Road crossover.

It has been advised that bus service will also be established to facilitate transport of students to and from the school from various localities. The school bus will access and egress the site Roland Road crossover turning around within the site.

A turn path assessment, using appropriate service vehicle and bus templates, was undertaken to confirm the suitability of the internal site design to support the relevant operations. The assessment has indicated that minor adjustments to internal driveways and the two crossovers are required. Refer **Appendix B** for more details.

5 Hours of Operation

The proposed development is an educational facility and as such will be operating during the typical school weekday hours.

6 Daily Traffic Volumes and Vehicle Types

6.1 Trip Generation

According to the advice provided, it is envisaged that the majority of students would be bused to and from the site which would result in reduction of the potential traffic-generation of the development. However, in order to allow for a robust assessment in this case, the traffic volumes likely to be generated by the proposed school have been estimated using trip rates sourced from *WAPC Transport impact Assessment Guidelines: Volume 5 Technical Guidance (August 2016)*.

Accordingly, the subject publication provides AM peak and PM peak hour trip rate of 1.0 trip/hr (for each peak hour).

Accordingly, it is estimated that the proposed development would generate a total of approximately **90** trips during both AM and PM peak hour periods. These trips include both inbound and outbound vehicle movements.

The traffic distribution detailed in **Table 1** was based on the 50/50 directional split assumptions for each peak hour periods.

Table 1: Peak hour trips for the development

Peak Period	Direction	Traffic Split	Total Peak Hour Trips
AM Peak	Inbound	45 trips	**90 trips**
	Outbound	45 trips	
PM Peak	Inbound	45 trips	**90 trips**
	Outbound	45 trips	

6.2 Trip Distribution

Considering the location of the proposed development as well as the available access and egress routes to and from the site, population distribution, the anticipated directional trip distribution of the development-generated traffic is assumed to be as follows:

- 20% of trips to/from the north along Roland Road;
- 75% of trips to/from the south along Roland Road and,
- 5% of trips to/from the south along Beacon Road.

The directional morning and afternoon trip distribution of the development-generated traffic is illustrated in **Figure 2**.



Figure 3. Estimated traffic movements for the subject development – morning peak/afternoon peak trips

6.3 Impact on Surrounding Roads

The *WAPC Transport Impact Assessment Guidelines (2016)* provides guidance on the assessment of traffic 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."

From **Figure 2** it can be seen that the estimated traffic impact from the proposed development would be below the critical thresholds, with the most pronounced traffic increases of 64vph along Roland Road during both AM and PM peak hours (south of the site). Therefore, the impact of the development traffic on the surrounding road network will not be significant.

It is considered that the surrounding roads and intersections have capacity to accommodate the relatively low traffic generation of the proposed development.

7 Traffic Management on Frontage Streets

7.1 Context

The subject site occupies space between Roland Road and Beacon Road immediately north of Richardson Road.

7.2 Existing Road Network

Roland Road, a north-south road link between the Toodyay Road and Parkerville town site, was recently upgraded to a 7.2m wide, mostly unkerbed, single-carriageway rural road with wide gravel shoulders.

Roland Road is classified as a *Regional Distributor* in the Main Roads Metropolitan Functional Road Hierarchy and is under the care and control of the relevant local authorities (City of Swan and Shire of Mundaring). The posted speed limit on Roland Road in the vicinity of the subject site is 50km/h (default built-up area speed limit).

Traffic count data sourced from Shire of Mundaring shows that Roland Road (south of Toodyay Road) carried average weekday traffic flow of about 1,810 vehicles per day (vpd) in 2021/22.

Beacon Road is a typical low-order rural un-kerbed road, approximately 5.0-6.0m wide with gravel shoulders and no pedestrian paths on either side of the road. Beacon Road operates under a default built-up area speed limit of 50km/h.

There is no available traffic count data for this road.

7.3 Heavy Vehicles

Restricted Access Vehicle (RAV) Network routes are designated for access by large heavy vehicle combinations, which is managed by Main Roads WA. According to Main Roads WA HVS department RAV network map, all roads immediately surrounding the subject site are currently classified as RAV Network 1, as shown **Figure 4**.

The RAV 1 Network classification permits operation of semi-trailers of up to 19m and short B-Doubles of up to 20m on these roads.

The same map shows Toodyay Road and Great Eastern Highway to be a RAV Network 4 road. RAV 4 network is designed to carry heavy vehicle compositions of up to 27.5m in length.

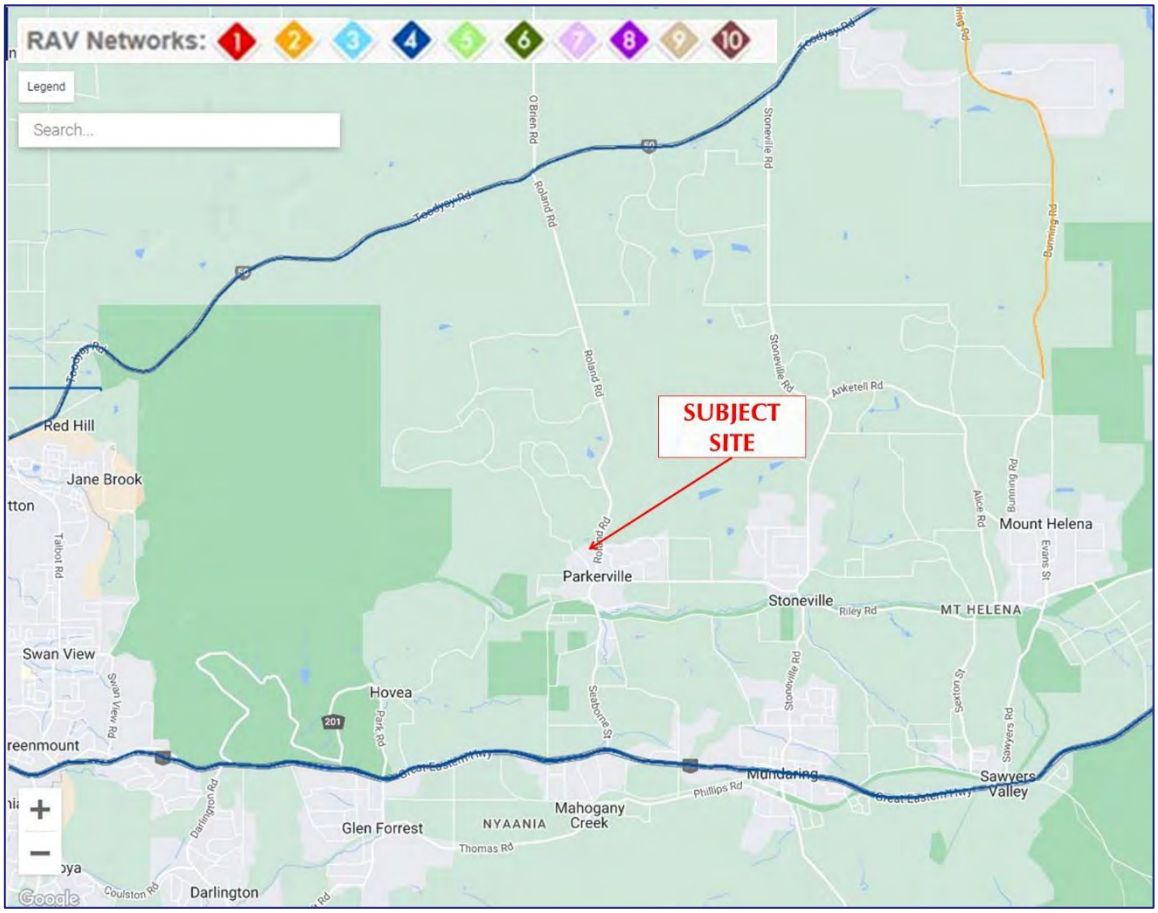


Figure 4. Existing heavy vehicle road network classification (RAV)

8 Public Transport Access

The Parkerville and Stoneville localities are presently served by bus services No. 328 and 331 which operate along Seaborne Street/Byfield Road/Richardson Road and Stoneville Road/Richardson Road routes providing connections to a bus/rail transfer facility at Midland Station and to Mundaring, Chidlow, and Wundowie town sites.

A closes pair of bus stops to the subject site is located on Richardson Road, approximately 400m walking distance east of the site (Bus service No. 328). Refer **Figure 5** from more details.

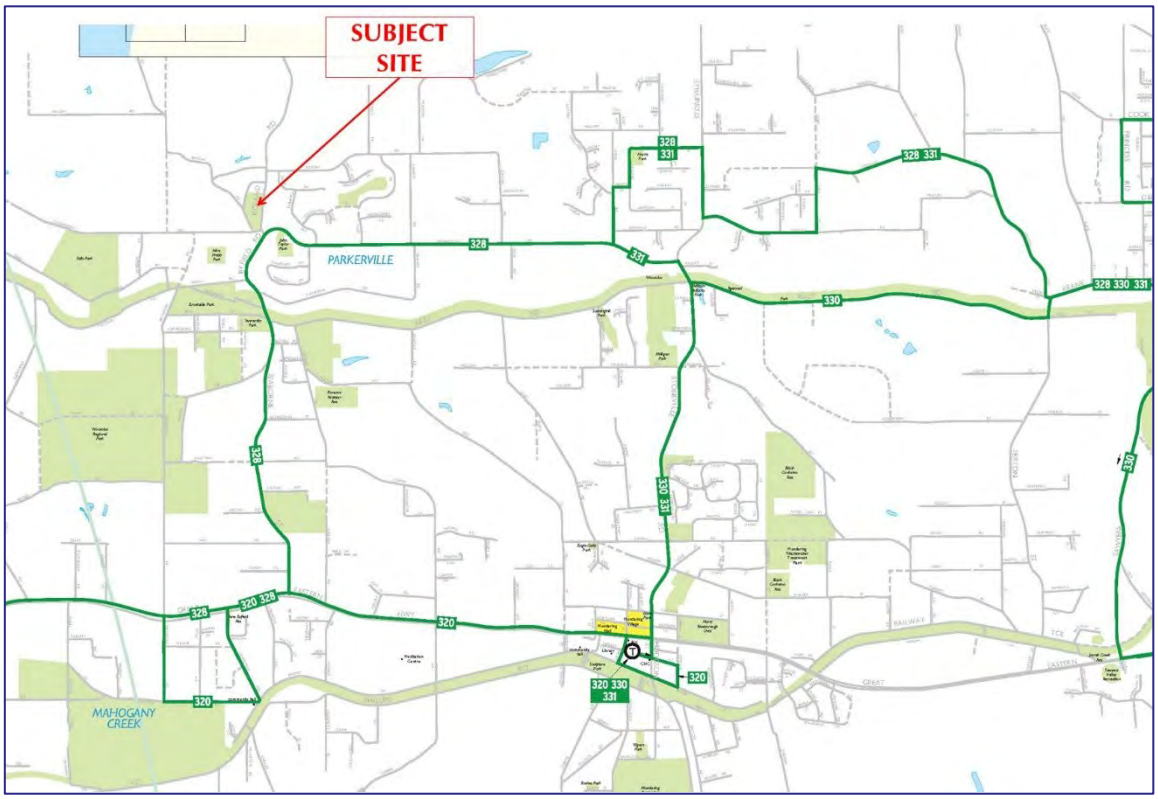


Figure 5: Public transport services (Transperth Map)

9 Pedestrian and Cyclist Access

The subject locality (area surrounding the site) does not have a network of footpaths or shared paths with the only limited and isolated path network being that located adjacent to Parkerville and Stoneville town sites.

However, a number of local roads, including Roland Road, are classified as a "good road riding environment" as shown in **Figure 6**, an extract from Perth Bike Maps published by the Department of Transport. The network of these roads provides good accessibility of the site by bikes.

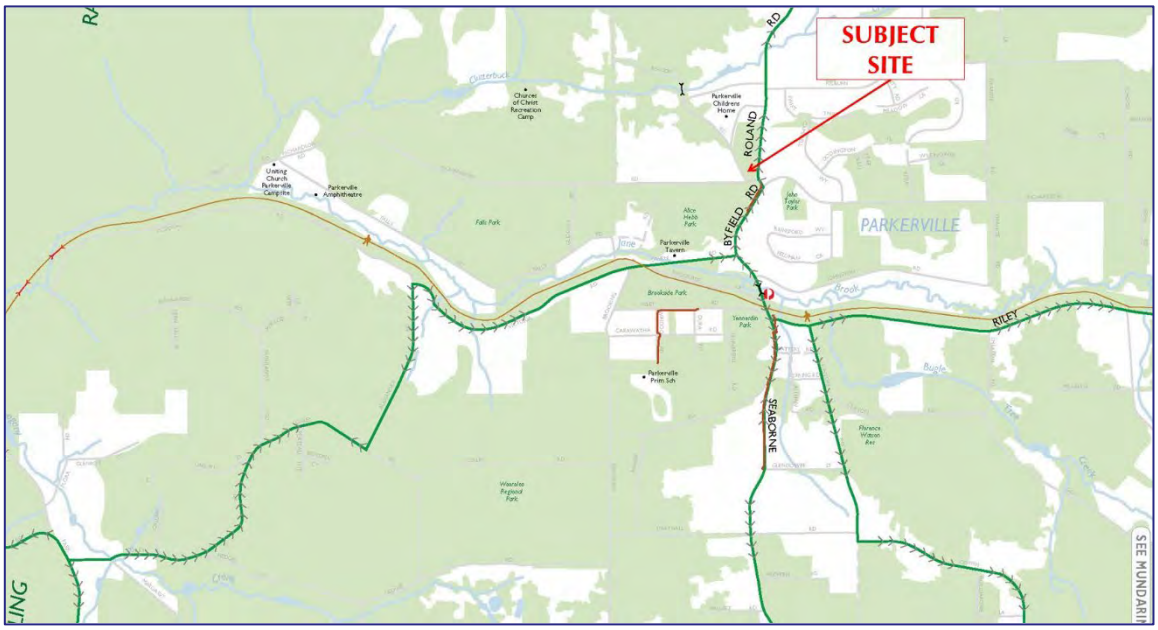


Figure 6: Extract from Perth Bike Map series (source: Department of Transport)

10 Site Specific Issues

Section of Beacon Road along the northwest end of the site is presently a gravel road. This approximately 90m-long section of road is proposed to be sealed to 6m wide standard to facilitate access to the bin storage shed via site's northernmost Beacon Road crossover.

No other site-specific issues have been identified within the scope of this assessment.

11 Safety Issues

No safety issues were identified within the scope of this assessment.

12 Conclusions

This Transport Impact Statement has been prepared by Transcore behalf of McCorkell Constructions (WA) Pty Ltd with regard to the proposed Children & Youth Care School to be constructed at Lots 9001, 3304 & 1636 Beacon Road in Parkerville, Shire of Mundaring.

The development proposal contemplates redevelopment of the existing site into a CARE school for high school aged young people who have experienced trauma and adverse childhood experience. Once fully developed, the school campus will accommodate up to 90 students to be catered by up to 20 staff.

The traffic modelling undertaken in this report shows that the traffic generation of the proposed development is estimated to be in order of about 90 morning and afternoon peak hour trips (both inbound and outbound).

The traffic analysis undertaken in this report demonstrates that the estimated development-generated traffic will have moderate and acceptable level of impact on the surrounding road network.

The subject site has no formal accessibility by the existing pedestrian and cyclist networks, which is often the case with rural areas. The site has access to public transport services (i.e., buses service) which operates along Richardson Road.

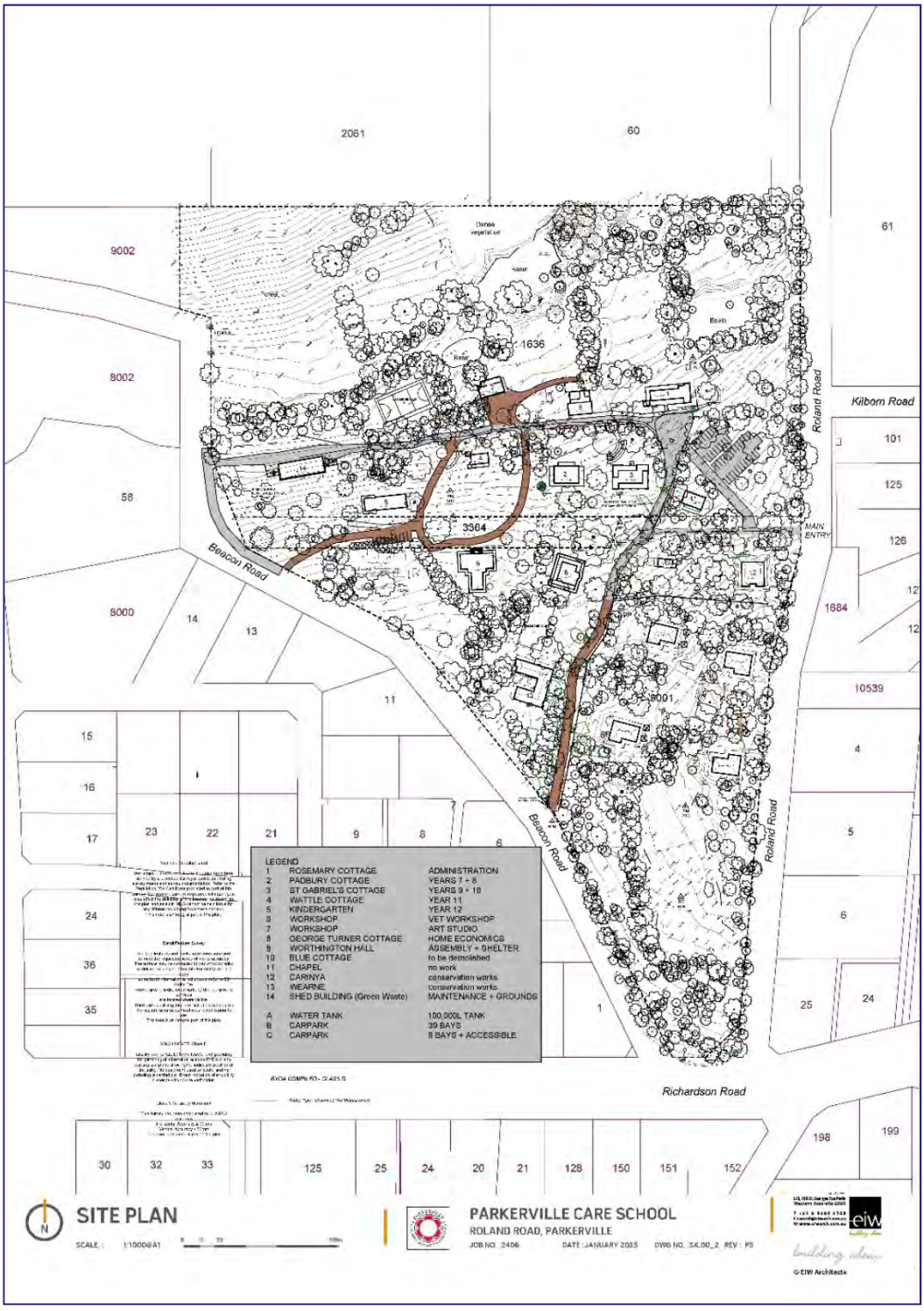
The total on-site parking supply exceeds the formal parking requirement for the proposed school.

In conclusion, the findings of this Transport Impact Statement are supportive of the proposed development.

Appendix A

PROPOSED SITE PLANS

20 years anniversary
transcore
transport planning
traffic engineering
modelling


2061
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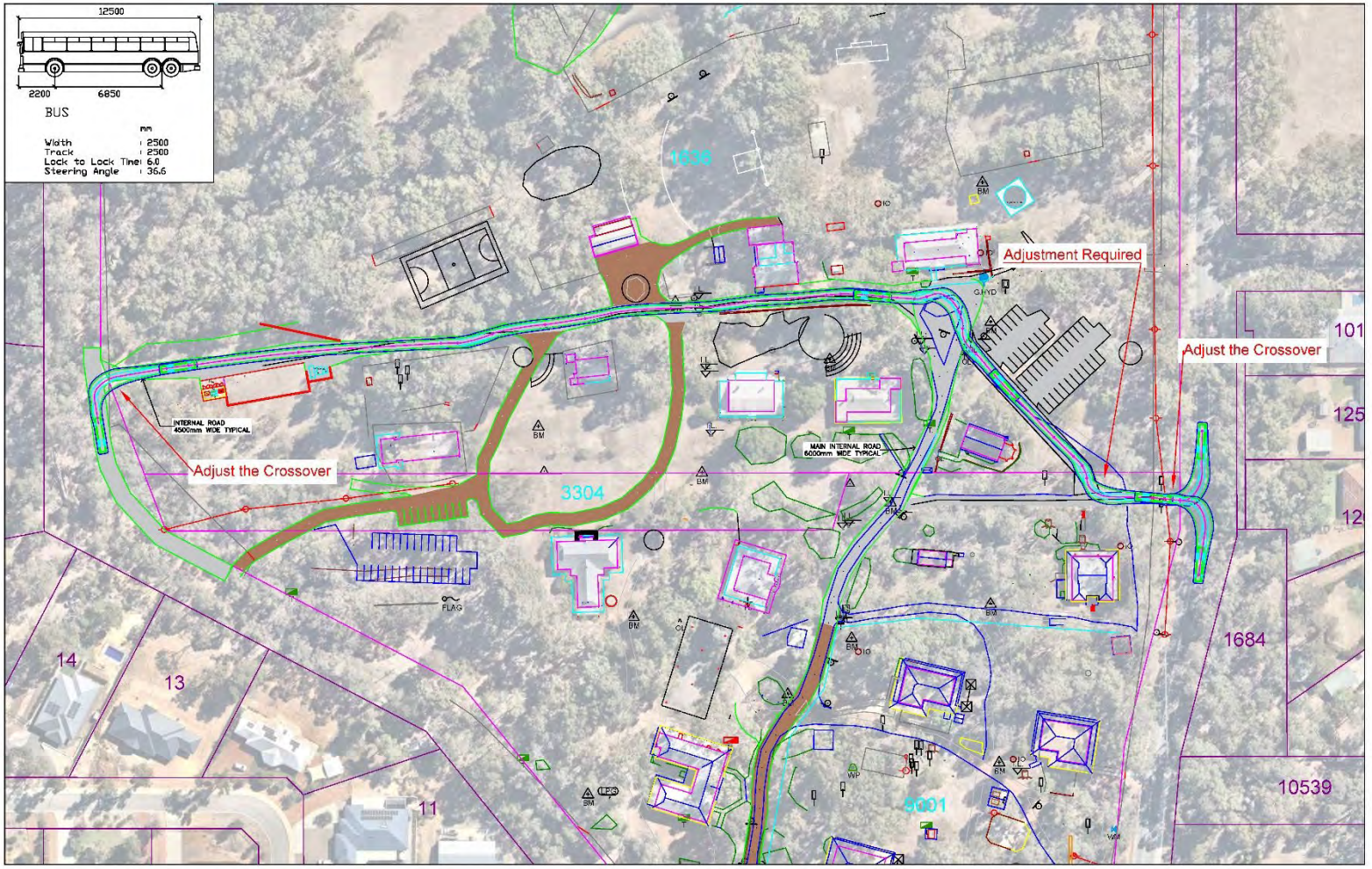
21
128
150
151
152
198
199
1636
3364
9001
1684
10539
101
125
126
4
5
6
25
24
Beacon Road
Roland Road
Kilborn Road
Richardson Road
MAIN ENTRY
LEGEND
1 ROSEMARY COTTAGE ADMINISTRATION
2 PADBURY COTTAGE YEARS 7 + 8
3 ST GABRIEL'S COTTAGE YEARS 9 + 10
4 WATTLE COTTAGE YEAR 11
5 KINDERGARTEN YEAR 12
6 WORKSHOP VET WORKSHOP
7 WORKSHOP ART STUDIO
8 GEORGE TURNER COTTAGE HOME ECONOMICS
9 WORTHINGTON HALL ASSEMBLY + SHELTER
10 BLUE COTTAGE to be demolished
11 CHAPEL no work
12 CARINYA conservation works
13 WEARNE conservation works
14 SHED BUILDING (Green Waste) MAINTENANCE + GROUNDS
A WATER TANK 100,000L TANK
B CARPARK 39 BAYS
C CARPARK 9 BAYS + ACCESSIBLE
SITE PLAN
SCALE : 1:1000@A1
PARKERVILLE CARE SCHOOL
ROLAND ROAD, PARKERVILLE
JOB NO. 2406
DATE : JANUARY 2025
DWG NO. SK.00_2 REV : P5
© EIW Architects

Appendix B

TURN PATH PLANS

20 years anniversary
transcore
transport planning
traffic engineering
modelling



Parkerville Care School

Austroads 2013 : 12.5m Bus

Bus Entry & Exit

LEGEND

Vehicle Body

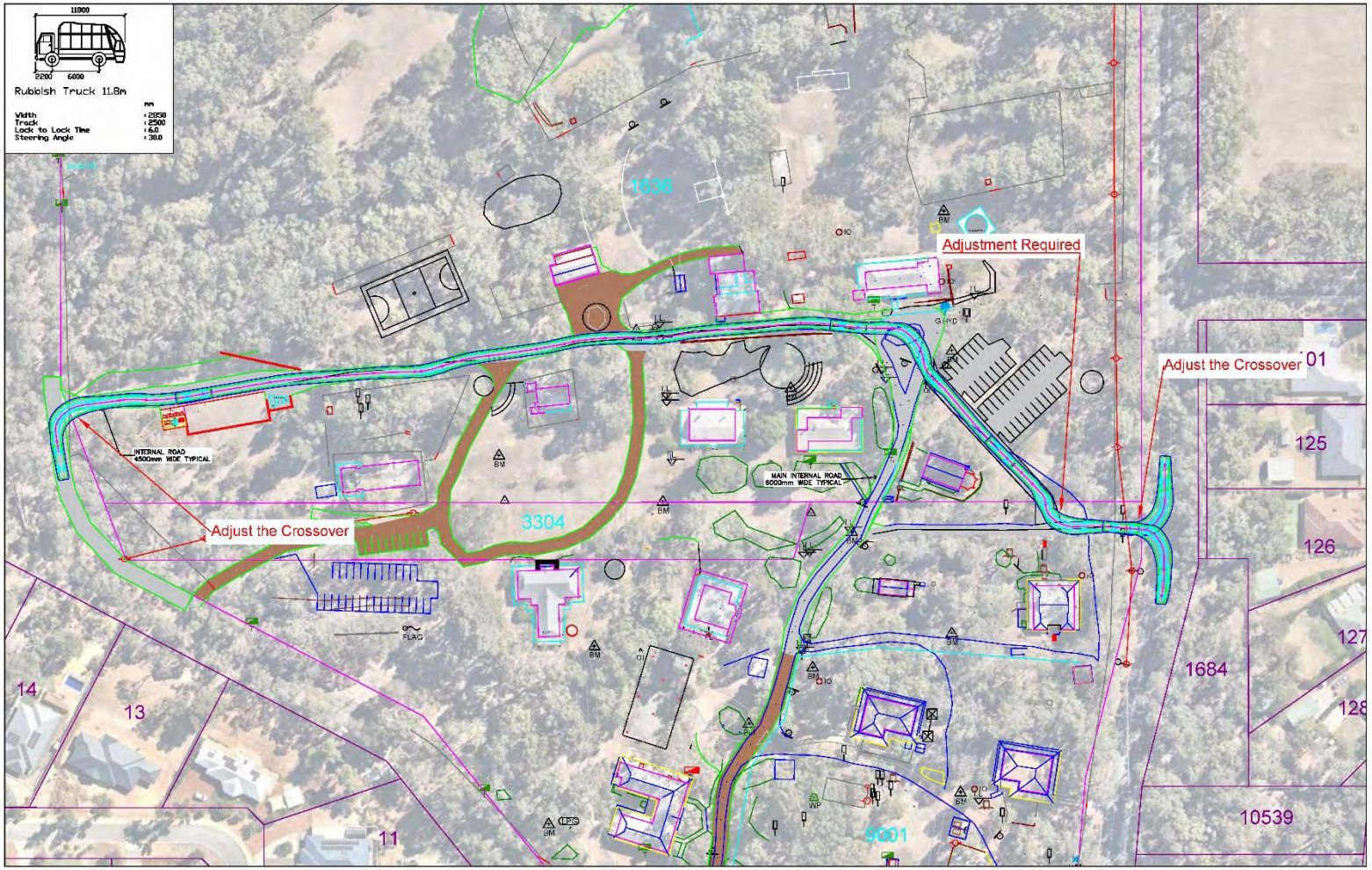
Wheel Path

500mm Clearance

t24.169.sk01a

23/01/2025

Scale: 1:1250 @ A3



Parkerville Care School

11.8m Waste Collection Truck

Proposed Bin Store Location Access & Egress

LEGEND

Vehicle Body

Wheel Path

500mm Clearance

t24.169.sk06a

23/01/2025

Scale: 1:1250 @ A3

transcore

GABRIELS HEARNE FARRELL

ENVIRONMENTAL ACOUSTICS

DEVELOPMENT APPROVAL REPORT

PROPOSED CARE SCHOOL
ROLAND ROAD, PARKERVILLE

22nd October 2024



For

McCORKELL CONSTRUCTIONS WA

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PERTH WA 6000

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Report Version	Author	Notes	Date
Initial Report	Michael Ferguson		22nd October 2024

Gabriels Hearne Farrell Pty Ltd is a Member Firm of the Association of Australasian Acoustical Consultants. The report author is a full member of the Australian Acoustical Society.

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1. INTRODUCTION

As requested, this report summarises the potential noise emissions from the proposed new Parkerville Care School development, located on Roalnd Road, Parkerville WA. This report is based upon the drawings received from the client on the 7th October, 2024. This report outlines the following:

- Demonstrates that the project team is aware of their Regulatory obligations with regards to noise emissions,
- Establishes the project specific Assigned Noise Level criteria in accordance with the Regulations,
- Identifies the relevant Noise Sources and the Assigned Nosie Levels applicable to each source,
- Identifies acoustic issues that will be addressed in detail during design and documentation stages, to ensure compliance with the Environmental Protection (Noise) Regulations (EPNR),
- Provides an initial assessment and recommendations to review compliance with the EPNR, including:
  - Mechanical noise, including fire pumps and generators
  - Educational noise

1.1 Qualifications Of Consultant

The author of this report, Michael Ferguson, has been working for Gabriels Hearne Farrell Pty Ltd (formerly Gabriels Environmental Design Pty Ltd) since the beginning of 2010. He became a full member of the Australian Acoustical Society on the 22nd March, 2014. GHF is also a Member Firm of the Association of Australasian Acoustical Consultants.

2. PROJECT BACKGROUND

2.1 Project Context

The proposed site is an existing Children and Youth Care Campus, with various buildings around the site. These existing buildings are to be upgraded to accommodate a new CARE School for high school aged young people who have experienced trauma and adverse childhood experiences, and where mainstream schooling environments are not supportive of their emotional, social, and psychological needs to support their educational development.

The site is located between Roland Road and Beacon Road, in Parkerville, Western Australia. There are existing residences to the East, South and West of the site, with bushland and noise sensitive school sites to the North.

2.2 Proposed Operations

We assume that the proposed operational period is standard school hours, restricted to within 7am to 7pm Monday to Saturday.

3. ENVIRONMENTAL NOISE EMISSIONS

Noise emissions generated by the use of the proposed facilities must comply with the Environmental Protection (Noise) Regulations, 1997 (as amended Dec 2013). The criteria for noise emissions from this development to neighbouring premises are called the Assigned Noise Levels, and vary depending on time of day, receiver location, duration of the noise source etc. The site specific criteria are set out in Section 3.1 of this report.

The neighbouring highly noise sensitive premises are:

- Existing single storey residents to the East, South and West
- Existing rural bushland and school sites to the North

Our current calculations and recommendations are based upon the above mentioned properties. Should this change in the future then this may have implications on the information contained within this report.

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The site specific Assigned Noise Level criteria takes into account the land zoning and traffic flows within 100m and 450m of the relevant receiver locations. This has been based on the land zoning information obtained from aerial imagery:



Image 01 –Assigned Noise Level Circumferences

Land Zoning Influencing Factor

There is no commercial properties within a 450m radius of the surrounding noise sensitive receivers. No Influencing Factor is applied for land use.

Transport Influencing Factor

Typically, the amount of traffic on nearby roads has an influencing factor on the assigned noise levels. For this development there are no Major or Secondary roads within a 450m radius, therefore there is no Influencing Factor applied for transport corridors.

3.1 Assigned Noise Levels

Based on the above, there is no Influencing Factor relevant to the residences surrounding area to the proposed development. On this basis, the regulatory Assigned Noise Level criteria to be applied to this development are:

Type of premises receiving noise	Time of day	Assigned Noise Level (dB)		
		L_{A10}	L_{A1}	$L_{A\,max}$
Noise sensitive premises; highly sensitive area (i.e. within 15m of a residential building)	0700 to 1900 hours Monday to Saturday	45	55	65
	0900 to 1900 hours Sunday and public holidays	40	50	65
	1900 to 2200 hours all days	40	50	55
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays.	35	45	55

Table 01 –Assigned Noise Levels (continued)

The sound level parameters used for the various environmental noise criteria are described below, based on an assessment period of 15 minutes up to 4 hours:

L_{A10} is the 'A' weighted noise level which is not to be exceeded for more than 10% of the time, e.g. for more than 10 minutes in 100 minutes. This is the parameter relevant to most HVAC equipment, and emissions from other longer term noise sources that run for extended duration (such as condensing units, generators during power outages, etc.).

L_{A1} is the 'A' weighted noise level which is not to be exceeded for more than 1% of the time, e.g. for more than 1 minute in 100 minutes, or up to 24 minutes in 4 hours. This is the parameter relevant to noise sources that only occur occasionally, for short durations.

L_{Amax} is the 'A' weighted noise level for individual events which is not to be exceeded at any time.

3.2 Adjustments for Noise Character

Regulation 9(3) requires that the noise emission must be free of annoying characteristics, namely tonality (e.g. whining, droning), modulation (like a siren), and impulsiveness (e.g. thumping). Where noise emissions do exhibit the above noise characteristics, an adjustment is made to the measured/calculated noise level:

Tonality	5dB is added to the measured level
Modulation	5dB is added to the measured level
Impulsiveness	10dB is added to the measured level

Where the noise emission is music the following adjustments to the measured noise levels apply:

Impulsiveness not present	10dB is added to the measurement level
Impulsiveness present	15dB is added to the measurement level

The above adjustments only apply where the noise character is audible and measurable the noise receiver.

4. NOISE SOURCES

Noise emission from one premises to another is governed by the Environmental Protection (Noise) Regulations, 1997. However, most activity noise emissions from schools are considered to be Community Noise and are technically exempt from compliance with the regulatory Assigned Noise Levels, as discussed below:

According to Regulation 16 and Schedule 2 (Item 4), the "exempt noise" applies to:

Noise emitted as a consequence of a recreational or educational activity from the premises occupied for educational purposes if the activity -

a) is conducted under the control of the occupier of the premises; and

b) does not include the use of mechanical equipment other than musical instruments

Therefore it is our belief that any school or educational activity occurring on this land is exempt from meeting the EPNR, provided they are not mechanical in nature, and are still under the control of the occupier. A summary of noise sources requiring consideration is set out below.

4.1 Dedicated Outdoor Play Areas

Although technically exempt from complying with the Environmental Protection (Noise) Regulations 1997, complaints from school play areas can occur, particularly when in close proximity to neighbours. In these cases, the CEO of the local government can enforce compliance with the noise regulations even if technically outdoor play areas are exempt.

In relation to this project the risk of noise complaints is reasonably mitigated by locating dedicated play areas internally on the site, with noticeable distances to neighbours. Whilst not required, where possible it is strongly recommended that buildings or other solid screening elements are located between play areas and the closest neighbouring receivers.

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4.2 Hard Courts

Like the external play areas mentioned above, it is our view that any noise emissions from the Hardcourts are also exempt from meeting the Regulations, provided they are under the control of the occupier. With this in mind the playing courts must not be hired for outside school hour usage or else compliance will need to be confirmed, and this is unlikely to be achieved without significant cost and alteration to the project.

Currently the hardcourts are located to the North of the site, as far as practicable from neighbouring noise sensitive receiver locations. No further action required.

4.3 Mechanical Equipment

Typically schools do not typically incorporate any significant external mechanical equipment (e.g. large chillers, cooling towers, etc.). If specific high noise equipment is proposed (e.g. commercial kitchen exhaust fans, dust collectors, etc.), a check of potential noise emissions may require further consideration. This will be reviewed in liaison with the project mechanical consultants during the following stages of this project.

We note that the use of small condensing units to each school building do not typically pose a concern, due to the distance to neighbouring properties, and limitation of use to daytime hours. Preliminary calculations have been undertaken based on standard side discharge condensing units located on each block. These calculations are indicating that compliance is likely to be achieved during day time hours, including any relevant penalties for characteristics of sound where applicable. Confirmation of this compliance will be undertaken during the following stages of this project once a detailed design and noise levels are provided.

4.4 Fire Pump

It is our understanding that fire pumps (if applicable to the development) are regularly tested for ongoing maintenance, to ensure smooth operation when needed during an emergency. This testing must therefore comply with the Regulations.

As this testing typically runs for less than 24 minutes during daytime hours, this is assessed against the less stringent L_{A1} criteria of the Regulations. Normally compliance is achieved with Class 1 fire pumps, combined with the pump room enclosure and a minimum distance of 30m to residential boundaries. The ventilation of the pump room itself should be located facing away from houses as far as practicable, and could potentially require further attenuation beyond weatherproof louvres if this is not possible.

During actual use of the fire pump during an emergency compliance is not required.

4.5 Generator

Generators like fire pumps described above also require regular testing for maintenance. As above, this testing is assessed against the less stringent L_{A1} criteria due to shorter run times. An acoustically housed unit within a dedicated plant room is normally possible for compliance during daytime hours, provided reasonable distances to neighbours.

Unlike fire pumps however, a generator could potentially be used during normal power outages, which would no longer be considered a “life safety device” and compliance with the Regulations would be required. Based on previous experience it is unlikely to be achieved without considerable attenuation of the generator enclosure, that may be beyond the scope and budget of the project.

If the generator can be ensured to only come on during bush fire emergencies then this could solve the compliance issues, however it is a significant concern if the generator has the potential of coming on during power outages i.e. an acoustically attenuated generator typically has a noise level of approximately 95 dB(A) (or 70 dB(A) at 7m), this would require a distance of approximately 220m from neighbours to comply during daytime hours.

Should a generator be required for this development, further discussions regarding compliance will need to be undertaken, however the client must be made aware of this potential issue going forward.

4.6 Bore Water Filtration Plant

It has recently come to light the potential for noise emissions from bore water filtration plant to be problematic (if one is required). Generally the issue arises from the requirement for these units to be running during the most stringent overnight period.

Given these units are typically located along the boundary of the site, should this system be required then an additional acoustic enclosure may be required. The exact nature of this enclosure is unknown until the radiated noise levels are confirmed, however this typically cannot be confirmed until the unit is installed and measurements can be taken. At this stage we would recommend a provisional sum is allowed for the construction of a brick or fibre cement clad shed with some internal acoustic lining and the required ventilation preferably facing away from residences.

4.7 School Sirens

The school sirens that are used to signal the beginning and ending of break times are deemed to be a 'mechanical device' as defined by the Environmental Protection (Noise) Regulations 1997 which means that technically the sirens are required to comply. However the reality is that school sirens will generally not comply with these noise regulations as their sole purpose is to be heard at distances.

Notwithstanding the above, things can be done to minimise the noise transmission to residences and therefore reduce the risk of complaint:

- Have more sirens/speakers spread around the school, rather than having one or two sirens in the centre of the school. Having more speakers will mean that the volume from each speaker can be significantly lower and therefore will reduce the overall noise emissions to neighbouring residences.
- Sirens should be localised to the specific play areas where possible.
- Selected sirens should have reduced annoying characteristics, and the length of time that the siren is played should be limited.
- Any sirens located near the boundary of the school should be directional in nature, facing back towards the school.

4.8 Vehicle Movements

It should be noted that the parking area available for the school site is typically open to the public. It is therefore our understanding that the main trafficable areas are considered 'road'. In accordance with clause 3 of the EPNR:

1) Nothing in these regulations applies to the following noise emissions-

a) noise emissions from the propulsion and braking systems of motor vehicles operating on a road;

Therefore propulsion and braking noise associated with vehicle movements has not been assessed.

5. ENVIRONMENTAL NOISE INTRUSION

The noise intrusion from the surrounding environment must be considered as a part of the proposed development. Based on a desktop assessment of the surrounding site, there does not appear to be any major roads or other potential noise intrusion sources (e.g. airports) requiring a Regulatory noise intrusion assessment.

Typical architectural detailing is therefore likely adequate to accommodate noise intrusion to meet AS2107 internal noise levels.

6. BUILDING CODE REQUIREMENTS

There are no specific BCA requirements for this building classification and is therefore not applicable to this project.

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7. CONCLUSION

This report summarises the project requirements in terms of compliance with the Environmental Protection (Noise) Regulations, 1997. This includes determination of the relevant site specific Assigned Noise Level criteria. A description of each noise source and applicable noise level criteria where relevant has been provided, including acknowledgment of relevant adjustments required for noise sources with particular characteristics.

A comprehensive acoustic evaluation will be conducted in the next phase of this project to verify compliance. At this preliminary stage, we anticipate no major issues with adhering to Environmental Regulations.

If you have any queries regarding this information please call the undersigned on 9474 5966.

Regards,

Michael Ferguson
Associate Director *B.IntArch(Hons) M.A.A.S.*



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HERITAGE IMPACT STATEMENT

Parkerville Children and Youth Care Inc

Formerly: PARKERVILLE CHILDREN"S HOME

PROPOSED PARKERVILLE CARE SCHOOL DEVELOPMENT

Padbury Cottage	proposed Years 7 & 8
Workshop (Kitchen/Dining)	proposed Art Room
Workshop (Laundry)	proposed Manual Arts
St Gabriels Cottage	proposed Years 9 & 10
Rosemary Cottage	proposed Administration
Blue Cottage	proposed demolition – structurally unsound.
Wattle Cottage	proposed Year 11
George Turner Cottage	proposed Home Economics
Kindergarten	proposed Year 12
Worthington Hall	proposed Shelter Building, Dining and Assembly
Carniya	no new works proposed – CMS maintenance only
Wearne Building	no new works proposed – CMS maintenance only

Parkerville Children and Youth Care Inc

Address	Roland Road, Parkerville
Date	16 October 2024
Prepared by	Heritage Intelligence (WA)
Prepared for:	McCorkell Constructions WA
Owner:	Parkerville Children and Youth Care Inc.
Heritage Listings	Department of Planning, Heritage & Lands**:** InHerit database No: 8546
	Heritage Council of WA's Register of Heritage Places: Permanent 2000
	Shire of Mundaring: Local Heritage Inventory.
Heritage reports	Conservation Plan: Heritage Intelligence (WA), 1999.
	Conservation Management Strategy: Heritage Intelligence (WA), 2022.
Statement of Significance	per Register of Heritage Places documentation
	Parkerville Children's Home & Cemetery, comprising Padbury Centre, Workshop (former kitchen), Trade Workshop (former laundry), St Gabriel's Cottage, Chapel, Wearne Centre (former school), Rosemary Cottage, Blue Cottage (former office), George Turner Cottage, Wattle Cottage, Kindergarten, Worthington Hall and Director's residence, which were constructed and developed over many years since 1903 and designed in response to developing functional requirements, located within a parkland setting and an associated cemetery, has cultural heritage significance for the following reasons:

since its establishment in 1903, the place has been the principle agency for the care of children in the Perth Diocese;

the place was the first residential child care facility in Western Australia to break from institutionalisation and introduce the 'cottage' system of care for orphans and needy children;

the place was established in 1903 by the Community of the Sisters of the Church, and has been supported from that time by philanthropists including Walter Padbury, and other Perth identities, organisations and individuals associated with the Anglican Church;

the place is important for its associations with Sister Kate, one of the founders of the home and later founder of Sister Kate's Children's Home in Queens Park (Manguri) based on the same lines of the Parkerville home;

the place is significant to the children of the Parkerville Children's Home who have been associated with the place since its establishment in 1903 and for whom it played an important role in their lives;

the place forms a significant cultural environment in a natural setting, exhibiting the aesthetic of the philosophy of care of Parkerville Children's Home and a characteristic highly valued by those associated with the place;

as the focus of spiritual life at Parkerville Children's Home the Chapel of St Michael and All Angels has been, and continues to be, a place of worship, commemoration and celebration;

the Cemetery is significant to those children who have been associated with the Parkerville Children's Home and, in particular, as a memorial to those children who died while at the home; and,

the site of St Nicholas Cottage has the potential to yield, through archaeological excavation, further information about the early years of the place's establishment.

Thirteen built places were assessed on the site. Another four built places within the precinct, namely Narbethong (1975), Uralla (1975), Waminda (1976) and Baroonga (1976), demonstrate the continuing ethos.

Context

Parkerville Children and Youth Care's precinct is located on Roland Road in Parkerville. It comprises buildings associated with the foundations of Parkerville Children's Home on the site, and the ongoing development since that time.

As noted in the Statement of Significance, there are thirteen places associated with the early development of the former Parkerville Children's Home, and four more care facilities that were constructed in the 1970s. The buildings relative to the proposal are as follows;

Padbury Cottage
Workshop (Kitchen/Dining)
Workshop (Laundry)
St Gabriels Cottage
Rosemary Cottage
Blue Cottage

Wattle Cottage
George Turner Cottage
Kindergarten (former)
Worthington Hall
Carinya
Wearne House

Parkerville Children and Youth Care supports vulnerable children, young people, and their families with specialist advocacy, therapeutic services, education and training, and out of home care. It develops innovative and culturally safe services in partnership with government and other not-for-profit organisations.

Parkerville Children and Youth Care was the first Child Safe accredited organisation in Western Australia and have continued to build that reputation for compassionate and progressive evidence-based services. That accreditation upholds the commitment to the wellbeing of children and young people by putting their best interest first.

The provision of services for the care and safe services for children and youth require appropriate compliant facilities.

The former Parkerville Children's Home precinct covers an expansive site with undulating topography. The site is mostly cleared with a range of native trees evident within the precinct and adjoining the site with native forest.

Many of the early buildings on site have been occupied, over recent decades, although only Rosemary Cottage is occupied, and the Trade Workshop (former kitchen and dining) used occasionally for trades training.

Future conservation works recommendations are detailed in the Conservation Management Strategy 2022. Three buildings were identified as at risk, due to deteriorated fabric that render them uninhabitable, however two of those are now proposed for retention and restoration for adaptive re-use.

The buildings are within the Registered site and each has a range of elements of significance that require consideration of the impact of the proposed development.

There are considerable issues that are relevant to every building; roof cladding, roof drainage and ground level drainage, the installation of partitions and interventions associated with the function and development of the long standing care facility.

Reference to the Conservation Management Strategy 2022 provides evidence and recommendations for each place under the relevant appendices. The elements of significance for each place are detailed hereunder;

CMS Appendix 4 Padbury Cottage

Elements of primary significance

- The original form, fabric, scale and layout (1906)
- Roof geometry & chimneys
- External face brick walls (1906)
- Front door set
- Interior and exterior doors (1904) and windows.
- Interior timber floors
- Curved coved ceilings and ceiling details in east and west rooms (1906)
- Fireplaces (east and west rooms)
- Kitchen fireplace and pressed metal raked ceiling lining

Elements of secondary significance

- Corrugated metal roof cladding

Elements of little or no significance

- North veranda addition

Elements that are intrusive to the significance

- Brick paved front veranda

CMS Appendix 5 Workshop (Kitchen/dining)

The building is in poor condition but retains a high degree of authenticity.

Elements of primary significance

- The original form, scale and layout (1908)
- Roof geometry & chimney
- External face brick walls
- Coved ceilings – battened flat sheets.
- Skylight in west room
- Windows and doors (1908)
- Timber floors
- Fireplaces

Elements of secondary significance

- Roof cladding
- Porch on south side
- Steel framed addition along the north side

CMS Appendix 6 Workshop (Laundry)

Elements of primary significance

- The original form, scale and fabric (1908)
- Roof geometry (including ridge vent)
- External face brick walls
- Windows and doors (1908)

Elements of secondary significance

- Roof cladding
- Timber framed and clad addition on the north

CMS Appendix 7 St Gabriel's Cottage

Elements of primary significance

- The original form, scale and layout (1909)
- Roof geometry & chimneys
- Limestone foundation
- External face brick walls (1909)
- Verandas- timber floors, balustrades, valances. (1999)
- Windows and doors (1909)
- Timber floors (1909)
- Fireplaces 1909)
- Coved ripple iron ceiling, hexagonal vent and timber cornice (1909)
- Bachelor, and other windows (1909)

Elements of secondary significance

- Corrugated roof cladding

Elements of little or no significance

- 1999 reconstructed verandas.

CMS Appendix 8 Wearne Centre

Not included in the proposed development

CMS Appendix 9 Rosemary Cottage

Elements of primary significance

- The original form, scale and layout (1920- masonry and 1920s timber builds)
- Roof geometry & chimneys
- External face brick walls (1920)
- Timber construction and weatherboard cladding (1920s)
- Windows and doors (1920 and 1920s)
- Interior timber floors
- Fireplaces
- Ceiling (1920)

Elements of secondary significance

- Roof cladding

Elements of little or no significance

- Verandas- structure, timber floors, balustrades.
- Ceilings (not original)

CMS Appendix 10 Blue Cottage

Extensive termite damage has impacted the opportunity to restore the building.

Blue Cottage (former office) evidences extensive termite damage to the structure and fabric, and is considered irredeemable.

Elements of primary significance

- The original form, scale and layout (1923)
- Roof geometry, clay tiles & chimney
- Timber frame, weatherboard cladding and timber floors
- Fireplaces

Elements of secondary significance

- Front veranda

Elements of little or no significance

- Skillion addition at the rear
- Freestanding toilet

CMS Appendix 11 Wattle Cottage

Wattle Cottage has been in a derelict state for decades and until recently, was earmarked for demolition.

A close inspection was not possible.

There are damaged and deteriorated external elements.

No specific structural assessment has been undertaken by an Engineer.

Elements of primary significance

- The original form, scale and layout (1930)
- Roof geometry & chimneys
- External weatherboard walls (1930)

- Veranda south (1930)
- Windows and doors (1930)
- Interior fabric and fittings (not viewed) (1930)

Elements of secondary significance

- North veranda
- Corrugated iron roof cladding

Elements of little or no significance

- Ablution additions (1953, 1963) at northwest and southwest corners.

CMS Appendix 12 George Turner Cottage

Elements of primary significance

- The original form, scale and layout (1929)
- Gabled bay window feature
- Roof geometry & chimney
- Timber frame, weatherboard cladding and timber floors
- Interior dado walls
- Fireplaces

Elements of secondary significance

- Veranda enclosures (1954)
- Ceilings
- Elements of little or no significance
- Metal deck roof cladding

CMS Appendix 13 Kindergarten (former)

The former kindergarten has been in a derelict state for decades, it is on the outskirt of the precinct, with no active or passive surveillance and, until recently, was earmarked for demolition.

No specific structural assessment has been undertaken by an Engineer.

A close inspection was not possible.

There are damaged external elements.

Elements of primary significance

- The original form, scale and layout (c.1904, c.1913)
- Roof cladding – short sheets corrugated iron
- Roof geometry & chimney
- Timber structure
- External weatherboard walls
- Interior timber dados, walls above dado and ceilings
- Enclosed verandas-north south (1913, c.1932)
- Windows and doors (c.1913, c.1932)
- Timber floors (interiors and verandas)
- Fireplace, stove
- Timber detailing, fixtures, fittings (c.1913, c.1932)

Elements of secondary significance

- The original form and layout (c.1932 addition to west end of south side. (c.1913)

- 1950's Asbestos additions (relevant due to making the place viable with the ablution facilities)

Elements of little or no significance

- Ceilings (not original)

Elements that are intrusive to the significance

- 1950's Asbestos additions
- Termite damaged and deteriorated elements of the ruinous north veranda

CMS Appendix 14 Worthington Hall

Elements of primary significance

- The original form, fabric, scale and layout (1941)
- Roof geometry & chimneys
- External face brick walls
- The main entry porch and stairs (1941)
- Windows and doors (1941)
- Timber floors and stage
- Servery windows

Elements of secondary significance

- Roof cladding
- Original insitu elements (ovens, cool room)

Elements of little or no significance

- Fireplace in the hall
- Ceilings (not original)
- Partition in the hall
- 1959 addition (due to dampness

CMS Appendix 15 Director's residence (former)

No proposed development – maintenance only

CMS Appendix 16 St Michael & All Angel's Chapel

No proposed development – maintenance only

The proposal

The proposal is to establish a Care School that will encompass the majority of the site and occupy most of the buildings on the site: summarised as follows;

Padbury Cottage – proposed Years 7 & 8.

Workshop (Kitchen/Dining) – proposed Art Room.

Workshop (Laundry) – proposed Manual Arts

St Gabriels Cottage – proposed Years 9 & 10.

Rosemary Cottage – proposed Administration.

Blue Cottage – proposed demolition – structurally unsound.

Wattle Cottage – proposed Year 11.

George Turner Cottage – proposed Home Economics.

Kindergarten – proposed Year 12.

Worthington Hall – proposed Shelter Building, Dining and Assembly.

Carniya - no new works proposed – CMS maintenance only.

Wearne Building – no new works proposed – CMS maintenance only.

Chapel –CMS 2021- not referenced in this report

The relative buildings will be retained and restored with alterations for the functions and requirements for safety, surveillance throughout the site and within the buildings, universal access, and updated and new legislative compliance.

The conservation works recommendations in the 2022 Conservation Management Strategy (CMS) will provide guidance regarding the significance of each place and the elements, and the relevant conservation works priorities.

One of the primary issues is compliance relative to the Bushfire requirements. *State Planning Policy (SPP) 3.7: Planning in Bushfire Areas,* outlines the requirements for development.

Although restoration/development of a single building does not require an Asset Protection Zone (APZ), given the site location and extent of the development comprising a number of buildings for the proposed Care School, an APZ is required for each building to achieve a Bushfire Attack Level (BAL) 19.

The proposed development will provide a comprehensive approach to:

- the site
- landscape
- site drainage
- retaining trees and plantings whilst providing surveillance across the site
- vehicular and pedestrian access over the entire site, including the primary entry access off Roland Road.

Buildings

The buildings present various levels of condition, interventions, occupation and deterioration. The proposed repurposing of the buildings responds appropriately to the overarching care function that is the core of Parkerville Children and Youth Care Inc;

Retention of original fabric where possible, and minimal intervention to that fabric.

The restoration of BAL 19 rated buildings (Rosemary Cottage, St, Gabriels Cottage, Padbury Cottage, Wattle Cottage, Kindergarten, Workshop (Kitchen), Workshop (Laundry) & George Turner Cottage, presents specific outcomes for windows.

The proposed development includes the following works to each of the buildings as well as specific requirements under “individual buildings”. Worthington Hall is of important note as it is the Shelter for the sit with a BAL29 rating.

- Inspect roof structures and reconstruct elements as required.
- Reroofing all the buildings with sarking and corrugated zincalume or light grey colorbond to replicate cgi.
- Removal of irretrievable damaged and deteriorated fabric.
- Installation of reverse cycle air-conditioners located under verandas where possible or in unobtrusive locations.
- Screening the under-veranda areas for BAL19 ratings, safety, and concealing airconditioners.
- Replacement of damaged timber weatherboards of bushfire resistant timber weatherboards per AS 3959.
- Restoration and replacement of timber decking and balustrades; jarrah timber is compliant with BAL 19. rating. Tightly space or seal timber decking.
- External windows:
    - Non-combustible material or timber with a density ≥650kg/m³. Existing buildings, being jarrah, are considered suitable for compliance.
    - Toughened glass (minimum 5mm thick) to all external windows.
    - Screens with corrosion-resistant mesh are only for full height windows. with openings are noted, although more suitable preference is to install a fire shutter/curtain.
    - Seals to restrict ember ingress for the protection of windows below 400mm.
- Doors:
    - External doors of non-combustible or solid timber ≥35 mm thick. The existing jarrah is compliant.
    - Weather strips at base to prevent ember entry.
- Universal access toilet facilities in most buildings; some freestanding construction. Drainage- roof, ground and site
- Compliance

  Many issues including compliance will be relative to all the buildings:

    - Fireproofing the BAL19 buildings except: BAL 29 building (Worthington Hall) fireproof screens to all windows.
    - Seal the windows
    - Insulating the buildings
    - Electrical
    - Plumbing•

Individual buildings;

PADBURY COTTAGE- proposed Years 7 & 8

EIW Architects: Drawing No. 2406- A03, A03d, SK03

Refer to CMS (2022) for detail conservation scopes of work.

CMS Appendix 4 Padbury Cottage

Retain and restore all original fabric

Reconstruct the veranda floors material and level to accommodate access into the building.

Veranda floor replacement fire retardant material or able to apply fire retardant to preferred timber.

Restore the front portico.

Insert surveillance openings in the rear walls of both main rooms.

Remove a partition wall on the rear veranda.

Refit the kitchen as an office- retain fireplace.

Interior ablution installation

WORKSHOP (KITCHEN/DINING) Proposed Art Studio

EIW Architects: Drawing No. 2406- A06, A06d, SK06

Refer to CMS (2022) for detail conservation scopes of work.

CMS Appendix 5 Workshop (kitchen/dining)

Extensive conservation works

Removal of interior wall between the two rooms. Retain nib walls

Retain and restore pressed metal ceilings where evident.

Opportunity to reveal the original elements of the wall (where plaster has been removed).

Reconstruct timber window and door framing as required.

New build addition (light weight construction) on the north side with minimal impact on the existing building.

WORKSHOP (LAUNDRY): Proposed Manual Arts

EIW Architects Drawing No. 2406- A07, A07d , SK07

Refer to CMS (2022) for detail conservation scopes of work.

CMS Appendix 6 Workshop (Laundry)

Restore as required.

ST GABRIEL'S COTTAGE: Proposed years 9 & 10

EIW Architects Drawing No. 2406- A02, A02d, SK02

Refer to CMS (2022) for detail conservation scopes of work.

CMS Appendix 7 St Gabriel's Cottage

Ensure structural stability of the veranda.

Reconstruct balustrade.

Restore veranda floors and face brick walls.

Install ablutions in the corner enclosures (2) on the veranda.

Reconstruct a partition within the main space.

ROSEMARY COTTAGE: Proposed Administration

EIW Architects Drawing No. 2406- A01, A01d, SK01

Refer to CMS (2022) for detail conservation scopes of work.

Appendix 9 Rosemary Cottage

Attention structural issue of veranda.

Veranda floor replacement fire retardant material or able to apply fire retardant to preferred timber.

Retain and restore weatherboard dado to veranda perimeter.

Install interior partitions.

Reconstruct a lightweight front access ramp.

Update ablution facilities.

BLUE COTTAGE: demolition

EIW Architects Drawing No. 2406- A10

Refer to CMS (2022) for detail conservation scopes of work.

CMS Appendix 10 Blue Cottage

Demolish due to structural inadequacy and irretrievable termite damage.

Consider retaining triple brick fireplace/chimney.

Retain and repurpose any salvageable timber.

Prepare an archival report.

Future interpretation of the site.

WATTLE COTTAGE: Proposed year 11

EIW Architects Drawing No. 2406- A04, A04d, SK04

Refer to CMS (2022) for detail conservation scopes of work.

Appendix 11 Wattle Cottage

Remove extraneous and damaged elements.

Restore remaining original fabric.

Remove 4 interior walls or part of.

Install ablutions in the corner enclosures (2) on the veranda.

Reconstruct verandas.

GEORGE TURNER COTTAGE: Proposed Home Economics

EIW Architects Drawing No. 2406- A08, A08d, SK08

Refer to CMS (2022) for detail conservation scopes of work.

CMS Appendix 12 George Turner Cottage

Remove existing ablutions.

Attention structural issue of veranda.

Reconstruct veranda to suit in location of the ablutions (to be demolished).

Veranda floor replacement fire retardant material or able to apply fire retardant to preferred timber.

Retain and restore weatherboard dado to veranda perimeter.

Remove louvred windows on the perimeter of the veranda.

Remove interior partitions (non-original).

Construct lightweight (minimal visual and site impact) access ramps to the front and side entries.

KINDERGARTEN (FORMER): Proposed year 12

EIW Architects Drawing No. 2406- A05, A05d, SK05

Refer to CMS (2022) for detail conservation scopes of work.

CMS Appendix 13 Kindergarten (former)

Reconstruct verandas with fire retardant material or able to apply fire retardant to preferred timber.

Remove extraneous and damaged elements and veranda enclosures.

Restore remaining original fabric.

Reconfigure the floorplan.

Install ablutions.

WORTHINGTON HALL – Proposed Shelter- Assembly Hall

EIW Architects Drawing No. 2406- A09, A09d, SK09

Refer to CMS (2022) for detail conservation scopes of work.

Appendix 14 Worthington Hall

Worthington Hall is the nominated 'Shelter' Building and apportioned BAL29 to incorporate the standard for community refuges and the pending Class 9b Performance Solutions.

Windows

- Must comply with BAL 19 requirements.
- Toughened glass (minimum 5mm thick).
- Frames - non-combustible material or hardwood timber ≥650 kg/m³ density: Jarrah frames with laminated glass and the bushfire shutters.

Replace all external timber doors and frames with bush fire resistant timber to match.

Install screen doors and window shutters with corrosion-resistant mesh.

Non-combustible materials are mandatory.

Contain mechanical systems within the roof space for the 'tenable area' and supplied from an external plant enclosure.

Retain maximum original fabric.

Remove addition at south end.

Restore/reconstruct front porch.

Remove partition (not original) in the main hall

Remove ceilings (not original) in the main hall.

Remove fireplace (not original).

Retain ovens in the kitchen.

Remove the coolroom and extraneous fabric from the south wing- adjoining the kitchen-retain

the storeroom on the east side.

Install ablution facilities in the south wing.

CARINYA (FORMER DIRECTORS RESIDENCE); No proposed development: maintenance only

EIW Architects Drawing No. 2406- A12

Refer to CMS (2022) for detail conservation scopes of work.

Appendix 15 Carinya (former Directors Residence)

WEARNE HOUSE; No proposed development: maintenance only

EIW Architects Drawing No. 2406- A13

Refer to CMS (2022) for detail conservation scopes of work.

Appendix 8 Wearne House

Aspects of the proposal that respond to the heritage significance of Parkerville Children's Home (former).

The proposed Care School that will re-purpose the former Parkerville Children's Home, more recently known as Parkerville Children and Youth Care Inc, is a development that retains the high level of integrity of the place, responding to the high level of cultural heritage significance of the place that has provided care to children for over 120 years.

There could not be a more appropriate function for this site, that has been under-utilised for several decades, contributing to the deterioration of some original fabric, but retained the buildings, the historic ambience and the spiritual heart of the place.

The Fire risk in the bushland of the hills area of Parkerville is very real and the BAL ratings indicates as such. Consequently there will be more impact to the buildings than would otherwise be required. However that impact is minimised by the conservation intentions and considered interventions to re-purpose and revive the building on the site.

The expansive undulating site will retain it's bushland character through considered landscape design to provide surveillance throughout, with gathering and recreation spaces, whilst retaining the ambience of the place.

The proposed Care School is an exceptional opportunity to retain and the high level of integrity and authenticity of this place and the buildings that represent its significant history, to be conserved for the future.

The response to the cultural heritage significance of the place is a well-considered outcome that contributes to retaining the exceptional significance and importantly retains the ongoing foundation function of caring for children, at the former Parkerville Children's Home.

Aspects of the proposal that could have a detrimental impact on the heritage significance of the Parkerville Children's Home (former).

The proposed demolition of the Blue Cottage, due to the extensive termite damage to the timber and weatherboard clad building and the consequent structural inadequacy is unfortunate. Demolition of any heritage place obviously impacts its heritage significance however diminished that may be. However, the degree of intervention to not only retain and provide fire risk, but to conserve and facilitate viable functions relevant to the standard of care required for the proposed Care School undertaken by Parkerville Children and Youth Care, would impact the viability of the place.

Although every place within the proposed Care School will require new roofs and interventions for the fire protection and alterations to accommodate the proposed function, in the context of the high-level care facility, high level fire risk, and the retention and conservation of all but one building on the site, any detrimental impact is more than compensated by retention and enhancement of the cultural heritage significance consideration of the proposal.

The proposed vehicular access to and within the site is essentially an upgrade of existing tracks, except for a track and carpark across the top of the Chapel, that may potentially impact drainage issues associated with the Chapel.

Alternative solutions that have been considered and why they have been discounted

The proposal has been developed by an extensive team of professionals who collaborated with due consideration of the options for the high-quality outcome that accounts for the safety of the site, the users of the function, and conservation of the buildings, all providing a well-considered proposal that retains and enhances the exceptional cultural heritage significance of the place for the present and the future.

Conclusion about the nature and extent of the heritage impact of the proposal.

The proposed Care School on the site of the original Parkerville Children's Home that has provided care for children for over 120 years is entirely appropriate, responding to challenges of fire risk, deteriorated buildings, site drainage and formation, and the diligence of considering the primary function of the Care School, and the most appropriate influences for the Care School participants.

Retaining and enhancing the integrity of the place is an outstanding outcome, despite impact on the buildings to accommodate those functions. Although, all of the buildings evidence interventions to facilitate requirements at different times, and improvements have been previously been undertaken including reroofing all the buildings and establishing Rosemary Cottage and St Gabriel's Cottage upgrades. The proposed interventions reference the recommendations in the Conservation Management Strategy (2022) identifying the levels of significance of each place and its elements to ensure appropriate responses to the significance of the place with due regard to the compliance issues that present considerable challenges.

The proposed Care School makes a considerable positive impact on the exceptional cultural heritage significance of the former Parkerville Children's Home, providing high level integrity, retaining authenticity and conserving the place for the future.

Recommendation

It is requested that due consideration be given to support the proposed development of Parkerville Care School at the former Parkerville Children's Home now known as Parkerville Children and Youth Care Inc. Despite interventions to the site and the buildings over the past 120 years, and further interventions and improvement relative to the proposal, the regulatory compliance issues are critical for the safety of the occupants and retention of the significant heritage places that comprise the exceptional cultural heritage significance of the former Parkerville Children's Home site.

References

EIW Architects: Job No. 2406, October 2024

Site plan Base 1- Dwg No. SK_1 Rev: P2

Site plan- Masterplan survey Dwg No. SK_1 Rev: P2

Rosemary Cottage	Dwg No.A.01
St Gabriels Cottage	Dwg No.A.02
Padbury Cottage	Dwg No.A.03
Wattle Cottage	Dwg No.A.04
Kindergarten	Dwg No.A.05
Workshop	Dwg No.A.06
Workshop (laundry)	Dwg No.A.07
George Turner Cottage	Dwg No.A.08
Worthington Hall	Dwg No.A.09
Blue Cottage	Dwg No.A.10

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Heritage intelligence (WA). Conservation Management Strategy (CMS) 2022:

Appendix 4	Padbury Cottage
Appendix 5	Workshop (Kitchen/dining)
Appendix 6	Workshop (Laundry)
Appendix 7	St Gabriel's Cottage
Appendix 8	Wearne Centre
Appendix 9	Rosemary Cottage
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Appendix 12	George Turner Cottage
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Appendix 15	Director's residence (former)
Appendix 16	CMS 2021: St Michael & All Angel's Chapel

CONSERVATION MANAGEMENT STRATEGY

Principle document

Refer to appendices for photographic records, levels of significance, and building condition report and conservation works recommendations specific to each relevant building at Parkerville.

Appendix 4	Padbury Cottage
Appendix 5	Workshop (Kitchen/dining)
Appendix 6	Workshop (Laundry)
Appendix 7	St Gabriel's Cottage
Appendix 8	Wearne Centre
Appendix 9	Rosemary Cottage
Appendix 10	Blue Cottage
Appendix 11	Wattle Cottage
Appendix 12	George Turner Cottage
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Appendix 14	Worthington Hall
Appendix 15	Director's residence (fmr)
Appendix 16	CMS 2021: St Michael & All Angel's Chapel

Parkerville Children and Youth Care Inc.

PARKERVILLE



HERITAGE INTELLIGENCE (WA)
Laura Gray
Heritage & Conservation Consultant

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1.0 INTRODUCTION

Parkerville Children and Youth Care's precinct is located in Beacon Road Parkerville. It comprises many buildings associated with the foundations of Parkerville Children's Home on the site, and the ongoing development since that time.

This report references specific buildings of heritage recognition that were associated with the early and subsequent development up to, and including, post World War Two. Four more recent buildings beyond that period are not included in this report.

A Conservation Management Strategy for St Michael and All Angels Chapel was undertaken in 2021. Refer to Appendix 14.

A Conservation Management Strategy is a prerequisite for an understanding of the place prior to any conservation works or future planning of the site.

The preparation of this document has been assisted by a grant through the Heritage Council of Western Australia's 2020-21 Heritage Grants Program

1.1 Details of the brief

The Parkerville Children and Youth Care's precinct is owned by Parkerville Children and Youth Care Inc who commissioned the Conservation Management Strategy to facilitate the future conservation of the heritage buildings at Parkerville.

The Conservation Management Strategy is undertaken within the guidelines of the Heritage Council's brief and in accordance with the Burra Charter (Appendix 1).

The aim of the Conservation Management Strategy is to retain the cultural significance of the place within the future conservation.

1.2 Heritage listings

The Department of Planning Lands and Heritage's (DLPH) inHerit database records all places of heritage significance throughout the state, compiled from local governments' heritage inventories.

The Register of Heritage Places encompasses places of the highest level of significance to the State. Parkerville Children's' Home and cemetery is included on the Register. Refer to Appendix 2 for Registration assessment statement.

inHerit database No. 8546	
Register of Heritage Places	2000
Shire of Mundaring Local Heritage Survey	1997

1.3 Statement of Significance

The Statement of Significance, extract from Registration document is as follows;

> *Parkerville Children's Home & Cemetery, comprising Padbury Centre, Workshop (former kitchen), Trade Workshop (former laundry), St Gabriel's Cottage, Chapel, Wearne Centre (former school), Rosemary Cottage, Blue Cottage (former office), George Turner Cottage, Wattle Cottage, Kindergarten, Worthington Hall and Director's residence, which were constructed and developed over many years since 1903 and designed in response to*

developing functional requirements, located within a parkland setting and an associated cemetery, has cultural heritage significance for the following reasons:

since its establishment in 1903, the place has been the principle agency for the care of children in the Perth Diocese;

the place was the first residential child care facility in Western Australia to break from institutionalisation and introduce the 'cottage' system of care for orphans and needy children;

the place was established in 1903 by the Community of the Sisters of the Church, and has been supported from that time by philanthropists including Walter Padbury, and other Perth identities, organisations and individuals associated with the Anglican Church;

the place is important for its associations with Sister Kate, one of the founders of the home and later founder of Sister Kate's Children's Home in Queens Park (Manguri) based on the same lines of the Parkerville home;

the place is significant to the children of the Parkerville Children's Home who have been associated with the place since its establishment in 1903 and for whom it played an important role in their lives;

the place forms a significant cultural environment in a natural setting, exhibiting the aesthetic of the philosophy of care of Parkerville Children's Home and a characteristic highly valued by those associated with the place;

as the focus of spiritual life at Parkerville Children's Home the Chapel of St Michael and All Angels has been, and continues to be, a place of worship, commemoration and celebration;

the Cemetery is significant to those children who have been associated with the Parkerville Children's Home and, in particular, as a memorial to those children who died while at the home; and,

the site of St Nicholas Cottage has the potential to yield, through archaeological excavation, further information about the early years of the place's establishment.

Thirteen built places were assessed on the site. Another four built places within the precinct, namely Narbethong (1975), Uralla (1975), Waminda (1976) and Baroonga (1976), demonstrate the continuing ethos of the place but are considered to be of little heritage significance.

1.4 Implications of Register of Heritage Places

By virtue of the *Heritage Act (1990)*, the owner is bound to conserve the place.

A Memorial is lodged on the Certificate of Title of the Registered place under the provisions of the *Heritage Act (1990).*

All development (including demolition) must be referred to DPLH for consideration PRIOR to undertaking any works.

The development application needs to be submitted to DPLH for approval for any proposed development, and Shire of Mundaring cannot approve contrary to DPLH recommendations.

It is recommended that a Heritage Impact Statement be prepared to support any Development Applications when submitted to DPLH. It serves to summarise the perceived and/or real impact, positive and/or negative, of the proposed development on the heritage significance of the place.

1.5 Site Details

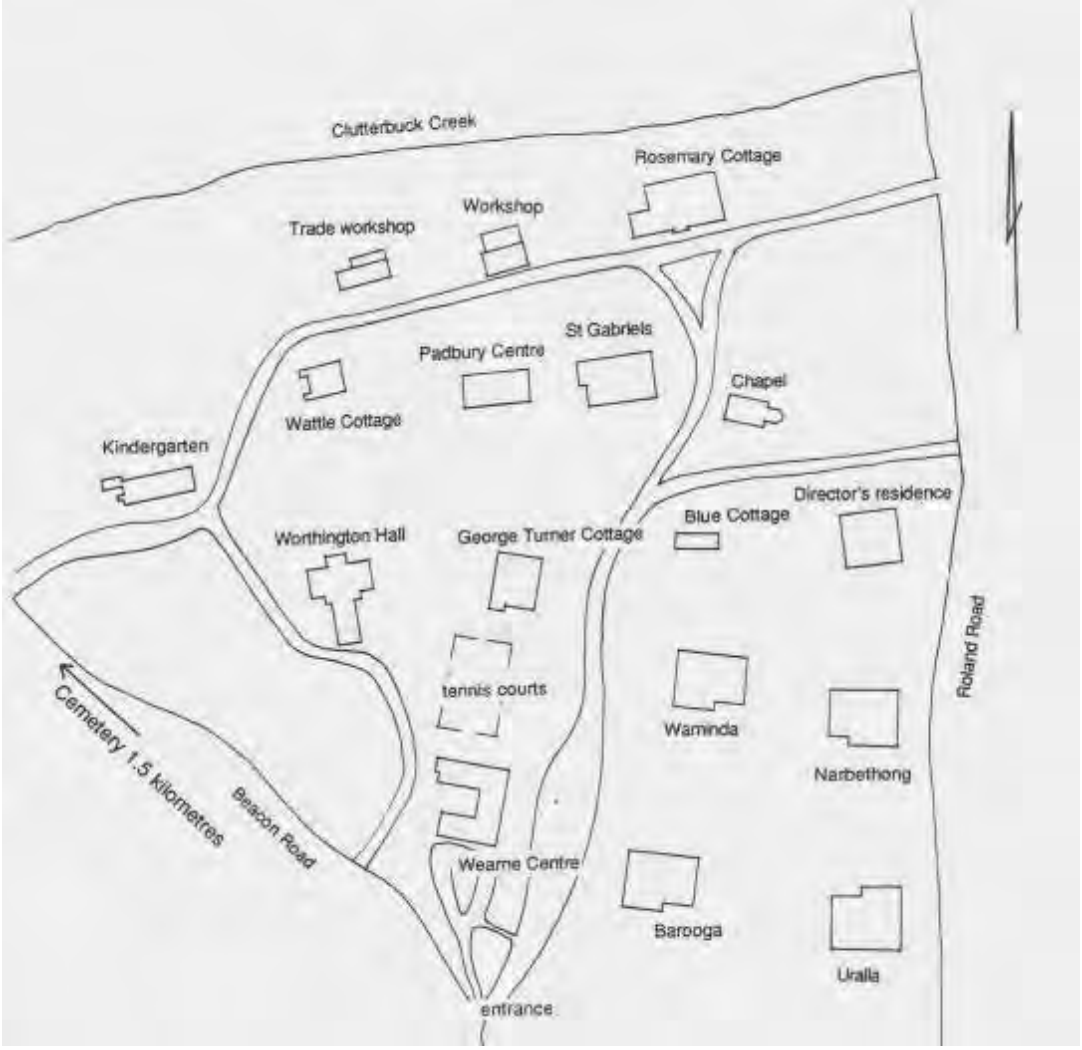


Figure 1. Plan extract from Conservation Plan 1999 (L.Gray).

1.6 Authorship

The Conservation Management Strategy was written by Laura Gray (Bachelor of Architecture (Hons), Graduate Diploma in Applied Heritage Studies) Heritage and Conservation Consultant, registered as Heritage Intelligence (WA).

2.0 THE PLACE

The documentary evidence and physical descriptions of each of the places are detailed in the Conservation Plan (1999). Appendix 3. Reference to the Conservation Plan also provides a comparative with regard to the changes over the past 20 years.

The current physical record of each place is included in the relevant Appendix for each place, that includes the assessed levels of significance, photographs, condition report and conservation works recommendations, specific to each place.

Appendix 4	Padbury Cottage
Appendix 5	Workshop (Kitchen/dining)
Appendix 6	Workshop (Laundry)
Appendix 7	St Gabriel's Cottage
Appendix 8	Wearne Centre
Appendix 9	Rosemary Cottage
Appendix 10	Blue Cottage
Appendix 11	Wattle Cottage
Appendix 12	George Turner Cottage
Appendix 13	Kindergarten (fmr)
Appendix 14	Worthington Hall
Appendix 15	Director's residence (fmr)

As afore mentioned, a Conservation Management Strategy was undertaken for St Michael and All Angels Chapel in 2021. Refer to Appendix 16.

3.0 LEVELS OF SIGNIFICANCE

Each place is graded to identify levels of significance. The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

The relevant Appendix for each place references their gradings.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

Primary significance

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

Secondary significance

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

Little or no significance

These elements neither contribute to, nor detract from, the significance of the place.

Intrusive

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

4.0 CONSERVATION POLICY

A Conservation Policy is developed in response to the assessment of cultural heritage significance of the place, as identified in the Statement of Significance and the levels of significance that are specific to that place.

The purpose of the Conservation Policy is to establish a framework within which the cultural significance of the place can be retained, respected, and protected. The conservation policy outlines an appropriate framework for decision-making and recommends a logical sequence of works to facilitate the short term and long-term conservation of the place.

The Conservation Policy is warranted, and its implementation is imperative to ensure that the place is properly conserved for present and future generations. It is very important that on-going appropriate and viable functions are established and retained in the long-term.

Refer to Appendix 3 Refer to Conservation Plan 1999

Generally, the policy recommends that places within the Parkerville Children and Youth Care's precinct be retained and conserved.

Key policy statements

Policy 1.1 The Conservation Management Strategy is understood, accepted, and implemented by the owners, managers, and occupants.

Policy 1.2 The Conservation Management Strategy is referred to and implemented as a guide to future conservation and development of the place.

Policy 1.3 Any maintenance, conservation works, interpretation, or development interventions should be undertaken in accordance with the principles and guidelines of Australia ICOMOS's Burra Charter, and in compliance with all heritage and statutory bodies.

Policy 1.4 The establishment of appropriate and preferred uses be monitored and managed to ensure the ongoing viability of the place.

Policy 1.5 Undertake conservation works as detailed in the relevant Appendices for each place within the Parkerville Children and Youth Care's precinct.

Policy 1.6 Evaluate all future development proposals against the Statements of Significance. Consult with Conservation professionals for advice through planning process and the Heritage Council (DPLH) for approval of proposed works. The governing controls should always be guided by:-

- The conservation of the surviving original fabric
- The ensure that change will not jeopardise the original fabric.
- The proper briefing of intending users to ensure that a general understanding of the cultural significance of the place is accepted as a condition of use.

Policy 1.7 Future policy decisions should be guided by conservation principles relevant and in force at the time. Should there be no policy in place for a particular

situation, the matter should be referred to the DPLH for assistance to resolve the matter.

Policy 1.8 To assist in defining and resolving any development issues, persons responsible for the implementation of the Conservation Management Strategy, should acquire some skills and experience in cultural heritage resource management, in order to recognise issues that might require advice and call in at the proper time, appropriate professional guidance or to facilitate resolving issues not foreseen in the Conservation Management Strategy.

5.0 APPENDICES

Appendix 1	Burra Charter
Appendix 2	Parkerville: Heritage Council Register statement
Appendix 3	Conservation Plan 1999
Appendix 4	Padbury Cottage
Appendix 5	Workshop (Kitchen/dining)
Appendix 6	Workshop (Laundry)
Appendix 7	St Gabriel's Cottage
Appendix 8	Wearne Centre
Appendix 9	Rosemary Cottage
Appendix 10	Blue Cottage
Appendix 11	Wattle Cottage
Appendix 12	George Turner Cottage
Appendix 13	Kindergarten (fmr)
Appendix 14	Worthington Hall
Appendix 15	Director's residence (fmr)
Appendix 16	CMS 2021 St Michael & All Angel's Chapel

APPENDIX 4

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

PADBURY COTTAGE



5.1 PHOTOGRAPHIC RECORD	Page 2
5.2 LEVELS OF SIGNIFICANCE	Page 18
5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS	Page 21
5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN	Page 26
5.5 MAINTENANCE SCHEDULE	Page 27

5.1 PHOTOGRAPHIC RECORD





View to the northwest showing the south frontage (left), and view to southwest showing the rear with stairs access to the veranda.





View to the northwest showing the south front (left) and east end, and veranda detail showing timber to the east side and brick paving to the centre south veranda.





Views of the stairs accessing the northwest corner.





Views of the stairs accessing the northwest corner of the north veranda.




Views of the north veranda.




Views of the timber subfloor structure of the veranda and the random stone foundation of the main building.





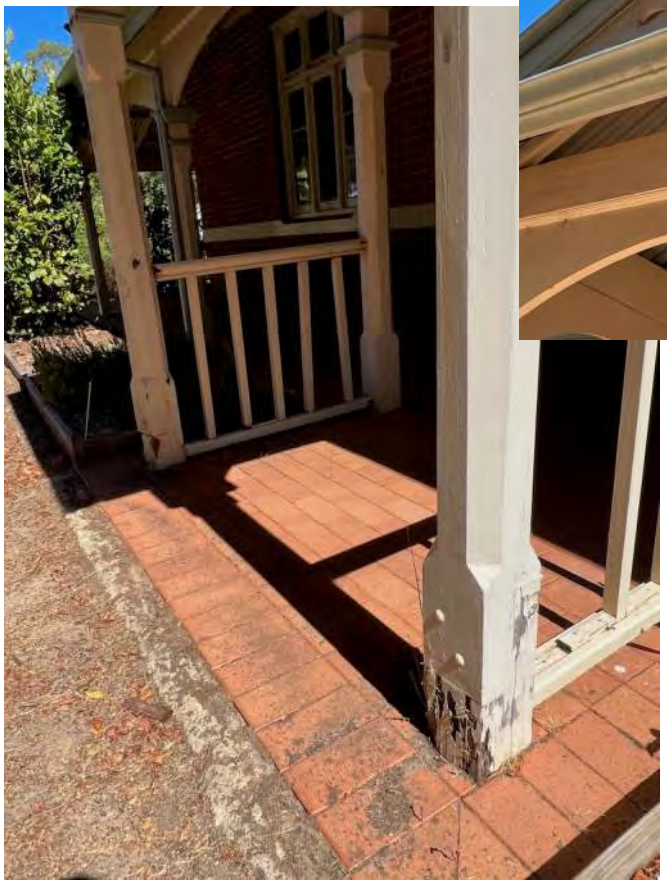
Detail of the west chimney, and view of the northwest corner.





The west wall- painted brick, and front (south view).

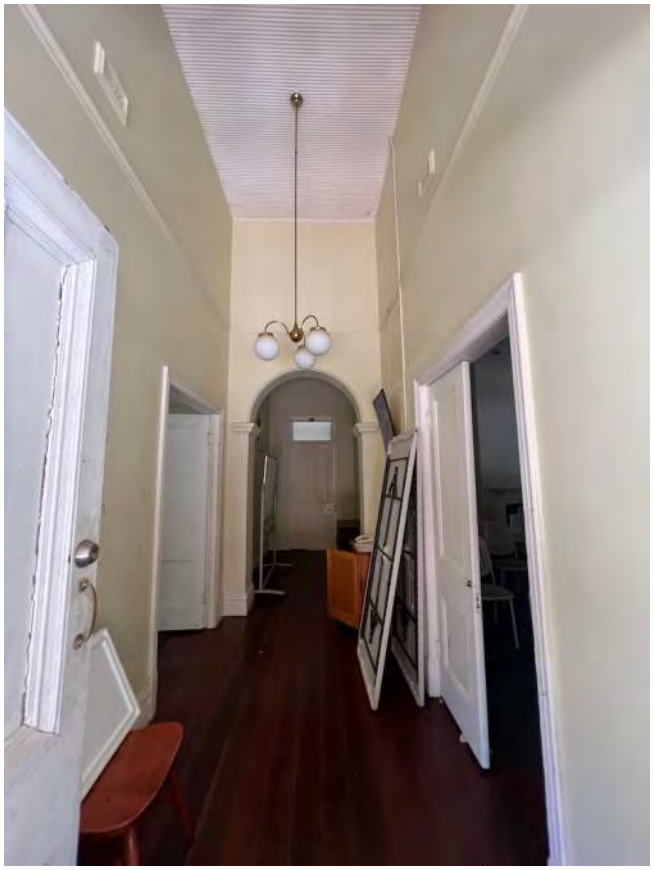




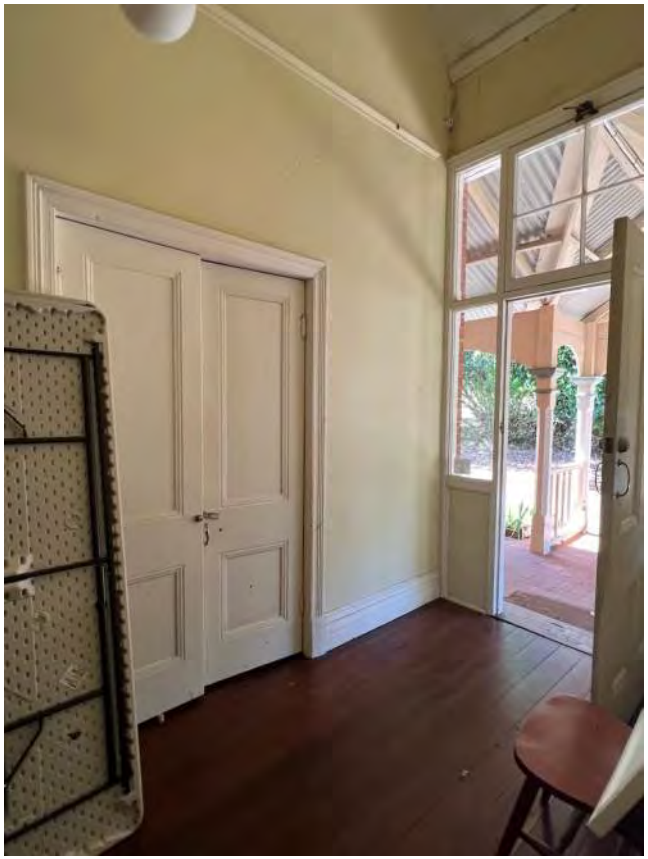
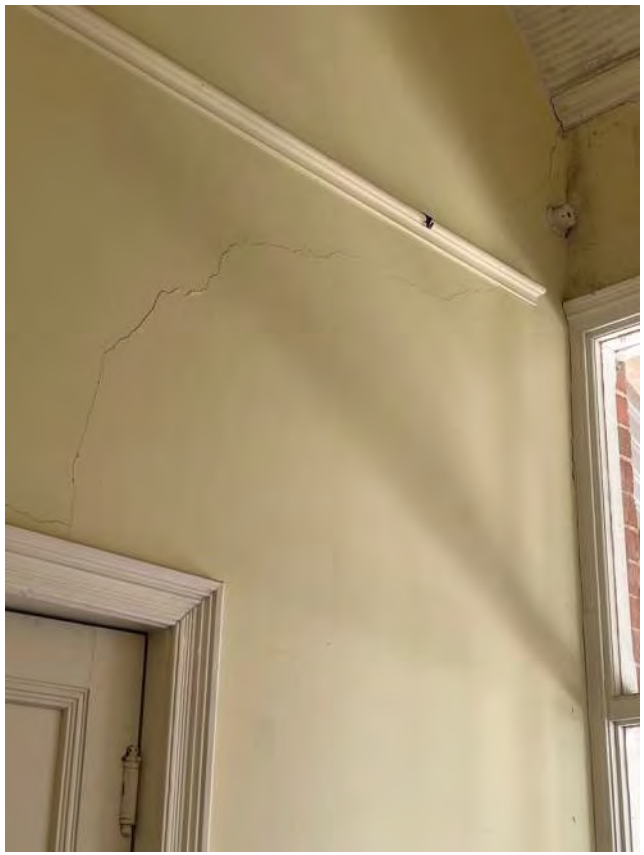


South veranda looking west, entry detail and porch damage.



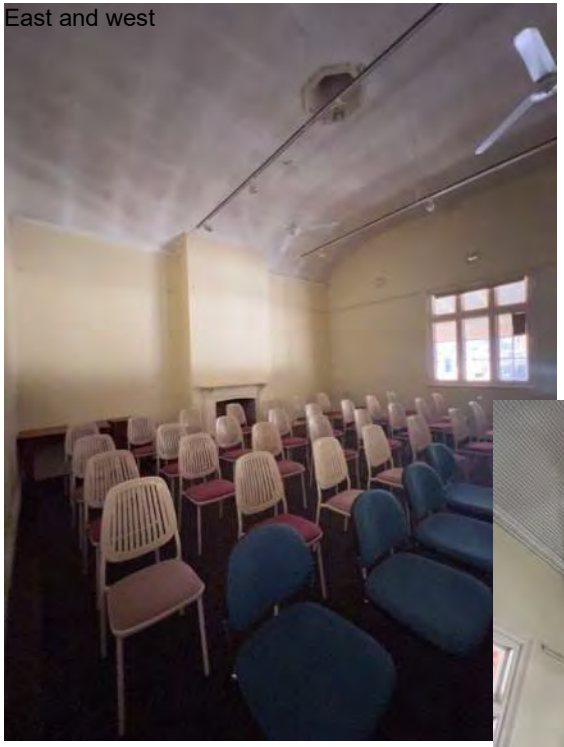



The main entry central on the south frontage, entry door and surround, and interior entry foyer.

Interior view form entry to rear door, double doors into the east room, and cracking above those doors.

East and west



East and west rooms



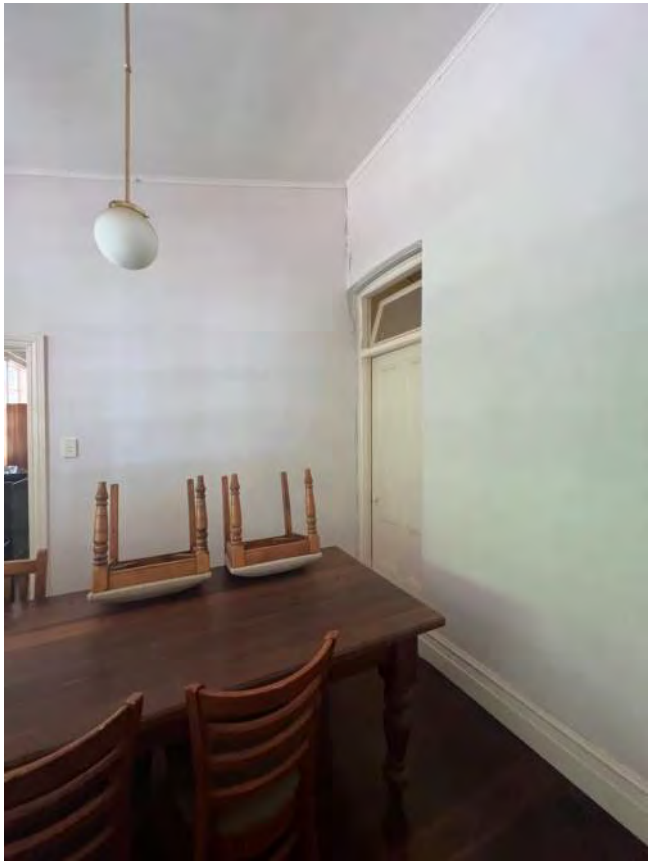




Interior: west room looking to north wall, details of the ripple iron curved cove ceiling (same as east room), skylight lined with decorative pressed metal, and hexagonal roof vent.









Interior: Door at north end of entry hall, north wall of veranda enclosure and cracking of wall between kitchen and veranda enclosure.

5.2 LEVELS OF SIGNIFICANCE

The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, fabric, scale and layout (1906)
- Roof geometry & chimneys
- External face brick walls (1906)
- Front door set
- Interior and exterior doors (1904) and windows.
- Interior timber floors
- Curved coved ceilings and ceiling details in east and west rooms (1906)
- Fireplaces (east and west rooms)

- Kitchen fireplace and pressed metal raked ceiling lining

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- Corrugated metal roof cladding

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- North veranda addition

APPENDIX 4

PADBURY COTTAGE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as an urgent matter.

3.4.1 Elements that are intrusive to the significance

- Brick paved front veranda

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter (Appendix 1) also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter have been used to describe the required work.

Conservation: means all the processes of looking after a place to retain its cultural significance.

Restoration: means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction: means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.

Maintenance: means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to providing the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

Description of element	Rating	Condition	Conservation Works	Priority
Structure	B	No specific structural assessment has been undertaken by an Engineer. The building appears to be structurally sound although there is some cracking evident on the external faux limestone wall on the north, and on the interior at the juncture of the original rear wall onto the north veranda, and above the interior doors into the east room.	Monitor for cracks for future movement of the masonry structure. Consider an Engineer if any significant movement.	1
Foundation and subfloor structure	B/C	The foundation and subfloor have not been investigated. The perimeter stumps visible along the north veranda and part of the west end, evidence some misalignment but otherwise in good condition.	Investigate the subfloor stone foundation and timber structures that are not accessible at this time. The acsessible subfloor of the north veranda appears stable. The random stone foundation wall visible on the north and part of the west, appears to be in good condition.	1

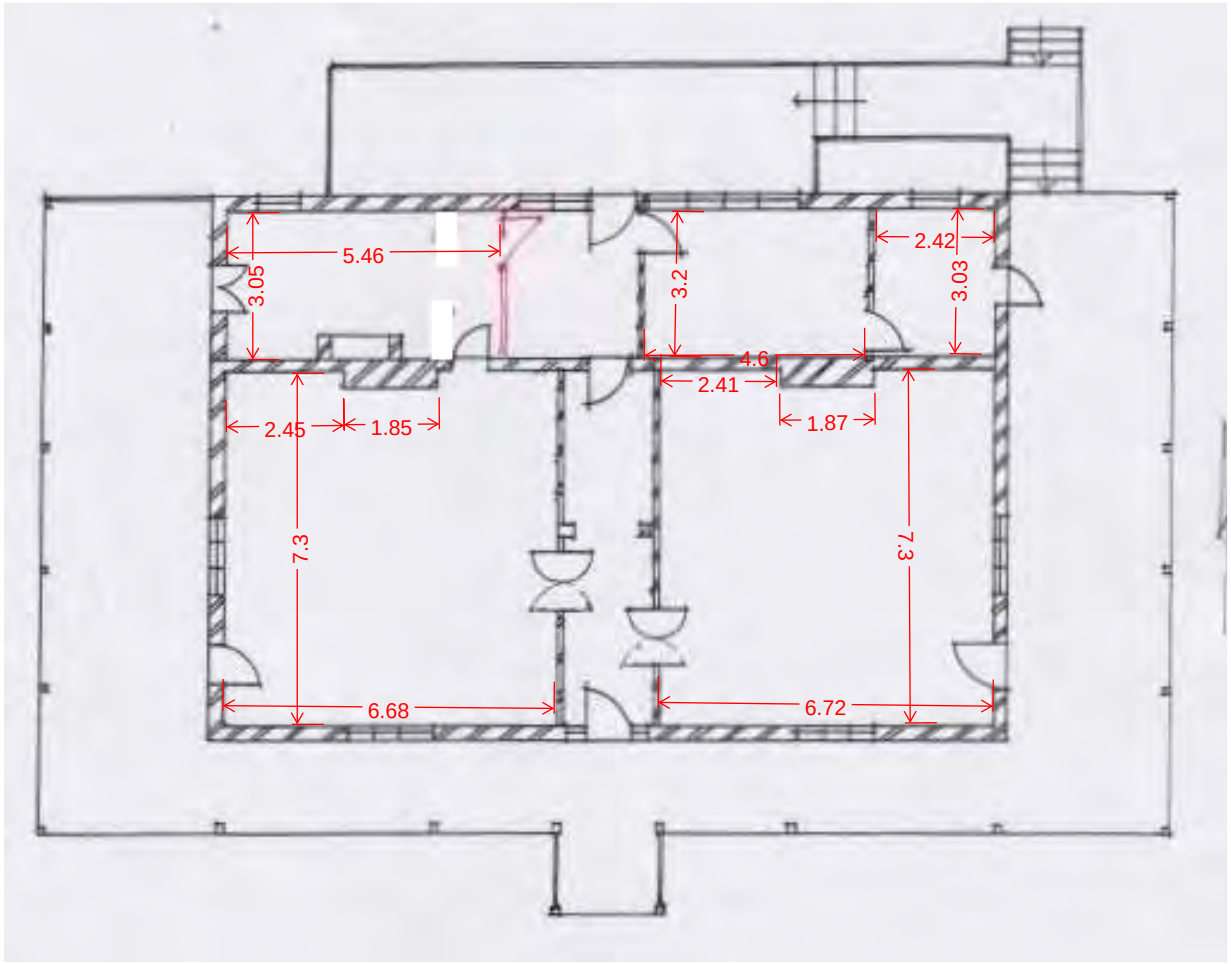
		There is no evidence of termite damage. The south wall stumps are not visible as they are below ground level.	Remove earth build-up along the south wall and any underfloor ground build-up where possible. Restore/reconstruct damaged timbers as required. Termite treatment at the completion of the new works.	
Roof structure and cladding	C	The roof has been replaced in recent years. From ground level view it appears to be in good condition. The roof structure is not visible. The face brick chimney is in fair condition with the lower half cement rendered.	Inspect roof structure and cladding and action as required. Ensure roof is securely fixed. Restore/reconstruct any damaged roof timbers as required. Inspect flashings and fixing and restore as required. Restore the chimneys. Remove cement render if possible.	1
Roof plumbing/drainage	B/D	Gutters and downpipes are evident. Ground level discharge is inconsistent. Gardens across the south frontage exacerbate moisture and salt and subsidence.	Inspect and undertake any works in response to ensuring the roof flashings and detailing, and the roof drainage system throughout is adequately discharging as necessary, with enough downpipes to discharge the catchment and direct away from the perimeter of the building. Roof drainage to be undertaken in conjunction with the ground level drainage requirements to ensure downpipes in appropriate locations, with correct gutter gradients. Gutters, downpipes, and roof sheeting to be compatible materials.	1
Ground level drainage	D	There is no apparent drainage system at ground level, with lack of downpipes and no discharge outlet for the existing downpipes. The ground level is built up to the veranda edge of the south wall with garden along that area. Ground level drainage is critical to the stability of the building.	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.** The ground level should be graded away from the perimeter walls so that no run-off (south side) or erosion (north side) impacts the building. The south side ground level should allow for the stumps to be exposed and provide cross ventilation under the floor. Downpipes should connect to ground level or closed drains to discharge beyond the building perimeter. On the north side and part of the sloping sides, the erosion requires backfill of earth where eroded.	1
Veranda	D	The perimeter veranda is open to the front (south) and both sides. It has been enclosed across the north from the the skillion kitchen at the west end,	Restore timber elements, including the staircase Reduce the gardens along the front and minimise watering within that space.	3

		and a separate veranda added beyond that enclosure. The is balustrade along the edge of the north veranda. The front section of the veranda on the south has been brick paved. The flanking verandas along the east and west are timber lined (not original). The timber floors are in good condition, the balustrade shows some weathering, as do the stairs at the northeast corner.		
External walls	B/C	The external original face brick walls are in good condition, although the west wall has been painted, and the northwest corner (kitchen) wall shows some deterioration. There is a crack in the more recent faux lime stone wall on the rear enclosure. are in good condition except for the lower parts of the west wall, northwest and southwest corners, part of the north wall, and the subsided veranda.	**After the roof and ground level drainage is attentioned:** Restore the brick walls, repointing with high lime ration mortar colour tested prior to the works. No mechanical devices. Retain and restore the entire 1904 front facade.	2
Doors and windows	B	Timber framing reveals some weathering and flaked paint.	Restore as required.	3
Interior				
Floors	A/B	The timber floors are in good condition. The subfloor elements were not inspected.	Restore as required.	4
Walls	B/C	The hard plaster walls are mostly in good condition with minimal evidence of cracking and no moisture damage evident.	Monitor the cracks and any moisture damage. **After the roof and ground level drainage is attentioned:** Restore walls as required.	2
Ceilings	B	The original in the two main rooms have curved coved ceilings. They are detailed in painted mini orb each of the two rooms with a central hexagonal roof vent, and the southwest room also having a rectangular roof light lined with patterned press metal. Those and are in good condition. The kitchen skillion roof is lined on the rake with patterned press metal and the remaining skillion	Restore the ripple iron and pressed metal ceilings when required, by specialist conservation contractors.	2

		rooms across the north are lined with battened flat sheets.		
Detailing: doors, frames, windows, architraves & skirtings, fire-surrounds and mantelpieces, and other elements.	A/B	Timber elements and detailing are in good condition.	Restore/reconstruct as required.	3

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN

APPENDIX 4



APPENDIX 4

PADBURY COTTAGE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

5.5 MAINTENANCE SCHEDULE

Proposal
for an
Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place
Check roof discharge and **ground drainage**
Monitor any problem areas
Ensure security is maintained

Monthly

Check gutters and downpipes
Monitor any water penetration
Attend to any works arising from the inspections

Annually

Termite inspection and treatment
Roof inspection and repair as required
Inspect and assess structural adequacy
Inspect paint work throughout
Inspect floor surfaces and repair as required

APPENDIX 4

PADBURY COTTAGE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

APPENDIX 5

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

WORKSHOP (original kitchen/dining)



5.1 PHOTOGRAPHIC RECORD Page 2

5.2 LEVELS OF SIGNIFICANCE Page 12

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS Page 15

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN Page 19

5.5 MAINTENANCE SCHEDULE Page 20

5.1 PHOTOGRAPHIC RECORD





Views of the west end of the building showing the porch addition and the steel framed and clad addition on the north (left).





Details of the damage and deterioration on the west wall.



Views of the porch addition, typical window, and a painted section of the face brick walls.

APPENDIX 5

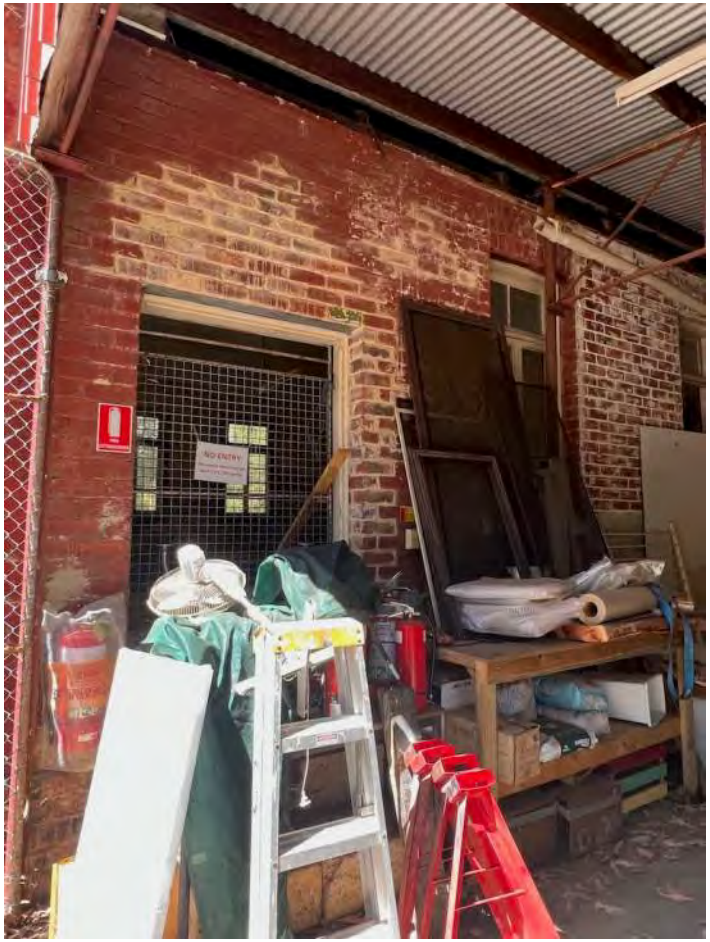
WORKSHOP

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children & Youth Care




Views of the southeast corner, and the east elevation.





Views of the north wall, undercover due to the steel framed and clad addition along the north.





Views of the north wall and undercover area.

APPENDIX 5

WORKSHOP

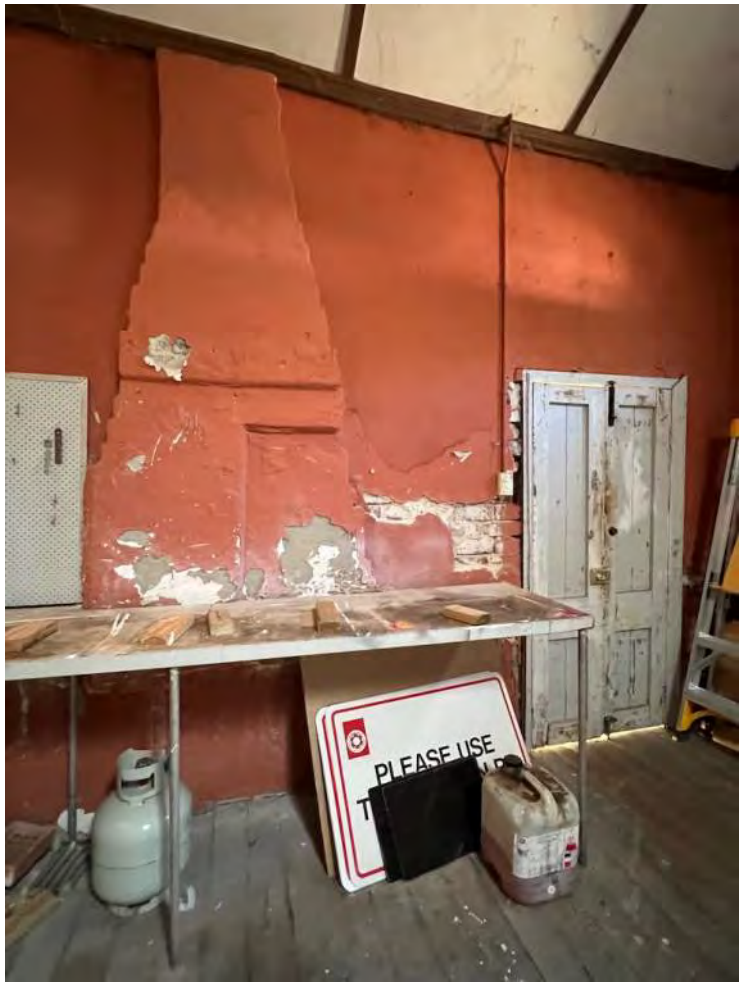
CONSERVATION MANAGEMENT STRATEGY

Parkerville Children & Youth Care



Interior; west end room looking to east wall, south wall with chimney and double doors, and the west wall with extensive damage about the door and fireplace.





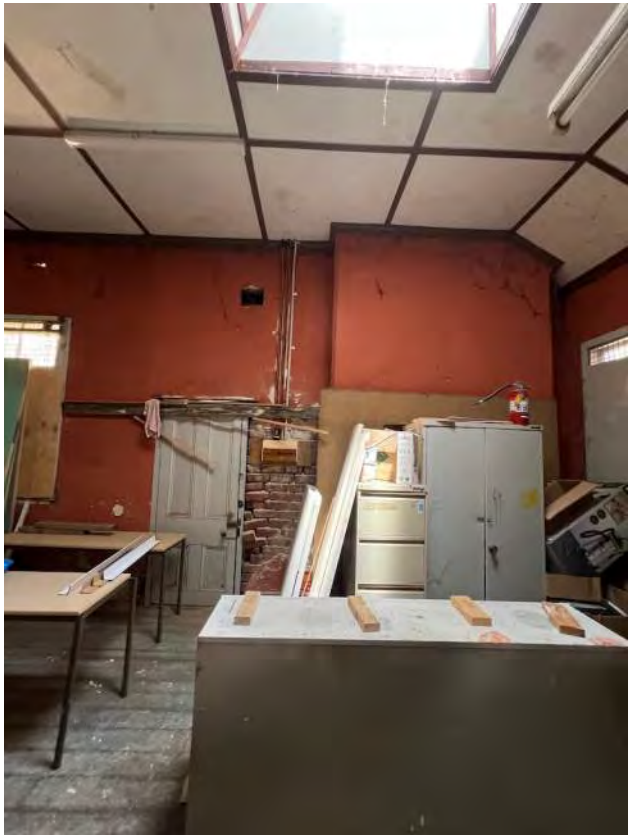
Interior; west end room looking to south corner showing the south wall with chimney and double doors.

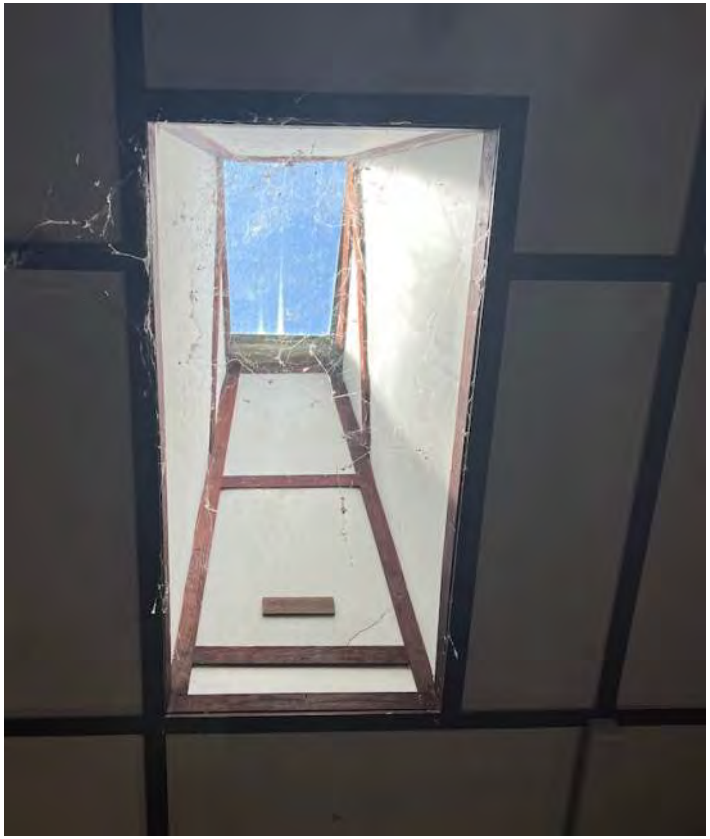
APPENDIX 5

WORKSHOP

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children & Youth Care





Interior; west wall detail of damage, and skylight in the ceiling.





Looking through a hole in the wall to the inaccessible east room showing extensive damage.

5.2 LEVELS OF SIGNIFICANCE

The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, scale and layout (1908)
- Roof geometry & chimney
- External face brick walls
- Coved ceilings – battened flat sheets.
- Skylight in west room
- Windows and doors (1908)
- Timber floors
- Fireplaces

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- Roof cladding

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- Porch on south side

APPENDIX 5

WORKSHOP

CONSERVATION MANAGEMENT STRATEGY

- Steel framed addition along the north side

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as an urgent matter.

3.4.1 Elements that are intrusive to the significance

- Any damaged Asbestos fabric

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation: means all the processes of looking after a place to retain its cultural significance.

Restoration: means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction: means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.

Maintenance: means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to providing the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

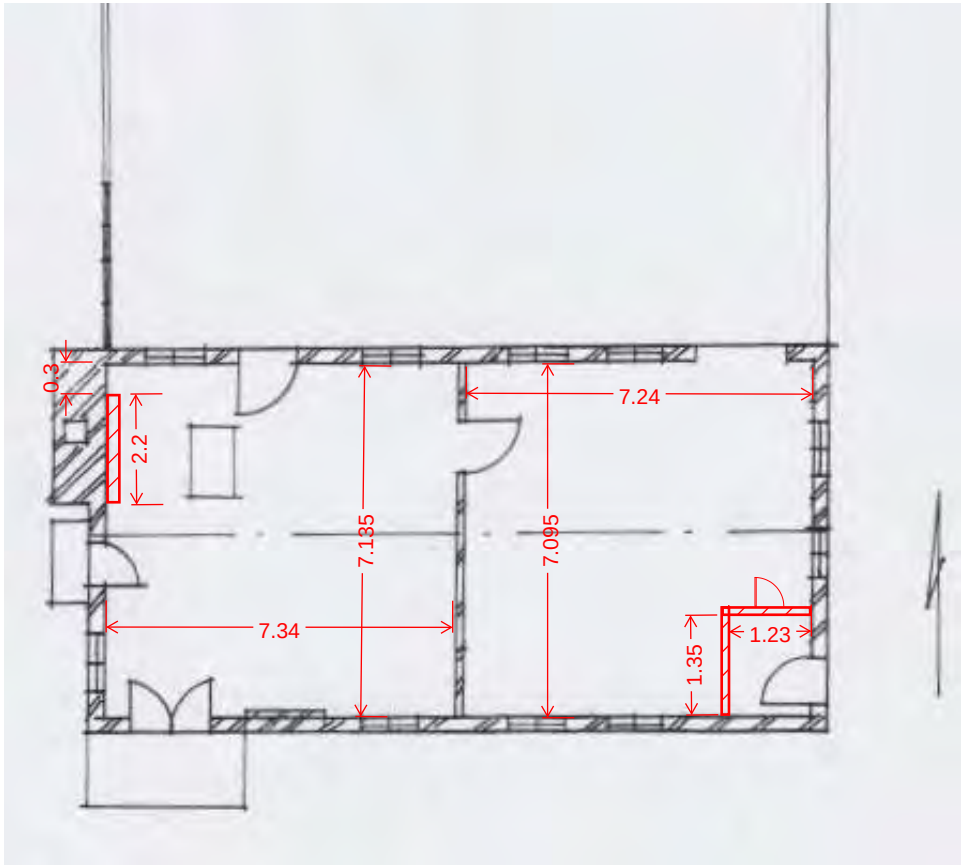
It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

Description of element	Rating	Condition	Conservation Works	Priority
Structure	B	No specific structural assessment has been undertaken by an Engineer. The building appears to be structurally sound although there is cracking evident on west wall. The east end was inaccessible and in poor condition.	Monitor the cracks on the west and south walls and the entire east end room for cracking and movement of the masonry structure. Consider an Engineer if any significant movement.	1
Foundation and subfloor structure	B/C	The foundation and subfloor have not been investigated.	Investigate the subfloor structures that are not accessible at this time. Remove earth build-up along the south wall and any underfloor ground build-up where possible. Restore/reconstruct damaged timbers as required.	1

			Termite treatment at the completion of the new works.	
Roof structure and cladding	C	The roof has been replaced in recent years. From ground level view it appears to be in good condition. The roof structure is not visible. The chimneys have been removed above the roof line.	Inspect roof structure and cladding and action as required. Ensure roof is securely fixed. Restore/reconstruct any damaged roof timbers as required. Inspect flashings and fixing and restore as required	1
Roof plumbing/drainage	B/D	Gutters and downpipes are evident. Ground level discharge is inconsistent. Ground level buildup across the south and east exacerbate moisture and salt impact and subsidence.	Inspect and undertake any works in response to ensuring the roof flashings and detailing, and the roof drainage system throughout is adequately discharging as necessary, with enough downpipes to discharge the catchment and direct away from the perimeter of the building. Roof drainage to be undertaken in conjunction with the ground level drainage requirements to ensure downpipes in appropriate locations, with correct gutter gradients. Gutters, downpipes, and roof sheeting to be compatible materials.	1
Ground level drainage	D	There is no apparent drainage system at ground level, with lack of downpipes and no discharge outlet for the existing downpipes. The ground level is built up on the south and east walls. Ground level drainage is critical to the stability of the building.	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.** The ground level should be graded away from the perimeter walls so that no run-off (south side) or erosion (north side) impacts the building.	1
External walls	D	The external original face brick walls are in poor condition. Most of the face bricks have been or still are painted and various intrusive repairs are evident.	**After the roof and ground level drainage is attentioned:** Restore the brick walls, removing paint and intrusive repairs where possible and repointing with high lime ration mortar colour tested prior to the works. No mechanical devices.	1
Doors and windows	B	Timber framing reveals weathering and deterioration.	Restore/reconstruct as required.	2
Interior		The east room was no accessible- viewed through a hole in the wall from the west room.		

Floors	A/B	The timber floors are in poor condition with evidence of termite damage. The subfloor elements were not inspected.	Restore/reconstruct as required.	2
Walls	B/C	The hard plaster walls are mostly in poor condition with significant cracking evident about the doors on the south, west and north walls of the west rooms. There is extensive damp damage and interventions to the walls in the east room, and dislodgement of bricks in part of the west wall of the west room (between the door and fireplace)	**After the roof and ground level drainage is attentioned:** Restore /reconstruct the walls.	1
Ceilings	B	The original coved ceilings are flat sheet, possibly caneite, with timber battens. Many of the ceilings sheets are buckled. There is a rectangular light well in the west room ceiling.	Restore /reconstruct as required.	2
Detailing: doors, frames, windows, architraves & skirtings, fire-surrounds and mantelpieces, and other elements.	A/B	Timber elements, fireplaces, chimneys, and detailing are in poor condition.	Restore/reconstruct.	2

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN



5.5 MAINTENANCE SCHEDULE

APPENDIX 5

WORKSHOP

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children & Youth Care

Proposal
for an
Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place
Check roof discharge and **ground drainage**
Monitor any problem areas
Ensure security is maintained

Monthly

Check gutters and downpipes
Monitor any water penetration
Attend to any works arising from the inspections

Annually

Termite inspection and treatment
Roof inspection and repair as required
Inspect and assess structural adequacy
Inspect paint work throughout
Inspect floor surfaces and repair as required

APPENDIX 5

WORKSHOP
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

APPENDIX 6

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

WORKSHOP (Laundry)



5.1 PHOTOGRAPHIC RECORD Page 2

5.2 LEVELS OF SIGNIFICANCE Page 7

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS Page 10

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN Page 14

5.5 MAINTENANCE SCHEDULE Page 15

5.1 PHOTOGRAPHIC RECORD





Views of southeast corner showing the south frontage, and east end.





West end, and damage to the windows on that wall.



Views of vents and cracking, typical window on west wall, and part of north wall.





Timber framed shelter along the north wall.





North wall at the east end showing the timber framed and clad addition, typical “front” (south) windows, and doors on east, below ground level.

5.2 LEVELS OF SIGNIFICANCE

The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

INTERIOR NOT VIEWED

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, scale and fabric (1908)
- Roof geometry (including ridge vent)
- External face brick walls
- Windows and doors (1908)

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- Roof cladding
- Timber framed and clad addition on the north

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- There are no elements that are intrusive to the significance.

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as an urgent matter.

3.4.1 Elements that are intrusive to the significance

nil

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation:	means all the processes of looking after a place to retain its cultural significance.
Restoration:	means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.
Reconstruction:	means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.
Maintenance:	means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

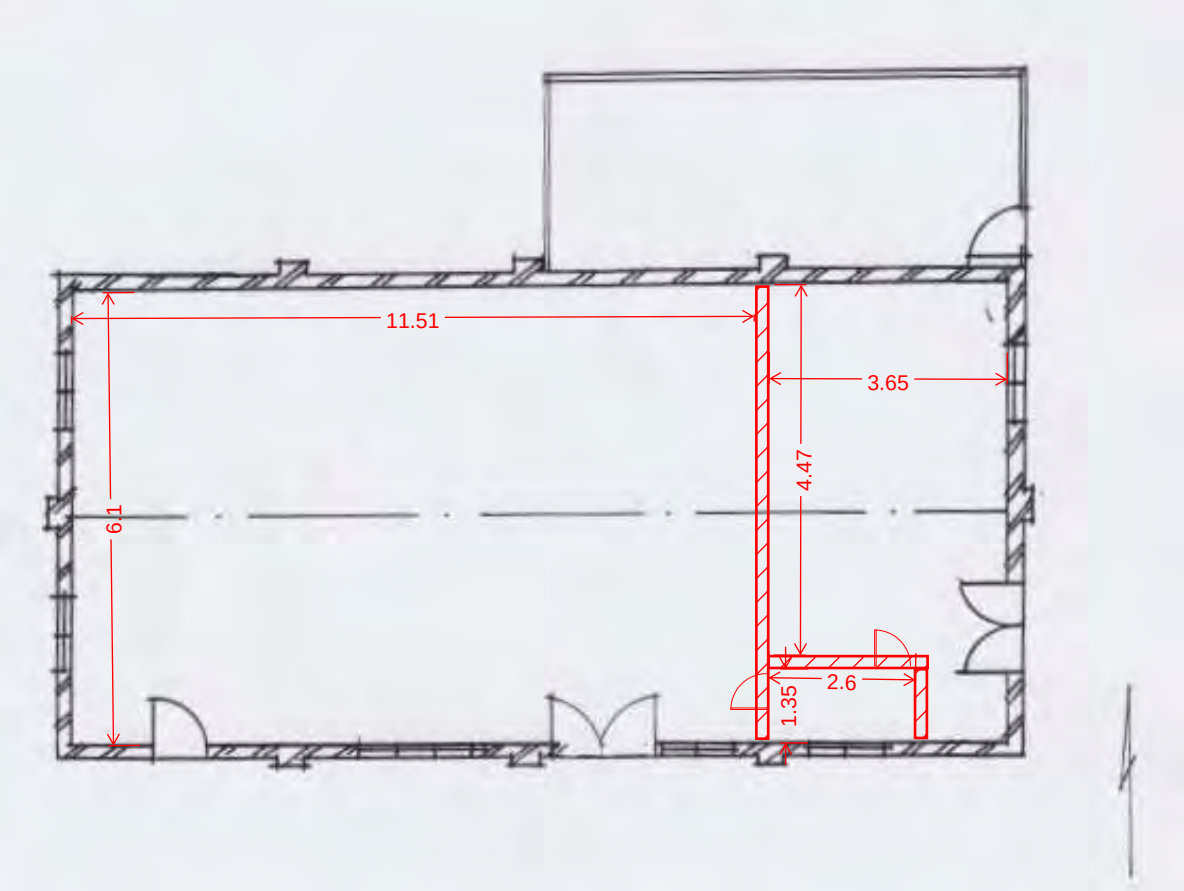
This table is a guide to providing the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

Description of element	Rating	Condition	Conservation Works	Priority
Structure	B	No specific structural assessment has been undertaken by an Engineer. The building appears to be structurally sound although there is cracking evident on west wall. The east end was inaccessible and in poor condition.	Monitor the cracks and the east end room for cracking and movement of the masonry structure. Consider an Engineer if any significant movement.	1
Foundation and subfloor structure	B/C	The foundation and subfloor have not been investigated.	Investigate the subfloor structures that are not accessible at this time. Remove earth build-up along the south and east walls wall and any underfloor ground build-up where possible. Restore/reconstruct damaged timbers as required. Termite treatment at the completion of the new works.	1
Roof structure and cladding	C	The roof has been replaced in recent years. From ground level view it appears to be in good condition with a ridge vent. The roof structure is not visible.	Inspect roof structure and cladding and action as required. Ensure roof is securely fixed. Restore/reconstruct any damaged roof timbers as required. Inspect flashings and fixing and restore as required.	1
Roof plumbing/drainage	B/D	Some gutters and downpipes are evident. Gutter guards are evident with leaf debris. Ground level discharge is inconsistent. Ground level buildup across the south and east exacerbate moisture and salt impact and subsidence.	Inspect and undertake any works in response to ensuring the roof flashings and detailing, and the roof drainage system throughout is adequately discharging as necessary, with enough downpipes to discharge the catchment and direct away from the perimeter of the building. Roof drainage to be undertaken in conjunction with the ground level drainage requirements to ensure downpipes in appropriate locations, with correct gutter gradients. Gutters, downpipes and roof sheeting to be compatible materials.	1
Ground level drainage	D	There is no apparent drainage system at ground level, with lack of downpipes and no discharge outlet for the existing downpipes.	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.**	1

		The building is set at below ground level along the south and east walls. ground level is built up on the south and east walls. Ground level drainage is critical to the stability of the building.	The ground level should be graded away from the perimeter walls to minimise impact on the building.	
External walls	B/C	The external original face brick walls are in fair/good condition. Some of the face bricks have been painted. There is minimal cracking evident. West wall vertical crack on the gable.	**After the roof and ground level drainage is attentioned:** Restore the brick walls.	3
Doors and windows	B	Timber framing reveals some weathering.	Restore/reconstruct as required.	2
North lean-to	C/D	The lean-to across the north is in poor condition, particularly the timber walls at the northeast end.	Restore/reconstruct as required.	3
Interior		THE INTERIOR WAS NOT ACCESSIBLE.	**After the roof and ground level drainage is attentioned:** Restore/reconstruct as required.	2
Floors				
Walls				
Ceilings				
Detailing: doors, frames, windows, architraves & skirtings and other elements.				

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN



APPENDIX 6

WORSHOP (Laundry)
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

5.5 MAINTENANCE SCHEDULE

Proposal
for an
Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place
Check roof discharge and **ground drainage**
Monitor any problem areas
Ensure security is maintained

Monthly

Check gutters and downpipes
Monitor any water penetration
Attend to any works arising from the inspections

Annually

Termite inspection and treatment
Roof inspection and repair as required
Inspect and assess structural adequacy
Inspect paint work throughout
Inspect floor surfaces and repair as required

APPENDIX 6

WORSHOP (Laundry)
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

APPENDIX 7

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

SAINT GABRIEL'S COTTAGE



5.1 PHOTOGRAPHIC RECORD Page 2

5.2 LEVELS OF SIGNIFICANCE Page 13

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS Page 16

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN Page 20

5.5 MAINTENANCE SCHEDULE Page 21

5.1 PHOTOGRAPHIC RECORD





Views looking to the southeast showing the northwest corner, and view to the southwest showing Padbury Cottage to the west.




View of the northeast corner northwest corner, and cracking in the limestone foundation on the north wall.



Cracking in the limestone foundation about the northeast corner, window typical, and repair interventions.

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY







Veranda reconstruction 1999, along the north and about the northwest corner.

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY





Views of the west wall, and the southwest corner.

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SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY





Views of the south veranda showing drainage issue, and paint removal from the face-brick and reconstructed veranda.

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SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY



Views of the south veranda showing paint removal from the face-brick and reconstructed veranda (looking to the east).

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY




Interior showing coved ceiling, fireplaces, and kitchenette in northwest corner.





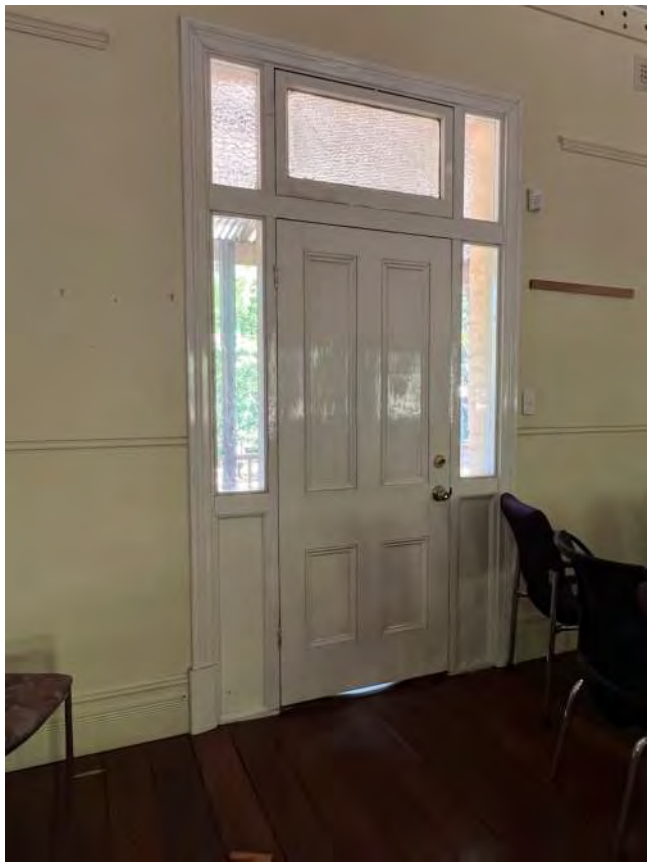
Interior showing the ripple iron coved ceiling with hexagonal vente, and distinctive timber cornice.

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY





Interior showing damage to the ripple iron ceiling, bachelor window on west wall, and entry door set on north “frontage”.

APPENDIX 7

SAINT GABRIEL’S COTTAGE

CONSERVATION MANAGEMENT STRATEGY





Interior showing part of the kitchenette in the northwest corner, and fireplace on the west wall.

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY

5.2 LEVELS OF SIGNIFICANCE

Referencing the Statement of Significance with relevance to the existing fabric zones of the place are graded to identify levels of significance. The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, scale and layout (1909)
- Roof geometry & chimneys
- Limestone foundation
- External face brick walls (1909)
- Verandas- timber floors, balustrades, valances. (1999)
- Windows and doors (1909)

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY

- Timber floors (1909)
- Fireplaces 1909)
- Coved ripple iron ceiling, hexagonal vent and timber cornice (1909)
- Bachelor, and other windows (1909)

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- Corrugated roof cladding

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- 1999 reconstructed verandas.

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as an urgent matter.

3.4.1 Elements that are intrusive to the significance

- There are no elements that are intrusive to the significance.

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation: means all the processes of looking after a place to retain its cultural significance.

Restoration: means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction: means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.

Maintenance: means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to providing the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

Description of element	Rating	Condition	Conservation Works	Priority
Structure	B	No specific structural assessment has been undertaken by an Engineer. The building appears to be structurally sound.	Monitor the foundation cracks. Consider an Engineer if any significant movement becomes apparent.	1
Foundation and subfloor structure	C	The foundation and subfloor have not been investigated. The perimeter stumps visible along the north and northwest corner veranda evidence some misalignment but otherwise in good condition. More recent stumps are in evidence around the southeast and south veranda, There is no evidence of termite damage.	Investigate the subfloor stone foundation and timber structures that are not accessible at this time. The accessible subfloor of the north and northwest corner verandas appear stable. Restore the cracks and erosion of limestone foundation walls. Remove earth build-up along the south wall and any underfloor ground build-up where possible.	1

		Limestone foundation is evident around the northeast corner and under the veranda along the remainder of the north wall and about northwest corner. There is diagonal cracking evident on the north wall and stone and mortar erosion.	Restore/reconstruct damaged timbers as required. Termite treatment at the completion of the new works.	
Roof structure and cladding	C	The roof has been replaced in recent years. From ground level view it appears to be in good condition. The roof structure is not visible. The face brick chimney is in fair/good condition.	Inspect roof structure and cladding and action as required. Ensure roof is securely fixed. Restore/reconstruct any damaged roof timbers as required. Inspect flashings and fixing and restore as required. Restore the chimney.	1
Roof plumbing/drainage	B/D	The gutters and downpipes are evident. Ground level discharge is inconsistent.	Inspect and undertake any works in response to ensuring the roof flashings and detailing, and the roof drainage system throughout is adequately discharging as necessary, with enough downpipes to discharge the catchment and direct away from the perimeter of the building. Roof drainage to be undertaken in conjunction with the ground level drainage requirements to ensure downpipes in appropriate locations, with correct gutter gradients. Gutters, downpipes and roof sheeting to be compatible materials.	1
Ground level drainage	D	There is no apparent drainage system at ground level, with lack of downpipes and no discharge outlet for the existing downpipes. The ground level is built up to the veranda edge of the south wall. Ground level drainage is critical to the stability of the building.	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.** The ground level should be graded away from the perimeter walls so that no run-off (south side) or erosion (north side) impacts the building. The south side ground level should allow for the stumps to be exposed and provide cross ventilation under the floor. Downpipes should connect to ground level or closed drains to discharge beyond the building perimeter. On the north side and part of the sloping sides, the erosion requires backfill of earth where eroded.	1

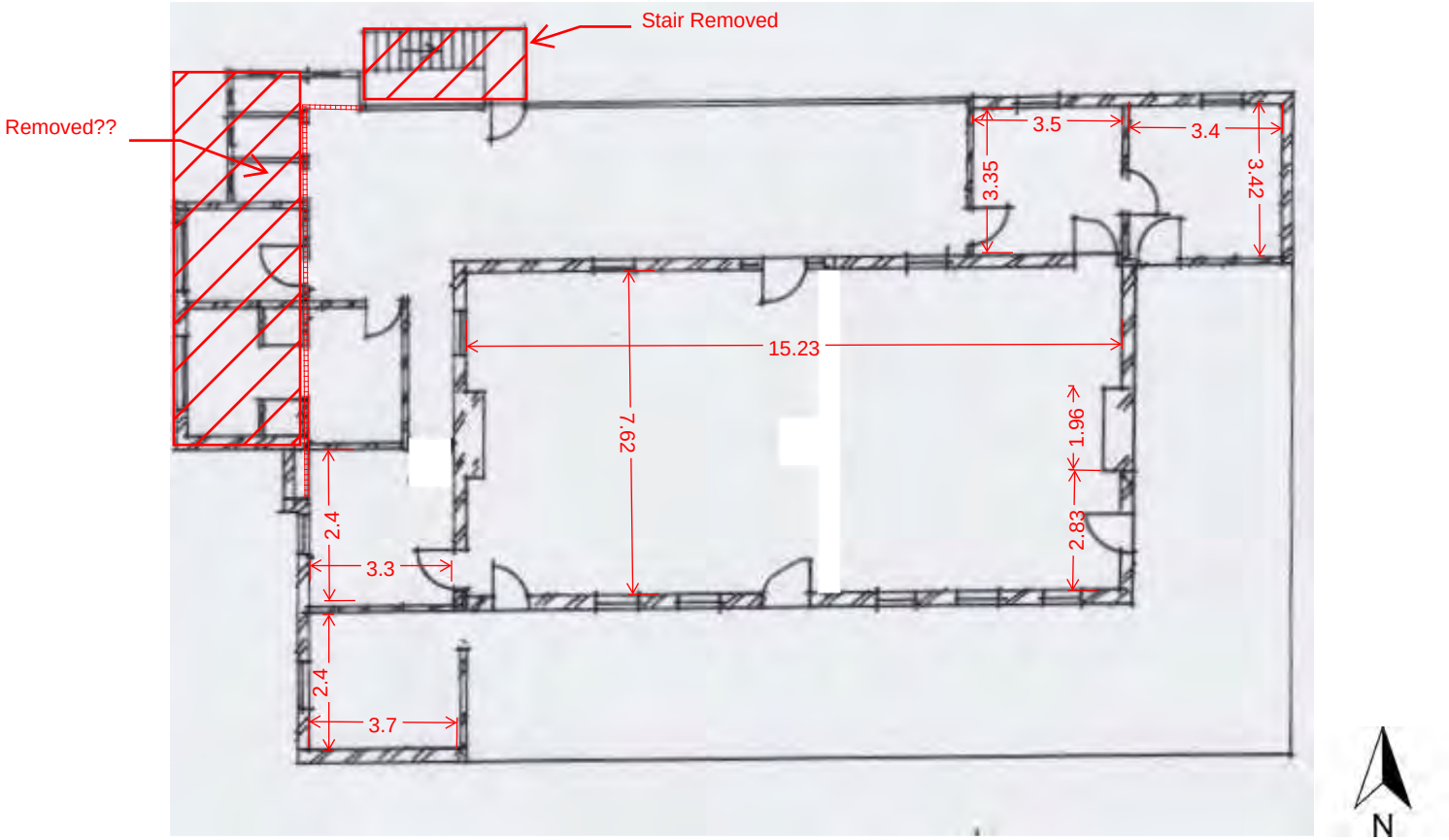
Verandas	B	The veranda is open to the front (south) and part of the east side. The north veranda is elevated and extends along part of the west side, with timber balustrades, and staircase, on north side. The non-original timber floors are in good condition, the balustrade shows some weathering, as do the stairs.	Restore timber elements, including the staircase.	3
External walls	B	The external original face brick walls are in good condition, evidencing the removal of paint on some walls and evidence of former enclosures. The original face brick north wall and return west wall are painted. The northeast corner shows some interventions /repairs.	Restore as may be required.	3/4
Doors and windows	B	Timber framing reveals some weathering and flaked paint.	Restore as required.	3
Interior				
Floors	A/B	The timber floors are in good condition. The subfloor elements were not inspected.	Restore as required.	4
Walls	B	The hard plaster walls are mostly in good condition with minimal evidence of cracking and no moisture damage evident.	Monitor any cracks and moisture damage. **After the roof and ground level drainage is attentioned:** Restore walls as required.	2
Ceilings	C	The original coved ceiling is detailed in painted mini orb with a central hexagonal skylight. The ceiling shows some rust and loose sheeting.	Restore the ripple iron and pressed metal ceilings by specialist conservation contractors.	1
Detailing: doors, frames, windows, architraves & skirtings, fire-surrounds etc.	A/B	Timber elements and detailing are in good condition.	Restore/reconstruct as required.	3

5.4 SKETCH FLOOR PLAN 1991 CONSERVATION MANAGEMENT PLAN

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY



5.5 MAINTENANCE SCHEDULE

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children & Youth Care

Proposal

for an

Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place

Check roof discharge and **ground drainage**

Monitor any problem areas

Ensure security is maintained

Monthly

Check gutters and downpipes

Monitor any water penetration

Attend to any works arising from the inspections

Annually

Termite inspection and treatment

Roof inspection and repair as required

Inspect and assess structural adequacy

Inspect paint work throughout

Inspect floor surfaces and repair as required

APPENDIX 7

SAINT GABRIEL'S COTTAGE

CONSERVATION MANAGEMENT STRATEGY

APPENDIX 8

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

WEARNE CENTRE



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5.1 PHOTOGRAPHIC RECORD





Views looking to southeast, showing the south side (left), and view across the main frontage on the east.





Views of the main east frontage.

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WEARNE HOUSE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care





Views of the main east frontage and looking down the veranda on the north side.







Views of the veranda on the north side and details.




View of the north side and part of the west, and a view of the west (rear) of the building.





View of the west (rear) of the building at the southwest corner of the south wing, and detail of the north wall of that wing.





The “courtyard” at the west showing the north wing (left) and the rear of the 1916 east wind (right), and the paved forecourt at the northeast corner of the two wings.





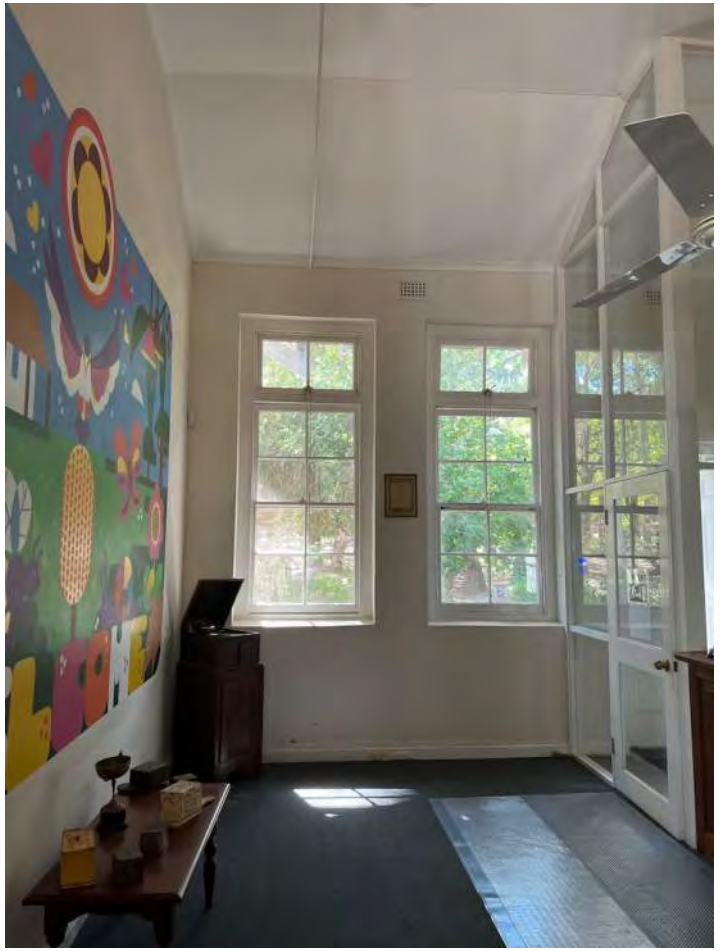
Details of the brick work, roof drainage and timber posts of the courtyard and west veranda (post).



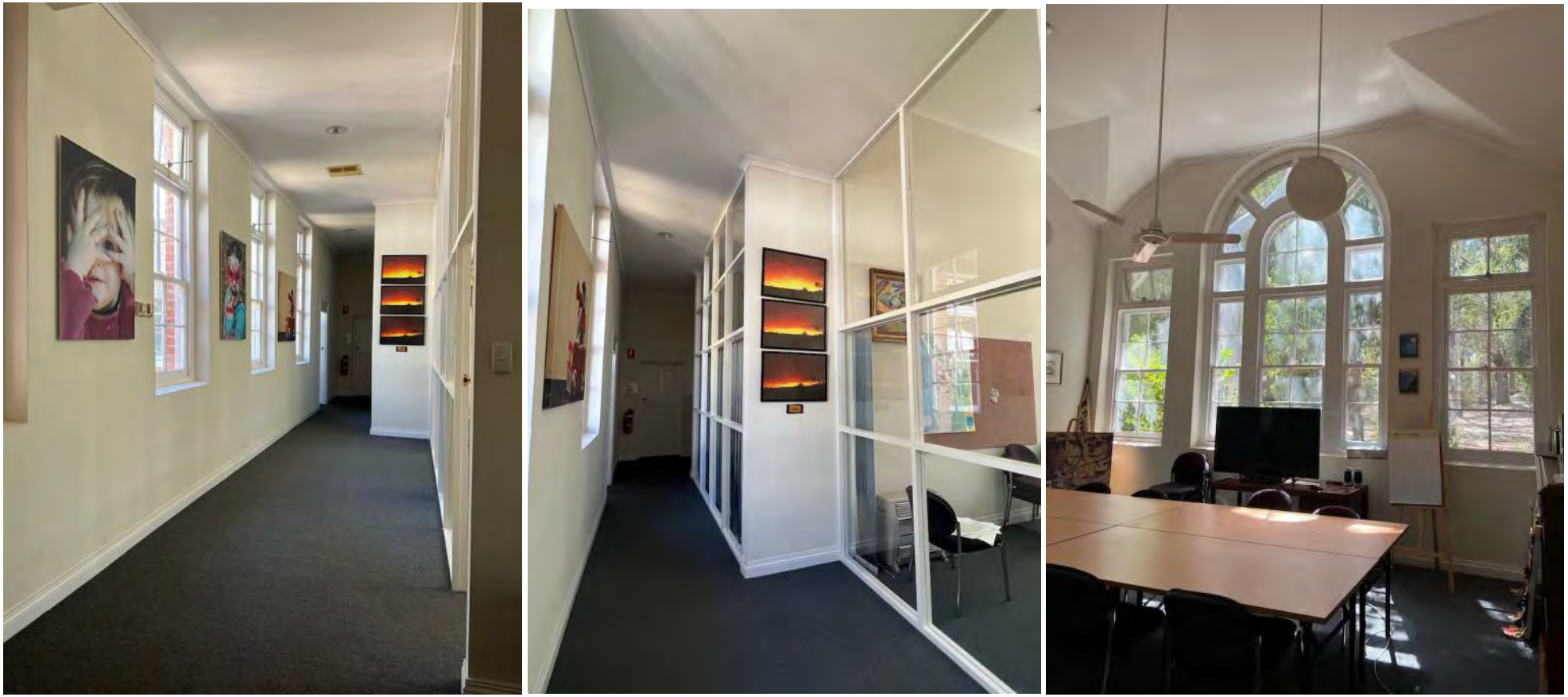


View looking to north east showing the west and south sides of the building, Interior entry on the east frontage.





Interior foyer of the main entry on the east frontage.



Interior corridor north from the foyer of the main entry (courtyard (on left), and the office with the prominent east window on the east frontage (right).



Interior of the north wing looking to the rear (west) with the courtyard (on left) , and the office partition along the north wall of the north wing.




Interior of the north wing looking to the rear showing the kitchen (left) and toilets (right, next to the fireplace), and view looking east to the main corridor.





Interior of the north wing showing the fireplace (toilets (right, next to the fireplace), and the kitchen fitout.

APPENDIX 8

WEARNE HOUSE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care



Interior view of office suites in the northeast end of the east wing (frontage), the corridor showing the double entry off the east frontage.

5.2 LEVELS OF SIGNIFICANCE

The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, scale, fabric and layout (1916 and 1954)
- Roof geometry & chimneys
- External face brick walls
- The feature window on the east frontage
- Verandas
- Windows and doors (1916 and 1954)
- Staircases (1904, c.1906)
- Timber floors

- Fireplaces
- Ceilings (1916 and 1954)

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- Roof cladding

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

APPENDIX 8

WEARNE HOUSE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- Office partitions
- Ceilings (not original)
- Paving to north veranda and courtyard

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as an urgent matter.

3.4.1 Elements that are intrusive to the significance

- There are no elements that are intrusive to the significance.

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation: means all the processes of looking after a place to retain its cultural significance.

Restoration: means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction: means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.

Maintenance: means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to providing the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

Description of element	Rating	Condition	Conservation Works	Priority
Structure	B	No specific structural assessment has been undertaken by an Engineer. The building appears to be structurally sound.	Consider an Engineer if any significant movement becomes apparent.	3
Foundation and subfloor structure	B	The foundation and subfloor have not been investigated. Face brick foundation areas evidence moisture retention (particularly in the “U” enclosure at the rear.	Investigate the subfloor foundation and timber structures that are not accessible at this time. Remove earth build-up along the south wall and any underfloor ground build-up where possible. Restore/reconstruct damaged timbers as required. Termite treatment at the completion of the new works.	1
Roof structure and cladding	B/C	The roof has been replaced in recent years. From ground level view it appears to be in good condition. The roof structure is not visible.	Inspect roof structure and cladding and action as required. Ensure roof is securely fixed. Restore/reconstruct any damaged roof timbers as required.	1

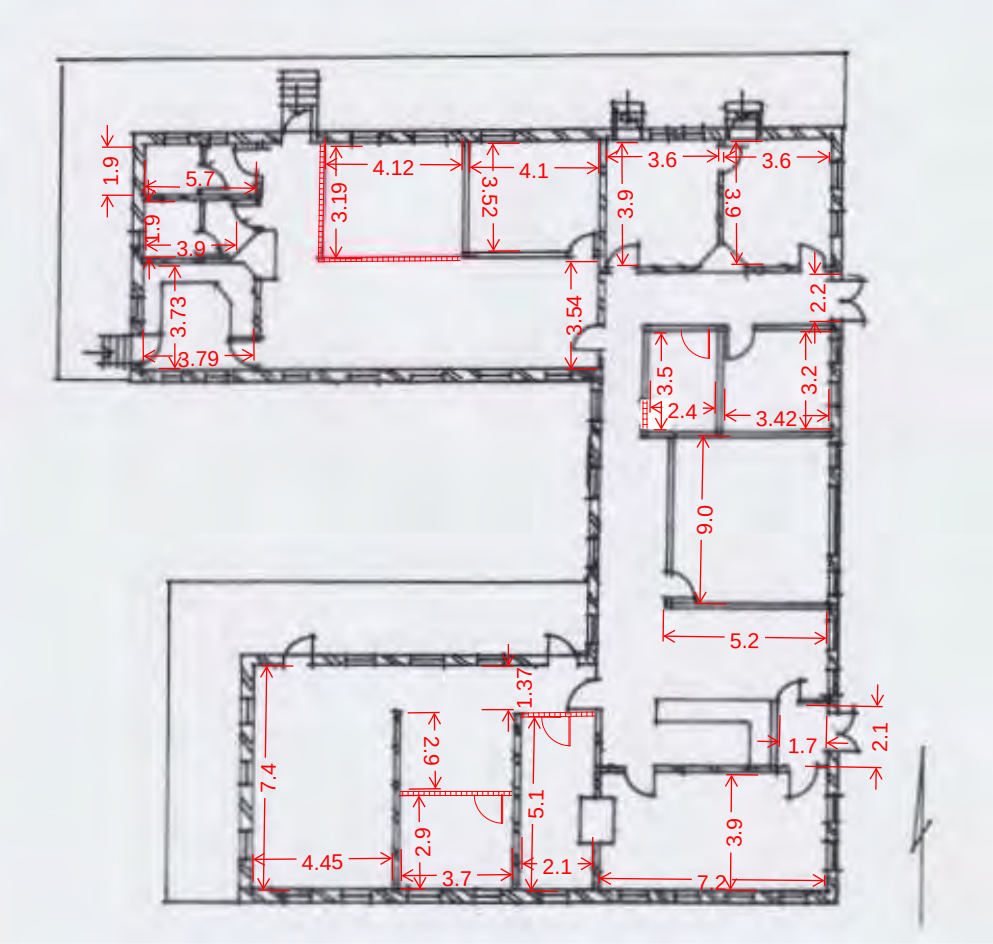
		The face brick chimneys are in fair/good condition.	Inspect flashings and fixing and restore as required. Restore the chimneys.	
Roof plumbing/drainage	B/C	The gutters and downpipes are evident. Ground level discharge is inconsistent.	Inspect and undertake any works in response to ensuring the roof flashings and detailing, and the roof drainage system throughout is adequately discharging as necessary, with enough downpipes to discharge the catchment and direct away from the perimeter of the building. Roof drainage to be undertaken in conjunction with the ground level drainage requirements to ensure downpipes in appropriate locations, with correct gutter gradients. More downpipes may be required. Gutters, downpipes and roof sheeting to be compatible materials.	1
Ground level drainage	D	There is no apparent drainage system at ground level, with lack of downpipes and no discharge outlet for the existing downpipes. The ground level is built up to the veranda edge of the south wall. Ground level drainage is critical to the stability of the building.	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.** The ground level should be graded away from the perimeter walls so that no run-off or erosion impacts the building. Restrict plantings and watering in close proximity to the masonry walls. Ensure all downpipes direct discharge away from the building.	1
External walls	B	The external face brick walls are in good condition. All except the walls in the "U" section are painted. The "U" section walls evidence damp along the lower section.	**After the roof and ground level drainage is attentioned:** Restore the damp walls as may be required.	3
Doors and windows Veranda posts	B/D	Timber framing reveals some weathering. Veranda post evidence weathering and previous damage and repair.	Restore as required. Veranda posts may require some reconstruction.	2
Interior				
Floors	A/B	The timber floors are in good condition. The subfloor elements were not inspected.	Restore as required.	4

Walls	A/B	The hard plaster walls are mostly in good condition with no evidence of cracking or moisture damage.	Monitor any cracks and moisture damage. **After the roof and ground level drainage is attentioned:** Restore walls as required.	2
Ceilings	A/B	The flat ceilings appear to be plasterglass and/or gyprock.	Restore/reconstruct as required.	2
Detailing: doors, frames, windows, architraves & skirtings, fire-surrounds and mantelpieces, and other elements.	A/B	Timber elements and detailing are in good condition.	Restore/reconstruct as required.	3

5.4 SKETCH FLOOR PLAN & PHOTO from 1991 CONSERVATION MANAGEMENT PLAN

APPENDIX 8

WEARNE HOUSE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care



5.5 MAINTENANCE SCHEDULE

APPENDIX 8

WEARNE HOUSE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

Proposal

for an

Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place
Check roof discharge and **ground drainage**
Monitor any problem areas
Ensure security is maintained

Monthly

Check gutters and downpipes
Monitor any water penetration
Attend to any works arising from the inspections

Annually

Termite inspection and treatment
Roof inspection and repair as required
Inspect and assess structural adequacy
Inspect paint work throughout
Inspect floor surfaces and repair as required

APPENDIX 8

WEARNE HOUSE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

APPENDIX 9

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

ROSEMARY COTTAGE



5.1 PHOTOGRAPHIC RECORD Page 2

5.2 LEVELS OF SIGNIFICANCE Page 14

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS Page 17

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT Page 21

5.5 MAINTENANCE SCHEDULE Page 22

5.1 PHOTOGRAPHIC RECORD





Views showing the southwest corner and west elevation.





View showing the northwest corner and north elevation.



North elevation (original frontage)





Views showing the northeast corner, and part of the east wall, showing damage.





Views showing part of the east wall, showing damage, and drainage issues at the northeast corner.




Views showing the southeast corner and south frontage, and the south frontage..



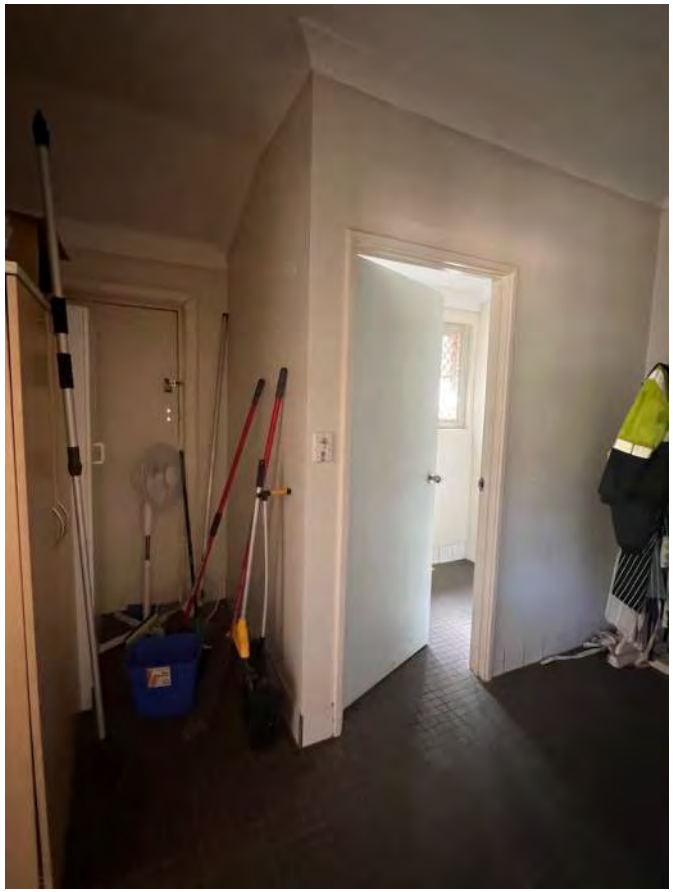
The south front wall of the original section – painted face brick.

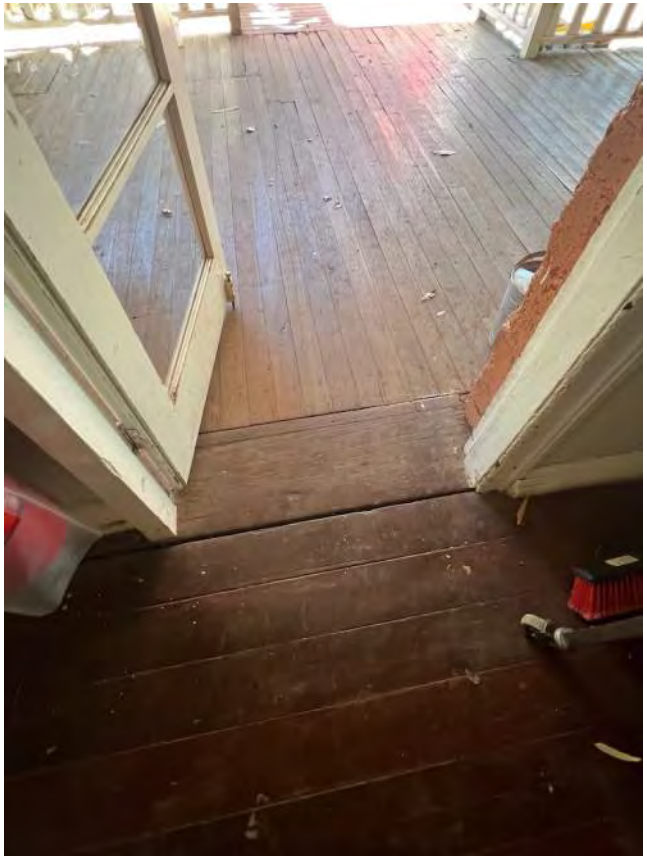




Interior of the original section (east)




Interiors of the service end of the original section (east end)






Threshold on south side shwoing original interiro floors nad new veranda timbers, the 1920s tmiber addition on the west end, abutting the 1920 brithe oriugnal 1920 brick, and view to the west of the south front reconstructed veranda.



Interior of the 1920s timber addition shing (right) the west wall of the original build.





West end of the south veranda accessing the west veranda, and views along the reconstructed north veranda.

5.2 LEVELS OF SIGNIFICANCE

No development or works should adversely impact on the setting or aspect of the place.
The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, scale and layout (1920- masonry and 1920s timber builds)
- Roof geometry & chimneys
- External face brick walls (1920)
- Timber construction and weatherboard cladding (1920s)
- Windows and doors (1920 and 1920s)
- Interior timber floors
- Fireplaces
- Ceiling (1920)

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- Roof cladding

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- Verandas- structure, timber floors, balustrades.
- Ceilings (not original)

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as an urgent matter.

3.4.1 Elements that are intrusive to the significance

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5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation: means all the processes of looking after a place to retain its cultural significance.

Restoration: means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction: means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.

Maintenance: means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to providing the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

Description of element	Rating	Condition	Conservation Works	Priority
Structure	B	No specific structural assessment has been undertaken by an Engineer. The building appears to be structurally sound.	Monitor the foundation cracks. Consider an Engineer if any significant movement becomes apparent.	1
Foundation and subfloor structure	B	The foundation and subfloor have not been investigated. The perimeter stumps visible along the north and west veranda evidence some are in good condition. There is no evidence of termite damage. Limestone foundation is evident around the northeast corner and under the veranda along the remainder of the north wall and about northwest corner.	Investigate the subfloor stone foundation and timber structures that are not accessible at this time. Remove earth build-up along the south wall and any underfloor ground build-up where possible. Restore/reconstruct damaged timbers as required. Termite treatment at the completion of the new works.	1

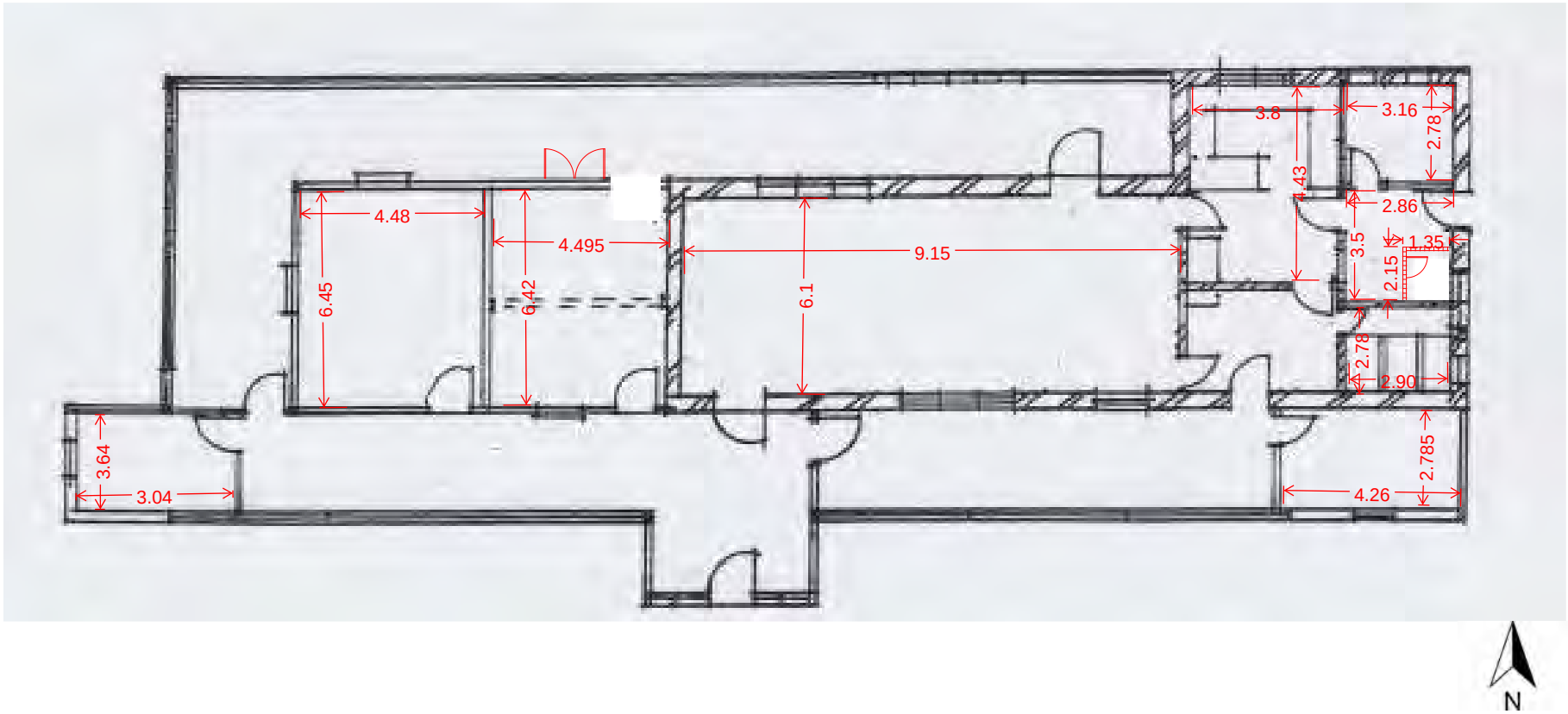
Roof structure and cladding	B?C	The roof has been replaced in recent years. From ground level view it appears to be in good condition. The roof structure is not visible. The face brick chimneys are in fair/good condition.	Inspect roof structure and cladding and action as required. Ensure roof is securely fixed. Restore/reconstruct any damaged roof timbers as required. Inspect flashings and fixing and restore as required. Restore the chimneys.	1
Roof plumbing/drainage	B/C	Gutters and downpipes are evident. Ground level discharge is inconsistent.	Inspect and undertake any works in response to ensuring the roof flashings and detailing, and the roof drainage system throughout is adequately discharging as necessary, with enough downpipes to discharge the catchment and direct away from the perimeter of the building. Roof drainage to be undertaken in conjunction with the ground level drainage requirements to ensure downpipes in appropriate locations, with correct gutter gradients. Gutters, downpipes and roof sheeting to be compatible materials.	1
Ground level drainage	D	There is no apparent drainage system at ground level, with lack of downpipes and no discharge outlet for the existing downpipes. The ground level is built up to the veranda edge of the south wall. Ground level drainage is critical to the stability of the building.	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.** The ground level should be graded away from the perimeter walls so that no run-off (south side) or erosion (north side) impacts the building. The south side ground level should allow for the stumps to be exposed and provide cross ventilation under the floor. Downpipes should connect to ground level or closed drains to discharge beyond the building perimeter. On the north side and part of the sloping sides, the erosion requires backfill of earth where eroded.	1
Verandas	B	The original veranda is open across the centre front (south) and most of the north and west sides. The north and west verandas are elevated with timber balustrades and staircase on the north side. The non-original timber floors are in good condition, the balustrade shows some weathering, as do the stairs.	Restore timber elements, including the staircase.	3

External walls	B	The external original face brick walls of the east end of the building are in good condition on the south wall. The east wall and return section on the north are dace brick in fair condition with eroded bricks and mortar and interventions. The south 'frontage' of the original brick sections has been painted. The west end of the building is clad with painted weatherboards in good condition.	Restore the east wall, and the remainder as may be required.	3/4
Doors and windows	B	Timber framing reveals some weathering and flaked paint.	Restore as required.	3
Interior				
Floors	A/B	The timber floors are in good condition. The subfloor elements were not inspected.	Restore as required.	4
Walls	B	The hard plaster walls are mostly in good condition with minimal evidence of cracking and no moisture damage evident.	Monitor any cracks and moisture damage. **After the roof and ground level drainage is attentioned:** Restore walls as required.	2
Ceilings	C	The original coved ceiling is detailed in painted mini-orb with a central hexagonal roof vent. The ceiling shows some rust and loose sheeting.	Restore the ripple iron and pressed metal ceilings by specialist conservation contractors.	1
Detailing: doors, frames, windows, architraves & skirtings, fire-surrounds and mantelpieces, and other elements.	A/B	Timber elements and detailing are in good condition.	Restore/reconstruct as required.	3

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN

APPENDIX 9

ROSEMARY COTTAGE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care



5.5 MAINTENANCE SCHEDULE

APPENDIX 9

ROSEMARY COTTAGE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

Proposal

for an

Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place
Check roof discharge and **ground drainage**
Monitor any problem areas
Ensure security is maintained

Monthly

Check gutters and downpipes
Monitor any water penetration
Attend to any works arising from the inspections

Annually

Termite inspection and treatment
Roof inspection and repair as required
Inspect and assess structural adequacy
Inspect paint work throughout
Inspect floor surfaces and repair as required

APPENDIX 9

ROSEMARY COTTAGE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

APPENDIX 10

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

BLUE COTTAGE



5.1 PHOTOGRAPHIC RECORD	Page 2
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5.1 PHOTOGRAPHIC RECORD



Views showing east elevation, front coner looking to northeast, view shoing the notrh side, and rear view showing the freestanding toilet.






View to northwest, detail of earth build up at southeast corner, roof tiles dislodged at northeast corner and chimney detail.








Views of the north wall showing extensive termite damage, including to the window frame at the west end of the wall.







View of extensive termite damage to the window frame at the west end of the north wall, wall damage detail, stump on the north side, and dowpipe erosion on the northwest corner.





View of extensive termite damage on the front veranda deck, weathered front (west) door, and view through a south window to the interiror of the north wall.

5.2 LEVELS OF SIGNIFICANCE

The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, scale and layout (1923)
- Roof geometry, clay tiles & chimney
- Timber frame, weatherboard cladding and timber floors
- Fireplaces

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.

- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- Front veranda

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- Skillion addition at the rear
- Freestanding toilet

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as urgent.
- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.

- There are no elements that are intrusive to the significance.

5.3 BUILDING CONDITION REPORT & CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation:	means all the processes of looking after a place to retain its cultural significance.
Restoration:	means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction: means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.

Maintenance: means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

Description of element	Rating	Condition	Conservation Works	Priority
Structure	C/D	No specific structural assessment has been undertaken by an Engineer. The structural adequacy of the timber frame is at risk due to termite damage that is visibly evident on the north wall, and the west front veranda. An inspection would likely reveal more extensive termite damage to the roof, walls and subfloor timber structures.	Undertake urgent works to stabilise structure. Reconstruction of some timber framework will be necessary.	1
Foundation and subfloor structure	B/C	The foundation and subfloor have not been investigated. The perimeter stumps visible along the north wall evidence some termite damage. The south wall stumps are not visible as they are below ground level.	Investigate the subfloor timber structures that are not accessible at this time. Remove earth build-up along the south wall and any underfloor ground build-up where possible. Restore/reconstruct damaged timbers as required. Termite treatment to that the completion of the new works.	1
Roof structure and cladding	B/D	From ground level the clay tiles roof appears to be in fair condition. (1982 replacement) The roof structure is not visible, however, sagging on the south side of the roof and the misalignment of the roof tiles in the northeast corner suggest issues with the timber roof structure. The rear lean-to addition has a corrugated iron clad skillion roof. The face brick chimney is in fair condition.	Inspect roof structure and tiles and action as required. Restore/reconstruct damaged roof timbers as required. Replace any obvious damaged roof tiles after the structure has been attentioned. Inspect flashings and fixings particularly the chimney. Restore/reconstruct chimney flashing.	1
Roof plumbing/drainage	B/D	Gutters are evident along the north and south sides, and across the rear (east) of the skillion roof.	Inspect and undertake any works in response to ensuring the roof drainage system throughout is adequately discharging as necessary, away from the perimeter of the building.	1

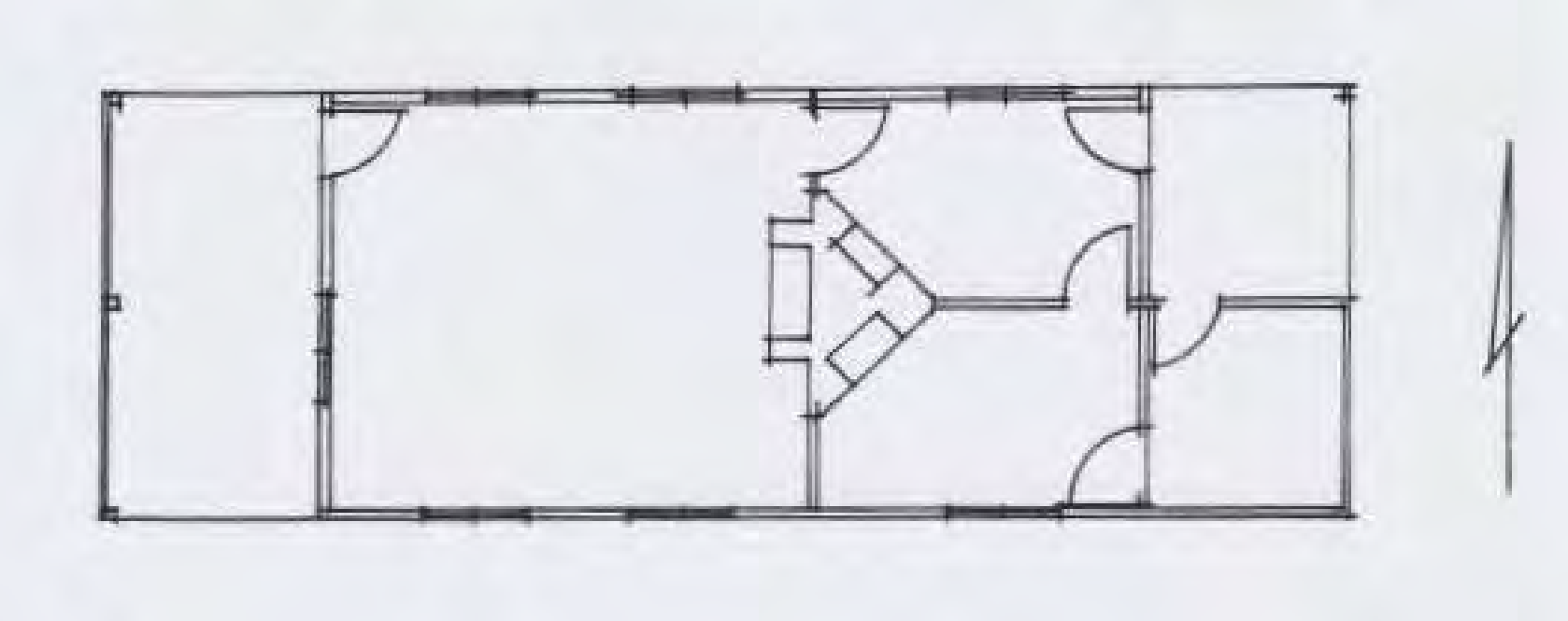
		The north and south gutters have gutter guards, although leaf build-up is evident. The north gutter appears to sag in the centre, not providing correct gradient to the only downpipe at the west end. There is only one downpipe off the main roof, located on the northwest corner of the north side. There are no downpipes off the south gutter. There is a downpipe in the northeast corner of the skillion roof. Ground level discharge is inconsistent.	Ensure the gutters are adequate for their function, with downpipes at the east and west ends of both side gutters (north and south). Ensure appropriate gradients to the outlets at each end. Install downpipes at both ends of both side gutters. Gutters and downpipes to be compatible materials. Roof drainage to be undertaken in conjunctions with the ground level drainage requirements.	
Ground level drainage	D	There is no apparent drainage system at ground level, with lack of downpipes and no discharge outlet for the two existing downpipes. The ground level is built up to the lower edge of the south wall and erodes on the southeast corner, and there is erosion at the discharge of the downpipe on the northwest corner. Ground level drainage is critical to the stability of the building and the authentic fabric of the place overall.	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.** The ground level should be graded away from the perimeter walls so that no run-off (south side) or erosion (north side) impacts the building. Install drainage systems along the north and south sides. The south side requires an ag drain parallel with the wall, extending past the length of the building, with the ground level grades down away from the wall to the ag drain. The ground level should allow for the stumps to be exposed and provide cross ventilation under the floor. Downpipes should connect to ground level – or closed drains to discharge beyond the building perimeter on the south side. On the north side, the erosion particularly at the west end requires backfill of earth, an even level along the wall, graded down to a spoon drain along the length of the wall for the runoff to drain away without erosion along that wall.	1
Veranda	D/E	The veranda is unstable and unable to be utilised due to extensive termite damage.	Reconstruct the veranda utilising hardwood timbers. Take the opportunity to reinstate the original skillion roof over the veranda deck (as evidenced in 1999 report), although lattice not necessary.	1
External walls	C/E	The external painted weatherboard walls seem to be in fair condition on the south and front (west) sides, but evidence irretrievable termite damage on the north wall.	**After the structural framework has been attentioned, and the roof and ground level drainage are attentioned:** Restore where possible and reconstruct as necessary (most of north wall), with hardwood weatherboards to match existing. If match not possible, restore the south and west walls with salvageable remnants from the north wall and	1

			reconstruct the north wall completely with a profile as similar as possible to the original. Restoration includes appropriate paint removal, and preparation and repainting of timber elements.	
Doors and windows	C/E	Timber framing reveals some weathering and flaked paint and is mostly in fair condition except the north wall window framing and the front door. The western most window on the north wall evidences extensive termite damage. .	Restore timber framing throughout, reconstruct elements as required (window on north wall). Restore front door. Restoration includes appropriate paint removal, and preparation and repainting.	1
Interior		THE COTTAGE WAS INACCESSIBLE. Viewed through a window on the south side.		
Floors	A/B	The timber floors appear to be undamaged but given the extent of termite damage to the walls, veranda deck and some stumps, it is likely the floor or subfloor may be damaged. The subfloor elements were not inspected.	Investigate floors and subfloor for structural and termite damage. Restore/reconstruct as required.	1
Walls Framing & cladding	B/D	The framing is not visible. The flat sheet wall cladding appears to be undamaged. Given the extent of termite damage to the walls, veranda deck and some stumps, it is likely the walls are affected, particularly the north wall.	Restore/reconstruct as required.	1
Ceilings		No viewed. Given the possible termite damage to the roof structure, walls, the ceilings may be affected.	Restore/reconstruct as required.	2/3
Detailing: doors, frames, windows, architraves & skirtings, and other elements.	A/B	Timber elements and detailing were not viewed. Given the extent of termite damage to the walls, veranda deck and some stumps, the timber detailing may be affected. The face brick fireplace in west room (only one visible) appears to be in good condition.	Restore/reconstruct as required.	2/3

5.4 SKETCH FLOOR PLAN & PHOTO from 1991 CONSERVATION MANAGEMENT PLAN

APPENDIX 10

Blue Cottage
CONSERVATION MANAGEMENT STRATEGY
Parkerville



5.5 MAINTENANCE SCHEDULE

APPENDIX 10

Blue Cottage
CONSERVATION MANAGEMENT STRATEGY
Parkerville

Proposal

for an

Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place
Check roof discharge and **ground drainage**
Monitor any problem areas
Ensure security is maintained

Monthly

Check gutters and downpipes
Monitor any water penetration
Attend to any works arising from the inspections

Annually

Termite inspection and treatment
Roof inspection and repair as required
Inspect and assess structural adequacy
Inspect paint work throughout
Inspect floor surfaces and repair as required

APPENDIX 10

Blue Cottage
CONSERVATION MANAGEMENT STRATEGY
Parkerville

APPENDIX 11

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

WATTLE COTTAGE



5.1 PHOTOGRAPHIC RECORD Page 2

5.2 LEVELS OF SIGNIFICANCE Page

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS Page

5.4 SKETCH FLOOR PLAN & PHOTO from 1991 CONSERVATION MANAGEMENT PLAN Page 12

5.5 MAINTENANCE SCHEDULE Page 27

5.1 PHOTOGRAPHIC RECORD





Views looking north showing the south frontage.





Views looking northwest across the south frontage, part of the east end, and a view of the east end.





East elevation and north elevation showing the collapsed veranda.



North frontage showing collapsed veranda.





North frontage showing collapsed veranda and chimney.





Views of the west end.

5.2 LEVELS OF SIGNIFICANCE

The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, scale and layout (1930)
- Roof geometry & chimneys
- External weatherboard walls (1930)
- Veranda south (1930)
- Windows and doors (1930)
- Interior fabric and fittings (not viewed) (1930)

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- North veranda
- Corrugated iron roof cladding

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- Ablution additions (1953, 1963) at northwest and southwest corners.

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as an urgent matter.

3.4.1 Elements that are intrusive to the significance

- There are no elements intrusive to the significance of the place

5.3 BUILDING CONDITION REPORT & CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation: means all the processes of looking after a place to retain its cultural significance.

Restoration: means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction: means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.

Maintenance: means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to providing the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

THE BUILDING IS FENCED AND INACCESSIBLE DUE TO EXTENSIVE DAMAGE. NO INTERIOR OR CLOSE INSPECTION WAS UNDERTAKEN.

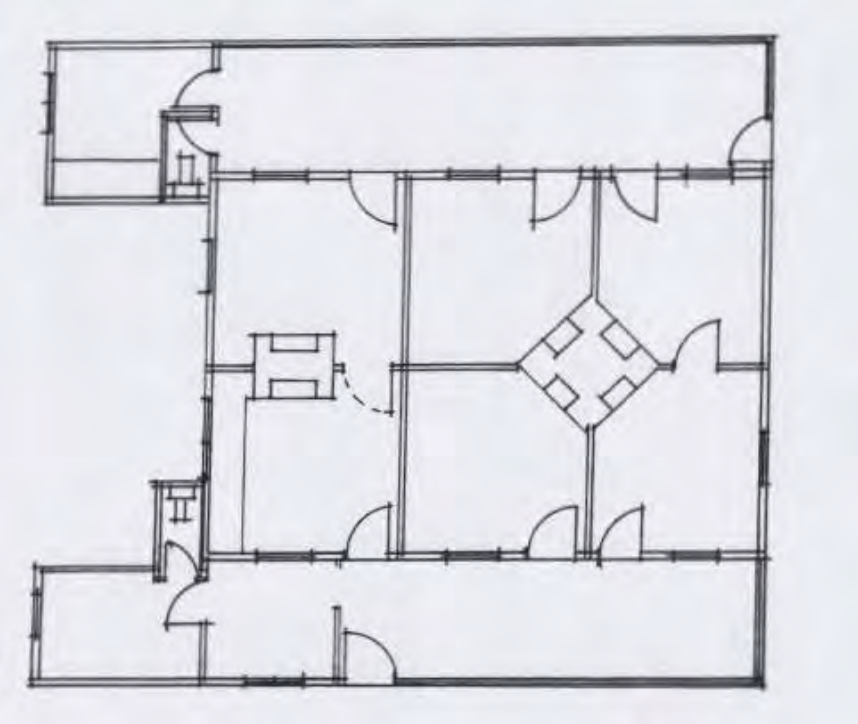
It is possible that the place is irretrievably deteriorated damaged and conservation may not be viable outcome for part or all of the building

Description of element	Rating	Condition	Conservation Works	Priority
Structure	C/E	No specific structural assessment has been undertaken by an Engineer. There is termite damage, the collapse of the roof structure of north veranda, and damage and deterioration to the veranda floor and sub	Engage a structural engineer to determine the structural integrity of the building. Review the outcome of the Engineer's report in association with a Conservation consultant. If conservation is achievable, undertake urgent works to stabilise structure. Reconstruction of some elements will be necessary.	1

		structure, and, removal of the enclosure to the south veranda. .		
Foundation and subfloor structure	C/E	The foundation and subfloor have not been investigated. The perimeter stumps visible along the north edge of the north veranda evidence subsidence, weathering and termite damage. No other areas are visible.	Investigate the subfloor timber structures that are not accessible at this time. Restore/reconstruct damaged timbers as required. Termite treatment to that the completion of the new works.	1
Roof structure and cladding	B/D	From ground level the corrugated iron roof over the main part of the building appears intact, although rusted. The north veranda roof has collapsed. The face brick chimneys appear to be in fair/good condition.	Inspect roof structure and cladding and action as required. Restore/reconstruct damaged roof timbers as required. Reconstruct the roof with corrugated galvanised sheeting- short sheets preferred. Inspect flashings and fixings particularly the chimneys and restore/reconstruct as required.	1
Roof plumbing/drainage	E	Remnants of gutters and downpipes are evident. They are irretrievable.	In association with the roof cladding reconstruction, install gutters in Ogee profile and round galvanized downpipes to maximise roof catchment and disposal. All roof and roof plumbing to be compatible in galvanized material. Roof drainage to be undertaken in conjunction with the ground level drainage requirements.	1
Ground level drainage	D	There is no apparent drainage system at ground level. The ground level is built up to the lower edge of the south wall and erodes along the north wall.	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.** The ground level should be graded away from the perimeter walls so that no run-off (south side) or erosion (north side) impacts the building. Install drainage systems along the north and south sides. The south side requires an ag drain parallel with the wall, extending past the length of the building, with the ground level grades down away from the wall to the ag drain. The ground level should allow for the stumps to be exposed and provide cross ventilation under the floor. Downpipes should connect to	1

			ground level – or closed drains to discharge beyond the building perimeter on the south side. On the north side backfill for even level along the wall, graded down to a spoon drain along the length of the wall for the runoff to drain away without erosion along that wall.	
Veranda	D/E	The veranda is unstable and unable to be utilised due to collapse and extensive termite damage.	Reconstruct the open veranda utilising hardwood timbers.	1
External walls	B/D	The external painted weatherboard walls seem to be in fair condition although more weathered on the west end of the north wall where its been exposed due to the veranda collapse. The additions in the northwest and southwest corners are likely lined with Asbestos. The Asbestos evidences some damage.	**After the structural framework has been attentioned, and the roof and ground level drainage are attentioned:** Restore the weatherboards where possible and reconstruct as necessary. Remove the Asbestos in compliance with all health and safety requirements. Reclad with flat sheet if the additions deemed necessary for the future of the cottage. Restoration includes appropriate paint removal, and preparation and repainting of timber elements.	1
Doors and windows	C/E	Timber framing reveals some weathering and flaked paint and is mostly in fair condition except the north wall that is more deteriorated.	Restore timber framing throughout, reconstruct elements as required (window on north wall). Restore front door. Restoration includes appropriate paint removal, and preparation and repainting.	1
Interior		The cottage was inaccessible.		

5.4 SKETCH FLOOR PLAN & PHOTO from 1991 CONSERVATION MANAGEMENT PLAN







APPENDIX 11

WATTLE COTTAGE

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children & Youth Care

5.5 MAINTENANCE SCHEDULE

Proposal
for an
Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place
Check roof discharge and **ground drainage**
Monitor any problem areas
Ensure security is maintained

Monthly

Check gutters and downpipes
Monitor any water penetration
Attend to any works arising from the inspections

Annually

Termite inspection and treatment
Roof inspection and repair as required
Inspect and assess structural adequacy
Inspect paint work throughout
Inspect floor surfaces and repair as required

APPENDIX 11

WATTLE COTTAGE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

APPENDIX 12

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

GEORGE TURNER COTTAGE



5.1 PHOTOGRAPHIC RECORD Page 2

5.2 LEVELS OF SIGNIFICANCE Page 13

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS Page 15

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN Page 19

5.5 MAINTENANCE SCHEDULE Page 20

5.1 PHOTOGRAPHIC RECORD





View looking to southwest showing the south side, and view to the southeast, showing the east facing frontage with the bay window.





View looking to northwest showing the expansive north side with veranda enclosure, and the similar south side with full enclosure on the southwest corner.







View looking to north along west wall, and the west corner of the south wall showing damage and drainage detail.





View looking to west along the south wall, the northeast corner showing drainage detail, and view showing the eaves and gable detail of the bay window on the east frontage.









Details of window sill on the bay window, and the floor at the entry door, both on the east frontage, drainage detail on north west corner, and a view of the underfloor structure.





Interior views of the French door access off the south enclosed veranda into the main house and view east to the front form those doors.

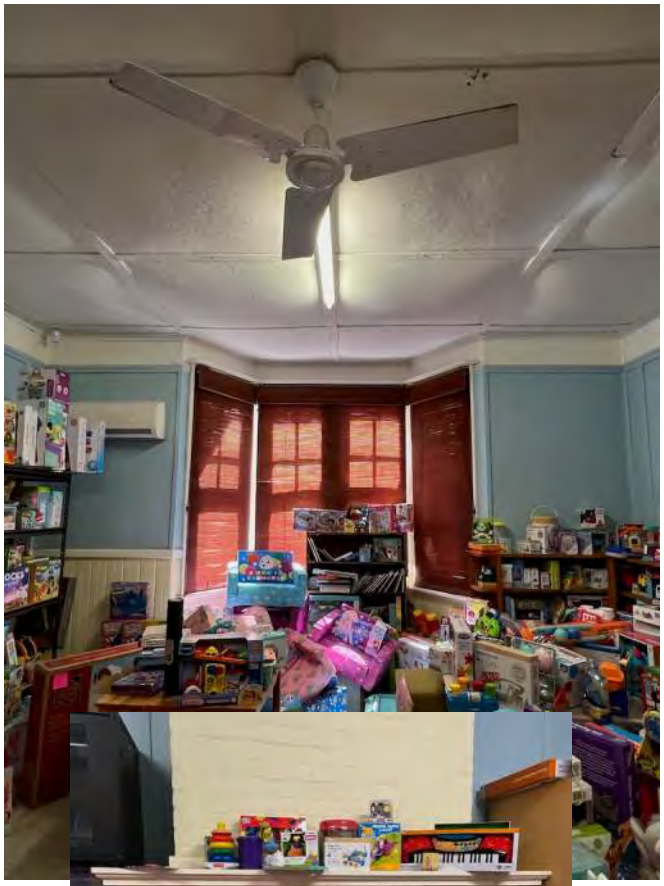


Interior views of the south west corner (looking to the west) showing damage to the raked ceiling.





Interior views of the original northeast corner room with veranda enclosure (east wall with louvred windows) and wall removal to the east, and ceiling damage.









Interior views of the main east room, showing the dado wall, fireplace and mantle, and original paneled door (1930s)









Interior views of the northwest corner room showing double (French) doors onto the north veranda; and a view to the north along the west veranda and showing damage to the Asbestos dado wall. door (1930s)



Veranda views of the northwest corner room and along the west wall to the southwest corner and the laundry in that location, against the south wall.

5.2 LEVELS OF SIGNIFICANCE

The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, scale and layout (1929)
- Gabled bay window feature
- Roof geometry & chimney
- Timber frame, weatherboard cladding and timber floors
- Interior dado walls
- Fireplaces

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.

- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- Veranda enclosures (1954)
- Ceilings

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- Metal deck roof cladding

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as urgent.
- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
    - Remove damaged Asbestos elements.

5.3 BUILDING CONDITION REPORT & CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation:	means all the processes of looking after a place to retain its cultural significance.

Restoration: means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction: means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.

Maintenance: means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

Description of element	Rating	Condition	Conservation Works	Priority
Structure	B	No specific structural assessment has been undertaken by an Engineer. The structural adequacy of the timber frame appears to be intact with no obvious termite or other damage.	Inspect and review, restore as required. Undertake termite inspection and treatment as ongoing maintenance requirement.	3
Foundation and subfloor structure	B	The foundation and subfloor have not been investigated. From an external view, the subfloor structure and stumps appear to be in good condition.	Investigate the subfloor timber structures that are not accessible at this time. Restore/reconstruct damaged timbers as required.	3
Roof structure and cladding	B	The roof has been replaced in recent years. From ground level view it appears to be in good condition. The roof structure is not visible. The face brick chimney is in fair/good condition.	Inspect roof structure and cladding and action as required. Ensure roof is securely fixed. Restore/reconstruct any damaged roof timbers as required. Inspect flashings and fixing and restore as required.	2
Roof plumbing/drainage	B/C	Gutters are evident around the perimeter. Downpipes seem adequate, although ground level discharge is eroding the outlet areas. Ground level discharge is inconsistent.	Inspect and undertake any works in response to ensuring the roof drainage system throughout is adequately discharging as necessary, with enough downpipes to discharge the catchment, and direct away from the perimeter of the building. Roof drainage to be undertaken in conjunction with the ground level drainage requirements.	1
Ground level drainage	D	There is no drainage system at ground level, with lack of discharge outlets directing the discharge away from the perimeter of the building in regard	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.**	1

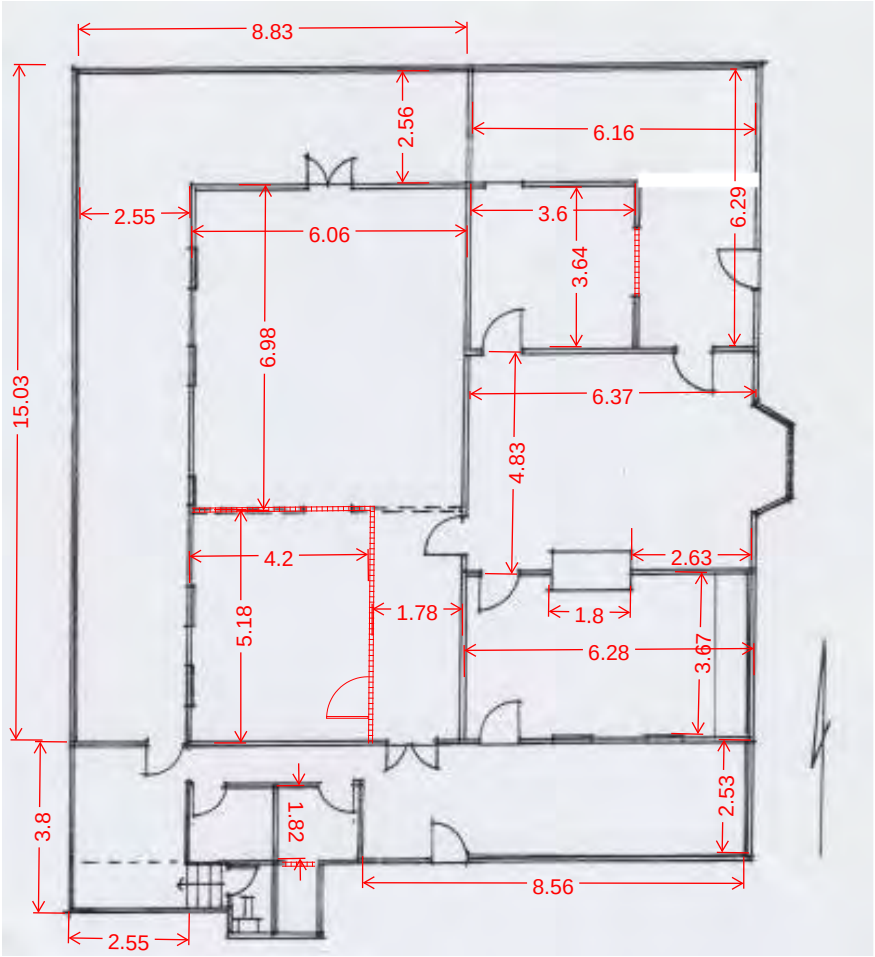
		to the fall of the land. That causes buildup of the earth level and moisture on the south side and runoff erosion on the sloping sides at the west and east, and along the north side. Ground level drainage is critical to the stability of the building.	The ground level should be graded away from the perimeter of the building so that no run-off (south side) or erosion (north side) impacts the building. The south side ground level should allow for the stumps to be exposed and provide cross ventilation under the floor. Downpipes should connect to ground level or closed drains to discharge beyond the building perimeter. On the north side and part of the sloping sides, the erosion requires backfill of earth where eroded.	
External walls	B/C	The external painted walls of painted weatherboard with louvred windows above, to the entire north and west sides and part south and the east frontage that has a central gable, seem to be in fair condition with some damage evident about the southwest corner.	Restore where required. Restoration includes appropriate paint removal, and preparation and repainting of timber elements.	1
Doors and windows	C	Timber framing reveals some weathering and flaked paint and is mostly in fair condition.	Restore timber framing throughout. Restoration includes appropriate paint removal, and preparation and repainting.	1
Interior				
Floors	A/B	The timber floors appear to be solid and in fair/good condition. The veranda floors have some damage along the external perimeter the exposed area at the main front entry the worst. The subfloor elements were not inspected.	Investigate floors and subfloor for structural and termite damage. Restore/reconstruct as required.	1
Walls Framing & cladding	B/D	The framing is not visible. The main section of the building has painted vertical tongue and groove timber dados with flat sheet lining above to the interior walls. The original exterior walls that are now enclosed (and protected) by the external enclosures, have flat sheet dados with timber framed glass louvred windows above. The flat sheet wall cladding (Asbestos) is mostly undamaged except for damage on the west wall.	Restore/reconstruct as required. Remove the damaged Asbestos in compliance with all health and safety requirements.	1
Ceilings		No viewed. Given the possible termite damage to the roof structure, walls, the ceilings may be affected.	Restore/reconstruct as required.	2/3

Detailing: doors, frames, windows, architraves & skirtings, and other elements.	A/B	Timber elements and detailing, and painted face brick fireplaces are in good condition.	Restore/reconstruct as required.	2/3

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN

APPENDIX 12

GEORGE TURNER COTTAGE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care



5.5 MAINTENANCE SCHEDULE

APPENDIX 12

GEORGE TURNER COTTAGE
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

Proposal

for an

Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place

Check roof discharge and **ground drainage**

Monitor any problem areas

Ensure security is maintained

Monthly

Check gutters and downpipes

Monitor any water penetration

Attend to any works arising from the inspections

Annually

Termite inspection and treatment

Roof inspection and repair as required

Inspect and assess structural adequacy

Inspect paint work throughout

Inspect floor surfaces and repair as required

APPENDIX 13

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

KINDERGARTEN (former)



5.1 PHOTOGRAPHIC RECORD Page 2

5.2 LEVELS OF SIGNIFICANCE Page 7

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS Page 10

5.4 SKETCH FLOOR PLAN & PHOTO from 1991 CONSERVATION MANAGEMENT PLAN Page 14

5.5 MAINTENANCE SCHEDULE Page 15

5.1 PHOTOGRAPHIC RECORD





South frontage views.





Views of the southeast corner front, and northeast corner.



Views of the north wall showing the c.1913 east end, detail of the roof between the c.1913 and c.1904 (right), and the north entry central on the enclosed veranda of the c.1904 section.





Views of the north wall showing the c.1952 Asbestos ablutions (right- west end)





West elevation and view looking north showing the west end c.1952 Asbestos ablutions.

5.2 LEVELS OF SIGNIFICANCE

The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, scale and layout (c.1904, c.1913)
- Roof cladding – short sheets corrugated iron
- Roof geometry & chimney
- Timber structure
- External weatherboard walls
- Interior timber dados, walls above dado and ceilings
- Enclosed verandas-north south (1913, c.1932)

- Windows and doors (c.1913, c.1932)
- Timber floors (interiors and verandas)
- Fireplace, stove
- Timber detailing, fixtures, fittings (c.1913, c.1932)

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- The original form and layout (c.1932 addition to west end of south side. (c.1913)
- 1950's Asbestos additions (relevant due to making the place viable with the ablution facilities)

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- Ceilings (not original)

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as an urgent matter.

3.4.1 Elements that are intrusive to the significance

- 1950's Asbestos additions
- Termite damaged and deteriorated elements of the ruinous north veranda

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation: means all the processes of looking after a place to retain its cultural significance.

Restoration: means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction: means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.

Maintenance: means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to providing the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

THE BUILDING IS FENCED AND INACCESSIBLE DUE TO EXTENSIVE DAMAGE. NO INTERIOR OR CLOSE INSPECTION WAS UNDERTAKEN.

It is possible that the place is irretrievably deteriorated damaged, and conservation may not be viable outcome for part or all of the building

Description of element	Rating	Condition	Conservation Works	Priority
Structure	C/E	No specific structural assessment has been undertaken by an Engineer. There is termite damage, the collapse of the structure of north veranda, and damage and deterioration to the veranda floor and sub	Engage a structural engineer to determine the structural integrity of the building. Review the outcome of the Engineer's report in association with a Conservation consultant. If conservation is achievable, undertake urgent works to stabilise structure. Reconstruction of some elements will be necessary.	1

		structure, and removal of the enclosure to the south veranda.		
Foundation and subfloor structure	C/E	The foundation and subfloor have not been investigated. The perimeter stumps visible along the north edge of the north veranda evidence subsidence, weathering and termite damage. No other areas are visible.	Investigate the subfloor timber structures that are not accessible at this time. Restore/reconstruct damaged timbers as required. Termite treatment to that the completion of the new works.	1
Roof structure and cladding	B/D	From ground level the corrugated iron roof over the main part of the building appears intact, although rusted. The north veranda roof has collapsed. The face brick chimneys appear to be in fair/good condition.	Inspect roof structure and cladding and action as required. Restore/reconstruct damaged roof timbers as required. Reconstruct the roof with corrugated galvanised sheeting- short sheets preferred. Inspect flashings and fixings particularly the chimneys and restore/reconstruct as required.	1
Roof plumbing/drainage	E	Remnants of gutters and downpipes are evident. They are irretrievable.	In association with the roof cladding reconstruction, install gutters in Ogee profile and round galvanized downpipes to maximise roof catchment and disposal. All roof and roof plumbing to be compatible in galvanized material. Roof drainage to be undertaken in conjunction with the ground level drainage requirements.	1
Ground level drainage	D	There is no apparent drainage system at ground level. The ground level is built up to the lower edge of the south wall and erodes along the north wall.	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.** The ground level should be graded away from the perimeter walls so that no run-off (south side) or erosion (north side) impacts the building. Install drainage systems along the north and south sides. The south side requires an ag drain parallel with the wall, extending past the length of the building, with the ground level grades down away from the wall to the ag drain. The ground level should allow for the stumps to be exposed and provide cross ventilation under the floor. Downpipes should connect to	1

			ground level – or closed drains to discharge beyond the building perimeter on the south side. On the north side backfill for even level along the wall, graded down to a spoon drain along the length of the wall for the runoff to drain away without erosion along that wall.	
Veranda	D/E	The veranda is unstable and unable to be utilised due to collapse and extensive termite damage.	Reconstruct the open veranda utilising hardwood timbers.	1
External walls	B/D	The external painted weatherboard walls seem to be in fair condition although more weathered on the west end of the north wall where it's been exposed. The additions in the northwest and southwest corners are likely lined with Asbestos. The Asbestos evidences some damage.	**After the structural framework has been attentioned, and the roof and ground level drainage are attentioned:** Restore the weatherboards where possible and reconstruct as necessary. Remove the Asbestos in compliance with all health and safety requirements. Reclad with flat sheet if the additions deemed necessary for the future of the cottage. Restoration includes appropriate paint removal, and preparation and repainting of timber elements.	1
Doors and windows	C/E	Timber framing reveals some weathering and flaked paint and is mostly in fair condition except the north wall that is more deteriorated.	Restore timber framing throughout, reconstruct elements as required (window on north wall). Restore front door. Restoration includes appropriate paint removal, and preparation and repainting.	1
Interior		THE COTTAGE WAS INACCESSIBLE.		

5.4 SKETCH FLOOR PLAN & PHOTO from 1991 CONSERVATION MANAGEMENT PLAN

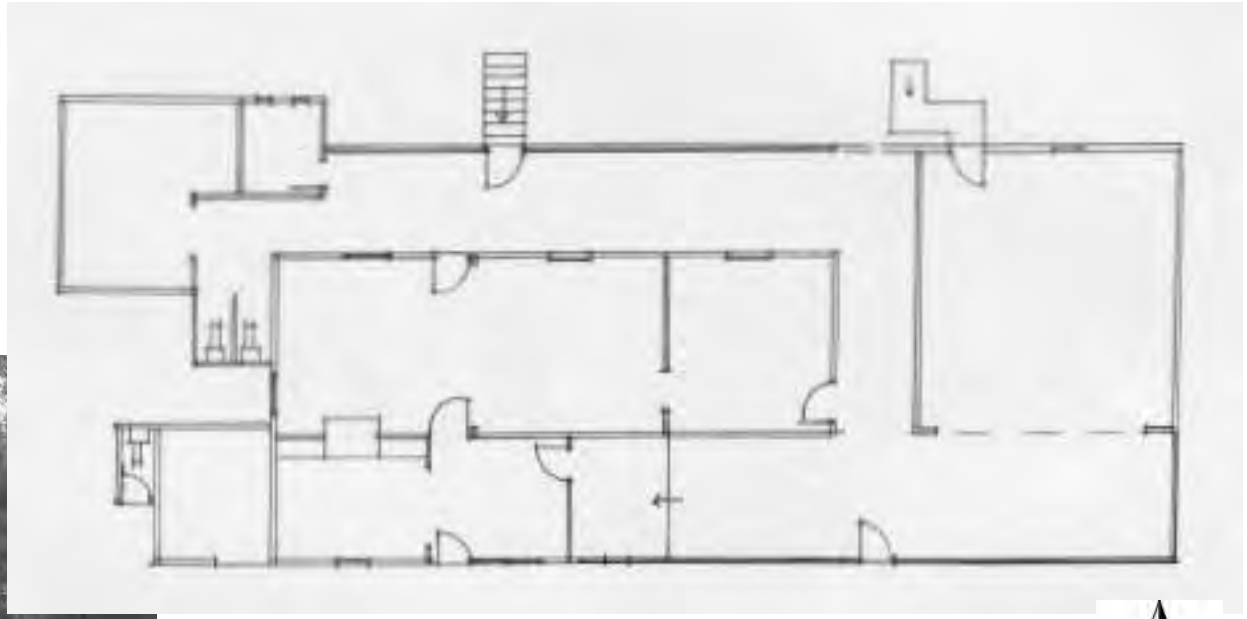




Photo extract from Conservation Management Plan 1991. View of the south frontage.

APPENDIX 13

KINDERGARTEN (former)
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

5.5 MAINTENANCE SCHEDULE

Proposal
for an
Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place
Check roof discharge and **ground drainage**
Monitor any problem areas
Ensure security is maintained

Monthly

Check gutters and downpipes
Monitor any water penetration
Attend to any works arising from the inspections

Annually

Termite inspection and treatment
Roof inspection and repair as required
Inspect and assess structural adequacy
Inspect paint work throughout
Inspect floor surfaces and repair as required

APPENDIX 13

KINDERGARTEN (former)
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

APPENDIX 14

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

WORTHINGTON HALL



5.1 PHOTOGRAPHIC RECORD Page 2

5.2 LEVELS OF SIGNIFICANCE Page 16

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS Page 19

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN Page 24

5.5 MAINTENANCE SCHEDULE Page 25

5.1 PHOTOGRAPHIC RECORD





The main entry on the north, and a view of the northwest corner.





Detail of the damage at main entry.





A view of the east side, and the northeast corner.





A view of the east side, and the northeast corner.





Southeast entry into the north wing hall, view looking to northwest.





View of the south end showing the cut across the south, view of the 1959 addition.





View of the south end, detail of the damp damage on south wall.





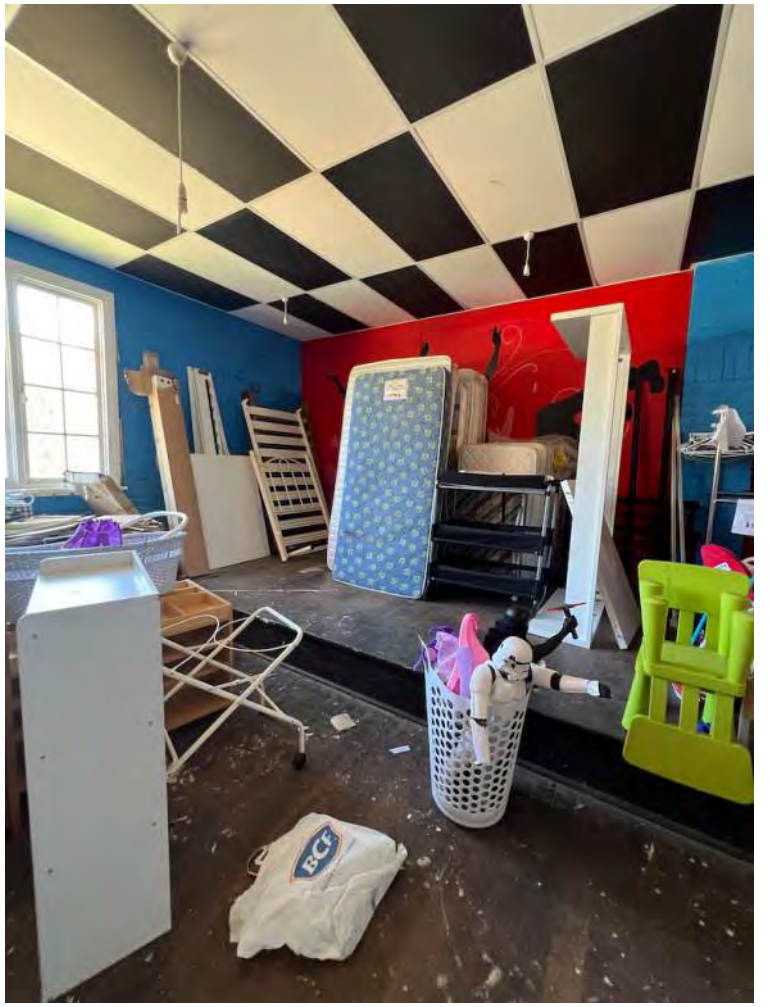
Views of the west side showing repairs to damp damage.





View of the south side on the west of the hall, typical window that shows cracking on north front.





Interior of hall looking to the west, and the northeast end (showing the stepped stage (right).

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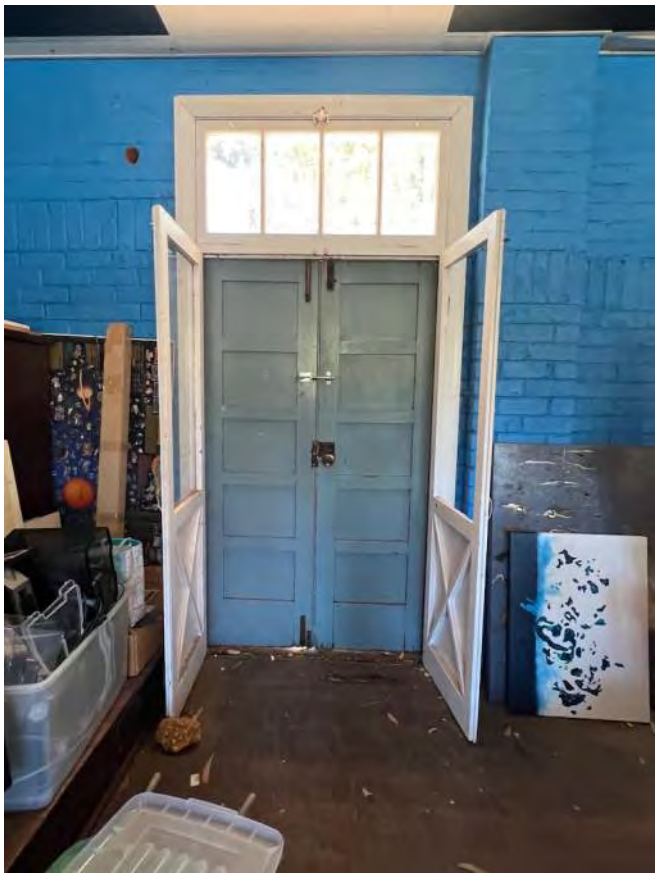
WORTHINGTON HALL
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care



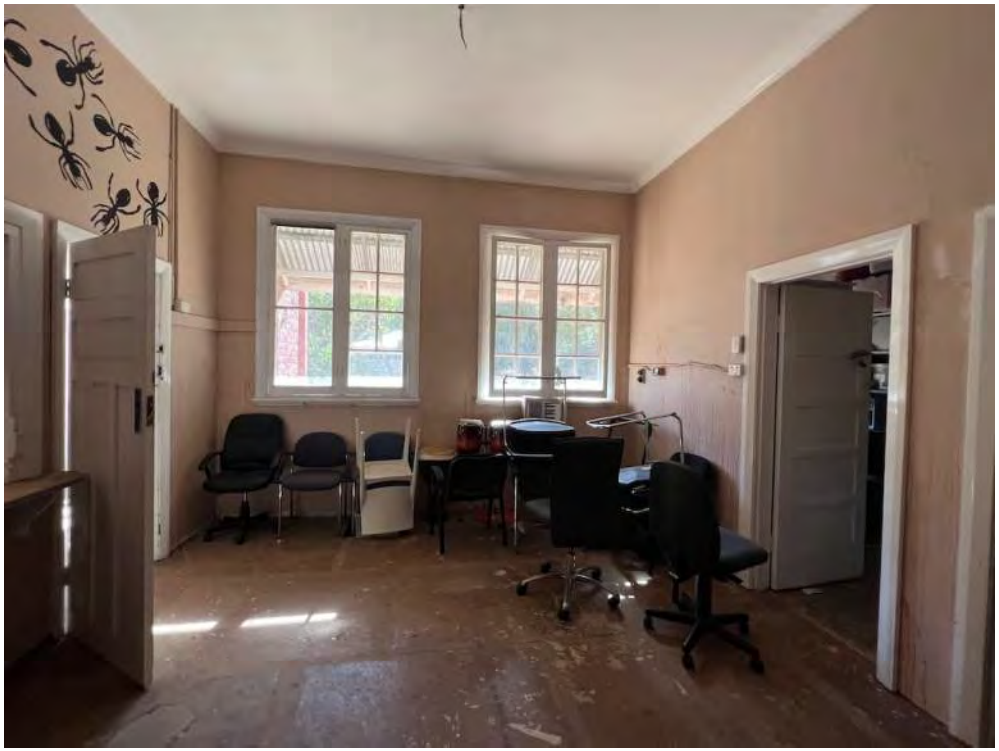


Interior of hall looking showing the exit door son to the south on at the east end of the hall, serving windows through to the rear corridor and kitchen, and the corridor looking to the kitchen.





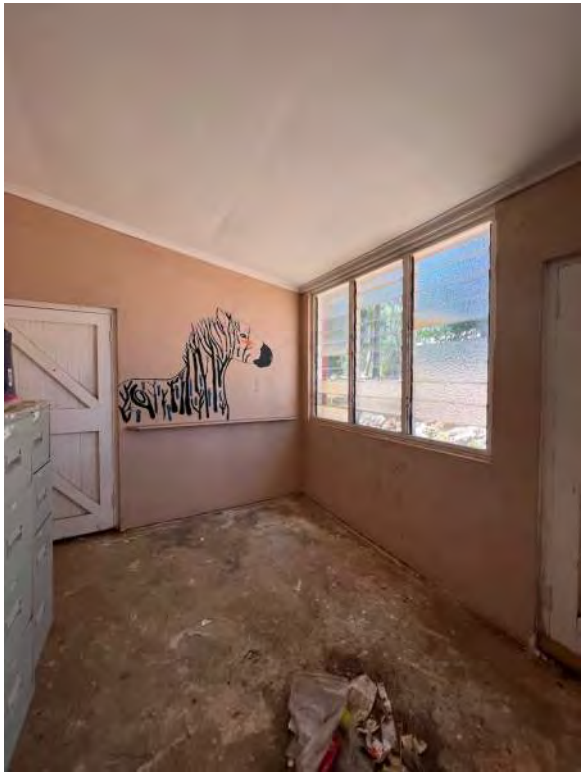
Interior views looking west along the corridor at the rear wall of the hall, the kitchen with the original ovens insitu.





Interior views of the kitchen looking to the east wall, and the north wall with the serving windows through to the corridor behind the hall.





Interior views of the west end partitioned from the Hall, exist doors to the south from the southwest corner of the hall, and the 1959 rear addition.

5.2 LEVELS OF SIGNIFICANCE

The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, fabric, scale and layout (1941)
- Roof geometry & chimneys
- External face brick walls
- The main entry porch and stairs (1941)
- Windows and doors (1941)
- Timber floors and stage
- Servery windows

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- Roof cladding
- Original insitu elements (ovens, cool room)

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

- Fireplace in the hall
- Ceilings (not original)
- Partition in the hall
- 1959 addition (due to dampness)

INTRUSIVE

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as an urgent matter.

3.4.1 Elements that are intrusive to the significance

- There are no elements that are intrusive to the significance of the place.

5.3 BUILDING CONDITION REPORT BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation:	means all the processes of looking after a place to retain its cultural significance.
Restoration:	means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.
Reconstruction:	means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.
Maintenance:	means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to providing the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

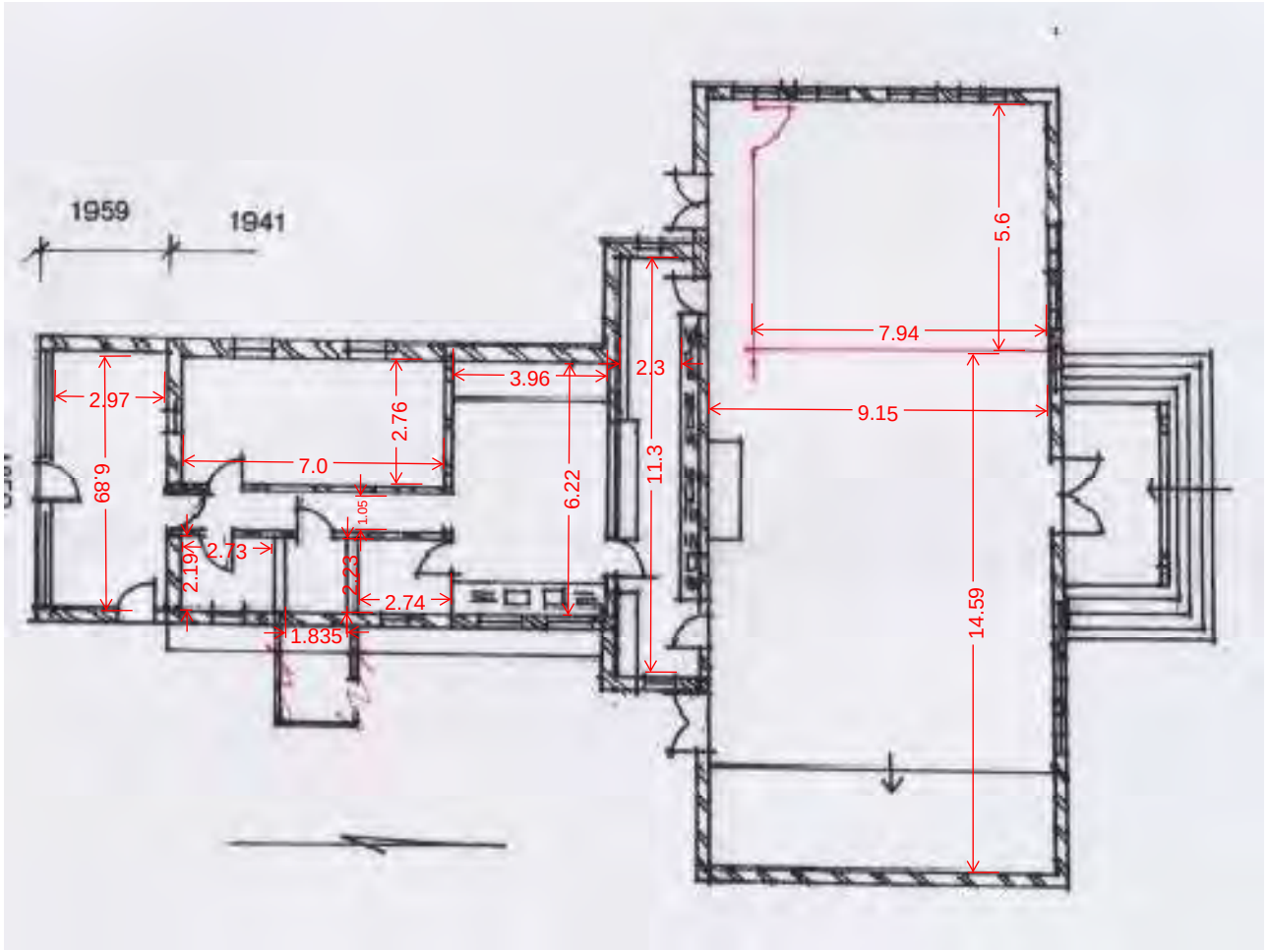
It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

Description of element	Rating	Condition	Conservation Works	Priority
Structure	B/C	No specific structural assessment has been undertaken by an Engineer. The masonry structure of the building appears to be structurally sound although there is cracking on the northeast and northwest front corners, and the lintel over the porch entry is unstable.	Action the reconstruction of the porch lintel. Monitor for future movement of the masonry structure. Consider an Engineer if any significant movement.	1
Foundation and subfloor structure	B/C	The foundation and subfloor have not been investigated.	Investigate the subfloor timber structures that are not accessible at this time. Inspect for termite activity/damage. Undertake any works necessary in response to recommendations arising from the termite inspection. Remove any underfloor ground build-up where possible. Restore/reconstruct damaged timbers as required. Effect sub floor ventilation where possible.	1
Roof structure and cladding	C	From ground level the long sheets of corrugated roof cladding appears to be in good condition. The tall chimneys appear to have weathered paint and possible eroded mortar.	Inspect roof structure and cladding and action as required. Ensure all sheets are fully secured. Inspect flashings and fixings. Undertake recommendations arising from structural investigations.	1
Roof plumbing/drainage	B/D	Gutters and downpipes are evident. Ground level discharge is inconsistent. The slope of the site and the cut and fill at the east end and along the west side evidences considerable moisture ingress due to lack of site drainage that expedites subsidence, cracking and damage.	Inspect and undertake any works in response to ensuring the roof drainage system throughout is adequately discharging as necessary, away from the perimeter of the building. Ensure all flashings and gutters are adequate for their function. Reconstruction of gutters and downpipes could provide an opportunity for the installation of oversize gutters and downpipes, and more downpipes to effectively discharge the roof rainfall, with closed drain system at ground level.	1

			Roof drainage to be undertaken in conjunctions with the ground level drainage requirements to ensure downpipes in appropriate locations, with correct gutter gradients.	
Ground level drainage	D	The perimeter walls of the building evidence the retention and subsequent moisture damage at ground levels of the wall, from downpipe discharge to the base of the building and runoff from the south, impacting the stability and fabric as evidenced by eroded bricks and mortar on the south and much of the west wall- also exacerbated by the plantings that shade the wall, restricting sunshine and airflow that dries the wall. The ground level drainage is critical to the stability of the buildings and the authentic fabric of the place overall.	Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building with particular attention to the ground levels and runoff impacting the south and west walls and erosion across the front (north). The ground level should be graded away from the perimeter wall so that no run-off impacts the building.	1
External walls	B/D	The external face brick walls are in fair condition except for the south end wall, and most of the west wall where moisture has impacted the lower levels of the walls. Intrusive mortar repairs exacerbate the problem. Cracking about the northwest and northeast front corners results from the ground level drainage issues. The lintel over the entry is in a dangerous condition.	Restore porch and lintel as a matter of urgency. **After the roof and ground level drainage is attentioned:** Restore the brick walls, repointing with high lime ration mortar colour tested prior to the works. No mechanical devices.	1 2
Doors and windows	B	Timber framing reveals s weathering and flaked paint.	Restore/reconstruct as required.	3
Interior				
Floors	A/B	The timber floors are in good condition. The concrete floor in the south end addition is damp. The subfloor elements were not inspected.	Restore/reconstruct as required.	4
Walls	B/C	The hard plaster walls are mostly in good condition with no evidence of cracking. Moisture damage is evident along the west wall behind the hall.	**After the roof and ground level drainage is attentioned:** Restore the cracked and moisture damaged walls by specialist conservation contractors.	2

Ceilings	A/C	Most ceilings throughout are not original and are in fair/ good condition. Suspended ceiling panels in the hall across the north frontage are in relatively good condition with a few panels dislodged.	Restore/reconstruct as required.	2/3
Detailing: doors, frames, windows, architraves & skirtings, fire-surrounds and mantelpieces, shelving, and other elements.	A/B	Timber elements and detailing are in good condition The original ovens remain insitu- likely not functional. The hall fireplace has been “decorated”.	Restore/reconstruct as required.	3

5.4 SKETCH FLOOR PLAN from 1991 CONSERVATION MANAGEMENT PLAN



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WORTHINGTON HALL

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children & Youth Care

5.5 MAINTENANCE SCHEDULE

Proposal
for an
Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place
Check roof discharge and **ground drainage**
Monitor any problem areas
Ensure security is maintained

Monthly

Check gutters and downpipes
Monitor any water penetration
Attend to any works arising from the inspections

Annually

Termite inspection and treatment
Roof inspection and repair as required
Inspect and assess structural adequacy
Inspect paint work throughout
Inspect floor surfaces and repair as required

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APPENDIX 15

CONSERVATION MANAGEMENT STRATEGY

Parkerville Children and Youth Care

PARKERVILLE

DIRECTOR'S RESIDENCE (former)



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5.4 MAINTENANCE SCHEDULE Page 12

5.1 PHOTOGRAPHIC RECORD





North (front) elevation and view to east corner.



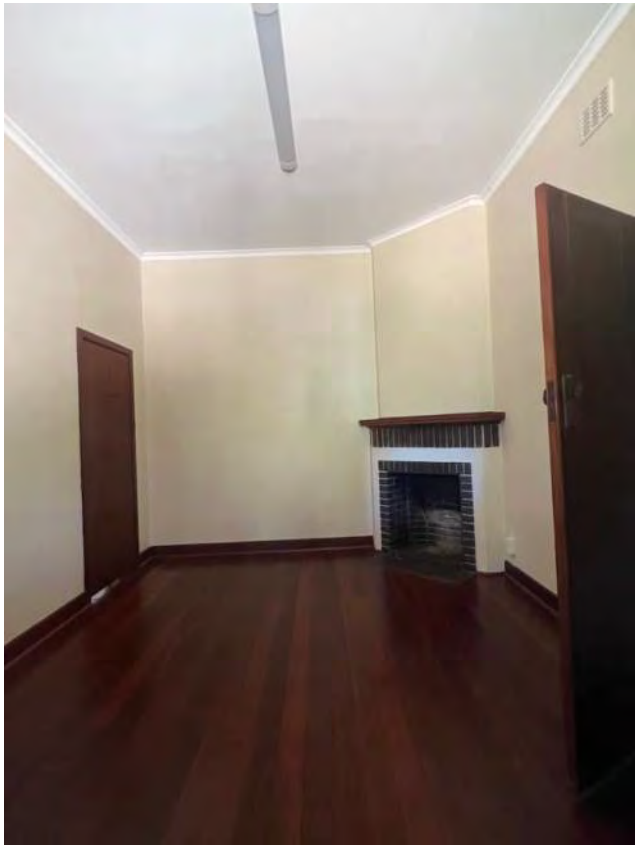


View west across the front (north) veranda, and west elevation.



View of the rear (south) doors opening in a veranda with rooms to the east (centre photo) and west (right photo).





View north along the west veranda, and west elevation. Interior was not accessible. Views through front windows evidenced 2 rooms with fireplaces.

5.2 LEVELS OF SIGNIFICANCE

The analysis of significance is determined within the following criteria determined by the Heritage Council to provide a standard against which all places are assessed.

Examination of the evidence reveals that certain constraints arise to ensure that the significance of the place is not diminished. That understanding provides a basis for recommendations for appropriate action to elements and fabric within specific gradings of significance.

PRIMARY SIGNIFICANCE

These areas are extremely important in terms of the place and should be conserved if the place is to retain its meaning and significance.

- All identifiable original fabric should be retained and conserved.
- Intrusive elements should be removed at an opportune time.
- Any damaged original fabric should be restored.
- Minor adaptation should be limited to the introduction of new services with consideration of alternatives prior to the intrusion into any original fabric.
- Structural alteration to the original fabric is generally not acceptable. However, minor structural adaptation could be considered if the assessed impact was minimal.
- Undertake full documentation of the adaption or intervention (before, during and after).
- No development or works should adversely impact on the setting or aspect of the place.
- Any development proposal must be referred to the relevant statutory bodies for the appropriate approvals.

Elements of primary significance

- The original form, scale fabric and layout of the entire1941 building.
- Roof geometry & chimneys
- External face brick walls
- Architectural style
- Windows, doors and timber detailing (1941)
- Interior floors, walls, ceilings, fitouts and fixtures (1941)

SECONDARY SIGNIFICANCE

Elements of secondary significance are elements of the original fabric of the place that have generally undergone considerable change or alteration.

- Although the elements relate to the history and development of the place, they may be adapted or altered, provided the impact is assessed against the conservation of the place in its entirety.
- This category can include additions and alterations made to the original fabric to accommodate changing requirements. They tend to be expedient and their impact upon the place ranges from neutral to moderately intrusive.
- Any damaged original fabric should be retained, restored and conserved as appropriate.
- Intrusive elements should be removed at an opportune time.
- Adaptation should be limited to the introduction of new services, fixtures and partitions of a removable nature that do not impact original fabric or form.
- Small scale, discreet structural alterations or openings to the original fabric may be acceptable but require careful consideration of options and the impact prior to any works.
- Full documentation and recording of the adaption (before, during and after) should be undertaken.
- Finishes that are new or different should not damage or impact on original evidence of significant materials or finishes.
- The elements can be altered for adaptive, or conservation works, depending on future use requirements and careful consideration of options and the impact prior to any works.
- Ensure that any proposed works to elements of secondary significance do not impact on or detract from elements of primary significance.

Elements of secondary significance

- Roof cladding

LITTLE OR NO SIGNIFICANCE

These elements neither contribute to, nor detract from, the significance of the place.

- Removal of elements of little or no significance should be assessed in consideration of the impact of what is proposed to replace that element and issues such as function and economics.

Elements of little or no significance

nil

INTRUSIVE

APPENDIX 15

DIRECTOR'S RESIDENCE (former)
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

Intrusive elements include items that, in their present form, have an adverse effect upon the significance of the place and removal should be encouraged.

- Removal of any intrusive elements should be assessed in consideration of issues such as function and economics prior to implementation.
- Before removal or adaptation of any elements, full documentation and recording (before, during and after) should be undertaken.
- Removal should be undertaken when the opportunity arises, or when the element is no longer required, unless their removal is identified as an urgent matter.

3.4.1 Elements that are intrusive to the significance

- There are no elements that are intrusive to the significance

5.3 BUILDING CONDITION REPORT and CONSERVATION WORKS RECOMMENDATIONS

The following summary lists elements that comprise the place and identifies the nature of the element and what is required in the context of the conservation of the place. The condition rating codes provide the relevant guidance for identifying issues and recommending action in terms of the required works and the priority time frame for those works.

Condition rating codes:

A	Excellent:	No defects. As new condition and appearance.
B	Good:	Minor deterioration. Superficial wear and tear.
C	Fair:	Damaged. Services functional but need attention.
D	Poor:	Failed but retrievable. Badly deteriorated. Potential structural problems.
E	Very Poor**:**	Failed and not retrievable. Not operational. Unfit for occupancy or normal use.

Priority rating:

1.	Immediate	Works required to prevent further deterioration of the fabric and/or disruption of activities and/or may incur higher costs and exacerbated deterioration causing works and/or loss of original fabric if not addressed within a year.
2.	Urgent	Works that need to be addressed between one to two years to prevent serious deterioration.
3.	Medium term	Works required to be done within two to three years.
4.	Long term	Works that can be deferred beyond three years.
5.	Maintenance	Part of the established maintenance regime.
6.	Other projects	When an opportunity arises.

The physical action as recommended needs to be undertaken to ensure the stability of the fabric is maintained and its significance conserved. The Burra Charter also references the need for an ongoing appropriate use and security of a place, in terms of its everyday vulnerability of the place and occupants, and its long-term sustainability.

The following definitions from the Burra Charter (Appendix 1) have been used to describe the required work.

Conservation: means all the processes of looking after a place to retain its cultural significance.

Restoration: means returning the existing fabric of a place to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction: means returning a place as nearly as possible to a known earlier state and is distinguished by the introduction of materials (new or old) into the fabric. This is not to be confused with either recreation or conjectural reconstruction.

Maintenance: means the continuous protective repair of the fabric, contents and setting of the place, and is to be distinguished from repair. Repair involves restoration and reconstruction, and it should be treated accordingly.

This table is a guide to providing the recommended conservation works with a priority rating, as it is envisaged that these works will need to be phased over time.

It is reasonable to expect that, during the course of carrying out the works, further conservation works will be found to be necessary.

Description of element	Rating	Condition	Conservation Works	Priority
Structure	B	No specific structural assessment has been undertaken by an Engineer. The building appears to be structurally sound.	Monitor for cracks.	4
Foundation and subfloor structure	C	The foundation and subfloor have not been investigated. There is no evidence of termite damage.	Remove earth build-up along the south wall and any underfloor ground build-up where possible. Restore as required. Termite treatment at the completion of the any works.	2
Roof structure and cladding	C	The roof cladding has been replaced in recent years. From ground level view it appears to be in good condition. The roof structure is not visible. The face brick chimney is in good condition.	Inspect roof structure and cladding and action as required. Ensure roof is securely fixed. Restore/reconstruct any damaged roof timbers as required. Inspect flashings and fixing and restore as required. Restore the chimney.	2
Roof plumbing/drainage	B/D	The gutters and downpipes are evident. Ground level discharge is inconsistent.	Inspect and undertake any works in response to ensuring the roof flashings and detailing, and the roof drainage system throughout is adequately discharging as necessary, with enough downpipes to discharge the catchment and direct away from the perimeter of the building.	1

			Roof drainage to be undertaken in conjunction with the ground level drainage requirements to ensure downpipes in appropriate locations, with correct gutter gradients.	
Ground level drainage	D	There is no apparent drainage system at ground level, with lack of downpipes and no discharge outlet for the existing downpipes. Ground level drainage is critical to the stability of the building.	**Consolidate the entire roof and ground level drainage system to effect drainage away from the perimeter of the building.** The ground level should be graded away from the perimeter walls so that no run-off (south side) or erosion (north side) impacts the building.	1
External walls	B	The external original face brick walls are in good condition.	Restore as may be required.	3
Doors and windows	B	Timber framing reveals some weathering.	Restore as required.	3
Interior		NO ACCESS – viewed though front windows. The interior appeared to be in good condition.	Restore as required	4
Floors		Timber		
Walls		Hard plaster		
Ceilings		.Plaster		
Detailing: doors, frames, windows, architraves & skirtings, fireplaces etc.		Timber		

Proposal

for an

Inspection and Maintenance Schedule

The schedule has been compiled to provide guidance in the preparation of an inspection and maintenance program and assist the nominated person in undertaking a comprehensive maintenance program to ensure the conservation of the place in its entirety, with special consideration for the cultural heritage aspects of the place.

The schedule is a proposal, and it is expected that it will be adapted to suit specific places. It should, however, be regarded as a minimal requirement for inspection and maintenance for a place of cultural heritage significance.

Weekly

Check the general presentation of the place
Check roof discharge and **ground drainage**
Monitor any problem areas
Ensure security is maintained

Monthly

Check gutters and downpipes
Monitor any water penetration
Attend to any works arising from the inspections

Annually

Termite inspection and treatment
Roof inspection and repair as required
Inspect and assess structural adequacy
Inspect paint work throughout
Inspect floor surfaces and repair as required

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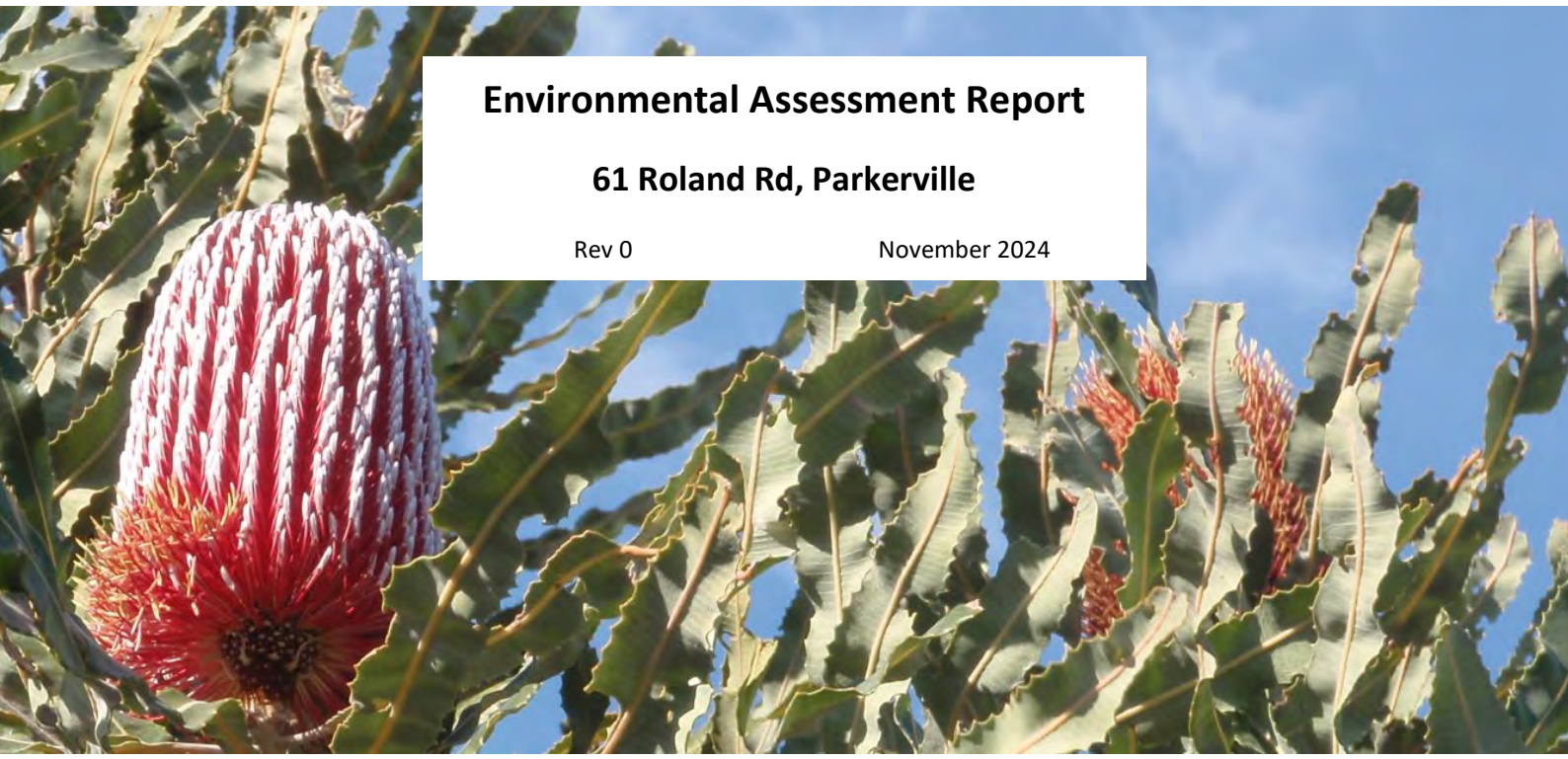
DIRECTOR'S RESIDENCE (former)
CONSERVATION MANAGEMENT STRATEGY
Parkerville Children & Youth Care

COTERRA ENVIRONMENT



Environmental Assessment Report

61 Roland Rd, Parkerville

Rev 0 November 2024

CALIBRE | COMMITMENT | COLLABORATION

This report was prepared by: Coterra Pty Ltd trading as COTERRA ENVIRONMENT
ABN: ABN: 92 143 411 456
Our Ref: MCCROL01
Author(s): E. O'Brien, C. Norman
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Report Version: Rev 0
Date: November 2024

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1 Introduction

1.1 Background

Parkerville Children and Youth Care (PCYC) are based at Lot 1636 (No. 340), Lot 3304 and Lot 9001 Roland Road, Parkerville, in the Shire of Mundaring, approximately 30 kilometres (km) north-east of the Perth CBD (the site; Figure 1). This site comprises numerous school buildings which include youth training and educational facilities over an approximate area of 14.5 hectares (ha).

The Parkerville Children's Home has been operating since 1903, originally consisting of a single hut and barn, with development of the school site progressing over the last century. The school was first opened by Sister Kate (born Katherine Mary Clutterbuck) and support for the facility grew quickly amongst the Guildford community, with financial aid provided by renowned colonial builder Walter Padbury, the first Mayor of Guildford (Parkerville, undated).

The school site is zoned 'Rural' under the Metropolitan Region Scheme (MRS) and 'Special Use' and 'Rural Residential' under the Shire of Mundaring Local Planning Scheme No. 4 (LPS4) (Shire of Mundaring, 2024a). No changes to the proposed land use are required to facilitate the development and land use at the site has remained consistent over the past century.

PCYC is considering the redevelopment/expansion of buildings and infrastructure within the northern portion of the site to facilitate the growing need for the facility.

The project aims to expand the school's ability to support high school aged young people who have experienced trauma and adverse childhood experiences, as an alternative to mainstream schooling environments which may not provide enough support for their emotional, social and psychological education needs.

1.2 Proposed Development

Currently, the school site comprises 17 existing buildings, four of which are foster homes located within the 'Residential Precinct' (Plate 1-1) and which do not form part of the proposed upgrades.

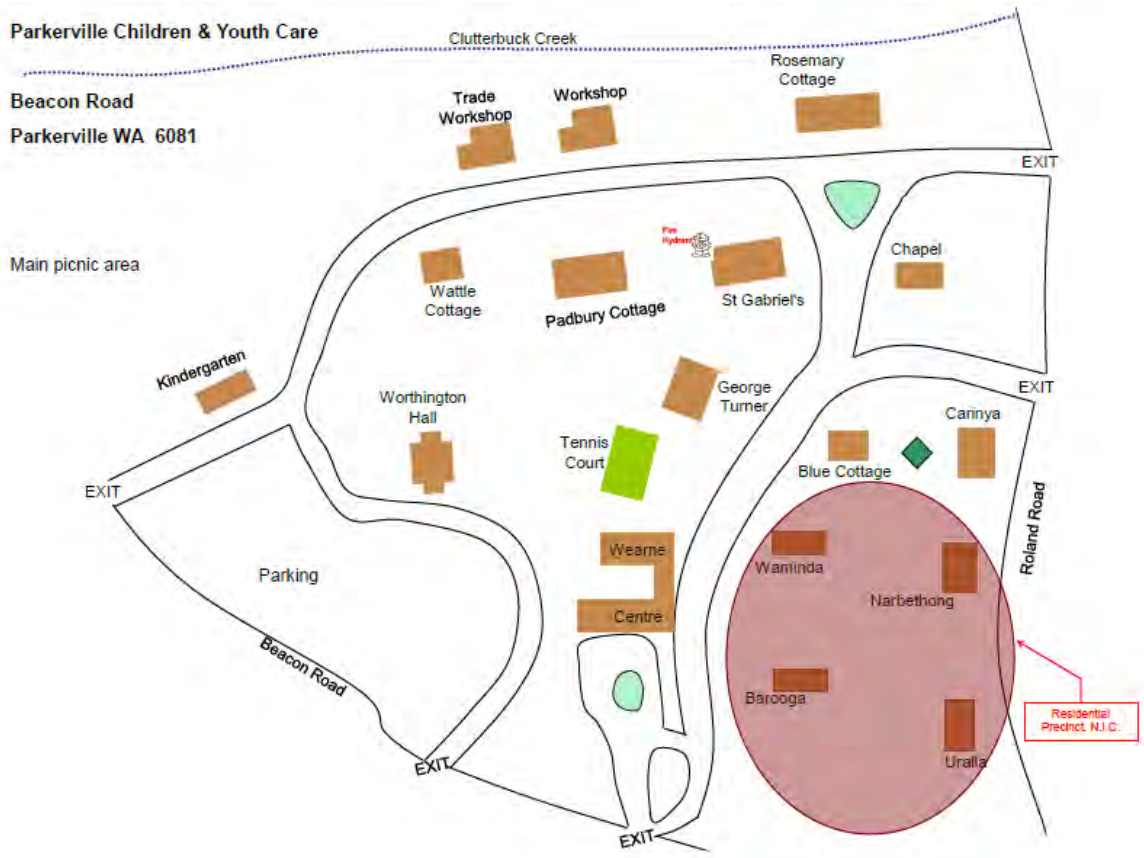

Plate 1-1: Existing Site Layout

Source: McCorkell Constructions

The 13 non-residential buildings (Plate 1-1) require either renovation, expansion, partial or complete demolition to meet the schools target of accommodating 90 students by 2030. In addition, upgraded internal access roads and carparking facilities will also be provided (Appendix 1).

A copy of the development layout overlaid on aerial photography is provided in Figure 2.

1.3 Purpose of this Report

This Environmental Assessment Report (EAR) identifies current environmental characteristics, potential environmental impacts of the proposed development and outlines broad design and management measures to address potential environmental impacts.

This EAR has been developed in conjunction with information provided in attached specialist reports and advice, including:

- Bushfire Management Plan (Envision, 2024)
- Visual Tree Assessment and Arboricultural Report (Arboribus Consulting, 2024)
- Flora and Vegetation Survey (Plantecology Consulting, 2024)
- Fauna Survey and Black Cockatoo Habitat Assessment (Bamford Consulting Ecologists, 2024)
- Hazardous Materials Report (SERS, 2024)

1.4 Key Policies and Guidance

Relevant policy and guidance documents which have informed site-specific investigations and/or have been used to assess potential environmental impacts as a result of the proposed expansion include:

- Shire of Mundaring PS-02-Heritage Policy (Shire of Mundaring, 2016)
- Shire of Mundaring Council Policy 2.20 – Environmental Sustainability (Shire of Mundaring, 2024b)
- State Planning Policy 2.9 Planning for Water (WAPC, 2006) and draft State Planning Policy 2.9 Planning for Water (WAPC, 2021a)
- State Planning Policy 3.5 Historic Heritage Conservation (WAPC, 2007)
- State Planning Policy 3.7: Planning in Bushfire Prone Areas (WAPC, 2015) and Guidelines for Planning in Bushfire Prone Areas State Planning Policy 3.7 (SPP 3.7) – Planning in Bushfire Prone Areas (WAPC, 2021b)
- Environmental Protection Authority (EPA) Guidance Statement No. 33 – Environmental Guidance for Planning and Development (EPA, 2008).

2 Existing Environment

2.1 Topography and Landforms

Topographic elevation at the site ranges from 250 m Australian height Datum (mAHD) in the south to 235 mAHD along Clutterbuck Creek, forming a valley either side of the creekline (MNG, 2024; Figure 3).

2.2 Geology and Soils

Regional geology and soil mapping identifies two geological units at the site (Smurthwaite, 1986; Figure 3):

- G2 – GRAVEL: Yellow- brown to reddish brown, loose, fine to coarse, ferruginous pisolites, poorly sorted; variable amounts of sand and silt in matrix, minor recementation; colluvial origin.
- LA1 – LATERITE: Massive, hard, cemented, vuggy and pisolitic; up to 4 m thick, overlain by and associated with gravels (G2 and G3) of residual origin.

Both the G2 and LA1 geological units are considered compatible with construction of roads and urbanisation (Smurthwaite, 1986).

Soils within the site comprise the Yarragil 1 & 4 Phase and Dwellingup 2 Phase (DPIRD, 2024; Figure 4, Table 2-1). These soils are generally not prone to salinity risk, but may be prone to wind erosion (Table 2-2).

Table 2-1: Land System

Mapping Units	Land System	Description
255DpYG1	Yarragil 1 phase	Very gentle to moderately inclined concave side slopes. Moderately well drained yellow duplex soils and yellow and brown massive earths and gravels. Woodland of *E. wandoo*, *E. marginata, E. Accedens*. *Casuarina obesa* on salt affected areas
255DpYG4	Yarragil 4 phase	Valley floors with some poorly drained mottled yellow duplex soils and gentle lower slopes with moderately well to well drained loamy and sandy earths, gravels and duplex soils. Low woodland of *E. wandoo, E. marginata* and *Acacia spp.*
255DpDW2	Dwellingup 2 phase	Very gently to gently undulating terrain (<10%) with well drained, shallow to moderately deep gravelly brownish sands, pale brown sands and earthy sands overlying lateritic duricrust

Source: DPIRD, 2024

Table 2-2: Land degradation Risk categories

Land Degradation Risk Category	255DpYG1	255DpYG4	255DpDW2
Water Erosion	0% of map unit has a very high to extreme hazard	12% of map unit has a very high to extreme hazard	0% of map unit has a very high to extreme hazard
Wind Erosion	26% of map unit has a high to extreme hazard	10% of map unit has a high to extreme hazard	95% of map unit has a high to extreme hazard
Flood Hazard	0% of the map unit has a moderate to high hazard	17% of the map unit has a moderate to high hazard	0% of the map unit has a moderate to high hazard

Land Degradation Risk Category	255DpYG1	255DpYG4	255DpDW2
Salinity Risk	0% of map unit has a moderate hazard	0% of map unit has a moderate hazard	0% of map unit has a moderate hazard
Waterlogging and Inundation	2% of map unit has a moderate to very high risk	33% of map unit has a moderate to very high risk	0% of map unit has a moderate to very high risk

Source: DPIRD, 2024

2.2.1 Acid Sulfate Soils

The site is mapped as having 'Extremely low probability of occurrence' of Acid Sulfate Soils (ASS) at depths of up to three metres below ground level (CSIRO, 2024).

2.3 Hydrology

2.3.1 Groundwater

Groundwater monitoring has been undertaken by the Department of Water and Environmental Regulation (DWER) on numerous occasions within the site from water information network (WIN) Bore 5466 (located along Clutterbuck Creek valley) from February 1983 to September 1990 (DWER, 2013; Figure 5). This bore was recorded to have a maximum level of 232.515 mAHD over the monitoring period (DWER, 2013). As no bore construction information is available, it is unclear whether this level represents a perched or regional groundwater level (DWER, 2013).

There are no Public Drinking Water Source Areas (PDWSA) located within the site, with the Priority 1 & 3 Middle Helena Catchment Area located approximately 4 km northeast of the site (Landgate, 2024).

The site is underlain by a fractured rock aquifer within the (un-proclaimed) Karri Groundwater Area (Landgate, 2024).

2.3.2 Surface Water and Drainage

Clutterbuck Creek, a minor perennial watercourse, is located in an east-west alignment across the northern boundary of the site (Figure 5), with waters flowing toward the west. Clutterbuck Creek is a tributary of the Jane Brook, which ultimately discharges into the Swan River.

2.3.3 Wetlands

No mapped Geomorphic Wetlands of the Swan Coastal Plain occur on the site (Landgate, 2024). However, the site contains riparian vegetation and a perennial watercourse so it may be considered that the site has wetland attributes nearby the creekline.

2.4 Flora and Vegetation

2.4.1 Pre-European vegetation

Broad scale mapping of pre-European vegetation within the region was undertaken by Beard (1975) which recorded major categories of plants. Shepherd et al. (2002) reassessed Beard's mapping and divided some of the larger vegetation units into smaller units, which then resulted in a total of 819 vegetation units being mapped across the state.

The site contains the West Darling_3 vegetation association, which is described 'mainly jarrah and marri; *Eucalyptus marginata, Corymbia calophylla*' (Landgate, 2024):

The remnant native vegetation of the West Darling 3 association within the Shire of Mundaring currently stands at 62.36% of the pre-European extent (Table 2-3).

Table 2-3: West Darling 3 - Vegetation Statistics

Area	Pre-European extent	Current Extent	Current Extent managed in DBCA lands (proportion of Pre-European Extent)	Current Extent Protected for Conservation
Western Australia **(1B)**	485,532.26 ha	416,850.04 ha (85.85%)	77.68%	14.72%
Jarrah Forest **(2B)**	485,532.26 ha	416,850.04 ha (85.85%)	77.68%	14.72%
Shire of Mundaring **(4B)**	20,486.33 ha	12,777.36 ha (62.36%)	34.88%	19.51%

Source: GoWA, 2019a

2.4.2 Vegetation Complexes

The site is located within the Jarrah Forest Bioregion, located on the Darling Scarp and the Darling Plateau. Of this bioregion, the site occurs in the Jarrah Forest South division (JF2) (Hearn et al, 2002).

Heddle et al. (1980) described the vegetation complexes of the Darling System at a scale of 1:250 000. The site is mapped as containing vegetation in the Yarragil, Dwellingup and Murray vegetation complexes (Figure 6). These complexes are described as follows:

- Yarragil Complex (Yg1): Consists of predominantly a mixture of open forest of *Corymbia calophylla - Eucalyptus marginata* with a mixture of *E. patens* and *E. megacarpa* on the valley floors. The dominant vegetation types are *Acacia alata, Agonis linearifolia, Astartea fascicularis, Lepidospermum angustatum, Mesomelaena tetragona, Dampiera alata, Hypocalymma angustifolium, Leptospermum ellipticum and Synaphea petiolaris.*
- Dwellingup (D2) complex in Medium to High Rainfall: Dominated by an open forest of *Corymbia calophylla - Eucalyptus marginata* on the uplands. Dominant species include *Banksia attenuata*, *Grevillea wilsonii, Hovea chorizemifolia*, *Lepidospermum angustatum*, *Acacia brownii, Leucopogon capitellatus* and *Patersonia rudis*.
- Murray (My2) in Medium to High Rainfall: Occurs on the moderately incised valleys of the Murray soil unit in the medium to high rainfall area on the western fringes of the Darling Plateau. Vegetation ranges from open forest of *E. marginata - E. calophylla* with *E. patens* on the slopes to fringing woodland of *E. rudis - M. rhaphiophylla* on the valley floors. Along the stream is a fringing woodland of flooded gum and paperbark.

Vegetation complexes are used by the EPA to determine regional representation of biodiversity (EPA, 2008). The EPA has an objective to retain 30% of the pre-clearing extent of each ecological community or at least 10% of the pre-clearing extent of each ecological community within defined constrained areas including the Perth Metropolitan Region (EPA ,2008).

Approximately 80.95% of the original extent of the Yarragil 1 (Yg1) Complex, 82.5% of the Dwellingup (D2) Complex and 76.13% of the Murray (My2) Complex remains within the Darling Plateau. Within the Shire of Mundaring, the remaining extents for these Complexes are 48.23%, 64.70% and 74.39% respectively (Table 2-4). The occurrence of all vegetation complexes over 30% at both the regional and local scale also meets the EPA's objective for vegetation protection.

Table 2-4 Remnant Regional Vegetation Complex Information

Area	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	Current Extent Protected for Conservation
Darling Scarp				
Yarragil 1 (Yg1)	80,202.95	64,927.06	80.95%	9.87%
Dwellingup (D2)	86,128.33	71,055.96	82.50%	19.31%
Murray (My2)	59,317.10	40,952.07	69.04%	15.89%
Shire of Mundaring				
Yarragil 1 (Yg1)	4,329.65	2,088.34	48.23%	5.4%
Dwellingup (D2)	10,431.72	6,749.02	64.70%	12.11%
Murray (My2)	19,064.28	14,181.61	74.39%	32.14%

Source: GoWA, 2019b

2.4.3 Flora and Vegetation Survey

A reconnaissance flora and vegetation survey was undertaken by Plantecology Consulting on 30 August 2024. The survey was undertaken in accordance with the EPA *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (2016). Summary results of the flora and vegetation survey are discussed below, with full botanical reporting to be completed following spring 2024.

Key results from the survey are summarised below (Plantecology, 2024).

- Broadly, the site comprised several remnant native trees (*Corymbia calophylla, Eucalyptus marginata, Agonis flexuosa, Melaleuca rhaphiophylla* and *Eucalyptus patens*) as well as many planted exotic species (**Eucalyptus robusta, *Eucalyptus camaldulensis, *Casuarina equisetifolia* and **Eucalyptus ?nutans*). The understorey was spare and comprised scattered *Xanthorrhoea preissii* and *Macrozamia riedlei* over weeds.
- Vegetation units identified at the site include (Figure 7):

  1. Acacia dealbata shrubland around dam

  2. Agonis flexuosa – Melaleuca rhaphiophylla riparian woodland

  3. Planted exotic eucalypts (inc. *Eucalyptus camaldulensis*)

  4. Planted exotic eucalypts (inc. *Eucalyptus camaldulensis*)

  6. Corymbia calophylla – Eucalyptus marginata Woodland

  8. Planted exotic eucalypts (inc. *Eucalyptus camaldulensis*)

  9. Corymbia calophylla – Eucalyptus marginata and Exotic species Woodland

  10. Infrastructure and isolated exotic planted trees

  11. Isolated *Corymbia calophylla*
- The site was recorded to be in 'Completely Degraded' condition as per the Keighery (1994) scale (Figure 8). 'Completely Degraded' condition is defined as vegetation 'areas that are completely or almost completely without native species in the structure of their vegetation, such as areas that are cleared or 'parkland cleared' with flora comprising weed or crop species with isolated native trees or shrubs' (EPA, 2016).

- Weeds recorded included **Briza Maxima, *Oxalis pes-caprae* (Bermuda buttercup) **Rubus anglocandicans* (Blackberry), **Acacia iteaphylla* (Flinders Range Wattle), **Olea europaea* (Olive) and **Asparagus asparagoides* (Bridal Creeper).
- As assessment of the likelihood for conservation significant communities to occur within the site was undertaken, concluding that the condition of the vegetation within the site and/ or the absence of suitable habitat would not support any of the conservation significant species or communities found within the area.

The flora and vegetation report is provided in Appendix 2.

2.4.4 Arboricultural Assessment

An arboricultural assessment of all trees with a Diameter at Breast Height (DBH) of greater than 300 millimetres (mm) was undertaken within the northern end of the school site, corresponding to the proposed development area, by Arboribus Consulting. Extracts from the report are provided in Appendix 3 for a full copy of the report provided with the Development Application submission.

A total of 451 trees were recorded and individual tree tags were installed. The following information was recorded for each tree (Arboribus, 2024):

- Genus, species and common name
- Current health, structure and age of tree
- Height, canopy spread and trunk diameter measurements
- Tree Protection Zone (TPZ) and Structural Root Zone (SRZ)
- Suitability rating (for incorporation into urban development)
- Preliminary tree protection considerations (to be further developed at later stages of the project)
- General observations and comments of each tree
- Conclusions and recommendations.

The 451 trees assessed consisted of 200 Eucalypt species, 180 Corymbia (Bloodwood) species, 14 *Syzygium smithii* (Lilly Pilly) trees, 12 *Agonis flexuosa* (WA Peppermint) trees, 8 *Melaleuca* (Paperbark) species and 37 other species. Of these, 17 trees were Early Mature in age, with the remaining 434 trees being Mature (Arboribus, 2024).

Assessment of the tree's suitability for incorporation into an urban development was based on (Arboribus, 2024):

- The trees current health and/or structural status
- If they are well positioned in relation to the proposed design
- The species known tolerances for disturbance
- Species characteristics that are considered suitable for retention and incorporation into an urban development area.

Based on the above, the following was recorded (Arboribus, 2024):

- 103 Optimal trees: These trees are considered well placed or display favourable health and/or structural characteristics and; are worthwhile incorporating.
- 274 Acceptable trees: These trees may be well placed and/or display reasonable health and/or structural form however may require a level of Horticultural/Arboricultural intervention to address minor issues observed.

- 65 Questionable trees: These trees may display health issues, structural defects, flaws or areas of concern that may lead to future issues. These trees may be considered for retention; however, will require specific Arboricultural health and/or structural management measures developed by an AQF 5 Arborist; be implemented as part of their retention into the development and monitored in an ongoing basis.
- 9 Unsuitable trees: These trees have limited life expectancy; are not considered compatible with proposed development and/or display substantial/major structural flaws where remedial, Arboricultural or Engineering intervention is unlikely to improve form or substantially reduce site risk. These trees are recommended to be removed or; retained and appropriately managed as habitat (where permissible).

Canopy health comprised the following (Figure 9) (Arboribus, 2024):

- Good: 320 trees
- Reasonable: 103 trees
- Questionable: 19 trees
- Poor: 3 trees
- Dead: 6 trees

Where trees had 'Questionable' health status, it was recommended that these trees undergo further arboricultural assessment or targeted remedial treatments to improve health if identified for retention. Removal of identified unsuitable trees (i.e. poor and dead canopy health trees) is not proposed at this stage, given they are not located in proximity to the buildings.

2.5 Fauna and Habitat

Bamford Consulting Ecologists (BCE) undertook a Basic fauna survey and a targeted Black Cockatoo habitat survey for the site over two days on 2 and 3 September 2024 in accordance with the EPA *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020). Key results of the fauna survey are discussed below, with full reporting to be completed.

2.5.1 Vegetation Substrate Association

Vegetation and substrate associations (VSAs) combine vegetation types, the soils or other substrate with which they are associated, and the landform. In the context of fauna assessment, VSAs are the environments that provide habitats for fauna.

BCE makes the distinction between 'habitat' (a species-specific term that may encompass the whole or part of one or more VSAs and is the physical subset of an ecosystem that a given species, or species group, utilises) and 'VSA' (a general, discrete and mutually exclusive spatial division of a target area, based on soil, vegetation and topography). It is recognised, however, that, within the broader EIA literature/guidance, the former term is used more or less synonymously to indicate the latter.

For the current assessment, VSAs were identified based on observations made during the field investigations. A total of four VSA's were recorded within the site, being (BCE, 2024; Figure 10):

- VSA 1: Open Marri and jarrah Woodland
  - Regrowth Marri (*Corymbia calophylla*) with scattered introduced eucalypts over Acacia spp. (introduced species and native spp *Acacia saligna*) over *Xanthorrhoea preissii*, with lots of disturbance and introduced grasses on fine brown lateritic gravel.
- VSA 2: Mixed Garden and Eucalypts

- Open mature ornamental garden with a range of remnant individual Marri (*Corymbia calophylla*) and Jarrah (*Eucalyptus marginata*) scattered and introduced eucalyptus Spotted Gum (*Corymbia maculata)* with midstory of planted *Agonis flexuosa* and exotic and native bushes/hedges and an understorey dominated by manicured lawn with various ornamental sedges and garden flora on brown lateritic gravel to loam.

- VSA 3: Dampland/ Creekline
  - Seasonal creek with introduced eucalyptus and Paperbarks (*Melaleuca rhaphiophylla*) and scattered peppermint (*Agonis flexuosa*) with understorey of bridal creeper, arum lily and other invasive grasses, weeds and seasonal sour grass (*Oxalis pes-caprae*) on fine brown lateritic gravel to loam.
- VSA 4: Dam
  - Artificial dam with dense wattles along edge with scattered introduced eucalyptus on clay loam

2.5.2 Black Cockatoo Habitat Assessment

As a part of the fauna and habitat assessment, BCE undertook a targeted assessment for Black Cockatoos. The site is within the known distribution range for three species of south-western black cockatoos, being:

- Baudin's Black Cockatoo (*Zanda baudinii*)
  - 'Endangered' under the Western Australian *Biodiversity Conservation Act 2016* (BC Act)
  - 'Endangered' under the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)
  - 'Vulnerable' under the BC Act
  - 'Vulnerable' under the EPBC Act
- Carnaby's Black Cockatoo (*Zanda latirostris*)
  - 'Endangered' under the BC Act
  - 'Endangered' under the EPBC Act.

Black Cockatoo habitat can be categorised into three values for the purposes of Environmental Impact Assessment, in line with the department of Climate Change, Energy, the Environment and Water's (DCCEEW's) *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022). These are breeding habitat, foraging habitat and night-roosting habitat. Each habitat is discussed further below.

2.5.2.1 Black Cockatoo Breeding Habitat

A total of 233 trees were inspected for value for Black Cockatoos, based on being of sufficient size to support potential black cockatoo breeding, as outlined in the data provided in the arboricultural assessment. Each tree was given a ranking of 1 to 5, based on the BCE scoring system, as outlined below (BCE, 2024; Figure 10):

- Rank 1: Activity at hollow observed; adult (or immature) bird seen entering or emerging from hollow. Can also be used for a known nest tree active in the previous 12 months (although this should be noted in the description). Note that activity at a hollow does not absolutely mean that breeding is occurring unless a young bird in hollow is observed.
- Rank 2: Hollow of suitable size visible with chew marks around entrance. Record if chew-marks are recent or old.
- Rank 3: Potentially suitable hollow visible but no chew marks present at entrance; or potentially suitable hollow suspected to be present - as suggested by structure of tree, such as large, vertical trunk broken off at a height of > 8 m; but note that hollow height is contextual. Carnaby's Black-

Cockatoo will nest in hollows < 5 m so in a Wheatbelt breeding site a lower criterion may be more appropriate.

- Rank 4: Tree with large hollows or broken branches that might contain large hollows, but hollows or potential hollows (nest chamber) are not vertical or near-vertical; thus a tree with or likely to have hollows of sufficient size but not to have hollows of the angle preferred by Black-Cockatoos. Trees with low but otherwise suitable hollows can also be assigned a rank or 4, depending on the species of black-cockatoo likely to be present.
- Rank 5: Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown.

Of the 233 trees with a DBH of appropriate size to support black cockatoo breeding, one tree (Tree ID #AO338) was given a Rank 3, based on the ground-level observation of a potential hollow present (Plate 2-1). All other trees assessed as being Rank 5 (BCE, 2024; Figure 10).



Plate 2-1: Tree ID #AO338 (Rank 3)

Source: Coterra Environment, 3 September 2024

2.5.2.2 Black Cockatoo Foraging Habitat

Each VSA was assigned a score out of 10 based on the BCE foraging habitat scoring system. VSA 1 scored the highest value for all three species (5 to 7 out of 10), with VSA 2 comprising the second highest foraging value for all (3 to 4 out of 10) (Table 2-5; BCE, 2024; Figure 10).

Foraging evidence of Baudin's and Forest Red-tailed Black Cockatoos was recorded, with all Marri trees containing old, intermediate and/or fresh evidence of Forest Red-tailed Black Cockatoo foraging and most Marri trees showing fresh and/or intermediate foraging evidence for Baudin's Black Cockatoo (Plate 2-2; BCE, 2024).

Carnaby's Black Cockatoos were heard in proximity to the site, however no foraging evidence was recorded directly within the site for the species.



Plate 2-2: Foraging Evidence on Marri Nuts for Baudin's Black Cockatoos (left) and Forest Red-tailed Black Cockatoos (right)

Source: Coterra Environment, 3 September 2024

Table 2-5: VSA Foraging Values for Black Cockatoos

VSA	Site Condition (out of 6)	Site Context (out of 3)	Species Stocking Rate (0 or 1)	Total (out of 10)
Carnaby's Black Cockatoo				
VSA 1: Open Marri/Jarrah Woodland	3	1	1	**5**
VSA 2: Mixed Garden & Eucalypts	2	1	0	**3**
VSA 3: Dampland/ Creekline	1	1	0	**2**
VSA 4: Dam	1	1	0	**2**
Forest Red-tailed Black Cockatoo				
VSA 1: Open Marri/Jarrah Woodland	4	2	1	**7**
VSA 2: Mixed Garden & Eucalypts	3	1	0	**4**

VSA	Site Condition (out of 6)	Site Context (out of 3)	Species Stocking Rate (0 or 1)	Total (out of 10)
VSA 3: Dampland/ Creekline	1	1	0	**2**
VSA 4: Dam	1	1	0	**2**
Baudin's Black Cockatoo				
VSA 1: Open Marri/Jarrah Woodland	4	2	1	**7**
VSA 2: Mixed Garden & Eucalypts	3	1	0	**4**
VSA 3: Dampland/ Creekline	1	1	0	**2**
VSA 4: Dam	1	1	0	**2**

Source: BCE, 2024

2.5.2.3 Black Cockatoo Night Roosting Habitat

The site contains many large trees which, in conjunction with the available water source on site, may have the potential to provide roosting habitat for Black Cockatoos. There are no records of Black Cockatoos roosting on the site.

The site is in proximity to a confirmed Carnaby's Roost Site, however the known roost site is outside of the site boundary (Landgate, 2024).

2.6 Conservation Areas

The site is not mapped as an Environmentally Sensitive Area (ESA) (Landgate, 2024). The closest conservation areas include (Landgate, 2024):

- Parkerville Nature Reserve, located approximately 1.2 km northwest of the site
- John Forrest National Park, located approximately 1.8 km west of the site
- Crown Freehold land managed by DBCA located more than 500m south of the site.

No Bush Forever sites occur in proximity to the site (Landgate, 2024). Portions of the broader site is identified as a Local Natural Area by the Shire of Mundaring (SoM, 2024a).

2.7 Bushfire Risk

The site is mapped as a Bushfire Prone Area (DFES, 2024). Bush Fire Prone areas are defined as being subject to, or likely subject to bushfire attack and are identified by the presence of and proximity to bushfire prone vegetation and include both the area containing the bushfire prone vegetation and a 100 m buffer zone immediately surrounding it (DFES, 2024).

A Bushfire Management Plan (BMP) was prepared by Envision Bushfire Protection. The BMP was prepared to meet planning requirements triggered under State Planning Policy 3.7 Planning in Bushfire-Prone Areas (SPP 3.7) (WAPC, 2015). Environmental considerations relevant under the BMP include (Envision Bushfire Protection, 2024):

- Jarrah/ Marri forests are prone to ejecting burnt embers in advance of a fire front, with the school site subject to ember attack from up to 5 km upwind from the site
- The greatest area of bushfire fuel extends from the west of the site, however historically fire has arrived from the east of the site

- Buildings require separation from vegetation to avoid flame contact, however most buildings are surrounded by parkland vegetation that if managed appropriately (irrigated grasses must be < 100 mm in height under tree canopies, tree canopies must be no lower than 3 m to the ground) can address bushfire risk management requirements
- Fuel management (vegetation management) of vegetation surrounding buildings (Plate 2-3) is the most practical means of reducing the impact of a bushfire
- Removal of up to 14 of the planted trees that surround Worthington Hall and other nearby buildings to achieve a 5 m separation, and reduce the canopy intensity to 15% to achieve BAL 19
    - It is noted that removal of these trees is flexible and will be considered in the context of value for black cockatoos. The nine trees identified for removal (and their adjacent alternatives if these trees were not selected) located directly adjacent to Worthington Hall are all planted non-endemic Spotted Gum (**Corymbia maculata*). This species is not identified to provide black cockatoo foraging or breeding opportunities (DEC, 2011). The remaining five trees are introduced species that are not noted to provide black cockatoo habitat opportunities.
- All vegetation outside of the site boundary will not be modified.

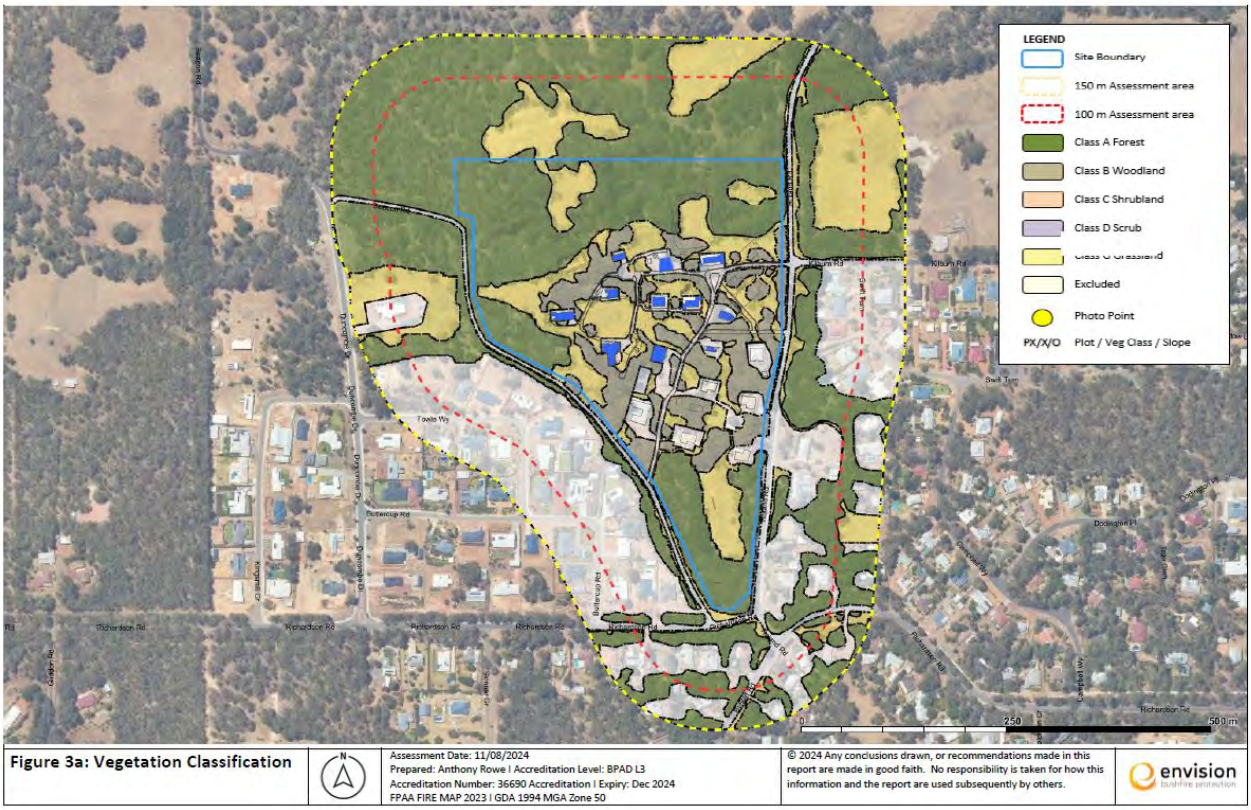

Plate 2-3: Vegetation Classification

Source: Envision Bushfire Protection (2024)

2.8 Building Materials

A hazardous materials report was undertaken for the Parkerville Youth Campus by Site Environmental and Remediation Services (SERS) in May 2024. A site-wide inspection recorded asbestos containing materials (ACM) within the following locations, with all areas unable to be accessed assumed to also contain ACM (SERS, 2024):

- Ground Floor - 1. Padbury Centre - Building interior, Kitchen fume hood
- External - 1. Padbury Centre - Building exterior, East and west Gable ends
- Ground Floor - 12. Worthington Hall - Building interior, Safe Room
- Ground Floor - 12. Worthington Hall - Building interior, Man hole cover
- Ground Floor - 2. Workshop - Building interior, North Internal Wall, adjacent door
- External - 2. Workshop - Building exterior, Top of soil surface
- Ground Floor - 9. George Turner Cottage - Building interior, South foyer, northern Internal Wall
- Ground Floor - 9. George Turner Cottage - Building interior, South toilet/Sports store Internal Walls and ceiling
- Ground Floor - 9. George Turner Cottage - Building interior, South Sports Store, Internal Walls and ceiling lining
- Ground Floor - 9. George Turner Cottage - Building interior, South west laundry/Games Room, Internal Walls and ceiling
- Ground Floor - 9. George Turner Cottage - Building interior, South west toilet, Internal Walls and ceiling
- Ground Floor - 9. George Turner Cottage - Building interior, East Internal Walls
- Ground Floor - 9. George Turner Cottage - Building interior, Stove area/Former fireplace Internal Walls

Analysis was also undertaken on paint used on both the external fixings, walls and internal features and walls of the buildings, identifying lead present in 17 samples of a total 30 paint chips, ranging in results from 0.21% to 8.6% (SERS, 2024).

Synthetic mineral fibre was recorded within the ground floor or Worthington Hall, within the ceiling void interior (SERS, 2024). Polychlorinated Biphenyls were also located within Worthington Hall, inside the building in the south-west room. No ozone depleting substances were identified during the survey (SERS, 2024).

2.9 Heritage

2.9.1 Indigenous heritage

Clutterbuck Creek (located within Lot 1636) is a Lodged Aboriginal Cultural Heritage Site (Site ID 40,579). It is associated with Artefacts/ Scatter; Water Source and is not identified as a Restricted or Culturally Sensitive (Landgate, 2024).

2.9.2 Non-indigenous heritage

Parkerville Children's Home & Cemetery (of which the site comprises) is listed as a State Registered place on the DPLH's Heritage List (Heritage Council, 2024), and is listed as 'exceptional significance' under the Shire of Mundaring's Municipal Inventory (Shire of Mundaring, 1997 & 2024c).

The Shire of Mundaring has outlined the following statement of significance regarding the site:

- MHI Site 73 - The Parkerville Children's Home has very high social and historic significance for the people of the Mundaring community, former residents and the State generally for the role it has played in the care of children. The place is significant historically and socially for its approach to 'cottage care' for children long before it was appreciated as a better alternative than 'institutionalised' care. It also has important historic significance for its associations with public

figures of the day such as Walter Padbury, Charles Harper, J.H. Worthington, and Sister Kate Clutterbuck. Many of the buildings have high aesthetic significance which are further complemented by their setting.

All buildings within the site (excluding Narbethong, Uralla, Waminda and Baroonga) are considered of heritage significance, and the InHerit database also identified that the trees on site are of heritage value when combined with the buildings to create a significant setting for the site.

2.9.3 Heritage Conservation Management Strategy

A Heritage Conservation Management Strategy was prepared by Heritage Intelligence in 2022 (Heritage Intelligence, 2022).

The Conservation Management Strategy is undertaken within the guidelines of the Heritage Council's brief and in accordance with the Burra Charter. The aim of the Conservation Management Strategy is to retain the cultural significance of the place within the future conservation.

Levels of Significance, building condition reports and conservation works recommendations have been provided for the following buildings, and have been used to inform project design:

- Padbury Cottage
- Workshop – Kitchen
- Workshop – Laundry
- St Gabriel's Cottage
- Wearne Centre
- Rosemary Cottage
- Blue Cottage
- Wattle Cottage
- George Turner Cottage
- Kindergarten (former)
- Worthington Hall
- Directors Residence (former)

Further details on the Conservation Plan for the site have been provided in other reports submitted with the site's Development Application.

3 Potential Environmental Impacts and Proposed Management

Construction works proposed at the site have the potential to result in disturbance to the environment. Key potential impacts and proposed design and management responses are discussed below.

3.1 Vegetation and Flora

3.1.1 Potential Impacts

Vegetation at the site predominantly comprises a mixture of remnant native trees as well as planted exotic species, with the understorey being sparse and comprising scattered *Xanthorrhoea preissii* (Grasstrees) and *Macrozamia riedlei* (Zamia palms) over weeds (Section 2.4).

The proposed building and site works will require removal of one tree which is a locally endemic species, being tree ID #342, a mature Marri (*Corymbia calophylla*)..

The Bushfire Management Plan (Envision Bushfire Protection, 2024) notes the following in relation to vegetation modification and clearing:

- The restoration will retain the majority of the trees identified in the Arboricultural report. A separation of 5 m from the nearest tree trunk is recommended (affecting 5 non-endemic trees onsite).
- Modification of trees will be required around Worthington Hall (south west) to achieve shelter standard, to reduce the heat intensity at the building. Nine trees in this location may be affected, however all trees are planted non-endemics.
- The bushfire risk treatment is to maintain the areas adjacent to the buildings in a parkland condition (to retain trees) but restrict the ground fuel continuity between trees and ground to canopy ignition, to avoid direct fire front contact.
- An Asset Protection Zone is to be established/maintained around each restoration building that achieves BAL 19. The APZ should extend 25 m to Woodland (-5) and 31 m to Forest (Flat). The APZ being irrigated grasses no taller than 100 mm under tree canopies maintained no lower than 3 m to the ground).
- Worthington Hall as a proposed shelter will require management (APZ standard) to achieve 10 kWm^2 (to support unrestricted vehicle evacuation) at the building. This will primarily involve understorey management.
- The understorey within the forest identified shelter protection area is to be maintained at less than 100 mm tall and all tree canopies should be no less than 3 m above the ground (i.e. under pruning of trees may be required to achieve this).
- No areas of native vegetation outside of the site are proposed to be modified by the proponent as part of the proposed development.

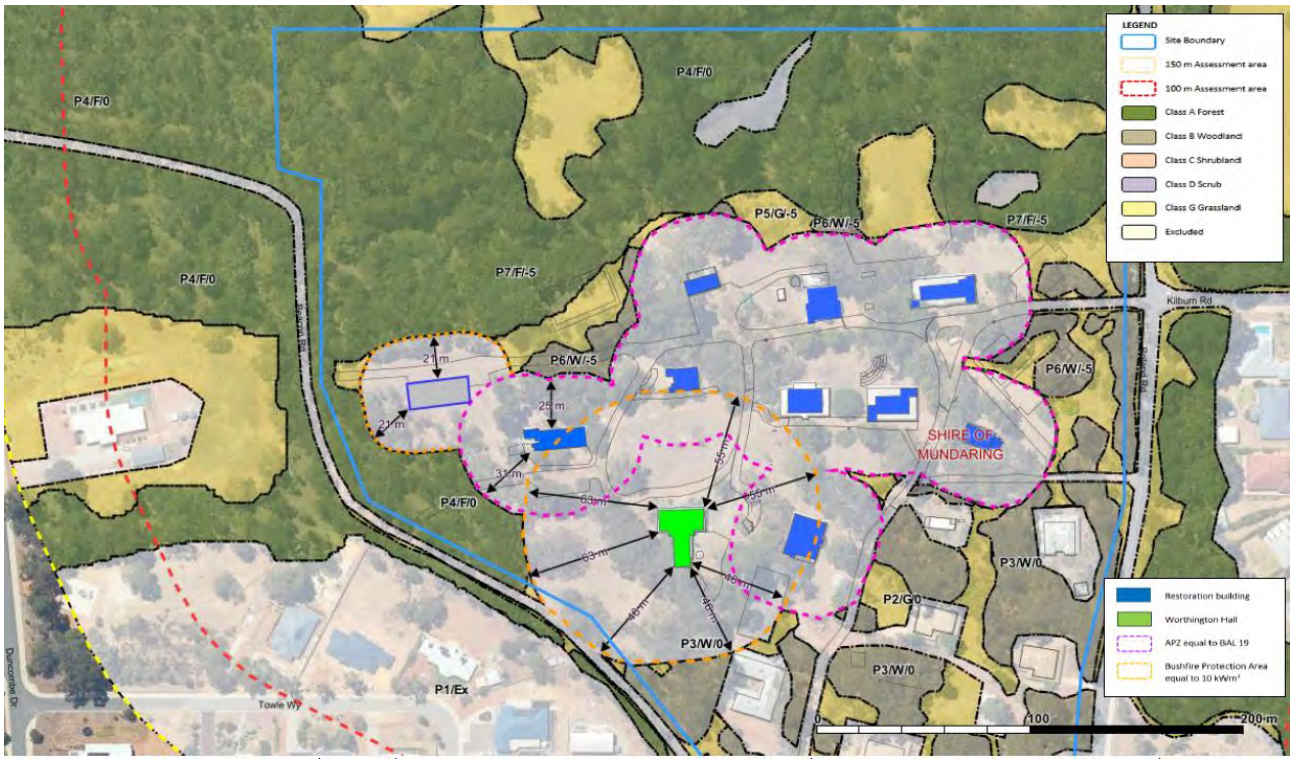

Plate 3-1: Vegetation Risk Treatment and Shelter Areas

Source: Envision Bushfire Protection, 2024

The Arboricultural report (Arboribus Consulting, 2024) noted a number of trees which may be considered for management or removal. As none of the trees that were recommended for removal fall within the proposed expansion footprint, removal of these trees is not proposed as part of these works.

3.1.2 Proposed Management

In order to ensure the retained vegetation onsite is not impacted by proposed building works the following management actions are proposed:

- Vegetation required to be cleared, pruned or managed under the BMP is to be clearly flagged
- Pruning is to be undertaken following the advice of the project Arborist
- Prior to entering the site any construction equipment and construction materials (i.e. pipes, bricks etc) must be clean and free of any adhered soil
- Construction equipment is to be restricted to the construction areas only and avoid moving into adjacent vegetated areas, utilising the existing paths on site as much as practical
- Tree Protection Zones (TPZ's) and Root Protection Zones (RPZ's) will be established during construction phases in accordance with plans provided by the Arborist. Hand excavation and/or air spading will be utilised for inground services and footings in proximity to TPZ's & RPZ's.

3.1.3 Native Vegetation Clearing Permit considerations

Clearing of native vegetation is regulated under the *Environmental Protection Act 1986* (EP Act) and related *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations). Clearing under the Act and Regulations is defined as:

(a) the killing or destruction of; or

(b) the removal of; or

(c) the severing or ringbarking of trunks or stems of; or

(d) the doing of any other substantial damage to,

some or all of the native vegetation in an area, and includes the draining or flooding of land, the burning of vegetation, the grazing of stock, or any other act or activity, that causes —

(e) the killing or destruction of; or

(f) the severing of trunks or stems of; or

(g) any other substantial damage to,

some or all of the native vegetation in an area

A permit must be sought from DWER for clearing of any native vegetation, unless for an exempt purpose. Exemptions which have been identified to be relevant to the proposed development include (DWER, 2019):

- EP Act, Schedule 6, Item 10: Clearing under the *Bush Fires Act 1954*. This allows for clearing to meet the requirements of the Shire of Mundaring annual Firebreak and Fuel Load Notice which identifies the requirement to maintain a low fuel zone a minimum of 20 m surrounding habitable buildings and the need to comply with approved Bushfire Management Plans.
- Clearing Regulations, Regulation 5, item 1: Clearing to construct a building. This allows for clearing required for the lawful construction of a building or other structure on a property, not including riparian vegetation or vegetation within ESAs.

As such, it is not identified that an approval under the EP Act is required vegetation management which is required to address the BMP requirements surrounding the building renovation sites for the proposed works.

3.2 Fauna and Habitat

3.2.1 Potential Impacts

As the proposed building and site works will require only limited the clearing of trees at the site and the understorey predominantly consists of sparse native flora over weeds, fauna habitat is not anticipated to be impacted to a large degree by the project. There may be limited duration disturbance to fauna from construction noise and increased population presence onsite associated with the construction works, although it is noted that these will occur in located areas for limited durations.

The site is noted to provide potential habitat for conservation significant Black Cockatoo species. Habitat potentially utilised by these species will predominantly not be impacted by the proposed works, particularly given vegetation management to address the BMP requirements (i.e. removal of 14 non-endemic trees) does not impact higher value black cockatoo habitat.

3.2.2 Proposed Management

Management measures proposed to support fauna populations and habitat protection include:

- Utilise local native flora species in future landscaping works to provide additional fauna habitat opportunities
- Vehicles speed onsite to remain below 30 km/hr
- Tree removal and pruning to be undertaken outside of the main bird nesting season (i.e. July to November), where possible
- Environmental Induction Memorandum to be provided to construction contractor will contain information relating to fauna projection and management including what to do if injured fauna or venomous snakes are observed on the site (Section 3.2.3) and contact details of appropriate personnel.

- Feral fauna attractants and potential native fauna traps such as open skip bins will be minimised during and post-construction. Contractors will be directed to disposal of food waste within sealed bins to avoid attracting fauna to the area.

3.2.3 Injured Fauna Protocol

Should injured, abandoned or distressed fauna be found onsite the following protocol is to be undertaken:

1. Animal found.
2. Contact Project Superintendent or Environmental Consultant for instructions. If these representatives cannot be reached, contact the DBCA Wildcare helpline (**9474 9055**).
3. If unable to stay with the animal, clearly mark its position so it is visible to all personnel that approach the site.
4. First preference is to leave the animal alone until experienced assistance arrives. If this is not possible, the following handling and temporary holding instructions may be enacted (only if absolutely necessary and only as a last resort):
    - Nesting birds (and all avifauna) should be left undisturbed until an appropriate course of action has been followed. Young birds found within a nest should only be removed if considered by a specialist to be abandoned or injured
    - For any small mammals found at any time on site, the best method of storage and transportation would be within calico bags. Mammals may become stressed and agitated in traps or hard containers, sometimes resulting in injury. Mammals transported in hessian sacks remain calmer due to the dark environment and if kept in the shade and on a soft, secure surface can be transported with relatively limited stress and injury
    - Reptiles can, in most cases, be transported within calico bags of varying size to suit the animal. Plastic carry boxes can also be used with some air holes, leaf litter and sand within them. The animals should always be placed within an area of shade so that they do not overheat.
5. If in any doubt about whether the animal is venomous, do not under any circumstances attempt to handle. Instead, monitor the location of the animal and await arrival of an experienced wildlife officer or reptile handler.
6. Project superintendent and/or Environmental Consultant to contact DBCA or wildlife carers as appropriate.

3.3 Water Management

The following water management actions will be undertaken at the site:

- Stormwater generated onsite will be infiltrates as close to source as practical
- Potential drainage runoff into Clutterbuck Creek will be prevented
- The Site is not connected to mains sewer and currently serviced by leach drains. The new development will upgrade the site effluent systems via installation of new Alternative Treatment Units (ATU's) proposed within the Effluent Management Plan.
- Stormwater will be integrated with the landscape design to utilize existing overland drainage with new overland drainage via swales depositing into new and existing basins proposed within the Stormwater Management Plan.

3.4 Hazardous Materials

Some of the building onsite contain potentially hazardous materials (Section 2.8). In order to ensure these materials and handled and disposed of safely the following will be undertaken as recommended by SERS (2024):

- An assessment plan to remove Asbestos Containing Material (ACM) will be prepared to inform the site works program
- ACM is to be removed before potential disturbance to ensure potential health risks do not arise
- ACM removal to be undertaken in accordance with the Code of Practice: How to Safely Remove Asbestos (WHSC, 2022). ACM removal will be undertaken by a licenced contractor.
- Lead-based paint management actions include:
  - Regardless of condition, immediate access restrictions should be applied and removal undertaken if the lead-based paint is located in areas that are likely to be chewed or licked by children, knocked or are subject to friction.
  - If the lead-based paint is flaking or in a poor/unstable condition (and not located in areas as described above), repainting is required.
  - Lead-based paint in good condition (and not located in areas as described above), should be left in in-situ unless major renovation and removal is required.
  - Painting over lead-based paint is a temporary solution limited by the life of the paint.
- Removal and replacement of Synthetic Mineral Fibre (SMF) is the preferred option if such materials were found in accessible areas or air conditioning systems. For bonded SMF in a good and stable condition, ongoing maintenance and periodic inspection to ensure they are not deteriorating would be appropriate controls.
- The preferred control option is to remove and replace all capacitors containing or suspected as containing Polychlorinated Biphenyls (PCB) or the fluorescent light fittings. If this is not immediately feasible, then a regular maintenance program should be enforced whereby capacitors found to be leaking PCB, are removed and replaced with non-PCB capacitors.
- Control, maintenance or removal of ozone depleting substances which may be present in refrigeration, fire retardants, solvents, aerosol propellants and in manufactured foams.

3.5 Heritage

3.5.1 Indigenous Heritage

As the proposed development does not intersect Clutterbuck Creek, and no earth-disturbing works are proposed in proximity to the creek, it is not anticipated that any impacts on known aboriginal heritage values will occur.

Sites of Aboriginal heritage significance are known to occur in the Parkerville locality. All contractors working on the site will be made aware of the requirements under the *Aboriginal Heritage Act 1972* in relation to avoidance of distance and reporting should an unexpected suspected Aboriginal Heritage site be uncovered during works.

3.5.2 Non-indigenous Heritage

The relevant management actions identified within the Conservation Management Strategy (Heritage Intelligence, 2022) and the Heritage Impact Statement (Heritage Intelligence, 2024) relevant to the site will be implemented during construction.

In general, the heritage management actions proposed are identified in the Conservation Management Strategy and Development Application Architectural drawings.

3.6 Acid Sulfate Soils

A number of scenarios which may potentially trigger the need for an ASS investigation are discussed in Table 3-1 (DER, 2015).

Table 3-1: ASS Investigation Trigger Criteria Assessment

Criteria	Comment
Acid sulfate soil disturbing subdivision or development that is subject to conditional approval requiring the investigation and management of acid sulfate soils	No approvals are in place at this time.
Soil or sediment disturbance of 100 m^3 or more in an area depicted on an ASS risk map as Class I 'high to moderate risk of ASS occurring within 3m of natural soil surface' (e.g. construction of roads, foundations, installation of underground infrastructure, drainage works, land forming works, dams and aquaculture ponds or sand or gravel extraction)	The DWER ASS risk mapping does not extend over this site. CSIRO (2024) mapping identifies the site as having an Extremely low probability of occurrence of ASS. As such Class I or II ASS risk areas are unlikely to occur onsite. In addition, work proposed onsite are primarily related to building construction and refurbishment. As such large areas of soil disturbance which is typically associated with bulk earthworks is not proposed.
Soil or sediment disturbance of 100 m^3 or more with excavation from below the natural watertable in an area depicted on an ASS risk map as Class II 'moderate to low risk of ASS occurring within 3m of natural soil surface but high to moderate risk of ASS beyond 3m of natural soil surface'	
Lowering of the watertable, whether temporary or permanent (e.g. for groundwater abstraction, dewatering, installation of new drainage, modification to existing drainage), in areas depicted in an ASS risk map as Class I 'high to moderate risk of AASS or PASS occurrence' or Class II 'moderate to low risk of AASS or PASS occurrence within 3m of natural soil surface'	Given the nature of the works proposed it is not anticipated that dewatering would be required.
Any dredging operations	No dredging is proposed.
Extractive industry works (e.g. mineral sand mining) in any of the areas listed in Table 1 (DER, 2015).	No extractive industries works are proposed.
Flood mitigation works, including construction of levees and flood gates, in any of the areas listed in Table 1 (DER, 2015).	No flood mitigation works are proposed.

On the basis of the above, further investigation in relation to ASS is not proposed.

4 Conclusion

The proposed development of the site has been designed to avoid key potential environmental impact through minimisation of vegetation removal and associated fauna habitat disturbance. Water management has been designed to reflect existing and natural hydrological conditions. Hazardous materials management has been identified to ensure human health is protected.

In summary, development of the site as proposed has not been identified as likely to result in any unacceptable environmental impacts. Any potential direct or indirect impacts associated with its implementation can be appropriately managed and mitigated, as development progresses.

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Figures

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Roland Rd

Kilburn Rd

Towle Wy

Beacon Rd

Richardson Rd

Byfield Rd

SITE

Ellenbrook
Aveley
Belhus
Baskerville
Henley Brook
Millendon
Landsdale
Cullacabardee
Alexander Heights
Brabham
Herne Hill
Whiteman
Ballajura
Koondoola
West Swan
Bennett Springs
Dayton
Middle Swan
Jane Brook
Mirrabooka
Malaga
Beechboro
Stratton
John Forrest National Park
Caversham
Noranda
Lockridge
Swan View
Hovea
Parkerville
Stoneville
Midvale
Dianella
Morley
Eden Hill
Woodbridge
Guildford
Greenmount
Mundaring
Embleton
Bassendean
Glen Forrest
Mahogany Creek
Bedford
South Guildford
Hazelmere
Bayswater
Ashfield
Darlington
Menora
Inglewood
Helena Valley
Mount Lawley
Maylands
Perth Airport
Munday Swamp
Highgate
Ascot
Redcliffe
High Wycombe
Belmont
Northbridge
Gooseberry Hill
Perth
City of Belmont
Rivervale
Cloverdale
Maida Vale
Piesse Brook
Paulls Valley
Victoria Park
Kewdale
Kalamunda

LEGEND

- Site Boundary
- Survey Area
- Cadastre

N

0 12.5 25 50 75 100 m

Scale: 1:2,000 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Orthophoto - NearMaps, 15.06.24

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McCorkell Construction
ENVIRONMENTAL ASSESSMENT REPORT
61 ROLAND ROAD, PARKERVILLE

SITE LOCATION

Figure 1

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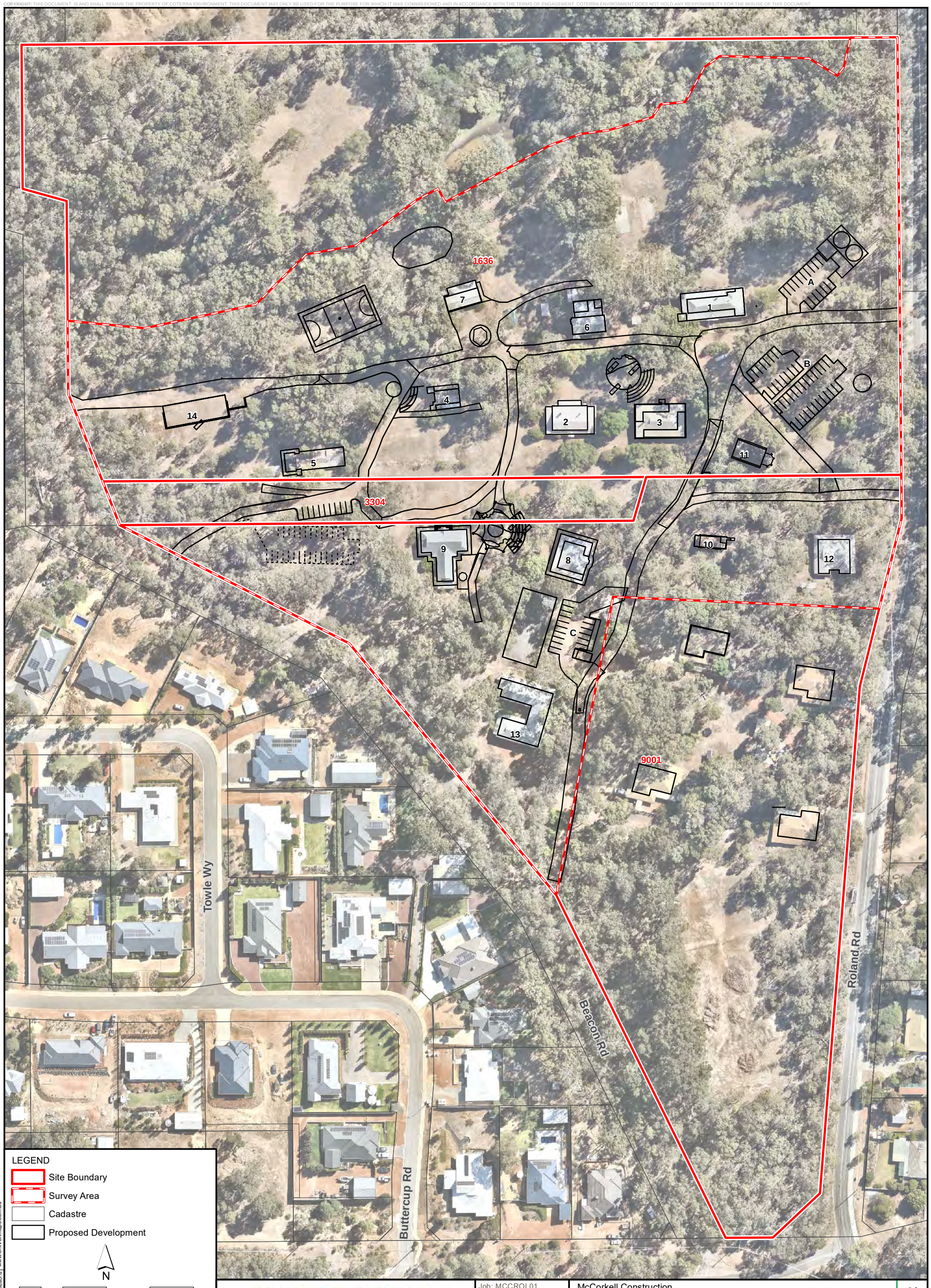

LEGEND

- Site Boundary
- Survey Area
- Cadastre
- Proposed Development

N

0 10 20 40 60 80 m

Scale: 1:1,500 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Orthophoto - NearMaps, 15.06.24

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ENVIRONMENTAL ASSESSMENT REPORT
61 ROLAND ROAD, PARKERVILLE

PROPOSED DEVELOPMENT

Figure 2

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3304
G2
LA1
Towle Wy
Beacon Rd
9001
Buttercup Rd
Richardson Rd
Byfield Rd
LA1
LA1
LA1
250
248
246
232
230
234
236
238
240
242
244
252
254
228
226
224

LEGEND

- Site Boundary
- Survey Area
- Cadastre
- Proposed Development
- Contour (mAHD)

Geology

- G2: GRAVEL - yellow-brown to reddish brown, loose, fine to coarse, ferruginous pisolites, poorly sorted; variable amounts of sand and silt in matrix, minor recementation; colluvial origin.
- LA1: LATERITE - massive hard, cemented, vuggy and pisilitic; up to 4m thick, overlain by and associated with gravels (G2 and G3) of residual origin.
- GR: GRANITES - fine to coarse-grained, occasionally porphyritic rocks of granite, granodiorite and adamellite composition.
- Sgc: CLAYEY GRAVELLY SAND - grey and yellow, kaolinitic, decomposed bedrock, sand and gravel veneer; granitic/gneissic origin.

N

0 12.5 25 50 75 100 m

Scale: 1:2,000 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Contours - DPIRD
Orthophoto - NearMaps, 15.06.24
Geology - DoIR: Geological Survey of W.A., 1999

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61 ROLAND ROAD, PARKERVILLE

TOPOGRAPHY AND GEOLOGY

Figure 3

C:\GIS\Jobs\CoTerra\MCCROL01 – 61 Roland Rd, Parkerville\Figures\MCCROL01_F03 Topography and Geology_241016.mxd

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255DpDW2
255DpYG4
255DpYG1
255DpDW2
255MvMY3
1636
3304
9001
Roland Rd
Kilburn Rd
Towle Wy
Beacon Rd
Buttercup Rd
Richardson Rd
Byfield Rd
A
B
C
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14

LEGEND
- Site Boundary
- Survey Area
- Cadastre
- Proposed Development

Soil Landscape Mapping
- 255DpDW2: Dwellingup 2 Phase
- 255DpYG1: Yarragil 1 Phase
- 255DpYG4: Yarragil 4 Phase
- 255MvMY2: Murray 2 Phase
- 255MvMY3: Murray 3 Phase

N

0 12.5 25 50 75 100 m

Scale: 1:2,000 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Orthophoto - NearMaps, 15.06.24
Soil Landscape Mapping - DPIRD

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SOIL LANDSCAPE MAPPING

Figure 4

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WIN BORE

CLUTTERBUCK CREEK

1636

3304

9001

Roland Rd

Kilburn Rd

Towle Wy

Buttercup Rd

Beacon Rd

Richardson Rd

Byfield Rd

1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C

LEGEND

- Site Boundary
- Survey
- Cadastre
- Proposed Development
- WIN Bore 5466
- Watercourse
- Lake - Perennial
- Earth Dam
- Dam Wall

N

0 12.5 25 50 75 100 m

Scale: 1:2,000 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Hydrography - DWER
Orthophoto - NearMaps, 15.06.24

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HYDROLOGY

Figure 5

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Roland Rd
Kilburn Rd
Towle Wy
Beacon Rd
Buttercup Rd
Richardson Rd
Byfield Rd

Yg1
1636
3304
9001
My2
D2

A
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LEGEND
- Site Boundary
- Survey Area
- Cadastre
- Proposed Development

Vegetation Complexes
- Yarragil 1 - Yg1
- Dwellingup - D2
- Murray 2 - My2

N
0 12.5 25 50 75 100 m
Scale: 1:2,000 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Vegetation Complex - DBCA
Orthophoto - NearMaps, 15.06.24

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VEGETATION COMPLEX

Figure 6

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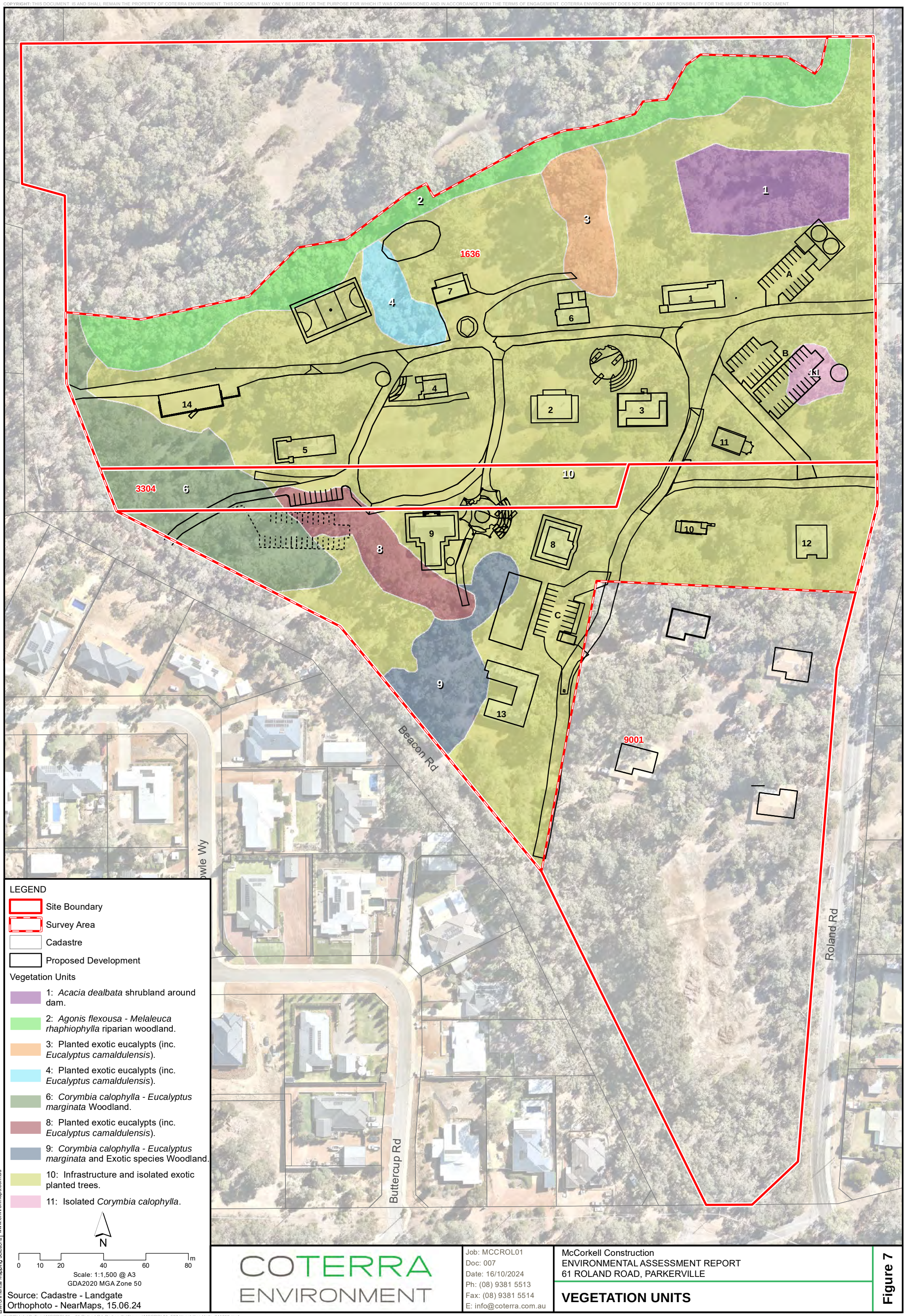

LEGEND

- Site Boundary
- Survey Area
- Cadastre
- Proposed Development

Vegetation Units

- 1: *Acacia dealbata* shrubland around dam.
- 2: *Agonis flexousa - Melaleuca rhaphiophylla* riparian woodland.
- 3: Planted exotic eucalypts (inc. *Eucalyptus camaldulensis*).
- 4: Planted exotic eucalypts (inc. *Eucalyptus camaldulensis*).
- 6: *Corymbia calophylla - Eucalyptus marginata* Woodland.
- 8: Planted exotic eucalypts (inc. *Eucalyptus camaldulensis*).
- 9: *Corymbia calophylla - Eucalyptus marginata* and Exotic species Woodland.
- 10: Infrastructure and isolated exotic planted trees.
- 11: Isolated *Corymbia calophylla*.

N

0 10 20 40 60 80 m

Scale: 1:1,500 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Orthophoto - NearMaps, 15.06.24

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VEGETATION UNITS

Figure 7

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1636
3304
9001
A
B
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1
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Beacon Rd
Towle Wy
Buttercup Rd
Roland Rd

LEGEND
- Site Boundary
- Survey
- Cadastre
- Proposed Development

Vegetation Condition
- Completely Degraded

N
0 10 20 40 60 80 m
Scale: 1:1,500 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Orthophoto - NearMaps, 15.06.24

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VEGETATION CONDITION

Figure 8

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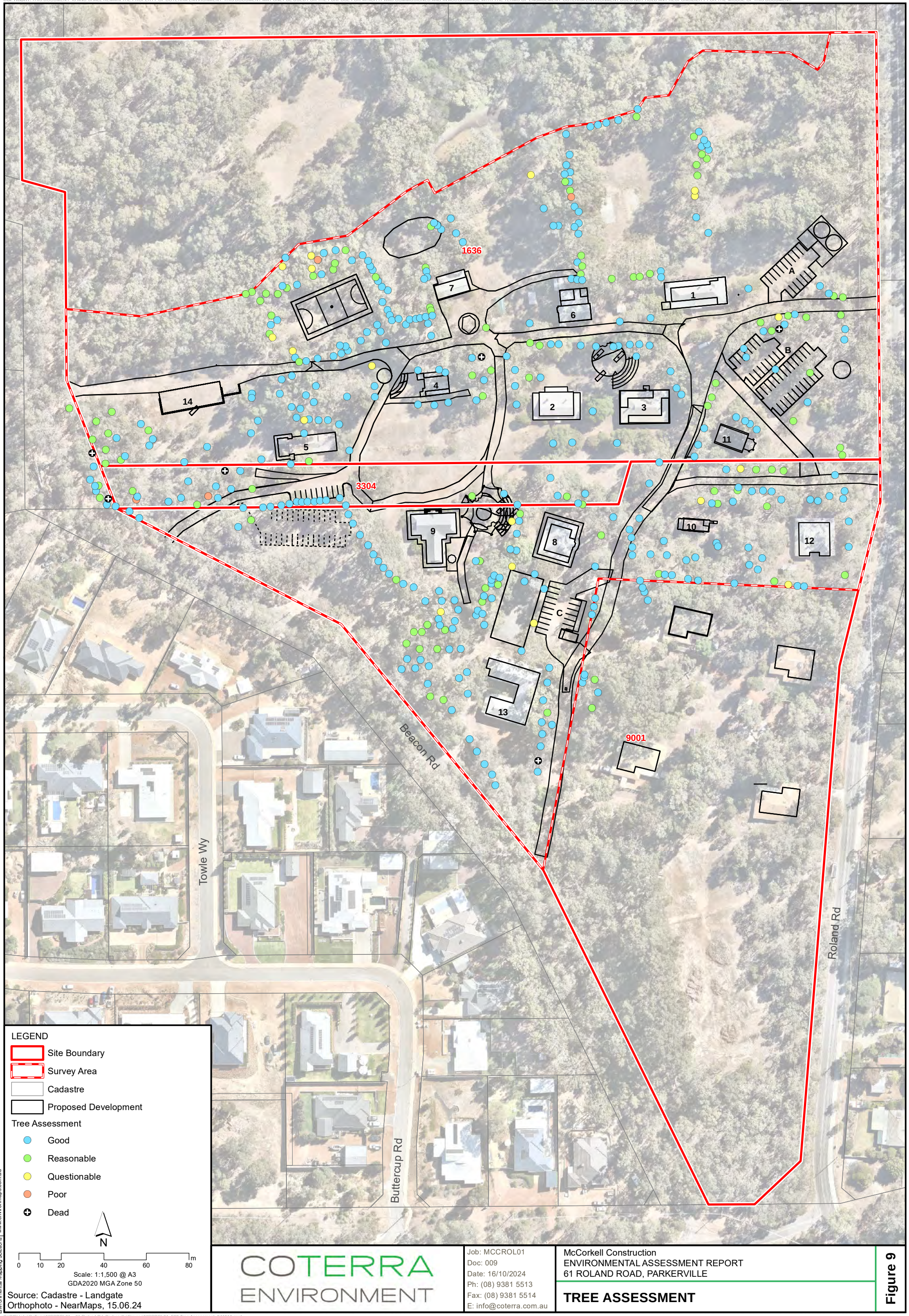

LEGEND

- Site Boundary
- Survey Area
- Cadastre
- Proposed Development

Tree Assessment

- Good
- Reasonable
- Questionable
- Poor
- Dead

N

0 10 20 40 60 80 m

Scale: 1:1,500 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Orthophoto - NearMaps, 15.06.24

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TREE ASSESSMENT

Figure 9

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1636
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Beacon Rd
Towle Wy
Buttercup Rd
Roland Rd

LEGEND
- Site Boundary
- Survey Area
- Cadastre
- Proposed Development
- Rank 3: Black Cockatoo Habitat Tree

Fauna Habitat
- VSA 1 Open Marri / Jarrah Woodland
- VSA 2 Mixed Garden and Eucalypts
- VSA 3 Dampland / Creekline
- VSA 4 Dam

N

0 10 20 40 60 80 m

Scale: 1:1,500 @ A3
GDA2020 MGA Zone 50

Source: Cadastre - Landgate
Orthophoto - NearMaps, 15.06.24

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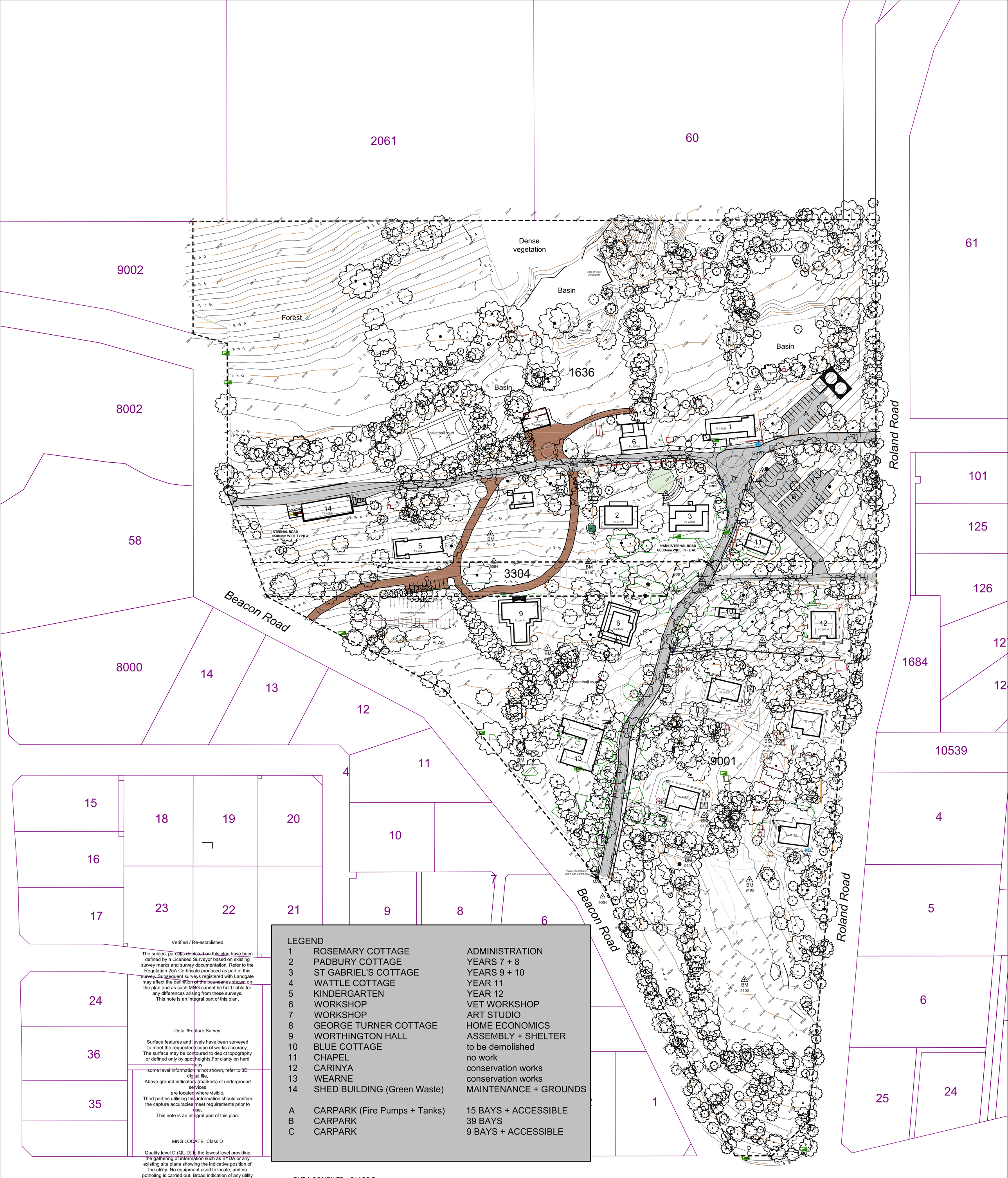
FAUNA HABITAT

Figure 10

Appendix 1 Site Plans showing proposed development layout



LEGEND

1	ROSEMARY COTTAGE	ADMINISTRATION
2	PADBURY COTTAGE	YEARS 7 + 8
3	ST GABRIEL'S COTTAGE	YEARS 9 + 10
4	WATTLE COTTAGE	YEAR 11
5	KINDERGARTEN	YEAR 12
6	WORKSHOP	VET WORKSHOP
7	WORKSHOP	ART STUDIO
8	GEORGE TURNER COTTAGE	HOME ECONOMICS
9	WORTHINGTON HALL	ASSEMBLY + SHELTER
10	BLUE COTTAGE	to be demolished
11	CHAPEL	no work
12	CARINYA	conservation works
13	WEARNE	conservation works
14	SHED BUILDING (Green Waste)	MAINTENANCE + GROUNDS
A	CARPARK (Fire Pumps + Tanks)	15 BAYS + ACCESSIBLE
B	CARPARK	39 BAYS
C	CARPARK	9 BAYS + ACCESSIBLE

Verified / Re-established

The subject parcel/s depicted on this plan have been defined by a Licensed Surveyor based on existing survey marks and survey documentation. Refer to the Regulation 25A Certificate produced as part of this survey. Subsequent surveys registered with Landgate may affect the definition of the boundaries shown on the plan and as such MNG cannot be held liable for any differences arising from these surveys.
This note is an integral part of this plan.

Detail/Feature Survey

Surface features and levels have been surveyed to meet the requested scope of works accuracy. The surface may be contoured to depict topography or defined only by spot heights.For clarity on hard copy some level information is not shown, refer to 3D digital file.
Above ground indicators (markers) of underground services are located where visible.
Third parties utilising this information should confirm the capture accuracies meet requirements prior to use.
This note is an integral part of this plan.

MNG LOCATE- Class D

Quality level D (QL-D) Is the lowest level providing the gathering of information such as BYDA or any existing site plans showing the indicative position of the utility. No equipment used to locate, and no potholing is carried out. Broad indication of any utility presence with no site verification.

BYDA COMPILED - CLASS D

Water Pipe - Unverified, No Measurement

Class 3 Accuracy Statement

This survey has been completed to CLASS 3 Accuracy
Horizontal Accuracy ± 30mm
Vertical Accuracy ± 50mm
This note is an integral part of this plan

SITE PLAN

SCALE. : 1:1000@A1 0 10 20 100m

PARKERVILLE CARE SCHOOL

ROLAND ROAD, PARKERVILLE

JOB NO. :2406 DATE :OCTOBER 2024 DWG NO. :SK.00_2 REV : P4

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Western Australia 6000
T +61 8 9484 4700
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building ideas

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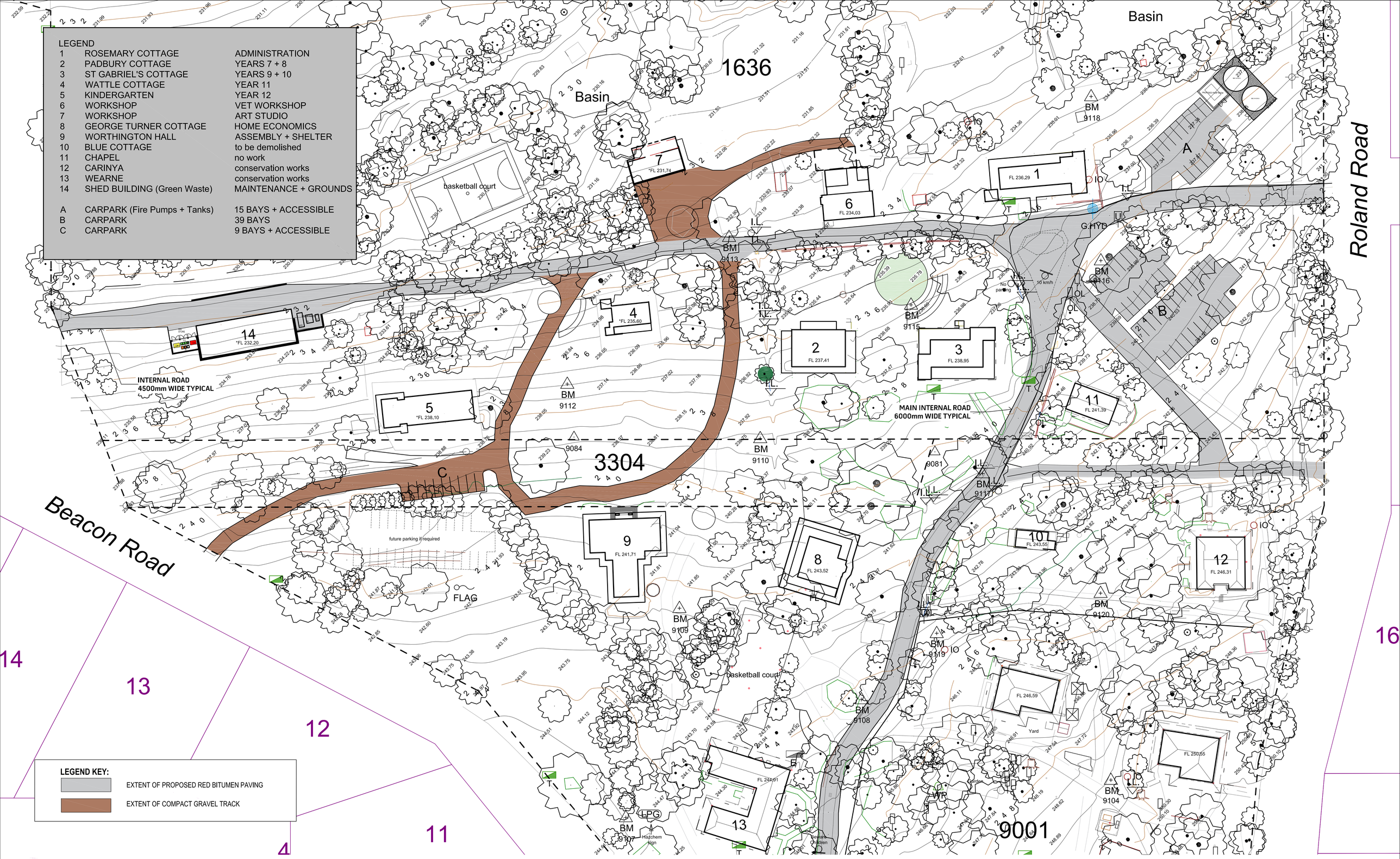

SITE PLAN

SCALE. : 1:500@A1

0 10 20 100m

PARKERVILLE CARE SCHOOL

ROLAND ROAD, PARKERVILLE

JOB NO. :2406 DATE :OCTOBER 2024 DWG NO. :SK.00_1 REV : P4

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building ideas

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Appendix 2 Flora and Vegetation Survey

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E shane@plantecology.com.au

ABN 18 849 210 133

28 October 2024

Claire Norman
Scientist
CoTerra Environment
Level 1, 98 Colin St
West Perth, WA 6005

Dear Claire,

This letter outlines the results of a reconnaissance level flora and vegetation survey of the Parkerville Children & Youth Care Campus at 61 Roland Rd, Parkerville in the Shire of Mundaring undertaken by myself on the 23rd August 2024 (the site; Figure 1).

1 Introduction

Parkerville Children & Youth Care is proposing to undertake upgrades at their campus in Parkerville. This may require clearing of vegetation and the purpose of the survey was, therefore, to evaluate the likelihood of occurrence of flora and ecological communities of conservation concern within the site.

1.1. Existing Environment

The site is situated within the Northern Jarrah Forest region on the Darling Plateau, approximately 27 km from the Perth CBD. The original vegetation of the uplands in the southern part of the site was the Dwellingup 2 vegetation complex, which is described as an open forest of *Eucalyptus marginata* and *Corymbia calophylla* on lateritic uplands (Government of Western Australia 2017). The lower slopes were part of the Yarragil 1 vegetation complex, described as an open forest of *Eucalyptus marginata* and *Corymbia calophylla* on slopes with mixtures of *Eucalyptus patens* and *Eucalyptus megacarpa* on valley floors (Government of Western Australia 2017).

The soils of the upper slopes comprised of the Dwellingup 2 phase of well drained, shallow to moderately deep gravelly brownish sands, pale brown sands and earthy sands overlying lateritic duricrust (DPIRD 2022-). A small band of soil downslope of the Dwellingup 2 phase comprises is part of the Yarragil 1 phase of moderately well drained yellow duplex soils and yellow and brown massive earths and gravels (DPIRD 2022-). The soils of the lower slopes in the north of the site are part of the Yarragil 4 phase which are valley floors with some poorly drained mottled yellow duplex soils and gentle lower slopes with moderately well to well drained loamy and sandy earths, gravels and duplex soils (DPIRD 2022-).

The site has been almost fully developed and now comprises mostly buildings and access roads with planted exotic trees over grass and gardens. The native remnants are restricted to the riparian overstorey of the creek line along the northern boundary of the surveyed site, and some stands with a native overstorey on the western boundary of the site. The overstorey of the remainder of the site comprises mainly planted exotic trees and a few isolated native trees such species such as *Corymbia calophylla*.

Searches of the State databases identified 38 conservation significant taxa and six conservation significant communities with the potential to occur within the site. An assessment of the likely presence of these conservation values is presented in the results section.

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E shane@plantecology.com.au

ABN 18 849 210 133

2 Methods

The site was traversed on foot by an experienced botanist on the 23rd August 2024 and observations made on the current vegetation condition at eleven points. At each point, photographs of the vegetation were taken, a list of the common plant taxa recorded and an assessment of the vegetation condition made using the criteria defined in Table 1, taking into account the integrity of the vertical structure, the presence and density of weeds, signs of disturbance and the ability of the vegetation to maintain, or regenerate to, a natural state.

Table 1: Vegetation Condition Scale (Keighery 1994)

Vegetation Condition Rank	Definition
Pristine (1)	Pristine or nearly so, no obvious signs of disturbance.
Excellent (2)	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

3 Results

The assessment of the potential presence for each taxon of Threatened and Priority Flora is shown in Table 2 and known locations are shown in Figure 2. Most taxa are known to occur in substrates or vegetation types that do not occur within the site, such as granite slopes on the Darling Scarp or in Banksia woodlands. Where the habitat may have been suitable to support occurrences of conservation significant flora, the Completely Degraded condition of the vegetation means that it is highly unlikely that any would occur within the site.

An assessment of the likelihood for conservation significant communities to occur within the site is shown in Table 3, and known occurrences are shown in Figure 3. The only conservation significant community in the local area that occurs in the jarrah forest is the Central Granite Shrublands (Com 5, Markey), which is a Priority 4 ecological community. The Central Granite Shrublands are shrublands and heaths on loamy soils and shallow sands among fragmented granite rock (Markey 1997). This habitat does not occur within the site and the upland remnant vegetation suggests it was *Corymbia calophylla* and *Eucalyptus marginata* woodlands rather than a heath vegetation.

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ABN 18 849 210 133

Only two native vegetation types are still discernible within the site (Figure 4). The *Agonis flexuosa* – *Melaleuca rhaphiophylla* riparian woodland mainly consists of the three species *Agonis flexuosa* and *Melaleuca rhaphiophylla* with occasional *Eucalyptus patens* over a grassy understorey of **Briza maxima, *Oxalis pes-caprae* and other introduced grasses and herbs. A clump of blackberry (**Rubus anglocandicans*) was also observed within the riparian vegetation. Two stands of remnant vegetation on the western part of the site consist of a *Corymbia calophylla – Eucalyptus marginata* woodland. Little native vegetation remains in the understorey with scattered individuals of a *Xanthorrhoea preissii*, *Macrozamia riedlei* and *Acacia lissocarpha* present. The introduced shrubs **Chamaecytisus palmensis* and **Acacia iteaphylla* were present in the midstorey.

The remainder, and majority, of the site consists of planted eucalypts and other tree species over cultivated grasses surrounding the access roads and outbuildings. These areas can no longer be considered native vegetation.

The condition of the vegetation within the site is rated as 'Completely Degraded' for the entire site (Figure 5). What little native vegetation remains has lost its structural integrity and largely now consists of only the tree overstorey. Few native shrub species were observed in the mid-storey (see above) and the groundlayer was almost entirely exotic grasses and herbs.

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ABN 18 849 210 133

Table 2: Threatened and Priority Flora with the potential to occur within the site.

Taxon	Conservation Status	EPBC Rank	Known Habitat	Habitat within Study area	Likely to Occur	Comments
Acacia aphylla	T	VU	Granite outcrops, hills. Sand and loams	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Acacia horridula	3		Gravelly soil over granite; rocky hillsides. Sand.	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Acacia oncinophylla subsp. oncinophylla	3		Granitic soils	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Adenanthos cygnorum subsp. chamaephyton	3		Lateritic gravel. Grey sand.	No	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Amanita preissii	3		Lateritic gravel. Sandy soil.	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Anthocercis gracilis	T	VU	Granite outcrops. Sandy or loamy soils	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Beaufortia purpurea	3		Lateritic or granitic soils. Rocky slopes	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Calothamnus accedens	4		Sandy soils over laterite.	Possible	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.

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Taxon	Conservation Status	EPBC Rank	Known Habitat	Habitat within Study area	Likely to Occur	Comments
Cyanothamnus tenuis	4		Laterite and granite in stony soils	No	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Cyathochaeta teretifolia	3		Sandy clay in swamps and creek edges	Yes	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Darwinia apiculata	T	EN	Lateritic soils	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Darwinia pimelioides	4		Granite outcrops. Loams.	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Diplolaena andrewsii	T	EN	Granite outcrops and hillsides. Loam or clay.	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Grevillea curviloba	T	EN	Winter-wet heath. Sand, sandy loam.	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Grevillea dissectifolia	3		Granite outcrops	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Grevillea flexuosa	T	VU	Sand over laterite or granite	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.

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Taxon	Conservation Status	EPBC Rank	Known Habitat	Habitat within Study area	Likely to Occur	Comments
Grevillea ornithopoda	2		Granite outcrops	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Grevillea pimeleoides	4		Gravelly soils over granite; hillsides.	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Halgania corymbosa	3		Gravelly soils over granite.	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Isopogon autumnalis	3		Sandy soils in Banksia woodland	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Juncus meianthus	3		Black sand, sandy clay. Creeks and seeps.	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Lasiopetalum bracteatum	4		Sandy clay, lateritic gravel. Drainage lines, creeks, granite outcrops.	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Lasiopetalum glutinosum subsp. glutinosum	3		Open woodland and low scrub	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Lepyrodia heleocharoides	3		Moist peaty sand, swamps.	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.

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Taxon	Conservation Status	EPBC Rank	Known Habitat	Habitat within Study area	Likely to Occur	Comments
Meionectes tenuifolia	3		Aquatic habitats	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Persoonia sulcata	4		Lateritic or granitic soils	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Pimelea rara	4		Lateritic soils	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Pithocarpa corymbulosa	3		Granite outcrops. Gravelly or sandy loams.	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Senecio leucoglossus	4		Gravelly lateritic or granitic soils.	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Sporobolus blakei	3		Red sandy clay, loam. Creeks.	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Stylidium striatum	4		Clay loam over laterite. Hillslopes	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Tetratheca pilifera	3		Gravelly soils.	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.

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Taxon	Conservation Status	EPBC Rank	Known Habitat	Habitat within Study area	Likely to Occur	Comments
Thelymitra dedmaniarum	T	EN	Granite	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Thelymitra variegata	T		Sand clay, sand. Laterite.	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Thysanotus anceps	3		Sand, lateritic gravel.	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Thysanotus glaucus	4		Sand, sandy gravel	No	No	Absence of suitable habitat and the Completely Degraded vegetation condition preclude the likelihood of occurrence within the site.
Tricostularia drummondii	3				No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.
Verticordia serrata var. linearis	3		White sand, gravel. Open woodland	Possible	No	The Completely Degraded vegetation condition precludes the likelihood of occurrence within the site.

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Table 3: Threatened Ecological Communities with the potential to occur within the site.

Community Name	Threatened Category	Known Habitat and characteristics	Habitat within Study area	Pre-European Occurrence	Likely to Occur	Comments
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Well-drained, low nutrient soils on sandplains; canopy dominated by *Banksia attenuata, Banksia menziesii, Banksia prionotes or Banksia ilicifolia.* Vegetation condition rating is Good or higher.	No	No	No	Dominant species not present and vegetation condition below threshold.
Central Northern Darling Scarp Granite Shrubland Community	Priority 4	Shrublands and heath on deeper loams and red earths on fragmented granite/quartzite.	No	No	No	The granite substrate not observed within the site and the Completely Degraded vegetation condition has removed most native taxa.
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	Endangered	Heavy soils of the eastern side of the Swan Coastal Plain, often with an impervious clay layer. Typical species may include *Corymbia calophylla, Eucalyptus wandoo, Xanthorrhoea preissii, Acacia pulchella* and *Hypocalymma angustifolium.*	No	No	No	The community occurs on the Swan Coastal Plain and the Completely Degraded vegetation condition has removed most native taxa.

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Community Name	Threatened Category	Known Habitat and characteristics	Habitat within Study area	Pre-European Occurrence	Likely to Occur	Comments
Eastern shrublands and woodlands	Critically Endangered	Sands of Forrestfield or Guildford units at the base of the Darling Scarp.	No	No	No	The community occurs on the Swan Coastal Plain and the Completely Degraded vegetation condition has removed most native taxa.
Corymbia calophylla - *Kingia australis* woodlands on heavy soils of the Swan Coastal Plain	Endangered	Heavy soils of the eastern side of the Swan Coastal Plain. Similar to 3c but with groundwater closer to the surface and therefore likely to be wetter than the former.	No	No	No	The community occurs on the Swan Coastal Plain and the Completely Degraded vegetation condition has removed most native taxa.
Low lying *Banksia attenuata* woodlands or shrublands (SCP 21c)	Priority 3	Associated with the Bassendean Dune System on lower lying wetter sites.	No	No	No	The community occurs on the Swan Coastal Plain and the Completely Degraded vegetation condition has removed most native taxa.

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4 Summary

The site at the Parkerville Children and Youth Care campus is highly modified and contains only a few remnants of vegetation with a native overstorey. The Completely Degraded vegetation condition means that is highly unlikely that any flora of conservation concern occur within the site.

The existing native tree canopy allows only two native vegetation types to be discernible: an *Agonis flexuosa* and *Melaleuca rhaphiophylla* woodland and a *Corymbia calophylla – Eucalyptus marginata* woodland. Neither vegetation type suggests that a community of conservation concern was originally present within the site.

Should you require any further information or have any other queries, please feel free to contact me.

Sincerely yours,



Dr. Shane Chalwell

Plantecology Consulting

5 References

DPIRD (2022-) Soil and Landscape Mapping – Best Available (DPIRD-027), Department of Primary Industries and Regional Development, https://catalogue.data.wa.gov.au/dataset/soil-landscape-mapping-best-available.

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Keighery, BJ (1994), Bushland plant survey: A Guide to Plant Community Survey for the Community, Wildflower Society of WA (inc), Nedlands, Western Australia.

Markey, A. (1997) Floristic survey of the northern Darling Scarp, Unpublished report to the Department of Conservation and Land Management, the Department of Environmental Protection and the Western Australian Conservation Council (inc.) for the Australian Heritage Commission.

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Plates

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Plate 1 (Photopoint 1): Acacia shrubland on dam bank.



Plate 2 (Photopoint 2): *Agonis flexuosa* – *Melaleuca rhaphiophylla* riparian woodland.

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Plate 3 (Photopoint 3): Planted exotic eucalypts (inc. *Eucalyptus camaldulensis*) woodland in 'Completely Degraded' condition.



Plate 4 (Photopoint 4): Planted exotic eucalypts (inc. *Eucalyptus camaldulensis*) woodland in 'Completely Degraded' condition.

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Plate 5 (Photopoint 5): *Agonis flexuosa* – *Melaleuca rhaphiophylla* woodland in 'Completely Degraded' condition.



Plate 6 (Photopoint 6): *Corymbia calophylla* – *Eucalyptus marginata* woodland in 'Completely Degraded' condition.

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Plate 7 (Photopoint 7): *Corymbia calophylla – Eucalyptus marginata* woodland in 'Completely Degraded' condition.



Plate 8 (Photopoint 8): Planted exotic eucalypts in 'Completely Degraded' condition.

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Plate 9 (Photopoint 9): *Corymbia calophylla – Eucalyptus marginata* and exotic species woodland in 'Completely Degraded' condition.



Plate 10 (Photopoint 10): Infrastructure and isolated exotic planted trees.

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Plate 11 (Photopoint 11): Isolated *Corymbia calophylla*.

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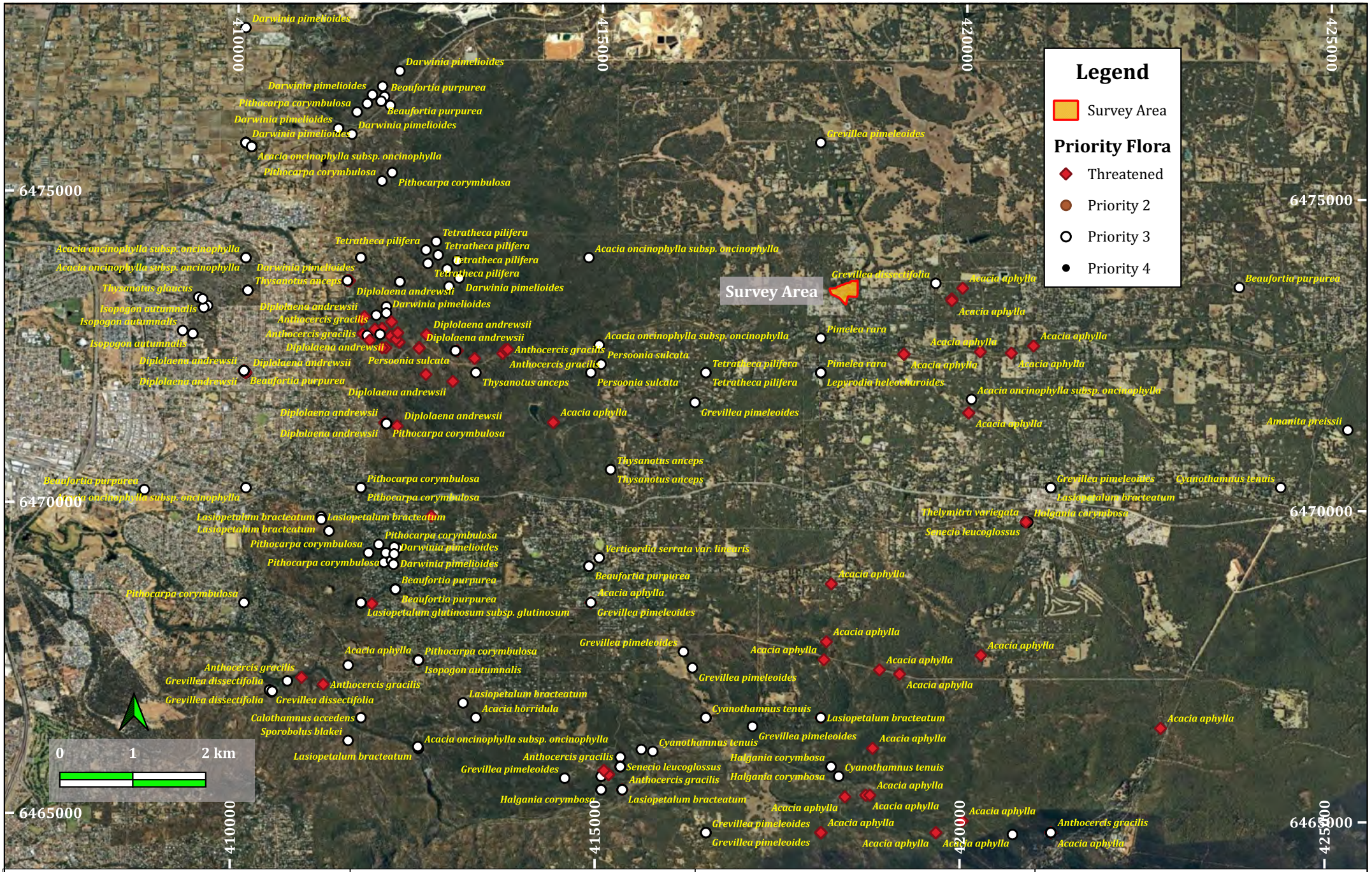
Figures



Plantecology CONSULTING 50 New Cross Rd Kingsley WA 6026	Scale: 1:7500 Basemap Source: Google Satellite Hybrid Datum: GDA2020 Projection: EPSG 7850	Client: Parkerville Choldren & Youth Care (INC). Project: Parkerville Children & Youth Care Campus Flora Survey Location: 61 Roland Rd, Parkerville Author: S.T.S. Chalwell Drawn: S.T.S. Chalwell	**Figure 1: Locality Plan**



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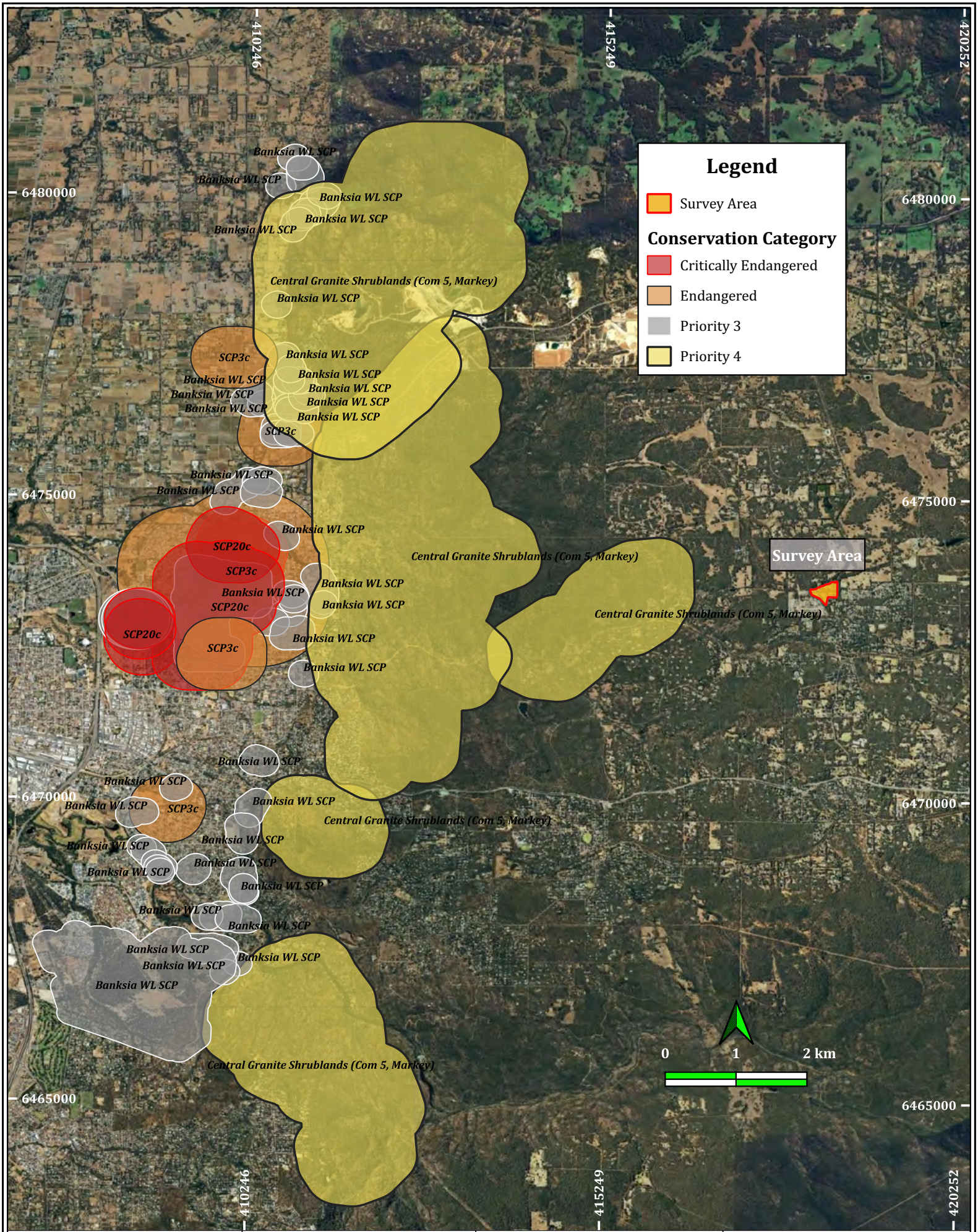
50 New Cross Rd
Kingsley WA 6026

Scale: 1:50 000
Basemap Source: Google Satellite
Datum: GDA2020
Projection: EPSG 7850

Client: Parkerville Children & Youth Care (INC).
Project: Parkerville Children & Youth Care Campus Flora Survey
Location: 61 Roland Rd, Parkerville
Author: S.T.S. Chalwell

Figure 2: Conservation Significant Flora



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50 New Cross Rd Kingsley WA 6026

Scale: 1:50 000
Basemap Source: Google Satellite
Datum: GDA2020
Projection: EPSG 7850

Client: Parkerville Children & Youth Care (INC).
Project: Parkerville Children & Youth Care Campus Flora Survey
Location: 61 Roland Rd, Parkerville
Author: S.T.S. Chalwell
Drawn: S.T.S. Chalwell

Figure 3: Conservation Significant Communities



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50 New Cross Rd Kingsley WA 6026

Scale: 1:2 000
Basemap Source: Google Satellite
Datum: GDA2020
Projection: EPSG 7850

Client: Parkerville Children & Youth Care (INC).
Project: Parkerville Children & Youth Care Campus Flora Survey
Location: 61 Roland Rd, Parkerville
Author: S.T.S. Chalwell
Drawn: S.T.S. Chalwell

Figure 4: Plant Communities



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50 New Cross Rd Kingsley WA 6026

Scale: 1:2 000
Basemap Source: Google Satellite
Datum: GDA2020
Projection: EPSG 7850

Client: Parkerville Children & Youth Care (INC).
Project: Parkerville Children & Youth Care Campus Flora Survey
Location: 61 Roland Rd, Parkerville
Author: S.T.S. Chalwell
Drawn: S.T.S. Chalwell

Figure 5: Vegetation Condition

Appendix 3 Arboricultural Assessment Report Extracts



Figure 6. Tree Location & ID Numbering Map Tree Location Please note: The location of the trees are indicative and for reference purposes only. Tree Locations require validation/verification by surveyor prior to works. Aerial image source https://web.metromap.com.au/map Image Date - 7 April 2024 Geographic Information System (GIS) via QGIS http://www.qgis.org

ARBORIBUS CONSULTING



Figure 7. Tree Location & ID Numbering Map Tree Location Please note: The location of the trees are indicative and for reference purposes only. Tree Locations require validation/verification by surveyor prior to works. Aerial image source https://web.metromap.com.au/map Image Date - 7 April 2024 Geographic Information System (GIS) via QGIS http://www.qgis.org



Figure 8. Tree Location & ID Numbering Map Tree Location Please note: The location of the trees are indicative and for reference purposes only. Tree Locations require validation/verification by surveyor prior to works. Aerial image source https://web.metromap.com.au/map Image Date - 7 April 2024 Geographic Information System (GIS) via QGIS http://www.qgis.org

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00084	*Eucalyptus camaldulensis (River Red Gum)*	Mature	11	10	40 + years	Reasonable	Reasonable	0.450	5.40	0.550	2.57	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.138504	-31.87108447
A00085	*Corymbia calophylla (Marri)*	Mature	10	8	15 - 40 years	Reasonable	Reasonable	0.380	4.56	0.450	2.37	Canopy noted to be slightly sparse. Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1384581	-31.8710792
A00086	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	11	10	40 + years	Good	Reasonable	0.480	5.76	0.530	2.53	Canopy displays leggy structural form. Main stem bifurcates above 4 meters+. Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1384348	-31.87106866
A00087	*Corymbia calophylla (Marri)*	Mature	10	10	40 + years	Good	Reasonable	0.580	6.60	0.500	2.47	Main stem bifurcates between 300 mm and 1 meter. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1383896	-31.87103627
A00088	*Erythrina x sykesii (Coral Tree)*	Mature	11	12	5 - 15 years	Good	Questionable	1.210	14.52	1.210	3.59	Canopy displays leggy structural form. Canopy previously lopped (not in keeping with AS4373). Main stem bifurcates between 500mm and 1 meter. Prior branch failures noted within canopy (150 mm to 300 mm dia.). Tree displays multi stemmed form. Tree displays questionable form. management plan required if tree is identified for retention.	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1380348	-31.87104456
A00089	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	16	16	15 - 40 years	Good	Reasonable	1.800	1.600	1.500	3.92	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates between ground level and 500mm. Minor canopy suppression noted. Rubbing & Crossing stems noted within canopy (150 mm to 300 mm dia.). Tree displays multi stemmed form	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia. - Remove Rubbing stems	116.1378382	-31.87080655
A00090	*Eucalyptus camaldulensis (River Red Gum)*	Early Mature	8	8	15 - 40 years	Good	Questionable	0.350	4.20	0.350	2.13	Canopy displays leggy structural form. Main stem bifurcates at ground level. Major canopy suppression noted. management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.137778	-31.87074103
A00091	*Eucalyptus globulus (Tasmanian Blue Gum)*	Mature	25	22	5 - 15 years	Questionable	Questionable	1.160	13.20	1.200	3.57	Bark Inclusions noted (minor). Canopy noted to be sparse. Canopy starting to indicate decline. Deadwood noted within canopy (50 mm to 150 mm dia.). Evidence of Termite mud noted however no active termites observed. Significant Rubbing & Crossing stems noted (300 mm + dia.). management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1377725	-31.87064988
A00092	*Eucalyptus globulus (Tasmanian Blue Gum)*	Mature	18	12	5 - 15 years	Questionable	Questionable	0.650	7.80	1.000	3.31	Canopy indicates decline, Canopy noted to be slightly sparse. Deadwood noted within canopy (50 mm to 150 mm dia.). Evidence of Termite mud noted however no active termites observed. management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1377729	-31.87062722
A00093	*Eucalyptus camaldulensis (River Red Gum)*	Mature	13	7	15 - 40 years	Reasonable	Reasonable	0.300	3.60	0.330	2.08	Bark Inclusions noted. Canopy displays leggy structural form. Main stem bifurcates between 1 meter and 2 meters. Minor canopy suppression noted. Prior branch failures noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1377857	-31.87056197
A00094	*Eucalyptus camaldulensis (River Red Gum)*	Mature	20	10	15 - 40 years	Reasonable	Reasonable	0.600	7.20	0.650	2.76	Canopy displays leggy structural form. Damage noted to main stem. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1377821	-31.87051696
A00095	*Eucalyptus camaldulensis (River Red Gum)*	Mature	18	10	15 - 40 years	Reasonable	Reasonable	0.420	5.04	0.500	2.47	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1378333	-31.87049252
A00096	*Eucalyptus camaldulensis (River Red Gum)*	Mature	18	10	15 - 40 years	Reasonable	Reasonable	0.410	4.92	0.500	2.47	Canopy displays leggy structural form. Minor canopy suppression noted. Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove Rubbing stems	116.1378092	-31.87047292
A00097	*Eucalyptus camaldulensis (River Red Gum)*	Mature	19	10	15 - 40 years	Good	Reasonable	0.410	4.92	0.450	2.37	Hollows /habitat noted throughout canopy. Minor canopy suppression noted. Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove Rubbing stems	116.1378426	-31.8704534
A00098	*Eucalyptus camaldulensis (River Red Gum)*	Mature	18	10	40 + years	Good	Reasonable	0.400	4.80	0.450	2.37	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.137808	-31.87044018
A00099	*Eucalyptus camaldulensis (River Red Gum)*	Mature	17	13	40 + years	Good	Reasonable	0.800	9.60	0.700	2.85	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1378344	-31.8704301
A00100	*Eucalyptus camaldulensis (River Red Gum)*	Mature	17	10	40 + years	Good	Reasonable	0.550	6.60	0.600	2.67	Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1378199	-31.8704131
A00101	*Eucalyptus camaldulensis (River Red Gum)*	Mature	13	14	15 - 40 years	Reasonable	Reasonable	1.100	13.20	1.100	3.44	Minor canopy suppression noted. Tree displays multi stemmed form. Stand of x3	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1377689	-31.87039799
A00102	*Eucalyptus camaldulensis (River Red Gum)*	Mature	18	8	15 - 40 years	Good	Questionable	0.350	4.20	0.360	2.20	Bark Inclusions noted (minor). Canopy displays leggy structural form. Main stem bifurcates between 3 metres and 4 meters. Minor canopy suppression noted. Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.). management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1377948	-31.87037784

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00103	*Eucalyptus robusta (Swamp Mahogany)*	Mature	16	14	15 - 40 years	Reasonable	Questionable	0.780	9.40	0.800	3.01	Canopy displays leggy structural form. Canopy noted to be sparse. Deadwood noted within canopy (<50 mm to 150 mm dia.). Evidence of Termite mud noted however no active termites observed, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation & or may display questionable health or structural issues)		116.1374851	-31.87031187
A00104	*Eucalyptus camaldulensis (River Red Gum)*	Mature	16	10	15 - 40 years	Good	Reasonable	0.500	6.00	0.550	2.57	Minor canopy suppression noted. Tree on lean (minor)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1374905	-31.87027944
A00105	*Eucalyptus diversicolor (Karri)*	Mature	23	12	15 - 40 years	Good	Reasonable	0.610	7.32	0.650	2.76	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1373932	-31.87032611
A00106	*Eucalyptus robusta (Swamp Mahogany)*	Mature	20	18	15 - 40 years	Good	Reasonable	0.780	9.36	0.800	3.01	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1373349	-31.8703368
A00107	*Eucalyptus robusta (Swamp Mahogany)*	Mature	22	20	15 - 40 years	Good	Reasonable	1.400	13.68	1.400	3.81	Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates at ground level. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1372931	-31.87034458
A00108	*Eucalyptus robusta (Swamp Mahogany)*	Mature	22	20	15 - 40 years	Good	Reasonable	1.000	12.00	1.000	3.31	Deadwood noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1372552	-31.87035236
A00109	*Corymbia calophylla (Marri)*	Mature	12	10	40 + years	Good	Reasonable	0.310	3.72	0.350	2.13	Canopy noted to be slightly sparse. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1371346	-31.87038347
A00110	*Eucalyptus grandis (Rose Gum)*	Early Mature	18	10	40 + years	Good	Reasonable	0.320	3.84	0.400	2.25	Canopy displays leggy structural form, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1371502	-31.87047098
A00111	*Eucalyptus patens (Blackbutt)*	Mature	8	10	40 + years	Good	Reasonable	0.260	4.20	0.400	2.25	Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species, Tree on lean (minor)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1371336	-31.87051376
A00112	*Eucalyptus grandis (Rose Gum)*	Mature	31	13	40 + years	Good	Reasonable	1.000	12.00	1.200	3.57	Canopy displays leggy structural form, Damage to surface roots (minor). Deadwood noted within canopy (150 mm to 300 mm dia.). Minor canopy suppression noted, Prior branch failures noted within canopy (150 mm to 300 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1371521	-31.87054487
A00113	*Eucalyptus grandis (Rose Gum)*	Mature	22	12	40 + years	Good	Reasonable	0.610	7.32	0.730	2.90	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.) Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1371259	-31.87055362
A00114	*Eucalyptus grandis (Rose Gum)*	Mature	32	25	40 + years	Good	Reasonable	1.900	15.00	1.900	4.33	Canopy displays leggy structural form, Deadwood noted within canopy (150 mm to 300 mm dia.). Minor canopy suppression noted. Prior branch failures noted within canopy (150 mm to 300 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1371482	-31.87058571
A00115	*Eucalyptus grandis (Rose Gum)*	Early Mature	10	10	40 + years	Reasonable	Reasonable	0.310	3.72	0.350	2.13	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1371288	-31.87058474
A00116	*Eucalyptus diversicolor (Karri)*	Mature	13	12	15 - 40 years	Reasonable	Reasonable	0.430	5.40	0.500	2.47	Canopy displays leggy structural form. Minor canopy suppression noted. Prior branch failures noted within canopy (150 mm to 300 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1371521	-31.87062266
A00117	*Eucalyptus conferruminata (Bushy Yate)*	Mature	8	6	<5 years	Poor	Questionable	0.310	3.72	0.580	2.13	Canopy indicates decline. Canopy noted to be sparse. Deadwood noted within canopy (50 mm to 150 mm dia.). Limited Estimated Life Expectancy, management plan required if tree is identified for retention	Unsuitable for incorporation (Not compatible with design &/or problematic health or structural form)	Dismantle or; undertake habitat pruning	116.137157	-31.87064988
A00118	*Eucalyptus grandis (Rose Gum)*	Mature	33	25	15 - 40 years	Good	Reasonable	0.950	11.40	1.200	3.57	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Prior branch failures noted within canopy (150 mm to 300 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1371735	-31.87069072
A00119	*Agonis flexuosa (WA Peppermint)*	Early Mature	5	10	15 - 40 years	Good	Reasonable	0.481	4.80	0.481	2.29	Tree displays multi stemmed form. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1371939	-31.87071308
A00120	*Eucalyptus camaldulensis (River Red Gum)*	Mature	26	10	15 - 40 years	Good	Reasonable	0.460	5.52	0.550	2.57	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1371939	-31.8707617
A00121	*Eucalyptus camaldulensis (River Red Gum)*	Mature	15	11	15 - 40 years	Good	Reasonable	0.950	11.40	0.950	3.24	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1371715	-31.87077628
A00122	*Eucalyptus camaldulensis (River Red Gum)*	Mature	25	20	15 - 40 years	Good	Reasonable	0.750	9.00	1.000	3.31	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted. Prior branch failures noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.137192	-31.87080642
A00123	*Eucalyptus robusta (Swamp Mahogany)*	Mature	15	10	15 - 40 years	Reasonable	Reasonable	1.160	13.20	1.160	3.44	Canopy noted to be slightly sparse. Deadwood noted within canopy (< 50mm dia.). Tree displays multi stemmed form. Stands x3	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1372046	-31.87089879

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00124	*Eucalyptus grandis (Rose Gum)*	Mature	33	17	15 - 40 years	Good	Reasonable	0.690	8.28	1.200	3.57	Canopy displays leggy structural form. Damage to surface roots (minor), Minor canopy suppression noted. Prior branch failures noted within canopy (150 mm to 300 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1371861	-31.87092699
A00125	*Eucalyptus rudis (Flooded Gum)*	Mature	14	10	15 - 40 years	Reasonable	Reasonable	0.600	7.20	0.600	2.67	Canopy displays leggy structural form, Canopy noted to be slightly sparse, Minor canopy suppression noted. Tree displays multi stemmed form	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1372091	-31.87094333
A00126	*Eucalyptus diversicolor (Karri)*	Mature	17	12	15 - 40 years	Reasonable	Reasonable	0.800	9.60	0.800	3.01	Canopy displays leggy structural form. Main stem bifurcates at ground level. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1372008	-31.87097838
A00127	*Eucalyptus grandis (Rose Gum)*	Mature	25	18	15 - 40 years	Good	Reasonable	0.740	8.88	0.860	3.11	Canopy displays leggy structural form, Deadwood noted within canopy (< 50 mm dia.). Minor canopy suppression noted. Prior branch failures noted within canopy (50 mm to 150 mm dia.). tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1371558	-31.87099703
A00128	*Eucalyptus grandis (Rose Gum)*	Mature	32	15	15 - 40 years	Good	Reasonable	0.890	10.68	1.100	3.44	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted. Prior branch failures noted within canopy (150 mm to 300 mm dia.). tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1371837	-31.87100074
A00129	*Eucalyptus camaldulensis (River Red Gum)*	Mature	14	11	15 - 40 years	Good	Reasonable	0.340	4.08	0.390	2.23	Canopy displays leggy structural form. Main stem bifurcates between 2 metres and 3 meters, Minor canopy suppression noted. tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1372085	-31.87100254
A00130	*Eucalyptus grandis (Rose Gum)*	Mature	32	25	15 - 40 years	Reasonable	Questionable	1.500	15.00	1.500	3.92	Canopy displays leggy structural form, Canopy noted to be slightly sparse, Damage noted to canopy, Damage to surface roots (minor), Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.), Significant branch failures noted (300 mm + dia), management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1373554	-31.87099805
A00131	*Eucalyptus grandis (Rose Gum)*	Mature	32	25	15 - 40 years	Reasonable	Reasonable	1.060	13.06	1.200	3.57	Canopy displays leggy structural form, Damage to surface roots (minor), Deadwood noted within canopy (< 50mm dia.), Evidence of Termite mud noted however no active termites observed, Minor canopy suppression noted. Prior branch failures noted within canopy (50 mm to 150 mm dia.). tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1374641	-31.87099205
A00132	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	12	11	15 - 40 years	Reasonable	Reasonable	0.390	4.68	0.420	2.30	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.137495	-31.87099027
A00133	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	12	12	15 - 40 years	Reasonable	Questionable	0.610	7.32	0.650	2.76	Canopy noted to be slightly sparse, Damage noted to main stem, Deadwood noted within canopy (50 mm to 150 mm dia.), Evidence of Termite mud noted however no active termites observed, Minor canopy suppression noted. management plan required if tree is identified for retention, tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1375443	-31.8709772
A00134	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	11	12	40 + years	Good	Reasonable	0.500	6.00	0.630	2.73	Canopy displays leggy structural form, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1375995	-31.87096816
A00135	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	11	6	40 + years	Good	Reasonable	0.340	4.08	0.400	2.25	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.) Minor canopy suppression noted, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1376015	-31.87099429
A00136	*Corymbia calophylla (Marri)*	Mature	13	10	15 - 40 years	Reasonable	Reasonable	0.350	4.20	0.400	2.25	Damage noted to main stem, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1384919	-31.87116079
A00137	*Eucalyptus diversicolor (Karri)*	Mature	23	10	15 - 40 years	Good	Reasonable	0.470	5.64	0.570	2.61	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1385129	-31.87122003
A00138	*Eucalyptus diversicolor (Karri)*	Mature	23	12	15 - 40 years	Good	Reasonable	0.610	7.32	0.660	2.81	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1385091	-31.87126503
A00139	*Corymbia calophylla (Marri)*	Mature	15	10	15 - 40 years	Reasonable	Reasonable	0.450	5.40	0.500	2.47	Canopy noted to be slightly sparse, Damage noted to main stem	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1383209	-31.87116829
A00140	*Eucalyptus diversicolor (Karri)*	Mature	18	15	15 - 40 years	Good	Questionable	0.570	6.84	0.660	2.81	Canopy displays leggy structural form. Damage to surface roots (minor), Deadwood noted within canopy (< 50mm dia.), Minor canopy suppression noted. Prior branch failures noted within canopy (50 mm to 150 mm dia.). management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1382646	-31.87115554
A00141	*Eucalyptus diversicolor (Karri)*	Mature	22	14	15 - 40 years	Reasonable	Questionable	0.480	5.76	0.550	2.57	Canopy displays leggy structural form. Damage to surface roots (minor). Minor canopy suppression noted. management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1382309	-31.87116079
A00142	*Eucalyptus diversicolor (Karri)*	Mature	14	10	15 - 40 years	Questionable	Questionable	0.450	5.40	0.500	2.47	Canopy displays leggy structural form. Minor canopy suppression noted. Tree displays questionable form. management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1381837	-31.87116679

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00143	*Eucalyptus diversicolor (Karri)*	Mature	14	12	15 - 40 years	Reasonable	Questionable	0.530	6.63	0.660	2.57	Canopy displays leggy structural form, Minor canopy suppression noted, Tree displays questionable form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1380937	-31.87118853
A00144	*Eucalyptus diversicolor (Karri)*	Mature	25	18	15 - 40 years	Good	Reasonable	0.660	7.92	0.700	2.85	Canopy displays leggy structural form, Damage to surface roots (minor), Deadwood noted within canopy (< 50mm dia), Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1382129	-31.87119903
A00145	*Eucalyptus diversicolor (Karri)*	Mature	23	15	Dead	Dead	Poor	0.630	N/A	0.760	N/A	Dead Tree - no chemical recovery	Unsuitable for incorporation (Not compatible with design &/or problematic health or structural form)	Dismantle or; undertake habitat pruning	116.1381852	-31.87121703
A00146	*Eucalyptus diversicolor (Karri)*	Mature	28	12	15 - 40 years	Reasonable	Questionable	0.520	6.24	0.580	2.53	Canopy displays leggy structural form, Canopy noted to be slightly sparse, Damage noted to main stem, Limited Estimated Life Expectancy, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1381477	-31.87122453
A00147	*Eucalyptus diversicolor (Karri)*	Mature	22	18	15 - 40 years	Good	Reasonable	0.570	6.84	0.650	2.75	Canopy displays leggy structural form, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1381072	-31.87122678
A00148	*Corymbia maculata (Spotted Gum)*	Mature	33	27	40 + years	Good	Good	1.260	15.00	1.590	4.02	Deadwood noted within canopy (50 mm to 150 mm dia.), Main stem bifurcates above 4 meters+, Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1380097	-31.87129877
A00149	*Washingtonia robusta (Mexican Fan Palm)*	Mature	11	5	40 + years	Good	Good	0.240	4.80	0.450	N/A	Damage noted to main stem, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove Dead Fronds and Flower Spikes	116.1380207	-31.87133547
A00150	*Corymbia maculata (Spotted Gum)*	Mature	19	10	40 + years	Good	Good	0.380	4.56	0.450	2.37	Canopy displays leggy structural form, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.138165	-31.87138815
A00151	*Corymbia calophylla (Marri)*	Mature	21	24	40 + years	Reasonable	Reasonable	1.450	15.00	2.070	4.49	Canopy noted to be slightly sparse, Canopy previously lopped not in keeping with AS4373), Deadwood noted within canopy (150 mm to 300 mm dia), Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1383375	-31.87140413
A00152	*Cupressus sempervirens (Pencil Pine)*	Mature	15	3	15 - 40 years	Good	Reasonable	0.330	3.96	0.430	2.32	Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.138324	-31.87152781
A00153	*Melia azedarach (Cape Lilac)*	Mature	7	10	15 - 40 years	Reasonable	Reasonable	0.240	5.00	0.500	2.47	Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1382525	-31.87160858
A00154	*Corymbia calophylla (Marri)*	Mature	20	19	15 - 40 years	Reasonable	Good	0.970	11.64	1.170	3.53	Canopy noted to be slightly sparse, Main stem bifurcates between 3 meters and 4 meters, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1384847	-31.871723
A00155	*Corymbia calophylla (Marri)*	Mature	12	10	15 - 40 years	Reasonable	Reasonable	0.370	4.44	0.450	2.37	Canopy noted to be slightly sparse, tree located adjacent old stump	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1384956	-31.87175413
A00156	*Corymbia citriodora (Lemon-scented Gum)*	Mature	22	17	40 + years	Good	Good	0.510	6.12	0.620	2.71	Canopy displays leggy structural form, Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1384578	-31.87183826
A00157	*Eucalyptus camaldulensis (River Red Gum)*	Mature	14	14	15 - 40 years	Reasonable	Reasonable	0.610	7.32	0.740	2.92	Canopy displays leggy structural form, Damage to surface roots (minor), Tree on lean (minor), Tree have noted at roadplate, mounding on far side of tree however appear to have stabilised	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.138202	-31.87181807
A00158	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	19	15 - 40 years	Reasonable	Good	0.820	9.84	0.910	3.18	Canopy noted to be slightly sparse, Main stem bifurcates above 4 meters+, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.138144	-31.87181386
A00159	*Eucalyptus camaldulensis (River Red Gum)*	Mature	13	12	15 - 40 years	Reasonable	Reasonable	0.610	7.32	0.710	2.87	Deadwood noted within canopy (< 50mm dia.) Minor canopy suppression noted, Tree on lean (minor), tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1380666	-31.87181302
A00160	*Casuarina cunninghamiana (River Sheoak)*	Mature	17	8	40 + years	Good	Good	0.430	5.16	0.470	2.41	Canopy displays leggy structural form, Tree is considered to be a good specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1380709	-31.87164309
A00161	*Casuarina cunninghamiana (River Sheoak)*	Mature	18	15	15 - 40 years	Good	Reasonable	0.510	6.12	0.750	2.93	Bark inclusions noted (minor), Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia), Main stem bifurcates above 4 meters+, Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1380368	-31.87161864

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00162	*Casuarina cunninghamiana (River Sheoak)*	Mature	17	10	15 - 40 years	Good	Reasonable	0.300	3.60	0.400	2.25	Canopy displays leggy structural form, Main stem bifurcates between 3 meters and 4 meters, Minor canopy suppression noted, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1380136	-31.87160641
A00163	*Casuarina cunninghamiana (River Sheoak)*	Mature	18	11	15 - 40 years	Good	Reasonable	0.310	6.12	0.620	2.71	Canopy displays leggy structural form, Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1379692	-31.87159032
A00164	*Eucalyptus camaldulensis (River Red Gum)*	Mature	17	13	15 - 40 years	Reasonable	Reasonable	0.440	5.28	0.520	2.51	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia), Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1378682	-31.87144487
A00165	*Eucalyptus camaldulensis (River Red Gum)*	Mature	20	10	15 - 40 years	Reasonable	Reasonable	0.420	5.04	0.480	2.43	Canopy displays leggy structural form, Main stem bifurcates above 4 meters+, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1378469	-31.87150472
A00166	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	16	15 - 40 years	Reasonable	Good	0.690	8.28	0.780	2.98	Damage to surface roots (minor), Deadwood noted within canopy (< 50mm dia), Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.137827	-31.87154076
A00167	*Eucalyptus camaldulensis (River Red Gum)*	Mature	20	18	15 - 40 years	Good	Reasonable	0.470	5.64	0.520	2.51	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia), Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.137809	-31.87163601
A00168	*Phoenix canariensis (Canary Island Date Palm)*	Mature	8	11	40 + years	Good	Good	0.700	6.00	0.900	N/A	Tree is considered to be a good specimen of the species, Tree situated in close proximity to buildings	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1377787	-31.87170616
A00169	*Phoenix canariensis (Canary Island Date Palm)*	Mature	8	11	40 + years	Good	Good	0.700	6.00	0.900	N/A	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1377588	-31.87175572
A00170	*Syzygium smithii (Lilly Pilly)*	Mature	12	12	40 + years	Good	Reasonable	0.450	5.40	0.500	2.47	Main stem bifurcates between 500mm and 1 meter, Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1376974	-31.87149204
A00171	*Syzygium smithii (Lilly Pilly)*	Mature	12	11	5 - 15 years	Good	Questionable	0.460	5.52	0.540	2.55	Bark Inclusions noted (major), Damage noted to main stem. Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia), Tree displays questionable form, management plan required if tree is identified for retention. Tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1376734	-31.87146475
A00172	*Eucalyptus robusta (Swamp Mahogany)*	Mature	17	17	40 + years	Good	Reasonable	0.800	9.60	0.910	3.18	Canopy displays leggy structural form, Damage to surface roots (minor), Deadwood noted within canopy (< 50mm dia.), Main stem bifurcates between 3 meters and 4 meters, Prior branch failures noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1376439	-31.87139291
A00173	*Eucalyptus cladocalyx (Sugar Gum)*	Mature	25	30	40 + years	Good	Reasonable	1.100	13.20	1.260	3.65	Canopy displays leggy structural form, Damage to surface roots (minor), Prior branch failures noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.137474	-31.87132687
A00174	*Syzygium smithii (Lilly Pilly)*	Mature	9	7	40 + years	Good	Reasonable	0.380	4.56	0.380	2.20	Main stem bifurcates between ground level and 500mm, Minor canopy suppression noted, Tree displays multi stemmed form	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1374891	-31.87127779
A00175	*Syzygium smithii (Lilly Pilly)*	Mature	10	7	40 + years	Good	Reasonable	0.350	4.20	0.390	2.13	Main stem bifurcates between 500mm and 1 meter, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.137541	-31.87128291
A00176	*Syzygium smithii (Lilly Pilly)*	Mature	11	10	5 - 15 years	Good	Questionable	0.450	5.40	0.500	2.47	Bark Inclusions noted (major), Main stem bifurcates between 500mm and 1 meter, Tree displays questionable form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1374423	-31.87127852
A00177	*Syzygium smithii (Lilly Pilly)*	Mature	11	6	40 + years	Good	Reasonable	0.600	7.20	0.600	2.67	Minor canopy suppression noted, Tree displays multi stemmed form, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1373859	-31.87128364
A00178	*Syzygium smithii (Lilly Pilly)*	Mature	12	6	5 - 15 years	Good	Questionable	0.400	4.80	0.450	2.37	Significant branch failures noted (300 mm + dia.), Tree displays questionable form	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1373611	-31.8712873
A00179	*Eucalyptus globulus (Tasmanian Blue Gum)*	Mature	30	17	40 + years	Good	Reasonable	1.070	12.84	1.200	3.57	Deadwood noted within canopy (50 mm to 1.40 mm dia), Evidence of Termite mud noted however no active termites observed	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1373933	-31.87118049
A00180	*Cinnamomum camphora (Camphora Laurel)*	Mature	14	28	40 + years	Good	Reasonable	1.090	13.08	1.100	3.44	Damage to surface roots (minor), Deadwood noted within canopy (50 mm to 150 mm dia.), tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1375469	-31.87116659
A00181	*Eucalyptus grandis (Rose Gum)*	Mature	30	12	40 + years	Good	Reasonable	0.550	6.60	0.620	2.71	Canopy displays leggy structural form, Minor canopy suppression noted, Stand of 2	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1370929	-31.87077033
A00182	*Eucalyptus grandis (Rose Gum)*	Mature	30	16	40 + years	Good	Reasonable	1.000	12.00	1.000	3.31	Canopy displays leggy structural form, Deadwood noted within canopy (50 mm to 150 mm dia), Minor canopy suppression noted, Tree displays multi stemmed form	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1370669	-31.87077142
A00183	*Eucalyptus grandis (Rose Gum)*	Mature	21	12	40 + years	Good	Reasonable	0.590	7.08	0.630	2.73	Canopy displays leggy structural form, Minor canopy suppression noted, Prior branch failures noted within canopy (150 mm to 300 mm dia)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1370203	-31.87069776
A00184	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	25	15	5 - 15 years	Questionable	Reasonable	1.100	13.20	1.100	3.44	Canopy noted to be sparse, Canopy starting to indicate decline, Deadwood noted within canopy (50 mm to 150 mm dia.), Tree displays multi stemmed form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1369575	-31.8705548

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00185	*Eucalyptus grandis (Rose Gum)*	Mature	24	22	15 - 40 years	Good	Reasonable	0.840	10.08	0.950	3.25	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted. Prior branch failures noted within canopy (150 mm to 300 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1365579	-31.87073676
A00186	*Eucalyptus camaldulensis (River Red Gum)*	Mature	16	18	40 + years	Good	Reasonable	0.800	9.60	1.200	3.57	Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates at ground level. Minor canopy suppression noted. Tree displays multi stemmed form. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1365839	-31.87080066
A00187	*Eucalyptus diversicolor (Karri)*	Mature	17	11	15 years	Good	Questionable	1.010	12.60	1.160	3.44	Canopy displays leggy structural form. Canopy previously lopped and in keeping with AS4373. Main stem bifurcates between 1 meter and 2 meters. Minor canopy suppression noted. Prior branch failures noted within canopy (150 mm to 300 mm dia.). Tree displays questionable form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/ or may display Questionable health or structural issues)		116.1366164	-31.87083748
A00188	*Eucalyptus camaldulensis (River Red Gum)*	Early Mature	11	10	40 + years	Good	Reasonable	0.330	3.96	0.400	2.25	Canopy displays leggy structural form. Minor canopy suppression noted. Tree on lean (minor). Part of stand of x10	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1365102	-31.87078225
A00189	*Eucalyptus camaldulensis (River Red Gum)*	Mature	16	10	40 + years	Good	Good	0.530	6.36	0.680	2.57	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted. Part of stand of x10	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364896	-31.87076492
A00190	*Eucalyptus camaldulensis (River Red Gum)*	Mature	15	6	40 + years	Reasonable	Reasonable	0.800	9.60	0.800	3.01	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia.). Minor canopy suppression noted. Significant branch failures noted (300 mm + dia.). Part of stand of x10	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364593	-31.87077033
A00191	*Eucalyptus camaldulensis (River Red Gum)*	Mature	14	7	40 + years	Good	Reasonable	0.420	5.04	0.350	2.13	Canopy displays leggy structural form. Minor canopy suppression noted. Part of stand of x10	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1364734	-31.87075517
A00192	*Eucalyptus camaldulensis (River Red Gum)*	Mature	18	15	40 + years	Reasonable	Reasonable	0.850	10.20	0.850	3.09	Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted. Prior branch failures noted within canopy (150 mm to 300 mm dia.). Tree on lean (minor)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364301	-31.87094471
A00193	*Eucalyptus camaldulensis (River Red Gum)*	Mature	23	17	40 + years	Good	Good	0.780	9.36	0.850	3.09	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a good specimen of the species. Tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364344	-31.87096096
A00194	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	24	40 + years	Good	Reasonable	0.800	9.60	0.800	3.01	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364387	-31.87098479
A00195	*Eucalyptus camaldulensis (River Red Gum)*	Mature	19	20	40 + years	Good	Reasonable	0.700	8.40	0.850	3.09	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted, tree situated in close proximity to buildings. Tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364236	-31.87099237
A00196	*Eucalyptus camaldulensis (River Red Gum)*	Mature	19	7	40 + years	Reasonable	Reasonable	0.420	5.04	0.500	2.47	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364502	-31.8711138
A00197	*Eucalyptus camaldulensis (River Red Gum)*	Mature	19	14	40 + years	Reasonable	Reasonable	0.800	9.60	0.800	3.01	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates at ground level. Minor canopy suppression noted, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364557	-31.87112694
A00198	*Eucalyptus camaldulensis (River Red Gum)*	Mature	21	16	15 - 40 years	Good	Reasonable	1.300	15.00	1.300	3.69	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates between 500mm and 1 meter. Minor canopy suppression noted. Rubbing & Crossing stems noted within canopy (150 mm to 300 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia. - Remove Rubbing stems	116.1362413	-31.8710401
A00199	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	12	15 - 40 years	Good	Reasonable	0.760	8.40	0.760	2.85	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates between 500 mm and 1 meter. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.136212	-31.87102505
A00200	*Eucalyptus camaldulensis (River Red Gum)*	Mature	20	15	15 - 40 years	Good	Reasonable	0.600	7.20	0.600	2.67	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia.). Main stem bifurcates at ground level. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1361938	-31.87100049
A00201	*Eucalyptus camaldulensis (River Red Gum)*	Mature	17	17	15 - 40 years	Reasonable	Reasonable	0.610	7.32	0.620	2.71	Canopy displays leggy structural form. Canopy noted to be slightly sparse. Main stem bifurcates between ground level and 500 mm. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1361819	-31.87098307
A00202	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	7	15 - 40 years	Good	Reasonable	0.350	4.20	0.430	2.32	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1361676	-31.87095376
A00203	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	21	15 - 40 years	Good	Reasonable	1.180	14.16	1.530	3.31	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates between ground level and 500 mm. Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1361558	-31.87093634
A00204	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	20	15 - 40 years	Good	Reasonable	0.750	9.00	0.750	2.93	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates between 500mm and 1 meter. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1361447	-31.87091416

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00205	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	15	14	15 - 40 years	Good	Reasonable	0.580	6.96	0.630	2.73	Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted. Significant branch failures noted (300 mm + dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1361185	-31.8708904
A00206	*Eucalyptus camaldulensis (River Red Gum)*	Mature	21	20	15 - 40 years	Good	Reasonable	0.800	9.60	0.800	3.01	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates between 500mm and 1 meter. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1360639	-31.8709111
A00207	*Melaleuca quinquenervia (Broad-leaved Paperbark)*	Mature	13	11	15 - 40 years	Reasonable	Questionable	0.630	7.56	0.630	2.67	Canopy displays leggy structural form. Minor canopy suppression noted. Tree displays multi-stemmed form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1360344	-31.87086866
A00208	*Melaleuca quinquenervia (Broad-leaved Paperbark)*	Mature	13	10	15 - 40 years	Good	Reasonable	0.400	4.80	0.500	2.47	Canopy displays leggy structural form. Main stem bifurcates between 2 meters and 3 meters. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1359839	-31.87086843
A00209	*Agonis flexuosa (WA Peppermint)*	Early Mature	11	10	15 - 40 years	Reasonable	Reasonable	0.480	4.80	0.420	2.30	Canopy displays leggy structural form. Canopy noted to be slightly sparse. Main stem bifurcates between 500mm and 1 meter. Star picket and wire wrapped at base of tree	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1359709	-31.8709494
A00210	*Eucalyptus camaldulensis (River Red Gum)*	Mature	21	10	15 - 40 years	Reasonable	Good	0.350	4.20	0.410	2.28	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1359802	-31.87092334
A00211	*Melaleuca quinquenervia (Broad-leaved Paperbark)*	Mature	14	10	15 - 40 years	Good	Reasonable	0.900	10.80	0.960	3.17	Canopy displays leggy structural form. Minor canopy suppression noted. Tree displays multi-stemmed form	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1359252	-31.8708796
A00212	*Eucalyptus camaldulensis (River Red Gum)*	Mature	23	24	15 - 40 years	Good	Good	0.640	7.68	0.710	2.87	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates between 3 meters and 4 meters. Minor canopy suppression noted. Prior branch failures noted within canopy (150 mm to 300 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1359141	-31.87096988
A00213	*Melaleuca quinquenervia (Broad-leaved Paperbark)*	Mature	11	10	15 - 40 years	Poor	Questionable	0.600	7.20	0.600	2.67	Canopy indicates decline. Canopy noted to be sparse. Limited Estimated Life Expectancy, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1358955	-31.87090752
A00214	*Melaleuca quinquenervia (Broad-leaved Paperbark)*	Mature	13	6	15 - 40 years	Questionable	Questionable	0.500	6.00	0.500	2.47	Bark Inclusions noted (minor). Canopy indicates decline. Canopy noted to be sparse. Main stem bifurcates between 500mm and 1 meter, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1358629	-31.87089076
A00215	*Eucalyptus robusta (Swamp Mahogany)*	Mature	14	11	15 - 40 years	Questionable	Questionable	0.900	10.80	0.900	3.17	Canopy indicates decline. Limited Estimated Life Expectancy. Main stem bifurcates at ground level. Minor canopy suppression noted, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1358647	-31.87094568
A00216	*Eucalyptus camaldulensis (River Red Gum)*	Mature	11	12	15 - 40 years	Reasonable	Questionable	0.500	6.00	0.600	2.67	Canopy displays leggy structural form. Damage noted to main stem. Minor canopy suppression noted. Prior branch failures noted within canopy (150 mm to 300 mm dia.). Significant Rubbing & Crossing stems noted (300 mm + dia.). Tree displays questionable form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1358722	-31.87097639
A00217	*Eucalyptus camaldulensis (River Red Gum)*	Mature	19	14	15 - 40 years	Good	Reasonable	0.600	7.20	0.650	2.76	Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted. Tree on lean (minor)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1357912	-31.87101269
A00218	*Eucalyptus camaldulensis (River Red Gum)*	Mature	21	12	15 - 40 years	Good	Good	0.410	4.92	0.450	2.37	Deadwood noted within canopy (< 50mm dia.). Minor canopy suppression noted. Tree is considered to be a good specimen of the species.	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1357344	-31.87089821
A00219	*Melaleuca quinquenervia (Broad-leaved Paperbark)*	Mature	12	10	5 - 15 years	Questionable	Questionable	0.860	9.60	0.860	3.01	Canopy indicates decline. Canopy noted to be sparse. Limited Estimated Life Expectancy. Tree displays multi-stemmed form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1357195	-31.87093544
A00220	*Eucalyptus rudis (Flooded Gum)*	Mature	13	10	15 - 40 years	Reasonable	Good	0.360	4.32	0.400	2.25	Canopy noted to be slightly sparse. Deadwood noted within canopy (< 50mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1357391	-31.87102758
A00221	*Eucalyptus rudis (Flooded Gum)*	Mature	22	13	15 - 40 years	Good	Good	0.560	6.72	0.620	2.71	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good specimen)	- Remove major deadwood >30mm dia.	116.1357177	-31.87101735
A00222	*Eucalyptus rudis (Flooded Gum)*	Mature	21	11	40 + years	Reasonable	Good	0.490	5.68	0.550	2.57	Canopy displays leggy structural form. Canopy noted to be slightly sparse. Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1356953	-31.87105085
A00223	*Eucalyptus rudis (Flooded Gum)*	Mature	21	5	40 + years	Reasonable	Reasonable	0.300	3.60	0.330	2.08	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1356358	-31.87104899
A00224	*Eucalyptus rudis (Flooded Gum)*	Mature	21	11	40 + years	Reasonable	Reasonable	0.440	5.28	0.500	2.47	Canopy noted to be slightly sparse. Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1356079	-31.87107971
A00225	*Melaleuca rhaphiophylla (Fresh Water Paperbark)*	Mature	10	7	15 - 40 years	Reasonable	Questionable	0.450	5.40	0.450	2.37	Canopy displays leggy structural form. Main stem bifurcates at ground level. Minor canopy suppression noted, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1355669	-31.87104155

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00226	*Melaleuca rhaphiophylla (Fresh Water Paperbark)*	Mature	10	10	15 - 40 years	Reasonable	Questionable	0.600	7.20	0.600	2.67	Minor canopy suppression noted. Tree displays multi stemmed form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1355353	-31.87104992
A00227	*Eucalyptus cornuta (Yate)*	Mature	14	14	15 - 40 years	Reasonable	Good	0.480	4.80	0.460	2.25	Canopy displays leggy structural form, Canopy noted to be slightly sparse, Deadwood noted within canopy (< 50mm dia). Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1356618	-31.87114207
A00228	*Eucalyptus cornuta (Yate)*	Mature	22	20	15 - 40 years	Good	Questionable	0.770	9.24	0.970	3.27	Canopy displays leggy structural form, Deadwood noted within canopy (50mm to 150 mm dia), Evidence of Termite mud noted however no active termites observed, Management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1356916	-31.87116161
A00229	*Eucalyptus cornuta (Yate)*	Mature	23	16	15 - 40 years	Good	Questionable	0.610	7.32	0.780	2.90	Canopy displays leggy structural form, Evidence of Termite mud noted however no active termites observed, Main stem bifurcates between 2 meters and 4 meters, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.135659	-31.87118209
A00230	*Eucalyptus robusta (Swamp Mahogany)*	Mature	19	14	15 - 40 years	Reasonable	Reasonable	0.590	7.08	0.690	2.83	Deadwood noted within canopy (< 50mm dia), Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1356525	-31.87122025
A00231	*Eucalyptus robusta (Swamp Mahogany)*	Mature	10	6	15 - 40 years	Questionable	Questionable	0.480	4.80	0.460	2.25	Canopy indicates decline, Canopy noted to be sparse, Deadwood noted within canopy (150 mm to 300 mm dia), Limited Estimated Life Expectancy management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1356665	-31.87123514
A00232	*Eucalyptus leucoxylon (S.A. Yellow Gum)*	Early Mature	7	10	5 - 15 years	Questionable	Good	0.320	3.84	0.320	2.05	Canopy indicates decline, Canopy noted to be sparse, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.135767	-31.87129378
A00233	*Corymbia maculata (Spotted Gum)*	Mature	19	8	40 + years	Good	Good	0.480	5.76	0.580	2.63	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1357791	-31.8713217
A00234	*Corymbia maculata (Spotted Gum)*	Mature	18	6	40 + years	Reasonable	Reasonable	0.330	3.96	0.450	2.37	Canopy displays leggy structural form, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1357987	-31.87134032
A00235	*Corymbia maculata (Spotted Gum)*	Mature	17	12	40 + years	Good	Good	0.560	6.72	0.610	2.69	Deadwood noted within canopy (< 50mm dia), Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.135834	-31.87133752
A00236	*Corymbia maculata (Spotted Gum)*	Mature	18	9	40 + years	Good	Reasonable	0.390	4.68	0.490	2.45	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia), Main stem bifurcates between 2 meters and 3 meters	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1358899	-31.87132729
A00237	*Corymbia maculata (Spotted Gum)*	Mature	18	8	40 + years	Good	Good	0.390	4.68	0.480	2.43	Canopy noted to be slightly sparse, Deadwood noted within canopy (< 50mm dia), Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.135969	-31.87131798
A00238	*Corymbia maculata (Spotted Gum)*	Mature	22	11	40 + years	Good	Good	0.550	6.60	0.660	2.78	Main stem bifurcates between 3 meters and 4 meters, Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1360081	-31.87130681
A00239	*Corymbia maculata (Spotted Gum)*	Mature	20	10	40 + years	Good	Good	0.390	4.68	0.460	2.39	Deadwood noted within canopy (< 50mm dia), Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1360407	-31.87129378
A00240	*Corymbia maculata (Spotted Gum)*	Mature	22	10	40 + years	Good	Good	0.440	5.28	0.550	2.57	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1360304	-31.87127516
A00241	*Corymbia maculata (Spotted Gum)*	Mature	22	10	40 + years	Good	Good	0.430	5.16	0.500	2.47	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1360025	-31.87127237
A00242	*Corymbia maculata (Spotted Gum)*	Mature	21	11	40 + years	Good	Reasonable	0.410	4.92	0.490	2.45	Canopy displays leggy structural form, Main stem bifurcates above 4 meters +, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1361052	-31.87125178
A00243	*Corymbia maculata (Spotted Gum)*	Mature	22	10	40 + years	Good	Reasonable	0.460	5.52	0.530	2.53	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia), Main stem bifurcates above 4 meters +	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1361366	-31.87121678
A00244	*Corymbia maculata (Spotted Gum)*	Mature	24	10	40 + years	Good	Good	0.370	4.44	0.450	2.37	Canopy displays leggy structural form, Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1361887	-31.87118627
A00245	*Corymbia maculata (Spotted Gum)*	Mature	19	12	40 + years	Good	Good	0.430	5.16	0.530	2.53	Deadwood noted within canopy (< 50mm dia), Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1362039	-31.87121499
A00246	*Corymbia maculata (Spotted Gum)*	Mature	10	13	40 + years	Good	Reasonable	0.430	5.16	0.510	2.49	Deadwood noted within canopy (< 50mm dia), Major canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1362302	-31.87126251
A00247	*Corymbia maculata (Spotted Gum)*	Mature	22	10	40 + years	Good	Good	0.390	4.68	0.480	2.43	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1362138	-31.87108936
A00248	*Corymbia maculata (Spotted Gum)*	Mature	10	10	40 + years	Good	Good	0.300	3.60	0.300	2.00	Deadwood noted within canopy (< 50mm dia), Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1362394	-31.87112341
A00249	*Corymbia maculata (Spotted Gum)*	Mature	24	9	40 + years	Good	Good	0.370	4.44	0.450	2.37	Canopy displays leggy structural form, Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1362497	-31.87114499

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00250	*Corymbia maculata (Spotted Gum)*	Mature	24	10	40 + years	Good	Reasonable	0.470	5.64	0.550	2.57	Canopy displays leggy structural form. Main stem bifurcates above 4 meters - Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1362604	-31.8711676
A00251	*Corymbia maculata (Spotted Gum)*	Mature	26	10	40 + years	Good	Good	0.460	5.52	0.550	2.57	Deadwood noted within canopy (< 50mm dia). Minor canopy suppression noted. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1362943	-31.87116132
A00252	*Corymbia maculata (Spotted Gum)*	Mature	26	10	40 + years	Good	Good	0.470	5.64	0.580	2.63	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1363305	-31.87118635
A00253	*Corymbia maculata (Spotted Gum)*	Mature	26	8	40 + years	Good	Good	0.390	4.68	0.460	2.38	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1363496	-31.8711641
A00254	*Corymbia maculata (Spotted Gum)*	Mature	24	10	40 + years	Good	Good	0.430	5.16	0.500	2.47	Deadwood noted within canopy (< 50mm dia). Minor canopy suppression noted. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1363806	-31.87116228
A00255	*Corymbia maculata (Spotted Gum)*	Mature	21	10	40 + years	Good	Good	0.380	4.56	0.450	2.37	Deadwood noted within canopy (< 50mm dia). Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364011	-31.87115912
A00256	*Corymbia maculata (Spotted Gum)*	Mature	29	15	40 + years	Good	Good	0.660	7.92	0.810	3.03	Deadwood noted within canopy (< 50mm dia). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1364284	-31.87115365
A00257	*Corymbia maculata (Spotted Gum)*	Mature	24	11	40 + years	Good	Good	0.440	5.28	0.520	2.51	Deadwood noted within canopy (< 50mm dia). Minor canopy suppression noted. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1364618	-31.8711488
A00258	*Corymbia maculata (Spotted Gum)*	Mature	24	8	40 + years	Good	Good	0.350	4.20	0.430	2.32	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia)	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1364405	-31.87118158
A00259	*Corymbia maculata (Spotted Gum)*	Mature	22	17	40 + years	Good	Good	0.580	6.96	0.670	2.80	Evidence of Termite mud noted however no active termites observed. Deadwood noted within canopy (50 mm to 150 mm dia). Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364568	-31.871234
A00260	*Eucalyptus camaldulensis (River Red Gum)*	Mature	20	18	40 + years	Reasonable	Reasonable	0.990	11.88	1.100	3.44	Canopy noted to be slightly sparse. Damage to surface roots (minor). Deadwood noted within canopy (50 mm to 150 mm dia). Main stem bifurcates between 2 meters and 3 meters. Rubbing & Crossing stems noted within canopy (150 mm to 300 mm dia)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia. - Remove Rubbing stems	116.1367285	-31.87120157
A00261	*Cotoneaster species (Cotoneaster)*	Mature	5	6	5 - 15 years	Good	Questionable	0.800	9.60	0.600	3.01	Deadwood noted within canopy (50 mm to 150 mm dia). Tree displays multi stemmed form. Tree displays questionable form. Limited Estimated Life Expectancy	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1372751	-31.87128544
A00262	*Syzygium smithii (Lilly Pilly)*	Mature	10	10	15 - 40 years	Good	Reasonable	0.700	8.40	0.700	2.85	Main stem bifurcates between ground level and 500mm. Tree displays multi stemmed form	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1371981	-31.87128007
A00263	*Syzygium smithii (Lilly Pilly)*	Mature	9	10	15 - 40 years	Good	Reasonable	0.550	6.60	0.550	2.57	Tree displays multi stemmed form. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1370895	-31.87127351
A00264	*Platanus x acerifolia (London Plane)*	Mature	12	14	15 - 40 years	Good	Good	0.700	8.40	0.700	2.85	Bark Inclusions noted (minor). Damage to surface roots (minor). Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1370501	-31.87127291
A00265	*Cotoneaster species (Cotoneaster)*	Mature	4	6	5 - 15 years	Reasonable	Questionable	0.900	10.80	0.900	3.17	Tree displays multi stemmed form. Tree displays questionable form. Limited Estimated Life Expectancy	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1369946	-31.87127888
A00266	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	14	16	40 + years	Reasonable	Reasonable	0.500	6.00	0.600	2.67	Canopy displays leggy structural form. Canopy noted to be slightly sparse. Damage to surface roots (minor)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1369469	-31.87126754
A00267	*Olea europaea (Olive)*	Mature	5	4	40 + years	Good	Reasonable	0.430	5.40	0.450	2.37	Rubbing & Crossing stems noted within canopy (< 50mm dia). Tree displays multi stemmed form	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove Rubbing stems	116.1369451	-31.8711846
A00268	*Corymbia citriodora (Lemon-scented Gum)*	Mature	23	14	40 + years	Good	Reasonable	0.550	6.60	0.660	2.78	Prior branch failures noted within canopy (50 mm to 150 mm dia). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1368293	-31.87132304
A00269	*Corymbia citriodora (Lemon-scented Gum)*	Mature	23	10	40 + years	Good	Good	0.410	4.92	0.500	2.47	Deadwood noted within canopy (< 50mm dia). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1368711	-31.87138212
A00270	*Corymbia citriodora (Lemon-scented Gum)*	Mature	15	14	40 + years	Good	Good	0.410	4.92	0.500	2.47	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia). Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species. Tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1368705	-31.87144955
A00271	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	14	10	40 + years	Reasonable	Good	0.380	4.56	0.450	2.37	Deadwood noted within canopy (< 50mm dia). Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species. Tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1369409	-31.87141434
A00272	*Morus rubra (Mulberry)*	Mature	7	13	5 - 15 years	Good	Questionable	1.500	15.00	1.500	3.92	Damage noted to main stem. Tree displays multi stemmed form. Tree displays questionable form. Stand of 8, management plan required if tree is identified for retention. Tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1369964	-31.87141494

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00273	*Cotoneaster species (Cotoneaster)*	Mature	4	12	5 - 15 years	Good	Questionable	0.500	18.61	0.580	3.17	Tree displays multi stemmed form, Tree displays questionable form, Limited Estimated Life Expectancy, tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1368783	-31.87152832
A00274	*Eucalyptus gomphocephala (Tuart)*	Mature	15	15	40 + years	Reasonable	Good	0.710	8.52	0.780	2.98	Canopy displays leggy structural form, Canopy noted to be slightly sparse, Damage noted to basal area, Deadwood noted within canopy (< 50mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1367098	-31.87149239
A00275	*Corymbia maculata (Spotted Gum)*	Mature	21	10	40 + years	Good	Reasonable	0.460	5.52	0.550	2.57	Canopy displays leggy structural form, Main stem bifurcates above 4 meters	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1366779	-31.87150962
A00276	*Corymbia calophylla (Marri)*	Mature	20	20	40 + years	Reasonable	Reasonable	1.500	13.00	1.500	3.92	Deadwood noted within canopy (50 mm to 150 mm dia.), Main stem bifurcates between 500mm and 1 meter, Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1366581	-31.87140368
A00277	*Corymbia maculata (Spotted Gum)*	Early Mature	17	10	40 + years	Good	Good	0.620	3.84	0.680	2.26	Minor canopy suppression noted, Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1367158	-31.87142349
A00278	*Eucalyptus gomphocephala (Tuart)*	Mature	24	15	40 + years	Reasonable	Reasonable	0.590	7.08	0.670	2.80	Deadwood noted within canopy (50 mm to 150 mm dia.), Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.136752	-31.87138214
A00279	*Eucalyptus gomphocephala (Tuart)*	Mature	23	10	Dead	Dead	Poor	0.340	N/A	0.400	N/A	Dead Tree - no chance of recovery	Unsuitable for incorporation (Not compatible with design &/or problematic health or structural form)	Dismantle or; undertake habitat pruning	116.1367046	-31.87132615
A00280	*Corymbia maculata (Spotted Gum)*	Mature	25	14	40 + years	Good	Good	0.530	6.36	0.620	2.71	Prior branch failures noted within canopy (50 mm to 150 mm dia.), Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1366581	-31.8713296
A00281	*Corymbia maculata (Spotted Gum)*	Mature	24	10	40 + years	Good	Reasonable	0.280	4.36	0.450	2.37	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.), Minor canopy suppression noted, Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.), tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia. - Remove Rubbing stems	116.1365246	-31.87138989
A00282	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	12	12	40 + years	Good	Reasonable	0.360	4.32	0.420	2.30	Canopy displays leggy structural form, Deadwood noted within canopy (50 mm to 150 mm dia.), Minor canopy suppression noted, Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.), tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia. - Remove Rubbing stems	116.1364944	-31.87137784
A00283	*Corymbia calophylla (Marri)*	Mature	15	17	40 + years	Good	Reasonable	1.260	14.40	1.400	3.81	Deadwood noted within canopy (150 mm to 300 mm dia.), Prior branch failures noted within canopy (150 mm to 300 mm dia.), Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.), Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia. - Remove Rubbing stems	116.1363885	-31.87137956
A00284	*Cotoneaster species (Cotoneaster)*	Mature	4	10	5 - 15 years	Good	Questionable	1.000	12.00	1.000	3.31	Tree displays multi stemmed form, tree located behind fence, Tree displays multi stemmed form, Tree displays questionable form, Limited Estimated Life Expectancy, tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1363876	-31.87152513
A00285	*Prunus species (Prunus)*	Mature	4	6	15 + 40 years	Good	Reasonable	0.480	4.80	0.490	2.25	Main stem bifurcates between ground level and 300mm, Tree displays multi stemmed form, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1364686	-31.87152857
A00286	*Cotoneaster species (Cotoneaster)*	Mature	4	8	5 - 15 years	Good	Questionable	0.900	10.80	0.900	3.17	Tree displays multi stemmed form, Tree displays questionable form, Limited Estimated Life Expectancy, tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1365375	-31.87151737
A00287	*Corymbia calophylla (Marri)*	Mature	16	20	40 + years	Reasonable	Good	0.950	11.04	1.030	3.35	Deadwood noted within canopy (50 mm to 150 mm dia.), Main stem bifurcates between 1 meter and 2 metres, Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1361182	-31.87186882
A00288	*Olea europaea (Olive)*	Mature	6	14	40 + years	Good	Reasonable	2.000	15.00	2.000	4.43	Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.), Tree displays multi stemmed form, Tree is considered to be a reasonable specimen of the species, Stand of 10 +, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove Rubbing stems	116.1360452	-31.8717178
A00289	*Olea europaea (Olive)*	Mature	6	10	40 + years	Good	Reasonable	2.000	15.00	2.000	4.43	Tree displays multi stemmed form, Stand of 10 +, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1359954	-31.87160661
A00290	*Eucalyptus melliodora (Yellow Box)*	Mature	21	18	40 + years	Good	Good	0.690	8.28	0.820	3.04	Deadwood noted within canopy (< 50mm dia.), Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1360348	-31.87149025
A00291	*Eucalyptus robusta (Swamp Mahogany)*	Mature	22	14	40 + years	Good	Reasonable	0.660	7.92	0.750	2.93	Canopy displays leggy structural form, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1358814	-31.87144326
A00292	*Eucalyptus cladocalyx (Sugar Gum)*	Mature	22	13	40 + years	Good	Reasonable	0.400	4.80	0.490	2.45	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.), Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1358691	-31.87151169
A00293	*Eucalyptus cladocalyx (Sugar Gum)*	Mature	22	10	40 + years	Good	Reasonable	0.460	5.40	0.530	2.53	Canopy displays leggy structural form, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1358311	-31.87148201
A00294	*Corymbia maculata (Spotted Gum)*	Mature	22	15	40 + years	Good	Reasonable	0.790	9.48	0.890	3.15	Deadwood noted within canopy (< 50mm dia.), Main stem bifurcates above 4 metres, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1358023	-31.8715389

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00295	*Eucalyptus cladocalyx (Sugar Gum)*	Mature	16	12	15 - 40 years	Good	Questionable	0.700	8.40	0.740	2.85	Canopy displays leggy structural form, Tree displays multi stemmed form, Tree displays questionable form, management plan required if tree is identified for retention, tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1359383	-31.87158919
A00296	*Eucalyptus cladocalyx (Sugar Gum)*	Mature	19	13	15 - 40 years	Good	Questionable	0.450	5.40	0.550	2.57	Canopy displays leggy structural form, Major canopy suppression noted, Tree displays questionable form, management plan required if tree is identified for retention, tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.135893	-31.87158837
A00297	*Corymbia maculata (Spotted Gum)*	Mature	22	7	40 + years	Good	Reasonable	0.480	4.56	0.450	2.37	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia), Minor canopy suppression noted, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1358451	-31.87158507
A00298	*Corymbia calophylla (Marri)*	Early Mature	10	10	5 - 15 years	Questionable	Questionable	0.300	3.60	0.300	2.00	Canopy indicates decline, Canopy noted to be sparse, Damage noted to main stem, Limited Estimated Life Expectancy, management plan required if tree is identified for retention, tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1358212	-31.87158754
A00299	*Eucalyptus cladocalyx (Sugar Gum)*	Mature	23	10	15 - 40 years	Good	Reasonable	0.450	5.40	0.530	2.53	Canopy displays leggy structural form, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1357825	-31.871576
A00300	*Corymbia maculata (Spotted Gum)*	Mature	21	5	40 + years	Good	Reasonable	0.400	4.80	0.400	2.25	Canopy displays leggy structural form, Minor canopy suppression noted, part of stand of 5 smaller Spotted Gum	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1357594	-31.87153148
A00301	*Corymbia citriodora (Lemon-scented Gum)*	Early Mature	16	6	40 + years	Good	Reasonable	0.320	3.84	0.350	2.13	Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1358204	-31.87164443
A00302	*Corymbia citriodora (Lemon-scented Gum)*	Mature	20	10	15 - 40 years	Good	Questionable	0.600	7.20	0.600	2.67	Canopy displays leggy structural form, Main stem bifurcates at ground level, Minor canopy suppression noted, Tree displays multi stemmed form, Tree displays questionable form	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1357009	-31.87147459
A00303	*Corymbia maculata (Spotted Gum)*	Mature	17	13	40 + years	Good	Good	0.620	7.44	0.690	2.83	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1361725	-31.8714919
A00304	*Eucalyptus gomphocephala (Tuart)*	Mature	23	16	40 + years	Good	Good	0.690	8.28	0.750	3.00	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1361716	-31.87144656
A00305	*Eucalyptus leucoxylon (S.A. Yellow Gum)*	Mature	7	11	5 - 15 years	Questionable	Reasonable	0.400	4.80	0.400	2.25	Canopy indicates decline, Canopy noted to be sparse, Limited Estimated Life Expectancy, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1361599	-31.87136052
A00306	*Corymbia maculata (Spotted Gum)*	Mature	19	13	40 + years	Good	Good	0.440	5.28	0.530	2.53	Deadwood noted within canopy (< 50mm dia.), Main stem bifurcates between 2 meters and 3 meters, Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1357611	-31.87139972
A00307	*Corymbia maculata (Spotted Gum)*	Mature	23	15	40 + years	Good	Good	0.540	6.48	0.660	2.78	Deadwood noted within canopy (< 50mm dia), Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1357106	-31.87141414
A00308	*Corymbia citriodora (Lemon-scented Gum)*	Mature	12	11	15 - 40 years	Good	Questionable	0.400	4.80	0.500	2.47	Bark Inclusions noted (minor), Canopy displays leggy structural form, Main stem bifurcates between ground level and 500mm, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1355618	-31.87147315
A00309	*Corymbia citriodora (Lemon-scented Gum)*	Mature	15	11	15 - 40 years	Good	Questionable	0.560	7.20	0.600	2.67	Bark Inclusions noted (minor), Canopy displays leggy structural form, Main stem bifurcates at ground level, Minor canopy suppression noted, Tree displays multi stemmed form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1355611	-31.87149151
A00310	*Corymbia maculata (Spotted Gum)*	Mature	17	10	15 - 40 years	Good	Questionable	0.430	5.16	0.480	2.43	Bark Inclusions noted (major), Canopy displays leggy structural form, Minor canopy suppression noted, Tree displays questionable form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1355913	-31.87158854
A00311	*Corymbia maculata (Spotted Gum)*	Mature	20	10	15 - 40 years	Good	Questionable	0.730	9.00	0.580	2.17	Bark Inclusions noted (major), Canopy displays leggy structural form, Main stem bifurcates between 2 meters and 4 meters, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1355572	-31.87164165
A00312	*Corymbia maculata (Spotted Gum)*	Mature	13	10	15 - 40 years	Good	Reasonable	0.650	7.80	0.650	2.76	Bark Inclusions noted (minor), Canopy displays leggy structural form, Main stem bifurcates at ground level, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.135607	-31.87175245
A00313	*Casuarina cunninghamiana (River Sheoak)*	Mature	11	10	40 + years	Good	Reasonable	0.450	5.40	0.550	2.57	Canopy displays leggy structural form, Tree is considered to be a reasonable specimen of the species, tree located behind fence, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1357526	-31.87177343
A00314	*Eucalyptus camaldulensis (River Red Gum)*	Mature	11	11	40 + years	Reasonable	Good	0.400	4.80	0.450	2.37	Canopy noted to be slightly sparse, Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1358424	-31.87176229
A00315	*Jacaranda mimosifolia (Jacaranda)*	Mature	9	12	40 + years	Good	Reasonable	0.750	9.00	0.750	2.93	Deadwood noted within canopy (< 50mm dia), Tree displays multi stemmed form, Tree is considered to be a good specimen of the species, tree situated in close proximity to buildings	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1372559	-31.87155953
A00316	*Corymbia calophylla (Marri)*	Mature	19	13	15 - 40 years	Reasonable	Good	0.590	7.08	0.630	2.73	Canopy noted to be slightly sparse, Deadwood noted within canopy (< 50mm dia), Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1346538	-31.87152933

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00317	*Corymbia calophylla (Marri)*	Mature	15	10	15 - 40 years	Reasonable	Reasonable	0.410	4.92	0.450	2.37	Canopy noted to be slightly sparse. Deadwood noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1347881	-31.87158509
A00318	*Corymbia calophylla (Marri)*	Mature	16	13	15 - 40 years	Reasonable	Good	0.580	6.96	0.620	2.71	Deadwood noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1348643	-31.87154661
A00319	*Eucalyptus melliodora (Yellow Box)*	Mature	19	11	15 - 40 years	Reasonable	Good	0.330	3.96	0.400	2.21	Canopy noted to be slightly sparse. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1347677	-31.87166205
A00320	*Corymbia calophylla (Marri)*	Mature	11	6	Dead	Dead	Poor	0.550	N/A	0.550	N/A	Dead Tree - no chance of recovery	Unsuitable for incorporation (Not compatible with design &/or problematic health or structural form)	Dismantle or; undertake habitat pruning	116.134766	-31.87172016
A00321	*Eucalyptus wandoo (Wandoo)*	Mature	21	10	40 - years	Good	Reasonable	0.210	2.52	0.330	2.08	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1347732	-31.87177645
A00322	*Eucalyptus marginata (Jarrah)*	Mature	20	10	40 - years	Reasonable	Good	0.450	5.40	0.450	2.37	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1349084	-31.87175087
A00323	*Eucalyptus melliodora (Yellow Box)*	Mature	23	11	40 - years	Good	Reasonable	0.370	4.44	0.430	2.32	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.134929	-31.8717339
A00324	*Eucalyptus melliodora (Yellow Box)*	Mature	23	18	40 - years	Good	Reasonable	0.630	7.56	0.690	2.83	Canopy displays leggy structural form. Minor canopy suppression noted; Tree on lean (minor)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1348878	-31.87165736
A00325	*Eucalyptus patens (Blackbutt)*	Mature	13	12	40 - years	Reasonable	Reasonable	0.340	4.08	0.350	2.13	Canopy noted to be slightly sparse. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1348342	-31.87170587
A00326	*Eucalyptus patens (Blackbutt)*	Mature	17	9	40 - years	Reasonable	Reasonable	0.340	4.08	0.400	2.25	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1348459	-31.87163774
A00327	*Eucalyptus melliodora (Yellow Box)*	Mature	10	15	40 - years	Good	Reasonable	0.780	9.40	0.700	2.85	Tree displays multi stemmed form. Tree is considered to be a good specimen of the species. Tree has previously failed at ground level but is still growing along the ground	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1350091	-31.87159821
A00328	*Eucalyptus patens (Blackbutt)*	Mature	13	10	40 - years	Reasonable	Reasonable	0.520	6.24	0.550	2.57	Bark Inclusions noted (minor). Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1350461	-31.87162596
A00329	*Eucalyptus melliodora (Yellow Box)*	Mature	21	12	40 - years	Good	Reasonable	0.410	4.92	0.420	2.30	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.135068	-31.87166297
A00330	*Eucalyptus patens (Blackbutt)*	Mature	20	10	5 - 15 years	Good	Questionable	0.350	4.20	0.400	2.25	Bark Inclusions noted (minor). Canopy displays leggy structural form. Minor canopy suppression noted. Rubbing & Cressing stems noted within canopy (50 mm to 150 mm dia.), management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1350495	-31.87168988
A00331	*Corymbia calophylla (Marri)*	Mature	15	15	40 - years	Reasonable	Reasonable	0.450	5.40	0.500	2.47	Deadwood noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1348323	-31.87176537
A00332	*Corymbia calophylla (Marri)*	Mature	13	10	40 - years	Good	Good	0.310	3.72	0.350	2.20	Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1351425	-31.87192788
A00333	*Eucalyptus marginata (Jarrah)*	Mature	18	10	5 - 15 years	Good	Questionable	0.570	6.84	0.650	2.76	Canopy displays leggy structural form. Canopy previously topped - not in keeping with AS4373). Prior branch failures noted within canopy (150 mm to 300 mm dia.). Tree displays questionable form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.135206	-31.8719138
A00334	*Corymbia calophylla (Marri)*	Mature	17	15	15 - 40 years	Reasonable	Reasonable	0.570	6.84	0.650	2.76	Canopy noted to be slightly sparse. Deadwood noted within canopy (< 50mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1352856	-31.87194276
A00335	*Corymbia calophylla (Marri)*	Mature	14	10	<5 years	Poor	Poor	0.450	5.40	0.500	2.47	Canopy indicates decline. Limited Estimated Life Expectancy	Unsuitable for incorporation (Not compatible with design &/or problematic health or structural form)	Dismantle or; undertake habitat pruning	116.1353401	-31.87190687
A00336	*Corymbia calophylla (Marri)*	Mature	14	11	15 - 40 years	Good	Good	0.330	3.96	0.350	2.13	Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1353893	-31.87191484
A00337	*Corymbia calophylla (Marri)*	Mature	19	10	40 - years	Good	Good	0.210	3.72	0.330	2.08	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.13538	-31.87186565
A00338	*Corymbia calophylla (Marri)*	Mature	15	14	Dead	Dead	Poor	1.000	N/A	1.200	N/A	Dead Tree - no chance of recovery	Unsuitable for incorporation (Not compatible with design &/or problematic health or structural form)	Dismantle or; undertake habitat pruning	116.1354252	-31.87179918
A00339	*Corymbia calophylla (Marri)*	Mature	19	10	40 - years	Good	Reasonable	0.310	3.72	0.450	2.37	Minor deadwood noted within canopy. Tree is considered to be a reasonable specimen of the species. Powerline resting against trunk	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1354557	-31.87187762
A00340	*Corymbia calophylla (Marri)*	Mature	14	16	40 - years	Reasonable	Good	0.570	6.84	0.520	2.51	Canopy noted to be slightly sparse. Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1355594	-31.87187762
A00341	*Corymbia calophylla (Marri)*	Mature	15	10	40 - years	Good	Good	0.450	5.40	0.500	2.47	Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1355009	-31.87180184

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00342	*Corymbia calophylla (Marri)*	Mature	16	11	40 + years	Good	Reasonable	0.450	5.40	0.600	2.67	Bark Inclusions noted (minor), Deadwood noted within canopy (<50mm dia), Main stem bifurcates above 4 meters+	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1353374	-31.87169814
A00343	*Corymbia calophylla (Marri)*	Mature	14	10	40 + years	Good	Good	0.350	4.20	0.460	2.25	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1352244	-31.87176195
A00344	*Corymbia calophylla (Marri)*	Mature	16	10	40 + years	Good	Good	0.380	4.56	0.420	2.32	Minor canopy suppression noted. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1352417	-31.87184305
A00345	*Eucalyptus marginata (Jarrah)*	Mature	8	11	40 + years	Good	Reasonable	0.630	7.20	0.660	2.67	Deadwood noted within canopy (50 mm to 150 mm dia). Tree displays multi stemmed form. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1355142	-31.87195872
A00346	*Eucalyptus grandis (Rose Gum)*	Mature	22	12	40 + years	Good	Reasonable	0.440	5.28	0.520	2.51	Canopy displays leggy structural form. Minor canopy suppression noted. Prior branch failures noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.135489	-31.87203848
A00347	*Corymbia calophylla (Marri)*	Mature	17	16	15 - 40 years	Reasonable	Good	0.520	6.24	0.660	2.67	Canopy noted to be slightly sparse. Deadwood noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1355528	-31.87201057
A00348	*Corymbia maculata (Spotted Gum)*	Early Mature	21	6	40 + years	Good	Good	0.310	3.72	0.330	2.08	Canopy displays leggy structural form. Minor canopy suppression noted. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1356126	-31.87195726
A00349	*Corymbia maculata (Spotted Gum)*	Mature	23	10	40 + years	Good	Good	0.360	4.32	0.400	2.25	Canopy displays leggy structural form. Damage noted to main stem. Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1356502	-31.87195351
A00350	*Corymbia maculata (Spotted Gum)*	Mature	25	10	40 + years	Good	Reasonable	0.390	4.68	0.430	2.32	Canopy displays leggy structural form. Main stem bifurcates above 4 meters+	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1357037	-31.87194875
A00351	*Corymbia maculata (Spotted Gum)*	Mature	25	10	40 + years	Good	Good	0.480	4.80	0.440	2.34	Canopy displays leggy structural form. Minor canopy suppression noted	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1357441	-31.87194312
A00352	*Corymbia maculata (Spotted Gum)*	Mature	26	12	40 + years	Good	Reasonable	0.490	5.88	0.550	2.57	Canopy displays leggy structural form. Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1357806	-31.87193434
A00353	*Corymbia maculata (Spotted Gum)*	Mature	25	10	40 + years	Good	Good	0.250	4.20	0.430	2.32	Canopy displays leggy structural form. Minor canopy suppression noted. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.135807	-31.8719352
A00354	*Corymbia maculata (Spotted Gum)*	Mature	26	15	40 + years	Good	Reasonable	0.600	7.20	0.640	2.74	Canopy displays leggy structural form, Main stem bifurcates above 4 meters+. Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1358349	-31.87193254
A00355	*Corymbia maculata (Spotted Gum)*	Mature	26	11	40 + years	Good	Good	0.410	4.92	0.440	2.34	Canopy displays leggy structural form. Minor canopy suppression noted. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1358676	-31.87193331
A00356	*Corymbia maculata (Spotted Gum)*	Mature	25	12	40 + years	Good	Reasonable	0.480	5.76	0.530	2.53	Canopy displays leggy structural form. Main stem bifurcates above 4 meters+. Minor canopy suppression noted.	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1358971	-31.87193011
A00357	*Corymbia maculata (Spotted Gum)*	Mature	21	12	40 + years	Good	Good	0.440	5.28	0.500	2.47	Minor canopy suppression noted. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1359278	-31.87192752
A00358	*Corymbia maculata (Spotted Gum)*	Early Mature	20	10	40 + years	Good	Good	0.300	3.60	0.330	2.08	Canopy displays leggy structural form. Tree is considered to be a reasonable specimen of the species. Stand of x2	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.135994	-31.87191925
A00359	*Corymbia maculata (Spotted Gum)*	Mature	24	18	40 + years	Good	Good	0.690	8.28	0.750	2.91	Deadwood noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1360253	-31.87195056
A00360	*Corymbia maculata (Spotted Gum)*	Mature	22	15	40 + years	Good	Reasonable	0.360	4.32	0.470	2.41	Deadwood noted within canopy (< 50mm dia.). Main stem bifurcates between 3 meters and 4 meters. Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1360374	-31.87196926
A00361	*Corymbia maculata (Spotted Gum)*	Mature	26	18	40 + years	Good	Good	0.670	8.04	0.530	2.53	Deadwood noted within canopy (< 50mm dia). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1360598	-31.87202757
A00362	*Corymbia maculata (Spotted Gum)*	Mature	25	12	40 + years	Good	Good	0.480	5.76	0.530	2.53	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1360935	-31.87207745
A00363	*Corymbia maculata (Spotted Gum)*	Mature	26	20	40 + years	Good	Good	0.630	7.56	0.650	2.63	Deadwood noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1361331	-31.87212072
A00364	*Corymbia maculata (Spotted Gum)*	Mature	26	17	40 + years	Good	Reasonable	0.510	6.12	0.590	2.65	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1361596	-31.87216032
A00365	*Corymbia maculata (Spotted Gum)*	Mature	26	22	40 + years	Good	Good	0.810	9.72	0.880	3.11	Deadwood noted within canopy (50 mm to 150 mm dia). Main stem bifurcates between 2 meters and 3 meters. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1361838	-31.87218819
A00366	*Corymbia maculata (Spotted Gum)*	Mature	26	13	40 + years	Good	Good	0.630	7.56	0.720	2.88	Deadwood noted within canopy (50 mm to 150 mm dia). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1362094	-31.8722168

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00367	*Corymbia maculata (Spotted Gum)*	Mature	21	12	40 + years	Good	Reasonable	0.620	6.26	0.760	2.65	Deadwood noted within canopy (< 50mm dia). Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1362373	-31.8722432
A00368	*Corymbia maculata (Spotted Gum)*	Mature	26	8	40 + years	Reasonable	Reasonable	0.440	5.28	0.530	2.53	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1362718	-31.87226814
A00369	*Corymbia maculata (Spotted Gum)*	Mature	26	10	40 + years	Good	Reasonable	0.410	4.92	0.500	2.47	Damage noted to canopy. Deadwood noted within canopy (< 50 mm dia.) Minor canopy suppression noted. Rubbing & Crossing stems noted within canopy (150 mm to 300 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia. - Remove Rubbing stems	116.136307	-31.87228574
A00370	*Corymbia maculata (Spotted Gum)*	Mature	25	22	40 + years	Good	Good	0.660	10.32	0.950	3.24	Canopy displays leggy structural form. Minor canopy suppression noted. Rubbing & Crossing stems noted within canopy (150 mm to 300 mm dia.)	Optimal (Well Placed &/or Good Specimen)	- Remove Rubbing stems	116.136359	-31.87229967
A00371	*Corymbia maculata (Spotted Gum)*	Mature	25	14	40 + years	Good	Good	0.380	6.12	0.580	2.63	Deadwood noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1364847	-31.87231637
A00372	*Corymbia maculata (Spotted Gum)*	Mature	18	11	40 + years	Good	Reasonable	0.390	4.68	0.450	2.37	Main stem bifurcates between 3 meters and 4 meters. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1365607	-31.87235723
A00373	*Corymbia maculata (Spotted Gum)*	Mature	19	12	40 + years	Good	Reasonable	0.380	6.12	0.550	2.57	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.) Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1365801	-31.87239747
A00374	*Corymbia maculata (Spotted Gum)*	Mature	20	10	40 + years	Good	Reasonable	0.350	4.20	0.410	2.28	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364984	-31.87235982
A00375	*Corymbia maculata (Spotted Gum)*	Mature	13	11	5 - 15 years	Good	Questionable	0.380	6.12	0.550	2.57	Bark Inclusions noted (major). Main stem bifurcates between 5 & 6m and 1 meter. Tree displays questionable form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1364163	-31.87235991
A00376	*Corymbia maculata (Spotted Gum)*	Mature	14	10	5 - 15 years	Questionable	Reasonable	0.310	3.72	0.330	2.08	Canopy noted to be sparse, Canopy starting to indicate decline, Limited Estimated Life Expectancy, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1364918	-31.87240582
A00377	*Corymbia maculata (Spotted Gum)*	Mature	26	14	15 - 40 years	Good	Reasonable	0.560	6.72	0.660	2.78	Canopy displays leggy structural form, Deadwood noted within canopy (< 50 mm dia). Main stem bifurcates between 3 meters and 4 meters. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.136481	-31.87243652
A00378	*Corymbia maculata (Spotted Gum)*	Mature	27	16	15 - 40 years	Good	Reasonable	0.570	6.84	0.630	2.73	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia). Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1365613	-31.87244497
A00379	*Corymbia maculata (Spotted Gum)*	Mature	25	12	40 + years	Good	Reasonable	0.540	6.48	0.620	2.71	Deadwood noted within canopy (< 50mm dia). Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1365508	-31.87247819
A00380	*Eucalyptus camaldulensis (River Red Gum)*	Mature	16	10	40 + years	Reasonable	Reasonable	0.370	4.44	0.410	2.28	Canopy displays leggy structural form. Canopy noted to be slightly sparse. Canopy starting to indicate decline. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1365133	-31.87248285
A00381	*Corymbia maculata (Spotted Gum)*	Mature	25	12	40 + years	Good	Good	0.450	5.40	0.490	2.45	Deadwood noted within canopy (< 50mm dia). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1364871	-31.87246274
A00382	*Eucalyptus camaldulensis (River Red Gum)*	Mature	15	5	40 + years	Reasonable	Reasonable	0.360	4.32	0.400	2.25	Canopy displays leggy structural form. Major canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1364259	-31.87246012
A00383	*Eucalyptus camaldulensis (River Red Gum)*	Early Mature	14	7	40 + years	Reasonable	Reasonable	0.320	3.84	0.350	2.13	Canopy displays leggy structural form. Canopy noted to be slightly sparse. Deadwood noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.136397	-31.87248984
A00384	*Eucalyptus camaldulensis (River Red Gum)*	Early Mature	14	10	40 + years	Reasonable	Reasonable	0.330	3.96	0.360	2.15	Canopy displays leggy structural form. Canopy noted to be slightly sparse. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1363586	-31.87248984
A00385	*Eucalyptus camaldulensis (River Red Gum)*	Mature	20	15	40 + years	Reasonable	Good	0.710	8.52	0.810	3.03	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia). Minor canopy suppression noted. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1363207	-31.87253868
A00386	*Eucalyptus camaldulensis (River Red Gum)*	Early Mature	15	16	40 + years	Reasonable	Reasonable	0.300	3.60	0.330	2.08	Canopy displays leggy structural form. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1363861	-31.87256289
A00387	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	8	40 + years	Reasonable	Reasonable	0.420	5.16	0.480	2.43	Canopy displays leggy structural form, Deadwood noted within canopy (50 mm to 150 mm dia). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364732	-31.87256289
A00388	*Corymbia maculata (Spotted Gum)*	Mature	22	11	40 + years	Good	Reasonable	0.410	4.92	0.480	2.43	Canopy displays leggy structural form. Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1365338	-31.8725641
A00389	*Corymbia citriodora (Lemon-scented Gum)*	Mature	19	10	40 + years	Good	Reasonable	0.360	3.72	0.360	2.13	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1365895	-31.87256289

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00390	*Corymbia maculata (Spotted Gum)*	Mature	26	11	40 + years	Good	Good	0.500	6.00	0.550	2.57	Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1363243	-31.87260405
A00391	*Eucalyptus camaldulensis (River Red Gum)*	Mature	15	10	40 + years	Good	Reasonable	0.410	4.92	0.520	2.51	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.) Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1363897	-31.87260841
A00392	*Eucalyptus camaldulensis (River Red Gum)*	Mature	21	15	40 + years	Good	Reasonable	0.750	9.00	0.810	3.03	Canopy displays leggy structural form, Deadwood noted within canopy (50 mm to 150 mm dia.), Main stem bifurcates between 2 meters and 3 meters, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1362953	-31.87264764
A00393	*Corymbia maculata (Spotted Gum)*	Mature	19	11	40 + years	Good	Reasonable	0.410	4.92	0.450	2.37	Canopy displays leggy structural form, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1363642	-31.87264314
A00394	*Eucalyptus camaldulensis (River Red Gum)*	Mature	10	10	40 + years	Good	Good	0.580	6.96	0.700	2.85	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.) Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1364315	-31.87263468
A00395	*Corymbia maculata (Spotted Gum)*	Mature	22	14	40 + years	Good	Good	0.510	6.12	0.590	2.65	Canopy displays leggy structural form, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1364247	-31.8727102
A00396	*Eucalyptus marginata (Jarrah)*	Mature	12	12	40 + years	Reasonable	Reasonable	0.590	7.08	0.630	2.73	Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1364361	-31.87276403
A00397	*Eucalyptus camaldulensis (River Red Gum)*	Mature	21	11	40 + years	Reasonable	Reasonable	0.450	5.40	0.500	2.47	Canopy displays leggy structural form, Deadwood noted within canopy (50 mm to 150 mm dia.) Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1365022	-31.87277928
A00398	*Corymbia calophylla (Marri)*	Mature	20	18	40 + years	Good	Good	0.610	7.32	0.780	2.98	Deadwood noted within canopy (50 mm to 150 mm dia.), Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1365429	-31.87282336
A00399	*Eucalyptus camaldulensis (River Red Gum)*	Mature	20	12	15 - 40 years	Good	Reasonable	0.670	8.04	0.820	3.04	Canopy displays leggy structural form, Deadwood noted within canopy (50 mm to 150 mm dia.) Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1366234	-31.8727547
A00400	*Corymbia citriodora (Lemon-scented Gum)*	Mature	23	14	40 + years	Good	Reasonable	0.570	6.84	0.700	2.85	Deadwood noted within canopy (< 50mm dia.), Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.136581	-31.87268774
A00401	*Corymbia citriodora (Lemon-scented Gum)*	Mature	20	17	40 + years	Good	Reasonable	0.710	8.52	0.730	2.90	Main stem bifurcates between 500mm and 1 meter. Minor canopy suppression noted. Prior branch failures noted within canopy (50 mm to 150 mm dia.), tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.13662	-31.87266316
A00402	*Psidium guajava (Guava)*	Mature	3	6	15 - 40 years	Good	Reasonable	0.450	5.40	0.450	2.37	Tree displays multi stemmed form. Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1367073	-31.87246228
A00403	*Eucalyptus camaldulensis (River Red Gum)*	Mature	7	10	5 - 15 years	Good	Questionable	0.350	4.20	0.600	2.67	Damage noted to main stem, Signifcant branch failures noted (300 mm + dia.), Tree displays questionable form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1366684	-31.87242159
A00404	*Corymbia maculata (Spotted Gum)*	Mature	26	14	40 + years	Good	Reasonable	0.590	7.08	0.660	2.81	Deadwood noted within canopy (< 50mm dia.), Main stem bifurcates above 4 meters +	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1366768	-31.8724021
A00405	*Corymbia citriodora (Lemon-scented Gum)*	Mature	22	14	15 - 40 years	Good	Questionable	0.450	5.40	0.540	2.55	Bark Inclusions noted (major), Canopy displays leggy structural form, Main stem bifurcates above 4 meters + Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.) management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1367006	-31.87241566
A00406	*Eucalyptus camaldulensis (River Red Gum)*	Mature	13	10	15 - 40 years	Reasonable	Good	0.310	3.72	0.360	2.15	Canopy noted to be slightly sparse, Deadwood noted within canopy (< 50mm dia.), Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1366997	-31.87236396
A00407	*Corymbia maculata (Spotted Gum)*	Mature	21	11	40 + years	Good	Good	0.440	5.28	0.530	2.47	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1367082	-31.87234022
A00408	*Syzygium smithii (Lilly Pilly)*	Mature	9	12	40 + years	Good	Reasonable	0.420	5.04	0.500	2.47	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1367463	-31.87235039
A00409	*Eucalyptus camaldulensis (River Red Gum)*	Mature	9	10	15 - 40 years	Reasonable	Reasonable	0.380	4.56	0.420	2.30	Canopy displays leggy structural form, Deadwood noted within canopy (50 mm to 150 mm dia.), Main stem bifurcates between 3 meters and 4 meters	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.136715	-31.87230632
A00410	*Corymbia maculata (Spotted Gum)*	Mature	22	10	40 + years	Good	Good	0.390	4.68	0.480	2.43	Canopy displays leggy structural form, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1367455	-31.8722878
A00411	*Corymbia maculata (Spotted Gum)*	Mature	24	10	40 + years	Good	Reasonable	0.440	5.28	0.520	2.51	Canopy displays leggy structural form, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1367463	-31.87227055
A00412	*Eucalyptus camaldulensis (River Red Gum)*	Mature	14	11	5 - 15 years	Reasonable	Questionable	0.510	6.12	0.530	2.53	Canopy displays leggy structural form, Major canopy suppression noted, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1367784	-31.87229261

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00413	*Eucalyptus camaldulensis (River Red Gum)*	Mature	10	12	40 + years	Good	Reasonable	0.450	5.40	0.570	2.61	Deadwood noted within canopy (50 mm to 150 mm dia). Major canopy suppression noted. Tree in lean (minor)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1367599	-31.87225331
A00414	*Eucalyptus grandis (Rose Gum)*	Mature	25	20	40 + years	Good	Reasonable	1.120	13.44	1.300	3.69	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia.), Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a reasonable specimen of the species.	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia. - Remove Rubbing stems	116.136786	-31.87226293
A00415	*Cupressus sempervirens (Pencil Pine)*	Mature	9	3	15 - 40 years	Reasonable	Reasonable	0.300	2.80	0.380	2.00	Canopy noted to be slightly sparse. Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1366883	-31.87219135
A00416	*Cupressus sempervirens (Pencil Pine)*	Mature	9	3	15 - 40 years	Good	Reasonable	0.350	4.20	0.350	2.13	Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1366685	-31.87219061
A00417	*Eucalyptus marginata (Jarrah)*	Mature	10	10	15 - 40 years	Reasonable	Reasonable	0.710	8.40	0.700	2.85	Deadwood noted within canopy (50 mm to 150 mm dia). Main stem bifurcates between ground level and 500mm. Tree displays multi stemmed form	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1366523	-31.87191546
A00418	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	12	14	40 + years	Good	Good	0.660	7.92	0.730	2.91	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1368105	-31.87190663
A00419	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	10	9	15 - 40 years	Good	Reasonable	0.480	4.80	0.600	2.25	Main stem bifurcates between ground level and 500mm. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1368774	-31.87195372
A00420	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	14	12	40 + years	Reasonable	Reasonable	0.400	4.80	0.460	2.39	Canopy displays leggy structural form. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1368914	-31.87199197
A00421	*Eucalyptus leucoxylon (S.A. Yellow Gum)*	Mature	7	11	40 + years	Good	Reasonable	0.350	4.20	0.400	2.25	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia) Main stem bifurcates between ground level and 500mm. tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1368848	-31.87202287
A00422	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	12	10	5 - 15 years	Questionable	Good	0.330	3.96	0.380	2.20	Canopy noted to be sparse. Canopy starting to indicate decline. Deadwood noted within canopy (50 mm to 150 mm dia.). Limited Estimated Life Expectancy, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1368494	-31.87202434
A00423	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	14	14	40 + years	Good	Reasonable	0.520	6.24	0.590	2.65	Canopy displays leggy structural form, Main stem bifurcates between 2 meters and 4 meters. Minor canopy suppression noted. Prior branch failures noted within canopy (50 mm to 150 mm dia). tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1368745	-31.87207658
A00424	*Syzygium smithii (Lilly Pilly)*	Mature	9	8	15 - 40 years	Good	Reasonable	0.450	5.40	0.450	2.37	Canopy displays leggy structural form, Minor canopy suppression noted. tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1368708	-31.87214721
A00425	*Syzygium smithii (Lilly Pilly)*	Mature	12	16	15 - 40 years	Good	Reasonable	0.910	10.92	0.930	3.21	Tree displays multi stemmed form, Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1368406	-31.87214279
A00426	*Eucalyptus sideroxylon (Iron Bark)*	Mature	13	10	5 - 15 years	Questionable	Questionable	0.500	6.00	0.500	2.47	Canopy displays leggy structural form. Damage noted to main stem, Limited Estimated Life Expectancy, Main stem bifurcates at ground level, Major canopy suppression noted, management plan required if tree is identified for retention. Tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1368487	-31.87221636
A00427	*Eucalyptus cinerea (Argyle Apple)*	Mature	16	17	40 + years	Good	Reasonable	0.620	7.44	0.650	2.76	Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species. tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.136909	-31.87227963
A00428	*Eucalyptus nichollii (Black Peppermint)*	Mature	16	18	15 - 40 years	Good	Good	1.050	12.60	1.370	3.78	Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a good specimen of the species. tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1369605	-31.87224947
A00429	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	14	12	15 - 40 years	Good	Reasonable	0.420	5.04	0.450	2.37	Canopy displays leggy structural form. Minor canopy suppression noted. Prior branch failures noted within canopy (50 mm to 150 mm dia)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1370076	-31.872312
A00430	*Jacaranda mimosifolia (Jacaranda)*	Early Mature	8	6	40 + years	Good	Reasonable	0.350	4.20	0.380	2.20	Bark Inclusions noted (minor). Deadwood noted within canopy (< 50mm dia.). Main stem bifurcates between 500mm and 1 meter	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1372437	-31.87242335
A00431	*Jacaranda mimosifolia (Jacaranda)*	Mature	9	10	40 + years	Good	Reasonable	0.520	6.24	0.620	2.71	Deadwood noted within canopy (50mm to 300 mm dia.) Tree displays multi stemmed form	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1372531	-31.87239011
A00432	*Eucalyptus cinerea (Argyle Apple)*	Mature	12	13	40 + years	Good	Reasonable	0.520	6.24	0.650	2.76	Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1372613	-31.87235374
A00433	*Corymbia calophylla (Marri)*	Mature	16	18	40 + years	Good	Reasonable	0.650	7.80	0.750	2.93	Canopy displays leggy structural form. Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1372625	-31.87221892
A00434	*Eucalyptus globulus (Tasmanian Blue Gum)*	Mature	25	14	5 - 15 years	Reasonable	Questionable	0.680	8.16	0.780	2.98	Canopy displays leggy structural form. Limited Estimated Life Expectancy. Major canopy suppression noted. Tree displays questionable form, fungal body noted on trunk - management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1372931	-31.87208596

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00435	*Corymbia calophylla (Marri)*	Mature	21	25	15 - 40 years	Good	Questionable	1.380	11.61	1.730	4.17	Evidence of Termite mud noted however no active termites observed. Significant branch failures noted (300 mm + dia). Significant deadwood noted within canopy (300 mm + dia.) management plan required if tree is identified for retention, hollows noted throughout canopy.	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1373538	-31.87200956
A00436	*Corymbia calophylla (Marri)*	Mature	17	18	15 - 40 years	Reasonable	Reasonable	0.920	11.04	1.100	3.44	Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates between 3 meters and 4 meters. Prior branch failures noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1372012	-31.87195497
A00437	*Corymbia calophylla (Marri)*	Mature	15	14	40 + years	Good	Reasonable	0.750	9.00	0.900	3.17	Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1371793	-31.87194901
A00438	*Eucalyptus leucoxylon (S.A. Yellow Gum)*	Mature	6	10	15 - 40 years	Reasonable	Reasonable	0.320	3.84	0.360	2.26	Canopy noted to be slightly sparse, Minor canopy suppression noted, Tree on lean (minor)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1371243	-31.87192007
A00439	*Citrus sinensis (Orange Tree)*	Mature	3	6	15 - 40 years	Good	Reasonable	0.400	4.80	0.400	2.25	Main stem bifurcates at ground level, Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1370776	-31.8719161
A00440	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	20	40 + years	Good	Good	0.790	9.48	0.900	3.17	Damage to surface roots (minor), Deadwood noted within canopy (< 50mm dia.), Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.), Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia. - Remove Rubbing stems	116.1370428	-31.8718416
A00441	*Syzygium smithii (Lilly Pilly)*	Mature	12	16	40 + years	Good	Reasonable	0.900	10.80	0.900	3.17	Main stem bifurcates between 300mm and 1 meter, Rubbing & Crossing stems noted within canopy (150 mm to 300 mm dia.). Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove Rubbing stems	116.1370577	-31.87169558
A00442	*Cotoneaster species (Cotoneaster)*	Mature	4	9	5 - 15 years	Good	Questionable	0.900	10.80	0.900	3.17	Tree displays multi stemmed form, Tree displays questionable form, Limited Estimated Life Expectancy	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1371531	-31.87169161
A00443	*Syzygium smithii (Lilly Pilly)*	Mature	13	16	15 - 40 years	Good	Reasonable	0.550	6.60	0.550	2.57	Canopy displays leggy structural form, Main stem bifurcates between 1 meter and 2 meters, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1373756	-31.87169558
A00444	*Eucalyptus camaldulensis (River Red Gum)*	Mature	19	12	15 - 40 years	Good	Reasonable	0.450	5.40	0.530	2.53	Canopy displays leggy structural form, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1375843	-31.87177888
A00445	*Corymbia calophylla (Marri)*	Mature	23	20	15 - 40 years	Good	Reasonable	1.260	15.00	1.470	3.89	Deadwood noted within canopy (50 mm to 150 mm dia.). Main stem bifurcates above 4 meters +. Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1375334	-31.87186818
A00446	*Eucalyptus camaldulensis (River Red Gum)*	Mature	12	10	40 + years	Good	Reasonable	0.320	3.84	0.350	2.13	Canopy displays leggy structural form, Minor canopy suppression noted, Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove Rubbing stems	116.1372148	-31.87190925
A00447	*Agonis flexuosa (WA Peppermint)*	Mature	7	10	40 + years	Good	Good	0.750	9.00	0.900	3.17	Main stem bifurcates between 500 mm and 1 meter. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1366305	-31.87294652
A00448	*Agonis flexuosa (WA Peppermint)*	Mature	8	11	40 + years	Good	Reasonable	0.660	7.92	0.700	2.65	Tree displays multi stemmed form. Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1366671	-31.87299988
A00449	*Agonis flexuosa (WA Peppermint)*	Mature	10	12	40 + years	Good	Good	0.650	7.80	1.000	3.31	Main stem bifurcates between 2 meters and 3 meters. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1367037	-31.87305401
A00450	*Agonis flexuosa (WA Peppermint)*	Mature	10	13	40 + years	Good	Reasonable	1.300	15.00	1.400	3.81	Canopy displays leggy structural form, Tree displays multi stemmed form	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1367403	-31.87309822
A00451	*Agonis flexuosa (WA Peppermint)*	Mature	7	10	40 + years	Good	Good	0.580	6.80	0.690	2.57	Minor canopy suppression noted, Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove Rubbing stems	116.1367563	-31.87314396
A00452	*Agonis flexuosa (WA Peppermint)*	Mature	8	13	40 + years	Good	Reasonable	0.700	8.40	0.700	2.85	Main stem bifurcates at ground level, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1369682	-31.87308755
A00453	*Agonis flexuosa (WA Peppermint)*	Mature	9	12	Dead	Dead	Poor	0.500	N/A	0.500	N/A	Dead Tree - no chance of recovery	Dismantle for incorporation (Not compatible with design &/or problematic health or structural form)	Dismantle or; undertake habitat pruning	116.1369712	-31.87303952
A00454	*Agonis flexuosa (WA Peppermint)*	Mature	8	11	40 + years	Good	Good	0.640	7.68	0.800	3.01	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1369834	-31.8729793
A00455	*Agonis flexuosa (WA Peppermint)*	Mature	11	12	40 + years	Good	Good	0.580	6.96	0.660	2.76	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1369926	-31.87292746
A00456	*Eucalyptus nicholii (Black Peppermint)*	Mature	18	12	40 + years	Good	Good	0.750	9.00	0.820	3.04	Deadwood noted within canopy (< 50mm dia.). Main stem bifurcates above 4 meters +. Tree is considered to be a good specimen of the species. tree situated in close proximity to buildings	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1369895	-31.87287714

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00457	*Eucalyptus nicholii (Black Peppermint)*	Mature	19	13	15 - 40 years	Good	Questionable	0.810	9.72	0.850	3.09	Bark Inclusions noted (minor), Deadwood noted within canopy (< 50mm dia), Main stem bifurcates above 4 meters - management plan required if tree is identified for retention, tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1370414	-31.87288858
A00458	*Eucalyptus camaldulensis (River Red Gum)*	Mature	11	11	15 - 40 years	Reasonable	Reasonable	0.400	4.80	0.450	2.37	Canopy displays leggy structural form, Canopy noted to be slightly sparse, Minor canopy suppression noted, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1370185	-31.8728375
A00459	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	14	12	15 - 40 years	Good	Reasonable	0.560	6.72	0.600	2.57	Canopy displays leggy structural form, Main stem bifurcates between 3 meters and 4 meters, Tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1369972	-31.8727849
A00460	*Eucalyptus camaldulensis var. obtusa (Northern River Red Gum)*	Mature	13	11	15 - 40 years	Good	Questionable	0.550	6.60	0.550	2.57	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia), Minor canopy suppression noted, Significant branch failures noted (300 mm - dia), management plan required if tree is identified for retention, tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.13702	-31.87270943
A00461	*Corymbia citriodora (Lemon-scented Gum)*	Mature	19	14	40 - years	Good	Good	0.560	6.72	0.620	2.71	Tree is considered to be a good specimen of the species, tree situated in close proximity to buildings	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1370299	-31.87264692
A00462	*Corymbia citriodora (Lemon-scented Gum)*	Mature	21	18	40 - years	Good	Reasonable	0.770	9.24	0.850	3.09	Canopy displays leggy structural form, Tree is considered to be a good specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1368927	-31.87257374
A00463	*Agonis flexuosa (WA Peppermint)*	Mature	5	6	5 - 15 years	Questionable	Questionable	0.480	4.80	0.560	3.17	Canopy noted to be sparse, Canopy previously lopped - not in keeping with AS4373, Deadwood noted within canopy (50 mm to 150 mm dia), management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1369545	-31.87245786
A00464	*Corymbia calophylla (Marri)*	Mature	17	10	40 - years	Good	Reasonable	0.460	5.52	0.500	2.47	Canopy noted to be slightly sparse, Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1371944	-31.87271056
A00465	*Corymbia calophylla (Marri)*	Mature	17	10	40 - years	Good	Reasonable	0.590	7.08	0.600	2.67	Canopy noted to be slightly sparse, Main stem bifurcates at ground level	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1372022	-31.87268694
A00466	*Corymbia calophylla (Marri)*	Mature	17	10	40 - years	Good	Reasonable	0.400	4.80	0.450	2.37	Canopy noted to be slightly sparse, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1372037	-31.87267675
A00467	*Eucalyptus grandis (Rose Gum)*	Mature	20	12	40 - years	Reasonable	Good	0.380	4.56	0.500	2.47	Canopy displays leggy structural form, Canopy noted to be slightly sparse	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1372403	-31.87281946
A00468	*Acacia species (Wattle)*	Mature	6	10	5 - 15 years	Good	Questionable	0.350	4.20	0.350	2.13	Limited Estimated Life Expectancy, Prior branch failures noted within canopy (50 mm to 150 mm dia.), Tree displays questionable form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1372705	-31.87275254
A00469	*Corymbia calophylla (Marri)*	Mature	19	14	40 - years	Reasonable	Reasonable	0.510	6.12	0.720	2.88	Canopy noted to be slightly sparse, Deadwood noted within canopy (< 50mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1372547	-31.87269744
A00470	*Brachychiton acerifolius (Illawarra Flame Tree)*	Mature	10	10	40 - years	Good	Reasonable	0.630	7.56	0.650	2.76	Bark Inclusions noted (minor), Main stem bifurcates between 500mm and 1 meter, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1375223	-31.87236356
A00471	*Eucalyptus camaldulensis (River Red Gum)*	Early Mature	11	10	40 - years	Good	Reasonable	0.400	4.80	0.450	2.13	Minor canopy suppression noted, Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.), Tree an lean (minor)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove Rubbing stems	116.1375055	-31.87232867
A00472	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	12	40 - years	Good	Good	0.530	6.36	0.620	2.71	Canopy displays leggy structural form, Damage to surface roots (minor), Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1374957	-31.87230966
A00473	*Eucalyptus camaldulensis (River Red Gum)*	Mature	11	12	40 - years	Good	Reasonable	0.470	5.64	0.520	2.51	Canopy displays leggy structural form, Deadwood noted within canopy (50 mm to 150 mm dia.) Minor canopy suppression noted, Tree an lean (minor)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1374844	-31.87227968
A00474	*Eucalyptus camaldulensis (River Red Gum)*	Mature	14	13	15 - 40 years	Reasonable	Reasonable	0.320	3.84	0.350	2.13	Canopy displays leggy structural form, Deadwood noted within canopy (50 mm to 150 mm dia.), Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1375778	-31.87225245
A00475	*Eucalyptus camaldulensis (River Red Gum)*	Mature	22	12	15 - 40 years	Good	Questionable	0.440	5.28	0.500	2.47	Bark Inclusions noted with swelling noted, Deadwood noted within canopy (< 50mm dia.), Main stem bifurcates above 4 meters - Tree displays questionable form, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1376079	-31.87225449
A00476	*Corymbia maculata (Spotted Gum)*	Mature	24	12	40 - years	Good	Reasonable	0.480	5.76	0.560	2.59	Canopy displays leggy structural form, Main stem bifurcates above 4 meters -	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1376434	-31.8722578
A00477	*Eucalyptus botryoides (Southern Mahogany)*	Mature	15	12	40 - years	Good	Reasonable	0.440	5.28	0.500	2.47	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia), Evidence of Termite mat noted however no active termites observed, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1377228	-31.87227504
A00478	*Eucalyptus botryoides (Southern Mahogany)*	Mature	18	16	40 - years	Good	Reasonable	0.610	7.32	0.630	2.73	Canopy displays leggy structural form, Damage to surface roots (minor), Deadwood noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1377728	-31.87228061
A00479	*Corymbia citriodora (Lemon-scented Gum)*	Mature	22	14	40 - years	Good	Reasonable	0.520	6.24	0.560	2.65	Canopy displays leggy structural form, Damage to surface roots (minor), Deadwood noted within canopy (< 50mm dia.), Minor canopy suppression noted	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1379528	-31.87229452

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00480	*Corymbia citriodora (Lemon-scented Gum)*	Mature	20	16	40 + years	Reasonable	Reasonable	0.450	5.40	0.560	2.59	Canopy displays leggy structural form, Canopy noted to be slightly sparse, Deadwood noted within canopy (50 mm to 150 mm dia.), Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1381522	-31.8722871
A00481	*Eucalyptus camaldulensis (River Red Gum)*	Mature	15	8	15 + 15 years	Questionable	Questionable	0.350	4.20	0.430	2.13	Canopy displays leggy structural form, Canopy indicates decline, Limited Estimated Life Expectancy, Minor canopy suppression noted, management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1382218	-31.87230194
A00482	*Corymbia citriodora (Lemon-scented Gum)*	Mature	21	18	40 + years	Good	Reasonable	0.550	6.60	0.640	2.74	Canopy displays leggy structural form, Main stem bifurcates between 3 meters and 4 meters, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1382663	-31.87230843
A00483	*Corymbia maculata (Spotted Gum)*	Mature	17	10	40 + years	Good	Reasonable	0.310	3.72	0.360	2.13	Canopy displays leggy structural form, Minor canopy suppression noted, Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1382997	-31.87230936
A00484	*Corymbia calophylla (Marri)*	Mature	19	19	40 + years	Reasonable	Good	0.970	11.64	1.100	3.44	Canopy noted to be slightly sparse, Canopy starting to indicate decline, Deadwood noted within canopy (50 mm to 150 mm dia.), Main stem bifurcates between 2 meters and 3 meters	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1385028	-31.87226391
A00485	*Eucalyptus marginata (Jarrah)*	Mature	15	11	40 + years	Good	Reasonable	0.550	6.61	0.700	2.85	Damage noted to basal area, Deadwood noted within canopy (50 mm to 150 mm dia.), Significant branch failures noted (300 mm + dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1385223	-31.87214427
A00486	*Corymbia citriodora (Lemon-scented Gum)*	Mature	17	18	40 + years	Good	Reasonable	0.450	5.40	0.520	2.51	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.), Main stem bifurcates above 4 meters +	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1385241	-31.87203668
A00487	*Corymbia citriodora (Lemon-scented Gum)*	Mature	20	17	40 + years	Good	Good	0.480	5.76	0.560	2.59	Minor canopy suppression noted, Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1384972	-31.87193929
A00488	*Corymbia calophylla (Marri)*	Mature	15	15	40 + years	Good	Good	0.580	6.96	0.630	2.73	Canopy noted to be slightly sparse, Deadwood noted within canopy (< 50mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1385046	-31.87190683
A00489	*Corymbia citriodora (Lemon-scented Gum)*	Mature	15	14	40 + years	Good	Reasonable	0.510	6.12	0.560	2.59	Canopy displays leggy structural form, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1384286	-31.87192723
A00490	*Jacaranda mimosifolia (Jacaranda)*	Mature	10	10	40 + years	Good	Good	0.390	4.68	0.500	2.47	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1383711	-31.87194857
A00491	*Jacaranda mimosifolia (Jacaranda)*	Mature	8	8	15 - 40 years	Good	Reasonable	0.350	4.20	0.350	2.13	Deadwood noted within canopy (50 mm to 150 mm dia.), Main stem bifurcates between ground level and 500mm	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.138334	-31.87194207
A00492	*Corymbia calophylla (Marri)*	Mature	22	25	40 + years	Good	Reasonable	0.990	11.86	1.200	3.57	Damage noted to main stem, Deadwood noted within canopy (50 mm to 150 mm dia.), Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1381902	-31.87194115
A00493	*Corymbia calophylla (Marri)*	Mature	13	12	40 + years	Good	Good	0.480	5.76	0.530	2.53	Deadwood noted within canopy (< 50mm dia.), Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.138142	-31.87190683
A00494	*Corymbia calophylla (Marri)*	Mature	22	18	15 - 40 years	Reasonable	Reasonable	0.720	8.64	0.850	3.09	Bark inclusions noted (minor), Canopy noted to be slightly sparse, Significant deadwood noted within canopy (300 mm + dia.), Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1381179	-31.87196897
A00495	*Corymbia calophylla (Marri)*	Mature	12	10	15 - 40 years	Good	Questionable	0.310	3.72	0.320	2.05	Canopy noted to be slightly sparse, Deadwood noted within canopy (50 mm to 150 mm dia.), Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1380993	-31.87190312
A00496	*Corymbia calophylla (Marri)*	Mature	12	12	40 + years	Good	Reasonable	0.310	3.72	0.330	2.08	Canopy displays leggy structural form, Main stem bifurcates between 2 meters and 3 meters, Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1380437	-31.87190405
A00497	*Corymbia calophylla (Marri)*	Mature	14	10	40 + years	Reasonable	Good	0.260	3.60	0.320	2.05	Canopy displays leggy structural form, Deadwood noted within canopy (50 mm to 150 mm dia.), Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1379732	-31.87190034
A00498	*Corymbia calophylla (Marri)*	Mature	13	11	40 + years	Good	Reasonable	0.340	4.08	0.360	2.15	Deadwood noted within canopy (50 mm to 150 mm dia.), Main stem bifurcates between 2 meters and 3 meters, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1379771	-31.87188751
A00499	*Corymbia ficifolia (Red Flowering Gum)*	Mature	6	10	5 - 15 years	Questionable	Reasonable	0.410	4.92	0.450	2.37	Canopy indicates decline, Limited Estimated Life Expectancy, management plan required if tree is identified for retention, Tree situated in close proximity to buildings	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1379886	-31.8718088
A00500	*Eucalyptus robusta (Swamp Mahogany)*	Mature	14	10	40 + years	Good	Reasonable	0.460	5.52	0.500	2.47	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.), Minor canopy suppression noted, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1379167	-31.87181071
A00501	*Eucalyptus gomphocephala (Tuart)*	Mature	22	11	40 + years	Good	Good	0.430	5.16	0.490	2.45	Canopy displays leggy structural form, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1379492	-31.87194702
A00502	*Corymbia calophylla (Marri)*	Mature	13	10	15 - 40 years	Reasonable	Reasonable	0.440	5.28	0.500	2.47	Canopy noted to be slightly sparse, Deadwood noted within canopy (50 mm to 150 mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1378727	-31.87195658

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00503	*Corymbia calophylla (Marri)*	Mature	20	20	40 + years	Good	Reasonable	1.800	1.080	1.800	4.24	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia). Main stem bifurcates at ground level. Minor canopy suppression noted	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1378441	-31.8719553
A00504	*Corymbia calophylla (Marri)*	Mature	12	11	15 - 40 years	Reasonable	Reasonable	0.450	5.40	0.450	2.37	Canopy displays leggy structural form. Canopy noted to be slightly sparse. Deadwood noted within canopy (< 50mm dia.)	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1378568	-31.87190244
A00505	*Corymbia calophylla (Marri)*	Mature	20	14	15 - 40 years	Questionable	Reasonable	0.560	7.92	0.700	2.85	Canopy indicates decline. Canopy noted to be sparse. Deadwood noted within canopy (50 mm to 150 mm dia.). Limited Estimated Life Expectancy. management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display questionable health or structural issues)		116.1377893	-31.87194256
A00506	*Eucalyptus marginata (Jarrah)*	Mature	12	11	40 + years	Good	Reasonable	0.510	6.12	0.560	2.59	Damage noted to basal area, Main stem bifurcates between 1 meter and 2 meters, Minor canopy suppression noted, Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1378657	-31.87212283
A00507	*Eucalyptus marginata (Jarrah)*	Mature	10	11	40 + years	Good	Good	0.440	5.28	0.480	2.43	Damage noted to main stem. Deadwood noted within canopy (50 mm to 150 mm dia). Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1376721	-31.87213684
A00508	*Corymbia calophylla (Marri)*	Mature	22	25	40 + years	Good	Good	1.100	13.20	1.300	3.69	Canopy displays leggy structural form. Deadwood noted within canopy (150 mm to 300 mm dia.). Main stem bifurcates above 4 meters+. Prior branch failures noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a good specimen of the species, tree situated in close proximity to buildings	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.1380243	-31.87214321
A00509	*Corymbia calophylla (Marri)*	Mature	21	20	40 + years	Good	Reasonable	0.810	9.72	0.900	3.17	Evidence of Termite mud noted however no active termites observed. Tree is considered to be a reasonable specimen of the species, tree situated in close proximity to buildings	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1380925	-31.87218907
A00510	*Corymbia citriodora (Lemon-scented Gum)*	Mature	25	30	40 + years	Good	Good	0.710	8.52	0.780	2.98	Canopy displays leggy structural form. Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1380708	-31.87223684
A00511	*Corymbia maculata (Spotted Gum)*	Mature	18	14	15 - 40 years	Good	Reasonable	0.360	4.32	0.400	2.25	Canopy displays leggy structural form. Minor canopy suppression noted. Prior branch failures noted within canopy (50 mm to 150 mm dia.). Rubbing & Crossing stems noted within canopy (50 mm to 150 mm dia.).	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove Rubbing stems	116.1380281	-31.8722171
A00512	*Eucalyptus botryoides (Southern Mahogany)*	Mature	15	14	40 + years	Good	Reasonable	0.520	6.24	0.690	2.83	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1377147	-31.8721948
A00513	*Eucalyptus botryoides (Southern Mahogany)*	Mature	20	12	15 - 40 years	Good	Questionable	0.540	6.48	0.600	2.67	Canopy displays leggy structural form, Canopy previously lopped not in keeping with AS4373, Damage noted to main stem, Main stem bifurcates above 4 meters+. management plan required if tree is identified for retention	Questionable (Modifications and inputs required for incorporation &/or may display Questionable health or structural issues)		116.1376186	-31.87217315
A00514	*Eucalyptus botryoides (Southern Mahogany)*	Mature	14	14	40 + years	Good	Good	0.520	6.24	0.750	2.93	Canopy displays leggy structural form, Deadwood noted within canopy (< 50mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1375377	-31.87216855
A00515	*Corymbia calophylla (Marri)*	Mature	10	12	40 + years	Good	Reasonable	0.800	9.60	0.800	3.01	Tree displays multi stemmed form. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1374462	-31.87217217
A00516	*Corymbia calophylla (Marri)*	Mature	12	10	40 + years	Good	Reasonable	0.330	3.96	0.350	2.13	Canopy noted to be slightly sparse. Tree is considered to be a good specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1374465	-31.87213745
A00517	*Corymbia calophylla (Marri)*	Mature	12	11	40 + years	Good	Good	0.340	4.08	0.360	2.15	Minor canopy suppression noted. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1374431	-31.87209723
A00518	*Corymbia calophylla (Marri)*	Mature	11	11	40 + years	Good	Reasonable	0.530	6.36	0.550	2.57	Main stem bifurcates between 2 meters and 3 meters. Prior branch failures noted within canopy (50 mm to 150 mm dia.). Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1374338	-31.87206285
A00519	*Corymbia citriodora (Lemon-scented Gum)*	Mature	15	12	40 + years	Good	Good	0.440	5.28	0.500	2.47	Canopy displays leggy structural form. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1374829	-31.8720163
A00520	*Eriobotrya japonica (Loquat)*	Mature	5	6	15 - 40 years	Good	Reasonable	0.350	4.20	0.350	2.13	Tree displays multi stemmed form. Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.137604	-31.87211258
A00521	*Eriobotrya japonica (Loquat)*	Mature	5	8	15 - 40 years	Good	Good	0.350	4.20	0.350	2.13	Tree displays multi stemmed form. Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1377609	-31.87218337
A00522	*Corymbia calophylla (Marri)*	Mature	16	14	40 + years	Good	Good	0.480	5.76	0.500	2.47	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1349495	-31.87196806
A00523	*Corymbia calophylla (Marri)*	Mature	24	18	<5 years	Poor	Questionable	0.850	10.20	1.300	3.31	Canopy indicates decline. Canopy noted to be sparse. Limited Estimated Life Expectancy. management plan required if tree is identified for retention	Unsuitable for incorporation (Not compatible with design &/or problematic health or structural form)	Dismantle or : undertake habitat pruning	116.1349829	-31.87191972
A00524	*Corymbia calophylla (Marri)*	Mature	20	20	40 + years	Good	Good	0.680	8.16	0.750	2.93	Deadwood noted within canopy (50 mm to 150 mm dia.). Minor canopy suppression noted. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1349894	-31.87190676

Tree Tag ID Number	Nomenclature & Tree Identification	Est Age	Est Tree Height	Est Canopy Spread	Estimated Life Expectancy (ELE)	Canopy Health	Canopy Structure	Trunk Diameter at 1.4m or Widest Point	Tree Protection Zone (TPZ) Radius (M)	Trunk Diameter Above Buttress	Structural Root Zone (SRZ) Radius (M)	Comments	Suitability for Incorporation Into An Urban Development	Canopy Pruning Works	Longitude (epsg 4326)	Latitude (epsg 4326)
A00525	*Corymbia calophylla (Marri)*	Mature	14	10	15 - 40 years	Reasonable	Reasonable	0.450	5.40	0.450	2.37	Canopy displays leggy structural form. Canopy noted to be slightly sparse. Main stem bifurcates between 500mm and 1 meter	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.134965	-31.87188234
A00526	*Corymbia calophylla (Marri)*	Mature	22	10	40 + years	Good	Good	0.350	4.20	0.400	2.25	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1348797	-31.87194763
A00527	*Corymbia calophylla (Marri)*	Mature	15	10	40 + years	Good	Reasonable	0.340	4.08	0.380	2.20	Main stem bifurcates above 4 meters +. Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1348369	-31.87194015
A00528	*Eucalyptus marginata (Jarrah)*	Mature	16	10	Dead	Dead	Poor	0.800	N/A	0.950	N/A	Dead Tree - no chance of recovery	Unsuitable for incorporation (Not compatible with design &/or problematic health or structural form)	Dismantle or; undertake habitat pruning	116.1348439	-31.87191424
A00529	*Corymbia calophylla (Marri)*	Mature	15	12	40 + years	Reasonable	Good	0.580	6.00	0.560	2.59	Deadwood noted within canopy (50 mm to 150 mm dia). Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Remove major deadwood >30mm dia.	116.134802	-31.87191025
A00530	*Corymbia calophylla (Marri)*	Mature	19	12	40 + years	Good	Reasonable	0.690	8.28	0.750	2.93	Canopy displays leggy structural form. Deadwood noted within canopy (50 mm to 150 mm dia). Main stem bifurcates between 1 meter and 2 meters	Acceptable (Reasonably located &/or Reasonable Specimen)	- Remove major deadwood >30mm dia.	116.1347831	-31.87188134
A00531	*Corymbia calophylla (Marri)*	Mature	13	10	40 + years	Reasonable	Good	0.350	3.96	0.350	2.13	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1347965	-31.87185892
A00532	*Corymbia calophylla (Marri)*	Mature	15	13	40 + years	Good	Reasonable	0.400	4.80	0.440	2.34	Main stem bifurcates between 3 meters and 4 meters. Tree is considered to be a reasonable specimen of the species	Acceptable (Reasonably located &/or Reasonable Specimen)	- Monitor and Reinspect in 12 months	116.1347791	-31.87185991
A00533	*Corymbia calophylla (Marri)*	Mature	14	12	40 + years	Good	Reasonable	0.500	6.00	0.550	2.57	Main stem bifurcates between 3 meters and 4 meters. Tree is considered to be a reasonable specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1347552	-31.871833
A00534	*Corymbia calophylla (Marri)*	Mature	13	10	40 + years	Good	Good	0.320	3.84	0.350	2.13	Tree is considered to be a good specimen of the species	Optimal (Well Placed &/or Good Specimen)	- Monitor and Reinspect in 12 months	116.1349977	-31.87199687

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01 site

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01 | LANDSCAPE MASTERPLAN
SITE ANALYSIS

LEGEND

VISUAL AND PEDESTRIAN CONNECTION WITH CREEK

OPPORTUNITY FOR CONNECTION NODES

DENSE TREE CANOPY

OPPORTUNITY FOR INFORMAL SEATING NODES

LEVEL CHANGE/MOUNDING

OPPORTUNITY FOR TERRACED SEATING WITH KEY VIEWS

KEY VIEWS

HIGH POINTS WITH KEY AND WIDE VIEWS

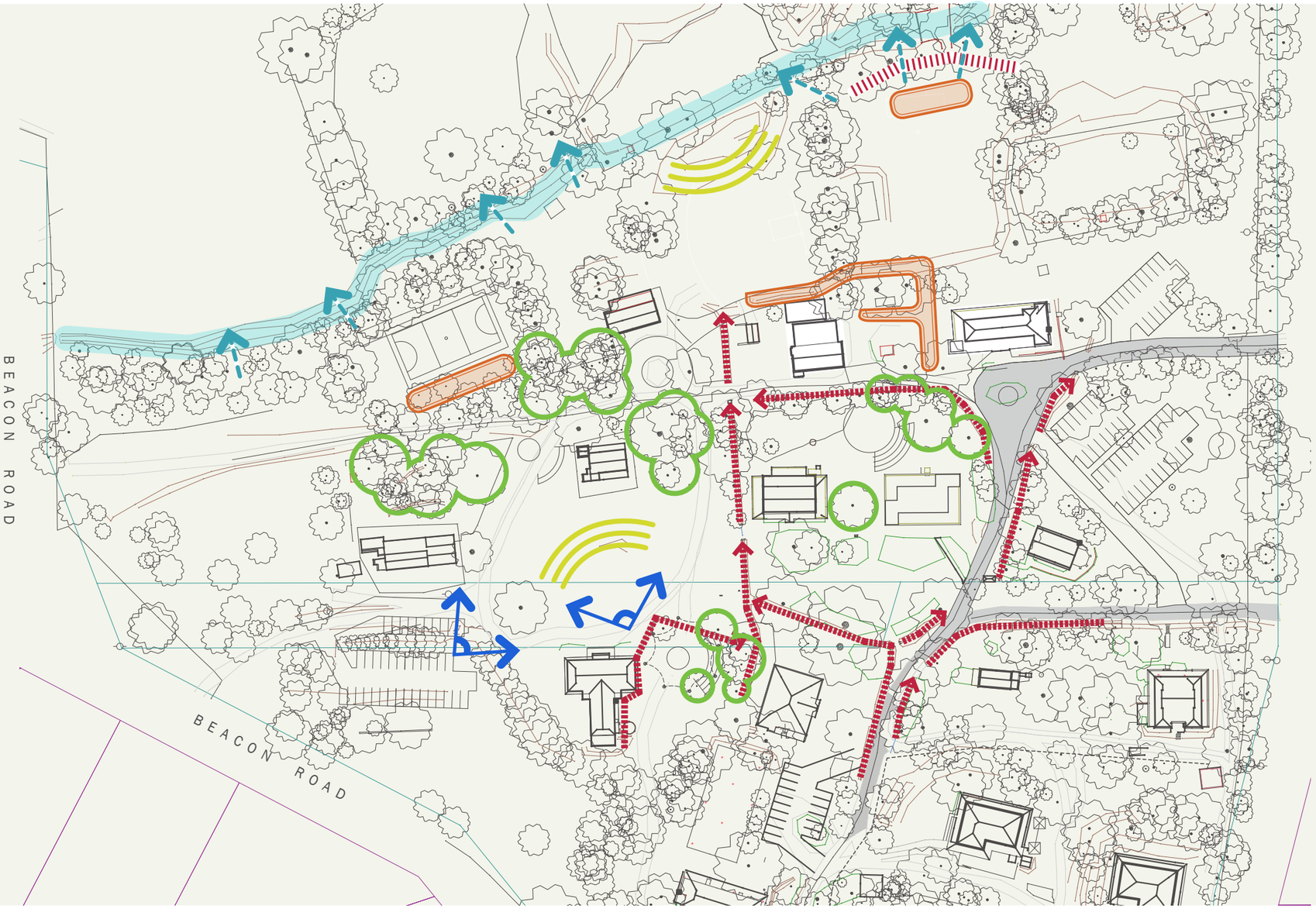
WATERLOGGED AREAS

EXISTING SWALES

POOR FORM AND NOT FUNCTIONING - WATER RUNNING OFF MAIN ROADS

UNSCREENED AREA

POTENTIAL ISSUE FOR SPORTS - SCREEN NEEDED



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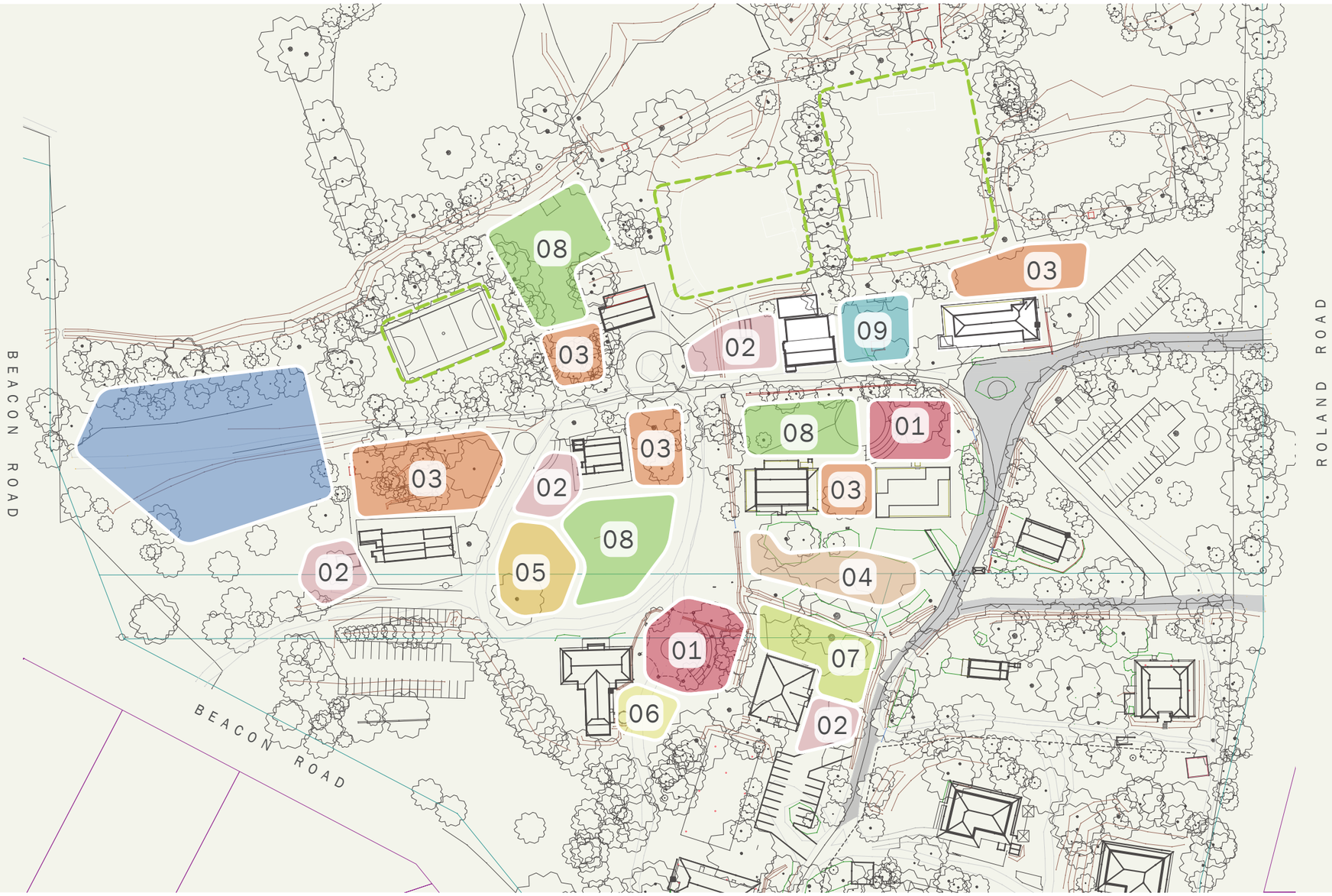
ZONING DIAGRAM

ZONING

- zone1: GATHERING AREA
- zone2: OUTDOOR LEARNING
- zone3: INFORMAL SEATING
- zone4: NATURE PLAY YR 7-10
- zone5: ACTIVE ZONE YR 11-12
- zone6: OUTDOOR DINNING
- zone7: COMMUNITY GARDEN
- zone8: OPEN KICK-ABOUT / FLEXIBLE
- zone9: OUTDOOR FLEXIBLE WORKSHOP
- OPEN TURF EMBANKMENT



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ZONE 1 - GATHERING AREAS



ground floor / key plan
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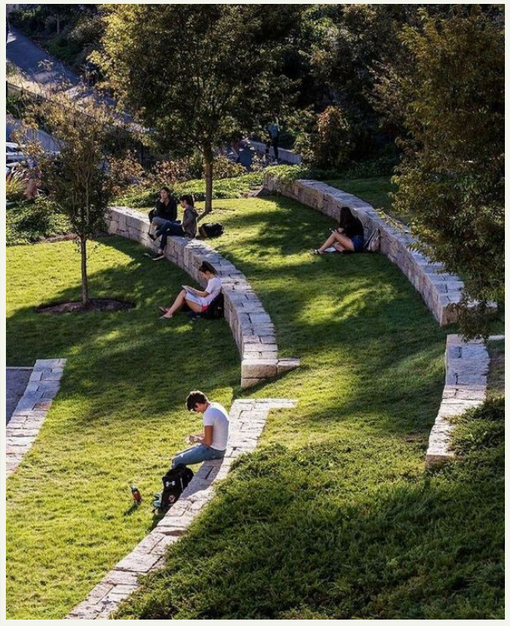
zone1:
GATHERING AREA















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ZONE 2 - OUTDOOR LEARNING



ground floor / key plan
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zone 2:
OUTDOOR LEARNING













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ZONE 3 - INFORMAL SEATING NODES



ground floor / key plan
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zone 3:
INFORMAL SEATING NODES















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ZONE 4 - NATURE PLAY YR 7-10



ground floor / key plan
NTS

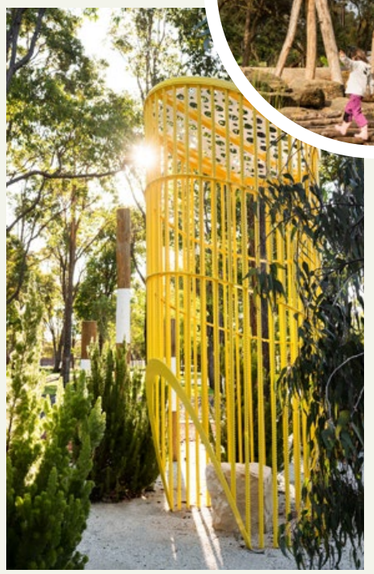
zone 4:
NATURE PLAY YR 7-10















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ZONE 5 - ACTIVE ZONE YR 11-12



ground floor / key plan

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zone 5:
ACTIVE ZONE YR 11-12













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ZONE 6 - OUTDOOR DINNING



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zone6:
OUTDOOR DINNING















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ZONE 7 - PRODUCTIVE GARDEN



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zone 7:
PRODUCTIVE GARDEN















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ZONE 8 - KICK-ABOUT FLEXIBLE



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zone 8:
KICK-ABOUT FLEXIBLE







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ZONE 9 - OUTDOOR FLEXIBLE WORKSHOP



ground floor / key plan
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zone 9:
OUTDOOR FLEXIBLE WORKSHOP













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DRAINAGE & WSUD OPPORTUNITIES











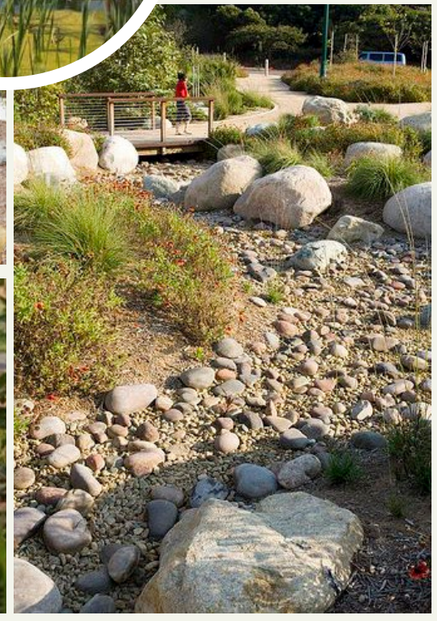





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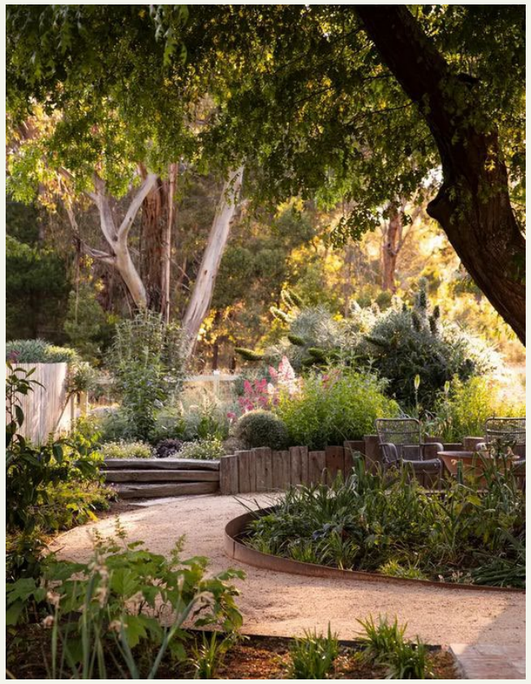
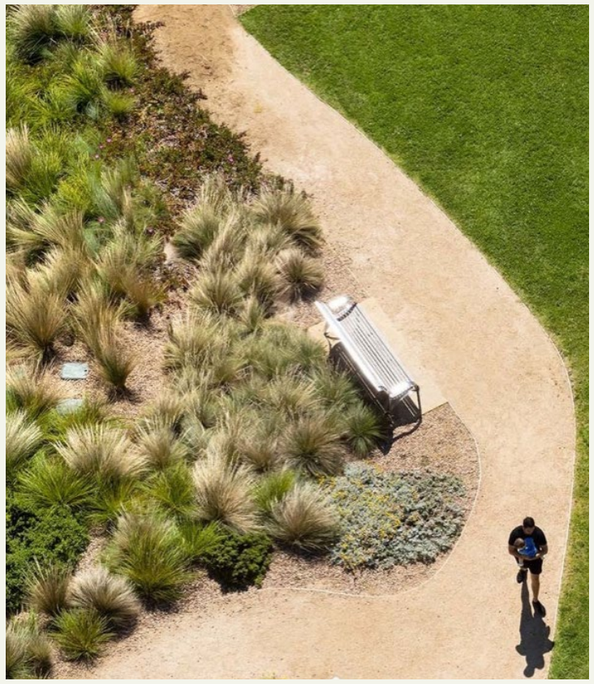
PEDESTRIAN CIRCULATION



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03 landscape concept

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03 | LANDSCAPE CONCEPT
LANDSCAPE STRATEGY

The existing landscape of the site is characterised by numerous large existing trees; & a sloping site, buildings are scattered throughout the site and there is a existing creek to the northern boundary which is the low point. Materiality is made up of gravel, laterite, stone boulders, various timber elements with a bitumised road access to the entry of the site & compacted gravel pathways/ roadways through the remaining of the site.

The site has numerous drainage issues and points of flooding throughout with a drainage strategy system required - refer to Civil drawings.

The landscape strategy for the site is to work with the existing slope of the site to provide opportunities for play; gathering and outdoor activities, the landscape strategy also looks at dealing with the drainage issues and how a series of landscape swales can be incorporated to help with overland drainage and to provide educational experiences.

Outdoor active zones i.e. sports fields are located at the Northern area of site which is the flattest section so no retaining is required to create appropriate sports field zones. Outdoor gathering spaces/ amphitheaters have been designed to work in with the existing slope and embankments of the site.

Pathways have been located to achieve a maximum of 1:21 slope- where this is not achievable steps have been shown- alternative pathways to all areas have been designed.

The design looks to keep as many existing trees as possible- some tree removal and/or pruning may be required for safety offsets of the buildings and vehicular roads. Trees noted to be in poor health in the arborist report will be removed where required.

Due to the high number of existing trees limited new trees have been proposed. The site has quite good existing shade and passive cooling. The landscape design aims to build upon this whilst creating a variety of outdoor spaces that are comfortable for the students & staff to use and provide a range of uses/ external activities.

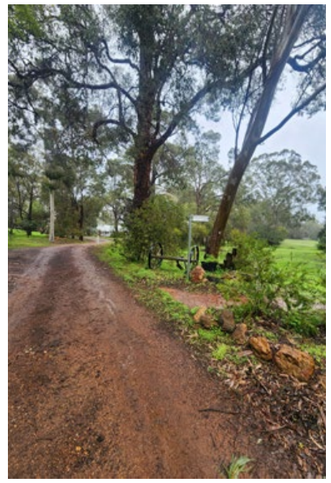
The landscape design also looks to pick up on natural elements and design language of existing and surrounding site character through form and material to integrate the School into the wider site context.

Existing trees that are to be removed can be re-used within the landscape design for log seating, steppers etc









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03 | LANDSCAPE CONCEPT
PRELIMINARY LANDSCAPE CONCEPT PLAN

LEGEND

01 SOCCER FIELD TURF ZONE
02 NATURAL ROCK AND LOG ELEMENTS TO PROVIDE RETAINING/ SEPARATION OF LOW POINTS TO PREVENT FLOODING TO SOCCER PITCH - WITH SEATING OPPORTUNITIES
03 SWALE ALONGSIDE BASE OF BUND TO BASIN TO PREVENT WATER FLOODING TO SOCCER PITCH
04 SWALE CONNECTING TO CREEK LINE TO DIRECT WATER OVERFLOW INTO CREEK
05 INFORMAL CONNECTION THROUGH TO CREEK - I.E. STEPPING STONES
06 OPEN TURF AREA FOR AFL
07 SEATING TERRACES TO EXISTING TURF EMBANKMENT
08 DRAINAGE BASIN
09 PROPOSED BREAK-OUT/ GATHERING SPACES WITH COMPACTED GRAVEL SURFACING AND SEATING OPPORTUNITIES ASSOCIATED WITH ADJACENT BUILDING/S
10 BASKETBALL COURT
11 FEATURE GATHERING SPACE OUTSIDE VET BUILDING
12 FEATURE OUTDOOR CLASSROOM WITH SPACE FOR OUTDOOR ARTS
13 BREAKOUT SPACE TO ARTS BLOCK WITH FLEXIBLE USE SPACES
14 PROPOSED SEATING OPPORTUNITIES NEAR SPORTS FIELDS WITH VIEWS ACROSS - ALSO POTENTIALLY STAFF BREAKOUT AREA TO BACK OF ADMIN
15 BITUMINISED VEHICULAR ACCESS PATH
16 COMPACTED GRAVEL VEHICULAR ACCESS PATHWAY
17 COVERED OUTDOOR GATHERING SPACE WITH SEATING OPPORTUNITIES
18 OPEN TURF SPACE FOR FLEXIBLE USE
19 OUTDOOR GATHERING SPACES
20 FEATURE SEATING UNDER EXISTING SHADE TREE
21 COMPACTED GRAVEL PEDESTRIAN PATHWAY
22 OUTDOOR AMPHITHEATRE/ GATHERING SPACE BUILT INTO EXISTING EMBANKMENT
23 OUTDOOR EXERCISE AREA WITH EXTERNAL GYM EQUIPMENT
24 LARGE OPEN CENTRAL TURF SPACE TO THE FRONT OF THE HALL
25 DRAINAGE SWALE WITH CROSSING POINTS WHERE ADJACENT TO PATHWAYS
26 FEATURE GATHERING AREA INTERSECTING WITH SWALE - POTENTIAL LEARNING OPPORTUNITY AREA
27 INFORMAL HANGOUT SPACE FOR TEEN GIRLS WITH PLANTING SEPARATION
28 PLAYGROUND AREA WITH CLIMBING STYLE EQUIPMENT SUITABLE TO EARLY TEEN AGE
29 PLAY EMBANKMENT WITH CLIMBING HOLDS; ROPES & SLIDE
30 YARNING CIRCLE/ TEEN HANGOUT SPACE
31 KITCHEN/ VEGETABLE GARDEN SPACES
32 OUTDOOR CLASSROOM/ GATHERING SPACE
33 OUTDOOR DINING AREA CONNECTED TO HALL/KITCHEN
34 LARGE OUTDOOR AMPHITHEATRE GATHERING SPACE BUILT INTO LEVELS OF EXISTING EMBANKMENT
35 SPILL OUT/ GATHERING SPACES FOR YR 12
36 INFORMAL HANG OUT AREAS AMONGST TREES

EXISTING TREES TO BE RETAINED



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04 materials & planting palette

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04 | MATERIAL PALETTE



BITUMEN/ ASPHALT ROAD -MAIN/ ENTRY VEHICULAR PATHWAYS 7 CAR PARKS



COMPACTED GRAVEL -SECONDARY VEHICULAR PATHWAYS



COMPACTED GRAVEL - PEDESTRIAN PATHWAYS



COMPACTED GRAVEL - FEATURE AREAS



MULCH TO PLAY AREAS



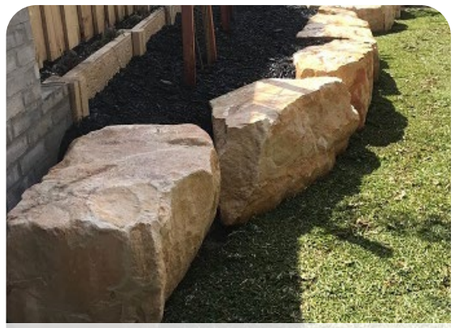
BASKETBALL COURT PAVEMENT



LATERITE BLOCK WALL



LOCAL STONE EMBANKMENTS



LOCAL STONE SEATING



NATURAL LOG SEATING



NATURAL PLAY ELEMENTS



SEATING



OUTDOOR TABLE SETTINGS

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04 | PLANTING PALETTE

TREE PLANTING


CORYMBIA CALOPHYLLA


EUCALYPTUS ‘WANDOO’


EUCALYPTUS LAELIAE


EUCALYPTUS NICHOLII


CORYMBIA FICIFOLIA


MELALEUCA LEUCADENDRA


EUCALYPTUS CAESIA


HAKEA PETIOLARIS


RICINOCARPUS ‘BRIDAL STAR’


GLEDITSIA ‘SUNBURST’


LAGERSTROEMIA ‘SIOUX’


PYRUS NIVALIS

SHRUB PLANTING- GENERAL AREAS


HEMIANDRA PUNGENS


KENNEDIA PROSTRATA


GREVILLEA ‘GIN GIN GEM’


EREMOPHILA ‘ALLARA’


EREMOPHILA NIVEA


WESTRINGIA ‘MUNDII’


MELALEUCA TRICHOPHYLLA


VERTICORDIA ACEROSA


CHORIZEMA CORDATUM


HYPOCALYMMA ANGUSTIFOLIUM


ACACIA DRUMMONDII


BANKSIA NIVEA


DIANELLA REVOLUTA


LOMANDRA ‘TANIKA’


LOMANDRA ‘LIME TUFF’


AUSTROSTIPA ELEGANTISSIMA

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04 | PLANTING PALETTE

SHRUB PLANTING - FEATURE PLANTING


XANTHORRHOEA PREISSEII


ANIGOZANTHOS ‘BIG RED’


ANIGOZANTHOS ‘BUSH PEARL’


PATERSONIA OCCIDENTALIS


CASUARINA ‘COUSIN IT’


SCAEVOLA ‘SURDIVA PINK’


CHRYSOCEPHALUM ‘SILVER AND GOLD’


LEUSCHENAULTIA BILOBA

SHRUB PLANTING - SENSORY & PRODUCTIVE GARDENS


CITRUS ‘MIGNIGHT SEEDLESS ORANGE’


CITRUS ‘EUREKA LEMON’


CITRUS ‘TAHITIAN LIME’


TULBAGHIA VARIEGATA


LAVANDULA ‘THE PRINCESS’


SALVIA ‘VICTORIAN BLUE’


MIXED VEGETABLES


MIXED HERBS

TREE & SHRUB PLANTING - DRAINAGE SWALES


MELALEUCA PREISSIANA


ASTARTEA SCOPARIA


MELALEUCA LATERITA


FICINIA NODOSA


BAUMEA JUNCEA


JUNCUS PAUCIFLORUS


LOBELIA ANCEPS


PATERSONIA OCCIDENTALIS


HYPOCALYMMA ANGUSTIFOLIUM

CREEPERS


HIBBERTIA SCANDENS


HARDENBERGIA COMPTONIANA

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PARKERVILLE CARE SCHOOL
ARCHITECTURAL DESIGN OVERVIEW

Project Masterplan

The proposed Masterplan is to establish a Care School that will encompass the majority of the site and repurpose most of the existing buildings on the site, summarised as follows:

1. Existing Rosemary Cottage – proposed refurbishment for new Administration.
2. Existing Padbury Cottage – proposed refurbishment for new Years 7 & 8 teaching.
3. Existing St Gabriels Cottage – proposed refurbishment for new Years 9 & 10.
4. Existing Wattle Cottage – proposed refurbishment for new Year 11.
5. Existing Kindergarten – proposed refurbishment and new extension for new Year 12.
6. Existing Workshop (Kitchen/Dining) – proposed refurbishment and new extension for new Art Room.
7. Existing Workshop (Laundry) – proposed refurbishment for new Manual Arts.
8. Existing George Turner Cottage – proposed refurbishment for new Home Economics.
9. Existing Worthington Hall – proposed refurbishment for new Shelter Building, Dining and Assembly.
10. Existing Blue Cottage – proposed demolition – structurally unsound.
11. Existing Chapel – no new works proposed – Conservation Management Strategy works & Maintenance previously completed.
12. Existing Carniya - no new works proposed – Conservation Management Strategy works & maintenance only.
13. Existing Wearne Building – no new works proposed – Conservation Management Strategy works & maintenance only.
14. New Maintenance and Grounds Workshop/Shed

Design Intent

The regeneration of the existing cottages at the Parkerville Children and Youth Centre is threefold –

1. Establish a years 7-12 school comprising year groups of 12-15 students in each. The master planning takes into account separation of different learning precincts to provide for the following
    a. Administration and Reception – Rosemary Cottage
    b. Years 7/8, 9/10 Learning Communities – St Gabriel's and Padbury Cottages
    c. Arts and Manual Arts – two workshops
    d. Home Economics – George Turner Cottage
    e. Year 11 – Wattle Cottage
    f. Year 12 – Former Kindergarten
    g. Assembly Hall + Bushfire Shelter – Worthington Hall

In addition to these buildings being regenerated for these specific purposes, there will be play areas established, a connecting pathway circuit and consolidation of the road network to cater for DFES requirements.

New parking areas are being located to align with the land gradient, a new hardcourt is being constructed and an existing court refurbished.

2. The design concepts for each building have been established with the following principles in mind:

    a. Retain as much of the existing built form as possible, even if materials are required to be replaced for conservation reasons.
    b. Apply recommendations from the Conservation Management Plan and where demolition and/or new extensions are required, only propose these elements where the existing has little to no significance and does not compromise the original heritage of the structures
    c. Retain the existing external fabric to establish new, compliant bathroom facilities in each building
    d. Ensure the levels of the verandahs are adjusted to suit universal access into each building, including the addition of lightweight access decks to avoid any steps
    e. Maintain the internal volumes of the rooms, including the ceiling linings wherever possible, and enhance the integrity of the spaces by avoiding major work to existing walls in the major spaces

3. Interior design considers the users of each Cottage in ensuring a level of supervision for each space. The learning spaces are not considered 'traditional' classrooms but based more on informal learning areas.

    a. The fitout will include mostly loose furniture with more of a lounge type setting.
    b. New lighting will include both pendant lights in various areas to provide a sense of seclusion, plus fully compliant task lighting where required.
    c. Sound attenuation will be addressed through the use of carpet and rugs on the floors, with some suspended acoustic panels possible through some of the more voluminous rooms.
    d. No whiteboards, pinboards or TV screens will be mounted on the walls but be freestanding, on wheels or on TV cabinets, in each room.
    e. Small glazed interventions are noted where supervision is required for staff. In instances where the doors are the most logical location, glass panels will be included within the existing fabric of the doors to ensure the style of the door is not compromised.
    f. The verandahs are being developed to become an extension of the learning spaces. Some verandahs requiring a rebuild are being re-levelled to suit the entry levels.
    g. Finishes to the rooms will all be neutral colours to avoid any psychological impact to the students.
    h. The location of the staff areas has carefully considered lines of sight to both internal and external play areas.

Schedule of Areas

St Gabriel's and Padbury Cottages

Standard area allocation for traditional classrooms in mainstream schools is 2m2/student. The nature of the students being catered for at Parkerville CARE School is based on 3-4m2/student to allow for a more informal 'family-friendly' scale within the spaces. This allows for the learning settings to be scaled to suit individuals, small groups and in some instances, a full year group of 12-15 students.

Each Cottage will have single Unisex toilets together with Universal Access toilets provided for the year groups. Activity Studios are designated for small hands-on activities including the use of wet areas. These are complimented by the Art and Manual Arts workshops and the Home Economics building.

Worthington Hall

Worthington Hall is retaining its historical purpose of a Hall with a servery kitchen. This is intended to be refurbished back to its original hall space to also be established as the Bushfire Emergency shelter and the required tenable area for 120 people.

The kitchen servery will be upgraded with some new equipment while new bathrooms are being established to cater for the number of potential occupants at any one time. It is proposed to demolish the southern 'lean-to' structure at the southern end of the building as this was not part of the original building and attracts a lot of site runoff in this low lying area.

George Turner Cottage

The regeneration of this Cottage will transform the original timber building into a home economics studio with a food preparation area for the studio, a staff office and the re-establishment of the dining room as an area suitable to cater for any hospitality activities.
The external verandahs are being rebuilt due to termite and structural damage. In doing so, it is proposed to remove the existing louvres and return the verandahs to being open areas. Bushfire shutters are proposed to avoid ingress of embers during an event. The timbers being utilised for replacement will be bushfire resistant wherever possible.

Workshops

The two existing workshops are being retained and upgraded to cater for the Visual Arts and Manual Arts.

The western most workshop will have conservation work carried out with the removal of the central lightweight wall. The building will substantially remain as its current purpose as a workshop.

The workshop building adjacent to Rosemary Cottage will be retained and converted into a large Arts Studio. The lean to shed structure will be demolished and replaced with a new structure to include a Digital Media Room, a Kiln Room and open wet area. This structure will be linked with a low pitched roof and the facilities themselves roofed with a skillion roof to clearly articulate the heritage building from the original.

Wattle Cottage

Suffering from major deterioration currently, the intent is to restore this building's integrity, retain the existing chimney stacks and establish a new open plan learning community for the year 11 group. The removal of some of the internal walls will provide a flexible space with a multitude of learning settings. This building is being retained although originally marked for demolition. The scale and integrity of the Cottage is worthy of retention and regenerating into a new year group learning community.

Kindergarten

The Conservation Management Plan clearly articulates the heritage of this building. Whilst developed and altered over many years, it is proposed to ensure the retention of the original two sections of the building and remove the asbestos bathroom outbuildings added in the 1950's. These will be replaced with a separate wing containing new bathrooms and a Staff Office that will overlook the adjacent play areas plus allow for supervision internally as well. The alignment of the internal windows ensures sightlines to inside the existing rooms via the windows in the original building.

The verandahs will be re-established and become part of the expanded and informal learning spaces being established for the year 12 year group.

The re-establishment of a use for this building is integral to the Parkerville CARE School given its history. Having the year 12s being located in this precinct provides a separate identity for the senior students and a recognition of their senior role on the campus as young adults.

Bushfire Management

A Bushfire Management Plan and Emergency Evacuation Plan was prepared by Envision Bushfire Protection (Level 3 Assessor) dated 14 October 2024. The plan addresses the following primary criteria elements informing architectural design:

- **Location** – planning decisions avoid areas of Extreme Bushfire Hazard levels but is not applicable to restoration of an existing development.
- **Siting & Design** – Whilst restorations are not required to provide an Asset Protection Zone (APZ), for this development an APZ is to be maintained around all buildings to achieve BAL19 – enabling retention of historic materials where possible.
- Worthington Hall is identified as the shelter of last resort and is sited at BAL29 requiring construction elements in accordance with NCC2022 in addition to providing internal tenability.
- **Vehicle Access** – required to have public access to two destinations. Internal Roads provide multiple ingress/egress points from Roland and Beacon Roads.
- **Water** – the site has access to reticulated water and requires fire hoses capable of applying water to all external surfaces for 10m around the buildings. The development will cater for both structural and bush fires via tanks and pumps.

The intent for the restoration of BAL 19 buildings (Rosemary, St. Gabriels, Padbury, Wattle, Kindergarten, Workshop – Kitchen, Workshop – Laundry & George Turner) is as follows –

Windows:

- External windows to be made of non-combustible material or timber with a density ≥650kg/m³. The existing buildings, being jarrah, are considered suitable for compliance.
- Toughened glass (minimum 5mm thick) is to be installed to all external windows.
- Screens with corrosion-resistant mesh are only to be considered where full height windows with openings are noted. However, there are few instances of this and it may be considered more suitable to install a fire shutter/curtain in preference to these. The protection of windows below 400mm is the more pertinent issue to issue to address here.
- Seals to restrict ember ingress.

Doors:

- External doors to be non-combustible or solid timber ≥35 mm thick. The existing buildings,

being jarrah, are considered suitable for compliance.

- Weather strips at base to prevent ember entry.
- Toughened glass (minimum 5mm thick) for any glazed portions. Any new replacements of panels with glazing in existing doors will comply with this requirement.
- Screen doors with mesh to prevent embers to be considered. All timber sills are currently jarrah and the verandahs are being reconstructed to be flush with the sills. Should areas be highlighted for the inclusion of a screen door, it is recommended to replace the sills with a bushfire resistant timber. The heritage of the doors is a significant part of the buildings and screen doors considered inappropriate.

Walls

- Walls to be made of non-combustible materials like masonry or brick veneer. Where timber weatherboards are to be replaced due to structural or termite damage, the boards will be replaced with bushfire resistant timber weatherboards as determined in AS 3959. For exposed timber weatherboards that are not required to be replaced for structural and condition reasons, the boards are to be replaced to a minimum of 400mm above floor level with bushfire resistant timbers.
- Gaps and joints sealed to prevent ember entry.
- Timber framing permitted with certain protective treatments – where required, the use of a fire rated board such as Fyrecheck or similar will be utilised in areas exposed below the floor levels where embers may appear. The verandah posts are all jarrah or a similarly compliant hardwood for the purposes of the BAL 19 rating. The wall construction is being reviewed structurally but will not be exposed framing.

Eaves

- Eaves must be non-combustible or made from a material like timber with a density ≥650 kg/m³. The existing buildings, being jarrah, are considered suitable for compliance.
- Openings must be sealed to prevent ember ingress. This will be done at the top of walls – whether brick or weatherboards as required.
- Eaves linings can be made from fire-resistant materials. Most of the buildings have unlined verandahs. Where there will be soffit linings on verandahs eg George Turner Cottage, this will be replaced with a fire resistant lining as required.

Verandahs

- Decking can be timber but should be spaced tightly or sealed at the edges to prevent ember collection. Where decking is to be replaced, the use of jarrah or a bushfire resistant timber will be used.
- Supports must be non-combustible or bushfire-resistant. As noted above, where support are exposed, this will be achieved using a fire rated board. Where timber posts are being replaced due to structural or reconstruction requirements, they will be replaced with a bushfire resistant timber.
- Gaps under the verandah should be enclosed or covered with non-combustible mesh. It is noted on the drawings that all opening areas under the verandahs are to be fully enclosed with a steel mesh with a min open of 2mm diameter. This will provide protection from embers, but will also ensure no access by students. Where it is proposed to place condenser units for the air conditioning under the verandahs, these will be sealed behind and any exposed structure above, lined with fire rated boards or cladding where not visible.

Worthington Hall has been identified as a shelter as a last resort option, to incorporate the standard for community refuges and the pending Class 9b Performance Solutions. It is to be sited at 10kWm2 based upon the NCC 2022 calculation, have a minimum construction standard BAL 19 (BAL 29 is recommended). It is to have a recommended capacity of 1.2 m2 per person for shelter and meet the

prescribed tenability requirement, no less than those specified in Specification 43. A direct vehicle access to the public roads Beacon Road and Roland Road.

The intent for Worthington Hall is to achieve a BAL 29 rating as follows:

Windows

- Must comply with BAL 19 requirements.
- Toughened glass (minimum 5mm thick).
- Frame made from non-combustible material or hardwood timber ≥650 kg/m³ density. Frames are considered jarrah but with the laminated glass and the bushfire shutters, are proposed to be suitable throughout.
- Bushfire shutters with the smallest profile frame are proposed as noted on the drawings. This particular model has a wide span which minimises the number of vertical frames wherever possible.

Doors

- It is proposed to replace all external timber doors and door frames with new constructed using bushfire resistant timber to match existing form.
- Screen doors with corrosion-resistant mesh are suggested but for the purposes of retaining the integrity of the doors, it is intended to include bushfire shutters to all door openings to match the window treatment.
- Glazing with 5 mm toughened glass will be used where any panels are being replaced with glass.

Walls

- Same as BAL 19 with stricter measures on sealing all joints, gaps, and vents.
- Non-combustible materials are mandatory, such as fiber cement or masonry cladding. The building is masonry and the integrity of the walls will be improved where there is any renovation work required with cracks and mortar deterioration.

Eaves

- Eaves must be non-combustible, and no exposed timber is allowed. Eaves will be sealed with fire resistant boarding where soffit linings exist, whilst the shade awnings to the west and east side will be similarly lined and the support struts replaced with steel.
- Sealed to prevent gaps where embers could penetrate.
- Vents will be fitted with ember-proof mesh.

Mechanical Systems

- All mechanical systems are being contained within the roof space for the ‘tenable area’ and supplied from an external plant enclosure. While that has been noted currently immediately adjacent to the building on the west side, it is recommended this be located away from the building – possibly 10m but to be confirmed with fire engineers – and fully screened to lessen the visual impact on Worthington Hall.

Structural Rectifications

Structural investigations of the existing buildings was conducted by Atelier/JV on the 27/28th June 2024 and the findings of this investigation are summarised as follows:

1. Rosemary Cottage (Proposed Admin) The primary structure is found to be in good condition with a majority of the defects to be minor cracks likely attributed to movement in the clay sub-soil and weathering. The building is observed to be constructed in two sections with an original brick fabric and a later timber addition. There is a significant separation between the

two building fabrics as well as subfloor stump defects that are critical to be addressed.
The roof structure appeared to be in good condition, with little to no moisture damage, ceiling damage, or leaks.

2. Padbury Cottage (Proposed Years 7 & 8) The primary structure is found to be in good condition with a majority of the defects to be minor cracking likely attributed to movement in the clay sub-soil.
   The roof structure appeared to be in good condition, however moisture damage can be observed around the internal ceiling / wall fabric It is likely that the cause has not yet been addressed and thus moisture damage is still affecting the structure.
   The surrounding porch is in fair condition with the main observed problem lying in the balustrades, posts, and floorboards. Bracing and stump damage was also observed and should be treated as the highest priority for this building.
3. St Gabriels Cottage (Proposed Years 9 & 10) The primary structure is found to be in good condition with a majority of the defects to be minor cracking likely attributed to movement in the clay sub-soil. The roof is observed to be in good condition with some signs of moisture damage.
4. Wattle Cottage (Proposed Year 11) The primary structure is found to be in poor condition with some areas showing major defects such as imminent or complete structural collapse. Most of the defects observed can be attributed to weathering and heavy moisture damage. The internal roof structure appeared to be in good condition in some areas and complete structural collapse in other areas. Heavy moisture and weathering damage can be observed throughout the structure as well as potential termite damage. The subfloor is also in critical condition with floor stumps showing heavy moisture and rotting damage.
5. Kindergarten (Proposed Year 12) The primary structure is found to be in poor condition with some areas showing major defects such as imminent or complete structural collapse. Most of the defects observed can be attributed to weathering and heavy moisture damage. The roof structural members are found to be in good condition however heavy moisture damage and leaks can be observed throughout the roof space. It was observed the building was originally two separate buildings with later additions providing walkways and connections between. The majority of the later additions are in poor condition and it is recommended that the building be stripped back to its original two part layout.
6. Workshop Formerly Kitchen/Dining (Proposed Art Room) The primary structure is found to be in good condition with a majority of the defects to be minor cracking in the masonry. The most critical area is the internal masonry wall found to have a severe defect with major cracking and damage to the masonry with significant mortar fretting. The roof structure appeared to be in good condition, with minor ceiling structure damage. The primary cause can be attributed to weathering and impact damage. Similarly, the same can be found for the floorboards and windows of the building.
7. Workshop Formerly Laundry (Proposed Manual Arts) The primary structure is found to be in good condition with a majority of the defects to be minor cracking in the masonry likely attributed to movement in the clay sub-soil. The roof structure appeared to be in good condition, with minor ceiling structure damage. The primary cause can be attributed to weathering and impact damage. Similarly, the same can be found for the floorboards and windows of the building.
8. George Turner Cottage (Proposed Home Economics) The primary structure is found to be in moderate condition with some areas showing minor defects such as cracking while other

areas are more significant showing severe termite damage. The internal roof structure appeared to be in good condition, with only minor ceiling panel damage that is primarily due to weathering & impact damage. The surrounding addition to the original structure is in critical condition as the majority of the building fabric is showing signs of termite damage. Active termites were spotted in the building and thus recommended to strip back the external cladding to determine the full extent of the structural damage.

9. Worthington Hall (Proposed Shelter Building, Dining and Assembly) The primary structure is found to be in moderate condition with some areas showing minor defects such as cracking while other areas are more significant showing severe termite damage. The internal roof structure appeared to be in good condition, with only minor ceiling panel damage that is primarily due to weathering & impact damage. The front porch of the building is in critical condition as it is showing signs of heavy settlement and improper ties back to the main structure. Heavy moisture damage is also observed to the supporting concrete beams of the structure.
10. Blue Cottage. The primary structure is found to be in critical condition with some areas showing major defects such as imminent structural collapse and severe termite damage. Most of the defects observed can be attributed to termite damage. The internal roof structure appeared to be in poor condition with structural members showing termite damage, The surrounding walls is in critical condition as the majority of the building is showing signs of termite damage. It is recommended that the building be considered to be demolished.
12. Carinya. The primary structure is found to be in very good condition with a majority of the defects to be minor cracking and weathering.
13. Wearne. The primary structure is found to be in good condition with a majority of the defects to be minor cracking and weathering.

Drawing Register

DE-002-A	Feature and Boundary Survey
SK.00_1 Rev: P4	Site Plan 1:500
SK.00_2 Rev: P4	Site Plan 1:1000
A01d Rev: P1:	Rosemary Cottage – Demo
A01 Rev: P1:	Rosemary Cottage – Floor Plan & Elevations
SK.01 Rev: A:	Rosemary Cottage (Administration) – Floor Plan & Elevations (Coloured)
A.02d- Rev: P1:	St Gabriels Cottage - Demo
A02 Rev: P1:	St Gabriels Cottage – Floor Plan & Elevations
SK.02 Rev: A:	St Gabriels Cottage (Years 9 & 10) – Floor Plan & Elevations (Coloured)
A.03d- Rev: P1:	Padbury Cottage - Demo
A03 Rev: P1:	Padbury Cottage – Floor Plan & Elevations
SK.03 Rev: A:	Padbury Cottage (Years 7 & 8) – Floor Plan & Elevations (Coloured)
A.04d- Rev: P1:	Wattle Cottage - Demo
A04 Rev: P1:	Wattle Cottage – Floor Plan & Elevations
SK.04 Rev: A:	Wattle Cottage (Year 11) – Floor Plan & Elevations (Coloured)
A.05d- Rev: P1:	Kindergarten - Demo
A05 Rev: P1:	Kindergarten – Floor Plan & Elevations
SK.05 Rev: A:	Kindergarten (Year 12) – Floor Plan & Elevations (Coloured)
A.06d- Rev: P1:	Workshop - Demo
A06 Rev: P1:	Workshop – Floor Plan & Elevations
SK.06 Rev: A:	Workshop (Arts Studio) – Floor Plan & Elevations (Coloured)
A.07d- Rev: P1:	Workshop (Laundry) - Demo
A07 Rev: P1:	Workshop – Floor Plan & Elevations
SK.07 Rev: A:	Workshop (Manual Arts) – Floor Plan & Elevations (Coloured)
A.08d- Rev: P1:	George Turner Cottage - Demo
A08 Rev: P1:	George Turner Cottage – Floor Plan & Elevations
SK.08 Rev: A:	George Turner Cottage (Home Ec) – Floor Plan & Elevations (Coloured)
A.09d- Rev: P1:	Worthington Hall - Demo
A09 Rev: P1:	Worthington Hall – Floor Plan & Elevations
SK.09 Rev: A:	Worthington Hall (Assembly Shelter) – Floor Plan & Elevations (Coloured)
A10 Rev: P1:	Blue Cottage – Floor Plan & Elevations
SK.10 Rev: A:	Blue Cottage – Floor Plan & Elevations (Coloured)
A12 Rev: P1:	Carinya – Floor Plan & Elevations
A13 Rev: P1:	Wearne House – Floor Plan & Elevations
SK.11.A:	New Maintenance and Grounds Workshop – Floor Plan & Elevations
SK.11.B:	New Maintenance and Grounds Workshop – Floor Plan & Elevations

40600.000 40800.000 41000.000

2061 60 61

9002 8002 58 8000 14 13 12 11 15 18 19 20 10 16 17 23 22 21 9 8 6 5 4 24 27 28 29 36 35 32 31 30 3 2 1 25 24 126 127 128 1684 10539 4 5 6 101 125 198 199 197

472400.000 472200.000 472000.000 471800.000

Dense vegetation

Basin

Forest

Basin

1636

3304

9001

Basketball court

FLAG

Beacon Road

Beacon Road

Roland Road

Roland Road

Richardson Road

Verified / Re-established

The subject parcel/s depicted on this plan have been defined by a Licensed Surveyor based on existing survey marks and survey documentation. Refer to the Regulation 25A Certificate produced as part of this survey. Subsequent surveys registered with Landgate may affect the definition of the boundaries shown on the plan and as such MNG cannot be held liable for any differences arising from these surveys.
This note is an integral part of this plan.

Detail/Feature Survey

Surface features and levels have been surveyed to meet the requested scope of works accuracy. The surface may be contoured to depict topography or defined only by spot heights.For clarity on hard copy some level information is not shown, refer to 3D digital file.
Above ground indicators (markers) of underground services are located where visible.
Third parties utilising this information should confirm the capture accuracies meet requirements prior to use.
This note is an integral part of this plan.

MNG LOCATE- Class D

Quality level D (QL-D) Is the lowest level providing the gathering of information such as BYDA or any existing site plans showing the indicative position of the utility. No equipment used to locate, and no potholing is carried out. Broad indication of any utility presence with no site verification.

Class 3 Accuracy Statement

This survey has been completed to CLASS 3 Accuracy
Horizontal Accuracy ± 30mm
Vertical Accuracy ± 50mm
This note is an integral part of this plan

BYDA COMPILED - CLASS D

Water Pipe - Unverified, No Measurement

Rev.	Description	Drawn	Date	Checked
A	Initial Issue	T. J. M.	31/05/2024	T. V.

Surveyor:- T. J. Mularczyk
Survey Date:- 30/05/2024
Precal/Cad:- 16/05/2024

Quality Management : ISO 9001 Global-Mark.com.au

Parkerville Children and Youth Care Campus
Beacon Road, Parkerville WA
Feature survey

CLIENT:
McCorkell Constructions

The contents of this plan are current and correct as of the date stated within the revision panel. All consultants and persons wishing to utilise this data should satisfy themselves of this plans currency by contacting the McMullen Nolan Group.

SCALE 1:2000 @ A3
0 50 100
ALL DISTANCES ARE IN METRES
For a true to scale reproduction of this plan, plot it to A3 with the Paging Scaling set to None.

The boundaries shown on this plan were not re-established as part of this survey, therefore this plan does not guarantee their accuracy. Existing easements, encumbrance or interest are not depicted and a title search is recommended to obtain this information. Re-establishment of the cadastral boundaries is recommended for any proposed works on or near existing boundaries.

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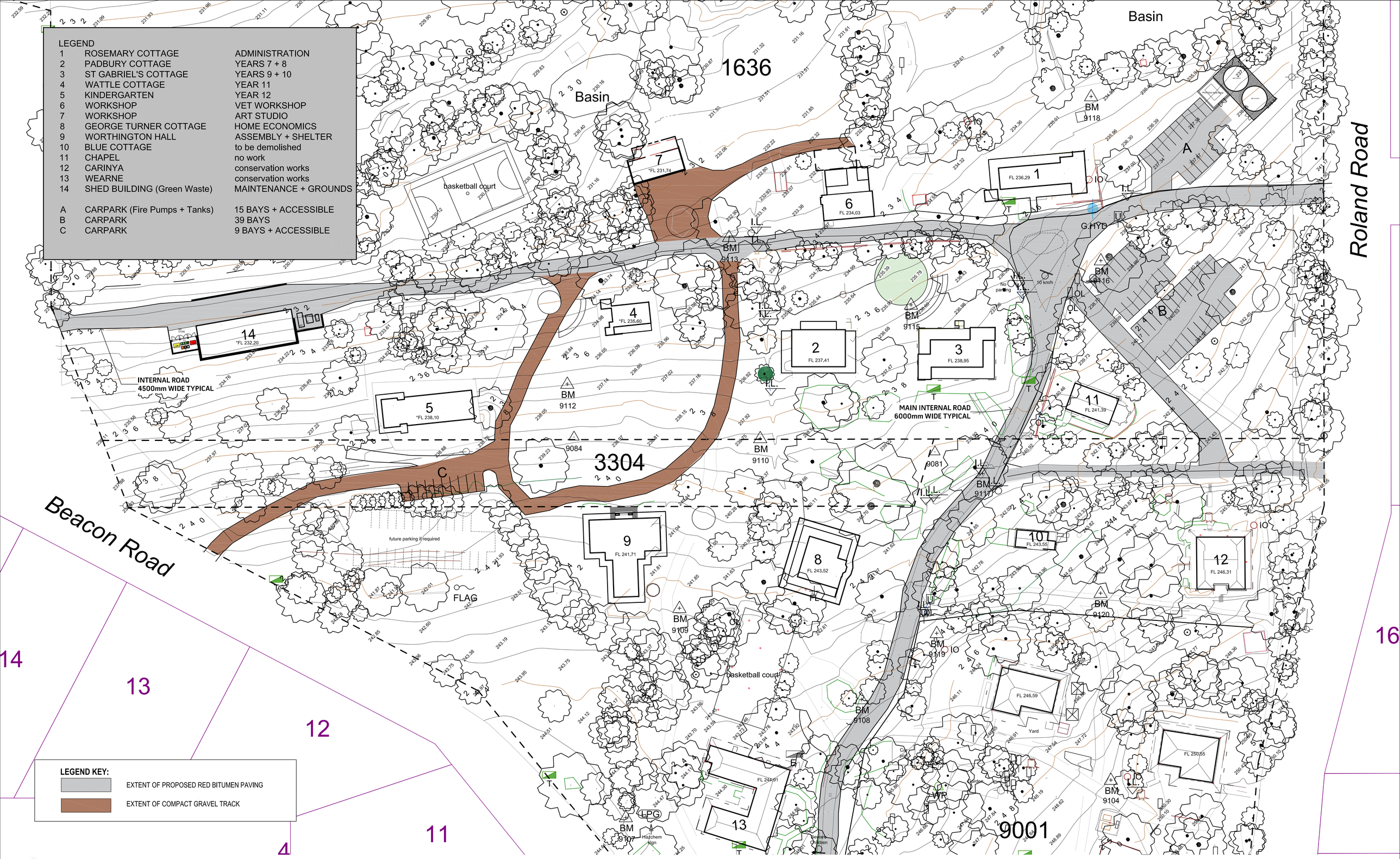
ABN 90 009 363 311

Project Mngr	Datum
Tim Vlasschaert	HUG94 / AHD

Job Number	Type	Plan Number	Revision
106368	DE	002	A



SITE PLAN

SCALE. : 1:500@A1

0 10 20 100m

PARKERVILLE CARE SCHOOL

ROLAND ROAD, PARKERVILLE

JOB NO. :2406 DATE :OCTOBER 2024 DWG NO. :SK.00_1 REV : P4

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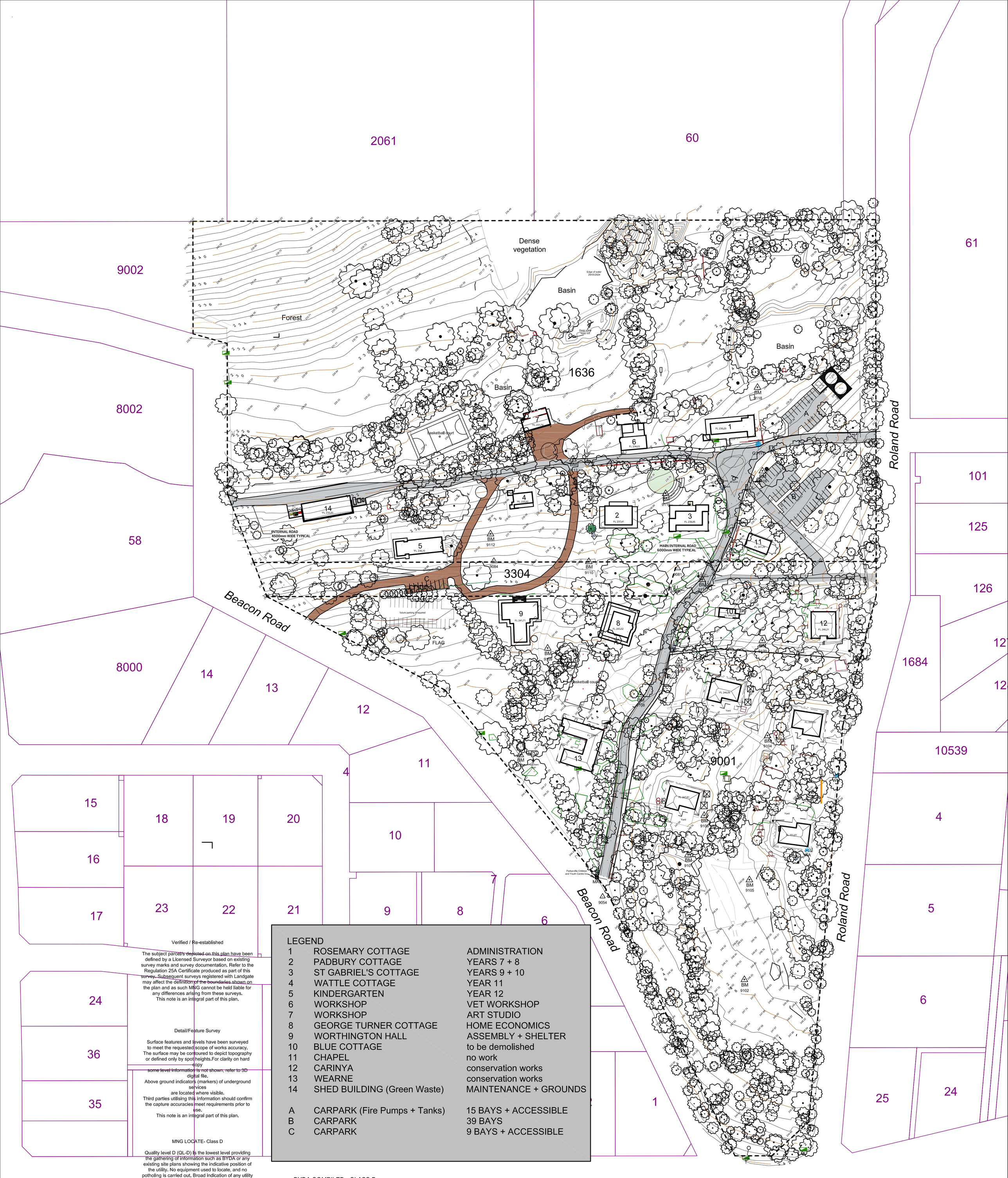

LEGEND

1	ROSEMARY COTTAGE	ADMINISTRATION
2	PADBURY COTTAGE	YEARS 7 + 8
3	ST GABRIEL'S COTTAGE	YEARS 9 + 10
4	WATTLE COTTAGE	YEAR 11
5	KINDERGARTEN	YEAR 12
6	WORKSHOP	VET WORKSHOP
7	WORKSHOP	ART STUDIO
8	GEORGE TURNER COTTAGE	HOME ECONOMICS
9	WORTHINGTON HALL	ASSEMBLY + SHELTER
10	BLUE COTTAGE	to be demolished
11	CHAPEL	no work
12	CARINYA	conservation works
13	WEARNE	conservation works
14	SHED BUILDING (Green Waste)	MAINTENANCE + GROUNDS
A	CARPARK (Fire Pumps + Tanks)	15 BAYS + ACCESSIBLE
B	CARPARK	39 BAYS
C	CARPARK	9 BAYS + ACCESSIBLE

Verified / Re-established

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BYDA COMPILED - CLASS D

Water Pipe - Unverified, No Measurement

Class 3 Accuracy Statement

This survey has been completed to CLASS 3 Accuracy
Horizontal Accuracy ± 30mm
Vertical Accuracy ± 50mm
This note is an integral part of this plan

SITE PLAN

SCALE. : 1:1000@A1 0 10 20 100m

PARKERVILLE CARE SCHOOL

ROLAND ROAD, PARKERVILLE

JOB NO. :2406 DATE :OCTOBER 2024 DWG NO. :SK.00_2 REV : P4

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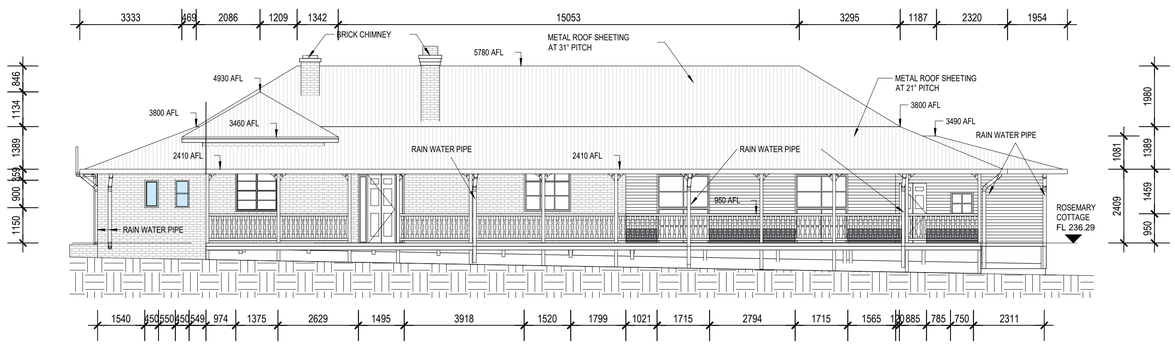

E3 - NORTH ELEVATION

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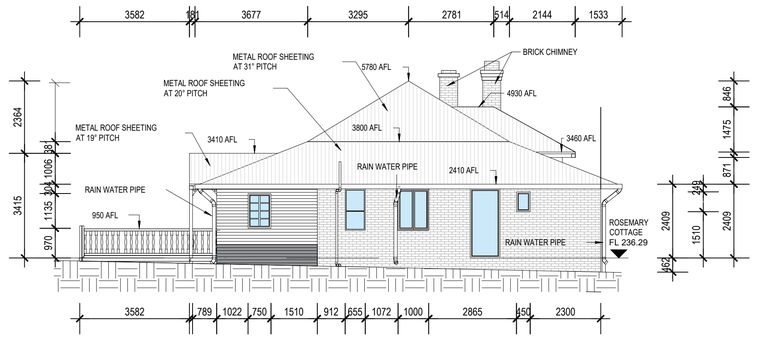

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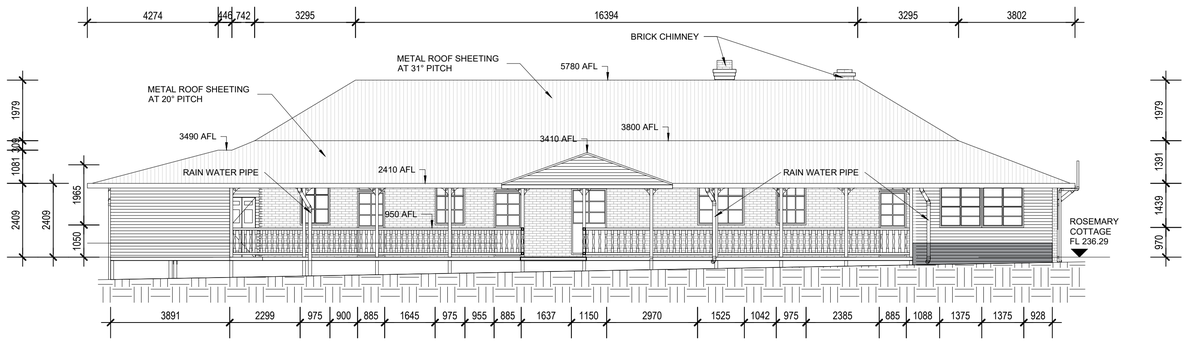

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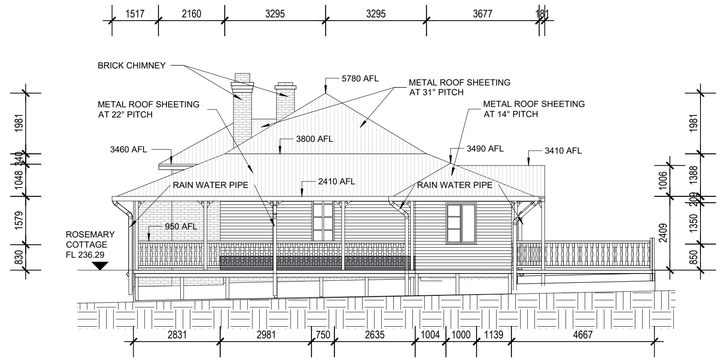

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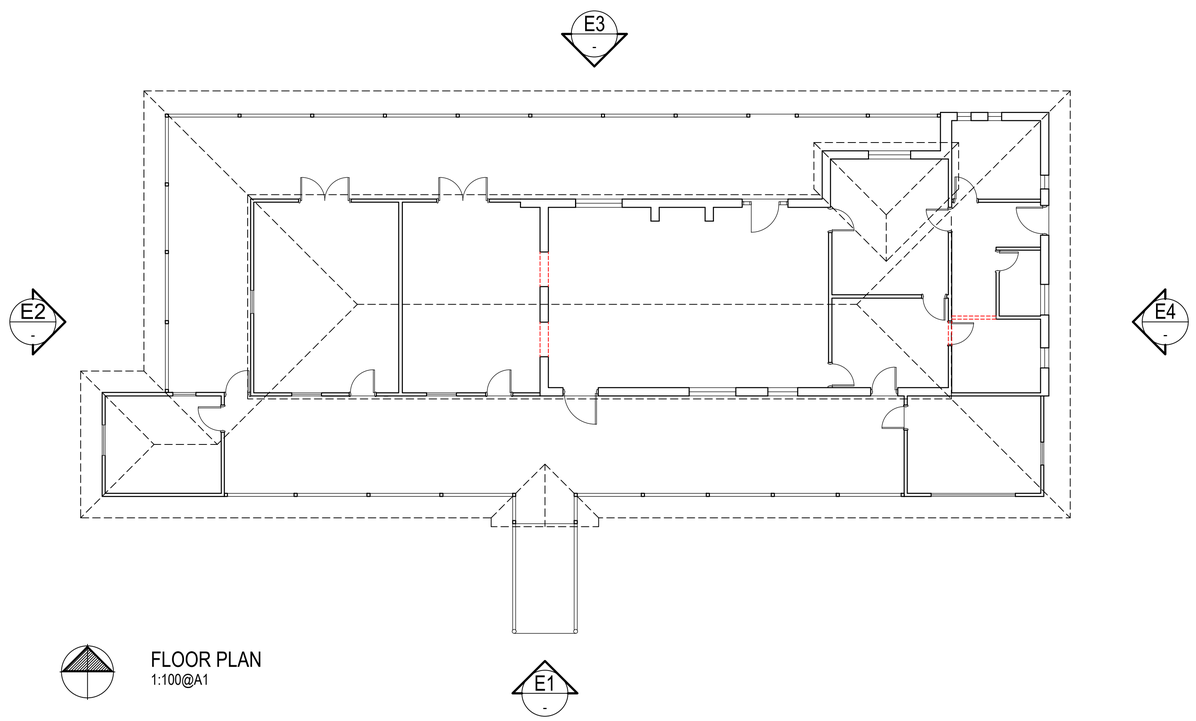

FLOOR PLAN

1:100@A1

PRELIMINARY

NOT FOR CONSTRUCTION

DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	
			P1

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PROJECT:

PARKERVILLE CARE SCHOOL

PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:

ROSEMARY COTTAGE - DEMO

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.01d
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	

FILE PATH: ---------

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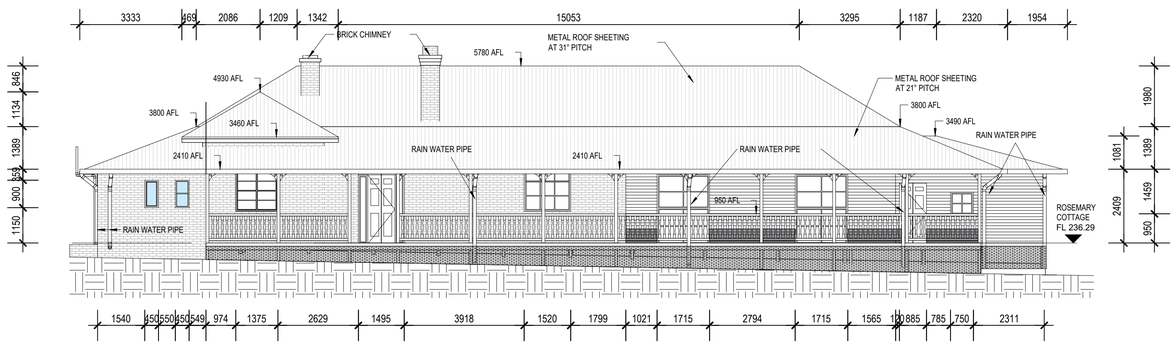

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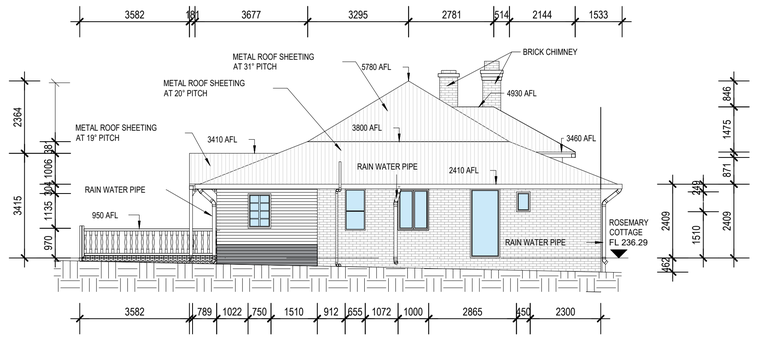

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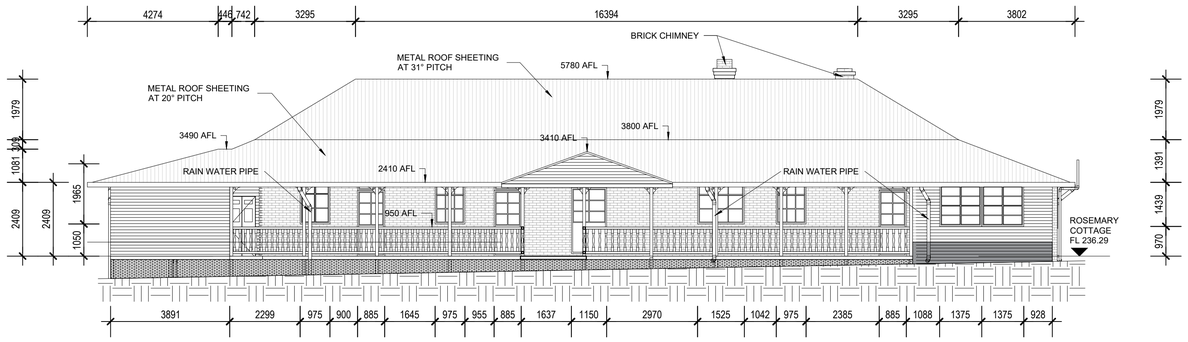

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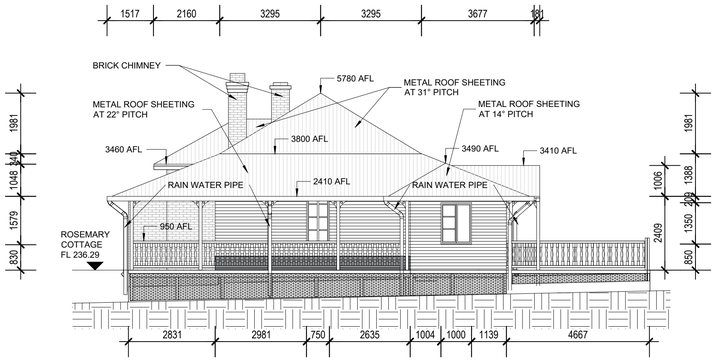

E2 - WEST ELEVATION
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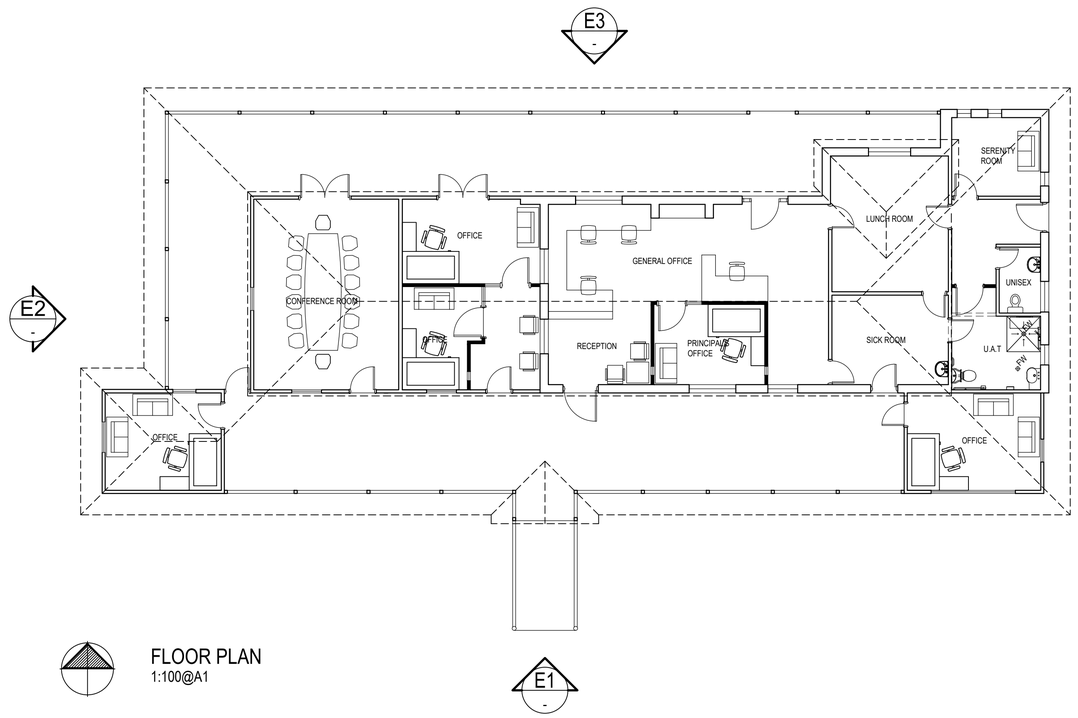

FLOOR PLAN
1:100@A1

PRELIMINARY
NOT FOR CONSTRUCTION

DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	P1

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PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
ROSEMARY COTTAGE

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.01
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	
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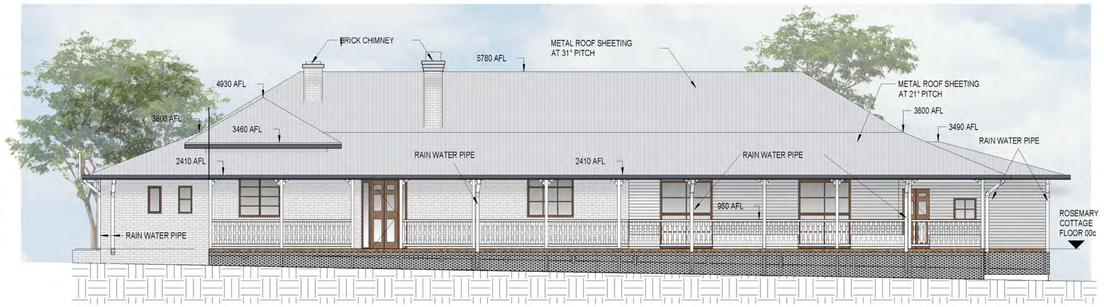
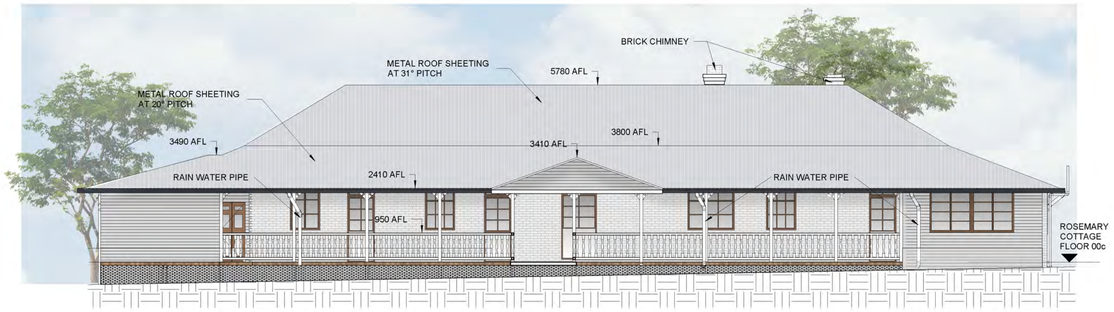


STEEL MESH SCREENING TO ENCLOSE UNDER VERANDAHS

E3 - NORTH ELEVATION
1:100



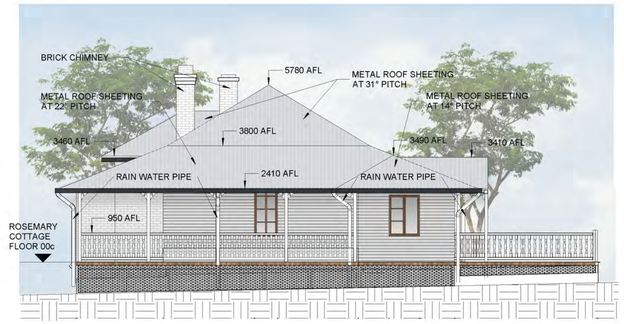
STEEL MESH SCREENING TO ENCLOSE UNDER VERANDAHS

E1 - SOUTH ELEVATION
1:100



GLAZING TO BE REPLACED WITH 5mm
TOUGHENED TO ALL EXPOSED WINDOWS FOR BAL 19

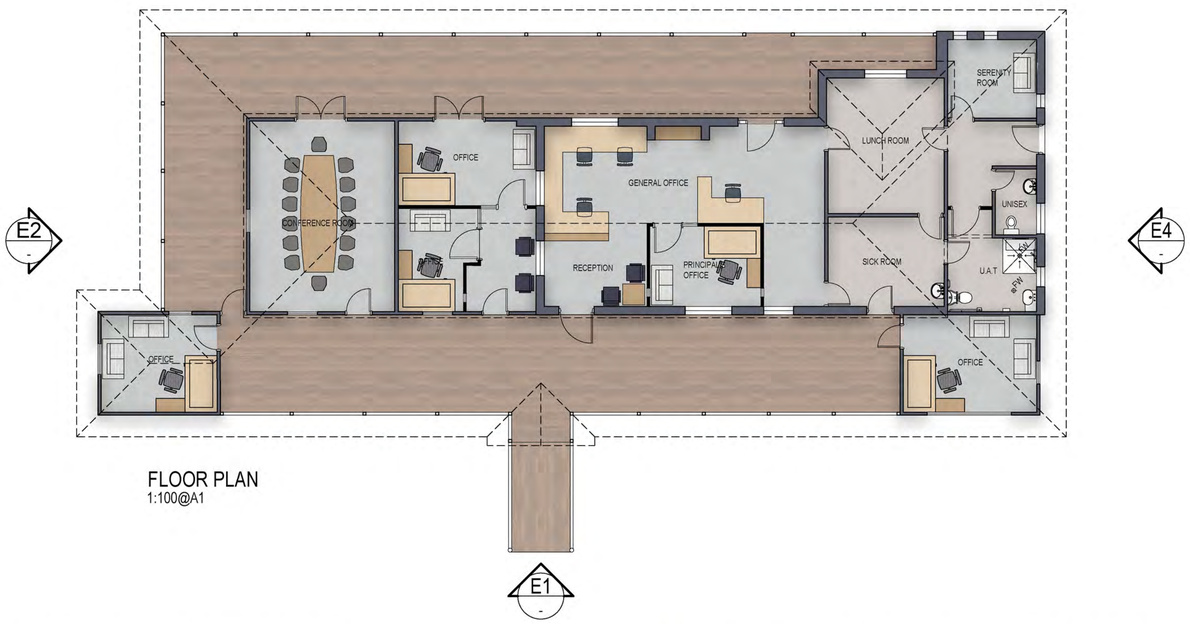
E4 - EAST ELEVATION
1:100



STEEL MESH SCREENING TO ENCLOSE UNDER VERANDAHS

E2 - WEST ELEVATION
1:100

TIMBER VERANDAH FLOOR BOARDS
TO BE REINSTALLED AT FLOOR LEVEL



FLOOR PLAN
1:100@A1

ROSEMARY COTTAGE
ADMINISTRATION
SCALE. : 1:100@A1

0 1 2 10m

PARKERVILLE CARE SCHOOL
ROLAND ROAD, PARKERVILLE

JOB NO. : 2406 DATE : SEPTEMBER 2024 DWG NO. : SK.01 REV : A

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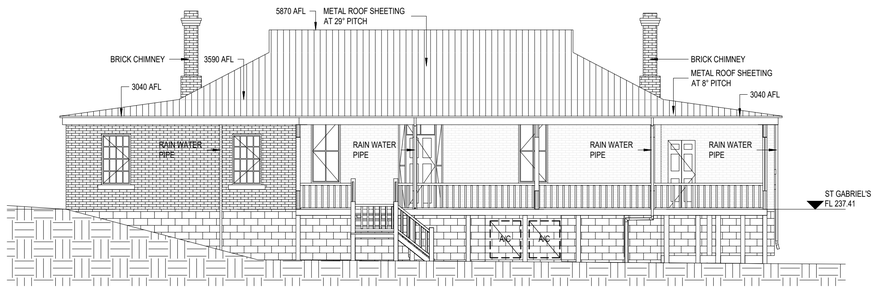

E3 - NORTH ELEVATION
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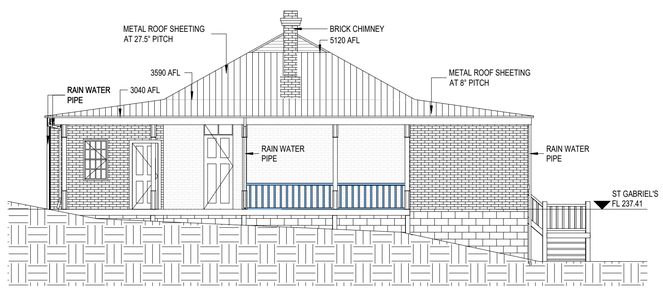

E4 - EAST ELEVATION
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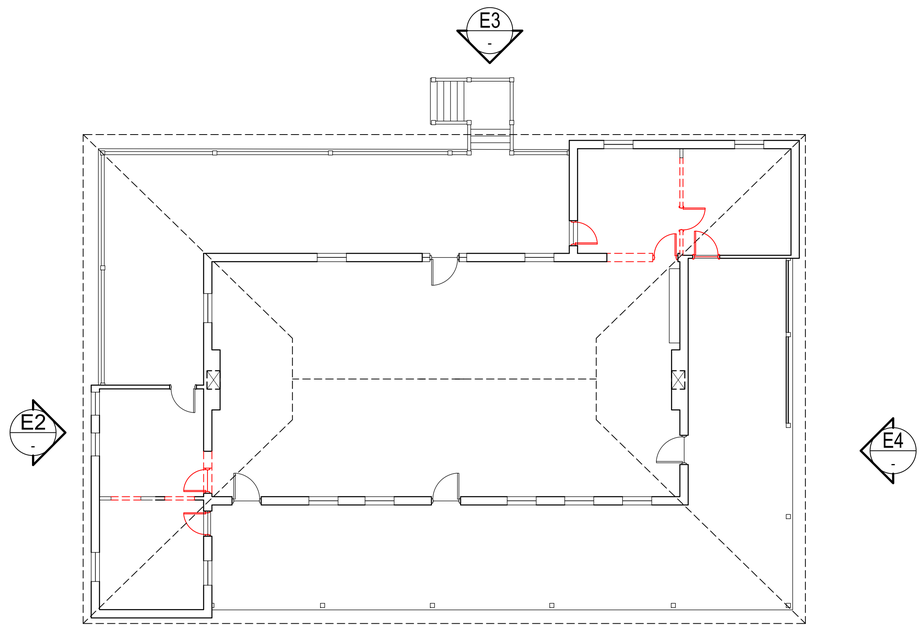
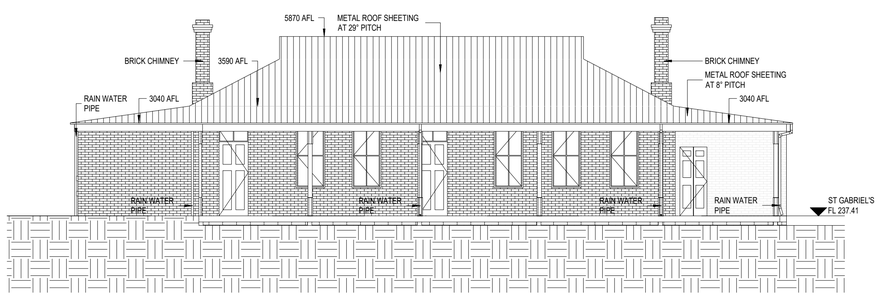
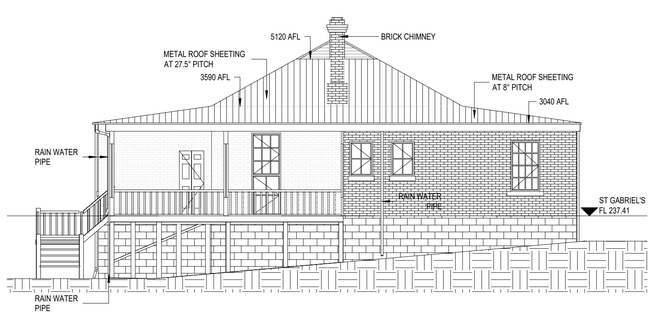




E1 - SOUTH ELEVATION
1:100



E2 - WEST ELEVATION
1:100

PRELIMINARY
NOT FOR CONSTRUCTION

07/10/24	P1	PRELIMINARY
DATE	ISSUE	REVISION
		ISSUE P1

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L12, 109 St. Georges Tce Perth Western Australia 6000
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PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
ST. GABRIEL'S COTTAGE - DEMO

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.02d
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	
FILE PATH: ********			

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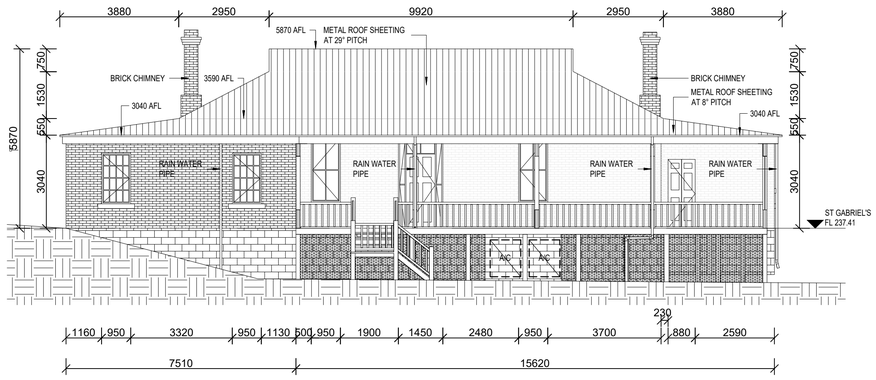

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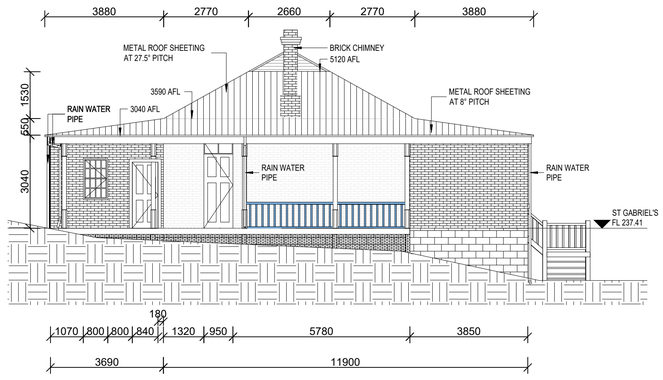
1:100



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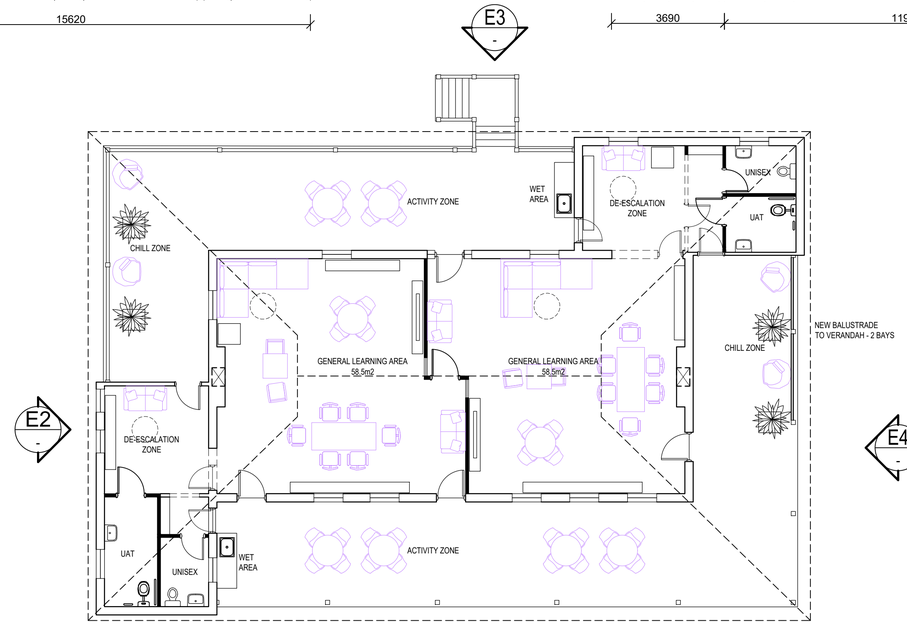
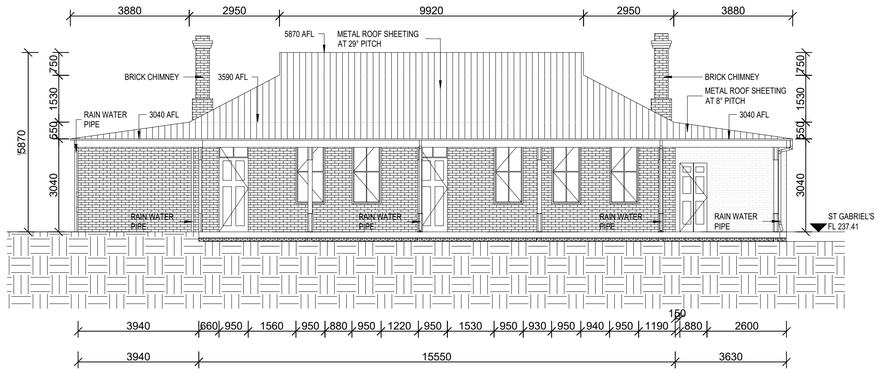
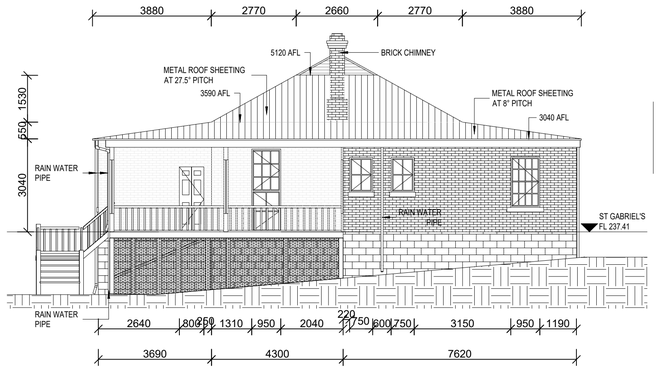
1:100





E1 - SOUTH ELEVATION
1:100



E2 - WEST ELEVATION
1:100

PRELIMINARY
NOT FOR CONSTRUCTION

07/10/24	P1	PRELIMINARY
DATE	ISSUE	REVISION
		ISSUE P1

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PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
ST. GABRIEL'S COTTAGE

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.02
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	
FILE PATH: ********			

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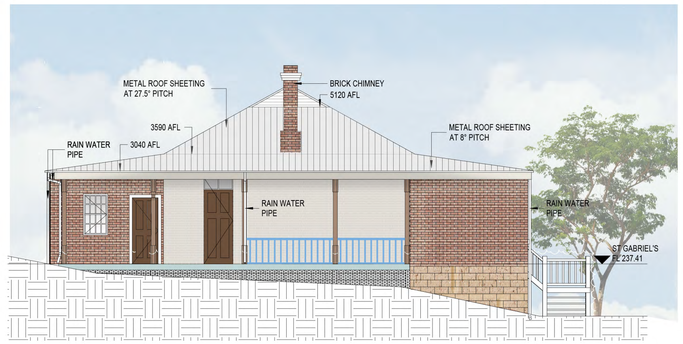

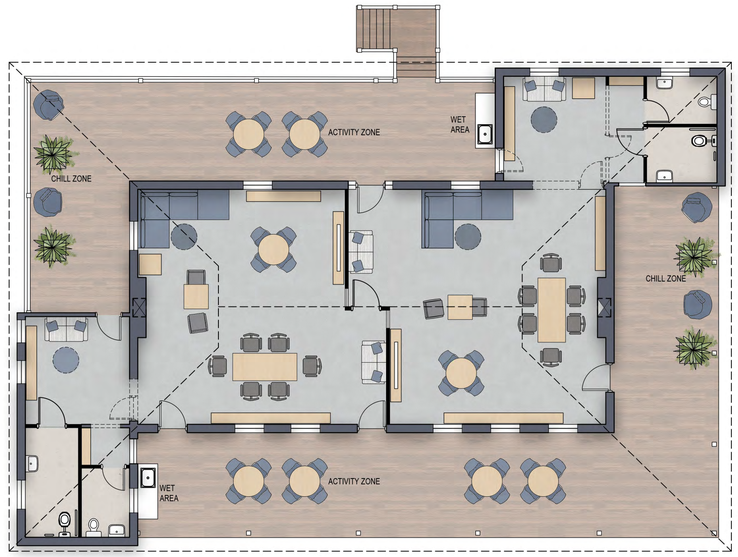

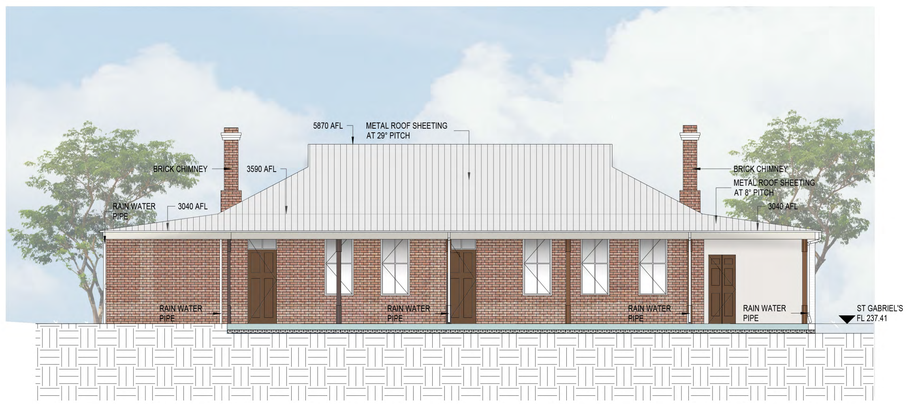



ST GABRIELS COTTAGE - YRS 9/10

SCALE. : 1:100@A1

0 1 2 10m

PARKERVILLE CARE SCHOOL

ROLAND ROAD, PARKERVILLE

JOB NO. : 2406 DATE : SEPTEMBER 2024 DWG NO. : SK.02 REV : A

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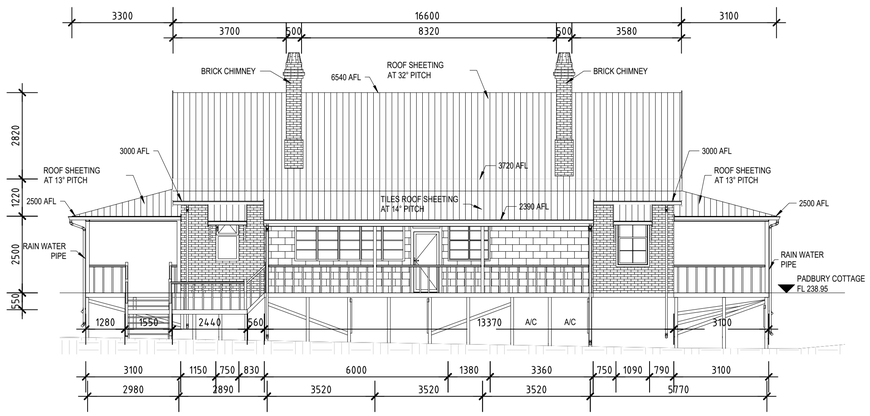
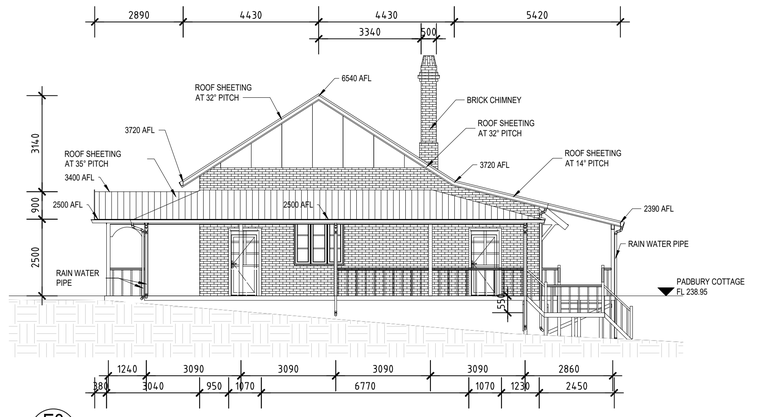


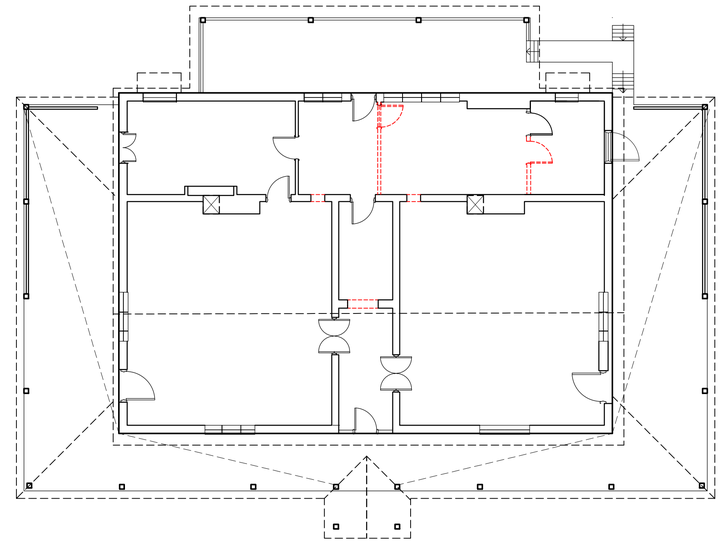
E3 - NORTH ELEVATION

1:100



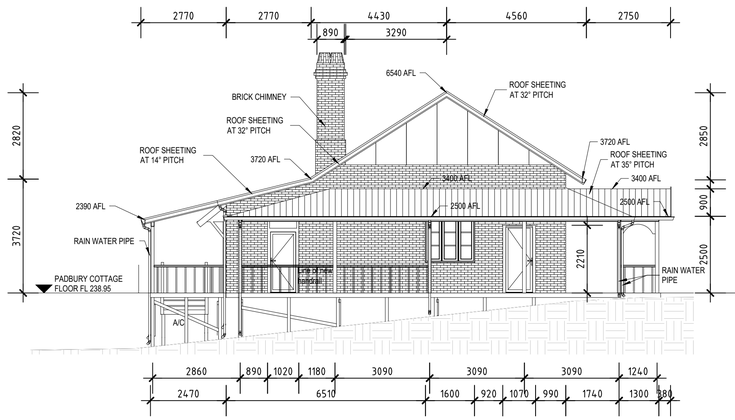
E4 - EAST ELEVATION

1:100



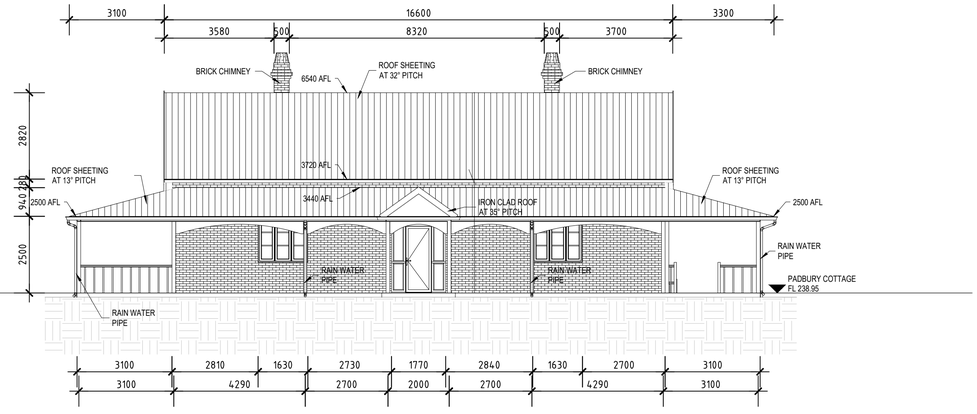
E2 - WEST ELEVATION

1:100



E1 - SOUTH ELEVATION

1:100



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07/10/24	P1	PRELIMINARY
DATE	ISSUE	REVISION
		ISSUE P1

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PROJECT:

PARKERVILLE CARE SCHOOL

PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:

PADBURY COTTAGE - DEMO

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.03d
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	
FILE PATH: --------			

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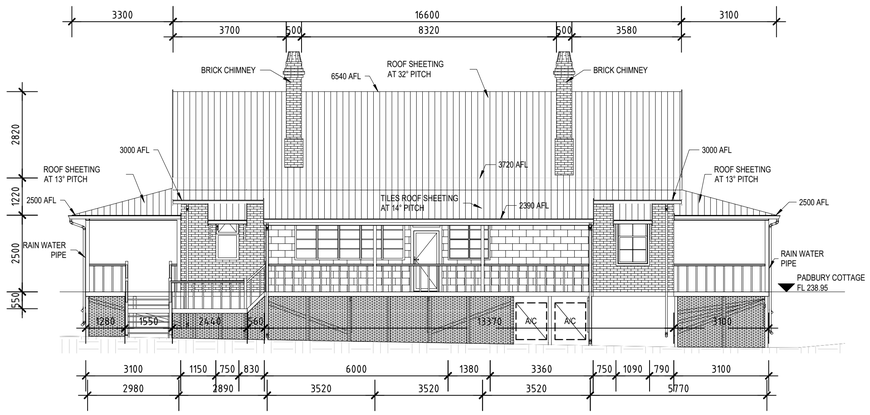
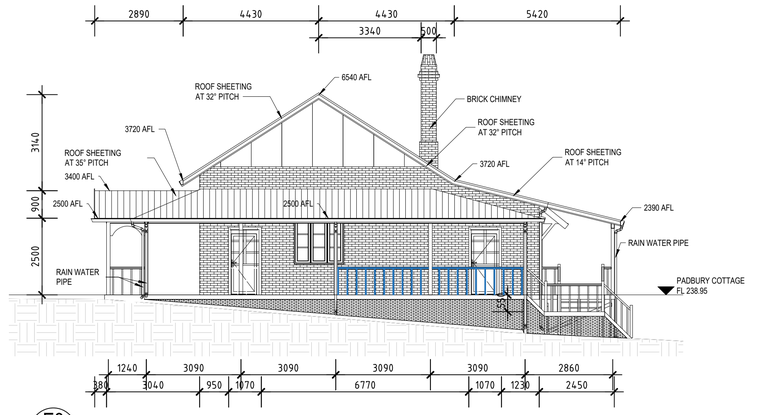


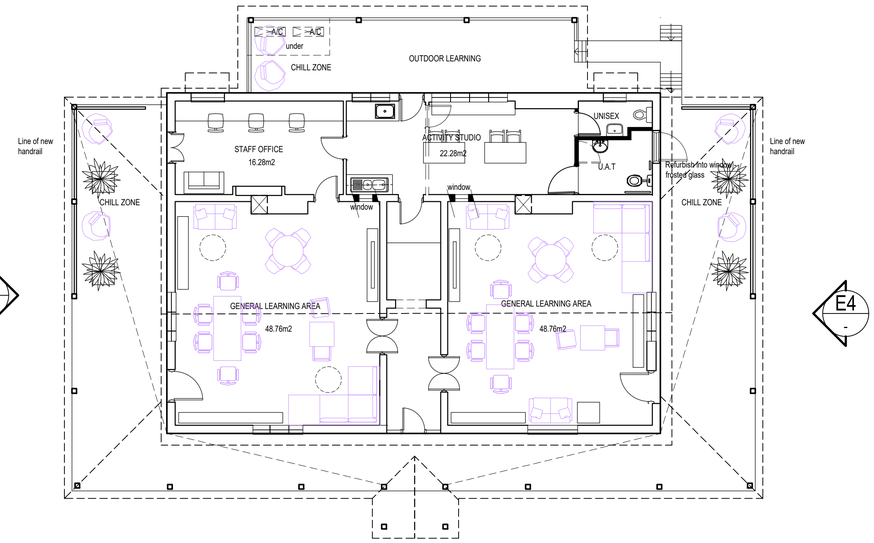
E3 - NORTH ELEVATION

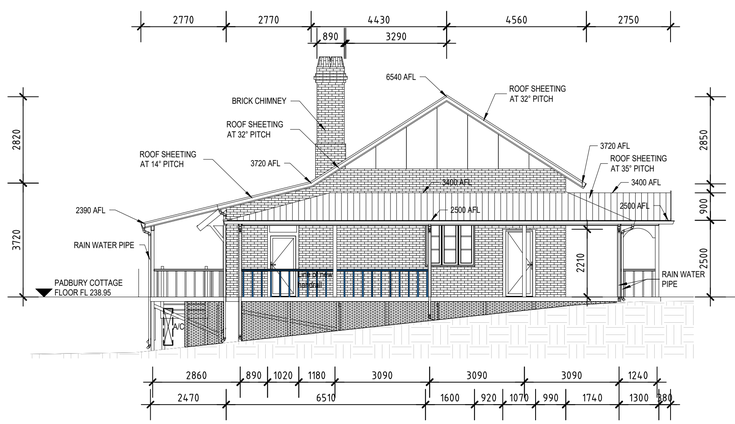
1:100



E4 - EAST ELEVATION

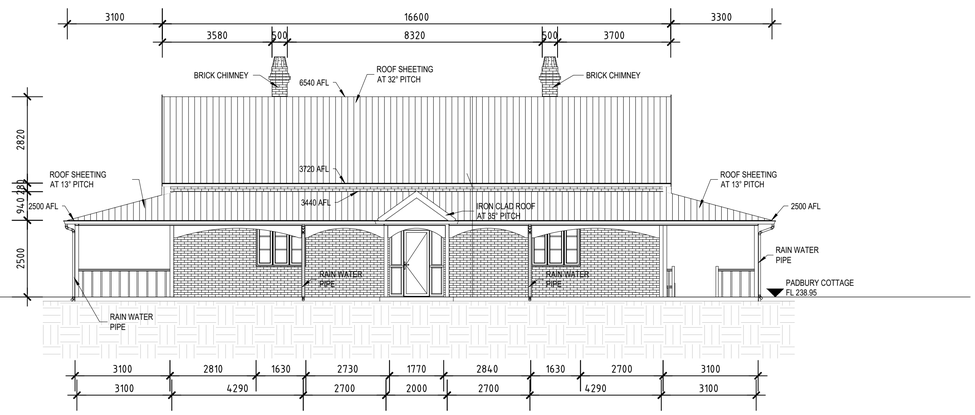
1:100





E2 - WEST ELEVATION

1:100



E1 - SOUTH ELEVATION

1:100

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07/10/24	P1	PRELIMINARY
DATE	ISSUE	REVISION

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PROJECT:

PARKERVILLE CARE SCHOOL

PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:

PADBURY COTTAGE

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.03
JOB DATE:	SCALE:	JOB No:	
02/09/24	1:-100@A1	2406	
FILE PATH:			

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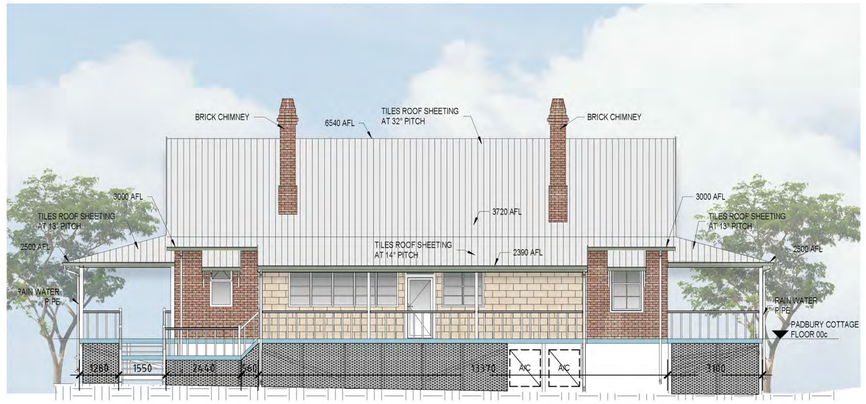
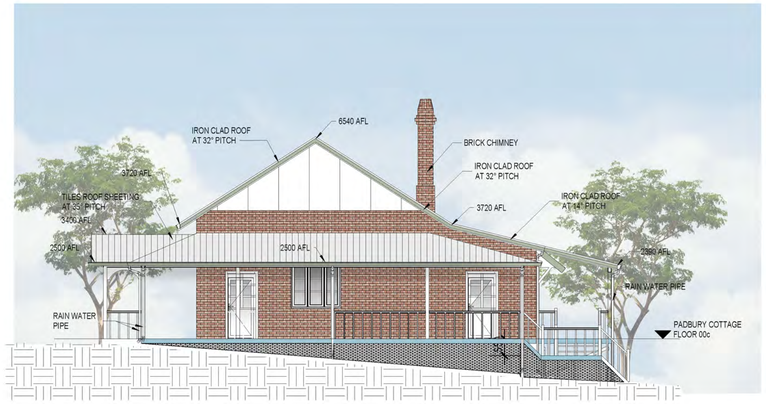
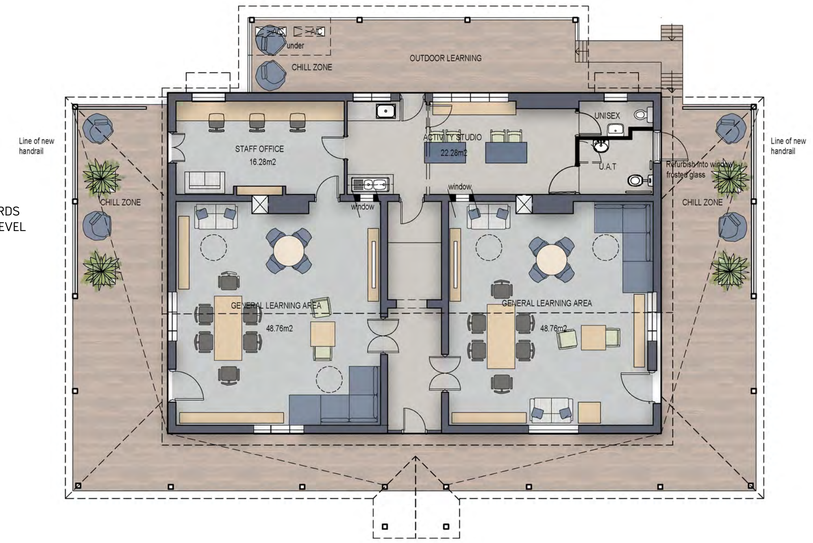


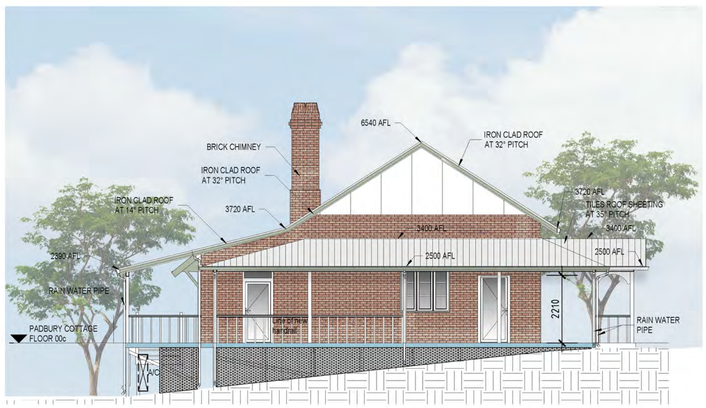
STEEL MESH SCREENING TO ENCLOSE UNDER VERANDAHS
A/C CONDESER UNITS UNDER VERANDAHS



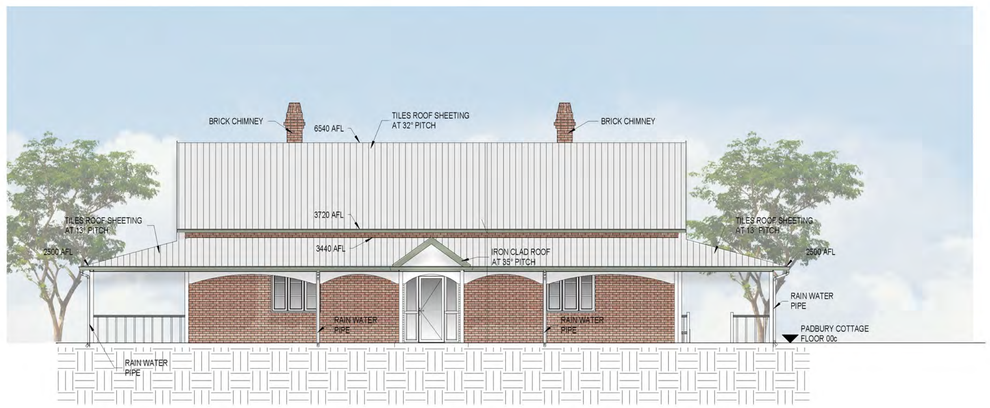
NEW BALUSTRADE TO EAST & WEST VERANDAHS

TIMBER VERANDAH FLOOR BOARDS
TO BE REINSTALLED AT FLOOR LEVEL





NEW BALUSTRADE TO EAST & WEST VERANDAHS
STEEL MESH SCREENING TO ENCLOSE UNDER VERANDAHS



PADBURY COTTAGE

YEARS 7 + 8

SCALE. : 1:100@A1

0 1 2 10m

PARKERVILLE CARE SCHOOL

ROLAND ROAD, PARKERVILLE

JOB NO. : 2406 DATE : SEPTEMBER 2024 DWG NO. : SK.03 REV : A

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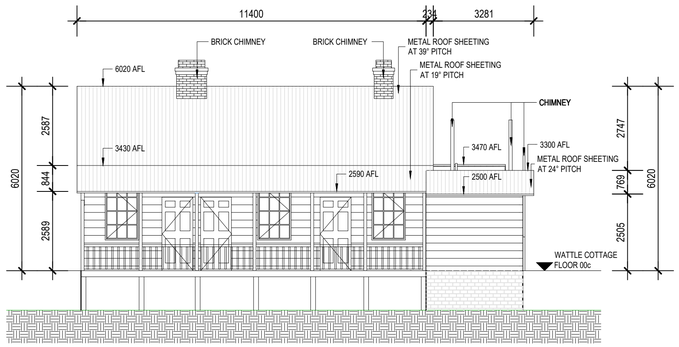
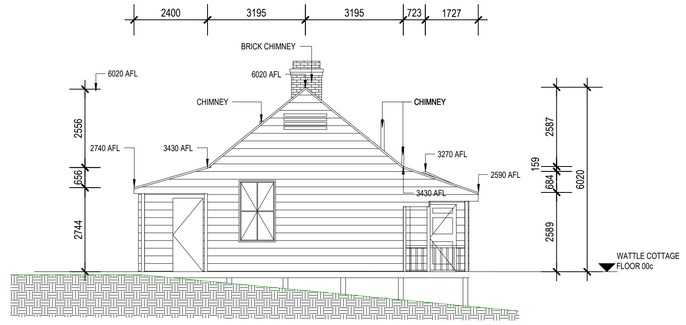


E3 - NORTH ELEVATION
1:100



E4 - EAST ELEVATION
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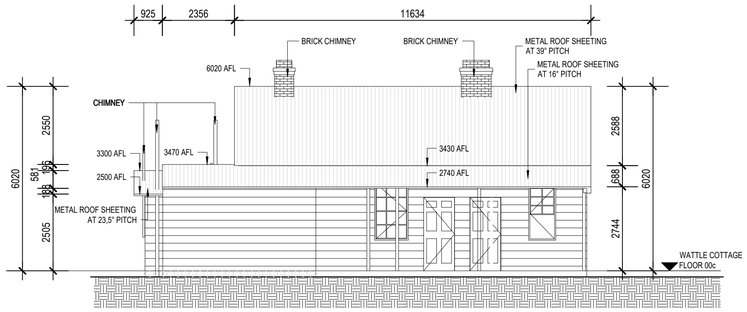
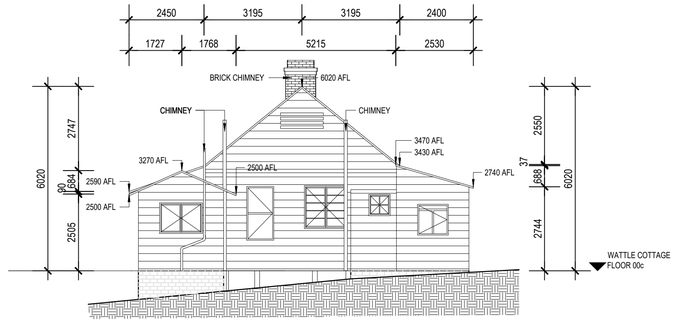
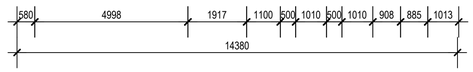
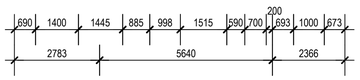




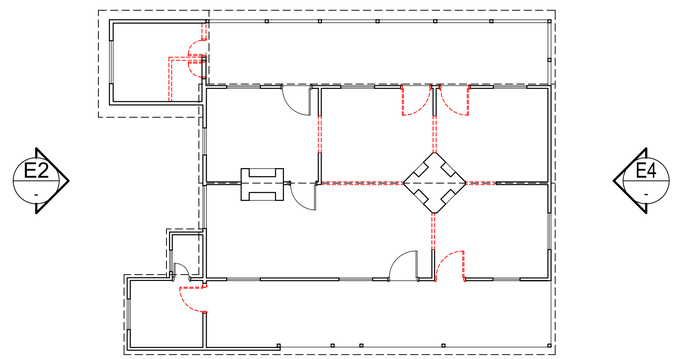


E1 - SOUTH ELEVATION
1:100



E2 - WEST ELEVATION
1:100

E3



E2 E4

FLOOR PLAN
1:100@A1

E1

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07/10/24	P1	PRELIMINARY
DATE	ISSUE	REVISION
		ISSUE P1

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PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
WATTLE COTTAGE - DEMO

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.04d
JOB DATE: 27/09/24	SCALE: 1:-100@A1	JOB No: 2406	
FILE PATH: ---------			

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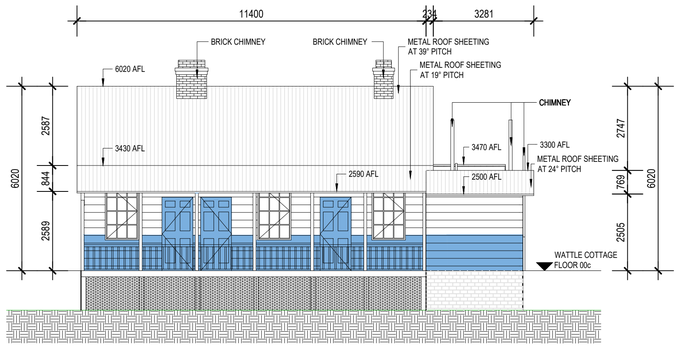

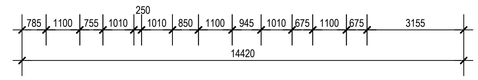

E3 - NORTH ELEVATION
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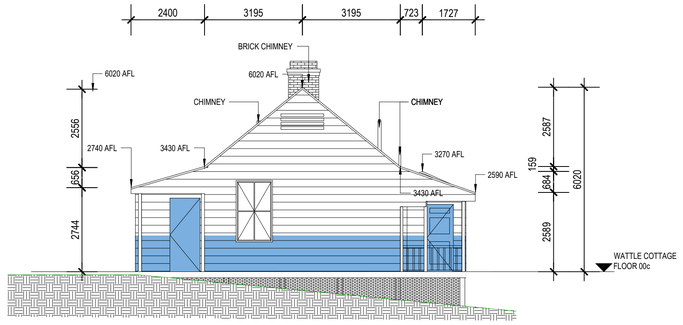

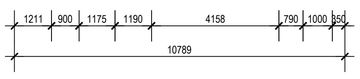

E4 - EAST ELEVATION
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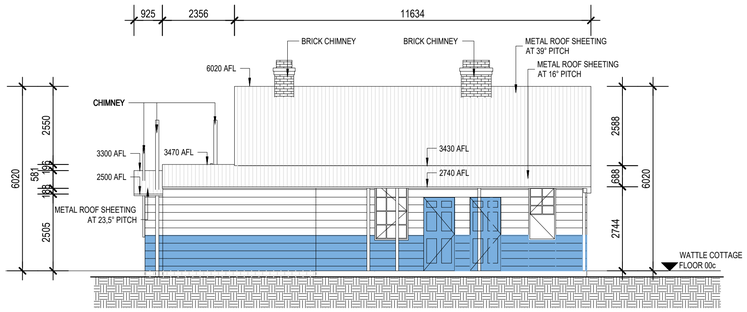
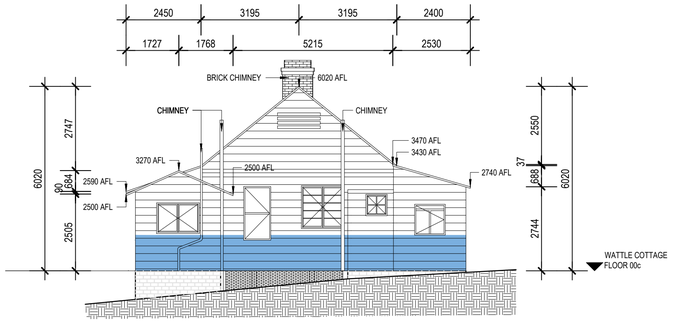
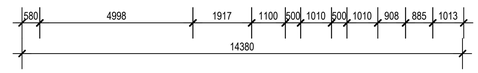
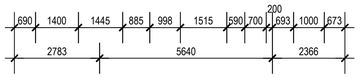




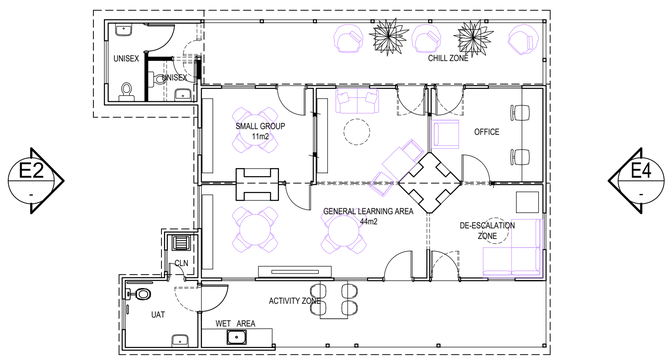


E1 - SOUTH ELEVATION
1:100



E2 - WEST ELEVATION
1:100

E3



FLOOR PLAN
1:100@A1

E1

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07/10/24	P1	PRELIMINARY
DATE	ISSUE	REVISION

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PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
WATTLE COTTAGE

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.04
JOB DATE: 27/09/24	SCALE: 1:-100@A1	JOB No: 2406	
FILE PATH: --------			

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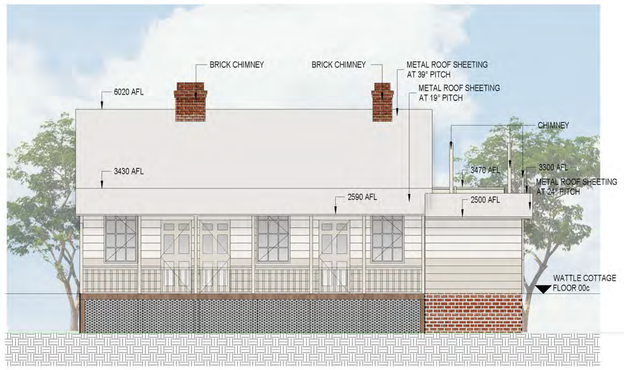
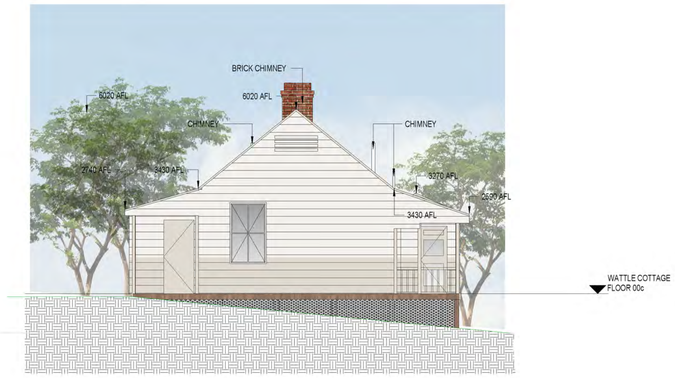
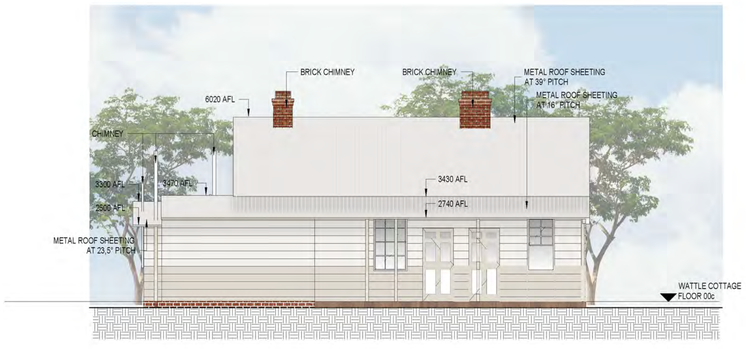


STEEL MESH SCREENING TO ENCLOSE UNDER VERANDAHS



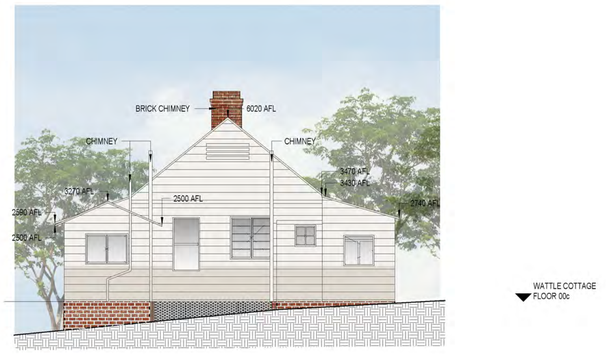
STEEL MESH SCREENING TO ENCLOSE UNDER VERANDAHS

E3 - NORTH ELEVATION
1:100



STEEL MESH SCREENING TO ENCLOSE UNDER VERANDAHS

E4 - EAST ELEVATION
1:100



STEEL MESH SCREENING TO ENCLOSE UNDER VERANDAHS

E1 - SOUTH ELEVATION
1:100

E2 - WEST ELEVATION
1:100



FLOOR PLAN
1:100@A1

WATTLE COTTAGE
YEAR 11
SCALE. : 1:100@A1

0 1 2 10m

E1 -

PARKERVILLE CARE SCHOOL
ROLAND ROAD, PARKERVILLE

JOB NO. : 2406 DATE : SEPTEMBER 2024 DWG NO. : SK.04 REV : A

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building ideas

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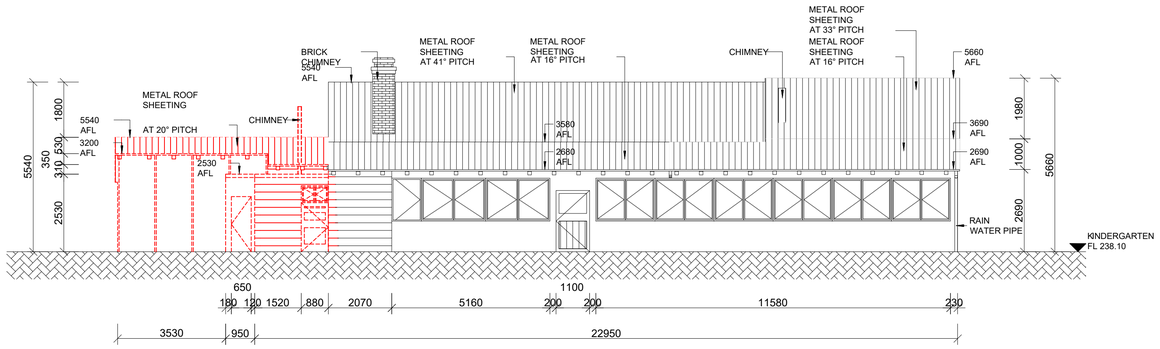
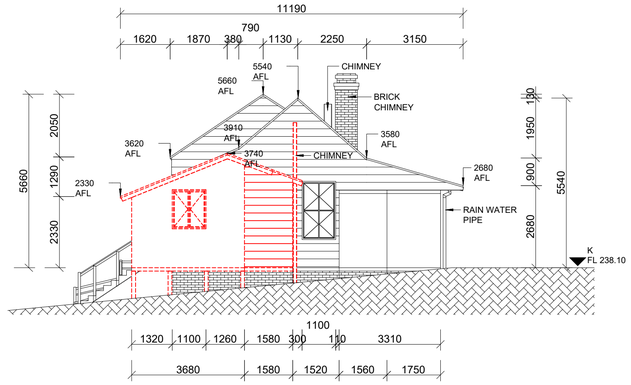
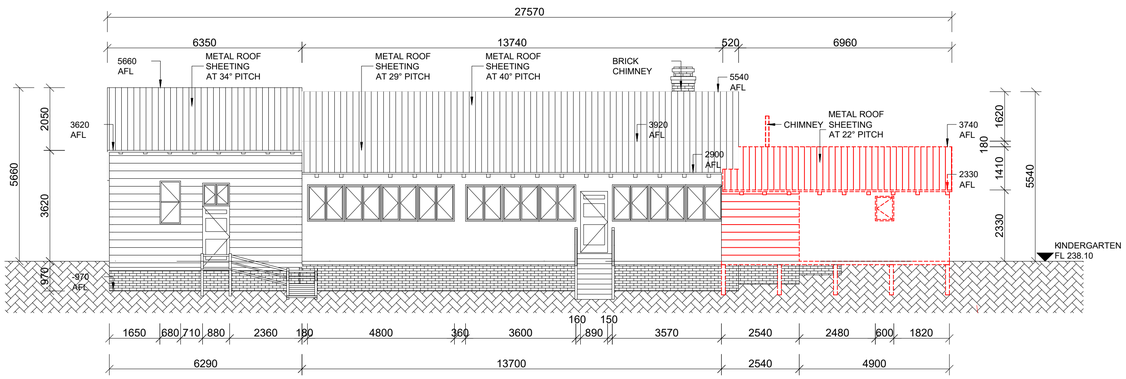


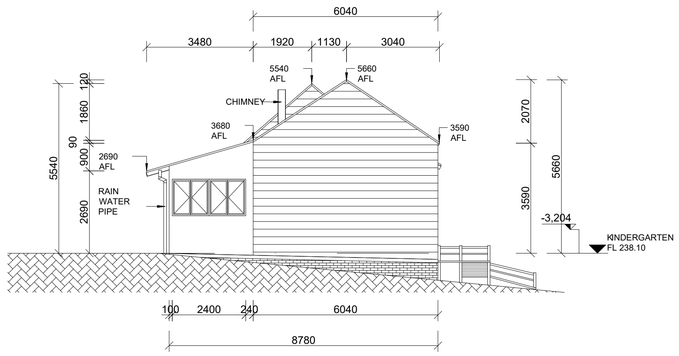
E3 - NORTH ELEVATION
1:100



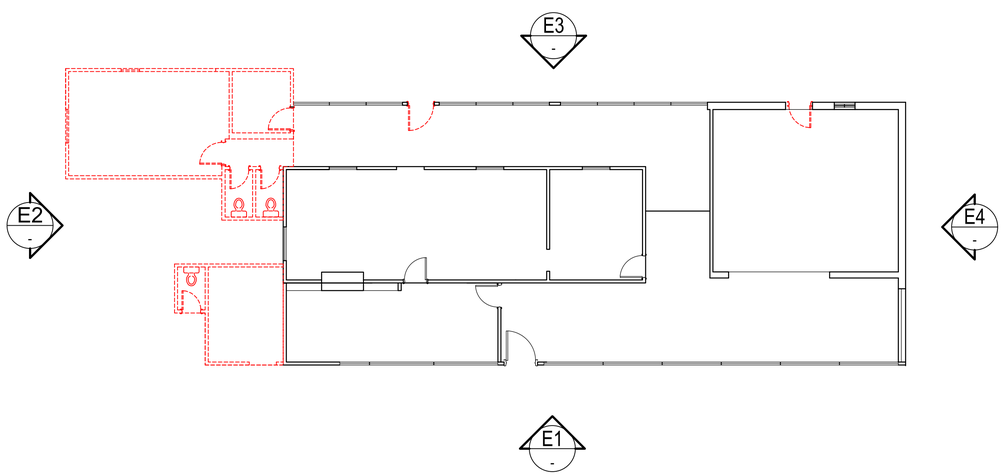
E2 - WEST ELEVATION
1:100



E1 - SOUTH ELEVATION
1:100



E4 - EAST ELEVATION
1:100



PRELIMINARY
NOT FOR CONSTRUCTION

DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	
			P1

building ideas
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W www.eiwarch.com.au

PROJECT:
PARKERVILLECARE
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
KINDERGARTEN - DEMO

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.05d
JOB DATE: 07/10/24	SCALE: 1:100@A1	JOB No: 2406	
FILE PATH: ---------			

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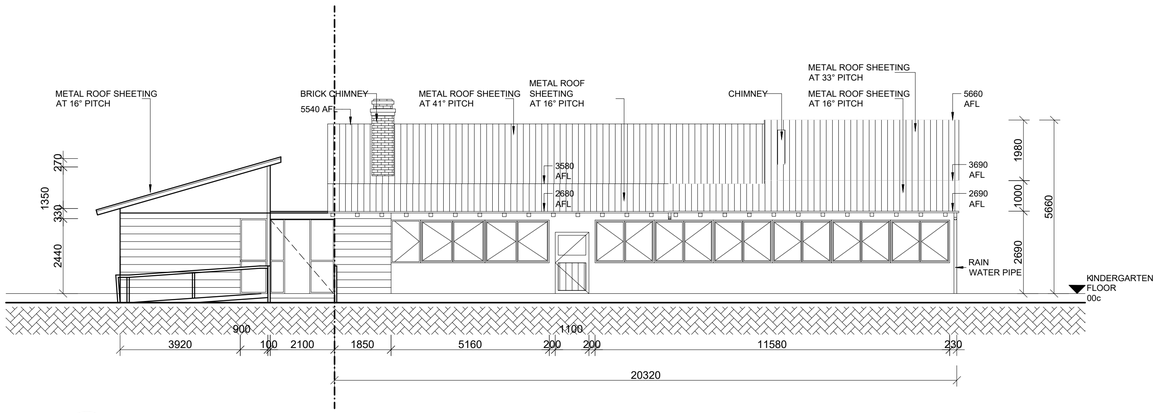
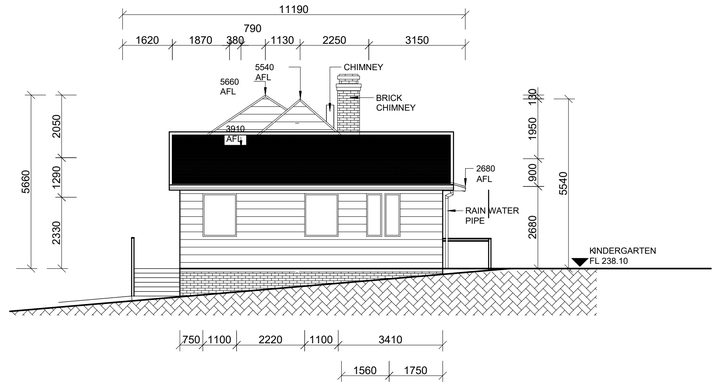


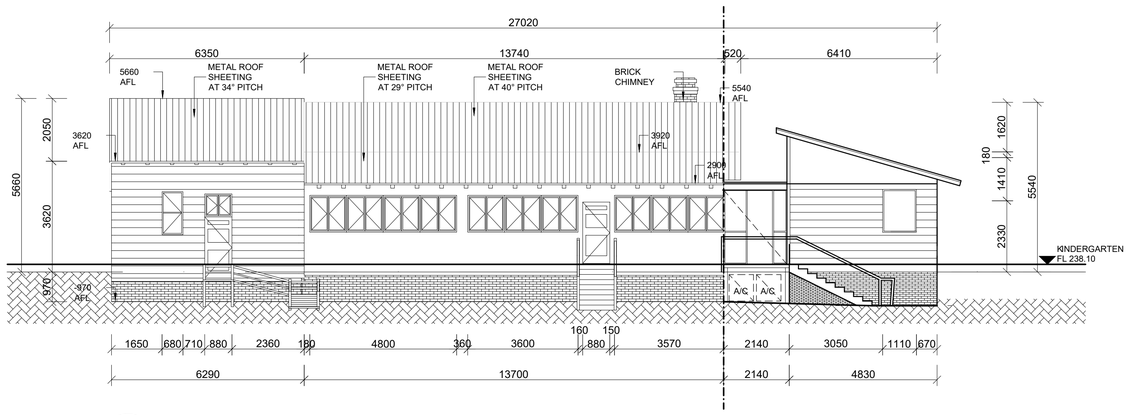
E3 - NORTH ELEVATION

1:100



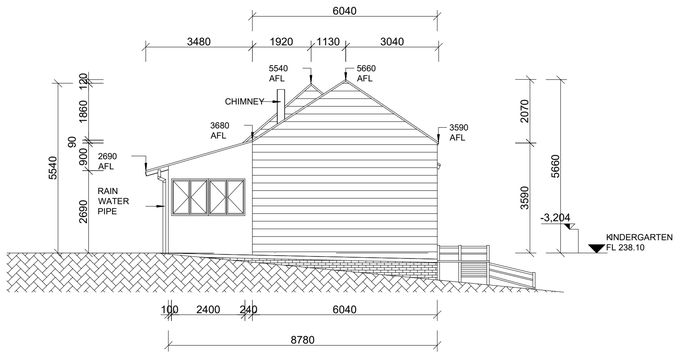
E2 - WEST ELEVATION

1:100



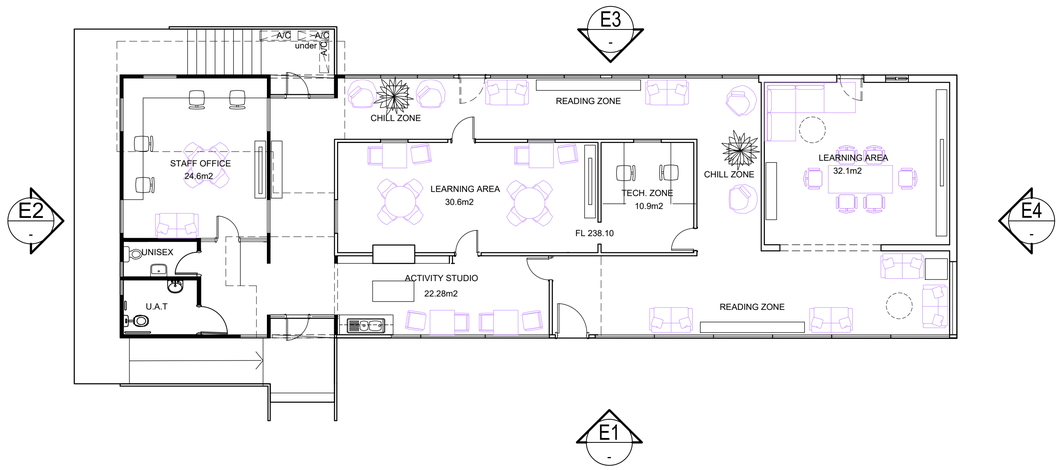
E1 - SOUTH ELEVATION

1:100



E4 - EAST ELEVATION

1:100



PRELIMINARY
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07/10/24	P1	PRELIMINARY
DATE	ISSUE	REVISION

ISSUE P1

building ideas

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W www.eiwarch.com.au

PROJECT:

PARKERVILLECARE

PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:

KINDEGARTEN

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.05
JOB DATE: 07/10/24	SCALE: 1:100@A1	JOB No: 2406	
FILE PATH: ---------			

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E3 NORTH ELEVATION
1:100



E2 WEST ELEVATION
1:100





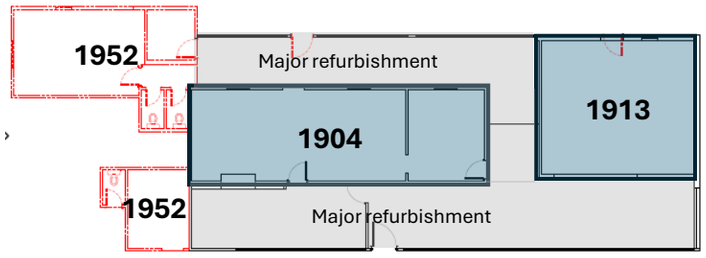
E1 SOUTH ELEVATION
1:100

New extension

E4 EAST ELEVATION
1:100



Demolish - asbestos



History

N

KINDERGARTEN

YEAR 12

SCALE. : 1:100@A1 0 1 2 10m

PARKERVILLE CARE SCHOOL

ROLAND ROAD, PARKERVILLE

JOB NO. : 2406 DATE : SEPTEMBER 2024 DWG NO. : SK.05 REV : A

McCorkell CONSTRUCTIONS WA

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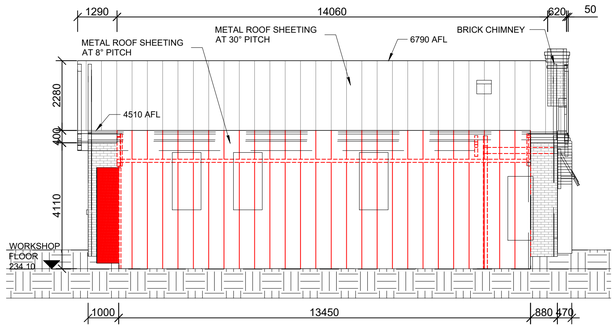
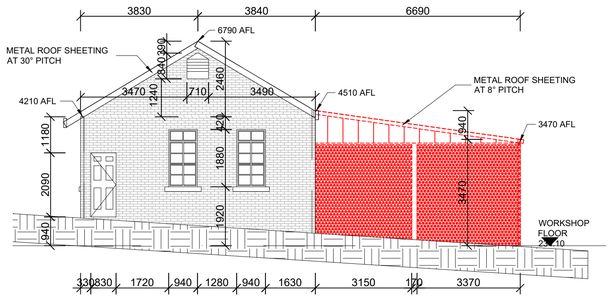


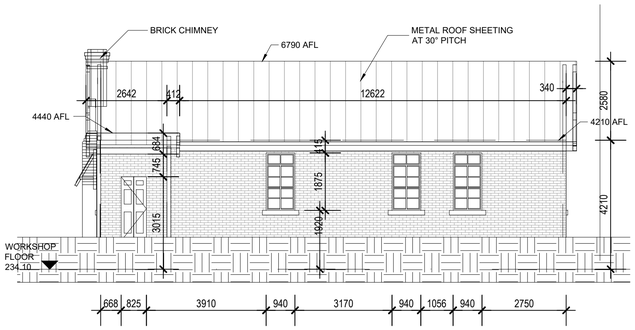
E3 - NORTH ELEVATION

1:100



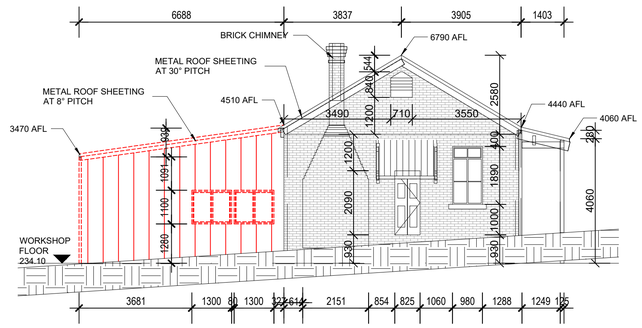
E4 - EAST ELEVATION

1:100



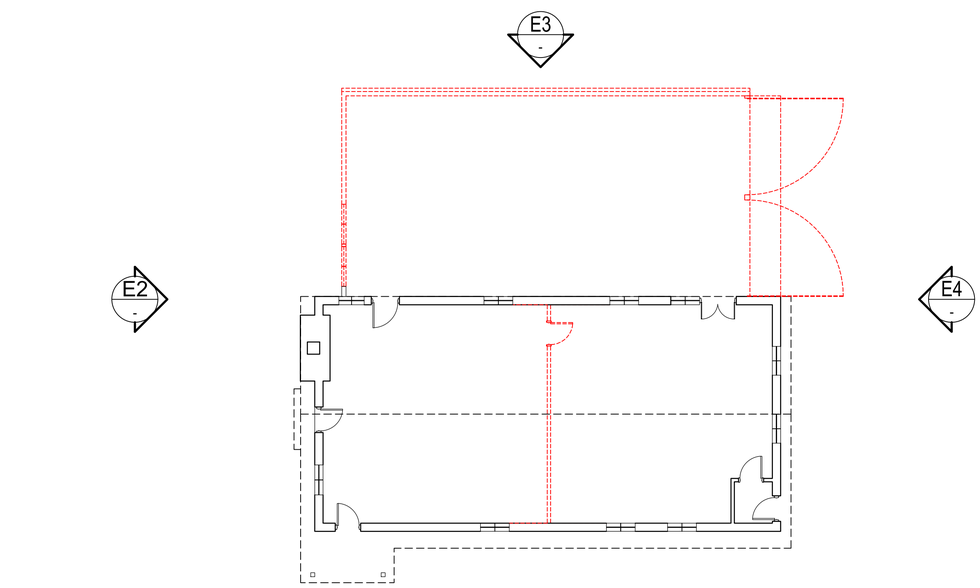
E1 - SOUTH ELEVATION

1:100



E2 - WEST ELEVATION

1:100



FLOOR PLAN

1:100@A1

PRELIMINARY

NOT FOR CONSTRUCTION

07/10/24	P1	PRELIMINARY
DATE	ISSUE	REVISION

ISSUE P1

building ideas

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PROJECT:

PARKERVILLE CARE SCHOOL

PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:

WORKSHOP - DEMO

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.06d
JOB DATE: 02/09/2024	SCALE: 1:100@A1	JOB No: 2406	
FILE PATH: --------			

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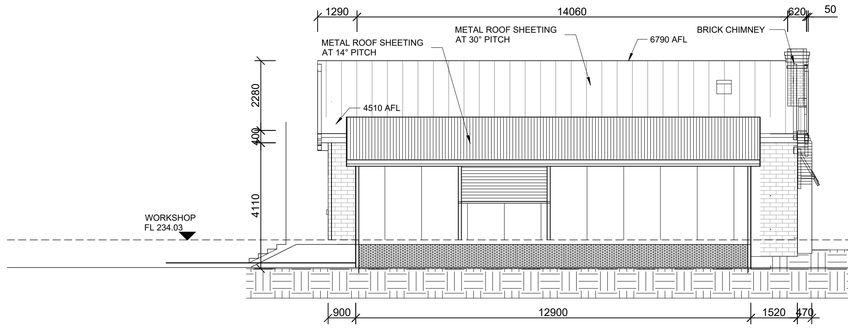
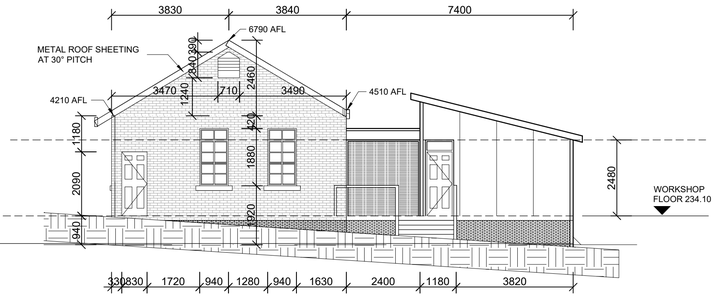


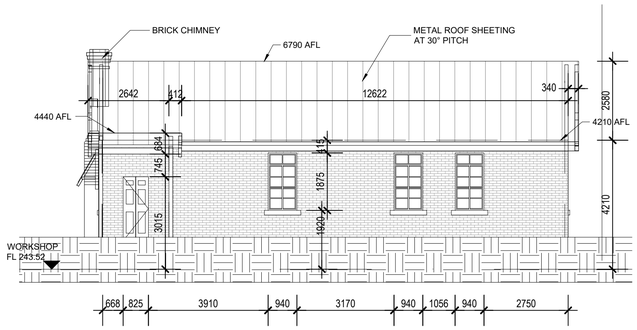
E3 - NORTH ELEVATION

1:100



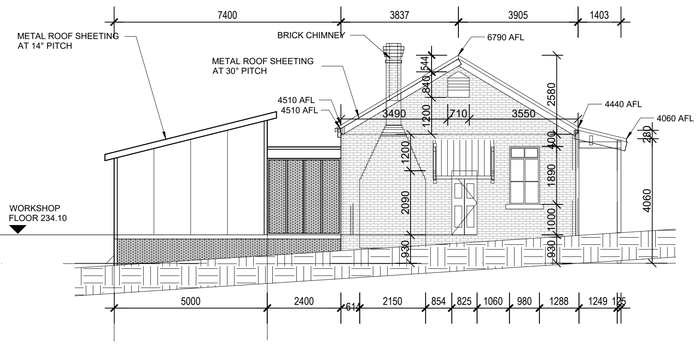
E4 - EAST ELEVATION

1:100



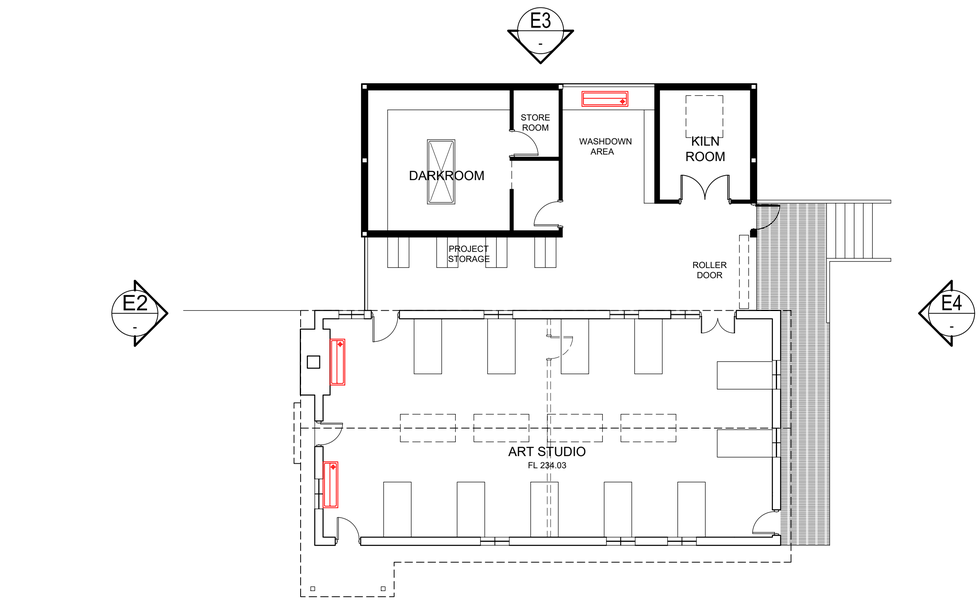
E1 - SOUTH ELEVATION

1:100



E2 - WEST ELEVATION

1:100



FLOOR PLAN

1:100@A1

PRELIMINARY

NOT FOR CONSTRUCTION

DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	
			P1

building ideas

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PROJECT:

PARKERVILLE CARE SCHOOL

PARKERVILLE CHILDREN + YOUTH CARE CAMPUS

ROLAND ROAD, PARKERVILLE

DRAWING:

WORKSHOP

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.06
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	
FILE PATH: ---------			

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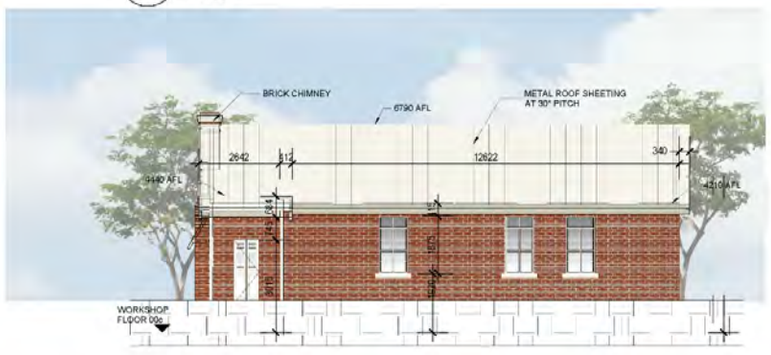
E3 - NORTH ELEVATION
1:100



E4 - EAST ELEVATION
1:100



E1 - SOUTH ELEVATION
1:100



E2 - WEST ELEVATION
1:100



FLOOR PLAN
1:100@A1

WORKSHOP
WORKSHOP & ARTS STUDIO

SCALE. : 1:100@A1 0 1 2 10m

PARKERVILLE CARE SCHOOL
ROLAND ROAD, PARKERVILLE

JOB NO. : 2406 DATE : SEPTEMBER 2024 DWG NO. : SK.05 REV : A

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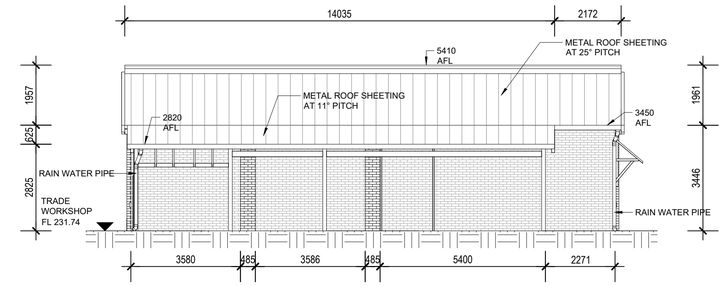
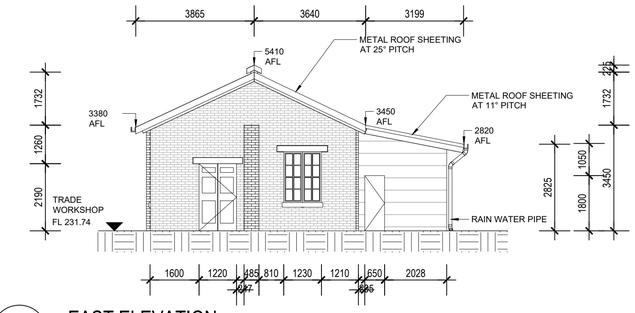


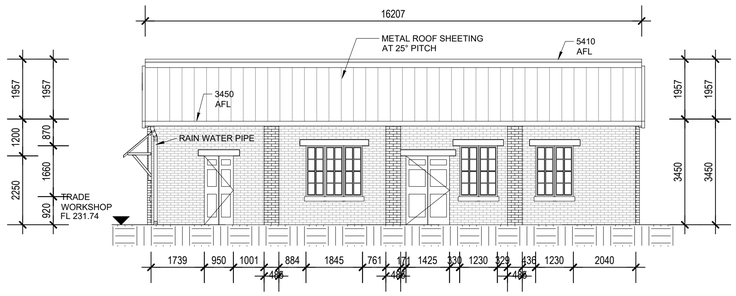
E3 - NORTH ELEVATION

1:100



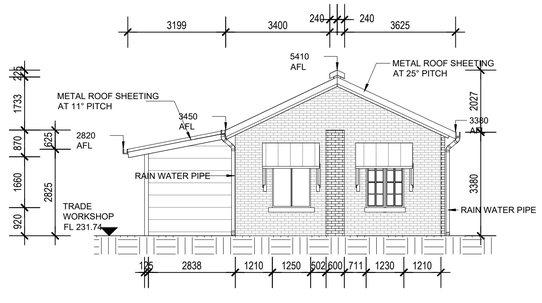
E4 - EAST ELEVATION

1:100



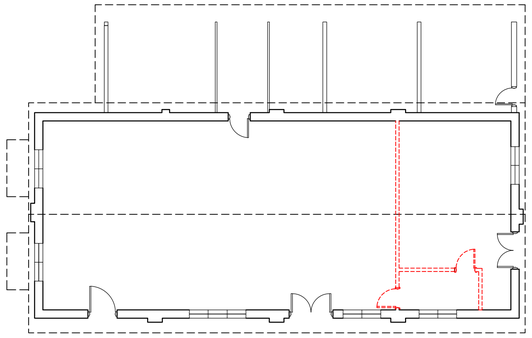
E1 - SOUTH ELEVATION

1:100



E2 - WEST ELEVATION

1:100



FLOOR PLAN

1:100@A1

PRELIMINARY

NOT FOR CONSTRUCTION

07/10/24	P1	PRELIMINARY
DATE	ISSUE	REVISION
		ISSUE P1

building ideas

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W www.eiwarch.com.au

PROJECT:

PARKERVILLE CARE SCHOOL

PARKERVILLE CHILDREN + YOUTH CARE CAMPUS

ROLAND ROAD, PARKERVILLE

DRAWING:

WORKSHOP (LAUNDRY) - DEMO

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.07d
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	
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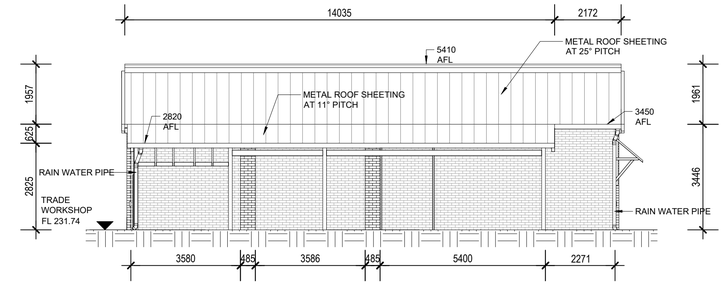
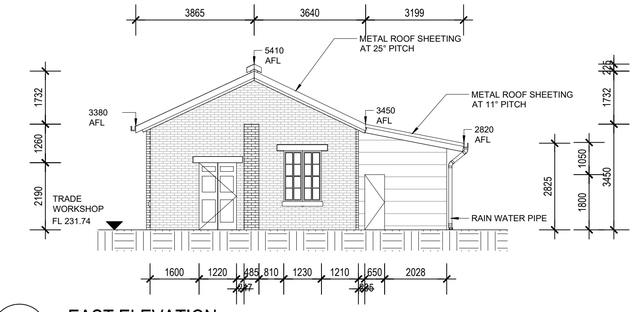
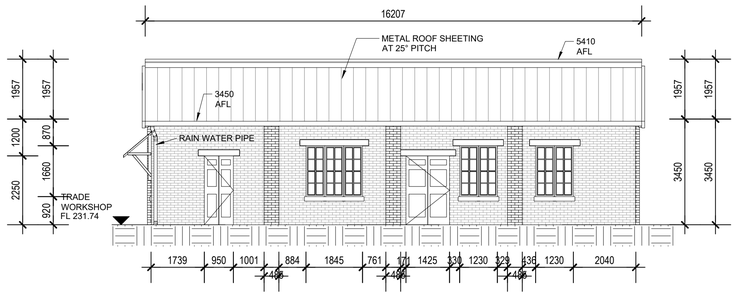


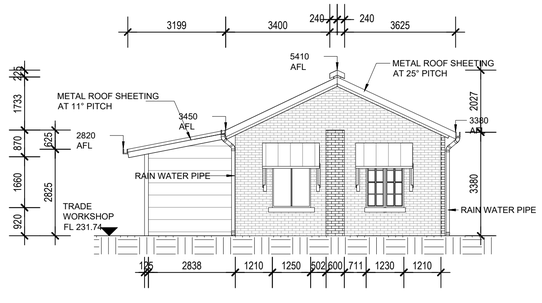
E3 - NORTH ELEVATION
1:100



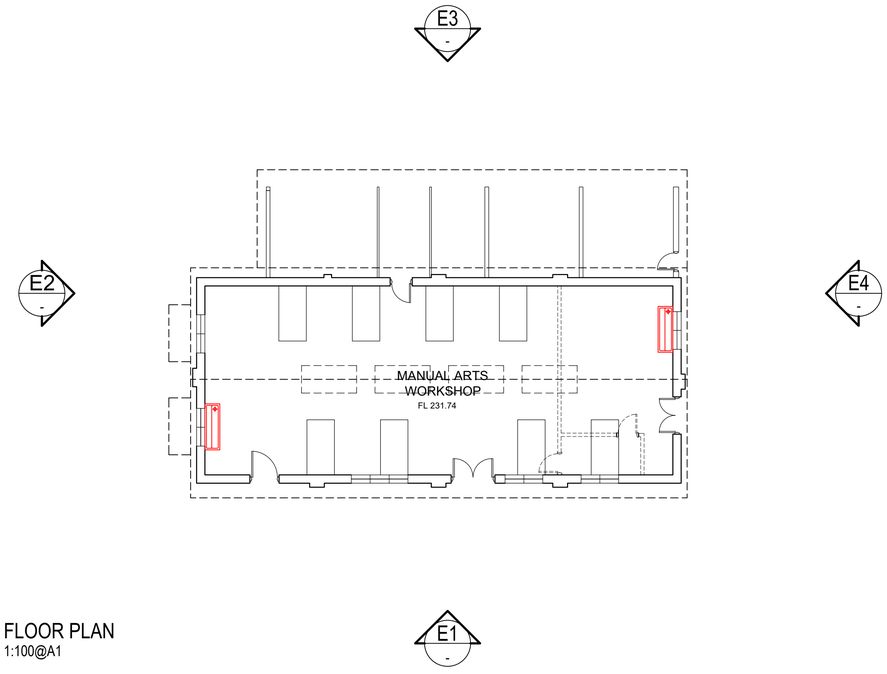
E4 - EAST ELEVATION
1:100



E1 - SOUTH ELEVATION
1:100



E2 - WEST ELEVATION
1:100



FLOOR PLAN
1:100@A1

PRELIMINARY
NOT FOR CONSTRUCTION

DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	
			P1

building ideas

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W www.eiwarch.com.au

PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
WORKSHOP (LAUNDRY)

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.07
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	
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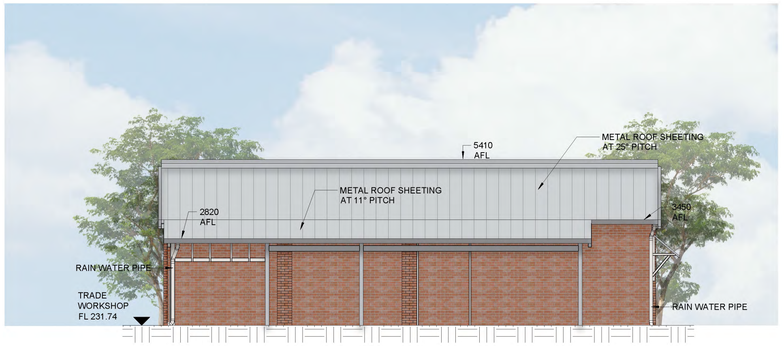
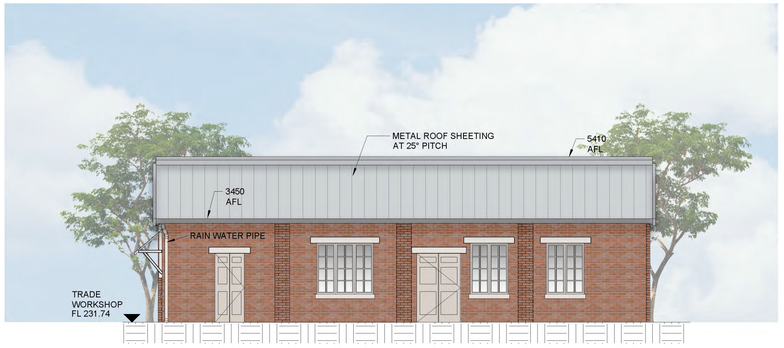


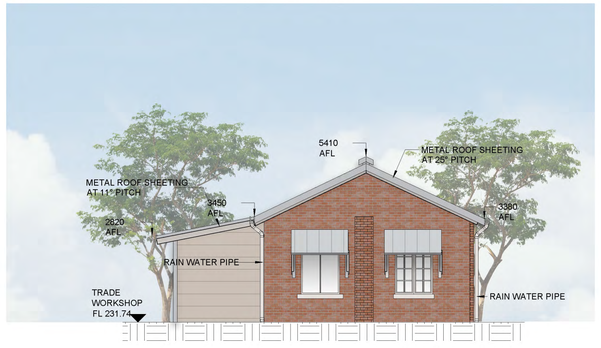
E3 - NORTH ELEVATION
1:100



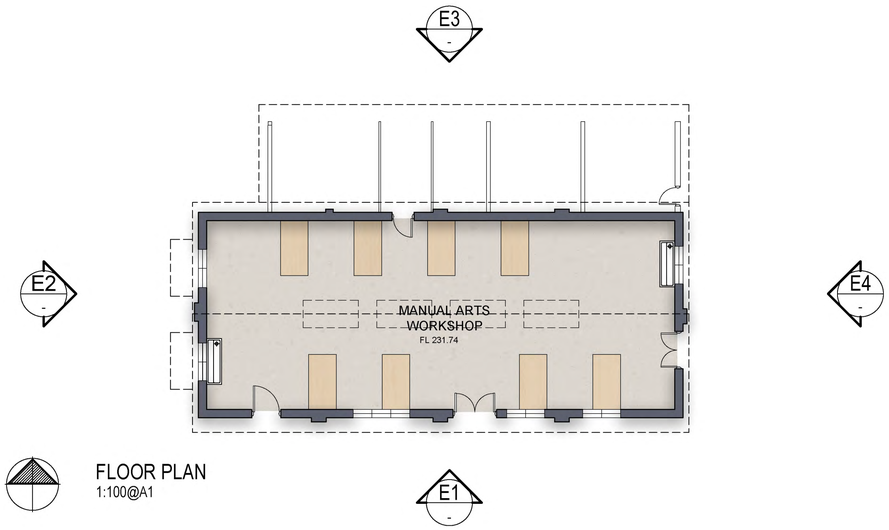
E4 - EAST ELEVATION
1:100



E1 - SOUTH ELEVATION
1:100



E2 - WEST ELEVATION
1:100



FLOOR PLAN
1:100@A1

WORKSHOP - MANUAL ARTS

SCALE. : 1:100@A1 0 1 2 10m

PARKERVILLE CARE SCHOOL
ROLAND ROAD, PARKERVILLE

JOB NO. : 2406 DATE : SEPTEMBER 2024 DWG NO. : SK.07 REV : A

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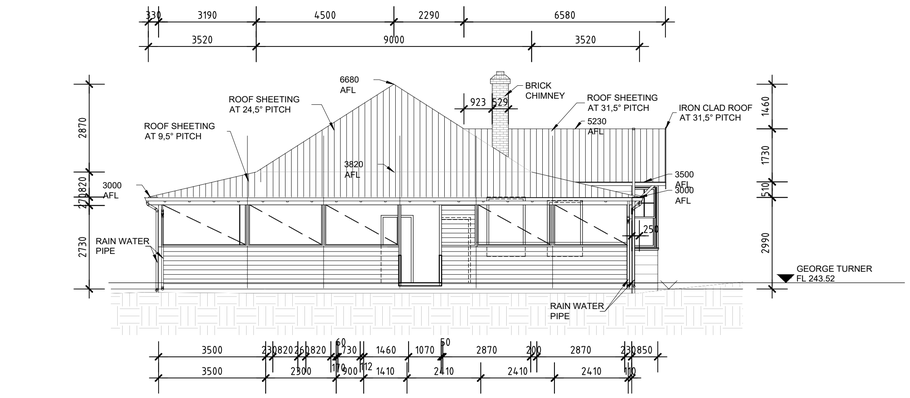
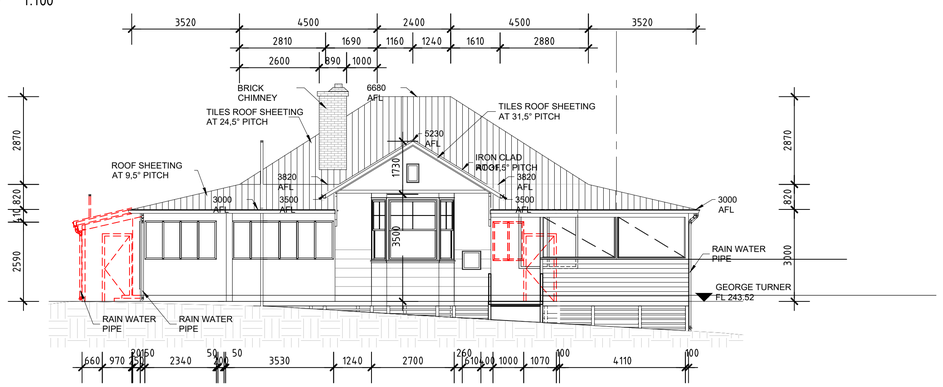


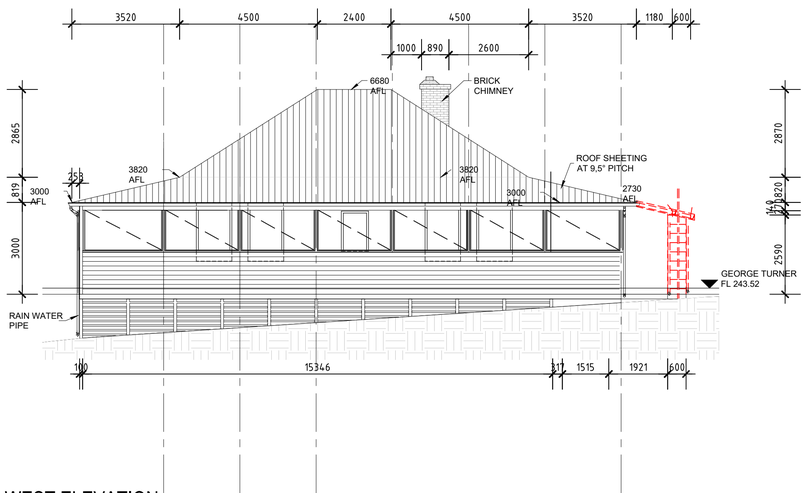
E1 - SOUTH ELEVATION

1:100



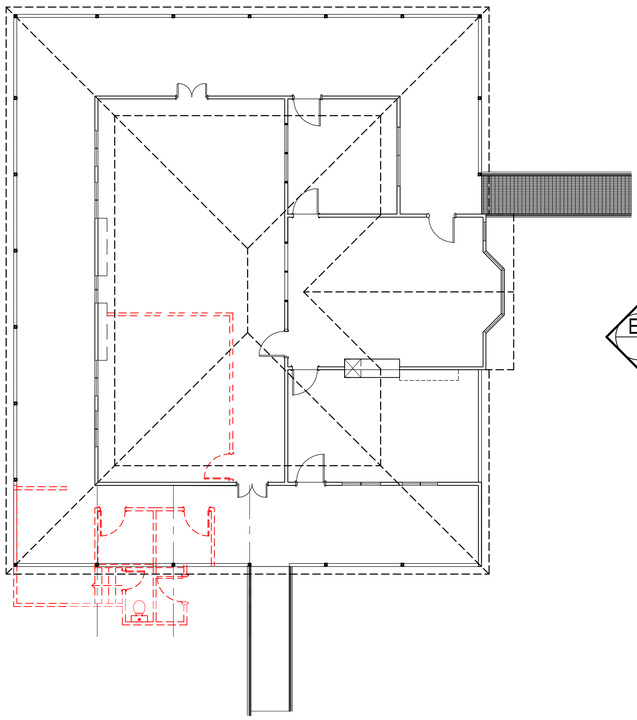
E4 - EAST ELEVATION

1:100



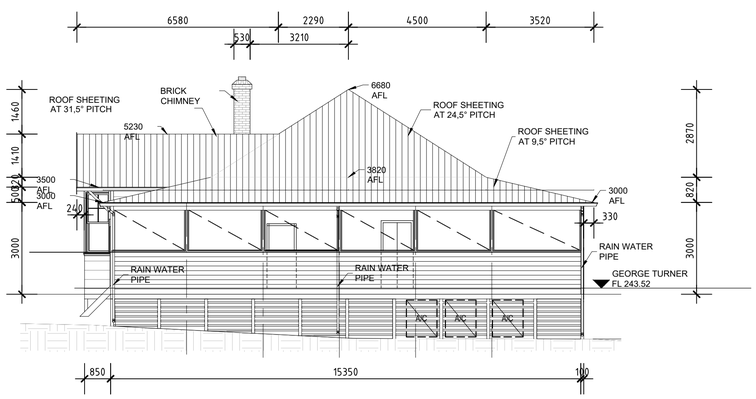
E2 - WEST ELEVATION

1:100



FLOOR PLAN

1:100@A1



E3 - NORTH ELEVATION

1:100

PRELIMINARY

NOT FOR CONSTRUCTION

DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	
			P1

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PROJECT:

PARKERVILLE CARE SCHOOL

PARKERVILLE CHILDREN + YOUTH CENTRE

ROLAND ROAD, PARKERVILLE

DRAWING:

GEORGE TURNER COTTAGE - DEMO

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.08d
JOB DATE: 25/09/24	SCALE: 1:-100@A1	JOB No: 2406	

FILE PATH: --------

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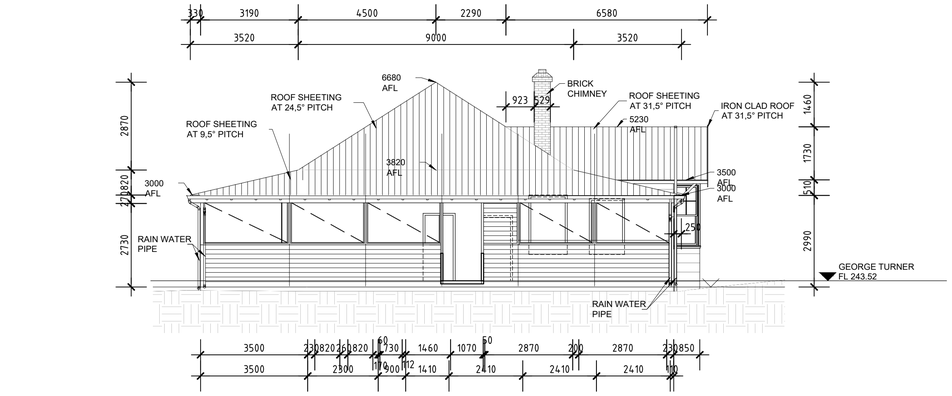
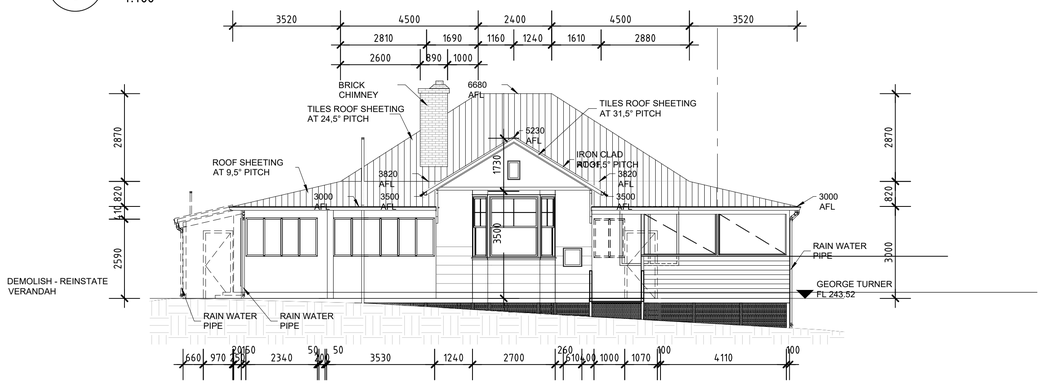


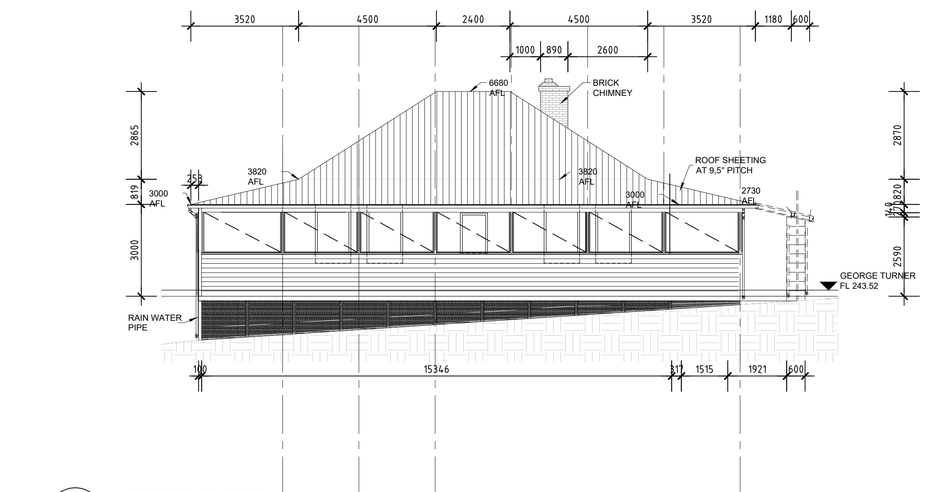
E1 - SOUTH ELEVATION

1:100



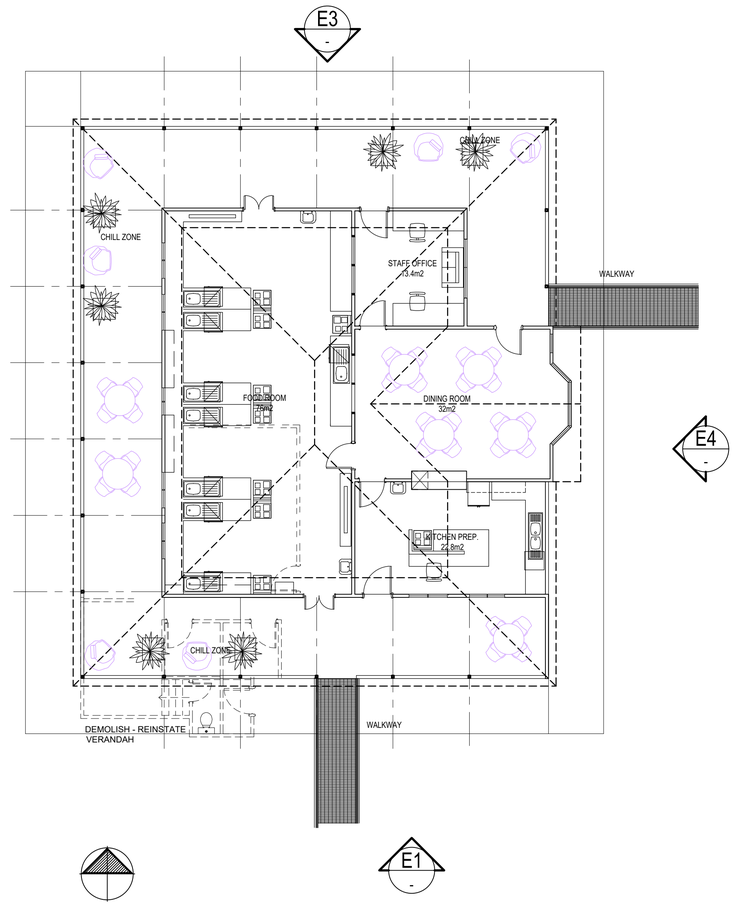
E4 - EAST ELEVATION

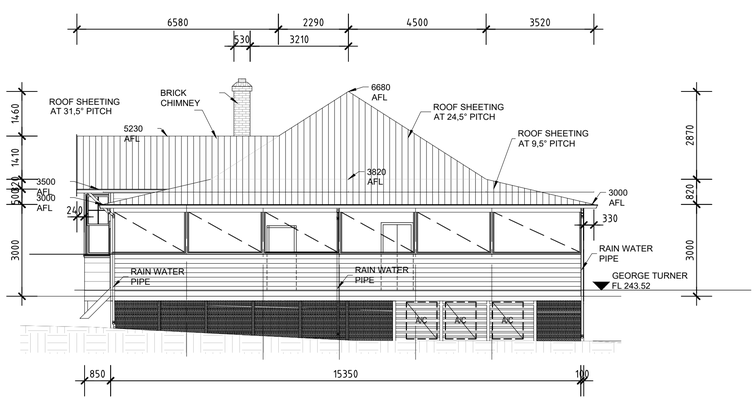
1:100



E2 - WEST ELEVATION

1:100





E3 - NORTH ELEVATION

1:100

PRELIMINARY

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DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	P1

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PROJECT:

PARKERVILLE CARE SCHOOL

PARKERVILLE CHILDREN + YOUTH CENTRE

ROLAND ROAD, PARKERVILLE

DRAWING:

GEORGE TURNER COTTAGE

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.08
JOB DATE: 25/09/24	SCALE: 1:-100@A1	JOB No: 2406	
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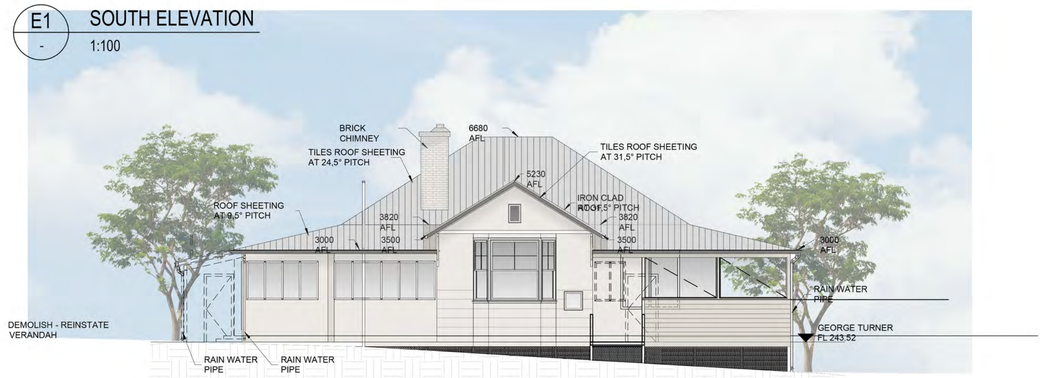
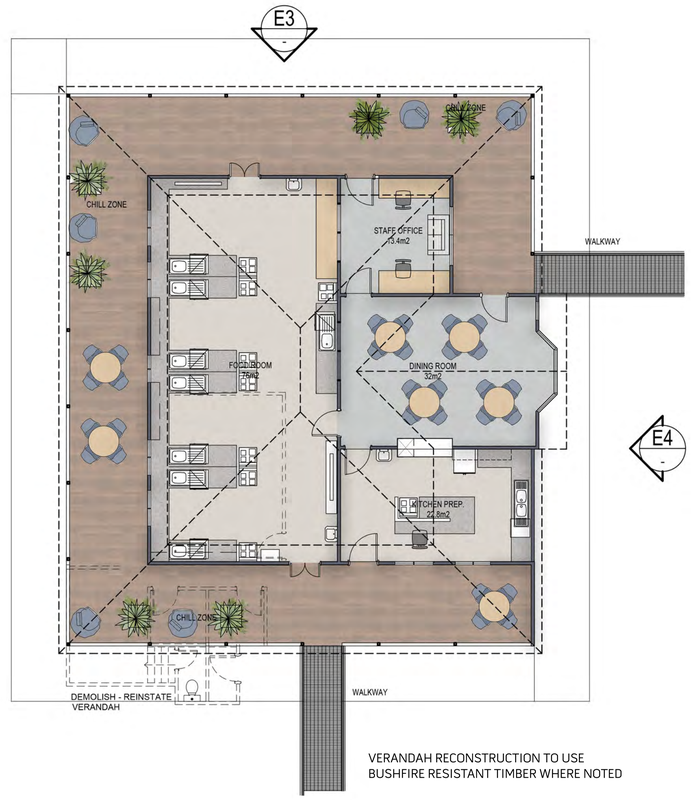
EXISTING TOILETS TO BE DEMOLISHED AND LINE OF
ORGINAL VERANDAH REINSTATED

E1 SOUTH ELEVATION

1:100



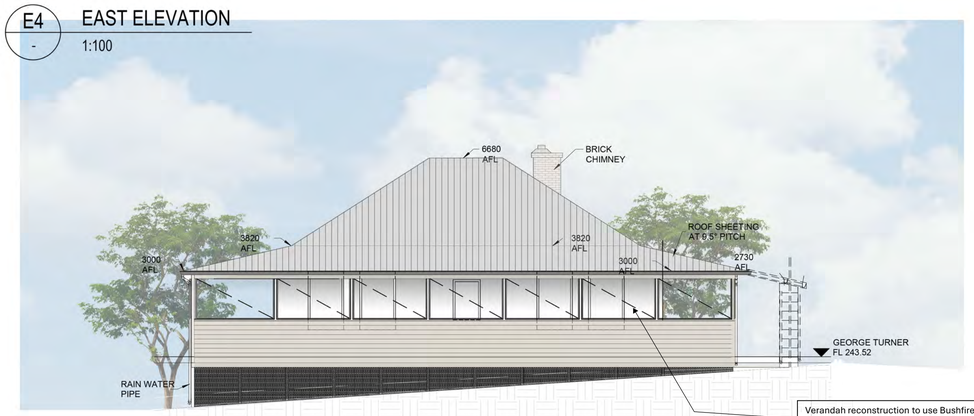
VERANDAH RECONSTRUCTION TO USE
BUSHFIRE RESISTANT TIMBER WHERE NOTED



VERANDAH RECONSTRUCTION TO USE
BUSHFIRE RESISTANT TIMBER WHERE NOTED

E4 EAST ELEVATION

1:100



VERANDAH RECONSTRUCTION TO USE
BUSHFIRE RESISTANT TIMBER WHERE NOTED

E2 WEST ELEVATION

1:100



E3 NORTH ELEVATION

1:100

GEORGE TURNER COTTAGE - ECS

HOME ECONOMICS

SCALE. : 1:100@A1 0 1 2 10m

PARKERVILLE CARE SCHOOL

ROLAND ROAD, PARKERVILLE

JOB NO. : 2406 DATE : SEPTEMBER 2024 DWG NO. : SK.08 REV : A

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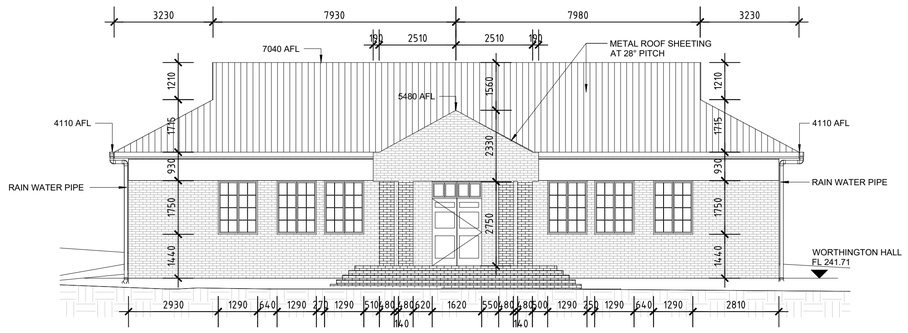

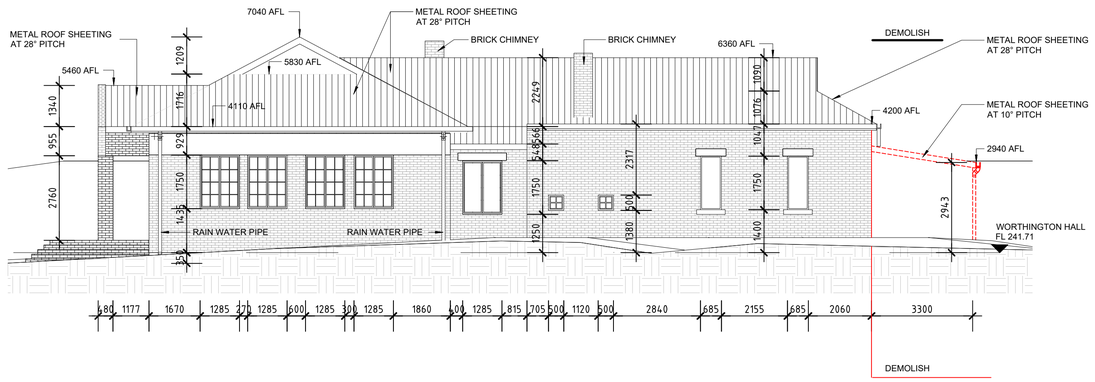

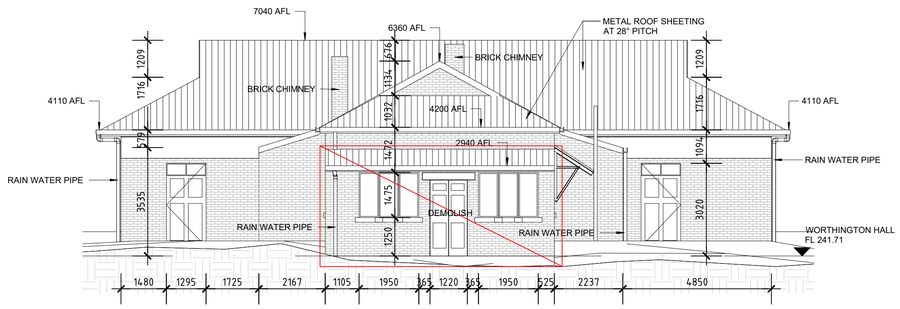

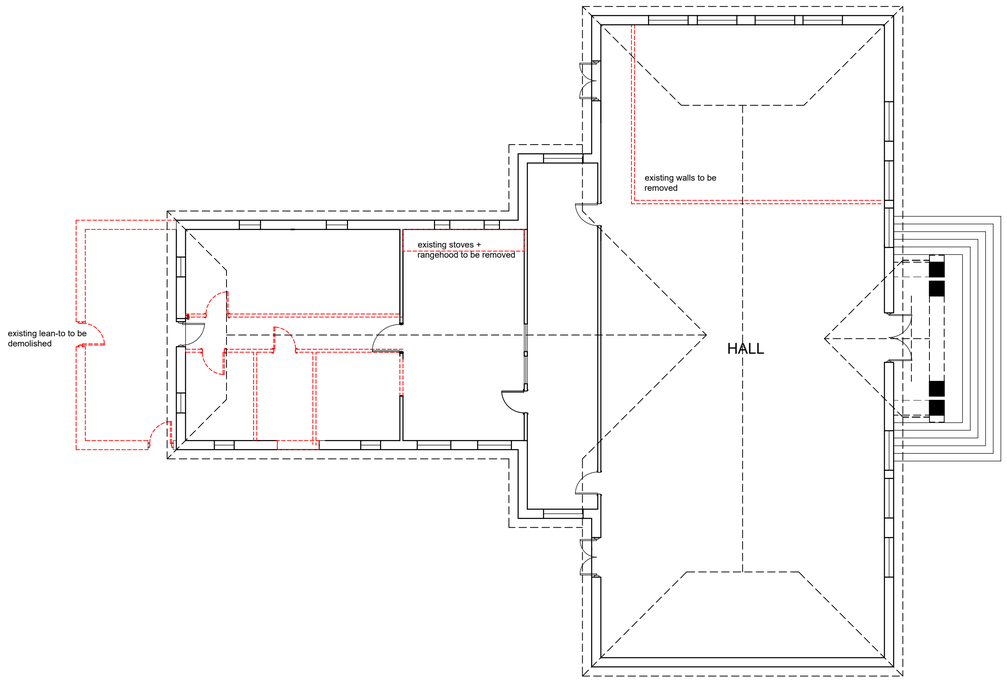

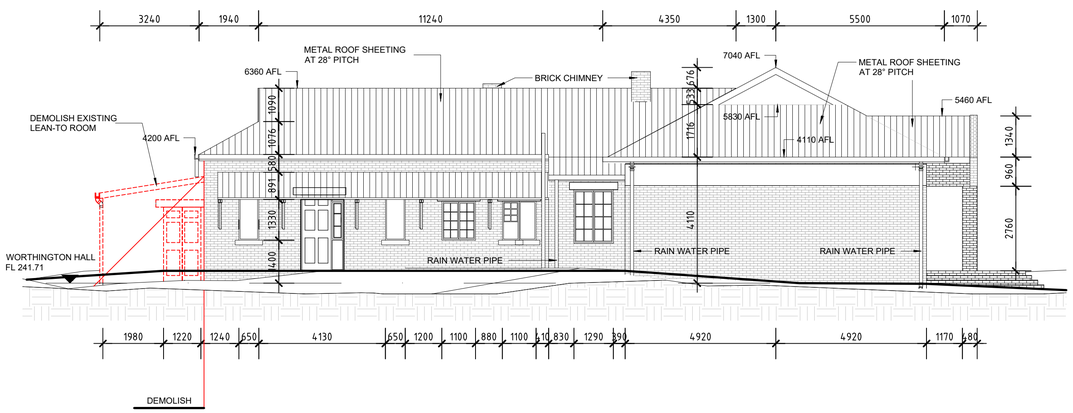

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DATE	ISSUE	REVISION	ISSUE
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			P1

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PROJECT:

PARKERVILLE CARE SCHOOL

PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:

WORTHINGTON HALL - DEMO

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.09d
JOB DATE: 16/09/24	SCALE: 1:-100@A1	JOB No: 2406	
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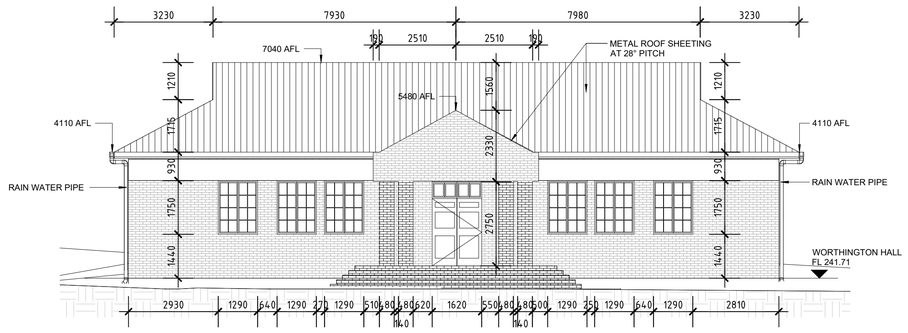

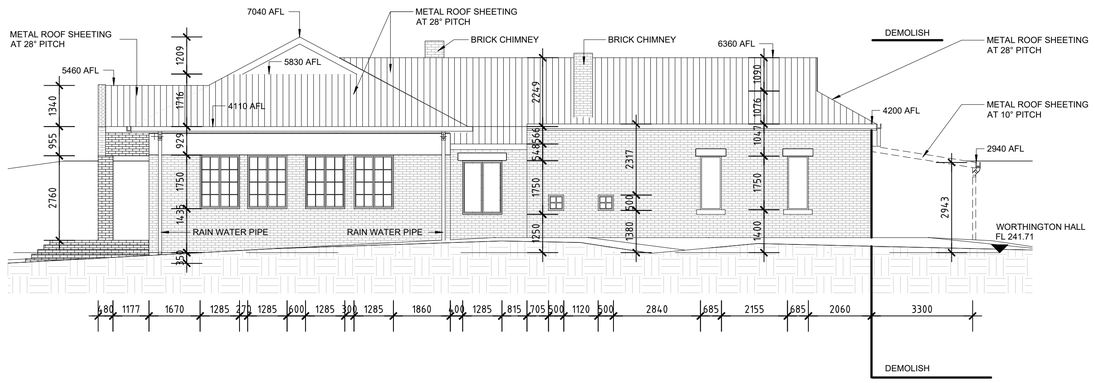

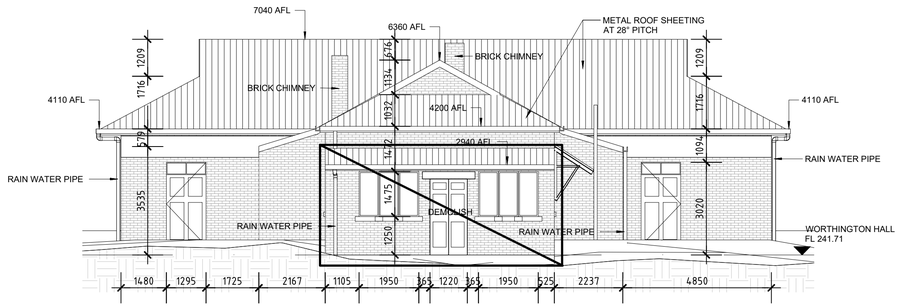

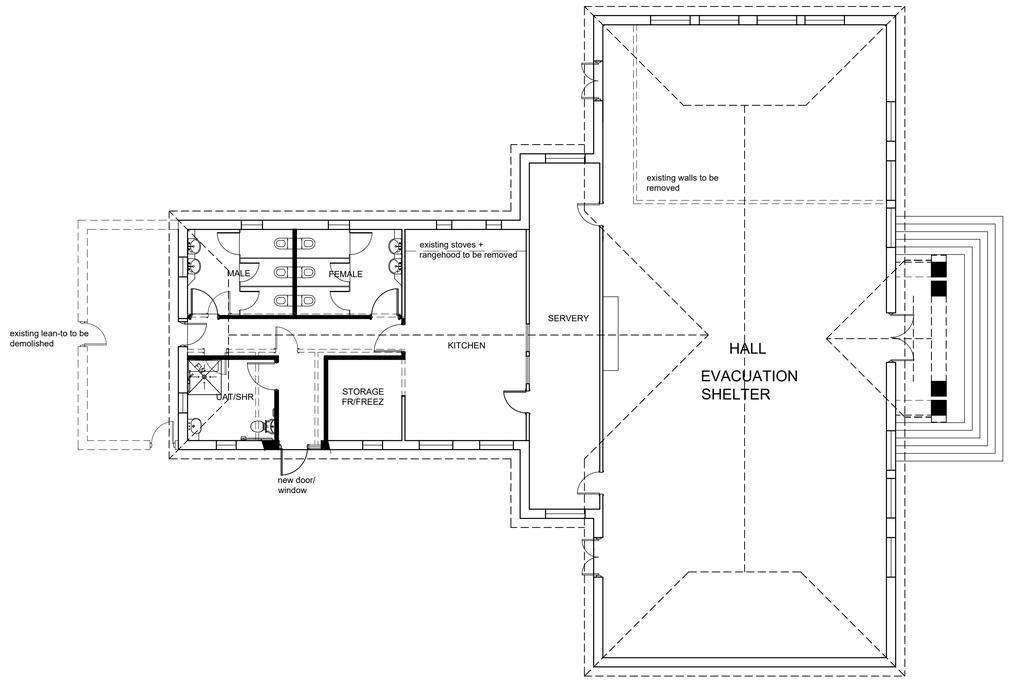

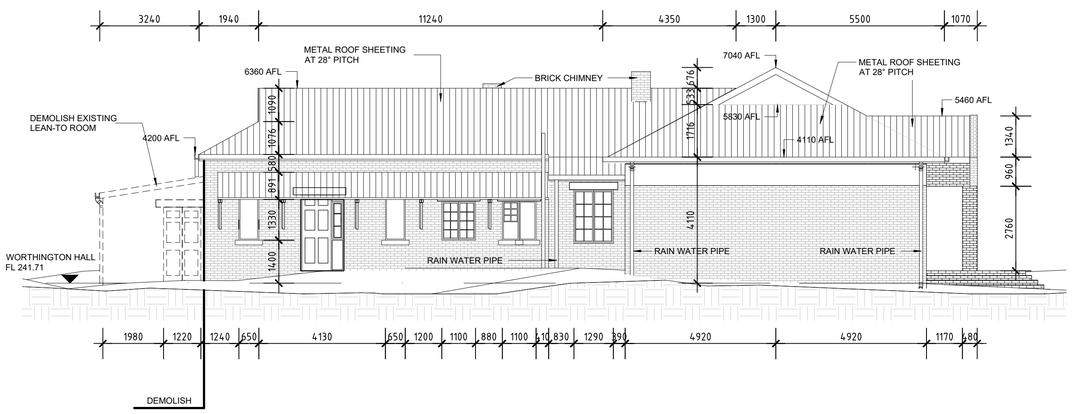

PRELIMINARY
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DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	P1

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PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
WORTHINGTON HALL

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.09
JOB DATE: 16/09/24	SCALE: 1:-100@A1	JOB No: 2406	
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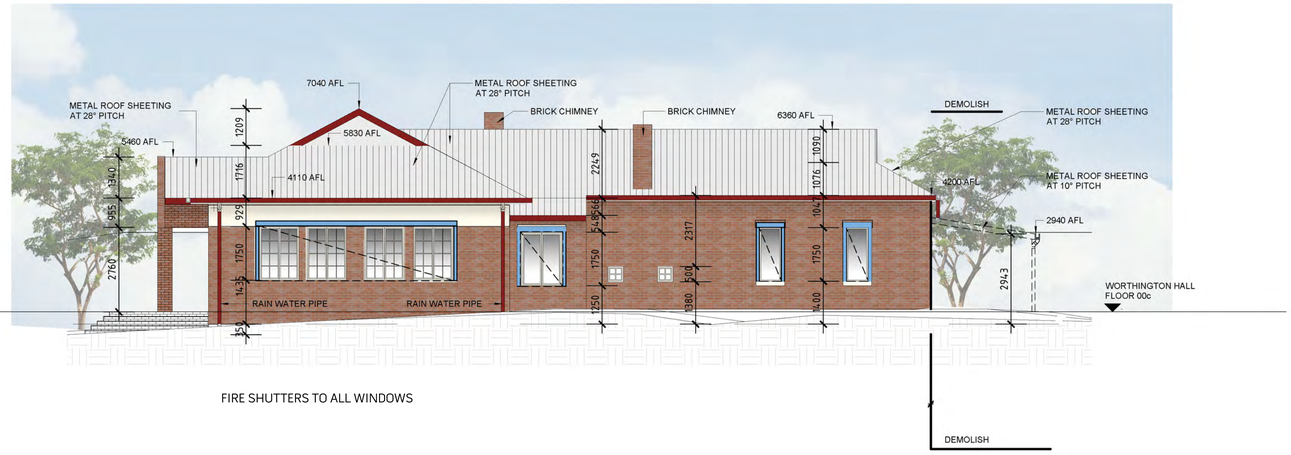
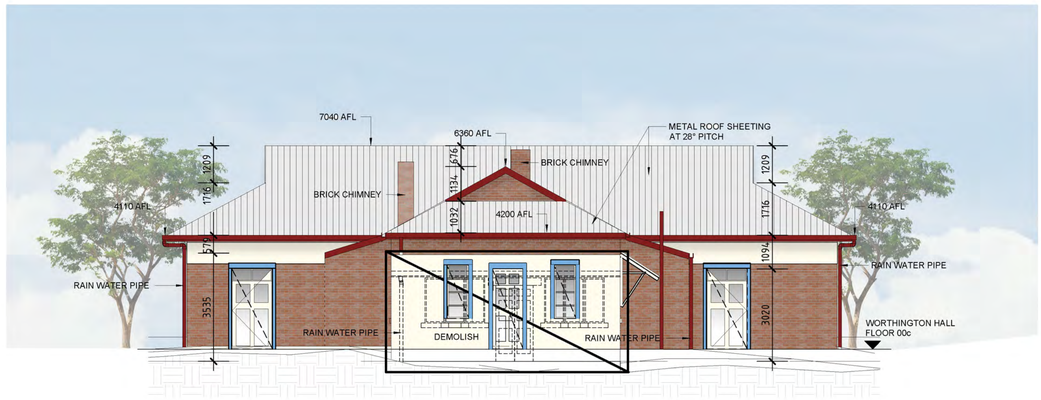
FIRE SHUTTERS TO ALL WINDOWS



FIRE SHUTTERS TO ALL WINDOWS

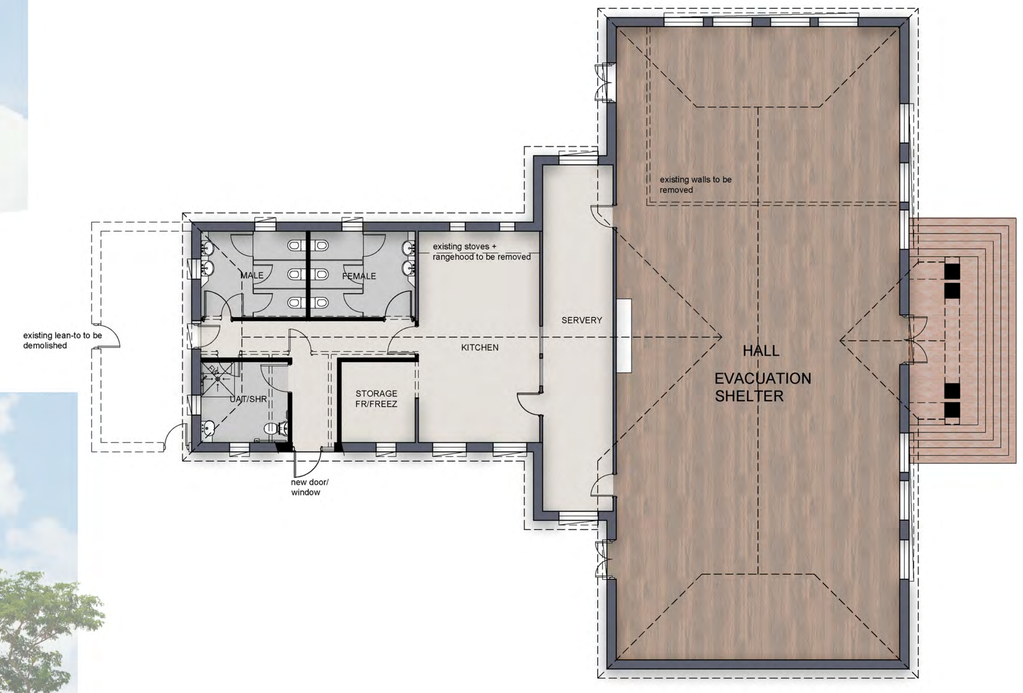


SOUTHERN LEAN-TO TO BE DEMOLISHED



NEW DOOR TO EASTERN WALL ACCESS TO BATHROOM AMENITIES

HALL DEEMED AS THE 'TENABLE SPACE' UNDER BAL 29



REBUILD FRONT PORTICO

WORTHINGTON HALL

ASSEMBLY HALL SHELTER

SCALE. : 1:100@A1 0 1 2 10m

PARKERVILLE CHILDREN AND YOUTH CENTRE

PARKERVILLE CARE SCHOOL

ROLAND ROAD, PARKERVILLE

JOB NO. : 2406 DATE : SEPTEMBER 2024 DWG NO. : SK.09 REV : A

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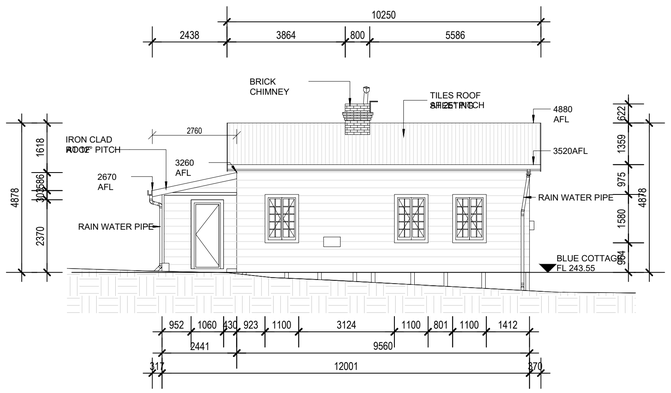
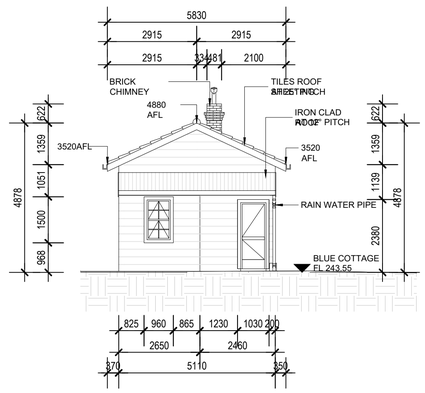
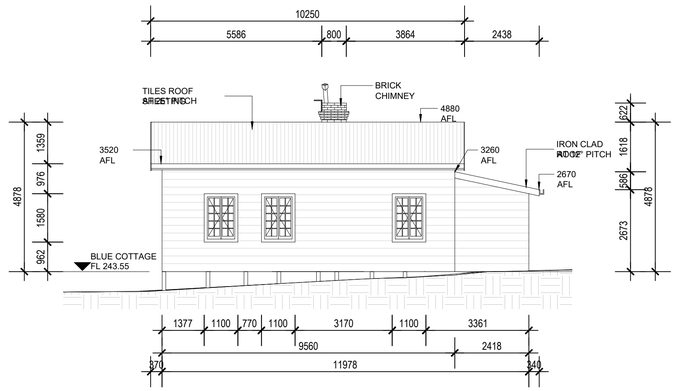


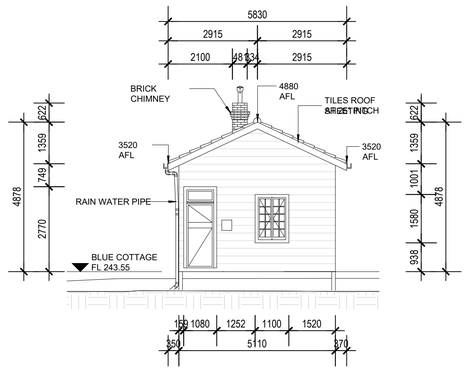
E1 NORTH ELEVATION
1:100



E2 EAST ELEVATION
1:100

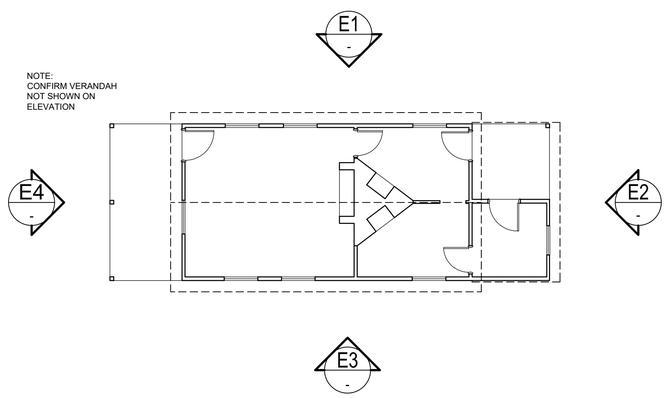


E3 SOUTH ELEVATION
1:100



E4 WEST ELEVATION
1:100

NOTE:
CONFIRM VERANDAH NOT SHOWN ON ELEVATION



FLOOR PLAN
1:100@A1

STRUCTURAL INVESTIGATION REPORT
P24062_ST_RPT_001 - 02/09/2024
conducted by Atelier JV found the structure to be in critical condition with some areas indicating imminent collapse and severe termite damage.

BLUE COTTAGE TO BE DEMOLISHED

PRELIMINARY
NOT FOR CONSTRUCTION

DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	P1

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PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
BLUE COTTAGE

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.10
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	
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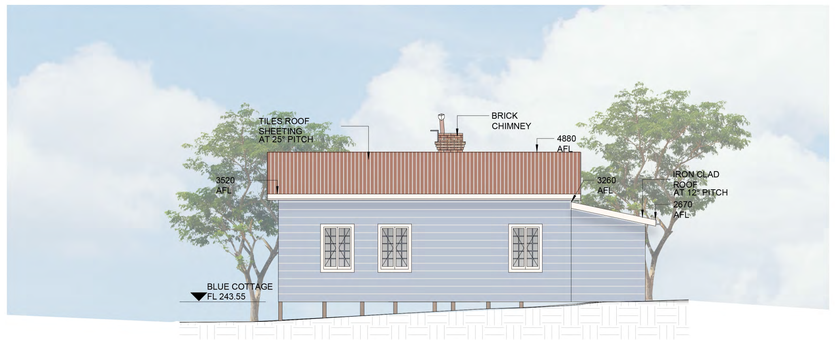
E1 - NORTH ELEVATION
1:100



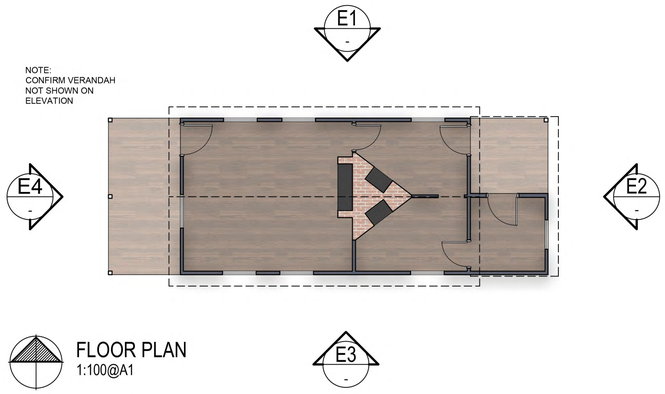
E2 - EAST ELEVATION
1:100



E3 - SOUTH ELEVATION
1:100



E4 - WEST ELEVATION
1:100



FLOOR PLAN
1:100@A1

STRUCTURAL INVESTIGATION REPORT P24062_ST_RPT_001 - 02/09/2024 conducted by Atelier JV found the structure to be in critical condition with some areas indicating imminent collapse and severe termite damage.

BLUE COTTAGE TO BE DEMOLISHED

BLUE COTTAGE

SCALE. : 1:100@A1 0 1 2 10m

PARKERVILLE CARE SCHOOL

ROLAND ROAD, PARKERVILLE

JOB NO. :2406 DATE :SEPTEMBER 2024 DWG NO. :SK.10 REV : A

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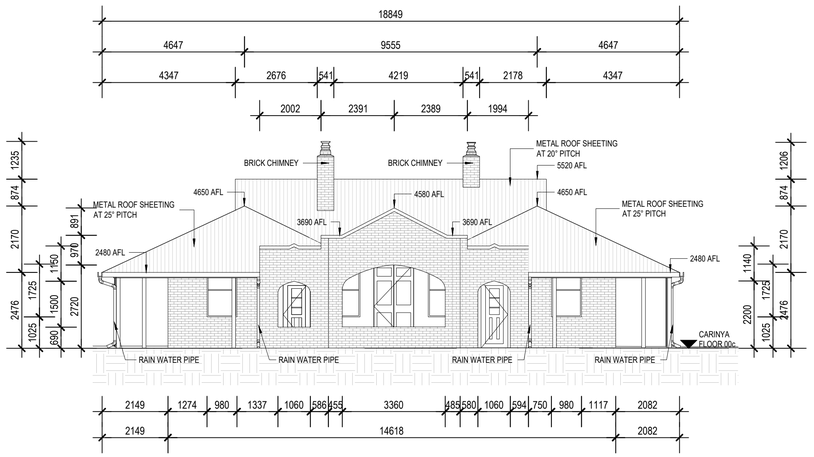
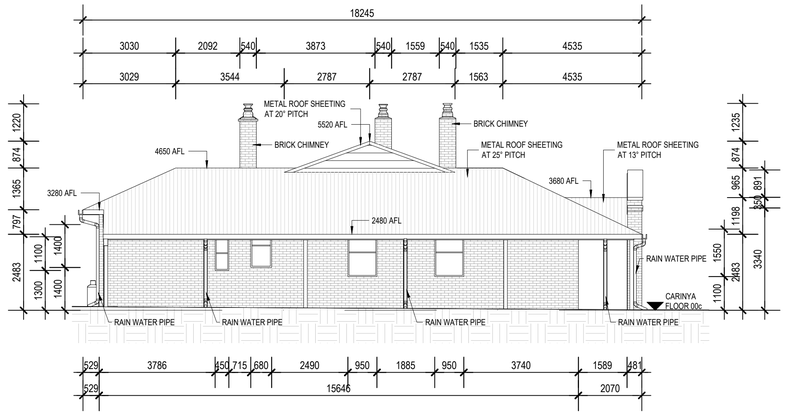
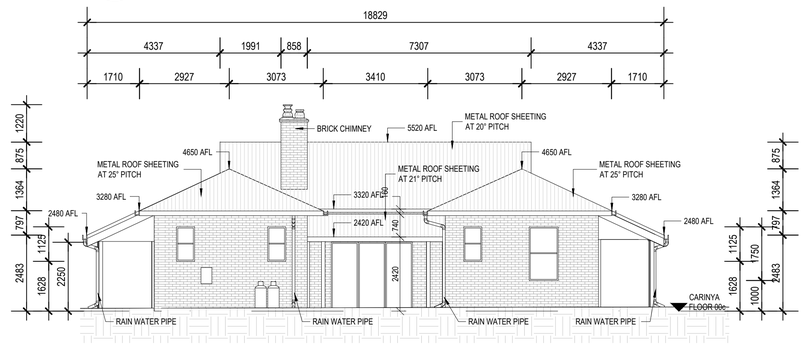


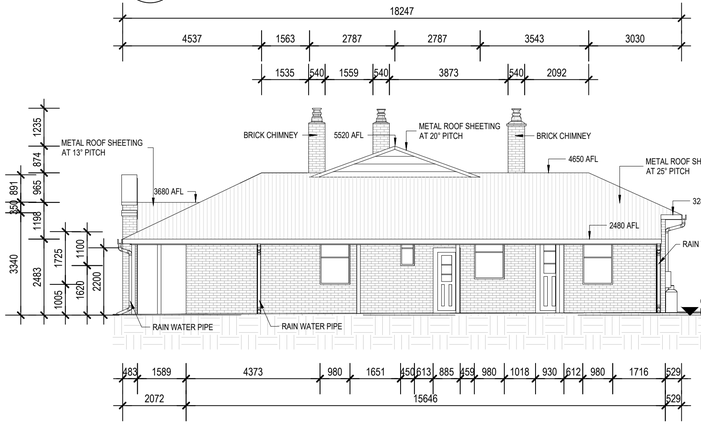
E1 NORTH ELEVATION
1:100



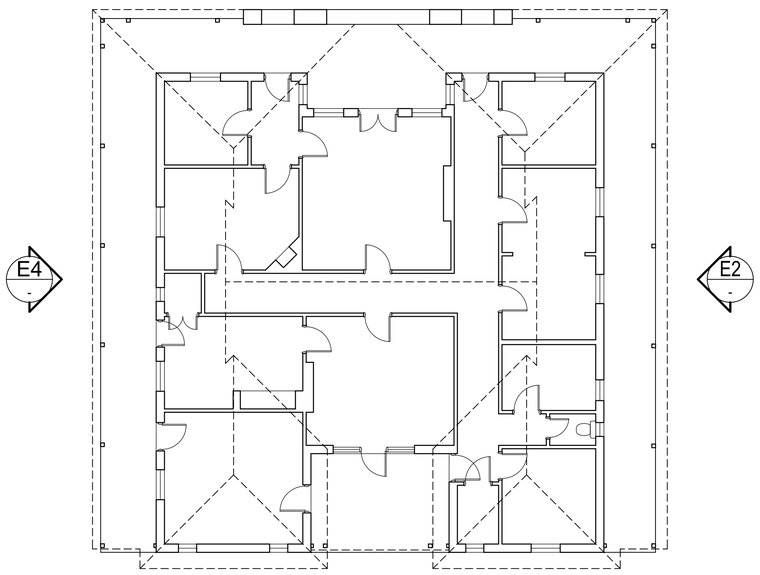
E2 EAST ELEVATION
1:100



E3 SOUTH ELEVATION
1:100



E4 WEST ELEVATION
1:100



FLOOR PLAN
1:100@A1

NO NEW WORKS PROPOSED TO CARINYA (FMR DIRECTORS)

REPAIRS AND MAINTENANCE ONLY IN ACCORDANCE WITH THE CONSERVATION MANAGEMENT STRATEGY

PRELIMINARY
NOT FOR CONSTRUCTION

DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	
			P1

building ideas
L12, 109 St. Georges Tce Perth Western Australia 6000
T +61 8 9484 4700 E eiwarch@eiwarch.com.au
W www.eiwarch.com.au

PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
CARINYA

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.12
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	
FILE PATH: ---------			

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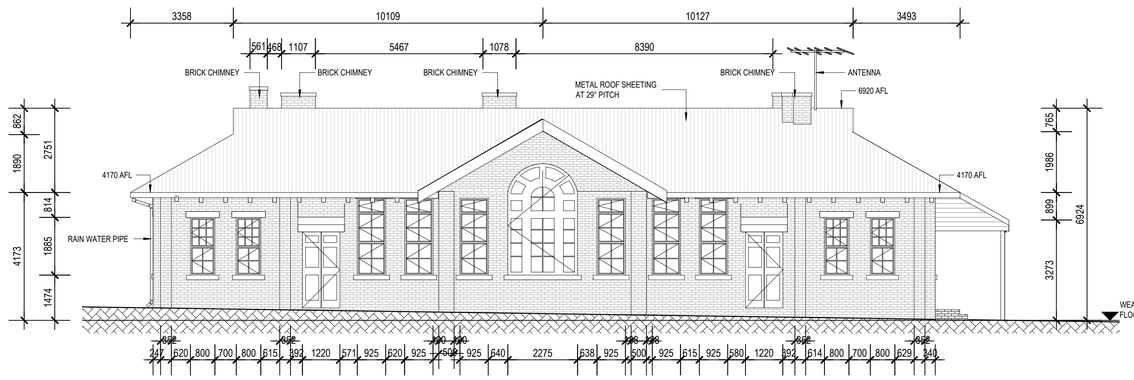

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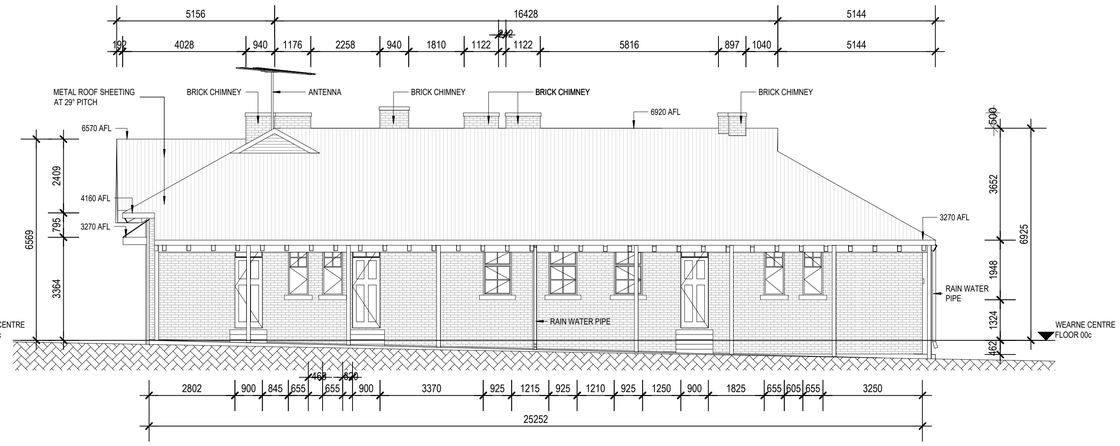

E2 - NORTH ELEVATION
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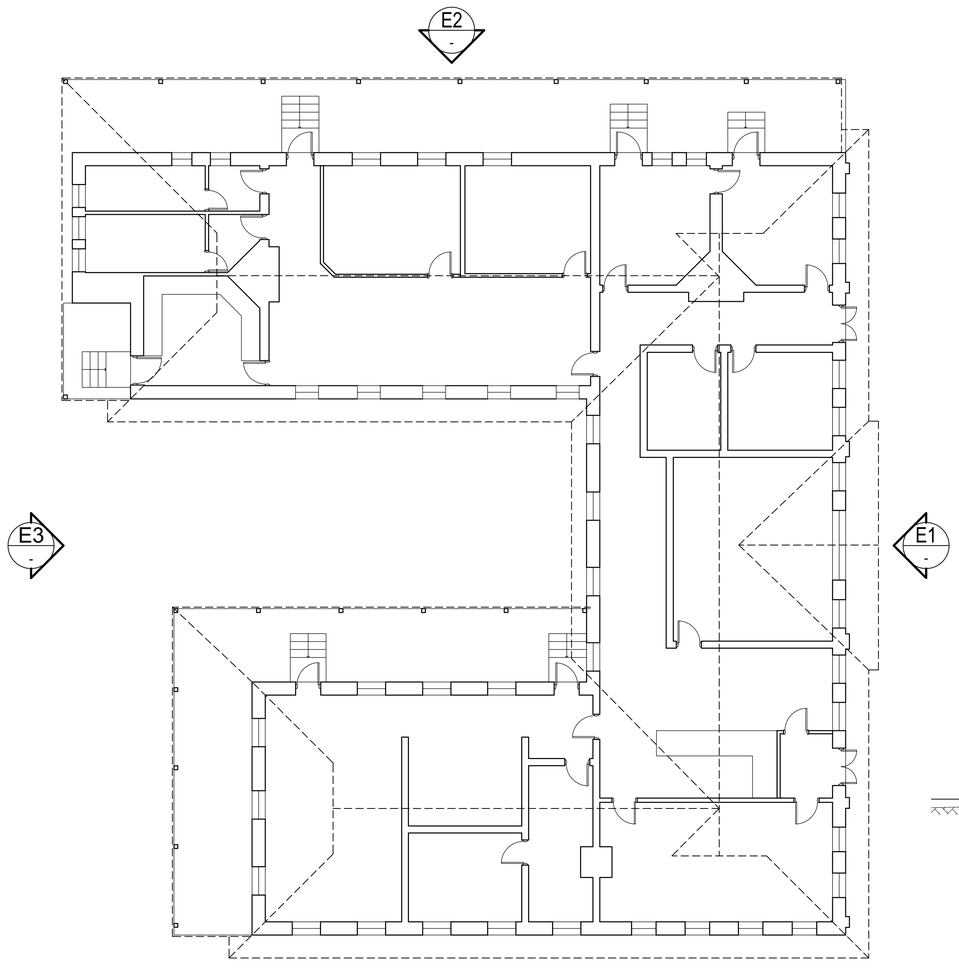

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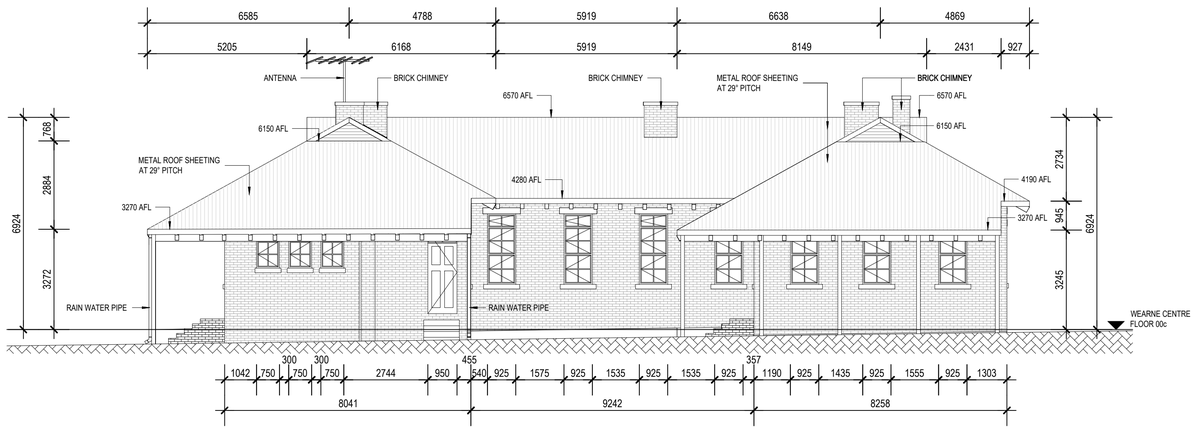

E4 - SOUTH ELEVATION
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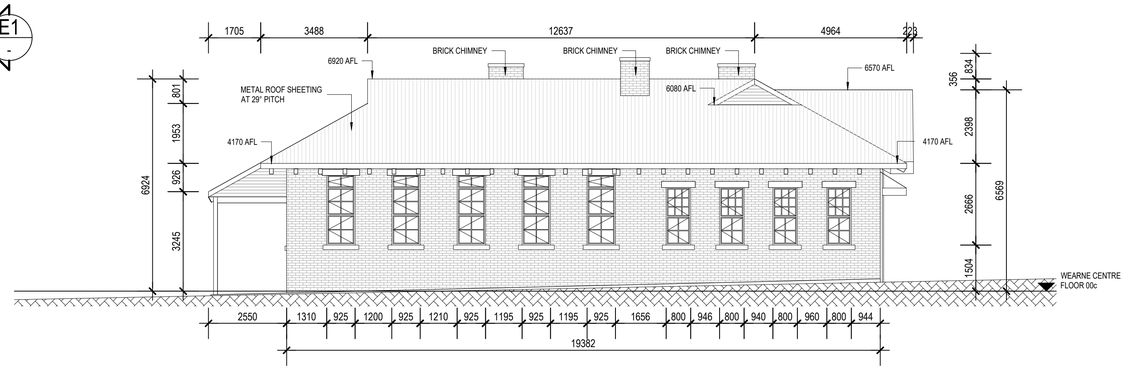

E2
-

E3
-

E1
-

E4
-

FLOOR PLAN
1:100@A1

NO NEW WORKS PROPOSED TO WEARNE HOUSE.

REPAIRS AND MAINTENANCE ONLY IN ACCORDANCE WITH THE CONSERVATION MANAGEMENT STRATEGY

PRELIMINARY
NOT FOR CONSTRUCTION

DATE	ISSUE	REVISION	ISSUE
07/10/24	P1	PRELIMINARY	
			P1

building ideas
L12, 109 St. Georges Tce Perth Western Australia 6000
T +61 8 9484 4700 E eiwarch@eiwarch.com.au
W www.eiwarch.com.au

PROJECT:
PARKERVILLE CARE SCHOOL
PARKERVILLE CHILDREN + YOUTH CARE CAMPUS
ROLAND ROAD, PARKERVILLE

DRAWING:
WEARNE HOUSE

DRAWN:	DESIGNED:	CHECKED:	DRAWING No:
INIT.	INIT.		A.13
JOB DATE: 02/09/24	SCALE: 1:-100@A1	JOB No: 2406	
FILE PATH: ---------			

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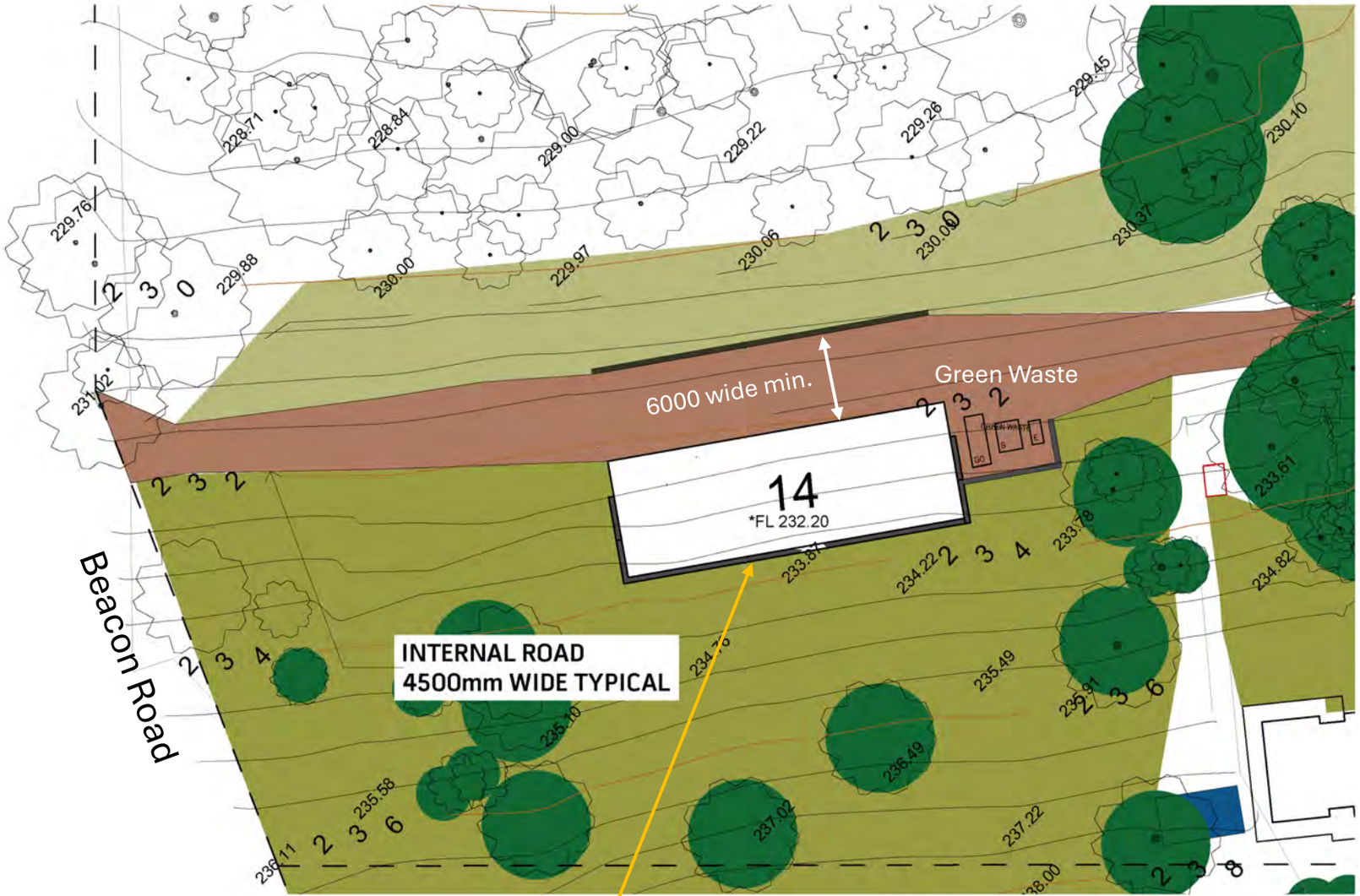
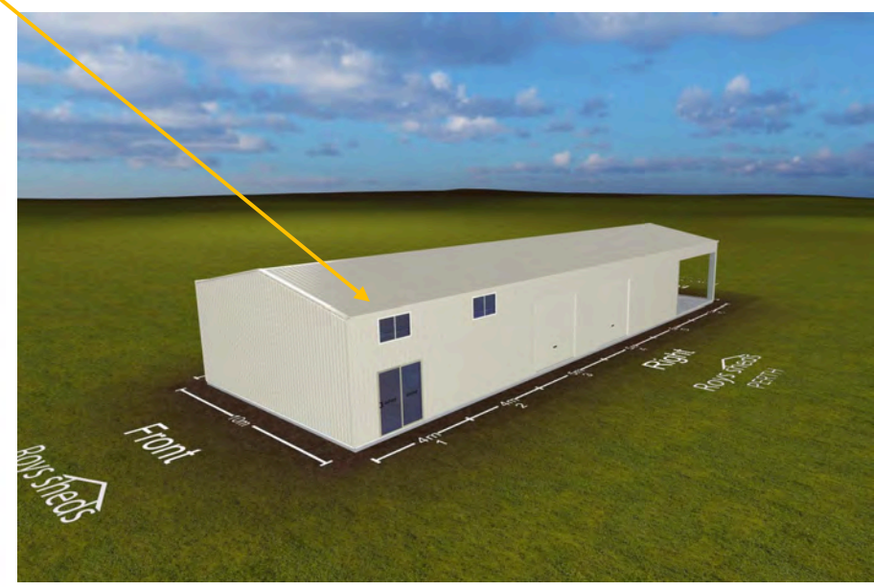
Maintenance Shed

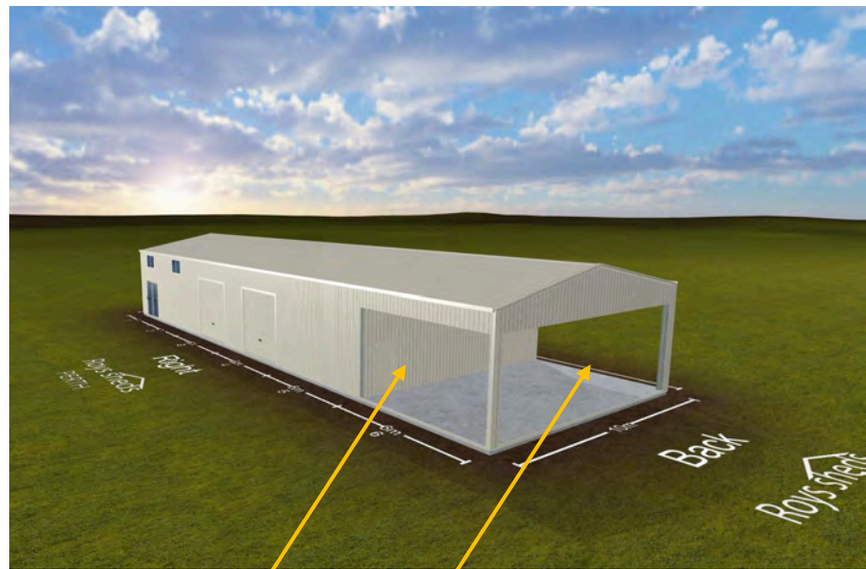
Pre-fabricated (Roys Sheds)

DRAFT



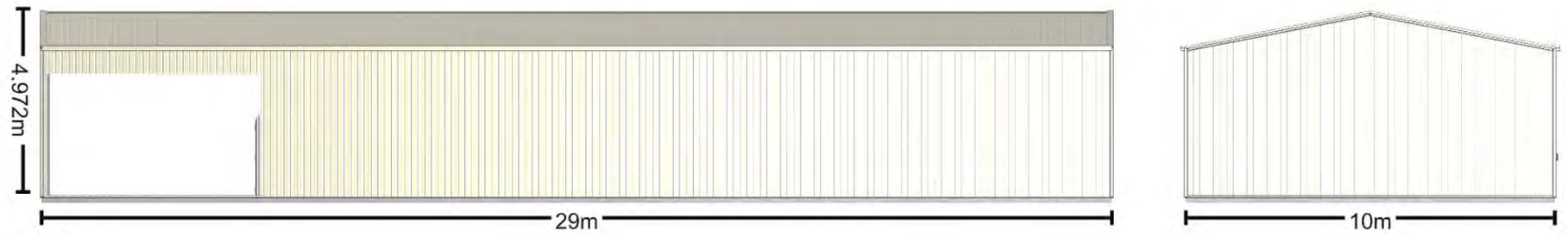
Doors and Windows
Fire shutters required to all door and window openings





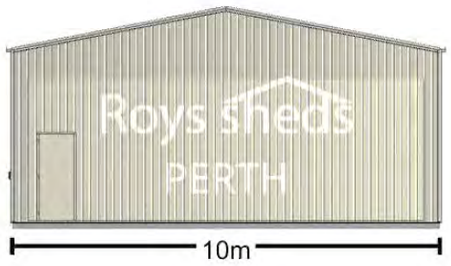
Retaining Walls
Topography requiring retaining walls where shown

Covered Service Area
Required to have roller shutters to prevent ember ingress

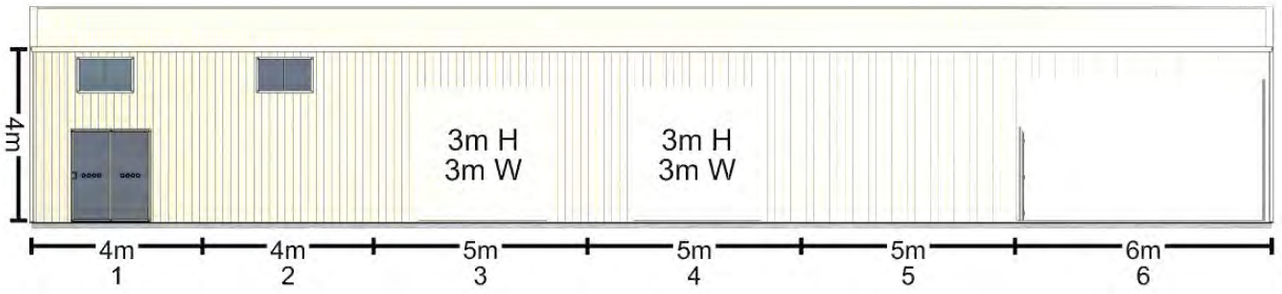


Left

Front



Back



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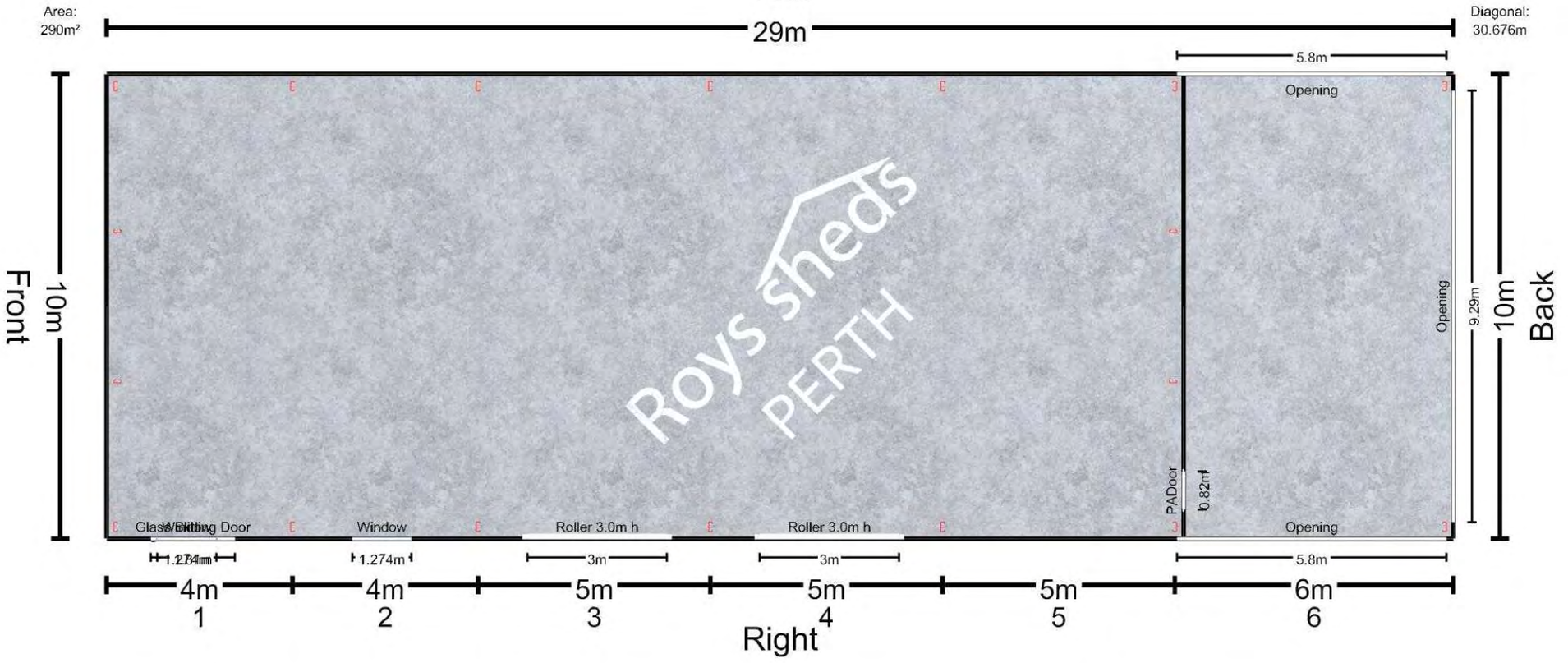

Right

SK.11.B - NEW MAINTENANCE AND GROUNDS WORKSHOP

PART D – CITY OF SWAN

1. Declarations of Due Consideration

2. Disclosure of Interests

3. Form 1 DAP Applications

3.1 Part Lot 900 Chittering Road, Lot 9501 Fairchild Street & Lot 9013 Tigermoth Boulevard, Bullsbrook – Proposed Lifestyle Village (Park Home Park) – DAP/24/02776

4. Form 2 DAP Applications

Nil.

5. Section 31 SAT Reconsiderations

Nil.

Part D – Item 3.1 – PART LOT 900 CHITTERING ROAD, LOT 9501 FAIRCHILD STREET & LOT 9013 TIGERMOTH BOULEVARD, BULLSBROOK – PROPOSED LIFESTYLE VILLAGE (PARK HOME PARK)

Form 1 – Responsible Authority Report
(Regulation 12)

DAP Name:	Metro Outer
Local Government Area:	City of Swan
Applicant:	Planning Solutions
Owner:	Amex Bullsbrook Pty Ltd, Sacri Association Inc, Tre Fontane Group Pty Ltd
Value of Development:	$20 million
Responsible Authority:	City of Swan
Authorising Officer:	Philip Russell – Manager Statutory Planning
LG Reference:	DA-692/2024
DAP File No:	DAP/24/02776
Application Received Date:	11 September 2024
Report Due Date:	18 Feb 2025
Application Statutory Process Timeframe:	90 Days with an additional 52 days
Attachment(s):	1. Location Plan 2. Development Plans a) Site Plan – A001 b) Clubhouse Floor Plan – Rev A c) House Type A Plan d) House Type B Plan e) House Type C Plan f) House Type D Plan g) Street Elevations h) E-W Elevations i) N-S Elevations j) Clubhouse Elevation – Rev A k) BBQ Plan – A3.01 l) Lookout Plan – A3.02 m) Workshop Plan <u>Other reports not subject of approval</u> 3. Planning Report – September 2024 4. Transport Impact Assessment – 10 September 2024 5. Bushfire Management Plan – 10 September 6. Updated BAL Contour Map – 6 January 2025 7. Sustainability Statement 8. Landscape Concept Plan – Rev D 9. Engineering Service Report – September 2024

	10. Environmental Assessment – 9 September 2024 11. Waste Management Plan – 10 September 2024 12. Erosion, Sediment and Drainage Control Plan – Rev1, 9 September 2024 13. Urban Water Management Plan – Rev0, 5 September 2024 14. 3D Perspectives 15. DWER Referral Response dated 11 December 2024 16. DBCA Referral Comments dated 16 December 2024 17. Main Roads Referral Comments dated 12 December 2024 18. Endorsed Design Review Report dated 1 October 2024 19. Endorsed Design Review Report dated 12 November 2024 20. Endorsed Design Review Report dated 18 December 21. Ki-It Monger Brook Crossing Plan – 6524-00-SK610, Rev A 22. Applicants Response to FIR dated 6 January 2025 23. Applicants Response to FIR dated 16 December 2024 24. Applicants Response to Submissions	
Is the Responsible Authority Recommendation the same as the Officer Recommendation?	☒ Yes ☐ N/A ☐ No	Complete Responsible Authority Recommendation section Complete Responsible Authority and Officer Recommendation sections

Responsible Authority Recommendation

That the Metro Outer Development Assessment Panel resolves to:

Refuse DAP Application reference DAP/24/02776 and accompanying plans in accordance with clause 68 of Schedule No.2 (Deemed Provisions) of the *Planning and Development (Local Planning Schemes) Regulations 2015*, and the provisions of clause 10.3 of the City of Swan Local Planning Scheme No.17. Pursuant to clause 26 of the Metropolitan Region Scheme, this application is deemed to be a refusal under clause 24(1) of the Metropolitan Region Scheme, for the following reason:

Reason

1. The proposed access road and vehicle crossing would have an undue impact on the Ki-It Monger Brook through the removal of remnant vegetation and earthworks within the waterway.

Details: outline of development application

Region Scheme	Metropolitan Region Scheme
Region Scheme - Zone/Reserve	Urban
Local Planning Scheme	Local Planning Scheme No.17
Local Planning Scheme - Zone/Reserve	Residential Development
Structure Plan/Precinct Plan	Bullsbrook Townsite District Structure Plan Bullsbrook Central Local Structure Plan Kingsford Town Centre Precinct Plan
Structure Plan/Precinct Plan - Land Use Designation	Residential
Use Class and permissibility:	Use Not Listed
Lot Size:	Lot 900 Chittering Road – 13.4496ha Lot 9501 Fairchild Street – 1.4403ha Lot 9013 Tigermoth Boulevard – 0.4212ha
Existing Land Use:	Vacant
State Heritage Register	No
Local Heritage	☒ N/A ☐ Heritage List ☐ Heritage Area
Design Review	☐ N/A ☒ Local Design Review Panel ☐ State Design Review Panel ☐ Other
Bushfire Prone Area	Yes
Swan River Trust Area	No

Proposal:

The City of Swan has received a Development Assessment Panel application from Planning Solutions on behalf of their client for a proposed Lifestyle Village (Park Home Park) over parts of Lot 900 Chittering Road, Lot 9501 Fairchild Street & Lot 9013 Tigermoth Boulevard, Bullsbrook. In total, the development comprises an area of 15.0111ha which has been calculated using the relevant portions of Lot 900, Lot 9501, and Lot 9013. The remaining portions of each respective lot will be subject to future development.

The development is for a Lifestyle Village (Park Home Park) comprised of 227 single storey park homes and communal facilities which include a clubhouse, reception centre, toilets, change rooms and communal gardens.

A total of 470 residential car parking bays are provided on site as well as 40 visitor and 30 caravan/boat bays. Main vehicle access to the subject site is proposed off Chittering Road. Crossovers onto Tigermoth Boulevard and Fairchild Street are also proposed which will be used for bushfire emergency access and cars with caravans/boats respectively.

Background:

The subject site includes Lot 900 Chittering Road, Lot 9501 Fairchild Street, and Lot 9013 Tigermoth Boulevard, Bullsbrook. The portions of each respective lot comprising this application are currently vacant and are largely cleared. The sites are generally bound by residential development to the south & east and abuts a recreation reserve to the north. The Ki-it Monger Brook creek line traverses the northern boundary of the subject site and bisects a portion of the subject site towards its western boundary.

The development site is largely identified as 'Residential' R20-R40 within the Bullsbrook Central Local Structure Plan. Furthermore, the structure plan identifies a portion of Lot 900 Chittering Road as reserved for 'recreation' comprised of areas of 'Public Open Space' and the 'Ki It Monger Brook'.

Legislation and Policy:

Legislation

- *Planning & Development Act 2005*
- Metropolitan Region Scheme (MRS)
- *Planning and Development (Local Planning Schemes) Regulations 2015*
- *Planning and Development (Development Assessment Panels) Regulations 2011*
- Local Planning Scheme No.17
- *Caravan & Camping Grounds Act 1995*
- *Caravan Park and Camping Grounds Regulations 1997*

State Government Policies

- State Planning Policy 3.7 - Bushfire
- State Planning Policy 5.4 - Road and Rail Noise
- State Planning Policy 7.0 - Design of the Built Environment
- State Planning Policy 7.3 - Residential Design Codes Volume No.1

Structure Plans/Activity Centre Plans

- Bullsbrook Townsite District Structure Plan
- Bullsbrook Central Local Structure Plan
- Kingsford Town Centre Precinct Plan

Local Policies

- POL-LP-1.10 Provision of Public Art
- POL-LP-1.13 Design Review

Consultation:

Public Consultation

The application was advertised for a period of 28 days in accordance with the requirements for a 'Complex Application' outlined in Clause 64a, Advertising Applications of the *Planning and Development (Local Planning Schemes) Regulations 2015,* Schedule No.2 Deemed Provisions. The consultation period commenced on 24 October 2024 and concluded on 22 November 2024. Letters were sent to owners and occupiers within a 200m radius, a notice was placed on the City's website and a sign was placed on-site.

During the public consultation period, a total of 50 submissions were received, comprising of 31 objections, 13 non-objections and six (6) submissions of conditional support.

All matters raised in the submissions received during the consultation period have been summarised in the table below. The Applicant has also addressed the matters raised in Attachment 24.

Issue Raised	**Officer comments**
Inappropriate land use that does not comply with the local planning scheme	Whilst the proposed land use is defined under the provisions of Local Planning Scheme No.17, it is not listed in the zoning table. In accordance with Clause 18(4)(b) of the *Planning and Development (Local Planning Schemes) Regulations 2015* the City has discretion to issue development approval in respect of a use not listed provided that use is consistent with the objectives of a particular zone. The subject site is zoned 'Residential' with a density code of R20 – R40 in accordance with the Bullsbrook Central Structure Plan. The proposed 227 Park Home lots are consistent with density requirements with what the Structure Plan envisaged. This gross density is considered to be compatible with future surrounding residential development and will not adversely impact the amenity of adjoining landowners. As the subject land is being developed essentially for urban residential purposes, City staff are satisfied the proposal is consistent with the objectives of the 'Residential Zone' and the structure plan which aims to provide diverse housing options, improve housing supply, and enhance affordability through urban development.
Environmental impacts on Ki-It Monger Brook	The management of the Ki-it Monger Brook has been addressed through the Foreshore Wetland Management Plan and Sediment & Drainage control Plan. Further, should the development be approved, a condition will be recommended requiring the

	preparation of an Urban Water Management Plan, Stormwater Management Plan as well as the installation of fencing around the brook.
Adverse impact of traffic on the surrounding road network	The proposed number of park homes is consistent with the intended lot yield for the site and forms part of the anticipated traffic generation of the Kingsford Town Centre Precinct which was planned for as part of the approved structure plan. The Traffic Impact Assessment prepared and submitted in support of the application concludes the development will have negligible impact on the surrounding road network.
Increased bushfire safety risks	The Bushfire Attack Level (BAL) assessment concludes the development achieves an acceptable BAL rating of BAL-29.
Inadequate infrastructure & community resources within the Bullsbrook area	The provision of sufficient community infrastructure was planned for as part of the approved structure plan.
Adversely impact the areas rural character	The subject site is identified as 'Residential' in accordance with the approved structure plan and is intended to be developed for residential purposes. The surrounding area has already been developed into residential lots.
Reduced Property Value	Impact on property values of itself is not a valid planning consideration.

Referrals/consultation with Government/Service Agencies

Main Roads Western Australia (MRWA):

The application was referred to MRWA for comment in accordance with the Instrument of Delegation (DEL 2022/03) as the subject site is affected by the Category No.2 Primary Regional Road Reservation (Great Northern Highway). MRWA advised they have no objection to the development subject to conditions and advice in regard to stormwater and construction within the road reserve.

Department of Biodiversity, Conservation and Attractions (DBCA):

The application was referred to DBCA for comment due to the proposed crossing over Ki-It Monger Brook. DBCA identified several matters which should be addressed prior to an approval being issued and recommended conditions regarding landscaping, erosion control and foreshore management. This has been addressed further in the report.

Department of Water and Environmental Regulation (DWER):

The application was referred to DWER due to the proposed crossing over Ki-It Monger Brook. DWER advised they object to the proposal due to the impact the development will have on water values and management as well as the access road through the Ki-It Monger Brook. The key issues raised by DWER have been addressed in the 'Planning Assessment' section of this report.

Planning Assessment

Zoning and Use Class Permissibility:

The subject site is zoned 'Urban' under the MRS and 'Residential Development' under the City of Swan's Local Planning Scheme No.17. The Zoning Table of Local Planning Scheme No.17 states that for land zoned 'Residential Development' development and the use of land is to be in accordance with an approved Structure Plan.

The land is subject of an approved Structure Plan – being the Bullsbrook Central Structure Plan approved by the Western Australian Planning Commission on 14 May 2019 and amended on 8 August 2024. This Structure Plan designates the majority of the land as 'Residential' (R20-R40) with a small portion reserved for 'Recreation'. Clause 4.1 of the structure plan states:

'Land Use permissibility within the Structure Plan area shall be in accordance with the Structure Plan Map (Plan 1) and the corresponding Zones and Reserves under the City of Swan Local Planning Scheme No.17.'

For the purposes of determining the permissibility of land uses, reference must be made to the 'Residential' zone set out in the Zoning Table of Local Planning Scheme No.17. The application seeks approval for a 'Park Home Park' which is defined under Local Planning Scheme No.17 as:

> ***"Park Home Park"*** *has the same meaning as in the Caravan Parks and Camping Grounds Regulations 1997.*

In accordance with the *Caravan Parks and Camping Grounds Regulations 1997* a 'Park Home Park' is defined as:

> ***"Park Home Park"*** *means a caravan park at which park homes, but not any other caravans or camps, are situated for habitation'.*

A 'Park Home' is defined under the *Caravan Parks and Camping Grounds Act 1995* as:

> *"**Park Home"** means a vehicle of a prescribed class or description that is fitted or designed for habitation.*

The *Caravan Parks and Camping Grounds Regulations 1997* further details the meaning of a 'Park Home'

> *"A caravan in respect of which a vehicle licence is not required under the Road Traffic (Vehicles) Act 2012 section 4, because it could not be drawn by another vehicle on a road due to its size, is a vehicle of a prescribed class or description for the purposes of the definition of "park home" in section 5(1) of the Act."*

It is important to note, a 'Caravan Park' is identified as a separate land use class in Local Planning Scheme No.17 and means:

> ***"Caravan Park"*** *has the same meaning as in the Caravan Parks and Camping Grounds Act 1995."*

A 'Caravan Park' is defined under the *Caravan Parks and Camping Grounds Act 1995* as:

> ***"Caravan Park"*** *means an area of land on which caravans, or caravans and camps, are situated for habitation."*

The key difference between a 'Caravan Park' and 'Park Home Park' is the use of caravans and tents as well as the duration of the stay. Caravan Parks are generally used by people with caravans or tents for short-stay accommodation and are not occupied for longer than three (3) consecutive months. In contrast, a 'Park Home Park' generally consists of prefabricated buildings (Park Homes) occupied as permanent homes.

Although a 'Park Home Park' is defined under Schedule No.1 of Local Planning Scheme No.17, the use is not included in the Zoning Table. For this reason, the proposed development has been considered a 'Use Not Listed'.

In accordance with Clause 18(4) of the *Planning and Development (Local Planning Schemes) Regulations 2015,* 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 may be consistent with the objectives of a particular zone and advertise under clause 64 of the deemed provisions before considering an application for development approval for the use of the land

Therefore, to determine if the land use is appropriate within the 'Residential' zone, the application has been assessed against the objectives of the nominal zoning and having due regard to the matters set out in Regulation 67 of Schedule No.2 (Deemed Provisions) of the *Planning and Development (Local Planning Scheme) Regulations 2015* inclusive of submissions from the public and government agencies.

The objectives of the 'Residential' zone are to:

a) Provide for a range of forms and densities of residential development to meet the needs of the wide variety of households which make up the community;

b) Promote a residential environment in each locality consistent with the form and density of residential development permissible in the locality, so as to enhance a sense of place and community identity;

c) Preserve and enhance those characteristics which contribute towards residential amenity, and to avoid those forms of development which have the potential to prejudice the development of a safe and attractive residential environment;

d) Provide for a limited range of ancillary development compatible with the form and density of residential development and complementary to the needs of local communities, but which will not compromise residential amenity;

e) Avoid development of land for any purpose or in any manner that would detract from the viability or integrity of development in either the Strategic Regional Centre or the Commercial Zones.

During the public consultation period, the City of Swan received nine (9) objections stating that the development was an inappropriate use of the site and would be incompatible with the surrounding residential areas. A further seven (7) objections raised concerns with a lack of infrastructure and facilities within the area to service the development.

Profile ID statistics highlight that Bullsbrook has a higher proportion of residents aged 60+ (19.4%) compared to the City of Swan (16.7%). In the 2023-2024 LAP consultation, "opportunities for seniors" ranked as the 7th most popular theme out of 12, with feedback indicating a need for aged care or retirement village options to support the aging population in staying within the area. The proposed 'Park Home Park' will contribute to providing seniors with a downsizing option. Furthermore, the development will provide diverse housing options, improve housing supply, and enhance affordability through urban development. Therefore, the development is considered to comply with objective a).

With regards to objective b) the approved Bullsbrook Central Structure Plan identifies the subject site has a nominal zoning of 'Residential' R20-40. Based on the minimum and average site area requirements applicable to the R20 density, the number of residential lots that could be created through conventional subdivision is 237. Furthermore, the structure plan projects a yield of 22 dwellings per site hectare across the Kingsford Estate. Based on this, the proposed 227 park homes align with the residential density envisioned for the site under the structure plan and satisfies objective b).

The development proposes 227 park homes as well as ancillary community infrastructure throughout the site. The entire landholding will be on one (1) title – there will only be one (1) lot. The sites will have boundaries, shown by fence lines but they just identify the lease boundaries for each park home. As the project is land lease and the homes are park homes, they are covered by the *Caravan & Camping Grounds Act 1995* and the *Caravan Park and Camping Grounds Regulations 1997*. The proposal is considered to comply with the built form requirements of the *Caravan Park and Camping Grounds Regulations 1997* with regards to building heights and internal road widths.

Seven (7) submissions raised concerns about a lack of community infrastructure to service the development. Planning for the provision of sufficient community infrastructure was undertaken as part of the approved structure plan and was largely based on the anticipated lot yield for the area. Given the proposed number of park home are consistent with the intended lot yield for the site, the development will not place an undue burden on the availability of community infrastructure within the area.

The development is considered a residential typology that will not compromise the amenity and can preserve and enhance those characteristics which contribute towards residential environment that can be measured against proposed traffic generation. The proposed number of park homes is consistent with the intended lot yield for the site and forms part of the anticipated traffic generation of the Kingsford Town Centre Precinct which was planned for as part of the approved structure plan.

Furthermore, the Traffic Impact Assessment (TIA) prepared and submitted in support of the application concludes the development will have negligible impact on the surrounding road network.

It is noted that 17 submissions raised concerns with the development's impact on the rural character and amenity of the area. Notwithstanding, the subject site is identified as 'Residential' in accordance with the approved structure plan and is intended to be developed for residential purposes. The surrounding area has already been developed into residential lots and the 227 single storey park homes are consistent with the current built form characteristics of the area.

State Planning Policy 7.0 – Design of the Built Environment

The development has been considered against State Planning Policy 7.0 – Design of the Built Environment. State Planning Policy 7.0 outlines the 10 principles for good design and establishes the framework for integrating design review as a part of the evaluation process. The City of Swan's Local Planning Policy POL-LP-1.13 Design Review requires all Development Assessment Panel applications be subject to the design review process.

The development was presented at the City of Swan's Design Review Panel meeting on 1 October 2024 and again on 12 November 2024. A further Chair Review was undertaken by the Design Review Panel Chairperson on 18 December 2024. The final Design Review comments conclude support for the development, with comments regarding recommended conditions of approval in respect to the provision of a landscape plan as well as details, colours and materials of the selected house types. City of Swan staff consider conditions will address the remaining concerns raised by the Design Review.

Environmental Considerations

The application was referred to both the Department of Biodiversity Conservation and Attractions (DBCA) and the Department of Water and Environmental Regulations (DWER) due to the proposed crossing over Ki-It Monger Brook. Both departments did not support the proposal. Their primary concerns have been summarised and addressed below.

Management

Both DBCA and DWER are concerned the development will prevent the appropriate management of the Ki-it Monger Brook and foreshore area. The DBCA requested the Applicant/Landowner prepare a Foreshore Management Plan to ensure the protection and rehabilitation of the brook.

Notwithstanding, the City of Swan have approved 'The Ki-it Monger Brook Foreshore and Wetland Management Plan' which sets out management strategies to ensure the preservation of the Ki-It Monger Brook. This plan is currently being used to manage other areas of the Ki-It Monger Brook within the Kingsford Estate. Taking this into consideration, City of Swan staff are satisfied the Ki-it Monger Brook can be appropriately protected and managed.

Should the application be approved, a condition will be recommended requiring the development to be managed in accordance with the approved Foreshore Wetlands Management Plan and include a requirement for the landowner to enter into a maintenance agreement with the City of Swan. Furthermore, as per advice from DBCA, a condition requiring fencing to restrict pedestrian access into the foreshore reserve will also be recommended.

Crossing

The primary concern raised by both DBCA and DWER was the impact the vehicle crossing would have on the Ki-It Monger Brook through the removal of remnant vegetation and earthworks within the waterway. Additionally, both agencies contend the crossing over the Ki-It Monger Brook should be realigned to avoid clearing of native vegetation and prevent filling or other impacts to the waterway.

City of Swan staff concur that the development fails to provide sufficient evidence to demonstrate the vehicle crossing will not significantly impact the Ki-It Monger Brook. Until such time further information is provided detailing the number of trees being removed and the extent of fill within the brook, the City of Swan is unable to support the development,

As such, refusal of the application is recommended.

Bushfire

The subject site is bushfire prone with the greatest exposure to radiant heat experienced from the north and west of the development site which abuts the Ki-It Monger Brook.

The Applicant has submitted a Bushfire Management Plan in support of the proposal. City of Swan staff are satisfied that the submitted Bushfire Management Plan demonstrates that each individual park home lot can achieve a BAL-29 rating, and that the bushfire risk to the development can be adequately managed in accordance with State Planning Policy 3.7.

Should the development be approved, conditions will be recommended where the development site is to be maintained in accordance with the submitted Bushfire Management Plan.

Traffic & Access

Principle vehicle access to the Park Home Park is achieved from Chittering Road via an internal road that crosses the Ki-It Monger Brook. Secondary access for caravan and boat parking is proposed from Amelia View and there is an emergency egress point onto Boomerang Road.

The Bullsbrook Central Structure Plan has identified the subject site for broad residential purposes. Given the proposed number of park homes is consistent with the nominal density, City of Swan staff concur that the number of vehicle trips generated by the development is consistent with the level of traffic generation

expected and assessed as part of the preparation of the approved Bullsbrook Central Structure Plan.

Furthermore, the Traffic Impact Assessment (TIA) prepared and submitted in support of the application details that the proposed development is expected to generate approximately 128 vehicle trips (61 in / 67 out) during peak AM periods and 140 vehicle trips (75 in / 65 out) during peak PM hours, 70% of which will be right hand turns onto Chittering Road. The TIA concludes the traffic generated by the development will have a negligible impact on the surrounding road network.

Notwithstanding, both the Department of Biodiversity, Conservation and Attractions and the Department of Water and Environmental Regulation objected to the proposal. Their principle concern was that the crossing would have a detrimental impact on the Ki-It Monger Brook through the removal of remnant vegetation and earthworks within the waterway.

In light of the above, City of Swan staff are unable to support vehicle access from Chittering Road via a new driveway and crossing over the Ki-It Monger Brook until sufficient evidence is provided that demonstrates the vehicle crossing will not adversely impact the Ki-It Monger Brook. The development hinges on using Chittering Road as its primary access and without this, the subject site has no other arterial access points.

As such, refusal of the application is recommended.

Developer Contributions

The proposed development is on land that is subject to an approved Development Contribution Plan for contributions to the cost of the provision of transport and community infrastructure for the Bullsbrook Central Structure Plan area and is within Development Contribution Area No.7 (DCA7 - Precinct 2).

The subject site contains land zoned 'Recreation' under the provisions of the Kingsford Local Structure Plan. Conservation Areas and Public Open Space are listed as a deduction from the gross subdivisible area in accordance with DCA7. The portion of the subject site that is zoned ‘Recreation’ will be excluded accordingly from any cost contribution.

Should the development be approved, a condition will be recommended requiring the Applicant contributing towards development infrastructure provisions pursuant to the City of Swan Local Planning Scheme No.17 based on the lot size at a rate per hectare.

Public Open Space (POS)

A minimum of 10% of the gross subdivisible area within the Structure Plan needs to be provided as POS and ceded to the Crown. The Bullsbrook Central Structure Plan has provided 21.7ha of POS which is 11.39% of the gross subdivisible area.

The Structure Plan identifies 1.16ha of the subject site as POS which is going to be retained in private ownership and used for recreational purposes by the residents of the Park Home Park.

Keeping the 1.16ha of Lot 900 Chittering Road in private ownership will not reduce the total amount of POS within the structure plan area below the required 10%.

Excluding the 1.16ha of POS on the subject site, the overall provision of POS within the structure plan area would be recalculated at 10.06% (20.09ha) still exceeding the 10% minimum requirement.

In light of the above, City of Swan staff are satisfied the retention of that part of the subject site identified as POS will not impact the overall POS availability in the structure plan area.

State Planning Policy 5.4 - Road and Rail Noise

The south western aspect of the subject site is within an area subject to State Planning Policy 5.4 - Road and Rail Transport Noise and Freight Considerations in Land Use Planning, due to its proximity to Great Northern Highway, a 'strategic freight/ major traffic route'. Table No.1 of State Planning Policy 5.4 identifies the State's transport corridors and the trigger distances to which the policy applies.

Great Northern Highway, in proximity to the subject site, is a two (2) lane road with Table No.2 of State Planning Policy 5.4 identifying that no further measures are required for sensitive premises located in excess of 150m from the edge of the road carriageway. The Park Homes located in the south western aspect of the subject site are located more than 250m from the edge of the Great Northern Highway Road carriageway. In light of this information, no noise mitigation measures are required.

Local Planning Policy POL-LP-1.10 Provision of Public Art

The City of Swan's Provision of Public Art Policy requires the proponent to make a contribution to Public Art. This can be either a cash-in-lieu contribution of $170,000 (being 1% of the estimated $20 million development cost inclusive of the applicable 15% discount per the Policy), or the provision of Public Art onsite to the value of $200,000. This is recommended as a condition of approval should the development be approved.

Conclusion

The City of Swan has received a Development Assessment Panel application for a proposed Park Home Park over parts of Lot 900 Chittering Road, Lot 9501 Fairchild Street, and Lot 9013 Tigermoth Boulevard, Bullsbrook. The proposed development has been considered a 'Use Not Listed' under the City of Swan's Local Planning Scheme No.17.

The subject site is zoned 'Urban' under the MRS and 'Residential Development' under Local Planning Scheme No.17. The land is subject of an approved Structure

Plan – being the Bullsbrook Central Structure Plan that designates the majority of the land as 'Residential'.

The built form of the development is considered compatible with the surrounding residential development. Furthermore, the proposed number of park homes is consistent with the intended density envisioned by the Structure Plan. It is also concluded that site access and traffic generated as a result of the proposed development will not adversely impact the surrounding road network.

Notwithstanding the above, the application has not addressed the objections raised by both the Department of Biodiversity, Conservation and Attractions and the Department of Water and Environmental Regulations. The development fails to provide sufficient evidence to demonstrate the vehicle crossing will not significantly impact the Ki-It Monger Brook. Until such time further information detailing the number of trees being removed and the extent of fill within the brook is provided, the City of Swan is unable to support the development.

It is recommended that the Metro Outer Development Assessment Panel refuse the application, for the following reason:

1. The proposed access road and vehicle crossing would have an undue impact on the Ki-It Monger Brook through the removal of remnant vegetation and earthworks within the waterway.



city of swan

DISCLAIMER: Information shown hereon is a composite of information from various different data sources. Users are warned that the information is provided by the City of Swan in this format as a general resource on the understanding that it is not suitable as a basis for decision making without verification with the original source.

14 January 2025

1:3000

N



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LEGEND

- LANDSCAPING
- 'RECREATION' ZONED AREA
- CORE CREEK AREA
- AREA SUBJECT TO FORESHORE & WETLAND MANAGEMENT PLAN
- VILLAGE AMENITIES
- LANDSCAPED DRAINAGE BASINS
- FENCE/GATE
- ROADWAY
- CADASTRAL BOUNDARY
- LEASE AREA BOUNDARY
- STONE PITCHED BANK

TOTAL HOUSE SITES - 227

TOTAL LEASE SITE AREA - 106,988m²
(NOT INCL. SHARED REC. AREA)

TOTAL RECREATION AREA - 35,286m²
(INCL SHARED REC. AREA)

N

ISSUE	DESCRIPTION	DATE
D	ENTRY MOVED, LOT NUMB. ADDED	19.08.2024
E	HOUSE-LOT ALLOCATION	02.09.2024
F	REVISED MASTERPLAN	09.10.2024
G	ROAD & LOT LAYOUT REVISED	05.12.2024
H	BAL & AERIAL ADDED	14.01.2025

DRAWING TITLE
Masterplan

PROJECT
BETHANIE - BULLSBROOK VILLAGE
CLIENT
BETHANIE
PROJECT ADDRESS
CHITTERING ROAD, BULLSBROOK, WA, 6084

Project number	-
Date	05.12.2024
Drawn by	RHA
Checked by	RHA
Scale @ A3	1 : 1500

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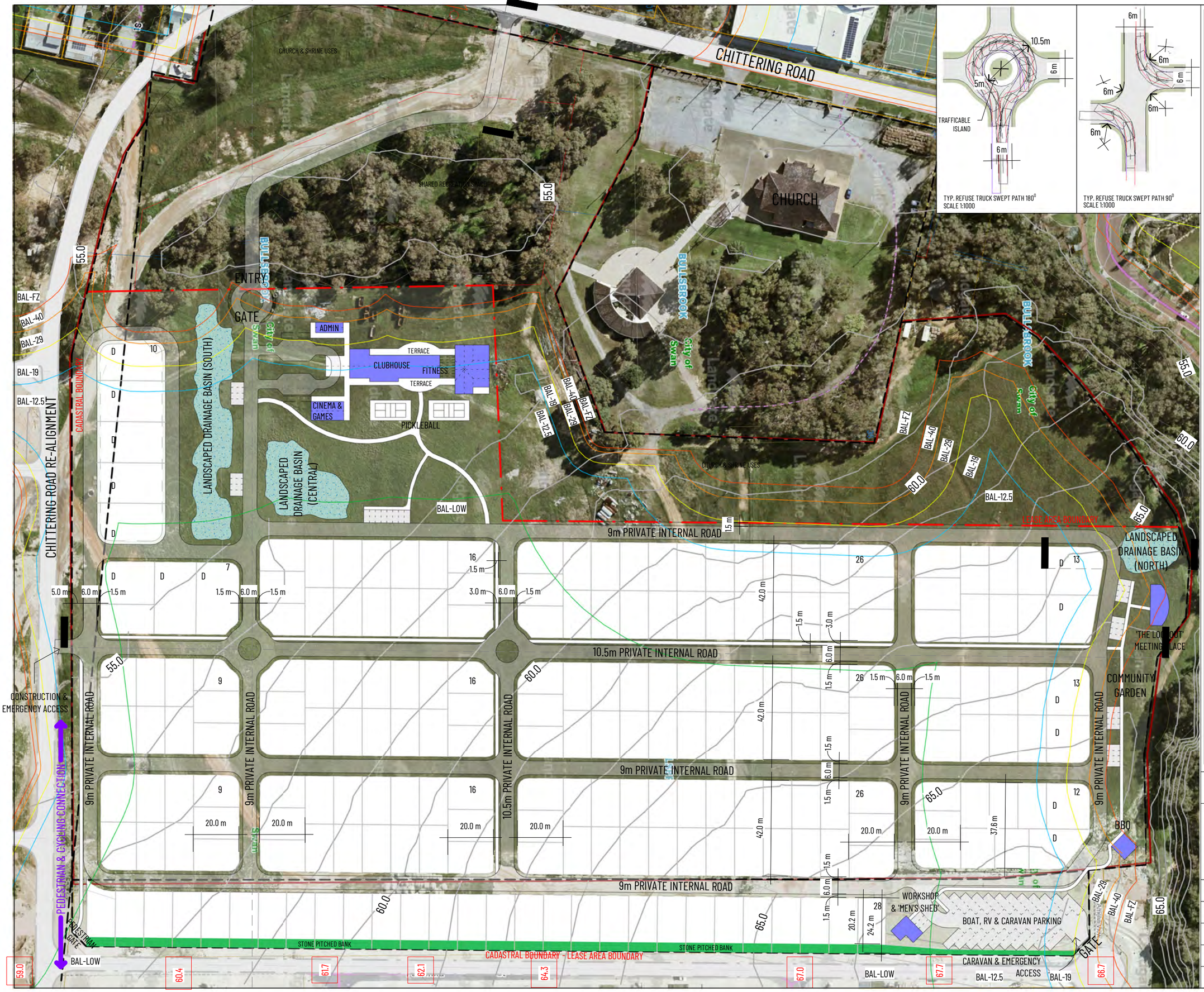

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Date	05.12.2024
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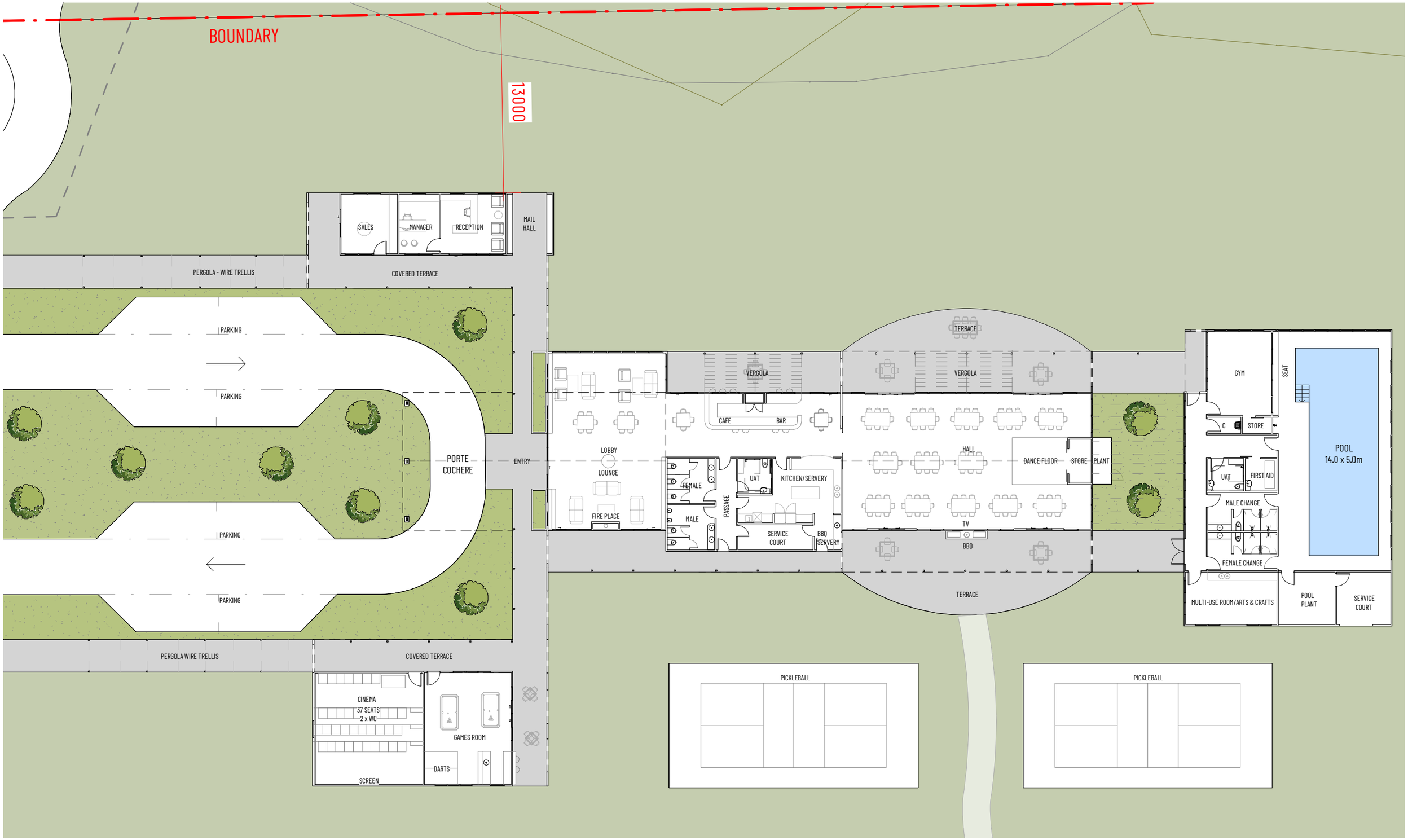

CLUBHOUSE INTERNAL AREA: 890m^2

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BETHANIE BULLSBROOK
CLUBHOUSE CONCEPT DESIGN RevA
SCALE | 1:250 @A3 22.08.2024

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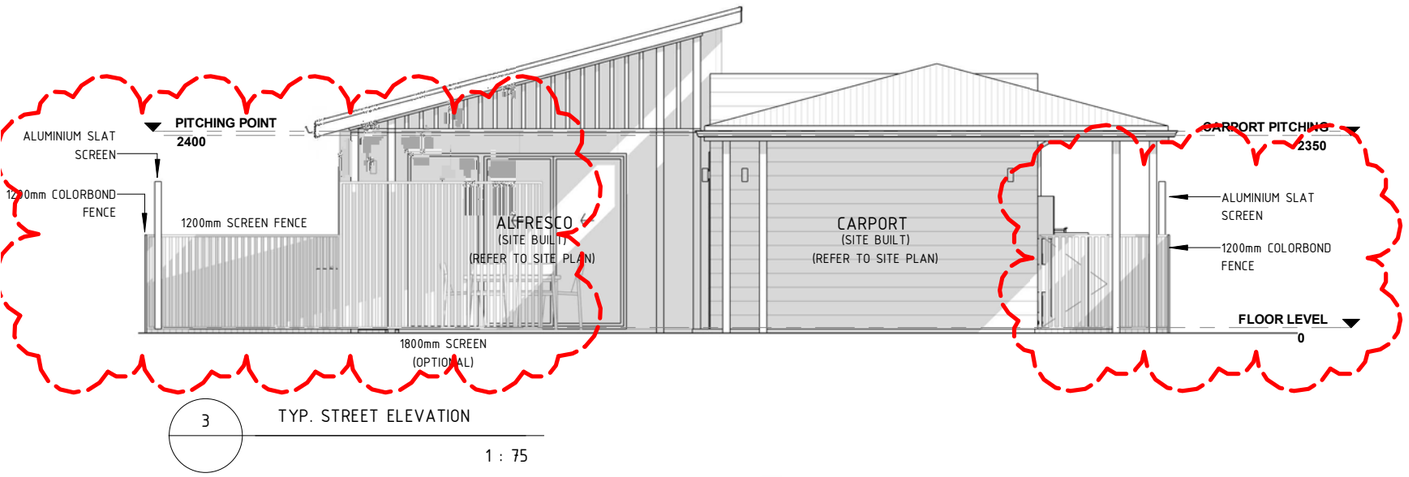

3 TYP. STREET ELEVATION

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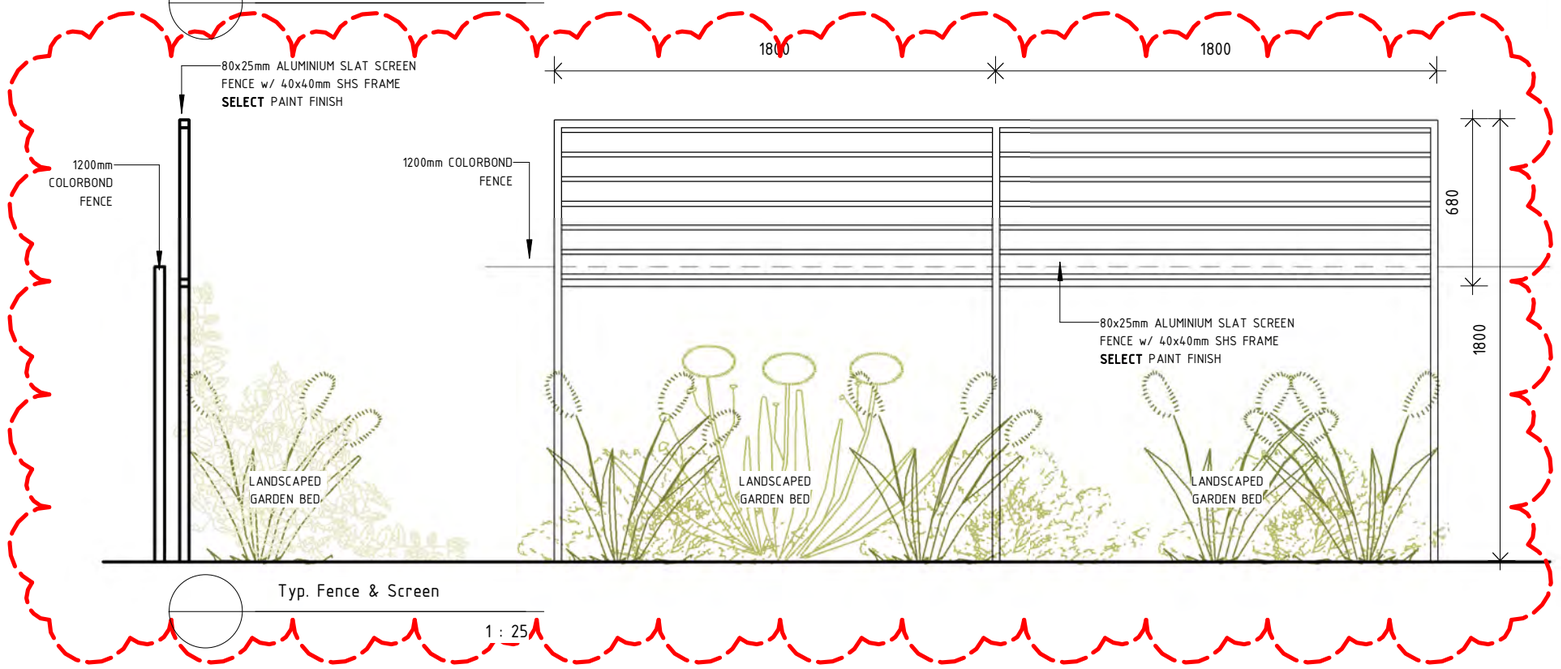
2 3D View



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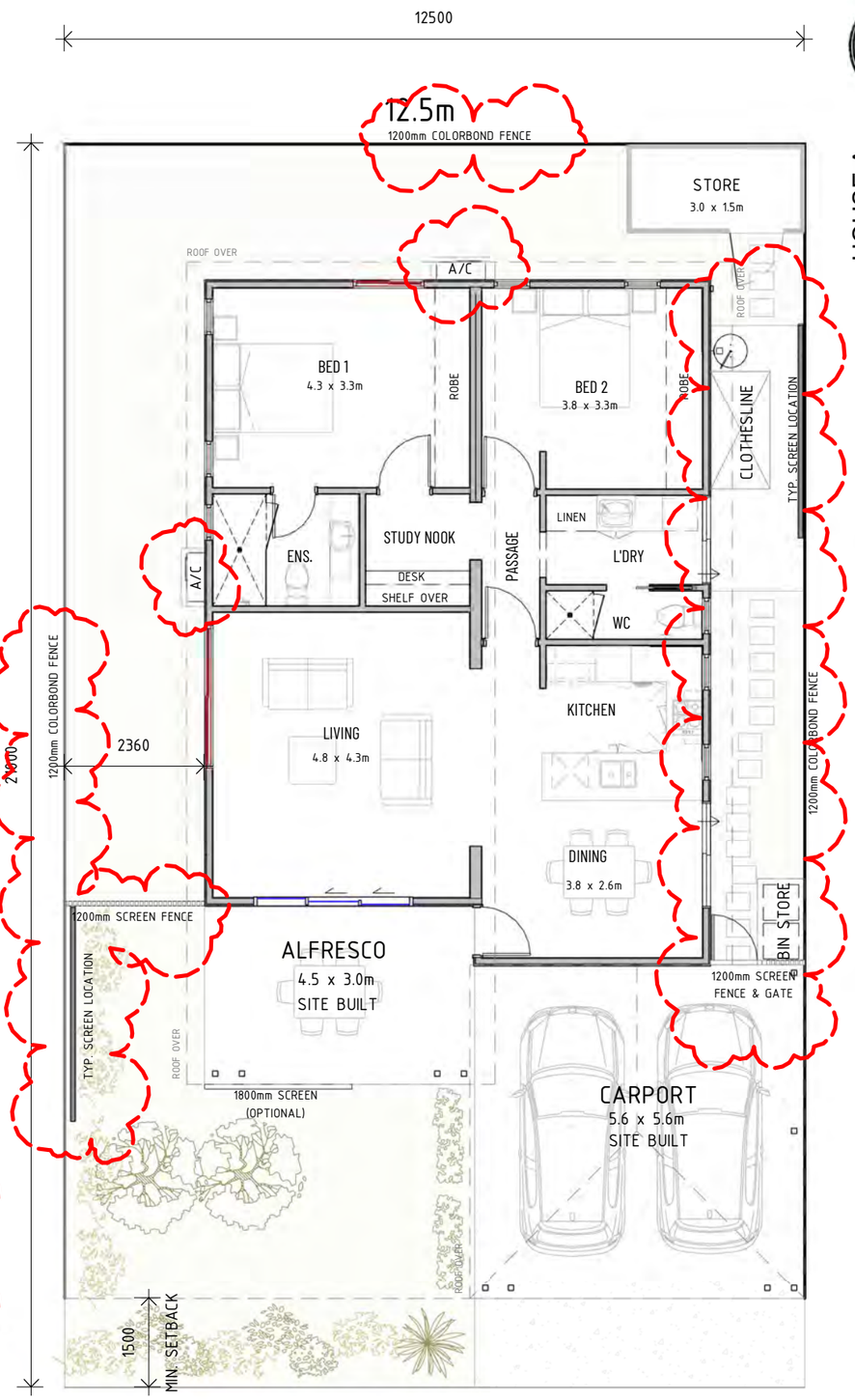

HOUSE A

A

31.10.2024

HOUSE A DESIGN | 1:100

N

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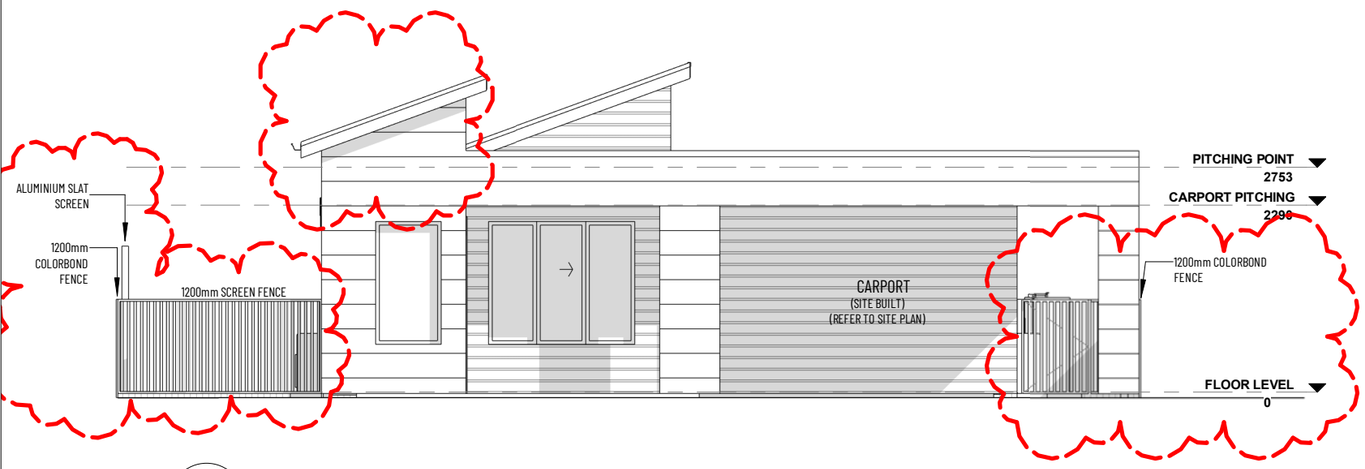

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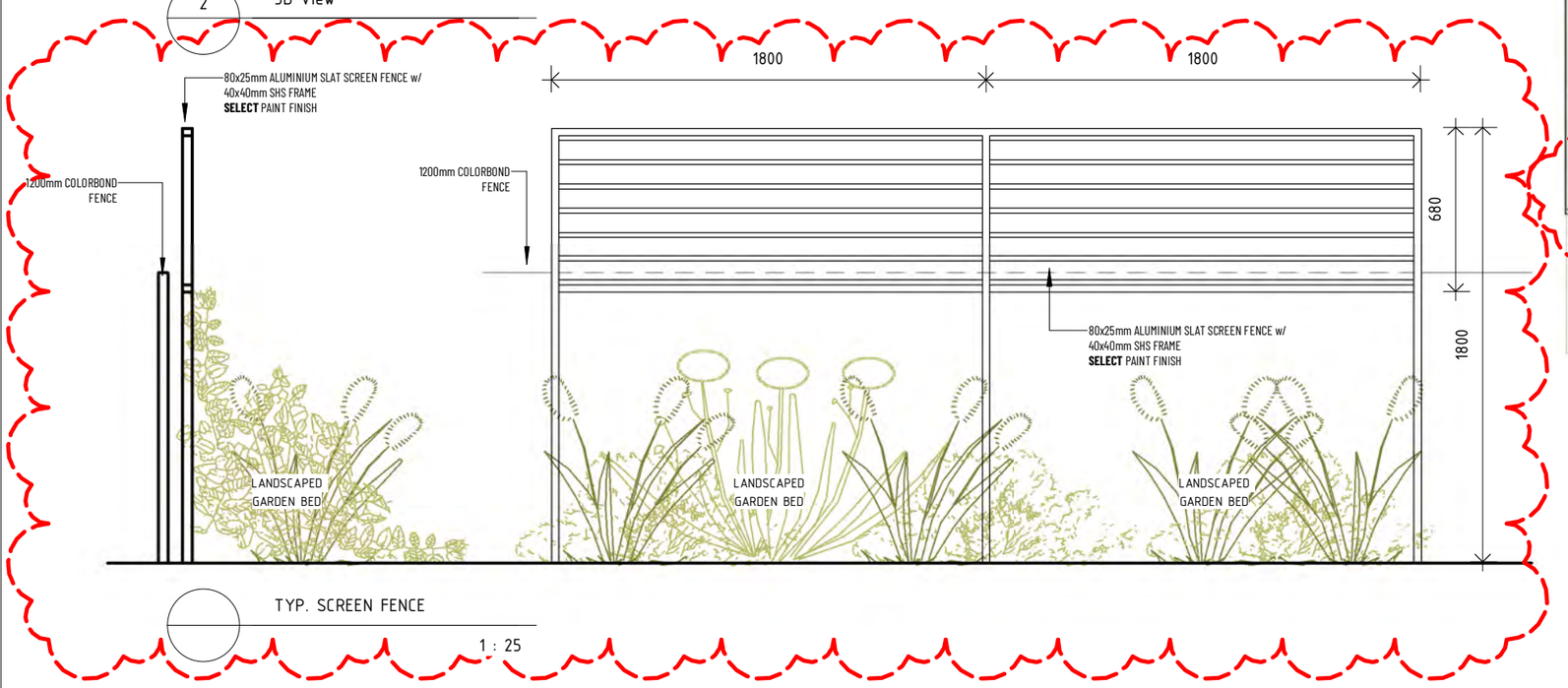

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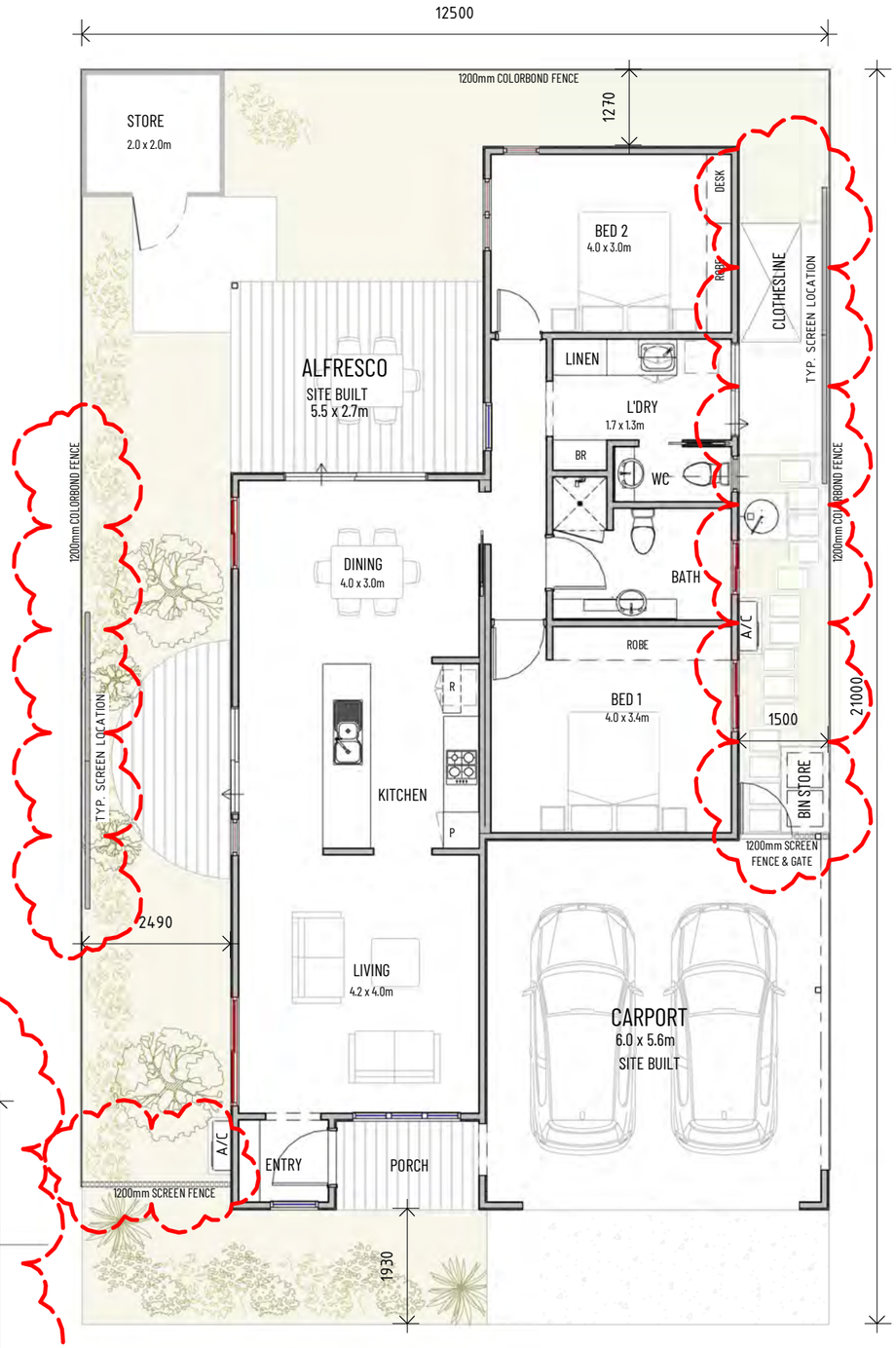

HOUSE B DESIGN | 1:100 N

HOUSE B

31.10.2024

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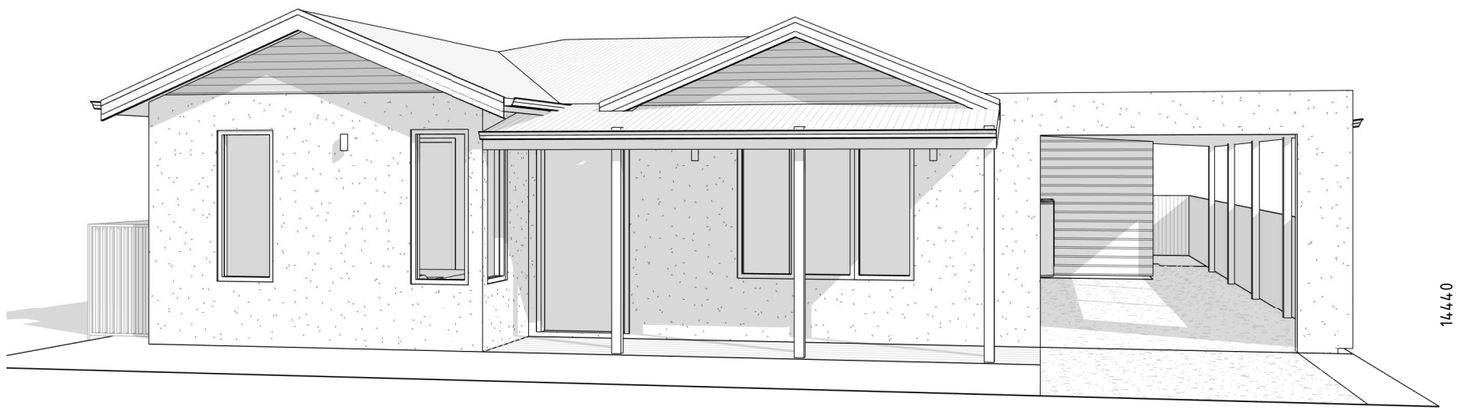

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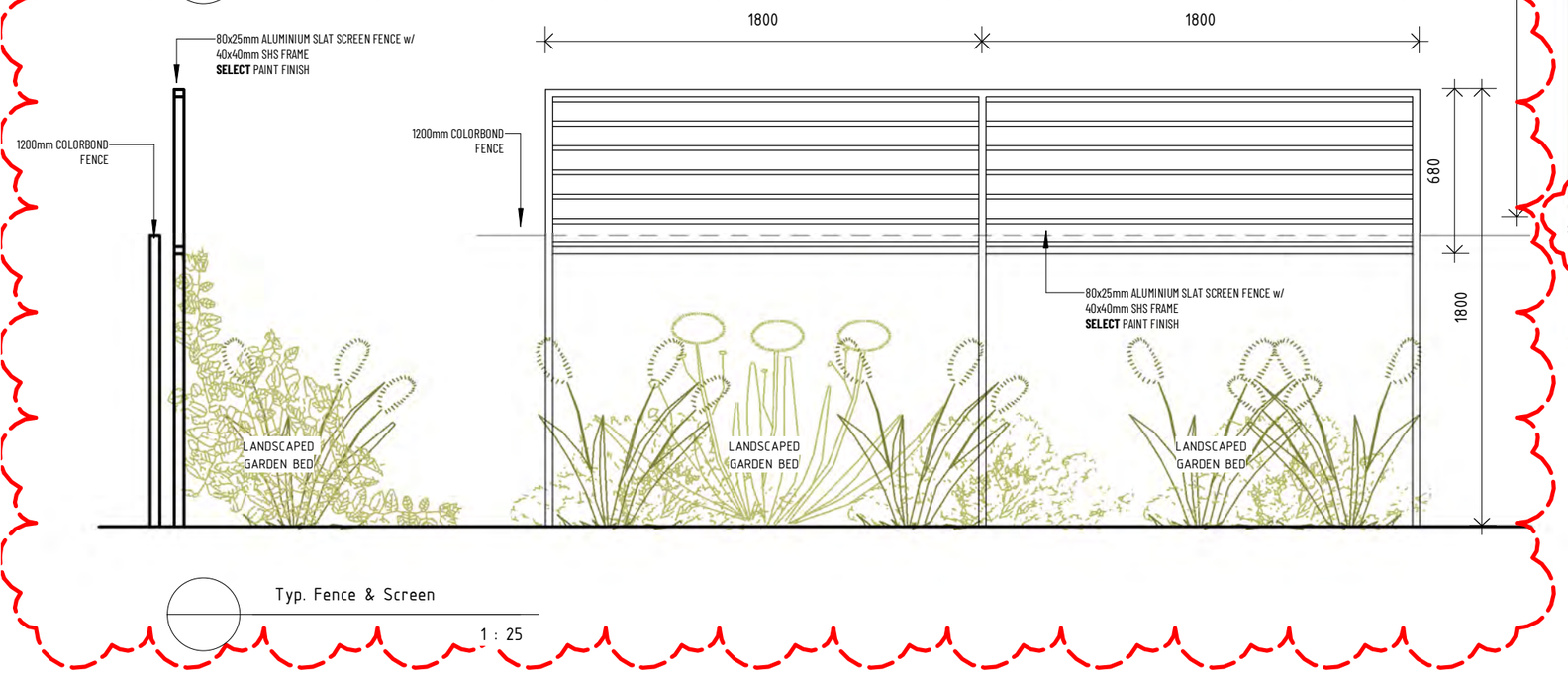

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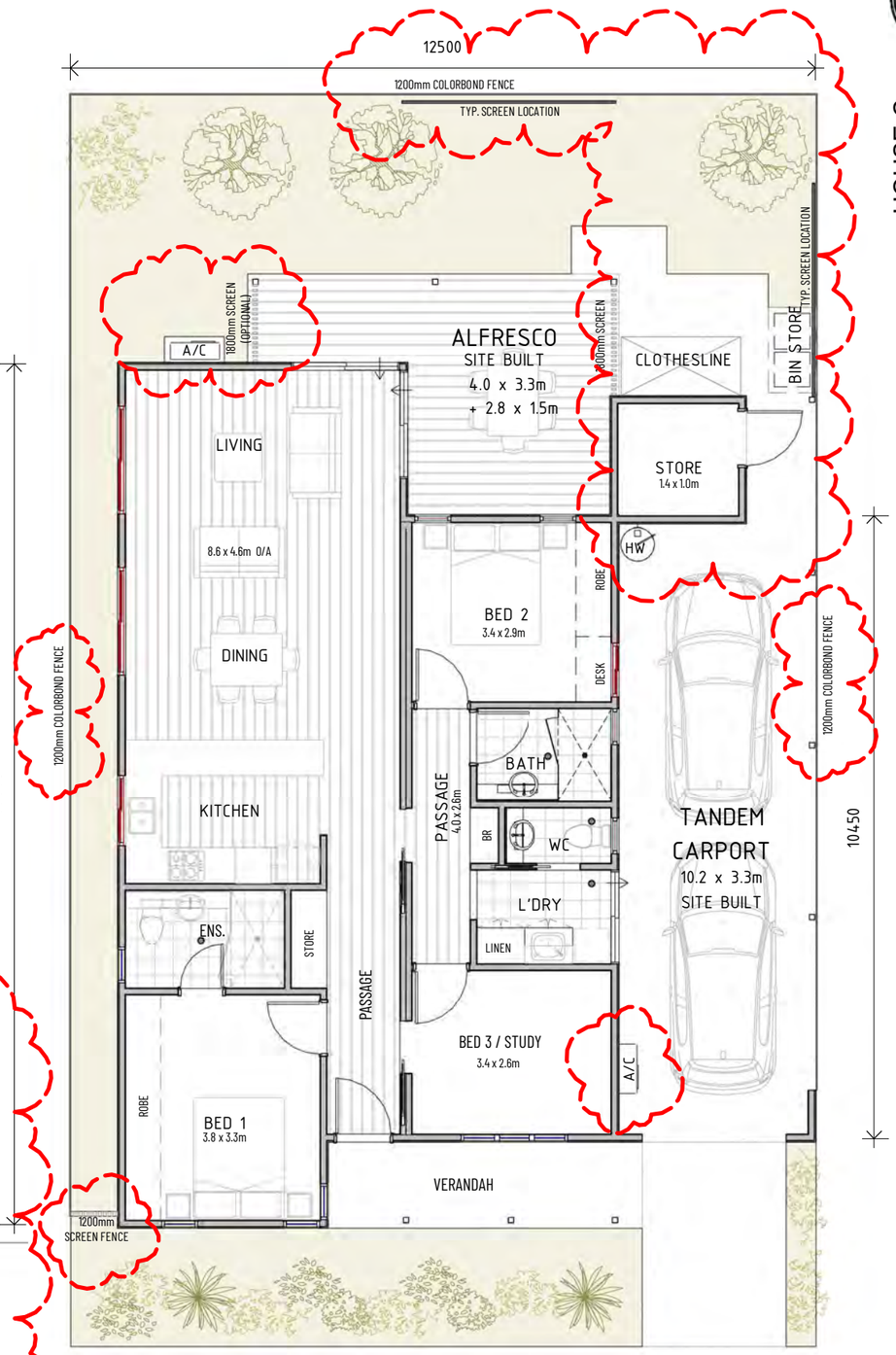

HOUSE C DESIGN | 1:100 N

HOUSE C
A
31.10.2024

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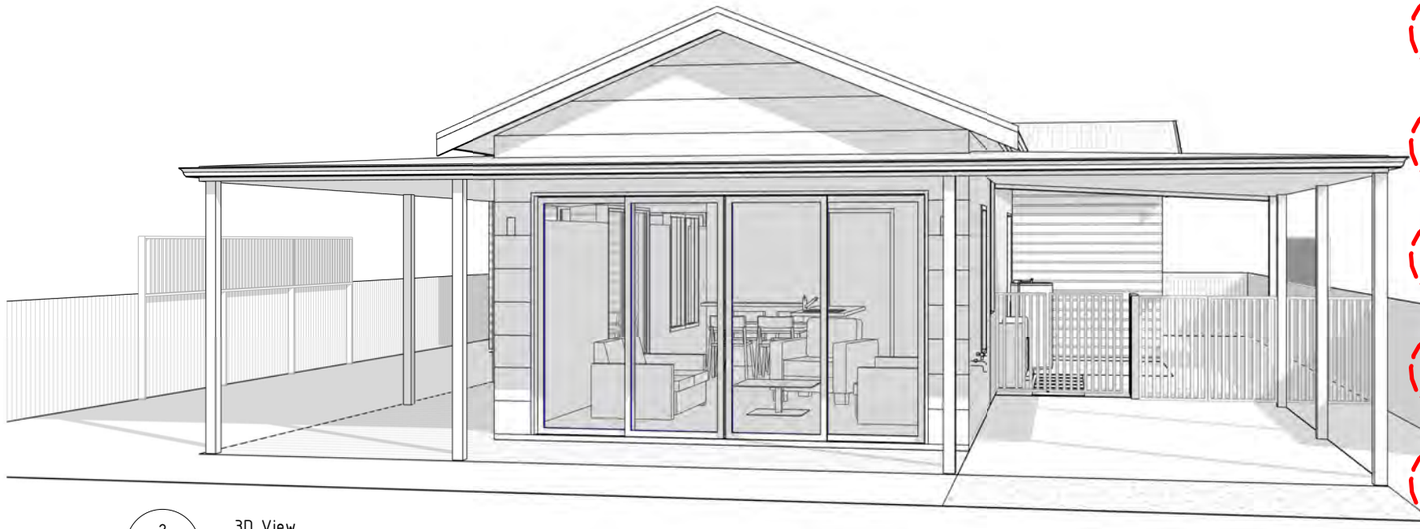

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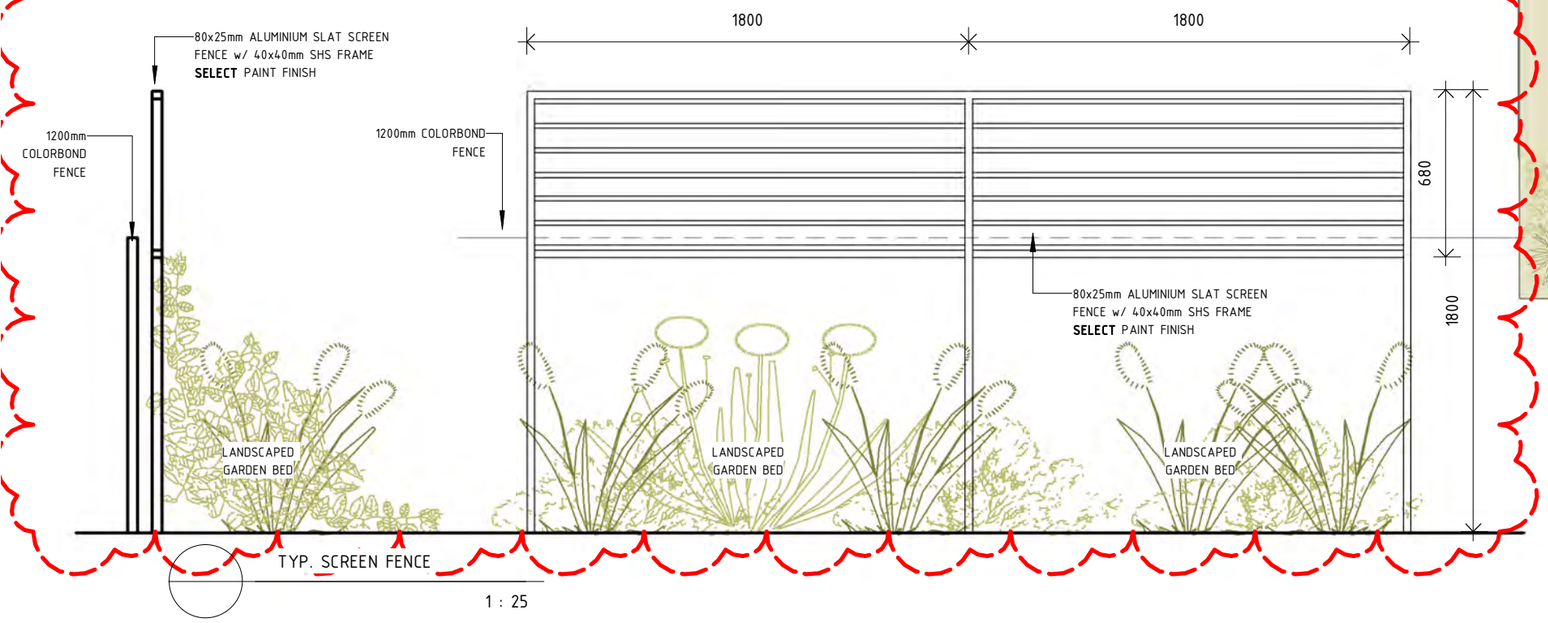

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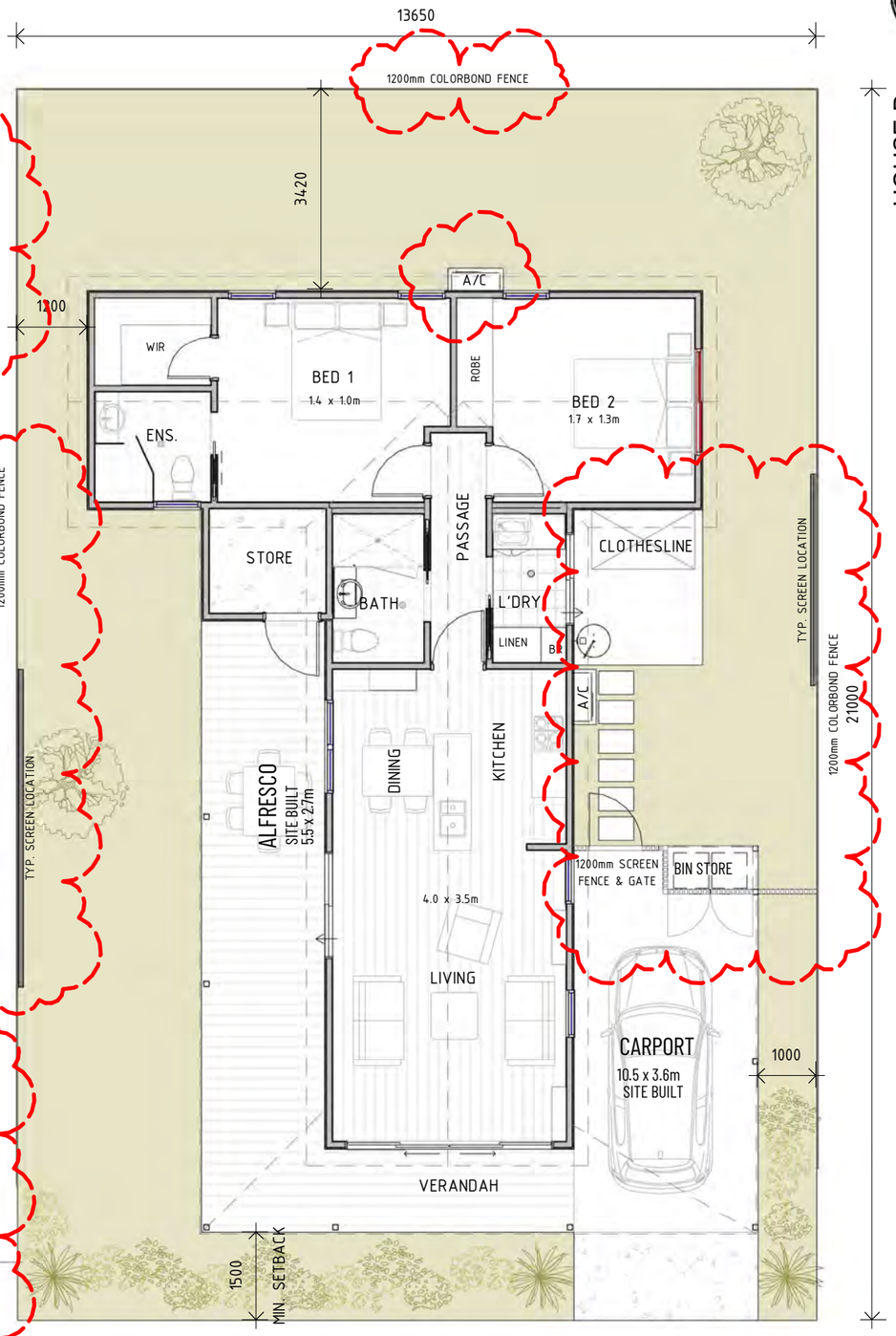

HOUSE D DESIGN | 1:100 N

HOUSE D
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31.10.2024

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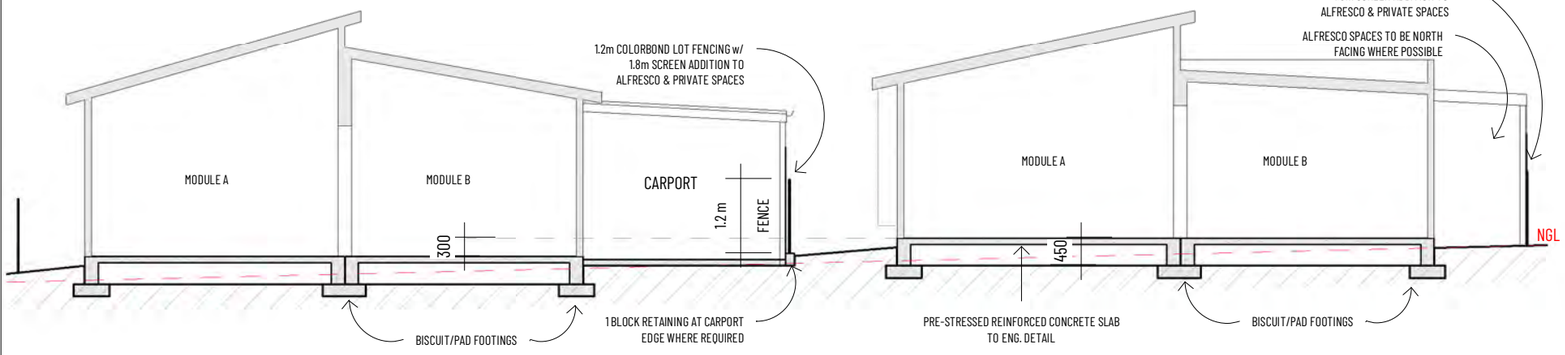

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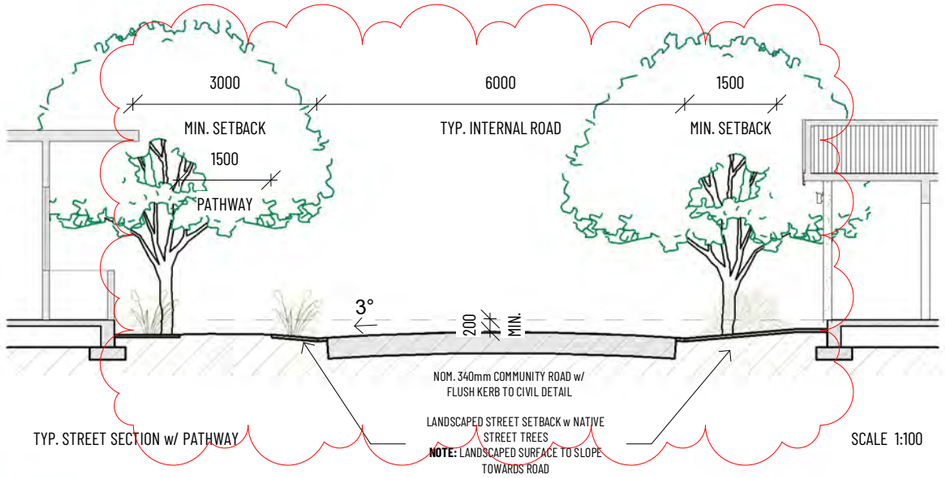

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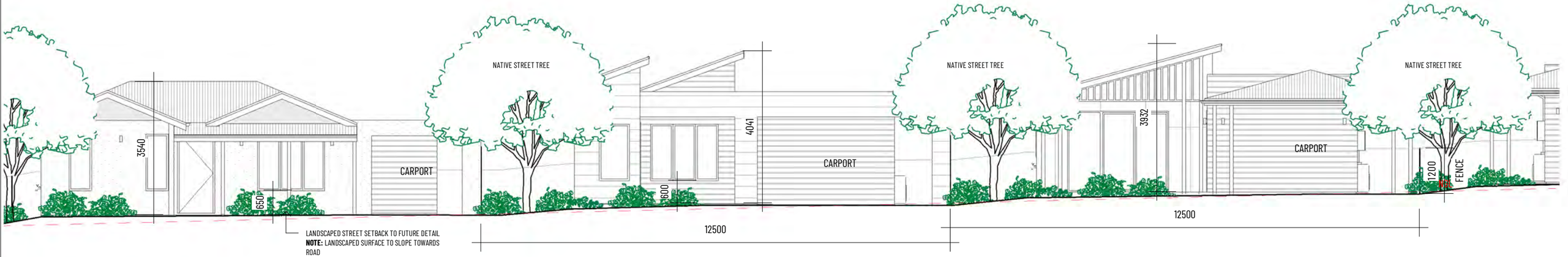

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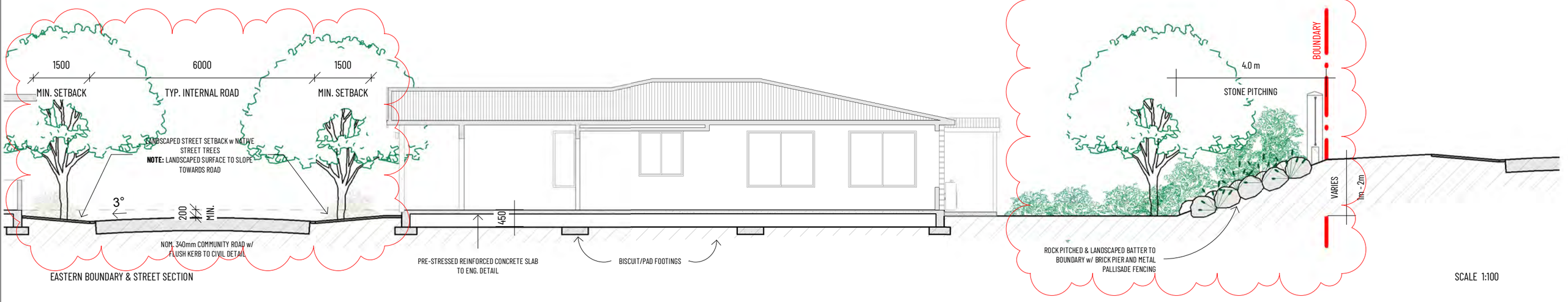

EASTERN BOUNDARY & STREET SECTION

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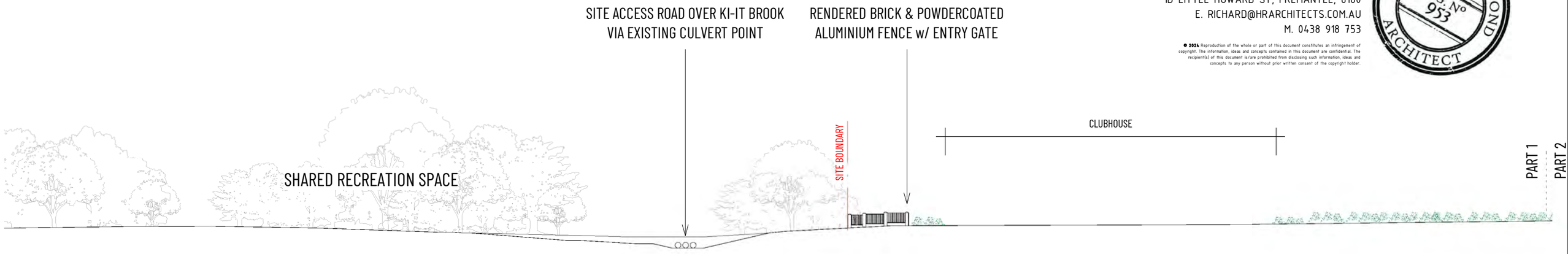

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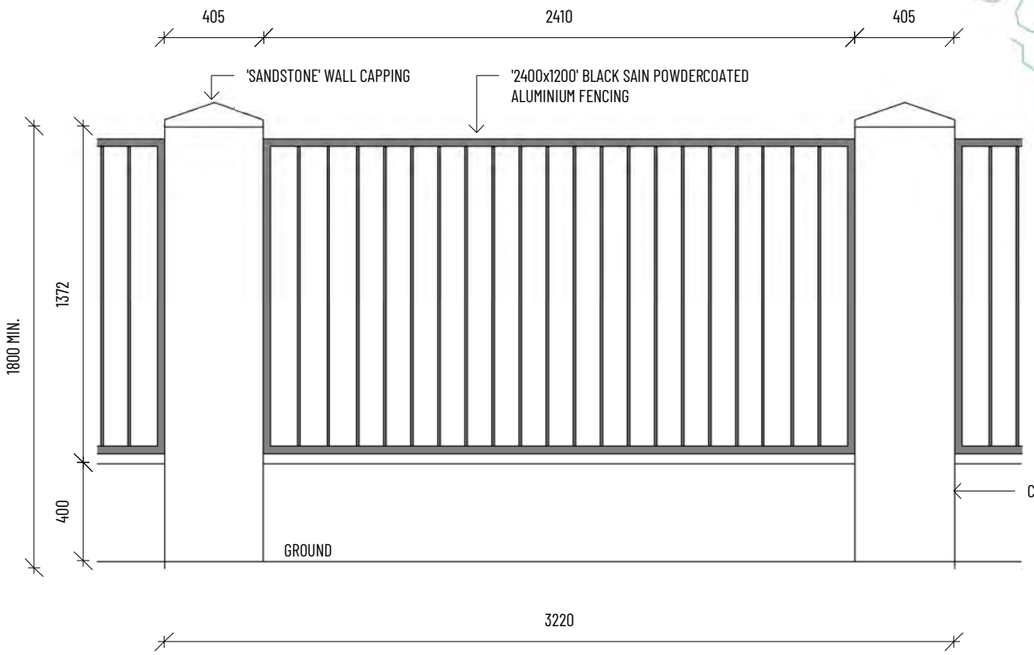
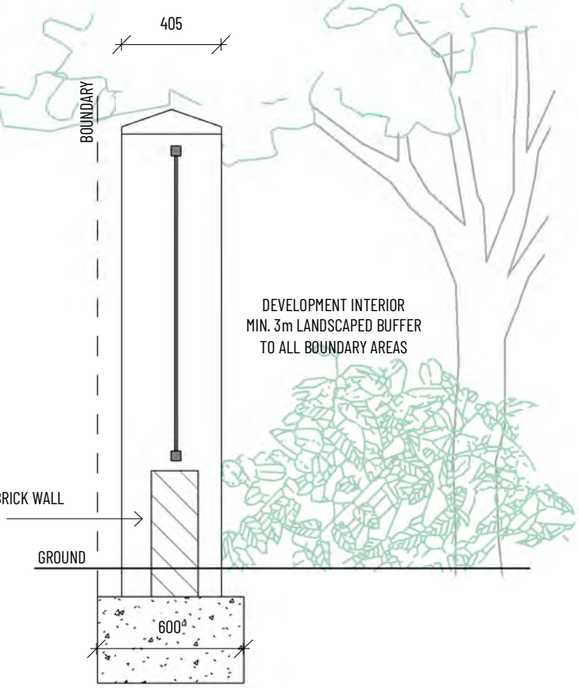


ELEVATION 1:25



SECTION 1:25

Typ. Fence Detail
1 : 25

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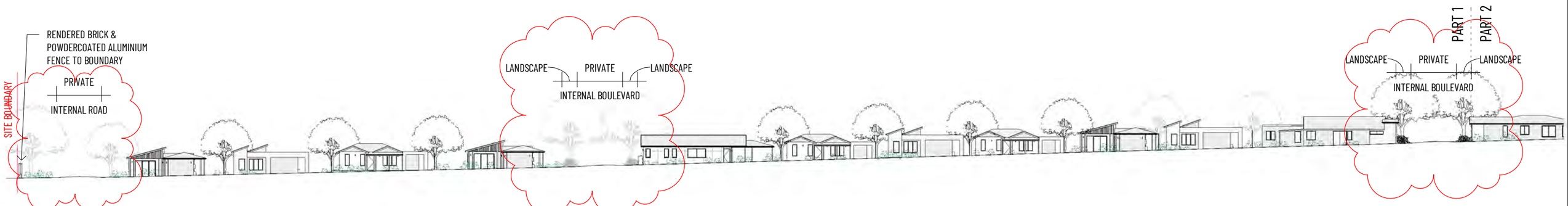

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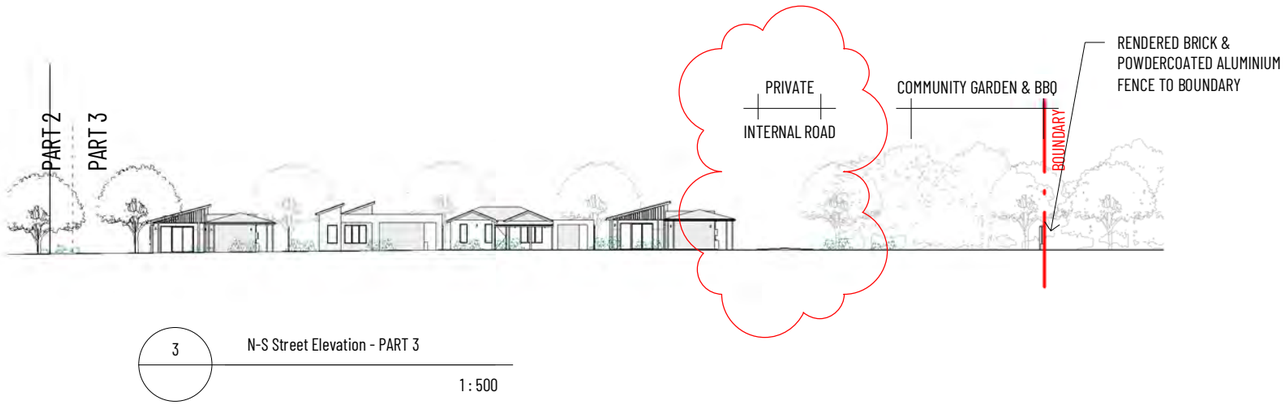

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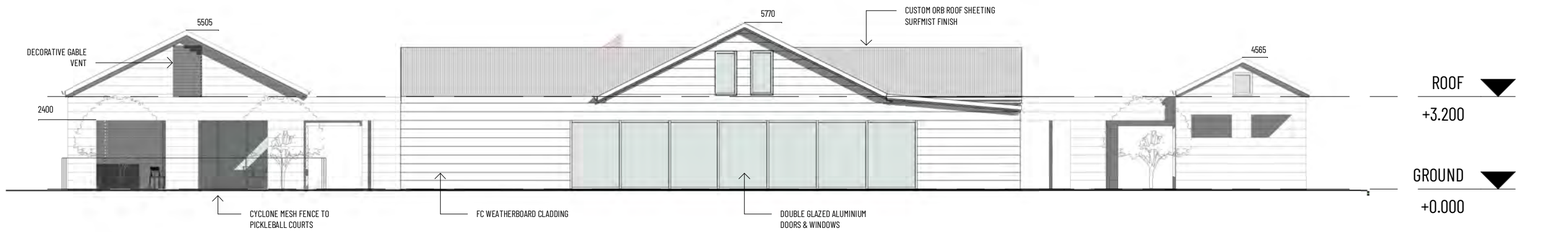

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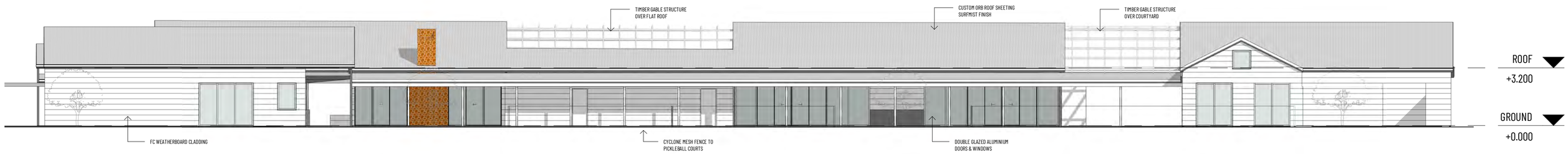
S SOUTHERN ELEVATION

1 : 150



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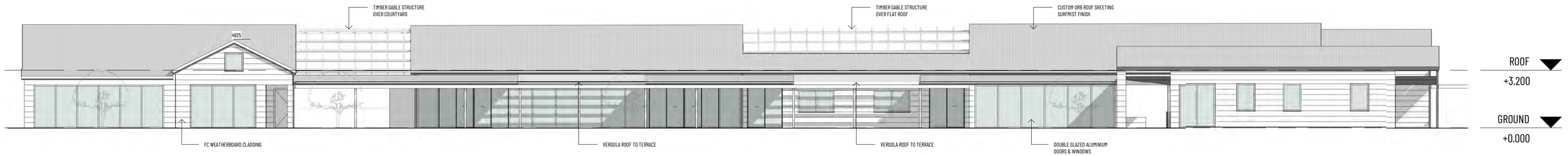

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BETHANIE BULLSBROOK
CLUBHOUSE CONCEPT DESIGN RevA
22.08.2024

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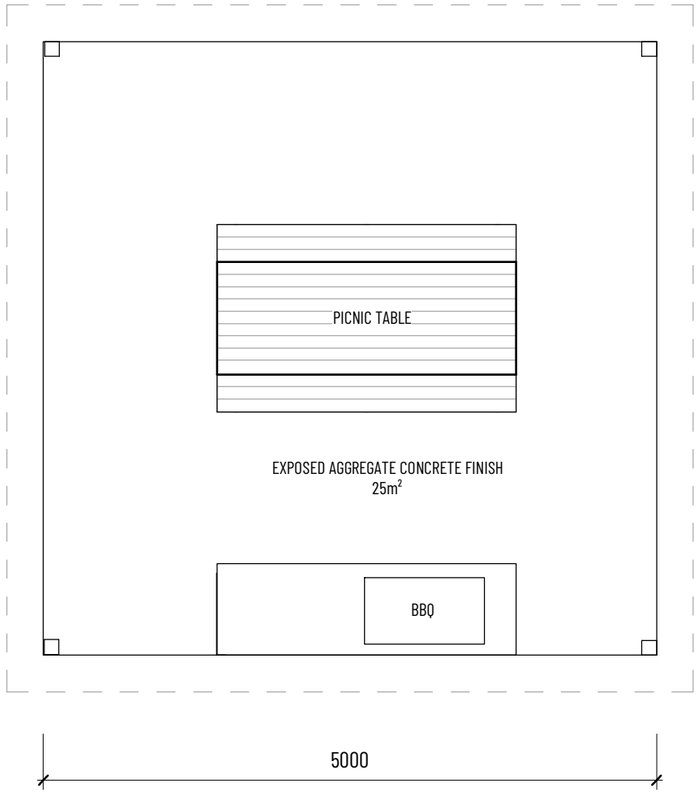

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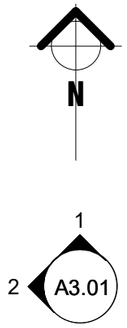

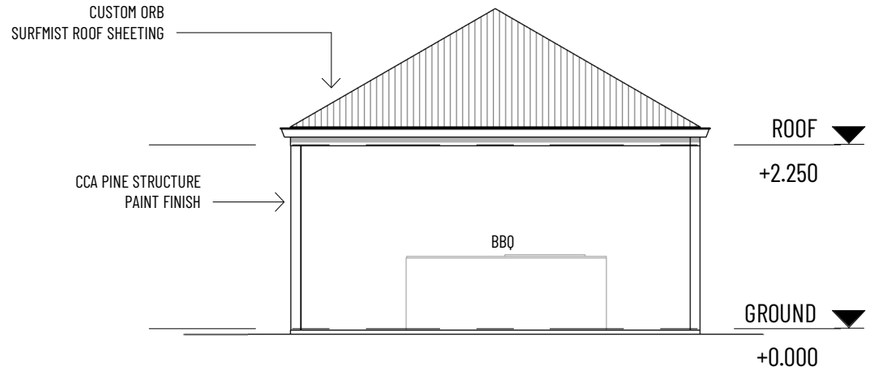

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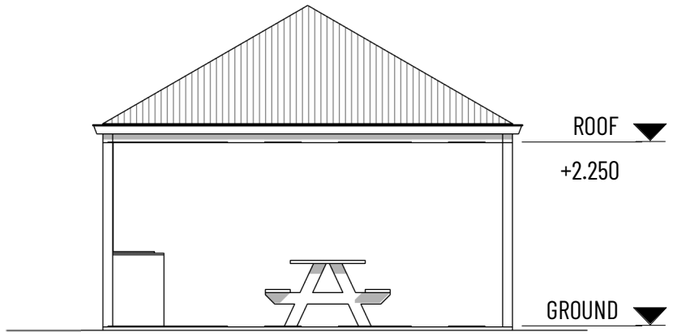

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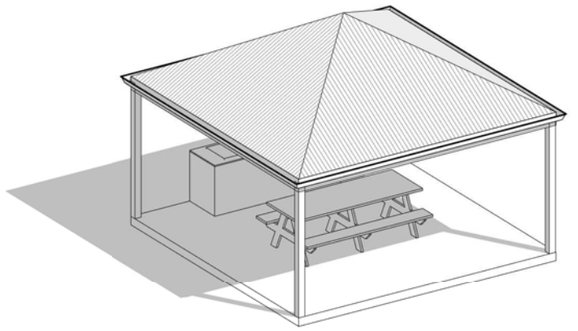

3 BBQ 3D PERSPECTIVE

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No.	Description	Date
A	PRELIMINARY ISSUE	09.09.24

BETHANIE

BULLSBROOK VILLAGE

CHITTERING ROAD, BULLSBROOK, WA, 6084

BBQ STRUCTURE

Project number	-	A3.01	
Date	09.09.2024		
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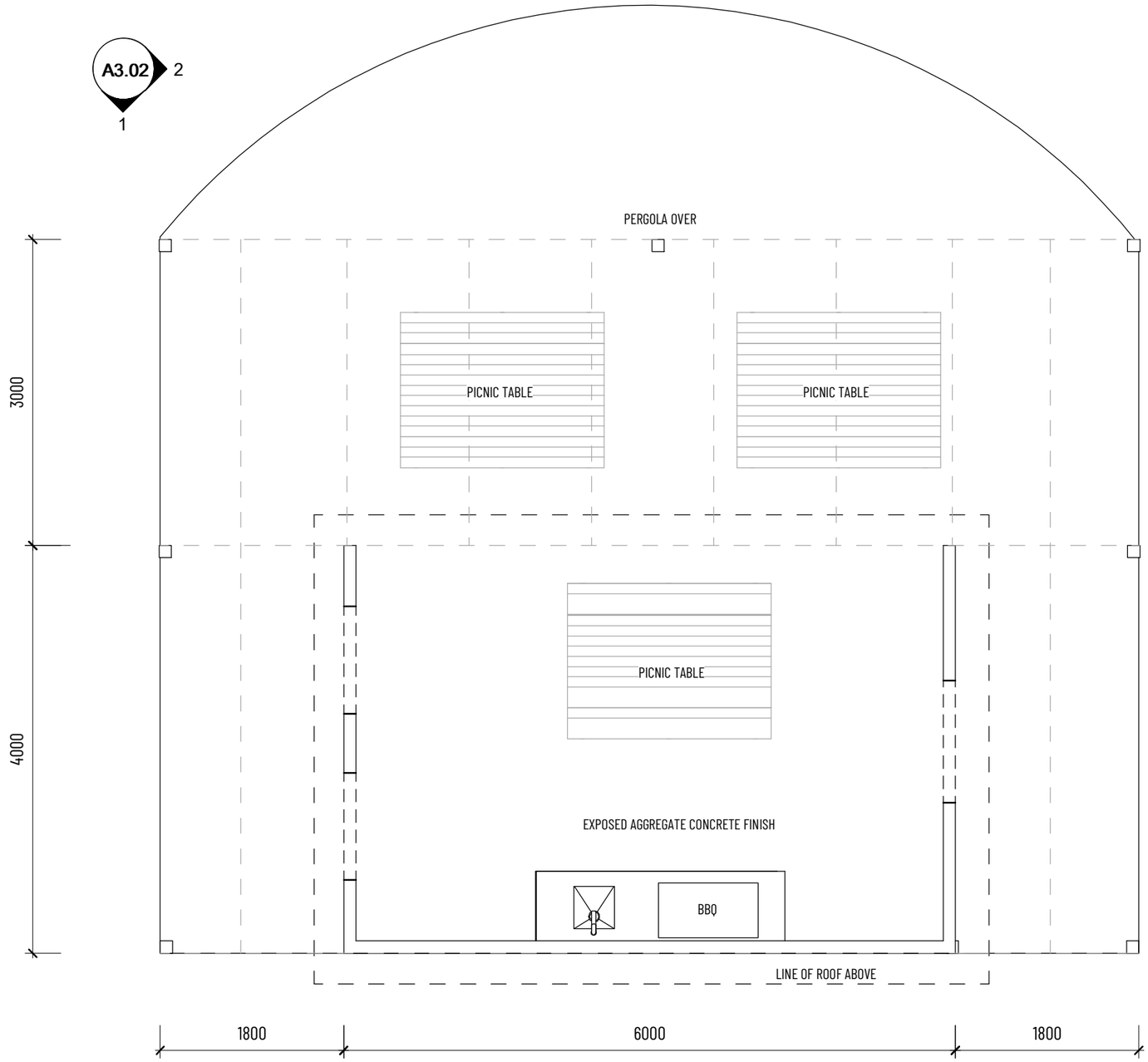

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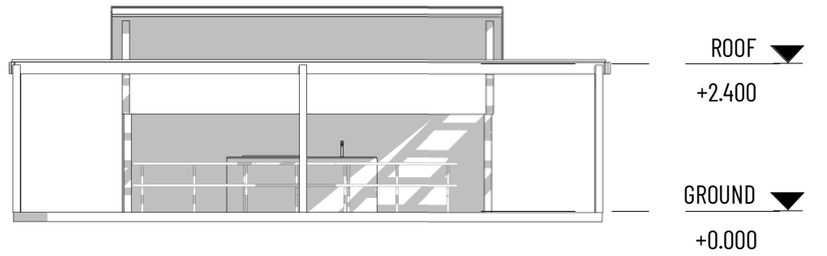

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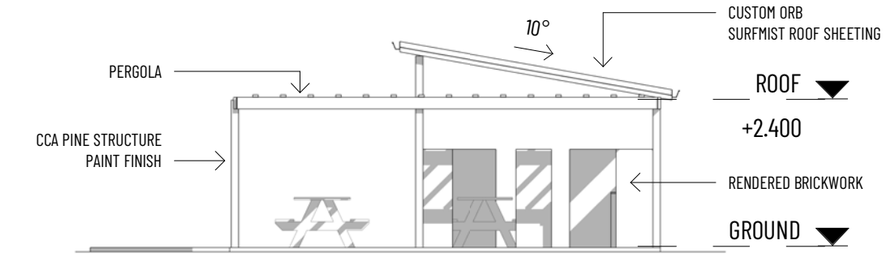

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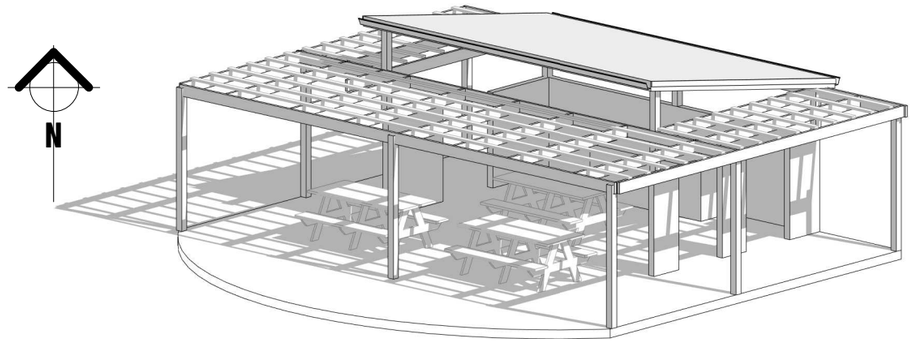

3 LOOKOUT 3D PERSPECTIVE

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BETHANIE

BULLSBROOK VILLAGE

CHITTERING ROAD, BULLSBROOK, WA, 6084

LOOKOUT STRUCTURE

Project number	-	A3.02	
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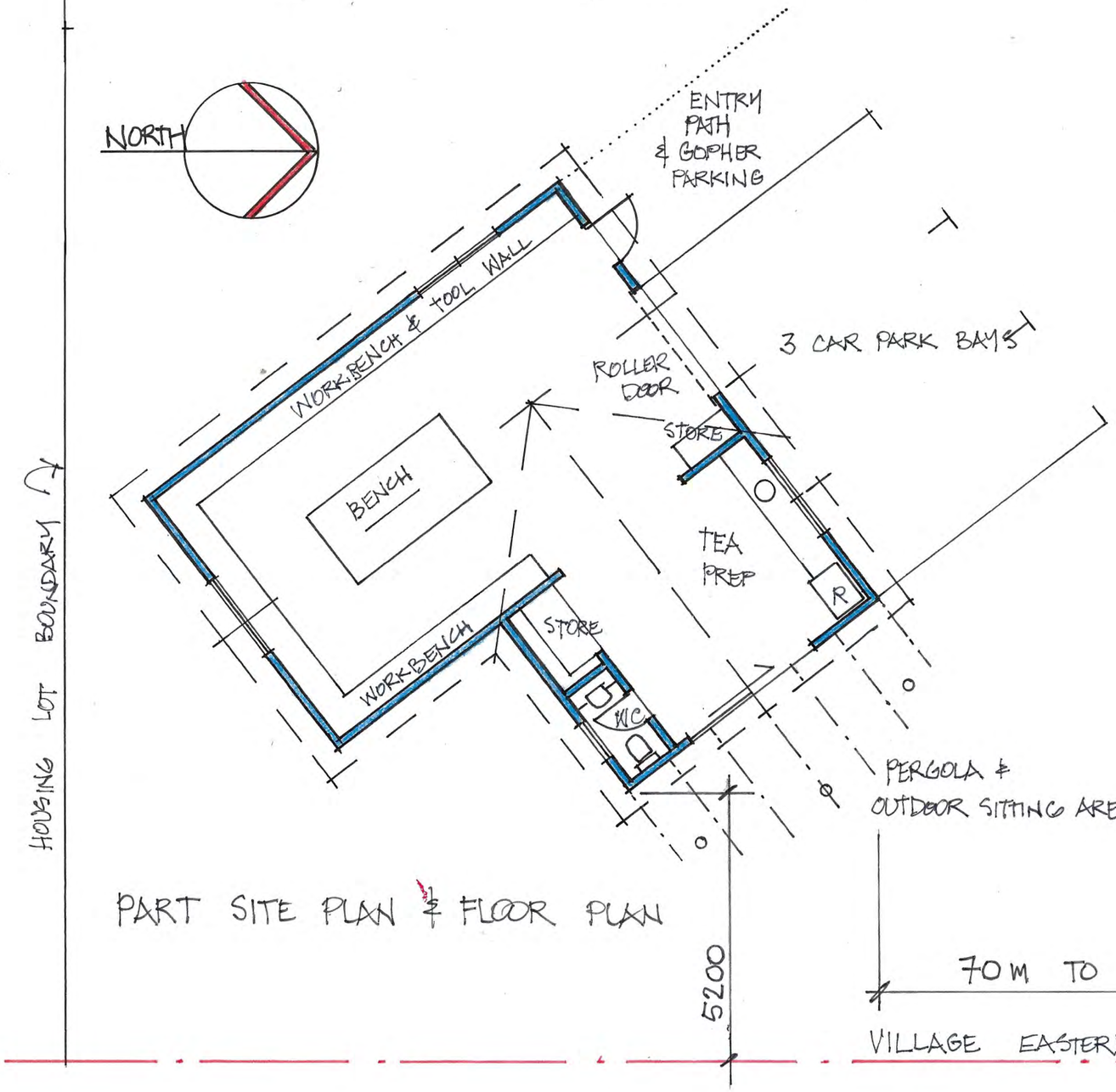
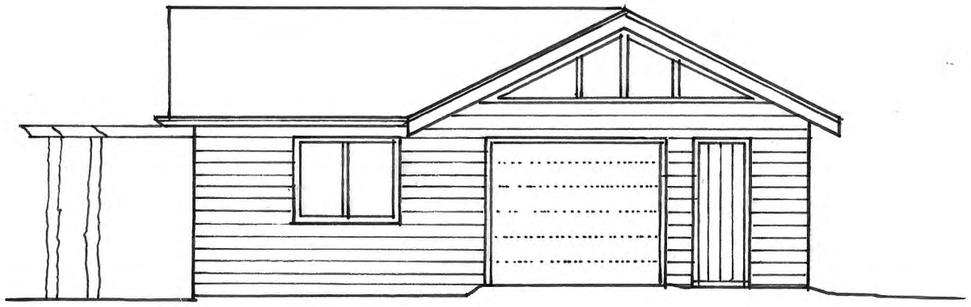


PART SITE PLAN & FLOOR PLAN



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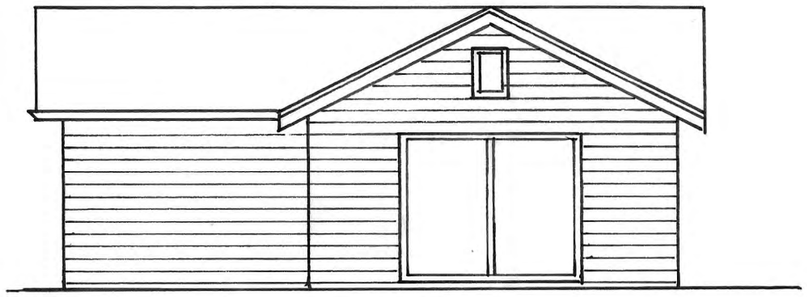

NORTH EAST ELEVATION
* PERGOLA OMITTED FOR CLARITY

THE BULLSBROOK VILLAGE FOR THE BETHANIE GROUP
CHITTERING ROAD BULLSBROOK
RESIDENTS' WORKSHOP 1:100 @ A3 JANUARY 2025

RICHARD HAMMOND ARCHITECT M 0438 918 753

Development Application Report

Bullsbrook Lifestyle Village (Park Home Park)

Lots 900, 9501 and 9013 Chittering Road,
Bullsbrook

PLANNING SOLUTIONS
URBAN & REGIONAL PLANNING

PS



Prepared for

Bethanie Group

September 2024

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	Bushfire management	Allerding & Associates
	Urban Water and Stormwater management	Pentium Water
	Environmental management	Pentium Water
	Sustainability / design	Richard Hammond Architect
	Civil engineering and servicing	Cossill & Webley Consulting Engineers
	Waste Management	PTG Consulting

Document Control

Revision number	File name	Document date	Prepared by	Checked by
Rev 0	240911 8799 DA Report - Bullsbrook Lifestyle Village	11 September 2024	OB	TE

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1 PRELIMINARY

1.1 Introduction

Planning Solutions acts on behalf of Bethanie Group, the proponent of the development of Lot 900, Lot 9501 and a portion of Lot 9013 Chittering Road, Bullsbrook (**subject site**) as a 'Lifestyle Village' (Park Home Park).

Planning Solutions has prepared the following report in support of an application for development approval. This report will discuss various matters pertinent to the proposal, including:

- Background.
- Site details.
- Proposed development.
- Statutory planning framework.

The application seeks approval to develop the subject site with 237 Park Homes and associated communal facilities, access, car parking and landscaping. The Park Homes are designed to a high standard and will contribute positively to the locality, catering for the demand for downsizers and over 50's living in the locality.

We respectfully request the Metro Outer Development Assessment Panel (**DAP**) grants approval to the proposed development.

1.2 Pre-lodgement consultation

Representatives of Planning Solutions, Bethanie Group, Richard Hammond Architects and the landowner met with officers of the City of Swan (**City**) on 29 May 2024. The purpose of the meeting was to present and receive initial feedback on the development of the subject site. The land use definition of the proposed development was discussed in detail, with the City's officers advising that it was their opinion the land use was defined as a 'Park Home Park' under the provisions of the City's Local Planning Scheme No.17 (**LPS17**).

Additional feedback was sought from the City's officers on the level of detail required to support of the proposed development, which was used to inform and finalise this development application.

2 SITE DETAILS

2.1 Land description

Refer to **Table 1** below for the lot details and a description of the subject site at the time of lodging this development application. We understand a subdivision has been progressed, with the new Lot 9017 proposed.

Table 1 - Lot details

Lot	Deposited Plan	Volume	Folio	Registered Proprietor	Area (m^2)
900	407242	2914	546	Sacri Association Inc	131,496
9501	76923	4035	49	Tre Fontane Group Pty Ltd	14,403
9013	425780	4049	419	Amex Bullsbrook Pty Ltd	4,212*
				Total	**150,111**

*For the purposes of calculating the total lot area subject to this development application, only the relevant 4,212m^2 of Lot 9013 has been in incorporated (total lot area of Lot 9013 is 18.7871 hectares).

Refer **Appendix 1** for a copy of the Certificates of Title and Deposited Plans, and the proposed Deposited Plan.

2.2 Location

2.2.1 Regional context

The subject site is located in the municipality of the City of Swan and in the suburb of Bullsbrook. The site is located approximately 34km north east of the Perth CBD, approximately 26km north of Midland, approximately 26km north east of Joondalup and approximately 9m north east of The Vines, Ellenbrook.

The Walyunga National Park and Avon River are located approximately 6.5km to the south east of the subject site. The Ellen Brook is located approximately 2.7km to the south west. Pearce Air Base is located 800m to the west of the subject site.

Great Northern Highway is located 100m to the west of the subject site's western lot boundary, providing a connection from Roe Highway in the south, to Tonkin Highway, Brand Highway and Great Northern Highway in the north.

2.2.2 Local context, land use and topography

The subject site fronts Chittering Road at its western lot boundary and is currently vacant, with existing vegetation located in its south western aspect. The adjoining land to the east in undergoing residential subdivision as park of the 'Kingsford at Bullsbrook' estate.

The subject site has historically been cleared for agricultural purposes and consists largely of cattle grazing paddocks, with limited environmental value. The scattered Eucalyptus rudis (Flooded Gums) which align with the Ki-it Monger Brook creek line represent the key environmental asset within the current Lot 900 (proposed Lot 9017). The Ki-it Monger Brook is a seasonal flowing creek line which traverses the northern boundary of the subject site and bisects a portion of the subject site towards its western boundary.

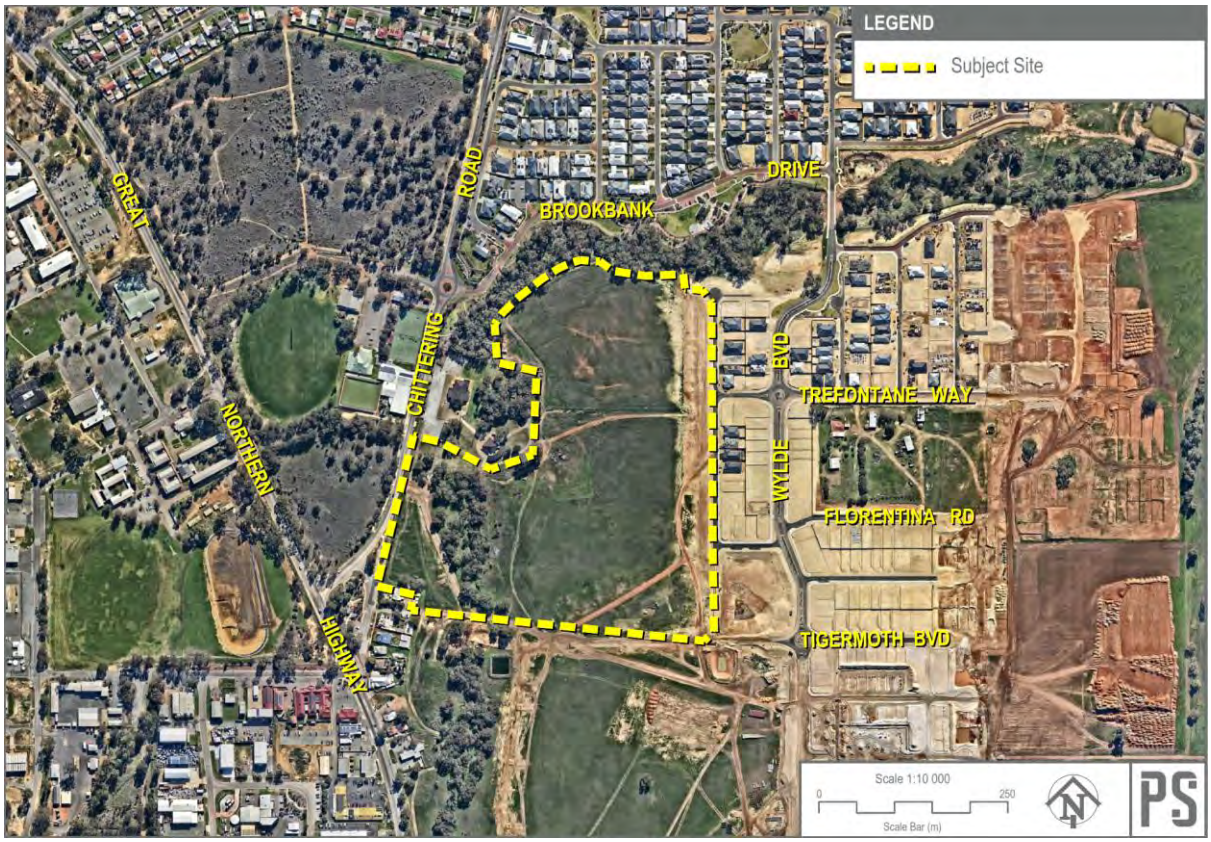


Figure 1: Aerial photograph of the subject site and surrounds (Source: Nearmap 2024)

In terms of topography, the subject site has a gentle slope from the north-east to the south-west, sloping downwards from a height of 65m Australian Height Datum (**AHD**) in the north east to 52m AHD in the south west. The Ki-it Monger Brook to the west and north of the subject site has levels between approximately 55m AHD and 63m AHD.

3 PROPOSED DEVELOPMENT

3.1 Development Summary

The proposal involves the development of the subject site to accommodate the 'Park Home Park' dwellings, access, landscaping and the communal facilities (clubhouse). The subject site is currently held in private ownership and the Lifestyle Village operator has secured a long-term lease arrangement with the landowner.

The overall development configuration has been carefully and holistically considered to ensure internal operation and site functionality are maximised, while ensuring the facility is designed responsively to the site's location. Specifically, the proposed development comprises:

- 237 single storey Park Homes being constructed on 237 leasehold lots, with dimensions of 12.5m wide x 21m long (262.5m^2). Four housing typologies (House Designs A, B, C and D) to encourage a diversity of residents;
- Each Park Home is provided with a carport, containing space for two (2) car parking bays for each house design, resulting in 470 residential car parking bays. House Design C has a carport for tandem parking;
- A communal facilities building (clubhouse), with an internal floor area of 890m^2 and maximum height of 5.85m is located in the western aspect of the site, set back 13m from the Ki-It Monger Brook foreshore boundary;
- Clubhouse car parking (four visitor bays) and porte cochere entry point is provided for accessible pick up and drop offs;
- Internal clubhouse amenities including a lobby, lounge, café and bar, dining area and communal landscaping areas, including covered terraces and pergola wire trellis' over pedestrian footpaths and vergolas over the outdoor terrace areas;
- Amenities within and adjacent to the clubhouse, including a 37-seat cinema, games room with pool and darts, two outdoor pickleball courts, swimming, fitness centre/gym and arts and craft room;
- A community garden, BBQ area and social meeting place area located in the northern aspect of the subject site;
- Lifestyle Village and clubhouse services including sales office, managers office, reception, mail hall, kitchen, toilets, changerooms first aid room, stores and plant rooms;
- Three landscaped drainage basins for stormwater retention;
- 30 caravan, RV and boat parking bays located in the south western aspect of the subject site;
- 40 visitor parking bays;
- Internal access via a network of 6m wide and 10m wide private internal roads;
- Main vehicular access via a 10m wide crossover to Chittering Road with a meandering road following historical access across the Ki-it Monger Brook;
- Emergency access in the north eastern aspect of the subject site for bushfire safety purposes; and
- An access point in the southern aspect of the subject site caravan, construction and emergency access.

Please refer to **Appendix 2** for the development plans prepared by Richard Hammond Architect.



Figure 2: Perspective of the Clubhouse driveway and entry



Figure 3: Perspective of one of the internal Clubhouse living areas

3.2 Built form, urban design and sustainability

The built form, bulk, scale and choice of materials have been considered in response to the character of the Bullsbrook locality. The single storey scale and size of the Park Homes is consistent with expectations for a Lifestyle Village. The proposed development utilises a materials and colour palette that is sympathetic to its historical rural context and emerging residential setting and urban context.

The combined use of both contemporary and traditional/natural materials results in a high quality of built form that is softened by landscaping throughout the subject site. Design features and materials implemented include weatherboard cladding, custom orb roof sheeting (Surfmist colour), double glazed aluminium doors and features, feature gables and timber gable structures.

The proposed Lifestyle Village (Park Home Park) has been designed to include a significant number of environmentally sustainable elements, with the aim of producing high quality, comfortable accommodation with economical running and management costs.

The design elements include:

- **Solar orientation:** the lot and road layout are designed to provide the Park Homes with good solar access. The floor plans oriented east-west and generous northern aspect provides screening from the summer sun whilst allowing the penetration of winter sun.
- **Solar Energy:** photovoltaic panels and battery storage (with main grid back-up) are proposed to minimise reliance on mains energy consumption.
- **Energy Efficiency:** carefully designed floor plans and home orientation provides good levels of natural lighting and ventilation, reducing energy use for artificial lighting and air conditioning. The homes will be fully electric for cooking, space heating and hot water supply. We understand all appliances will have a minimum 5 star energy rating. The village will include EV chargers for resident's electric vehicles and there will be an electric car available for residents' use on a small rental fee basis.
- **Waste Management:** a recycling facility is proposed to enable residents to stream recyclable waste into the appropriate containers, minimising waste stream contamination. The community gardens will contain a worm farm and composting facilities for organic waste. The compost will be distributed to fruit trees and vegetable gardens cared for by village residents, reducing waste to landfill.
- **Water Management:** Three drainage basins are proposed to retain and filter stormwater before it enters the Ki-It Monger Brook.
- **Site Development:** The Bethanie Village is designed to maintain the existing natural topography and reduce reliance on retaining walls and cut/fill.
- **Modular Homes:** the homes will be factory built modular construction, reducing the environmental footprint with the efficient use of resources, reduced waste and reduced transport costs.

Please refer to **Appendix 2** for the development plans prepared by Richard Hammond Architect and to **Appendix 3** for the Environmentally Sustainable Design Element statement prepared by Richard Hammond Architect.

3.3 Technical reporting

3.3.1 Traffic Impact Assessment

A Traffic Impact Assessment (**TIA**) prepared by traffic engineers GTA Consulting, provides a traffic analysis of the proposed development, specifically in relation to the potential number of vehicles movements generated by the Park Homes.

A summary of the TIA is provided below, with the investigation concluding that:

- The estimated number of trips generated by the proposed development is approximately 130 trips during the AM peak period and 144 trips during the PM peak period.
- Public transport within the surrounding area is considered to be below average as only a single low frequency service operates near the site. TransWA services are also available within the surrounding area though these routes only provide a single service per day.
- The pedestrian/bike network is below average within the surrounding area. While there are shared paths present along Great Northern Highway and Chittering Road.
- A sight distance assessment was conducted at the proposed access points and showed that the modified Chittering Road alignment had a negligible impact on sight visibility.
- The traffic impact of the proposal on the surrounding road network will be insignificant.

In summary, GTA Consulting consider that the proposed development will not result in any negative impact on the surrounding road network. Refer **Appendix 4** for a copy of the TIA prepared by GTA Consulting.

3.3.2 Landscaping

The proposed development includes substantial areas of landscaping over the subject site, ensuring the development provides green spaces for residents of the village, and complements the streetscape. Landscaping strips are located along the lot boundaries, providing native shrubs, groundcovers and shade trees. The landscaping along the lot boundaries is deemed low threat bushfire treatment adjacent to the Ki-It Monger Brook.

The landscaping planting palette includes twelve species of trees, twelve species of native shrubs and ground covers, and twelve species of feature shrubs and ground covers. Feature planting and trees are located along the Central Road and are proposed to enhance the amenity and provide a prominent entrance statement. Street trees are proposed within the landscaping areas at the front of each of the Park Homes.

Refer to **Figure 4** below for the proposed landscape tree planting palette prepared by Plan E Landscape Architects.

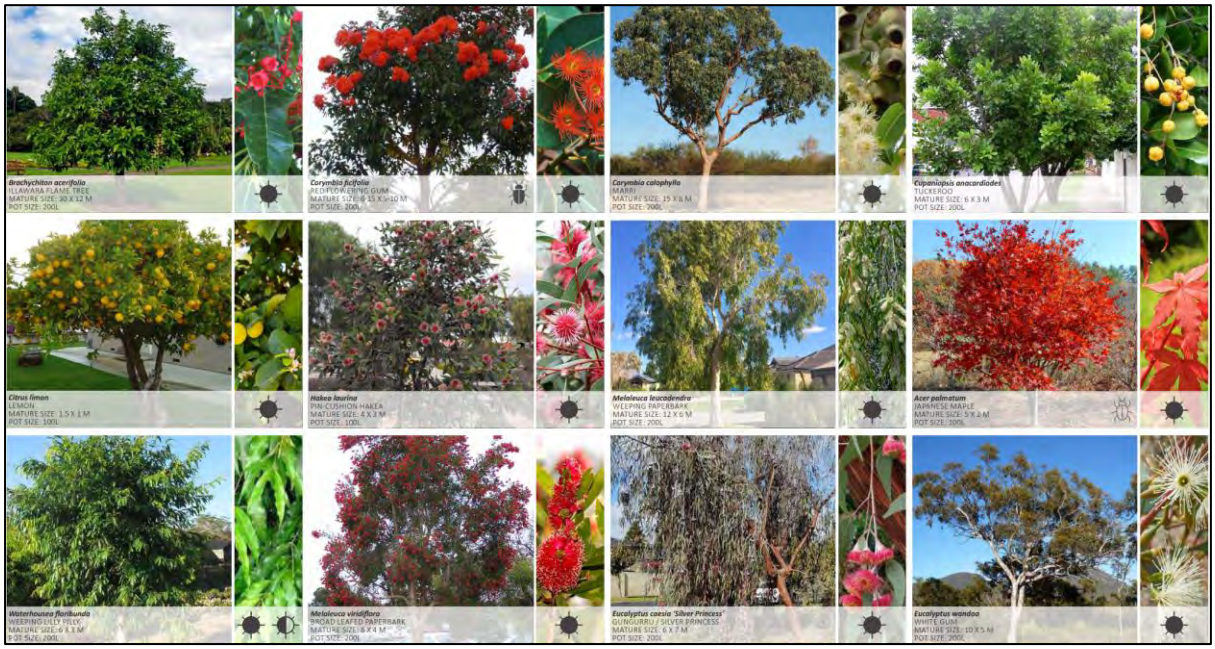


Figure 4: Extract of tree planting palette from the landscape plan prepare by Plan E Landscape Architects

Key landscaping elements and features include:

- Feature planting around the Clubhouse and key communal areas, with open turf kickabout spaces, shade trees, Pickleball courts.
- 'The Lookout' meeting place, with table settings and bench seating and a community garden in the northern aspect of the subject site.
- Three landscaped drainage basins, proposed to become landscaped wetlands to detain stormwater and provide native fauna habitat.
- The footpaths throughout the facility provide residents with opportunities for mobility, with seating provided adjacent to the footpath and landscaping strips for residents to sit and admire the landscaping area. Within the key communal landscaping area there are informal stabilised gravel paths through the landscape to provide walking trail opportunities and landscape interaction.

Refer to **Appendix 5** for the conceptual landscaping plans prepared by Plan E Landscape Architects. A detailed landscaping plan illustrating the specific location of plant species and sizes can be prepared as an appropriately worded condition of development approval.

3.3.3 Bushfire management

The subject site is located within a designated 'bushfire prone area' in accordance with the Department of Fire and Emergency Services Map of Bushfire Prone Areas. Accordingly, a Bushfire Attack Level (**BAL**) assessment was undertaken over the subject site by Allerding & Associates, with the development (Park Homes) achieving a maximum BAL rating of BAL-29.

A subsequent Bushfire Management Plan (**BMP**) was prepared, concluding that the proposed development satisfies the intent, aims and objectives of *State Planning Policy 3.7 Planning in bushfire prone areas* (**SPP3.7**) and the guidelines, and is recommended for approval, with bushfire risk able to be appropriately managed. The BMP acknowledges that the proposed land use is not a vulnerable land use, given it differs significantly from residential aged care facilities and nursing homes.

This BMP demonstrates that the proposal can fully comply with the acceptable solutions of the Guidelines, subject to:

- The ongoing management of low threat landscaping surrounding the clubhouse and community garden in a minimal fuel condition in accordance with the provisions set out in this BMP;
- The creation and ongoing maintenance of an Asset Protection Zone (**APZ**) within Plot 14 to the west of the development area in accordance with the provisions set out in this BMP;
- The construction and maintenance of the internal vehicular movement network, inclusive of internal private driveways, access routes and vehicle gates in accordance with the provisions set out in this BMP;
- The installation and maintenance of a reticulated water supply to service the development in accordance with the provisions set out in this BMP;
- The construction of nominated buildings to the relevant standards under AS3959;
- The placement of notifications on title to advise on bushfire risk management implementation measures; and
- The ongoing compliance with the City of Swan Fire Hazard Reduction Notice.

Please refer to **Appendix 6** for the BMP prepared by Allerding & Associates.

3.3.4 Civil engineering, site works, utilities and servicing

Expert civil engineering inputs detailing the engineering, civil infrastructure and drainage works have been undertaken by Cossill & Webley Consulting Engineers and incorporated into the development plans, in support of the proposed development of the subject site.

The existing topography and proposed civil design has been considered in a holistic manner to enable the development of the proposed Lifestyle Village (Park Home Park). The existing topography of the subject is largely maintained, retaining the current land form of the place.

The future development of the subject site will have access to services and utilities in the normal manner including a connection to reticulated sewer and water. Internal sewer reticulation from the subject site will discharge to the gravity sewer in Tigermoth Boulevard. It is anticipated the water supply to come from Chittering Road/Tigermoth Boulevard with a single property connection to the subject site.

In summary, the proposed civil arrangements are site responsive, addressing and respecting the natural topography of the site in an appropriate manner. Refer to **Appendix 7** for the Engineering Servicing Report prepared by Cossill & Webley Consulting Engineers.

3.3.5 Environmental and foreshore management

Pentium Water was commissioned to undertake a Preliminary Environmental Assessment in support of the proposed Lifestyle Village (Park Home Park). We understand the subject site has historically been cleared for agricultural purposes and consists largely of cattle grazing paddocks, with limited environmental value. The scattered Eucalyptus rudis (Flooded Gums) which align with the Ki-it Monger Brook creek line represent the key environmental asset within current Lot 900 (proposed Lot 9017).

The Ki-it Monger Brook is a seasonal flowing creek line which traverses the northern boundary of the subject site and bisects a portion of the subject site towards its western boundary. The portion of the Ki-it Monger Brook within and adjacent to the subject site has historically been modified, including the infilling of the creek and the installation of culverts.

The flooded gums trees within the Ki-it Monger Brook creek line will be maintained within the defined setback from the Brook, which was established in the approved 2021 Ki-it Monger Brook Foreshore Management Plan (**FMP**) (RPS 2021) for the purposes of conservation, flood protection, better urban water management and open space.

Refer to **Appendix 8** for the Preliminary Environmental Assessment prepared by Pentium Water.

3.3.6 Urban Water, Stormwater and erosion management

A Local Water Management Strategy (**LWMS**) was prepared by RPS (RPS, 2018) and approved by the Department of Water and Environmental Regulation to support the Kingsford Local Structure Plan.

A site specific preliminary Urban Water Management Plan (**UWMP**) has been prepared for the Bethanie Bullsbrook Lifestyle Village, in accordance with the strategies and commitments discussed in the LWMS. The UWMP provides an overview of the subject site's existing physical and hydrological conditions, and drainage design which will be implemented for the proposed development. The UMWP defines the stormwater management framework and the detailed bioretention swales design and landscape response, with stormwater runoff to be contained onsite to the extent possible.

Stormwater will be managed through vegetated swales/tree pits within the Lifestyle Village area and larger bioretention swales will be incorporated into open space areas adjacent to Ki-it Monger Brook, which we understand is consistent with the approved Local Water Management Strategy that was prepared for the neighbouring Kingsford Estate.

Refer to **Appendix 9** for the Urban Water Management Plan prepared by Pentium Water and to **Appendix 10** for the Erosion, Sediment and Drainage Control Plan prepared by Pentium Water.

3.3.7 Waste management

A Waste Management Plan (**WMP**) has been prepared by PTG Consulting in support of the proposed development. Waste collection of refuse and recycling will be collected on site by the City's waste management services, similar to a regular residential neighbourhood. Residents will be required to sort and prepare their waste based on the collection schedule for the area.

The WMP demonstrates that the proposed development makes sufficient provision for general waste, recyclable waste, and FOGO based on the estimated waste generation.

Refer to **Appendix 11** for the Waste Management Plan prepared by PTG Consulting.

4 STATUTORY PLANNING FRAMEWORK

4.1 State Planning Policies

4.1.1 State Planning Policy 3.7 – Planning in Bushfire Prone Areas

State Planning Policy 3.7 – Planning in Bushfire Prone Areas (**SPP3.7**) and its associated Guidelines seek to guide the implementation of effective risk-based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure. The BMP prepared by Allerding & Associates has been prepared to demonstrate that future development can meet the relevant requirements of SPP3.7.

4.1.2 State Planning Policy 7.0 - Design of the Built Environment

State Planning Policy 7.0 – Design of the Built Environment (**SPP7.0**) addresses the importance of design quality, and sets out the principles, processes and considerations which apply to the design of the built environment in Western Australia, across all levels of planning and development.

SPP7 establishes a set of ten 'design principles', providing a consistent framework to guide the design, review and decision-making process for planning proposals. An assessment of the proposed development against the design principles of SPP7.0 is provided in **Table 2** below.

Table 2: SPP7.0 Design Principles Statement

SPP7 design principle and design response
1. Context and character *Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.*
The surrounding area is best characterised as a developing semi-rural area on the outer fringe of the metropolitan region, characterised by relatively modern new builds to create an 'Urban Village' feel within the semi-rural locality, and areas of yet-to-be developed land. The Park Homes and Clubhouse feature modern designs with the use of pitched roofs and weatherboard cladding to have some resemblance to the types of residential buildings within a semi-rural area. The external colours, finishes and materials of the building are consistent with the building materials in the area and assist in creating a soft impression within the landscape. Retention of the natural topography is an important characteristic of this development. Having the main access across an existing and historical crossing over the Ki-It Monger Brook, adds considerably to the character and context of the development within the locality. The built form of the Lifestyle Village, the provision of landscaping and the land use itself will contribute to a sense of place, resulting in a development that is recognisable within the Bullsbrook locality.
2. Landscape quality *Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.*
A concept landscape plan has been prepared by Plan E Landscape Architects to ensure the proposed landscaping is implemented to the highest standard, with landscape design paramount to the design of the Lifestyle Village. An array of native flora species is proposed to be provided, including landscaping of the drainage swale to create future wetland habitats and enhance the amenity of the Ki-It Monger Brook and complement existing brook vegetation. The landscape design encourages Lifestyle Village residents to walk outside, interact with the gardens and socialise with other residents. Refer to **Appendix 5** for the landscape plan.
3. Built form and scale *Good design provides development with massing and height that is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.*

SPP7 design principle and design response
The single-storey scale of the Park Homes maximize the benefits of solar access between the individual leasehold lots. The maximum pitched roof height of 5.8m of the Clubhouse is considered entirely acceptable within its context as a Lifestyle Village within a low-rise developing fringe area.
4. Functionality and build quality *Good design meets the needs of users efficiently and effectively, balancing functional requirements to deliver optimum benefit and performing well over the full life-cycle.*
The homes will be factory built modular construction, ensuring a consistent and functional build quality. The selected materials for the Park Homes and Clubhouse are contemporary in nature, while being sympathetic to the semi-rural locality and creating a rural village feel.. There will be a consistent built form theme to maintain a continuity of architecture across the site. The materials have been selected with build quality in mind and are common materials for Park Homes, which can be relocated. The proposed development includes ample amenities to meet the needs of residents and visitors, ensuring functionality and longevity for the Lifestyle Village.
5. Sustainability *Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.*
The Park Homes and Clubhouse incorporate a number of sustainability and eco-friendly initiatives, with passive solar design. Such design include the orientation of rooms and external shading devices to minimise reliance on mechanical heating and cooling. Further sustainability initiatives are discussed in **section 3.2** of this report.
6. Amenity *Good design optimises internal and external amenity for occupants, visitors and neighbours, contributing to living and working environments that are comfortable and productive.*
The design of the Lifestyle Village (Park Home Park) considers the following: • Maintaining self-identity and individuality (e.g. three housing options to provide variety and housing diversity, and cater for individual needs of residents); • Personal enjoyment (e.g. liveable internal spaces within the Park Homes and Clubhouse, attractive outdoor landscaped areas, activities and amenities); • Designing for family and community (e.g. a homely and secure village environment in which family members can be involved in everyday and multigenerational activities); The principles of resident comfort, privacy, security and mobility are primary factors in the design.
7. Legibility *Good design results in buildings and places that are legible, with clear connections and memorable elements to help people find their way around.*
The building orientation and gable feature entry of the Clubhouse building creates a legible entry point to the development. The entrances to the Park Homes are clearly identifiable from the streets, with the garages located as the front of the homes, and architectural features used for legibility (i.e. gables and skillions roofs).
8. Safety *Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.*
The Lifestyle Village design creates a close and secure sense of community, with the orientation and layout of the Park Homes allowing for passive surveillance. The internal roads and their widths have been designed as a low speed environment for safety, given the roads are intended as a shared space for resident/visitor cars, cyclists and pedestrians.
9. Community *Good design responds to local community needs as well as the wider social context, providing buildings and spaces that support a diverse range of people and facilitate social interaction.*

SPP7 design principle and design response
Social interaction is promoted as part of the Lifestyle Village, with its communal facilities which will become a social hub. The Park Homes themselves and the layout of the Lifestyle Village creates a secure sense of community, with landscaping providing ample opportunities for interaction. Other design elements which encourage social interaction include the variety of amenities offered within and around the Clubhouse, and the community garden.
10. Aesthetics *Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.*
This will be a high-quality community development, designed to have a residential and homely feel. Park Homes and the internal lot layouts have been designed with solar passive design principles in mind. Housing materials are contemporary, while respecting the semi-rural nature of the locality and the character of the historic Bullsbrook town centre. The Lifestyle Village incorporates substantial landscaped areas to encourage residents to walk outside, interact with landscaping areas and gardens, and socialise with other residents.

The proposed development suitably responds to the SPP7 design principles and warrants approval.

4.1.3 State Planning Policy 5.4 – Road and Rail Noise

The south western aspect of the subject site is within an area subject to *State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning* (**SPP5.4**), due to its proximity to Great Northern Highway, a 'strategic freight / major traffic route'. Table 1 of SPP5.4 identifies the State's transport corridors and the trigger distances to which the policy applies.

Great Northern Highway in proximity to the subject site is a 2 lane road, with Table 2 of SPP5.4 identifying that no further measures are required for sensitive premises located in excess of 150m from the edge of the road carriageway. The Park Homes located in the south western aspect of the subject sire are located more than 250m from the edge of the Great Northern Highway Road carriageway, with no acoustic reporting required.

4.2 Metropolitan Region Scheme

Under the provisions of the Metropolitan Region Scheme (**MRS**) the subject site is zoned 'Urban'. The proposed development is consistent with the intent of the Urban zone and may be approved accordingly.

Great Northern Highway and the southern portion of Chittering Road are reserved 'Primary Regional Roads' under the provisions of the MRS. Access to the subject site is proposed from the part of Chittering Road that is not reserved by the MRS. The subject site is not affected by land reserved by the MRS, nor is it subject to any resolution or declaration made under the MRS.

4.3 City of Swan Local Planning Scheme No.17

The City of Swan *Local Planning Scheme No.17* (**LPS17**) applies to the subject site. LPS17 is supplemented by the 'Deemed Provisions' in Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015.* Where a deemed provision is inconsistent with a provision of LPS17, the deemed provision prevails to the extent of the inconsistency.

4.3.1 Zoning and objectives

Under the provisions of LPS17, the subject site is zoned 'Residential Development'. Refer to **Figure 5** below for an extract of the LPS17 Zoning Map.

Schedule 4 stipulates that land uses should be guided by an approved structure plan, with conditions that the approved structure plan shall apply to the area to guide subdivision and/or development.

An approved Structure Plan applies to the site and guides subdivision and development (the Kingsford Local Structure Plan). The effect of the Structure Plan is discussed in **section 4.4** of this report.

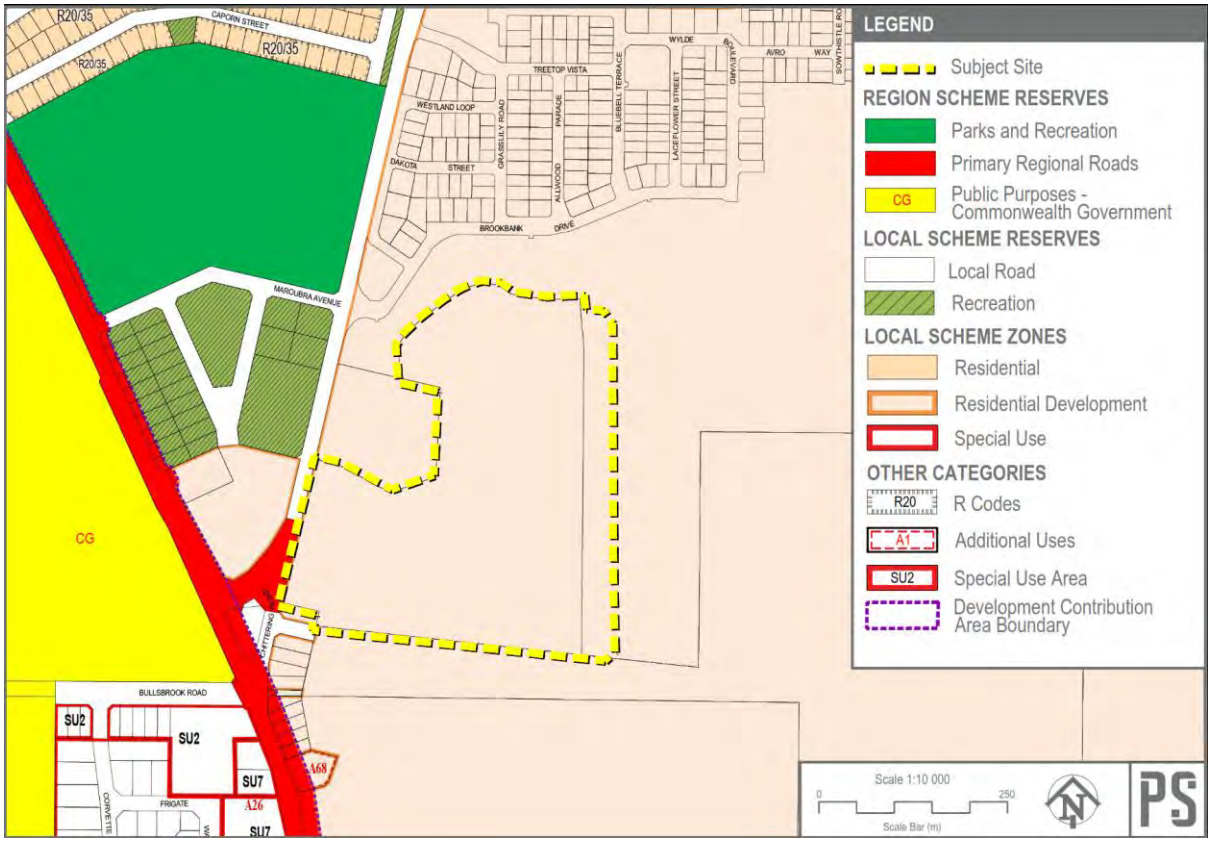


Figure 5: Extract of LPS17 zoning map

4.3.2 Land use classification and permissibility

The land use of 'Park Home Park' is defined in Schedule 1 of LPS17 as having the same meaning as in the Caravan Parks and Camping Grounds Regulations 1997 (WA) (**CPCG Regs**):

> ***Park Home Park*** *means a caravan park at which park homes, but not any other caravans or camps, are situated for habitation;*

A 'Park Home' is defined under the CPCG Act as:

> ***Park Home:*** *A vehicle of a prescribed class or description that is fitted or designed for habitation.*

The CPCG Regs provide a further definition of the meaning of a Park Home:

> *A caravan in respect of which a vehicle licence is not required under the Road Traffic (Vehicles) Act 2012 section 4, because it could not be drawn by another vehicle on a road due to its size, is a vehicle of a prescribed class or description for the purposes of the definition of "park home" in section 5(1) of the Act.*

The proposed development is considered to fit within the definition of 'Park Home Park' as defined in Schedule 1 of LPS17 (and relevantly the CPCG Regs and CPCG Act), as the relocatable, independent dwellings (Park Homes):

a. are capable of being propelled or drawn on wheels;
b. are fitted or designed for habitation; and
c. will be situated at a caravan park where no other caravans or camps are situated for habitation.

While the proposed land use is defined under the provisions of LPS17, it is not listed in the zoning table. The City has discretion to assess the proposed development as a 'Use Not Listed – Park Home Park'.

In accordance with Clause 18 (4)(b) of the *Planning and Development (Local Planning Schemes) Regulations 2015* (**LPS Regulations**):

> *(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 –*
>
> > *(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;* **[emphasis added]**

Accordingly, the proposed unlisted use of 'Park Home Park' should be assessed against the objectives of the Residential Development zone of LPS17.

Refer to **Appendix 12** for the letter containing land use classification advice prepared by Lavan.

4.3.3 Residential Development zone objectives and merit assessment

The objectives of the Residential Development zone under the provisions of LPS17 are to:

a) *provide for the coordinated development of future residential areas through the application of a comprehensive plan to guide subdivision and development to be known as a "Structure Plan";*

b) *provide for predominantly residential development, but including also a range of compatible services, consistent with the needs of an integrated neighbourhood, and planned so as to minimise adverse impacts on amenity;*

c) *avoid the development of land for any purposes or at a time when it is likely to compromise development elsewhere in the district or prejudice the future development of land in the Residential Development zone for more appropriate purposes;*

d) *take account of the need to protect the amenity and on-going use of adjacent property owners as well as to provide for the needs of future residents.*

The 'Park Home Park' land use involves dwellings, which are entirely compatible with the adjoining residential development to the east of the subject site. The housing typology offered by the Park Home Park dwellings caters for a different age demographic, allowing for an integrated community and neighbourhood.

The proposed development does not prejudice the future development of land in the Residential Development zone, instead offering an opportunity for convenient and much needed housing supply. The Kingsford Local Structure Plan does not propose any public roads through the subject site. Therefore, we consider the Structure Plan contemplates the singular coordinated development of the subject site, which is being proposed as part of this Lifestyle Village development.

The Recreation zoned land within the subject site will be held in private ownership and maintained in accordance with the provisions of the approved Foreshore Management Plan.

The proposed development and layout of the subject site has been designed in such a way to ensure the protection of existing amenity for adjoining landowners. Substantial areas of landscaping are proposed at the lot boundaries. The proposed development is consistent with the objectives of the Residential Development zone, warranting approval.

4.3.4 LPS17 Development standards and requirements

Part 5 of LPS17 contains general development requirements for the scheme area. Clause 5.5. allows for the application of discretion for the City to approve variations to development requirements where the R-Codes do not apply and where there is no adverse amenity impact resulting from the variation.

Part 5A of LPS17 relates to Structure Planning Areas. An assessment against the relevant development requirements and provisions of LPS17 has been completed in **Table 4** below.

Table 4: Assessment against the relevant Development Requirements of LPS17

Clause		Comment
5A.1 Structure Planning Areas		
5A.1.3 Subdivision and Development in Structure Planning Areas		
5A.1.3.1	*The subdivision and development of land within a Structure Planning Area is to be generally in accordance with any structure plan that applies to that land.*	An assessment against the key provisions of the Kingsford Local Structure Plan is provided in section 4.4 below. The proposal is generally consistent with the objectives and zoning.
5A.1.4 Structure Plan required		
5A.1.4.1	*The local government is not to:* *(a) consider recommending subdivision; or* *(b) approve development of land within a Structure Planning Area unless there is a structure plan for the area or for the relevant part of that area that adequately defines the comprehensive planning detail required to guide orderly subdivision and development for urban land use.*	The Kingsford Local Structure Plan has been prepared and applies to the subject site, providing guidance for development and land uses within the Structure Plan area. The environmental investigations and reporting enclosed within the submission have all been prepared to facilitate the appropriate and orderly development of the subject site, without prejudicing the existing structure plan. Further commentary on the appropriateness of the proposed Lifestyle Village (Park Home Park) in the context of the Structure Plan and its Residential zoning is provided throughout this report.
5A.1.4.2	*Notwithstanding clause 5A.1.4.1, a local government may recommend subdivision or approve the development of land within a Structure Planning Area prior to a structure plan coming into effect in relation to that land, if the local government is satisfied that this will not prejudice the specific purposes and requirements of the Structure Planning Area.*	

In accordance with the provisions of LPS17, the development of the subject site does not undermine the intent of the Structure Plan. An assessment against the development provisions of the Structure Plan is provided in section 4.4.

4.3.5 Residential Design Codes Volume 1

The Residential Design Codes Volume 1 (**R-Codes**) provides a basis for control of residential development throughout Western Australia. Part B applies to all single houses R40 and below and grouped dwellings R25 and below. Although the proposed Lifestyle Village (Park Home Park) is neither a single house or a grouped dwelling, the key provisions of the R-Codes have been used as a guide.

An assessment against the key deemed-to comply (**DTC**) provisions applicable to the R40 density code is provided in **Table 3** below, based on the metrics of the proposed leasehold lots.

Table 3: Deemed-to-comply assessment

DTC provision	Required		Proposed	Compliance
5.1.1 Site area				
C1.1 and C1.2 – Site area requirements (R40)	Minimum lot area:	180m²	Minimum 262.5m²	Yes
	Average lot area:	220m²		
5.1.2 Street setback				
C2.1 – Primary street	Minimum setback:	4m	1.93m	Design Principle Assessment

5.1.4 Open space				
C4 – Open space	Minimum 45% of site	118m²	Approx 118m² (45%)	Yes
5.1.6 Building height				
C6 – Building height	Top of wall (roof above)	7m	Maximum building height of 5.855m (Clubhouse).	Yes
	Pitched/hipped roof	10m		
	Top of wall (concealed, gable, skillion)	8m		

The following commentary is provided with respect to the variation to Street setback (Element 5.1.2) which does not meet the deemed-to-comply requirement (set back 1.93m in lieu of 4m). The following justification is provided in consideration of the Design Principles:

1. The Park Home street setbacks are to internal private roads as part of the Lifestyle Village.
2. There is currently no established streetscape which the lessor setback would conflict with. The proposed setbacks contribute to the consistency of the future streetscape.
3. The Park Homes are designed to provide an adequate privacy and open space for residents.
4. Site planning requirements such as parking, landscape and utilities aren't impacted by the lessor setback.
5. The Park Homes are an appropriate single storey scale. Proposed design elements, materials and landscaping soften any perceived impact on the Park Home providing a lessor setback to the street (private internal road).

The proposed street setbacks are therefore warranted.

In terms of the internal road widths, a variation to deemed-to-comply requirements C5.7 of 5.3.5 Vehicular access is proposed. The widths of the internal communal roads are 6m and 10m in lieu of 12m. The proposed road widths have been designed in consideration of the Lifestyle Village and its low speed environment and shared roads. The reduced road widths allow for more landscaping while maintaining safety and legibility.

4.3.6 Matters to be considered

Clause 67(2) of the Deemed Provisions sets out the matters for which due regard is to be given when considering a development application. Refer **Table 5** below for an assessment of the relevant matters.

Table 5: Matters to be considered

Matter to be considered	Provided
(a) the aims and provisions of this Scheme (including any planning codes that are read, with or without modifications, into this Scheme) and any other local planning scheme operating within the Scheme area;	The aims and provisions of LPS17 are considered and addressed throughout this report.
(b) the requirements of orderly and proper planning including any proposed local planning scheme or amendment to this Scheme that has been advertised under the Planning and Development (Local Planning Schemes) Regulations 2015 or any other proposed planning instrument that the local government is seriously considering adopting or approving;	The development application has been prepared consistent with the provisions of the approved Structure Plan and the requirements of orderly and proper planning.
(c) any approved State planning policy	Refer to section 4.1 of this report for consideration of the relevant State Planning Policies.

Matter to be considered	Provided
(d) any environmental protection policy approved under the Environmental Protection Act 1986 section 31(d)	The technical reports prepared by Pentium Water in support of this application have either considered or addressed the environmental considerations of the proposed development.
(e) any policy of the Commission	The WAPC's Position Statement: Residential accommodation for ageing persons is considered in section 4.6 of this report.
(f) any policy of the State	The Caravan Parks and Camping Grounds Act 1995 and Caravan Parks and Camping Grounds Regulations 1997 are considered in section 4.6 of this report.
(g) any local planning policy for the Scheme area;	Refer to section 4.5 of this report for consideration of the City's relevant local planning policies.
(h) any structure plan or local development plan that relates to the development	The Kingsford Local Structure Plan applies to the subject site and has been considered in Section 4.4 of this report.
(j) in the case of land reserved under this Scheme, the objectives for the reserve and the additional and permitted uses identified in this Scheme for the reserve	The subject site is not reserved under the provisions of LPS17. The Structure Plan's 'Recreation' zoning of the Ki-It monger Brook has been considered as part of this development application and the approved Foreshore Management Plan.
(l) the effect of the proposal on the cultural heritage significance of the area in which the development is located;	Aboriginal Cultural Heritage Place 3583 (Ki-It Monger Brook 2) is mapped over the subject site and surrounds. We understand the subject site is of mythological significance and was considered in the Ethnosciences desktop Aboriginal heritage assessment in support of the Kingsford Local Structure Plan.
(m) the compatibility of the development with its setting, including – *(i) the compatibility of the development with the desired future character of its setting; and* *(ii) the relationship of the development to development on adjoining land or on other land in the locality including, but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the development;*	Strong emphasis has been placed on the design and layout of the Park Homes and ancillary Clubhouse, ensuring the built form is sympathetic to the prevailing semi-rural and emerging residential character of the locality. Overall, the scale, height, orientation and appearance of the development is consistent with the character of the locality.
(n) the amenity of the locality including the following – *(i) environmental impacts of the development;* *(ii) the character of the locality;* *(iii) social impacts of the development;*	The proposed development responds to the character of the area through the use of various façade treatments, materials and textures. The development also provides substantial landscaping areas throughout the Lifestyle Village. The proposal will not affect the amenity of the locality. There will be no detrimental social impacts resulting from the proposed development. Conversely, the proposal will positively contribute to the locality, through the introduction of new residents and creation of a community.
(o) the likely effect of the development on the natural environment or water resources and any means that are proposed to protect or to mitigate impacts on the natural environment or the water resource	A UWMP has been prepared by Pentium Water in support of the proposal - refer to **Appendix 9.**
(p) whether adequate provision has been made for the landscaping of the land to which the application relates and whether any trees or other vegetation on the land should be preserved;	A concept landscape plan is provided in **Appendix 5** (Prepared by Plan E Landscape Architects) which demonstrates high quality landscaping will be provided throughout the subject site.

Matter to be considered	Provided
(q) the suitability of the land for the development taking into account the possible risk of flooding, tidal inundation, subsidence, landslip, bushfire, soil erosion, land degradation or any other risk	A Bushfire Management Plan has been prepared, demonstrating the proposed development is sound from a bushfire risk and management perspective– refer to **Appendix 6**. A UWMP and Erosion, Sediment & Drainage Control Plan have been prepared by Pentium Water - refer to **Appendices 9 and 10**.
(r) the suitability of the land for the development taking into account the possible risk to human health or safety	A Bushfire Management Plan has been prepared, demonstrating the proposed development is sound from a bushfire risk and management perspective– refer to **Appendix 6**.
(s) the adequacy of – *(i) the proposed means of access to and egress from the site; and* *(ii) arrangements for the loading, unloading, manoeuvring and parking of vehicles;*	A TIA has been prepared, demonstrating the proposed development is sound from a traffic and access point of view – refer to **Appendix 4**. The development provides sufficient spaces for resident parking, with each Park Home comprising a two car garage. Visitor car parking has been provided in proximity to the Clubhouse.
(t) the amount of traffic likely to be generated by the development, particularly in relation to the capacity of the road system in the locality and the probable effect on traffic flow and safety;	A TIA has been prepared, demonstrating the proposed development is sound from a traffic and access point of view – refer to **Appendix 4**.
(u) the availability and adequacy for the development of the following – *(i) public transport services;* *(ii) public utility services;* *(iii) storage, management and collection of waste;* *(iv) access for pedestrians and cyclists (including end of trip storage, toilet and shower facilities);* *(v) access by older people and people with disability;*	Availability of transport options near the subject site is considered in the TIA prepared for the proposed development – refer **Appendix 4**. Utility services is considered by the Engineering Services Report prepared by Cossill & Webley – refer to **Appendix 7**. Waste Management is expected to be undertaken in the normal manner, with the City's waste collection services collecting rubbish once per week from the individual Park Homes. Refer **Appendix 11** for the Waste Management Plan. The internal road layout and widths are designed as a shared space for cars, cyclists and pedestrians. The Lifestyle Village is designed for over 50's living and ageing in place, with accessible design principles considered in the design.
(v) the potential loss of any community service or benefit resulting from the development other than potential loss that may result from economic competition between new and existing businesses;	The proposed development will not result in the loss of a community service. Contrary, the proposed development will contribute to housing diversity and supply within the Bullsbrook locality. The 237 Park Homes will result in a community that are likely to support local businesses.
(w) the history of the site where the development is to be located;	The subject site has historically been cleared for rural purposes. The semi-rural character of the locality has been considered in the design of the Lifestyle Village and the Park Homes.
(x) the impact of the development on the community as a whole notwithstanding the impact of the development on particular individuals;	The proposed development will contribute to the delivery of important housing diversity and supply.
(y) any submissions received on the application;	Submissions will be considered during the assessment of the application.
(za) the comments or submissions received from any authority consulted under clause 66;	Noted.
(zb) any other planning consideration the local government considers appropriate.	No other planning considerations have been identified.

Having regard to **Table 5** above, it is considered that all relevant matters to be considered have been satisfactorily addressed within this report, demonstrating the proposed development warrants approval.

4.3.7 Developer contributions

LPS17 identifies the subject site as being within a Development Contribution Area for the purposes of sharing infrastructure costs. The Bullsbrook Residential Townsite – Development Contribution Plan applies, with the subject site located in Precinct 2. In calculating both the area of an Owner's land and the total area of land in a Development Contribution Area, LPS17 stipulates that existing public open space is excluded from the area subject to the contribution.

The subject site contains land zoned 'Recreation' under the provisions of the Kingsford Local Structure Plan. The land comprises the Ki-It Monger Brook and its foreshore will held in private ownership and will generally be used for recreation purposes. This area will be managed in accordance with the approved Foreshore Management Plan.

Conservation Areas are listed as a deduction from the gross subdivisible area. The portion of the subject that is zoned Recreation is shown as Conservation/Reserve by the DCP. Accordingly, the area of the subject site zoned by the Structure Plan for Recreation is free from trigging a development contribution calculation.

4.4 Kingsford Local Structure Plan

The Kingsford Local Structure Plan (**Structure Plan**) applies to the subject site. The subject site is predominantly zoned as 'Residential (R20-R40)' by the Structure Plan. A 'Recreation' zone applies to the south western aspect of the subject site (south of the church and fronting Chittering Road) and generally aligns with the Ki-It Monger Brook. Refer to **Figure 6** below for an extract of the Structure Plan map.

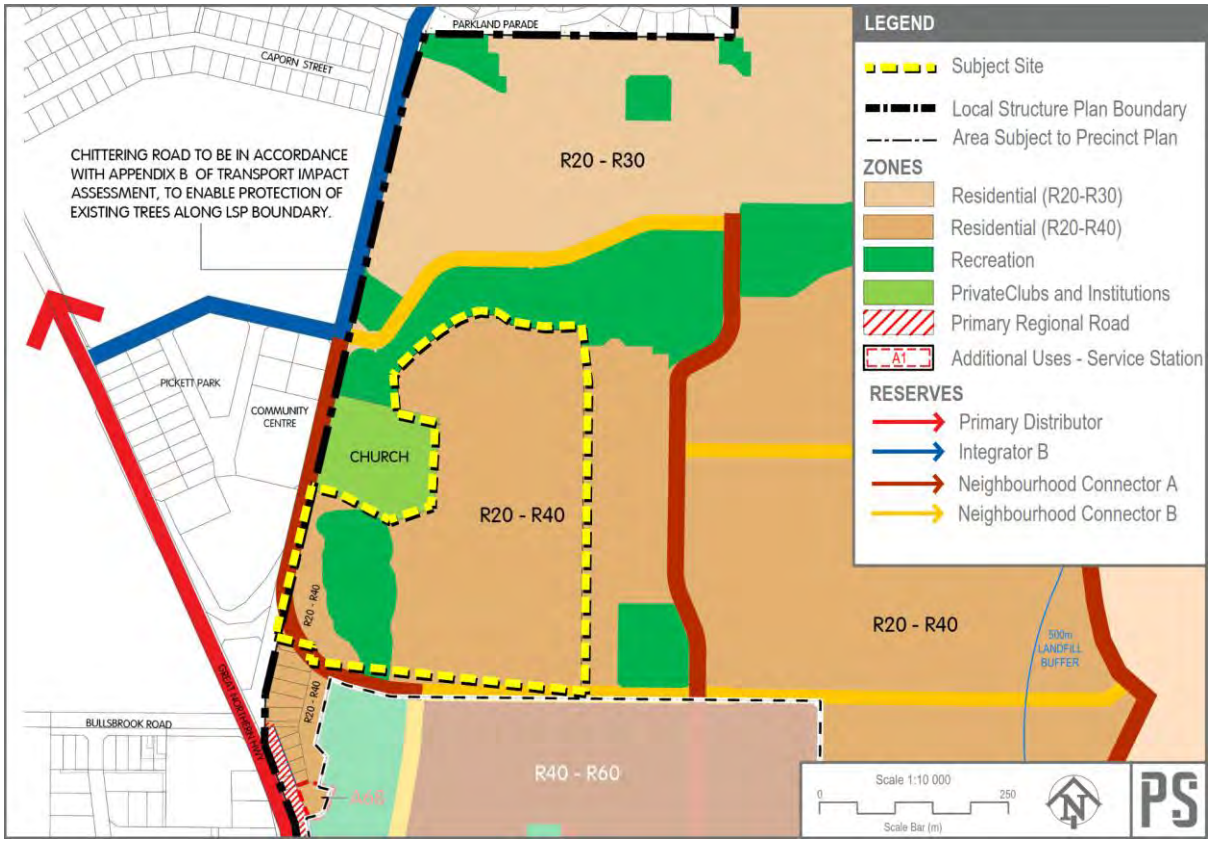


Figure 6: Extract of the structure plan map

4.4.1 Residential Zoned land and permissibility

The R20 density code applies as the base code. The R40 density code applies to Residential zoned lots where the lot is created within a 400m walkable catchment of the town centre. The southern aspect of the subject site is within 400m of the Commercial zone under the provisions of the Structure Plan.

Land Use permissibility within the Structure Plan area is in accordance with the Structure Plan map and the corresponding zones and reserve under the provisions of the City's LSP17. Accordingly, land use permissibility within the portion of the subject sized zoned 'Residential R20-R40' is in accordance with the Residential zone.

Given the proposed land use of 'Park Home Park' is a 'Use Not Listed' within the zoning table of LPS17, an assessment against the objectives of the Residential zone is required. The Residential zone objectives are to:

> *a) provide for a range of forms and densities of residential development to meet the needs of the wide variety of households which make up the community;*
>
> *b) promote a residential environment in each locality consistent with the form and density of residential development permissible in the locality, so as to enhance a sense of place and community identity;*
>
> *c) preserve and enhance those characteristics which contribute towards residential amenity, and to avoid those forms of development which have the potential to prejudice the development of a safe and attractive residential environment;*
>
> *d) provide for a limited range of ancillary development compatible with the form and density of residential development, and complementary to the needs of local communities, but which will not compromise residential amenity;*
>
> *e) avoid development of land for any purpose or in any manner that would detract from the viability or integrity of development in either the Strategic Regional Centre or the Commercial zones.*

The proposed development is consistent with these objectives for the following reasons:

1. A Lifestyle Village (Park Home Park) is by nature inherently a residential land use. The overall density of development is consistent with the underlying R40 density code, meeting the key DTC requirements of the R-Codes (with the exception of the primary street setback). The area of the subject site proposed to accommodate the Park Homes equates to approximately 28.2 dwellings per hectare.
2. The proposed development will create additional housing stock , housing diversity and affordable housing options for over 50's living for aged care and aged living. This form of residential development will meet the needs of the wide variety of households which make up the community;
3. The proposal development represents a residential environment consistent with the Bullsbrook locality, with the form and density of the Park Homes consistent with the R20-R40 residential density code outlined by the Structure Plan.
4. The internal layout of the Park Homes, Clubhouse and landscaping will create a sense of place and community identity within the Lifestyle Village;
5. The proposal seeks to preserve and enhance the characteristics of the subject site by a site responsive design of floor levels and existing topography. The Ki-It monger Brook and its associated foreshore boundaries and foreshore management plan have been considered as part of the proposal.
6. Proposed landscaping seeks to enhance the existing characteristics of the subject site and future residential amenity.
7. The proposal features an ancillary Clubhouse with amenities that is compatible with the form and density of residential development associated with the Park Homes. The ancillary amenities are complementary to the Park Home residents and the needs of the Lifestyle Village as a local community. The Clubhouse and amenities are located and designed to not compromise residential amenity; and
8. No commercial development is proposed. The proposed Lifestyle Village does not undermine any Strategic Regional Centre or Commercial zone within the municipality.

The Perth and Peel @ 3.5 million framework indicates that new urban areas are to use a minimum average residential target of 15 dwellings per gross hectare of Urban zoned land. The proposed development provides 237 Park Homes across approximately 15 hectares of the subject site. This equates to approximately 15.6 dwellings per gross hectare.

The area of the subject site proposed to accommodate the Park Homes and internals roads comprises an area of approximately 8.32 hectares, equating to approximately 28.2 dwellings per hectare. This complies with the Liveable Neighbourhood target of 22 dwellings per site hectare.

In consideration of the above, the proposed Lifestyle Village (Park Home Park) is consistent with the objectives of the Residential zone and residential density expected for the subject site, warranting approval.

4.4.2 Recreation zoned land

The portion of the subject site zoned 'Recreation' and comprising the Ki-It Monger Brook and its foreshore will be held in private ownership. The land will be used for conservation and recreation purposes.

The remnant trees within the Ki-It Monger Brook will be retained through the establishment of foreshore buffer areas, development setbacks, drainage retention and open space areas.

The access road from Chittering Road will cross the Ki-It Brook at the location of the existing culverts, minimising any potential impact on the environment or the Brook. The various technical and environmental reporting confirms the suitability of this access.

4.5 Local Planning Policies

4.5.1 Local Planning Policy POL-LP-1.10 Provision of Public Art

The City's Local Planning Policy POL-LP-1.10 Provision of Public Art states that a public art contribution will be required where a prescribed development will cause at least 20 people to become part of, or to interact with, the locality in which the prescribed development will be located, and who will therefore benefit from the public art.

4.5.2 Local Planning Policy POL-C-061 Filling of Land

Local Planning Policy POL-C-061 Filling of Land seeks to ensure that applications for the filling of land are dealt with in a consistent manner; and ensure that issues of amenity, drainage management, and environmental protection are given appropriate consideration in the development control process.

The natural topography of the subject site and drainage management have been considered in the proposed civil design of the subject site. The extent of required earthworks (cutting/filling) has been minimised to ensure the natural topography and slop of the land is maintained.

4.6 Other relevant policies and/or guidelines

4.6.1 WAPC Position Statement: Residential accommodation for ageing persons

The WAPC Position Statement: Residential accommodation for ageing persons outlines the WAPC's requirements to support the provision of residential accommodation for ageing persons within Western Australia. It encourages the provision of an appropriate supply and diversity of options for residential accommodation. The proposed Lifestyle Village (Park Home Park) provides housing diversity and supply for over 50's persons, therefore meeting the overarching intent of the Position Statement.

4.6.2 Caravan Parks and Camping Grounds Regulations 1997

Schedule 5, Division 2 of the *Caravan Parks and Camping Grounds Regulations 1997* (**CPCG Regs**) provides the standards applying to Park Homes. **Table 6** below provides an assessment against the relevant provisions.

Table 6: Assessment against the relevant provisions of the CPCG Regs

Provision	Provided	Met
2. Park homes to be of one storey		
A park home is to have only one storey.	Each of the proposed 237 Park Homes are single storey in height.	✓
3. Park home to have chassis, wheels, tie down points etc.		
(1) A park home, or where the park home is assembled from components, each component of the park home, is to have a chassis with an axle and wheel assembly attached at all times.	A heavy-duty fabricated steel castor is bolted to the perimeter edge beam of the precast concrete floors. Once the Park Home is located on site, the castors are removed. A stock of castors and a tow bar are kept on site should they ever be required. Once delivered to site, the Park Homes are installed by a low loader in position, or unloaded and positioned with a crane. Please refer to **Appendix 13** for additional Park Home information, demonstrating compliance with the CPCG Regs.	✓
(2) A park home, or where the park home is assembled from components, each component of the park home is to have a draw bar which need not be attached at all times.		
(3) A park home is to have tie down points, chains or similar devices and a device to provide and adjust tension so that the park home can be attached to permanent anchor blocks in the ground.	Biscuit/Pad Footings are proposed to secure and anchor the Park Homes.	✓
4. Park home stabilised and secured		
(1) A park home is to be stabilised as approved.	The Park Homes will be stabilised, consistent with any future statutory approval.	✓
(2) A park home is to be secured to anchor points at the site where it is parked.	Biscuit/Pad Footings are proposed to secure and anchor the Park Homes.	✓
5. Corrosion protection		
Metal coverings and exposed metal on a park home are to be of corrosion resistant materials, or are to be treated to resist corrosion.	This is a consideration that will be incorporated in the detailed design of the Park Homes, as required by the CPCG Regs.	✓
15. Facility roads in facilities other than nature based parks		
(1) A facility entrance road is to be at least 6 m wide.	The proposed internal entrance road to the development is 10m wide.	✓
(3) A facility road which is a 2 way road is to be at least 6 m wide, or such shorter distance as is approved under subclause (3a).	The north/south oriented private internal roads are a minimum width of 6m	✓
34. Park home parks		
If a park home park serviced by a fire brigade constituted under a written law of the State has a water supply, which in the opinion of the officer in charge of that brigade, is adequate for fire fighting then a fire hydrant is to be installed in the park home park to the satisfaction of that officer.	Noted. Bushfire considerations have also been considered in the Bushfire Management Plan prepared by Allerding & Associates.	✓

Separate to the requirements of the applicable town planning framework, the requirements of the CPCG Regs and Act provide specific legislative requirements for Park Homes. The assessment in **Table 6** above demonstrates compliance with the relevant provisions of the CPCG Regs.

5 CONCLUSION

The proposed development of the Lifestyle Village (Park Home Park) is entirely acceptable for development on the subject site and warrants approval for the following reasons:

1. The proposed development will provide essential housing diversity and housing supply to cater for the growing Bullsbrook community, which is currently undergoing residential subdivision and development. This development will cater for the shortage of over 50's living and housing options in the locality.
2. The development has been designed to a high standard, with a sympathetic built form and use of materials that are consistent with the existing and future character of the locality.
3. The facility incorporates an array of internal and external amenities for residents, resulting in a community development that has a homely and social feel for residents and visitors alike.
4. Substantial landscaping is provided throughout the development for additional amenity and softening of the development to the public realm. High quality landscaping is provided within the development to increase the amenity and liveability for residents.
5. The development and land use of Park Home Park is consistent with and does not undermine the intent of the Structure Plan. The land use is capable of being approved in the Residential Development zone without the need for an amendment to the structure plan.
6. It has been demonstrated that the proposal meets the objectives of both the Residential Development and Residential zones.
7. Expert technical reporting has been prepared to demonstrate the proposal is satisfactory from a bushfire risk and management, traffic generation, stormwater management, engineering and environmental perspective.

For the above reasons, it is respectfully requested the Metro Outer Development Assessment Panel grant approval to the proposed development.

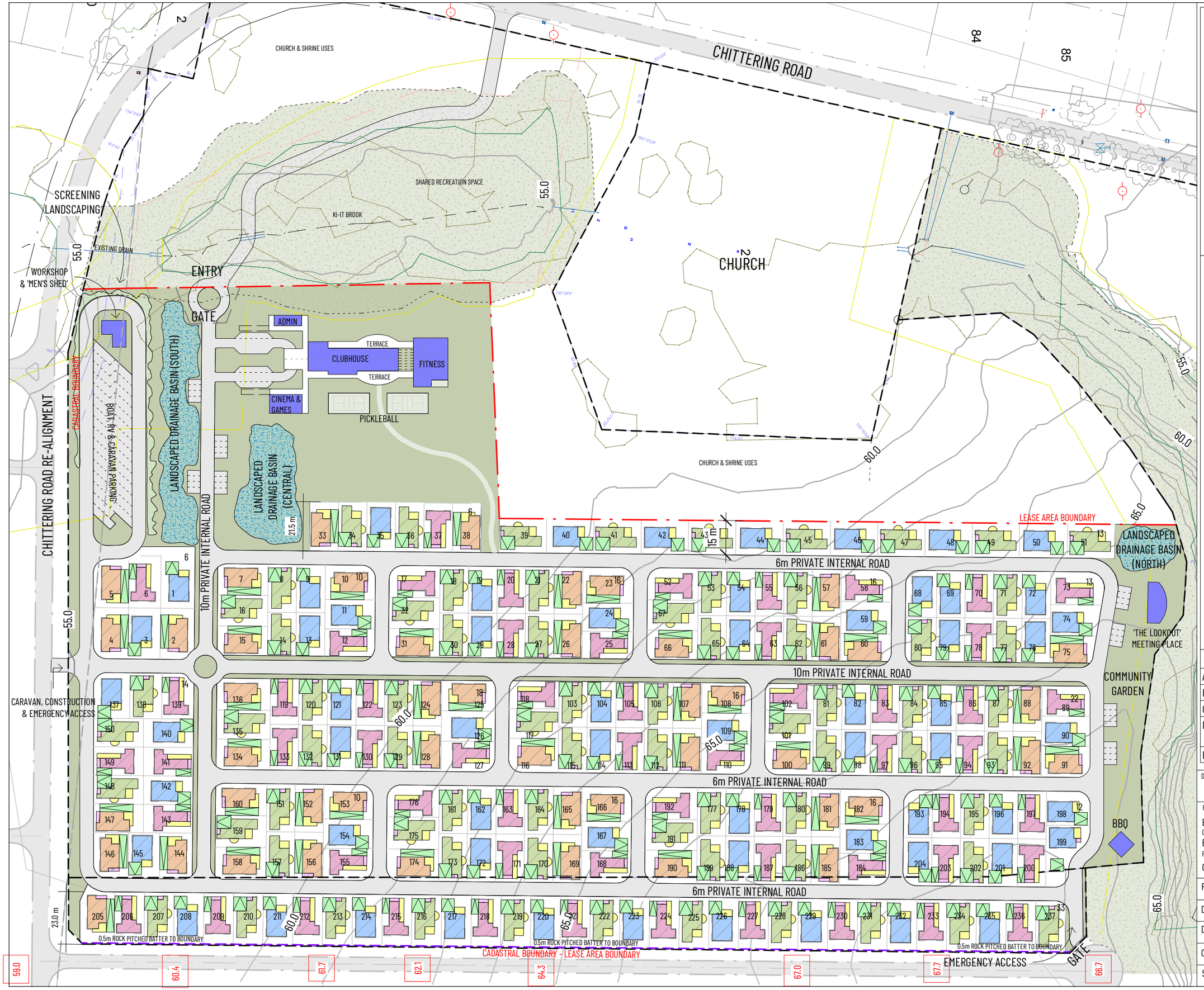
BULLSBROOK LIFESTYLE VILLAGE



Village Streetscape - Artists Impression

Bethanie

RICHARD HAMMOND
REG: No 953
ARCHITECT



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LEGEND

- LANDSCAPING
- 'RECREATION' ZONED AREA
- CORE CREEK AREA
- AREA SUBJECT TO FORESHORE & WETLAND MANAGEMENT PLAN
- VILLAGE AMENITIES
- LANDSCAPED DRAINAGE BASINS
- FENCE/GATE
- ROADWAY
- CADASTRAL BOUNDARY
- LEASE AREA BOUNDARY
- TYPE A (62)
- TYPE B (71)
- TYPE C (47)
- TYPE D (57)

TOTAL HOUSE SITES - 237

TOTAL LEASE SITE AREA - 106,988m²
(NOT INCL. SHARED REC. AREA)

TOTAL RECREATION AREA - 35,095m²
(INCL SHARED REC. AREA)

N

ISSUE	DESCRIPTION	DATE
A	PRELIMINARY MASTERPLAN	28.05.2024
B	REVISED MASTERPLAN	12.08.2024
C	REVISED MASTERPLAN	16.08.2024
D	ENTRY MOVED, LOT NUMB. ADDED	19.08.2024
E	HOUSE-LOT ALLOCATION	02.09.2024

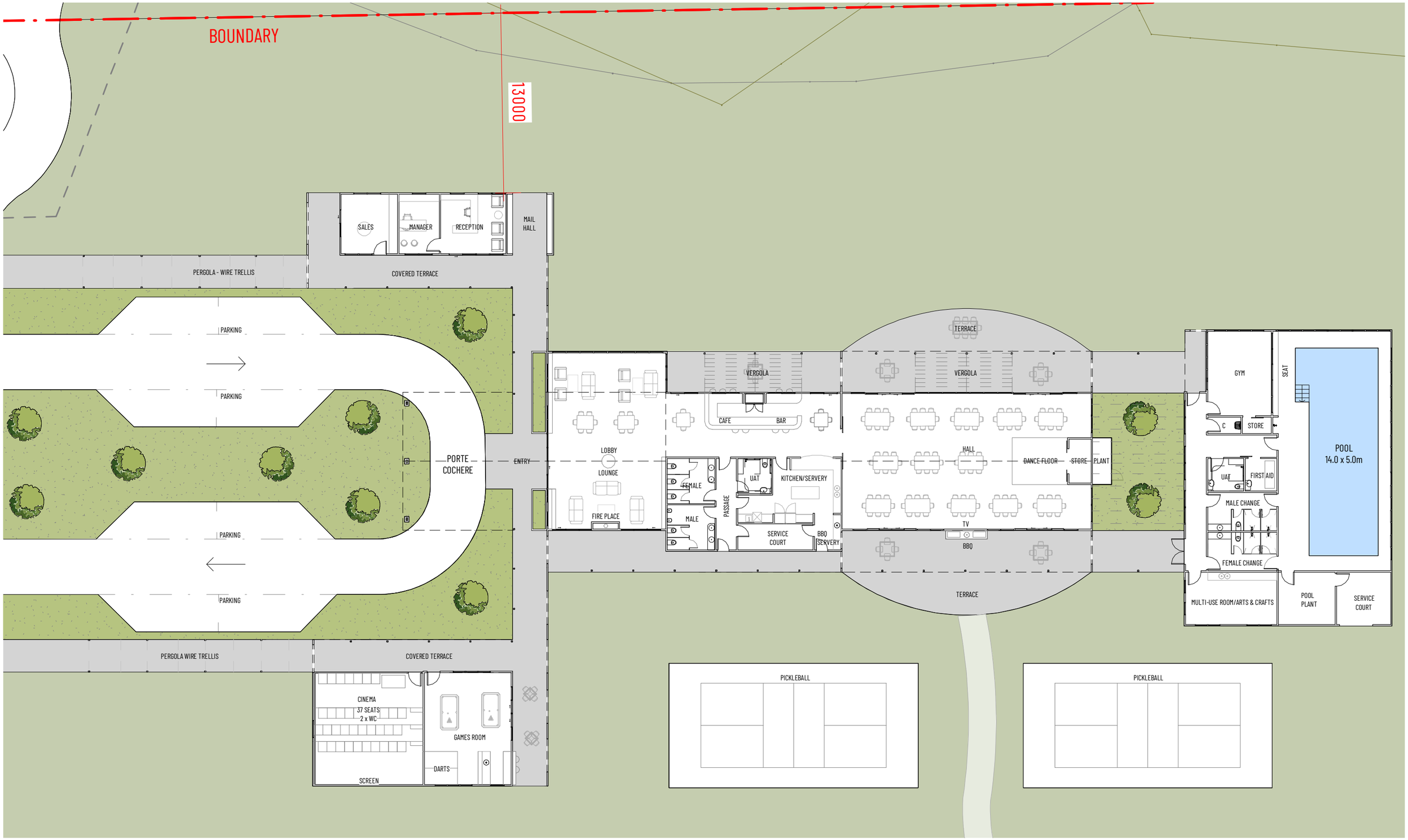
DRAWING TITLE
Masterplan

PROJECT
BETHANIE - BULLSBROOK VILLAGE
CLIENT
BETHANIE
PROJECT ADDRESS
CHITTERING ROAD, BULLSBROOK, WA, 6084

Project number	-
Date	02.09.2024
Drawn by	RHA
Checked by	RHA
Scale @ A3	1 : 1500

DRAWING NO.
A3.01

9/09/2024 1:46:32 PM



CLUBHOUSE INTERNAL AREA: 890m^2

N

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BETHANIE BULLSBROOK
CLUBHOUSE CONCEPT DESIGN RevA
SCALE | 1:250 @A3 22.08.2024

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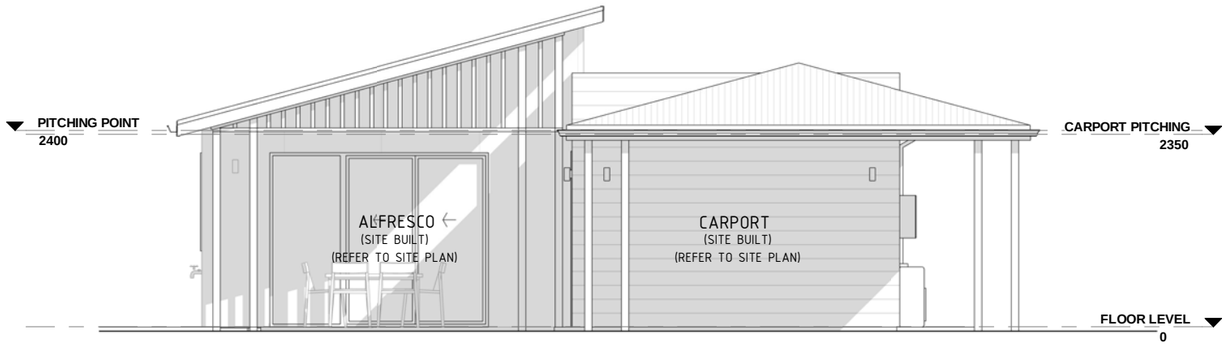

3 TYP. STREET ELEVATION

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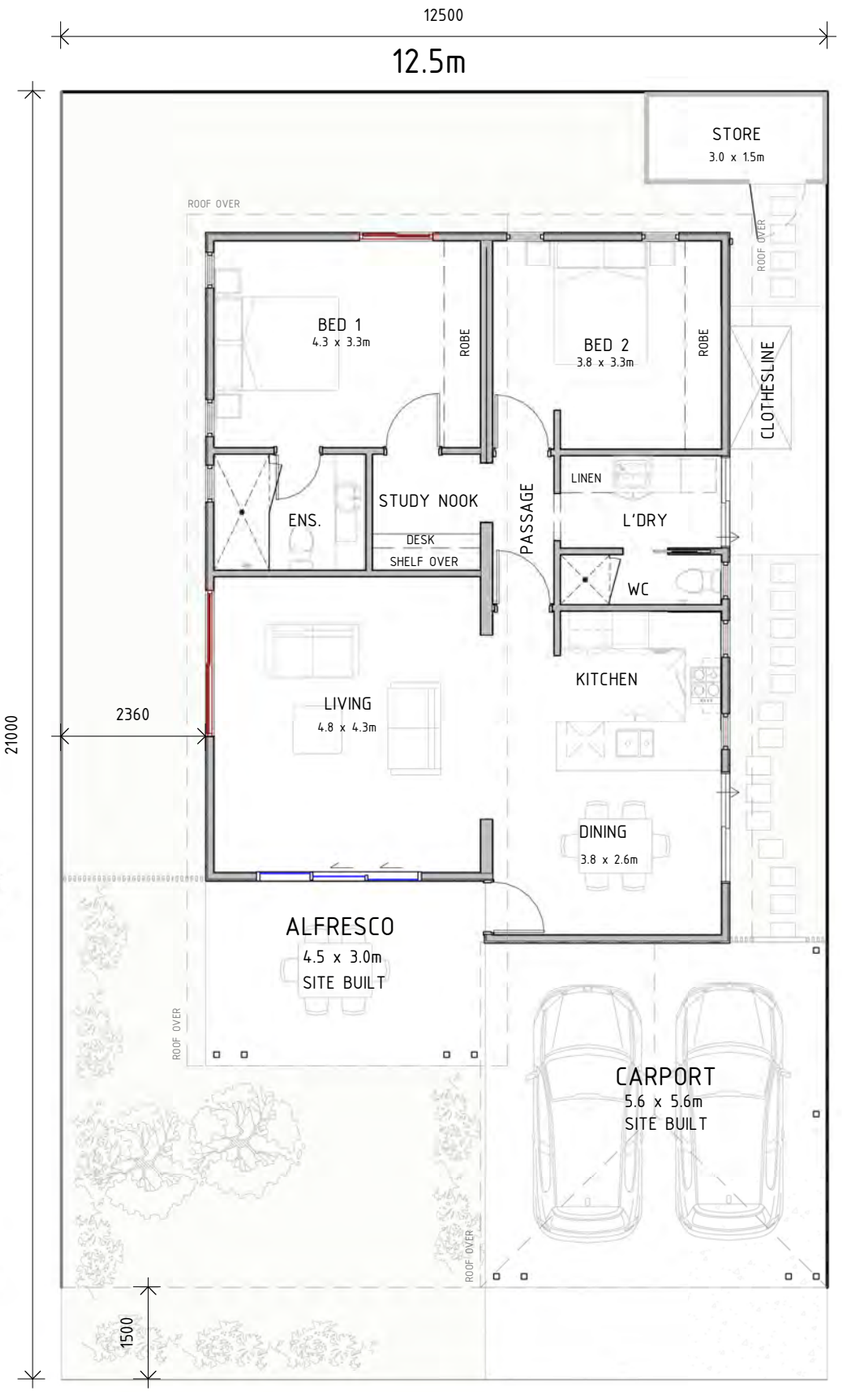
2 3D View



HOUSE A DESIGN | 1:100 N

HOUSE A
A
28.05.2024

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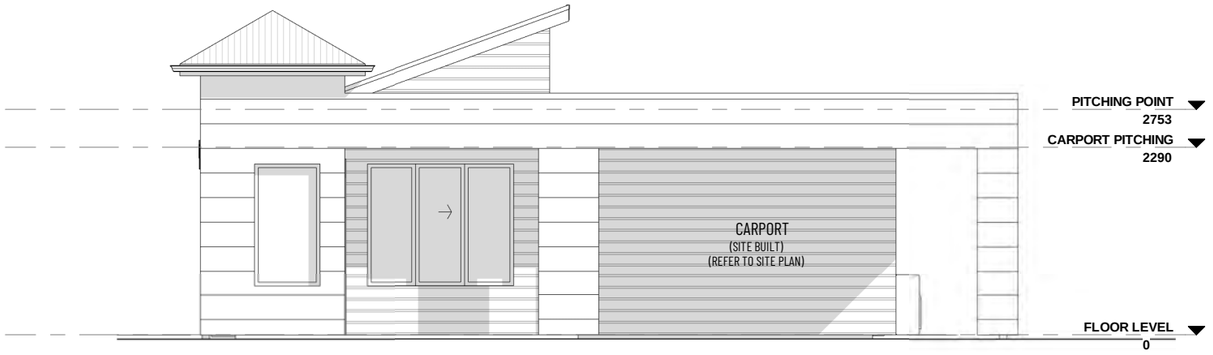

3 TYP. STREET ELEVATION

1 : 75



2 3D View



HOUSE B DESIGN | 1:100 N

HOUSE B
A
19.08.2024

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3 TYP. STREET ELEVATION

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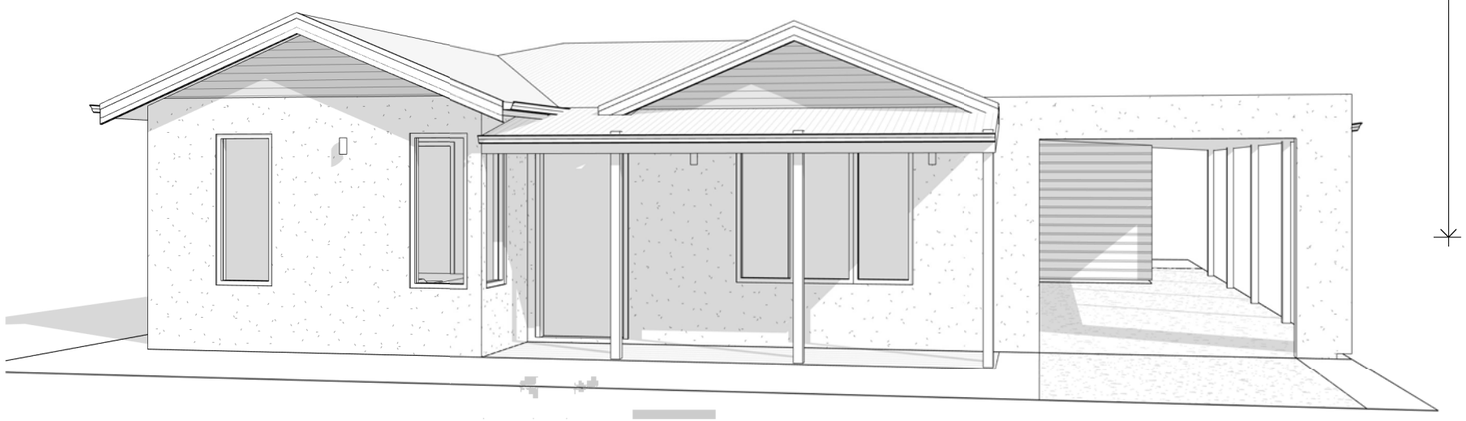

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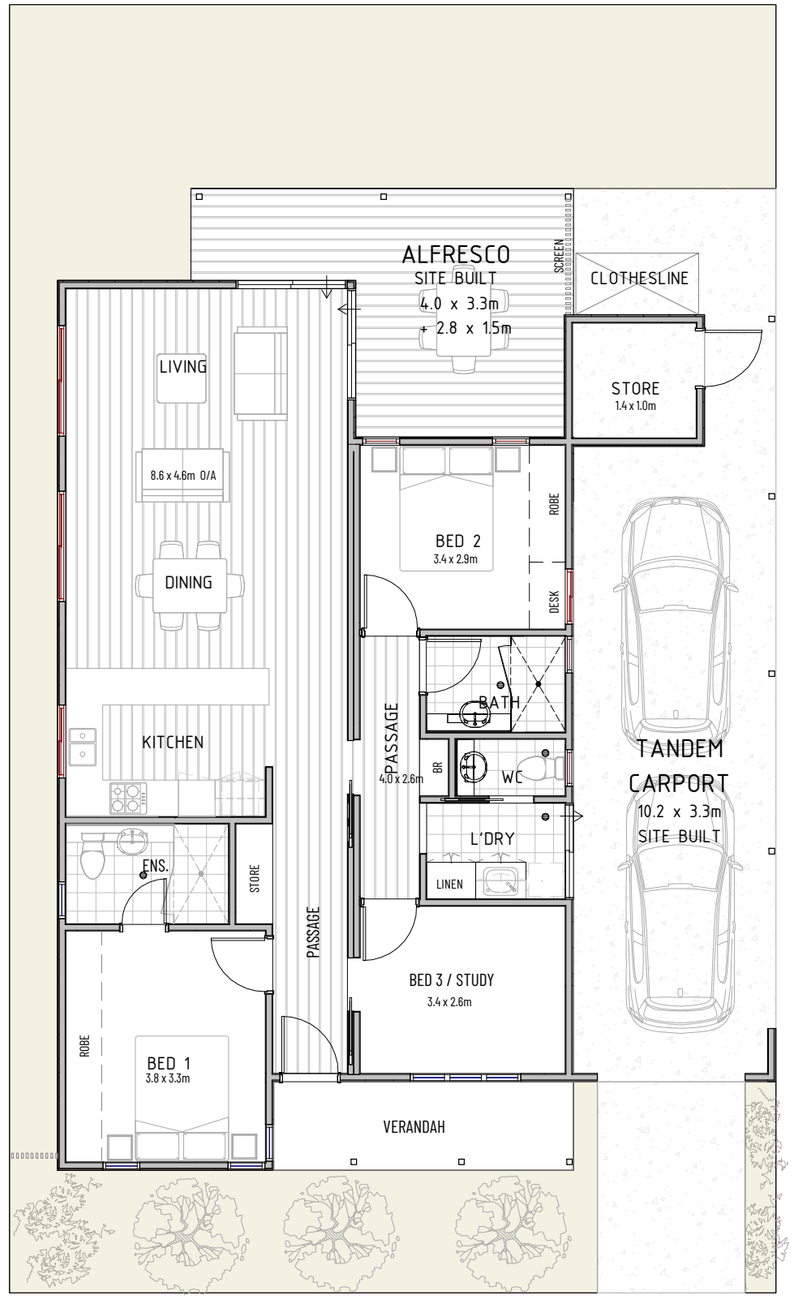

HOUSE C DESIGN | 1:100 N

HOUSE C A

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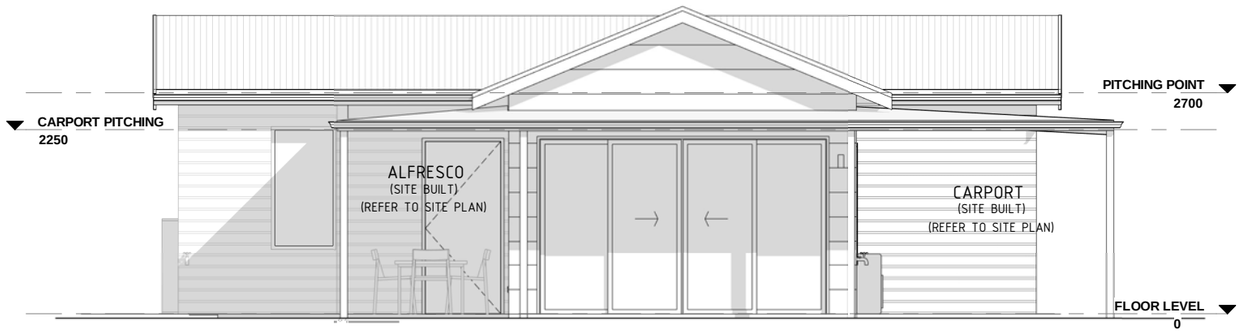

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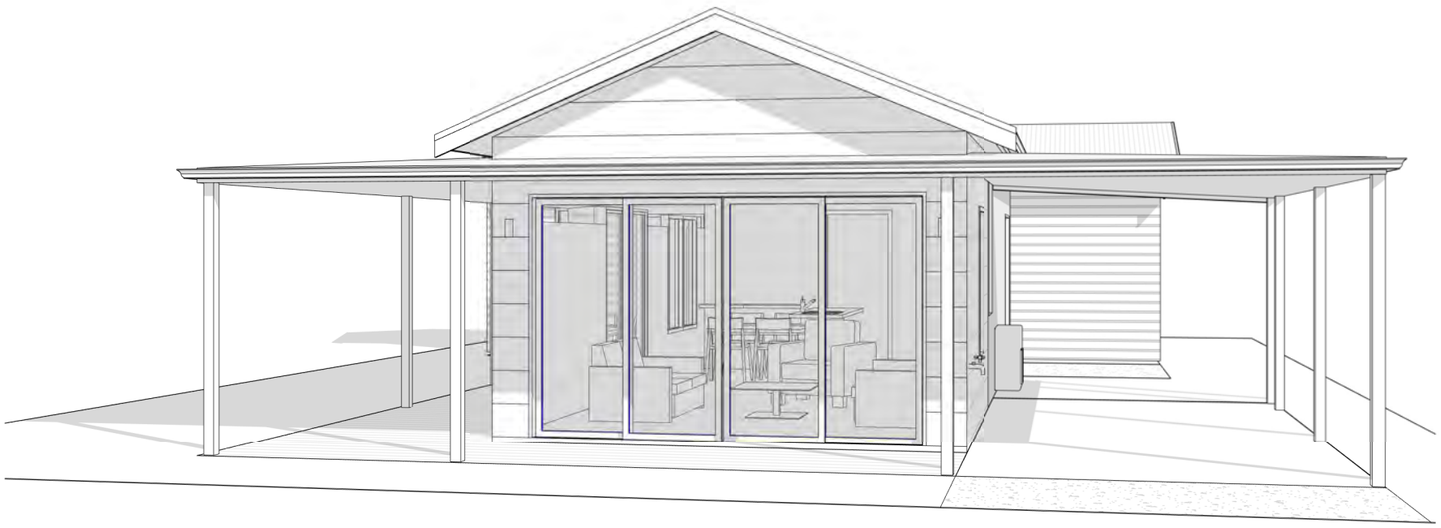
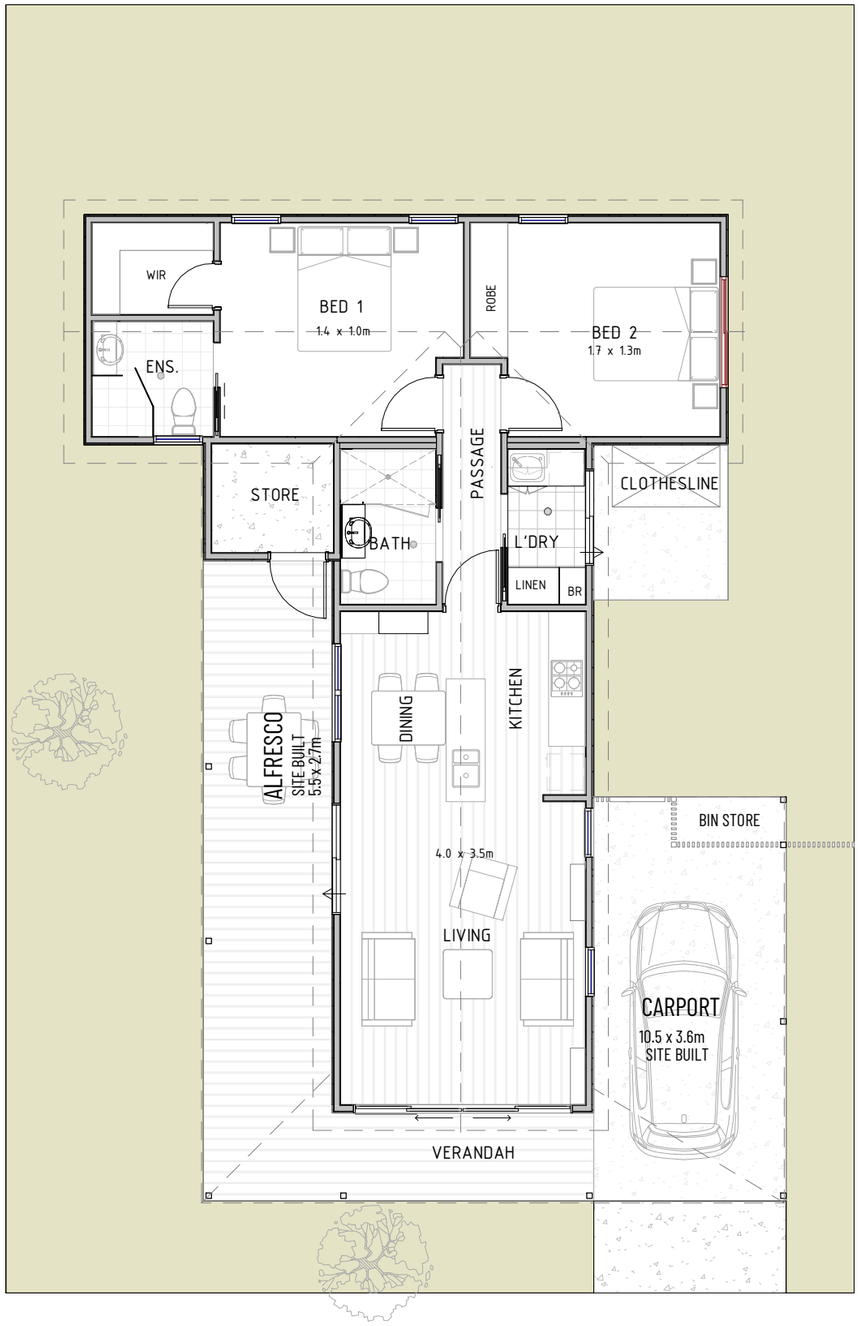


2 3D View



HOUSE D DESIGN | 1:100 N

HOUSE D A

16.08.2024

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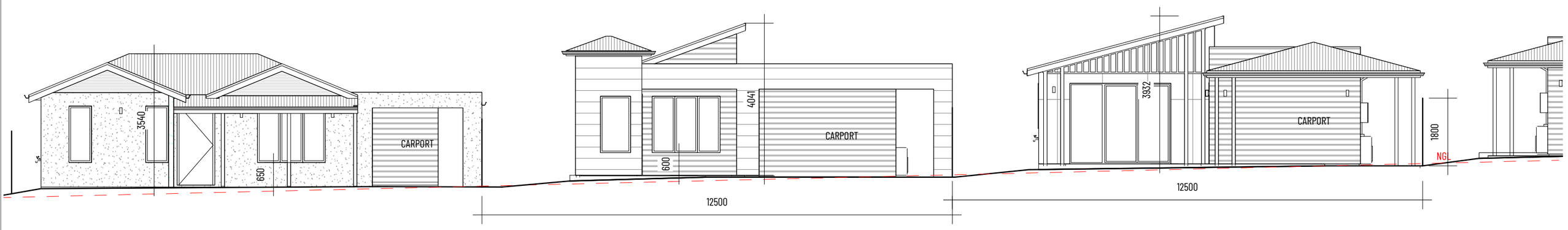

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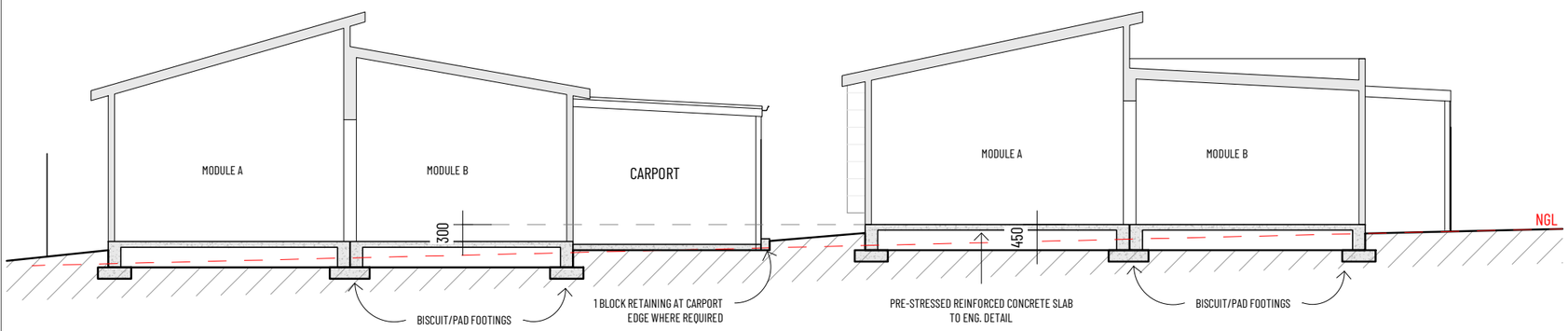

TYP. SITE SECTION

SCALE 1:100

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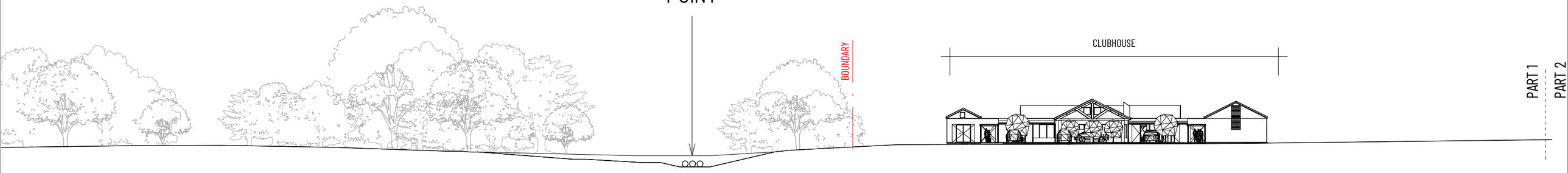
SITE ACCESS ROAD OVER KI-IT BROOK VIA EXISTING CULVERT POINT



1 E-W Street Elevation - PART 1

1 : 500



2 E-W Street Elevation - PART 2

1 : 500

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1 N-S Street Elevation - PART 1

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2 N-S Street Elevation - PART 2

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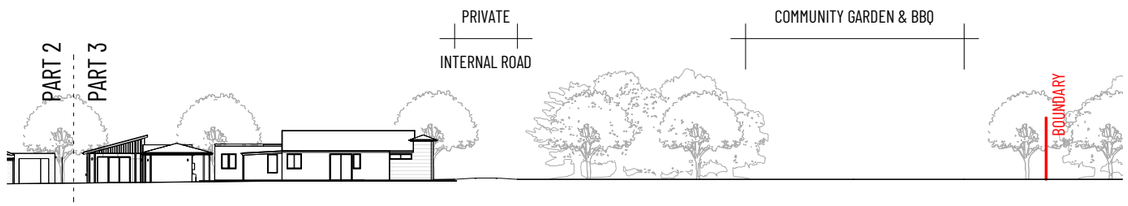

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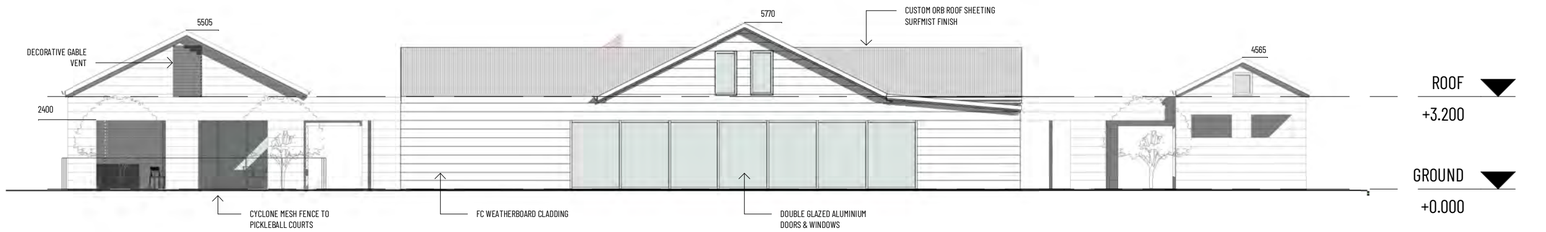

N NORTHERN ELEVATION

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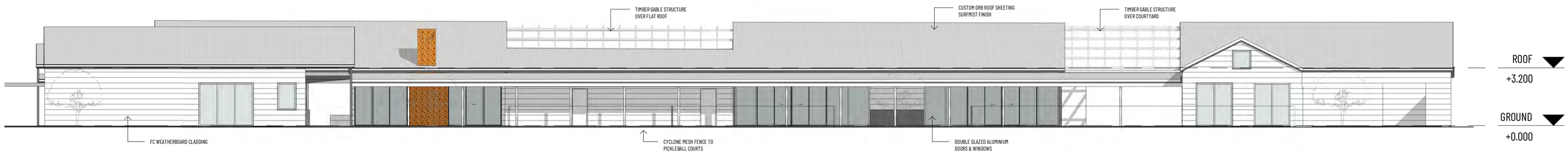
S SOUTHERN ELEVATION

1 : 150



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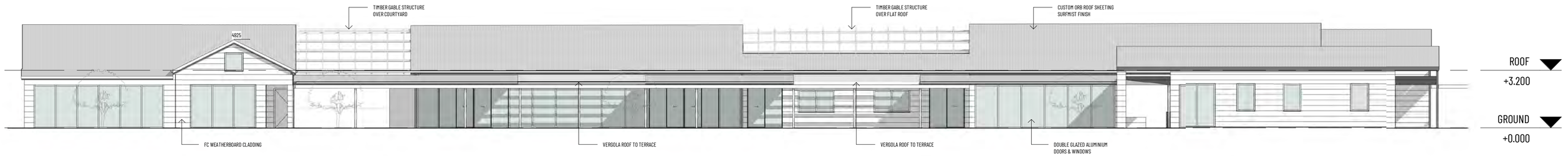

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BETHANIE BULLSBROOK
CLUBHOUSE CONCEPT DESIGN RevA
22.08.2024

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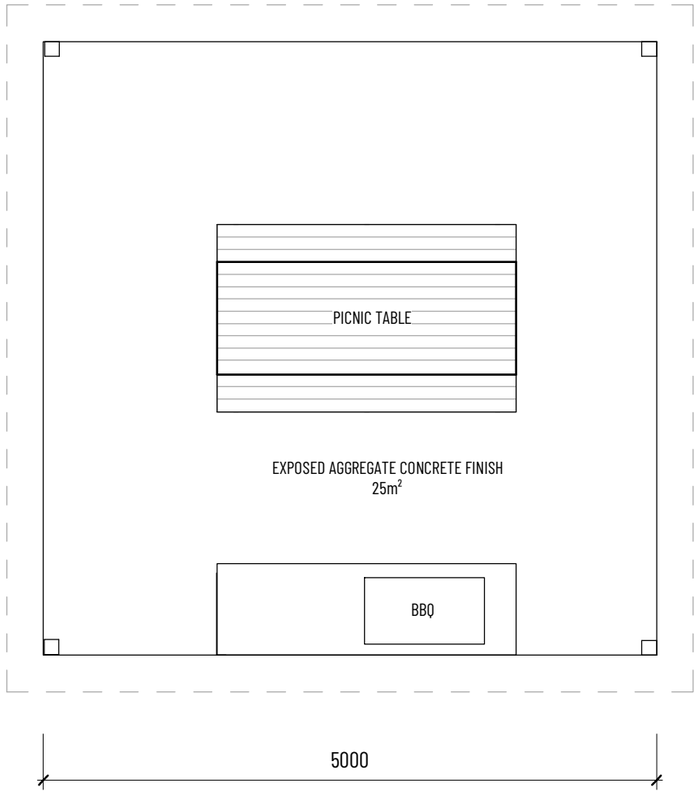

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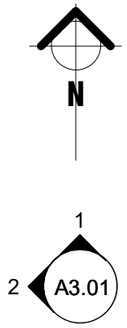

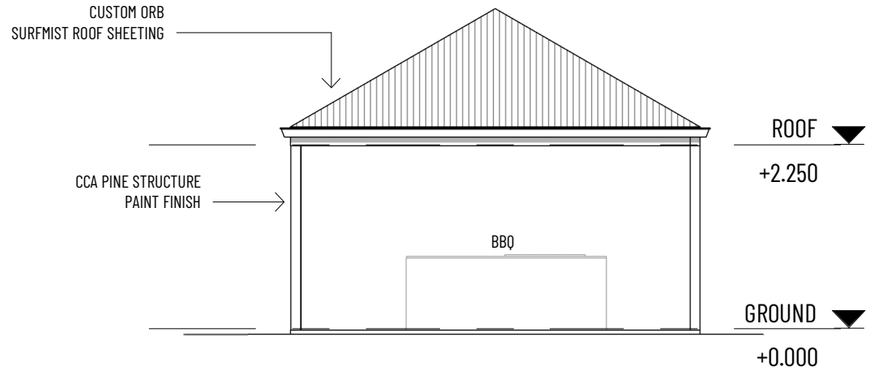

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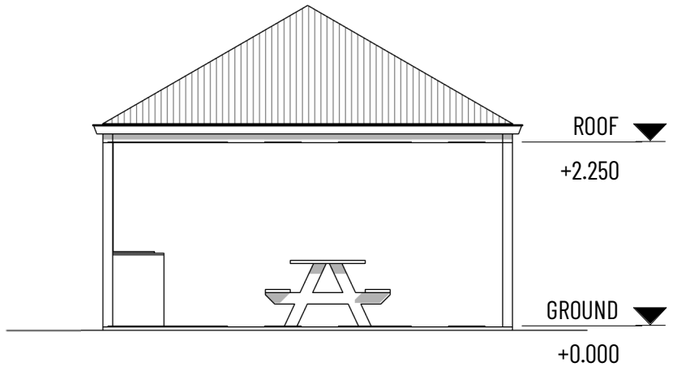

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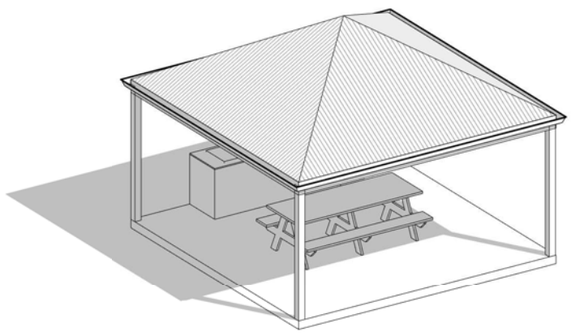

3 — BBQ 3D PERSPECTIVE

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No.	Description	Date
A	PRELIMINARY ISSUE	09.09.24

BETHANIE

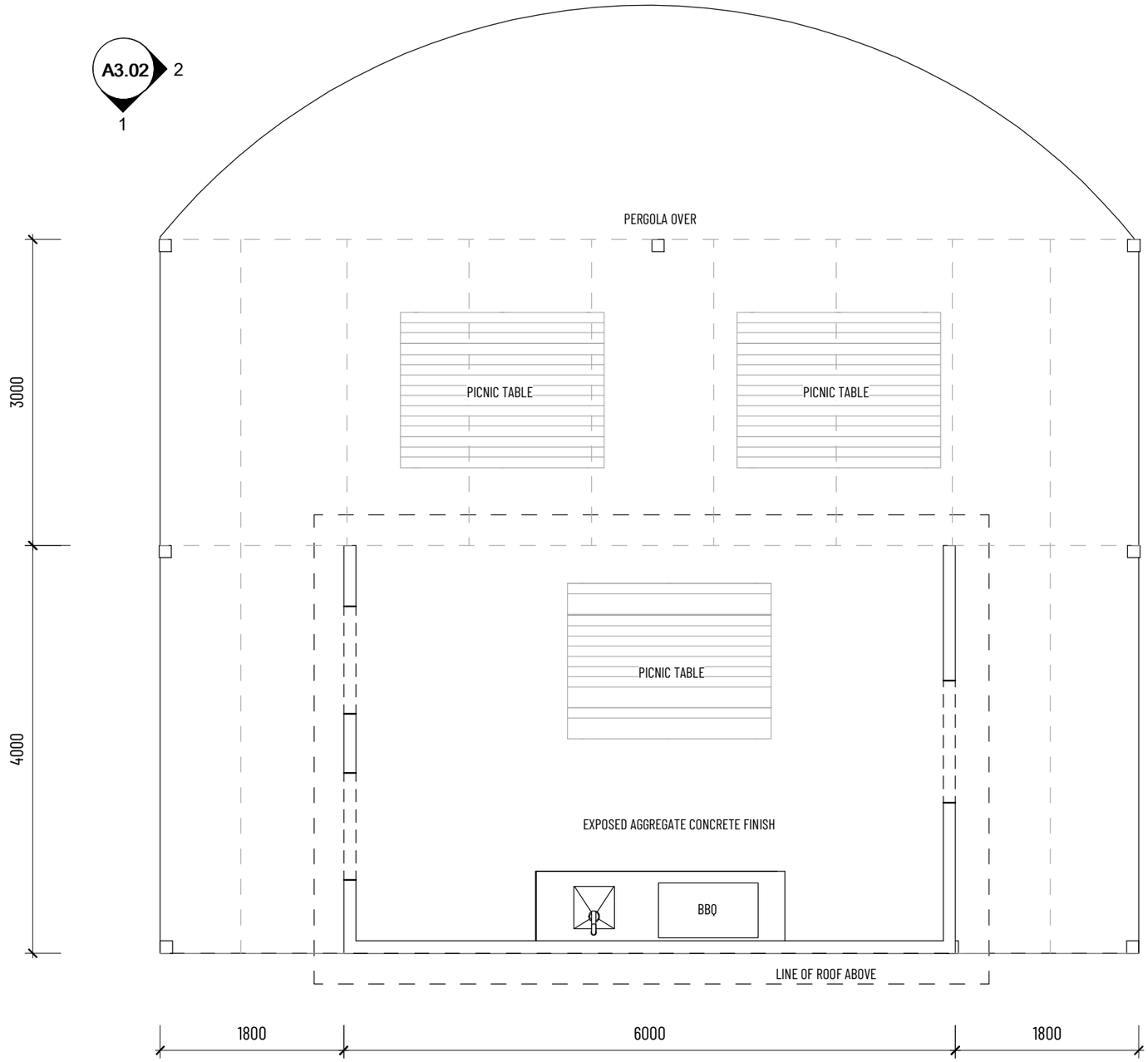
BULLSBROOK VILLAGE

CHITTERING ROAD, BULLSBROOK, WA, 6084

BBQ STRUCTURE

Project number	-	A3.01	
Date	09.09.2024		
Drawn by	RHA		
Checked by	RHA	Scale@A3	As indicated

9/09/2024 12:19:37 PM



0 A3.02 LOOKOUT PLAN

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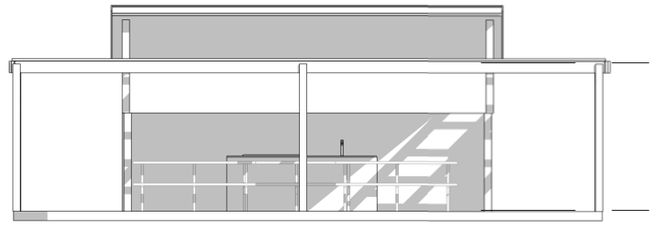

1 A3.02 ELEVATION 1

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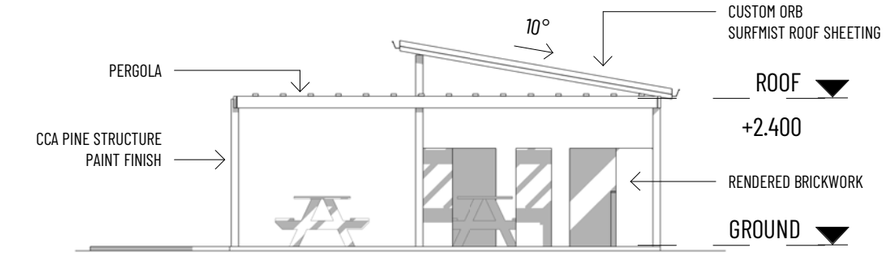

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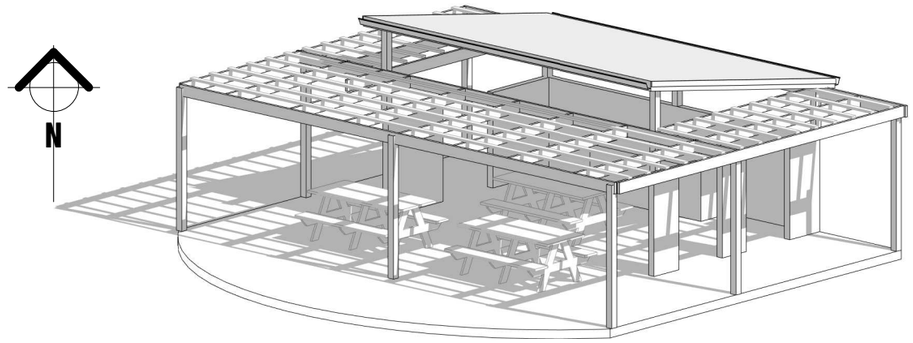

3 LOOKOUT 3D PERSPECTIVE

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No.	Description	Date
A	PRELIMINARY ISSUE	09.09.24

BETHANIE

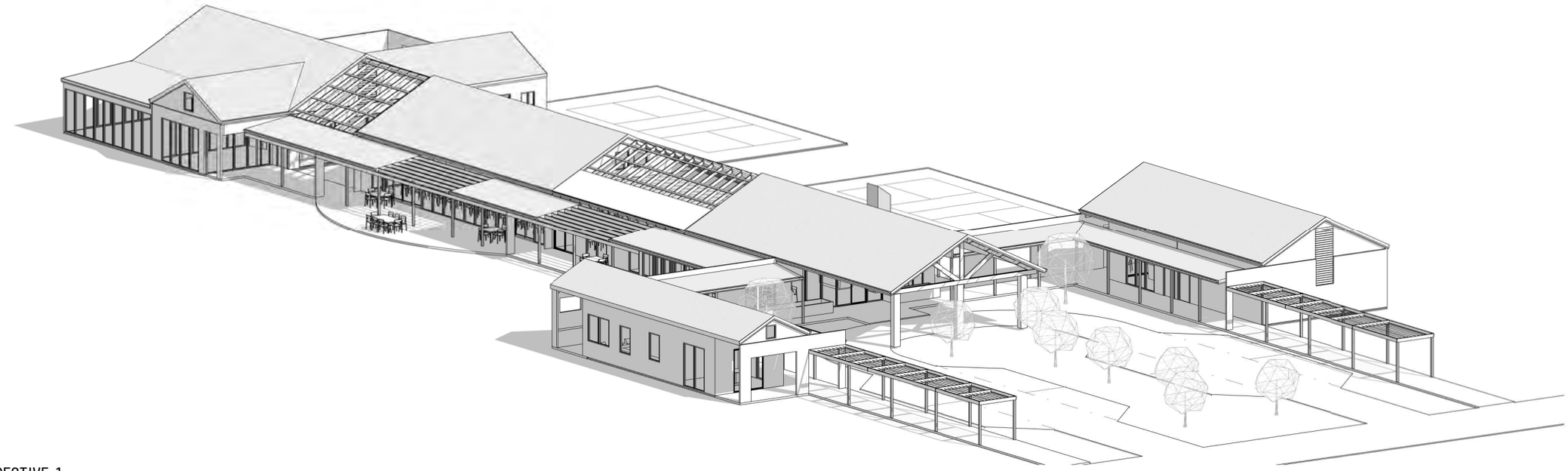
BULLSBROOK VILLAGE

CHITTERING ROAD, BULLSBROOK, WA, 6084

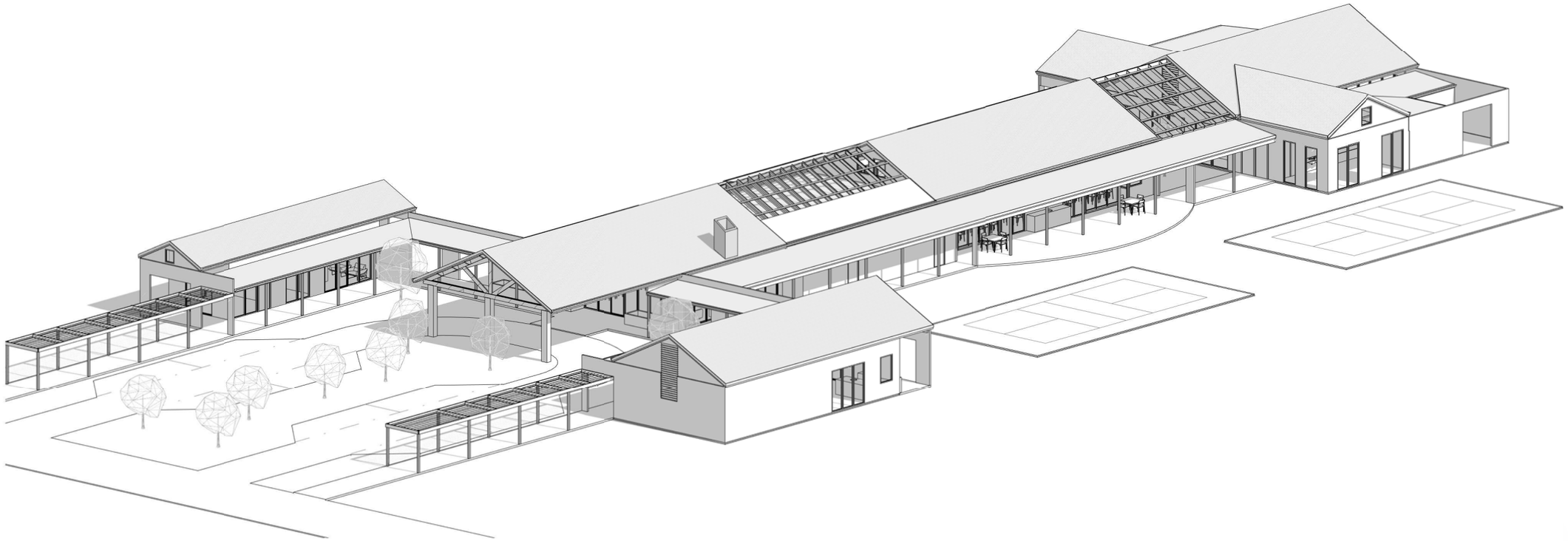
LOOKOUT STRUCTURE

Project number	-	A3.02	
Date	09.09.2024		
Drawn by	RHA		
Checked by	RHA	Scale@A3	As indicated

9/09/2024 12:17:13 PM



3D PERSPECTIVE_1



3D PERSPECTIVE_2

RICHARD HAMMOND ARCHITECT
BETHANIE BULLSBROOK
CLUBHOUSE CONCEPT DESIGN RevA
SCALE | 1:250 @A3
22.08.2024

RICHARD HAMMOND ARCHITECT REG. Nº 953



3D PERSPECTIVE_ENTRY ROAD



3D PERSPECTIVE_ENTRY LOUNGE

RICHARD HAMMOND ARCHITECT
BETHANIE BULLSBROOK
CLUBHOUSE CONCEPT DESIGN RevA
22.08.2024

RICHARD HAMMOND
REG. No 953
ARCHITECT



3D PERSPECTIVE_EXTERNAL TERRACE THROUGH TO HALL

RICHARD HAMMOND ARCHITECT
BETHANIE BULLSBROOK
CLUBHOUSE CONCEPT DESIGN RevA
22.08.2024

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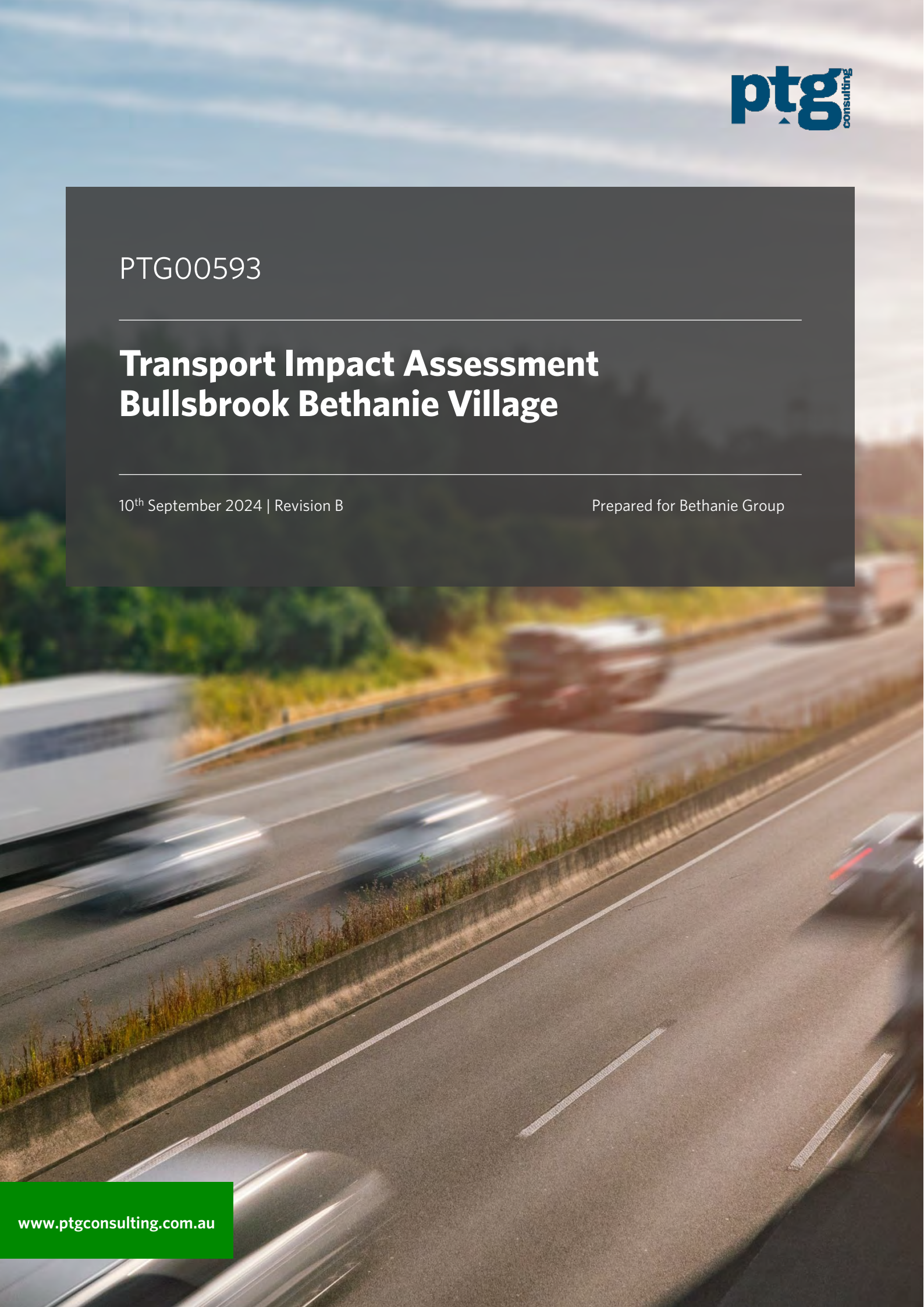

PTG00593

Transport Impact Assessment
Bullsbrook Bethanie Village

10th September 2024 | Revision B

Prepared for Bethanie Group

www.ptgconsulting.com.au

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REPORT DETAILS

Unique Document Identification

Document Title	Transport Impact Assessment – Bullsbrook Bethanie Village
Project Number	PTG00593
Document ID	Rev B
Client	Bethanie Group

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Revision Details

Revision No.	Date	Comments
Rev A	16/08/2024	For Issue
Rev B	10/09/2024	For Issue

Document Approval

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1 INTRODUCTION

1.1 Background

PTG Consulting (PTG) has been commissioned by Bethanie Group to prepare a Transport Impact Assessment (TIA) for the proposed lifestyle village (Park Home Park) located at Lots 900, 9501 and 9013 Chittering Road, Bullsbrook.

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 4– Individual Developments (2016) and the Transport Impact Assessment (TIA) Checklist is included at Appendix A.

Specifically, this report aims to assess the operations of the proposed development internally and its connections to the adjacent road network, with a focus on traffic volumes, access and accessibility.

This report also outlines the requirements and opportunities associated with traffic and transport within the development, referencing relevant Council and WAPC policies and guidelines as well as best-practice planning within Western Australia.

2 EXISTING SITUATION

2.1 Existing Site Use

Figure 1 shows the location of the proposed development which is located near the corner of the Great Northern Highway and Chittering Road intersection. The Site is bounded by Chittering Road to the west and undeveloped land and public open space to the north and south, while residential development is underway to the east.

Figure 1 – Existing Site Location

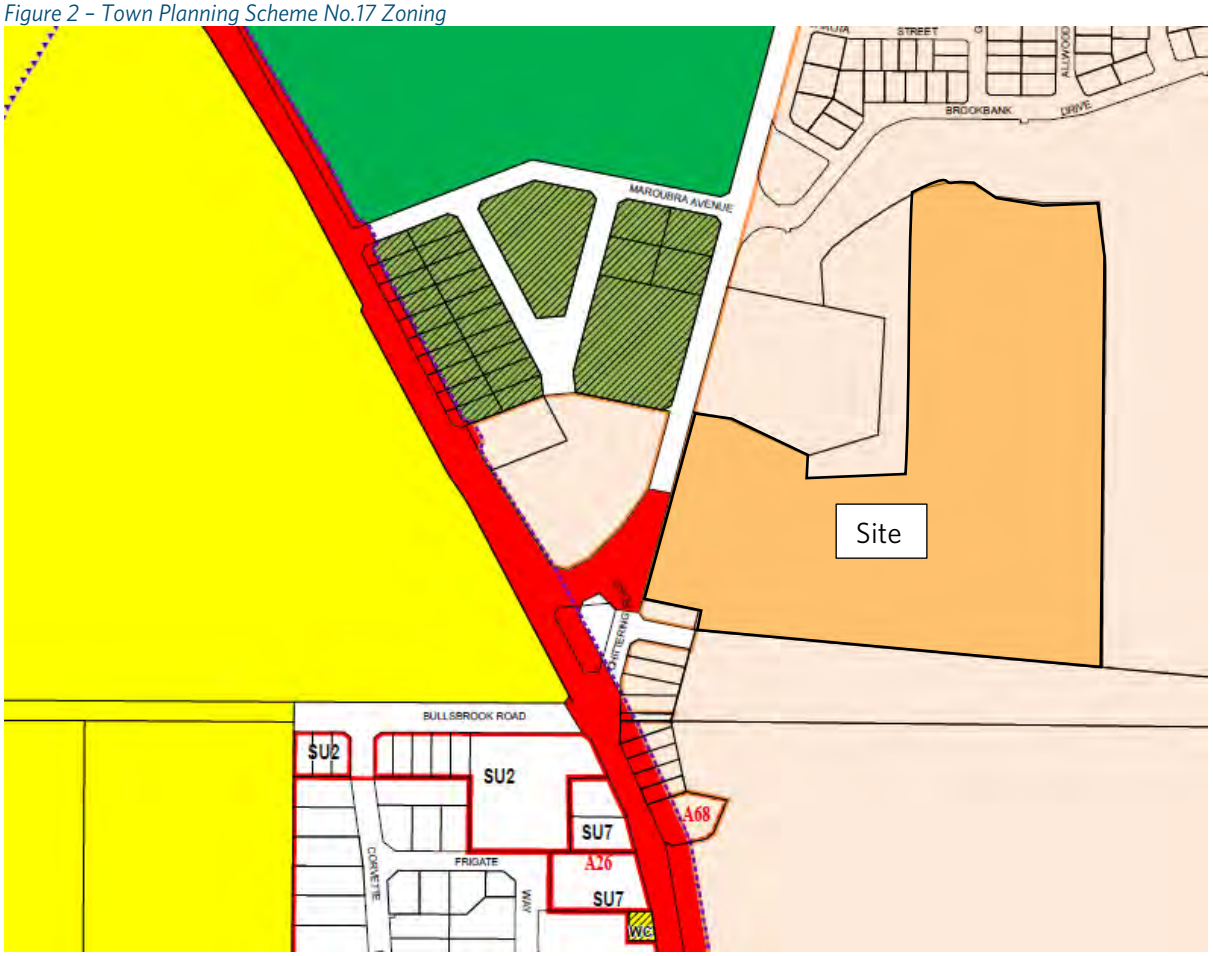


Source: Nearmap

2.1.1 Town Planning Scheme No.17

The City of Swan Town Planning Scheme No.17 zones the Site as "Residential Development" as shown in **Figure 2**. Under this scheme, the surrounding land uses consists of residential development.

Figure 2 – Town Planning Scheme No.17 Zoning



REGION SCHEME RESERVES (MRS)

- Civic and Cultural
- Other Regional Roads
- Parks and Recreation
- Parks and Recreation - restricted
- Port Installations
- Primary Regional Roads
- Railways
- State Forests
- Waterways
- Water Catchments
- Public Purposes
- CP Public Purposes - Car Park
- CG Public Purposes - Commonwealth Government
- HS Public Purposes - High School
- H Public Purposes - Hospital
- P Public Purposes - Prison
- SU Public Purposes - Special Uses
- SEC Public Purposes - State Energy Commission
- TS Public Purposes - Technical School
- U Public Purposes - University
- WSO Public Purposes - Water Authority of WA

LOCAL SCHEME ZONES

- General Commercial
- General Industrial
- General Rural
- Highway Service
- Industrial Development
- Landscape
- Light Industrial
- Midland Strategic Regional Centre
- Private Clubs and Institutions
- Residential
- Residential Development
- Residential Redevelopment
- Resource
- Rural Residential
- Special Rural
- Special Use
- Swan Valley Rural

LOCAL SCHEME RESERVES

- Local Road
- Public Open Space
- Public Purposes
- CP Public Purposes : Car Park
- CS Public Purposes : Cemeteries Board
- CC Public Purposes : Civic and Cultural
- FCSA Public Purposes : Fire and Emergency Services
- HS Public Purposes : High School
- PPS Public Purposes : Pre-Primary School
- PS Public Purposes : Primary School
- TN Public Purposes : Telstra
- WC Public Purposes : Water Corporation
- WP Public Purposes : Western Power
- Public Utilities
- Recreation

Source: City of Swan Town Planning Scheme No.17

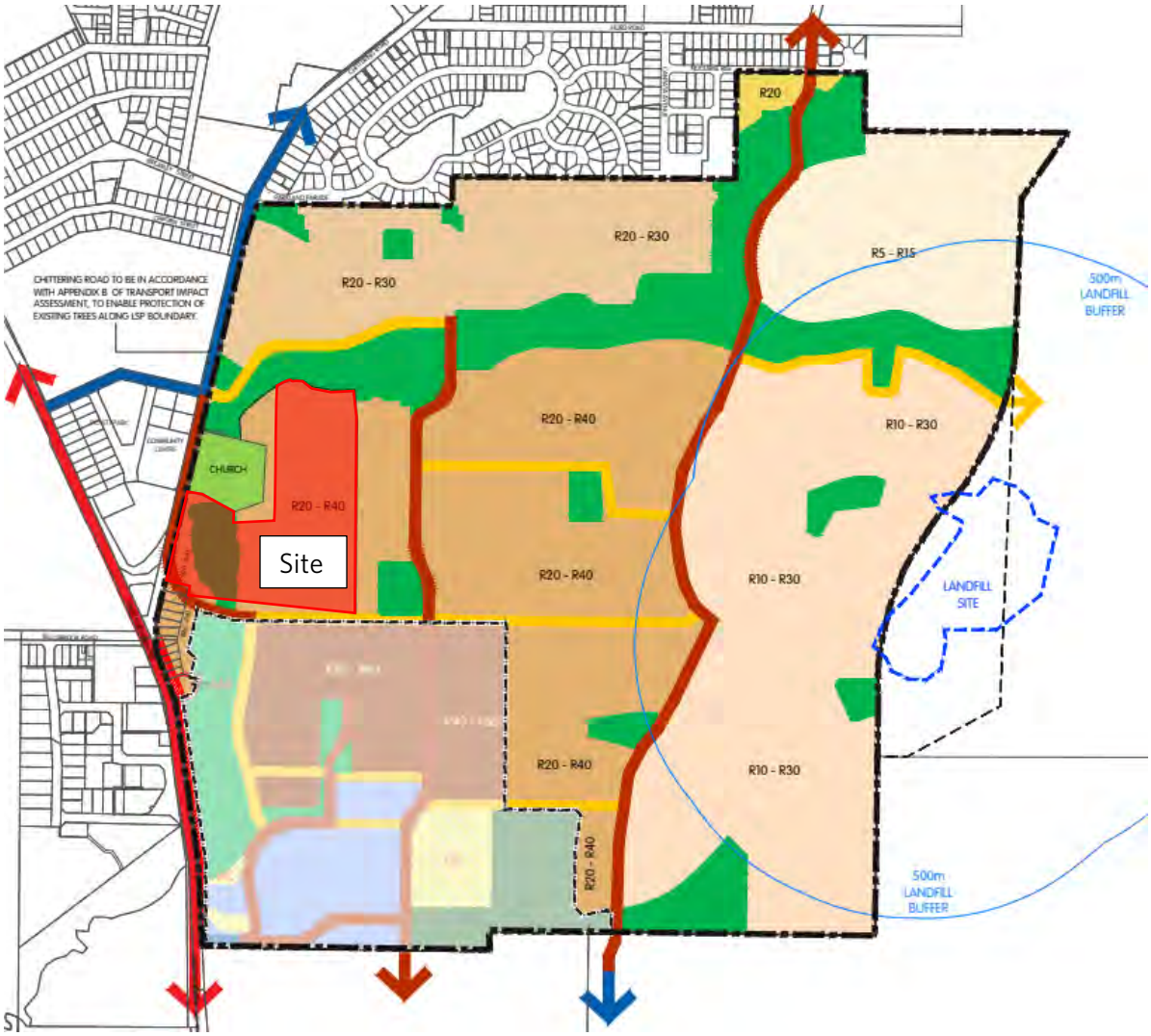
2.1.2 Kingsford Local Structure Plan

Under the Kingsford Local Structure Plan, the Site is zoned as "R20-R40 residential" with the surrounding area comprising of various residential densities as described below:

- R20-R30 to the north
- R20-R40 to the east
- R40-60 to the south

Figure 3 shows Kingsford Local Structure Plan area.

Figure 3 – Kingsford Local Structure Plan



Source: City of Swan

2.2 Existing Parking and Demand

The Site is currently vacant and contains no parking spaces and generates no parking demand.

2.3 Existing Access Arrangements

The Site is currently vacant and does not contain any existing access points.

2.4 Existing Site Traffic

The Site is currently undeveloped and therefore does not generate any existing traffic.

2.5 Existing Road Network and Traffic Management

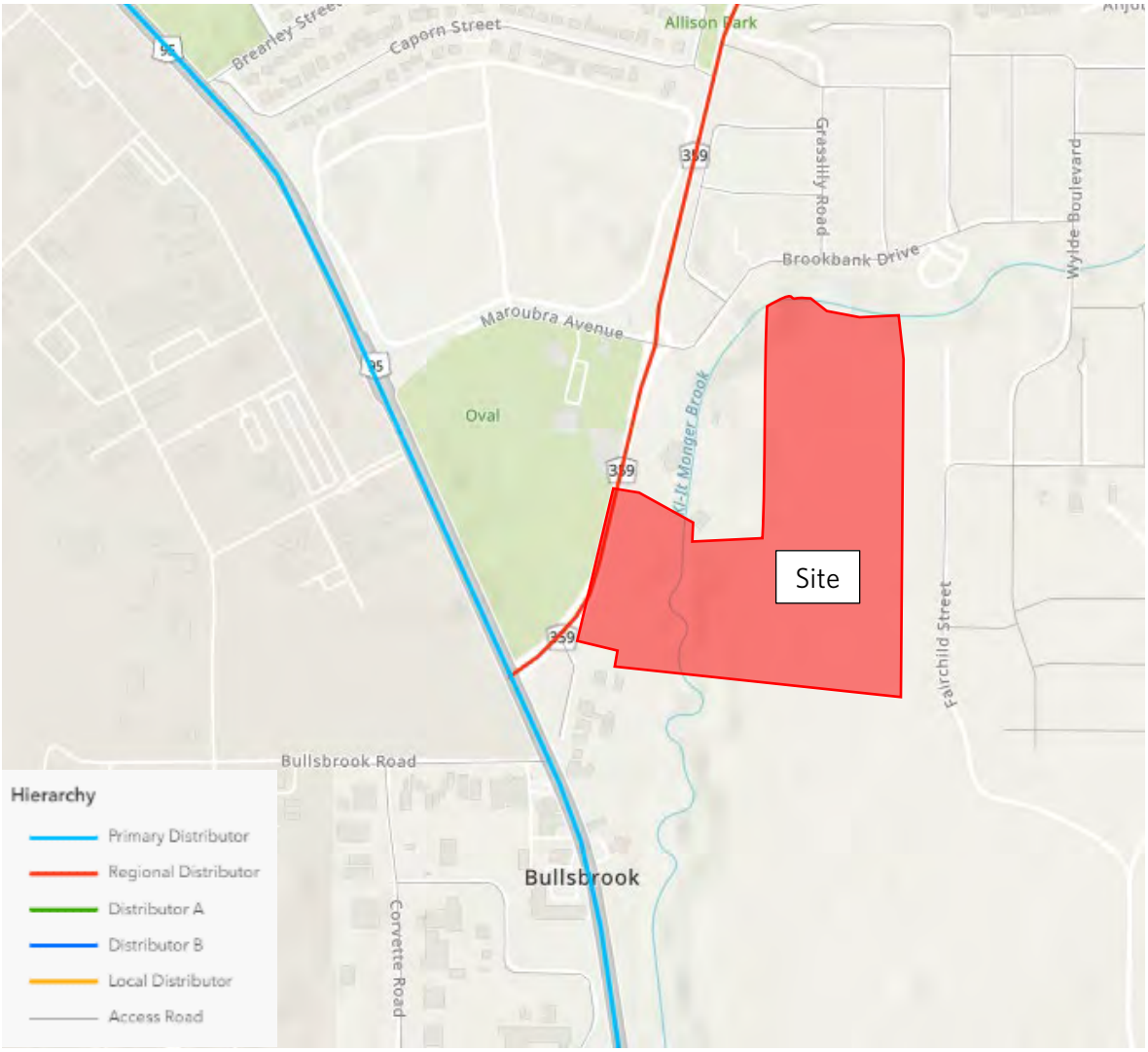
The road network within Western Australia is defined by Main Roads WA road hierarchy which describes the function, characteristic and management of each type of road. A description of each road type as per Main Roads WA Road Hierarchy criteria is summarised in **Table 1** below.

Table 1 – Road Hierarchy Description

Road Type	Description
Primary Distributors	Provide for major regional and inter-regional traffic movement and carry large volumes of generally fast moving traffic. Some are strategic freight routes and all are State Roads. They are managed by Main Roads Western Australia.
District Distributor A	Carry traffic between industrial, commercial and residential areas and generally connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property. They are managed by local government.
District Distributor B	Perform a similar function to type A District Distributors but with reduced capacity due to flow restrictions from access to and roadside parking alongside adjoining property. These are often older roads with a traffic demand in excess of that originally intended. District Distributor A and B roads run between land-use cells and generally not through them, forming a grid which would ideally space them around 1.5 kilometres apart. They are managed by local government.
Regional Distributor	Roads that are not Primary Distributors but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. They are managed by local government.
Local Distributor (Urban)	Roads that carry traffic within a cell and link District Distributors or Regional Distributors at the boundary, to access roads. The route of Local Distributors should discourage through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to, or serving the area. These roads should accommodate buses, but discourage trucks. Urban Local Distributor roads are managed by local government.
Local Distributor (Rural)	Connect to other Rural Distributors and to Rural Access Roads. Not Regional Distributors, but which are designed for efficient movement of people and goods within regional areas. Rural Local Distributor roads are managed by local government.
Access Roads	Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian friendly. They are managed by local government.

Figure 4 shows the road hierarchy network and **Table 2** provides a summary of the road characteristics of surrounding road network.

Figure 4 – Road Hierarchy



Source: Main Roads Road Information Mapping

Table 2 – Surrounding Network Road Hierarchy

Road Name	Road Hierarchy	Jurisdiction	No. of Lanes	No. of Footpaths	Road Pavement Width (m)	Speed Limit
Great Northern Highway	Primary Distributor	MRWA	2	0-1	~12m	60km/h
Chittering Road	Regional Distributor	Local Government	2	1	~9.5m	60km/h

2.6 Traffic Flows on Surrounding Roads

Existing traffic volumes were obtained from Main Roads WA Traffic Map for the road summarised in Table 3.

Table 3 – Existing Traffic Volumes

Road Name	Source	Date	Weekday	AM Peak	PM Peak	HV%
Chittering Road (east of Great Northern Highway)	MRWA	2020/21	6,079	552	583	13.6%
Great Northern Highway (south of Bullsbrook Road)	MRWA	2020/21	7,723	647	726	19.9%

2.7 Existing Pedestrian/Cycle Networks

While there is no cycling/pedestrian path map available, a shared path is present along the western edge of Great Northern Highway and along the northern/western edge of Chittering Road.

2.8 Existing Public Transport Services

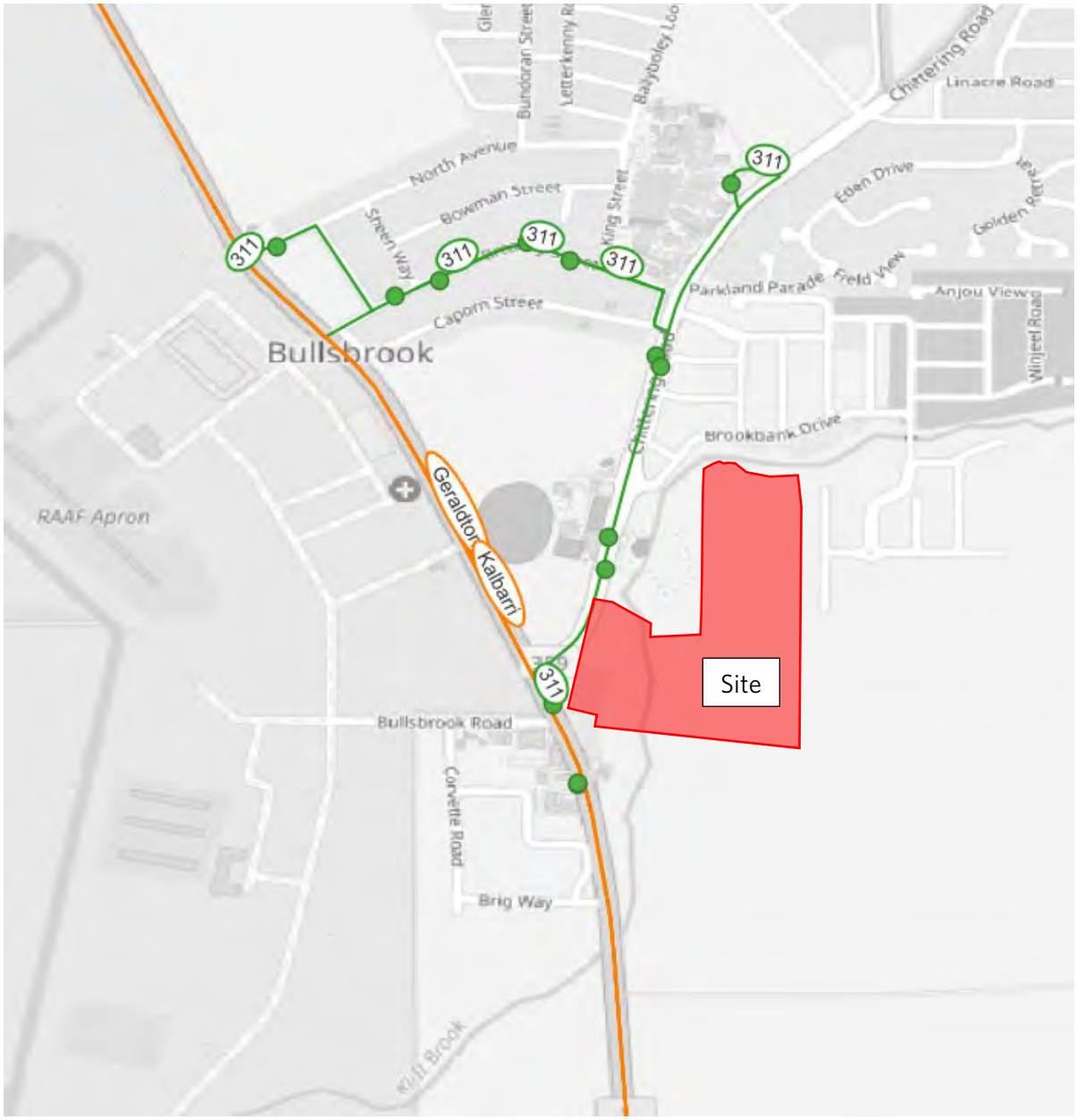
Only a single Transperth service operates within the surrounding area which is route 311. The nearest bus stop to the Site is located on the western frontage of the Site.

Two TransWA services are also within a reasonable distance from the Site (approximately 250m from the Site) and described below:

- N1 – East Perth to Kalbarri and Geraldton via Eneabba
- N2 – East Perth to Geraldton and Kabarri to East Perth via Moora

Figure 5 shows the surrounding are bus routes and bus stops including the service frequency summarised in **Table 4**.

Figure 5 – Existing Bus Routes and Stops



Source: Transperth

Table 4 – Bus Service Routes and Frequencies

Bus Route	Route Description	Service Frequencies		
		Weekdays	*Saturdays*	*Sundays & Public Holidays*
311 (Transperth)	Midland Stn – Bullsbrook via Great Northern Hwy	11 services per day	3 services per day	4 services per day
N1 (Transwa)	East Perth to Kalbarri and Geraldton via Eneabba	1 service per day (Mon to Fri)	1 service per day	No services
N2 (Transwa)	East Perth to Geraldton and Kalbarri to East Perth via Moora	1 service per day (Tue, Thur)	1 service per day	1 service per day

2.9 Crash Data

A review of the existing crash data from Main Roads WA Traffic Map for the period between 1st January 2019 to 31 December 2023 was conducted for the following intersections and road sections:

- Great Northern Highway/Chittering Road intersection
- Chittering Road midblock (between Great Northern Highway and Maroubra Avenue)

The crash locations are illustrated in **Figure 6** and the crash details summarised in **Table 5**.

Figure 6 – Crash Locations



Source: Main Roads WA Traffic Map

Table 5 – Great Northern Highway/Chittering Road Intersection Crashes

Crash Nature	Fatal	Hospital	Medical	PDO Major	PDO Minor	Total Crashes
Rear End	-	-	1	2	3	6
Right Angle	-	-	-	-	1	1
Total Crashes	0	0	1	2	4	7

3 PROPOSED DEVELOPMENT

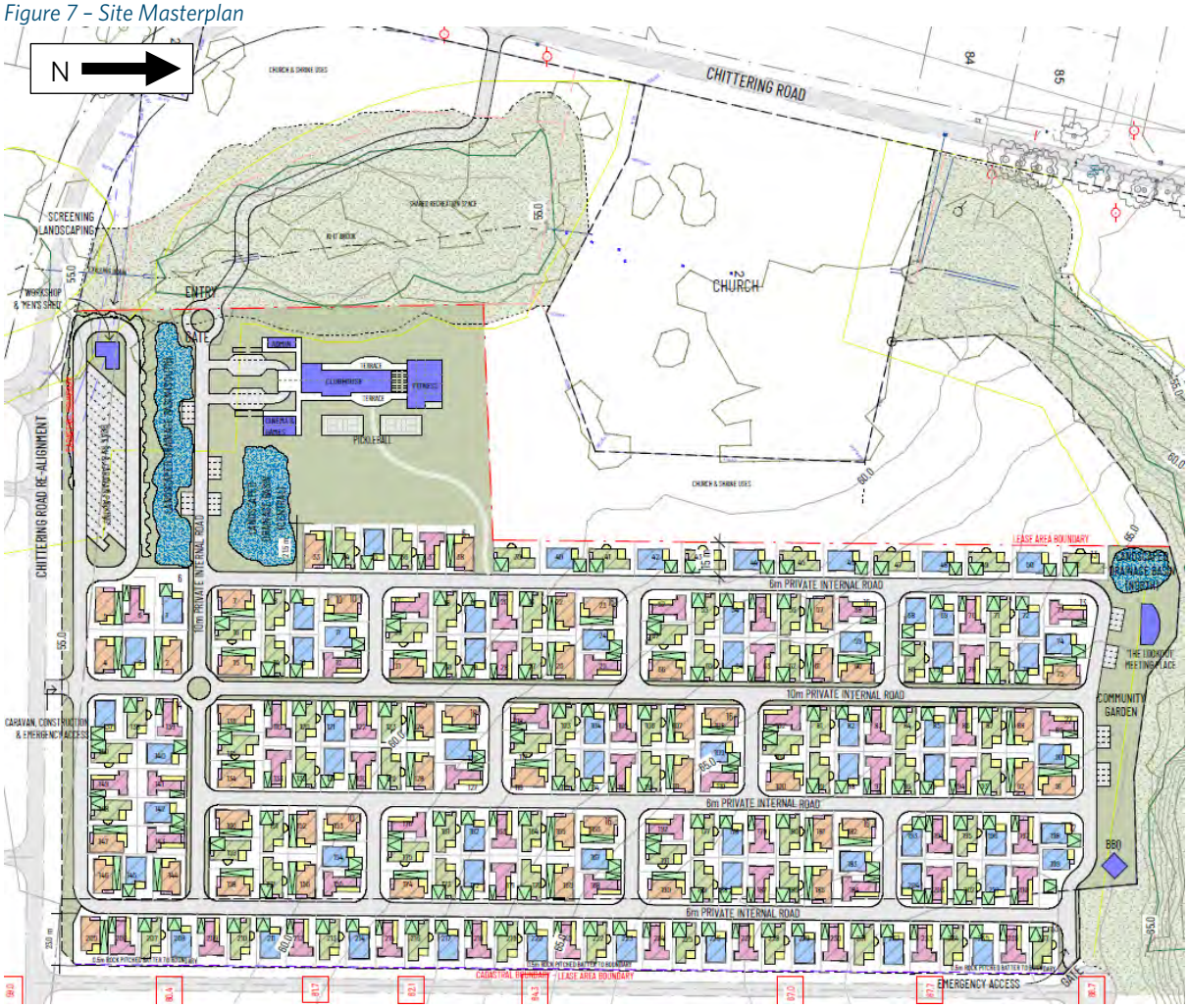
3.1 Proposed Land Use

The proposed development consists of the following elements:

- 237 retirement living residential lots
- Community garden
- Clubhouse and pickleball courts
- Boat, RV and caravan parking

The Site masterplan is shown in **Figure 7**.

Figure 7 – Site Masterplan



3.2 Access Arrangements

Three accesses are provided to the masterplan site as shown in **Figure 8** and described below:

- Access 1 – Main vehicle access to the lifestyle village (Park Home Park)
- Access 2 – Caravan, construction and emergency access only
- Access 3 – Emergency access only

Figure 8 – Access Arrangements

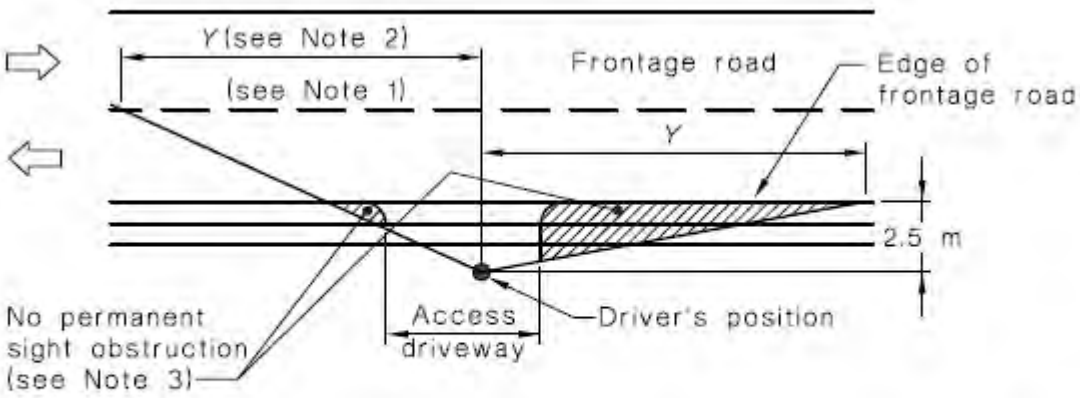


Source: Richard Hammond Architect

3.2.1 Sight Distance Assessment

A desktop sight distance assessment was conducted at Access 1 and 2 based on the requirements specified in AS2890.1 (excerpt provided in **Figure 9**). The purpose of this assessment is to ensure that sight visibility is not compromised by the road bend along the future Chittering Road alignment.

Figure 9 – Sight Distance Requirements at Access Driveways



Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2nd and 3rd columns
100	139	160	
110	153	190	

Source: AS2890.1

Assuming that the speed limit remains unchanged along Chittering Road at 60km/h, a minimum sight distance of 65m is required with a desirable sight distance of 83m. **Figure 10** and **Figure 11** show the sight distance requirements for Access 1 and 2 respectively. Overall, both accesses met the minimum SSD as well as the desirable 5s gap, assuming the verges are kept free of any obstacles that would impair sight-lines.

Figure 10 – Access 1 Sight Distance Requirements

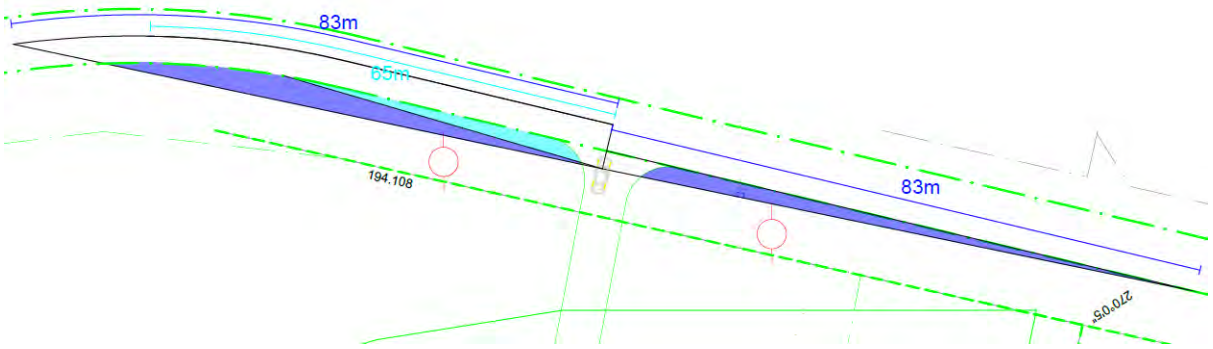


Figure 11 – Access 2 Sight Distance Requirements



3.3 Parking Provision

Though the individual dwellings for each lot have not been finalised, it is expected that each of the proposed Park Homes will contain a garage for 2 cars, as guided by the Residential Design Codes (R-codes) Volume 1.

3.4 End of Trip Facilities

As the masterplan consists mostly of residential lots, no end-of-trip facilities are provided. However, the provision of bike racks at the community garden and clubhouse would be beneficial to encourage cycling to these destinations.

3.5 Road Network

The proposed road reserve widths for the main north-south and east-west roadways are 10m which would be classified as Access Road D in accordance with Liveable Neighbourhoods (example provided in **Figure 14**). The rest of the internal roadway network will consist of 6m wide roadways as illustrated in **Figure 13**.

The internal road network also contains several long uninterrupted roadways and the provision of traffic management devices such as slow points and/or speed humps/cushions will help to discourage speeding along these straight sections.

Furthermore, the roadway that leads to and from the boat, RV and caravan parking area should be designed to accommodate the circulation movement of these vehicles. **Figure 12** shows recommended modifications to the crossover and roadways to accommodate boat, RV and caravan vehicles.

Figure 12 – Recommended Modifications to the Crossover and Roadway for Car + Boat, RVs and Caravans.

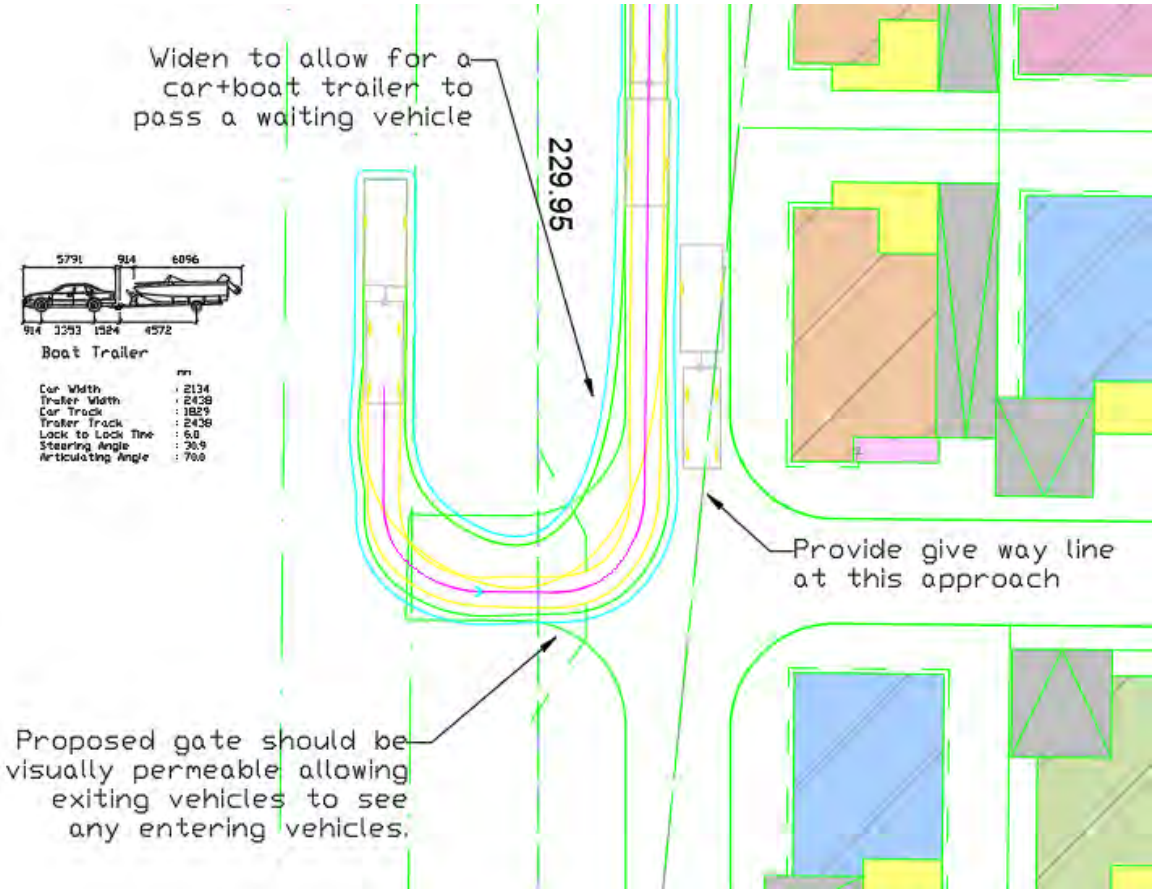
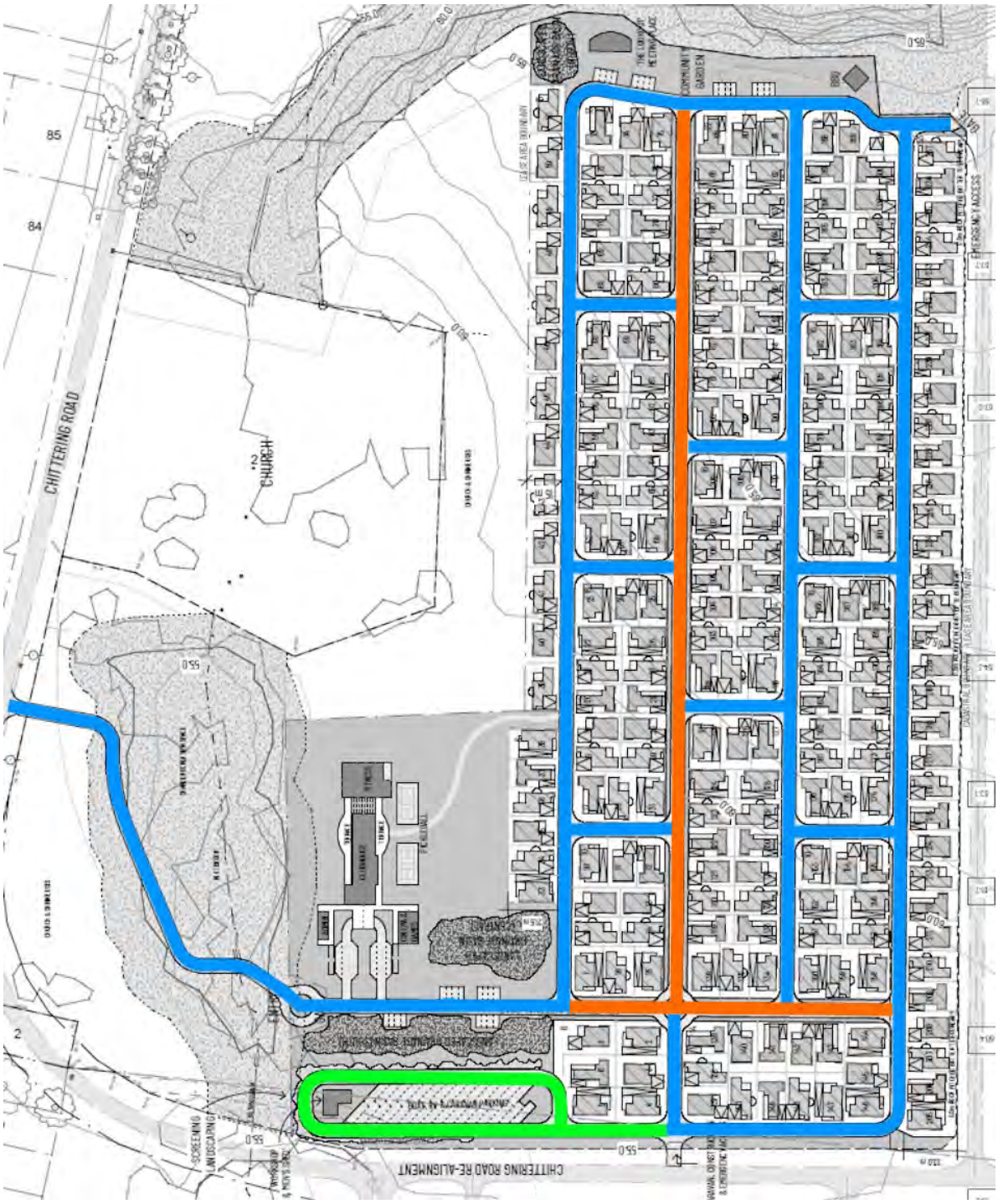


Figure 13 – Road Hierarchy



LEGEND	
	10m Road Reserve
	Roadway leading to the boat, RV and caravan parking area
	6m wide Roadway

Figure 14 – Example of an Access Road D



3.6 Intersection Layouts and Controls

A combination of roundabouts and t-intersections will by used as intersection controls within the internal road network.

3.7 Pedestrian/Cycle Networks and Crossing Facilities

No pedestrian and/or cycling paths are provided within the masterplan site. The internal roadways are intended to be low volume, low speed zones for shared use between drivers, cyclists and pedestrians.

3.8 Public Transport Services

Not applicable as there is no internal public transport services operating within the Site.

4 INTERGRATION WITH SURROUNDING AREA

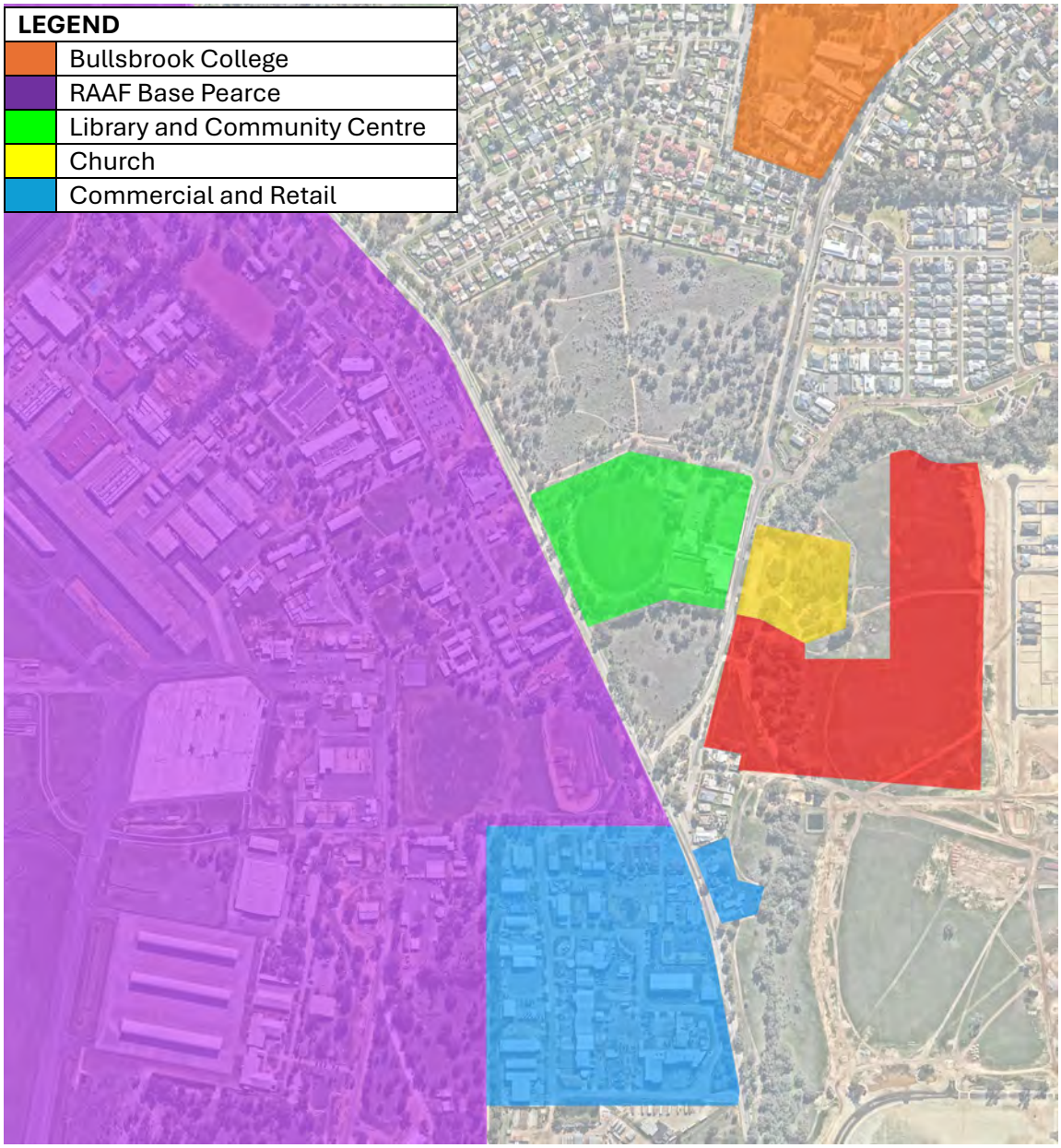
4.1 Surrounding Major Attractors/Generators

Major attractors and generators within the surrounding area of the Site are listed below:

- Bullsbrook College
- RAAF Base Pearce
- Bullsbrook Public Library
- Ethel Warren Bullsbrook Community Centre
- Shrine of Virgin of the Revelation, Mother of the Church
- Various commercial and retail

Figure 15 illustrates the major attractors/generators within the surrounding area of the Site.

Figure 15 – Key Attractors/Generators



4.2 Committed Development and Transport Proposals

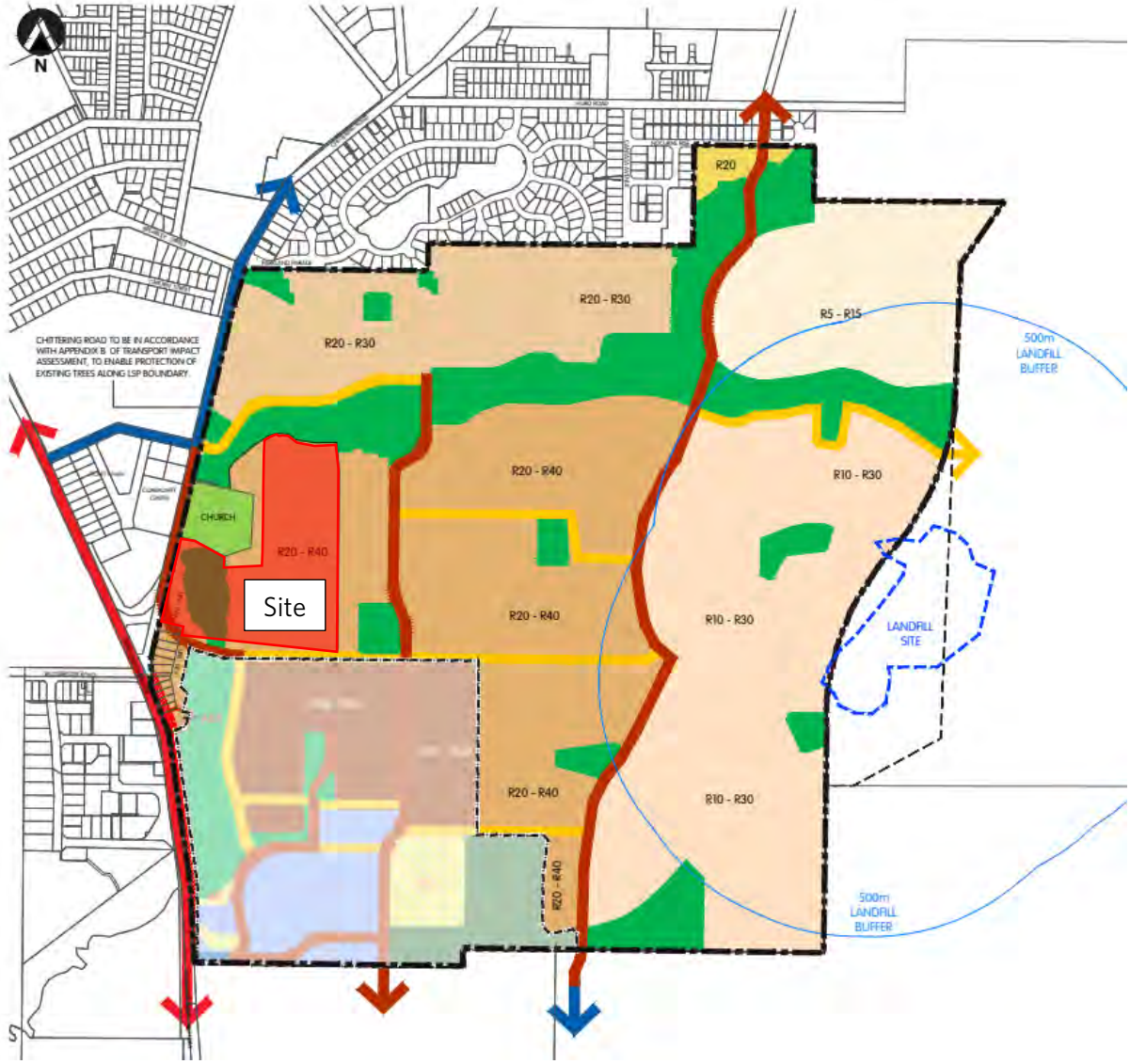
4.2.1 Kingsford Local Structure Plan

The Kingsford Local Structure Plan provides guidance for the future development within the surrounding locality. The structure plan comprises of a range of different residential densities anticipated to accommodate up to 2,355 residential dwellings.

The structure plan also shows significant changes to the road network, especially Chittering Road with the following modifications:

- The Great Northern Highway/Chittering Road intersection will be closed and changed to a cul-de sac.
- Maroubra Avenue is proposed to be extended west creating a new intersection with Great Northern Highway. This will replace Great Northern Highway/Chittering Road intersection as the main junction for access onto the main arterial road (i.e. Great Northern Highway).
- Chittering Road will be realigned and extend to the east continuing on into the structure plan area.

Figure 16 – Kingsford Local Structure Plan

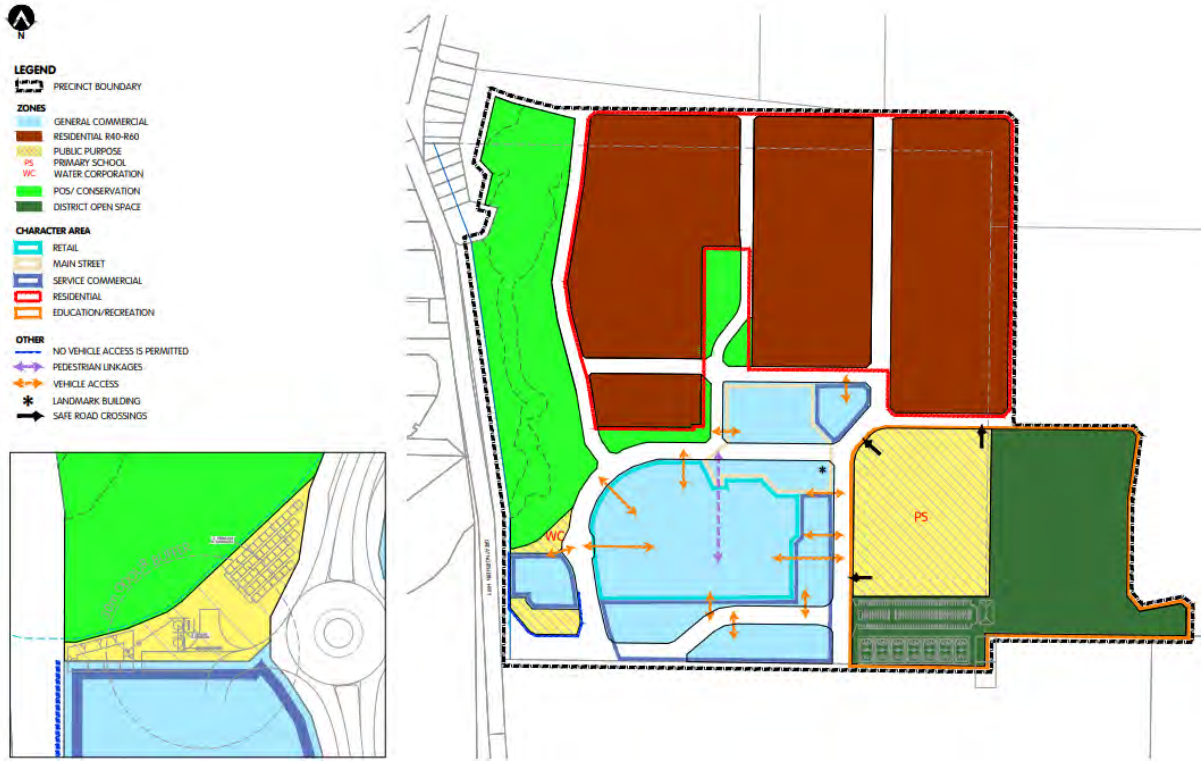


Source: City of Swan

4.2.2 Kingsford Town Centre Precinct Plan

The Kingsford Town Centre Activity Centre Plan covers the area south of the Kingsford Local Structure Plan and bounded by Great Northern Highway to the west. The area consists of retail, service commercial, a future primary school, public open space and residential dwellings. **Figure 17** shows the structure plan area for the precinct.

Figure 17 – Kingsford Town Centre Precinct Plan



Source: City of Swan

4.3 Proposed Changes to Land Uses within 1200 metres

There are no planned changes to the land uses within the surrounding area of the Site other than indicated in Section 4.2.

4.4 Travel Desire Lines from development to the Attractors/Generators

While the church, library school and community centre are easily accessible from Chittering Road, the future modifications to the surrounding road network significantly change travel behaviour for vehicles accessing the air force base and commercial/retail areas located on Great Northern Highway. A future intersection is proposed at Great Northern Highway/Maroubra Avenue and vehicles will likely redirect to this intersection to access Great Northern Highway.

4.5 Adequacy and Deficiencies of the Existing Transport Network

The public transport amenity within the surrounding area is considered to be poor due to the infrequency of public transport services operation within the surrounding area.

The pedestrian and cycling network within the surrounding area of the Site is also considered to be poor as there are no immediate pedestrian and cycling paths or routes that lead to the site due to the lack of demand for such facilities within the undeveloped surrounding area.

5 ANALYSIS OF TRANSPORT NETWORK

5.1 Assessment Years and Time Periods

The network peak periods as per Main Roads WA Traffic Map are as follows:

- AM Peak: 8:00am – 9:00am
- PM Peak: 4:00pm – 5:00pm

The WAPC *Transport Assessment Guidelines Volume 4* specifies the following years for assessment:

- Opening year of the proposed development
- 10 years after the opening of the proposed development

For this Site, the anticipated opening year for the proposed development is 2026 and the future year horizon assessment will be for 2036 (10 years after the opening of the proposed development).

Therefore, the assessment scenarios are listed as follows:

- Scenario 1 – Existing 2026 including development traffic
- Scenario 2 – Background 2036 including development traffic

5.2 Development Generated Traffic

The traffic generation rates used to calculate the traffic generated by the proposed development were sourced from the *Institute of Transport Engineers (ITE) Trip Generation Manual 11th Edition* and from the RTA Guide to Traffic Generating Developments – Updated traffic surveys.

Table 6 shows the trip generation rates for the proposed land uses, Table 7 shows the directional distribution and Table 8 shows the total traffic generated be the Site.

Table 6 – Trip Generation Rates

Land Use	Source	Yield	AM Peak	PM Peak
Retirement Village	RTA	237 dwellings	*0.4 trips per dwelling	0.4 trips per dwelling
Recreational Centre	ITE 495	1,570m^2	1.99 trips per 100m^2	2.72 trips per 100m^2

**The RTA Guide to Traffic Generating Developments – Updated traffic surveys does not provide a trip generation rate for the AM peak (as morning site peak hour does not generally coincide with the network peak hour). Therefore, the PM peak rate was used in lieu for the purpose of a robust assessment.*

Table 7 – Trip Distribution

Land Use	AM Peak		PM Peak	
	IN	OUT	IN	OUT
Retirement Village	43%	57%	56%	44%
Recreational Centre	63%	37%	47%	53%

Table 8 – Trip Generation Summary

Land Use	AM Peak		PM Peak	
	IN	OUT	IN	OUT
Retirement Village	41	55	54	42
Recreational Centre	20	12	21	23
Total	61	67	75	65
	128		140	

The development traffic is estimated to be 128 trips in the AM peak period and 140 trips in the PM peak period.

5.3 Distribution of Generated Traffic

The distribution of development traffic is shown in **Figure 18** and assumes that all traffic will arrive/leave the Site via the main access (Access 1). No traffic will be using Access 2 or 3 as these accesses will be gated and only used for emergency access or other authorised vehicles.

As Access 2 also allows for caravan access, additional traffic management measures (such as the provision of signage, separate key/fob for access through this gate and/or intercom and camera system) will be required to ensure that other residents are not using this access for general access.

Figure 18 – Development Traffic Distribution

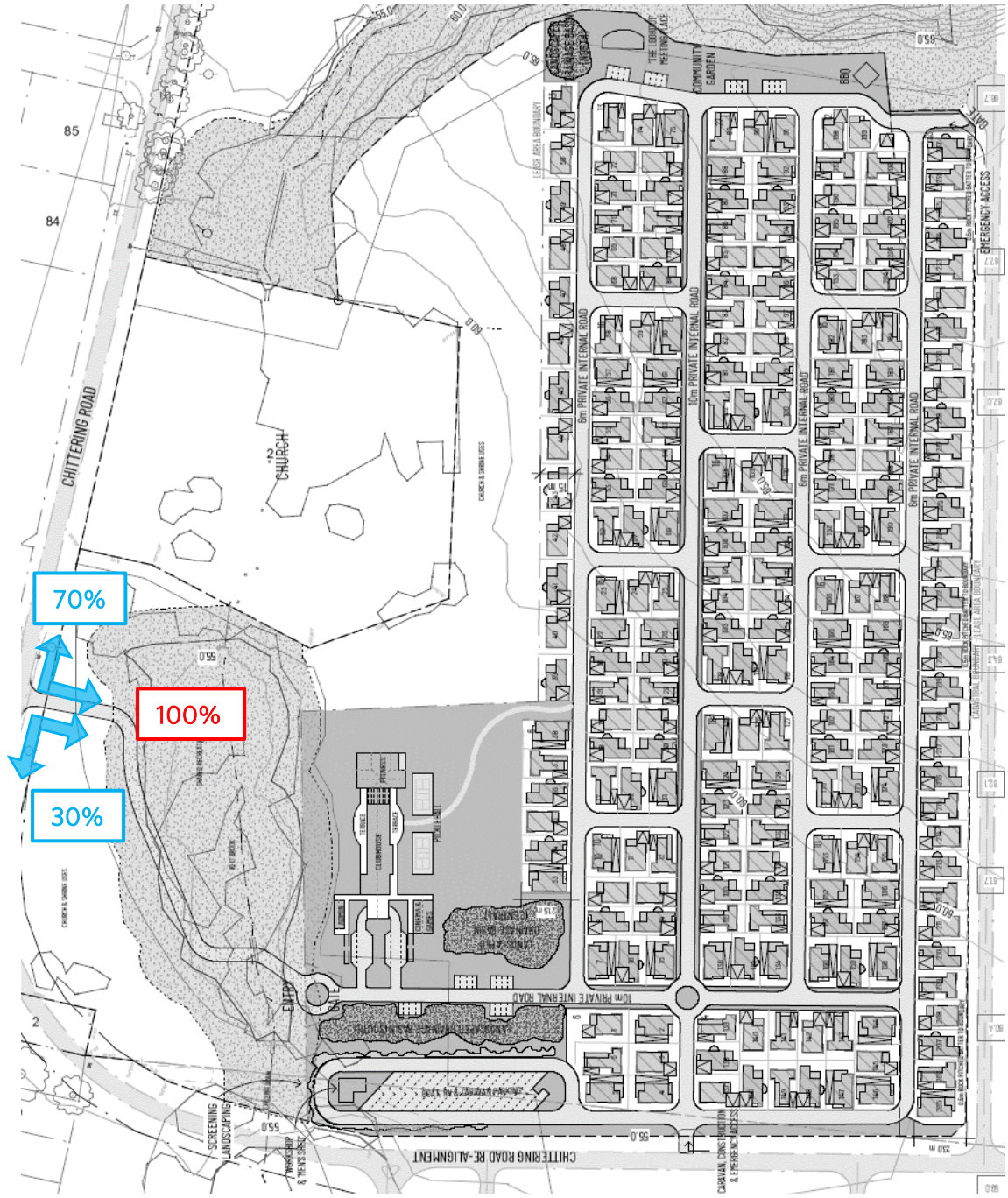
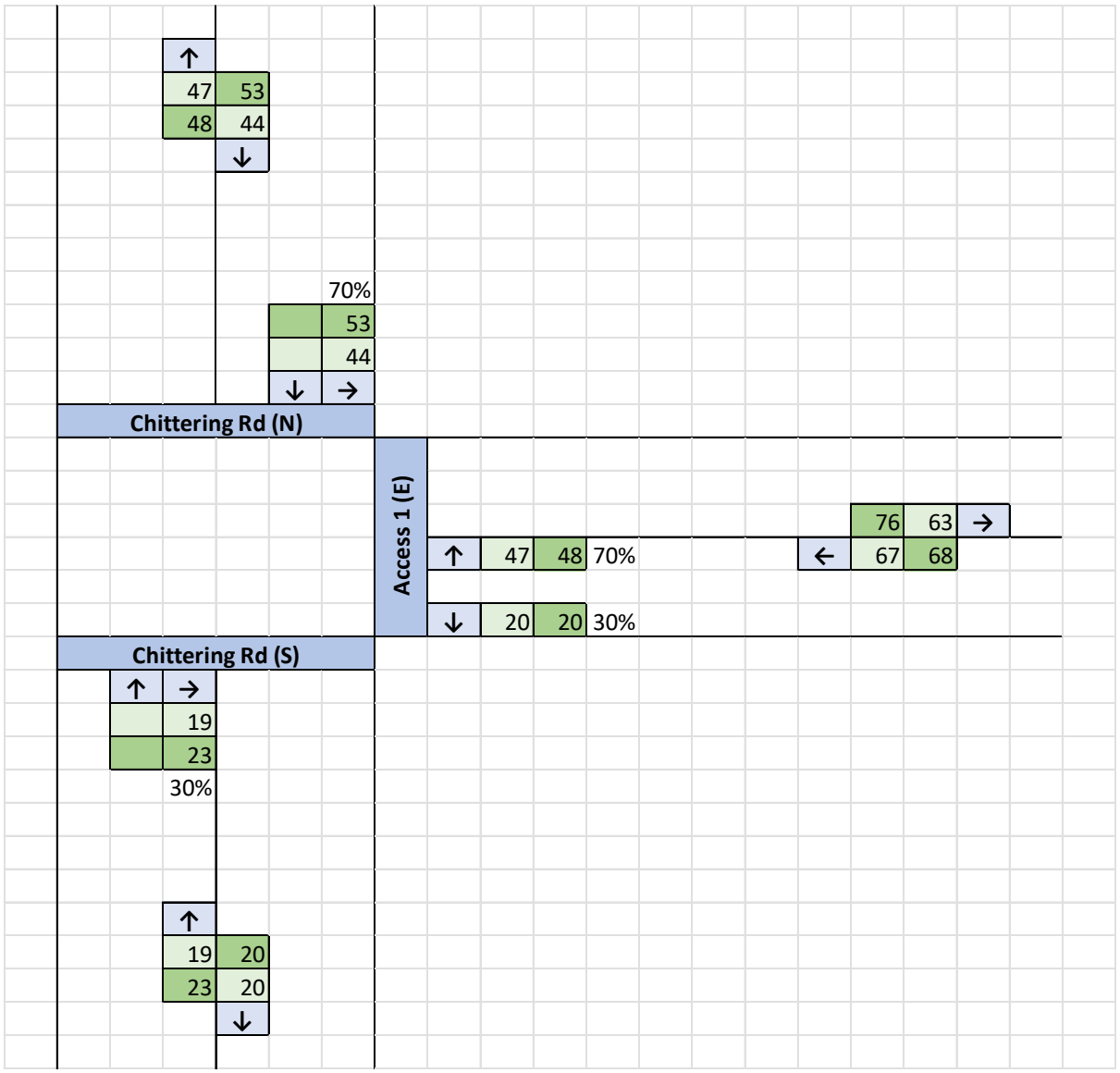


Figure 19 shows the development traffic volumes distributed within the surrounding road network.

Figure 19 – Development Traffic Volumes

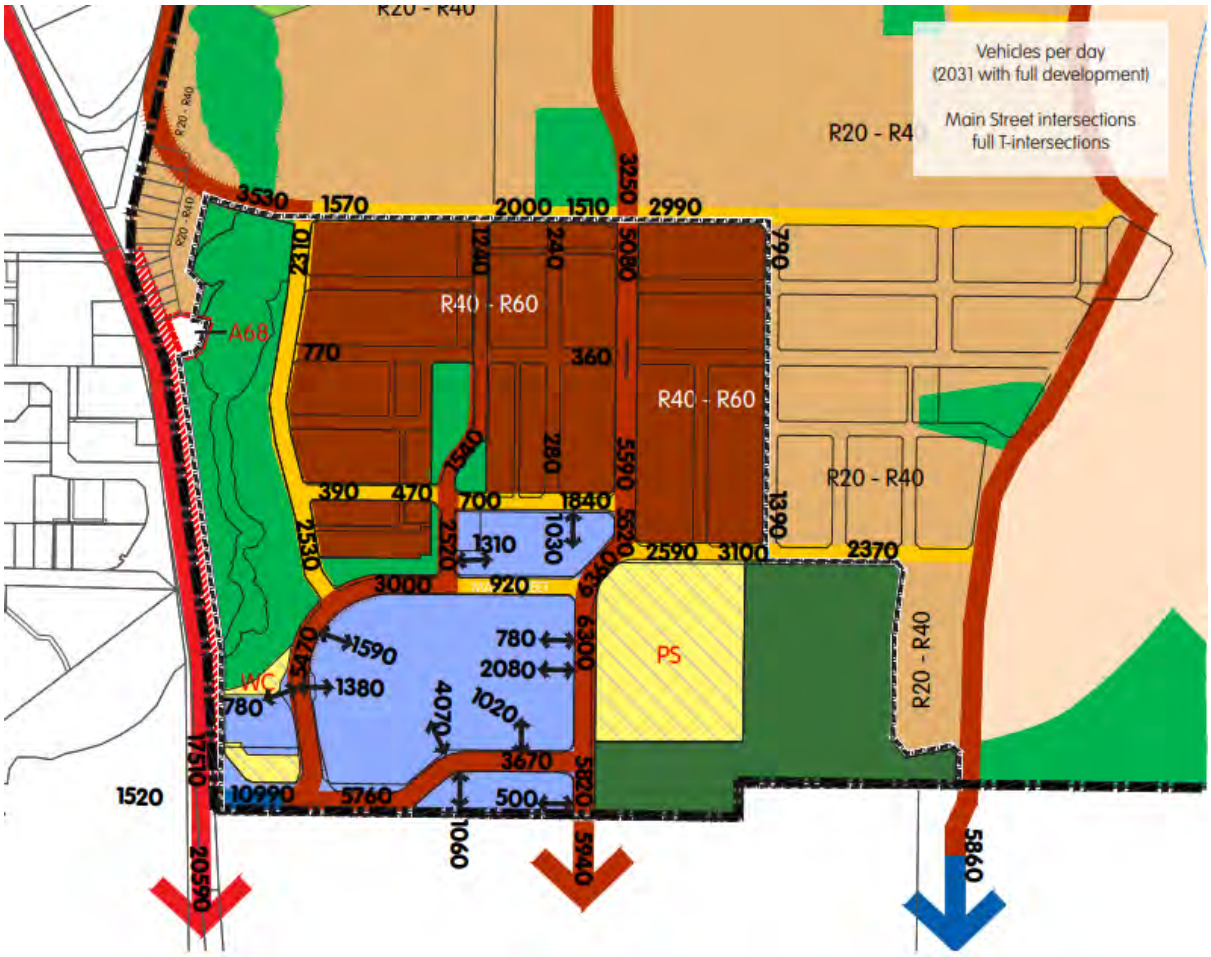


5.4 Key Assumptions

The key assumptions used for the trip generation and SIDRA assessment are as follows:

- The existing road network has not been assessed as the Kingsford Local Structure Plan mentions future road network modifications which will alter the Chittering Road alignment as well as the intersection arrangement in the surrounding area. These road upgrades will likely be completed prior to the construction of the masterplan development area. Thus, the existing road network arrangement will have no impact on the masterplan site and only the future road arrangement has been considered.
- The background volumes for both assessment years are based on the volumes provided in the Transport Impact Assessment conducted for the Kingsford Town Centre Precinct. An excerpt of the projected traffic volumes is provided in **Figure 20**.

Figure 20 – Kingsford Town Centre Projected Traffic Volumes



Source: Kingsford Town Centre Precinct Plan

- In addition to the projected traffic volumes, the following assumption were derived to obtain the volumes used in the SIDRA assessment:
  - Only daily projected volumes are provided. To estimate the peak period traffic volumes, the current traffic volumes along Chittering Road was taken and the proportion of AM and PM peak period traffic relative to the daily traffic volumes was determined and summarised in table below.
  - The AM and PM peak period percentages that were determined were applied to the future volumes to estimate the peak period traffic for the future assessment scenarios.
  - With regards to the direction split along Chittering Road, it is assumed that 70% of traffic will be travelling northbound and 30% of traffic will be travelling southbound. This accounts for the road alignment modification where, under this arrangement, a large proportion of traffic will be travelling north to reach Great Northern Highway and a small proportion heading south to reach the future Kingsford Town Centre.
  - Table 9 provides a summary of the projected volumes derived for the SIDRA assessment.

Table 9 – Summary of Projected Traffic Volumes

Road	Daily Volumes	AM Peak	PM Peak	AM Peak %	PM Peak %
Chittering Road (existing)	5,990	522	580	8.7%	9.7%
Chittering Road (future)	3,530	308 (215 NB/92 SB)	342 (239 NB/103 SB)	-	-

- The site is assumed to be fully developed for all scenarios for the purposes of a conservative assessment.
- Heavy vehicle volumes were based on the existing heavy vehicle proportions along Chittering Road obtained from Main Roads WA traffic map.
- Access 2 and 3 will not be assessed as this is intended to be a for emergency vehicles and authorised vehicles only.

5.5 Background and 'With Development' Traffic Flows

Figure 21 and **Figure 22** shows the background volumes with the inclusion of development traffic.

Figure 21 – Scenario 1 – Background 2026 with Development

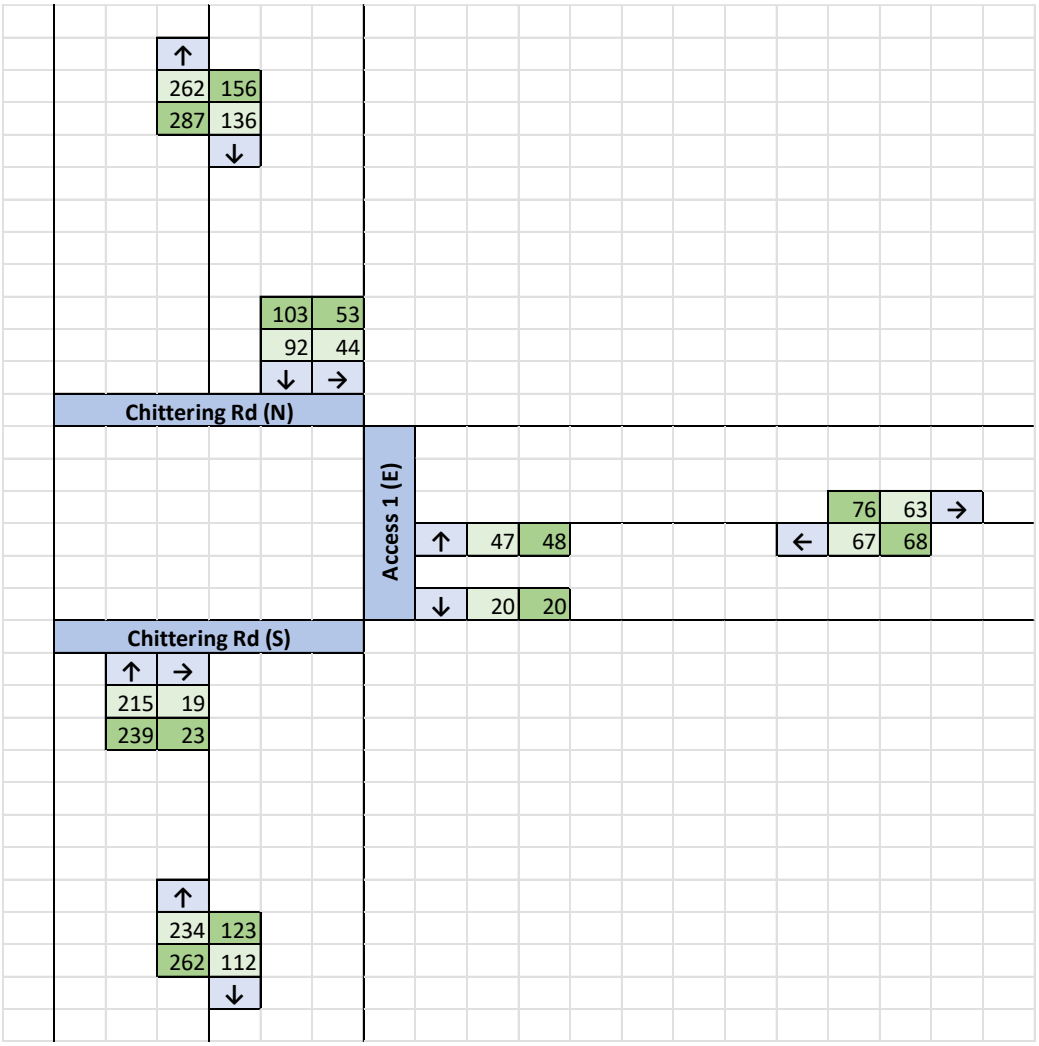
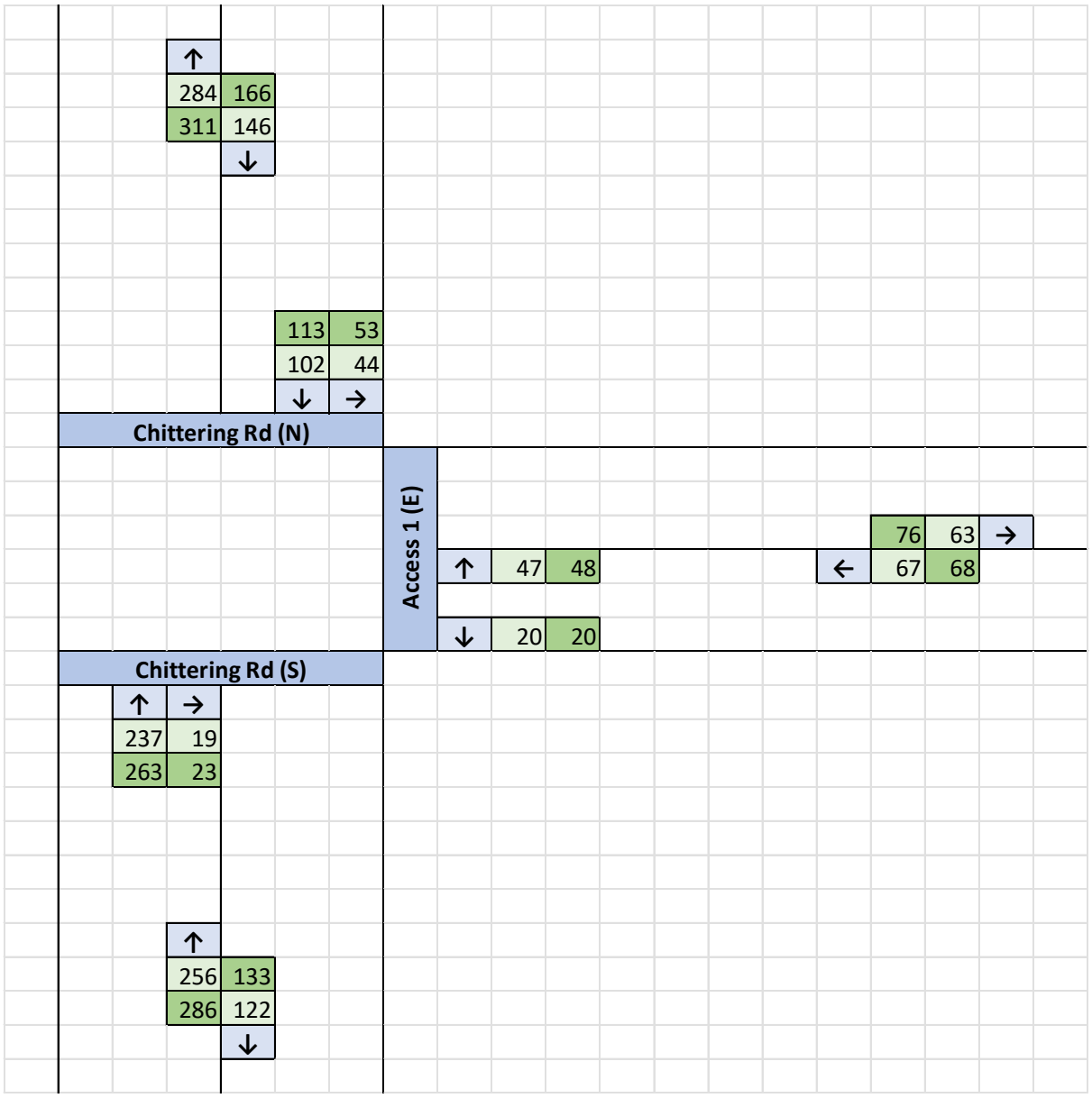


Figure 22 – Scenario 2 – Background 2036 with Development



5.6 Analysis of Development Accesses

To determine the traffic impacts of the proposed development on the surrounding network, a SIDRA intersection assessment was conducted for the intersection of Chittering Road / Access Road 1.

The following section provides a summary of the analysis.

5.7 Impact on Surrounding Roads and Intersections

A description of the SIDRA outputs are as follows:

- **Degree of Saturation** is defined as the ratio of arrival flow to capacity. Degrees of Saturation above 1.0 represent oversaturated conditions (demand flow exceeds capacity) and degrees of saturation below 1.0 represent undersaturated conditions (demand flow is below capacity).
- **Delay** is the additional (excess) travel time experienced by a vehicle or pedestrian relative to a base travel time. The delay estimated in SIDRA is average for all vehicles, queued and unqueued.
- **Level of Service** as defined in the HCM is a quality measure describing operational conditions within a traffic stream, and in the case of SIDRA, a function of the average delay thresholds. A description of the level of service thresholds are as follows.
    - LOS A represents completely unconstrained free flow conditions.
    - LOS B represents free flow conditions.
    - LOS C represents reduced free flow conditions.
    - LOS D represent restricted traffic flow conditions.
    - LOS E represents operations at or near capacity.
    - LOS F represents forced breakdown or breakdown of traffic flow.
- **95th Percentile Queue** is the value below which 95% of all observed cycle queue lengths fall or 5% of all observed queue lengths exceed.

5.7.1 Chittering Road/Access 1

The SIDRA layout for Chittering Road/Access 1 intersection is shown in **Figure 23** with the results summarised in **Table 10** and **Table 11**.

The results indicate the intersection will operate satisfactorily.

Figure 23 – SIDRA Layout for Chittering Road/Access 1 Intersection

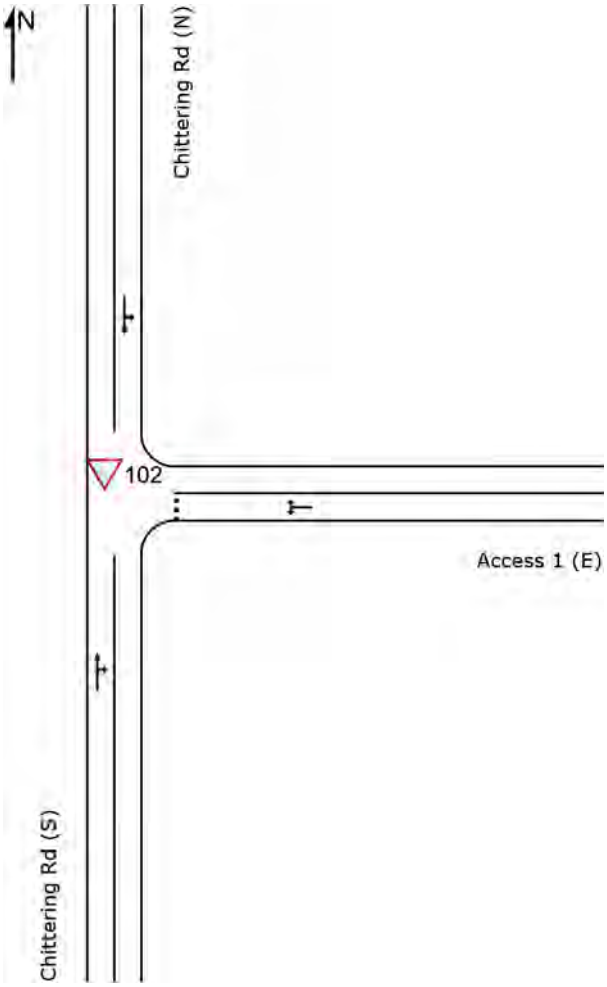


Table 10 – SIDRA Results for Chittering Road/Access 1 Intersection - Scenario 1

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay	LOS	95% Queue (m)	DOS	Delay	LOS	95% Queue (m)
Chittering Rd (S)	T	0.147	0.1	A	1.2	0.165	0.1	A	1.5
	R	0.147	5.1	A	1.2	0.165	5.2	A	1.5
Access 1 (E)	L	0.07	3.7	A	1.8	0.075	3.8	A	1.9
	R	0.07	5.2	A	1.8	0.075	5.5	A	1.9
Chittering Rd (N)	L	0.083	4.6	A	0	0.095	4.6	A	0
	T	0.083	0	A	0	0.095	0	A	0
Total		0.147	1.5	A	1.8	0.165	1.5	A	1.9

Table 11 – SIDRA Results for Chittering Road/Access 1 Intersection - Scenario 2

Intersection Approach	Turn	AM Peak				PM Peak			
		DOS	Delay	LOS	95% Queue (m)	DOS	Delay	LOS	95% Queue (m)
Chittering Rd (S)	T	0.161	0.1	A	1.2	0.18	0.1	A	1.5
	R	0.161	5.2	A	1.2	0.18	5.3	A	1.5
Access 1 (E)	L	0.073	3.8	A	1.9	0.078	3.8	A	2
	R	0.073	5.4	A	1.9	0.078	5.7	A	2
Chittering Rd (N)	L	0.089	4.6	A	0	0.101	4.6	A	0
	T	0.089	0	A	0	0.101	0	A	0
Total		0.161	1.4	A	1.9	0.18	1.4	A	2

6 ROAD SAFETY AND ACCESIBILITY IMPACT

6.1 Impact on Neighbouring Areas

The SIDRA results show that the Chittering Road/Access 1 intersection operate at an acceptable level of service for all assessment scenarios.

6.2 Road Safety

A summary of the crash data are as follows:

- A single crash was recorded at the Chittering Road/Maroubra Avenue intersection which required hospitalisation. This crash was the result of a driver losing control of their vehicles and colliding with a pedestrian.
- 7 crashes were recorded at the Great Northern Highway/Chittering Road intersection with one crash requiring medical attention and the remaining 6 crashes being property damage crashes.

Note that the Great Northern Highway/Chittering Road intersection will be cul-de saced as part of the future road upgrades which will likely reduce the risk of crashes.

6.3 Public Transport Access

The impact of the proposed development on the public transport network is expected to be negligible.

6.4 Pedestrian/Cycle Access Amenity

No additional pedestrian/cycle infrastructure is planned within the masterplan Site. However, provision of bicycle parking at recreational areas such as the community garden and clubhouse may be beneficial to encourage people to cycling.

6.5 Analysis of Pedestrian/Cycle Network

The internal roadway network is intended to be a low volume, low speed zone for shared use between drivers, cyclists and pedestrians. This low speed zoning arrangement is typical of many retirement villages.

6.6 Safe Walk/Cycle to School

Not applicable as proposal is for a lifestyle village.

6.7 Traffic Management Plan (where appropriate)

Not applicable as proposal is for a lifestyle village.

7 SUMMARY AND CONCLUSIONS

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Assessment Guidelines for Developments: Volume 4 – Individual Developments* (2016); the checklist is included at Appendix A.

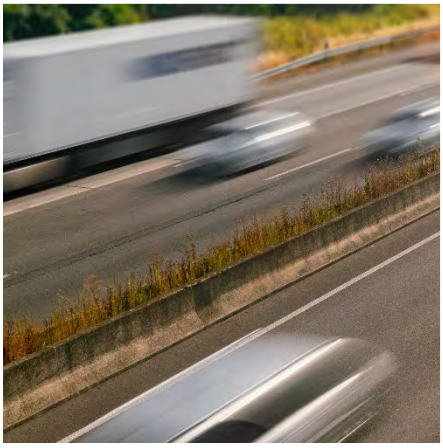
The following conclusions can be drawn from this TIA:

- The proposed development consists of a retirement village containing approximately 237 dwellings and various recreational facilities.
- The estimated number of trips generated by the proposed development is approximately 128 trips during the AM peak period and 140 trips during the PM peak period.
- Public transport within the surrounding area is considered to be below average as only a single low frequency service operates near the site. TransWA services are also available within the surrounding area though these routes only provide a single service per day.
- The pedestrian/bike network is below average within the surrounding area. While there are shared paths present along Great Northern Highway and Chittering Road.
- A sight distance assessment was conducted at the proposed access points and showed that the modified Chittering Road alignment had a negligible impact on sight visibility.
- Proposed parking provisions within the site should be guided by the residential design codes (R-codes).



Appendix A

WAPC CHECKLIST FOR INDIVIDUAL DEVELOPMENT - TRANSPORT IMPACT STATEMENT





APPENDIX A – WAPC CHECKLIST

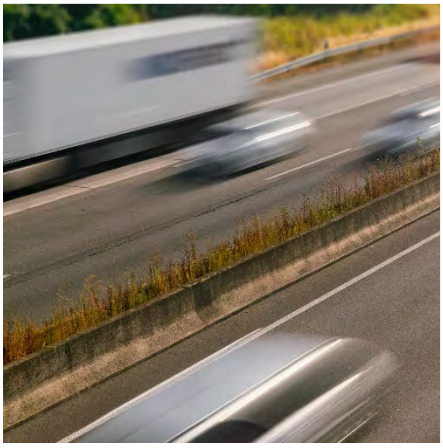
Item	Provided	Comments/Proposals
Summary		
Introduction/Background		
Name of Applicant and Consultant	Section 1	
Development Location and Context	Section 1	
Brief Description of Development Proposal	Section 3	
Key Issues	N/A	
Background Information	Section 1	
Existing Situation		
Existing Site Uses (If Any)	Section 2	
Existing Parking and Demand (If Appropriate)	Section 2	
Existing Access Arrangements	Section 2	
Existing Site Traffic	Section 2	
Surrounding Land Uses	Section 2	
Surrounding Road Network	Section 2	
Traffic Management on Frontage Roads	Section 2	
Traffic Flows on Surrounding Roads (Usually AM and PM Peak Hours)	Section 2	
Traffic Flows at Major Intersections (Usually AM and PM Peak Hours)	Section 2	
Operation of Surrounding Intersections	Section 2	
Existing Pedestrian/Cycle Networks	Section 2	
Existing Public Transport Services Surrounding the Development	Section 2	
Crash Data	Section 2	
Development Proposal		
Regional Context	Section 3	
Proposed Land Uses	Section 3	
Table of Land Uses and Quantities	Section 3	
Access Arrangements	Section 3	
Parking Provision	Section 3	
End of Trip Facilities	Section 3	
Any Specific Issues	N/A	
Road Network	Section 3	
Intersection Layouts and Controls	Section 3	
Pedestrian/Cycle Networks and Crossing Facilities	Section 3	
Public Transport Services	Section 3	
Integration With Surrounding Area		

Surrounding Major Attractors/Generators	Section 4	
Committed Developments and Transport Proposals	Section 4	
Proposed Changes to Land Uses Within 1200 Metres	Section 4	
Travel Desire Lines from Development to These Attractors/Generators	Section 4	
Adequacy of Existing Transport Networks	Section 4	
Deficiencies in Existing Transport Networks	Section 4	
Remedial Measures to Address Deficiencies	Section 4	
Analysis Of Transport Networks		
Assessment Years	Section 5	
Time Periods	Section 5	
Development Generated Traffic	Section 5	
Distribution of Generated Traffic	Section 5	
Parking Supply & Demand	Section 5	
Base and "With Development" Traffic Flows	Section 5	
Analysis of Development Accesses	Section 5	
Impact on Surrounding Roads	Section 5	
Impact on Intersections	Section 5	
Impact on Neighbouring Areas	Section 6	
Traffic Noise and Vibration	Section 6	
Road Safety	Section 6	
Public Transport Access	Section 6	
Pedestrian Access/Amenity	Section 6	
Cycle Access/Amenity	Section 6	
Analysis of Pedestrian/Cycle Networks	Section 6	
Safe Walk/Cycle to School (For Residential and School Site Developments Only)	N/A	
Traffic Management Plan (Where Appropriate)	N/A	
Conclusions	Section 7	

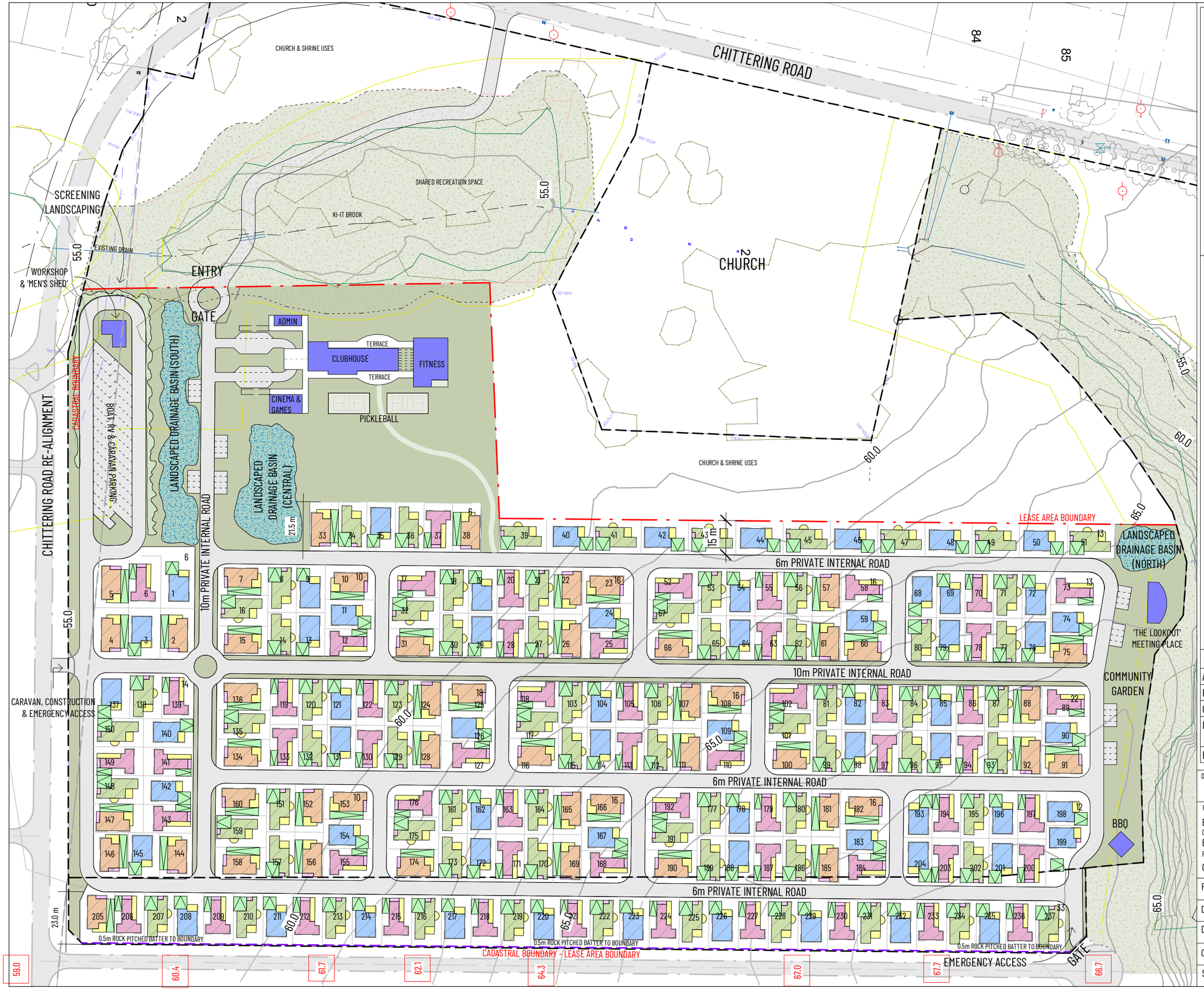


Appendix B

SITE PLANS







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LEGEND

- LANDSCAPING
- 'RECREATION' ZONED AREA
- CORE CREEK AREA
- AREA SUBJECT TO FORESHORE & WETLAND MANAGEMENT PLAN
- VILLAGE AMENITIES
- LANDSCAPED DRAINAGE BASINS
- FENCE/GATE
- ROADWAY
- CADASTRAL BOUNDARY
- LEASE AREA BOUNDARY
- TYPE A (62)
- TYPE B (71)
- TYPE C (47)
- TYPE D (57)

TOTAL HOUSE SITES - 237

TOTAL LEASE SITE AREA - 106,988m²
(NOT INCL. SHARED REC. AREA)

TOTAL RECREATION AREA - 35,095m²
(INCL SHARED REC. AREA)

N

ISSUE	DESCRIPTION	DATE
A	PRELIMINARY MASTERPLAN	28.05.2024
B	REVISED MASTERPLAN	12.08.2024
C	REVISED MASTERPLAN	16.08.2024
D	ENTRY MOVED, LOT NUMB. ADDED	19.08.2024
E	HOUSE-LOT ALLOCATION	02.09.2024

DRAWING TITLE
Masterplan

PROJECT
BETHANIE - BULLSBROOK VILLAGE
CLIENT
BETHANIE
PROJECT ADDRESS
CHITTERING ROAD, BULLSBROOK, WA, 6084

Project number	-
Date	02.09.2024
Drawn by	RHA
Checked by	RHA
Scale @ A3	1 : 1500

DRAWING NO.
A3.01

9/09/2024 1:46:32 PM





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BPAD Bushfire Planning & Design

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference: Lots 900, 9501 and Portion of 9013 Chittering Road

Suburb: Bullsbrook **State:** WA **P/code:** 6084

Local government area: City of Armadale

Description of the planning proposal: Park Home Park (Lifestyle Village)

BMP Plan / Reference Number: BET BUL ZB/2409 **Version:** 2 **Date of Issue:** 10/09/2024

Client / Business Name: Bethanie

Reason for referral to DFES	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	☐	☒
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?	☐	☒
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	☐	☒
Strategic planning proposal (including rezoning applications)	☐	☒
Minor development (in BAL-40 or BAL-FZ)	☐	☒
High risk land-use	☐	☒
Vulnerable land-use	☐	☒

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

N/A

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Tom Hockley	Level 2	BPAD39692	31/05/2025
Company		**Contact No.**	
Allerding & Associates		9382 3000	

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner  **Date** 10/09/2024

Bushfire Management Plan
Proposed Lifestyle Village (Park Home Park) Development
Lot 900, 9501, and portion of Lot 9013 Chittering Road, Bullsbrook
City of Swan



Prepared for: Bethanie

Prepared by: Allerding and Associates

September 2024

Allerding & Associates
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Document ID: BET BUL ZB/2409

Issue	Date	Status	Prepared by		Approved by	
			Name	Initials	Name	Initials
1	29.08.24	DRAFT	Tom Hockley	TH		
2	10.09.24	FINAL	Tom Hockley	TH	Tom Hockley	TH
3						
4						
Site Inspection:		25 July 2024				

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1.0 EXECUTIVE SUMMARY

This Bushfire Management Plan (BMP) has been prepared to accompany an Application for Development Approval to the City of Swan (the City) for the development of a Lifestyle Village comprising 237 dwellings and associated community and recreational facilities at Lots 900, 9501 and a portion of 9013 Chittering Road, Bullsbrook. The purpose of the BMP is to assess whether the proposal complies or can be made compliant with the relevant planning controls based on assessed bushfire risk.

The subject site is located within an area designated as bushfire prone due to the nature of vegetation within 100m of the site. *State Planning Policy 3.7 – Planning in Bushfire Prone Areas* (SPP3.7) requires that planning proposals on land designated as bushfire prone must be accompanied by an assessment (in the form of a BMP) under the provisions of Clause 6.5 (for development applications) where a Bushfire Attack Level (BAL) rating above BAL-LOW applies. In this instance, due to the presence of classified vegetation within and surrounding the subject site, a BAL rating above BAL-LOW will apply. As the BAL ratings exceed BAL-LOW an assessment against the provisions of SPP3.7 and the *Guidelines for Planning in Bushfire Prone Areas version 1.4* (the Guidelines) has been undertaken.

This BMP demonstrates that the proposal can fully comply with the acceptable solutions of the Guidelines, subject to the requirements set out in Table 5 and Sections 6.0 and 7.0, including:

- The ongoing management of low threat landscaping surrounding the clubhouse and community garden in a minimal fuel condition in accordance with the provisions set out in this BMP;
- The creation and ongoing maintenance of an Asset Protection Zone (APZ) within Plot 14 to the west of the development area in accordance with the provisions set out in this BMP;
- The construction and maintenance of the internal vehicular movement network, inclusive of internal private driveways, access routes and vehicle gates in accordance with the provisions set out in this BMP;
- The installation and maintenance of a reticulated water supply to service the development in accordance with the provisions set out in this BMP;
- The construction of nominated buildings to the relevant standards under AS3959;
- The placement of notifications on title to advise on bushfire risk management implementation measures; and
- The ongoing compliance with the City of Swan Fire Hazard Reduction Notice.

A BAL Contour Map has been prepared to determine the level of construction required for future dwellings within 100m of classified vegetation pursuant to Australian Standard AS3959-2018 *Construction of buildings in bushfire-prone areas* (AS3959). The applicable BAL ratings are set out as part of this BMP as a guideline for future construction standards having regard to the other management measures to be implemented as part of this plan. In preparing the BAL Contour Map, a post development scenario has been assessed on the basis that the classified vegetation within the portions of the subject site to be developed will either be removed or managed in a low threat state. Existing vegetation outside the developed areas but forming part of the overall subject site has also been considered in assessing the post development scenario. All other classified vegetation outside of the boundaries of the subject site will remain the same as the pre-development assessment.

This BMP sets out the immediate and longer term management strategies for bushfire hazards within and surrounding the subject site and provides a basis for an ongoing commitment by the landowner to undertake bushfire risk management measures for the life of the development. When implemented, the management measures contained within this BMP will assist in the preservation of life and the reduction in the impacts of bushfire on property and infrastructure.

2.0 PROPOSAL DETAILS

2.1 Purpose of the BMP

This BMP has been prepared to accompany an Application for Development Approval to the City for the development of a Lifestyle Village comprising 237 dwellings and associated community and recreational facilities at Lots 900, 9501 and a portion of 9013 Chittering Road, Bullsbrook (subject site).

As the ultimate form of the development is known, the purpose of the BMP is to assess whether the proposed park home development at the subject site currently complies, or can be made compliant with the relevant planning controls based on the assessed bushfire risk.

The BMP has been prepared to identify the areas within and surrounding the subject land which may present potential bushfire risk to the proposed development based on the BAL ratings across the subject land as demonstrated within the BAL Contour Map and provides additional management measures to address identified risks. In addition, this BMP identifies bushfire hazard issues arising from the BAL Contour Map, as well as an assessment against the bushfire protection criteria requirements contained within the Guidelines demonstrating compliance within the boundary of the development site.

2.2 Location

The subject site is situated in the suburb of Bullsbrook, approximately 35km north-east of the Perth CBD and approximately 26km east of Joondalup.

A location plan is included at **Figure 1** which identifies the site as being on the eastern side of Chittering Road.

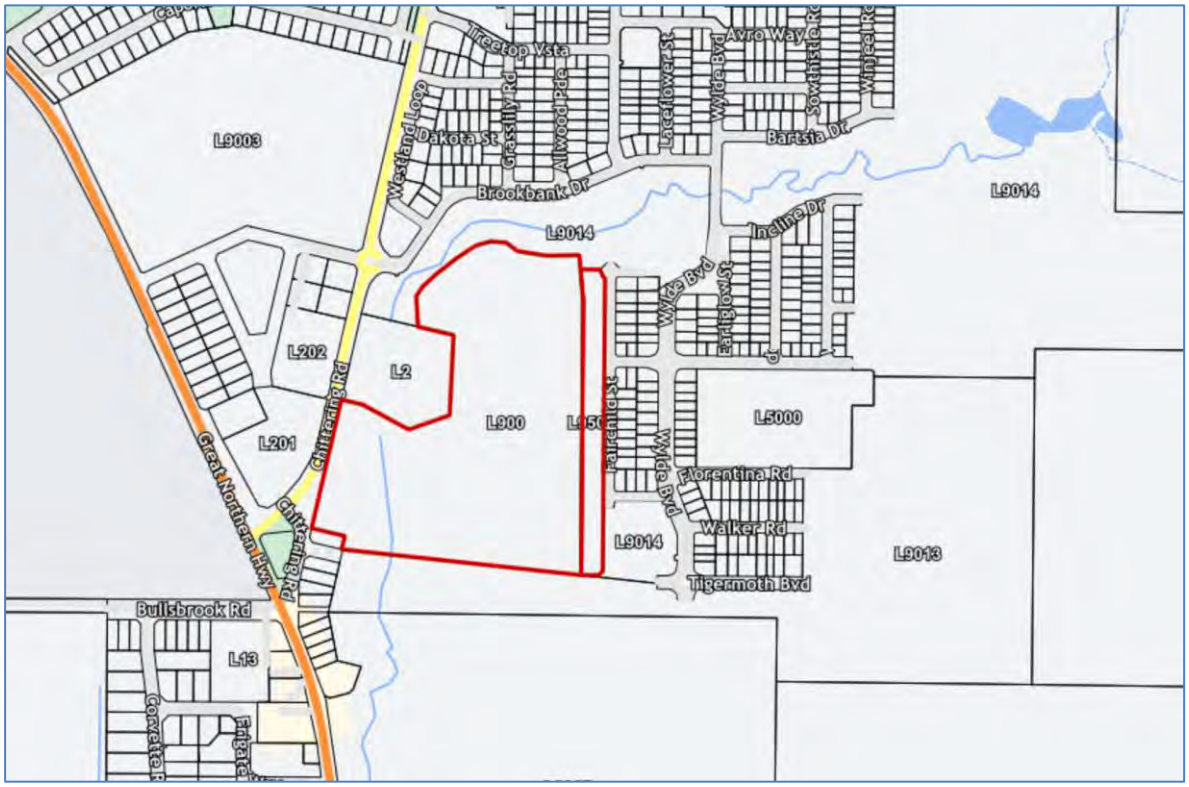


Figure 1 – Location Plan (Source: MNG 2024)

2.3 Zoning and Land Use

The subject site is presently zoned 'Residential Development' under the City of Swan Local Planning Scheme No. 17 (LPS17). The subject site is identified under the Kingsford Bullsbrook Central Revised Local Structure Plan (LSP) as 'Residential (R20-R40)'. Land Use permissibility within the LSP area is to accord with the corresponding zone under LPS17 and therefore, the proposed Lifestyle Village is being progressed as a "Park Home Park" use.

The proposal does not represent a vulnerable or high-risk land use. When consulted on a similar lifestyle community proposal in 2019, DFES acknowledged that the proposal was not a vulnerable land use and the Bushfire Policy Team at the Department of Planning, Lands and Heritage have also separately confirmed that lifestyle communities are not vulnerable land uses.

Section 5.5.1 of the Guidelines provide examples of vulnerable land uses, which include aged or assisted care and nursing homes. The proposed Lifestyle Village will cater for an average age at entry of 65 years and the facilities provided within the development cater for active adult living including a clubhouse with pool and gym, pickleball courts, cinema, games room, BBQ areas, boat and caravan storage which are facilities supporting an active lifestyle and reflect the interests of the residents who live there. As the proposal does not involve a nursing home or an aged or assisted care, it has not been designed to those standards and is not considered to be a vulnerable land use.

As outlined on the Department of Fire and Emergency Services (DFES) Western Australian Map of Bush Fire Prone Areas, the entire site is designated as bush fire prone (refer **Figure 2**).

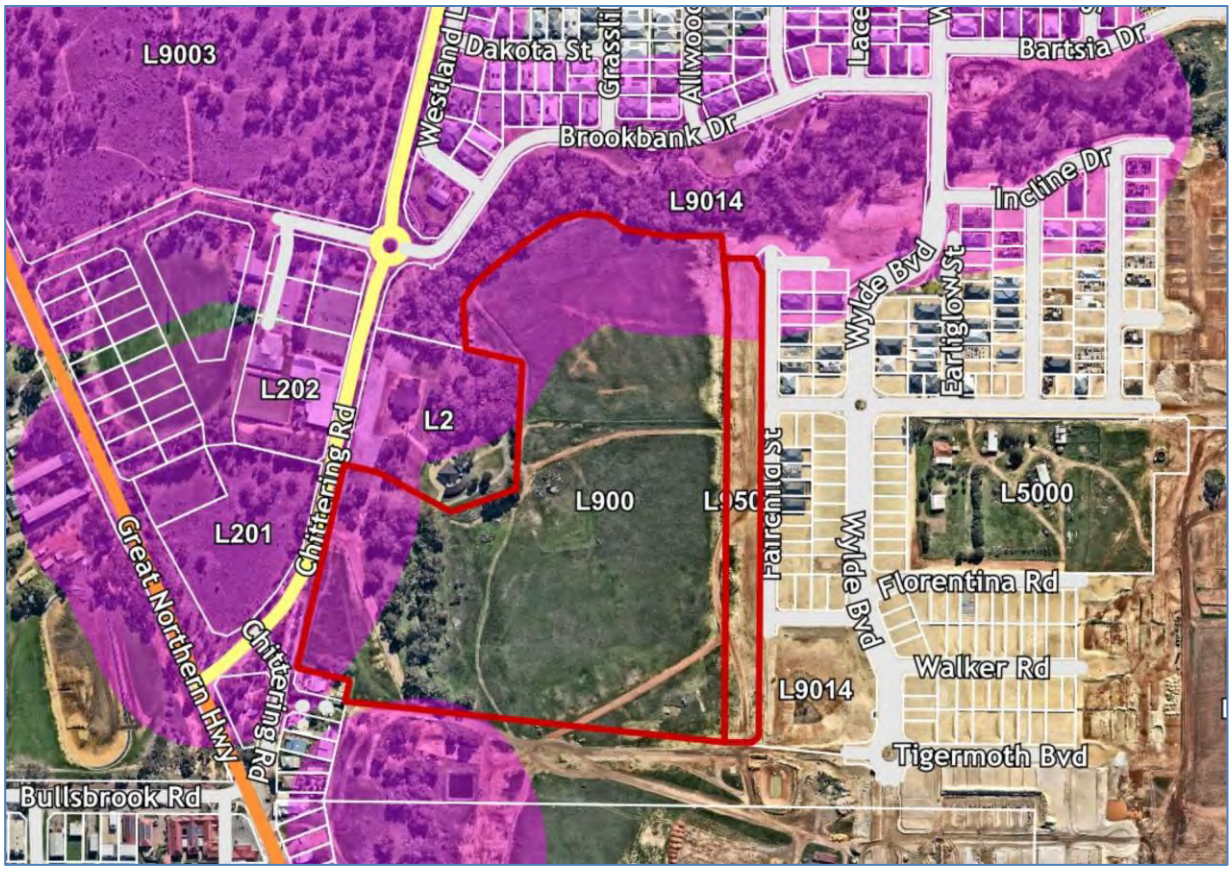


Figure 2 – Map of Bushfire Prone Areas (Source: DFES 2024)

The subject site is currently held in private ownership and the Lifestyle Village operator has secured a long term lease arrangement with the landowner for the use of the land for the proposed development.

The portion of the subject site to be developed for the Lifestyle Village is predominantly cleared pasture. Existing vegetation which follows the Ki-It Monger Brook around the western and northern boundaries will be retained as part of the development. The existing tree line within the boundaries of the subject site to the immediate west of the proposed clubhouse may require limited pruning to facilitate bushfire separation, however no tree removal is proposed to occur to facilitate the development.

2.4 Overview of Proposal

A Masterplan depicting the proposed development layout is included at **Figure 3**, with a copy of the supporting plans also included at **Appendix 1**. The design provides for the following:

- 237 dwellings with an average lot area of approximately 260m²;
- A Clubhouse building providing facilities for the exclusive use of residents in the Lifestyle Village comprising sales, management and reception, a cinema and games room, main lobby with lounge, café, bar, hall and an indoor fitness area comprising a pool, gym, multiuse room and changerooms;
- A Community Garden containing BBQ areas, a meeting place and pickleball courts;
- Landscaped wetlands to the north and south of the subject site;
- A Boat and Caravan Parking area adjacent to the southern boundary of the subject site;
- A permeable grid road network connecting the subject site to Chittering Road to the west via a main entry gate and driveway; and
- Secondary access via Amelia View to the north-east for emergency access and the future Chittering Road re-alignment to the south providing future caravan, construction and emergency access to the site.

The subject site currently comprises three separate lots including Lots 900, 9501 and a small portion of 9013 Chittering Road, Bullsbrook. It is understood that the lots will shortly be amalgamated into a single parcel (Lot 9017).

This BMP has been prepared to accompany the Application for Development Approval to the City prepared by Planning Solutions, dated August 2024.

A BMP dated 13 September 2021 was prepared to accompany the Kingsford Bullsbrook Central Revised LSP pursuant to Clause 6.3 of SPP3.7 relating to strategic planning proposals. The purpose of the current BMP is to assess the development application against Clause 6.5 of SPP3.7 to consider site specific bushfire hazard issues and bushfire protection criteria in relation to the proposed development at the subject site.

2.5 Access

Proposed vehicle access will include a new crossover and entry statement from Chittering Road to the west. Chittering Road currently comprises a sealed two-way undivided carriageway of approximately 8m in width with a total road reservation of approximately 20m. The road is constructed to an urban standard with drainage and curbing (refer **Figure 4**).

The proposal also includes two alternative emergency access points, including to the south via the future Chittering Road re-alignment providing access for caravan, construction and emergency purposes. At the time of writing, the Chittering Road re-alignment has not been completed, however the Kingsford Bullsbrook Central Revised LSP identifies the road as a sealed two-way undivided carriageway of approximately 7m in width (Neighbourhood Connector B) plus verge.

The second alternative emergency access point is provided in the north-eastern portion of the site via Amelia View. Amelia View is a local access road servicing the residential estate to the immediate east of the subject site. Amelia View is a sealed two-way undivided carriageway of approximately 5.5m in width with a total road reservation of approximately 16m. The road is constructed to an urban standard with drainage and curbing (refer **Figure 5**).

As the subject site will be retained in private ownership with the Lifestyle Village operating on a long term lease arrangement for the life of the development, the grounds and infrastructure throughout the site will be internally managed and maintained on an ongoing basis by the developer. As such, this development model does not provide public access connections through the development to surrounding local road networks and all vehicle access points will be secured with gates once the Lifestyle Village is occupied. The main entrance gate will remain open during the day, but will be closed during the evening hours. The secondary access gates to Amelia View and the future Chittering Road realignment will remain locked at all times. Residents will be provided with access cards providing afterhours access to the Lifestyle Village via the main entrance gate as well as future access to the caravan and boat storage area via the future Chittering Road realignment once constructed. In an emergency event if an evacuation response is triggered, residents will be able to egress through the main gate and future southern gate using access cards. A breakglass will be installed at the exit to Amelia View for residents egressing to the north-east. Emergency services and/or local government will be provided with a master key providing access to Lifestyle Village via the emergency access gates and the main village gate in the event that internal access is required.

2.6 Water and Power Supply

Reticulated water supply exists adjacent to the subject site in the Chittering Road road reserve to the west and the Amelia View road reserve to the east. The proximity of reticulated water in the locality provides opportunities for connection as part of the future redevelopment of the subject site.

Below ground power distribution cables exist within the road reserves to the north-west and east of the subject site providing capacity for power connection to the subject site.

2.7 Bushfire Response Capability

The Bullsbrook Volunteer Fire and Emergency Service stationed at the intersection of Maroubra Avenue and Chittering Road, located approximately 100m to the west of the subject site, is the closest responder and will provide the best-case emergency suppression response time of 30 minutes should a bushfire threaten lives or buildings on or adjacent to the site.

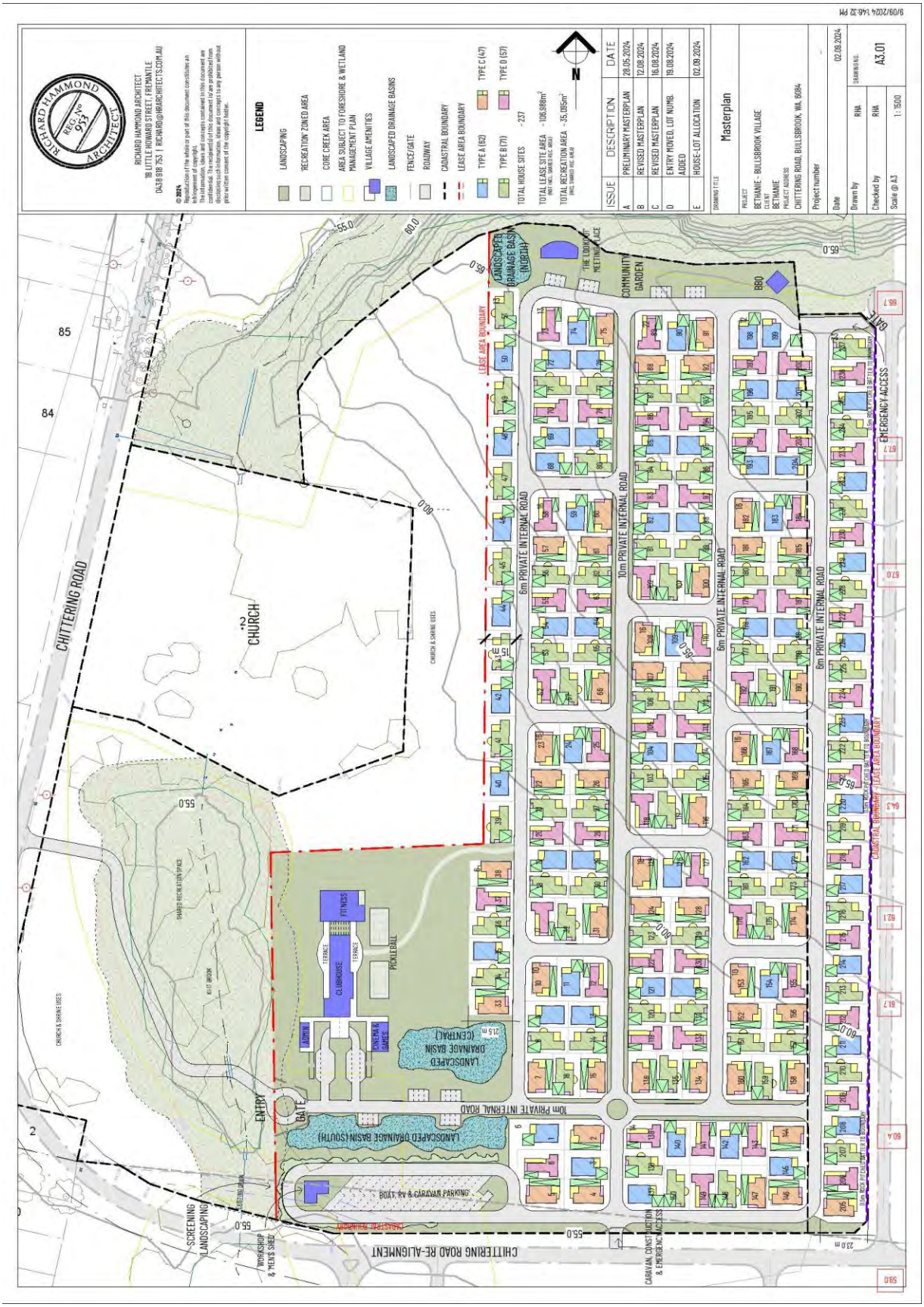


Figure 3 – Masterplan



Figure 4 – View north-west along Chittering Road adjacent to subject site



Figure 5 – View south along Amelia View adjacent to subject site

3.0 ENVIRONMENTAL CONSIDERATIONS

The subject site contains a combination of cleared pasture and existing native vegetation which follows the Ki-It Monger Brook.

3.1 Native Vegetation – Modification and Clearing

The portion of the subject site to be developed for the Lifestyle Village is predominantly cleared pasture. The existing tree line within the boundaries of the subject site to the immediate west of the proposed clubhouse may require limited pruning to facilitate bushfire separation, however no tree removal is proposed to occur to facilitate the development.

3.2 Revegetation and Landscape Plans

The land will be landscaped as part of the proposed Lifestyle Village. However given the density of development, there is limited potential for any future landscaping to result in any significant increase in bushfire threat to dwellings within the subject site. As demonstrated in the Landscape Plan provided as part of the Development Plan package at **Appendix 1**, targeted landscaping is proposed around the communal spaces surrounding the clubhouse and the open space to the north of the village and will comprise a low threat managed native shrubs, groundcovers and tree planting adjacent to the brook and open turf spaces. The landscaped gardens will be retained under the management of the operator in perpetuity.

4.0 BUSHFIRE ASSESSMENT RESULTS

A Method 1 procedure in accordance with AS3959 has been undertaken to inform this bushfire assessment.

4.1 Assessment Inputs

4.1.1 Vegetation Classification

The vegetation classification has been determined within and surrounding the development site in accordance with Clause 2.2.3 of AS3959. Each distinguishable vegetation plot with the potential to determine the BAL is identified in **Table 1** below with the plots mapped in **Figure 6** in their current pre-development (existing) condition. **Figure 7** contains the vegetation plots for the post-development scenario which have been used to develop the BAL Contour Map at **Figure 9.** A copy of the bushfire mapping is also contained within **Appendix 2**.

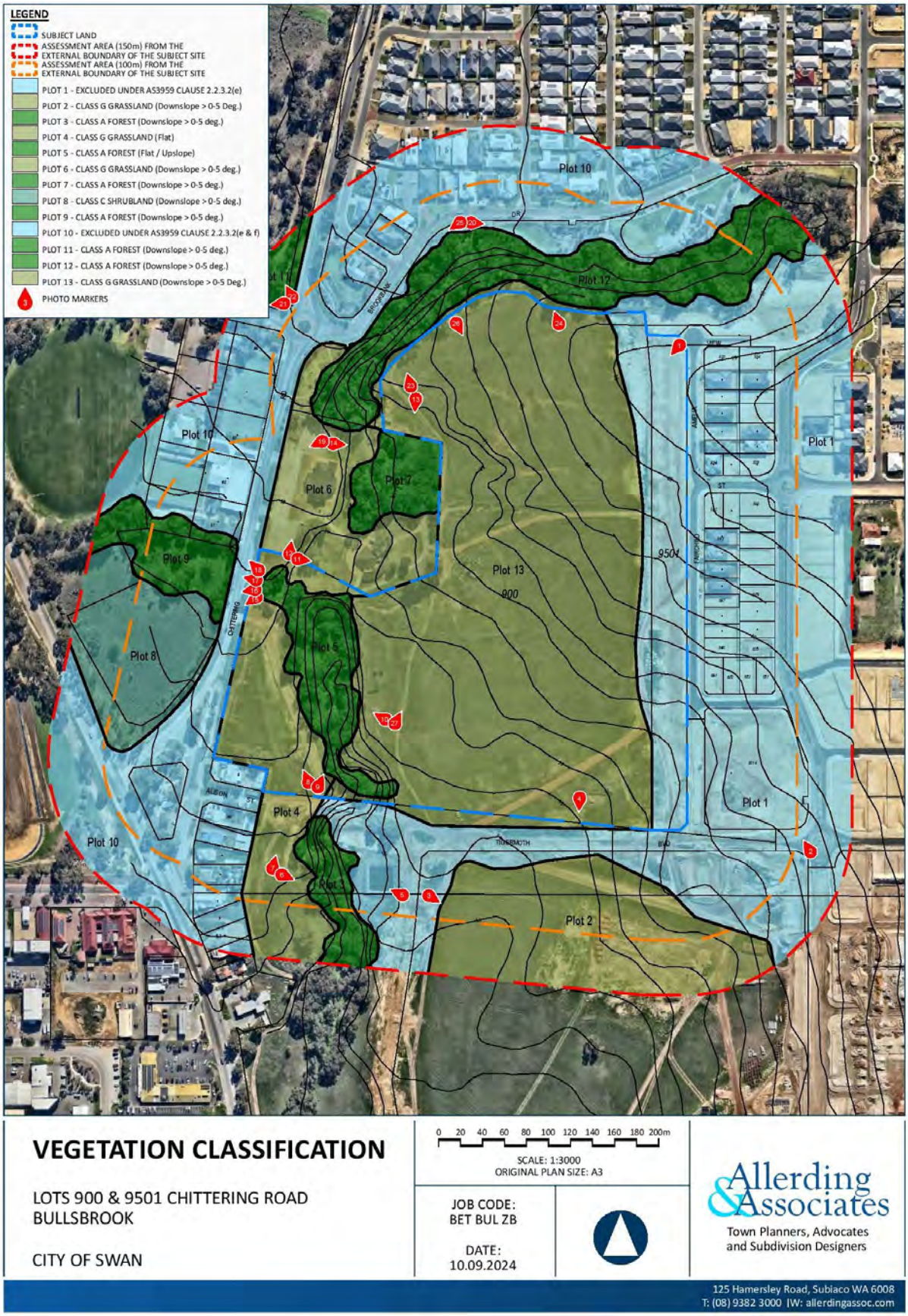


Figure 6 – Vegetation Classification

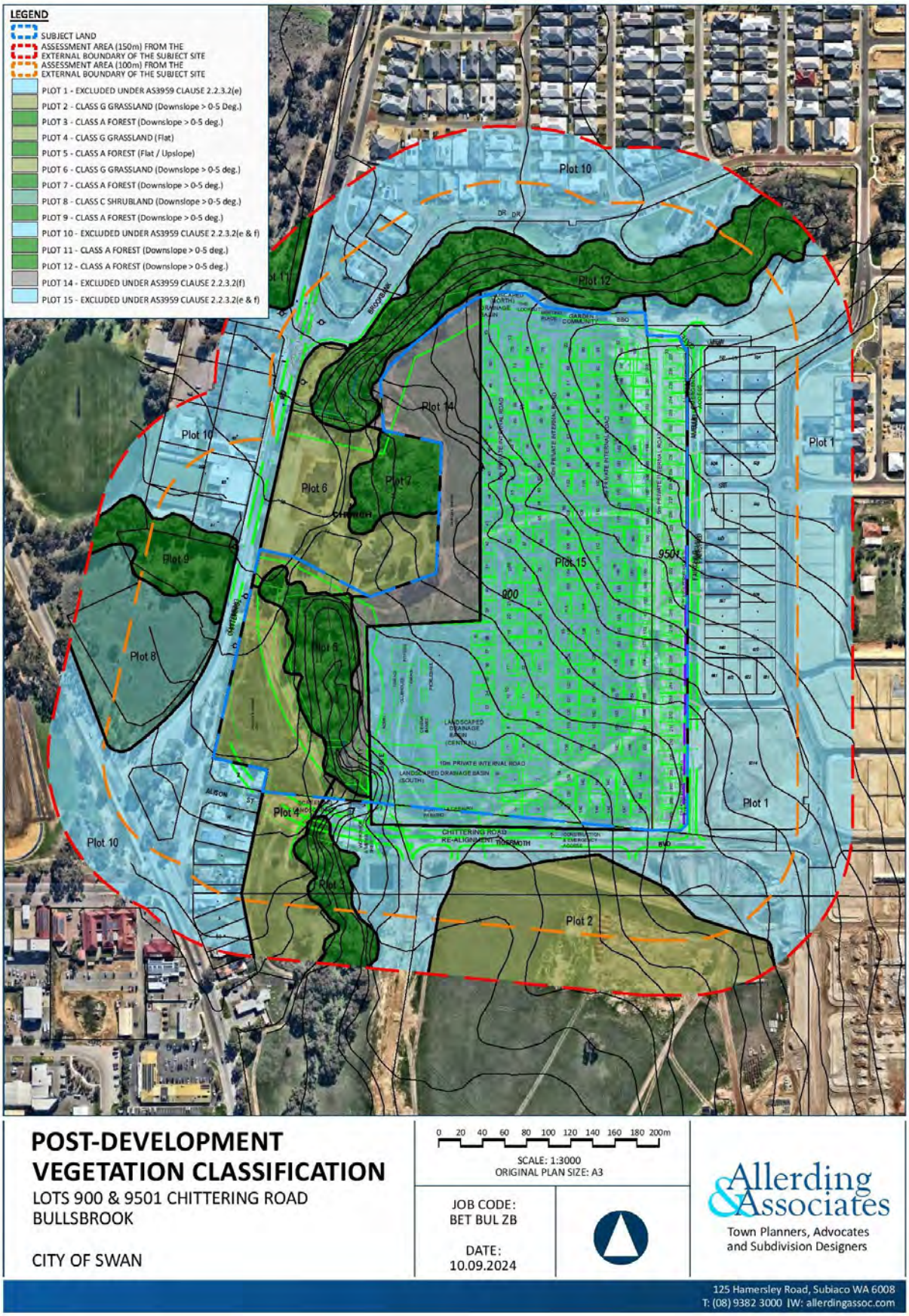


Figure 7 – Vegetation Classification (Indicative Post Development Scenario)

Table 1: Vegetation Classification

Photo ID	1	**Plot**	1
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(e) Non Vegetated Areas			
Description / Justification for Classification			
Plot 1 to the east of the subject site contains a new residential estate comprising cleared lots, new dwellings and a partially constructed road network.			



Photo ID	2	**Plot**	1
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(e) Non Vegetated Areas			
Description / Justification for Classification			
Plot 1 to the east of the subject site contains a new residential estate comprising cleared lots, new dwellings and a partially constructed road network.			



Photo ID	3	**Plot**	2
Vegetation Classification or Exclusion Clause			
Class G Grassland			
Description / Justification for Classification			
Plot 2 to the south of the subject site contains cleared pasture which is predominantly unmanaged. No canopy trees exist within the plot.			



Photo ID	4	Plot	2
Vegetation Classification or Exclusion Clause			
Class G Grassland			
Description / Justification for Classification			
Plot 2 to the south of the subject site contains cleared pasture which is predominantly unmanaged. No canopy trees exist within the plot.			



Photo ID	5	Plot	3
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 3 located south-west of the subject site contains mature open forest vegetation which follows the natural brook ranging in height from 10m to 12m, with a canopy cover of approximately 70%. The understory contains grasses and low trees in an unmanaged state.			



Photo ID	6	Plot	3
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 3 located south-west of the subject site contains mature open forest vegetation which follows the natural brook ranging in height from 10m to 12m, with a canopy cover of approximately 70%. The understory contains grasses and low trees in an unmanaged state.			

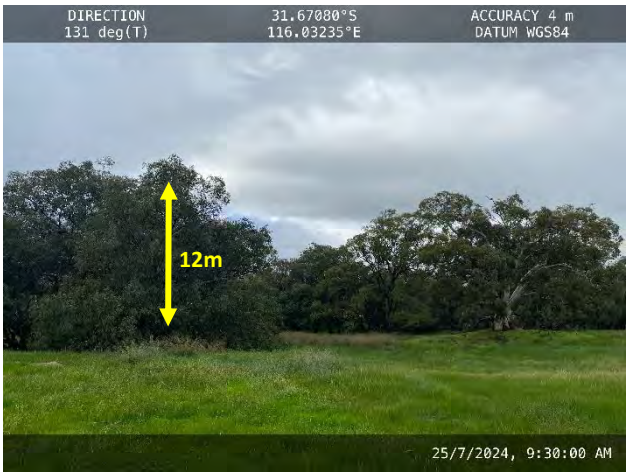


Photo ID	7	Plot	4
Vegetation Classification or Exclusion Clause			
Class G Grassland			
Description / Justification for Classification			
Plot 4 in the south-western corner of the subject site contains pasture which is predominantly unmanaged. Mature canopy trees exist within the plot, however the overstorey foliage cover is less than 10%.			



Photo ID	8	Plot	4
Vegetation Classification or Exclusion Clause			
Class G Grassland			
Description / Justification for Classification			
Plot 4 in the south-western corner of the subject site contains pasture which is predominantly unmanaged. Mature canopy trees exist within the plot, however the overstorey foliage cover is less than 10%.			



Photo ID	9	Plot	5
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 5 within the south-western corner of the subject site contains mature open forest vegetation which follows the natural brook ranging in height from 10m to 15m, with a canopy cover of approximately 70%. The understory contains grasses and low trees in an unmanaged state.			



Photo ID	10	Plot	5
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 5 within the south-western corner of the subject site contains mature open forest vegetation which follows the natural brook ranging in height from 10m to 15m, with a canopy cover of approximately 70%. The understory contains grasses and low trees in an unmanaged state.			



Photo ID	11	Plot	6
Vegetation Classification or Exclusion Clause			
Class G Grassland			
Description / Justification for Classification			
Plot 6 to the immediate west of the subject site contains an existing church with grassed areas and associated car parking. The grassed areas appear in a generally managed condition, with some unmanaged areas throughout the plot. Mature canopy trees exist within the plot, however the overstorey foliage cover is less than 10%.			



Photo ID	12	Plot	6
Vegetation Classification or Exclusion Clause			
Class G Grassland			
Description / Justification for Classification			
Plot 6 to the immediate west of the subject site contains an existing church with grassed areas and associated car parking. The grassed areas appear in a generally managed condition, with some unmanaged areas throughout the plot. Mature canopy trees exist within the plot, however the overstorey foliage cover is less than 10%.			



Photo ID	13	Plot	7
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 7 to the immediate west of the subject site contains a stand of mature open forest vegetation ranging in height from 12m to 14m, with a canopy cover of approximately 60%. The understory contains grasses in a partially managed state.			



Photo ID	14	Plot	7
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 7 to the immediate west of the subject site contains a stand of mature open forest vegetation ranging in height from 12m to 14m, with a canopy cover of approximately 60%. The understory contains grasses in a partially managed state.			



Photo ID	15	Plot	8
Vegetation Classification or Exclusion Clause			
Class C Shrubland			
Description / Justification for Classification			
Plot 8 to the west of the subject site on the western side of Chittering Road is predominated by low shrubs <2m in height with a foliage cover of 90%.			



Photo ID	16	Plot	8
Vegetation Classification or Exclusion Clause			
Class C Shrubland			
Description / Justification for Classification			
Plot 8 to the west of the subject site on the western side of Chittering Road is predominated by low shrubs <2m in height with a foliage cover of 90%.			



Photo ID	17	Plot	9
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 9 to the west of the subject site on the western side of Chittering Road contains mature open forest vegetation ranging in height from 12m to 15m, with a canopy cover of approximately 40%. The understory contains grasses and low shrubs in an unmanaged state.			



Photo ID	18	Plot	9
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 9 to the west of the subject site on the western side of Chittering Road contains mature open forest vegetation ranging in height from 12m to 15m, with a canopy cover of approximately 40%. The understory contains grasses and low shrubs in an unmanaged state.			



Photo ID	19	Plot	10
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(e) Non Vegetated Areas			
Description / Justification for Classification			
Plot 10 to the north and west of the subject site contains a combination of non-vegetated land comprising buildings and roads, with managed parkland to the north of the plot.			



Photo ID	20	Plot	10
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(f) Low Threat Veg			
Description / Justification for Classification			
Plot 10 to the north and west of the subject site contains a combination of non-vegetated land comprising buildings and roads, with managed parkland to the north of the plot.			



Photo ID	21	Plot	11
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 11 in the north-west of the assessment area to the west Chittering Road contains mature open forest vegetation ranging in height from 14m to 16m, with a canopy cover of approximately 50%. The understory contains grasses and low shrubs in an unmanaged state.			



Photo ID	22	Plot	11
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 11 in the north-west of the assessment area to the west Chittering Road contains mature open forest vegetation ranging in height from 14m to 16m, with a canopy cover of approximately 50%. The understory contains grasses and low shrubs in an unmanaged state.			



Photo ID	23	Plot	12
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 12 to the north of the subject site contains mature open forest vegetation which follows the natural brook ranging in height from 15m to 22m, with a canopy cover of approximately 75%. The understory contains grasses and low trees in an unmanaged state.			



Photo ID	24	Plot	12
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 12 to the north of the subject site contains mature open forest vegetation which follows the natural brook ranging in height from 15m to 22m, with a canopy cover of approximately 75%. The understory contains grasses and low trees in an unmanaged state.			



Photo ID	25	Plot	12
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 12 to the north of the subject site contains mature open forest vegetation which follows the natural brook ranging in height from 15m to 22m, with a canopy cover of approximately 75%. The understory contains grasses and low trees in an unmanaged state.			



Photo ID	26	Plot	13
Vegetation Classification or Exclusion Clause			
Class G Grassland			
Description / Justification for Classification			
Plot 13 comprising the majority of the subject site contains cleared pasture which is predominantly unmanaged. No canopy trees exist within the plot.			



Photo ID	27	Plot	13
Vegetation Classification or Exclusion Clause			
Class G Grassland			
Description / Justification for Classification			
Plot 13 comprising the majority of the subject site contains cleared pasture which is predominantly unmanaged. No canopy trees exist within the plot.			



4.1.2 Site Topography and Slope

Based on site observations and available topographical mapping for the broader locality beyond 100m from the edge of the subject site, it has been verified that the majority of the subject site and surrounding land is relatively flat and level with a gradual south-westerly fall across the site. A topographical plan is included at **Figure 8**.



Figure 8 – Topographical Plan

4.1.3 Summary of Vegetation Classifications and Effective Slope

Table 2 provides a summary of the vegetation classification and effective slope as provided within the Vegetation Classification maps in **Figures 6** and **7**, and **Appendix 2.**

Table 2: Summary of Vegetation Classification and Effective Slope

Vegetation Plot	Vegetation Classification	Effective Slope	Comments
Plot 1	Excluded Clause 2.2.3.2(e)	NA	Residential subdivision to the east and south of the subject site currently under construction and permanently cleared of vegetation.
Plot 2	Class G Grassland	Downslope >0 to 5°	Open paddock containing pasture and scattered trees.
Plot 3	Class A Forest	Downslope >0 to 5°	Existing bushland to the south-west of the subject site following the Ki-It Monger Brook.
Plot 4	Class G Grassland	Flat	Cleared land containing pasture and scattered trees.
Plot 5	Class A Forest	Flat / Upslope	Existing bushland in the western portion of the subject site following the Ki-It Monger Brook.
Plot 6	Class G Grassland	Downslope >0 to 5°	Cleared grassland and scattered trees surrounding church and associated structures and parking areas.
Plot 7	Class A Forest	Downslope >0 to 5°	Existing stand of canopy trees to the immediate east of the church with parkland cleared understorey.
Plot 8	Class C Shrubland	Downslope >0 to 5°	Low shrubs with scattered trees within public reserve to the west of Chittering Road.
Plot 9	Class A Forest	Downslope >0 to 5°	Existing bushland within public reserve to the west of Chittering Road.
Plot 10	Excluded Clauses 2.2.3.2(e)&(f)	NA	Existing residential development and maintained public reserves and recreational facilities to the north and west of the subject site.

Table 2: Summary of Vegetation Classification and Effective Slope			
Vegetation Plot	**Vegetation Classification**	**Effective Slope**	**Comments**
Plot 11	Class A Forest	Downslope >0 to 5°	Existing bushland within public reserve to the north-west of Chittering Road.
Plot 12	Class A Forest	Downslope >0 to 5°	Existing bushland to the north of the subject site following the Ki-It Monger Brook.
Plot 13	Class G Grassland	Downslope >0 to 5°	Open paddock within the subject site containing pasture and access tracks.
Plot 14	Excluded Clause 2.2.3.2(f)	NA	Land to be maintained as low threat vegetation (lawn, gardens etc) within the subject site to the immediate west of the proposed development.
Plot 15	Excluded Clauses 2.2.3.2(e)&(f)	NA	Land to be modified to non-vegetated elements (roads, paths, buildings, infrastructure) or low threat vegetation (lawn, gardens etc), as part of proposed development.

4.2 Assessment Outputs

4.2.1 Bushfire Attack Level (BAL) Assessment

The BAL Assessment was undertaken in accordance with AS3959 Methodology 1 to determine the potential worst case scenario radiant heat impact on the prospective development. **Table 3** below outlines the worst-case BAL for each of the vegetation plots based on separation distance to the proposed habitable buildings within the development. **Table 4** below provides the BAL for each of the new habitable buildings based on the assessed separation distance from the vegetation plots. The vegetation plots referenced in **Table 3** are based on the post-development scenario as demonstrated in **Figure 7** (and **Appendix 2**).

Table 2.1 of AS3959-2018 identifies a Fire Danger Index (FDI) of 80 for Western Australia. Therefore, Table 2.4.3 of AS3959-2018 has been used to develop the BAL Contour Map (refer **Figure 9** and **Appendix 2**) to calculate the BAL for the proposed residential lots and inform the standard of building construction required for future habitable buildings on those proposed lots to withstand such impacts.

Table 3: Worst Case BAL Table for Proposed Development				
Vegetation Plot	**Applied Vegetation Classification**	**Effective Slope Under Classified Vegetation (degrees)**	**Minimum Separation Distance to Classified Vegetation (m)**	**Bushfire Attack Level**
Plot 2	Class G Grassland	Downslope >0 to 5°	32m	12.5
Plot 3	Class A Forest	Downslope >0 to 5°	95m	12.5
Plot 5	Class A Forest	Flat	21m	29
Plot 6	Class G Grassland	Downslope >0 to 5°	41m	12.5
Plot 7	Class A Forest	Downslope >0 to 5°	35m	29
Plot 12	Class A Forest	Downslope >0 to 5°	27m	29
			Worst case BAL	**29**

Table 4: Indicative BAL Ratings for Proposed Park Homes	
Dwelling Number	**Bushfire Attack Level**
1-3, 6-20, 26-38, 81-83, 97-136, 138-145, 151-192, 204-232.	Low
4, 5, 21-25, 39-41, 49, 50, 52-72, 76-80, 84-87, 93-96, 137, 146-150, 193-196, 200-203, 233-236.	12.5
42-48, 73, 74, 88, 92, 197, 237.	19
51, 75, 89, 90, 91, 198, 199.	29
Nil	40/FZ

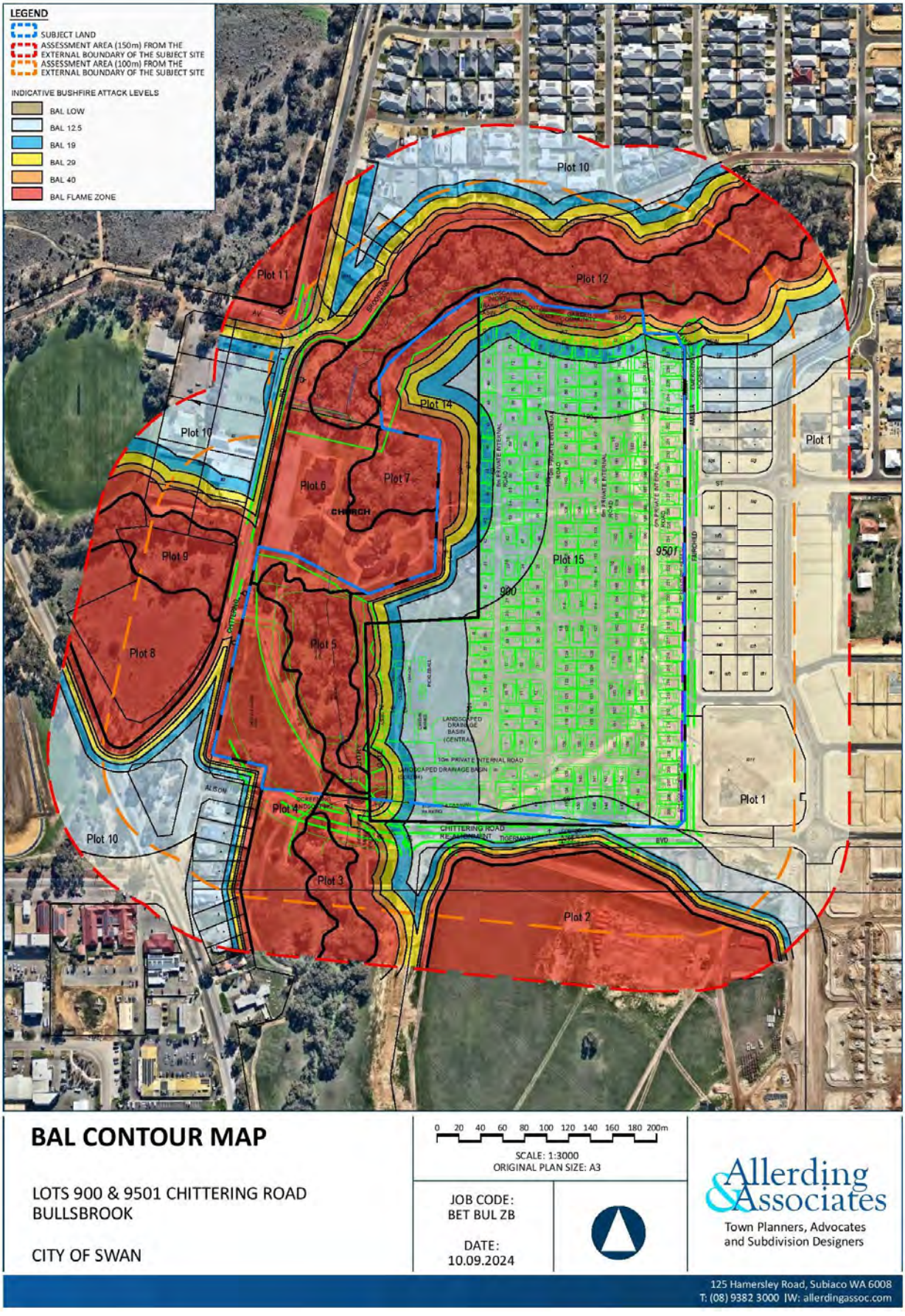


Figure 9 – BAL Contour Map

5.0 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

5.1 Overview

Based on the BAL assessment undertaken as part of this BMP, the highest determined BAL associated with those areas within the subject site where new development is planned to occur is BAL29. It is noted that these areas are associated with the existing classified Class A Forest vegetation which follows the Ki-It Monger Brook along the northern boundary (Plot 12) and through the western portion of the subject site (Plot 5). It is anticipated that the future urban development of the neighbouring land to the south of the subject site (within Plot 2) will reduce the BAL rating for the proposed dwellings located at the interface with this boundary. Having regard to the other proposed dwellings within the subject site with indicative BAL ratings of BAL29 or lower, it is likely that physical separation from bushfire prone vegetation will be the most effective management measure due to the extent of non-vegetated land within the central portion of the site and in surrounding areas to the immediate east and west.

5.2 Consideration of Landscaping and Management Arrangements

Targeted plantings and landscaping throughout the site, particularly surrounding the clubhouse and open space to the north will improve both environmental values and public recreational values. Given the proposed maintenance arrangements for these spaces involving mulching beneath trees and around ground covers adjoining maintained grassed play areas, the landscaped areas will be capable of management to a low threat state and will not contribute to increased bushfire risk.

5.3 Consideration of Broader Context

On completion of the Lifestyle Village development, the classified vegetation within and immediately surrounding the subject site to the north and west along the Ki-It Monger Brook and adjacent to the church (Plots 3, 5, 7 and 12) will represent areas of fragmented vegetation which are interspersed with the adjacent local road networks, existing and establishing urban areas, public recreation facilities and cleared farmland. The combined effect of these unmanaged vegetated areas may present opportunities for extended fire runs, particularly noting the extent of Forest vegetation within the plots. However, the fragmented nature of these immediately surrounding classified vegetation plots is likely to reduce the bushfire risk and intensity, particularly in milder conditions. These existing areas of classified vegetation will be separated from the proposed residential development on the subject site by perimeter roads which will be accessible for fire suppression from different directions during a bushfire event. These presence of this vegetation therefore does not pose a significant threat to the development.

Further, surrounding landowners will be required to conform to the City of Swan Fire Hazard Reduction Notice issued annually. For surrounding land to the west and south, land owners/occupiers are required to maintain 3m wide firebreaks with a 4m vertical height clearance within 5m of all external boundaries. Properties containing dwellings, assembly buildings and other public buildings must also install and maintain Asset Protection Zones (APZs) around building in accordance with the requirements of the Fire Hazard Reduction Notice.

The subject site is well serviced by the existing road network. The site is proposed to be serviced by Chittering Road to the west which connects to the regional road network further west via Great Northern Highway providing access to locations north and south of the Bullsbrook locality. To the immediate east of the subject site, Amelia View connects to the establishing urban areas to the east and north of the subject site.

Pursuant to Clause 6.5 of SPP3.7, the proposal has been assessed against the bushfire protection criteria requirements contained within the Guidelines. Sections 6.0 and 7.0 of this report demonstrate that the proposal complies with the bushfire protection criteria of the Guidelines and it is therefore considered that the bushfire hazard issues can be effectively managed and mitigated.

6.0 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA

An assessment of the proposal against the bushfire protection criteria of the Guidelines in contained in **Table 5** which demonstrates that the development meets all acceptable solutions.

These strategies have been recommended for guiding future planning and development stages associated with the proposal. These strategies are based on best practice in bushfire protection and reflect the guidance provided by SPP3.7 and the Guidelines.

6.1 Bushfire Management Strategies

6.1.1 Maintain Asset Protection Zones Throughout Site (A2.1 Asset Protection Zones)

The proposed APZ areas are spatially demonstrated in the Bushfire Management Strategies map (refer **Figure 10** and **Appendix 2**). The standards for APZs are included at **Appendix 4**.

Pursuant to the standards for APZs (refer **Appendix 4**), the following measures shall be applied to the land contained within Plot 14 to the west of the development area between the outer edge of the retained vegetation within Plots 5, 6 and 7:

- Existing grass is to be maintained to a height of 100 millimetres or less at all times.
- Any fine fuel load is to be managed and removed on a regular basis from the APZ area to maintain a low threat state and achieve <2 tonnes per hectare (on average).
- For existing and proposed canopy trees >6m in height, development is to be positioned to be a minimum distance of 6m from any trunks with branches not overhanging buildings. Pruning will also be undertaken to ensure that lower branches are removed below 2m from the ground and appropriate canopy separation can be achieved.

As demonstrated in **Figure 10** (and **Appendix 2**), habitable buildings will require minimum separation from existing classified vegetation within the subject site as follows:

- Buildings separated by a minimum of 21m from the Class A Forest vegetation within Plot 5.
- Buildings separated by a minimum of 27m from the Class A Forest vegetation within Plot 7.
- Buildings separated by a minimum of 27m from the Class A Forest vegetation within Plot 12.

6.1.2 Maintain Landscaping in Minimal Fuel Condition

The proposed landscaped areas within the community garden in the northern portion of the Lifestyle Village and surrounding the clubhouse to the west shall be established and maintained in a low threat state for the life of the development. The low threat landscaped areas are spatially demonstrated in the Bushfire Management Strategies map (refer **Figure 10** and **Appendix 2**) and shall be maintained as follows:

- Grass is to be maintained to a height of 100 millimetres or less at all times and reticulated to increase moisture content.
- Any fine fuel load is to be managed and removed on a regular basis to maintain a low threat state and achieve <2 tonnes per hectare (on average).

- Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
- Ground covers <0.5 metres in height can be planted under trees but must be maintained to remove dead plant material. Ground covers can be located within two metres of a structure, but much be separated by 3m (min.) from windows or doors if >100 millimetres in height.
- For proposed canopy trees which, at maturity, will establish to >6m in height, development is to be positioned to be a minimum distance of 6m from any trunks with branches not overhanging buildings. Pruning will also be undertaken to ensure that lower branches are removed below 2m from the ground and appropriate canopy separation can be achieved.

6.1.3 Vehicular Access

The subject site is proposed to be serviced by an internal private driveway exceeding 70m in length. The private driveway servicing the development site has a total length of approximately 600m measured from the entry gate to the most distant extent of the development to the north-east. The subject site is serviced from Chittering Road to the west and an emergency access to the north-east via Amelia View, with an additional emergency access road to the south planned once the Chittering Road realignment is constructed as shown in **Figure 10** (and **Appendix 2**).

The proposed development is to include the following vehicular access:

- The private driveway network within the development is to comply the private driveway specifications of the Guidelines (refer to **Appendix 5**), including the requirements of Table 6, Column 4.
- The private driveway being designed with a permeable grid network to avoid dead-ends.
- The subject site providing two-way access to Chittering Road via the main village entrance.
- The internal road network with a minimum trafficable surface of 6m, with a minimum horizontal clearance of 6m and a minimum vertical clearance exceeding 4.5m, as shown in **Figure 10** (and **Appendix 2**).

6.1.4 Emergency Access Gates

In addition to the internal driveway network and main entrance gate from Chittering Road, the subject site will provide emergency access to Amelia View to the north and the future Chittering Road realignment to the south which form part of the public road network (refer **Figure 10** and **Appendix 2**). The following standards shall apply to locked gated emergency access points as well as the main Lifestyle Village gate which will remain closed during evening hours:

- The Amelia View emergency access point shall be signposted as “emergency access only”, as agreed with the local government.
- The future Chittering Road realignment emergency access point shall be signposted as “fire access”, as agreed with the local government.
- All gates must open the whole trafficable width of 6m.
- The main entrance gate and future Chittering Road realignment access must be operable internally for residents and staff via access cards, or an alternative system as agreed with the local government.
- The exit to Amelia View must be operable internally for residents and staff via a breakglass, or an alternative system as agreed with the local government.
- Access to the Lifestyle Village for emergency services via the emergency access gates and the main village shall be provided via a master key held by emergency services and/or local government, or an alternative system as agreed with the local government.

6.1.5 Provision of Water for Firefighting Purposes

The subject site is serviced by a reticulated water supply which will enable the installation of hydrants throughout the site in accordance with the Water Corporation Design Standard DS 63 (refer to **Figure 10**), generally located in accordance with the following requirements:

- *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 residential areas with lots per dwelling;*
- *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;*
- *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; and*
- *directly on top of the main using a tee unless proved to be impractical.*

6.1.6 Building Construction Standards

The Building Code of Australia contains bushfire construction requirements that are applied to residential classes of development, being Class 1, 2, 3 buildings in designated bushfire prone areas, or Class 10a buildings or decks associated with Class 1, 2 or 3 buildings in designated bushfire prone areas. The Building Code of Australia references AS3959 as a deemed to satisfy solution that provides one way of demonstrating compliance with the bushfire performance requirements of the Building Code.

In this instance, the form of development for park home park dwellings is akin to a Class 1 building under the Building Code of Australia and it has been assumed for the purposes of this BMP that this building class will be applied.

The bushfire construction provisions of the Building Code of Australia do not apply to Class 4 to Class 8 buildings, and some Class 9 buildings. In these instances the applicant has the discretion to utilise any or all of the elements of AS 3959 in the construction of the building that they deem appropriate.

6.1.7 Notification(s) on Title

Pursuant to SPP3.7, in instances where land is assessed with a BAL rating above BAL-LOW, it is recommended that notifications be placed on title to advise on bushfire risk management implementation measures, including:

- To advise that the site is located in a bushfire prone area; and
- To advise that the site is subject to a Bushfire Management Plan.

6.1.8 Staging

In the event that Lifestyle Village development occurs in a staged manner, it will be necessary to ensure that appropriate interim bushfire management measures are provided, including:

- Interim access or emergency access routes;
- Creation of additional low fuel zones / cleared areas to ensure that the intended BAL ratings can be applied; or
- The provision of boundary firebreaks especially on any balance lot.

It is recommended that for any proposed stage of the future development, a statement and plan of the proposed interim fire management strategies be submitted and approved by the City to guide the management of the site until such a time that the complete suite of management measures can be implemented pursuant to **Figure 10**.

6.1.9 Compliance with City of Swan Fire Hazard Reduction Notice

The City of Swan Fire Hazard Reduction Notice (included at **Appendix 3**) contains the land management practices for properties during the period from 1st November to 30th April. The remaining areas of the subject site outside the Lifestyle Village development area are to be managed by the landowner /operator to comply with the Fire Hazard Reduction Notice. The provisions relevant to the subject site include:

3. All land with an area greater than 25,000m2 (2.5 Hectares or 6.2 Acres)

1) Install and maintain an asset protection zone in accordance with the requirements specified in clause 13 of this notice.

2) Install firebreaks as close as practicable inside of, but no more than 5m from, the property's external boundaries. Firebreaks need to be 3 metres wide with a 4 metre vertical height clearance free from flammable materials and overhanging branches (see section 10 in this notice for further details). a) Properties over 100 hectares require additional firebreaks to divide the land into areas not exceeding 100 hectares.

3) Maintain all grass immediately adjacent to one side of any firebreak to a height of no greater than 10cm and a minimum width of 3 metres.

a) If the land is stocked, this grass must be reduced and maintained to a height of no greater than 10cm by the 1st day of December.

4) Natural vegetation within 100 metres of buildings including attached and adjacent structures and essential infrastructure shall be maintained at or below 8 tonnes per hectare, by passive methods of fuel reduction that does not permanently remove or reduce the quantity or occurrence of the native plants, shrubs and trees within the subject area.

5) Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this notice and with any additional requirements outlined within that plan.

13. Asset Protection Zones Specification

Asset protection zones must be installed around relevant buildings (see section 17) and must meet the following requirements:

1) *Extends 20 metres out from any external walls of the building, attached structures, or adjacent structures within 6 metres of the habitable building, unless varied under an approved bushfire management plan.*

2) *On sloping ground, the asset protection zone distance shall increase with 1 metre for every degree in slope on the sides of the building/ structure that are exposed to down slope natural vegetation.*

3) *Asset protection zone requirements only apply within the boundaries of the lot on which the asset is located and cannot be enforced across boundaries.*

4) *The average fuel loads must be reduced and maintained at two tonnes per hectare or lower.*

5) *It is recommended asset protection zones predominantly contain vegetation of low-flammability, reticulated lawns and gardens and other non-flammable features.*

6) *All grass is maintained to or under 10cm.*

7) *The crowns of trees are to be separated where possible to create a clear separation distance between adjoining or nearby tree crowns. Clearing or thinning trees to create distances greater than 10 metres separation between tree crowns is not required or supported by this.*

8) *A small group of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species.*

9) *Trees are to be low pruned (or under pruned) to at least a height of 2 metres from ground.*

10) *No tree, or shrub over 2 metres high is planted within 3 metres of a building, especially adjacent to windows.*

11) *There are no tree crowns or branches hanging over buildings.*

12) *Clear and prune scrub to reduce to a sparse density (able to walk through vegetation with relative ease with minimal deviation around trees and shrubs).*

13) *Install paths or clear flammable or dry vegetation, debris and materials immediately adjacent to the building.*

14) *Wood piles and flammable materials stored a safe distance from buildings.*

17. Definitions

*'**Relevant building**' is classified under the Building Code as one of the following:*

- *single dwelling such as a detached house, duplex, villa or townhouse (Class 1a);*
- *small boarding house, guest house or hostel (Class 1b);*

- *dwellings such as apartments and flats in a building containing two or more units (Class 2);*
- *accommodation for unrelated people such as hotel, motel, residential part of a school, accommodation for the aged, children or people with disabilities (Class 3);*
- *building of a public nature such as a health care building (9a), an assembly building such as a school (9b) or an aged care building (9c);*
- *private bushfire shelters associated with a single dwelling (Class 10c); or*
- *non-habitable building including sheds, carports and private garages (Class 10a) when within six metres of a class 1a, 1b, 2, 3 or 9 building.*

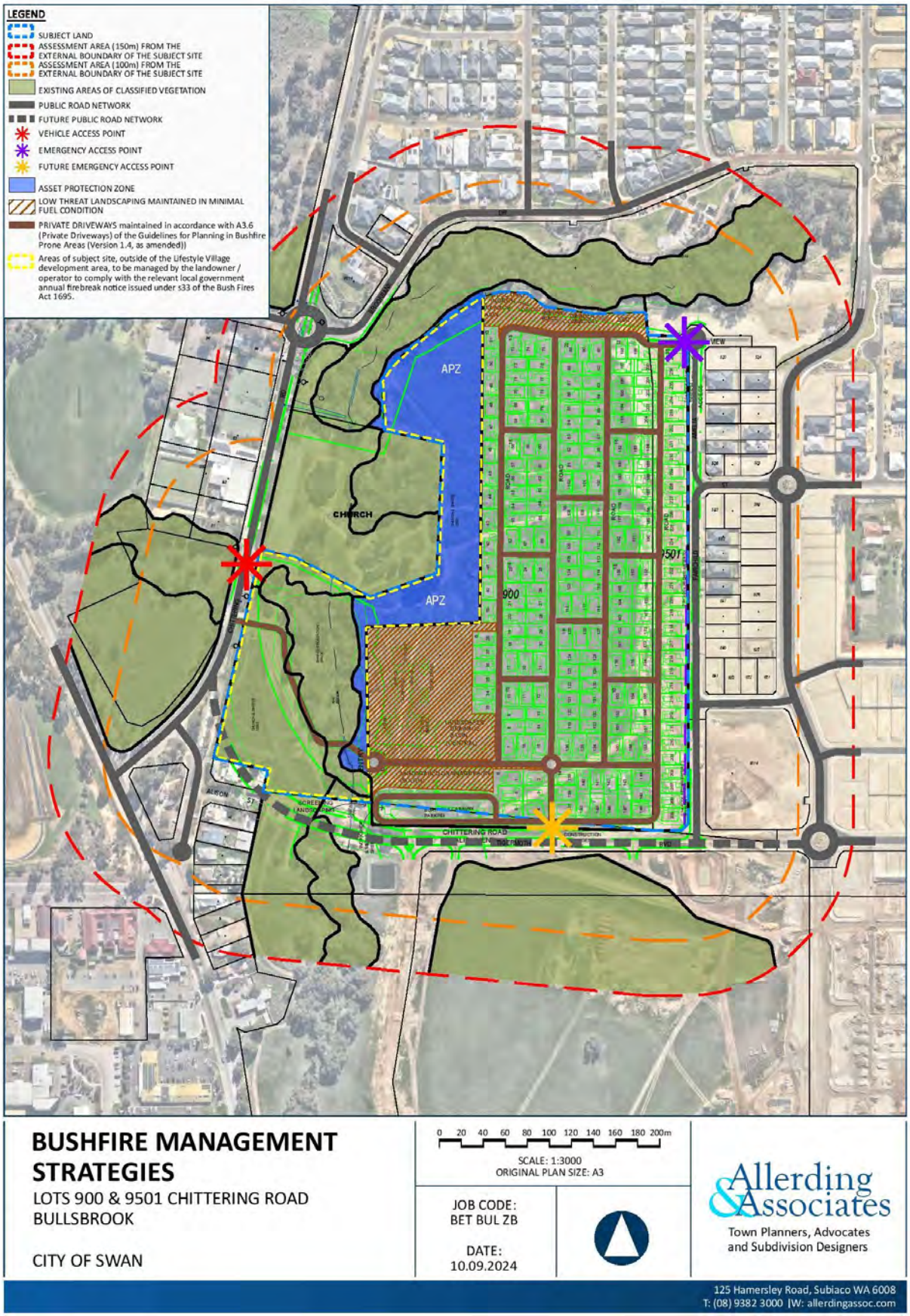


Figure 10 – Bushfire Management Strategies

6.2 Compliance Table

Table 5: Assessment Against the Bushfire Protection Criteria

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
Element 1: Location	To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.	A1.1 Development location The strategic planning proposal, subdivision and development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL–29 or below.	The BAL Contour Map at **Figure 9** demonstrates that the proposed habitable dwellings will be capable of separation from the adjacent bushfire hazard to achieve a BAL of BAL29 or lower. Accordingly, the development will be appropriately located.	The proposal meets the intent of Element 1 and achieves acceptable solution A1.1.
Element 2: Siting and Design of Development	To ensure that the siting and design of development minimises the level of bushfire impact.	A2.1 Asset Protection Zone (APZ) Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements: • Width: Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a bushfire	As demonstrated in the BAL Contour Map at **Figure 9** above, future habitable buildings on proposed lots will be appropriately sited to achieve a BAL rating of BAL29 or lower due to the separation provided to the surrounding classified vegetation and the maintenance of an APZ to	The proposal meets the intent of Element 2 and achieves acceptable solution A2.1.

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
		does not exceed 29kW/m² (BAL-29) in all circumstances. • Location: the APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity (see explanatory notes). • Management: the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones'. (see Schedule 1).	the standards as outlined in this BMP. The proposed APZ areas are spatially demonstrated in **Figure 10**. The standards for APZs are included at **Appendix 4**.	
Element 3: Vehicular Access	To ensure that the vehicular access serving a subdivision / development is available and safe during a bushfire event.	*To achieve the intent, <u>all applicable</u> 'acceptable solutions' must be addressed:* * The acceptable solutions do not apply at every stage of the planning process. Refer to the annotations next to each acceptable solution to determine if they apply. The annotations are outlined below. SP – Strategic planning proposal and structure plan where the lot layout is not known Sb – Structure plan where the lot layout is known and subdivision application Dd – Development application for a single dwelling, ancillary dwelling or minor development	NA	The provisions for "Do" will be considered as part of this assessment.

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
		Do – Development application for any other development		
		A3.1 Public roads (SP Sb **Do**) The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads. Public roads are to meet the minimum technical requirements in Table 6, Column 1. The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.	Chittering Road and Amelia View which represent the connecting public roads to the subject site form part of the existing road network and are understood to comply with the standards contained within Appendix 4, Table 6, Column 1 of the Guidelines (refer **Appendix 5**). The internal road network will be retained under the ownership and management of the future Lifestyle Village operator and therefore the roads will be maintained as private driveways. Notwithstanding the future internal road classification, the indicative Lifestyle Village Masterplan (refer **Appendix 1**) provides for an internal road network comprising 6m (minimum) wide roads which achieve the horizontal and vertical clearance requirements under Figure 20 of the Guidelines.	The proposal meets the intent of Element 3 and achieves acceptable solution A3.1 though compliance with the vehicular access technical requirements of Table 6.

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
		A3.2a Multiple access routes (SP Sb **Do**) Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access). If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.	The subject land gains vehicular access from Chittering Road to the west and Amelia View to the north-east (via an emergency exit). Both Chittering Road and Amelia View provide safe access and egress via the public road network in two different from the subject land to at least two different suitable destinations with an all-weather surface. Once the future access to the Chittering Road realignment is established to the south of the subject site, connections to the future residential areas to the south and east providing additional safe access and egress via the public road network with an all-weather surface. The proposed access arrangements are spatially demonstrated in **Figure 10**. The term "suitable destination" is defined in Appendix One (Definitions) of the Guidelines as follows:	The proposal meets the intent of Element 3 and achieves acceptable solution A3.2a.

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
			An area that can provide shelter during a bushfire event and is either: *- not classified as bushfire prone on the Map of Bushfire Prone Areas; or* *- greater than 100m from classifiable vegetation.* To the north and north-east of the subject site, the existing urban areas of Bullsbrook and its surrounds include residential built out areas not mapped as bushfire prone on the Map of Bushfire Prone Areas. These areas include larger parcels of land and several facilities and amenities.	
		A3.2b Emergency access way (SP Sb **Do**) Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution. An emergency access way is to meet all the following requirements: • requirements in Table 6, Column 2;	The subject site will ultimately be provided three points of direct public road access via Chittering Road to the west, Amelia View to the north-east and the future Chittering Road realignment to the south. The proposal therefore achieves the Acceptable Solution A3.2a and does not require	The proposal meets the intent of Element 3 and achieves acceptable solution A3.2b.

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
		• provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.	assessment against Acceptable Solution A3.2b (Emergency Access Way). Notwithstanding, Amelia View is intended to operate as an emergency access and the Chittering Road realignment connections will ultimately provide access for caravans, construction and emergency access. Both Amelia View and the Chittering Road realignment will be under the control of the City of Swan. The existing section of Amelia View to the north-east of the subject site is construction and currently services existing residential development. The use of this road as an emergency access from the subject site, with the primary vehicle entrance provided via Chittering Road, represents a logical outcome providing for functional and safe emergency access to the subject site once developed. Once the future access to the Chittering	

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
			Road realignment is established to the south of the subject site, connections to the future residential areas to the south and east will provide additional evacuation options for residents of the Lifestyle Village. The location of proposed emergency access points is spatially demonstrated in **Figure 10.**	

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
		A3.6 Private driveways (Dd **Do**) There are no private driveway technical requirements where the private driveway is: • within a lot serviced by reticulated water; • no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and • accessed by a public road where the road speed limit is not greater than 70 km/h. In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following require: • requirements in Table 6, Column 4; • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and • turn-around area as shown in Figure 28 and within 30 metres of the habitable building.	The indicative internal road network within the Lifestyle Village development (as demonstrated in the Masterplan at **Appendix 1**) meets the requirements of Acceptable Solution A3.6 and Table 6, Column 4 of the Guidelines.	The proposal meets the intent of Element 3 and achieves acceptable solution A3.6.
Element 4: Water	To ensure that water is available to enable people, property and infrastructure to	*To achieve the intent, all applicable 'acceptable solutions' must be addressed:* SP – Strategic planning proposal and structure plan where the lot layout is not known **Sb** – Structure plan where the lot layout is known and subdivision application	NA	The provisions for "Sb" will be considered as part of this assessment.

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
	be defended from bushfire.	Dd – Development application for a single dwelling, ancillary dwelling or minor development Do – Development application for any other development that is not a single dwelling, ancillary dwelling or minor development		
		A4.1 Identification of future water supply (SP) Evidence that a reticulated or sufficient non-reticulated water supply for bushfire fighting can be provided at the subdivision and/or development application stage, in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2. Where the provision of a strategic water tank(s) is required a suitable area within a road reserve or a dedicated lot the location should be identified, should be identified on the structure plan, to the satisfaction of the local government.	NA	NA
		A4.2 Provision of water for firefighting purposes (**Sb** Dd Do) Where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, then the following applies:	The subject site is serviced by a reticulated water supply which will enable the installation of hydrants throughout the site in accordance with the Water Corporation Design Standard DS 63 (refer to **Figure 10**).	The proposal meets the intent of Element 4 and achieves acceptable solution A4.2.

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
		• The provision of a water tank(s), in accordance with the requirements of Schedule 2; and • Where the provision of a strategic water tank(s) is applicable, then the following requirements apply: - land to be ceded free of cost to the local government for the placement of the tank(s); - the lot or road reserve where the tank is to be located is identified on the plan of subdivision; - tank capacity, construction, and fittings, provided in accordance with the requirements of Schedule 2; and - a strategic water tank is to be located no more than 10 minutes from the subject site (at legal road speeds). Where a subdivision includes an existing habitable building(s) that is to be retained, a water supply should be provided to this existing habitable building(s), in accordance with the requirements listed above.		
Element 5: Vulnerable Tourism Land Uses	To provide bushfire protection for tourism land uses relevant to the	Not applicable as vulnerable tourism land uses are not proposed.	NA	NA

Bushfire Protection Criteria	Intent	Method of Compliance Acceptable Solutions	Proposed Bushfire Management Strategies	Response
	characteristics of the occupants and/or the location, to preserve life and reduce the impact of bushfire on property and infrastructure.			

7.0 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT

The following tables set out the responsibilities of the developer, landowner, and local government with regard to the initial implementation and ongoing maintenance of the required actions as contained within this BMP.

No.	Action	Implementation		Management	
		Responsible	Timing	Responsible	Timing
1	Construction of buildings to AS3959.	Landowner / Developer	Prior to the occupation of development	NA	NA
2	Install and maintain vehicular access routes and private driveways to the required surface condition and clearances as stated in the BMP.	Landowner / Developer	Prior to the occupation of development	Landowner / Operator	Ongoing
3	Install and maintain emergency access gates to the required standards as stated in the BMP.	Landowner / Developer	Prior to the occupation of development	Landowner / Operator	Ongoing
4	Install and maintain reticulated water supply to the required standards as stated in the BMP.	Landowner / Developer	Prior to the occupation of development	Landowner / Operator	Ongoing
5	Establish and maintain Plot 14 as an Asset Protection Zone to the required standards as stated in the BMP	Landowner / Developer	Prior to the occupation of development	Landowner / Operator	Ongoing
6	Establish and maintain the landscaped areas within the Lifestyle Village in a low threat state to the required standards as stated in the BMP.	Landowner / Developer	Prior to the occupation of development	Landowner / Operator	Ongoing
7	Notification on Title notifying that the site/lot is located in a bushfire prone area and is subject to a BMP.	Landowner / Developer	Following development approval	NA	NA
8	Comply with the relevant local government annual firebreak notice issued	Landowner	Ongoing	Landowner / Operator	Ongoing

No.	Action	Implementation		Management	
		Responsible	Timing	Responsible	Timing
	under s33 of the Bush Fires Act 1954.				
9	Inspection and compliance action.	NA	NA	Local Government	Ongoing
10	Future revisions / amendments to BMP.	NA	NA	Landowner / Developer	Prior to any future development outside the scope of this BMP.

8.0 REFERENCES

Department of Fire and Emergency Services 2024, *Mapping standard for bush fire prone areas,* Government of Western Australia, <https://www.dfes.wa.gov.au/waemergencyandriskmanagement/obrm/Documents/OBRM-Mapping-Standard-for-Bush-Fire-Prone-Areas.pdf>.

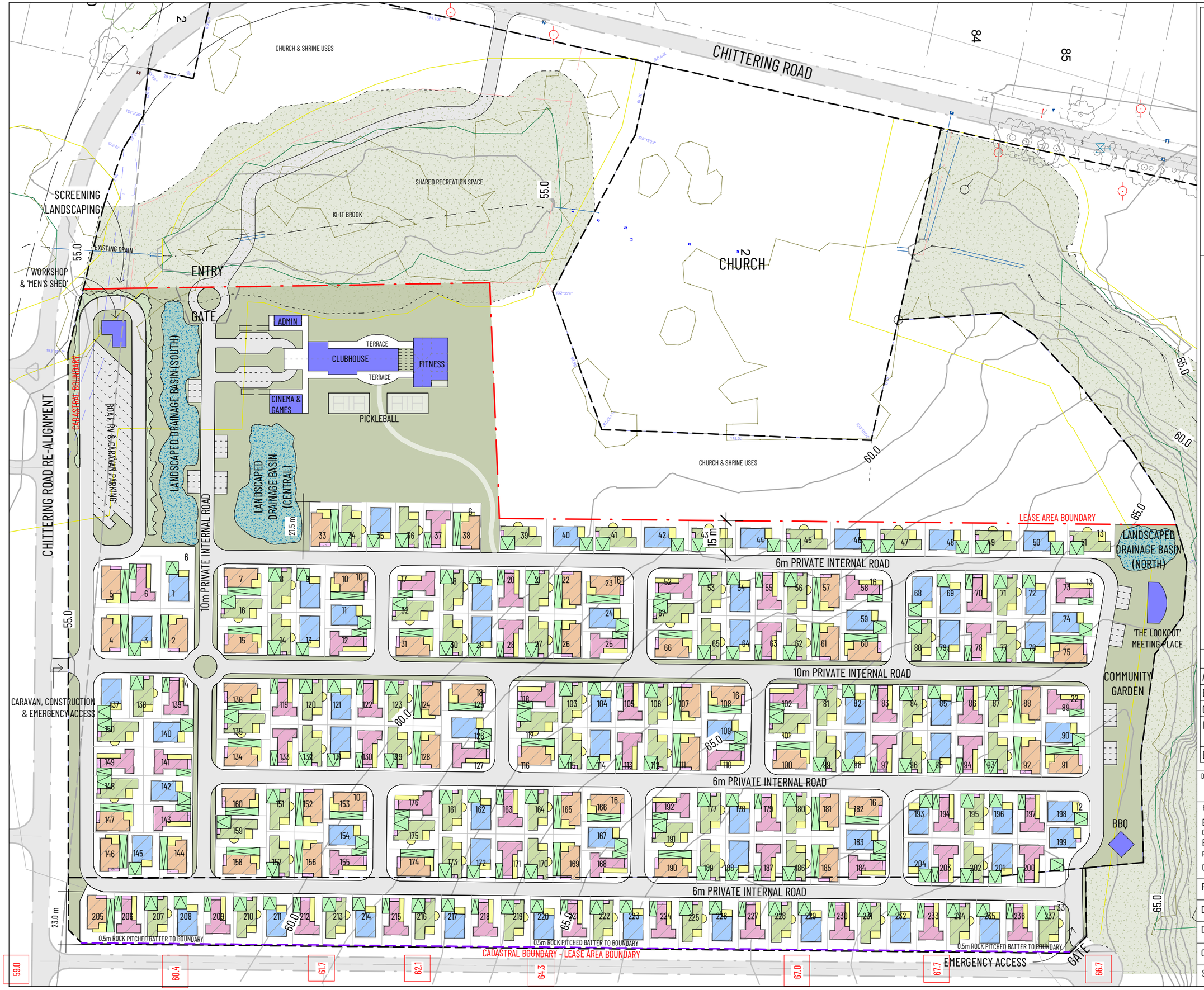
City of Swan 2023, *Fire Hazard Reduction Notice,* <https://www.swan.wa.gov.au/awcontent/Web/Documents/Services%20and%20Community/Emergency%20management/Hazard-Reduction-Notice-2023-24.pdf>.

Standards Australia Online 2018, *Construction of buildings in bushfire-prone areas*, AS 3959:2018.

Western Australian Planning Commission 2021, *Guidelines for planning in bushfire prone areas version 1.4,* <https://www.wa.gov.au/system/files/2021-12/Guidelines-for-planning-in-bushfire-prone-areas-version-1.4.pdf>.

Western Australian Planning Commission 2015, *State planning policy 3.7 planning in bushfire prone areas,* <https://www.planning.wa.gov.au/dop_pub_pdf/SPP_3.7_Planning_in_Bushfire_Prone_Areas.pdf>.

APPENDIX 1 – SUPPORTING PLANS



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LEGEND

- LANDSCAPING
- 'RECREATION' ZONED AREA
- CORE CREEK AREA
- AREA SUBJECT TO FORESHORE & WETLAND MANAGEMENT PLAN
- VILLAGE AMENITIES
- LANDSCAPED DRAINAGE BASINS
- FENCE/GATE
- ROADWAY
- CADASTRAL BOUNDARY
- LEASE AREA BOUNDARY
- TYPE A (62)
- TYPE B (71)
- TYPE C (47)
- TYPE D (57)

TOTAL HOUSE SITES - 237

TOTAL LEASE SITE AREA - 106,988m²
(NOT INCL. SHARED REC. AREA)

TOTAL RECREATION AREA - 35,095m²
(INCL SHARED REC. AREA)

N

ISSUE	DESCRIPTION	DATE
A	PRELIMINARY MASTERPLAN	28.05.2024
B	REVISED MASTERPLAN	12.08.2024
C	REVISED MASTERPLAN	16.08.2024
D	ENTRY MOVED, LOT NUMB. ADDED	19.08.2024
E	HOUSE-LOT ALLOCATION	02.09.2024

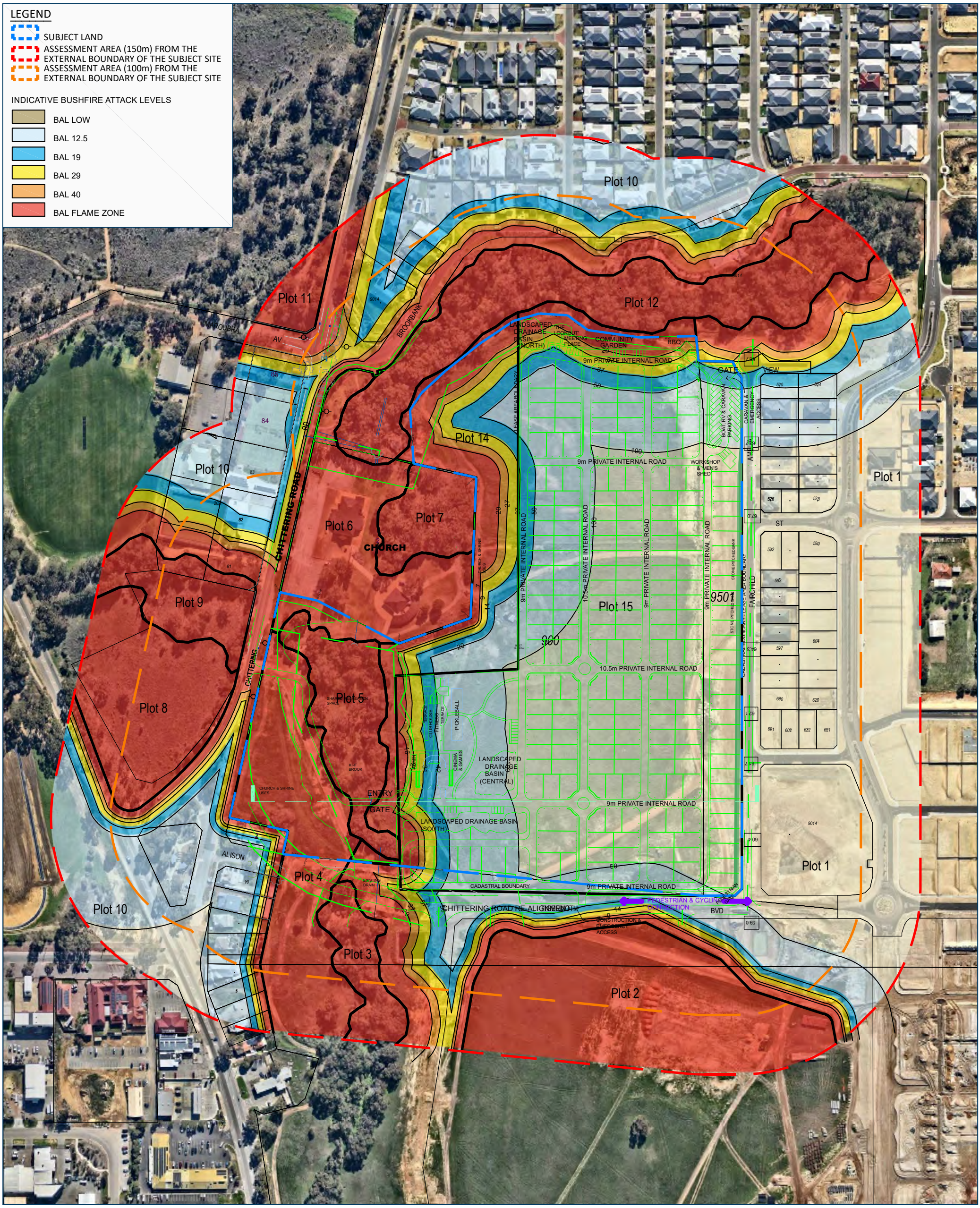
DRAWING TITLE
Masterplan

PROJECT
BETHANIE - BULLSBROOK VILLAGE
CLIENT
BETHANIE
PROJECT ADDRESS
CHITTERING ROAD, BULLSBROOK, WA, 6084

Project number	-
Date	02.09.2024
Drawn by	RHA
Checked by	RHA
Scale @ A3	1 : 1500

DRAWING NO.
A3.01

9/09/2024 1:46:32 PM



BAL CONTOUR MAP

LOTS 900 & 9501 CHITTERING ROAD
BULLSBROOK

CITY OF SWAN

JOB CODE:
BET BUL ZB

DATE:
06.01.2025

Allerding & Associates
Town Planners, Advocates and Subdivision Designers

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Bullsbrook Village for the Bethanie Group

Environmentally Sustainable Design Elements

The proposed Bullsbrook Village has been designed to include a significant number of environmentally sustainable elements, with the aim of producing high quality, comfortable accommodation with economical running and management costs.

The design elements include:

Solar orientation: the cadastral pattern is designed to provide the homes with good solar access – with the majority of roads running north – south, and the home floor plans running east-west, the long axis of the homes provides good northern aspect allowing screening from summer sun and winter sun access to the buildings. As demonstrated with the typical home floor plans, this allows passive solar gain to the living areas and main bedroom, facing a north facing garden the full length of the floor plan.

Solar Energy: all the homes will have appropriately sized photovoltaic panel installations, complete with battery storage and main grid back-up. Experience in similar projects has demonstrated that residents can maximise energy consumption during the main electricity generation times – for example with use of washing machines at mid-day – and minimise costs.

The communal buildings – the clubhouse, workshop and meeting place will similarly include photo-voltaic installations, minimising mains energy consumption.

Energy Efficiency: the use of carefully designed floor plans with appropriate orientation provides good levels of natural lighting and ventilation. This minimises energy use for artificial lighting and air conditioning. The provision of thermal mass in the homes, with pre-cast concrete floors, provides climate moderation and acoustic separation.

The homes will be fully electric for cooking, space heating and hot water supply. All appliances will have a minimum 5 star energy rating and energy saving luminaires will be used throughout.

The village will include EV chargers for resident's electric vehicles and there will be an electric car available for residents' use on a small rental fee basis.

Waste Management: the village will provide a recycling facility which will enable residents to stream recyclable waste into the appropriate containers, minimising waste stream contamination. The community gardens will contain a worm farm and composting facilities for organic waste. The compost will be distributed to fruit trees and vegetable gardens cared for by village residents. Use of these systems in previous villages has demonstrated a significant reduction in waste to landfill.

Water Management: As illustrated on the master plan, there will be three significant basins for the retention of surface water. Well vegetated, these basins will enable the cleaning of storm water from roofs and roads, prior to dispersal in the Ki It Brook.

While the site soil conditions seem that it may prevent the use of grey water systems from the homes, further investigations are ongoing, with the research aim of using treated grey water for sub surface garden reticulation – with the overall principle of minimising the use of potable water outside the home.

Site Development: Traditional residential developments require extensive site development work with the use of retaining walls and fill to produce flat sites. The Bethanie Village is designed to maintain the topography and to work with it – the establishment of homes on sites allows for undulation and minimises site works – as demonstrated in the site section drawings.

Landscape Species Selection: The landscape design will feature the use of indigenous "Waterwise" species, to provide a lush, vegetated environment while minimising the use of water, fertiliser and insecticides.

Modular Homes: all of the dwellings in the village will be factory built modular construction. This method of construction has demonstrated a reduced environmental footprint for the following reasons:

Speed of construction – far less time than site-built homes, resulting in more efficient use of resources and reduced costs.
Reduced Waste – inherent in the factory process is the designed use of construction materials and consequent minimisation of construction waste. The factory setting reduces weather damage, vandalism and theft inherent in site-built construction.
Reduced Transport – as the homes are built in a factory setting and are far quicker than site built, there is a measurable reduction in materials delivery and worker transportation to sites.
Improved Quality – site built homes have low levels of supervision – 1 supervisor may be responsible for 20 homes. In the factory setting, supervisors are in the homes, inspecting construction several times a day – maximising quality and minimising re-works.

BETHANIE BULLSBROOK

Landscape Concept (REV D)

prepared for The Bethanie Group
SEPTEMBER 2024

PLAN E

LANDSCAPE ARCHITECTS

L1.278 RAILWAY PARADE WEST LEEDERVILLE
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landscape design



LEGEND

01 NATIVE SHRUBS, GROUNDCOVERS AND TREE PLANTING TO LOT BOUNDARY. LOW THREAT BUSHFIRE TREATMENTS ADJACENT BROOK

02 FEATURE PLANTING TO CLUBHOUSE AND KEY COMMUNAL LANDSCAPE AREAS

03 OPEN TURF KICKABOUT SPACES WITH SHADE TREES

04 PEDESTRIAN PATH NETWORK TO PROVIDE UNIVERSAL ACECSSIBILITY TO COMMUNAL LANDSCAPE AREAS

05 LANDSCAPED WETLAND TO TAKE STORMWATER DRAINAGE AND PROVIDE NATIVE FAUNA HABITAT

06 'THE LOOKOUT' MEETING PLACE, WITH SHADE STRUCTURE, TABLE SETTINGS AND BENCH SEATING

07 INFORMAL STABILISED GRAVEL PATHS THROUGH LANDSCAPE TO PROVIDE WALKING TRAIL AND LANDSCAPE INTERACTION

08 COMMUNITY GARDEN WITH INFORMAL PATHWAYS, SEATING OPPORTUNITIES AND SHADE TREE PLANTING

09 BBQ MEETING NODE WITH COOKING FACILITIES, SHADE STRUCTURE AND SEATING

10 STREET TREES TO THE FRONT OF EACH RESIDENTIAL LOT

11 FEATURE PLANTING AND TREES TO CENTRAL ROAD, CAPABLE OF TAKING A PORTION OF STORMWATER DRAINAGE FROM INTERNAL ROADS

12 PICKLEBALL COURTS

13 WORKSHOP WITH BREAKOUT SPACE

14 CLUBHOUSE TERRACE

BETHANIE BULLSBROOK

PREPARED FOR THE BETHANIE GROUP

LANDSCAPE CONCEPT
SEPTEMBER 2024

JOB NO. 2410001
1:750 @ A1

C1.102 REV D

0 15 30 45 75m

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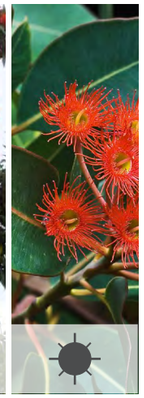
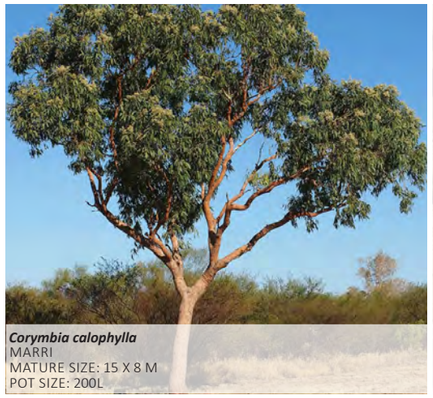
planting palette - trees




Brachychiton acerifolia
ILLAWARA FLAME TREE
MATURE SIZE: 30 X 12 M
POT SIZE: 200L

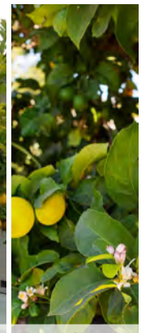
Corymbia ficifolia
RED FLOWERING GUM
MATURE SIZE: 6-15 X 5-10 M
POT SIZE: 200L




Corymbia calophylla
MARRI
MATURE SIZE: 15 X 8 M
POT SIZE: 200L



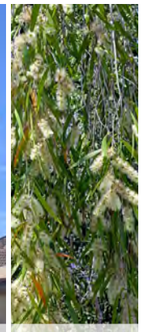

Cupaniopsis anacardiodes
TUCKEROO
MATURE SIZE: 6 X 3 M
POT SIZE: 200L

Citrus limon
LEMON
MATURE SIZE: 1.5 X 1 M
POT SIZE: 100L



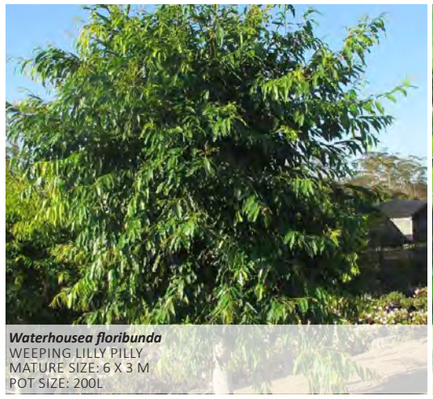

Hakea laurina
PIN-CUSHION HAKEA
MATURE SIZE: 4 X 3 M
POT SIZE: 100L

Melaleuca leucadendra
WEEPING PAPERBARK
MATURE SIZE: 12 X 6 M
POT SIZE: 200L




Acer palmatum
JAPANESE MAPLE
MATURE SIZE: 5 X 2 M
POT SIZE: 100L




Waterhousea floribunda
WEEPING LILLY PILLY
MATURE SIZE: 6 X 3 M
POT SIZE: 200L




Melaleuca viridiflora
BROAD LEAFED PAPERBARK
MATURE SIZE: 8 X 4 M
POT SIZE: 200L




Eucalyptus caesia 'Silver Princess'
GUNGURRU / SILVER PRINCESS
MATURE SIZE: 6 X 7 M
POT SIZE: 200L




Eucalyptus wandoo
WHITE GUM
MATURE SIZE: 10 X 5 M
POT SIZE: 200L

BETHANIE BULLSBROOK

PREPARED FOR THE BETHANIE GROUP

LANDSCAPE CONCEPT
SEPTEMBER 2024

JOB NO. 2410001 C1.103 REV C
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planting palette - native shrubs & ground covers



Banksia repens
CREEPING BANKSIA
MATURE SIZE: 0.5 X 3 M
SPACING: 1/M² POT SIZE: 140 MM



Grevillea 'Gin Gin Gem'
SPIDER FLOWER
MATURE SIZE: 0.3 X 2 M
SPACING: 2/M² POT SIZE: 140 MM



Hemiandra pungens 'Alba'
WHITE SNAKE BUSH
MATURE SIZE: 0.3 X 1.5 M
SPACING: 2/M² POT SIZE: 140 MM



Chorizema cordatum
HEAR LEAF FLAME PEA
MATURE SIZE: 1.2 X 1.2 M
SPACING: 2/M² POT SIZE: 140 MM



Eremophila Kalbarri Carpet
EMU BUSH
MATURE SIZE: 0.2 X 2 M
SPACING: 2/M² POT SIZE: 140 MM



Grevillea crithmifolia 'Little crith'
LITTLE CRITH
MATURE SIZE: 1 X 1 M
SPACING: 1/M² POT SIZE: 140 MM



Grevillea Moonlight
GREVILLEA
MATURE SIZE: 3.5 X 3 M
SPACING: 1/M² POT SIZE: 200 MM



Adenanthos cuneata
BASKET FLOWER
MATURE SIZE: 1 X 1.5 M
SPACING: 1/M² POT SIZE: 140 MM



Leucospermum Yellow
NODDING PINCUSHION
MATURE SIZE: 1.5 X 1.2 M
SPACING: 2/M² POT SIZE: 140 MM



Calothamnus quadrifidus prostrate
ONE SIDED BOTTLEBRUSH
MATURE SIZE: 0.8 X 2 M
SPACING: 1/M² POT SIZE: 140 MM



Conostylis candicans
GREY COTTONHEADS
MATURE SIZE: 0.3 X 0.5 M
SPACING: 4/M² POT SIZE: 140 MM



Banksia Ashbyi 'Dwarf'
BANKSIA
MATURE SIZE: 1.5 X 2 M
SPACING: 1/M² POT SIZE: 5L

BETHANIE BULLSBROOK

PREPARED FOR THE BETHANIE GROUP

LANDSCAPE CONCEPT
SEPTEMBER 2024

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planting palette - feature shrubs & ground covers



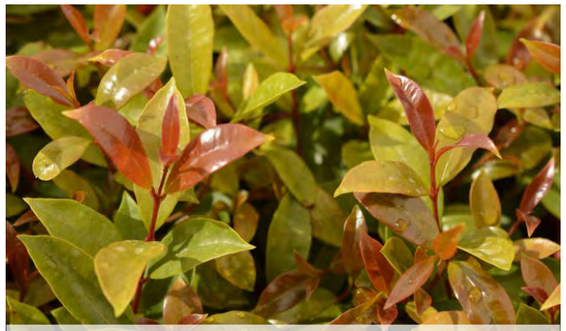
Pittosporum 'Miss Muffet'
DWARF PITTOSPORUM
MATURE SIZE: 1 X 2 M
SPACING: 4/M² POT SIZE: 140 MM



Zamia furfuracea
CARDBOARD PALM
MATURE SIZE: 1 X 1 M
SPACING: 2/M² POT SIZE: 140 MM



Murraya paniculata
ORANGE JESSAMINE
MATURE SIZE: 3 X 3 M
SPACING: 1/M² POT SIZE: 5L



Syzygium elegance
LILLY PILLY
MATURE SIZE: 3 X 1.5 M
SPACING: 1/M² POT SIZE: 5L



Hibbertia scandens
SNAKE VINE
MATURE SIZE: 0.8 X 3 M
SPACING: 2/M² POT SIZE: 140 MM



Dichondra 'Silver falls'
KIDNEY WEED
MATURE SIZE: 0.1 X 2 M
SPACING: 4/M² POT SIZE: 140 MM



Liriope 'Just right'
LILY TURF
MATURE SIZE: 0.45 X 0.5 M
SPACING: 4/M² POT SIZE: 140 MM



Viola hederacea
AUSTRALIAN NATIVE VIOLET
MATURE SIZE: 0.1 X 1 M
SPACING: 3/M² POT SIZE: 140 MM



Festuca glauca
BLUE FESCUE
MATURE SIZE: 0.3 X 0.3 M
SPACING: 4/M² POT SIZE: 140 MM



Ficinia nodosa
KNOTTED CLUB-RUSH
MATURE SIZE: 1 X 1 M
SPACING: 1/M² POT SIZE: 140 MM



Carex testacea
ORANGE SEDGE
MATURE SIZE: 0.3 X 0.6 M
SPACING: 3/M² POT SIZE: 140 MM



Lomandra 'Lime Tuff'
MAT RUSH
MATURE SIZE: 0.5 X 0.5 M
SPACING: 4/M² POT SIZE: 140 MM

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Cossill & Webley
CONSULTING ENGINEERS



Bethanie Village - Bullsbrook
Engineering Services Report
September 2024

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1. INTRODUCTION

This report has been prepared by Cossill & Webley (CW) to support Bethanie's Development Application for the development of a 237-dwelling village located at Bullsbrook. The extent and location of The Site is defined in Figure 1 below.

This report summarises our assessment of the engineering aspects of the proposed development of the village (referred to herein as The Site).



Figure 1 – Locality Plan (Aerial: Metromap)

2. SITE DESCRIPTION

The Site is located at Bullsbrook, within the City of Swan Local Government Area.

The Site has an area of 10.6 hectares and sits on land currently described as:

- Lot 900
- Lot 9501
- Lot 9013 – Part Lot

The Site is bound by the existing Sacri Church to the west and Fairchild Street to the east. Adjacent to the southern boundary will be the future Chittering Road re-alignment. The northern boundary is bound by Lot 9014 consisting of existing vegetation. The Site is currently vacant.

3. PROPOSED DEVELOPMENT

The proposed development consists of:

- 237 residential dwellings;
- A Clubhouse for residents;
- A meeting place 'The Lookout'
- Leisure facilities consisting of pickleball courts, community garden and BBQ; and
- Landscaped drainage swales

The proposed development layout of The Site is shown in Figure 2 below.



Figure 2 - Development Layout (Source: Richard Hammond Architect – Bethanie Bullsbrook Village Masterplan)

3.1 Geology and Landform

3.1.1 Geology

The Geological Survey of Western Australia indicates that the Site is characterized by the following soil types:

- Pebbly Silt on the southern portion of the site; and
- Sandy Silt on the northern portion of the site.

Figure 3 below shows the extent of each soil type identified on the Geological Survey of Western Australia.

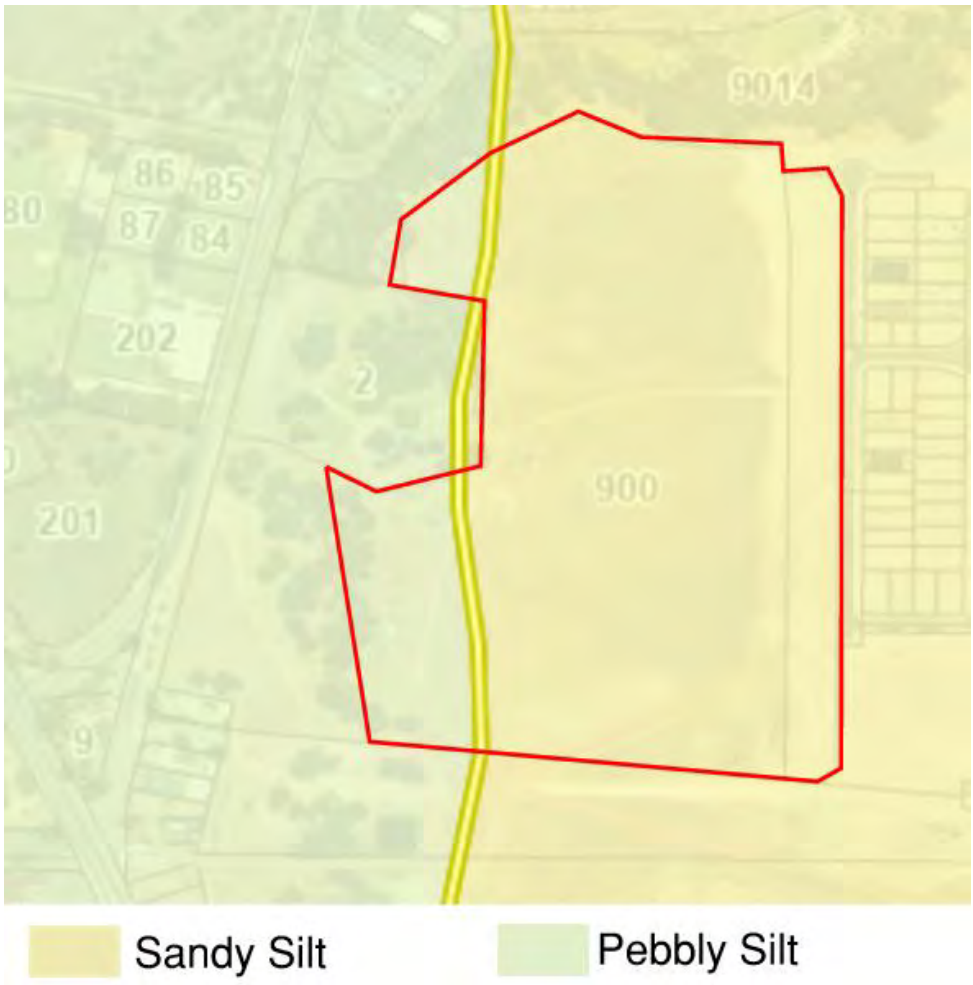


Figure 3 – Geology of The Site (Source: Geological Survey of WA)

3.1.2 Landform

The Site grades from northeast to southwest with an average gradient of 3%. The highest point of The Site is located around the northeast boundary towards Fairchild St located at RL68m AHD. The lowest point of The Site is located on the south-western boundary at RL54m AHD, as shown in Figure 4 below. There is a fill batter along the edge of Fairchild Street that extends into The Site that will be graded out with the future development levels.



Figure 4 - Existing Surface Contours (mAHD) *(Source: MNG Access)*

3.2 Groundwater

The groundwater levels that have been determined from the Groundwater Atlas shown on the Perth Groundwater Map indicate that the maximum groundwater level is at 32mAHD and the minimum is at 31mAHD across The Site. The natural surface levels across The Site vary between RL55m AHD to RL68m AHD as defined in Figure 5 below. The groundwater will therefore not be impacted by the proposed works on The Site.



Figure 5 - Existing Maximum & Minimum Groundwater Levels (Source: MNG Access)

3.3 Acid Sulfate Soils

The Site is classified as low risk of encountering Acid Sulfate Soils within 3m of the natural surface as published on the Acid Sulfate Soils Risk Map, Swan Coastal Plain (DWER-055). It is recommended that on site testing be conducted prior to development to confirm no presence of acid sulfate soils.

3.4 PFAS

The Site is located near the RAAF Base Pearce (Bullsbrook). Former air base activities involved fire training and disposing of PFAS in the soil and therefore PFAS has been detected in the bore water of some residents. As part of the soil remediation works, Water Corporation has commissioned to construction of a water pipeline to supply water to the affected area for water supply. Bethanie Bullsbrook Village is not in the affected area as shown in 6 below.

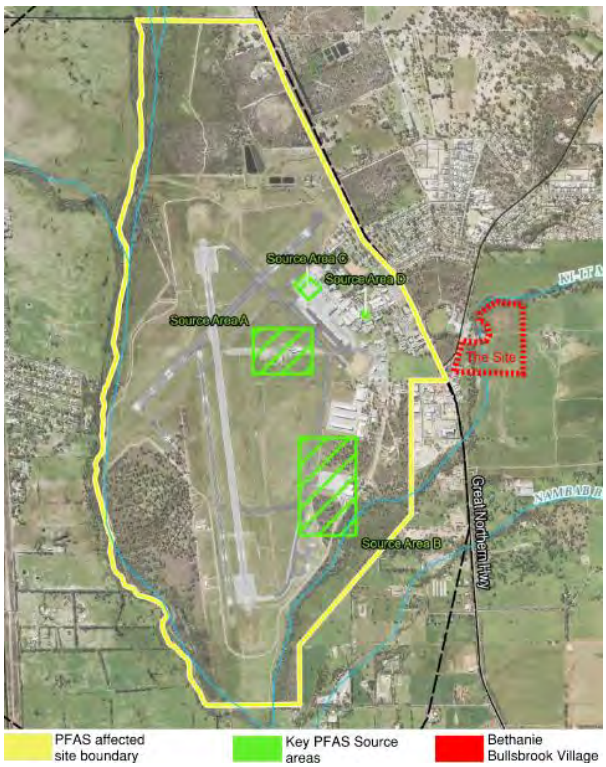


Figure 6 – Existing PFAS-affected Site boundary with The Site *(Source: Department of Defence)*

4. EARTHWORKS

It is proposed to undertake earthworks across The Site to create suitably sloped building sites for each dwelling in the development and to cater for road grading, stormwater management and services installation. A grading plan for the site has been prepared and in included in Appendix A.

The extremities of the site tie into the existing ground levels. A rock pitched batter is proposed along the rear of the lots adjacent to Fairchild Street to reduce the gradients across the site and to facilitate level changes within lot cells to be taken up by the built form.

5. ROADWORKS & FOOTPATHS

5.1 Connection to Existing Roads

Access to The Site is proposed from Chittering Road as shown on the Bethanie Bullsbrook Village Masterplan, in Figure 2. The Site access road will be constructed as part of the Stage 1 development and will cross the Ki-It Brook at the location of the existing culverts.

The Kingsford Local Structure Plan shows Chittering Road to be-realigned and run parallel to the southern boundary of The Site. Chittering Road is classified as Neighbourhood Connector A and Neighbourhood Connector B as shown in Figure 7 below. An emergency access and caravan access is shown on the Masterplan to connect to the Neighbourhood Connector B section of Chittering Road re-alignment. This section is proposed as a 3.5m carriageway with no median which is suitable to cater for the proposed secondary access point to The Site.

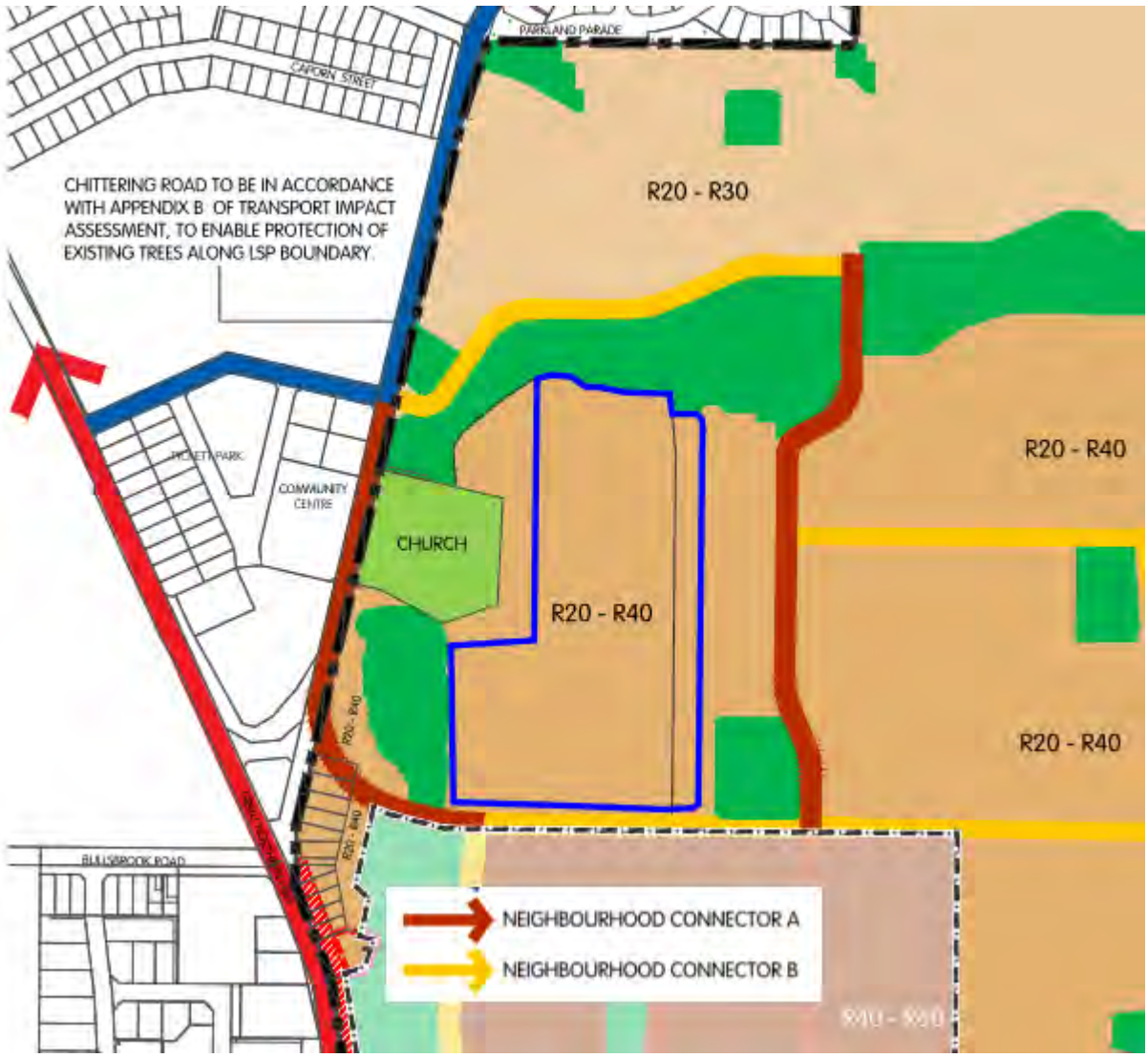


Figure 7 – Kingsford Local Structure Plan (HATCH Roberts Day)

5.2 Internal Road Network

The internal road network is intended to be privately owned and maintained by the operators of the Bethanie Bullsbrook Village. The internal road network consists of the entrance road, dwelling access roads and carparks for boat, recreational vehicle, caravan and visitor parking. The internal road network is illustrated on drawing Bethanie Bullsbrook Village Masterplan shown in Figure 2.

5.2.1 Entrance Road

The entrance road, as shown in Figure 8 below, consists of a roundabout and a divided road that serves the following purposes:

- Access to visitor car parking;
- Access to lots; and
- Turn-around area for errant drivers.

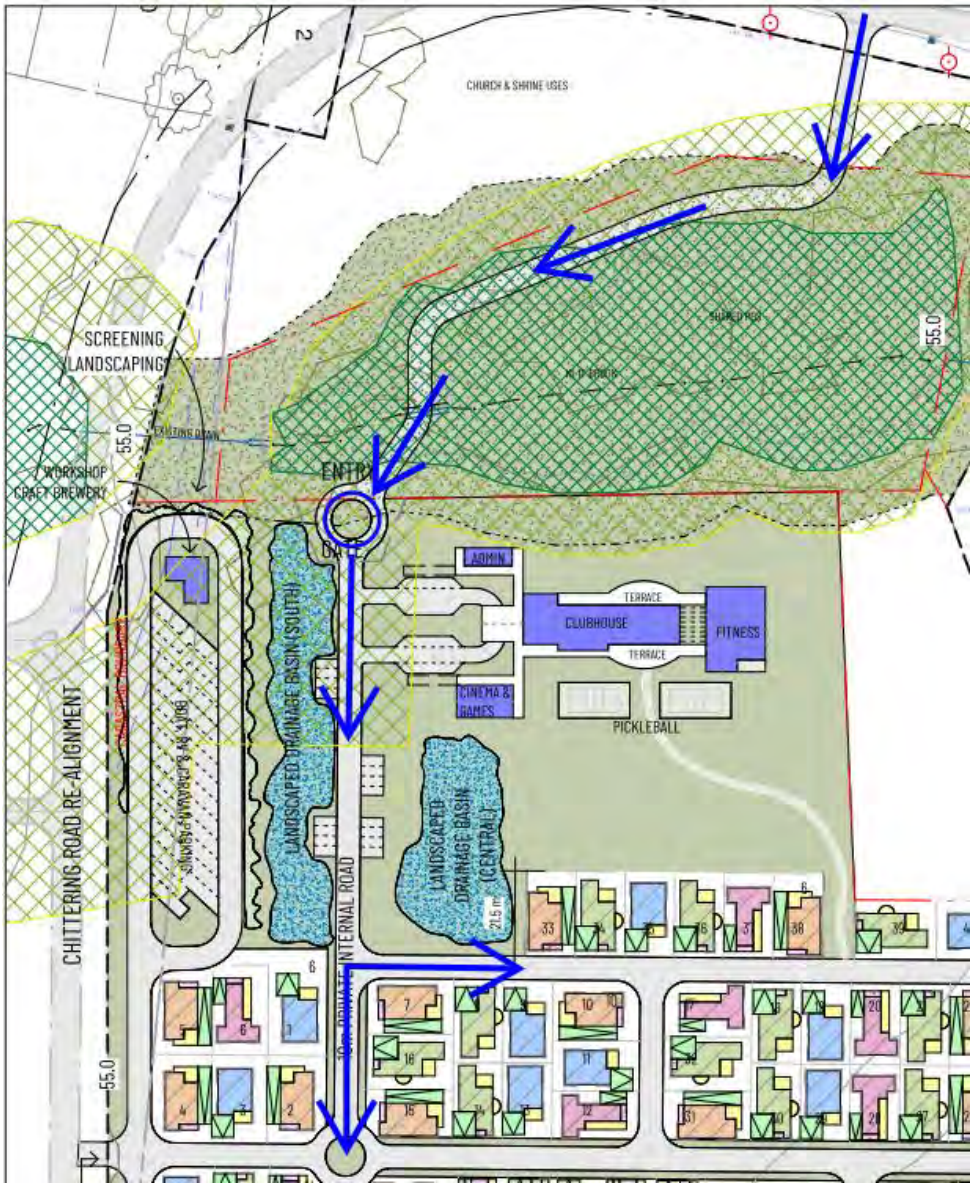


Figure 8 - Entrance Road Arrangement

5.2.2 Dwelling Access Roads

Internal access roads are proposed to be shared vehicle and pedestrian zones, with a speed limit of 10km/h. The carriageway varies in width, typically 5.5m to 6.0m width, and is proposed to be constructed from asphalt pavement.

A typical carriageway cross section is shown in Figure 9 below.

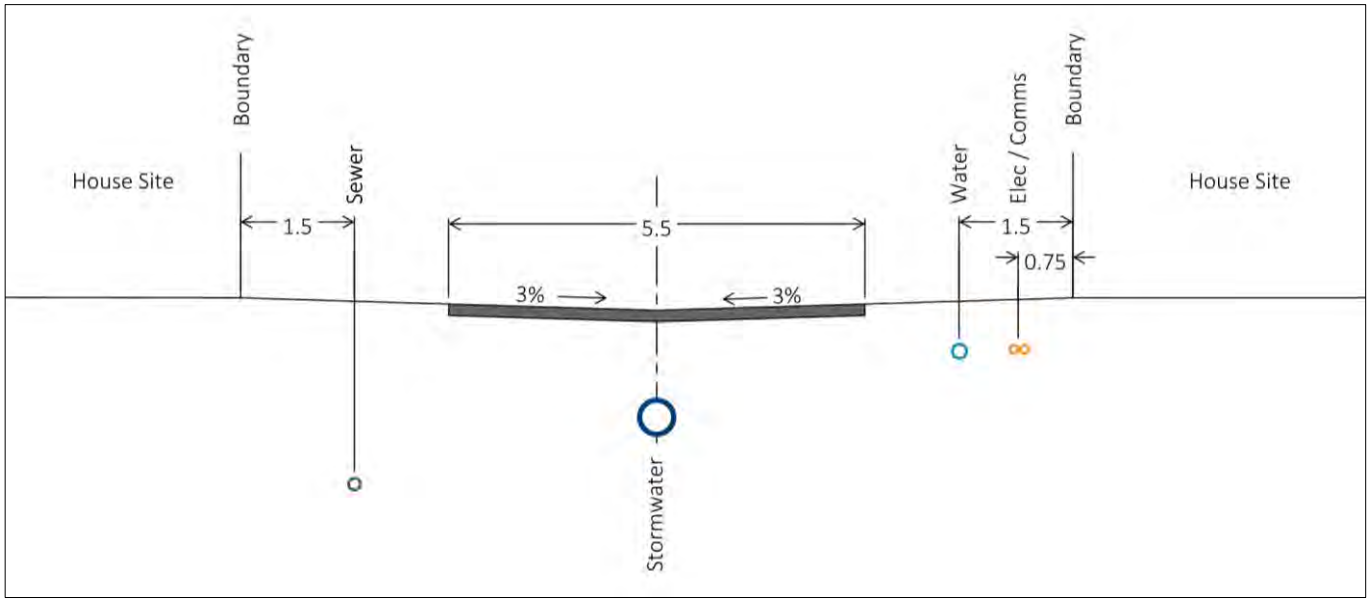


Figure 9 - Typical Dwelling Access Road Cross Section

5.2.3 Parking Bays

Parking bays are proposed for boat, recreational vehicle & caravans, located adjacent to the proposed clubhouse, entry gate, and landscaped drainage basins, as shown on the Bethanie Bullsbrook Village Masterplan. A total of 30 parking spaces, designed to AS/NZS 2890.1:2004 Australian Standard are proposed to be provided.

There are a further 32 additional car spaces in groups of 4 adjacent to the landscaped basins, community gardens, BBQ and lookout areas making the total parking bays for all vehicles 62.

5.3 Refuse Collection

It is intended that the residential dwellings, along with the clubhouse will be serviced by general waste and recycling bins, collected by a garbage truck operated by the City of Swan.

Turning movements for a typical garbage truck have been undertaken for The Site which demonstrate that a City of Swan garbage truck can have full access to The Site for the purposes of garbage collection.

6. STORMWATER DRAINAGE

Pentium Hydrologists have prepared a technical note summarising the proposed drainage strategy for The Site, that is consistent with the approved Local Water Management Strategy.

The general stormwater strategy for the site is to:

- Manage, retain and treat stormwater runoff generated by the first 15 mm of rainfall at-source as much as practical (e.g., in potential roadside swales, storage basins), with no discharge into the Ki-it Monger Brook.
- Provide adequate conveyance (e.g., roadside swales or piped drainage etc.) for the critical 20% AEP rainfall event to maintain serviceability of roads and pedestrian areas.
- Provide adequate flood detention storage to maintain pre-development flow rates downstream of the site

(i.e., limited discharge into Ki-it Monger Brook in accordance with existing peak flow rates).

The Bethanie Bullsbrook Masterplan shows the locations of landscaped drainage basins within the site to accommodate the various rainfall events up to and including the 1% AEP. Pit and pipe drainage will be designed within the road carriageways suitable to cater for the critical 20% AEP rainfall with larger events accommodated overland on the road pavements. Stormwater drainage infrastructure within the Bethanie village will be privately owned and operated by the owner.

7. WATER RETICULATION

7.1 Point of Supply

The Site is surrounded by potable water as shown in Figure 10 below. There is a DN300 water distribution watermain in Chittering Road, a DN100 reticulation main in Amelia Way and Fairchild Street and a DN100 watermain in Tigermoth Boulevard. It is anticipated the water supply to come from Chittering Road/Tigermoth Blvd with a single property connection to the site.



Figure 10 – Water Mains Surrounding the Site (Source: MNG Access)

7.2 Internal Water Reticulation

From the point of connection, water reticulation will continue through The Site, servicing every dwelling, the clubhouse and gym. This water reticulation will also provide fire fighting coverage through the provision of fire hydrants.

Beyond the point of connections, the water reticulation will be owned and maintained, by the operators of the Bethanie village.

8. SEWER RETICULATION

8.1 Point of Connection

Internal sewer reticulation from The Site will discharge to the ϕ225 gravity sewer in Tigermoth Boulevard as shown in Figure 11 below and in accordance with JDSi's sewer catchment plan for the area. The gravity sewer along Tigermoth Boulevard have been designed to capture the overall sewer from the Site.

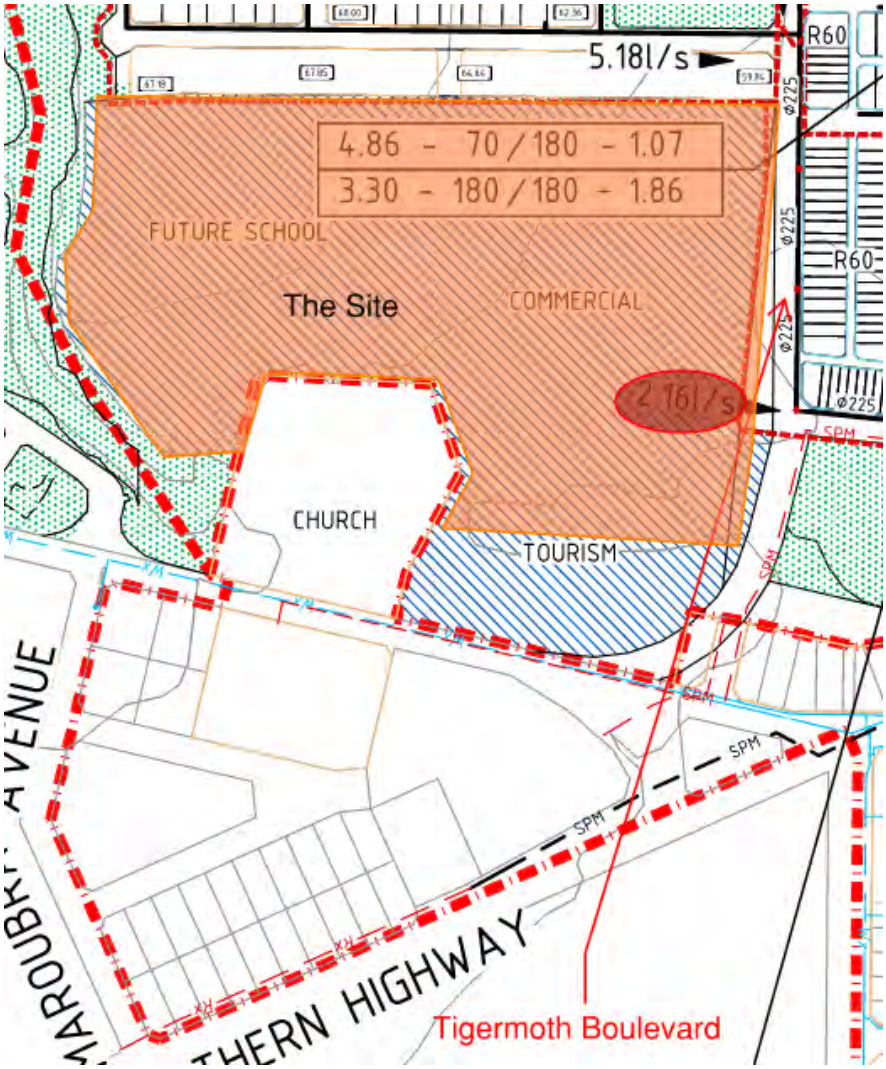


Figure 11 - Extract from Bullsbrook Overall Catchment Plan (Source: JDSi)

8.2 Internal Sewer Reticulation

From the point of connection, as shown in Figure 11, internal private sewer reticulation will continue through The Site, servicing every dwelling, the clubhouse and gym. Beyond the point of connection, the gravity sewer will be owned and maintained, by the operators of the Bethanie village.

9. POWER SUPPLY

9.1 Point of Supply

According to Western Power's Networks Mapping Tool, the site is serviced by power from the Muchea Zone substation, with spare capacity of approximately 20MVA. There is an existing High Voltage (HV) network along Chittering Road to which the Site would connect via a HV switchgear that is interconnected to that existing HV. From the HV switchgear, it is anticipated that 2x1MVA sole use transformers would extend into the site, as close to the clubhouse as possible. The internal HV cables will be protected by an easement vested to Western Power.

9.2 Internal Power Network

From the point of Western Power supply, the internal power network is intended to be a privately owned and operated AS3000 compliant network with servicing through distribution boards located throughout the site.

10. COMMUNICATIONS NETWORK

10.1 Point of Supply

There is existing optic fibre reticulation within the subdivision to the east, and a trunk connection will be obtained from this network to service the overall development.

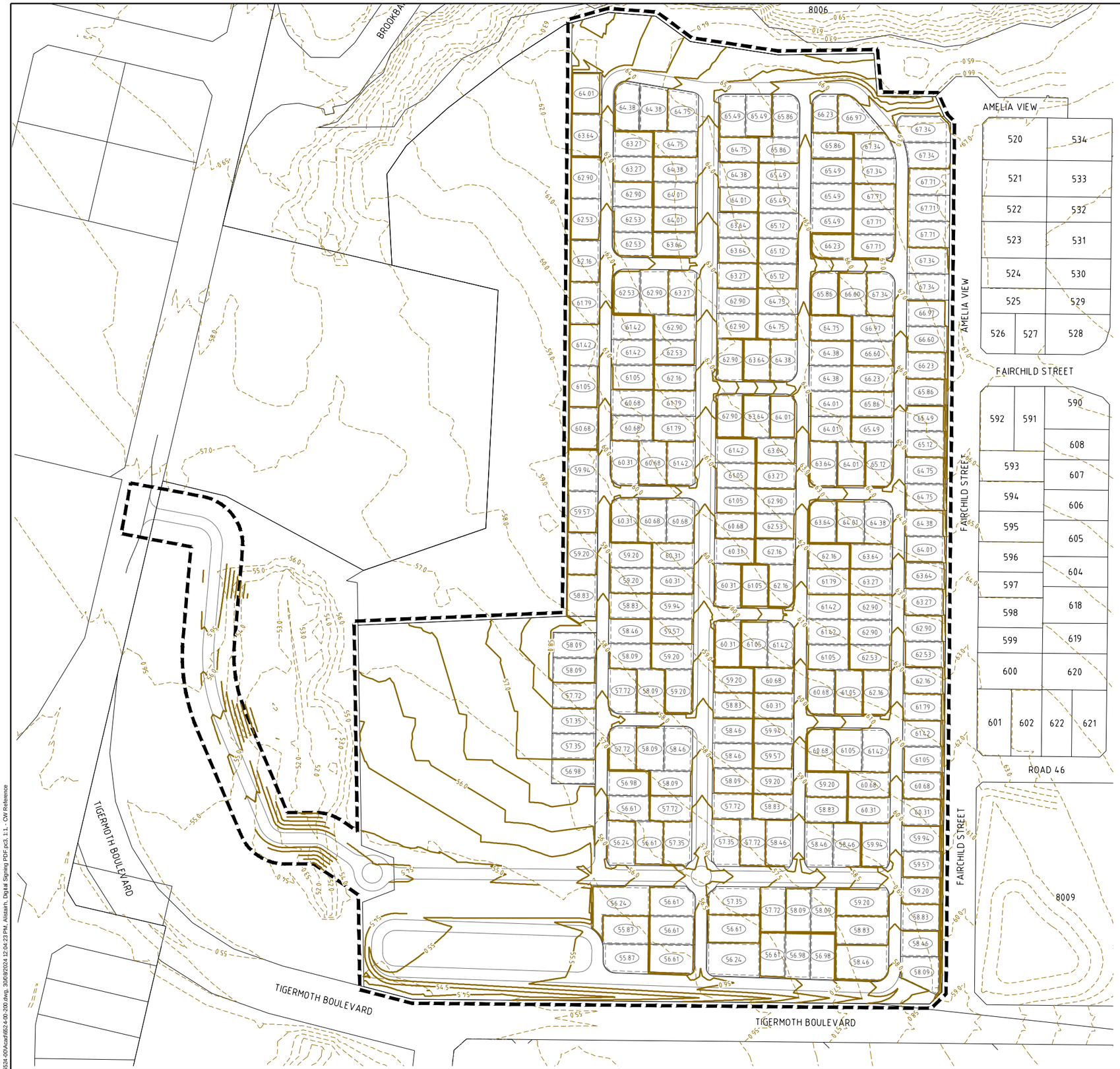
10.2 Internal Communications Network

The internal communication network will be designed for network fiber serviced either via NBN or Opticomm, to allow for a fibre connection to each dwelling. The pit and pipe will be owned and operated by the network operator. Discussion will need to be had with the operators to take advantage of any smart community infrastructure to allow for CCTV/Gate Controls within the site, coupled onto the fibre network.

11. CONCLUSION

This Engineering Services Report demonstrates that Bethanie Bullsbrook Village can be suitably accommodated, as it can be provided with points of connection for water reticulation, sewer reticulation, electrical reticulation, and communications. This Engineering Services Report also affirms that stormwater runoff from The Site, generated by the Bethanie Bullsbrook Village can be suitably managed.

APPENDIX A – SITE GRADING PLAN



NOTES

1. ALL LEVELS IN METRES TO AHD. SURVEY BY xxx.
2. BATTERS TO EXISTING SURFACE AT 1:3 (CUT) 1:4 (FILL) UNLESS NOTED OTHERWISE.
3. BATTER POSITION FOR FUTURE WALLS TO ENSURE CUT TO FILL EARTHWORKS BALANCE.
4. ALL UNSUITABLE MATERIAL TO BE REMOVED BY THE CONTRACTOR TO APPROVED TIPPING SITE PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL FEES TO BE PAID BY CONTRACTOR.
5. EXTENT OF CLEARING AND EARTHWORKS TO BE LIMITED TO THE STAGE CLEARING BOUNDARY UNLESS AGREED WITH THE SUPERINTENDENT.
6. ALL CLEARED MATERIAL TO BE MULCHED AND STOCKPILED ON SITE AS DIRECTED BY THE SUPERINTENDENT.
7. CONTRACTOR TO LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS ON SITE.
8. CONTRACTOR TO GRADE EVENLY BETWEEN DESIGN CONTOURS AND MATCH INTO EXISTING SURFACE AT LIMIT OF EARTHWORKS BOUNDARY WHERE APPROPRIATE.
9. EXCESS CUT FROM EARTHWORKS SHALL BE PLACED ON SITE AS DIRECTED BY THE SUPERINTENDENT.
10. WHERE LIMESTONE IS WITHIN 600mm OF THE FINAL SURFACE LEVEL THE CONTRACTOR SHALL TREAT THE SITE IN ACCORDANCE WITH THE SPECIFICATION.
11. DESIGN LEVELS SHOWN SHALL BE ON THE FINISHED SURFACE INCLUDING TOPSOIL WHERE SPECIFIED.
12. THE CONTRACTOR SHALL LIMIT THE MOVEMENT OF EQUIPMENT AND MANPOWER TO THE MINIMUM AREA NECESSARY AND PROTECT ALL VEGETATION AND EXISTING SERVICES ON SITE.
13. ADJACENT RESIDENTS TO BE NOTIFIED OF THE WORKS AT LEAST TWO WEEKS IN ADVANCE. CONTRACTOR TO PROVIDE MOBILE NUMBER FOR SUPERVISOR AS PART OF NOTIFICATION.

LEGEND

DESCRIPTION	SYMBOL
LIMIT OF WORKS BOUNDARY	
FINISHED SURFACE CONTOUR MAJOR	25.0
EXISTING SURFACE CONTOUR	25.0
FINISHED LOT PAD LEVEL	25.00
PROPOSED RETAINING WALL	
EXISTING RETAINING WALL	
FUTURE RETAINING WALL	
BUILDING SETBACK LINE	
EXISTING TREE TO BE RETAINED	
EXISTING TREE TO BE REMOVED	

NOTICE TO CONTRACTOR

IT IS THE CONTRACTOR'S RESPONSIBILITY TO INVESTIGATE THE NATURE AND LOCATION OF ALL SERVICES WHICH MAY BE ENCOUNTERED AND TO CONSULT WITH THE RELEVANT SERVICE AUTHORITIES PRIOR TO COMMENCEMENT OF EXCAVATIONS. FAILURE TO DO SO OR TO TAKE DUE CARE SHALL NOT LIMIT THE CONTRACTOR'S LIABILITY FOR REPAIR OF ALL SERVICES DAMAGED BY HIM DURING CONSTRUCTION WORKS THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY FOR THE PROTECTION OF ALL EXISTING SERVICES.

REV	DATE	DRN	CKD	APP	AMENDMENT
A	30.08.24	ARH	-		ISSUED FOR INFORMATION

N

BEFORE YOU DIG www.byda.com.au

1:1000 0m 20 40 60

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CLIENT: BETHANIE

APPROVED

DESIGNED: ARH

SCALE: 1:1000

PROJECT: BETHANIE BULLSBROOK

TITLE: EARTHWORKS PLAN

WAPC No.

DRAWING No.: 6524-00-200

REVISION: A

ORIGINAL SIZE: A1

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Technical Memo

Date: 09 September 2024
To: Bethanie Group Ltd – David Lorimer
From: John Halleen

Preliminary Environmental Assessment – Bethanie Bullsbrook Village
Lot 900 Chittering Road, Bullsbrook.

Overview

Pentium Water has been engaged by 'The Bethanie Group Ltd' (Bethanie) to complete a technical, environmental summary memo for Lot 900, Chittering Road, Bullsbrook Western Australia ('the site') to support the Bethanie Bullsbrook Village Development Application (DA).

Bethanie proposes constructing and operating a contemporary lifestyle community village (the Bethanie Bullsbrook Village) to provide accommodation for over-50s who want to downsize and/or seek more affordable accommodation options.

The Bullsbrook Village consists of the following elements:

- Residential dwellings (or group dwellings)
- Internal roads
- Open space areas for village residents & visitors
- Stormwater bio-retention swales
- Bowls club
- Community garden and BBQ areas.

The Bethanie Bullsbrook Village will be entirely managed (onsite by Bethanie), including security, grounds building maintenance and landscape services.

The Bethanie Bullsbrook Village concept plan is provided in Appendix A.

Site Context

Lot 900 covers a total area of approximately 13.15 hectares (ha). The Ki-it Monger Brook separates the lot (towards the western boundary).

The land used adjacent to Lot 900 includes the Kingsford residential estate to the east and the Bullsbrook Our Lady of the Revelation Church (owned and operated by the SACRI Association).

Regionally, the site is located approximately:

- 35 kilometres (km) northeast of the Perth CBD
- Less than 1 km northeast of Bullsbrook town centre
- 1 km east of RAAF Pearce air base.

Outside the core Ki-it Monger Brook creek line, the 13.15 ha site has been historically cleared and primarily used as cattle paddocks. The cleared cattle paddock area (east and south of Ki-it Monger Brook) totals approximately 10 ha. This cleared paddock area is the focus of the Bethanie Bullsbrook Village development. Temporary uses within

the site include a construction access road that services the Kingsford residential estate development via Chittering Road.

Key environmental asset – Ki-it Monger Brook

Historically, the site has been extensively cleared for agricultural purposes and consists mainly of cattle grazing paddocks; therefore, it has limited environmental value. The scattered *Eucalyptus rudis* (flooded gums) trees within the Ki-it Monger Brook creek line represent the key ecological asset within Lot 900.

The Ki-it Monger Brook is a seasonal flowing creek line that traverses the northern boundary and dissects a portion of the site towards the western boundary. The portion of the Ki-it Monger Brook within and adjacent to the site has historically been modified, including the infilling of the creek and the installation of culverts.

The flooded gum trees within the Ki-it Monger Brook creek line will be maintained within the defined setback from the brook, which was established in the approved 2021 Ki-it Monger Brook Foreshore Management Plan (FMP) (RPS 2021) for conservation, flood protection, better urban water management and open space.

Figure 1 illustrates the site boundary, the Ki-it Monger Brook, the adjacent Kingsford residential estate subdivision and the Our Lady of the Revelation Church.



Figure 1: Site Boundary of Lot 900 and adjacent land uses

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Objective

The objective of this memo is to support the preparation and implementation of the Bethanie Bullsbrook Village Development Application through:

- An assessment of the synthesis of environmental and planning information from various sources regarding the site's critical environmental attributes and values.
- Define the critical management actions that will be implemented to mitigate risks to the key environmental asset throughout the construction and post-construction phase of the Bethanie Bullsbrook Village.

This assessment is based upon:

- Perform a desktop assessment of the landholding, including the existing planning and environmental approvals.
- Desktop assessment of the key environmental elements, including the Ki-it Monger Brook.
- Kingsford Residential Estate LSP (Hatch 2022) which included:
    - Environmental Assessment Report (RPS 2018)
    - Vegetation and Flora survey (Ecologia 2016)
    - Local Water Management Strategy (RPS 2018)
    - Ki-it Monger Brook Foreshore Management Plan (RPS 2021)

Surrounding Land Uses

The landholdings surrounding the site include:

- Kingsford residential estate
- RAAF Pearce airbase
- Bullsbrook town centre
- Bush Forever Site No.89
- Playing fields/football oval

Table 1 presents a summary of the main land uses within approximately 1 km of the site, as identified from the site walkover and a review of available geographic information systems.

Table 1: Land uses, structures and/or sensitive receptors within 1 km of the site

Site	Land Use	Distance
Ki-it Monger Brook	Ki-it Monger Brook is an ephemeral creek which traverses across the north of Lot 900	Within & adjacent to Lot 900
Kingsford Residential Estate	Kingsford residential estate is currently under development. and expected to contain 2,355 dwellings	Adjacent to Lot 900
Existing Bullsbrook town centre	The Bullsbrook central shopping area	500 m south-west
Great Northern Hwy	The highway is the main north-south route between Perth and northern WA	90 m west
Bush Forever Site 89	EPA threatened or poorly reserved Plant Communities, subject to protection under EPBC	40 m west
Pearce RAAF Base	Pearce RAAF base is the primary Air Force base in WA and one of the busiest RAAF bases in the country	1 km west
Our Lady the Revelation Church (Sacri Church)	Lot 2 Chittering Road which is owned and managed by the SACRI Association as a place of worship within the Our Lady of the Revelation Church and surrounds	Adjacent to Lot 900
Chittering Rd	A main road within Bullsbrook that connects with Great Northern Hwy	Adjacent to Lot 900

These are illustrated in Figure 2.

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Figure 2: The main land uses within 1 km of Lot 900 site

Planning and Environmental Approval Status

Land use zoning

Lot 900 Bullsbrook Village is zoned 'Urban' under the Metropolitan Region Scheme (MRS) and 'Urban Development' under the City of Swan Local Planning Scheme No. 17 (Figure 3).

Lot 900 benefited from the planning and environmental approvals underpinning the Kingsford residential development land use re-zoning, local structure plan and management plans. Specifically, Lot 900 (and therefore Bethanie Bullsbrook Village DA) benefits from the following historical planning (and environmental) approvals:

1. Lot 900 was identified for 'Urban' development within the Bullsbrook Townsite District Structure Plan (City of Swan 2018).
2. 'Urban' land use under the Metropolitan Region Scheme (MRS) & 'Residential' under the City of Swan Local Planning Scheme No. 17.
3. The planning and land use approvals were supported by:
   a. District Water Management Strategy (DWMS) (RPS 2016)
   b. Local Water Management Strategy (LWMS) (RPS 2018)
   c. Ki-it Monger Brook Foreshore Management Plan (FMP) (RPS 2021)
   d. Landscape masterplan or concept plan (Richard Hammond 2024)

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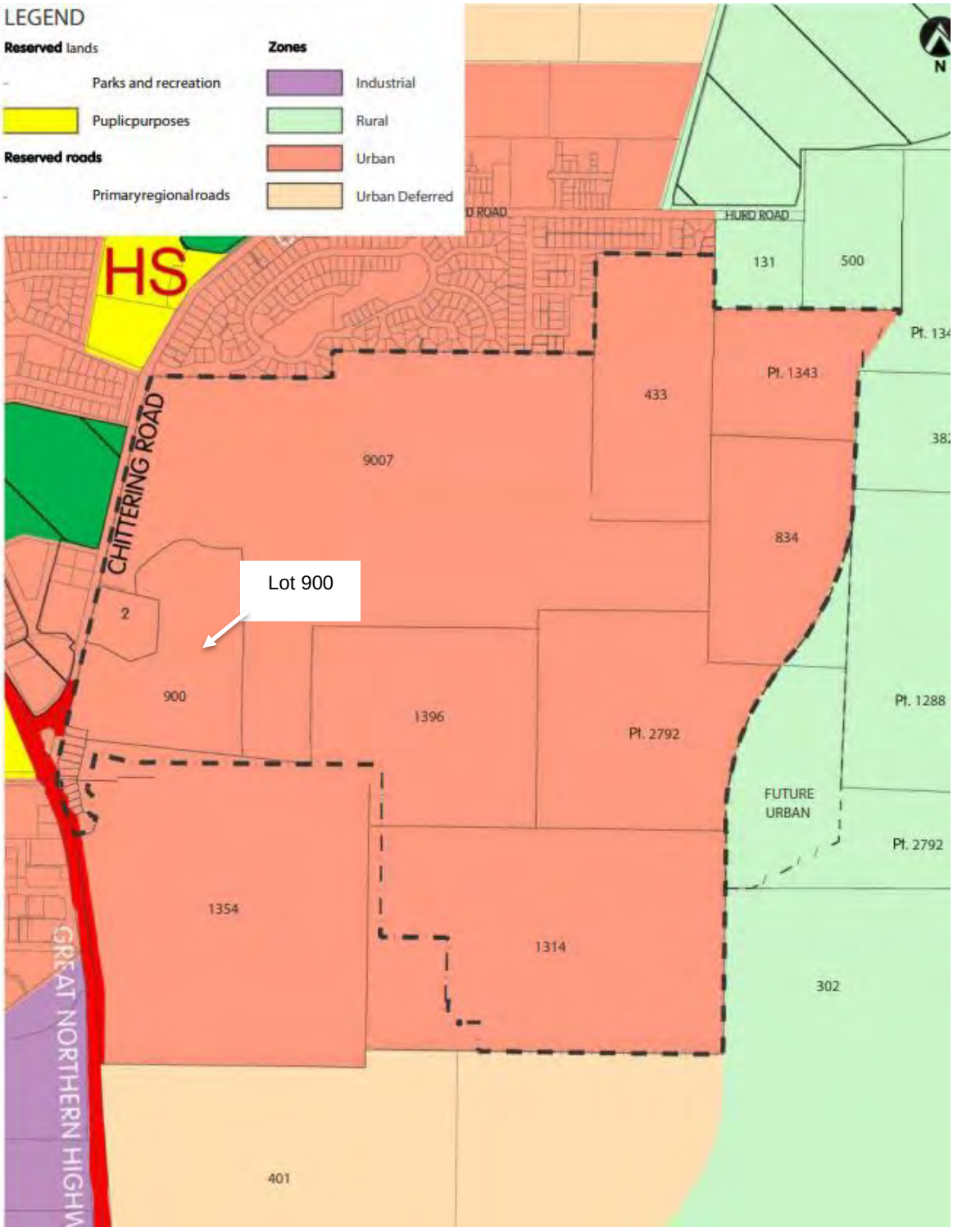

Figure 3: MRS land use zoning (Urban)

A detailed summary of the site's planning and lot title status Table 2.

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Table 2: Site Summary

Element	Lot 900 Bullsbrook		
Address	**Lot**		**Suburb**
Lot 900 Bullsbrook Village			Bullsbrook
Lot details	**Deposited Plan**	**C/T**	**Area**
900	P407242	2914/546	13.15 ha
Local Government Area	City of Swan		
Zoning	**Metropolitan Region Scheme (MRS)**	**Local Planning Scheme (LPS) No. 17**	
Lot 900	Urban – 13.15 ha	Residential – 13.15 ha	
District Structure Plan	Bullsbrook Townsite District Structure Plan (City of Swan 2018).		
Local Structure Plan	Kingsford Bullsbrook Central (Hatch 2022)		

Bethanie Bullsbrook Village

Bethanie Bullsbrook Village development area is predominantly confined to the historical cattle paddock area as illustrated in Appendix 1.

The Bethanie Bullsbrook Village development includes the establishment of approximately 3 ha open spaces areas and landscape plantings adjacent to the Ki-it Monger Brook.

Stormwater will be managed through vegetated swales/tree pits within the village area and larger bioretention swales will be incorporated into open space areas adjacent to Ki-it Monger Brook consistent with the approved Local Water Management Strategy (LWMS) neighbouring the village development. A site-specific Urban Water Management Plan (UWMP) has been prepared specifically for the Bethanie Bullsbrook Village. The UWMP defines the stormwater management framework, including the detailed bioretention swales design and landscape response.

The internal road network provides access to the village from Chittering Road and the adjacent Kingsford residential estate. The entry road from Chittering Road will traverse a historically infilled portion of the Ki-it Monger Brook. The construction of the entry road will be subject to a specific management framework defined in the Department of Water and Environmental Regulation (DWER) permit to interfere with bed and banks and an Erosion, Sediment and Drainage Control Plan (ESDCP).

Historical and Current Land Use

The area of Lot 900 comprises largely cleared land, historically used for agricultural purposes, namely cattle and sheep grazing with limited environmental value. Site historical aerial photography from 1965 to 2024 shows that most of the site has been cleared of native vegetation since pre-1965 (Figures 4, 5 and 6).

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Figure 4: Aerial photography of the site in 1965

The 1965 image identifies portions of the Ki-it Monger Brook that were cleared and infilled, with pipes and culverts installed. The land adjacent to the brook was cleared of native vegetation and used as livestock paddocks.



Figure 5: Aerial photography of the site in 1983

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The 1983 image shows that the creek line remained cleared and infilled. The dominant land use was a rural cattle paddock. An internal track crosses the brook, providing access to Chittering Road.



Figure 6: Aerial photography of the site in 2024

The aerial image of the 2024 (or current) site shows that the dominant land use remains an open paddock. Additional flooded gum trees (< 20) have grown on the eastern side of the brook. A temporary access track that traverses Ki-it Monger Brook is evident along the southern boundary of Lot 900.

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Figure 6: Lot 900 and the adjacent Kingsford residential development

Key Environmental Elements

Bush Forever

Bush Forever sites within 1 km of Lot 900 are shown in Figure 7.

Bush Forever Site 89 is located approximately 30 m – 40 m (at the closest point) to Lot 900. Bush Forever Site 89 is separated from Lot 900 by the Chittering Road Reserve. The Bethanie Bullsbrook Village is located on the eastern side of Ki-it Monger Brook. The distance from Bush Forever Site 89 to the Bullsbrook Village will be over 100 m.



Figure 7: Bush Forever Locations

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Ki-it Monger Brook

The Ki-it Monger Brook is an ephemeral waterway that runs west of the site. Its catchment area is approximately 5.2 km^2 upstream of the Great Northern Highway. The Ki-it Monger Brook creek line was historically formalised (infilled in areas) and cleared with culverts installed, as seen in historical images above in Figures 4 and 5.

An informal track that traverses the Ki-it Monger Brook was constructed and used (prior to 1960) to access Chittering Road.

No significant flora species have been recorded or are likely to occur along the Ki-it Monger Brook. The site was historically cleared of native vegetation and the land used for agricultural purposes. The fauna habitat values are limited to the flooded gum trees.

The modelled 1% Annual Exceedance Probability (AEP) stormwater flows (which define the 1 in 100-year flood event) show that stormwater in a 100-year event is contained within the brook channel (or 5 m—10 m either side of the brook).

Figure 8 illustrates the flood levels within a 1 in 100-year stormwater event.

There are no mapped Resource Enhancement Wetlands or Conservation Category Wetlands within Lot 900.

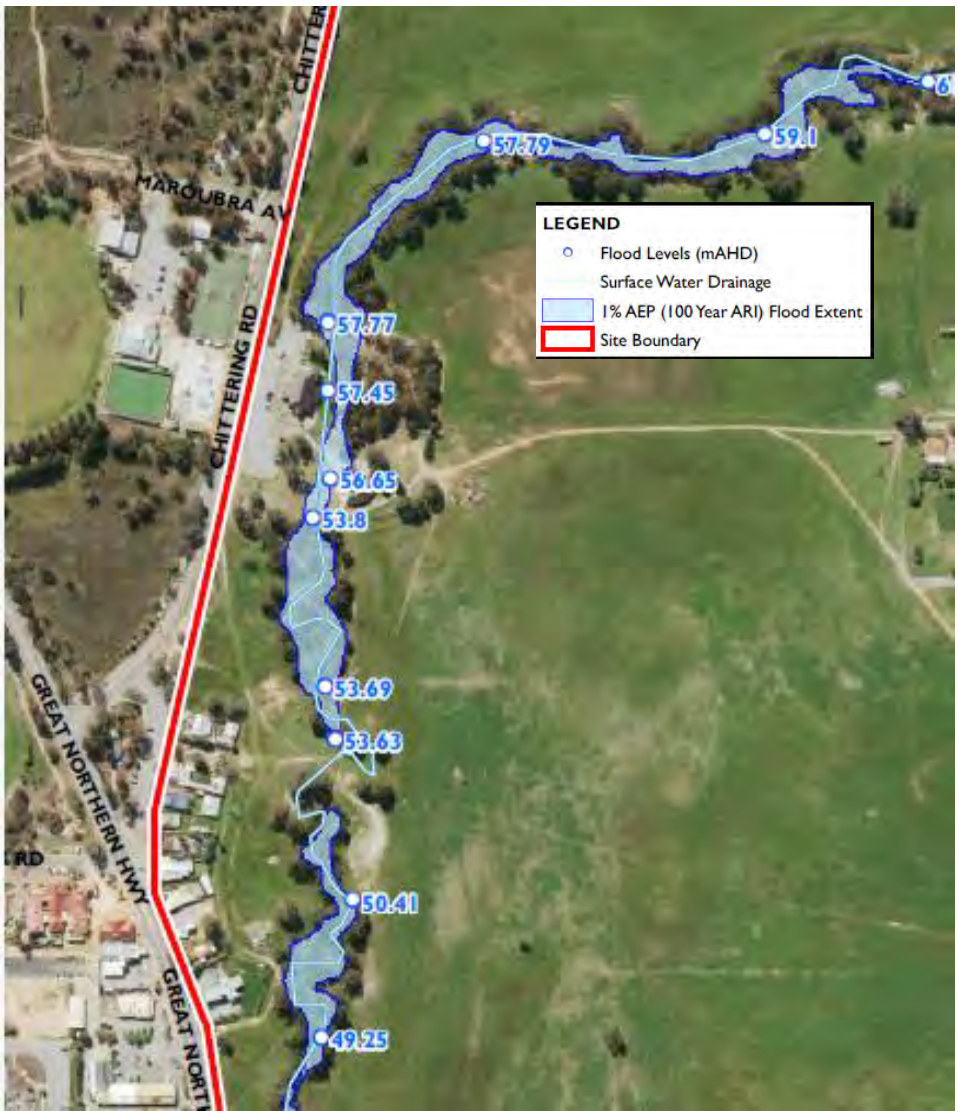

Figure 8: Pre-development 1% AEP Flood Levels (RPS 2018)

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Topography & Geology

The site gently slopes from the northeast to the southwest. Topographically, it slopes from the northeast with a 65 m Australian Height Datum (AHD) height to 52 m AHD in the southwest. The Ki-it Monger Brook to the north of the site has elevations between approximately 56 m AHD and 63 m AHD.

Figure 9 details the topography of the site.

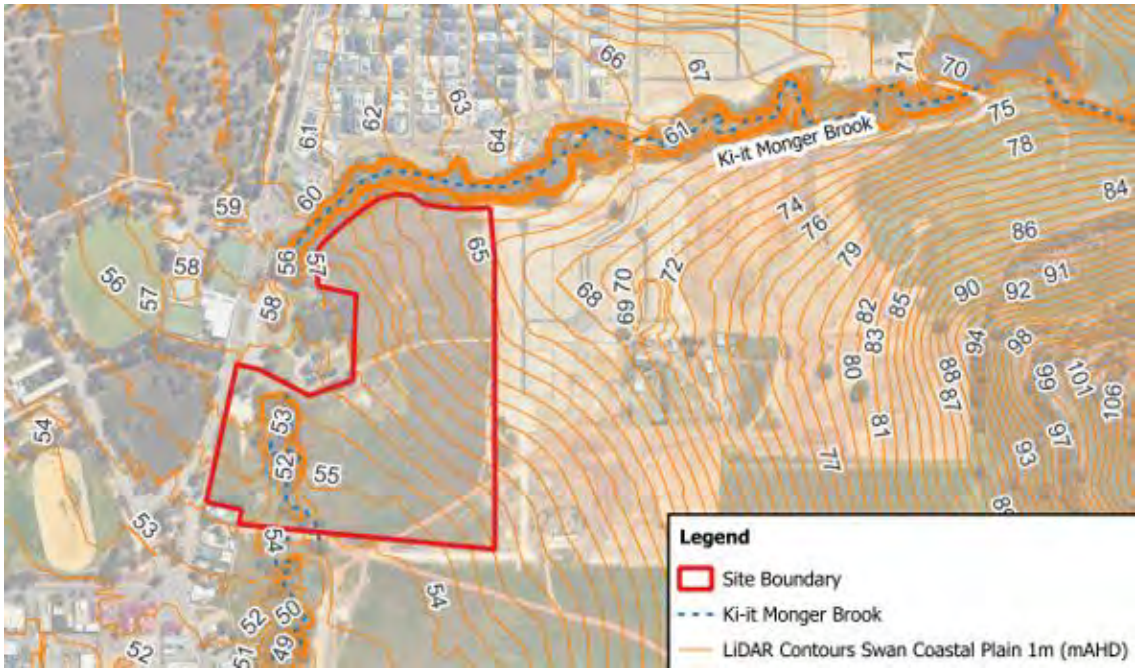

Figure 9: 1m contour lines

The environmental geological mapping (Gozzard, 1986) is shown in Figure 3. This mapping indicates two surficial geological units within the site:

Sandy silt (Msg): underlying the majority of the site, described as brown solid, firm, friable, dispersive in part, occasional pebbly horizons with a little matrix containing quartzite, quartz, granite, laterite, of colluvial origin.

Pebbly silt (Mgs1): underlying the southwestern corner of the site, described as solid brown silt with common fine to occasionally coarse-grained, sub-rounded laterite quartz, heavily weathered granite pebbles, some fine to medium-grained quartz sand, of alluvial origin.

Figure 10 shows the site is predominantly sandy silt (Msg), while the western portion is dominated by pebbly silt (Mgs1).

Geotechnical Assessment

A geotechnical investigation was undertaken by Structerre in 2024 for Lot 900. This comprised 17 boreholes to a depth of 2.1m, 15 Dynamic Cone Penetration Tests (DCP) to a depth of 1 m and six permeability tests to a depth of 1 m. The main results from the investigation include:

- Soil permeability ranging from 0.5 to 3.1 m/day.
- Lot 900 generally consist of:
    - Topsoil 0.2 m overlaying Sandy Clay with gravel to the investigated depth of 2.5 m.
    - Pockets of Sand / Gravelly Sand encountered (Bores 8 - 15) to 1.9 m, which overlayed the Sandy Clay material to a target depth of 2.5 m.
- Water table not encountered.
- Localised surface ponding and water perching on cohesive soils may occur during periods of rainfall.

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- The site investigation results are consistent with the regional surface geology (Figure 3), which identifies most of the site as Msg (Sandy silt) and the western portion of the site as Mgs1 (pebbly silt).

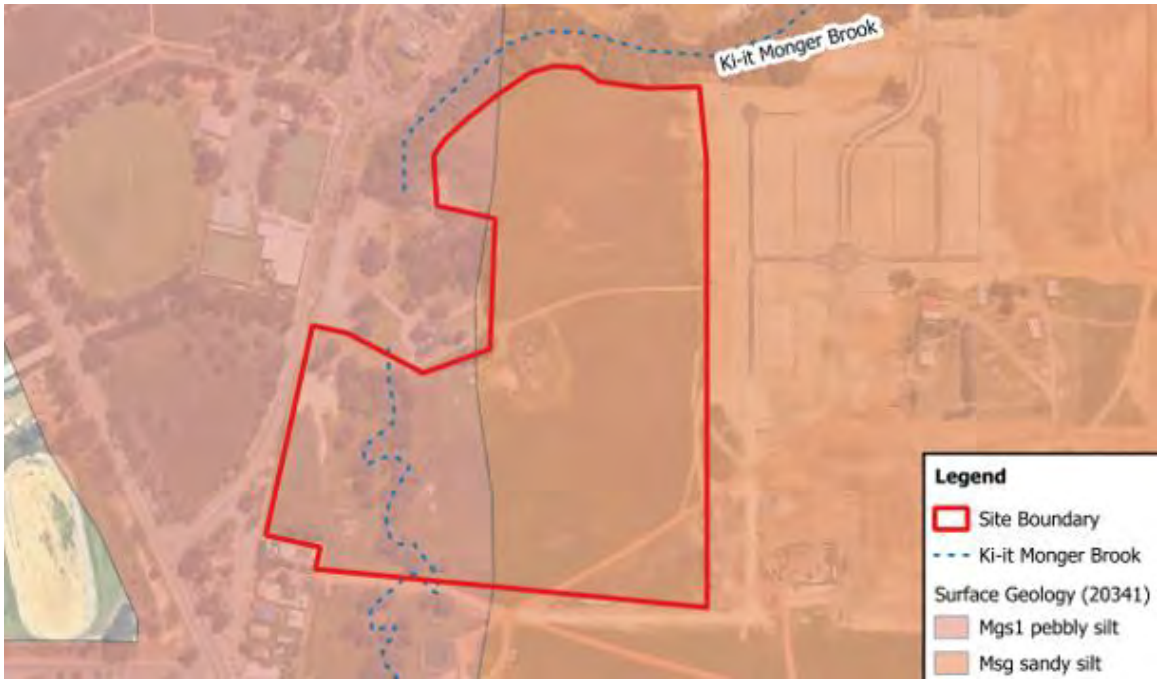

Figure 10: Environmental Geological Mapping

Social Surrounds

The Pearce RAAF Base is located approximately 1 km west of Lot 900. The assessed and mapped Australian Noise Exposure Forecast (ANEF) 20 contour for the Pearce RAAF Base is located outside Lot 900 and, therefore, the Bethanie Bullsbrook Village. No specific or additional noise amelioration specific to aircraft is required.

Great Northern Highway is approximately 90 m (at the closest point) to Lot 900. Chittering Road is directly adjacent to Lot 900's western boundary.

Bethanie Bullsbrook Village, located on the eastern side of Ki-it Monger Brook, is separated from the Great Northern Highway and Chittering Road by approximately 100 m.

Aboriginal Heritage

Ki-it Monger Brook 2—Bullya Spring 22669 is associated with mythological and natural features and is a water source. The Aboriginal heritage report (Ethnoscience 2017) confirmed that Bullya Spring 22669 is in Lot 2 (near the eastern boundary).

The Bullya Spring 22669 site is outside Lot 900 and the Bethanie Bullsbrook Village development area. Figure 11 illustrates its location within Lot 2.

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Figure 11: Aboriginal Heritage Site

Environmental Management

Identification of Key Environmental Risks

The site, since pre-1965, has been cleared and used for cattle livestock paddocks.

The sole environmental asset within Lot 900 is the Ki-it Monger Brook. The brook has been historically modified (pre-1960), including the clearing of native vegetation and the infilling of the creek line, the installation of informal track crossings, and the use of the creek area by livestock.

The construction of the Bethanie Bullsbrook Village (including the internal entry road across the brook) presents limited risks to the Ki-it Monger Brook during the construction phase (specific to earthworks, dust, road crossing, and drainage management).

The critical focus is post-construction, stormwater management, and the Ki-it Monger Brook FMP implementation.

Table 3 defines the management framework applied across the construction and post-construction work phases.

Table 3: Bethanie Bullsbrook Village Management Framework

Element	Management Responses
	Construction Phase
Earthworks: • Site earthworks are required to install civil infrastructure and construct roads, group dwelling sites, community (resident) assets, and bio-retention drainage basins.	• Prepare and implement an Erosion, Sediment and Drainage Control Plan (ESDCP) throughout the earthworks/village development stage. The ESDCP includes the following elements: o Erosion, sediment and drainage risk assessment Erosion and Sediment Control Policy and Guidelines for Local Government (EMRC 2008). o Erosion, sedimentation, drainage control measures objectives and management actions. o Monitoring program. o Implementation strategy and responsibilities.

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Element	Management Responses
Entry Road Crossing: • An entry road crossing will be constructed across the Ki-it Monger Brook to enable access to the development area. • The location of the road crossing will be within a historically cleared area.	• Implement the DWER-approved permit to interfere with beds and banks for the Ki-it Monger Brook entry road crossing. ESDCP will complement the permit. • The permit will address the following elements: o Spatially define the entry road crossing traversing the brook. o The detailed engineering design of the road crossing. o Define the management action(s) to be implemented that mitigate the disturbance risks (i.e., primarily erosion & sedimentation) to the Ki-it Monger Brook watercourse. The management actions include: ▪ Sediment control actions ▪ Timing of the road construction activities (i.e., avoiding work in winter storm events).
Dust: • The removal of the livestock grazing pasture layer will expose loosened soil. This poses a dust generation risk, particularly during the summer period.	• ESDCP outlines prescriptions of risk management actions for dust control. The key dust management actions include: o Dust/wind fences. o Dust suppression measures (i.e., via water carts/sprinklers). o Weather (and precisely wind direction & speed) assessment. o Addressing dust complaints.
Drainage management during the construction phase: • Stormwater runoff during construction may pose a risk to the Ki-it Monger Brook.	• The UWMP details the size and location of the bioretention and stormwater management swales, including the engineering design and landscape design. • The ESDCP addresses the specific management actions, including: o Sediment fencing. o Temporary drainage areas. o Stockpile management.
Post Construction phase	
Stormwater management post-development: • The site's development will see an increased level of impervious surfaces, which may increase runoff. • Due to the Kingsford development being uphill from Lot 900, this may slightly increase the site's flood risk. • Management addressed through future UWMP and existing FMP incorporating flood management controls.	• Stormwater from roofed, paved and driveway areas be collected and detained within the bio-retention stormwater basin to reduce peak flow rates before discharging into the Kit-it Monger Brook. o UWMP will address the abovementioned aspects and Water quality trigger levels for post-development monitoring. o Floodways to be maintained concerning their ecological value and hydraulic capacity.
Foreshore management: • Landscaping of open space areas and people management adjacent to the Ki-it Monger Brook.	• The City of Swan approved Foreshore Management Plan (RPS 2021), which will be implemented through detailed landscape plans and civil engineering designs. The critical management outcomes include: o Landscape, including tree planting within open space areas and the location of pedestrian paths, will be by the FMP and City of Swan. o Design of bioretention swales in POS adjacent to Ki-it Monger Brook.

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Key Management Outcomes

Permit to interfere with bed and banks for the Ki-it Monger Brook entry road crossing: Approved by DWER prior to the commencement of the entry road construction.

Erosion, Sediment and Drainage Control Plan (ESDCP): Approved by the City of Swan as a component of the Bethanie Bullsbrook Village DA before the commencement of construction works.

Urban Water Management Plan (UWMP): Approved by the City of Swan as a component of the Bethanie Bullsbrook Village DA before the commencement of construction works.

Complementary Management Plan

Ki-it Monger Brook Foreshore Management

The approved Ki-it Monger Brook FMP (RPS 2021) includes the portion of the brook within Lot 900. The FMP outlines the management actions for the interface area along the Ki-It Monger Brook, inclusive of:

- Rehabilitation of the brook foreshore area.
- Passive recreation opportunities and formalised open space areas for picnics and informal gatherings.
- The pedestrian path system will extend, where possible, along the length of the interface area to define the public use area.
- The landscaping of the bioretention swales areas adjacent to the Ki-it Monger Brook.

Conclusion

The Bethanie Bullsbrook Village is located within a historically cleared open paddock area. The key environmental attribute, Kit-it Monger Brook (and associated values), has been accommodated within the Bethanie Bullsbrook Village DA. The construction and operation of the village within a former paddock area represents negligible environmental risk. The identified risk(s) are focused on Ki-it Monger Brook (the sole environmental asset) and are primarily short-term through the construction phase.

The management plans, defined in Table 3, address the environmental risks to the Ki-it Monger Brook throughout the village construction and operational phases. Implementing the management plan(s) and associated actions will ensure no significant impact(s) on the Ki-it Monger Brook.

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Appendix A: Proposed Bethanie Bullsbrook Village



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PTG00593

Waste Management Plan
Bullsbrook Bethanie Village

Date 10th September 2024 | Revision B

Prepared for Bethanie Group

www.ptgconsulting.com.au

REVISION SCHEDULE

Revision No.	Date	Description	Prepared by	Quality Reviewer	Independent Reviewer	Project Manager Final Approval
A	22/08/2024	For issue	KC	AW	AW	AW
B	10/09/2024	For issue	KC	AW	AW	AW

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1 INTRODUCTION

1.1 Background

PTG has been commissioned by Bethanie Group ("the Client") to prepare a Waste Management Plan (WMP) in support of proposed residential village (the Development) located at Lots 900, 9501 and 9013 Chittering Road, Bullsbrook (the Site).

The scope of this WMP is limited to the estimation of general, recycling and Food Organics and Garden Organics (FOGO) waste generated by the proposed Development and includes recommendations for the appropriate collection, storage, handling and transportation of waste and recycling, in accordance with the requirements outlined by the City and the WALGA's Commercial and Industrial Waste Management Plan Guidelines.

1.2 Site Description

The Development is located at Lots 900, 9501 and 9013 Chittering Road, Bullsbrook as illustrated in **Figure 1.**

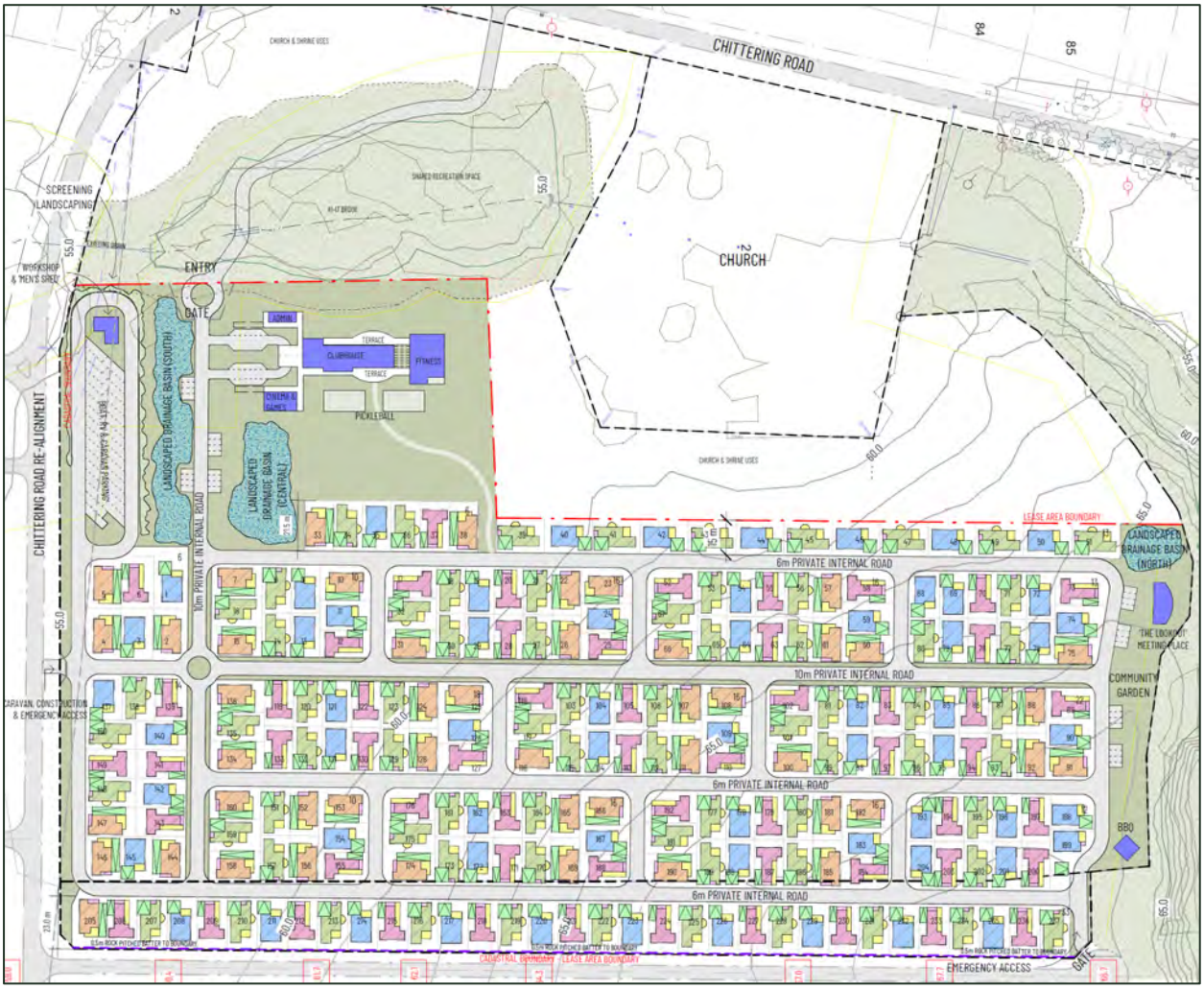
Figure 1 Existing Site Location



Source: Nearmap (2024)

The proposed development is an aged care facility that will comprise of 237 dwellings and a recreational centre as shown in **Figure 2** and summarised in **Table 1**.

Figure 2 Proposed Development Layout



Source: Richard Hammond Architect

Table 1 Proposed Development Yields

Land Use	Yield
Retirement Village	237 dwellings
Clubhouse, administration, fitness and cinema/games room	1,570m^2

2 WASTE SERVICES AND SPECIFICATIONS

2.1 Waste and Recycling Collection Services

While the City of Swan has introduced a three-bin kerbside collection system in 2024, as described in Section 3.7.1, the FOGO system will not be rolled out for the Site until the winter of 2026. However, as the proposed development will be unlikely to open prior to winter 2026, the waste calculations and recommended bin arrangements include the FOGO waste and bins.

Based on information from the City of Swan website (**City of Swan - Waste and recycling services**), the current collection schedule per type of waste is summarised in **Table 2**.

Table 2 Schedule of Waste Collection

Type of Waste	Bin Colour	Schedule
Recyclables	Yellow	Fortnightly
General Waste	Red	Fortnightly
FOGO	Green	Weekly

2.2 Bin Specifications

Each household will have three Mobile Garbage Bins (MGBs), one for each type of waste. The MGBs should be provided by the local government or adhere to the Australian Standard for Mobile Waste Containers (AS 4213), which requires bins to be fitted with permanent lids and two wheels.

2.3 Bin Configuration

The bins will be placed on the verges in front of the individual properties for kerbside collection and should be 0.5 meter apart from one another and have a 1-meter clearance from any obstructions such as trees, posts, walls, etc.

3 WASTE GENERATION AND MANAGEMENT

To ensure that the waste from the development is properly managed, it is necessary to estimate the volume of waste that is likely to be generated on the premises.

The waste generation rates outlined in the WALGA Multiple Dwelling Waste Management Plan Guidelines have been adopted for these calculations. Using these general, recycling and FOGO waste generation rates, a broad estimation of daily waste generation for the development has been calculated.

3.1 Waste Streams

3.1.1 General, Recycling and FOGO

Waste will be sorted by the residents into the respective bins according to the following types:

- General Waste.
- Recycling, which includes clean aluminium foil and trays, glass bottles and jars, milk and juice cartons, cardboard, plastic containers, tins, cans, etc.
- Food organics and garden organics (FOGO), which includes food and green waste, uncontaminated wood waste, forestry residues and other biodegradable organic residues. The City will dictate what can be included in these bins.

3.2 Other Streams

The City provides an on-demand service collection for bulk goods, e-wastes, and white goods (major appliances), as well as general junk.

In addition to the above, the Red Hill Waste Management Facility, Malaga Recycling Centre, Bullsbrook Recycling Centre, The Green Room, accept both e-waste and hazardous waste, while some libraries also accept e-waste.

Moreover, the City has two recycling centres that allow residents to recycle items such as furniture, mobile phones and more at no cost. The facilities are located at Bullsbrook Recycling Centre and Malaga Recycling Centre.

3.3 Waste Streams Estimates

Each residential unit is assumed to have 2 bedrooms. As the Development is an aged care facility, residents are not expected to have any children living with them.

The waste generation and bin requirements have been calculated using the waste generation rates detailed in **Table 3**.

Table 3 Waste Generation Rates

Premises	Yields	General Waste	Recycling	FOGO
Residential (2 Bedrooms)	237 dwellings	120 L/unit/week	80L/fortnight = 40L/week	80L/fortnight = 40L/week

A summary of the estimated weekly waste generated for each waste stream is provided in **Table 4** which were obtained by multiplying the number of dwellings to the weekly waste generated per unit.

Table 4 Weekly Waste Generation

Premises	Weekly General Waste	Weekly Recycling	Weekly FOGO
237 Residential Dwellings (2 Bedrooms each)	28,440 L	9,480 L	9,480 L

3.4 Bin Requirements

A summary of the breakdown of the anticipated MGB requirements for the proposed development, the proposed bin sizes, and the proposed collection frequencies are provided in **Table 5.**

Table 5 Bin Requirements for Proposed Site

Type of Waste	Size (L)	Collection	Number of Bins
Recyclables	240	Fortnightly	237
General Waste	240	Fortnightly	237
FOGO	240	Weekly	237

3.5 Transfer of Waste and Recycling

3.5.1 Waste Transfer

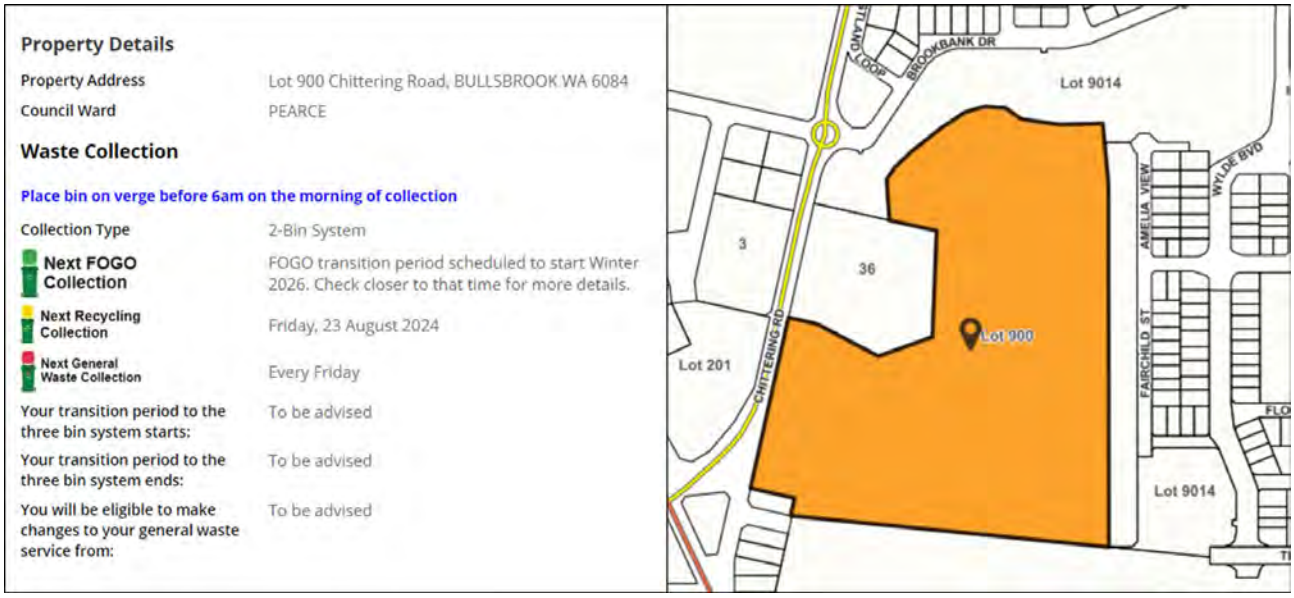
The residents will transfer waste to the their allocated bins, which are to be moved to the verge areas in front of each of the individual properties the day before their allocated bin collection days.

3.6 Collection of waste and recycling

3.6.1 Waste Collection

The collection and waste will be facilitated by the local government. Information on waste collection for the Site are shown in **Figure 3**.

Figure 3 Waste Collection Information



Source: City of Swan (2024)

3.6.2 Provision of Service Vehicle

Swept path analysis for a 10.1 m waste collection vehicle was undertaken as illustrated in **Figure 4**, **Figure 5** and **Figure 6.**

The swept paths for the roundabouts indicate that the waste collection vehicles will encroach on some sections of the central islands of the roundabouts. As such, these sections of the roundabouts will need to be designed to be mountable, which will be resolved as part of the detailed design process.

The swept paths for the internal roads suggest that the waste collection vehicle is able to traverse the internal roads, although it will not be able to turn in a lane-correct manner at the intersections. However, as the roads will not be used by any external traffic, as well as the low-speed environment within the Site, this is considered to be an acceptable arrangement.

Figure 4 Swept Path – Waste Vehicle Collection (Entry Gate)



Figure 5 Swept Path – Waste Collection (Roundabout)

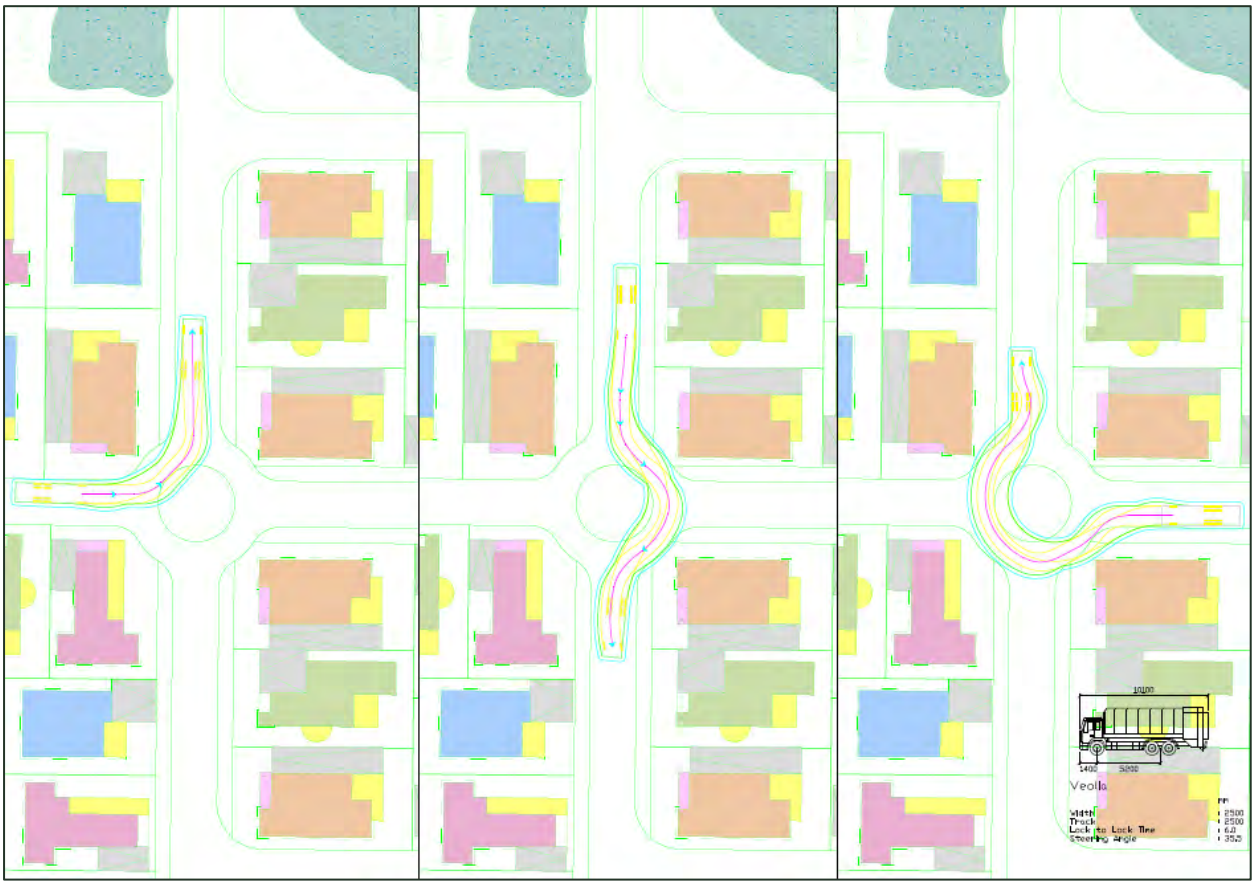


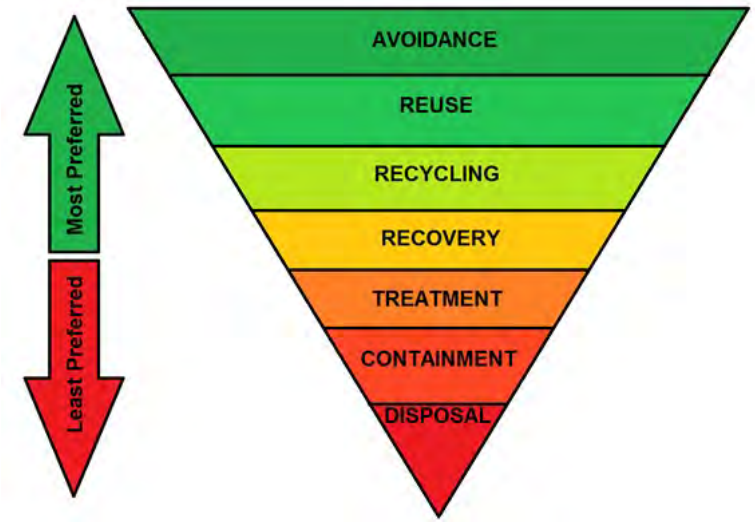
Figure 6 Waste Collection Vehicle - Internal Roads



4 WASTE REDUCTION AND MANAGEMENT STRATEGY

This waste management plan has been developed with the strategic approach of reducing waste through best practices and education of residents. The waste hierarchy is demonstrated below in **Figure 4-1.**

Figure 4-1 Waste Hierarchy



4.1 Provision of Information

Information dissemination is essential in order to communicate well the best practices of waste management. Suitable types of information which can be provided includes:

- Online information;
- Marketing materials such as posters and leaflets demonstrating procedures of waste segregation and waste collection days; and
- Sufficient labelling of bins to reinforce waste separation.

However, information on its own is not enough and it must be paired with initiatives to be effective.

4.2 Engagement

A regular engagement between all the stakeholders of the development should take place in order to remind the residents the proper and best practices of waste management. The engagement should include:

- Demonstration of waste management systems pertinent to an individual's role; and
- An explanation of the benefits of waste separation and recycling.

In the event that waste generation rates for the Development change, a waste audit may be required by the Shire or other regulatory bodies. Similarly, should a change to the waste regulations be implemented by the Shire or other regulatory bodies, a waste audit may be required in addition to further waste stream separation.

5 CONCLUSION

This Waste Management Plan demonstrates that the proposed Development provides sufficient provision for general waste, recyclable waste, and FOGO based on the estimated waste generation.

Waste collections will be undertaken on-site by the local government and residents will be required to sort and prepare their waste based on the collection schedule for the area.

6 REFERENCES

WALGA (n.d.), Multiple Dwelling Waste Management Plan Guidelines: A Resource for Western Australian Local Government and Developers, Perth.

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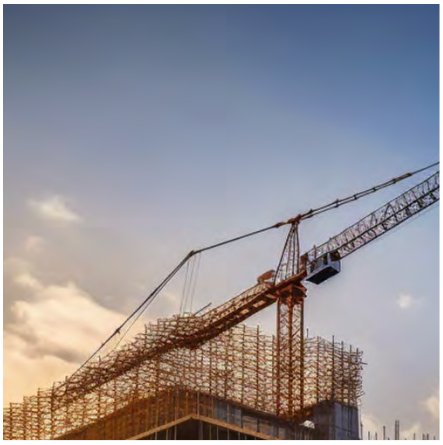
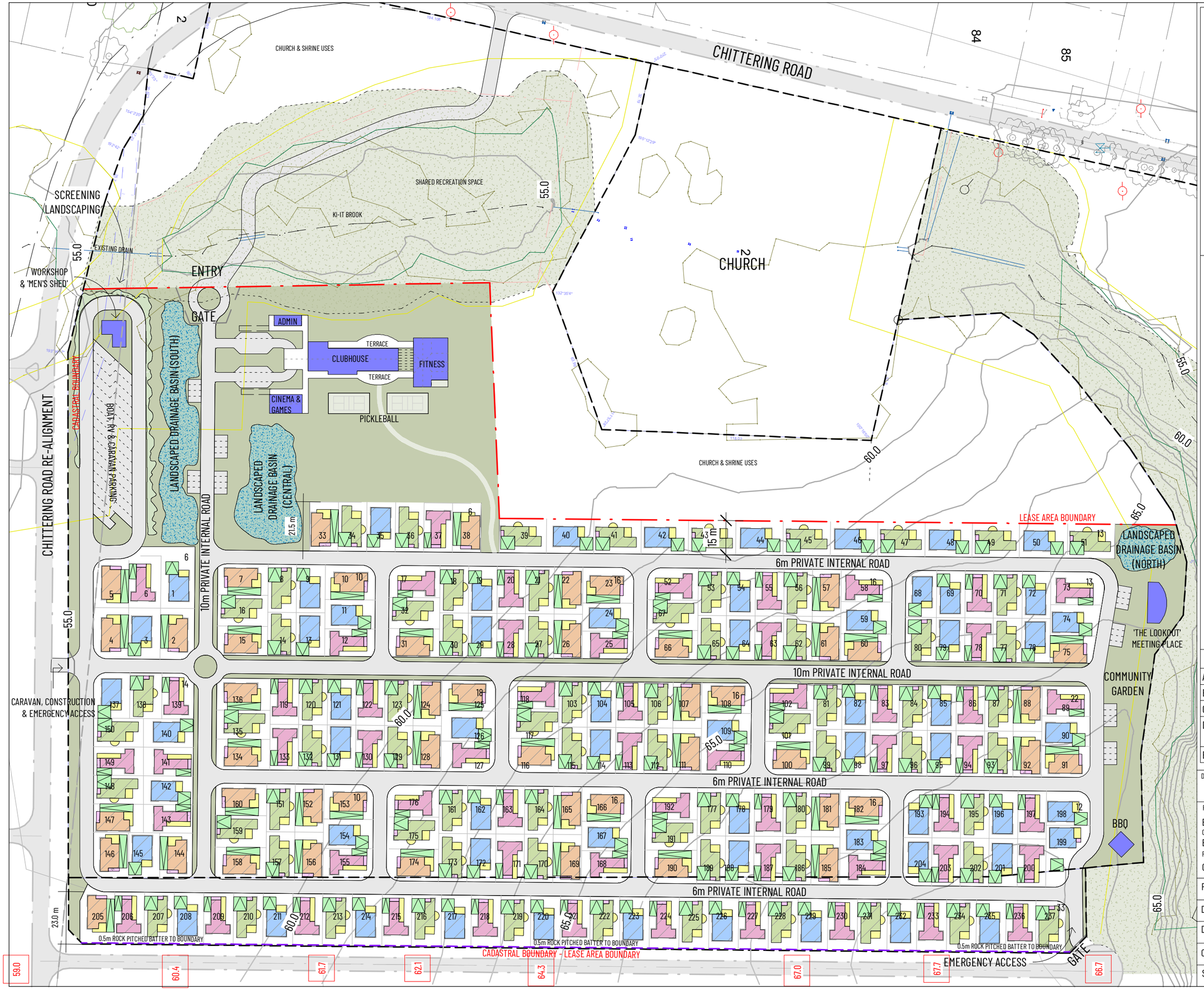


Appendix A
Site Plan







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LEGEND

- LANDSCAPING
- 'RECREATION' ZONED AREA
- CORE CREEK AREA
- AREA SUBJECT TO FORESHORE & WETLAND MANAGEMENT PLAN
- VILLAGE AMENITIES
- LANDSCAPED DRAINAGE BASINS
- FENCE/GATE
- ROADWAY
- CADASTRAL BOUNDARY
- LEASE AREA BOUNDARY
- TYPE A (62)
- TYPE B (71)
- TYPE C (47)
- TYPE D (57)

TOTAL HOUSE SITES - 237

TOTAL LEASE SITE AREA - 106,988m²
(NOT INCL. SHARED REC. AREA)

TOTAL RECREATION AREA - 35,095m²
(INCL SHARED REC. AREA)

N

ISSUE	DESCRIPTION	DATE
A	PRELIMINARY MASTERPLAN	28.05.2024
B	REVISED MASTERPLAN	12.08.2024
C	REVISED MASTERPLAN	16.08.2024
D	ENTRY MOVED, LOT NUMB. ADDED	19.08.2024
E	HOUSE-LOT ALLOCATION	02.09.2024

DRAWING TITLE
Masterplan

PROJECT
BETHANIE - BULLSBROOK VILLAGE
CLIENT
BETHANIE
PROJECT ADDRESS
CHITTERING ROAD, BULLSBROOK, WA, 6084

Project number	-
Date	02.09.2024
Drawn by	RHA
Checked by	RHA
Scale @ A3	1 : 1500

DRAWING NO.
A3.01

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PENTIUM
WATER

BETHANIE BULLSBROOK VILLAGE

Erosion, Sediment and Drainage Control Plan



Document Status

Version	Purpose of document	Authorised by	Reviewed by	Review Date
Rev 0	Draft for Review	Myles Leaming	John Halleen	08/8/2024
Rev 1	Draft for Review	Myles Leaming	John Halleen	09/9/2024

Approval for Issue

Name	Signature	Date
John Halleen		09/09/2024

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1. Introduction

1.1. Background

Bethanie Group Ltd (Bethanie) is proposing to construct and operate a contemporary lifestyle community village (referred to as the Bethanie Bullsbrook Village) to provide accommodation for over-50s who want to downsize and/or seek more affordable accommodation options.

The Bullsbrook Village consists of the following elements:

- Residential dwellings (or group dwellings)
- Internal roads
- Open space areas for village residents & visitors
- Stormwater bio-retention swales
- Bowls club
- Community garden and BBQ areas.

Bethanie Bullsbrook Village will be entirely managed (onsite), including security, grounds building maintenance and landscape services.

The Bethanie Bullsbrook Village concept plan is provided in Appendix A.

The Bethanie Bullsbrook Village is located within Lot 900 Chittering Road, Bullsbrook ("the site"), within the municipality of the City of Swan. Lot 900 covers a total area of approximately 13.15 hectares (ha).

Lot 900 is generally bound by Chittering Road, the Bullsbrook Our Lady of the Revelation Church (which is owned and operated by the SACRI Association) and private landholdings to the west, and the Kingsford residential estate to the north, east, and south. The Ki-it Monger Brook traverses the northern boundary and inside the western boundary of Lot 900.

Lot 900 location and local context is provided in Figure 1.



Figure 1: Site Location

1.2. Purpose of this Document

Bethanie has engaged Pentium Water to prepare an Erosion, Sediment, and Drainage Control Plan (ESDCP) to specifically manage drainage, erosion, and sedimentation risks from the construction of the Bethanie Bullsbrook Village to the Ki-it Monger Brook.

Accordingly, this ESDCP incorporates the following elements:

- Erosion control measures
- Sediment control measures
- Drainage control measures

This ESDCP has been prepared consistent with the following:

- Development Design Specification – Erosion Control and Stormwater Management (City of Swan 2002).
- Policy and Guidelines for Local Government – 5.1.2 Erosion and Sediment Control (EMRC 2008).

1.3. Supporting Information

Previous works and underlying approvals used to inform both the Development Application and this ESDCP include:

- Bethanie Bullsbrook Masterplan (Richard Hammond Architect 2024)

- Geotechnical Investigation Lot 900 Chittering Road, Bullsbrook (Structerre Consulting 2024)
- Geotechnical Study – Various Lots Great Northern Highway Bullsbrook (Galt Geotechnics 2014)
- Kingsford Bullsbrook Central – Local Structure Plan (Revised) (Hatch 2022)
- Ki-it Monger Brook Foreshore Management Plan (FMP) (RPS 2021)
- Local Water Management Strategy (RPS 2018)
- Environmental Summary Report – Bullsbrook Landholding Structure Plan (RPS 2021)
- Specification 211 – Control of Erosion and Sedimentation (City of Swan 2001)
- Erosion Control and Stormwater Management (City of Swan 2002)
- Erosion and Sediment Control Policy and Guidelines for Local Government (EMRC 2008)

2. Site Context

2.1. Planning Approvals

Regionally, the site is located approximately 40 km northeast of the Perth Central Business District and approximately 25 km north of the Midland Strategic Metropolitan Centre.

The site is:

- 13.15 ha in size.
- Zoned 'Urban' under the Metropolitan Region Scheme (MRS).
- Zoned 'Residential' under the Swan City Local Planning Scheme (LPS) No. 17.

2.2. Existing Land Uses

The site consists of cleared cattle paddocks and the Ki-it Monger Brook. A temporary access road linking Chittering Road with the Kingsford residential estate traverses the southern portion of the site.

Outside of the Ki-it Monger Brook creek, the balance of the site was historically cleared (pre-1960) and used as cattle/livestock grazing paddocks. The cleared former cattle paddock area (east and south of Ki-it Monger Brook) totals approximately 10 ha (or 76% of the site). This cleared paddock area is the focus of the Bethanie Bullsbrook Village development. This area has negligible environmental values.

The remnant native vegetation within the site is limited to mature *Eucalyptus rudis* (flooded gums) trees within the Ki-it Monger Brook creek line. The flooded gum trees within the Ki-it Monger Brook will be maintained within the defined setback from the brook, which was established for the purposes of conservation, flood protection, better urban water management and open space in the 2021 City of Swan-approved Ki-it Monger Brook Foreshore Management Plan (FMP) (RPS 2021).

The key (and only) environmental asset within Lot 900 is the Ki-it Monger Brook. The brook is a seasonal flowing creek that traverses the northern boundary and dissects the site towards the western boundary. Bethanie Bullsbrook Village development area is consistent with the setback and stormwater management requirements established under the approved:

- Ki-it Monger Brook FMP (RPS 2021).
- Local Water Management Strategy (LWMS) (RPS 2018).

2.1. Climate and Rainfall

The site experiences a Mediterranean climate with cool, wet winters and hot, dry summers. Peak rainfall periods are usually between May and September. The nearest Bureau of Meteorology (BoM) weather station to the site is the Pearce RAAF weather station (Station Number 009053), located approximately 1.5 km from the site. Based on the rainfall data collected from 1937 to 2024 at this station, the local area experiences an average of 651 mm of rainfall annually (Bureau of Meteorology 2024).

Summer is generally hot, with average minimum and maximum temperatures of 16 OC and 32.5 OC, respectively. Conversely, the average minimum and maximum temperatures in winter are 8.5 ^{O}C and 18.5 ^{O}C, respectively (BOM 2024).

Table 1 summarises the average monthly temperature in the local Bullsbrook area.

Table 1: Average Monthly Mean Temperature (°C) (Pearce Station No 94612)

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean rainfall	9.9	12.8	16.3	33.6	82.4	129.5	134.0	105.6	67.6	36.6	22.0	10.5	651.2
Mean max temp	33.6	33.4	30.6	26.5	22.1	19.1	17.9	18.5	20.2	23.6	27.4	30.7	25.3

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean min temp	17.0	17.6	16.1	13.3	10.7	9.3	8.4	8.2	8.8	10.2	12.6	14.7	12.2
Mean evaporation	297	257	224	123	87	59	60	69	106	154	203	259	1,898

2.2. Topography

Topographically, the site slopes from 65 m Australian Height Datum (AHD) in the northeast to 52 m AHD in the southwest. The Ki-it Monger Brook to the north of the site has elevations between approximately 56 m AHD and 63 m AHD.

Figure 2 details the topography of the site.

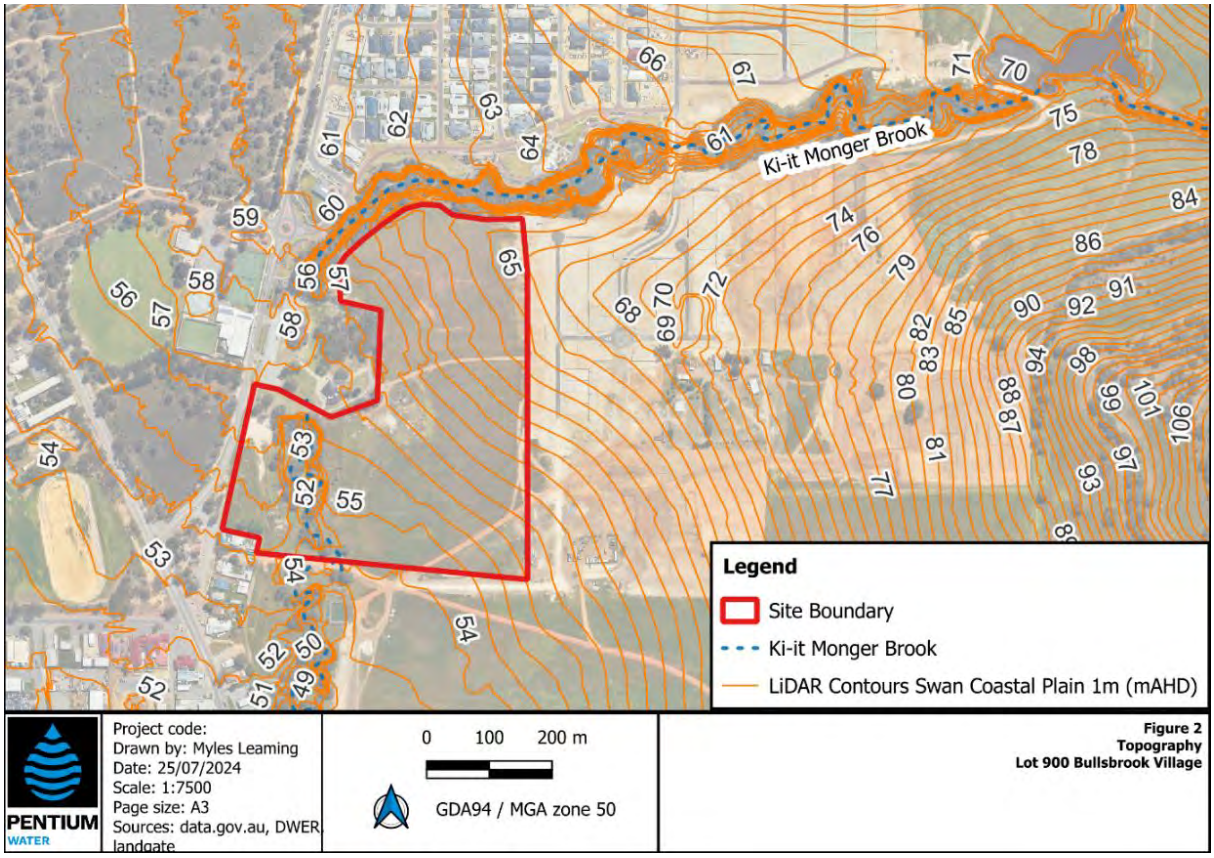

Figure 2: Topographic Map

2.3. Soil and Geology

2.3.1. Land systems

The mapping describes and groups the land with a recurring topography, soil type, and vegetation pattern. The site, according to the soil landscape mapping data published by the Department of Primary Industries and Regional Development (DPIRD), is underlain by two land systems:

- **Forrestfield System (213Fo):** underlying the majority of the site, described as the undulating foot slopes of the Darling and Whicher Scarps. It comprises duplex sandy gravels, pale deep sands and grey deep sandy duplexes. Most of the vegetation consists of woodland of E. Marginata, calophylla and wandoo, and some B. Grandis.
- **Pinjarra System (213Pj):** underlying the site's southwestern corner, described as the Swan Coastal Plain from Perth to Capel. It comprises a poorly drained coastal plain with variable alluvial and aeolian soils. The vegetation is highly variable, but the majority of the vegetation consists of the following tree species jarrah, marri, wandoo, paperbark sheoaks and rudis.

2.3.2. Geological units

The environmental geological map provided in Figure 3 indicates the site is dominated by two surficial geological units (Gozzard 1986):

- **Sandy silt (Msg):** underlying the majority of the site, described as strong brown, firm, friable, dispersive in part, occasional pebbly horizons with little matrix containing quartzite, quartz, granite, laterite, of colluvial origin.
- **Pebbly silt (Mgs1):** underlying the southwestern corner of the site, described as strong brown silt with common fine to occasionally coarse-grained, sub-rounded laterite quartz, heavily weathered granite pebbles, some fine to medium-grained quartz sand, of alluvial origin.

2.3.3. Geotechnical Assessment

Structerre undertook a geotechnical investigation for Lot 900 in 2024. This comprised 17 boreholes to a depth of 2.1m, 15 Dynamic Cone Penetration Tests (DCP) to a depth of 1 m, and 6 permeability tests to a depth of 1 m.

The main results from the investigation include:

- Soil permeability ranging from 0.5 to 3.1 m/day
- Lot 900 generally consist of:
    - Topsoil 0.2 m overlaying Sandy Clay with gravel to the investigated depth of 2.5 m.
    - Pockets of Sand / Gravelly Sand encountered (Bores 8 - 15) to 1.9 m, overlaying the Sandy Clay material to a target depth of 2.5 m.
- Water table not encountered.
- Localised surface ponding and water perching on cohesive soils may occur during periods of rainfall.

The geotechnical investigation conclusions is broadly consistent with the regional surface geology (Figure 3).

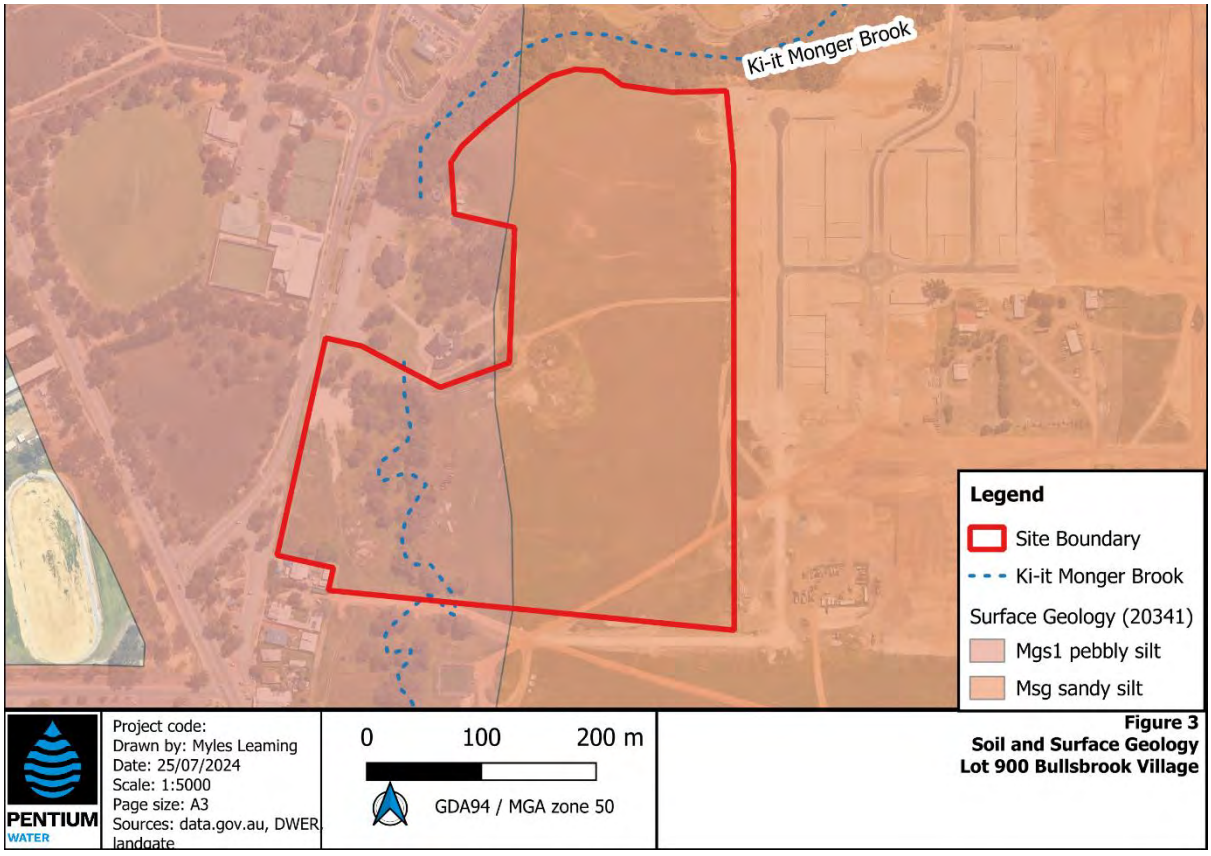

Figure 3: Soil and Surface Geology

2.3.4. Acid Sulphate Soils

Acid Sulphate Soil (ASS) is naturally occurring soil containing iron sulphides, which when oxidised, can lead to acidification of soils and groundwater and, consequently, extensive environmental damage. The entire site has not been assigned a risk of ASS occurring within 3m of the natural soil surface.

2.4. Contaminated sites

A search of the DWER Contaminated Sites database has been undertaken and no recorded contaminated sites were identified within the site boundary.

2.5. Groundwater

Groundwater resource mapping available from the Water Register (DWER 2024) indicates the site is underlain by the following aquifer resources:

- Perth - Superficial Swan aquifer (Swan groundwater area - Bandy Spring subarea)
- Perth - Leederville aquifer (Swan groundwater area - Swan Confined subarea)

The regional groundwater contours show water flowing in westerly direction towards the Ki-it Monger Brook.

2.5.1. Regional groundwater levels

Regional groundwater mapping indicates groundwater flows is in a south-south-westerly direction towards the Ellen Brook, located approximately 2.5 km southwest of the site.

According to the Perth Groundwater Map (Department of Water and Environmental Regulation, 2023), the Gnangara Jandakot Maximum Water Table elevation contours at the site indicate the water table elevations range from approximately 32.75 m AHD in the north to 30.5 m AHD in the south. These elevations correspond to maximum groundwater levels ranging from approximately 23.5 to 34.25 meters below ground level (mbgl) across the site.

2.5.2. Site-specific groundwater levels

The site-specific groundwater levels range from approximately 32 m AHD at the south western boundary to 48 m AHD at the north eastern boundary, corresponding to depths to groundwater between 19 mbgl and 22 mbgl.

Figure 4 shows the groundwater contour mapping across Lot 900.

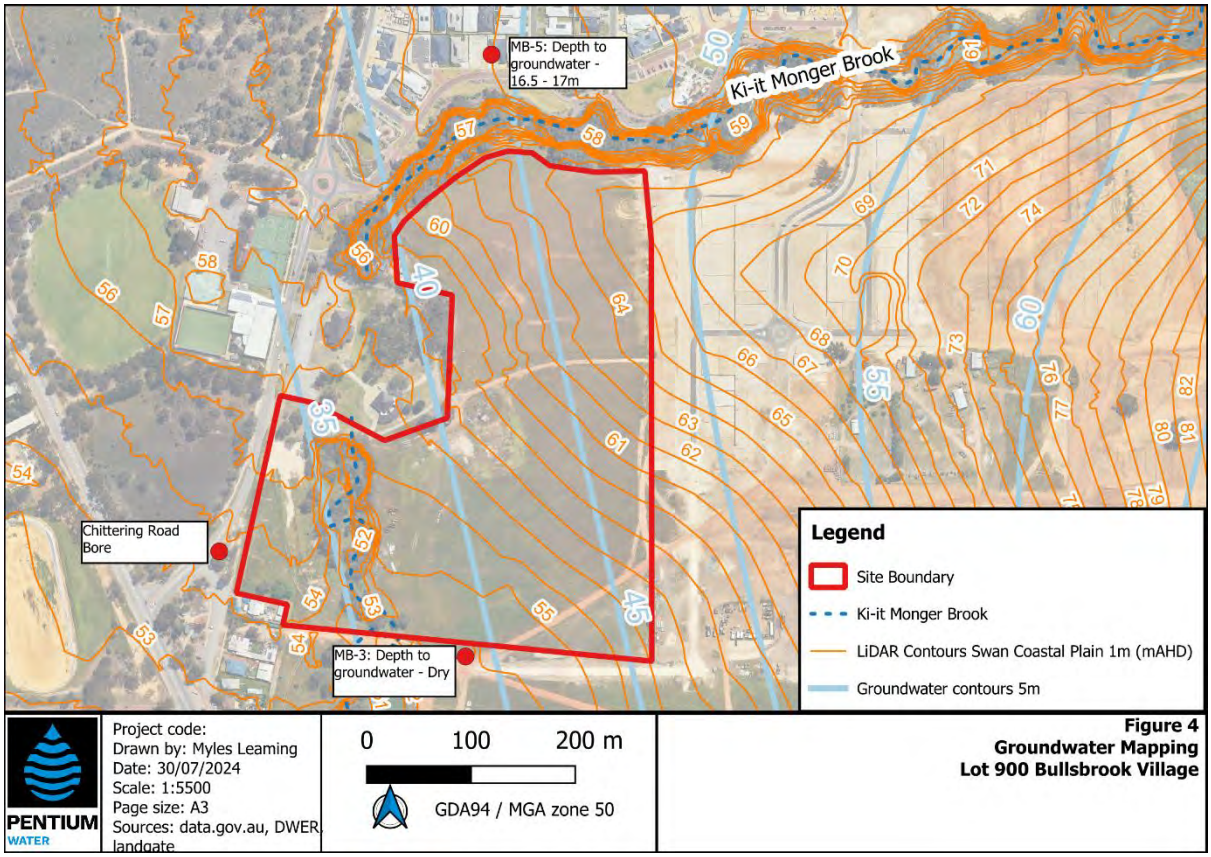

Figure 4: Groundwater Mapping

2.6. Surface Water Hydrology

The main hydrological feature of the site is the Ki-it Monger Brook, which traverses the north boundary of the site and down the west of the site. The seasonal Ki-it Monger Brook water flows towards the south west before crossing via a culvert under the Great Northern Highway.

Historically, the Ki-it Monger Brook has been considerably modified including within Lot 900 the infilling and installation of culverts which restrict flows.

Flood level assessment for the Ki-it Monger Brook modelled 1% Annual Exceedance Probability (AEP) (or 100-year storm event) ranges from approximately 63.06m AHD to 61.15 m AHD within Lot 900. The 1% AEP flows are contained within (or approximately 5 m to 10 m either side) of the brook channel area. The flood event does not extend into adjacent open space areas or the residential development area.

The historical modifications of the Ki-it Monger Brook creek line and the use of the brook and adjacent areas as cattle paddocks have resulted in:

- A cleared creek line with no native understorey and scattered stands of flooded gum trees.
- No significant flora species occur along or in the vicinity of the creek line.
- No Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed species, or WA *Biodiversity Conservation Act 2016* listed species of significance occur within the Ki-it Monger Brook.

2.6.1. Wetlands

Figure 5 provides the geomorphic wetland mapping, which shows the southwest of the site is mapped as Multiple Use Wetland. The presence of Conservation Category Wetland (CCW) and Resource Enhancement Wetland (REW) are also highlighted in Figure 5. However, these mapped wetlands are located outside of Lot 900, separated by Chittering Road. Neither of

these wetlands will be affected by the proposed Bethanie Bullsbrook Village, which is located on the eastern side of the Ki-it Monger Brook.

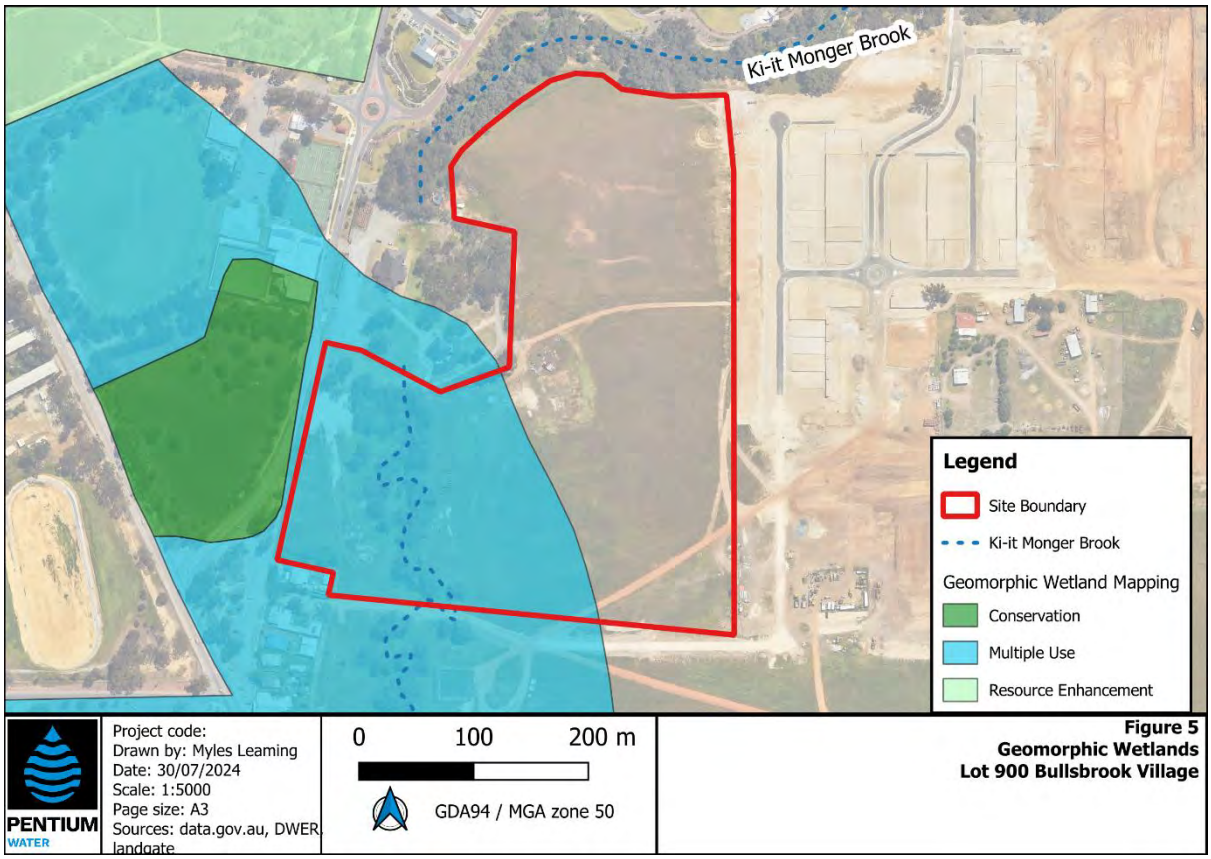

Figure 5: Geomorphic Wetlands

3. Erosion, Sediment & Drainage Risk

The Ki-it Monger Brook is the sole environmental asset within Lot 900. The management actions are focused on the associated village construction phase risks and operation risks to the Ki-it Monger Brook.

An assessment of the erosion risks during the development of the site is outlined below.

3.1. Assessment Methodology

An erosion risk assessment has been undertaken for the site based on the methodology outlined in the *Erosion and Sediment Control Policy and Guidelines for Local Government* (EMRC 2008).

The risk assessment factors outlined in Table 2 were used to determine the total erosion potential (or risk) score, which was primarily driven by construction activities.

The total erosion potential score rankings are based on the following ranges:

- High – 15 to 20 points
- Moderate – 10 – 15 points
- Low – 5 to 10 points

As per the EMRC (2008) guidelines:

- A 'High' score requires careful site-specific planning and a variety of management measures to address the erosion potential at several locations within the site.
- A 'Moderate' score requires site-specific management controls for erosion.
- A 'Low' score may only require a basic level of erosion control.

Table 2: Erosion Risk Assessment Factors and Ratings (EMRC 2008)

Assessment factor	High (four points)	Moderate (two points)	Low (one point)
Slope	1 in 5	1 in 5 – 1 in 10	< 1 in 10
Area of disturbance	>5000 m^2	1000 m^2 – 5000 m^2	< 1000 m^2
Remnant vegetation down slope of development site	Lacking cover	Some shrub and grass cover, 1 – 5 m wide, intermittent	Continuous cover >5 m wide
Distance to drains / watercourses	<50m	50 m – 200 m	>200m
Land capability	High	Moderate	Low

3.2. Erosion Risk Assessment

The site's erosion risk assessment was conducted using the methodology outlined in the *Erosion and Sediment Control Policy and Guidelines for Local Government* (EMRC 2008).

The assessment utilised the risk assessment factors detailed in Table 3 to calculate construction activities' total erosion potential (or risk) score.

As per the EMRC (2008) guidelines:

- A 'High' score will require careful site-specific planning and a variety of management measures to address the erosion potential at several locations within the site.
- A 'Moderate' score will require management controls for erosion.
- A 'Low' score may only require a basic level of erosion control.

Table 3: Erosion Risk Assessment Factors and Ratings for site (EMRC 2008)

Assessment factor	Comments	Risk
Slope	▪ The site slopes roughly 2.2% across the site. ▪ Highest point of 65 m AHD in the north-eastern portion of Lot 900 and the lowest point of 55 m AHD in the south-western corner towards the Ki-it Monger Brook.	Low (1)

Area of disturbance	▪ The Lot is approximately 13.15 ha ▪ Approximately 10 ha will be subject to earthworks, installation of civil infrastructure and associated development works including the construction of internal roads, group house dwellings, community facilities and biofiltration swales. ▪ The open space areas adjacent to the Ki-it Monger Brook will be minimally impacted and will be subject to re-planting, landscaping, walking paths and biofiltration swales.	High (4)
Remnant vegetation down slope of development site	▪ The development area is within a former cattle paddock and is completed cleared of native vegetation. ▪ Scattered alignment of flooded gum trees along the Ki-it Monger Brook creek line are the key environmental assets. These trees will be retained within the brook's foreshore area.	Low (1)
Distance to drains / watercourses	▪ The Ki-it Monger Brook is located approx. 40 m to 100 m from the south west boundary of Lot 900. ▪ The majority of the Bethanie Bullsbrook Village will be at least 50 m from the brook separated by an open space area.	High (4)
Land capability	▪ Geotechnical testing completed by Structerre confirmed areas of near surface Sandy & Clay Sand / Gravelly Sand present across the site. ▪ The near surface clay area presents a construction management risk (i.e., sedimentation source).	High (4)

4. Erosion, Sediment & Drainage Controls

4.1. Aims and Objectives

Based on the risk assessment, the cumulative erosion risk score was 14, which categorises the erosion risk as 'moderate'.

Accordingly, site-specific erosion, sediment and drainage management controls have been defined to manage these risks. The key seasonal risks requiring management applicable throughout the construction phase include:

- Dust control across the summer, particularly during strong easterly winds.
- Stormwater runoff (as associated with sedimentation) during winter rain events.

4.2. Controls

The application of best practice erosion and sediment control is based upon the appropriate integration of:

- **Erosion controls:** are source controls that aim to prevent or limit site erosion and keep topsoil on site (EMRC 2008).
- **Sediment controls:** aim to capture eroded (mobile) sediment, including soil, sand, and dust, and minimise its movement from the site (ERMC 2008).
- **Drainage controls** aim to manage stormwater during the earthworks and construction phase. Drainage controls should be considered a basic component of effective erosion and sediment control (IECA 2008).

The recommended management actions are based on the local topography and geology, seasonal weather conditions, and the Bullsbrook Bethanie Village projected civil engineering construction activities.

Contingency responses relating to the management controls are presented in Table 4.

4.2.1. Planning / Pre-Development of Site

The following controls are recommended before the development of the site.

4.2.1.1. Site Management

- Develop and implementation of an ESDCP (i.e. this document).
- Install required management controls (i.e., sediment and/or dust fencing) before any ground disturbance occurs and other controls as soon as practical (refer to Section 4.2.2).
- The civil contractor will need to plan for additional or contingency measures and/or adjust existing controls to remain effective throughout all stages of the development.

4.2.1.2. Training

- Civil contractor site inductions and training ensure the ESDCP risks and controls are well-understood by all personnel.
- The ESDCP document is to be provided to the civil contractor and kept on-site for the duration of the civil construction program.

4.2.2. Development of Site

The following sections detail the erosion, sediment, and drainage controls to be implemented during the subdivision works.

4.2.2.1. Site Preparation, Earthworks and Construction

- No earthworks will be undertaken until a pre-start meeting and a review of the erosion, sediment, and drainage control measures have been conducted.
- Before earthworks, a sediment fence and/or dust fence will be installed along the boundary of the civil construction area and the Ki-it Monger Brook foreshore. The civil contractor can use a single fence with dual management purposes or two separate fences installed in winter and summer.
- The sediment fence will use geotextile material (or similar) to prevent sediment from passing underneath the fence. The sediment geotextile material will be buried ~ 200 mm

below the surface. Hay bales may be employed as an additional measure with a sediment fence.

- The location of the sediment/dust fencing is shown in Figure 6.
- The Ki-it Monger Brook foreshore area will be approximately demarcated using the fencing.
- Existing flooded gum trees (and associated understorey vegetation) will be preserved within the foreshore reserve. This minimises the erosion risks within the brook.
- No earthworks are required within the foreshore area during the rehabilitation phase of the development. Management of the foreshore area is addressed in the approved Ki-it Monger Brook FMP (RPS 2021).
- Open space areas will be landscaped, and the bioretention swales will be constructed as soon as practicable after earthworks. If there is a delay between clearing/earthworks and landscaping, the area will be hydro mulched to minimise erosion if necessary.
- Site access is to be established and controlled to prevent sediment from being tracked onto roads.

4.2.2.2. Stockpile Management

- Stockpiles must be located a minimum of 30 m from the Ki-it Monger Brook.
- Signs advising construction workers of this requirement will be installed on the temporary fencing installed at the edge of the open space and foreshore reserve.
- The stockpiles are not to be located immediately adjacent to constructed stormwater drains or roads (i.e., ensure the stockpile is not within 2 m of the stormwater inlet pit).
- Stockpiles are to be designed with slopes no greater than 2:1 (horizon : vertical).
- During earthworks, civil contractor personnel will conduct regular visual inspections of the sediment/dust fence line, stockpile areas and any pooled water area(s) to assess need for:
  - Additional erosion controls on stockpiles (e.g. mulch, soil binders, tarps).
  - Additional sediment controls on stockpiles (e.g. installing further sediment fencing around high risk sediment areas).
- The stockpiles will be subject to regular watering to prevent dust during the summer period.

4.2.2.3. Dust Management

- The proposed erosion and sediment controls will also benefit dust management; for example, installing wind fencing will help trap wind-borne dust.
- Dust suppression using water:
  - Water carts
  - Sprinklers
  - Hand-held hoses
- Areas to be targeted for dust suppression include:
  - Haul roads or other trafficked areas
  - Areas of earthworks
  - Stockpiles
- Regular monitoring of the Bureau of Meteorology weather forecasts is recommended to consider predicted conditions that may present an increased risk for potential dust generation on and off-site.
- In extreme weather conditions (hot, dry, and windy—easterly winds in particular), construction activities that generate dust will need to be halted or stopped until the weather conditions subside.
- Any dust complaints will be directed to the Site Manager and recorded. Rectification (dust suppression) will occur as soon as practicable or within 12 hours.

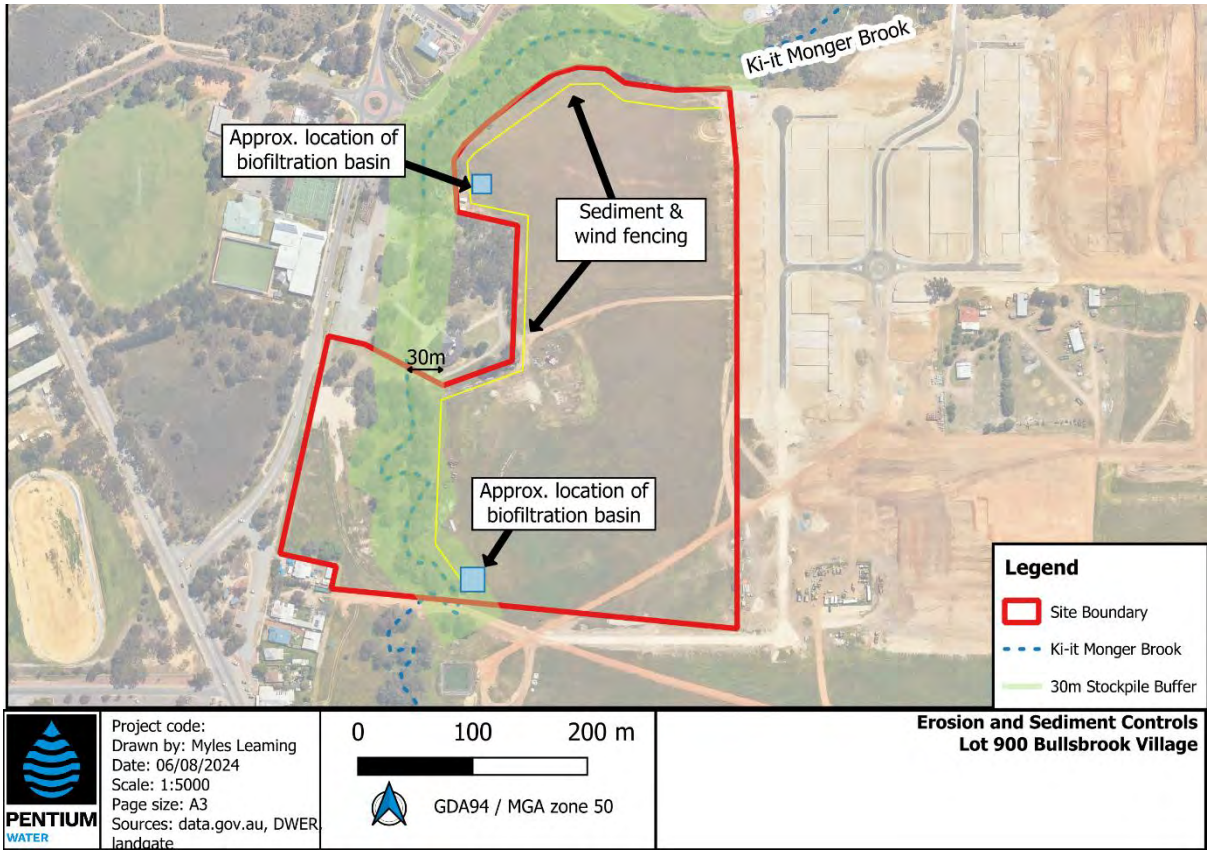

Figure 6: Erosion and Sediment Controls

4.2.2.4. Waste Management

- Establish waste collection areas in fenced compound area. The waste control area must be located as far as practical, or at least 20 m, from the Ki-it Monger foreshore.
- Ensure sufficient materials and equipment are available on-site for site clean-up.
- All fill material placed on site must comprise only natural earth and rock. It must also be free-draining and free of contaminants.
- Site entries and surrounding streets are to be swept at least monthly, and debris removed.
- The frequency of street sweeping events is to be increased if notable sediment is present on the streets and/or at the request of Swan City.

4.2.2.5. Drainage / Stormwater Management

Rainfall events can mobilise sediment. Surface water runoff generated across the site due is unlikely to generate significant volumes. A portion of the surface water runoff will be recharged into the superficial aquifer. In recognition of the surface water runoff and associated sedimentation risk the following actions will be implemented:

- Regularly monitoring the weather forecasts to forecast storm events that present an increased risk for potential stormwater runoff.
- Installation of sedimentation fencing along the Ki-it Monger Brook foreshore area.
- If required, install an additional sedimentation fence adjacent to topsoil/soil stockpile areas.
- If required, install temporary drainage basins within the construction area to control and manage surface flow rates (and sediment) within the site.

The earthwork grades will grade towards stormwater swales/biofiltration basin. The biofiltration basin will be sized and landscaped with native wetland vegetation to manage the stormwater flow rates before discharging into the Ki-it Monger Brook.

5. Monitoring Program

Monitoring undertaken during the civil construction phase of the works identifies the effectiveness of the management controls and if the controls need adjusting to maintain the performance standard which minimise erosion, sediment and drainage risk to the Ki-it Monger Brook.

5.1. Contingencies

In the instance of erosion and sediment runoff, the ESDCP should be reviewed and amended. The guidelines below are recommended to reduce further risk:

- Identify the source: where erosion has occurred, where the sediment is leaving the site.
- Fix the cause of the erosion and /or sediment runoff.
- Check the rest of the site to eliminate or reduce all erosion, sediment and drainage risks.
- Sweep/clean up builder's sand, soil, silt and mud and return it to the site. Do not hose it into the gutter or down the drain.
- Keep stakeholders informed (where relevant).

The monitoring program to be undertaken is outlined in Table 4 and includes reference to monitoring methods, monitoring frequency, triggers for change and remedial actions / contingencies.

Table 4: ESDCP Implementation and Responsibilities

Description of Controls	Monitoring Method	Monitoring Frequency	Trigger for Change	Remedial Actions / Contingency	Responsibility
Site Preparation, Earthworks and Construction					
▪ Ensure no earthworks are undertaken until a pre-start meeting and a review of the ESDCP. ▪ Install a sediment and/or wind fence along the boundary of the Ki-it Monger Brook foreshore area. This fence will remain in place for the subdivision construction activities. ▪ Demarcation (using fencing and signage) to restrict access to the foreshore area. ▪ Preserve existing vegetation within the foreshore reserve. ▪ Minimise time between clearing/earthworks and construction purposes. ▪ Keep cleared areas to a minimum. Disturb only ground where necessary for construction purposes. ▪ Promptly stabilise cleared areas that are not directly subject to earthworks. ▪ Control site access to prevent sediment from being tracked onto roads, both within and outside the site. Limit vehicle movements to existing tracks where possible. ▪ Restrict speed limits on site.	▪ Visual inspections of controls.	▪ Daily – by the contractor. ▪ Quarterly – by Developer during construction.	▪ Breach in the site perimeter sediment fencing. ▪ Signs of uncontrolled access – e.g. vehicle tracks in no-go zones. ▪ Runoff from the site, causing scouring along the foreshore area.	▪ Repair existing or install additional sediment fencing. ▪ Report signs of uncontrolled access. Improve site access management (e.g. fencing, signage) if necessary. ▪ Hay bales (with no seed) or coir logs are to be added along the development side of the sediment fencing.	Civil Contractor.
Stockpile Management					
▪ Locate stockpiles >30m from the Ki-it Monger foreshore.	▪ Visual inspection of controls.	▪ Daily (or after a large storm event).	▪ Stockpile slopes > 2:1 ▪ Waste from stockpile eroding; movement	▪ Repair or install erosion controls as required.	Civil Contractor.

Description of Controls	Monitoring Method	Monitoring Frequency	Trigger for Change	Remedial Actions / Contingency	Responsibility
▪ Ensure stockpiles are not located adjacent to constructed stormwater drains or roads. ▪ Stockpiles are to be designed with slopes no greater than 2:1 (horizontal: vertical). ▪ Water stockpiles regularly ▪ During earthworks, assess the need for: o Stockpile erosion control (e.g. mulch, soil binders, tarps). o Sediment controls on stockpiles (e.g. sediment fencing).		▪ Quarterly – by Developer during construction.	outside of stockpile area.	▪ Additional sediment fencing adjacent to stockpiles.	
Dust Management					
▪ Install sediment and wind fencing to manage dust. ▪ Implement regular street sweeping. ▪ Monitor weather forecasts to anticipate adverse weather events. ▪ Cessation of works in adverse (high wind) weather conditions. ▪ Re-schedule dust-generating activities to avoid adverse weather conditions. ▪ Any dust complaints should be directed to the site manager and recorded. Rectification is to occur as soon as possible (or within 18 hours). ▪ Areas to target for dust suppression: o Haul roads or other trafficked areas o Areas of earthworks	▪ Visual inspection of controls. ▪ Complaint register (dust).	▪ Daily. ▪ Extra monitoring in anticipation of adverse weather.	▪ Dust and sediment clearly visible: airborne or on work surfaces. ▪ Complaints regarding dust emissions received.	▪ Undertake dust monitoring if required. ▪ Additional dust suppression via water carts. ▪ Install additional wind fencing.	Civil Contractor.

Description of Controls	Monitoring Method	Monitoring Frequency	Trigger for Change	Remedial Actions / Contingency	Responsibility
○ Stockpiles ▪ Dust to be suppressed using water, sprayed via: ○ Water carts ○ Sprinklers ○ Hand-held hoses					
Waste Management					
▪ Establish waste collection areas at least 20 m from the Ki-it Monger Brook foreshore area. ▪ Ensure sufficient materials are available for site cleanup. ▪ Regular inspection of waste across site (and appropriate disposal)	▪ Visual inspection of waste areas and rest of site	▪ Daily. ▪ Extra inspections following adverse weather.	▪ Waste collecting outside designated areas or within the foreshore region. ▪ Occurrences of litter.	▪ Collect waste across the site and dispose of it appropriately (off-site). ▪ Additional training to ensure waste is managed effectively.	Civil Contractor.
Drainage / Stormwater Management					
▪ Monitoring of weather forecasts to anticipate adverse wet weather events. ▪ Sediment and wind/dust fencing.	▪ Visual inspection controls. ▪ Monitoring of weather conditions.	▪ Weekly (or after a large storm event).	▪ Evidence of significant water runoff. ▪ Occurrences of sediment deposition (on-site or off-site).	▪ Remove gross pollutants and / or sediments from receptors. ▪ Repair or install additional sediment and wind/dust fencing. ▪ Installation of hay bales of coir logs on the development site of the sediment fence.	Civil Contractor.

5.2. Post-Development Management Roles and Responsibilities

A summary of the post-development roles and responsibilities for implementing the ESDCP is provided in Table 6.

Table 5: Post-development of the ESDCP Roles and Responsibilities

Controls	Description of Controls	Responsibility
Post-Development of Subdivision		
Dust Control	▪ Remove all temporary erosion, sediment and drainage control works before the end of the Contract. ▪ All materials used for the temporary control works should be removed from the site (to the satisfaction of the site Superintendent).	Civil Contractor
On-going drainage management	▪ Regular inspections and maintenance of drainage infrastructure.	Bethanie
On-going landscape management	▪ Regular inspections and maintenance of open space and foreshore areas (i.e. vegetation condition) ▪ Once the development site is established, implement temporary soil and erosion management. E.g. hydro-mulch or soil binding.	Bethanie

6. References

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Appendix A: Development Plan

Proposed Bethanie Bullsbrook Village



PENTIUM
WATER

PRELIMINARY URBAN WATER MANAGEMENT PLAN

Bethanie Bullsbrook Village

Rev 0
05/09/2024



Document status

Version	Purpose of document	Authored by	Reviewed by	Review Date
Rev 0	Final for issue	J. Hollander	D. Williams	05/09/2024

Approval for issue

Name	Signature	Date
Daniel Williams		05/09/2024

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Executive summary

This Preliminary Urban Water Management Plan (UWMP) has been prepared for Bethanie to support the Bethanie Bullsbrook Village (herein referred to as the 'site') development application (DA) submission and approval. The site falls within the City of Swan and is located approximately 35 km northeast of the Perth CBD. The site comprises an area of approximately 10.7 hectares (ha) consisting of a significant portion of Lot 900. The site is proposed to be developed into a 237-dwelling village with associated clubhouse and landscaped areas.

A Local Water Management Strategy (LWMS) was prepared by RPS (RPS, 2018) and approved by DWER to support the Local Structure Plan submission of various lots in Bullsbrook. This Preliminary UWMP has been prepared in accordance with the strategies and commitments discussed in the LWMS. This Preliminary UWMP provides an overview of the site's existing physical and hydrological conditions as well as a drainage design which will be implemented for the development in line with Better Urban Water Management (BUWM) principles (Department of Planning and Infrastructure, 2008). The key design and compliance objectives of the UWMP are summarised in Table 1.

Table 1: Design objectives and strategies

Key LWMS elements	Details
Introduction (Section 1)	Bethanie is seeking development application (DA) approval for a 10.7 ha parcel located in Bullsbrook, within the City of Swan. The site is currently zoned "Residential Development" under the City of Swan Local Planning Scheme No. 17 Map 02. The development of the site is in accordance with the Bullsbrook Local Water Management Strategy (RPS, 2018). The site has been predominantly cleared of vegetation and historically used for semi-rural and agricultural purposes.
Climate (Section 2.2)	The site is characterized by a Mediterranean climate, experiencing an average annual rainfall of 651 mm, with the majority being received between May and September. The site experiences monthly mean maximum temperatures between 17.9 °C and 33.6 °C and monthly mean minimum temperatures between 8.2 °C and 17.6 °C.
Topography (Section 2.3)	Surface elevations within the site range from approximately 67 mAHD at the northeastern boundary to 54 mAHD at the southwestern boundary of the site.
Geology (Section 2.4)	The majority of the site is underlain by the Forrestfield System, with the southwestern corner being underlain by the Pinjarra System. The surface geology of the majority of the site is identified as sandy silt, with the southwestern corner being identified as pebbly silt. Permeability of the natural soils is generally low with permeability across the site ranging from 0.5 m/day to 3.1 m/day. Several geotechnical investigations have been undertaken across the site which generally encountered surficial material overlaying sandy clay. The entire site has not been assigned a risk of acid sulphate soils occurring within 3m of the natural soil surface.
Groundwater (Section 2.7)	The site is underlain by a multi-layered aquifer system; the Perth - Superficial Swan aquifer and the Perth - Leederville aquifer. Groundwater underlying the site generally has a south-south-westerly flow direction towards the Ellen Brook. A groundwater monitoring program has been completed across the development area, which estimated the maximum groundwater level across the site from groundwater level data monitored at locations within and adjacent to the site. The estimated site-specific groundwater levels across the site range from approximately 36 mAHD at the southwestern boundary to approximately 48 mAHD at the northeastern

	boundary, with groundwater separation distances ranging from approximately 18 to 19 mbgl across the site.
Surface hydrology (Section 2.8)	The Ki-it Monger Brook flows east to west, north to south along the northern and western part of the site, respectively, before crossing under the Great Northern Highway. A number of smaller drainage tributaries contribute to the Ki-it Monger Brook. Although the Ki-it Monger Brook has been identified as a "Conservation Area", it has been modified significantly over time, including the construction of dams and installation of culverts on the site which restrict flows, as well as the clearing of riparian vegetation. A site-specific XPSWMM model was used to simulate the flow rates discharging from the site into the Ki-it Monger Brook in existing conditions. This model indicated a total discharge rate from the site into Ki-it Monger Brook of approximately 0.20 m^3/s.
Wetlands (Section 2.9)	A small part of the site is classified as a 'Multiple Use Wetland' (MUW). The nearest 'Conservation Category Wetland' (CCW) is located approximately 150 m to the west of the site.
Non-potable water servicing (Section 3.3)	One existing groundwater license has been issued to landholdings within the site for an allocation of 142,961 kL. Opportunities for securing groundwater resources are currently being investigated, including the potential for this groundwater licence to be used for permanent irrigation purposes across the site, via a connection to the City's irrigation network within the Kingsford development. Alternatively, scheme water could be utilised to satisfy the permanent irrigation water demand.
Water conservation (Section 4)	The use of water efficient fixtures and fittings within households will be promoted to reduce household potable water use. Additionally, waterwise landscaping and gardening principles will be implemented within all landscaped areas across the development area, which include incorporating waterwise native plants to reduce irrigation demand and limiting turf to areas of active recreation.
Stormwater management (Section 5)	The following design criteria are adopted in the drainage strategy and drainage design: ▪ Maintain existing peak flow rates from the site ▪ Manage, retain and/or detain, and treat stormwater run-off from constructed impervious surfaces generated by the first 15 mm of rainfall at-source as much as practical, with no discharge into the Ki-it Monger Brook ▪ Provide adequate conveyance for the critical 20% AEP rainfall event to maintain serviceability of roads and pedestrian areas, allowing for limited discharge into Ki-it Monger Brook at a controlled rate ▪ Provide adequate flood detention storage to maintain existing flow rates downstream of the site The stormwater drainage demonstrates that the land is capable of managing stormwater for all events up to and including the 1% AEP event. Stormwater runoff from constructed impervious surfaces generated by storms up to and including the 1% AEP event will be managed at source as much as practical. Runoff will be collected and conveyed to the northern or southern bioretention basins for larger rainfall events. These basins have been designed to retain, treat, and infiltrate lot and road reserve runoff generated from the first 15 mm of rainfall, as well as from larger events up to and including the 1% AEP storm event, while allowing limited discharge into the Ki-it Monger Brook for larger events in accordance with existing discharge rates. Structural and non-structural controls will be used to improve stormwater quality. The use of native vegetation where possible, minimal fertiliser application, and soil amendment will assist with the management of groundwater and surface water quality. Native vegetation will be maintained in all suitable stormwater management areas to remove nutrient through plant uptake prior to infiltrating to the groundwater.
Groundwater management (Section 6)	Due to the significant clearance to groundwater over the site, the development is not expected to impact on groundwater levels and no active management of groundwater levels (i.e., subsoil drains) is expected to be required. However, if a system of subsoil

	drains is required to control groundwater levels, the Controlled Groundwater Level (CGL) would be set according to DoW Water Resource Considerations when Controlling Groundwater Levels. Underlying groundwater resources will be protected by minimising nutrient export to maintain or improve the quality of groundwater leaving the site through: ▪ encouraging infiltration of stormwater as close to source as possible (e.g., roadside swales) to prevent mobilisation of contaminants to downstream drainage / infiltration areas. ▪ utilising waterwise gardening and landscaping practices to minimise fertiliser use and irrigation. Amended soil with a PRI >10 will be used beneath bioretention areas.

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1. Introduction

1.1. Project background

This Preliminary Urban Water Management Plan (UWMP) has been prepared for Bethanie to support the Bethanie Bullsbrook Village (herein referred to as the 'site') development application (DA) submission and approval. This report describes the site conditions and the proposed integrated water management strategies to be implemented in the proposed development. Preliminary drainage design information is provided herein for the purpose of demonstrating that the proposed development is cognisant of the stormwater management requirements and that adequate site area has been identified for the purpose of stormwater management. However, the ultimate design of stormwater management infrastructure is subject to further detailed civil and landscape design and it is acknowledged that the drainage design will be subject to further assessment and review following DA approval. It is anticipated that an update or addendum to this Preliminary UWMP will be prepared to document the detailed civil, drainage, and landscape design in the future.

The site falls within the City of Swan and is located approximately 35 km northeast of the Perth CBD. The site comprises an area of approximately 10.7 hectares (ha) consisting of a significant portion of Lot 900. The site location and surrounding area are shown on Figure A. The site is proposed for the creation of a 237-dwelling village.

A Local Water Management Strategy (LWMS) was prepared by RPS (RPS, 2018) and approved by DWER to support the Local Structure Plan submission of various lots in Bullsbrook. This Preliminary UWMP has been prepared in accordance with the strategies and commitments discussed in the LWMS. The proposed master plan for the site is illustrated in Appendix A. This Preliminary UWMP provides an overview of the site's existing physical and hydrological conditions as well as a drainage design which will be implemented for the development in line with Better Urban Water Management (BUWM) principles (Department of Planning and Infrastructure, 2008).

1.2. Planning background

The Bethanie Bullsbrook Village area is zoned as "Residential Development" under the City of Swan Local Planning Scheme (LPS) No. 17 Map 02 (Department of Planning, Lands and Heritage, 2022), and "Urban" under the Metropolitan Region Scheme (MRS).

1.3. Design objectives

This UWMP is prepared in accordance with State Planning Policy 2.9: Water Resources (Government of Western Australia, 2007) and has been developed with reference to the following guidance documents:

- Western Australia State Water Plan (Government of Western Australia, 2007)
- Decision Process for Stormwater Management in WA (Department of Water and Environmental Regulation, 2017)
- Urban Water Management Plans: Guidelines for Preparing Plans and for Complying with Subdivision Conditions (Department of Water, 2008)
- Better Urban Water Management (Department of Planning and Infrastructure, 2008)
- Stormwater Management Manual for Western Australia (Department of Water, 2004-2007)
- Liveable Neighbourhoods (Western Australian Planning Commission, 2015b)
- Water resource considerations when controlling groundwater levels in urban development (Department of Water, 2013)
- Specification Separation Distances for Groundwater Controlled Urban Development (IPWEA, 2016)
- Water monitoring guidelines for better urban water management strategies and plans (Department of Water, 2012)

The UWMP details the integrated water management principles and strategies to facilitate future urban water management planning for the site. The UWMP will achieve integrated water management through the following design objectives:

- Effectively manage the risk to human life, property damage and environmental degradation from water contamination, flooding, and waterlogging.
- Maintain and if possible, improve water quality (surface and groundwater) within the development in relation to pre-development water quality.
- Reduce potable water consumption within both public and private spaces using practical and cost-effective measures.
- Implement best management practices in regard to stormwater and groundwater management.
- Incorporate where possible, low maintenance, cost-effective landscaping, and stormwater treatment systems.
- Reduce the use of natural resources (e.g., sand fill) where possible.

1.4. Previous studies

Lot 900 is immediately adjacent to the Kingsford residential development and as such, Lot 900 benefitted from the planning and environmental approvals which underpinned the Kingsford residential development land use re-zoning, local structure plan and management plans. Specifically, a number of on-site investigations and environmental reports have previously been completed for the site to support the proposed land use planning changes. The documents that have been referred to for the preparation of the UMWP include:

- Regional Water Management Strategy - Report for Bullsbrook Townsite Area (GHD, 2012)
- District Water Management Strategy - Bullsbrook Landholding (RPS, 2016)
- Local Water Management Strategy - Bullsbrook Landholding (RPS, 2018)
- Ki-it Monger Brook Foreshore Management Plan - Bullsbrook Landholding (RPS, 2017)
- Geotechnical Investigation - Proposed Bethanie Bullsbrook Village and Vehicle Bridge (Structerre Consulting Engineers, 2024)

2. Existing environment

2.1. Site location and existing land use

The site is located in the suburb of Bullsbrook, within the City of Swan, approximately 35 km northeast of Perth CBD. The site has been predominantly cleared of vegetation and historically used for semi-rural and agricultural purposes. The site is bound by:

- north: Ki-it Monger Brook is located directly north of the site, with residential land use located further north.
- east: residential land use, part of which is associated with the Kingsford development, is located directly east of the site.
- south: semi-rural land use is located to the south of the site.
- west: an Aboriginal Heritage site is located to the west of the site, which includes the Sacri church.

2.2. Climate

The site experiences a Mediterranean climate with cool, wet winters and hot, dry summers. Peak rainfall periods are usually between May and September. The nearest Bureau of Meteorology (BoM) weather station to the site is the Pearce RAAF weather station (Station Number 009053), located approximately 1.5 km from the site. Based on the rainfall data collected from 1937 to 2024 at this station, the local area experiences an average of 651 mm rainfall annually (Bureau of Meteorlogy, 2024).

Other climate data has also been taken from the Pearce RAAF station. Based on climate data collected from 1937 to 2024, the local area experiences monthly mean maximum temperatures between 17.9 °C and 33.6 °C and monthly mean minimum temperatures between 8.2 °C and 17.6 °C (Bureau of Meteorlogy, 2024). The monthly mean climatic data for rainfall and temperature is summarised in Table 2 below.

Evaporation data estimated from The Department of Agriculture and Food (Luke, Burke, & O'Brien, 1987) indicates that evaporation generally exceeds rainfall annually at the site. On average there are three months of the year (June to August) where the rainfall exceeds the evaporation.

Table 2: BoM monthly temperature, rainfall, and evaporation

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean rainfall	9.9	12.8	16.3	33.6	82.4	129.5	134.0	105.6	67.6	36.6	22.0	10.5	651.2
Mean max temp	33.6	33.4	30.6	26.5	22.1	19.1	17.9	18.5	20.2	23.6	27.4	30.7	25.3
Mean min temp	17.0	17.6	16.1	13.3	10.7	9.3	8.4	8.2	8.8	10.2	12.6	14.7	12.2
Mean evaporation	297	257	224	123	87	59	60	69	106	154	203	259	1,898

2.3. Topography

The regional topographic contours show that the site has a gradient from northeast to southwest. Elevations across the site range from approximately 67 m Australian Height Datum (mAHD) at the northeastern boundary to 54 mAHD at the southwestern boundary of the site. The Ki-it Monger Brook to the north of the site has elevations between approximately 56 mAHD and 63 mAHD. Regional topographic contours are presented in Figure B.

2.4. Geology

2.4.1. Land systems

Regional land systems have previously been mapped over the site and surrounding area. The mapping describes and groups the land with a recurring pattern on topography, soil type, and vegetation. Land systems mapping provides an indication of variability of the soils present over the survey area. According to the Soil Landscape Mapping data published by the Department of Primary Industries and Regional Development, the site is underlain by two land systems:

Forrestfield System (213Fo): underlying the majority of the site, described as the undulating foot slopes of the Darling and Whicher Scarps. It consists of duplex sandy gravels, pale deep sands and grey deep sandy duplexes. The majority of the vegetation consists of woodland of E. Marginata, calophylla and wandoo, and some B. Grandis.

Pinjarra System (213Pj): underlying the southwestern corner of the site, described as the Swan Coastal Plain from Perth to Capel. It consists of a poorly drained coastal plain with variable alluvial and aeolian soils. The vegetation is highly variable, but the majority of the vegetation consists of jarrah, marri, wandoo, paperbark sheoaks and rudis.

2.4.2. Surface geology units

Environmental geological mapping (Gozzard, 1986) is provided in Figure C and indicates the site is dominated by two surficial geological units:

Sandy silt (Msg): underlying the majority of the site, described as strong brown, firm, friable, dispersive in part, occasional pebbly horizons with little matrix containing quartzite, quartz, granite, laterite, of colluvial origin

Pebbly silt (Mgs1): underlying the southwestern corner of the site, described as strong brown, silt with common fine to occasionally coarse grained, sub-rounded laterite quartz, heavily weathered granite pebbles, some fine to medium-grained quartz sand, of alluvial origin.

2.4.3. Site investigations

A geotechnical investigation was undertaken by Structerre in 2024 (Structerre Consulting Engineers, 2024) to carry out soil testing and to provide advice on site preparation works. The investigation included 17 sample retrieval boreholes to a refusal depth of 2.1 m over the site for material assessment and soil profiling, 15 dynamic cone penetration tests to a maximum depth of 1.0 m or refusal for measurement of the strength and compressibility of the upper soil layers, and 6 in-situ percolation tests to determine the permeability of the materials within the upper 1.0 m. The main results from the Structerre investigation include:

- The subsurface soil profile generally consisted of topsoil surficial material to a maximum depth of 2.0 m overlaying sandy clay with gravel.
- Soil permeability across the entire investigation area ranged from 0.5 m/day to 3.1 m/day. As such, the existing ground conditions are not suitable for on-site disposal of stormwater runoff using shallow soakwells.

The geotechnical report prepared by Structerre is included as Appendix B.

2.4.4. Acid Sulphate Soils

Acid Sulphate Soil (ASS) is naturally occurring soil containing iron sulphides, which when oxidised, can lead to acidification of soils and groundwater and, consequently, extensive environmental damage. Department of Water and Environmental Regulation (DWER) broad-scale Acid Sulphate Soil (ASS) risk mapping is based on surface geology mapping and provides a broad-scale indication of the risk of occurrence of ASS. The entire site has not been assigned a risk of acid sulphate soils occurring within 3m of the natural soil surface.

2.5. Contaminated sites

A search of the DWER Contaminated Sites database has been undertaken and no recorded contaminated sites were identified within the site boundary. A contaminated area (Lot 1 on Diagram 9938) has been identified approximately 200m southwest of the site. This area is

classified as “remediated for restricted use” due to the presence of hydrocarbon-impacted soils beneath the building and forecourt area of a former service station. However, given the flow direction of groundwater according to regional groundwater mapping, this contaminated area is not anticipated to negatively impact the site.

2.6. Public Drinking Water Source Areas

The Perth Groundwater Map (Department of Water and Environmental Regulation, 2023) indicates the site is not located within a Public Drinking Water Source Protection Area (PDWSA). The nearest PDWSA is the P1 Gnangara Underground Water Pollution Control Area located approximately 8 km to the west of the site. No well head protection zones were identified on-site or within the immediate site surrounds.

Priority 1 areas are usually assigned over crown land covered with native vegetation and are managed to avoid water quality risks. These areas are defined to ensure that there is no degradation of the drinking water source through the principle of risk avoidance.

2.7. Groundwater

2.7.1. Aquifers

Groundwater resource mapping available from the DoW Water Register (Department of Water and Environmental Regulation, 2022) indicates that the site is underlain by a multi-layered aquifer system comprising the following resources:

- Perth - Superficial Swan aquifer (Swan groundwater area - Bandy Spring subarea)
- Perth - Leederville aquifer (Swan groundwater area - Swan Confined subarea)

2.7.2. Groundwater levels

2.7.2.1. Regional groundwater levels

Although the Gnangara Jandakot Maximum Water Table contours do not fully extent into the site, regional groundwater mapping by DWER still provides an indication of the groundwater flows across the site; groundwater flows in a south-south-westerly direction towards the Ellen Brook, located approximately 2.5 km southwest of the site. According to the Perth Groundwater Map (Department of Water and Environmental Regulation, 2023), the Gnangara Jandakot Maximum Water Table elevation contours at the site indicate the water table elevations range from approximately 32.75 mAHD in the north to 30.5 mAHD in the south. These elevations correspond to maximum groundwater levels ranging from approximately 23.5 to 34.25 m below ground level (mbgl) across the site.

2.7.2.2. Site-specific groundwater levels

As part of the hydrogeological assessment undertaken by RPS and documented in the Local Water Management Strategy for the Kingsford Estate, six monitoring bores (MB1 - MB6) were installed across the entire LSP area and groundwater levels were measured from these bores, as well as from three existing bores (MW1 - MW3) in September 2015, October 2015, and November 2016. Groundwater levels monitored from all bores ranged from 30.49 mAHD to 77.89 mAHD. Although none of the monitoring bores are located within the subject site, bores MB3 and MB5 are located within 150 m of the site.

2.7.2.3. Groundwater contours

Groundwater contours were generated by RPS from the October 2015 monitoring event for the entire LSP area, ranging from approximately 75 mAHD to 30 mAHD, as illustrated by Figure D. The site-specific groundwater levels across the site range from approximately 36 mAHD at the southwestern boundary to 48 mAHD at the northeastern boundary, with depths to groundwater ranging between 18 mbgl and 19 mbgl.

Due to the significant depth to groundwater over the majority of the site, a complete 18-month groundwater monitoring program covering two winter peaks has not been undertaken.

2.7.3. Groundwater quality

Groundwater quality sampling within the Bullsbrook Landholdings Local Structure Plan area was undertaken by RPS (RPS, 2016) on two occasions. These monitoring efforts included the collection of groundwater samples from several groundwater bores in the entire LSP area, one of which (MB5) in close proximity to the subject site. All samples were sent to a NATA accredited laboratory to be analysed for a suite of nutrients. Physico-chemical parameters were also measured in the field as part of the monitoring events.

The average results for the measured bores by RPS and the relevant guidelines for wetlands in southwest Western Australia (ANZECC, 2000) and for the Swan Canning Water Quality Improvement Plan (SCWIP) (Swan River Trust, 2009) targets for total nitrogen (TN) and total phosphorous (TP) are summarised in Table 3, with the monitoring locations shown in Figure E.

Table 3: Summary of average groundwater quality monitoring results (RPS, 2016)

Bore	Physic-chemical			Nutrients					
	Temp (°C)	pH	EC (µS/cm)	TN (mg/L)	TKN (mg/L)	NH_4-N (mg/L)	NO_x-N (mg/L)	TP (mg/L)	FRP (mg/L)
ANZECC FWG 2000	-	7 - 8.5	-	1.50	-	0.040	0.10	0.06	0.03
SCWIP 2009	-	-	-	1.00	-	-	-	0.10	-
MB1	21.9	6.30	1705	1.75	1.75	0.02	0.03	8.58	0.01
MB2	22.1	5.50	1365	0.83	0.73	0.02	0.09	3.74	0.02
MB3	-	-	-	-	-	-	-	-	-
MB4	-	-	-	-	-	-	-	-	-
MB5	27.1	6.68	1556	-	-	-	-	-	-
MB6	19.9	6.02	1174	1.60	1.55	0.04	0.09	3.10	0.03
MW1	19.2	5.50	582	3.70	0.95	0.02	2.75	0.52	0.01
MW2	22.7	4.68	153	5.60	0.75	0.02	4.83	0.16	0.01
MW3	23.9	5.16	890	1.45	1.25	0.03	0.22	0.96	0.04
Mean	21.6	5.53	969	2.49	1.16	0.02	1.33	2.84	0.02

Note: Orange and yellow shading indicates guideline exceedance. Results below the limit of reporting (LOR) have been assigned half the LOR for the calculation of the mean. Bores MB3 & MB4 were dry during all monitoring events, bore MB5 was either dry or had insufficient water to sample.

The groundwater quality data reflects the historical agricultural land uses within the catchment and the elevated nutrient concentrations that would be expected to occur as a result. The groundwater was generally found to be acidic (average pH of 5.53), with all of the monitoring events registering pH levels outside of the ANZECC freshwater guidelines range. The salinity (measured as electrical conductivity) was generally found to be marginally brackish (average EC of 969 µS/cm), although slightly elevated salinity values (up to EC of 1766 µS/cm) were monitored as well. Moderately elevated nutrient concentrations were observed across the site, with total nitrogen (TN) concentrations exceeding both ANZECC freshwater guidelines as well as SCWIP targets on most occasions. Total phosphorous (TP) concentrations exceeded ANZECC guidelines and SCWIP targets at all locations, and NO_x-N concentrations were generally found to be exceeding ANZECC freshwater guidelines values at the eastern part of the LSP area.

2.8. Surface hydrology

The site falls within the subarea of the Ellen Brook, with the Ellen Brook located approximately 2.5 km to the west of the site. The Ki-it Monger Brook flows east to west, north to south along the northern and western part of the site, respectively, before crossing

under the Great Northern Highway. The confluence of Ki-it Monger Brook with Ellen Brook occurs approximately 2.5 km to the southwest of the site.

The pre-development hydrological regime is likely to consist of infiltration through the sandy surface soils followed by runoff generated during more intense or longer precipitation events when the infiltration capacity of the soils is exceeded. Runoff will flow with the grade of the site towards the Ki-it Monger Brook to the west or southwest.

2.8.1. Ki-it Monger Brook

The Ki-it Monger Brook has an approximate catchment area of 5.2 km^2 upstream of the Great Northern Highway (RPS, 2013). A number of smaller drainage tributaries contribute to the Ki-it Monger Brook. Although the Ki-it Monger Brook has been identified as a "Conservation Area" within previous foreshore management planning undertaken to support Local Structure Planning, the watercourse has been modified significantly over time, including the construction of dams and installation of culverts on the site which restrict flows, as well as the clearing of riparian vegetation. The pre-development surface water features are illustrated in Figure 1.



Figure 1: Pre-development surface water features and flood extent

RPS has undertaken a flood level assessment for the Ki-it Monger Brook as part of the previous water management reporting stages for the project. The modelled 1% AEP flood level of the Ki-it Monger Brook ranges between approximately 57.79 and 59.1 mAHD (northeastern corner of the site) and 53.6 m AHD (southwestern corner of the site) and is illustrated in Figure 1. The 1% AEP flows are contained within the brook channel which is deeply incised adjacent to and within the site and do not impact on overbank areas where development is to occur. A biophysical assessment of the Ki-it Monger Brook was completed during the Structure Plan process to define a suitable foreshore area for the brook.

2.8.2. Pre-development discharge rates

RPS completed flood modelling for the Ki-it Monger Brook which included developing a hydrological and hydraulic model in the XPSWMM modelling package. The modelling incorporated surveyed cross sections and invert levels of the Ki-it Monger Brook watercourse

along with inverts and dimensions of all culverts. It was determined that the 1% AEP flood event is generally contained within the well-defined and deeply incised channel of the brook. However, both modelling exercises indicated that surcharge of floodwaters above the top of the banks of the brook may occur at the upstream end of the culvert west of the site during the critical 1% AEP flood event (RPS, 2018).

A key output of the pre-development modelling is the peak flow rates within the Ki-it Monger Brook which are to be maintained by the post-development drainage design. The modelling determined the critical design storm is the 6-hour rainfall event and that the peak 1% AEP pre-development flow rate at the discharge point from the site beneath Great Northern Highway is 12 m^3/s (RPS, 2018).

Additionally, site-specific hydrological (rainfall-runoff) modelling was undertaken by Pentium Water in XPSWMM, to simulate the flow rates discharging from the subject site into the Ki-it Monger Brook in existing conditions. This model indicated a total discharge rate from the site into Ki-it Monger Brook of approximately 0.20 m^3/s in the 1% AEP event.

2.8.3. Surface water quality

There are no surface water quality monitoring sites located within the site boundary recorded in the DWER Water Information Reporting database. Two DWER monitoring sites are located west of the site, however, these have minimal water quality readings. The average conductivity at these sites was recorded between values of 2,590 µS/cm and 1,014 µS/cm.

A surface water monitoring program was undertaken for the Ki-it Monger Brook by RPS (RPS, 2018), which consisted of four surface water monitoring sites in close proximity to the subject site; one at the major dam on the Ki-it Monger Brook (SW-1), one at the brook further downstream (west) of the dam (SW-2), another at the brook further upstream (SW-3), and the last one south of the subject site (SW-4). These sites were sampled between November 2016 and October 2018. All samples were sent to a NATA accredited laboratory to be analysed for a suite of nutrients. Physico-chemical parameters were also measured in the field as part of the monitoring events.

The average results for the measured bores by RPS and the relevant guidelines for wetlands in southwest Western Australia (ANZECC, 2000) and for the Swan Canning Water Quality Improvement Plan (SCWIP) (Swan River Trust, 2009) targets for total nitrogen (TN) and total phosphorous (TP) are summarised in Table 4, with the monitoring locations shown in Figure E.

Table 4: Summary of average surface water quality monitoring results (RPS, 2016)

Bore	Physic-chemical			Nutrients					
	Temp (°C)	pH	EC (µS/cm)	TN (mg/L)	TKN (mg/L)	NH_4-N (mg/L)	NO_x-N (mg/L)	TP (mg/L)	FRP (mg/L)
ANZECC FWG 2000	-	7 - 8.5	-	1.50	-	0.040	0.10	0.06	0.03
SCWIP 2009	-	-	-	1.00	-	-	-	0.10	-
SW-1	24.6	7.77	2197	0.93	0.70	0.02	0.38	0.05	0.01
SW-2	32.3	7.47	2310	0.83	1.00	0.02	0.23	0.04	0.01
SW-3	-	-	-	0.80	-	0.05	0.29	0.03	0.01
SW-4	-	-	-	1.25	-	0.03	0.69	0.04	0.01
Mean	28.5	7.62	2254	0.94	0.85	0.03	0.40	0.04	0.01

Note: Orange and yellow shading indicates guideline exceedance. Results below the limit of reporting (LOR) have been assigned half the LOR for the calculation of the mean.

The surface water quality was generally found to be consistent across the area. The salinity (measured in electrical conductivity) was generally found to be saline (average EC of 2254 µS/cm) (NHMRC & NRMMC, 2011), and the average pH was measured at 7.62. The majority of

nutrient concentrations were found to be within ANZECC freshwater guidelines and SCWIP targets, however, elevated concentrations of NO_X-N were found at all surface water monitoring locations.

2.9. Wetlands and GDEs

The Department of Biodiversity Conservation and Attractions (Department of Biodiversity, Conservation and Attractions, 2018) *Swan Coastal Plain Geomorphic Wetland Mapping* has identified several wetlands within and around the site. The wetland mapped partially within the site (UFI 15282) is classified as 'Multiple Use Wetland' (MUW). Several wetlands have been identified in close proximity to the site, consisting of several 'Conservation Category Wetlands' (CCW) to the west and southwest. The nearest CCW (UFI 15143) is located approximately 150 m to the west of the site. The mapped geomorphic wetlands within and in close proximity to the site are presented in Figure F.

2.10. Sewage Sensitive Areas

Sewage Sensitive Areas (SSAs) are proclaimed under the *Government Sewerage Policy* (GSP) (Department of Planning, Lands and Heritage, 2019) to protect groundwater and surface water systems. A review of the GSP online data set (Geoscience Australia, 2023) maps the entire site as an estuary catchment on the Swan and Scott Coastal Plains as well as being within 1 km of significant wetlands.

2.11. Bush Forever

Bush Forever areas are locally significant natural areas that require conservation. There are no Bush Forever sites located within the proposed development boundary, however, several Bush Forever sites are located within 1 km of the site; the nearest of which is Bush Forever site No. 89 located approximately 150 m west of the site.

2.12. Heritage

2.12.1. Aboriginal Heritage

A search of the Department of Planning Lands and Heritage (DPLH) Aboriginal Heritage Inquiry System (AHIS) database identified three registered aboriginal heritage sites directly within the development area or its immediate surroundings (at a distance <1 km); the Ellen Brook Upper Swan, the Ki-it Monger Brook 2, and Bullya Spring (associated with the Sacri church).

2.13. Summary of constraints and opportunities from the existing environment

The previous sections have identified the following key constraints and opportunities for development at the site in regard to the current existing environment:

- Surface elevations across the site range from approximately 67 m Australian Height Datum (mAHD) at the northeastern boundary to 54 mAHD at the southwestern boundary of the site.
- Groundwater underlying the site generally has a south-south-westerly flow direction towards the Ellen Brook. The estimated site-specific groundwater levels across the site range from approximately 36 mAHD at the southwestern boundary to approximately 48 mAHD at the northeastern boundary, with groundwater separation distances ranging from approximately 18 to 19 metres below ground level across the site.
- The majority of the site is underlain by the Forrestfield System, with the southwestern corner being underlain by the Pinjarra System. The surface geology of the majority of the site is identified as sandy silt, with the southwestern corner being identified as pebbly silt. Permeability of the natural soils is generally low with permeability across the site ranging from 0.5 m/day to 3.1 m/day.
- The entire site has not been assigned a risk of acid sulphate soils occurring within 3m of the natural soil surface.

- The Ki-it Monger Brook flows east to west, north to south along the northern and western part of the site, respectively, before crossing under the Great Northern Highway. The brook has been modified including installation of culverts at several locations (including adjacent to the subject site).
- Hydrological modelling has been undertaken to estimate flow rates discharging from the site into the Ki-it Monger Brook in existing conditions. This model indicated a total discharge rate from the site into Ki-it Monger Brook of approximately 0.20 m^3/s in the 1% AEP event.
- A small part of the site is classified as a 'Multiple Use Wetland' (MUW). The nearest 'Conservation Category Wetland' (CCW) is located approximately 150 m to the west of the site.
- The site has been predominantly cleared of vegetation and historically used for semi-rural and agricultural purposes.

3. Water servicing

The water servicing and sewer reticulation servicing have been designed by Cossill & Webley (Cossill & Webley, 2024), the details of which are summarised below with the full report available as Appendix C.

3.1. Potable water supply

Potable water supply for the site will be via a connection to the existing Water Corporation water supply scheme. It is anticipated that the water supply will come from a DN300 water distribution watermain in Chittering Road/Tigermoth Blvd to the west with a single property connection to the site. (Cossill & Webley, 2024).

3.2. Wastewater servicing

Wastewater servicing for the site is proposed to be realised through a connection to the existing Water Corporation sewerage network. Sewer reticulation from the site will discharge to the gravity sewer in Tigermoth Blvd, which has been designed to capture the overall sewer from the site (Cossill & Webley, 2024).

3.3. Non-potable water supply - Irrigation

An estimate of the permanent irrigation demand for the site is provided in Table 5 below, based on the landscape concept plan (Appendix D). Based on a typical irrigation rate of 6,750 kL/ha/yr, the irrigation water demand for the site equates to approximately 5,800 kL/yr.

Table 5: Irrigation water demand

Area	Irrigated area (ha)	Irrigation rate (kL/ha/yr)	Total water demand (kL/yr)
Turf	0.43	6,750	2,903
Feature planting	0.43	6,750	2,903
Total	1,538		5,806

3.3.1. Groundwater licences

There has been one groundwater licence issued to landholdings within the site, as summarised in Table 6 (Department of Water and Environmental Regulation, 2022).

Opportunities for securing groundwater resources are currently being investigated, including the potential for this groundwater licence to be used for permanent irrigation purposes across the site, via a connection to the City's irrigation network within the Kingsford development. Alternatively, scheme water could be utilised to satisfy the permanent irrigation water demand. It is anticipated that an update to this Preliminary UWMP will be prepared to document the detailed long-term irrigation demand and water source.

Table 6: Summary of existing groundwater licence holders

Licence number	Adress	Parties	Aquifer	Volume (kL/yr)
177269	Lot 3 on Diagram 61059, Lot 834 on Plan 246328, Lot 1165 on Plan 246222, et al.	City of Swan	Perth - Superficial Swan	142,961

4. Water conservation

Conservation of water through fit-for-purpose use and best management practices is encouraged to minimize the waste of water. Fit-for-purpose describes the use of water that is of a quality suitable for the required use of the water. Fit-for-purpose principles have been utilised in the water conservation strategy for the site.

4.1. Proposed strategy

The State Water Plan (Government of Western Australia, 2007) is a strategic policy and planning framework to meet the state's water demands to the year 2030. One of the key targets is to reduce scheme water consumption to 40 kL - 60 kL per person per year. Water conservation measures will be adopted to create a "Waterwise" development and minimise water-servicing requirements. The water conservation strategy will aim to reduce water demand through incorporating a variety of effective initiatives, which are described in more detail below. Furthermore, the development will comply with the following objectives:

- No potable water should be used outside the homes and buildings and achieve efficient use of scheme water, where alternative water sources are available.
- Waterwise landscaping techniques should be employed, and irrigation should be restricted during the day.

Methods that will be utilised to achieve these criteria include:

- Water efficient fixtures and fittings (WEFA) installed in households
- Waterwise landscaping design incorporating waterwise native plants to reduce irrigation demand and limiting turf to areas of active recreation

4.1.1. Household water conservation

The Building Code of Australia sets minimum standards of efficiency for water using fixtures and fittings in homes. These include:

- All tap fittings, except bath outlets, garden taps and toilets must be a minimum 4-star WELS rated.
- All showerheads must be a minimum of 3-star WELS rated.
- An outdoor private swimming pool or spa associated with a Class 1 building must be supplied with a cover or blanket.
- All internal hot water outlets (such as taps, showers and washing machine water supply fittings) must be connected to a hot water system or a recirculating hot water system with pipes installed and insulated in accordance with AS/NZS 3500.
- Lot owners will be encouraged to install grey water systems for the irrigation of individual household landscaping.
- Lot owners will also be encouraged to install rainwater tanks. Rainwater tanks can be connected to water using fixtures such as toilets, washing machines and external taps to reduce potable water demand as well as assisting in reducing stormwater run-off.

4.1.2. Waterwise landscaping

The landscape treatments for the site will include a variety of passive and recreational areas. Additionally, the landscaping design will incorporate a number of measures to minimise the long-term irrigation requirement and create a waterwise urban development. These will include but are not limited to:

- Minimising areas of turf and selecting turf species endorsed by the UWA Turf Industries Research Steering Committee.
- Improving soil with conditioner certified to Australian Standard AS4454 to a minimum depth of 150 mm where turf is to be planted and a minimum depth of 300 mm for garden beds.
- Designing and installing the irrigation systems according to best water efficient practices:
  - Control systems must be able to irrigate different zones with different irrigation rates.
  - Emitters must disperse coarse droplets or be subterranean.
  - Utilise subsoil irrigation where appropriate.

- Mulching garden beds to 75 mm with a product certified by Australian Standard AS4454.
- Minimising the use of fertiliser pesticides and utilizing slow-release fertilizers.
- Hydro zoning irrigation to optimise water usage across different planting zones.
- Utilising planting sections for drainage and rain garden areas in accordance with *Vegetation Guidelines for Stormwater Biofilters in the South-West of Western Australia* (Monash University, 2014).

Waterwise landscaping and gardening principles will be implemented within all landscaped areas across the site. Additionally, low to no water requirement native vegetation is proposed to be used in most areas.

5. Stormwater management

5.1. Design criteria and objectives

The objectives and preliminary design criteria that will be used to guide the stormwater management strategy for this site were identified in the DWMS (RPS, 2016) and the LWMS (RPS, 2018) as well as relevant state policies and guidelines.

The objective for stormwater management at the site will be to effectively manage runoff generated from small, minor, and major events. The key principles for stormwater management at the site are to safely convey and contain runoff from major events to provide flood protection to infrastructure and people, and to promote opportunities for capture and infiltration close-to-source of runoff from first flush and small rainfall events. The engineering and drainage design will seek to implement water sensitive urban design (WSUD) principles and best management practices where possible. The key design criteria for the site are summarised below and have been established in accordance with the design objectives outlined in Section 1.3.

5.1.1. Design criteria

5.1.1.1. Small / common events (1 EY - one hour event)

The following criteria are adopted for the management of small rainfall events, defined as the one hour - one exceedance per year (one hour - 1 EY) rainfall event:

- Maintain the pre-development hydrological regime by encouraging infiltration close-to-source.
- Manage, retain and/or detain, and treat (if required) stormwater run-off from constructed impervious surfaces generated by the first 15 mm of rainfall at-source as much as practical.

5.1.1.2. Minor events (20% AEP)

- Provide stormwater conveyance system capacity for the critical 20% AEP event to maintain serviceability of roads and pedestrian areas.

5.1.1.3. Major events (1% AEP)

- Provide adequate flood detention storage to maintain pre-development flow rates downstream of the site.
- Habitable floor levels to be at least 0.3 m above the 1% AEP flood level of the urban drainage system and road reserve.
- Habitable floor levels at least 0.5 m above the 1% AEP flood level of major systems to protect people and property from flooding.

5.2. Drainage strategy

The stormwater drainage strategy of the development is consistent with the strategy set out in the LWMS (RPS, 2018) which involves retaining and infiltrating stormwater runoff generated by the first 15 mm of rainfall at source as much as practical, and detaining stormwater generated by larger rainfall events up to and including the 1% AEP event on-site, while allowing limited discharge into the Ki-it Monger Brook for larger events in accordance with existing discharge rates.

The preliminary drainage design comprises two stormwater catchments: a smaller catchment in the north and a larger catchment in the south. Each catchment incorporates a vegetated drainage basin (or basins) within landscaped areas to retain, treat, and infiltrate road reserve runoff generated from the first 15 mm of rainfall, as well as detain larger events up to and including the 1% AEP storm event with controlled discharge into the Ki-it Monger Brook in accordance with existing discharge rates.

5.3. Drainage design

Drainage calculations were undertaken to inform the drainage strategy and the proposed development layout. The calculations were used to simulate post-development drainage

design for the purpose of determining preliminary design dimensions of the drainage basins. The calculations demonstrated that the site allocates adequate land for all basins. It should be noted that the following assumptions have been applied:

- The basins are designed to contain the 1% AEP event on-site, inclusive of limited discharge into the Ki-it Monger Brook at a controlled rate for larger rainfall events.
    - the total permissible discharge for both catchments into the Ki-it Monger Brook is assumed to be 0.2 m^3/s in the 1% AEP event, in accordance with hydrological modelling of the existing conditions.
- An infiltration rate of 1.5 m/d has been applied in the calculations, based on the geotechnical investigation.
- The basins were designed with preliminary geometry of 1:4 batters and a depth of 1.0 m.
- Lots / dwellings have been assumed to provide some degree of on-site retention/detention of stormwater (e.g., landscaped swales, rainwater tanks, etc.).
- The site has been assumed to be developed with at least some import of free-draining fill, allowing for infiltration of at least small events at-source (i.e., within inter-dwelling landscaped areas / yards).
- Potential exists for storage and infiltration within roadside swales; however, such losses have conservatively been excluded in these calculations (the inclusion of any roadside conveyance swales will be subject to detailed design and reflected in final design calculations / basin sizing).

Table 7 provides the breakdown of land uses within the site for all catchments whilst Table 8 provides the preliminary basin details for the northern and southern catchments. Figure G provides the stormwater catchments which have been delineated from the stormwater drainage catchment plan, as well as the stormwater management strategy. The locations for the drainage basins and the basin outlet infrastructure are indicative only.

Table 7: Catchment areas

Catchment	Roads (ha)	Dwelling sites / Lots (ha)	Amenities (ha)	Landscape (ha)	Drainage (ha)	Total (ha)
Northern catchment	0.26	1.11	-	0.31	0.04	1.72
Southern catchment	1.65	5.53	0.40	1.25	0.21	9.04

Table 8: Storage sizing details

Catchment	Design AEP	Maximum discharge (m^3/s)	Storage depth (m)	Batter slopes	Base area (m^2)	Top area (m^2)	Volume (m^3)
Northern basin	1% AEP	0.05	1.0	1:4	145	400	260
Southern upstream basin	1% AEP	0.15	1.0	1:4	630	1110	860
Southern downstream basin			1.0	1:4	640	1410	1010

The runoff from the northern catchment is to be contained within a single basin, with limited discharge into the Ki-it Monger Brook for larger events. Given the size of the southern catchments and the required storage, the runoff from the southern catchment is currently

intended to be contained within two basins, similarly allowing limited discharge into the Ki-it Monger Brook.

As per the basin sizing calculation, the northern basin preliminary sizing assumes a maximum discharge rate into the Ki-it Monger Brook of 0.05 m^3/s and a storage volume of approximately 260 m^3. The southern basins preliminary sizing assumes a combined maximum discharge rate into the Ki-it Monger Brook of 0.15 m^3/s and a combined storage volume of approximately 1870 m^3. These volumes are indicative only and subject to detailed drainage design.

5.4. Structural controls

5.4.1. Small drainage system (15 mm rainfall)

Retaining small rainfall events close to the source is particularly important for the management of water quality. Rainfall events up to 15 mm (equivalent to the 1 EY - 1 hour event) account for approximately 99% of all stormwater run-off and the majority of pollutants from road and roof surfaces. The objective for these events is to retain and infiltrate runoff as close to source and as high in the catchment as possible with the aim to maintain the pre-development hydrologic regime and maximise close-to-source treatment of stormwater. The strategy is to achieve this objective through detention of roof runoff close to dwellings via rainwater tanks and/or infiltration of first flush events within landscaped portions of dwelling allotments. In addition, the option to incorporate roadside conveyance swales will be explored to provide at-source infiltration opportunity for road pavement runoff.

5.4.2. Minor drainage system (20% AEP event)

Stormwater conveyance will be via piped drainage and/or roadside swales to the drainage basins within the landscaped areas in the north and south of the site. This drainage system will be designed to ensure roads and pedestrian areas remain serviceable for the 20% AEP events.

5.4.3. Major drainage system (1% AEP event)

The major drainage system design will comprise overland flow paths through the roads to ensure major events are able to be safely conveyed towards the drainage basins within landscaped areas adjacent to Ki-it Monger Brook.

The drainage basins will be constructed with a controlled outlet to the Ki-it Monger Brook. It is anticipated that these outlets will be in the form of pipes with headwall outlets to the bank of the brook. Outlets will be constructed with appropriate scour protection measures such as rock pitching.

Dwelling pad levels will be designed to ensure minimum 0.3 m freeboard from the local stormwater drainage system and 0.5 m freeboard from the adjacent flood level within the Ki-it Monger Brook.

5.5. Vegetation

Vegetation will be included in all suitable stormwater management areas to help prevent erosion, maintain soil infiltration, restrict water flows, and remove particulate and soluble pollutants, particularly nitrogen. The plants will mainly be associated with drainage basin areas and will be appropriately selected based on their intended function, using native species as much as possible.

5.6. Non-structural controls

Non-structural controls will be used to provide additional stormwater quality management and will include establishing operation and maintenance activities and controlling land use and management. The development will use the following non-structural controls to improve stormwater quality and reduce contamination.

5.6.1. Nutrient control and landscaping

Appropriate landscape design and maintenance practices will provide improvement of stormwater quality through ensuring:

- Appropriate native plant species are continually used
- Drainage basin areas to contain an amended soil with a minimum PRI of 10
- Landscaped areas and drainage basins to be maintained
- Appropriate fertiliser, pesticide and irrigation regimes are followed

5.6.2. Waste and construction management

Waste management plans will include provisions for stormwater protection through:

- Prompt removal of litter when discovered
- Discouraging waste dumping in drains and drainage swale through restricted access (i.e. bollards around POS) and signage
- Providing sufficient public facilities for rubbish disposal
- Construction activities will be subject to sediment and erosion control measures.

6. Groundwater management

The main principles of groundwater management are to protect underlying groundwater resources by minimising the export of nutrients and to protect infrastructure from groundwater inundation, as summarised in Table 9. The main objective to protect the underlying groundwater resources is defined as maintaining or improving the quality of groundwater leaving the site. Improvements to groundwater quality can be achieved by either reducing the total nutrient load received by groundwater, or by the treatment of surface water prior to infiltration to groundwater. The reduction of the nutrient and contaminant loads will be achieved by various methods, including infiltration at the source, vegetation and soil amendment, as well as management measures.

Table 9: Groundwater management principles and objectives

Principle	Objective	Approach / design criteria
Protect underlying groundwater resources by minimising nutrient export	Maintain or improve the quality of groundwater leaving the site	Encourage infiltration of stormwater as close to source as possible (e.g., use of soakwells where possible, road run-off directed to bioretention areas) to prevent mobilisation of contaminants to downstream drainage / infiltration areas
		Provide a minimum separation of 300 mm between bioretention and flood storage areas and underlying subsoil drainage / controlled groundwater level
		Utilise waterwise gardening practices to minimise fertiliser use and irrigation. Use amended soil (PRI >10) beneath bioretention areas
Protect infrastructure from groundwater inundation		Provide a minimum of 1.2 m between lot levels and MGL or CGL

6.1. Groundwater level management

There is significant clearance to groundwater levels at the site with pre-development monitoring determining groundwater to be at least 11 m below the natural surface. Due to the significant clearance to groundwater over the site, the development will not impact groundwater levels and no active management of groundwater levels (i.e., subsoil drains) is expected to be required, except perhaps for localised control of potential perching. Groundwater controls will be reviewed at detailed design stage when further information is available on the final earthworks levels and thickness of imported fill.

If a system of subsoil drains is required to control groundwater levels, the level at which subsoil drains are installed, the Controlled Groundwater Level (CGL), would be set in accordance with DoW Water Resource Considerations when Controlling Groundwater Levels in Urban Development (Department of Water, 2013). As specified in (Department of Water, 2013) the CGL would be set with consideration of:

- A free-flowing drainage outlet
- Infrastructure protection
- Groundwater quality
- Protection of water dependent ecosystems (WDEs) and water resources
- Catchment and nearby land use constraints

6.2. Groundwater quality management

6.2.1. Infiltration close to source

The proposed stormwater management strategy includes a series of measures to facilitate the infiltration of stormwater run-off as close to the source as possible. These measures prevent the mobilisation of contaminants that are typically transported with higher loads during first flush rainfall events, which will instead be retained and infiltrated higher in the

catchment, providing further opportunity for nutrient uptake and attenuation through the soil profile.

6.2.2. Vegetation and soil amendment

As discussed in Section 4.1.2, the development will utilise waterwise landscaping including the use of native vegetation and aim to minimise the use of turf and use appropriate turf. In addition to the conservation of water, the use of waterwise principles will also minimise the overall fertiliser requirements and therefore the nutrient load that could be transported to the groundwater via infiltration will be reduced.

6.2.3. Management measures

Many of the stormwater management measures will improve the quality of infiltrated water through reducing flow velocities and scour potential, biological uptake of nutrients, phosphorus adsorption to soil and increasing infiltration/treatment areas. The stormwater management strategy is expected to provide a significant level of treatment of infiltrating stormwater. To further ensure groundwater quality protection the following additional measures will be adopted:

- Minimise and control the amount of fertilisers and pesticides applied to the site through appropriate plant selection and appropriate operation and maintenance protocols.
- Maintain healthy and well-established plants, particularly in vegetated drainage systems.

7. Management construction works

7.1. Construction and waste management

Construction work undertaken during development will be controlled and monitored by the proponent/development manager to ensure that the specified engineering drawings are followed, and the drainage system is not compromised and continues to function as intended. Management and control measures to be implemented during construction works include:

- Waste management measures will be put in place to prevent litter and construction wastes from collecting in the drainage system and polluting downstream receiving environments.
- Temporary fencing will be used during the earthworks/construction phase to prevent unauthorised access to the site.

7.2. Erosion and sediment control

Management of construction activities will include best management practices to minimise discharges of sediments and other contaminants into the drainage network. This will include:

- Regular street sweeping.
- The civil contractor will use groundwater and/or polymer dust suppression material for dust suppression and stabilisation of lots and verges during construction work.
- Placement of silt fencing where required adjacent to drains, waterways, etc.
- Further details will be provided by the civil contractor via a Construction and Environmental Management Plan.

8. Monitoring

8.1. Pre-development monitoring

An updated UWMP to be prepared as a condition of the development application (DA) approval will detail the post-development monitoring commitments, including monitoring parameters, locations, frequency, and timeframes. These monitoring commitments will be consistent with those outlined in the approved Local Water Management Strategy.

This UWMP will also detail assessment criteria and trigger levels for the monitoring results to be assessed against, reporting requirements and contingency responses in the event that monitoring results identify any concerns around surface or groundwater quality of levels.

9. Future UWMP Information

It is anticipated that this Preliminary UWMP will be updated following DA approval and subsequent completion of the detailed civil, drainage and landscape design process. The final UWMP will include (but not be limited to) the following additional information.

- An approved development layout
- Earthworks design including road and dwelling pad levels
- Road and drainage design including pipe and/or swale alignments, dimensions and elevations
- Confirmed locations and design details for any at-source infiltration and treatment areas (e.g., roadside swales)
- Civil and landscape design for the drainage basins
- Any relevant landscape design details consistent with foreshore and bushfire management requirements
- Long-term irrigation demand and irrigation water source
- Post-development monitoring requirements
- UWMP implementation plan, including tasks, roles and responsibilities

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Page size: A3
Sources: data.gov.au, DWER, landgate

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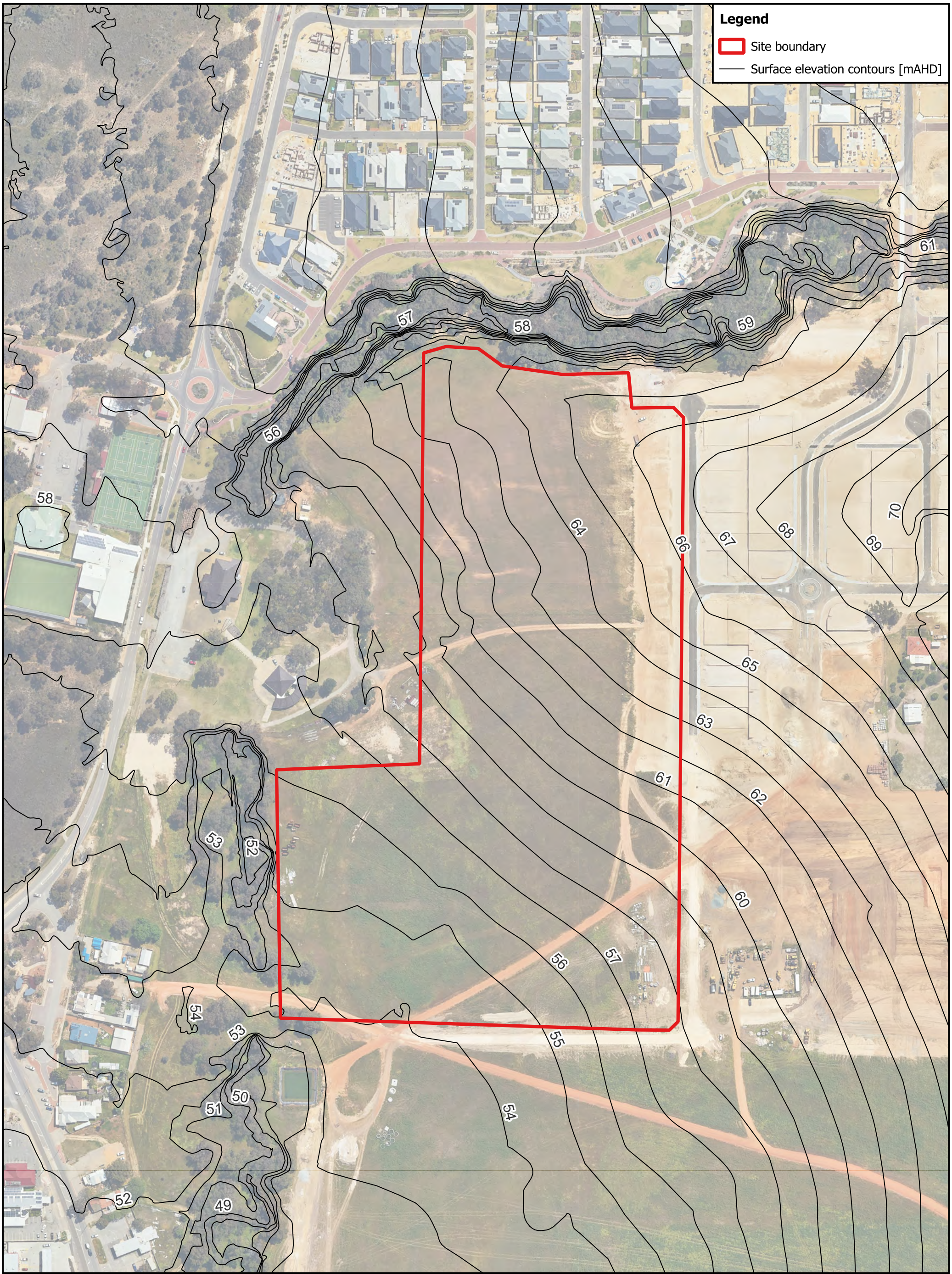
GDA94 / MGA zone 50

Figure A

Bullsbrook Village - Site location



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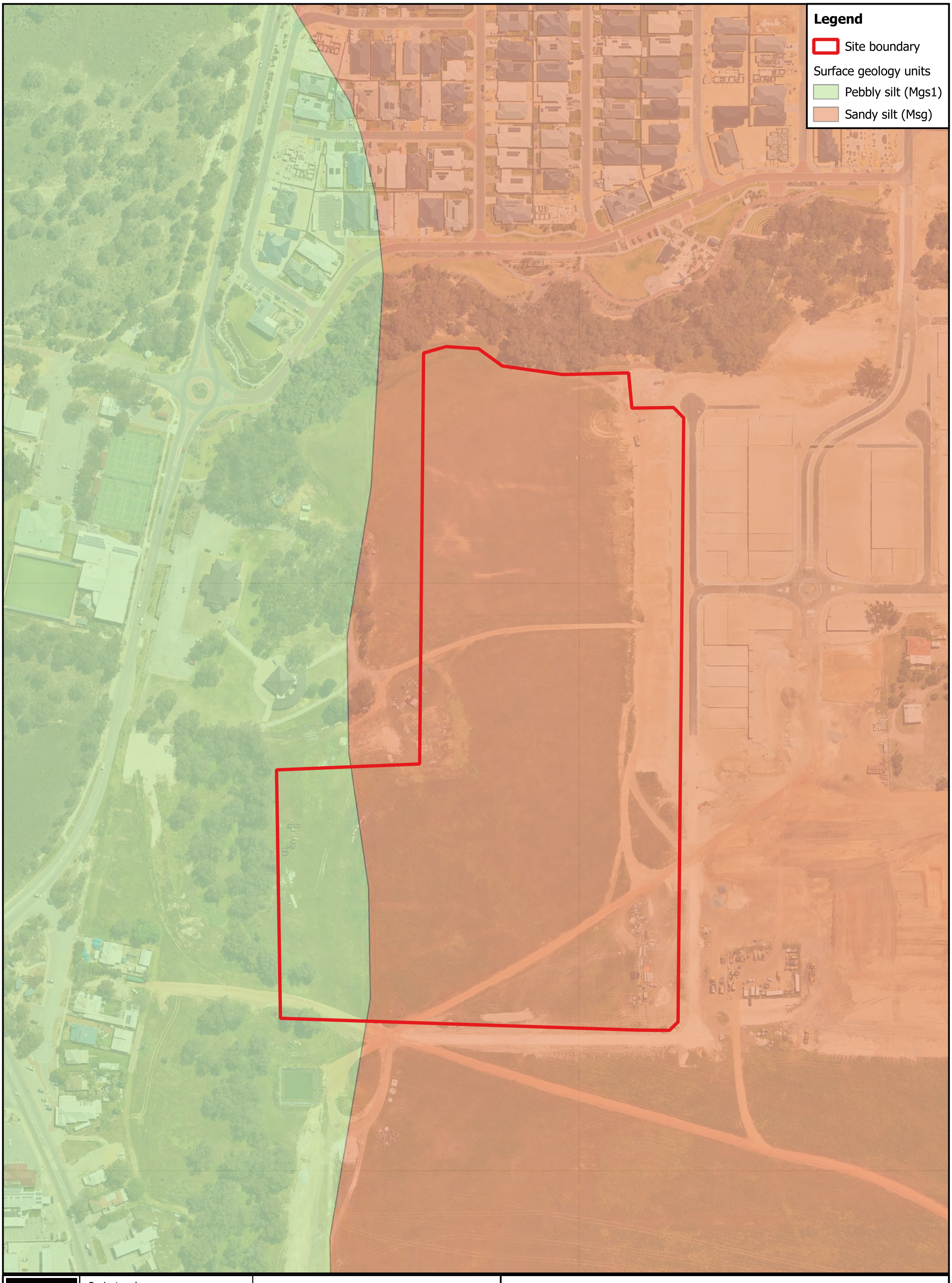
GDA94 / MGA zone 50

Figure B

Bullsbrook Village - Topography



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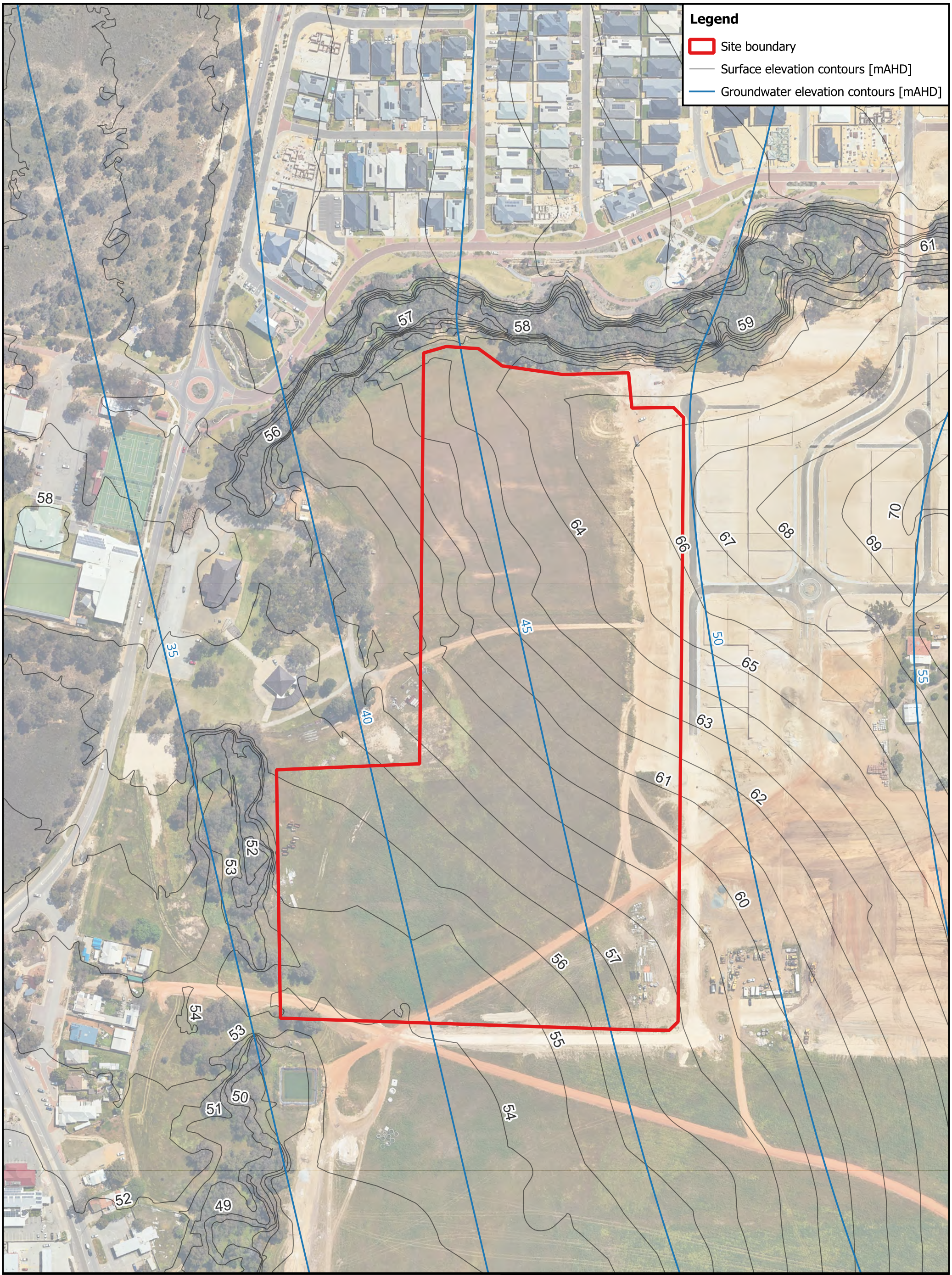
GDA94 / MGA zone 50

Figure C

Bullsbrook Village - Surface geology



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GDA94 / MGA zone 50

Figure D

Bullsbrook Village - Groundwater contours



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Sources: data.gov.au, DWER, landgate

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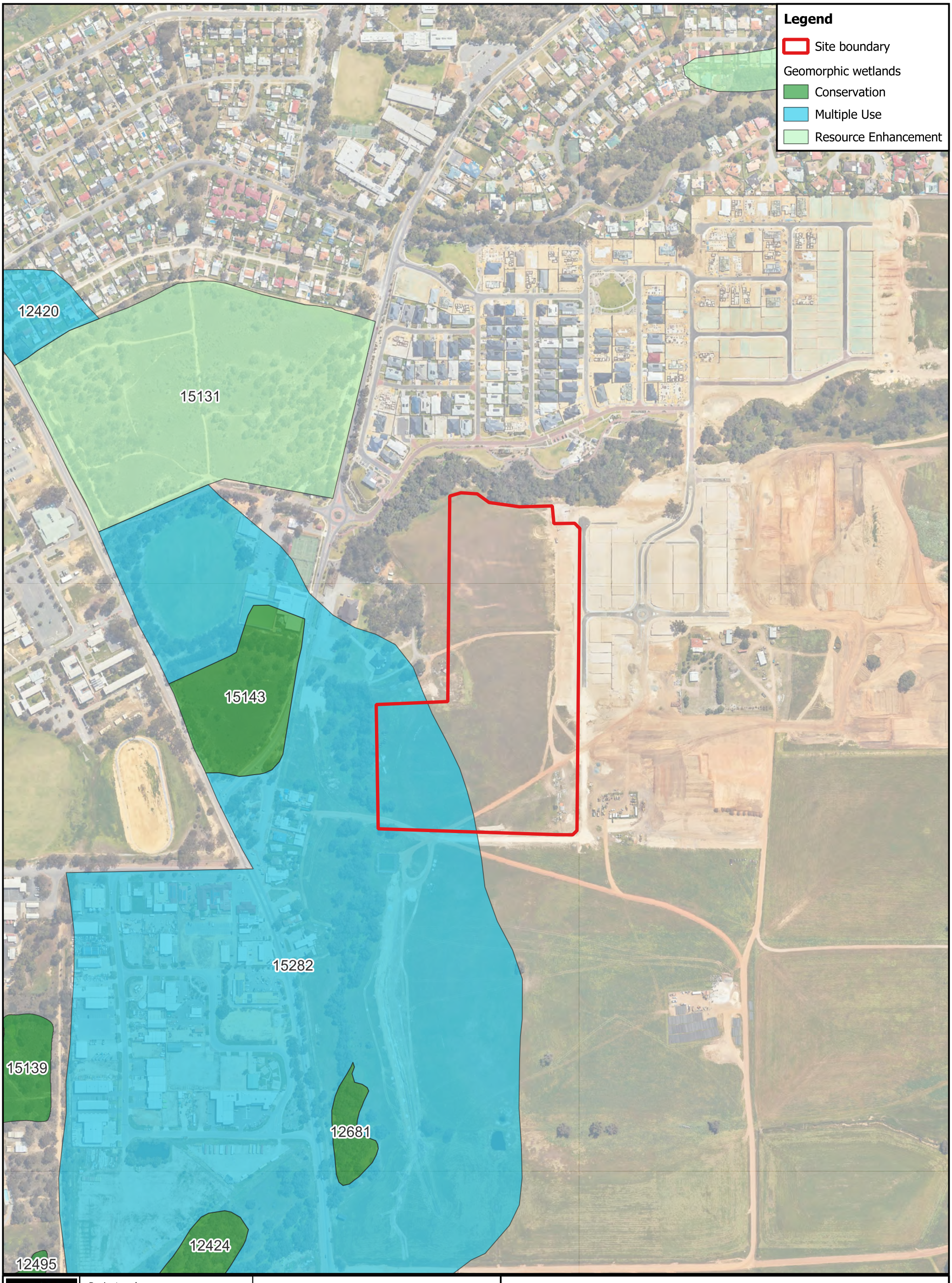
GDA94 / MGA zone 50

Figure E

Bullsbrook Village - Monitoring locations



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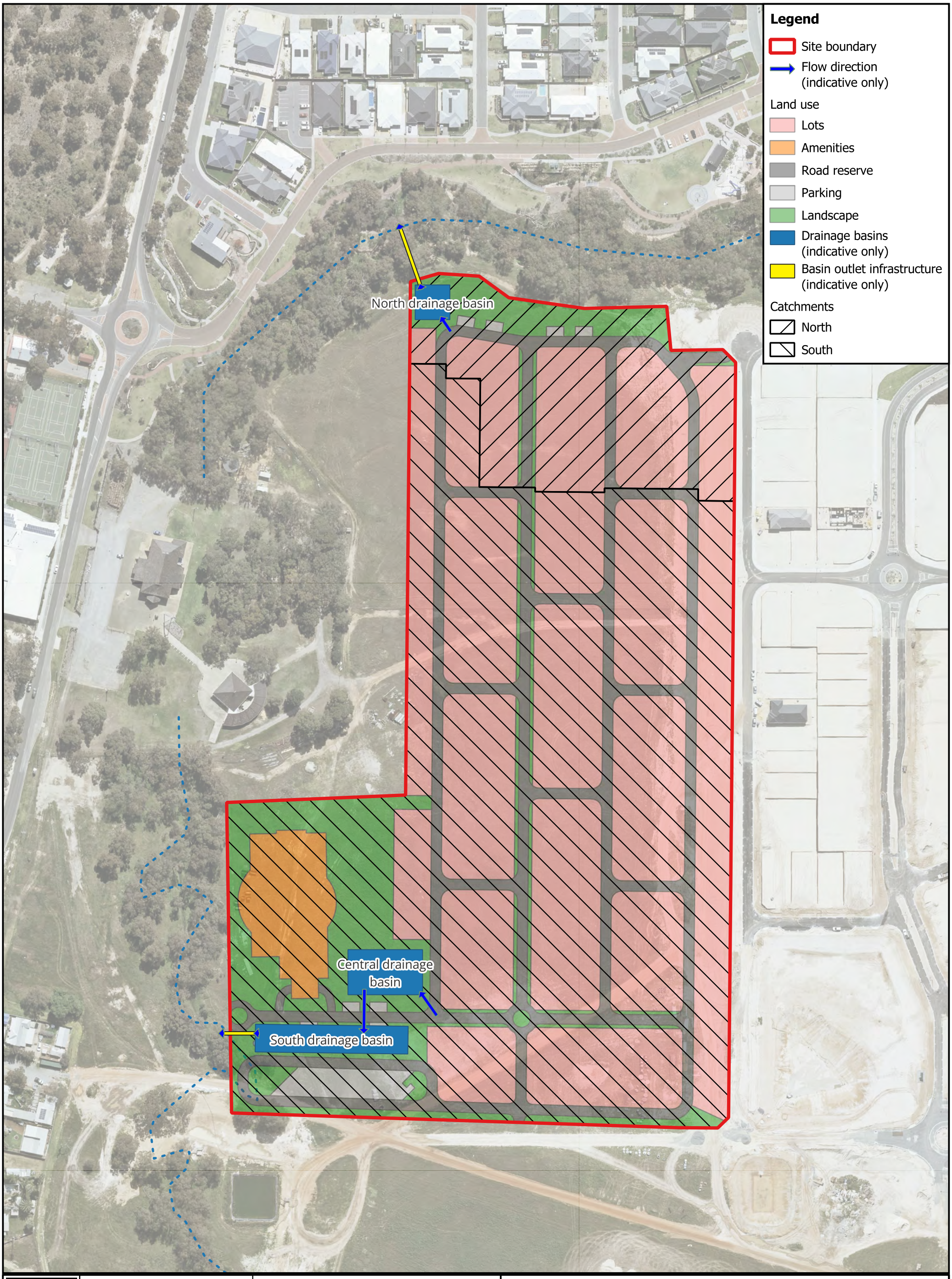
Sources: data.gov.au, DWER, landgate

0 100 200 m

GDA94 / MGA zone 50

Figure G

Bullsbrook Village - Geomorphic wetlands



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Sources: data.gov.au, DWER, landgate

0 50 100 m

GDA94 / MGA zone 50

Figure H

Bullsbrook Village - Stormwater management strategy

Appendix A: Master Plan

Richard Hammond Architect, 2024

CHURCH & SHRINE USES

CHITTERING ROAD

SCREENING LANDSCAPING

SHARED POS

KI-IT BROOK

EXISTING DRAIN

WORKSHOP CRAFT BREWERY

ENTRY

GATE

ADMIN

CLUBHOUSE

TERRACE

FITNESS

CINEMA & GAMES

PICKLEBALL

CHURCH

CHITTERING ROAD RE-ALIGNMENT

CADASTRAL BOUNDARY

BOAT & CARAVAN PARKING

LANDSCAPED DRAINAGE BASIN (SOUTH)

10m PRIVATE INTERNAL ROAD

LANDSCAPED DRAINAGE BASIN (CENTRAL)

6m PRIVATE INTERNAL ROAD

LEASE AREA BOUNDARY

LANDSCAPED DRAINAGE BASIN (NORTH)

'THE LOOKOUT' MEETING PLACE

COMMUNITY GARDEN

BBQ

CARAVAN, CONSTRUCTION & EMERGENCY ACCESS

0.5m ROCK PITCHED BATTER TO BOUNDARY

CADASTRAL BOUNDARY / LEASE AREA BOUNDARY

EMERGENCY ACCESS

GATE

59.0 60.4 61.7 62.1 64.3 67.0 67.7 66.7

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LEGEND

- LANDSCAPING
- EXISTING VEGETATION
- CORE CREEK AREA
- KIT-MONGER BROOK POS AREA
- VILLAGE AMENITIES
- LANDSCAPED DRAINAGE BASINS
- FENCE/GATE
- ROADWAY
- CADASTRAL BOUNDARY
- LEASE AREA BOUNDARY
- TYPE A (62)
- TYPE B (71)
- TYPE C (47)
- TYPE D (57)

TOTAL HOUSE SITES - 237
TOTAL SITE AREA - 106,520m²
TOTAL RECREATION AREA - 31,350m²
(INCL SHARED P.O.S.)

ISSUE	DESCRIPTION	DATE
A	PRELIMINARY MASTERPLAN	28.05.2024
B	REVISED MASTERPLAN	12.08.2024
C	REVISED MASTERPLAN	16.08.2024
D	ENTRY MOVED, LOT NUMB. ADDED	19.08.2024
E	HOUSE-LOT ALLOCATION	02.09.2024

DRAWING TITLE
Masterplan

PROJECT
BETHANIE - BULLSBROOK VILLAGE
CLIENT
BETHANIE
PROJECT ADDRESS
CHITTERING ROAD, BULLSBROOK, WA, 6084

Project number -
Date 02.09.2024
Drawn by RHA
Checked by RHA
Scale @ A3 1 : 1500
DRAWING NO. A3.01

3/09/2024 11:59:58 AM

Appendix B: Geotechnical Investigation

Structerre, 2024

Doc GE2.2.1

GEOTECHNICAL INVESTIGATION

For: The Bethanie Group Ltd

Project: Proposed Bethanie Bullsbrook Village and Vehicle Bridge

Project Address: Lot 900 Chittering Road, Bullsbrook, WA

Project Number: D340179

Job Number: J460592

Revision Number: 0

Date: 01/08/2024

Structerre Consulting Engineers
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1. PROJECT DETAILS

1.1. Introduction

At the request of David Lorimer of The Bethanie Group Ltd (The Client), Structerre Consulting (Structerre) have conducted a Geotechnical Investigation at Lot 900 Chittering Road, Bullsbrook, WA. The purpose of the investigation was to provide the following for the proposed development of a retirement community:

- Desktop study including a summary of geology, groundwater, site history (obtained from historical photographs) and potential presence of Acid Sulfate Soils (ASS).
- Summary of encountered ground and groundwater conditions.
- Site Classification in accordance with AS2870.
- Earthquake site factor in accordance with AS1170.4.
- Recommendations for stormwater drainage design.
- Site preparation requirements (earthworks), including site traffic, excavation, reuse of materials and batter slopes.
- Ground bearing capacity and estimated settlements for pad and strip footings founded at 0.3m and 0.5m.
- Geotechnical design parameters for retaining structures and or deep foundations.
- Preliminary pavement design parameter, indicative California Bearing Ratio (CBR) values determined from penetrometer results and ground conditions encountered.

This report details the scope of the geotechnical investigation, presents an interpretation of ground conditions and material properties across the site, provides geotechnical design parameters for the design of the proposed infrastructure, and evaluates the suitability of materials for use in earthworks. Interpretation of site conditions is based on the subsurface lithology revealed during the investigation programme, visual assessments of the in-situ materials and the results of in situ field tests.

Terms of reference for this investigation were presented in a Structerre Consulting proposal reference Q107273 (dated 25 June 2024), which was submitted to and accepted by The Client.

1.2. Site Description & Proposed Development

The site is located at Lot 900 Chittering Road, Bullsbrook, within the City of Swan, WA. The site lies east of Chittering Road and south of Brookbank Park. The east of the site is under development as residential addresses, with the south currently vacant. A small (Ki-it Monger) brook is located on the western edge of the site with an existing church.

The site slopes gently downward from the northeast to the southwest, with a gradient different of approximately 12m. At the time of the field investigation the majority of the site was vacant unmaintained vegetation with trees along the western boundary.

We understand that the site is proposed for the development of a retirement community, including residential dwellings, clubhouse, bowls club, caravan parking, workshops, community garden, entry road, internal roadways and vehicle bridge over the existing brook.

1.3. Field Investigation – Scope of Works

The field investigation was carried out on 28 June 2024 and comprised:

- Seventeen (17) Sample Retrieval Probe boreholes to a refusal depth of 2.1m over the site for material assessment and soil profiling.
- Fifteen (15) Dynamic Cone Penetration (DCP) Tests to a maximum depth of 1.0m or refusal for measurement of the strength and compressibility of the upper soil layers.
- Six (6) In-situ percolation tests to determine the permeability of the materials within the upper 1.0m

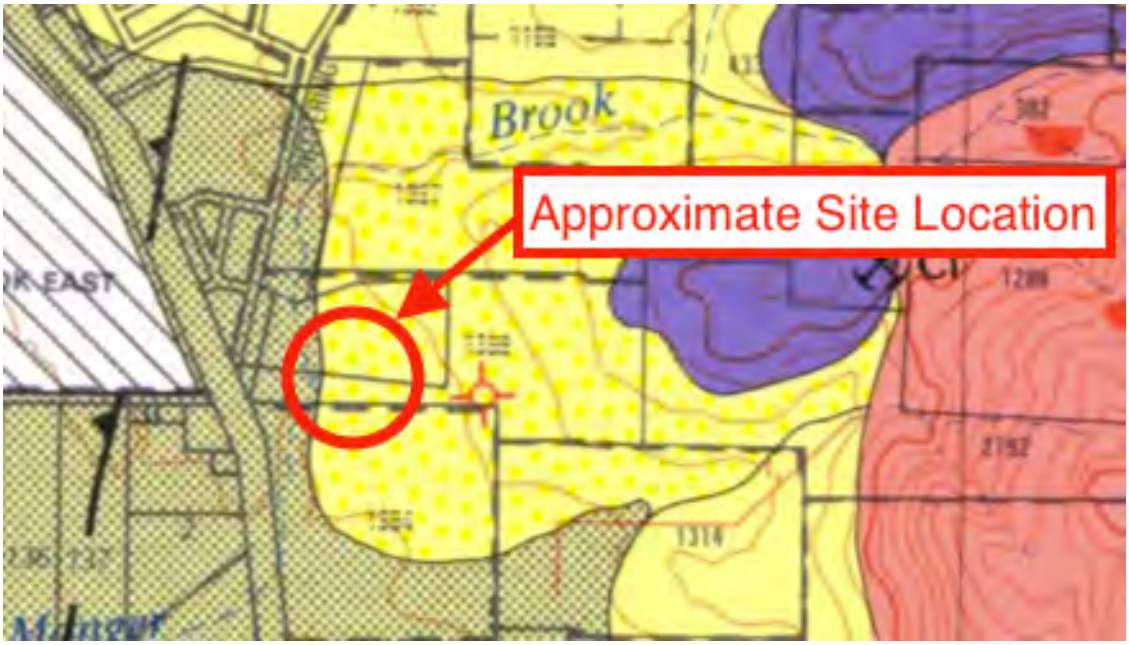
The test locations are shown on the attached site plan in Appendix 1.

Suitable qualified geotechnical personnel from Structerre supervised the fieldwork and all fieldwork, interpretation and terminology used in this report are in accordance with the guidelines presented in AS1726-2017 Geotechnical Site Investigations.

2. DESK STUDY

2.1. Geological Setting

The Muchea sheet 1: 50,000 Environmental Geology Series (Part Sheets 2034 I and 2134 IV, 1986) prepared by the Geological Survey of Western Australia indicates that the following geological layers underlie the site:



Msg — Sandy SILT – strong brown, firm, friable, dispersive in part, occasional pebbly horizons with little matrix containing quartzite, quartz, granite, laterite, of colluvial origin.

Mgs_1 — Pebbly SILT – strong brown silt, with common fine to occasionally coarse grained, sub-rounded laterite quartz, heavily weathered granite pebbles, some fine to medium-grained quartz sand, of alluvial origin.

2.2. Ground Surface, Groundwater Level and Acid Sulfate Soils (ASS)

Publicly available topographic mapping service Landgate Map Viewer indicates the ground surface level at this site was approximately 67.0m – 55.0m Australian Height Datum (AHD).

Perth Groundwater Atlas indicates groundwater is expected to be encountered between 31.6m (maximum) and 30.4m (minimum) AHD. This is approximately 25.0m below existing levels.

Information from publicly available Landgate website indicates that the site lies within a zone of no known risk of ASS occurring within 3m of natural surface.

2.3. Site History

Historical aerial photographs dating back to 1965 are publicly available through Landgate Map Viewer were assessed and a summary is presented in Table 1.

Table 1 – Historical Site Information

Date	Description
1965	The site is used for farming, with Chittering Road already developed. (unsealed)
1981	The site remains the same, with ongoing development surrounding (northern suburbs)
1985	The existing church located at #36 (western edge of the site) is developed.
2019	The start of development of the subdivision to the east of the site. (still ongoing at the time of investigation)
2021	Potential stock yard located between the site and church for the development of the neighbouring subdivision
2024	Stockyard is cleared and regrowth underway with the site remaining relatively unchanged until the current day.

3. RESULTS OF THE INVESTIGATION

3.1. Subsurface Soil Profile

The subsurface soil profile presented below was determined from the ground conditions encountered during the investigation and laboratory test results:

Table 2 – Subsurface Soil Profile (Boreholes: 01 - 07, 16 & 17)

Depth to Strata Base (m)	Geological Setting	Material Description
0.1 – 0.2	SURFICIAL	TOPSOIL
1.1 – 2.5 +	NATURAL	Sandy CLAY (high plasticity) fine to medium grained, with gravel, red / brown, firm to stiff.

Table 3 – Subsurface Soil Profile (Boreholes: 11 - 15)

Depth to Strata Base (m)	Geological Setting	Material Description
0.1 – 0.2	SURFICIAL	TOPSOIL
0.6 – 1.1	NATURAL	*SAND (medium to coarse grained), non-plastic, with gravel, pale yellow medium dense to dense.*
1.1 – 1.9		Gravelly SAND (medium grained), non-plastic, brown **BH11 & BH15 Refused on dense gravel*
2.5 +		Sandy CLAY (high plasticity) fine to medium grained, with gravel, red / brown, firm to stiff.

Table 4 – Subsurface Soil Profile (Boreholes: 08 - 10)

Depth to Strata Base (m)	Geological Setting	Material Description
0.1 – 0.2	SURFICIAL	TOPSOIL
1.0 – 1.9	NATURAL	*SAND (medium to coarse grained), non-plastic, with gravel, pale yellow medium dense to dense.*
2.5 +		Sandy CLAY (high plasticity) fine to medium grained, with gravel, red / brown, firm to stiff.

The soils encountered are consistent with the expected site conditions as predicted from the Environmental Geology Map. It is important to note that there may be pockets of fill on site that were not encountered by the investigation boreholes. The subsurface soil conditions encountered are presented in the bore logs, within Appendix 3.

3.2. Groundwater

Although groundwater was not encountered during the investigation, it should be noted water may perch above the cohesive material underlying the surficial material during the wetter seasons of the year (localised surface ponding may occur during heavy downpour events).

Previous history from earthworks conducted surrounding this site has intersected the presence of spring feeds, (subsurface water flows), which may be encountered during earthworks, and this should be taken into account when conducting service excavations and designing drainage systems for the proposed development.

3.3. Percolation Testing

Percolation testing of the in-situ soils was undertaken in three locations. Results of the testing are summarised below:

Table 5 – In Situ Percolation Test Results

Test Location	Testing Depth (m)	Soil Type	Permeability (m/day)
BH01	1.1	Sandy CLAY	1.3
BH05			
BH08		SAND / Sandy CLAY	2.2
BH10			3.1
BH13		SAND / Gravelly SAND	2.8
BH16			0.5

3.4. Laboratory Test Results

Samples were tested by Structerre's in-house NATA accredited laboratory for Particle Size Distribution as per AS1289.3.6.1, Plasticity Index / Linear Shrinkage as per AS1289.3.1.2 – 3.4.1, soil compaction via Modified Maximum Dry Density (MMDD) as per AS 1289 5.2.1-2003 and California Bearing Ratio (CBR) as per AS 1289.6.1.1-2017, and Organic Content as per ASTM D2974.

3.4.1. Organic Content Testing

Results for organic content tests are summarised below:

Table 6 – Organic Content Test Results

Test Hole	Depth (m)	Organic Content (%)	Moisture Content (%)
BH19	0.1 - 0.2	1.6	0.0

Based on the above result the sample tested is considered suitable as structural fill (i.e. <2% organics), subject to screening / removal of vegetation, grasses, roots and coarse organic inclusions.

3.4.2. Atterberg Limits

Results of the testing are presented in Appendix 4 summarised below:

Table 7 – Atterberg Limit Test Results

Sample Identification	BH04 @ 1.4m - 1.8m	BH09 @ 1.5m - 1.9m
Liquid Limit (%)	55	42
Plastic Limit (%)	23	20
Plasticity Index (%)	32	22
Linear Shrinkage (%)	12	9.5
Material Passing 0.075mm (%)	66	47

Test results indicate that the natural clayey soils, has moderate to high shrink swell capacity or degree of expansion.

3.4.3. California Bearing Ratio (CBR)

The test certificates are presented in Appendix 4 and are summarised in Table 5 below.

Table 8 – CBR Results

Test Hole	Depth (m)	Soil Description	Optimum Moisture Content (%)	Maximum Dry Density (t/m³)	Penetration (%)	
					2.5mm	5.0mm
BH17	0.2 – 0.4	Clayey SAND	8.0	2.10	-	30
BH18			8.5	1.96	35	-
SAND : Natural o (Imported Fill) @ 95% MMDD*						12

** Implies the maximum dry density ratio using Modified compaction in accordance with AS 1289 5.2.1-2003.*

Based on the above results a conservative soaked CBR of 12% would be recommended for the design of pavement subgrade materials, which will incorporate a minimum of 500mm layer of sand (imported or natural) for subgrade materials.

4. GEOTECHNICAL CONSTRUCTION CONSIDERATIONS

4.1. Site Classification

AS 2870-2011 Residential Slabs and Footings provides guidance on site classification for residential slabs and footing design based on the expected ground surface movement and depth of expected moisture changes.

Based on results of this investigation the site can be classified as Class “S” provided that all unsuitable materials are removed and replaced with engineer-controlled sand fill materials in accordance with earthwork recommendations outlined in Section 4.4 in this report.

Footings suitable for this site should be adopted to accommodate expected ground surface movements of approximately y_s < 20mm associated with the presence of low to moderately reactive Sandy CLAY encountered.

4.2. Drainage

The existing ground conditions are not suitable for on-site disposal of stormwater runoff using shallow soakwells. It is recommended that all stormwater from roofed, paved and driveway areas be collected and detained to reduce peak flow rates prior to discharging off site as per council requirements.

Alternative (onsite) options may include the design and installation of detention basins and or compensating swales, however these will be required to be designed and constructed in accordance with local council requirements for onsite stormwater drainage management.

4.3. Seismic Site Subsoil Class

The seismic subsoil site class has been assessed in accordance with AS 1170.4-2007, using the results of this investigation and published information.

Table 9 – Summary of Seismic Parameters

Hazard Factor	Site Sub-soil Class
0.1	Class Ce –shallow soil site

4.4. Earthworks

All earthworks shall be undertaken in accordance with AS 3798-2007 Guidelines on Earthworks for Commercial and Residential Developments and are to include the following:

- All unsuitable materials to be stripped and removed from the site. Unsuitable materials include vegetation, topsoils, uncontrolled filling if encountered and any deleterious and organic materials. The surficial strip is expected to be approximately 0.1 – 0.2m in depth.
- It is considered that the near surface materials may require improvement post surficial strip. Therefore, proof compaction of the exposed base is recommended. The compaction requirements are set out in the table below, as per AS 3798-2007:

Table 10 – Compaction Requirements

Item	Application	Minimum relative compaction, %	
		Minimum density ratio (Standard Compaction Effort) (Cohesive soils)	Minimum density index (Cohesionless soils)
2	Commercial – fills to support minor loadings, including floor loading of up to 20kPa and isolated pad or strip footings to 100kPa	98	75
3	Fill to support pavements. a) General fill b) Subgrade (to a depth of 0.3m)	 95 98	 70 75

- After excavation and proof compaction, the exposed base is to be inspected and approved by a representative from this office prior to backfilling. At this stage it can be assessed whether any further materials need to be removed or whether further compaction of the base is required.
- The ground level should be built up to design levels with any suitable stockpiled materials and imported sand fill. If required, the imported fill should consist of free draining sand with not more than 5% passing a 75µm sieve and be free of organic matter and other deleterious materials. The fill sand materials should be placed in layers not exceeding 300mm loose thickness and compacted to achieve the values stated in the table above. As a guide a minimum of 7 PSP blows over the interval 150 – 450mm, 9 PSP blows over the interval 450 – 750mm and 11 PSP blows over the interval 750 – 1050mm should be achieved, however it is recommended that this be verified with appropriate laboratory testing.
- For design loadings above 100kPa additional compactive effort may be required over the base. Bearing capacities as outlined in Section 4.6 of this report can be achieved with compaction of the base of foundation to a minimum of 95% modified maximum dry density as determined by AS1289 5.2.1 and 5.4.1, to a minimum depth of 0.5m below the base of foundation.
- After remedial earthworks have been completed, the earthworks should be inspected and approved by a representative from this office.
- A minimum of 0.6m sand cover is to be placed / maintained above the reactive material to achieve a Class “S” site with y_s = 20mm.
- A minimum of 0.8m sand cover is to be placed / maintained above the reactive material to achieve a Class “S” site with y_s = 15mm.
- A minimum of 1.2m sand cover is to be placed / maintained above the reactive material to achieve a Class “S” site with y_s = 10mm.
- A minimum of 1.5m sand cover is to be placed / maintained above the reactive material to achieve a Class “A” site with y_s < 3mm.

It is considered that standard small to medium sized earthmoving equipment would be appropriate for the proposed earthworks. The near surface ground is competent and should not pose an issue to site traffic movements.

The upper material encountered on site can be deemed as 'easy' to excavate with medium sized earthwork equipment (i.e., a 20t excavator). Some rock ripping and or breaking will be required in deeper excavations due to the presence of lateritic rock. Should excavations encounter groundwater, dewatering will be necessary.

Ideally, excavation earthworks should be conducted at the end of the dry season (February / March) to account for the seasonal variations of the groundwater or perching of water on the clayey materials close to surface at this location.

4.5. Geotechnical Design Parameters

Based on the field investigation and test results, the interpreted geotechnical soil parameters of the encountered materials are presented in Table 11:

Table 11 – Soil Parameters

Soil Type	Depths (m)	Friction Angle Ø' (^{0})	Cohesion c' (kPa)	Density Y (t/m^3)	Elastic Modulus E (MPa)
Sandy CLAY with gravel	0.2 – 2.5 +	20	15	1.85	20
SAND	0.2 – 1.9	34	0	1.80	40
Gravelly SAND	0.2 – 1.9	38		1.90	60

4.6. Shallow Footings – Allowable Soil Bearing Capacities

Based on the findings of the current preliminary geotechnical investigation, shallow pad and strip footings are considered appropriate for the proposed development. Allowable bearing capacities for shallow footings at the site have been calculated under the following assumptions:

- The site preparation procedures specified in Section 4.4 have been carried out.
- The specified level of compaction has been achieved below the base of each footing.
- Loads are vertical and not eccentric.
- Isolated footings (i.e., interaction of foundations has not been considered).
- The foundations are flexible.
- A factor of safety (FoS) of 3.0 against bearing capacity failure.
- Maximum allowable settlement of 20mm.

The tables below present the allowable bearing pressures for pad and strip footings of various dimensions, with embedment depths of 0.5m and 1.0m below finished surface levels.

Table 12 – Allowable Bearing Capacities for Pad Footings

Minimum Depth of Embedment (m)	Minimum Plan Dimension (m)	Allowable Bearing Capacities (kPa)	Settlement (mm)
0.3	0.5	135	< 20
	1.0		
	1.5		
	2.0		
0.5	0.5	160	< 20
	1.0		
	1.5		
	2.0		

Table 13 – Allowable Bearing Capacities for Strip Footings

Minimum Depth of Embedment (m)	Minimum Plan Dimension (m)	Allowable Bearing Capacities (kPa)	Settlement (mm)
0.3	0.5	105	< 20
	1.0		
	1.5		
0.5	0.5	135	< 20
	1.0		
	1.5		

The actual allowable bearing capacity of a particular foundation will be dependent on its location, geometry and founding depth, as well as the founding horizon. Therefore, once specific foundation geometries have been determined and the earthworks completed, it is recommended that the allowable bearing capacity and associated settlements be verified.

Additionally, should undermining issue prevent the excavation of the near surface loose materials, it is recommended that the allowable bearing capacity be reviewed. However, this will likely result in lower allowable bearing capacities.

4.7. Retaining Walls

Retaining walls proposed to be installed at the site will likely support sandy soils. Where imported granular backfill is to be used in conjunction with retaining walls, the geotechnical properties will vary depending upon the nature of the granular materials imported.

For cohesion-less free draining sand, the following parameters can be used as a guide for design purposes:

- Angle of internal friction, Ø = 32°
- Coefficient of active earth pressure K_a = 0.307
- Coefficient of passive earth pressure K_p = 3.255

- At rest coefficient of earth pressure K_0 = 0.470
- Bulk density 18 kN/m^3

Retaining structures should be designed in accordance with AS 4678-2002 Earth Retaining Structures. Guidance on allowable footing bearing pressures is provided in Section 4.6. Where significant eccentric and /or horizontal loading is applied, further assessment will be required.

Retaining wall design should ensure adequate drainage to the rear of the wall and that handheld compaction equipment is utilised within 2.0m of the walls, to reduce the potential increase in lateral pressure on the retaining wall.

Excavation immediately in front of retaining walls may cause movement to the wall to occur. This can lead to cracking of adjoining structures and needs to be accounted for in the design and construction sequencing of the new works.

5. CONCLUSIONS

A site investigation was carried out at the proposed commercial development site to assess the geotechnical conditions. Parameter and design recommendations are incorporated in the body of the report. The following conclusions have been drawn from the site investigation:

- The subsurface soil profile encountered generally consisted of TOPSOIL surficial material to a maximum depth of 0.2m overlying a Sandy CLAY with gravel to the investigated depth of 2.5m. There were pockets of SAND /Gravelly SAND encountered (within BHs 08 – 15) to 1.9m, which were overlying the Sandy CLAY material to the target depth of 2.5m
- The water table was not encountered during the investigation, however localised surface ponding and water perching on the cohesive soils may occur in the winter months of the year, and there is a potential for sub surface spring feeds to be encountered on the site.
- The site classification can be upgraded to and equivalent Class “S” in accordance with AS 2870-2011 provided the recommended earthworks are undertaken and a minimum of 0.6m of non-reactive (sand) cover is placed (or maintained) and compacted above the natural cohesive materials encountered onsite.
- It is considered that the site is not suitable for on-site drainage in its current condition.
- Recommended earthworks include stripping of surficial materials, proof compaction of the base, placement of engineered fill and compaction of final level.
- Allowable bearing capacity for pad footings range from 135kPa to 160kPa and from 105kPa to 135kPa for strip footings. The estimation of settlement of the footings is limited to 20mm.

6. LIMITATION OF FIELD INVESTIGATIONS

This report has been prepared in accordance with generally accepted consulting practice for The Client using information supplied at the time and for the project specific requirements as understood by Structerre. To the best of our knowledge the information contained in this report is accurate at the date of issue, however it should be emphasised that any changes to ground conditions and/or the proposed structures may invalidate the recommendations given herein.

The conclusions and recommendations in this report are based on the site conditions revealed through selective point sampling, representing the conditions of the site in total, although the area investigated represents only a small portion of the site. The actual characteristics may vary significantly between successive test locations and sample intervals other than where observations, explorations and investigations have been made.

The materials and their geotechnical properties presented in this report may not represent the full range of materials and strengths that actually exist on site and the recommendations should be regarded as preliminary in nature. Allowances should be made for variability in ground conditions and any consequent impact on the development. Structerre accepts no responsibility and shall not be liable for any consequence of variations in ground conditions.

If ground conditions encountered during construction are different to that described in this report, this office should be notified immediately.

For and behalf of

STRUCTERRE CONSULTING

Author: Luke Young
Geotechnical Assistant Manager

BEng Civil (Hons)

Checked by: Mel Castle
Geotechnical Manager

Disclaimer

This report is at the request of the addressee and no liability is accepted by Structerre Consulting to any third person reading or relying upon the report, notwithstanding any rule of law and/or equity to the contrary and that this report is strictly confidential and intended to be read and relied upon only be the addressee.

Job #	Revision	Authored	Checked	Authorised
J460592	0	LYG	MEC	MEC

7. REFERENCES

Department of Water – Perth Groundwater Atlas

Landgate Map Viewer

Geological Survey of Western Australia 1:50,000 Environmental Geology Series

AS 1170.4-2007 Structural design actions – Earthquake actions in Australia

AS 1289.3.1.2-2009 Methods of testing soils for engineering purposes – Soil classification tests – Determination of the liquid limit of a soil

AS 1289.3.2.1-2009 Methods of testing soils for engineering purposes – Soil classification tests – Determination of the plastic limit of a soil

AS 1289.3.3.1-2009 Methods of testing soils for engineering purposes – Soil classification tests – Calculation of the plasticity index of a soil

AS 1289.3.4.1-2009 Methods of testing soils for engineering purposes – Soil classification tests – Determination of the linear shrinkage of a soil

AS 1289.5.1.1- 2017 Methods of testing soils for engineering purposes – Soil compaction and density tests – Determination of the dry density / moisture content relation of a soil using standard compactive effort.

AS 1289.5.2.1- 2017 Methods of testing soils for engineering purposes – Soil compaction and density tests – Determination of the dry density / moisture content relation of a soil using modified compactive effort.

AS 1289.6.1.1-2014 Methods of testing soils for engineering purposes – Soil strength and consolidation tests – Determination of the California Bearing Ratio of a soil – Standard laboratory method for a remoulded specimen.

AS 1289.6.3.1-2009 Soil classification tests – Determination of the particle size distribution of a soil – Standard method of analysis by sieving

AS 1289.6.3.2-1997 Methods of testing soils for engineering purposes – Soil strength and consolidation tests – Determination of the penetration resistance of a soil – 9kg dynamic cone penetrometer test

AS 1726-2017 Geotechnical Site Investigation

AS 2870-2011 Residential Slabs and Footings

AS 3798-2007 Guidelines on Earthworks for Commercial and Residential Developments

APPENDIX 1 – SITE PLAN



Note: Showing approximate test locations only

LEGEND

BH Borehole

Depth to Reactive Material

STRUCterre consulting

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PROJECT:	Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook
PROJECT #:	D340179
CLIENT:	**The Bethanie Group Ltd**
JOB #:	J460592
SCALE:	NTS
TITLE:	Geotechnical Investigation Site Plan
DATE:	31 JUL '24
DRAWN BY:	MM
CHECKED BY:	LY

DOC: GE:3.001

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APPENDIX 2 – SITE PHOTOS



PHOTO 1 - Facing north from BH1 location



PHOTO 2 - Facing south from BH1 location

STRUCterre consulting	PROJECT: Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook	
	PROJECT #: D340179	CLIENT: **The Bethanie Group Ltd**
	JOB #: J460592	
Zemla Pty Ltd (ABN 71 349 772 837) ATF the Young Purich and Higham Unit Trust trading as Structerre Consulting 1 ERINDALE ROAD, BALCATTA, WA 6021 TEL 9205 4500 FAX 9205 4501 EMAIL: wageotecheng@structerre.com.au	SCALE: NTS	TITLE: Site Photographs
	DATE: 11 Jul '24	DRAWN BY: MM / CHECKED BY: LY

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PHOTO 3 - Facing west from BH10 location



PHOTO 4 - Facing east from southwest corner

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PROJECT:	Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook
PROJECT #:	D340179
CLIENT:	**The Bethanie Group Ltd**
JOB #:	J460592
SCALE:	NTS
TITLE:	Site Photographs
DATE:	11 Jul '24
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PHOTO 5 - Sample taken at BH1



PHOTO 6 - Sample taken at BH6



PHOTO 7 - Sample taken at BH14



PHOTO 8 - Sample taken at BH17

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PROJECT #:	D340179
CLIENT:	**The Bethanie Group Ltd**
JOB #:	J460592
SCALE:	NTS
TITLE:	Photographs - Borehole Samples
DATE:	11 Jul '24
DRAWN BY:	MM
CHECKED BY:	LY

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APPENDIX 3 – BORELOGS & TERMINOLOGY

STRUCterre consulting engineers

Residential | Geotechnical | Commercial & Infrastructure

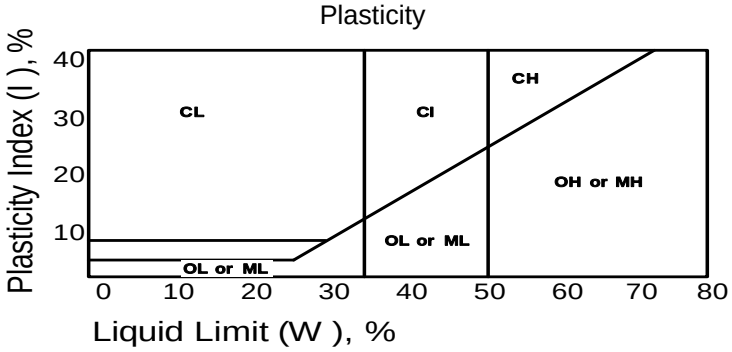
Inspect & Investigate | Energy Assessment | Environmental

BOREHOLE TERMINOLOGY

Particle Size Distribution

Major Division	Subdivision	Size
Boulders		>200mm
Cobbles		200 - 63mm
Gravel	Coarse	63 - 20mm
	Medium	20- 6mm
	Fine	6 - 2.36mm
Sand	Coarse	2.36 - 0.6mm
	Medium	0.6 - 0.2mm
	Fine	0.2 - 0.075mm

Plasticity



Consistency of Cohesive Soils

Term	Undrained Strength Su (kPa)	Field Guide
Very Soft	< 12	Exudes between the fingers when squeezed in hand
Soft	12 - 25	Can be moulded by light finger pressure
Firm	25 - 50	Can be moulded by strong finger pressure
Stiff	50 - 100	Cannot be moulded by Fingers. Can be indented by thumb.
Very Stiff	100 - 200	Can be indented by thumb nail
Hard	> 200	Can be indented with difficulty by thumb nail.
Friable	-	Crumbles or powders when scraped by thumbnail

Consistency/Density of Non-Cohesive Soils

Term	Density Index (%)	SPT "N" Value Comparison
Very Loose	< 15	0 - 4
Loose	15 - 35	4 - 10
Medium Dense	35 - 65	10 - 30
Dense	65 - 85	30 - 50
Very Dense	> 85	> 50

Moisture Content

D	Dry
M	Moist
W	Wet
S	Saturated

Minor Components

Term	Assessment Guide	Proportion of Minor Component In:
Trace	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component	Coarse grained soils: < 5 % Fine grained soils: <15%
With	Presence easily detected by feel or eye, soil properties little different to general properties of primary component	Coarse grained soils: 5 - 12 % Fine grained soils: 15 - 30%

Soil Legend

FILL	CLAY	GRAVEL	CONCRETE
TOPSOIL	SILT	LIMESTONE	COMBINATIONS
PEAT	SAND	BEDROCK	eg: Clay, Silty, Sandy

USCS

GW	Well graded gravel	SC	Clayey sand	OL	Organic low plasticity silt	CL	Low plasticity clay
GP	Poorly graded gravel	SM	Silty sand	ML	Low plasticity silt	CI	Intermediate plasticity clay
SW	Well graded sand			MH	High plasticity silt	CH	High plasticity clay
SP	Poorly graded sand			OH	Organic high plasticity silt	PT	Peat

DOC:GE:3.003

WA | QLD | NSW | VIC

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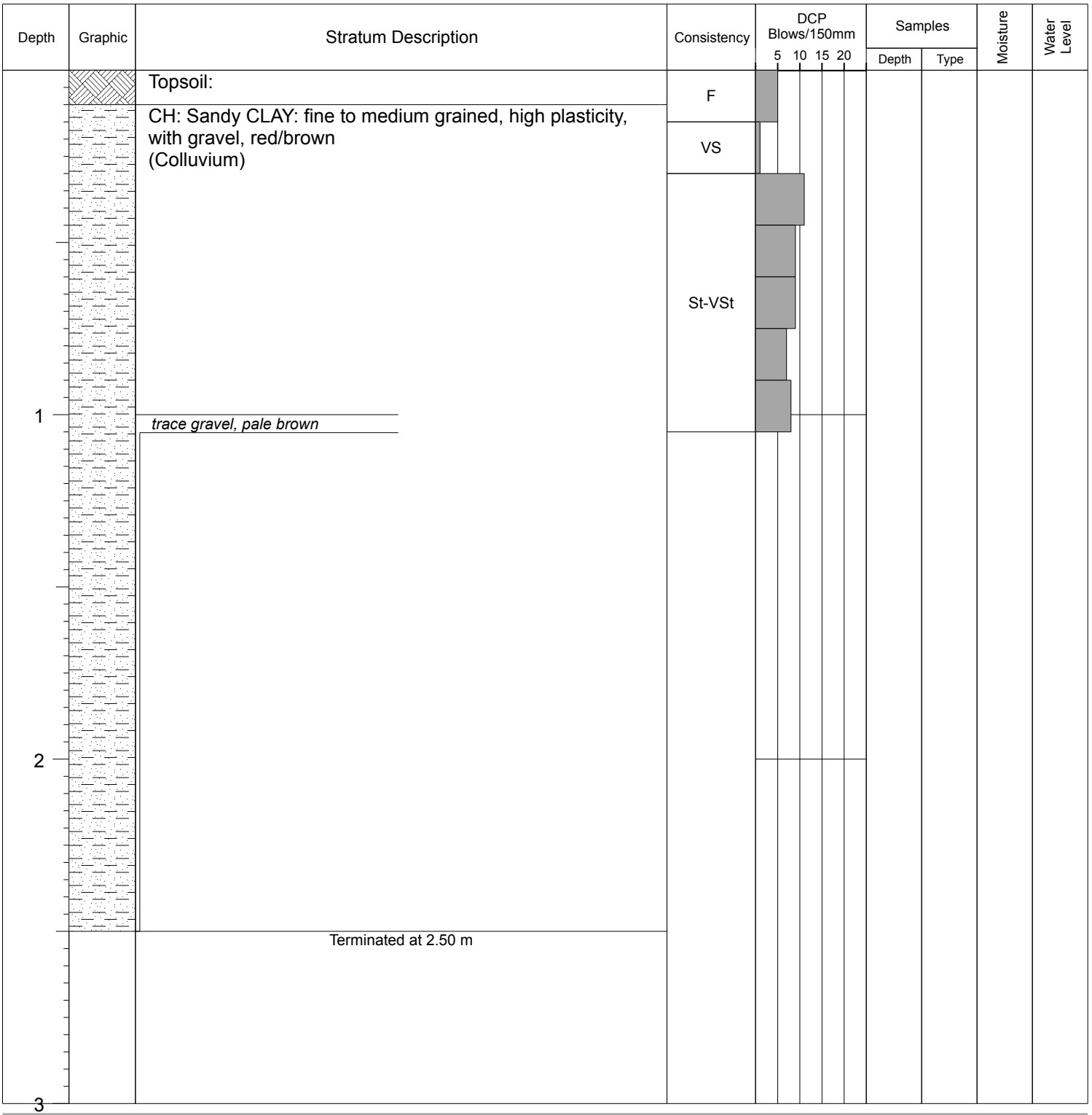
Project	Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook
Client	The Bethanie Group Ltd

Test No.

BH01

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408478
Job No.	J460592	**Date**	11/07/2024	**Hole Dia.**	65mm	**Northing**	6496141



Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook

Client The Bethanie Group Ltd

Test No. **BH02**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408615
Job No.	J460592	**Date**	11/07/2024	**Hole Dia.**	65mm	**Northing**	6496118

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		CH: Sandy CLAY: fine to medium grained, high plasticity, trace gravel, red/brown (Colluvium)	St-VSt					
1		*pale brown*						
		Terminated at 1.30 m						
2								
3								

Remarks

1. Termination reason: Refusal - interpreted on stiff clay
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook

Client The Bethanie Group Ltd

Test No. **BH03**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408545
Job No.	J460592	**Date**	11/07/2024	**Hole Dia.**	65mm	**Northing**	6496087

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		CH: Sandy CLAY: fine to medium grained, high plasticity, with gravel, red/brown (Colluvium)						
1		*trace gravel, pale red/brown*						
		Terminated at 1.20 m						
2								
3								

Remarks

1. Termination reason: Refusal - interpreted on stiff clay
2. Hole stability: Hole partially stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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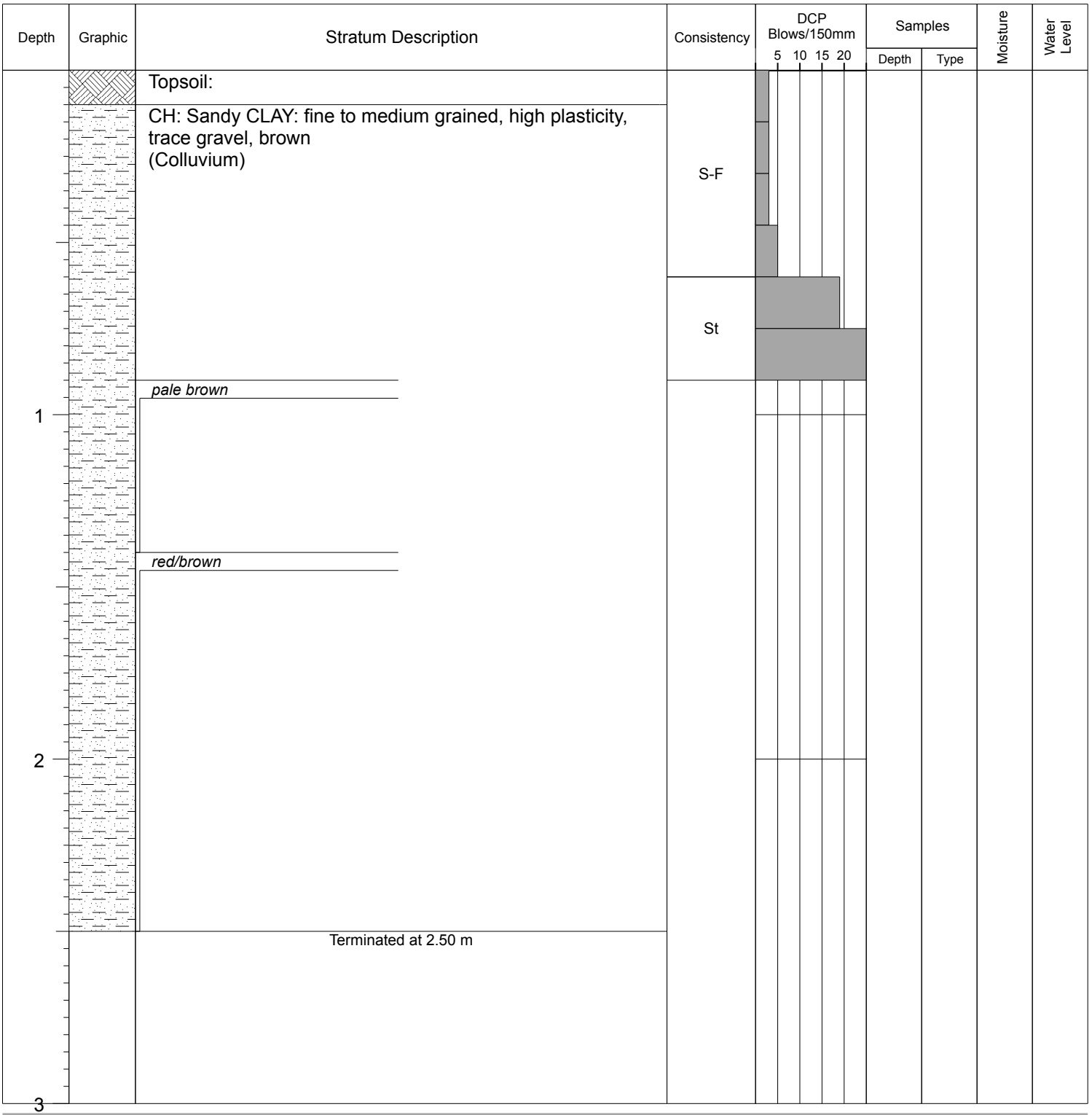
Client The Bethanie Group Ltd

Test No. **BH04**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408877
Job No.	J460592	**Date**	11/07/2024	**Hole Dia.**	65mm	**Northing**	6496042



Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook

Client The Bethanie Group Ltd

Test No. **BH05**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	648588
Job No.	J460592	**Date**	11/07/2024	**Hole Dia.**	65mm	**Northing**	6496047

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		CH: Sandy CLAY: fine to medium grained, high plasticity, with gravel, red/brown (Colluvium)						
1		*pale brown*						
		Terminated at 1.80 m						
2								
3								

Remarks

1. Termination reason: Refusal - interpreted on stiff clay
2. Hole stability: Hole partially stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook

Client The Bethanie Group Ltd

Test No. **BH06**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408513
Job No.	J460592	**Date**	11/07/2024	**Hole Dia.**	65mm	**Northing**	649559

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:	S-F					
		CI: Sandy CLAY: fine to medium grained, medium plasticity, with gravel, brown (Colluvium)	F-St					
1								
		Terminated at 1.40 m						
2								
3								

Remarks

1. Termination reason: Refusal - interpreted on stiff clay
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook

Client The Bethanie Group Ltd

Test No. **BH07**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408605
Job No.	J460592	**Date**	11/07/2024	**Hole Dia.**	65mm	**Northing**	6495885

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:	VS-S					
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, brown	VSt					
1								
2								
		Terminated at 2.50 m						
3								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

STRUCterre consulting engineers

Project	Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook
Client	The Bethanie Group Ltd

Test No.

BH08

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408474
Job No.	J460592	**Date**	11/07/2024	**Hole Dia.**	65mm	**Northing**	6495887

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		SP: SAND: medium to coarse grained, non-plastic, with gravel, pale yellow (Colluvium)	MD-D					
1			D-VD					
2		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown						
		Terminated at 2.50 m						
3								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project	Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook
Client	The Bethanie Group Ltd

Test No.

BH09

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408524
Job No.	J460592	**Date**	11/07/2024	**Hole Dia.**	65mm	**Northing**	6495861

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		SP: SAND: medium to coarse grained, non-plastic, with gravel, pale yellow (Colluvium)	L-MD					
			D					
1		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown						
		Terminated at 2.50 m						
2								
3								

Remarks

1. Termination reason: Target depth
2. Hole stability:
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project	Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook
Client	The Bethanie Group Ltd

Test No. **BH10**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408588
Job No.	J460592	**Date**	11/07/2024	**Hole Dia.**	65mm	**Northing**	6495820

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:	L					
		SP: SAND: medium to coarse grained, non-plastic, with gravel, pale yellow (Colluvium)	MD-D					
1		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown						
		Terminated at 2.50 m						
2								
3								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook

Client The Bethanie Group Ltd

Test No. **BH11**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408579
Job No.	J460592	**Date**	12/07/2024	**Hole Dia.**	65mm	**Northing**	608579

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:	VL					
		SP: SAND: fine to medium grained, non-plastic, brown (Colluvium)	MD - D					
			VD					
		SP: Gravelly SAND: medium grained, non-plastic, brown						
1		Terminated at 1.10 m						
2								
3								

Remarks

1. Termination reason: Refusal - interpreted on dense gravel
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook

Client The Bethanie Group Ltd

Test No. **BH12**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408487
Job No.	J460592	**Date**	12/07/2024	**Hole Dia.**	65mm	**Northing**	6495741

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:	L					
		SP: SAND: fine to medium grained, non-plastic, brown (Colluvium)	D-VD					
1		SP: Gravelly SAND: medium grained, non-plastic, brown						
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown						
2		Terminated at 2.50 m						
3								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook

Client The Bethanie Group Ltd

Test No. **BH13**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408479
Job No.	J460592	**Date**	12/07/2024	**Hole Dia.**	65mm	**Northing**	6495798

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		SP: SAND: fine to medium grained, non-plastic, brown (Colluvium)	VL-L					
		SP: Gravelly SAND: medium grained, non-plastic, brown	MD-D					
1								
		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown						
2								
		Terminated at 2.50 m						
3								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project	Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook
Client	The Bethanie Group Ltd

Test No.

BH14

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408491
Job No.	J460592	**Date**	12/07/2024	**Hole Dia.**	65mm	**Northing**	6495858

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		SP: SAND: fine to medium grained, non-plastic, brown (Colluvium)	VL-L					
1		SP: Gravelly SAND: medium grained, non-plastic, brown	D					
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, red/brown						
2		Terminated at 2.50 m						
3								

Remarks

1. Termination reason: Target depth
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

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Project Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook

Client The Bethanie Group Ltd

Test No. **BH15**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408427
Job No.	J460592	**Date**	12/07/2024	**Hole Dia.**	65mm	**Northing**	6495839

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		SP: SAND: fine to medium grained, non-plastic, brown (Colluvium)	VL-L					
1			MD					
		SP: Gravelly SAND: medium grained, non-plastic, brown						
		Terminated at 1.60 m						
2								
3								

Remarks

1. Termination reason: Refusal - interpreted on dense gravel
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

STRUCterre consulting engineers

Project Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook

Client The Bethanie Group Ltd

Test No. **BH16**

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408381
Job No.	J460592	**Date**	12/07/2024	**Hole Dia.**	65mm	**Northing**	6495736

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
0		Topsoil:						
		Cl: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, pale red/brown (Colluvium)	S-F					
			St					
1		*with gravel, pale brown*						
		trace gravel						
2		Terminated at 2.20 m						
3								

Remarks

1. Termination reason: Refusal - interpreted on stiff clay
2. Hole stability: Hole stable
3. Samples taken: None
4. Co-ordinate system: WGS 84

STRUCterre consulting engineers

Project	Bethanie Bullsbrook Village & Vehicle Bridge - Lot 900 Chittering Road, Bullsbrook
Client	The Bethanie Group Ltd

Test No.

BH17

Project No.	D340179	**Logged By**	Ankush Rabadia	**Machine**	Soil Retrieval Probe	**Easting**	408292
Job No.	J460592	**Date**	12/07/2024	**Hole Dia.**	65mm	**Northing**	6495770

Depth	Graphic	Stratum Description	Consistency	DCP Blows/150mm (5 10 15 20)	Samples Depth	Samples Type	Moisture	Water Level
		Topsoil:						
		CI: Sandy CLAY: fine to medium grained, medium plasticity, trace gravel, pale yellow (Colluvium)	S-F					
			VSt					
1		Terminated at 1.10 m						
2								
3								

Remarks

1. Termination reason: Refusal - interpreted on stiff clay
2. Hole stability:
3. Samples taken: None
4. Co-ordinate system: WGS 84

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APPENDIX 4 – LABORATORY TEST RESULTS

Sample No.	**39134**	**Client**	Geotechnical
Job No.	J460592	**Project**	Lot 900 CHITTERING RD, BULLSBROOK

Laboratory testing carried out at Malaga Laboratory 44 Crocker Dr Malaga WA 6090

SAMPLE DETAILS

BH No. / Depth	BH4 1.4-1.8m	Sampling Method	Client
Sample History	50°C Oven Dried	Sample Preparation	AS 1289 1.1

ATTERBERG LIMITS

Description	Method	Result (%)
Liquid Limit	AS 1289.3.1.2	55
Plastic Limit	AS 1289.3.2.1	23
Plasticity Index	AS 1289.3.3.1	32
Linear Shrinkage	AS 1289.3.4.1	12
Nature of Shrinkage		Flat

PARTICLE SIZE DISTRIBUTION

Method: AS 1289.3.6.1
Description: Particle size distribution by sieve analysis

Sieve Size (mm)	% Passing
19.0	100
2.36	99
0.425	84
0.075	66

AS 1726:2017 Clause 6.1
Material Description: Sandy CLAY trace gravel
AS Group Symbol: CH or OH

NATA WORLD RECOGNISED ACCREDITATION

Accreditation Number 18742

Ben Stroop
Authorized Signatory

Senior Laboratory Technician

Date: 19-Jul-24

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ABN 71 349 772 837 Zemla Pty Ltd ACN 008 966 283 as trustee for the Young Purich and Higham Unit Trust trading as Structerre Consulting Engineers

Sample No.	**39135**	**Client**	Geotechnical
Job No.	J460592	**Project**	Lot 900 CHITTERING RD, BULLSBROOK

Laboratory testing carried out at Malaga Laboratory 44 Crocker Dr Malaga WA 6090

SAMPLE DETAILS

BH No. / Depth	BH9 1.5-1.9m	Sampling Method	Client
Sample History	50°C Oven Dried	Sample Preparation	AS 1289 1.1

ATTERBERG LIMITS

Description	Method	Result (%)
Liquid Limit	AS 1289.3.1.2	42
Plastic Limit	AS 1289.3.2.1	20
Plasticity Index	AS 1289.3.3.1	22
Linear Shrinkage	AS 1289.3.4.1	9.5
Nature of Shrinkage		Flat

PARTICLE SIZE DISTRIBUTION

Method: AS 1289.3.6.1
Description: Particle size distribution by sieve analysis

Sieve Size (mm)	% Passing
19.0	100
2.36	100
0.425	79
0.075	47

AS 1726:2017 Clause 6.1
Material Description: Sandy CLAY trace gravel
AS Group Symbol: CI or OI

NATA WORLD RECOGNISED ACCREDITATION

Accreditation Number 18742

Ben Stroop
Authorized Signatory Senior Laboratory Technician

Date: 19-Jul-24

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Website: www.structerre.com.au
ABN: 71 349 772 837 / ACN: 008 966 283

California Bearing Ratio Test Report

Report Number: CBR:24S-07234
Date of Issue01/08/2024
Issue Number: 1

Client:	The Bethanie Group Ltd
Client Address:	Level 3 / 202 Pier Street Perth WA 6000
Project:	BETHANIE BULLSBROOK VILLAGE & VEHICLE BRIDGE
Project No:	D340179

Accreditation Number 18742

NATA WORLD RECOGNISED ACCREDITATION

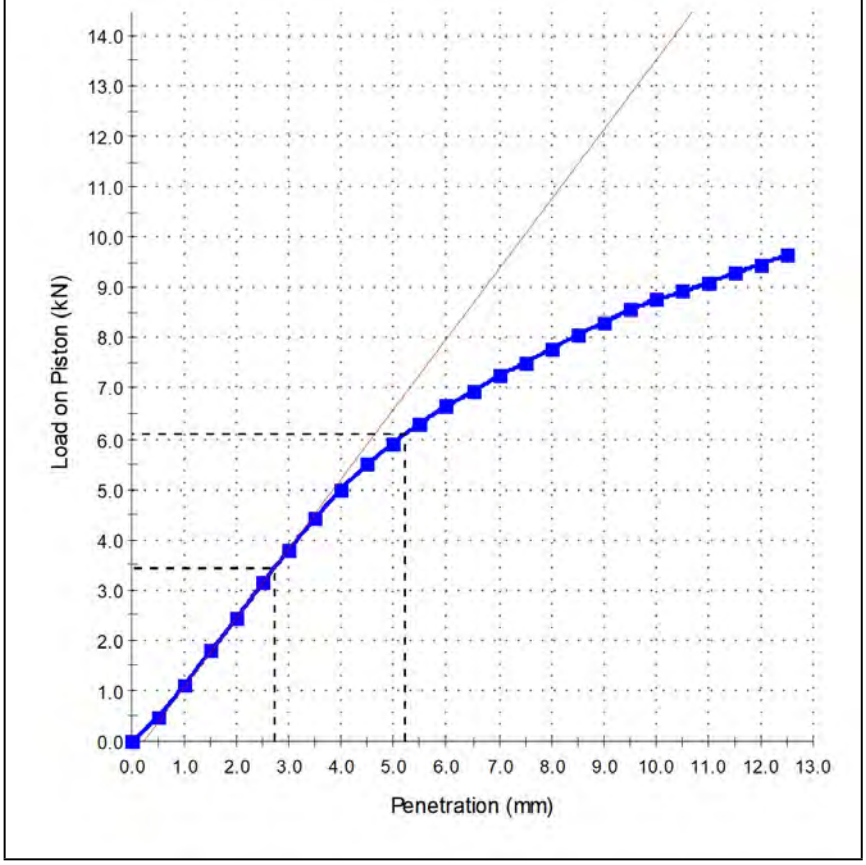
Approved Signatory: Ben Stroop

Accredited for compliance with ISO/IEC 17025

Sample Details

Sample ID:	Proposed Fill	**Field Sample ID:**	BH17
Date Tested:	23/07/2024	**Date Sampled:**	12/07/2024
Soil Description:	Clayey Sand	**Proposed Use:**	Fill
Depth of Test:	N/A	**Depth of Layer:**	
Sampling Method:	Sampled by Client	**TRN:**	-
Work Order ID:	W24-02840		

Load vs Penetration



Test Results

	AS 1289.6.1.1
CBR at 5.0mm (%):	**30**
Dry Density before Soaking (t/m³):	1.99
Density Ratio before Soaking (%):	95.0
Moisture Content before Soaking (%):	8.4
Moisture Ratio before Soaking (%):	103.5
Dry Density after Soaking (t/m³):	1.99
Density Ratio after Soaking (%):	95.0
Swell (%):	0.0
Moisture Content of Top 30mm (%):	10.7
Moisture Content of Remaining Depth (%):	10.2
Compaction Hammer Used:	Modified AS 1289.5.2.1
Surcharge Mass (kg):	4.50
Period of Soaking (Days):	4
Retained on 19 mm Sieve (%):	0
CBR Moisture Content Method:	AS 1289.2.1.1
Sample Curing Time (h):	24
Plasticity Determination Method:	Visual/Tactile

Comments

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Website: www.structerre.com.au
ABN: 71 349 772 837 / ACN: 008 966 283

Maximum Dry Density Report

Report Number: MDD:24S-07234
Date of Issue01/08/2024
Issue Number: 1

Client:	The Bethanie Group Ltd
Client Address:	Level 3 / 202 Pier Street Perth WA 6000
Project:	BETHANIE BULLSBROOK VILLAGE & VEHICLE BRIDGE
Project No:	D340179

Accreditation Number 18742

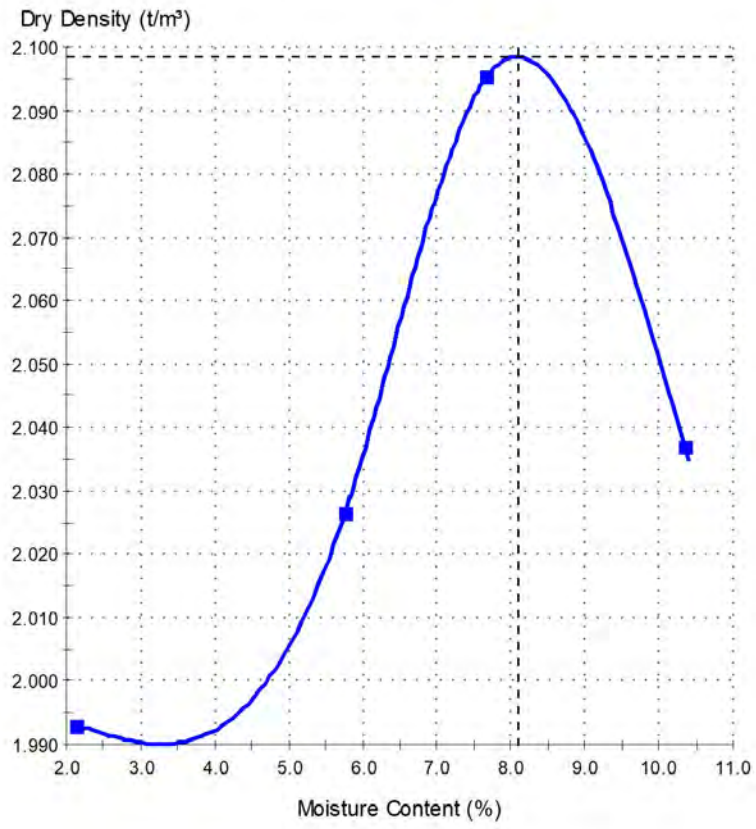
Approved Signatory: Ben Stroop

Accredited for compliance with ISO/IEC 17025

Sample Details

Sample ID:	Proposed Fill	**Field Sample ID:**	BH17
Date Tested:	17/07/2024	**Date Sampled:**	12/07/2024
Soil Description:	Clayey Sand	**Proposed Use:**	Fill
Depth of Test:	N/A	**Depth of Layer:**	
Sampling Method:	Sampled by Client	**TRN:**	-
Work Order ID:	W24-02840		

Dry Density - Moisture Content Relationship



Test Results

AS 1289.5.2.1

Modified MDD (t/m³):	**2.10**
Modified OMC (%):	**8.0**
Retained Sieve (mm):	19.0
Oversize Material (%):	0
Curing Time (h):	24
LL Method:	Visual / Tactile

Comments

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California Bearing Ratio Test Report

Report Number: CBR:24S-07235
Date of Issue01/08/2024
Issue Number: 1

Client:	The Bethanie Group Ltd
Client Address:	Level 3 / 202 Pier Street Perth WA 6000
Project:	BETHANIE BULLSBROOK VILLAGE & VEHICLE BRIDGE
Project No:	D340179

Accreditation Number 18742

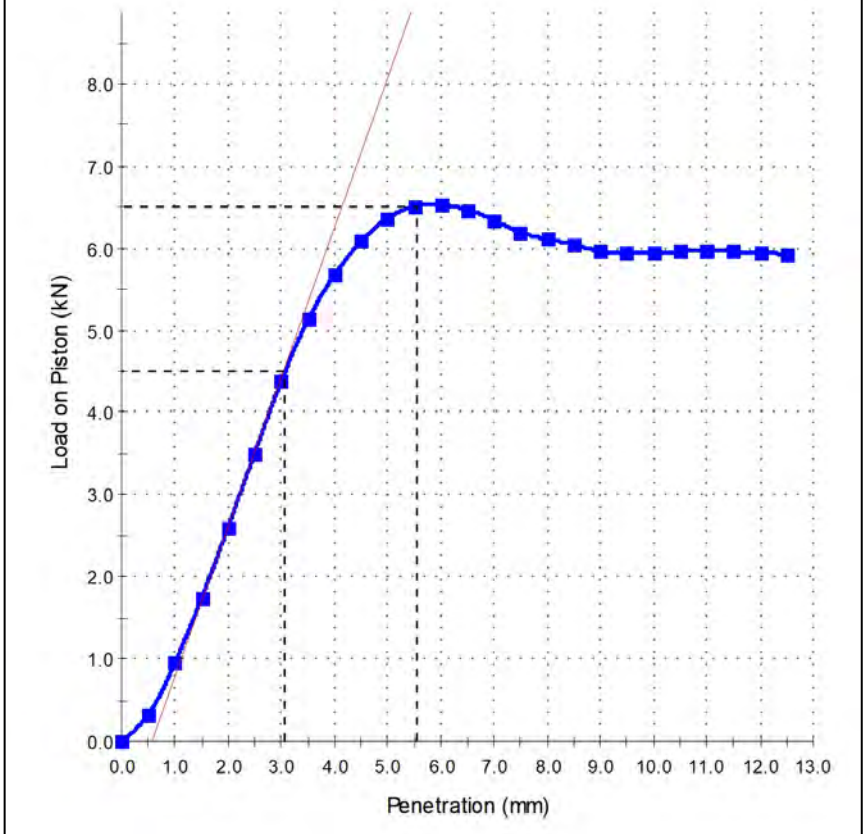
Approved Signatory: Ben Stroop

Accredited for compliance with ISO/IEC 17025

Sample Details

Sample ID:	Proposed Fill	**Field Sample ID:**	BH18
Date Tested:	23/07/2024	**Date Sampled:**	12/07/2024
Soil Description:	Sand	**Proposed Use:**	Fill
Depth of Test:	N/A	**Depth of Layer:**	
Sampling Method:	Sampled by Client	**TRN:**	-
Work Order ID:	W24-02840		

Load vs Penetration



Test Results

	AS 1289.6.1.1
CBR at 2.5mm (%):	**35**
Dry Density before Soaking (t/m³):	1.87
Density Ratio before Soaking (%):	95.5
Moisture Content before Soaking (%):	8.5
Moisture Ratio before Soaking (%):	101.0
Dry Density after Soaking (t/m³):	1.87
Density Ratio after Soaking (%):	95.5
Swell (%):	0.0
Moisture Content of Top 30mm (%):	11.4
Moisture Content of Remaining Depth (%):	11.8
Compaction Hammer Used:	Modified AS 1289.5.2.1
Surcharge Mass (kg):	4.50
Period of Soaking (Days):	4
Retained on 19 mm Sieve (%):	0
CBR Moisture Content Method:	AS 1289.2.1.1
Sample Curing Time (h):	24
Plasticity Determination Method:	Visual/Tactile

Comments

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Report Number: MDD:24S-07235
Date of Issue01/08/2024
Issue Number: 1

Maximum Dry Density Report

Client:	The Bethanie Group Ltd
Client Address:	Level 3 / 202 Pier Street Perth WA 6000
Project:	BETHANIE BULLSBROOK VILLAGE & VEHICLE BRIDGE
Project No:	D340179

Accreditation Number 18742

NATA WORLD RECOGNISED ACCREDITATION

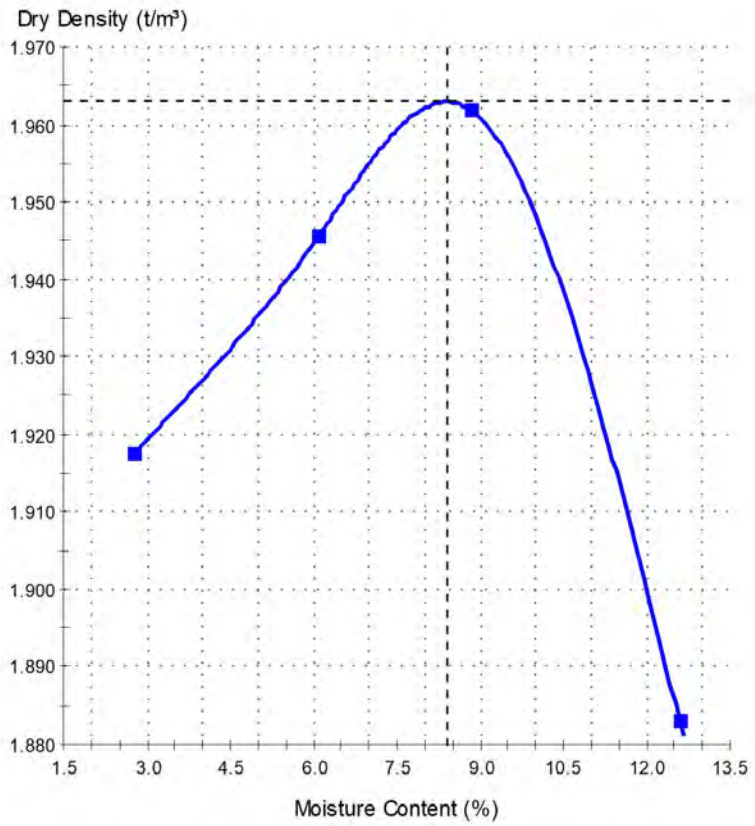
Approved Signatory: Ben Stroop

Accredited for compliance with ISO/IEC 17025

Sample Details

Sample ID:	Proposed Fill	**Field Sample ID:**	BH18
Date Tested:	17/07/2024	**Date Sampled:**	12/07/2024
Soil Description:	Sand	**Proposed Use:**	Fill
Depth of Test:	N/A	**Depth of Layer:**	
Sampling Method:	Sampled by Client	**TRN:**	-
Work Order ID:	W24-02840		

Dry Density - Moisture Content Relationship



Test Results

AS 1289.5.2.1

Modified MDD (t/m³):	**1.96**
Modified OMC (%):	**8.5**
Retained Sieve (mm):	19.0
Oversize Material (%):	0
Curing Time (h):	24
LL Method:	Visual / Tactile

Comments

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Material Test Report

Report Number: MAT:24S-07237
Date of Issue01/08/2024
Issue Number: 1

Client:	The Bethanie Group Ltd
Client Address:	Level 3 / 202 Pier Street Perth WA 6000
Project:	BETHANIE BULLSBROOK VILLAGE & VEHICLE BRIDGE
Project No:	D340179



Approved Signatory: Ben Stroop

Accredited for compliance with ISO/IEC 17025

Sample Details

Sample ID	Proposed Fill
Field Sample ID	BH19
Date Tested	22/07/2024
Date Sampled	12/07/2024
Soil Description	Sand
Proposed Use	Fill
Depth of Test	N/A
Depth of Layer	
Sampling Method	Sampled by Client
TRN	-
Work Order ID	W24-02840

Test Results

Description	Method	Result	Limits
Ash Content (%)	ASTM D 2974	98.4	
Organic Content (%)		1.6	
Furnace Temperature (°C)		440	
Moisture Content (%)		0	
Moisture contents are proportioned by		as-received mass	
Moisture Content Method (A or B)		A	
Ash Content Method (C or D)		C	
Date Tested		22/07/2024	

Comments

ASTM D 2974 Not covered under scope of accreditation.

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Appendix C: Engineering Servicing Report

Cossill & Webley, 2024

Cossill & Webley
CONSULTING ENGINEERS



Bethanie Village - Bullsbrook
Engineering Services Report
August 2024

Level 2, 431 Roberts Road,
Subiaco WA 6008.
PO Box 680 Subiaco, WA 6904

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1. INTRODUCTION

This report has been prepared by Cossill & Webley (CW) to support Bethanie's Development Application for the development of a 235-dwelling village located at Bullsbrook. The extent and location of The Site is defined in Figure 1 below.

This report summarises our assessment of the engineering aspects of the proposed development of the village (referred to herein as The Site).



Figure 1 – Locality Plan *(Aerial: Metromap)*

2. SITE DESCRIPTION

The Site is located at Bullsbrook, within the City of Swan Local Government Area.

The Site has an area of 10.6 hectares and sits on land currently described as:

- Lot 900
- Lot 9501
- Lot 2 – existing church
- Lot 9014 – existing vegetation
- Lot 9013 – Part Lot

The Site is bound by the existing Sacri Church to the west and Fairchild Street to the east. Adjacent to the southern boundary will be the future Chittering Road re-alignment. The northern boundary is bound by Lot 9014 consisting of existing vegetation.

The Site is currently vacant.

3. PROPOSED DEVELOPMENT

The proposed development consists of:

- 235 residential dwellings;
- A Clubhouse for residents;
- A meeting place 'The Lookout'
- Leisure facilities consisting of a lawn bowls green, pickleball courts, community garden and BBQ; and
- Landscaped drainage swales

The proposed development layout of The Site is shown in Figure 2 below.

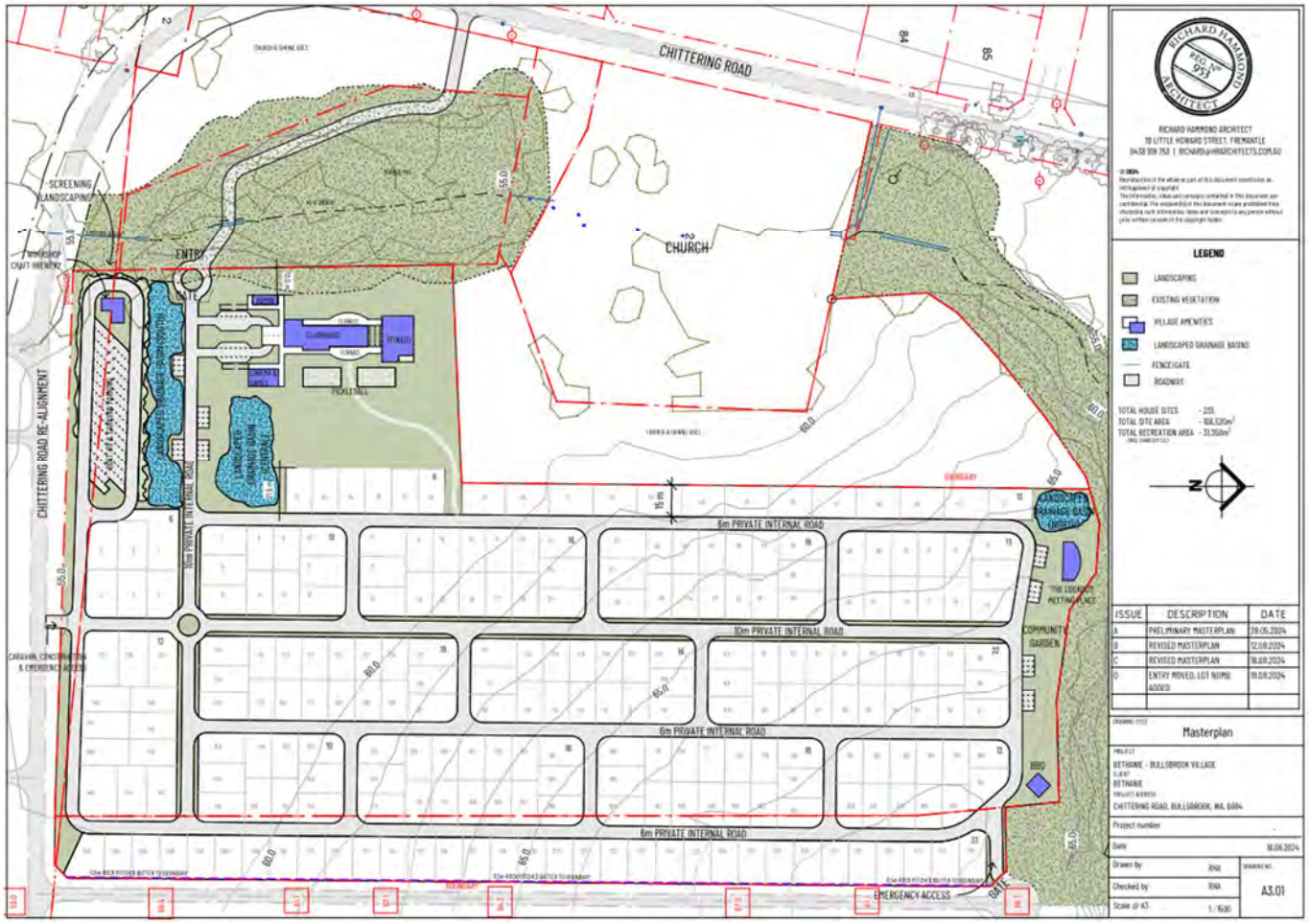

Figure 2 - Development Layout (Source: Richard Hammond Architect – Bethanie Bullsbrook Village Masterplan)

3.1 Geology and Landform

3.1.1 Geology

The Geological Survey of Western Australia indicates that the Site is characterized by the following soil types:

- Pebbly Silt on the southern portion of the site; and
- Sandy Silt on the northern portion of the site.

Figure 3 below shows the extent of each soil type identified on the Geological Survey of Western Australia.

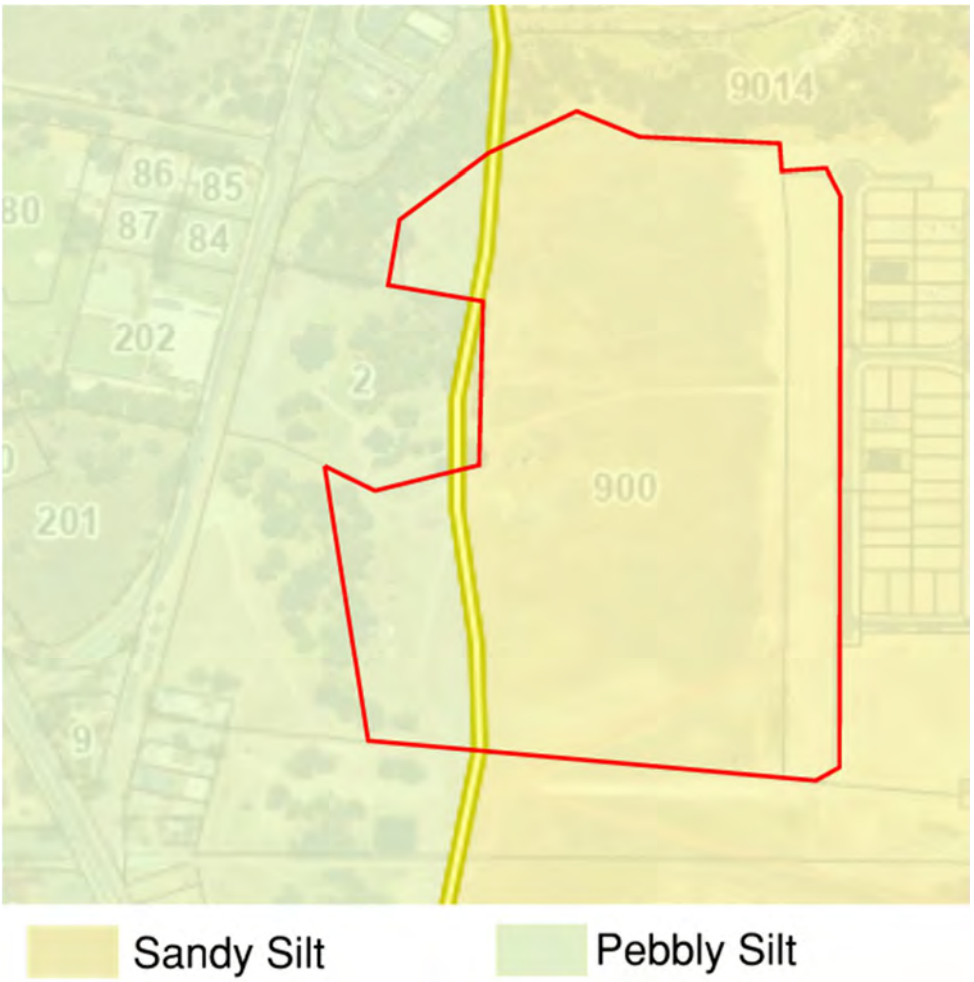

Figure 3 – Geology of The Site (Source: Geological Survey of WA)

3.1.2 Landform

The Site grades from northeast to southwest with an average gradient of 3%. The highest point of The Site is located around the northeast boundary towards Fairchild St located at RL68m AHD. The lowest point of The Site is located on the south-western boundary at RL54m AHD, as shown in Figure 4 below. There is a fill batter along the edge of Fairchild Street that extends into The Site that will be graded out with the future development levels.



Figure 4 - Existing Surface Contours (mAHD) (Source: MNG Access)

3.2 Groundwater

The groundwater levels that have been determined from the Groundwater Atlas shown on the Perth Groundwater Map indicate that the maximum groundwater level is at 32mAHD and the minimum is at 31mAHD across The Site. The natural surface levels across The Site vary between RL55m AHD to RL68m AHD as defined in Figure 5 below. The groundwater will therefore not be impacted by the proposed works on The Site.

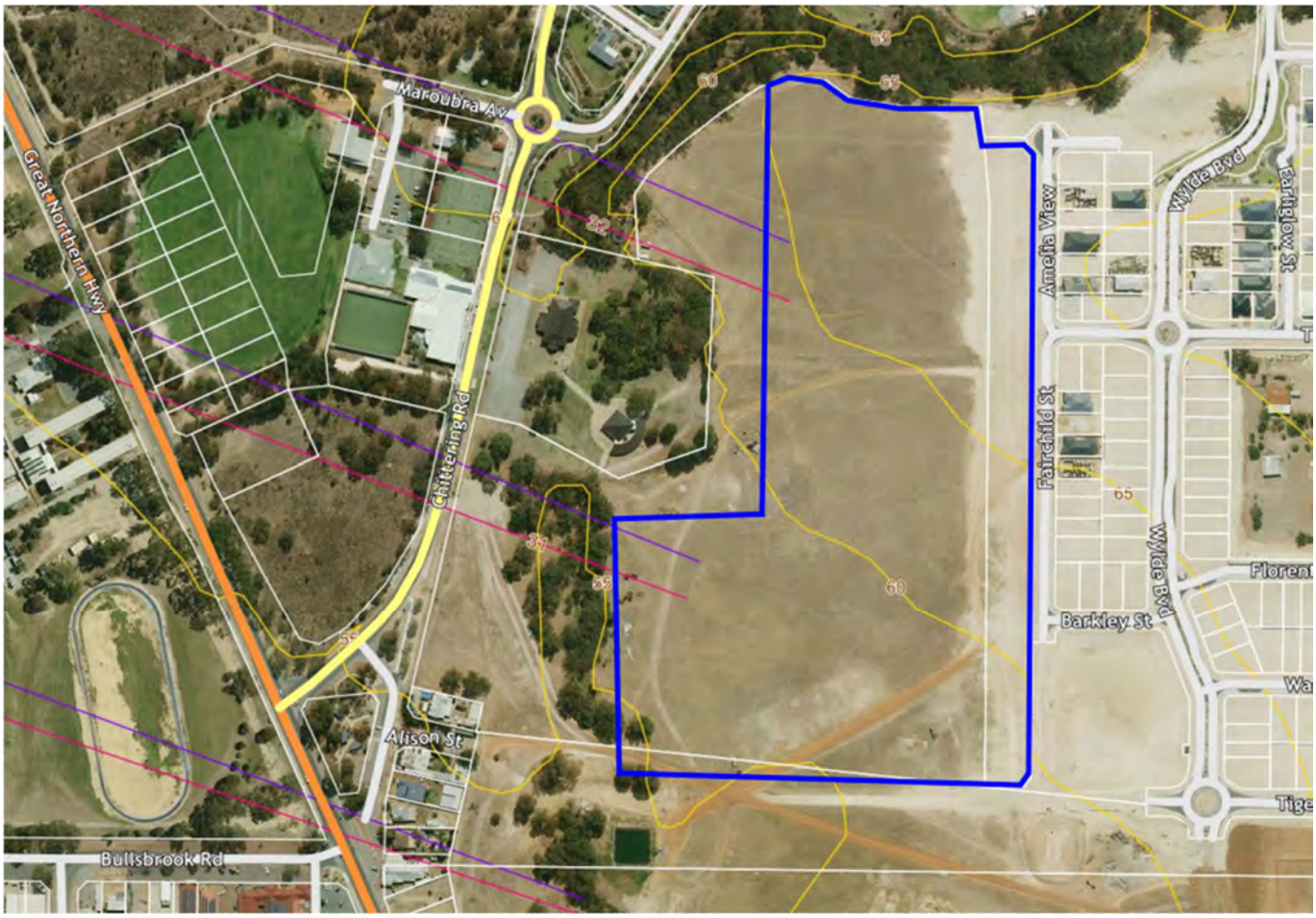

Figure 5 - Existing Maximum & Minimum Groundwater Levels (Source: MNG Access)

3.3 Acid Sulfate Soils

The Site is classified as low risk of encountering Acid Sulfate Soils within 3m of the natural surface as published on the Acid Sulfate Soils Risk Map, Swan Coastal Plain (DWER-055). It is recommended that on site testing be conducted prior to development to confirm no presence of acid sulfate soils.

3.4 PFAS

The Site is located near the RAAF Base Pearce (Bullsbrook). Former air base activities involved fire training and disposing of PFAS in the soil and therefore PFAS has been detected in the bore water of some residents. As part of the soil remediation works, Water Corporation has commissioned to construction of a water pipeline to supply water to the affected area for water supply. Bethanie Bullsbrook Village is not in the affected area as shown in 6 below.

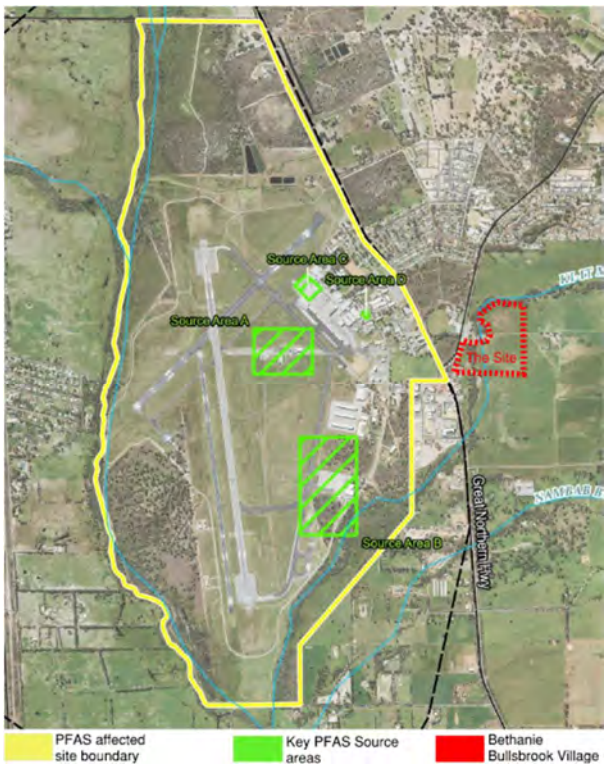

Figure 6 – Existing PFAS-affected Site boundary with The Site (Source: Department of Defence)

4. EARTHWORKS

It is proposed to undertake earthworks across The Site to create suitably sloped building sites for each dwelling in the development and to cater for road grading, stormwater management and services installation. A grading plan for the site has been prepared and in included in Appendix A.

The extremities of the site tie into the existing ground levels. A retaining wall is proposed along the rear of the lots adjacent to Fairchild Street to reduce the gradients across the site and to facilitate level changes within lot cells to be taken up by the built form.

5. ROADWORKS & FOOTPATHS

5.1 Connection to Existing Roads

Access to The Site is proposed from Chittering Road as shown on the Bethanie Bullsbrook Village Masterplan, in Figure 2. The Site access road will be constructed as part of the Stage 1 development and will cross the Ki-It Brook at the location of the existing culverts.

The Kingsford Local Structure Plan shows Chittering Road to be-realigned and run parallel to the southern boundary of The Site. Chittering Road is classified as Neighbourhood Connector A and Neighbourhood Connector B as shown in Figure 7 below. An emergency access and caravan access is shown on the Masterplan to connect to the Neighbourhood Connector B section of Chittering Road re-alignment. This section is proposed as a 3.5m carriageway with no median which is suitable to cater for the proposed secondary access point to The Site.

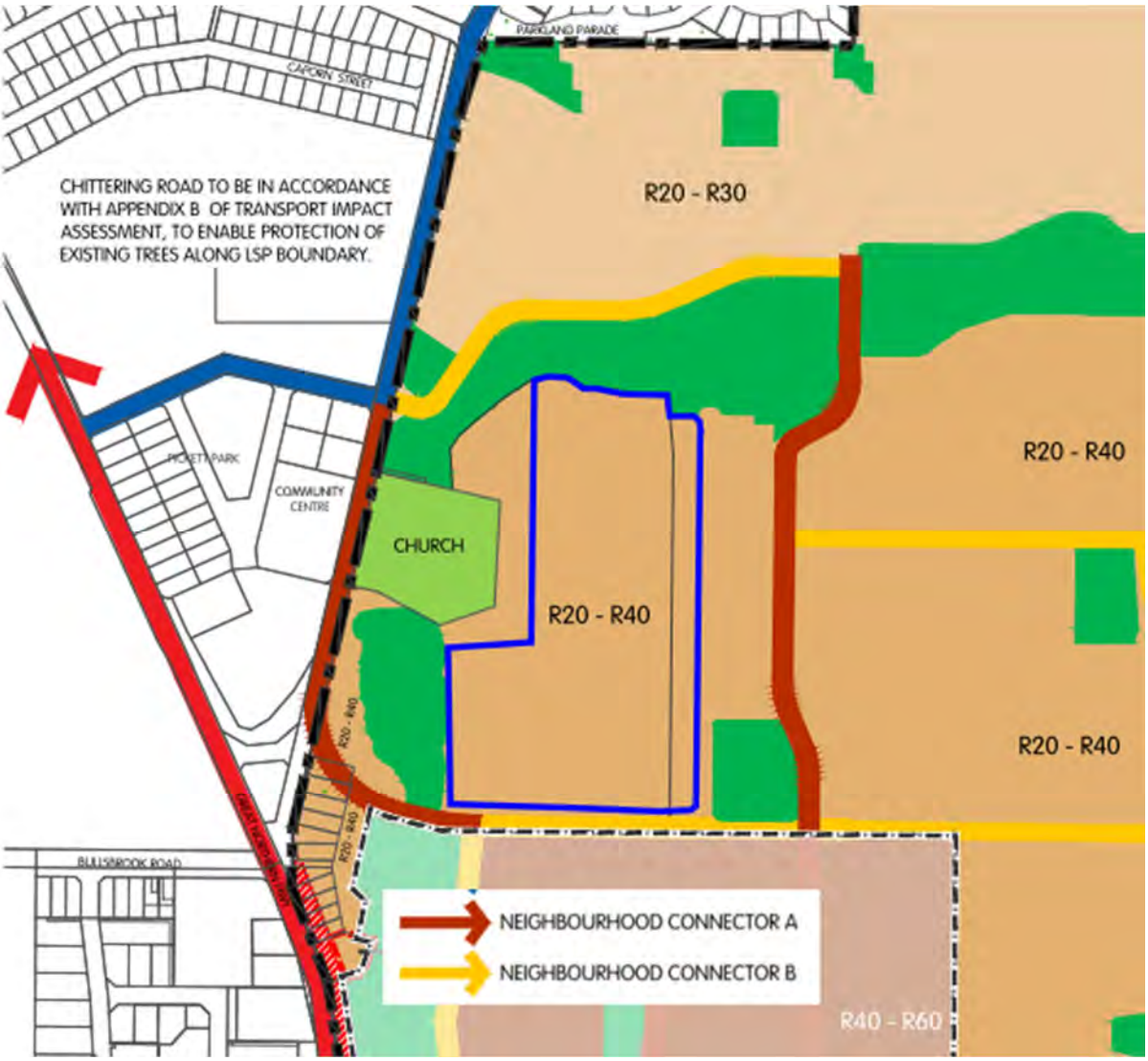

Figure 7 – Kingsford Local Structure Plan (HATCH Roberts Day)

5.2 Internal Road Network

The internal road network is intended to be privately owned and maintained by the operators of the Bethanie Bullsbrook Village. The internal road network consists of the entrance road, dwelling access roads and carparks for boat, recreational vehicle, caravan and visitor parking. The internal road network is illustrated on drawing Bethanie Bullsbrook Village Masterplan shown in Figure 2.

5.2.1 Entrance Road

The entrance road, as shown in Figure 8 below, consists of a roundabout and a divided road that serves the following purposes:

- Access to visitor car parking;
- Access to lots; and
- Turn-around area for errant drivers.

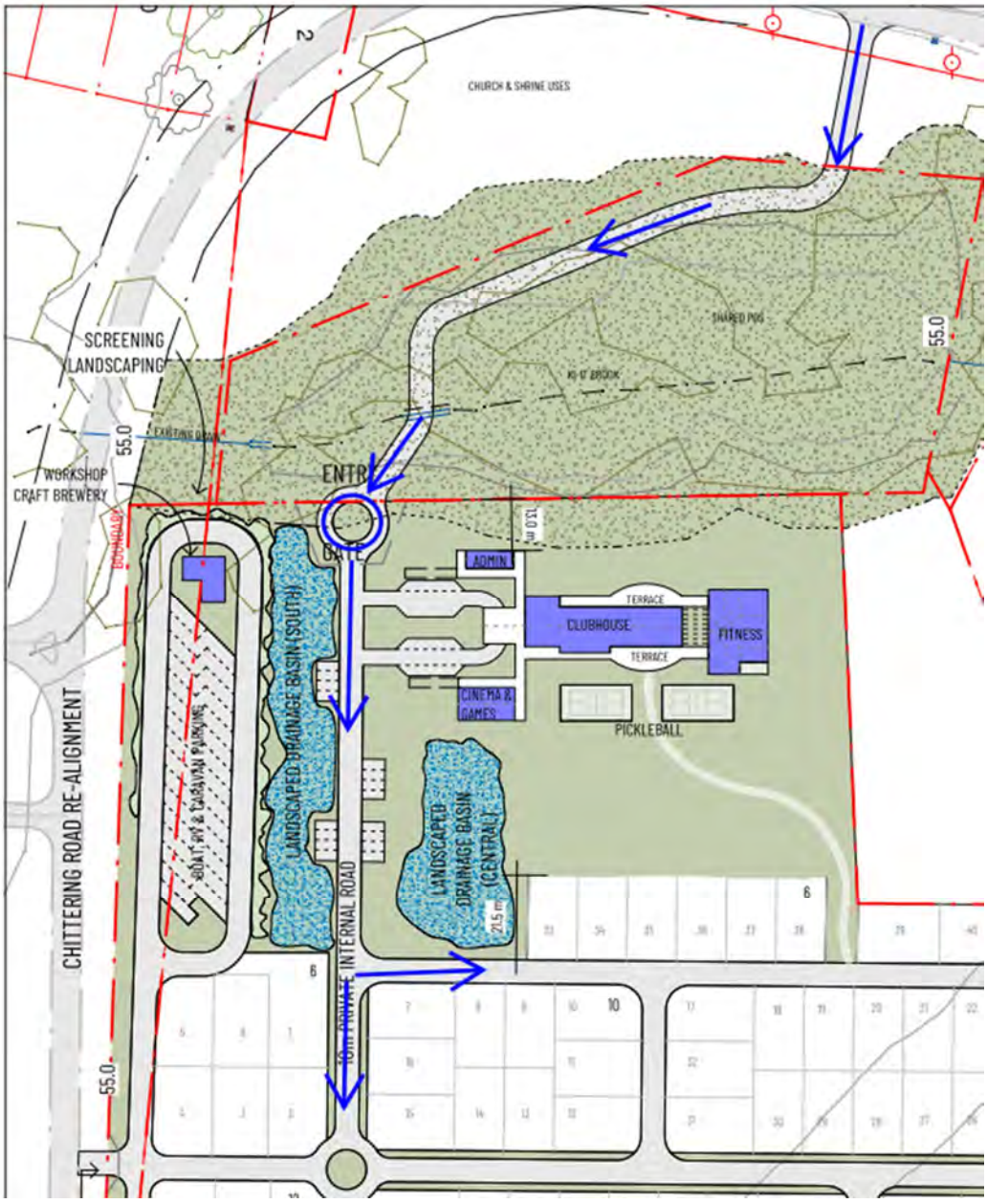

Figure 8 - Entrance Road Arrangement

5.2.2 Dwelling Access Roads

Internal access roads are proposed to be shared vehicle and pedestrian zones, with a speed limit of 10km/h. The carriageway varies in width, typically 5.5m to 6.0m width, and is proposed to be constructed from asphalt pavement.

A typical carriageway cross section is shown in Figure 9 below.

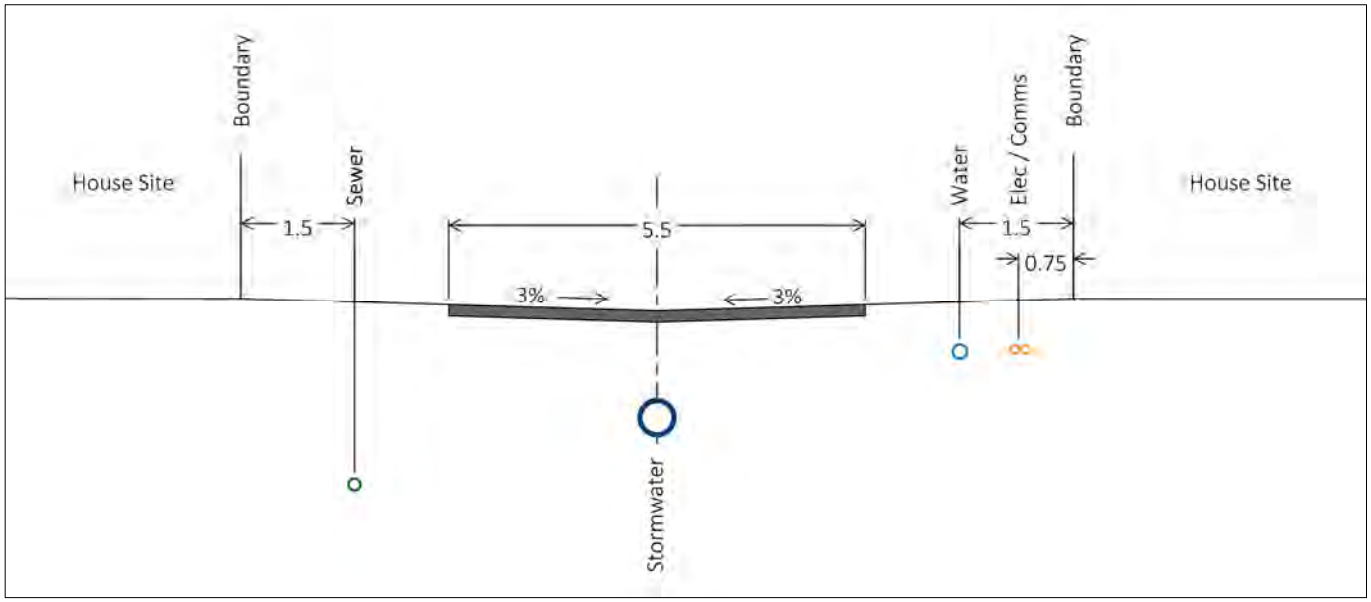

Figure 9 - Typical Dwelling Access Road Cross Section

5.2.3 Parking Bays

Parking bays are proposed for boat, recreational vehicle & caravans, located adjacent to the proposed clubhouse, entry gate, and landscaped drainage basins, as shown on the Bethanie Bullsbrook Village Masterplan. A total of 30 parking spaces, designed to AS/NZS 2890.1:2004 Australian Standard are proposed to be provided.

There are a further 32 additional car spaces in groups of 4 adjacent to the landscaped basins, community gardens, BBQ and lookout areas making the total parking bays for all vehicles 62.

5.3 Refuse Collection

It is intended that the residential dwellings, along with the clubhouse will be serviced by general waste and recycling bins, collected by a garbage truck operated by the City of Swan.

Turning movements for a typical garbage truck have been undertaken for The Site which demonstrate that a City of Swan garbage truck can have full access to The Site for the purposes of garbage collection.

6. STORMWATER DRAINAGE

Pentium Hydrologists have prepared a technical note summarising the proposed drainage strategy for The Site, that is consistent with the approved Local Water Management Strategy.

The general stormwater strategy for the site is to:

- Manage, retain and treat stormwater runoff generated by the first 15 mm of rainfall at-source as much as practical (e.g., in potential roadside swales, storage basins), with no discharge into the Ki-it Monger Brook.
- Provide adequate conveyance (e.g., roadside swales or piped drainage etc.) for the critical 20% AEP rainfall event to maintain serviceability of roads and pedestrian areas.
- Provide adequate flood detention storage to maintain pre-development flow rates downstream of the site

(i.e., limited discharge into Ki-it Monger Brook in accordance with existing peak flow rates).

The Bethanie Bullsbrook Masterplan shows the locations of landscaped drainage basins within the site to accommodate the various rainfall events up to and including the 1% AEP. Pit and pipe drainage will be designed within the road carriageways suitable to cater for the critical 20% AEP rainfall with larger events accommodated overland on the road pavements. Stormwater drainage infrastructure within the Bethanie village will be privately owned and operated by the owner.

7. WATER RETICULATION

7.1 Point of Supply

The Site is surrounded by potable water as shown in Figure 10 below. There is a DN300 water distribution watermain in Chittering Road, a DN100 reticulation main in Amelia Way and Fairchild Street and a DN100 watermain in Tigermoth Boulevard. It is anticipated the water supply to come from Chittering Road/Tigermoth Blvd with a single property connection to the site.

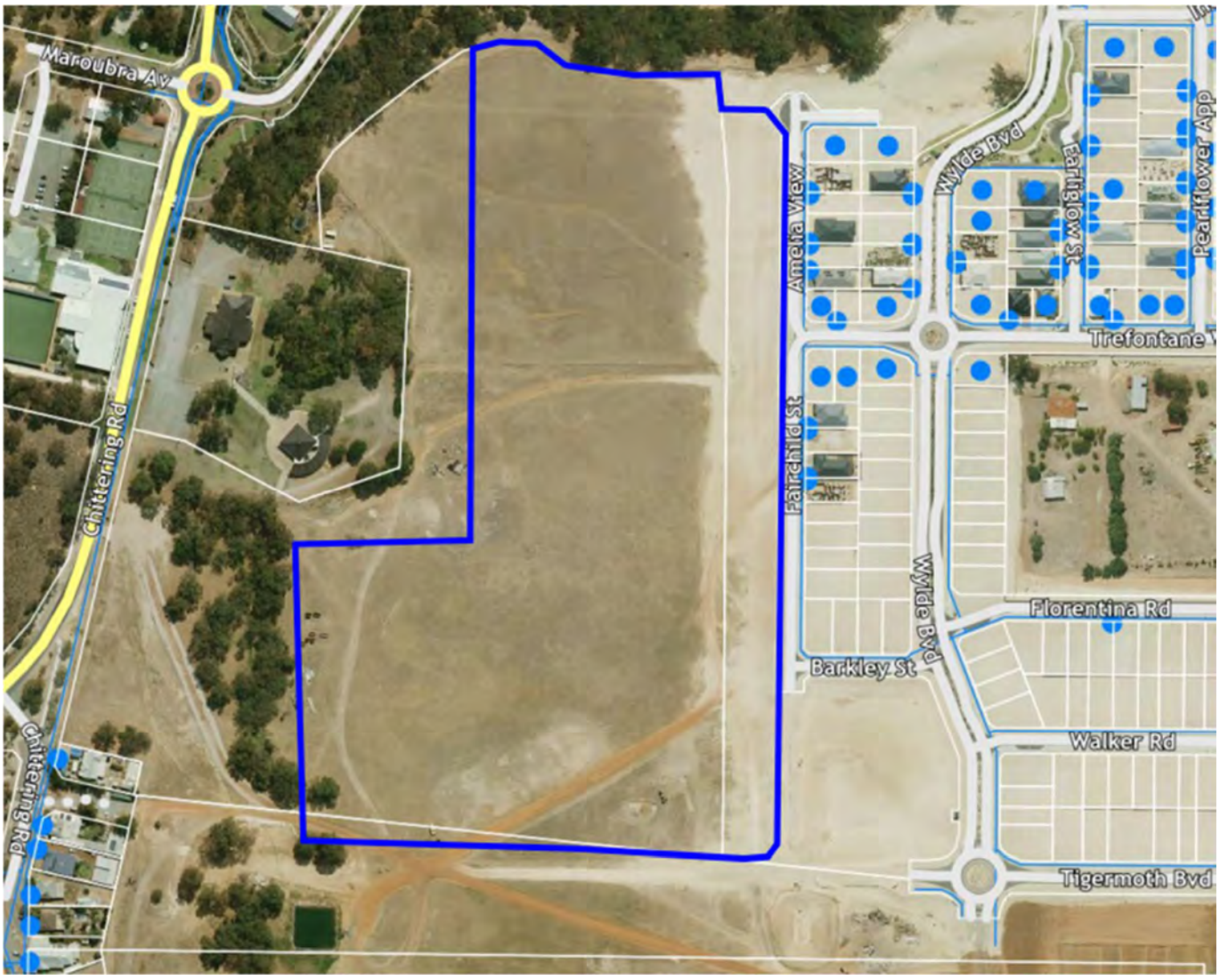

Figure 10 – Water Mains Surrounding the Site (Source: MNG Access)

7.2 Internal Water Reticulation

From the point of connection, water reticulation will continue through The Site, servicing every dwelling, the clubhouse and gym. This water reticulation will also provide fire fighting coverage through the provision of fire hydrants.

Beyond the point of connections, the water reticulation will be owned and maintained, by the operators of the Bethanie village.

8. SEWER RETICULATION

8.1 Point of Connection

Internal sewer reticulation from The Site will discharge to the ϕ225 gravity sewer in Tigermoth Boulevard as shown in Figure 11 below and in accordance with JDSi's sewer catchment plan for the area. The gravity sewer along Tigermoth Boulevard have been designed to capture the overall sewer from the Site.

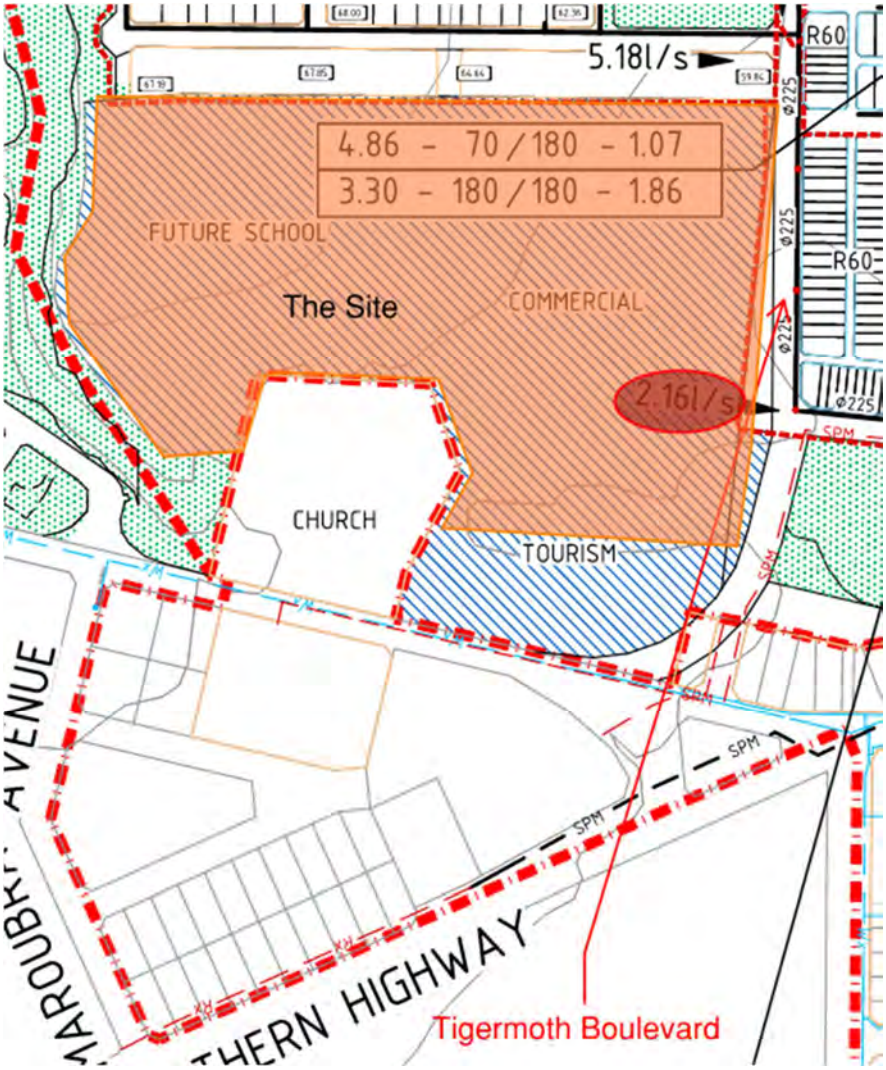

Figure 11 - Extract from Bullsbrook Overall Catchment Plan (Source: JDSi)

8.2 Internal Sewer Reticulation

From the point of connection, as shown in Figure 11, internal private sewer reticulation will continue through The Site, servicing every dwelling, the clubhouse and gym. Beyond the point of connection, the gravity sewer will be owned and maintained, by the operators of the Bethanie village.

9. POWER SUPPLY

9.1 Point of Supply

According to Western Power's Networks Mapping Tool, the site is serviced by power from the Muchea Zone substation, with spare capacity of approximately 20MVA. There is an existing High Voltage (HV) network along Chittering Road to which the Site would connect via a HV switchgear that is interconnected to that existing HV. From the HV switchgear, it is anticipated that 2x1MVA sole use transformers would extend into the site, as close to the clubhouse as possible. The internal HV cables will be protected by an easement vested to Western Power.

9.2 Internal Power Network

From the point of Western Power supply, the internal power network is intended to be a privately owned and operated AS3000 compliant network with servicing through distribution boards located throughout the site.

10. COMMUNICATIONS NETWORK

10.1 Point of Supply

There is existing optic fibre reticulation within the subdivision to the east, and a trunk connection will be obtained from this network to service the overall development.

10.2 Internal Communications Network

The internal communication network will be designed for network fiber serviced either via NBN or Opticomm, to allow for a fibre connection to each dwelling. The pit and pipe will be owned and operated by the network operator. Discussion will need to be had with the operators to take advantage of any smart community infrastructure to allow for CCTV/Gate Controls within the site, coupled onto the fibre network.

11. CONCLUSION

This Engineering Services Report demonstrates that Bethanie Bullsbrook Village can be suitably accommodated, as it can be provided with points of connection for water reticulation, sewer reticulation, electrical reticulation, and communications. This Engineering Services Report also affirms that stormwater runoff from The Site, generated by the Bethanie Bullsbrook Village can be suitably managed.

APPENDIX A – SITE GRADING PLAN

Appendix D: Landscape Concept Plan

Plan E, 2024

BETHANIE BULLSBROOK

Landscape Concept (REV B)

prepared for The Bethanie Group

AUGUST 2024

PLAN E

LANDSCAPE ARCHITECTS

L1.278 RAILWAY PARADE WEST LEEDERVILLE

T: (08) 9388 9566 E: mail@plane.com.au

landscape design



LEGEND

01 NATIVE SHRUBS, GROUNDCOVERS AND TREE PLANTING TO LOT BOUNDARY. LOW THREAT BUSHFIRE TREATMENTS ADJACENT BROOK

02 FEATURE PLANTING TO CLUBHOUSE AND KEY COMMUNAL LANDSCAPE AREAS

03 OPEN TURF KICKABOUT SPACES WITH SHADE TREES

04 PEDESTRIAN PATH NETWORK TO PROVIDE UNIVERSAL ACECSSIBILITY TO COMMUNAL LANDSCAPE AREAS

05 LANDSCAPED WETLAND TO TAKE STORMWATER DRAINAGE AND PROVIDE NATIVE FAUNA HABITAT

06 'THE LOOKOUT' MEETING PLACE, WITH SHADE STRUCTURE, TABLE SETTINGS AND BENCH SEATING

07 INFORMAL STABILISED GRAVEL PATHS THROUGH LANDSCAPE TO PROVIDE WALKING TRAIL AND LANDSCAPE INTERACTION

08 COMMUNITY GARDEN WITH INFORMAL PATHWAYS, SEATING OPPORTUNITIES AND SHADE TREE PLANTING

09 BBQ MEETING NODE WITH COOKING FACILITIES, SHADE STRUCTURE AND SEATING

10 STREET TREES TO THE FRONT OF EACH RESIDENTIAL LOT

11 FEATURE PLANTING AND TREES TO CENTRAL ROAD, CAPABLE OF TAKING A PORTION OF STORMWATER DRAINAGE FROM INTERNAL ROADS

12 PICKLEBALL COURTS

13 WORKSHOP / CRAFT BREWERY WITH BREAKOUT SPACE

14 CLUBHOUSE TERRACE

BETHANIE BULLSBROOK

PREPARED FOR THE BETHANIE GROUP

LANDSCAPE CONCEPT
AUGUST 2024

JOB NO. 2410001
1:750 @ A1

C1.102 REV B

0 15 30 45 75m

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planting palette - trees

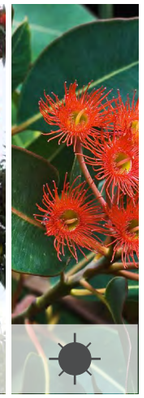


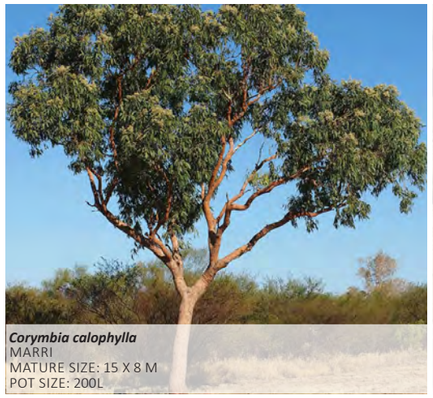
Brachychiton acerifolia
ILLAWARA FLAME TREE
MATURE SIZE: 30 X 12 M
POT SIZE: 200L





Corymbia ficifolia
RED FLOWERING GUM
MATURE SIZE: 6-15 X 5-10 M
POT SIZE: 200L





Corymbia calophylla
MARRI
MATURE SIZE: 15 X 8 M
POT SIZE: 200L



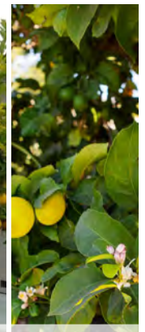


Cupaniopsis anacardiodes
TUCKEROO
MATURE SIZE: 6 X 3 M
POT SIZE: 200L





Citrus limon
LEMON
MATURE SIZE: 1.5 X 1 M
POT SIZE: 100L



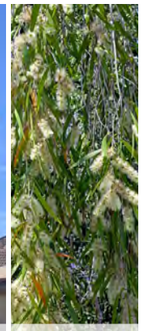


Hakea laurina
PIN-CUSHION HAKEA
MATURE SIZE: 4 X 3 M
POT SIZE: 100L





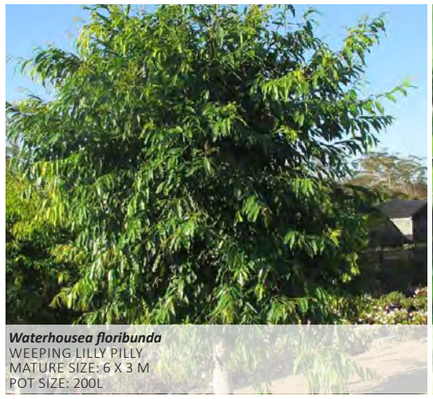
Melaleuca leucadendra
WEEPING PAPERBARK
MATURE SIZE: 12 X 6 M
POT SIZE: 200L





Acer palmatum
JAPANESE MAPLE
MATURE SIZE: 5 X 2 M
POT SIZE: 100L





Waterhousea floribunda
WEEPING LILLY PILLY
MATURE SIZE: 6 X 3 M
POT SIZE: 200L





Melaleuca viridiflora
BROAD LEAFED PAPERBARK
MATURE SIZE: 8 X 4 M
POT SIZE: 200L





Eucalyptus caesia 'Silver Princess'
GUNGURRU / SILVER PRINCESS
MATURE SIZE: 6 X 7 M
POT SIZE: 200L





Eucalyptus wandoo
WHITE GUM
MATURE SIZE: 10 X 5 M
POT SIZE: 200L



BETHANIE BULLSBROOK

PREPARED FOR THE BETHANIE GROUP

LANDSCAPE CONCEPT
AUGUST 2024

JOB NO. 2410001 C1.103 REV B
NTS

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planting palette - native shrubs & ground covers



Banksia repens
CREEPING BANKSIA
MATURE SIZE: 0.5 X 3 M
SPACING: 1/M² POT SIZE: 140 MM



Grevillea 'Gin Gin Gem'
SPIDER FLOWER
MATURE SIZE: 0.3 X 2 M
SPACING: 2/M² POT SIZE: 140 MM



Hemiandra pungens 'Alba'
WHITE SNAKE BUSH
MATURE SIZE: 0.3 X 1.5 M
SPACING: 2/M² POT SIZE: 140 MM



Chorizema cordatum
HEAR LEAF FLAME PEA
MATURE SIZE: 1.2 X 1.2 M
SPACING: 2/M² POT SIZE: 140 MM



Eremophila Kalbarri Carpet
EMU BUSH
MATURE SIZE: 0.2 X 2 M
SPACING: 2/M² POT SIZE: 140 MM



Grevillea crithmifolia 'Little crith'
LITTLE CRITH
MATURE SIZE: 1 X 1 M
SPACING: 1/M² POT SIZE: 140 MM



Grevillea Moonlight
GREVILLEA
MATURE SIZE: 3.5 X 3 M
SPACING: 1/M² POT SIZE: 200 MM



Adenanthos cuneata
BASKET FLOWER
MATURE SIZE: 1 X 1.5 M
SPACING: 1/M² POT SIZE: 140 MM



Leucospermum Yellow
NODDING PINCUSHION
MATURE SIZE: 1.5 X 1.2 M
SPACING: 2/M² POT SIZE: 140 MM



Calothamnus quadrifidus prostrate
ONE SIDED BOTTLEBRUSH
MATURE SIZE: 0.8 X 2 M
SPACING: 1/M² POT SIZE: 140 MM



Conostylis candicans
GREY COTTONHEADS
MATURE SIZE: 0.3 X 0.5 M
SPACING: 4/M² POT SIZE: 140 MM



Banksia Ashbyi 'Dwarf'
BANKSIA
MATURE SIZE: 1.5 X 2 M
SPACING: 1/M² POT SIZE: 5L

BETHANIE BULLSBROOK

PREPARED FOR THE BETHANIE GROUP

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AUGUST 2024

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planting palette - feature shrubs & ground covers



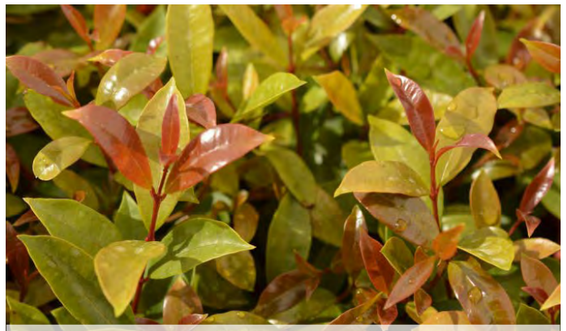
Pittosporum 'Miss Muffet'
DWARF PITTOSPORUM
MATURE SIZE: 1 X 2 M
SPACING: 4/M² POT SIZE: 140 MM



Zamia furfuracea
CARDBOARD PALM
MATURE SIZE: 1 X 1 M
SPACING: 2/M² POT SIZE: 140 MM



Murraya paniculata
ORANGE JESSAMINE
MATURE SIZE: 3 X 3 M
SPACING: 1/M² POT SIZE: 5L



Syzygium elegance
LILLY PILLY
MATURE SIZE: 3 X 1.5 M
SPACING: 1/M² POT SIZE: 5L



Hibbertia scandens
SNAKE VINE
MATURE SIZE: 0.8 X 3 M
SPACING: 2/M² POT SIZE: 140 MM



Dichondra 'Silver falls'
KIDNEY WEED
MATURE SIZE: 0.1 X 2 M
SPACING: 4/M² POT SIZE: 140 MM



Liriope 'Just right'
LILY TURF
MATURE SIZE: 0.45 X 0.5 M
SPACING: 4/M² POT SIZE: 140 MM



Viola hederacea
AUSTRALIAN NATIVE VIOLET
MATURE SIZE: 0.1 X 1 M
SPACING: 3/M² POT SIZE: 140 MM



Festuca glauca
BLUE FESCUE
MATURE SIZE: 0.3 X 0.3 M
SPACING: 4/M² POT SIZE: 140 MM



Ficinia nodosa
KNOTTED CLUB-RUSH
MATURE SIZE: 1 X 1 M
SPACING: 1/M² POT SIZE: 140 MM



Carex testacea
ORANGE SEDGE
MATURE SIZE: 0.3 X 0.6 M
SPACING: 3/M² POT SIZE: 140 MM



Lomandra 'Lime Tuff'
MAT RUSH
MATURE SIZE: 0.5 X 0.5 M
SPACING: 4/M² POT SIZE: 140 MM

BETHANIE BULLSBROOK

PREPARED FOR THE BETHANIE GROUP

LANDSCAPE CONCEPT
AUGUST 2024

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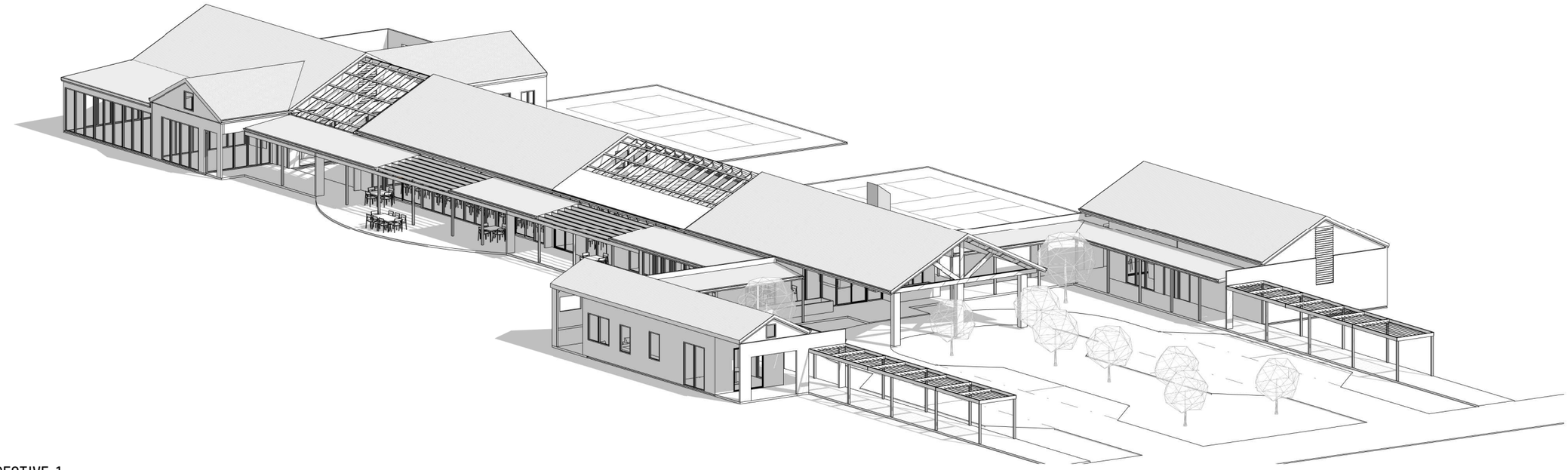
BULLSBROOK LIFESTYLE VILLAGE



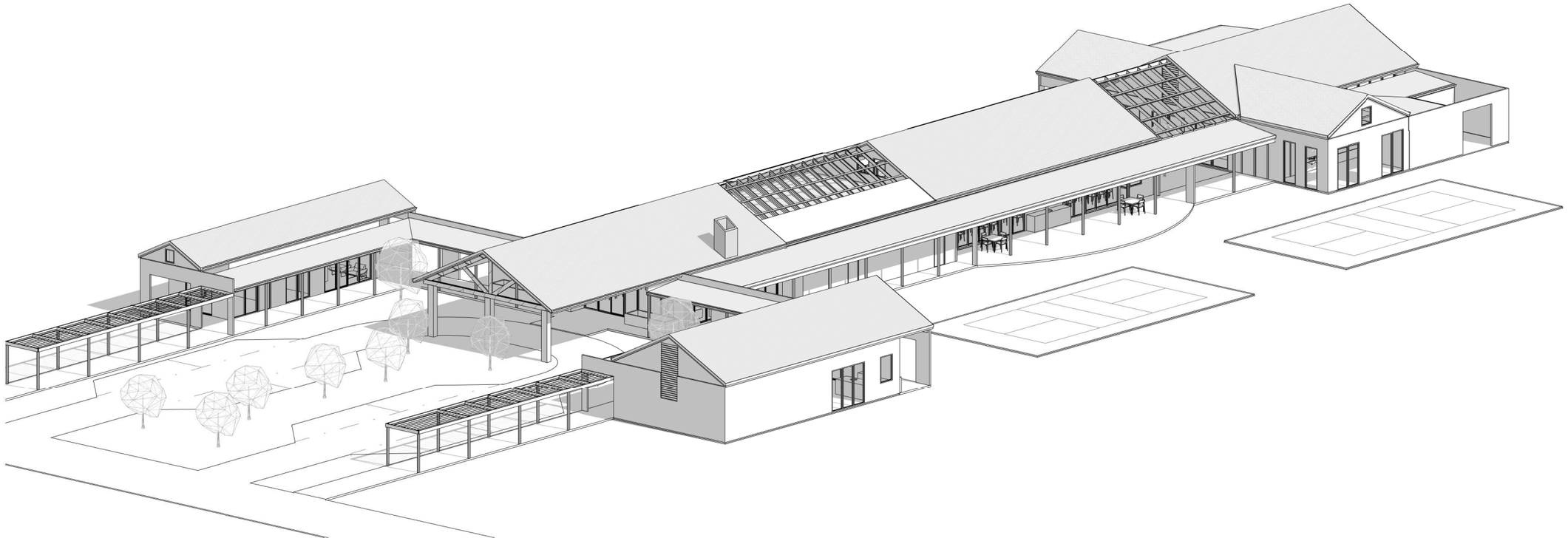
Village Streetscape - Artists Impression

Bethanie

RICHARD HAMMOND
REG. No 953
ARCHITECT



3D PERSPECTIVE_1



3D PERSPECTIVE_2

RICHARD HAMMOND ARCHITECT
BETHANIE BULLSBROOK
CLUBHOUSE CONCEPT DESIGN RevA
SCALE | 1:250 @A3
22.08.2024

RICHARD HAMMOND ARCHITECT REG. Nº 953



3D PERSPECTIVE_ENTRY ROAD



3D PERSPECTIVE_ENTRY LOUNGE

RICHARD HAMMOND ARCHITECT
BETHANIE BULLSBROOK
CLUBHOUSE CONCEPT DESIGN RevA
22.08.2024

RICHARD HAMMOND
REG. No 953
ARCHITECT



3D PERSPECTIVE_EXTERNAL TERRACE THROUGH TO HALL

RICHARD HAMMOND ARCHITECT
BETHANIE BULLSBROOK
CLUBHOUSE CONCEPT DESIGN RevA
22.08.2024

RICHARD HAMMOND ARCHITECT REG. No 953

Government of Western Australia
Department of Water and Environmental Regulation

Your ref: DA-692/2024
Our ref: DWERT950 PA068114
Enquiries: Bree Lyons, Ph 6250 8035

David Tomkin
City of Swan
PO Box 196
MIDLAND DC WA 6936

Via email: swan@swan.wa.gov.au

Dear David,

Proposed Park Home Park (Lifestyle Village) – Lot 900 Chittering Road, Bullsbrook – DA692/2024

Thank you for providing the above referral for the Department of Water and Environmental Regulation (Department) to consider.

The Department has identified that the proposal will impact on water values and management therefore the Department objects to the referral, and key issues and recommendations are provided below, and these matters must be addressed:

The proposed access road and creek crossing is inconsistent with the approved Local Water Management Strategy (LWMS) for the site. The proposed access road meandering through the foreshore reserve within the existing fringing vegetation of the Ki-it Monger Brook is not in keeping with the purpose of a foreshore reserve as outlined in *Operational Policy 4.3: Identifying and establishing waterways foreshore areas*.

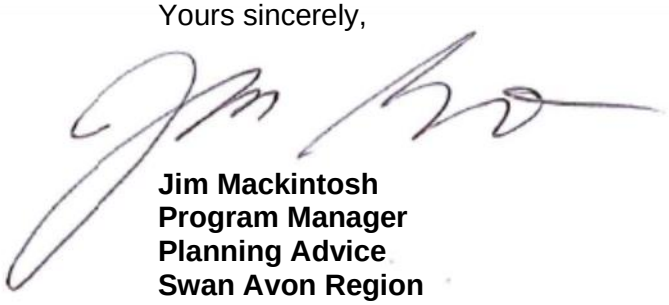
The Department objects to the path of the access road through the creek reserve and advises that the applicant should negotiate with the City of Swan for a more appropriate route for the access road. The Department would support a more direct path through the foreshore area, minimizing the impact of the access road on the foreshore area and fringing vegetation.

It should be noted that the Department has not beeninvolved with the management of the foreshore area since the structure plan stage, and as such we have not seen the foreshore management plan. Therefore, the Department is unaware of what management measures are laid out by the foreshore management plan.

Swan Avon Region
7 Ellam Street Victoria Park WA 6100
Telephone: 08 6250 8000 Facsimile: 08 6250 8050
www.dwer.wa.gov.au

If you would like more information regarding this matter, please contact Bree Lyons on 6250 8035 or bree.lyons@dwer.wa.gov.au.

Yours sincerely,



Jim Mackintosh
Program Manager
Planning Advice
Swan Avon Region

11 December 2024

GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

SWAN RIVER TRUST

Your ref: DA-692/2024
Our ref: 24-4945
Enquiries: Josie Watson
Phone: 9278 0910
Email: josie.watson@dbca.wa.gov.au

Chief Executive Officer
City of Swan
PO Box 196
MIDLAND WA 6936

Dear Mr Cain

CLAUSE 30A(2)b(ii) – PARK HOME PARK (LIFESTYLE VILLAGE) – LOTS 900, 9501 & 9030 CHITTERING ROAD, BULLSBROOK

Thank you for providing the Department of Biodiversity, Conservation and Attractions (DBCA) with the opportunity to comment on the above development application received on 4 November 2024.

DBCA has reviewed the Development Application Report prepared by Planning Solutions (September 2024) along with supporting reports and plans, including the Bushfire Management Plan (Allerding & Associates, 2024), Urban Water Management Plan (Pentium, 2024), Preliminary Environmental Assessment (Pentium, 2024), the Foreshore Wetland Management Plan (RPS, 2018) and the Landscape Masterplan (Plan E, 2024).

As you are aware the subject land is located within the Ellen Brook Catchment. The Swan Canning Water Quality Improvement Plan (2009) identified the Ellen Brook catchment as the largest contributor of total nitrogen and total phosphorous loads to the Swan Canning estuary, and is experiencing significant land and water degradation as a consequence of extensive land use changes and development. It is important to ensure that the transition of this area from principally rural activities to urban activities occurs in a way that minimises impacts to the quality of ground water and surface water. Development should occur in line with the principles of water sensitive urban design and in particular focus on restoration of the naturally existing waterways.

DBCA has considered the proposal on behalf of the Trust against *State Planning Policy 2.10: Swan-Canning River System* and Swan Canning Development Control Area policies and has concerns regarding the appropriate management and development proposed around the Ki-it Monger Brook which traverses the site and flows into the Ellen Brook and ultimately the Swan River.

Foreshore Reserve and Ki-it Monger Brook
A section of the Ki-it Monger Brook approximately 110m long runs north-south within the privately owned Lot 900 immediately to the south of Lot 2 (Our Lady of the Revelation Shrine). The development application proposes to retain the land including this section of the brook in private ownership.

This area of the brook is classified as a 'Multiple Use' wetland and is zoned 'Recreation' under the Kingsford Bullsbrook Central Local Structure Plan (the Structure Plan). In accordance with the Structure Plan, public open space (POS) is to be provided adjacent to the Ki-it Monger Brook foreshore area to provide a buffer between the foreshore and development and to facilitate stormwater treatment, and is to be vested with the City of Swan for maintenance and management.

The Ki-it Monger Brook Foreshore and Wetland Management Plan (FWMP) (RPS, 2018) identifies the extent of the 'core creek area' of the brook and proposes a suitable POS area adjacent. The FWMP guides the retention and protection of the brook including remnant vegetation, through controlled access, prevention of weeds and regeneration of native vegetation in designated areas.

DBCA supports the protection and rehabilitation of the Ki-it Monger Brook and considers that in the context of extensive redevelopment proposed in the area, including the subject development proposal, the Ki-it Monger Brook and the associated identified POS area should be ceded and vested with the City of Swan for maintenance and management as part of the proposed development. This will provide future community benefit of public access and recreation and allow for environmental and water quality values of the Ki-it Monger Brook to be protected and enhanced.

Ki-it Monger Brook crossing

The proposal includes a new vehicular crossing of the Ki-it Monger Brook for access to the development. DBCA does not support the crossing in its current location because it will have a detrimental impact on the brook through the removal of existing fringing vegetation and require a substantial amount of fill being placed within the waterway. Existing, nearby crossings should be utlised if possible or more suitable alternatives explored to minimise or avoid environmental impacts.

Bushfire Planning

State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7), policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values. SPP 3.7 states that bushfire mitigation measures should be contained within the development area and must not place impositions on the future management of adjoining land.

As outlined above, DBCA supports the Ki-it Monger Brook and associated POS area within Lot 900 being vested with the City. Accordingly, it is expected that the resulting waterway and foreshore area be classified as 'Class A – Forest' to allow for future rehabilitation and revegetation, consistent with the FWMP (RPS, 2018). No vegetation within the waterway or foreshore POS should be pruned or managed to a low threat state, and the Bushfire Attack Level (BAL) ratings should be amended accordingly.

Similarly, no part of the Ki-it Monger Brook waterway or foreshore POS to the north of the proposed development should be pruned or managed to low threat. The foreshore area should be classified as 'Class A – Forest' and the Bushfire Attack Level (BAL) ratings amended accordingly to allow for future revegetation within the publicly owned foreshore land.

It is recognised that a substantial asset protection zone (APZ) has been provided for along two thirds of the western boundary, and the proposed APZ may allow for the relocation of a number of park homes away from the foreshore interfaces extending west where BAL ratings would allow.

Urban Water Management Plan

DBCA recommends that for small rainfall events, stormwater retention and/or detention should occur as high in the catchment and as close to the run-off source as possible, for the management of water quality. Opportunities to retain or detain stormwater runoff from small rainfall events (i.e. first 15mm) within individual lots and road reserves (i.e. tree pits, roadside swales and biofilters) should be considered. Maximising drainage opportunities in the road reserves will help to minimise the size and depth of proposed drainage basins, allowing for more usable and appealing open space areas adjacent to waterways.

The UWMP does not contain the level of detail necessary to demonstrate compliance with the requirements and objectives of Better Urban Water Management (DoW, 2008). DBCA is happy to provide comment on a more detailed UWMP and provides the following comments to assist:

- The UWMP should include a detailed description of the size, location and design of drainage basins, as well as commit to the implementation of any management or infiltration measures for stormwater within individual lots and within the road reserves.
- The plans provided do not appear to have sufficient space within the road reserve for the construction of any roadside drainage infrastructure, despite the UWMP referring to such structures.
- Stormwater for all events appears to be piped to the three drainage basins, in foreshore areas. This design is not consistent with the best practice water sensitive urban design.
- Details of proposed vegetation and soil types in bioretention area should be provided. Soils should be a minimum PRI of 15 and contain appropriate native species capable of nutrient uptake.
- It is recommended that the biofilters are designed in accordance with the: *Adoption Guidelines for Stormwater Biofiltration Systems* (Payne et al. 2015) and the *Vegetation Guidelines for Stormwater Biofilters in the South-West of Western Australia* (Monash University 2014).
- Details of outflows to the brook are required, particularly in the northern area of the development where the basin will be a number of meters higher than the base of the waterway adjacent.

Fencing and landscaping

DBCA understands the development is proposed to be a closed community and it is therefore expected that there will be fencing along the boundary of the private development with the public foreshore land to the north. Additionally, in anticipation of the ceding of the Ki-it Monger Brook land to the south of the development, fencing will be required along the boundary of the public and private land proposed.

Accordingly, DBCA suggests a condition of approval that the plans and design for any proposed boundary fencing be submitted for approval as part of a detailed Landscaping Plan prior to commencement of works.

The Landscaping Plan can also detail the proposed species within the development. DBCA recommends only locally native species be used for landscsaping throughout the development. Deciduous trees are not supported due to the proximity of the Ki-it Monger Brook and the potential for additional nutrient loads to the waterway.

Recommendation

In summary, **DBCA recommends that the following matters are addressed prior to approval** of the development proposal:

- The area of Lot 900 containing the Ki-it Monger Brook and the identified POS area adjacent is to be ceded and vested with the City of Swan.
- The Bushfire Management Plan is to be revised to classify the ceded area described in point 1 and any other foreshore areas as ‘Class A – Forest’ to allow for the future revegetation and rehabilitation of the waterway, and to prevent the responsibility being placed on the City to manage vegetation to lot threat levels. BAL ratings should be reassessed accordingly.
- The proposed crossing of the Ki-it Monger Brook is to be removed from the plans or realigned to avoid clearing of native vegetation and prevent filling or other impacts to the waterway.
- A more comprehensive Urban Water Management Plan is to be prepared to demonstrate compliance with best practice water sensitive urban design.

Subject to these matters being suitably addressed, DBCA recommends the following conditions and advice.

CONDITIONS

1. A Sediment and Erosion Control Plan detailing how risk of drainage, erosion and sedimentation or other environmental impacts into nearby water bodies will be minimised during works is to be:
    a. prepared by the landowner/applicant and approved prior to the commencement of works; and
    b. implemented during works. (Department of Biodiversity, Conservation and Attractions – Swan Canning Waterways Branch) (**Advice Note 1**)

2. A detailed Foreshore Management Plan for the adjacent Ki-it Monger Brook foreshore areas and public open space is to be submitted to and approved by the City of Swan, to the specification of the Department of Biodiversity, Conservation and Attractions prior to commencement of works. (**Advice Note 2**)

3. All works are to be undertaken in accordance with an amended Landscaping Plan which is to be submitted to and approved by the City of Swan, to the specification of the Department of Biodiversity, Conservation and Attractions prior to commencement of works. (**Advice Note 3**)

4. The development shall be connected to the reticulated sewerage system.

ADVICE TO APPLICANT

1. Regarding **Condition 1**, the Sediment and Erosion Control Plan should describe how the authorised works will be appropriately managed and implemented to minimise the risk of drainage, erosion and sedimentation on nearby water bodies and may include control measures such as:
    a. daily recovery of sediment (including imported building sand) from outside the works area (e.g. end-of day sweeping).
    b. perimeter controls such as sediment control fences.
    c. sediment traps at stormwater drain inlets.
    d. vehicle washdown and vibration grids at entry/exits.
    e. containment of stockpiles.

    For further guidance on best management practices for sediment and erosion control, refer to the *Erosion and Sediment Control Information sheets* found at: https://www.perthnrm.com/resource/sediment-management/

2. Regarding **Condition 2**, the detailed Foreshore Management Plan for the Ki-it Monger Brook foreshore areas should be consistent with the Ki-it Monger Brook Foreshore Wetland Management Plan (RPS, 2018) and include:
    a. the location, details of planting densities and species composition proposed.
    b. a schedule of works.
    c. weed control, including target species and any chemicals to be used, and its management within a water sensitive environment.
    d. stabilisation measures.
    e. a reticulation plan, indicating type and location of sprinkler, bubbler, drippers and if bore or scheme water will be utilised.
    f. ongoing monitoring and maintenance requirements.

3. Regarding **Condition 3**, the Landscape Plan should include details on:
    a. the interface between the development and the public open space, including the height, style, colours and materials of structures/fencing visible from the reserve which complement the riverine environment.
    b. details of any pedestrian access directly to the foreshore area from the development.
    c. all landscaping to include locally native plant species only, suited to the soil type of the area to sustain local biodiversity and reduce fertiliser requirements.

If you have any queries regarding this matter, please contact the officer above. Please quote the above reference number in all correspondence.

Yours sincerely



Greg Comiskey
Manager, Statutory Assessments
As delegate of the Swan River Trust
Under Section 28B(2) of the SCRM Act 2006

16 December 2024

Enquiries: Isabel Huston on (08) 9323 6232
Our Ref: 24/9718 (D24#1534005)
Your Ref: DA-692/2024
DAP Ref: DAP/24/02776

12 December 2024

Chief Executive Officer
City of Swan
PO Box 196
MIDLAND WA 6936

Email: planning.submissions@swan.wa.gov.au (via email)

Dear Sir/Madam,

PROPOSED PARK HOME PARK (BULLSBROOK LIFESTYLE VILLAGE) – REF DA-692/2024 AND DAP/24/02776 - LOT 900, LOT 9501, LOT 9013 (CHITTERING ROAD), BULLSBROOK

In response to correspondence received on 12 November 2024, Main Roads supports the proposal and recommends that if development approval is granted, the following conditions being imposed:

Conditions

1. Stormwater shall not be discharged into the Great Northern Highway (GNH) Road Reserve or the future widened road reservation.

   Justification for Non-Standard Condition
   To ensure there is sufficient capacity in the GNH stormwater network to accommodate its requirements. This is a standard requirement for development adjacent to a State Road.

2. No works are permitted within the Great Northern Highway Road Reserve, unless Main Roads has issued a Working on Roads Permit.

   Justification for Non-Standard Condition
   Public safety and reflects the approval process for works.

Advice

a) The upgrading/widening of GNH is not in Main Roads current 4-year forward estimated construction program and all projects not listed are subject to change without notice, and Main Roads assumes no liability for the information provided.

b) The applicant is required to submit an Application form to undertake works within the road reserve prior to undertaking any works within the road reserve. Application forms and supporting information about the procedure can be found on the Main Roads website > Technical & Commercial > Working on Roads.

General Comments

This development will increase traffic on the surrounding road network. The City of Swan's 'Bullsbrook Residential Townsite Contribution Plan' (September 2021) for Development Contribution Area No. 7 outlines several road infrastructure projects to modify or upgrade local road connections near Great Northern Highway (GNH). The City should consider the timing for delivering these projects due to the ongoing development in this area.

Main Roads encourages local government in liaising with applicants to promote and capitalise on our pre-lodgement consultation service, prior to lodgement of planning proposals, especially where development plans involve land adjacent to or have the potential to impact on the State road network.

Further information on the pre-lodgement consultation process can be found on Main Roads website at mainroads.wa.gov.au > Technical & Commercial > Planning & Development

Should the JDAP disagree with the above conditions or require further information please do not hesitate to contact Isabel Huston on (08) 9323 6232.

Please ensure a copy of the JDAP's final determination is sent to planninginfo@mainroads.wa.gov.au.

Yours sincerely

mthornely.

Maryanne Thornely
Road Access and Planning Manager

Design Review Report

Location/Venue: **City of Swan Council Chambers - Midland Town Hall - 312 Great Eastern Highway Midland**
Meeting Date: **Tuesday 1st October 2024**
Meeting Time: **3:00pm**

Item 3 – Lifestyle Village (Park Home) – Lot 9015 Squadron Blvd, Lot 900 & Lot 9013 Chittering Road BULLSBROOK – DRP-25/2024 & DA- 692/2024 – 1st DRP Meeting Post DA

Design Review Report	
Subject	Item 3 - Lifestyle Village (Park Home) – Lot 9015 Squadron Blvd, Lot 900 & Lot 9013 Chittering Road BULLSBROOK
Design Reviewers	Malcolm Mackay - Chairperson (Mackay Urban Design)
	Brett Wood-Gush – Deputy Chairperson (Insight Urbanism)
	Wayne Dufty – Panel Member (DNA Architects)
	Peter Damen - Panel Member (Level 5 Design)
Proponent & Project Team	Richard Hammond – Richard Hammond Architect Tayne Evershed – Planning Solutions David Lorimer – Bethanie Oliver Basson – Planning Solutions David Lombardo - Landowner
Declarations	None.

Design quality evaluation		
Principle 1 **Context and character**		*Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.*
Comments and Recommendation		**Strengths** a) Description of the context provided in the planning report and presentation. b) Simple traditional housing forms with a rural quality, that is arguably more relevant and appealing than the surrounding suburban housing. c) The entry sequence across the brook draws character from the natural environment. d) The response to the topography and avoidance of benched lots is supported.

		Areas for improvement e) Provide more explanation on the forms, materials and colours with reference to the sense of place in the broader locality. f) Show pedestrian/bike connections and linkages beyond the site and nearby pedestrian/bike destinations. g) The communal vehicle area is a poor street interface and should be relocated to a less prominent location. h) Provide more information on the site edge conditions and fencing, both in elevation and through detailed cross sections. i) Provide more information (If known) about the intention for the southern portion of the Church land along the sites' northern border. j) There remains more opportunity in the site planning to respond to the rural and walkable character of the place than simply resorting to a repetitive orthogonal grid. ***Recommendations*** ***1. Provide more contextual analysis regarding local character.*** ***2. Provide a plan that defines the local pedestrian network, destinations, and connections.*** ***3. Review the use of the communal vehicle area as a street interface.*** ***4. Provide more information on the site edge conditions (fencing, landscape, levels, etc)*** ***5. Provide more information on the intent of the southern Church land.*** ***6. Break down the monotony of the grid to better create a sense of place.***
Principle 2 **Landscape quality**		*Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.*
Comments and Recommendation		**Strengths** a) Early design input from a landscape professional is good. b) A well-considered landscape master plan, albeit requiring some more supporting detail. **Areas for improvement** c) Provide more details on hardscape materials, landscape furniture, as well as exemplar imaging that helps to explain the intent regarding the character and quality of landscape spaces. d) Provide street cross-sections and detailed plan vignettes to demonstrate how street trees are to be accommodated and how the landscaping of front

		yards contributes to the streetscape. e) Provide more information on the drainage basins – whether they are permanent or ephemeral, the edge conditions, the integration of planting, etc. f) Provide more effective screening to the communal vehicle compound if retained in the current location. g) Develop a clear and diverse hierarchy of connected spaces – commons parkland, pocket parks, boulevards, streets, courtyards, etc ***Recommendations*** ***1. Provide detail on hardscape materials, landscape furniture and imagery that illustrates the general landscape intent.*** ***2. Provide street cross sections to show how landscape is integrated into the streetscape.*** ***3. Develop a clear hierarchy of diverse external spaces.*** ***4. Provide more information on the detention basins, function and edge treatments.*** ***5. Review the screening to the communal vehicle area if retained in the current location.***
Principle 3 **Built form and scale**		*Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.*
Comments and Recommendation		**Strengths** a) The site planning is simple and logical, albeit arguably too simple b) The building types, height, and scale are appropriate for the use, locality, and price point. c) The delivery of relatively affordable housing types using cost-effective modular construction. d) The use of car ports rather than garages, which creates a more open quality to the streetscape and improves visual interaction with the street. e) A well-considered form of the communal buildings – effectively creating a village of buildings within a village and maintaining an appealing balance of formality and informality. **Areas for improvement** f) Review the roof forms of house type B. The mix of pitched and skillion roofs is awkward and could be simplified to a single roof type as per the other house types. g) Being off centre the communal facilities should be either more central or better connected to the remainder of the development area via the pedestrian network - consider additional and more

		direct connections. h) Whilst it acknowledged that the houses may have strong market appeal, there remains opportunity for them to interpret the rural character of the places (i.e. simple timber-framed, barn-like, gabled structures rather than literal interpretations of traditional cottages. ***Recommendations*** ***1. Review the roof forms of house type B.*** ***2. Review the location and/or the pedestrian connectivity to the communal facilities to make them more accessible to all the residents.*** ***3. Explore a simpler and more elegant interpretation of what a small rural-style house could be.***
Principle 4 **Functionality and build quality**		*Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.*
Comments and Recommendation		**Strengths** a) The internal planning of the houses and the communal facilities are generally functional. b) The house designs are generally well resolved and efficient in their use of space. c) Overall waste management has been considered. However, discreet bin locations need to be identified on the house plan. d) The provision of the communal vehicle compound (boat trailers, caravans etc) is good but the lack of screening and adjacency to the street is a concern. street **Areas for improvement** e) Nominate locations for bin storage. f) Nominate locations for AC condensers. ***Recommendations*** ***1. Identify locations for bin storage and AC condensers in the house plans.***
Principle 5 **Sustainability**		*Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.*
Comments and Recommendation		**Strengths** a) Sustainability has been clearly considered in the design process. b) The use of lightweight modular construction is positive. c) The avoidance of benched lots and retaining is

		positive. d) Smaller than average dwellings reduce material input and energy costs and enables more landscape. e) The provision of affordable housing for older people is more socially sustainable. f) The provision of on-site amenities reduces travel demand to other places. **Areas for improvement** g) Flesh out the sustainability narrative into a more detailed strategy with identified and quantified commitments. h) Develop further narrative around reduction in embedded energy in the specification of materials. ***Recommendations*** ***1. Flesh out the sustainability narrative into a more detailed strategy with identified and quantified commitments.***
Principle 6 **Amenity**		*Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.*
Comments and Recommendation		**Strengths** a) The provision of on-site communal amenities is good. b) The house types have a generosity of landscape compared to standard suburban practice. c) The provision of street trees and other landscape looks promising but needs to be clarified using street cross sections. **Areas for improvement** d) Review the street treatments to ensure that those streets without dedicated footpaths feel like slow-speed shared spaces where pedestrians feel safe and comfortable. e) Review the configuration of the communal amenities for opportunities to increase the extent of northern aspect. f) Optimise shade and shelter (predominately through street trees) to the pedestrian network. ***Recommendations*** ***1. Blah***
Principle 7 **Legibility**		*Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.*

Comments and Recommendation		**Strengths** a) The simple logical grid layout has some inherent legibility, albeit diminished by the offset intersections. b) The singular main entrance is clearly the way into the development. c) The use of a spinal boulevard(s) with footpaths is supported but consider a singular L-shaped boulevard that terminates on a landscape element rather than two with uneventful terminations. **Areas for improvement** d) Include opportunities for greater pedestrian connectivity with surrounding area through the inclusion of additional gateways and connectivity with the surrounding path network. e) The staggered T-intersections result in less legibility than 4 -ways intersections – review how to either create more 4-ways or how the introduction of pocket paths between T-intersections can allow continuity of pedestrian movement between them. f) Develop a pedestrian network diagram for the site and adjacent streets that shows the level of connectivity and clarifies the types of pedestrian connection. g) The 6 units facing the communal area create a barrier between the residential area and the communal facilities – consider how these could be relocated to open up the relationship between the residential area and the communal facilities. h) Strengthen the northern pedestrian connection to the communal area. i) Review how to break up the sameness of the grid with some bends, small parks, deflected vistas, and improve legibility in the process. j) Consider how the entry boulevard can be bent around into the N-S boulevard for continuity of passage, rather than introducing the roundabout. k) Provide pedestrian connectivity to the communal vehicle area. ***Recommendations*** ***1. Provide for better pedestrian connectivity to the surrounding area.*** ***2. Review the reliance on staggered T-intersections and how to break down the sameness of the grid.*** ***3. Develop a pedestrian network diagram for the site.*** ***4. Review the location of the 6 units backing onto the communal area.***

		5. Improve pedestrian connectivity between the housing and the communal area. ***6. Consider a singular L-shaped Boulevard with continual passage.*** ***7. Provide better pedestrian connectivity to the communal vehicle area.***
Principle 8 **Safety**		*Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.*
Comments and Recommendation		**Strengths** a) The format of the development provides a good sense of security for residents. b) Bushfire risks appears to have been considered and addressed. **Areas for improvement** c) The degree of engagement with, and passive surveillance of, the adjacent streets from the houses is unclear and a matter of concern – ensure there is visual permeability and demonstrate In detailed cross sections. d) Reinforce the shared nature of those streets without dedicated footpaths using materials, changes of level, avoidance of raised kerbs, landscape, etc. e) Provide clearly demarcated crossing points where footpaths cross vehicle paths. f) Show swept paths for waste and service vehicles. g) Review and demonstrate the edge conditions of the detention swales so that safety can be achieved without recourse to fencing. h) Utilise subtle traffic calming measures to support the slow-speed shared streets. ***Recommendations*** ***1. Clarify through detailed cross-sections the interfaces with adjacent streets*** ***2. Clarify through detailed cross-sections, plans and materials how the shared space streets can best favour pedestrians.*** ***3. Identify pedestrian crossing points along the boulevard(s).*** ***4. Show swept paths for waste and service vehicles.*** ***5. Clarify the edge conditions of the detention swales.***
Principle 9 **Community**		*Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.*

Comments and Recommendation		**Strengths** a) The provision of communal facilities is relatively generous. **Areas for improvement** b) Drop out a few units and/or redistribute open space to enable pocket parks at key intersections for localised engagement between residents and improved wayfinding and legibility. c) Review fencing treatments to adjacent streets to enable engagement and passive surveillance. d) Identify whether there is a public art requirement and, if so, the strategy. ***Recommendations*** ***1. Review the distribution of open space with a view to creating more localised landscape spaces for neighbourly interaction.*** ***2. Review and clarify feigning interfaces with the public realm.*** ***3. Identify whether there is a public art requirement and, if so, what the strategy will be.***
Principle 10 **Aesthetics**		*Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.*
Comments and Recommendation		**Strengths** a) Generally, the use of forms, elements and materials is positive and appropriate to a more rural context than it would be in a more metropolitan context. **Areas for improvement** b) Review the roof forms on house type B. c) Provide more information on the material and colour palette. d) Provide more information on the fencing treatments. ***Recommendations*** ***1. Review the roof forms on house type B.*** ***2. Provide more information on colours and materials.*** ***3. Provide more information on the fencing treatments.***

Design Review progress.				
	Supported			
	Pending further attention			
	Not yet supported			
	Yet to be addressed			
	DRP Meeting 1 01/10/24 Post DA	***DRP Meeting 2***	***DRP Meeting 3***	***DRP Meeting 4***
Principle 1 - **Context and character**				
Principle 2 - **Landscape quality**				
Principle 3 - **Built form and scale**				
Principle 4 - **Functionality and build quality**				
Principle 5 - **Sustainability**				
Principle 6 - **Amenity**				
Principle 7 - **Legibility**				
Principle 8 - **Safety**				
Principle 9 - **Community**				
Principle 10 - **Aesthetics**				

Concluding Remarks

The Panel thanks the Applicant for presenting to the DRP, although it would have been more efficient to come to the DRP earlier in the process. The Panel supports the overall intent of the project, which has the potential to deliver much needed affordable accommodation for older people. The architect is commended for embedding a consideration of sustainability into the design and the inclusion of a landscape professional on the team is good.

Whilst the overall intent is supported, there are matters that are of concern to the Panel, most of which relate to connectivity, both internally and externally, and the quality of the pedestrian environment, and the interface of the development with the surrounding public realm. Some of the logical solutions lie in the provision of more detail, whilst other relate to the configuration of the master plan. Most of the other issues raised by the DRP are matters of detail that can be readily addressed through more information and minor design changes.

The Applicant is strongly encouraged to consider the comments from the DRP, because the further changes arising from them could easily elevate the development to an exemplar to inspire others. The Panel looks forward to seeing the next iteration of the design in due course.

Is the proposal required to go back to a future Design Review Panel Meeting?
Please tick one of the following:
√ **Yes – future full panel design review**
☐ **No – future chair review only**
☐ **No – supported – no further review required**

Is the proposal supported?
Please tick one of the following:
☐ **Yes - Supported**
√ **Yes - Supported – pending further attention and/or conditions to be imposed**
☐ **No - Not supported**

Design Review Report endorsement & DRP Recommendation	 Malcolm Mackay DRP Chair

Design Review Report

Location/Venue:	City of Swan Council Chambers - Midland Town Hall - 312 Great Eastern Highway Midland
Meeting Date:	Tuesday 12th November 2024
Meeting Time:	3:00pm

Item 3 – Lifestyle village (Park Home) – Lot 9501, 900 and 9013 Chittering Road BULLSBROOK – DRP-25/2024 & DA-692/2024 – 2nd DRP meeting Post DA

Design Review Report	
Subject	Lifestyle village (Park Home) – Lot 9501, 900 and 9013 Chittering Road BULLSBROOK
Design Reviewers	Malcolm Mackay - Chairperson (Mackay Urban Design)
	Brett Wood-Gush – Deputy Chairperson (Insight Urbanism)
	Wayne Dufty – Panel Member (DNA Architects)
	Rachel Lewis - Panel Member (DWC Studio Pty Ltd)
Proponent & Project Team	Richard Hammond – Richard Hammond Architect Tayne Evershed – Planning Solutions David Lorimer – Bethanie Oliver Basson – Planning Solutions David Lombardo – Landowner
Declarations	None.

Design quality evaluation		
Principle 1 Context and character		*Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.*
Comments and Recommendation		**Strengths** a) Description of the context provided in the planning report and presentation. b) Simple traditional housing forms with a rural quality, that is arguably more relevant and appealing than the surrounding suburban housing. c) The entry sequence across the brook draws character from the natural environment. d) The response to the topography and avoidance of benched lots is supported. **Areas for improvement** e) Provide more explanation on the forms, materials

		and colours with reference to the sense of place in the broader locality – noting that whilst the approach is generally supported by the DRP, it may need explanation for others. f) Provide more information on the site edge conditions and fencing, both in elevation and through detailed cross sections. ***Recommendations*** ***1. Provide more contextual analysis regarding local character.*** ***2. Provide detailed cross sections of the typical site edge conditions (fencing, landscape, levels, etc)***
Principle 2 Landscape quality		*Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.*
Comments and Recommendation		**Strengths** a) Early design input from a landscape professional is good. b) A well-considered landscape master plan. c) The use of landscape in the front setbacks is supported, and that it will be centrally managed by the operator rather than left to the tenants. d) The use of landscape t screen the 'toy park' from the public realm is supported. **Areas for improvement** e) It is noted that tree placement in the front setbacks will be dependent on the allocation of house types – ensure that this is coordinated in a timely manner along with tree types indicated on a landscape /canopy plan so there is clarity on which tree types go where. f)Provide a cross section of the streets that have a footpath. ***Recommendations*** ***1. Provide more detail on which tree types are located where (noting that this is partially dependant on allocation of house types and house type C is more challenging in respect to street tree provision).*** ***2. Provide a cross section of the streets that have a footpath.***
Principle 3 Built form and scale		*Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.*

Comments and Recommendation		**Strengths** a) The site planning has improved significantly and is simple and logical, consistent with WA regional settlements. b) The building types, height, and scale are appropriate for the use, locality, and price point. c) The delivery of relatively affordable housing types using cost-effective modular construction is strongly supported. d) The use of carports rather than garages is good, which creates a more open quality to the streetscape and improves visual interaction with the street. e) The location and form of the communal buildings is well-considered – effectively creating a village of buildings within a village and maintaining an appealing balance of formality and informality. f) The issue with extensive back fences to streets and the community park/clubhouse has been resolved. g) The outlook from the clubhouse is across the landscape, and the relocation of the boat store seems less intrusive. h) The use of both N-S and E-W orientation to streets is good, and the extent of backing onto streets and landscape spaces has been reduced. i) The relocation of the toy park and men's shed provoked some debate, but on balance was supported. j) The integration of stores in some (but, alas, not all house types) is supported. k) The raked internal ceilings to the skillion roofs is supported, along with the use of operable clerestory windows. **Areas for improvement** l) The southern internal roadway is inefficient – there may be some merit in saving the cost of the road and using the saved space for deeper front setbacks through the site and providing a well-landscaped interface to the existing street. m) In the allocation of houses to lots, review the location of the free -standing stores to group them together where possible. n) The treatment of the carriageway and the allocation of landscape will be critical to the success of the shared streets. ***Recommendations*** ***1. Review the need for the southern internal roadway and whether a landscape interface may provide a better design outcome.***

		2. Group free-standing stores together when the house types are allocated to the lots.
Principle 4 Functionality and build quality		*Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.*
Comments and Recommendation		**Strengths** a) The internal planning of the houses and the communal facilities are generally functional. b) The house designs are generally well resolved and efficient in their use of space. c) Overall waste management has been considered. However, discreet bin locations need to be identified on the house plan. d) The provision of the communal vehicle compound (boat trailers, caravans etc) in a discreet location is supported. **Areas for improvement** e) Check the capacity for window positions to be refined for better solar orientation when a house type is reorientated. ***Recommendations*** ***1. Check the capacity for window positions to be refined for better solar orientation when a house type is reorientated.***
Principle 5 Sustainability		*Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.*
Comments and Recommendation		**Strengths** a) Sustainability has been clearly considered in the design process. b) The use of lightweight modular construction is positive. c) The avoidance of benched lots and retaining is positive. d) Smaller than average dwellings reduce material input and energy costs and enables more landscape. e) The provision of affordable housing for older people is more socially sustainable. f) The provision of on-site amenities reduces travel demand to other places. **Areas for improvement** g) Flesh out the sustainability narrative into a more detailed strategy with identified and quantified commitments.

		h) Develop further narrative around reduction in embedded energy in the specification of materials. ***Recommendations*** ***1. Flesh out the sustainability narrative into a more detailed strategy with identified and quantified commitments.***
Principle 6 Amenity		*Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.*
Comments and Recommendation		**Strengths** a) The provision of on-site communal amenities is good. b) The house types have a generosity of landscape compared to standard suburban practice. c) The provision of street trees and other landscape looks promising – a render of each typical street type would be useful for decision makers. **Areas for improvement** d) Check the performance of large, glazed area in the shoulder seasons. e) Consider ways of achieving more north-facing openings within the clubhouse. f) Ensure the placement or privacy screens is coordinated at the time of allocating the house types to the lots. ***Recommendations*** ***1. Test and fine tune solar access during the detailed design stage.*** ***2. Ensure the placement or privacy screens is coordinated at the time of allocating the house types to the lots.***
Principle 7 Legibility		*Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.*
Comments and Recommendation		**Strengths** a) The simple logical grid layout has inherent legibility. b) The singular main entrance is clearly the way into the development. c) The use of subtly different street treatments to the streets most likely to be used for circulation is supported but needs to be reinforced through the landscape treatment. d) The rationale for pedestrian path locations and the two wider streets is logical.

		Areas for improvement e) None. ***Recommendations*** ***1. None.***
Principle 8 Safety		*Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.*
Comments and Recommendation		**Strengths** a) The format of the development provides a good sense of security for residents. b) Bushfire risks appears to have been considered and addressed. **Areas for improvement** c) Provide clearly demarcated crossing points where footpaths cross vehicle paths. d) Show swept paths for waste and service vehicles. e) Utilise subtle traffic calming measures to support the slow-speed shared streets. f) The treatment of the carriageway and the allocation of landscape will be critical to the success of the shared streets as safe environments. ***Recommendations*** ***1. Demarcate pedestrian crossing points along the boulevard(s) through changes in materials and levels.*** ***2. Show swept paths for waste and service vehicles.***
Principle 9 Community		*Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.*
Comments and Recommendation		**Strengths** a) The provision of communal facilities is relatively generous. b) The provision of housing diversity and relative affordability is strongly supported. **Areas for improvement** c) Identify whether there is a public art requirement and, if so, what the strategy will be. ***Recommendations***

		1. Identify whether there is a public art requirement and, if so, what the strategy will be.
Principle 10 Aesthetics		*Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.*
Comments and Recommendation		**Strengths** a) Generally, the use of forms, elements and materials is positive and appropriate to a more rural context than it would be in a more metropolitan context. **Areas for improvement** b) Review the roof form on house type B to remove the small skillion roof at the front and, instead, to extrude the larger skillion behind it to the front of the house. c) Whilst the overall design intent of the house types is supported, provide more information on the material and colour palette (typical house type examples will suffice rather than allocating a colour palette to every lot) - refer to Context and Character above. ***Recommendations*** ***1. Review the roof forms on house type B.*** ***2. Provide more information on colours and materials.***

Design Review progress	
	Supported
	Pending further attention
	Not yet supported
	Yet to be addressed

	DRP Meeting 1 01/10/24 Post DA	***DRP Meeting 2 12/11/24 Post DA***	***DRP Meeting 3***	***DRP Meeting 4***
Principle 1 - Context and character				
Principle 2 - Landscape quality				
Principle 3 - Built form and scale				
Principle 4 - Functionality and build quality				

Principle 5 - Sustainability				
Principle 6 - Amenity				
Principle 7 - Legibility				
Principle 8 - Safety				
Principle 9 - Community				
Principle 10 - Aesthetics				

Concluding Remarks
The Panel thanks the Applicant for presenting to the DRP. The Panel supports the overall intent of the project, which has the potential to deliver much needed affordable accommodation for older people. The architect is commended for embedding a consideration of sustainability into the design and the inclusion of a landscape professional on the team is good. The design is getting close to the point that the Panel can support it as an acceptable response to the 10 design principles of SPP7, However, there remain a few areas for improvement, most of which are areas where further clarification or information is required rather than design changes per se. The Applicant is strongly encouraged to consider the comments from the DRP, because this information will assist in the assessment and consideration of the DA and will help to elevate the development to the level of an exemplar to inspire others. Given the degree of improvement, the design does not need to return to the DRP and a Chair review will suffice in respect to the next iteration of the design.
Is the proposal required to go back to a future Design Review Panel Meeting? Please tick one of the following: ☐ **Yes – future full panel design review** √ **No – future chair review only** ☐ **No – supported – no further review required** **Is the proposal supported?** Please tick one of the following: ☐ **Yes - Supported** √ **Yes - Supported – pending further attention and/or conditions to be imposed** ☐ **No - Not supported**

Design Review Report endorsement & DRP Recommendation	 Malcolm Mackay Chairperson

Design Review Report
Chair Review Report

Chair Review Date: Wednesday, 18 December 2024

Item: Lifestyle village (Park Home) – Lot 9501, 900 and 9013 Chittering Road BULLSBROOK – DRP-25/2024 & DA-692/2024

Design Review Report	
Item Reviewed by Chairperson	Lifestyle village (Park Home) – Lot 9501, 900 and 9013 Chittering Road BULLSBROOK
Chairperson undertaking the Review	Malcolm Mackay - Chairperson (Mackay Urban Design)

Design quality evaluation		
Principle 1 **Context and character**		*Good design responds to and enhances the distinctive characteristics of a local area, contributing to a sense of place.*
Comments and Recommendation		**Strengths** a) Description of the context provided in the planning report and presentation. b) Simple traditional housing forms with a rural quality, that is arguably more relevant and appealing than the surrounding suburban housing. c) The entry sequence across the brook draws character from the natural environment. d) The response to the topography and avoidance of benched lots is supported. **Areas for improvement** e) More explanation on the forms, materials and colours with reference to the sense of place in the broader locality would be beneficial. f) Provide more information on the site edge conditions and fencing, both in elevation and through detailed cross sections. ***Recommendations*** ***1. The City should consider a condition of approval requiring a schedule of materials and colours for all building types, and a plan***

		locating the various colour combinations on site, to the satisfaction of the City prior to Building Permit.
Principle 2 **Landscape quality**		*Good design recognises that together landscape and buildings operate as an integrated and sustainable system, within a broader ecological context.*
Comments and Recommendation		**Strengths** a) Early design input from a landscape professional is good. b) A well-considered landscape master plan. c) The use of landscape in the front setbacks is supported, and that it will be centrally managed by the operator rather than left to the tenants. d) The use of landscape t screen the 'toy park' from the public realm is supported. **Areas for improvement** e) It is noted that tree placement in the front setbacks will be dependent on the allocation of house types – ensure that this is coordinated in a timely manner along with tree types indicated on a landscape /canopy plan so there is clarity on which tree types go where. f) Provide a cross section of the streets that have a footpath. ***Recommendations*** ***1. The City should consider a condition of approval requiring details of the selected house type, associated trees, the location of any free -standing external stores, free-standing screens and a schedule of materials and colours for each 'lot' to the satisfaction of the City prior to dwelling installation.***
Principle 3 **Built form and scale**		*Good design ensures that the massing and height of development is appropriate to its setting and successfully negotiates between existing built form and the intended future character of the local area.*
Comments and Recommendation		**Strengths** a) The site planning has improved significantly and is simple and logical, consistent with WA regional settlements. b) The building types, height, and scale are appropriate for the use, locality, and price point. c) The delivery of relatively affordable housing types using cost-effective modular construction is strongly supported. d) The use of carports rather than garages is good, which creates a more open quality to the

		streetscape and improves visual interaction with the street. e) The location and form of the communal buildings is well-considered – effectively creating a village of buildings within a village and maintaining an appealing balance of formality and informality. f) The issue with extensive back fences to streets and the community park/clubhouse has been resolved. g) The outlook from the clubhouse is across the landscape, and the relocation of the boat store seems less intrusive. h) The use of both N-S and E-W orientation to streets is good, and the extent of backing onto streets and landscape spaces has been reduced. i) The relocation of the toy park and men's shed provoked some debate, but on balance was supported. j) The integration of stores in some (but, alas, not all house types) is supported. k) The raked internal ceilings to the skillion roofs is supported, along with the use of operable clerestory windows. **Areas for improvement** l) In the allocation of houses to lots, review the location of the free -standing stores to group them together where possible. m) The treatment of the carriageway and the allocation of landscape will be critical to the success of the shared streets and should be further refined during the detailed design stage. ***Recommendations*** ***1. The City should consider a condition of approval requiring details of the selected house type, associated trees, the location of any free -standing external stores, free-standing privacy screens, and a schedule of materials and colours for each 'lot' to the satisfaction of the City prior to dwelling installation.*** ***2. Continue to refine the landscape design, including hard surfaces, during the detailed design stage.***
Principle 4 **Functionality and build quality**		*Good design meets the needs of users efficiently and effectively, balancing functional requirements to perform well and deliver optimum benefit over the full life-cycle.*
Comments and Recommendation		**Strengths** a) The internal planning of the houses and the communal facilities are generally functional.

		b) The house designs are generally well resolved and efficient in their use of space. c) Overall waste management has been considered. However, discreet bin locations need to be identified on the house plan. d) The provision of the communal vehicle compound (boat trailers, caravans etc) in a discreet location is supported. **Areas for improvement** e) Review window positions to be refined, mirrored or reorientated for better solar orientation when a house type is selected for each 'lot' ***Recommendations*** ***2. Review whether window positions can be refined, or plans can be mirrored or reorientated for better solar orientation when a house type is selected for each 'lot' during the detailed design process. The City may wish to apply a condition of approval to that effect, to ensure it is considered prior to dwelling installation.***
Principle 5 **Sustainability**		*Good design optimises the sustainability of the built environment, delivering positive environmental, social and economic outcomes.*
Comments and Recommendation		**Strengths** a) Sustainability has been clearly considered in the design process. b) The use of lightweight modular construction is positive. c) The avoidance of benched lots and retaining is positive. d) Smaller than average dwellings reduce material input and energy costs and enables more landscape. e) The provision of affordable housing for older people is more socially sustainable. f) The provision of on-site amenities reduces travel demand to other places. **Areas for improvement** g) The lack of documentation of the sustainability narrative is disappointing. However, the inherent sustainability benefits of the general development intent and the construction methodology are acknowledged and demonstrate a reasonable design response to the sustainably design principle.

		Recommendations ***1. None.***
Principle 6 **Amenity**		*Good design optimises internal and external amenity for occupants, visitors and neighbours, providing environments that are comfortable, productive and healthy.*
Comments and Recommendation		**Strengths** a) The provision of on-site communal amenities is good. b) The house types have a generosity of landscape compared to standard suburban practice. c) The provision of street trees and other landscape looks promising – a render of each typical street type would be useful for decision makers. **Areas for improvement** d) Check the performance of large, glazed area in the shoulder seasons. e) Consider ways of achieving more north-facing openings within the clubhouse. f) Ensure the placement or privacy screens is coordinated at the time of allocating the house types to the lots. ***Recommendations*** ***1. Review whether window positions can be refined, or plans can be mirrored or reorientated for better solar orientation when a house type is selected for each 'lot' during the detailed design process. The City may wish to apply a condition of approval to that effect, to ensure it is considered prior to dwelling installation.*** ***2. The City should consider a condition of approval requiring details of the selected house type, associated trees, the location of any free -standing external stores, free-standing privacy screens, and a schedule of materials and colours for each 'lot' to the satisfaction of the City prior to dwelling installation.***
Principle 7 **Legibility**		*Good design results in buildings and places that are legible, with clear connections and easily identifiable elements to help people find their way around.*
Comments and Recommendation		**Strengths** a) The simple logical grid layout has inherent legibility. b) The singular main entrance is clearly the way into the development. c) The use of subtly different street treatments to the

		streets most likely to be used for circulation is supported but needs to be reinforced through the landscape treatment. d) The rationale for pedestrian path locations and the two wider streets is logical. **Areas for improvement** e) None. ***Recommendations*** ***1. None.***
Principle 8 **Safety**		*Good design optimises safety and security, minimising the risk of personal harm and supporting safe behaviour and use.*
Comments and Recommendation		**Strengths** a) The format of the development provides a good sense of security for residents. b) Bushfire risks appears to have been considered and addressed. **Areas for improvement** c) Provide clearly demarcated crossing points where footpaths cross vehicle paths. d) Show swept paths for waste and service vehicles. e) Utilise subtle traffic calming measures to support the slow-speed shared streets. f) The treatment of the carriageway and the allocation of landscape will be critical to the success of the shared streets as safe environments. ***Recommendations*** ***1. Demarcate pedestrian crossing points along the boulevard(s) through changes in materials and levels. The City may wish to apply a condition of approval to that effect, to ensure it is considered prior to building permit for the site civil works.*** ***2. Show swept paths for waste and service vehicles. The City may wish to apply a condition of approval to that effect, to ensure it is considered prior to building permit for the site civil works.***
Principle 9 **Community**		*Good design responds to local community needs as well as the wider social context, providing environments that support a diverse range of people and facilitate social interaction.*
Comments and Recommendation		**Strengths** a) The provision of communal facilities is relatively

		generous. b) The provision of housing diversity and relative affordability is strongly supported. **Areas for improvement** c) Identify whether there is a public art requirement and, if so, what the strategy will be. ***Recommendations*** ***1. The City should consider a condition of approval requiring details of any necessary public art to the satisfaction of the City prior to a suitable milestone (e.g. building permit for the communal building or installation of the first dwelling).***
Principle 10 **Aesthetics**		*Good design is the product of a skilled, judicious design process that results in attractive and inviting buildings and places that engage the senses.*
Comments and Recommendation		**Strengths** a) Generally, the use of forms, elements and materials is positive and appropriate to a more rural context than it would be in a more metropolitan context. **Areas for improvement** b) Review the roof form on house type B to remove the small skillion roof at the front and, instead, to extrude the larger skillion behind it to the front of the house. The DRP notes that the Applicant has declined to amend the design, but the DRP reiterates its position that it does not support the design of house type B in its current form c) Whilst the overall design intent of the house types is supported, provide more information on the material and colour palette for each dwelling. ***Recommendations*** ***1. The City may wish to consider a condition of approval that requires an amendment to the roof form of house type B to delete the small skillion roof on the front elevation to the satisfaction of the City prior to any type B dwelling installation.*** ***2. The City should consider a condition of approval requiring a schedule of materials and colours for all building types, and a plan locating the various colour combinations on site, to the satisfaction of the City prior to Building Permit.***

Design Review progress	
	Supported
	Pending further attention
	Not yet supported
	Yet to be addressed

	DRP Meeting 1 01/10/24 Post DA	***DRP Meeting 2 12/11/24 Post DA***	***Chair Review 1 18/12/2024***	***DRP Meeting 4***
Principle 1 - **Context and character**				
Principle 2 - **Landscape quality**				
Principle 3 - **Built form and scale**				
Principle 4 - **Functionality and build quality**				
Principle 5 - **Sustainability**				
Principle 6 - **Amenity**				
Principle 7 - **Legibility**				
Principle 8 - **Safety**				
Principle 9 - **Community**				
Principle 10 - **Aesthetics**				

Concluding Remarks

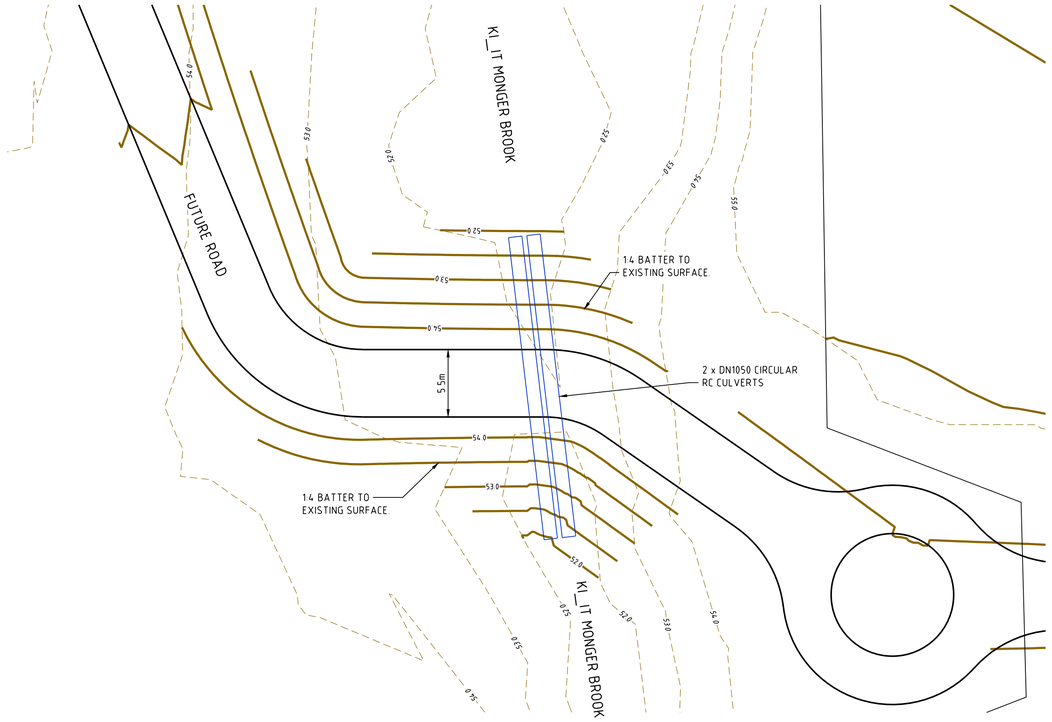
The Panel thanks the Applicant for presenting to the DRP. The Panel supports the overall intent of the project, which has the potential to deliver much needed affordable accommodation for older people. The architect is commended for embedding a consideration of sustainability into the design and the inclusion of a landscape professional on the team is good.

The design has reached the point that the Panel can support it as an acceptable response to the 10 design principles of SPP7. However, there remain a few areas for improvement, but these can be dealt with through further consideration at the detailed design stage and/or an appropriate condition of approval.

Is the proposal required to go back to a future Design Review Panel Meeting?
Please tick one of the following:
☐ **Yes – future full panel design review**
√ **No – future chair review only**
√ **No – no further review required**

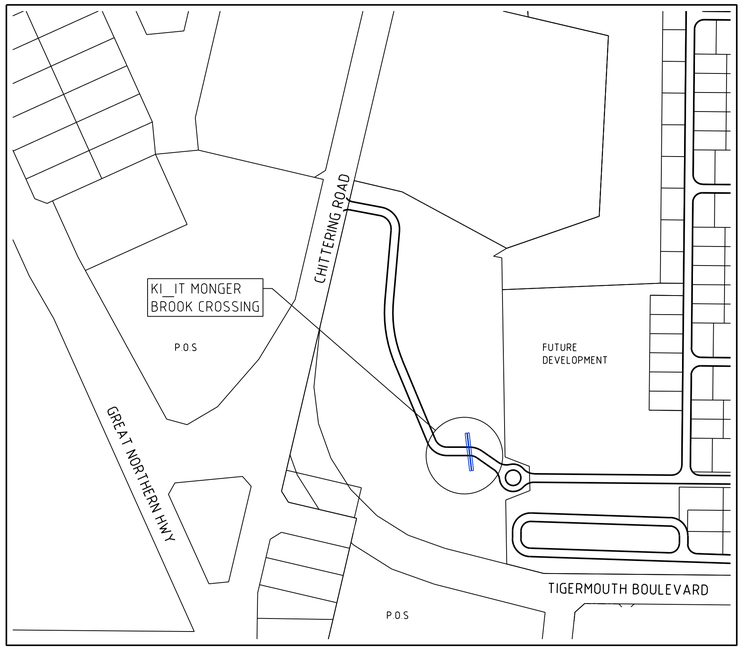
Is the proposal supported?
Please tick one of the following:

☐ **Yes - Supported** √ **Yes - Supported – pending further attention and/or conditions to be imposed** ☐ **No - Not supported**	
Design Review Report endorsement & DRP Recommendation	 Malcolm Mackay DRP Chair



FORSHORE RESERVE CULVERT CROSSING PLAN

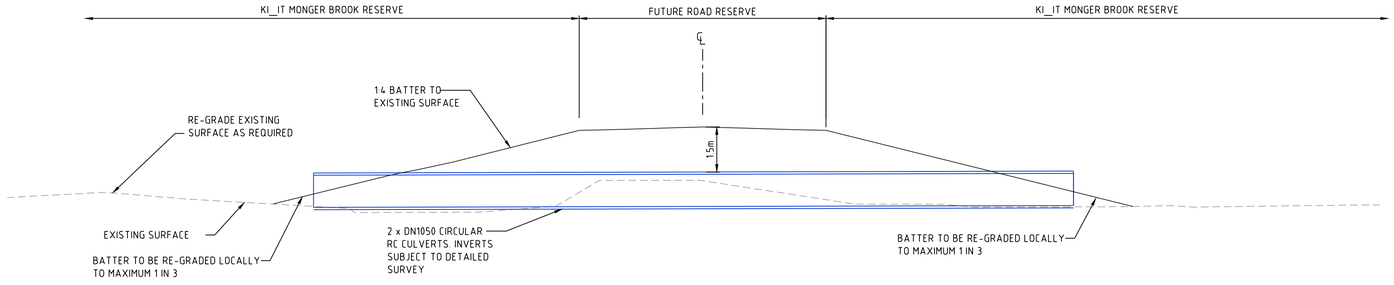
SCALE 1:250



LOCALITY PLAN

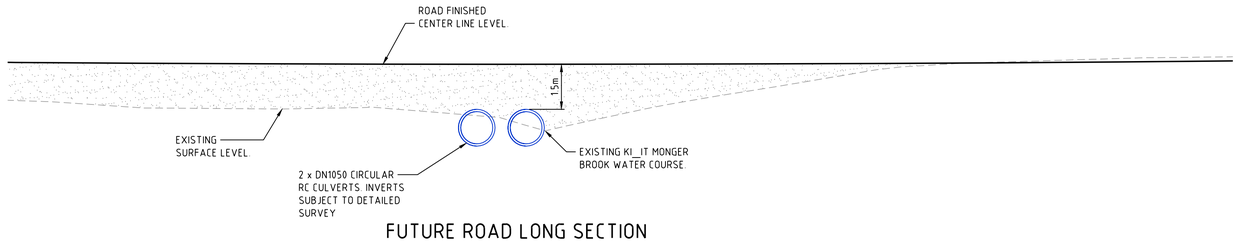
SCALE 1:2000

LEGEND	
DESCRIPTION	SYMBOL
PROPOSED ROAD	
EXISTING ROAD	
FUTURE ROAD	
PROPOSED DRAINAGE PIPE	
PROPOSED DRAINAGE PIPE WITH JUNCTION PIT (JP), SIDE ENTRY PIT (SEP), GRATED PIT (GP) AND CIRCULAR GRATED PIT (CGP)	
FUTURE WATER MAIN	WF
FUTURE SEWER MAIN	SF
FUTURE SUBSOIL DRAINAGE PIPE	SDF
PROPOSED CONTOUR	
BATTER CONTOUR MAJOR	



CULVERT CROSSING SECTION

SCALE 1:100



FUTURE ROAD LONG SECTION

SCALE 1:100

REV	DATE	DRN	CKD	APP	AMENDMENT
A	12.12.24	ARH			ISSUED FOR INFORMATION

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CLIENT: BETHANIE

APPROVED

DESIGNED: ARH

SCALE: 1:100 1:250

PROJECT: BETHANIE BULLSBROOK

TITLE: KI_IT MONGER BROOK CROSSING

WAPC No.

DRAWING No.: 6524-00-SK610

REVISION: A

ORIGINAL SIZE: A1

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PS ref: 8799
LG ref: DA-692/2024

6 January 2025

City of Swan
2 Midland Square
MIDLAND WA 6056

Attention: David Tomkin, Senior Planning Officer

Dear David,

APPLICATION FOR DEVELOPMENT APPROVAL
RESPONSE TO REQUEST FOR FURTHER INFORMATION
PROPOSED PARK HOME PARK (LIFESTYLE VILLAGE)

We refer to the City of Swan (**City**) additional request for further information correspondence (**RFI**) dated 20 December 2024 related to the proposed Park Home Park (Lifestyle Village) development at Lot 900 Chittering Road, Lot 9501 Fairchild Street, Lot 9013 Tigermoth Boulevard, Bullsbrook (**subject site**).

We are pleased to provide the following information in response to the City's RFI. This submission includes responses to the City's comments, as well as a response to external referral submissions.

We are pleased to provide the following information in support of the proposed development application:

1. Ki-It Brook Crossing Indicative Design (refer **Appendix 1**)
2. Revised Bushfire Attack Level Assessment Contour Map (refer **Appendix 3**)
3. Indicative Workshop Concept Plan (refer **Appendix 4**)

RESPONSE TO DESIGN REVIEW COMMENTARY

It is noted that the revised development design was reviewed by the City's Design Review Panel Chair on 18 December 2024, and that overall, the proposed design is generally supported by the City's DRP subject to recommended conditions regarding submission of detail relating to the following:

- Final dwelling design
- Schedule of materials and colours
- Landscaping

The above matters are considered minor in nature and can be addressed by way of a suitably worded condition of approval.

RESPONSE TO REFERRAL COMMENTS

We understand the City has received formal responses from the following external stakeholder agencies:

- Department of Biodiversity Conservation and Attractions (**DBCA**)
- Department of Water and Environmental Regulation (**DWER**)
- Main Roads WA

Based on the referral commentary provided by each organisation, MRWA supports the proposed development application, whilst and DBCA and DWER do not support the development application.

As set out in the RFI correspondence dated 20 December 2024, the City is acceptable to supporting the proposed access road through the Ki-it Monger Brook subject to provision of additional information. Information required by the City in relation to the access road is addressed in **Table 1** below.

Table 1 –Response to RFI – Ki-It Monger Brook Crossing

City Comment	Applicant Response
Details of the proposed crossing over the Ki-It Monger Brook as well as the location, number and details of any trees which are proposed to be removed (if any) within the conservation reserve to construct the access road are required. In the event a significant number of trees are being removed, changes to the access road may be required.	The project engineer (Cossill & Webley) has prepared a preliminary Ki-It Brook Crossing Plan demonstrating culvert crossing design and proposed water management strategy (refer **Appendix 1**). In relation to tree removal, the consultant team has advised that at this stage in the design process, one tree may be removed to facilitate access, based on the current design.
Although the DBCA considers that the conservation reserve and identified POS area should be ceded and vested with the City of Swan, the City are happy to support these areas remaining in private ownership, subject to a condition of approval requiring these sections of the lot to be managed in accordance with the approved Foreshore Wetlands Management Plan and the landowner entering into a maintenance agreement with the City.	Noted. This matter can be addressed via a suitably worded condition of development approval.
To address the DBCA's concerns regarding water management, conditions requiring the submission of a detailed Urban Water Management Plan & Stormwater Management plan/calculations will be recommended.	Noted. This matter can be addressed via a suitably worded condition of development approval.
Despite the DBCAs recommendation to include a condition requiring the preparation of a foreshore wetland management plan, the City has previously approved a foreshore management plan in 2021 which has been used to clear numerous stages of subdivision within the Kingsford estate. Taking this into consideration, the City are satisfied with the current approved Foreshore Wetland Management Pan and contend an updated document is not required. As mentioned above, a condition will be recommended requiring the conservation reserve be managed in accordance with the approved FWMP.	Noted.
The City's Engineering Department support the Sediment & Drainage control plan submitted in support of the proposal and are satisfied the management strategies outlined in this document will mitigate the disturbance risks (i.e., primarily erosion & sedimentation) to the Ki-it Monger Brook watercourse. Despite DBCA's advice, the City will not be recommending a condition requiring the submission of a Sediment and Erosion Control Plan.	City's support for the Erosion, Sediment and Drainage Control Plan noted.
DBCA have recommended a condition requiring fencing be provided along the boundary of the foreshore reserve to prevent access into the area. Given this has been done for previous subdivisions within the Kingsford Estate, the City will be recommending this as a condition. Noting construction of fencing around that portion of the foreshore reserve abutting the site to the North will be undertaken by Amex.	Noted. This matter can be addressed via a suitably worded condition of development approval.

RESPONSE TO OTHER MATTERS

The City's RFI correspondence seeks further information in relation to several final matters, specifically bushfire assessment, design and function of the workshop, and updated consultant reporting. Additional information on each of these matters is provided below.

Bushfire

In response to the amended site layout, the BAL Contour Map (**BAL Map**) has been updated by Allerding & Associates (refer **Appendix 2**).

The revised BAL Map identifies two elements of the proposed development that encroach into areas designated BAL-40 and/or BAL-Flame Zone along the western boundary of the subject site. The specific elements of the proposed development include a minor portion of the administration building and portion of the western-most residential lot in the south-western corner of the subject site.

Both elements are minor in nature and are capable of modification through the detailed design process to ensure any future development is sited within areas identified BAL-29 or lower.

It is considered that this matter can be addressed via a suitably worded condition of approval requiring update to the development design prior to issue of a Building Permit.

The Bushfire Management Plan issued with the original development application will be updated post-development approval to ensure consistency with the revised site layout. This can be addressed via a suitably worded condition of approval.

Workshop

The proposed development includes a small workshop building in the northeastern corner of the subject site. This building is an amenity/hobby space for future residents that provides a small workshop space, store, toilet and kitchenette. The workshop building is proposed to be constructed with timber framing, fibre cement weatherboard cladding and colorbond roof.

The proposed building is considered ancillary to the main development and land use.

An indicative concept floor and elevation plan has been prepared to show the proposed building form, layout and purpose (refer **Appendix 3**). Final building design detail will be included within the Building Permit and material issued to the City to address conditions of development approval.

Consultant Reports

The Development Application is supported by a range of consultant technical reports. Where required, these reports will be updated and issued to the City post-development approval to reflect final design and technical detail.

The following technical reports are intended to be updated and issued to the City following resolution of detailed design:

- Landscape Plan
- Bushfire Management Plan
- Waste Management Plan
- Urban Water Management Plan
- Stormwater Management Plan

Provision of the final updated consultant reports is appropriately addressed by way of suitably worded conditions of approval.

CONCLUSION

We trust the information provided above, and enclosed, addresses the matters raised in the City's request for further information correspondence dated 20 December 2024, as well as those matters raised by the City's DRP Chair and external referrals agencies.

Accordingly, we respectfully request the City finalise their assessment of the proposed development and submit a recommendation of approval to the DAP.

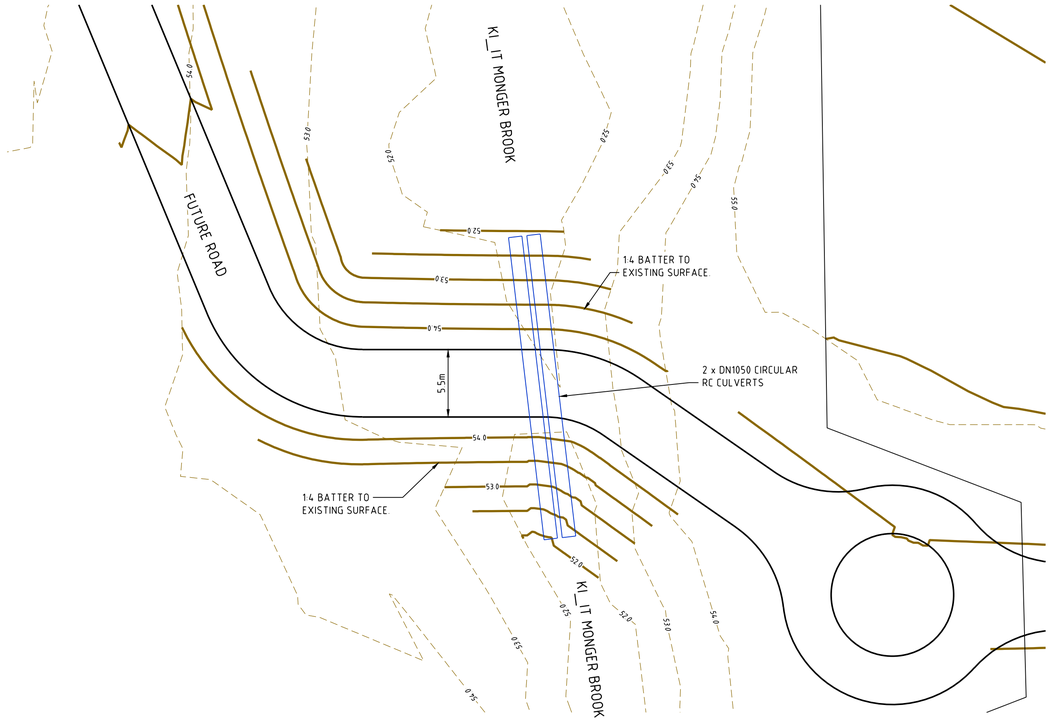
Should you have any queries or require further clarification in regard to the above matter please do not hesitate to contact the writer.

Yours faithfully,



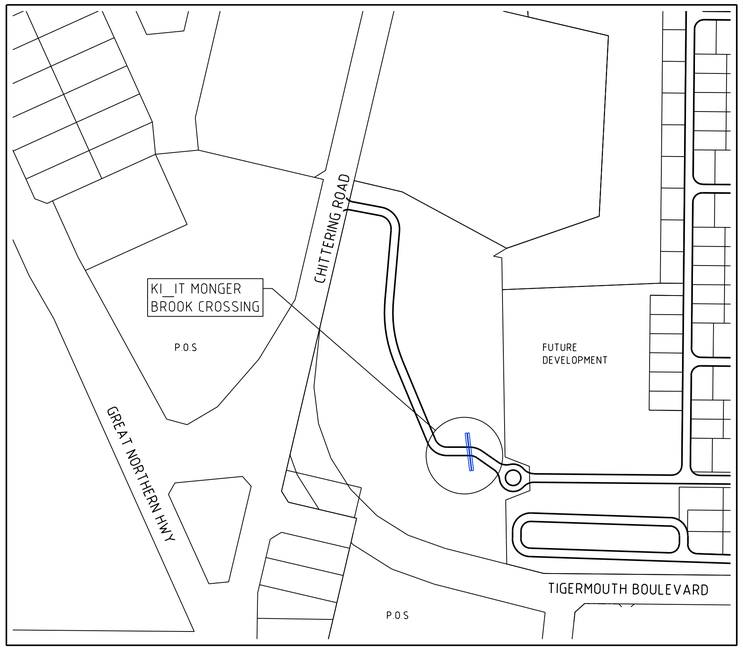
MATTHEW CAIN
ASSOCIATE

APPENDIX 1
KI-IT BROOK CROSSING DETAIL



FORSHORE RESERVE CULVERT CROSSING PLAN

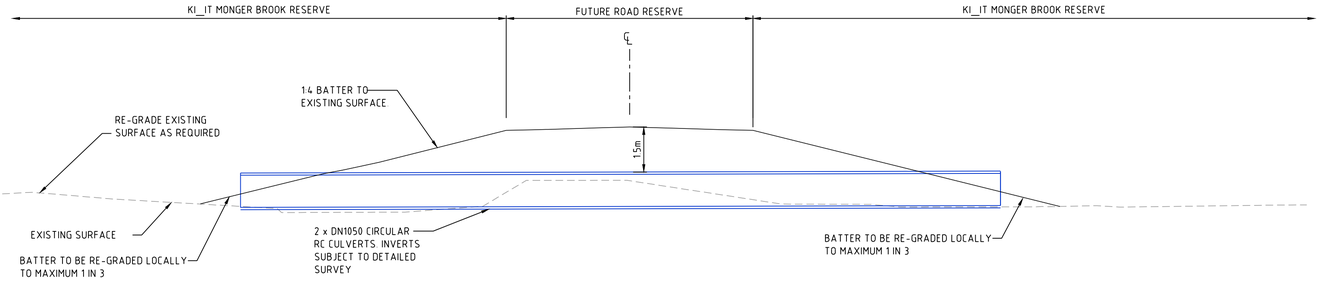
SCALE 1:250



LOCALITY PLAN

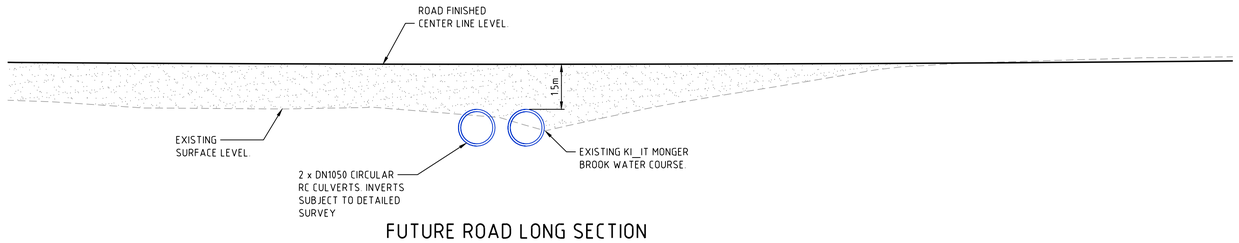
SCALE 1:2000

LEGEND	
DESCRIPTION	SYMBOL
PROPOSED ROAD	
EXISTING ROAD	
FUTURE ROAD	
PROPOSED DRAINAGE PIPE	
PROPOSED DRAINAGE PIPE WITH JUNCTION PIT (JP), SIDE ENTRY PIT (SEP), GRATED PIT (GP) AND CIRCULAR GRATED PIT (CGP)	
FUTURE WATER MAIN	WF
FUTURE SEWER MAIN	SF
FUTURE SUBSOIL DRAINAGE PIPE	SDF
PROPOSED CONTOUR	
BATTER CONTOUR MAJOR	



CULVERT CROSSING SECTION

SCALE 1:100



FUTURE ROAD LONG SECTION

SCALE 1:100

REV	DATE	DRN	CKD	APP	AMENDMENT
A	12.12.24	ARH			ISSUED FOR INFORMATION

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CLIENT: BETHANIE

APPROVED

DESIGNED: ARH

SCALE: 1:100 1:250

PROJECT: BETHANIE BULLSBROOK

TITLE: KI_IT MONGER BROOK CROSSING

WAPC No.

DRAWING No.: 6524-00-SK610

REVISION: A

ORIGINAL SIZE: A1

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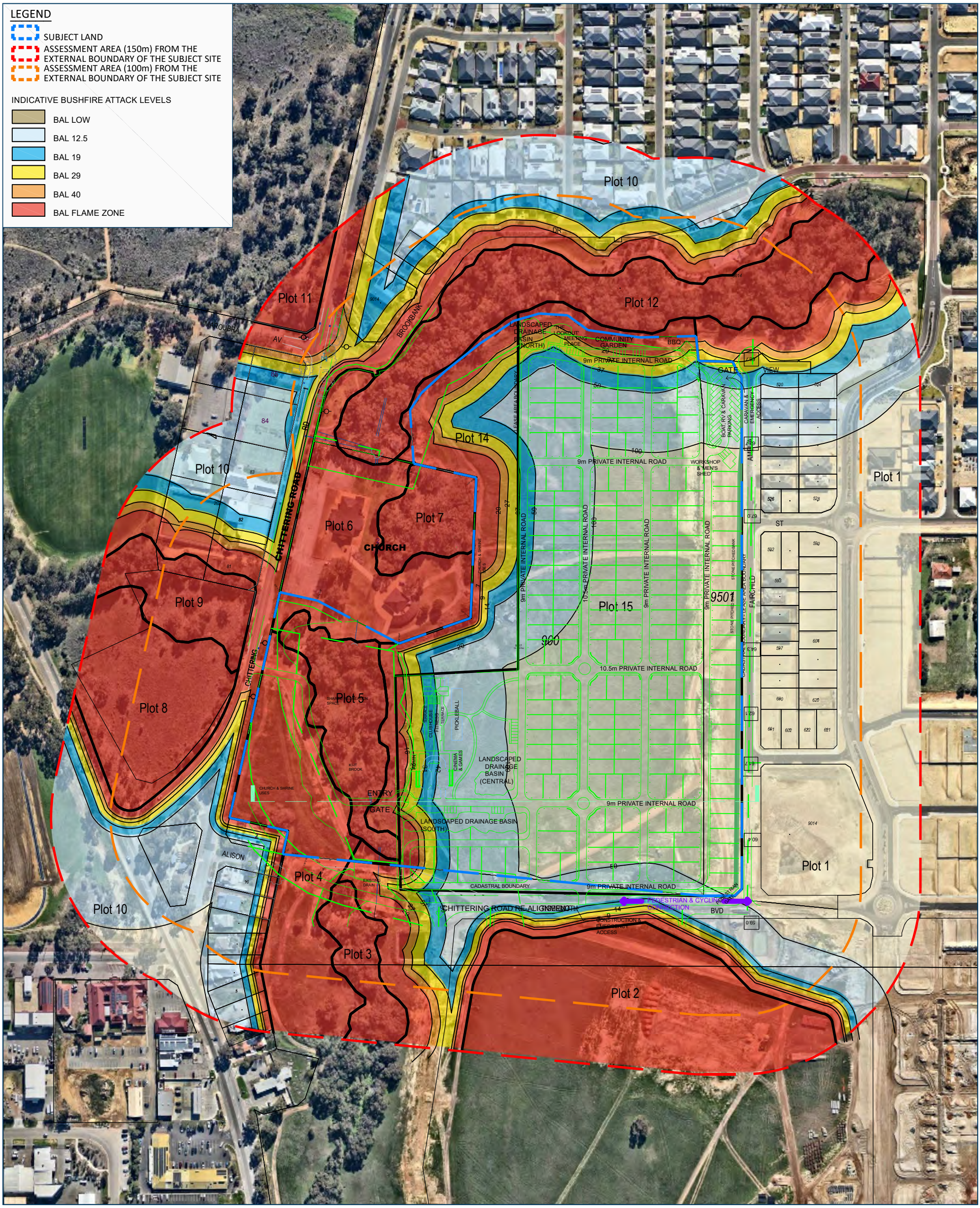
APPENDIX 2
REVISED BAL CONTOUR MAP



BAL CONTOUR MAP

LOTS 900 & 9501 CHITTERING ROAD
BULLSBROOK

CITY OF SWAN

0 20 40 60 80 100 120 140 160 180 200m

SCALE: 1:3000
ORIGINAL PLAN SIZE: A3

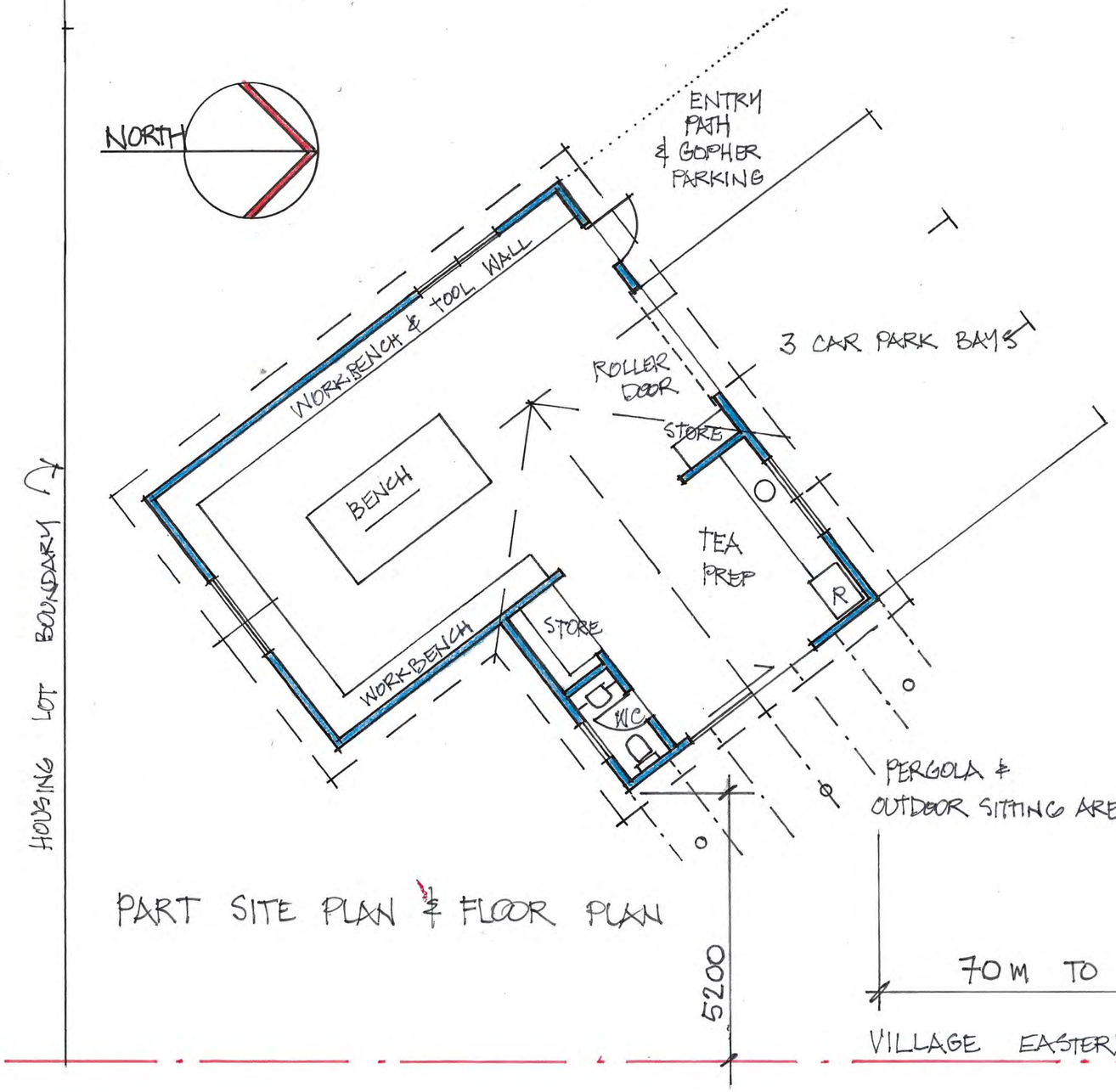
JOB CODE:
BET BUL ZB

DATE:
06.01.2025

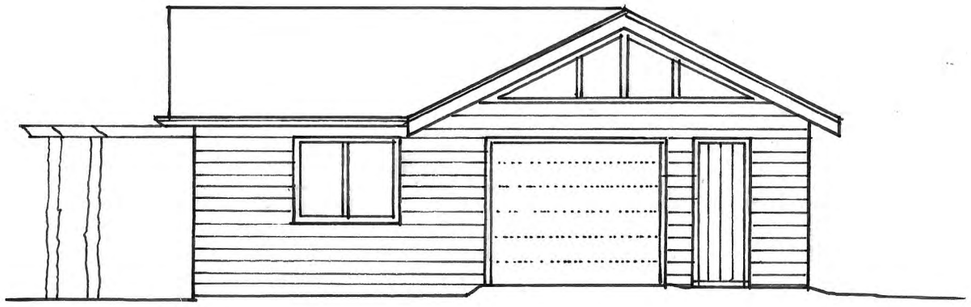
Allerding & Associates
Town Planners, Advocates and Subdivision Designers

125 Hamersley Road, Subiaco WA 6008
T: (08) 9382 3000 |W: allerdingassoc.com

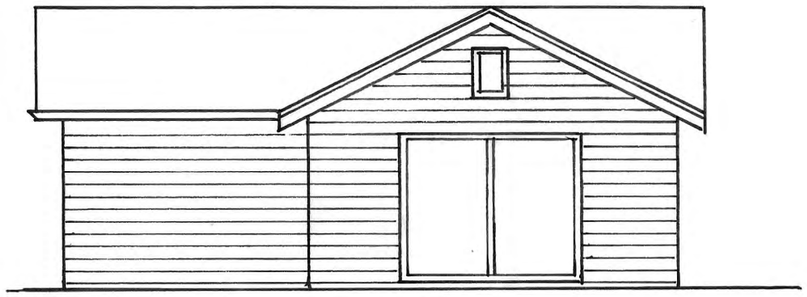
APPENDIX 3
WORKSHOP CONCEPT PLAN



PART SITE PLAN & FLOOR PLAN



NORTH WEST ELEVATION



NORTH EAST ELEVATION
* PERGOLA OMITTED FOR CLARITY

THE BULLSBROOK VILLAGE FOR THE BETHANIE GROUP
CHITTERING ROAD BULLSBROOK
RESIDENTS' WORKSHOP 1:100 @ A3 JANUARY 2025

RICHARD HAMMOND ARCHITECT M 0438 918 753

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Planning Solutions (Aust) Pty Ltd

PS ref: 8799
LG ref: DA-692/2024

16 December 2024

City of Swan
2 Midland Square
MIDLAND WA 6056

Attention: David Tomkin, Senior Planning Officer

Dear David,

APPLICATION FOR DEVELOPMENT APPROVAL
RESPONSE TO REQUEST FOR FURTHER INFORMATION
PROPOSED PARK HOME PARK (LIFESTYLE VILLAGE)

We refer to the City of Swan (**City**) request for further information correspondence (**RFI**) dated 21 November and 3 December 2024 related to the proposed Park Home Park (Lifestyle Village) development at Lot 900 Chittering Road, Lot 9501 Fairchild Street, Lot 9013 Tigermoth Boulevard, Bullsbrook (**subject site**).

We are pleased to provide the following information in response to the City's RFI. This submission includes responses to the City's planning and technical comments, as well as a response to Design Review 2 commentary and public consultation submissions.

We are pleased to provide the following information in support of the proposed development application:

1. Amended Development Plans (refer **Appendix 1**)
2. Response to public submission (refer **Appendix 2**)

RESPONSE TO PUBLIC SUBMISSIONS

We understand that during the public consultation period the City received a total of 48 submissions on the proposed development.

A response to the key themes raised during the submission period is provided in **Appendix 2**.

REFERRAL COMMENTS

We understand the City is awaiting formal responses from the following external stakeholder agencies:

- Department of Biodiversity Conservation and Attractions.
- Department of Water and Environmental Regulation.
- Main Roads WA.

Referral responses are due on, or before, 16 December 2024. Upon receipt, the City will issue referral comments to the Applicant for review and response. This will be completed under separate cover.

RESPONSE TO DESIGN REVIEW PANEL ADVICE

The proposed development application was referred to the City's Design Review Panel (**DRP**) for a second design review on 12 November 2024.

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As set out in this submission, the Amended Development Plans have been modified to address comments raised through Design Review 2. Comments in response to DRP recommendations are provided below:

Design Principle 1

- It is considered sufficient character and contextual analysis has been provided throughout design review 1 and 2, noting the area is being developed with a largely residential suburban character with 'project homes'. A condition of approval requiring an agreed set of village colours and materials will ensure the character of the village addresses its context.
- Additional cross sections have been provided in the updated plans appended to this submission. These include sections through the revised eastern boundary treatment and internal street cross sections.

Design Principle 2

- Tree types will be selected based on the final arrangement of housing and can be included as a condition of development approval. Concerns regarding spacing for street trees have been partially addressed by increase the width of internal roads to 9.0m and 10.5m respectively which provides a greater opportunity for private street planting.
- Additional cross sections have been provided, noting the increased private street widths allow for greater opportunities for footpaths. Details will be provided at building permit / civil works drawing stage.

Design Principle 3

- The eastern (not southern) internal roadway has been deleted and replaced with landscaping. This has also allowed the street widths of north-south roads to be increased to improve opportunities for trees and pedestrian paths, whilst also improving access for rubbish trucks.
- Opportunities to group storerooms will be considered at dwelling installation stage.

Design Principle 4

- Opportunities to reposition windows will be considered at dwelling installation stage.

Design Principle 5

- No additional sustainability measures are proposed beyond those previously committed to.

Design Principle 6

- Principle supported by DRP. No further design amendments incorporated into the development design.

Design Principle 7

- Principle supported, no further DRP recommendations.

Design Principle 8

- Principle supported by DRP.
- Increased private street widths will improve swept path movement for trucks.

Design Principle 9

- The development will be subject to consideration with the City's Public Art Policy (POL-LP-1.10).
- This matter will be resolved through condition of approval and addressed in detailed design.

Design Principle 10

- Roof form to house type B has been amended from the lodged plans, however the DRP have suggested the small skillion over the entry portico be further amended. No change is proposed.
- Colours and materials can be addressed a s a condition of approval.

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RESPONSE TO REQUEST FOR CITY'S TECHNICAL ASSESSMENT

A response to matters raised by the City in the RFI correspondence received 21 November 2024 is provided below. This information should be read in conjunction with the updated Development Plans (**Appendix 1**).

Land use

City's comment

- *Given a 'Park Home Park' is a use not listed in the zoning table of the City's Local Planning Scheme nor is it included in the approved Bullsbrook Central Structure Plan (SWAN-SP/2017/5/B) as an addition use, please provide justification evaluating why the land use does not prejudice the objectives of the Bullsbrook Central Structure Plan or adversely impact the intended amenity of the Kingsford Estate. Furthermore, in addition to the advice provided by Lavan, please justify why the use does not warrant an amendment to the approved Structure Plan.*

Applicant Response

The proposed land use of a 'Park Home Park' does not prejudice the objectives of the Structure Plan or impact the amenity of the locality for the following reasons:

- A Park Home is, for all intents and purposes, a type of residential development. The Park Homes are designed to have the appearance of dwellings and are provided with all the same amenities included within a typical suburban area including access to on-site rubbish collection, internal streets, communal areas for recreation and a clubhouse for resident use.
- Because of the nature of the development, it meets to objectives of the Residential zone and associated residential density assigned by the Structure Plan.
- The development will not negatively impact the implementation of the Structure Plan area which identified the subject site as a singular development site (no internal roads were proposed within the site). Designated 'recreation' areas on the Structure Plan will be retained for use by residents.
- Potential amenity concerns relating to waste collection, traffic, boundary treatments and environmental matters (retention of Ki-It Monger Brook) have been addressed by the development application. This ensures existing and future residents of the wider estate won't be affected by the development.
- A 'Park Home Park' land use, in the form of a Lifestyle Village, is a separate use to a 'Caravan Park' and is entirely appropriate in a Residential area. This is because a 'Park Home Park' is only permitted to have Park Homes and cannot accommodate caravans and tents. This ensures the development is compatible with the surrounding residential character.

Waste Management

The following further detail regarding waste collection and internal vehicle movements is provided:

- We understand the City's Waste Services are agreeable to collection of waste on-site from each house, subject to the proponent entering into a deed of indemnification against damage caused to private property from trucks accessing the site. The proponent is generally acceptable to this arrangement, and requests this matter be resolved through an appropriately worded condition of development approval.
- Revised swept path detail for proposed roundabout treatments has been included in the amended Development Plans (refer **Appendix 1**).
- If required, the Waste Management Plan can be updated through a condition of approval, to address:
    - Bin pad locations or typical bin collection location for each house.
    - The City's waste collection process and vehicle movements on site.

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Public open Space

City's comment

- *In accordance with the Bullsbrook Central Structure Plan Public Open Space (POS) Schedule, approximately 1.16 ha of the site, surrounding the Ki-It Monger Brook core creek area is identified as public open space. Given this land is to remain in private ownership, please provide written justification as to why the proposal will not adversely impact the availability of POS.*

Applicant Response

In accordance with the Bullsbrook Central Structure Plan (**Structure Plan**), Table 2: Public Open Space Schedule (**POS Schedule**) sets out identified public open space provision (**POS**) for the Structure Plan area. The land on the subject site is identified as recreation reference number 18 (**figure 01**). The POS Schedule illustrates how the Structure Plan achieves compliance with the minimum 10% creditable POS requirement, consistent with the requirements of Liveable Neighbourhoods.

The Gross Subdivisible Area of the Structure Plan equates to 190.4ha. To achieve the requirements of Liveable Neighbourhoods, the minimum 10% contribution requires the Structure Plan to achieve a minimum of 19.04ha of POS. The POS Schedule identifies a POS surplus of 1.59%or 2.66ha.

Recreation area 18 contributes 1.16ha of POS to the structure plan area. Whilst this area will be excluded from being part of the public network of open space, it will be retained as a natural area and remain undeveloped (except for the access road) and will be available to the residents of the lifestyle village for recreation, primarily providing visual amenity to residents. This will be supplemented by additional communal recreation areas included in the overall development.

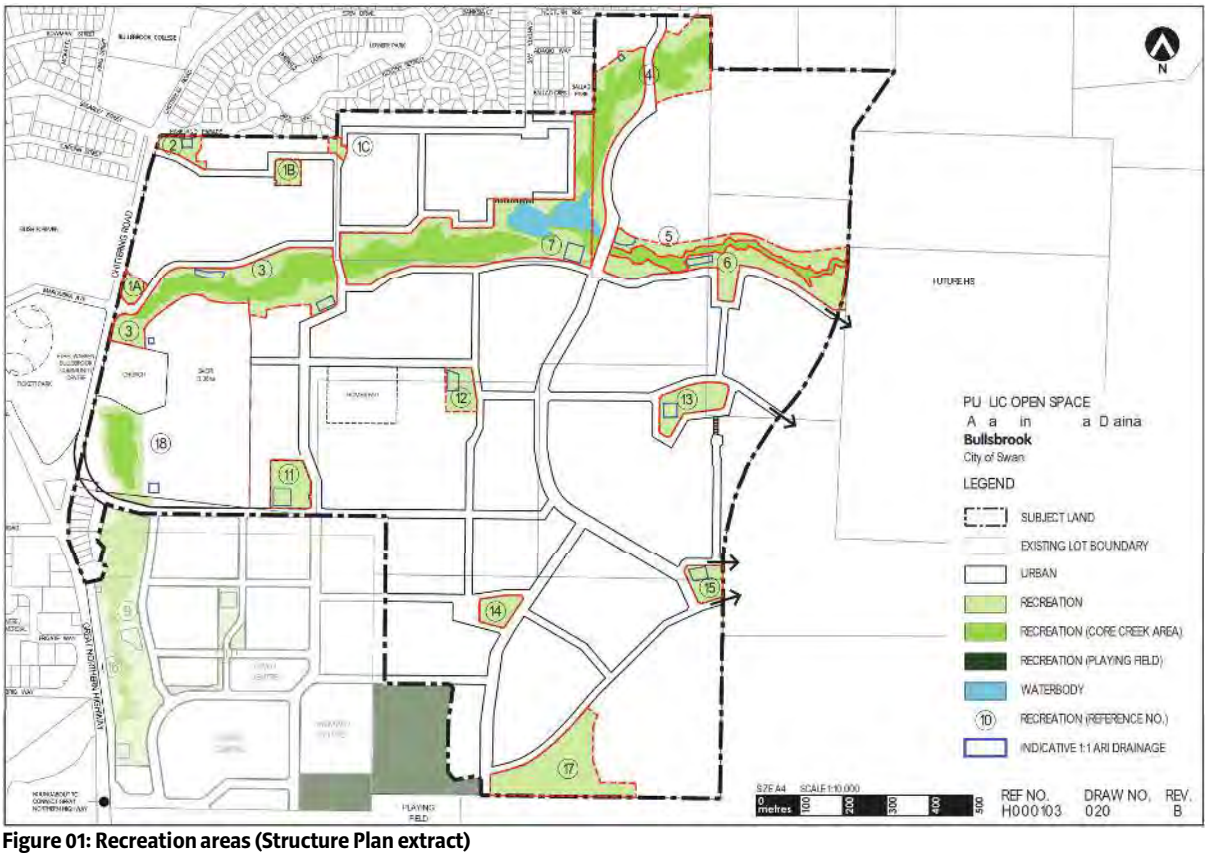

Figure 01: Recreation areas (Structure Plan extract)

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Table 1 below provides an update to the Public Open Space schedule in the structure plan, confirming the overall amount of POS in the Structure Plan area remains compliant.

Table 01: Updated POS schedule

Gross Site Area			207.32 ha
DEDUCTIONS			
Church	2.06 ha		
Recreation Area	13.20 ha		
1:1 Year Drainage	1.66 ha	16.92 ha	
Gross Subdivisible area			190.04 ha
Public Open Space @ 10%			19.04 ha
PUBLIC OPEN SPACE CONTRIBUTION			
May Comprise			
Minimum 80% unrestricted public open space		15.23 ha	
Maximum 20% restricted public open space		3.81 ha	19.04ha
UNRESTRICTED PUBLIC OPEN SPACE			
Local and Neighbourhood Parks (area minus 1:1 year drainage area)			
1A		0.30 ha	
1B		0.35 ha	
1C		0.16 ha	
1 (Total 1A + 1B + 1C)	Total		0.81 ha
2			0.47 ha
3			2.87 ha
4			1.45 ha
5			1.40 ha
6			2.12 ha
7			3.61 ha
8			0 ha
9			PP
10			PP
11			0.98 ha
12			0.67 ha
13			1.67 ha
14			0.72 ha
15			0.49 ha
16			PP
17			2.94 ha
18			~~1.16 ha~~
Total			**20.02 ha**
UNRESTRICTED PUBLIC OPEN SPACE			
Drainage filtration are between 1:1 and 1:5 year	0.70 ha		
TOTAL			20.09 ha
Public Open Space Provision			**10.06%**

As evidenced in **Table 1**, maintaining the site in private ownership does not diminish the overall provision of POS for the Structure Plan area, with the precinct still exceeding the 10% minimum requirement of Liveable Neighbourhoods.

Stormwater

A preliminary Urban Water Management Plan (**UWMP**) has been prepared by Pentium Water and was issued with the development application to outline the proposed stormwater drainage strategy and preliminary design detail (refer **Appendix 9** of original Development Application).

The preliminary UWMP provides preliminary detail regarding design requirements, drainage strategy and proposed drainage design.

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The final UWMP will be addressed via an appropriate condition of development approval, and will include further detail detailed design and drainage calculations required by the City.

Access

City's comment

- *It is noted the application is proposing its main vehicle access from chittering road across the Ki-it Monger Brook. The City's Engineering department have requested further information with relation to the proposed access road including details of the crossing over the Ki-It Monger Brook as well as the finishes and standard of the driveway itself. This will require amended plans and additional information.*
- *If vegetation is required to be removed to facilitate the construction of the access road through the Ki-It foreshore area, please provide details of the number and location of trees which are proposed to be removed.*

Applicant Response

The project engineer is finalising a response. This will be provided under a separate cover.

Groundwater Allocation

City's comment

- *Engineering have raised concerns around groundwater allocation to the site. It has been noted the groundwater license quoted belongs to the Kingsford Estate developer. Given the site is within a bushfire prone area, it is important the development has access to groundwater to ensure the proposed landscaping can be maintained in perpetuity to an exclusion standard. Please provide further information/clarification addressing this matter.*

Applicant Response

The project engineer is finalising a response and understands the existing groundwater licence GWL177269 does not belong to the Kingsford Estate developer. The licence holder is the City of Swan. A response will be provided under a separate cover.

CONCLUSION

We trust the information provided above, and enclosed, addresses the matters raised in the City's request for further information correspondence, as well as those matters raised by the City's DRP and through public submissions.

The amendments to the development and further information are considered to provide a refined design outcome for the development.

Accordingly, we respectfully request the City finalise their assessment of the proposed development and submit a recommendation of approval to the DAP.

Should you have any queries or require further clarification in regard to the above matter please do not hesitate to contact the writer.

Yours faithfully,



TAYNE EVERSHED
DIRECTOR

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APPENDIX 1
AMENDED DEVELOPMENT PLANS

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BULLSBROOK LIFESTYLE VILLAGE



Village Streetscape - Artists Impression

Bethanie

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LEGEND

- LANDSCAPING
- 'RECREATION' ZONED AREA
- CORE CREEK AREA
- AREA SUBJECT TO FORESHORE & WETLAND MANAGEMENT PLAN
- VILLAGE AMENITIES
- LANDSCAPED DRAINAGE BASINS
- FENCE/GATE
- ROADWAY
- CADASTRAL BOUNDARY
- LEASE AREA BOUNDARY
- STONE PITCHED BANK

TOTAL HOUSE SITES - 227

TOTAL LEASE SITE AREA - 106,988m²
(NOT INCL. SHARED REC. AREA)

TOTAL RECREATION AREA - 35,286m²
(INCL SHARED REC. AREA)

N

ISSUE	DESCRIPTION	DATE
C	REVISED MASTERPLAN	16.08.2024
D	ENTRY MOVED, LOT NUMB. ADDED	19.08.2024
E	HOUSE-LOT ALLOCATION	02.09.2024
F	REVISED MASTERPLAN	09.10.2024
G	ROAD & LOT LAYOUT REVISED	05.12.2024

DRAWING TITLE
Masterplan

PROJECT
BETHANIE - BULLSBROOK VILLAGE
CLIENT
BETHANIE
PROJECT ADDRESS
CHITTERING ROAD, BULLSBROOK, WA, 6084

Project number	-
Date	05.12.2024
Drawn by	RHA
Checked by	RHA
Scale @ A3	1 : 1500

DRAWING NO.
A.001

12/12/2024 9:47:33 AM

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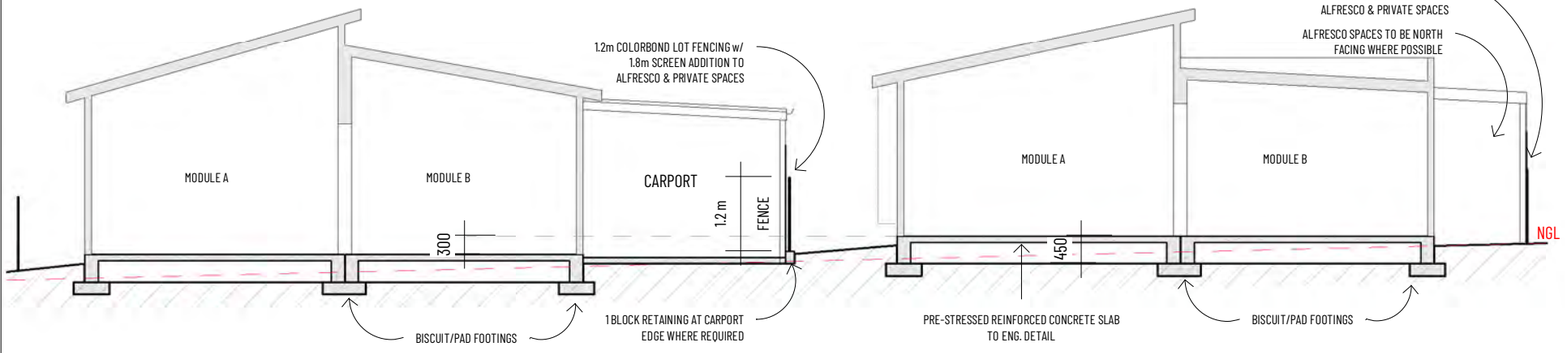

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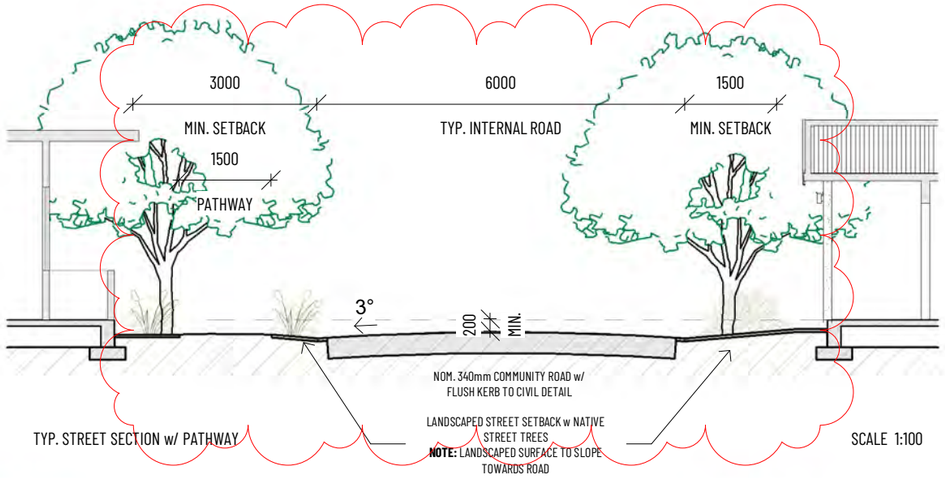

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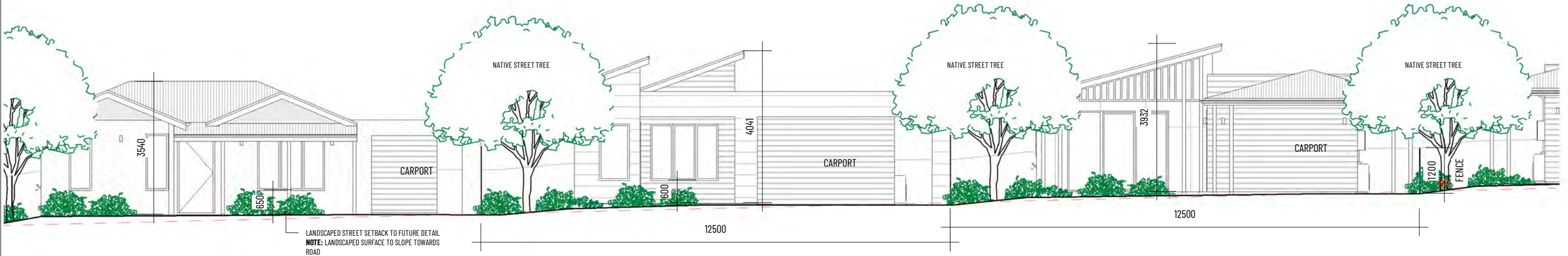

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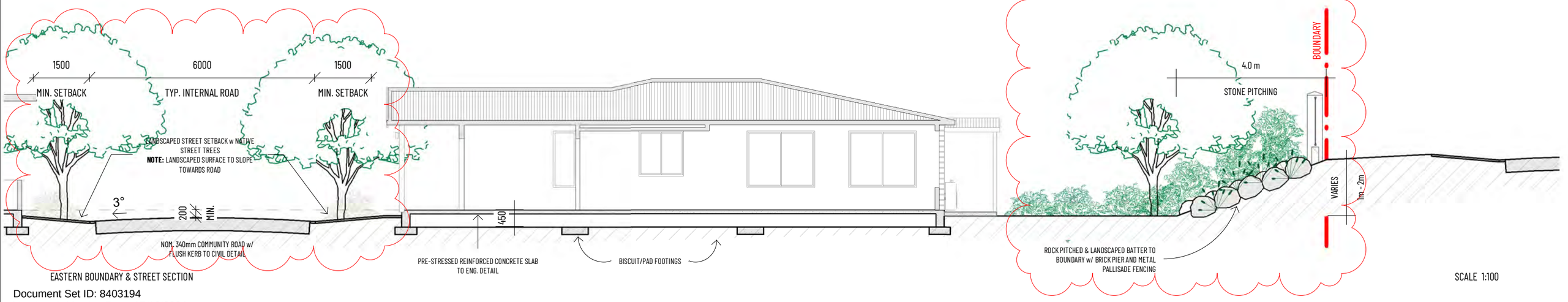

EASTERN BOUNDARY & STREET SECTION

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2 A.001 E-W Street Elevation - PART 2
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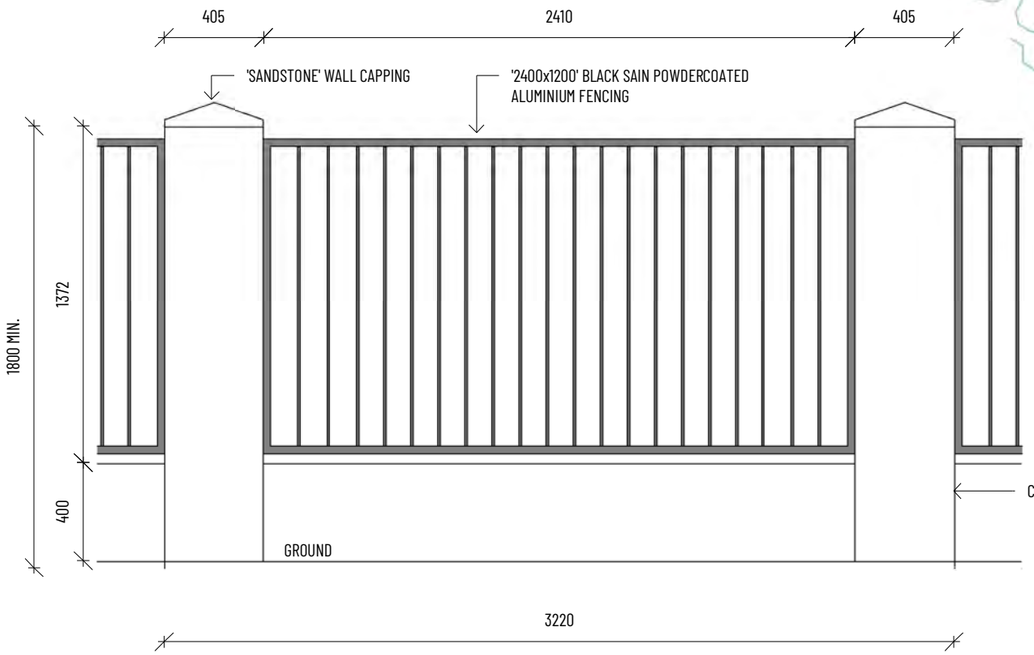

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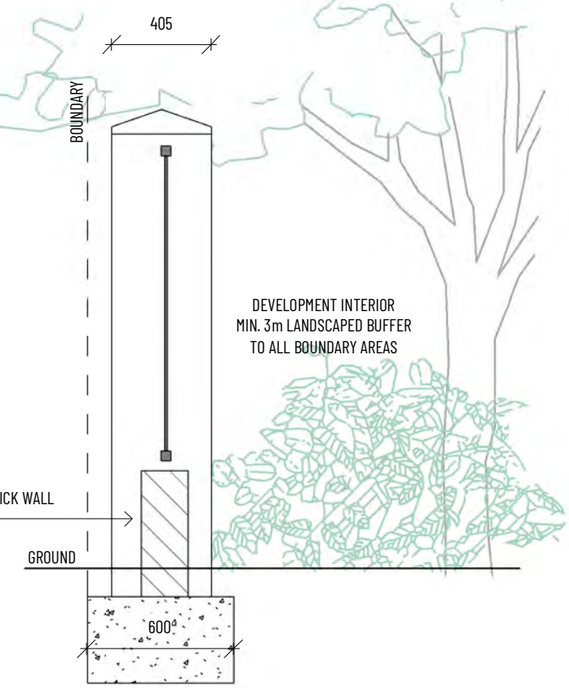

SECTION 1:25

Typ. Fence Detail
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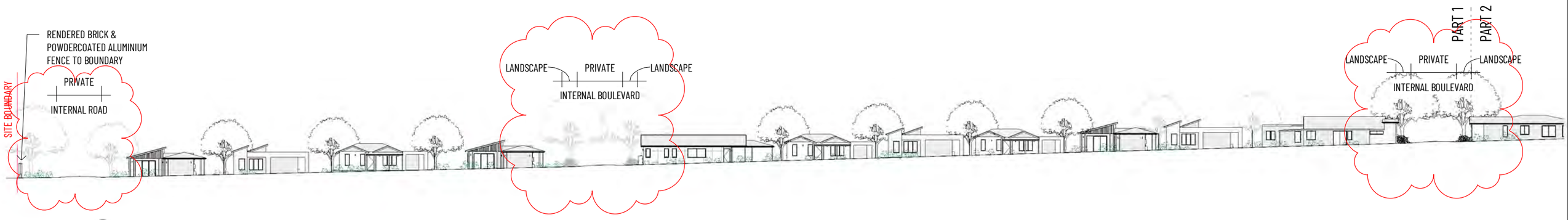

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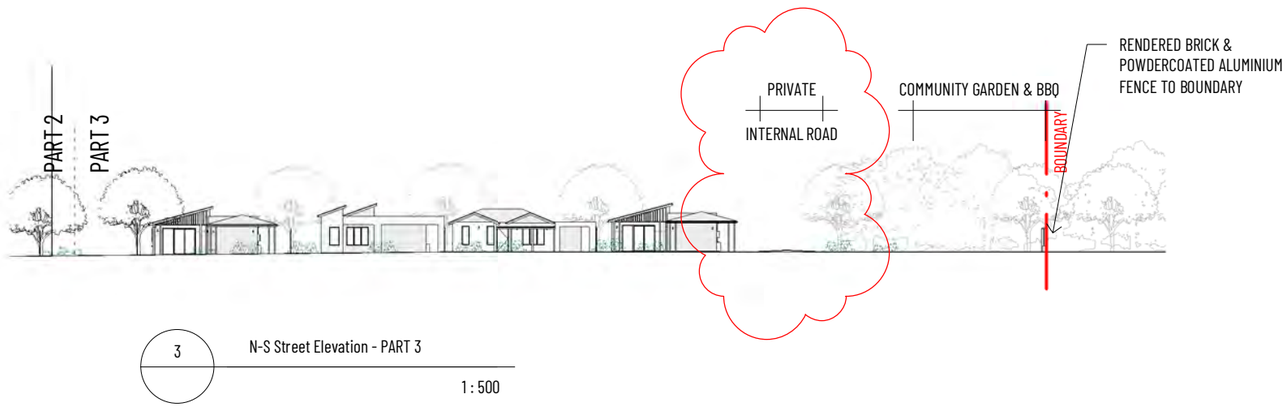

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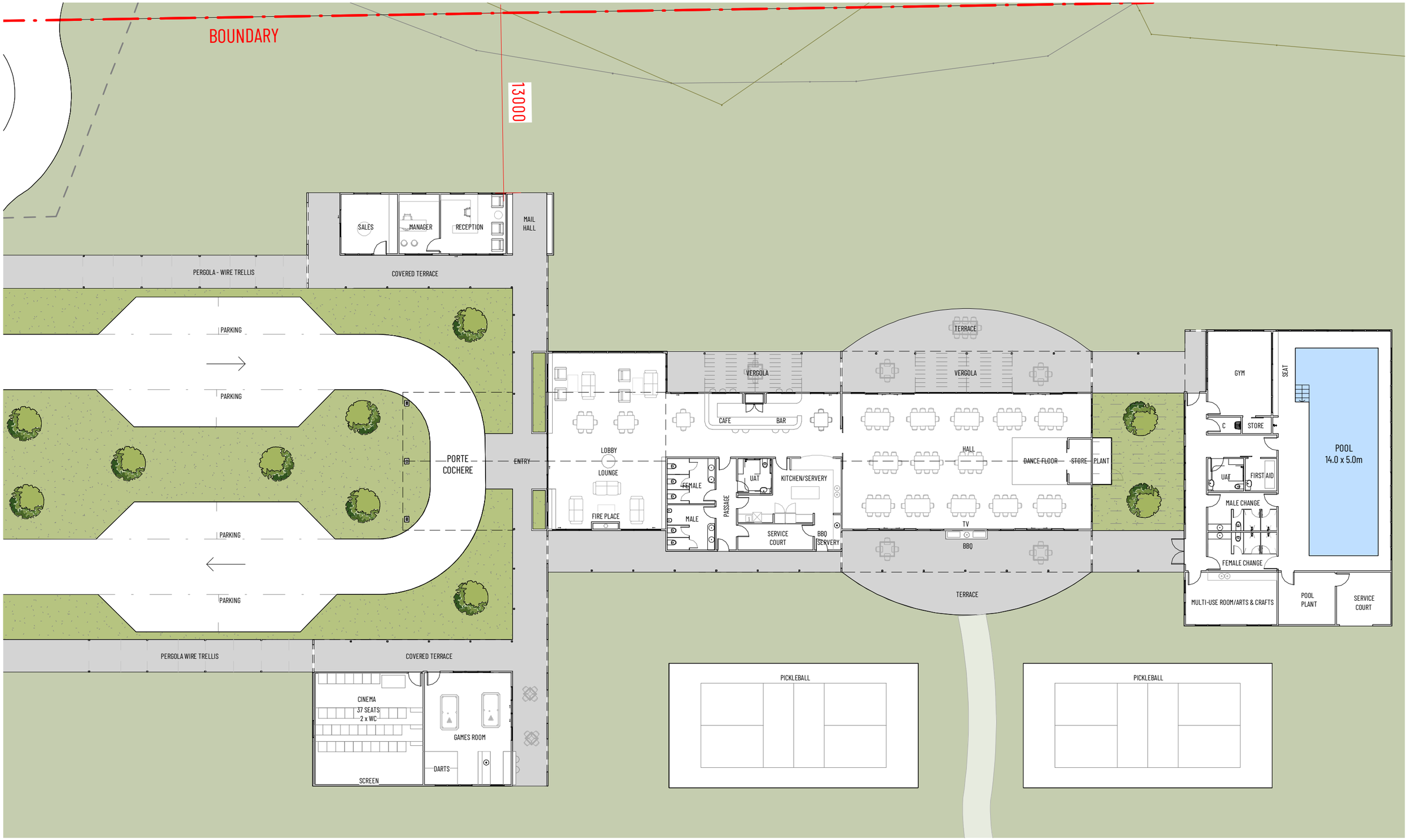

CLUBHOUSE INTERNAL AREA: 890m^2

N

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CLUBHOUSE CONCEPT DESIGN RevA
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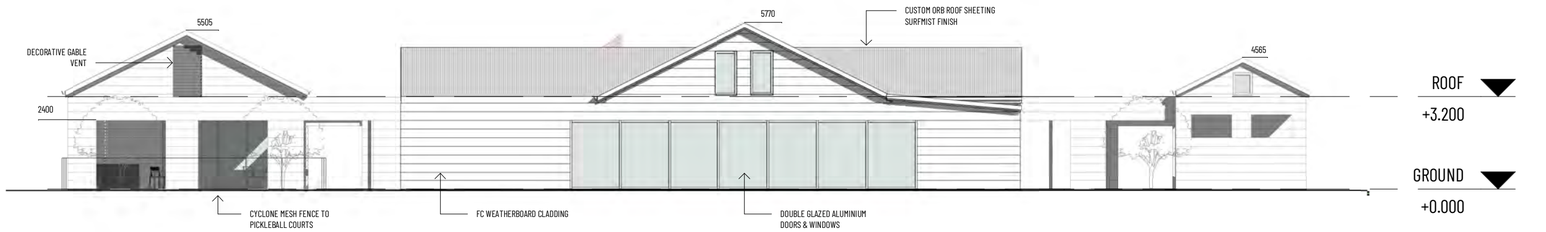

N NORTHERN ELEVATION

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S SOUTHERN ELEVATION

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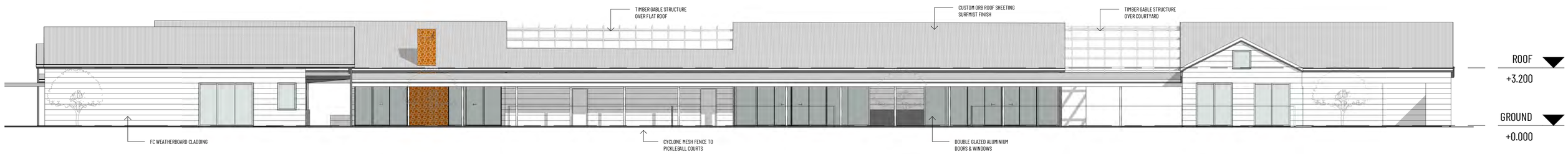

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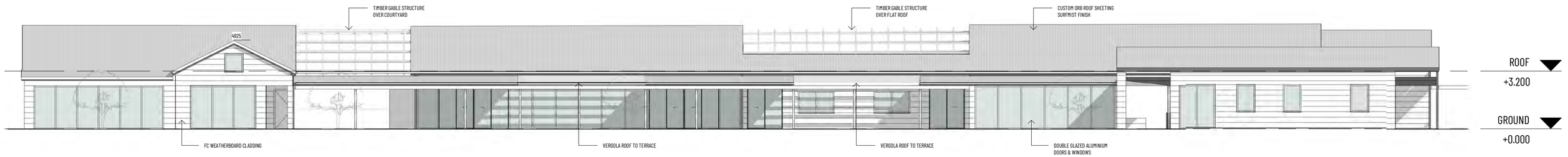

W WESTERN ELEVATION

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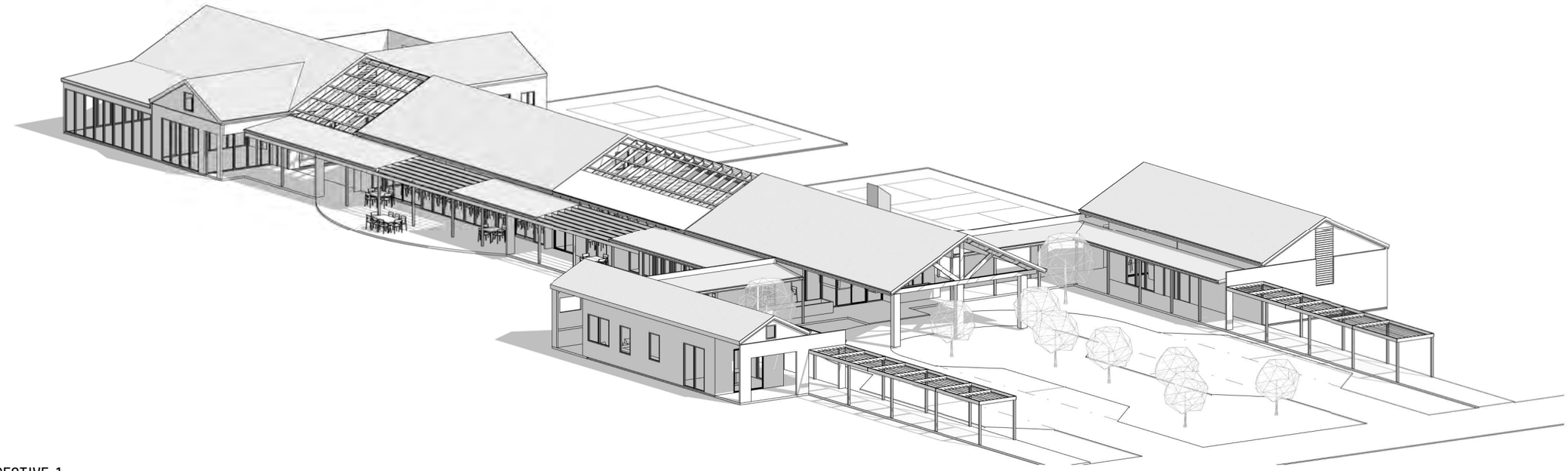
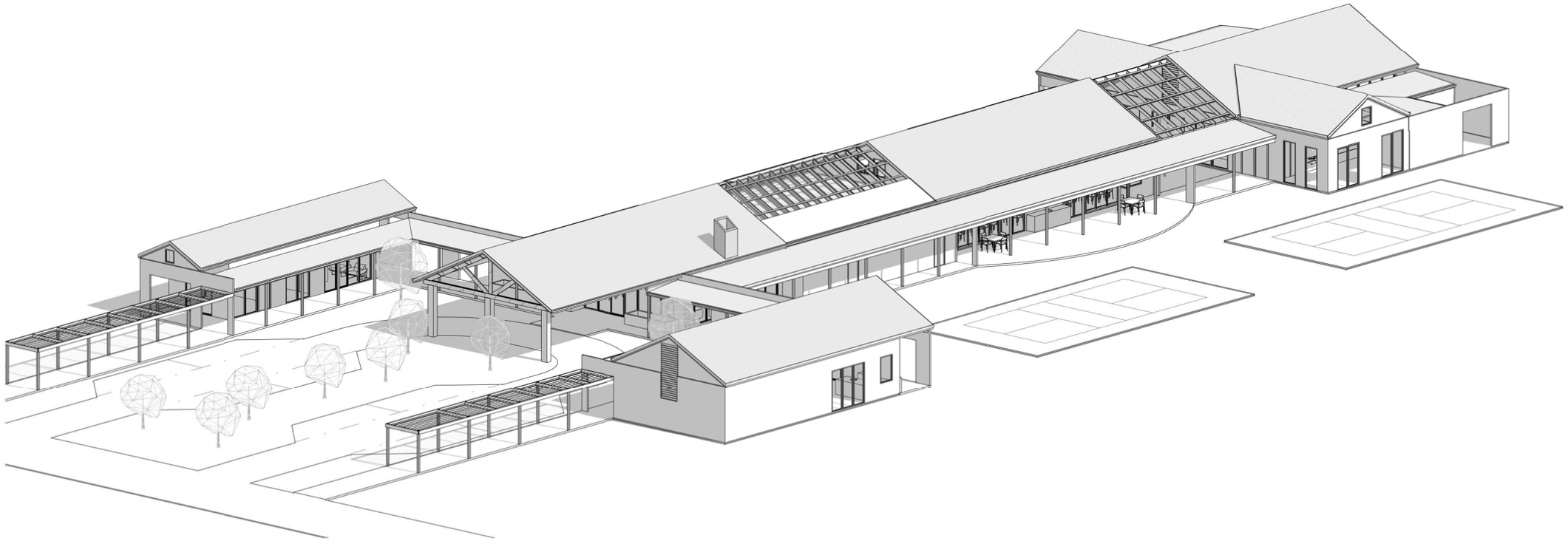


3D PERSPECTIVE_1



3D PERSPECTIVE_2

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3D PERSPECTIVE_ENTRY ROAD



3D PERSPECTIVE_ENTRY LOUNGE

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3D PERSPECTIVE_EXTERNAL TERRACE THROUGH TO HALL

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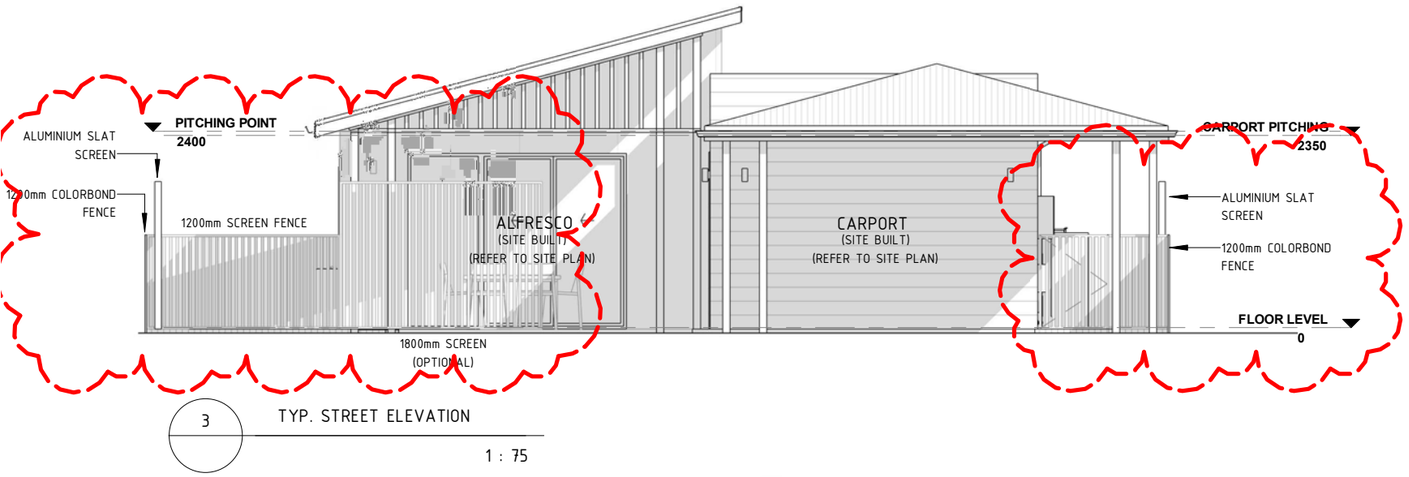
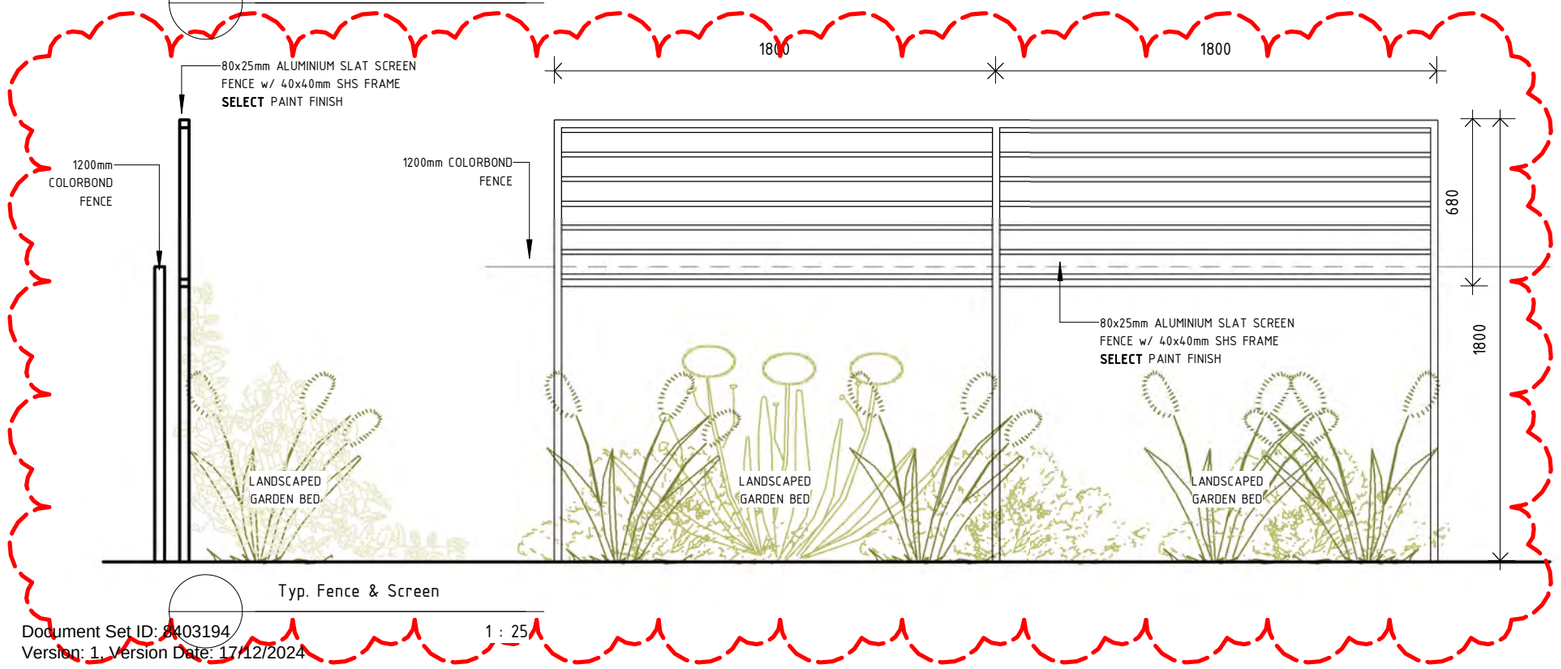


3 TYP. STREET ELEVATION

1 : 75



2 3D View



Typ. Fence & Screen

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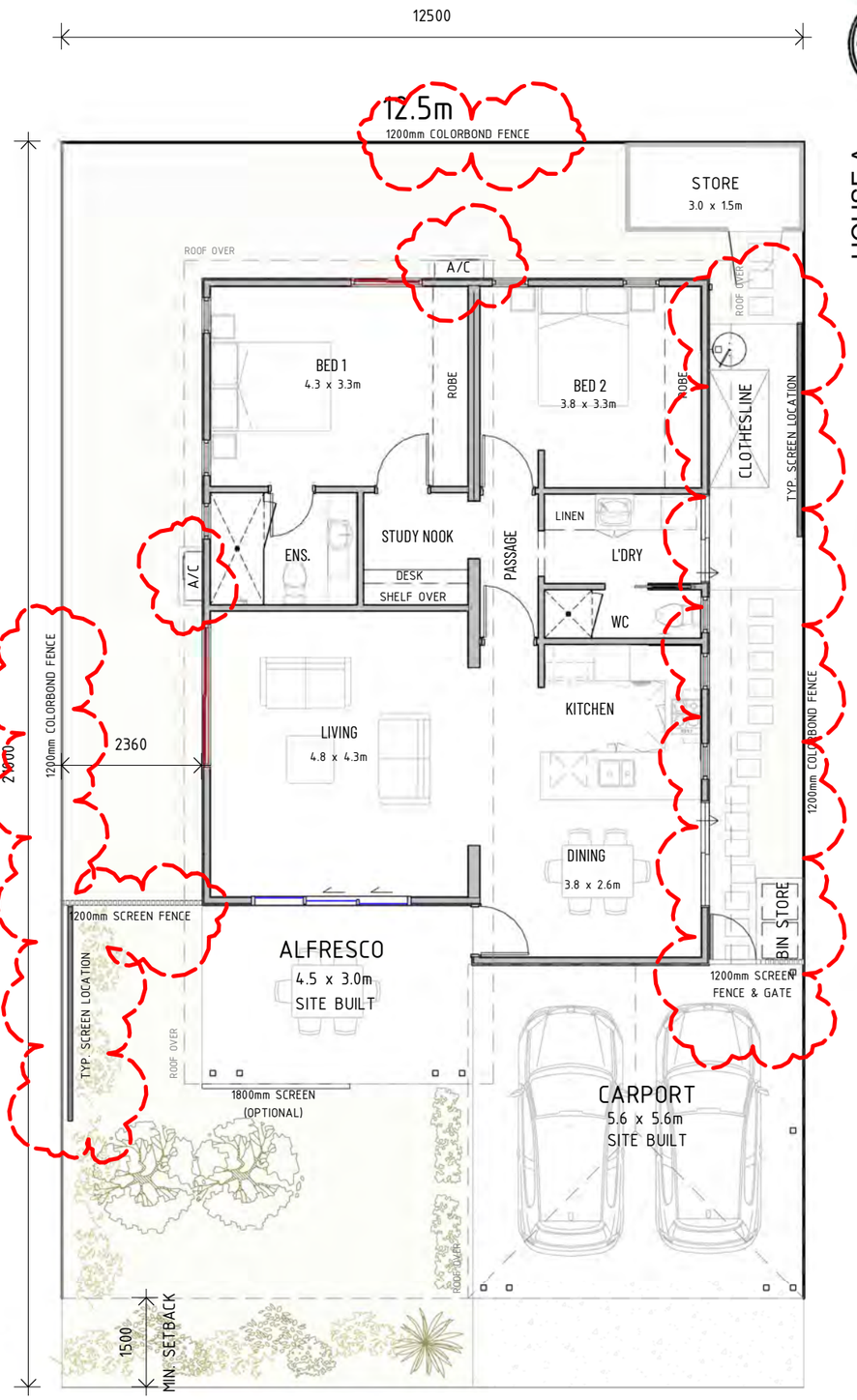

HOUSE A DESIGN | 1:100

N

HOUSE A
A
31.10.2024

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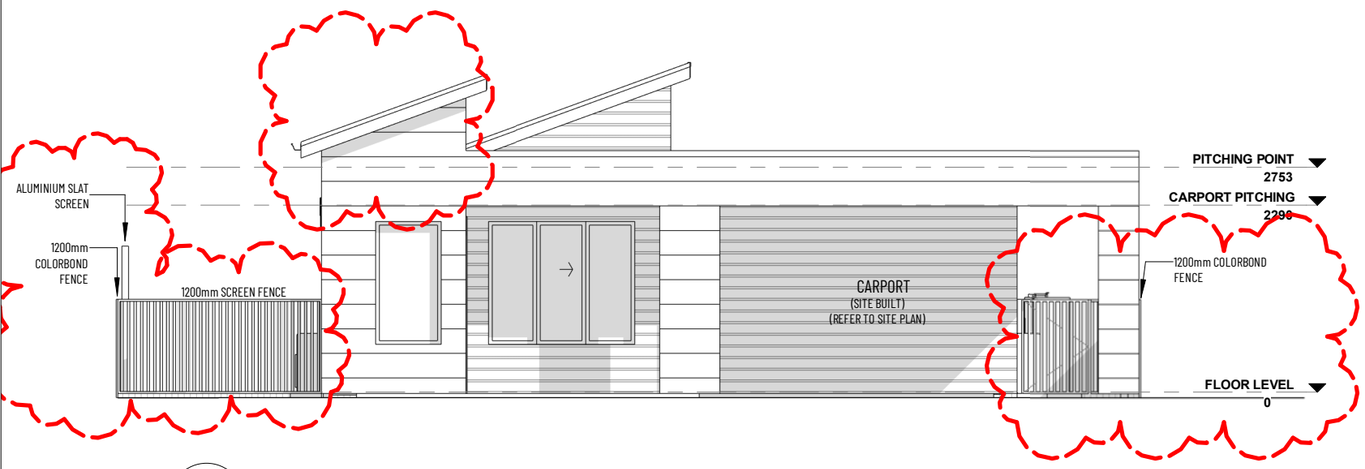
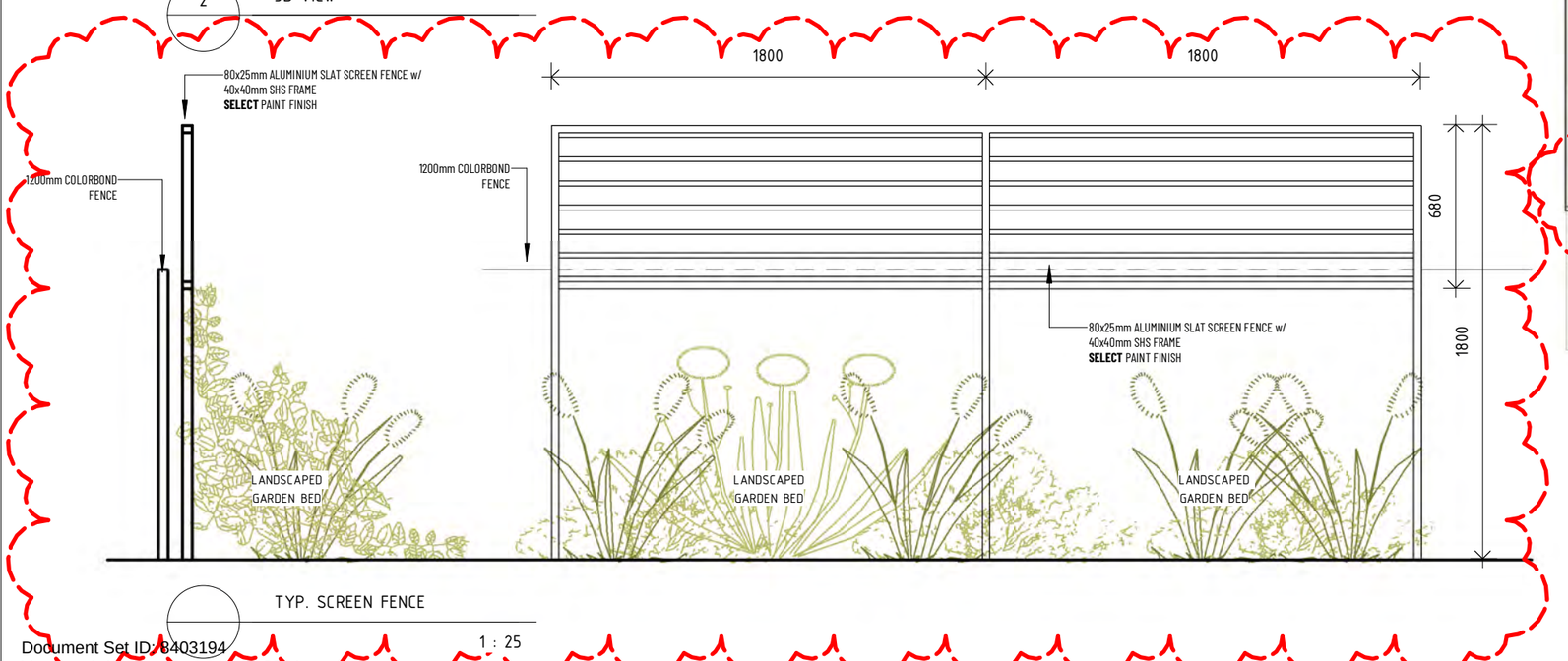


3 TYP. STREET ELEVATION

1 : 75



2 3D View



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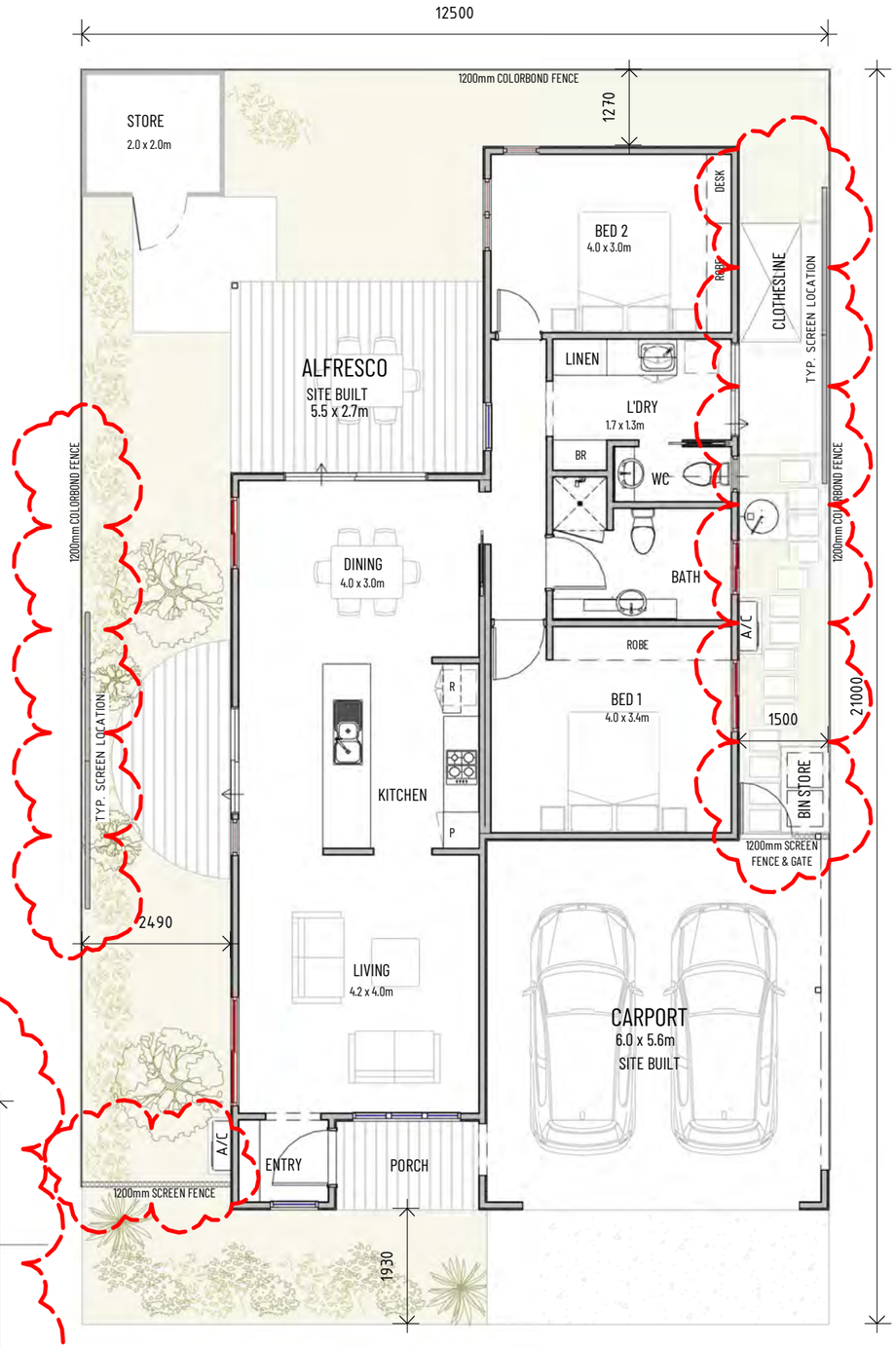

HOUSE B DESIGN | 1:100 N

HOUSE B

31.10.2024

RICHARD HAMMOND ARCHITECT
1B LITTLE HOWARD ST, FREMANTLE, 6160 E. RICHARD@HRARCHITECTS.COM.AU M. 0438 918 753

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Document Set ID: 8403194
Version: 1, Version Date: 17/12/2024



3 TYP. STREET ELEVATION

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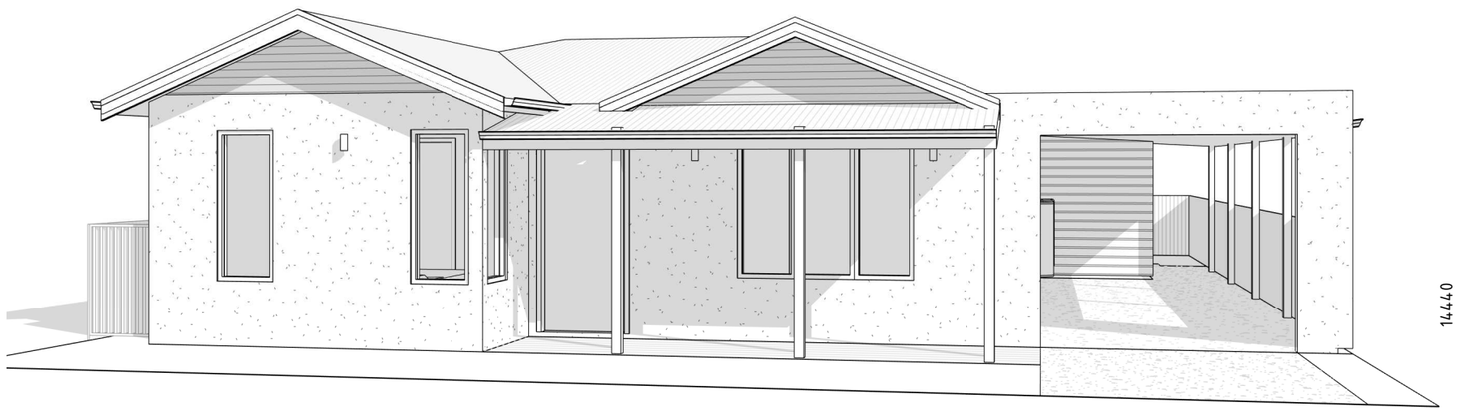

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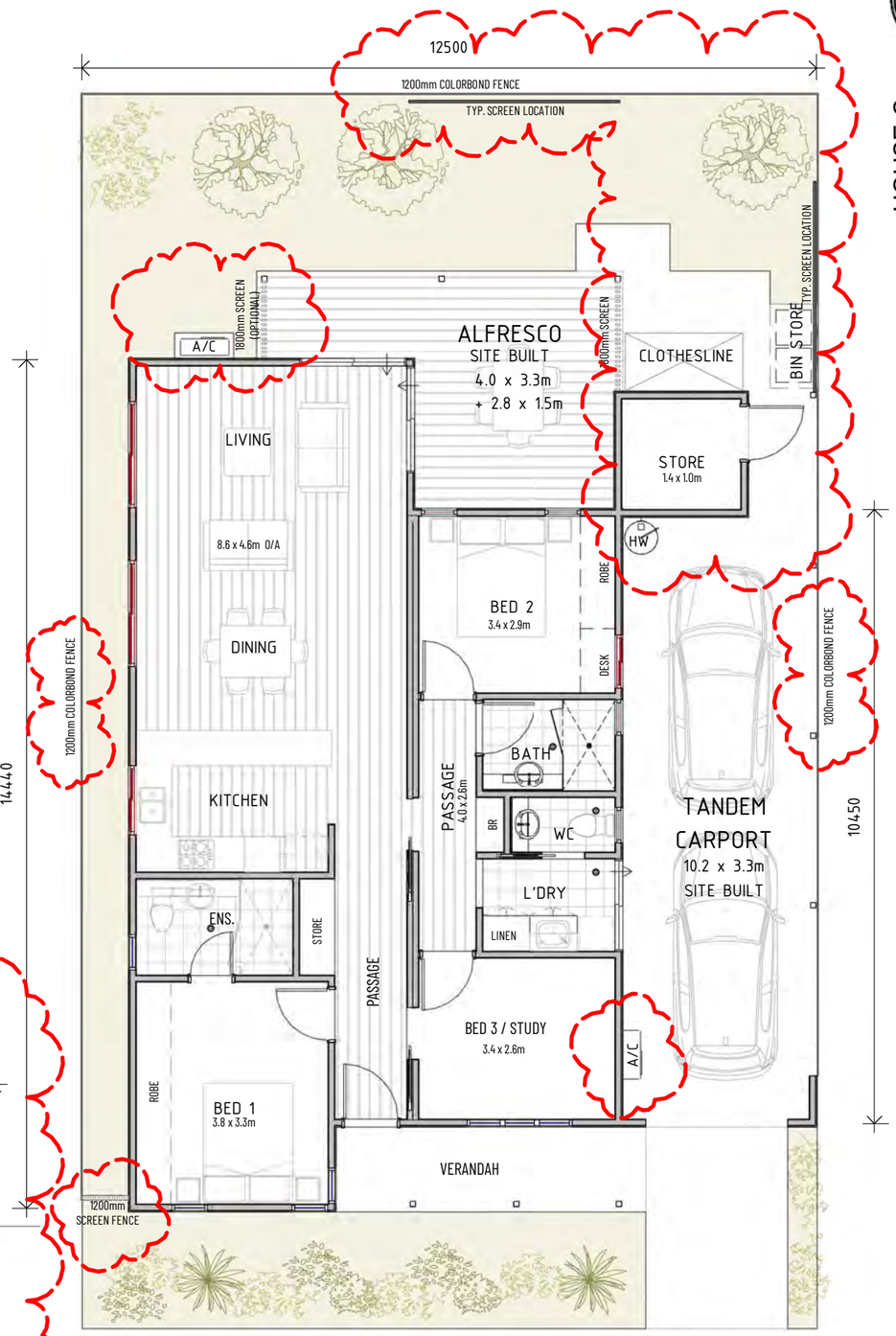

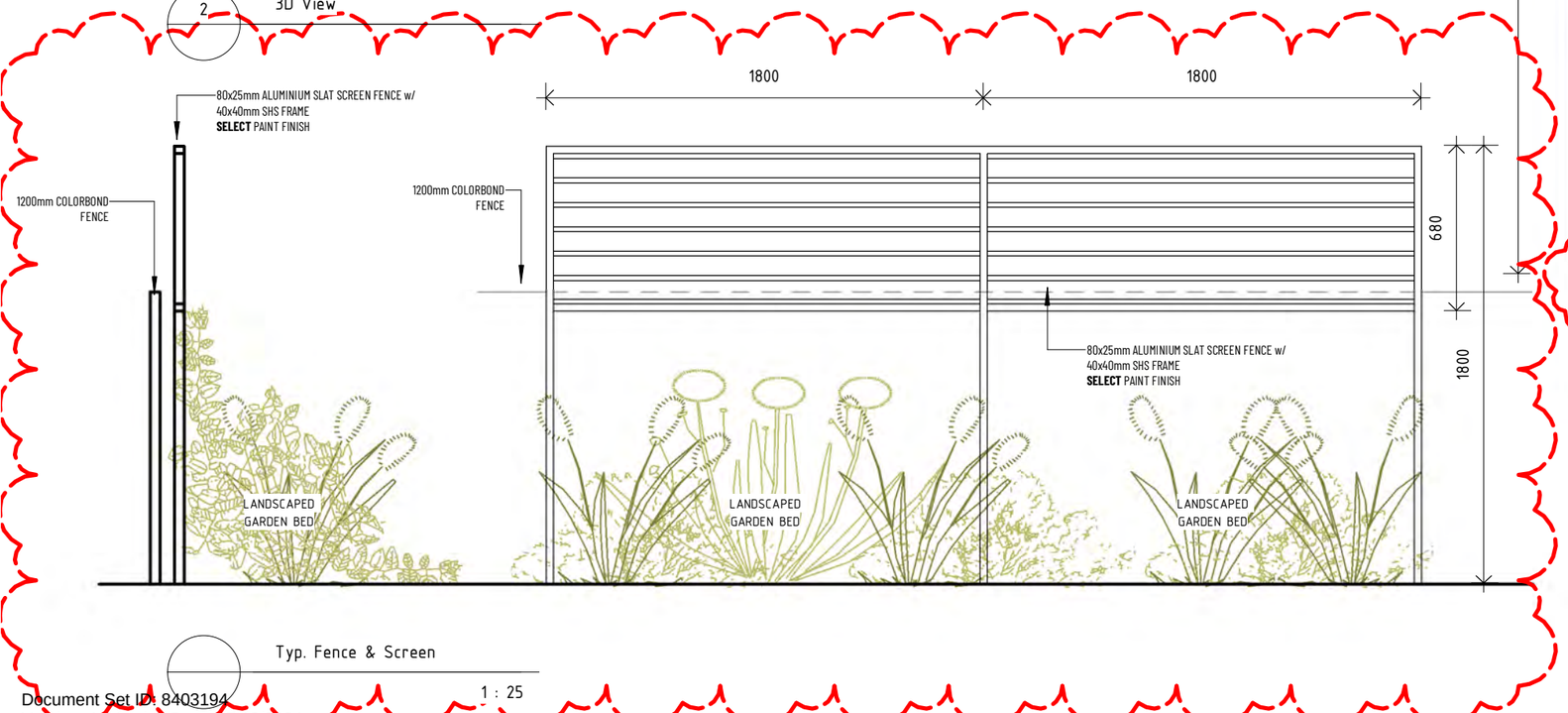

Typ. Fence & Screen

1 : 25

HOUSE C DESIGN | 1:100 N

HOUSE C A

31.10.2024

RICHARD HAMMOND ARCHITECT
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Document Set ID: 8403194
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3 TYP. STREET ELEVATION

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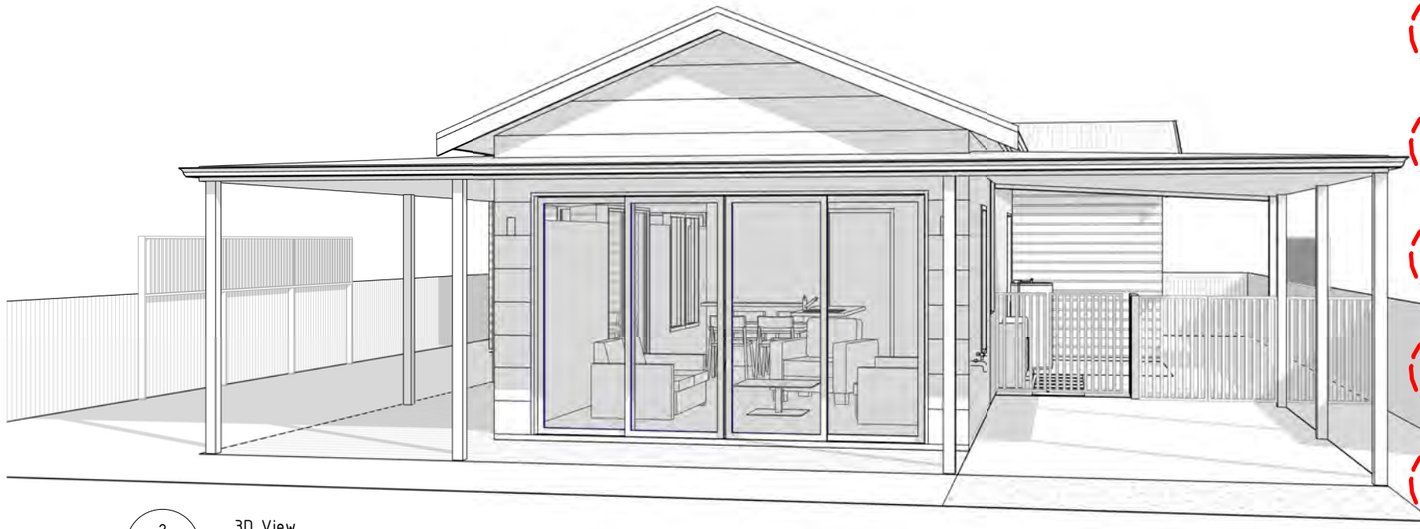

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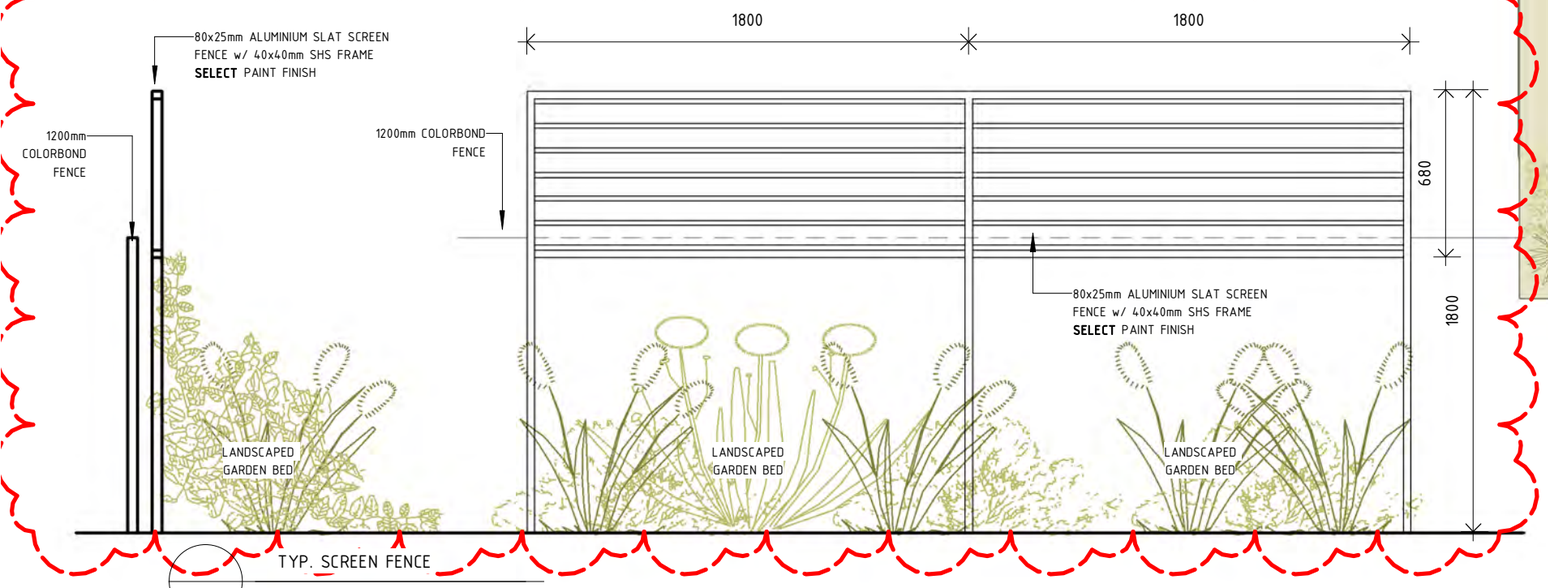

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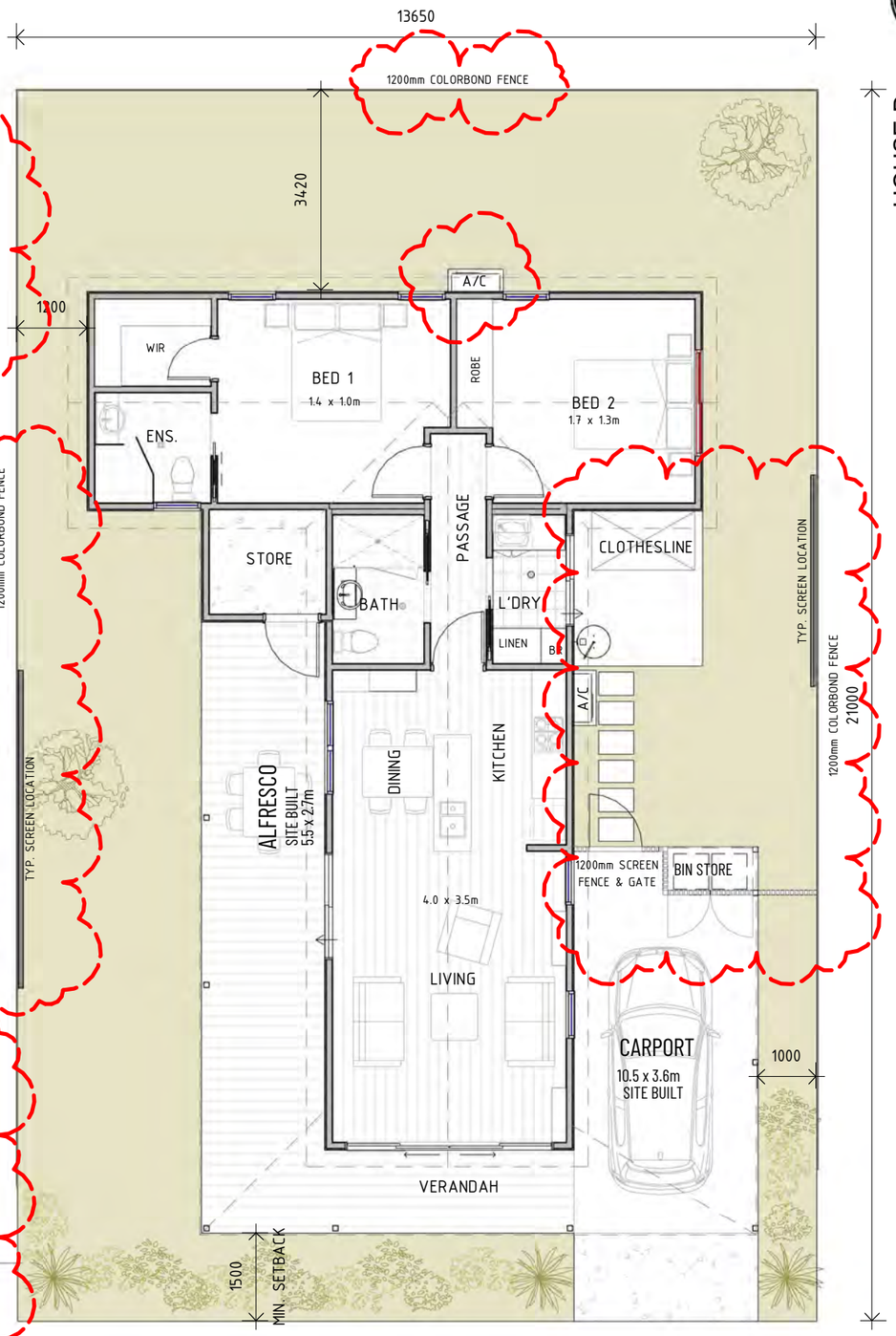

HOUSE D DESIGN | 1:100 N

HOUSE D
A
31.10.2024

RICHARD HAMMOND ARCHITECT
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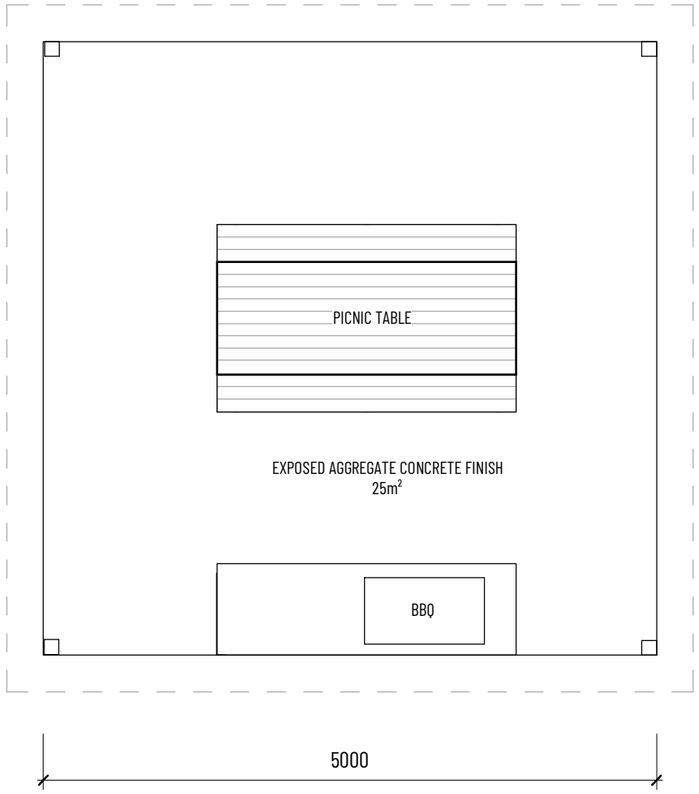

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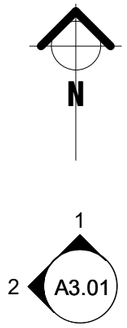

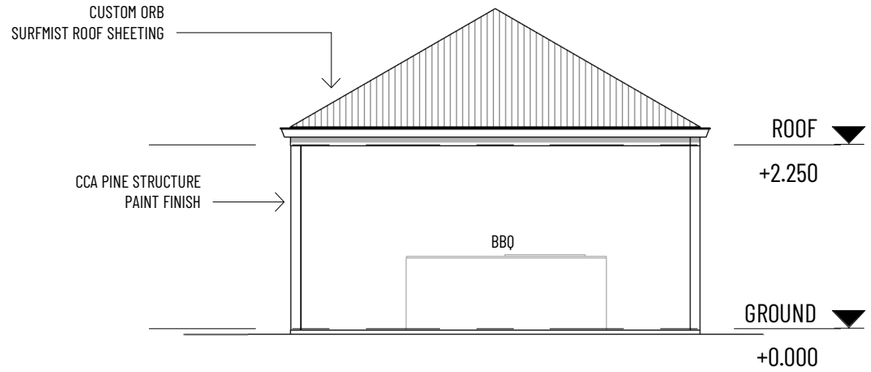

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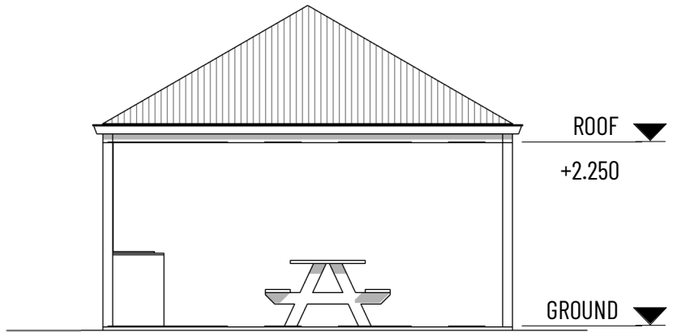

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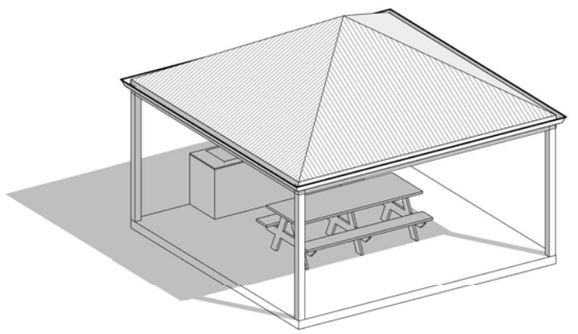

3 — BBQ 3D PERSPECTIVE

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No.	Description	Date
A	PRELIMINARY ISSUE	09.09.24

BETHANIE

BULLSBROOK VILLAGE

CHITTERING ROAD, BULLSBROOK, WA, 6084

BBQ STRUCTURE

Project number	-	A3.01	
Date	09.09.2024		
Drawn by	RHA		
Checked by	RHA	Scale@A3	As indicated

Document Set ID: 8403194
Version: 1, Version Date: 17/12/2024

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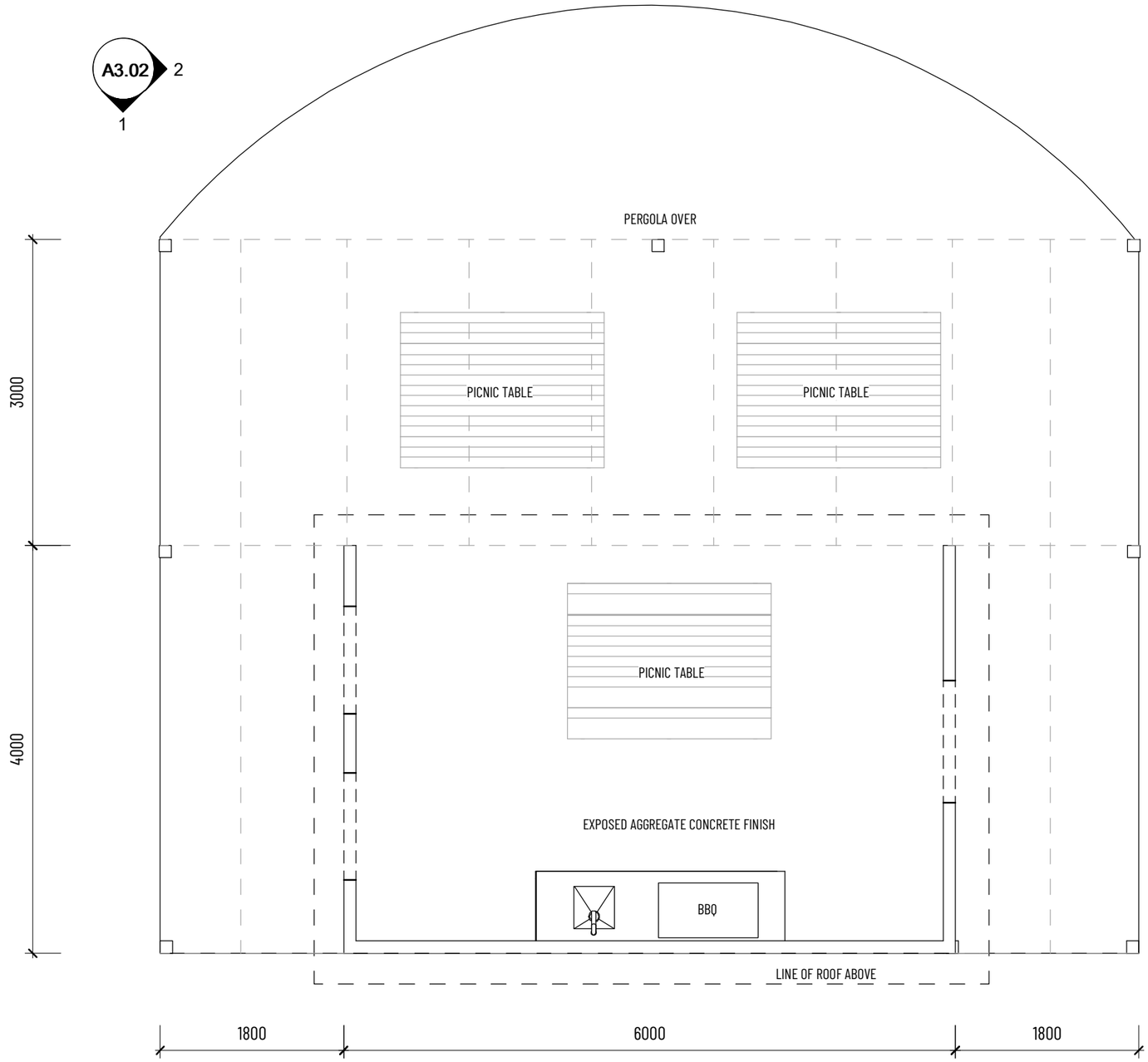

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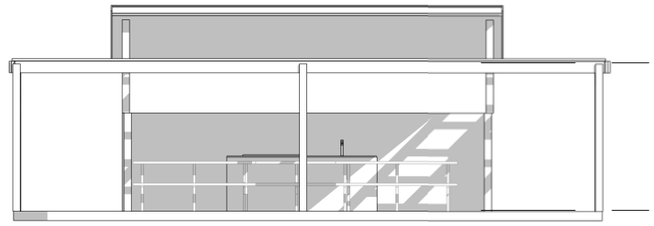

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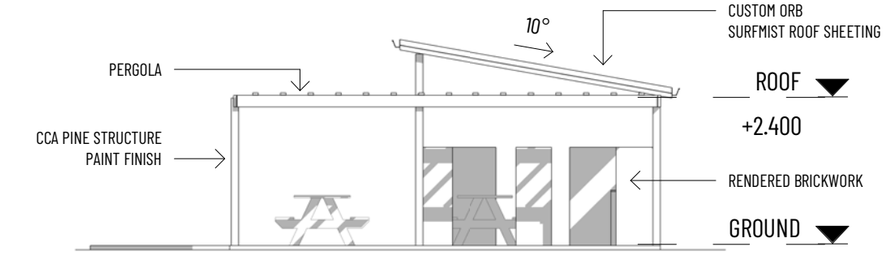

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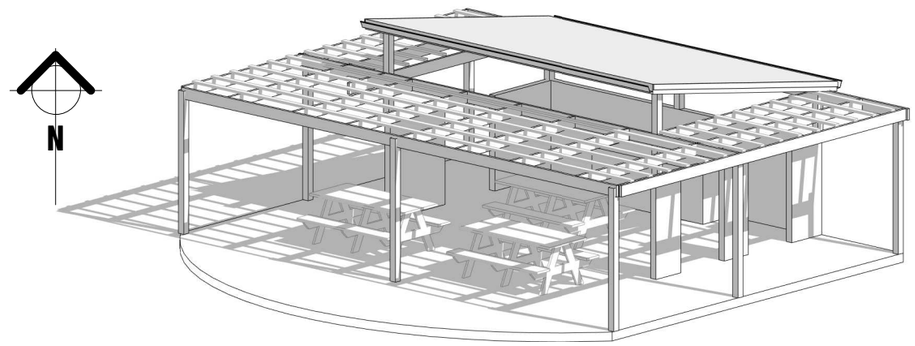

3 LOOKOUT 3D PERSPECTIVE

RICHARD HAMMOND ARCHITECT
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No.	Description	Date
A	PRELIMINARY ISSUE	09.09.24

BETHANIE

BULLSBROOK VILLAGE

CHITTERING ROAD, BULLSBROOK, WA, 6084

LOOKOUT STRUCTURE

Project number	-	A3.02	
Date	09.09.2024		
Drawn by	RHA		
Checked by	RHA	Scale@A3	As indicated

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Document Set ID: 8403194
Version: 1, Version Date: 17/12/2024

APPENDIX 2
RESPONSE TO SUBMISSIONS

Document Set ID: 8403194
Version: 1, Version Date: 17/12/2024

DAP Application (DAP/24/02776) – Proposed Park Home Park

Public Submission Responses

Key Issue	Comment	Applicant Response
Non-compliance with the local planning scheme	The use is not listed under the local planning scheme and therefore was never intended within the Bullsbrook area. Will set an undesirable precedent.	The land use of 'Park Home Park' is defined in Schedule 1 of LPS17 as having the same meaning as in the Caravan Parks and Camping Grounds Regulations 1997 (WA) (CPCG Regs). Park Home Park means a caravan park at which park homes, but not any other caravans or camps, are situated for habitation; A 'Park Home' is defined under the CPCG Act as: Park Home: A vehicle of a prescribed class or description that is fitted or designed for habitation. The proposed development is considered to fit within the definition of 'Park Home Park' as defined in Schedule 1 of LPS17 (and relevantly the CPCG Regs and CPCG Act), as the relocatable, independent dwellings (Park Homes): a. are capable of being propelled or drawn on wheels; b. are fitted or designed for habitation; and c. will be situated at a caravan park where no other caravans or camps are situated for habitation. Whilst the proposed land use is defined under the provisions of LPS17, it is not listed in the zoning table. The City has discretion to assess the proposed development as a 'Use Not Listed – Park Home Park'. In accordance with Clause 18(4)(b) of the *Planning and Development (Local Planning Schemes) Regulations 2015*: (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 – (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; [emphasis added] Accordingly, the proposed unlisted use can be considered with the objectives of the Residential Development zone of LPS17. As set out within the development application, the proposed land use is compatible with the aims and objectives of the Residential Development zone.

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Key Issue	Comment	Applicant Response
Environmental impacts on Ki-It Monger Brook	The access way will adversely impact the Ki-It Monger Brook Flora, ecosystems, habitats and Flora and Fauna within the Ki-it Brook. Concerns with potential for increase risk of pollution, soil erosion, water quality degradation and habitat destruction.	Pentium Water was commissioned to undertake a preliminary environmental assessment in response to the proposed Park Home Park (Lifestyle Village). It is understood the subject site has historically been cleared for agricultural purposes. Scattered Eucalyptus rudis (Flooded Gums) aligns with the Ki-it Monger Brook creek line and represent the key environmental asset within Lot 900. The Ki-it Monger Brook is a seasonal flowing creek line which traverses the northern boundary of the subject site and bisects a portion of the subject site towards its western boundary. The portion of the Ki-it Monger Brook within, and adjacent to, the subject site has historically been modified, including the infilling of the creek and the installation of culverts. The flooded gums trees within the Ki-it Monger Brook creek line will be maintained within the defined setback from the Brook, which was established in the approved 2021 Ki-it Monger Brook Foreshore Management Plan for the purposes of conservation, flood protection, better urban water management and open space.
Traffic and safety concerns	Increase traffic onto chittering road and other local roads will result in congestion and noise pollution.	A Traffic Impact Assessment (**TIA**) was prepared by GTA Consulting in support of the proposed development. The TIA provides traffic analysis of the proposed development. The TIA concludes that the traffic impact of the proposal on the surrounding road network will not have any negative impacts on the surrounding road network.
Increased bushfire safety risks	Development within close proximity to the brook will increase bushfire safety to residents. Lack of emergency services within the area in the event of a bushfire and the density of the development and small emergency access point will result in congestion.	The subject site is located within a designated Bushfire Prone Area. Accordingly, a Bushfire Attack Level (**BAL**) assessment was undertaken and identified the development achieving a BAL rating of BAL-29. A Bushfire Management Plan (**BMP**) was also prepared in support of the development and concludes that the proposed development satisfies the intent, aims and objectives of State Planning Policy 3.7 Planning in bushfire prone areas and the associated bushfire planning guidelines. The BMP acknowledges that the proposed land use is not a vulnerable land use, given it differs significantly from residential aged care facilities and nursing homes. The BMP demonstrates the proposal can fully comply with the acceptable solutions of the Guidelines.

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Key Issue	Comment	Applicant Response
Inadequate infrastructure & community resources	Lack of existing services with the Bullsbrook and Kingsford area to service the development including roads, healthcare, community resources and emergency infrastructure. Lack of water supply for the development. Existing services within the area cannot cater for elderly people.	The project has been subject to civil engineering inputs detailing the engineering, civil infrastructure and drainage works required to support the development project. This information has been considered and addressed in the original development application submission, specifically through the Engineering Servicing Report (refer **Appendix 7** - original Development Application submission). The existing topography and proposed civil design has been considered in a holistic manner to enable the development of the proposed Park Home Park (Lifestyle Village). The existing topography of the subject is largely maintained, retaining the current land form of the place. The future development of the subject site will have access to services and utilities in the normal manner including a connection to reticulated sewer and water. Internal sewer reticulation from the subject site will discharge to the gravity sewer in Tigermoth Boulevard. It is anticipated the water supply to come from Chittering Road/Tigermoth Boulevard with a single property connection to the subject site. Lack of existing healthcare, community resources and emergency infrastructure are not matters under the control of the applicant, but in any event available given the growing population of the Bullsbrook area.
Incompatible land use	The proposal is not compatible with the surrounding residential housing and the area is not suitable for a retirement village. Area not suitable for a retirement village. Size and density does not align with the existing neighbourhood character. The area is not suitable for a retirement village given the surrounding residents are made up by young families.	In accordance with LPS17, the subject site is zoned 'Residential Development'. The development is considered to align with the objectives of the Residential Development zone and the development is therefore deemed to be capable of approval. The following is noted in relation to the land use and compatibility with the surrounding residential area: • The 'Park Home Park' land use proposed dwellings that are entirely compatible with adjoining residential developments. • The housing typology offered by the Park Home Park dwellings caters for a different age demographic, allowing for an integrated community and neighbourhood. • The development does not prejudice the future development of land in the Residential Development zone, instead, it offers an opportunity for convenient and much needed housing supply. • The Kingsford Local Structure Plan does not propose any public roads through the subject site. Therefore, we consider the Structure Plan contemplates a singular, coordinated development of the subject site. • The Recreation zoned land within the subject site will be held in private ownership and maintained in accordance with the provisions of the approved Foreshore Management Plan. • The proposed development and layout of the subject site has been designed in such a way to ensure the protection of existing amenity for adjoining landowners.

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Key Issue	Comment	Applicant Response
Adversely impact the areas rural character	Design of a retirement village does not compliment the areas rural character. Noise from recreational activities will ruin the country style living, visual amenity and obscure views of the church from surrounding residents.	The design of the Park Home Park has been reviewed by the City's Design Review Panel (DRP) and the design is broadly supported. The DRP noted that in relation to the designs response to the character and context of the surrounding area, the simple and traditional housing forms maintained a rural quality that was "more relevant and appealing than the surrounding suburban housing". Noise from the proposed development will not adversely impact the amenity and atmosphere of the surrounding area. All development must comply with the *Environmental Protection (Noise) Regulations 1997*.
Reduced land value	Reduction in the value of surrounding residential properties due to the development providing more affordable house opportunities.	This is not a relevant planning consideration.
Interface Boundary with Kingsford Estate	The eastern boundary abuts Kingsford Estates' Fairchild Street and Amelia View and has housing orientated inwards to address the laneway leaving the backyards to address the existing streets. No information included on the rear fencing detail.	The plans have been amended to remove the real laneway along the eastern boundary. This will be replaced by landscaping behind fencing with elements of visual permeability. This will break up the appearance of fencing and provide a better outlook to residents' opposite.
Boat and RV parking area	Concerns about emergency access to Tigermoth Boulevard.	The Boat and RV parking area has been relocated.
Landscaping	Consideration of species that don't host the shot hole borer.	A condition requiring the City's approval of a landscape plan can address any concerns.

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PART E – OTHER BUSINESS

1. State Administrative Tribunal Applications and Supreme Court Appeals

2. Meeting Closure