

TUART LAKES LIFESTYLE VILLAGE

STRUCTURE PLAN



Prepared by

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For Serenitas Communities Holdings Pty Ltd

August 2026



Endorsement Page

This structure plan is prepared under the provisions of the City of Rockingham
Local Planning Scheme No. 2

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE
WESTERN AUSTRALIAN PLANNING COMMISSION ON:

18 AUGUST 2026

Signed for and on behalf of the Western Australian Planning Commission



An officer of the Commission duly authorised by the Commission pursuant to section 24 of the
Planning and Development Act 2005 for that purpose, in the presence of:

Anne Woodin

Witness

20 AUGUST 2026

Date

20 AUGUST 2036

Date of Expiry

**RECORD OF AMENDMENTS MADE TO THE
TUART LAKES AGREED STRUCTURE PLAN NO. xx**

Amendment No.	Summary of the Amendment	Amendment Type	Date approved by WAPC

EXECUTIVE SUMMARY

This Structure Plan has been prepared for the Tuart Lakes Lifestyle Village. The Tuart Lakes Lifestyle Village covers Lot 102 (831) and Lot 1 (851) Mandurah Rod, Baldivis.

The Structure Plan designates land within the structure plan area as “Park Home Village”.

The land subject of the Tuart Lakes Structure Plan is located 39 km from Perth CBD, in a generally southerly direction.

This Structure Plan has been prepared in accordance with the provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015*: Schedule 2, Part 4 ‘Structure Plans’. The City of Rockingham Local Planning Scheme No. 2 (**LPS 2**) requires the preparation and approval of a Structure Plan for land zoned ‘Development’. The Structure Plan area forms part of the Baldivis (North) District Structure Plan (DSP) and abuts proposed and establishing urban areas, developed under the following approved Structure Plans:

- Lot 302 Mandurah Road and Lot 309 Kerosene Lane to the north;
- Paradiso Estate Structure Plan to the north east; and
- Lot 306 McDonald Road Structure Plan to the south east.

The area subject of this Structure Plan integrates with the existing development within the Tuart Lakes Lifestyle Village as well as the subdivision and development to the north, north-east and south east and utilises an existing road connection to the north (via Wellspring Road). The following table is a summary of the proposed Structure Plan Area.

A copy of the proposed Structure Plan is provided in **Plan 1**.

Item	Data	Structure plan ref (Section no.)
Total area covered by this Structure Plan is:	18.16 hectares	Part 1: Section 1 Part 2: Section 2.0
Areas of each land use proposed within the Structure Plan Area	Park Home Park	Part 1: Section 4 Part 2: Section 2
Total estimated number of homesites within Structure Plan area:	480	
Estimated residential site density	N/A	
Estimated population (of the whole of Tuart Lakes)	770	
Estimated area and percentage of public open space	N/A – no change	
Estimated percentage of natural area	No change	

PART ONE – IMPLEMENTATION

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PLAN 1 – STRUCTURE PLAN

PLAN 2 – FORMER STRUCTURE PLAN

Document ID: NLV TR2 GE/ Tuart Lakes Structure Plan August 2026						
Issue	Date	Status	Prepared by;		Approved by:	
			Name	Initials	Name	Initials
1	Sept 2020	Draft to client	Amanda Butterworth	AB	Steve Allerding	SA
2	March 2025	Revised Draft	Amanda Butterworth	AB	Tom Hockley	TH
3	April 2025	FINAL	Amanda Butterworth	AB	Tom Hockley	TH
4	March 2026	Revised	Tom Hockley	TH		
5	August 2026	Revised FINAL	Tom Hockley	TH	Steve Allerding	SA

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1.0 STRUCTURE PLAN AREA AND OPERATION

A copy of the proposed Tuart Lakes Structure Plan is contained as **Plan 1**.

The Tuart Lakes Structure Plan covers the following lots:

Lot Number	Address	Diagram	Volume	Folio	Lot Area
102	831 Mandurah Road, Baldivis	Plan 54139	2692	236	15.7662 ha
1	851 Mandurah Road, Baldivis	Diagram 27568	1385	81	9.2154 ha
101	823 Mandurah Road, Baldivis	DP54139	2692	235	2.0010ha

The Tuart Lakes Structure Plan covers land is that is zoned Development under the City of Rockingham Local Planning Scheme No. 2 (**LPS2**). Schedule 8 of LPS2 details Development Areas under LPS2. The land subject of the Tuart Lakes Structure Plan is within the following Development Areas:

- DA22, being the “Baldivis (North)” Development Area – which relates to the wider Baldivis North District Structure Plan; and
- DA30 “Lifestyle Village” being the Tuart Lakes Structure Plan Area (that is subject of this Structure Plan). The provisions under DA30 read as follows:

An approved Structure Plan together with all approved amendments and Detailed Area Plans, where applicable, shall apply to the land in order to guide subdivision and development.

This Structure Plan relates to the Development Area DA30 only.

The former Tuart Lakes Structure Plan identified that the rear portion of the site (rear of Lots 1 & 102), measuring 50 metres in from the rear boundary, as Residential R20, with the remainder of the land zoned ‘Development’ comprising Lots 1 & 102 and portion of Lot 101 (No. 823) Mandurah Road being designated as ‘Park Home Village.’ Refer to **Plan 2** for a copy of the former Structure Plan.

This Structure Plan designates all land zoned ‘Development’ within the Tuart Lakes Lifestyle Village as “Park Home Village”.

The road connection to the land to the north-east is consistent with the approved Tuart Lakes Lifestyle Village operations and that shown on the approved Lot 302 Mandurah Road and Lot 309 Kerosene Lane Baldivis Structure Plan.

The Structure Plan has also been prepared reflect the current arrangements of internal roads and the location of the future community facilities with the Tuart Lakes Lifestyle Village. The Structure Plan is included as **Plan 1**.

The date the Structure Plan comes into effect is the date the Structure Plan is approved by the Western Australian Planning Commission as set out in the Structure Plan – Certification Page.

The former Tuart Lakes Structure Plan expired in October 2025 in accordance with Schedule 2, Part 4 Clause 28 of the *Planning and Development (Local Planning Schemes) Regulations 2015*. As the staging is such that the whole of Tuart Lakes will not be comprehensively developed on or before October 2025, this proposed Structure Plan has been advanced to enable the delivery of the final stages of the village.

2.0 PURPOSE

The purpose of the Structure Plan for Tuart Lakes is to provide a framework for the comprehensive and ongoing development of the Tuart Lakes Estate in a proper and orderly manner.

It will ensure that the development within Tuart Lakes is consistent in form and provides for an attractive and appropriate interface to the open space to the rear of the lot, which accommodates the APA Natural Gas Pipeline.

3.0 STAGING

Tuart Lakes Lifestyle Village has been progressively developed with homesites generally to the west being developed first and gradually to the east in response to demand. Other than demand, there are no specific triggers for staging of development.

4.0 SUBDIVISION AND DEVELOPMENT REQUIREMENTS

The Structure Plan identifies all land zoned “Development” under the City of Rockingham Local Planning Scheme No. 2 (**LPS2**) as “Park Home Village”.

The only land use permitted pursuant to the Tuart Lakes Structure Plan is “Park Home Park”, which is defined under Schedule 1 – Interpretations: Clause 2 of LPS2.

The land subject of the Structure Plan is identified as being bushfire prone. All development is to be in accordance with the approved Bushfire Management Plan (see Part Two: Explanatory Section of this Structure Plan). All buildings are to achieve a Bushfire Attack Level 29 or lower in accordance with the Australian Standard AS3959-2009, unless otherwise approved at a higher BAL rating.

No native vegetation shall be removed unless approved by the City of Rockingham (See Part Two: Explanatory Section of this Structure Plan report).

All development shall be in accordance with an approved Local Water Management Report (See Part Two: Explanatory Section of this Structure Plan report).

Homesites adjacent to the rear boundary shall include major openings facing towards the adjacent public open space (eastern boundary of Tuart Lakes Lifestyle Village). Fencing along the eastern boundary of the structure plan shall be open style fencing with landscaping installed along the fence line, inside the property boundary.

Given the proximity of the land in the eastern portion of the Tuart Lakes Lifestyle Village to the Parmelia Gas Pipeline, development on the site shall be in accordance with the Risk Assessment (and updated technical note) prepared pursuant to Australian Standard AS2885 Risk Assessment (See Part Two: Explanatory Section of this Structure Plan).

Development alongside the rear (eastern) boundary shall take into account the approved levels on the adjacent reserve to the rear, noting that levels within the reserve are constrained by the Parmelia Gas Pipeline (operated by APA Group). The proposed levels shall be compatible with the levels within the gas pipeline easement and the associated reserve and as approved by the City of Rockingham.

The site currently has access to/from Mandurah Road and Wellspring Road and any future land use planning proposal which departs from the structure plan and, as a result, would affect these points of access should be supported by appropriate technical justification. Any change to the constructed access will need to meet City of Rockingham engineering specifications.

All development is to be carried out in accordance with the relevant development approval/s issued by the City of Rockingham.

5.0 ADDITIONAL DETAILS

There are no other additional details relevant to this Structure Plan.

5.1 Local Development Plans

Nil.

Schedule 8 of LPS2 relating to DA30 Tuart Lakes Lifestyle Village refers to Detailed Area Plans. There are no Local Development Plans or Detailed Area Plans within the Structure Plan Area.

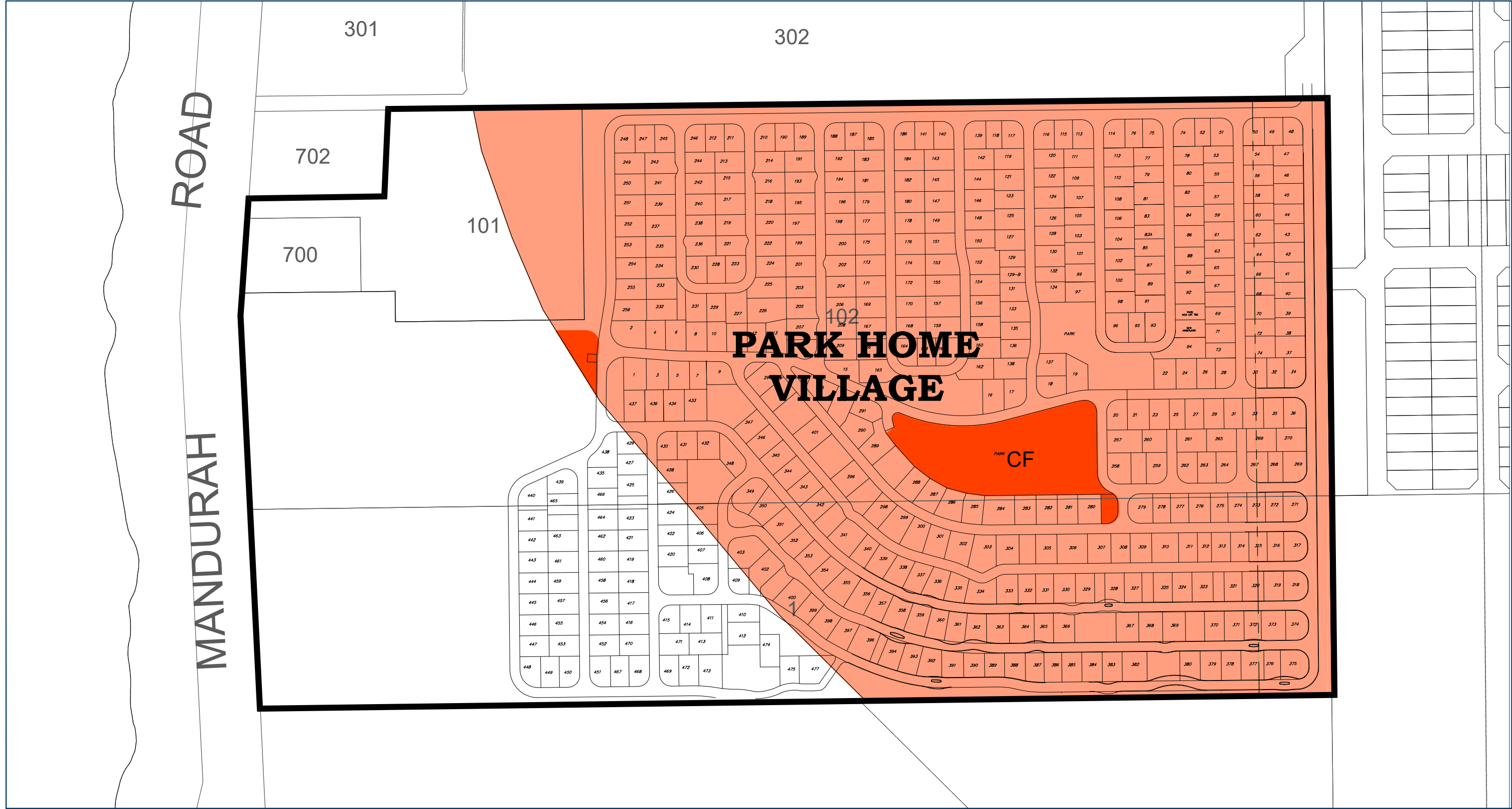
All development is to be carried out in accordance with the relevant development approval/s issued by the City of Rockingham.

5.2 Other Requirements

There are no other requirements relevant to this Structure Plan.

PLAN 1

STRUCTURE PLAN



PLAN 1 - REVISED STRUCTURE PLAN

LOTS 1, 101, 102 & 700 MANDURAH ROAD
BALDIVIS

for Serenitas Communities Holdings Pty Ltd



SCALE: 1:2500
ORIGINAL PLAN SIZE: A3

JOB CODE:
NLV TR2 GE

DATE:
12.05.2026



LEGEND:

SUBJECT LAND -



PARK HOME VILLAGE -



COMMUNITY FACILITIES -



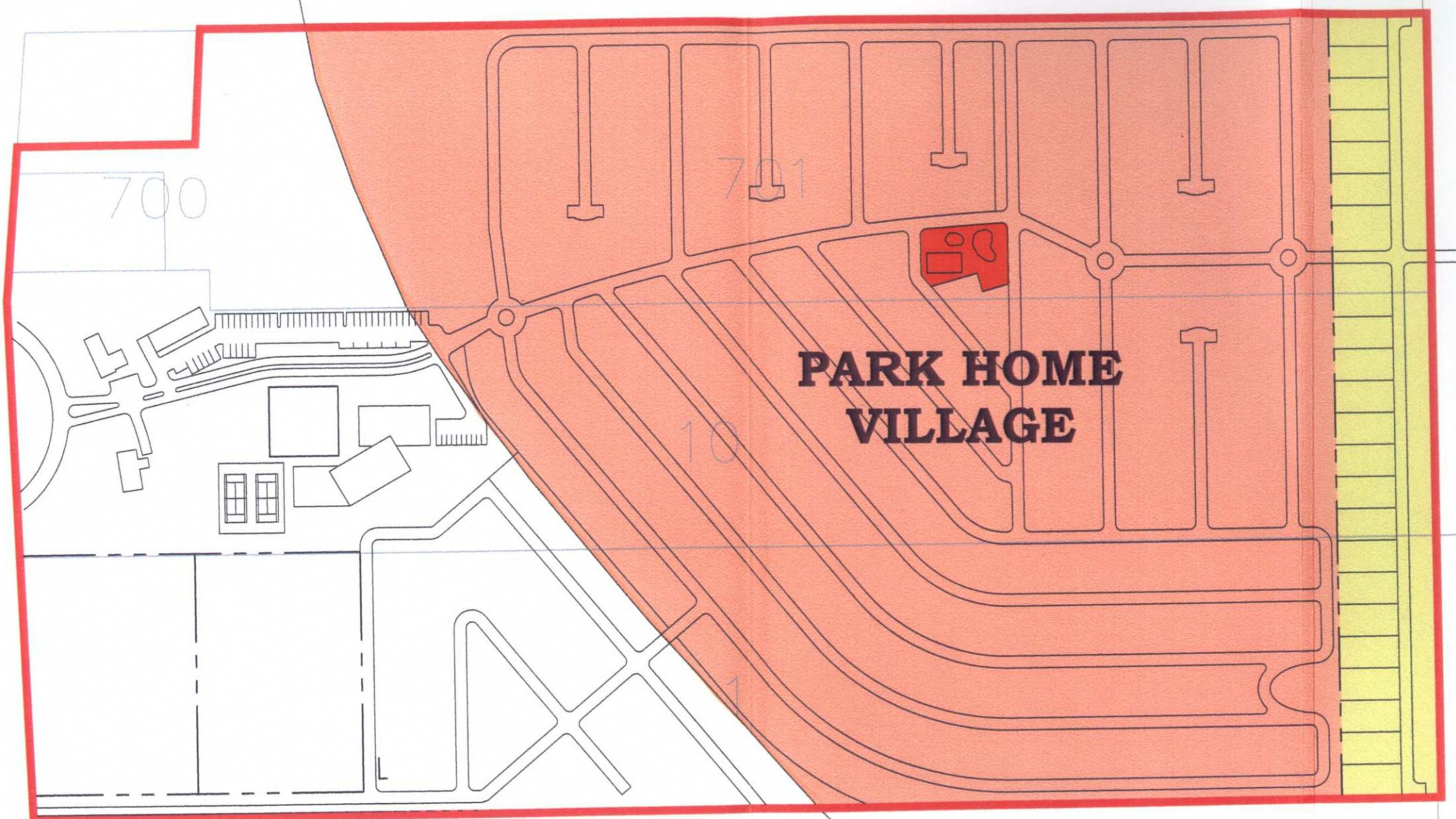
Allerding
& Associates

Town Planners, Advocates
and Subdivision Designers

PLAN 2 – FORMER STRUCTURE PLAN

ROAD

MANDURAH



AlleringBurgess
Town Planning, Urban Design & Advocacy



DRAWING NUMBER:
NLV ROC SP

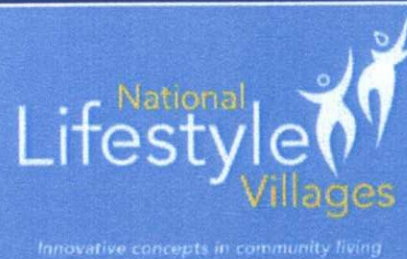
DATE:
27.01.2006

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AAPC
Australian Association of Planning Consultants

- SUBJECT LAND
- PARK HOME VILLAGE
- RESIDENTIAL - R20
- COMMUNITY FACILITIES



**PROPOSED
STRUCTURE PLAN
LIFESTYLE VILLAGE BALDIVIS**

LOTS 1, 3, 700 & 703 MANDURAH ROAD
BALDIVIS
for National Lifestyle Villages

PART TWO

**EXPLANATORY SECTION
AND
TECHNICAL APPENDICES**

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Technical Appendices.

Appendix	Technical Report	Date
1	Certificates of Title (for land subject of Structure Plan)	Mar 2025
2	Development Approval for Tree Removal and Retention	Jan 2026
3	Local Water Management Report (Local WMR)	Aug 2026
4	Bushfire Management Plan	Feb 2017
5	Bushfire Management Plan (Development – Residential)	Feb 2026
6	Technical note: Risk Assessment	Mar 2020
7	Landscaping and Fencing Concept Plan	Feb 2026
8	Technical Note for Full Movement Access to Wellspring Road	Nov 2025

Part Two – Explanatory Section and Technical Appendices

The purpose of Part Two is to support the structure plan contained in Part One by providing the background and explanatory information used to prepare the structure plan.

Explanatory Report

1.0 INTRODUCTION AND PURPOSE

The purpose of this Structure Plan is to allow for the completion of the final stages of the Tuart Lakes Lifestyle Village up to the rear boundary of Lots 1 & 102.

Plan 1: Structure Plan details:

- the land use as being Park Home Village, to accommodate Park Homes, consistent with the developed portions of Tuart Lakes;
- the movement network ,including road connection/s to adjoining land;
- the location of community facilities for the Park Home Park; and
- Indicative layout of future homesites.

2.0 SITE AND CONTEXT ANALYSIS

2.1 Physical Context

The following provides a description of the land the subject of the Structure Plan.

2.1.1 Subject Lots

Table 1 provides a description of the land subject of the Tuart Lakes Structure Plan.

Table 1: Land description

Lot Number	Street Address	Lot Area	Area within Structure Plan
102	831 Mandurah Road, Baldivis	15.7662 ha	12.6 ha
1	851 Mandurah Road, Baldivis	9.2154 ha	4.8 ha
101	823 Mandurah Road, Baldivis	2.0010 ha	0.7 ha

The land the subject of the Tuart Lakes Structure Plan is 18.2 hectares.

Lots 1 & 102 subject of the Tuart Lakes Structure Plan are owned by Serenitas Communities Holdings Pty Ltd and accommodate a Park Home Park being Tuart Lakes Lifestyle Village. Refer to the attached Certificates of Title for Lots 1 & 102 (**Appendix 1**). The Structure Plan area is predominantly cleared, with the exception of trees that were required to be retained in accordance with a planning approval issued by the City of Rockingham (refer **Appendix 2**).

Lot 101 is owned by a separate entity and is not associated with the Tuart Lakes Lifestyle Village. Lot 101 accommodates a single dwelling and is used for rural lifestyle purposes. The rear portion of Lot 101 that is zoned Development under LPS2 was designated Park Home Village in the former Tuart Lakes Structure Plan and that is not proposed to change under this Structure Plan.

2.1.2 Location

The area subject of this Structure Plan is located 39 km from Perth CBD, in a generally southerly direction.

2.1.3 Area and Land Use

The area subject of this Structure Plan comprises a combination of land developed as part of the Tuart Lakes Lifestyle Village included park homes and communal facilities, as well as cleared land to the east which will be developed as part of the final stages of the Tuart Lakes Lifestyle Village.

2.1.4 Surrounding Context

As demonstrated in **Figure 1**, the Structure Plan area sits adjacent to existing residential subdivisions to the east and north, existing vegetated land to the south and Mandurah Road to the west. The eastern boundary of the subject site interfaces with a gas pipeline easement which runs in a north-south alignment along the boundary, separating the land from the neighbouring residential development to the east.

2.2 Planning Framework

2.2.1 Zoning and Reservations

Refer to **Figure 2** for a copy of the zoning plan. The western (front) portion of Lots 1 & 102 is zoned Rural under both the Metropolitan Region Scheme (MRS) and the City of Rockingham Local Planning Scheme No. 2 (**LPS2**).

The eastern (rear) portion of Lots 1 & 102 is zoned Development under the provisions of LPS2 and Urban under the MRS. The land zoned development is identified as “DA30” “Lifestyle Village” being the Tuart Lakes Structure Plan Area (that is subject of this Structure Plan). The provisions under DA30 read as follows:

An approved Structure Plan together with all approved amendments and Detailed Area Plans, where applicable, shall apply to the land in order to guide subdivision and development.

This Structure Plan relates to the Development Area DA30 only.



Figure 1: Locality Plan: Tuart Lakes Lifestyle Village

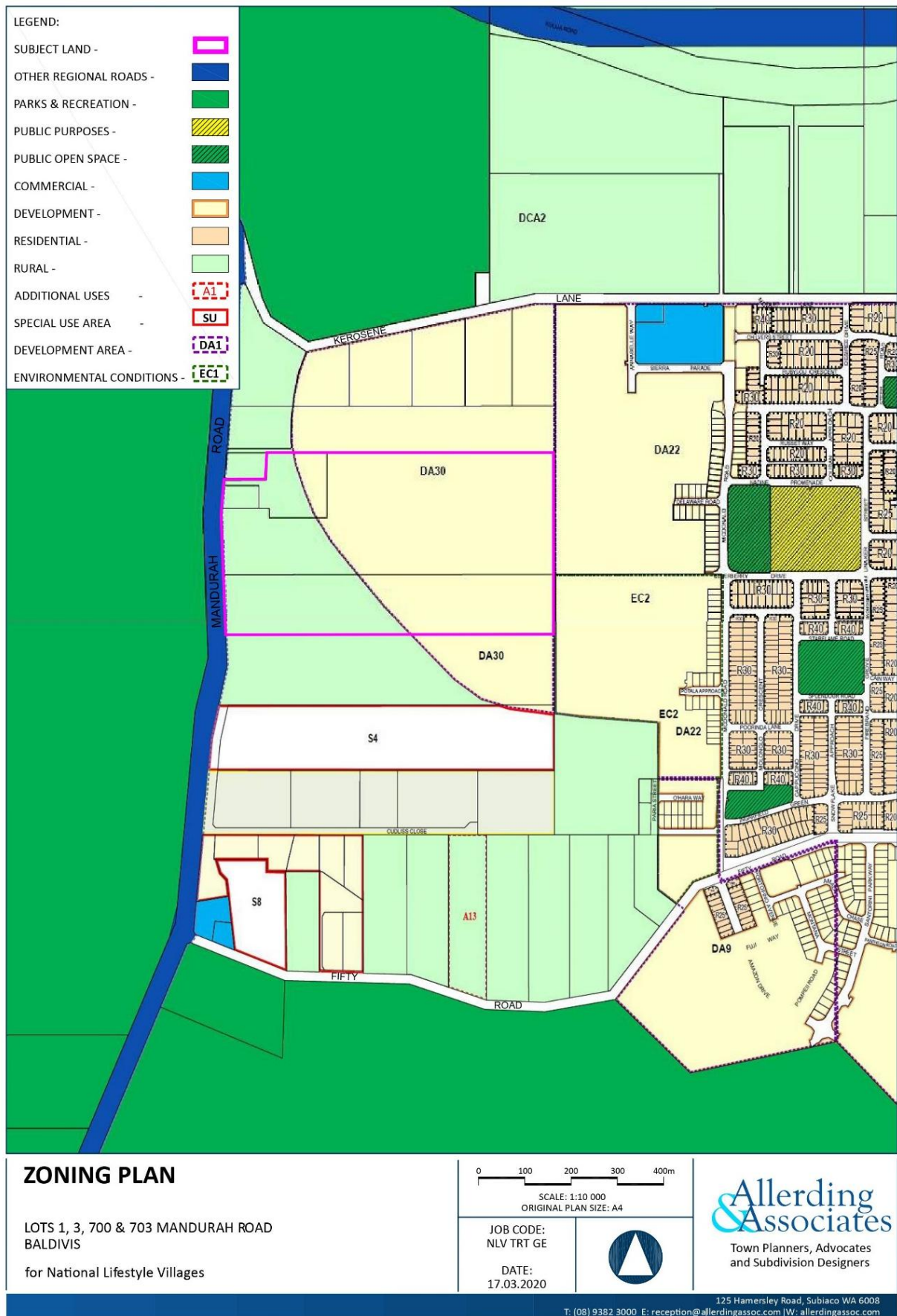


Figure 2 – Zoning Plan

2.2.2 Regional and Sub-Regional Structure Plan

The WAPC's South Metropolitan Peel Sub Regional Planning Framework, dated March 2018 applies to the subject land. **Figures 3 & 4** identifies the subject land within the context of this Framework.

2.2.3 Local Planning Framework

The land subject of the Structure Plan is zoned "Development" under LPS2. The land is further designated as "DA30" on the scheme Maps. Schedule 8 of LPS2 provides relevant provisions in regard to development areas. In regard to DA30, Schedule 8 refers to the area as "Lifestyle village" and the provisions state:

An approved Structure Plan together with all approved amendments and Detailed Area Plans, where applicable, shall apply to the land in order to guide subdivision and development.

The area subject of this Structure Plan is also subject to the Baldivis District Structure Plan. Refer to **Figure 5** for an extract of the Baldivis District Structure Plan.

The proposed Structure Plan is generally consistent with the Baldivis District Structure Plan.



Figure 3: An extract WAPC's South Metropolitan Peel Sub Regional Planning Framework

2.2.4 Planning Strategies

The western (front) portion of Lots 1, 101 and 102 are zoned Rural and are subject to the City of Rockingham Rural Land Strategy. However, the Rural Lands Strategy is not applicable to the land that is subject of this Structure Plan.

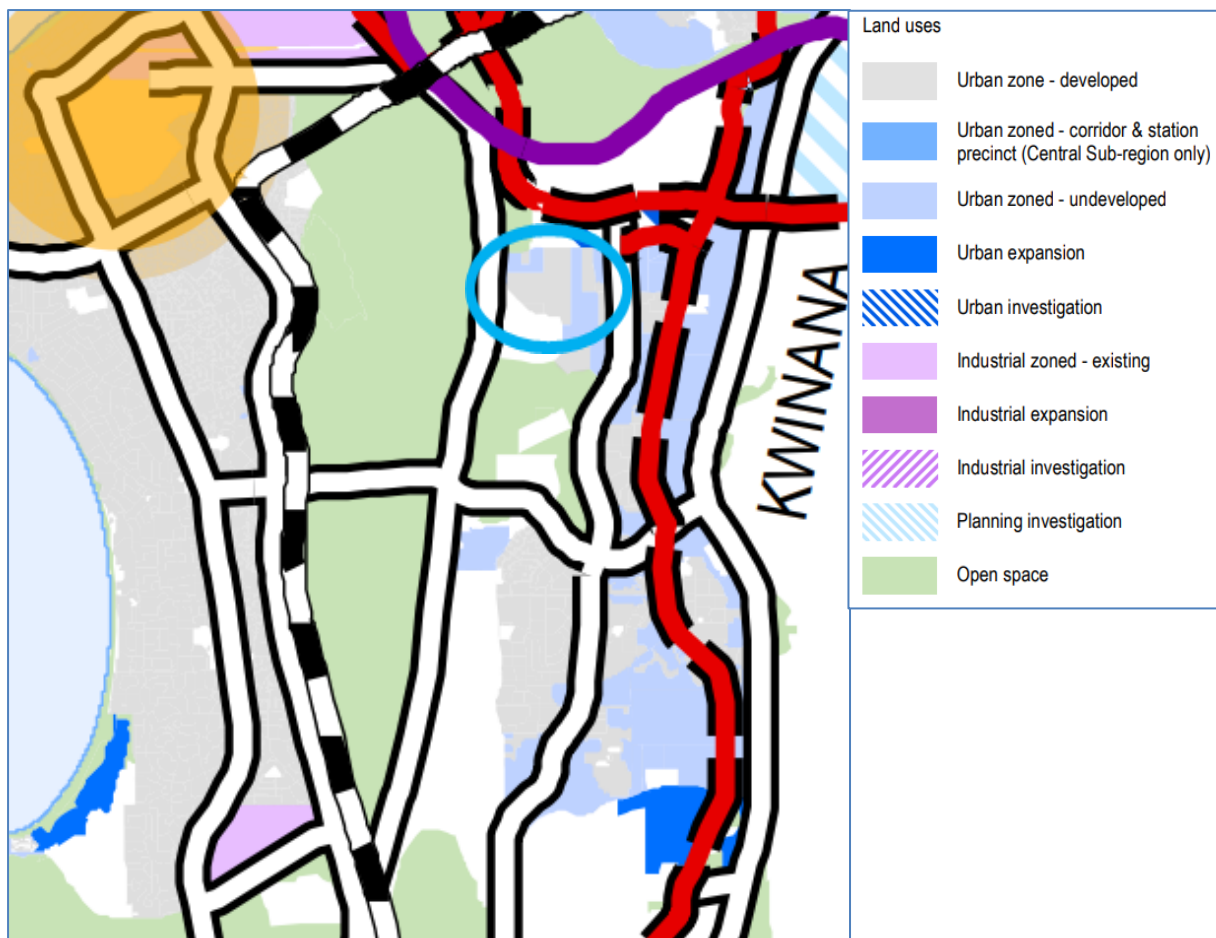


Figure 4 – Extract from WAPC's South Metropolitan Peel Sub Regional Planning Framework

2.2.5 Planning Policies

A desktop review of the City's Local Planning Policies revealed that the City's Planning Policy No. 3.4.3 Urban Water Management would be a relevant consideration. This requires the preparation of a Local Water Management Strategy for a local structure plan. State Planning Policy 2.9 Water (SPP2.9) and the associated *Planning for Water Guidelines* became operational in December 2025 and contain new requirements for water management reporting at the various stages of the planning process. Under SPP2.9, a Local Water Management Report (Local WMR) is now required to inform a local structure plan. Therefore, a Local WMR has been commissioned for the Tuart Lakes Lifestyle Village and references previous work prepared for the village including the local water management strategy and Urban Water Management Plan. The Local WMR is contained at **Appendix 3**.

2.2.6 Other Approvals and Decisions

In December 2006, planning approval was granted for a park home estate for Tuart Lakes Lifestyle Village in line with the structure plan area. In May 2009, planning approval was granted for revised plans associated with the park home park of Tuart Lakes Lifestyle Village. The 2009 approved plan identified the eastern portion of the village as "Area subject of separate structure plan amendment."

In January 2026 the City granted planning approval for an amendment to the approved development plan, which provided an approved Earthworks and Tree Retention Plan for the eastern extent of the Tuart Lakes Lifestyle Village. The tree retention plan identified existing trees to be retained; trees

previously approved for removal; and existing trees to be removed within the Structure Plan Area as part of any future development.

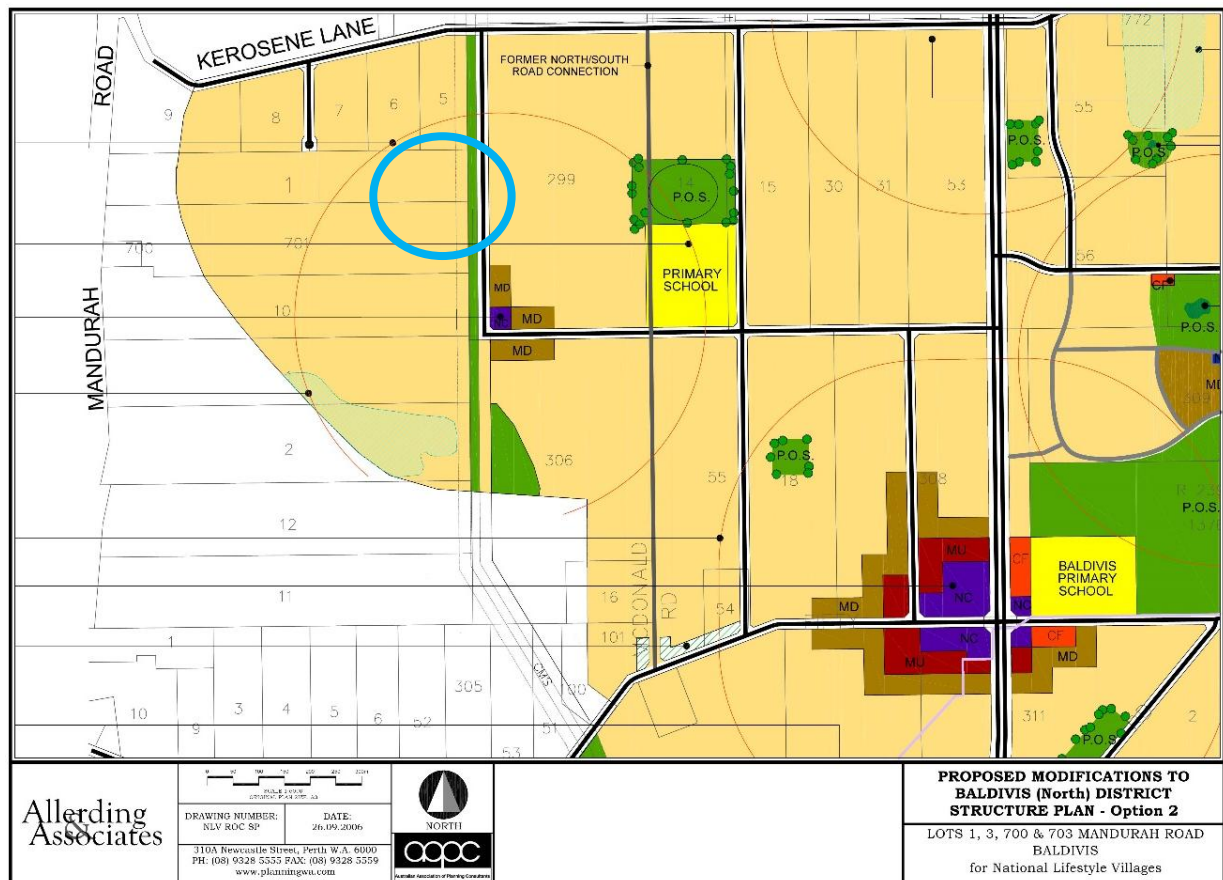


Figure 5: Extract of Baldvis District Structure Plan

2.2.7 Pre lodgement Consultation

In the years preceding lodging this Structure Plan, numerous meetings were held with the City officers to clarify requirements of the lodgement. Recently further consultation was undertaken with the City's officers and officers of the Department of Planning, Lands and Heritage (DPLH).

The land along the eastern boundary of the Structure Plan area is adjacent to the Parmelia High Pressure Gas Transmission Pipeline, operated by APA Group. Preliminary Consultation has been undertaken with APA and an updated Risk Assessment prepared.

Consultation has occurred with the adjoining landowners to the north, south and east to ensure that the proposed levels for this site are compatible with the levels on the adjoining sites and the proposed levels for the land within the gas pipeline easement.

Consultation with the landowner to the south has been undertaken to ensure that there is consistency and compatibility between the proposed finished ground levels for the area subject of the structure plan and that of the adjoining estate to the south.

2.3 Environmental Considerations

2.3.1 Biodiversity and Natural Area Assets

The land the subject of the Structure Plan is predominantly cleared, but contains isolated native vegetation adjacent to the southern boundary. In January 2026 the City approved a Tree Retention Plan for the eastern extent of the Tuart Lakes Lifestyle Village. The tree retention plan identified existing trees to be retained; trees previously approved for removal; and existing trees to be removed within the Structure Plan Area as part of any future development. A copy of the approved tree retention plan date stamped 22 January 2026 is included at **Appendix 2**.

2.3.2 Landform and Soils

The properties constituting Tuart Lakes Lifestyle Village comprise undulating topography ranging between 6m AHD and 34m AHD. The highest point of the site is located on the slope of a hill at the southern boundary of the village. The central portion of the village slopes down in both the western direction (towards the low-lying lakes interface adjacent to Mandurah Road) and eastwards.

Regional soil mapping suggests that most of the village is situated on a layer of limestone and white sand occupies the north east corner.

2.4 Groundwater and Surface Water

In terms of surface water, the site is at the interface between the Cockburn/Kwinana coast and Lower Serpentine River catchments, though there are no waterways on site.

In terms of groundwater, DWER regional groundwater mapping indicates that the maximum groundwater level within the Tuart Lakes Lifestyle Village site varies between 3mAHD and 4mAHD and the depth of the water table varies from approximately 5m to 33m.

A Local WMR has been prepared for the whole of the Tuart Lakes Lifestyle Village and taking into account the continued and future use contemplated in this Structure Plan. The Local WMR is included as a Technical Report (**Appendix 3**). The Local WMR, at the time of preparation was provided to the City separately for review and comment.

The Local WMR sets out strategies to address the identified water management objectives to be delivered as part of future development including delivery of the following drainage elements:

- *“Proposed” soakwells and other drainage elements that remain unconstructed in existing parts of the study area.*
- *Underground storage systems for future stages of the development consistent with the strategy applied throughout the study area.*
- *Formalised above ground flood storage swale (20m³ capacity) adjacent to Woodbine Drive sized to prevent overland flow to the adjacent property in the 1% AEP event.*

In addition to the above items, formalisation of the informal vegetated surface storage area adjacent to the RV Park and community garden area is recommended to prevent further erosion of hardstand edges.

2.5 Bushfire Hazard

The areas around the southern and western perimeters of the Tuart Lakes Lifestyle Village, including land within the southern areas of the Structure Plan, is mapped as Bushfire Prone.

A Bushfire Management Plan (BMP) was previously prepared by Bushfire Prone Planning for the Tuart Lakes Lifestyle Village (dated July 2016). Refer **Appendix 4** for a copy of the Bushfire Management Plan. Whilst the BMP is dated July 2016 on the cover, it is noted that Version 1.2 of the report was provided to the City in February 2017. The BMP addressed the relevant Bushfire Protection Criteria as contained within the *Guidelines for Planning in Bushfire Prone Areas* and outlined responsibilities in regard to vegetation management, vehicular access, fire fighting water supply and building construction standards.

As the village is existing and has been developed in accordance with the management measures outlined in the original BMP, the undeveloped land subject of the Structure Plan will continue to be managed in accordance with the adopted BMP which sets out responsibilities for implementation which are consistent with current standards, including construction of the internal road network (private driveways), construction of habitable buildings to Australian Standard AS3959 *Construction of buildings in bushfire prone areas* (AS3959), installation and maintenance of Asset Protection Zones within the property boundary and compliance with the City of Rockingham Fire Control Notice.

Since the preparation of the BMP in 2017, various revised Bushfire Attack Level (BAL) assessments have been undertaken across the Tuart Lakes Lifestyle Village site to inform construction standards for park homes in accordance with AS3959 as land has been progressively cleared both within the boundaries of the subject site and on neighbouring lots to the north and east. **Figures 6 & 7** below demonstrate the extent of clearing which has occurred since 2016. BAL Assessments have been undertaken in January 2020, June 2021, November 2022, June 2023 and November 2024 to provide updated BAL ratings as staged development has occurred.

The most recent BMP was prepared in February 2026 to inform building permit applications for approved development within Stages 12 and 14 of the Tuart Lakes Lifestyle Village and also to accompany an application for development approval for Stage 16 representing the final stage in the village along the eastern boundary. The Vegetation Classification Table and BAL Contour map produced in February 2026 (refer **Appendix 5**) demonstrates how the majority of lots are identified as either BAL Low or BAL12.5, with only the southern row of lots being within BAL29. The February 2026 BMP demonstrates that development within the Tuart Lakes Lifestyle Village is appropriately sited to manage the bushfire risk to people, property and infrastructure.



Figure 6: Aerial mapping from January 2016 showing vegetation within the southern and eastern extents of the subject site and along the northern boundary (Source: Nearmap, 2026)

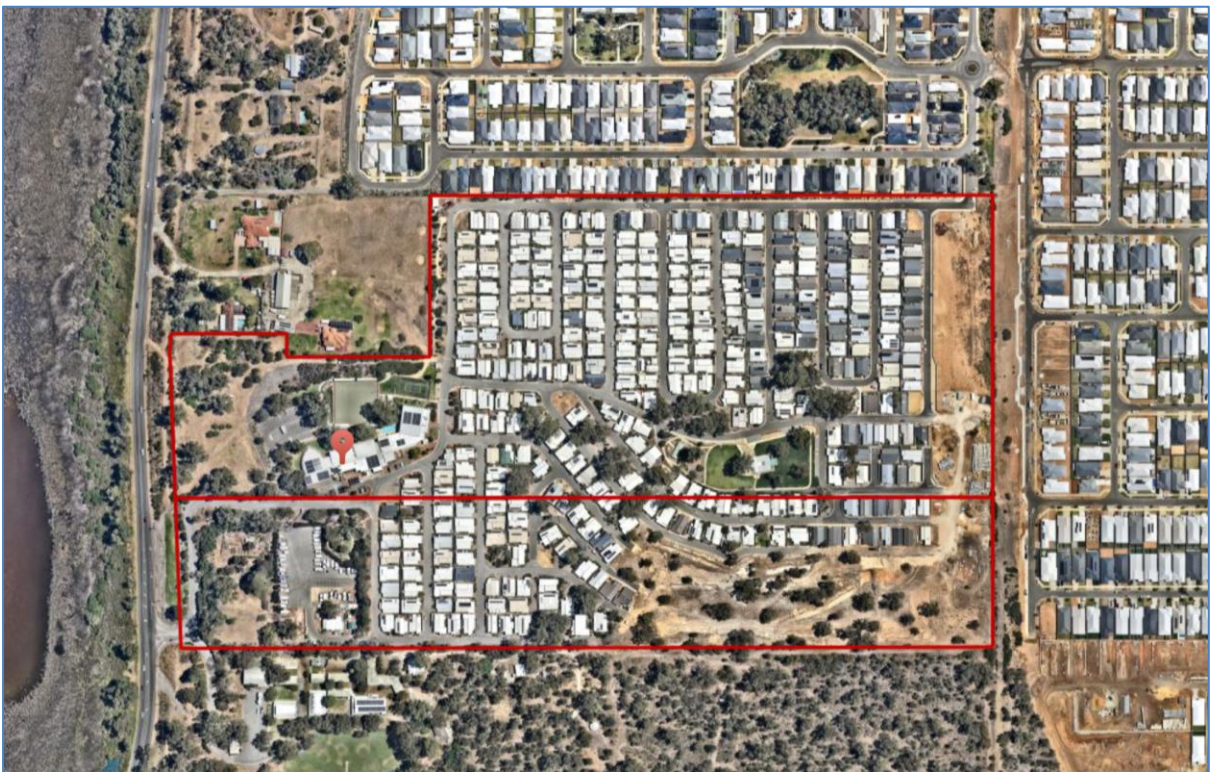


Figure 7: Aerial mapping from January 2026 showing clearing areas within the southern and eastern extents of the subject site and along the northern boundary (Source: Nearmap, 2026)

2.6 Heritage

No relevant considerations.

2.7 Coast and Foreshores

Not a relevant consideration.

3.0 OPPORTUNITIES AND CONSTRAINTS

3.1 Gas Pipeline

In proximity to the eastern boundary of the Structure Plan area are easements for two gas pipelines being:

- Parmelia gas pipeline, operated by APA; and
- Alcoa of Australia pipeline.

The Parmelia gas pipeline easement is located to the immediate east of the rear boundary of Tuart Lakes Lifestyle Village within the following properties:

- Lot 294 which is a Crown Land Title; +
- Lot 9026, which is presently owned by A & P Galati;
- Lot 651 which is a Crown Land Title; and
- Lot 8002 (Reserve 54482) which has a management order to the City of Rockingham for the purpose of Public Recreation.

The easement runs north-south and measures 12.19m in width. The easement for Alcoa is to the immediate east of the Parmelia easement and the Alcoa easement measures 6.1m in width.

As part of the original development of Tuart Lakes Lifestyle Village, in 2007, Worley Parsons prepared a risk assessment pursuant to AS 2885 due to the proximity of the Village to the Parmelia Natural Gas Pipeline. A copy of the 2885 risk assessment dated 2007 is provided in **Appendix 6**.

As part of the due diligence work for the preparation of this Structure Plan a meeting was conducted with APA in relation to the constraints on development due to the proximity to the Parmelia Gas Pipeline.

A copy of correspondence from APA is included in **Appendix 6** which identifies the requirement for a Technical Note to refresh the Existing AS2885 Risk Assessment.

Appendix 6 contains the technical note to update the 2007 risk assessment pursuant to AS 2885, prepared by Advisian. The technical note details threat identification, action status and update as well as a conclusion and recommendations.

The technical note recommends the preparation of a Safety Management Study in accordance with AS 2885.6-2018 prior to the commencement of construction. This could be imposed as a condition of

development approval is issued for homesites adjacent to the eastern boundary of the Structure Plan Area.

3.2 Landscaping and Residential Interface

Resident safety and security are key objectives across all lifestyle villages managed and owned by Serpenitas Communities Holdings Pty Ltd, however it is also important to ensure that positive streetscape and passive surveillance outcomes are achieved where lifestyle villages front onto existing residential streets and public open space. As part of the delivery of the final stage of homes along the eastern extent of the Structure Plan area, there is an opportunity to design the eastern boundary to promote visual interaction between the lifestyle village, the adjacent gas pipeline, open space and residential subdivision beyond.

A landscaping and fencing concept plan has been developed to demonstrate how this can be achieved (refer **Appendix 7**).

The landscaping and fencing concept plan incorporates open style garrison fencing along the boundary to enable views in both directions into and out of the village. Inside the village boundary, a strip of managed landscaping incorporating a combination of canopy and low plantings provide for a softening of the built form of the village beyond, but will enable surveillance to and from the public realm. In the event that the adjacent gas pipeline easement is maintained and landscaped, the proposed landscaping within the village boundary will complement these adjacent public open space areas.

3.3 Traffic and Transport

As the Tuart Lakes Lifestyle Village the subject of this Structure Plan has been predominantly developed in line with the previous structure plan, a traffic technical note has been prepared to consider the operation of a full movement access via Wellspring Road to provide a secondary point of access for village residents. The technical note (refer **Appendix 8**) addresses current and expected traffic flows associated with the delivery of the final stage of homes along the eastern boundary of the Structure Plan area and assesses whether the increased use of vehicles on a proposed full movement Wellspring Road access arrangement can support an expanded use into the future. It also investigates if any road upgrade works are required to the access arrangements without the requirement to construct any new roads across the gas pipeline.

The traffic technical note concludes that the existing access arrangements via Mandurah Road and Wellspring Road are considered sufficient to accommodate the full development of the Tuart Lakes Lifestyle Village. No additional road connections, including the previously identified crossing of the Dampier to Bunbury Natural Gas Pipeline, are deemed required. The traffic advice recommends the continued and future proposed use of the current access configuration in an all movement two way use format. Accordingly, the Structure Plan identifies road connections north-east via Wellspring Road and west via Mandurah Road.

The above notwithstanding, the existing development approvals granted by the City of Rockingham (to date) do not allow for full movement for residents on Wellspring Road. The landowner/applicant will be required to liaise further with the City of Rockingham in relation to any changes to access arrangements at this access.

4.0 STAKEHOLDER AND COMMUNITY ENGAGEMENT

Consultation has included meeting with the City of Rockingham on a number of occasions, spanning a number of years including in 2020 and 2025 and more recently with Department of Planning, Lands and Heritage during 2025 and 2026.

Consultation has also occurred with the developers of the subdivisions to the north, south and east to ensure that the levels on Tuart Lakes and the adjoining lots are compatible, particularly where there are road connections.

Consultation also was undertaken with the gas pipeline operators given the proximity of the Structure Plan Area to the pipelines.

5.0 DESIGN RESPONSE

The Structure Plan responds to the fact that there is an increasing demand for affordable housing for an aging population. The surrounding sites are being developed with single residential low density dwellings. This proposal will facilitate the continued delivery of affordable housing for the ageing population and finalise the eastern stages of the existing Tuart Lakes Lifestyle Village.

The inclusion of a landscaped interface with visual surveillance to the public open space/ pipeline easement will ensure a positive and attractive presentation to the adjoining land to the east.

The land subject of the Structure Plan has been mostly cleared and developed, with the trees to be retained in accordance with the development approval.

The design responds to the bushfire risk and development as proposed in this Structure Plan is capable of satisfying the requirements of the Bushfire Management Plan.

Overall, the Structure Plan proposes an appropriate design response to complete the remaining homes within the Tuart Lakes Lifestyle Village.

6.0 TECHNICAL STUDIES APPENDICES INDEX

Appendix 1 contains the Certificates of Titles for the subject lots.

6.1 Technical Appendices

The following Technical Reports have been prepared as part of this Structure Plan.

Appendix	Technical Report	Separate approval/ supporting document	Date	Status
3	Local Water Management Report (WMR)	Supporting document, to be approved by City of Rockingham.	August 2026	This Local WMR, prepared by Urbaqua supersedes the July 2020 UWMP prepared by Urbaqua .

Appendix	Technical Report	Separate approval/ supporting document	Date	Status
4	Bushfire Management Plan	Supporting document to be approved by City of Rockingham only.	Feb 2017	Approved by the City of Rockingham 2016/2017.
5	Bushfire Management Plan	Supporting document to be approved by City of Rockingham only.	Feb 2026	This is intended to substitute previous BAL Contour Mapping and Vegetation Classification contained within the 2017 BMP.
6	Technical note: Risk Assessment	Supporting document, to be provided to APA.	Mar 2020	This is intended to accompany and update the AS 2885 Risk Assessment prepared by Worley Parsons, dated March 2007, for Tuart Lakes (at that time, it referred to as Rockingham Lifestyle Village).
7	Landscaping and Fencing Concept Plan	Supporting document to be approved by City of Rockingham only.	Feb 2026	This concept is intended to guide future development outcomes.
8	Technical Note for Full Movement Access to Wellspring Road.	Supporting document to be supported by DPLH and ultimately approved by City of Rockingham.	Nov 2025	This Technical Note is intended to demonstrate the suitability of full movement access arrangements provided via existing connections at Mandurah Road and Wellspring Road.

Appendix 1

Certificate of Title

WESTERN



AUSTRALIA

TITLE NUMBER

Volume

Folio

2692

236

RECORD OF CERTIFICATE OF TITLE UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts
REGISTRAR OF TITLES



LAND DESCRIPTION:

LOT 102 ON DEPOSITED PLAN 54139

REGISTERED PROPRIETOR: (FIRST SCHEDULE)

SERENITAS COMMUNITIES HOLDINGS PTY LTD OF LEVEL 4 28 O'CONNELL STREET SYDNEY NSW 2000
(T O137577) REGISTERED 24/4/2019

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS: (SECOND SCHEDULE)

1. N737405 CAVEAT BY RICHARD DEREK CLEVELAND, JENNIFER ANNE CLEVELAND AS TO PORTION ONLY LODGED 9/10/2017.
N874440 CHANGE OF SERVICE OF NOTICE ADDRESS REGISTERED 13/4/2018.
2. P903627 MORTGAGE TO NATIONAL AUSTRALIA BANK LTD REGISTERED 29/2/2024.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP54139
PREVIOUS TITLE: 276-179A, 2520-527
PROPERTY STREET ADDRESS: 831 MANDURAH RD, BALDIVIS.
LOCAL GOVERNMENT AUTHORITY: CITY OF ROCKINGHAM

WESTERN



AUSTRALIA

TITLE NUMBER

Volume Folio

1385 81

RECORD OF CERTIFICATE OF TITLE UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts
REGISTRAR OF TITLES



LAND DESCRIPTION:

LOT 1 ON DIAGRAM 27568

REGISTERED PROPRIETOR: (FIRST SCHEDULE)

SERENITAS COMMUNITIES HOLDINGS PTY LTD OF LEVEL 4 28 O'CONNELL STREET SYDNEY NSW 2000
(T O137577) REGISTERED 24/4/2019

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS: (SECOND SCHEDULE)

1. P903627 MORTGAGE TO NATIONAL AUSTRALIA BANK LTD REGISTERED 29/2/2024.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1385-81 (1/D27568)
PREVIOUS TITLE: 1063-574
PROPERTY STREET ADDRESS: 851 MANDURAH RD, BALDIVIS.
LOCAL GOVERNMENT AUTHORITY: CITY OF ROCKINGHAM

Appendix 2

Development Approval for Tree Removal and Retention

Our Ref: 20.2025.539.1 – AD26/4820
Your Ref: NLV TRT GE / 2025 TREE RETENTION DA
Enquiries to: Ms Nyah Cheater



27 May 2026

Mr Tom Hockley
Allerding & Associates
125 Hamersley Road
SUBIACO WA 6008

Email: tom@allerdingassoc.com

Dear Mr Hockley

Re: Proposed Amendment to Development Approval (Earthworks and Tree Retention Plan) and Retaining Walls - Lot 1 (No.851) and Lot 102 (No.831) Mandurah Road, Baldivis

Your application for Development Approval received on 4 December 2025 for the above has been approved under clause 68(2)(b) of the deemed provisions of Town Planning Scheme No.2 in accordance the attached Notice of Determination, under delegated authority.

Development Approval does not, however, remove the need for approvals, licences and other permits that may be required under other legislation. Prior to the works commencing it may be necessary to obtain a Building Permit (pursuant to section 9 of the *Building Act 2011*) from the City's Building Services.

If the applicant is aggrieved by this determination, the City may, on written application from the owner, amend the approval period, amend a condition or aspect of the approval, or cancel the approval, during or after the period within which the development approval must be substantially commenced under clause 77 of the *Planning and Development (Local Planning Schemes) Regulations 2015*. Furthermore, there may be a right of review by the State Administrative Tribunal in accordance with section 252 of the *Planning and Development Act 2005*. An application to the Tribunal for review of this decision must be made within 28 days of the determination.

Should you have any enquiries with respect to this advice, please contact Ms Nyah Cheater on 9528 0316 or via email Nyah.Cheater@rockingham.wa.gov.au.

Yours faithfully

DAVE WALLER
COORDINATOR STATUTORY PLANNING



FORM 2

Planning and Development Act 2005

CITY OF ROCKINGHAM TOWN PLANNING SCHEME No.2

**NOTICE OF DETERMINATION ON APPLICATION FOR
DEVELOPMENT APPROVAL**

LOCATION: No.851 and No.831 Mandurah Road, Baldivis

LOT: 1 and 102

PLAN/DIAGRAM: D027568 and P054139

VOL. NO: 1385 and 2692

FOLIO NO: 81 and 236

APPLICATION DATE: 28 November 2025

RECEIVED ON: 4 December 2025

DESCRIPTION OF PROPOSED DEVELOPMENT: Proposed Amendment to Development Approval (Earthworks and Tree Retention Plan) and Retaining Walls

The application seeking Development Approval in accordance with the submitted plans and application received on 4 December 2025 and amended plans received on 9 January 2026 and 21 May 2026 is approved subject to the following conditions:

1. All development must be carried out in accordance with the approved plans listed below:

- Tree Retention Plan (DWG No: C108, Rev.B) dated 20 May 2026; and
- Retaining Wall Plan (DWG No: C101, Rev.1) received 9 January 2026;

save that, in the event of an inconsistency between the approved plans and a requirement of the conditions set out below, the requirement of the conditions shall prevail.

2. Earthworks over the site associated with the development must be stabilised to prevent sand or dust blowing off the site, and appropriate measures must be implemented within the time and in the manner directed by the City of Rockingham in the event that sand or dust is blown from the site.

3. To offset the removal of trees identified on the approved plans, forty (40) tree saplings must be planted on site as outlined in Table 1 of the applicant's correspondence dated the 4 December 2025 (Ref: NV TRT GE / 2025 Tree Retention DA), by the 31 August 2026. Photographic evidence and plans of the plantings must be submitted to the City of Rockingham by the 30 September 2026.

Monitoring of the offset saplings must be conducted for a period of two (2) years following planting, after which any trees lost in that time to be replaced to the satisfaction of the City of Rockingham.

4. Prior to the commencement of works, the trees flagged for retention in the approved Tree Retention Plan referenced in Condition No.1 must have identity tagged installed, yellow tape flagged and have their Tree Protection Zones (TPZs) and Structural Root Zones (SRZ) as defined under AS4970 - Protection of Trees on Development Sites, fenced, or similar. Photographs of each of the tagged trees must be emailed to the City within two (2) working days.

Date of determination: 27 May 2026

FOOTNOTES

- Note 1: If the development the subject of this approval is not substantially commenced within a period of 2 years, or another period specified in the approval after the date of the determination, the approval will lapse and be of no further effect.
- Note 2: Where an approval has so lapsed, no development must be carried out without the further approval of the local government having first been sought and obtained.
- Note 3: If an applicant or owner is aggrieved by this determination, there is a right of review by the State Administrative Tribunal in accordance with the *Planning and Development Act 2005* Part 14. An application must be made within 28 days of the determination.
- Note 4: This Approval supersedes the previous Approval dated 22 January 2026.
- Note 5: This Approval relates to the details provided in the application; to undertake the development in a different manner to that stated in the application, a new application for Development Approval must be submitted to the City.
- Note 6: The applicant is advised to contact APA Group's "Third Party Works" prior to commencing any development or earthworks on site.
- Note 7: The applicant is advised that all works within Structural Root Zones and Tree Protection Zones shall be undertaken in accordance with AS4970 - Protection of Trees on Development Sites.
- Note 8: The applicant is advised that a separate application for Development Approval is required to be submitted prior to development commencing once detailed engineering drawings have been prepared for the future Residential lots and roads within the area the subject of the current application.
- Note 9: The Applicant/Owner is advised that this approval is not a Building Permit, which constitutes a separate legislative requirement. Prior to any building work commencing on-site, a Building Permit must be obtained. Please liaise with the City's Building Services for further information in this regard.

Signed:

Date: 27 May 2026

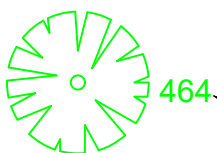
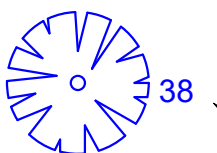
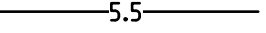


DAVE WALLER
COORDINATOR STATUTORY PLANNING

for and on behalf of the City of Rockingham

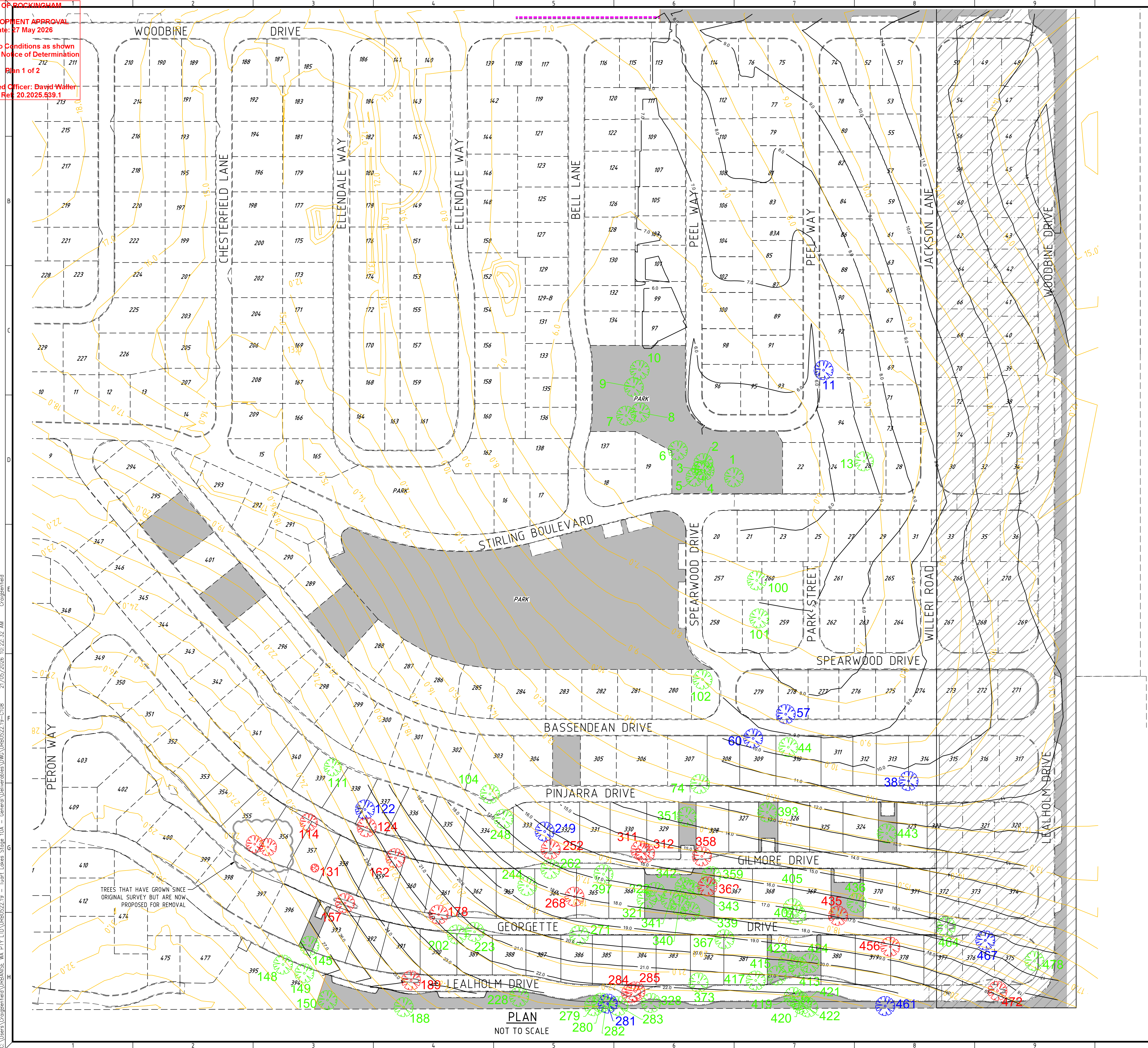
CITY OF ROCKINGHAM
DEVELOPMENT APPROVAL
Date: 27 May 2026
Subject to Conditions as shown
on Form 2 Notice of Determination
Plan 1 of 2
Authorised Officer: David Waller
COR Ref: 20.2025.539.1

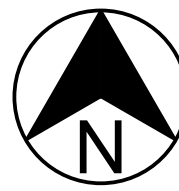
TREE RETENTION LEGEND:

-  EXISTING TREES TO BE RETAINED
TREE TAG NUMBER
-  TREES APPROVED FOR REMOVAL SINCE THE PREVIOUS TREE
RETENTION PLAN WAS APPROVED IN 2023
TREE TAG NUMBER
-  EXISTING TREES TO BE REMOVED
TREE TAG NUMBER
-  AREA SUBJECT TO SEPARATE DEVELOPMENT APPLICATION
APPROVAL
-  INDICATIVE AREA FOR TREE RE PLANTING
-  EXISTING CONTOUR LEVEL (0.25m INTERVAL)
-  APPROVED DESIGN FINISHED SURFACE CONTOURS (1.0m INTERVAL)

FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

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CITY OF ROCKINGHAM
DEVELOPMENT APPROVAL
Date: 27 May 2026
Subject to Conditions as shown
on Form 2 Notice of Determination
Plan 2 of 2
Authorised Officer: David Waller
COR Rek 20.2025.539.1

NOTES:

1. LEVEL DATUM - AUSTRALIAN HEIGHT DATUM.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE RETAINING WALL PROFILES AND THE STANDARD DETAILS.
3. THE CONTRACTOR SHALL STEP THE TOP OF THE RETAINING WALLS AT REGULAR INTERVALS, TO ACHIEVE THE KEY FINISHED LEVELS AS SHOWN ON THE PROFILE DRAWINGS.
4. THE CONTRACTOR SHALL COMMUNICATE WITH THE ADJOINING PROPERTY OWNERS PRIOR TO COMMENCEMENT OF WORKS ON SITE TO ENSURE THE OWNERS ARE IN AGREEMENT WITH THE PROPOSED WORKS.
5. THE CONTRACTOR SHALL MAKE ALLOWANCE TO PROVIDE TEMPORARY FENCING AS DEEMED NECESSARY TO INSTALL THE RETAINING WALLS.
6. THE CONTRACTOR SHALL COMMUNICATE WITH THE PROJECT SURVEYOR TO ENSURE BOUNDARY PEGS ARE IN PLACE PRIOR TO COMMENCEMENT OF WORKS ON SITE.
7. THE CONTRACTOR SHALL MAKE ALLOWANCE TO INSTALL THE FENCES TO COMPLY WITH THE LOCAL AUTHORITY FENCING BY LAW.
8. THE CONTRACTOR SHALL ALLOW FOR IMPORTATION OF CLEAN FREE DRAINING SAND AS REQUIRED TO ACHIEVE THE PROPOSED FINISHED LOT LEVELS. THE SAND SHOULD CONTAIN NO MORE THAN 5% (BY WEIGHT) OF FRACTIONS FINER THAN 0.075mm AND NO MATERIAL GREATER THAN A NOMINAL SIZE OF 150mm. SAND SHOULD BE PLACED IN LAYERS AT CLOSE TO ITS OPTIMUM MOISTURE CONTENT, IN LAYERS NOT EXCEEDING A LOOSE LIFT THICKNESS OF 300mm AND EACH LAYER COMPACTED TO ACHIEVE A MINIMUM OF 9 BLOWS PER METRE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SUPPLY ALL OF THE NECESSARY TEST CERTIFICATES AND GRADING CHARTS, INCLUDING COMPACTION ETC BY A NATA REGISTERED TESTING LABORATORY TO THE SUPERINTENDENT.
9. THE CONTRACTOR SHALL MAKE ALLOWANCE TO PROVIDE COMPLIANCE CERTIFICATE FOR CONSTRUCTION OF RETAINING WALL BY A SUITABLY QUALIFIED ENGINEER.

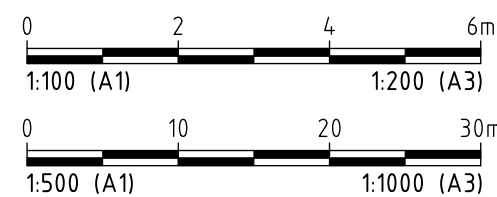
LEGEND:

- RECOMMENDED FINISHED FLOOR LEVEL
- FINISHED BULK EARTHWORKS LEVEL
- EXISTING RETAINING WALLS
- PROPOSED RETAINING WALLS
- FUTURE RETAINING WALLS
- PROPOSED PLINTH FENCING TO BE INSTALLED BY THE CLIENT'S LANDSCAPER
- TREE TO BE RETAINED
- TREE TAG NUMBER
- EXISTING TREES TO BE REMOVED - SUBJECT TO CITY OF ROCKINGHAM APPROVAL
- TREE TAG NUMBER

NOTE:

NO ADDITIONAL EXCAVATION BY HOME BUILDER I.E. DOUGHNUTS ARE PLACED ON FINISHED EARTHWORKS LEVEL. ADDITIONAL FILL TO BE IMPORTED BY HOME BUILDER

PLAN SCALE 1:500



ISSUED FOR CONSTRUCTION

1	09/01/25	DR	CB	BP	EXISTING TREES AND RETAINING WALLS AMENDED
0	05/12/25	DR	CB	BP	ISSUED FOR CONSTRUCTION
REV No.	DATE	DRAWN BY	REVIEW	DATE	AMENDMENT DESCRIPTION
Urbanise wa ENGINEERING SOLUTIONS					
Perth Westpoint Centre 207 / 396 Scarborough Beach Road Osborne Park WA 6017					
Margaret River Wave Court 7 / 30 Fernside Ave Margaret River WA 8265					
CLIENT TRUSTEE FOR SERENITAS DEVELOPMENT TRUST					
PROJECT TUART LAKES LIFESTYLE VILLAGE STAGE 10A					
TITLE RETAINING WALL PLAN					
DRAFTER D.RISTOSKI	DESIGNED C.BENFIELD	APPROVED PROJECT MANAGER B.PATON	APPROVED PROJECT DIRECTOR B.PATON		
DATUM AHD	SCALE AS SHOWN	PROJECT No. URB0522.19A	DRAWING No. C101	REV 1	
GRID PCG94	WAPC No. -				

Appendix 3

Local Water Management Report

Tuart Lakes Lifestyle Village

Local Water Management Report

Prepared for:

Serenitas Communities Holdings

By Urbaqua

August 2026

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1 INTRODUCTION AND BACKGROUND

This Local Water Management Report (LWMR) has been prepared to support an amendment to the 2006 Tuart Lakes National Lifestyle Village Structure Plan for Lot 102 Mandurah Road & Lot 1 Mandurah Road (the Study Area) approximately 25 ha (Figure 1). The changes to the previous structure plan include expansion of the lifestyle village and alternative road layouts in the eastern portion of the site (zoned R20) and additional development on the western portion of the site. Water management on the site is proposed to utilise existing infrastructure and implement further Water Sensitive Urban Design (WSUD).

Consistent with *State Planning Policy 2.9 Water (SPP2.9)* and the *Planning for Water Guidelines* (WAPC, 2025) a local water management report is required to support adoption of a Local Structure Plan to identify appropriate water management strategies. The position of this strategy within the state government planning framework is defined in the *Planning for Water Guidelines* (WAPC, 2025) and is outlined in Chart 1.

Noting that the study area will remain entirely in private ownership, including all roads and drainage systems, this LWMR contains sufficient detail to support all future planning and development decisions within the study area and therefore no further Water Management Report will be required in accordance with the *Planning for Water Guidelines* (WAPC, 2025).

This report addresses the study area presented in Figure 1.

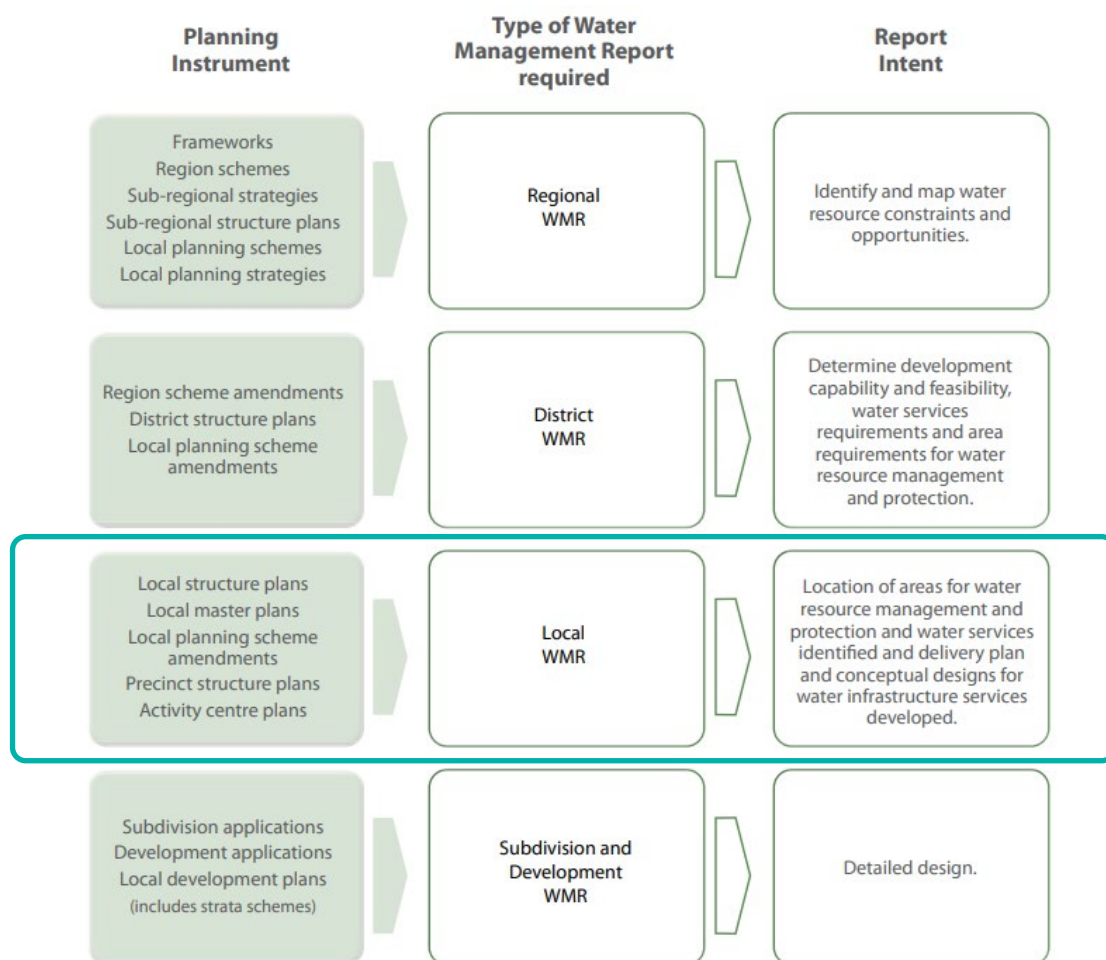
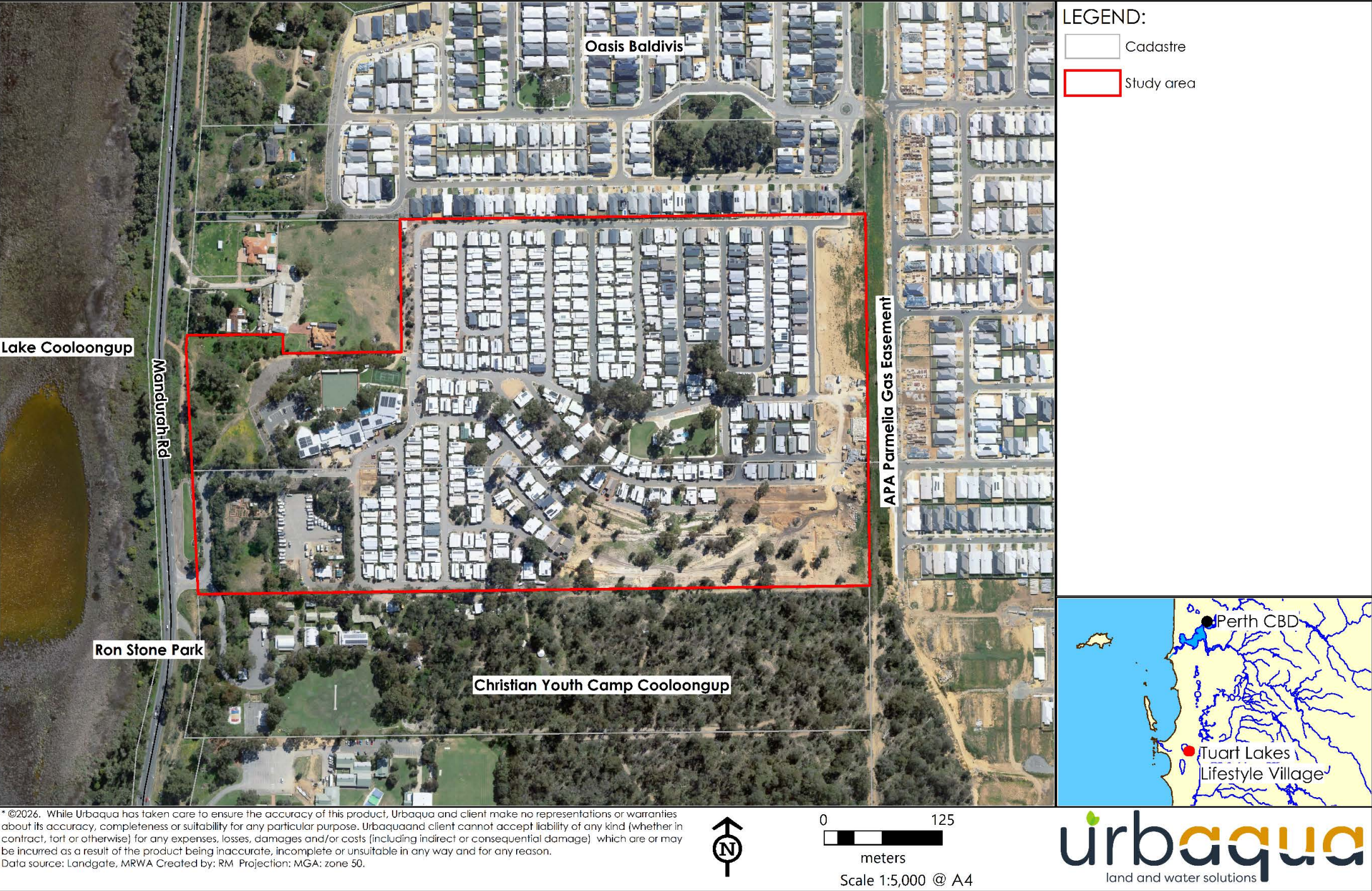


Chart 1: The water management report and planning instrument hierarchy (WAPC, 2025)

Serenitas Communities Holdings - Tuart Lakes Lifestyle Village Local Water Management Report

Figure 1 - Location Plan



1.1.1 Metropolitan Region Scheme

The study area is zoned partly 'Urban' and partly 'Rural' under the Metropolitan Region Scheme (MRS).

1.1.2 Local Planning Scheme

The study area is zoned partly 'Development' and partly 'Rural' under the City of Rockingham's Town Planning Scheme No.2 (TPS 2).

1.1.3 Local structure plan

This local water management report has been prepared to support the revised local structure plan shown in Figure 2. The structure plan provides the framework to guide ongoing development of the Tuart Lakes Lifestyle Resort, supporting over 50's residential outcomes alongside community facilities and spaces.

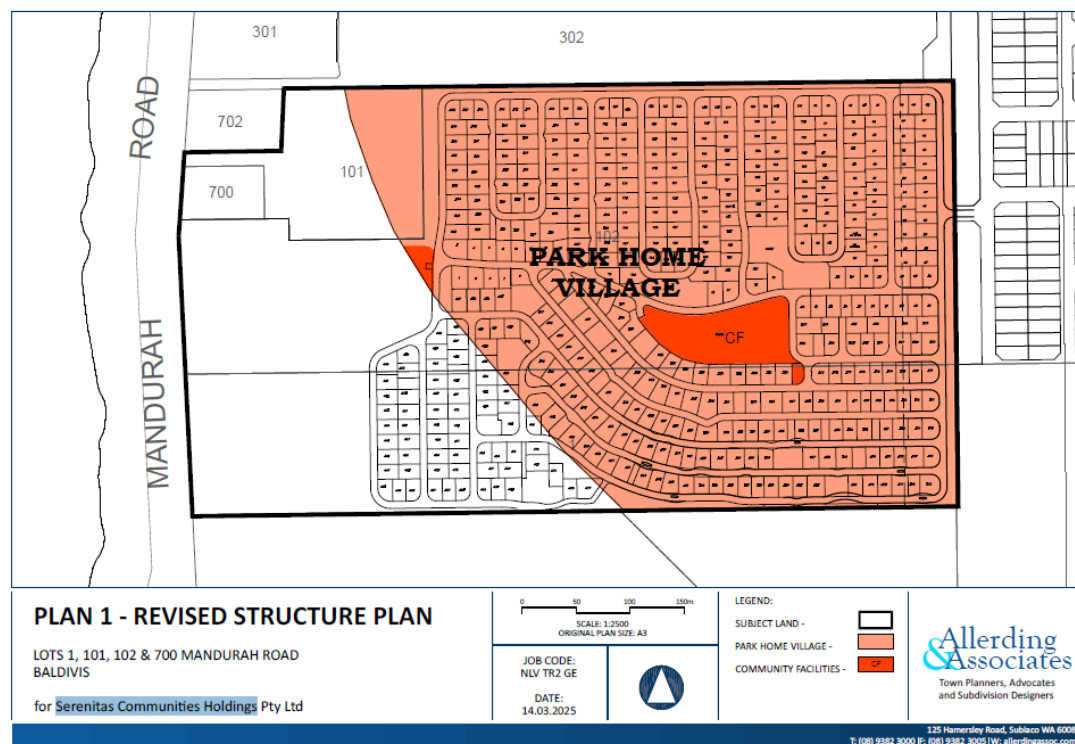


Figure 2: Revised Structure Plan

1.2 Previous water management reports

Preparation of the LWMR is informed by and replaces the *National Lifestyle Villages Tuart Lakes Baldivis Urban Water Management Plan* prepared by VDM (2009) and the *Draft Tuart Lakes Lifestyle Village Expansion Urban Water Management Plan* (Urbaqua, 2020). The previous reports provided guidance regarding water conservation, water quality, flood control and groundwater management, however proposed amendments require an overarching re-assessment of previous water management approaches to identify any required upgrades to constructed urban drainage systems and provide strategic direction for the remainder of the developing area. The previous UWMP (VDM, 2009) was guided by an Urban Water Management Strategy prepared by National Lifestyle Villages in 2007.

1.3 Key site considerations

Detailed analysis of existing study area conditions within the study area is provided in Section 2. Key considerations for water management in the precinct are summarised below.

1.3.1 Current and historic land use

Figure 1 displays the current land uses within and surrounding the study area. The study area was historically used as a poultry farm and market gardens but has been developed as a lifestyle village since 2010. The surrounding environment and land use include:

- Oasis Baldivis, a recently completed residential development to the north.
- Christian Youth Camp Cooloongup to the south.
- Mandurah Rd directly west and Lake Cooloongup beyond.
- APA Parmelia Gas Pipeline to the east and other residential developments beyond. The pipe centreline is located around 10m east of the site boundary and the easement is estimated to measure around 32m (Creative, 2016).

1.3.2 Climate

It is important to consider historic, current, and future climate as an integral part of water management investigations and modelling to inform development and validation of strategies. This should include an understanding of local monitoring results and demonstrated understanding of how future changes are likely to impact on the total water cycle.

As discussed in Section 2.2, retention of existing trees and vegetation where possible is a key focus for urban greening in the precinct, together with development of a Landscape Master Plan to support the PSP and maximise tree cover and vegetation. The creation of public open space represents a considerable opportunity for urban greening, along with vegetated streetscapes.

Water sensitive urban design is a key contributor to the effectiveness of urban greening. It is critical that strategies are implemented to maintain soil moisture through retention and infiltration of stormwater as close to source as possible.

1.3.3 Geotechnical considerations

Geotechnical investigations, described in section 2.3.3 have confirmed that the soils present in the precinct are generally sandy and highly permeable.

The nature of soils, particularly permeability, is a critical element in determining an appropriate drainage strategy. Highly permeable soils provide opportunities for on-site infiltration strategies to be applied to avoid any increases in peak flows to existing drainage systems and sensitive receiving water bodies and should be applied wherever possible throughout the study area.

1.3.4 Vegetation and wetlands

Lake Cooloongup, a shallow, saline groundwater-dependent lake adjacent to the study area, is classified as a Conservation Category Wetland and is located within Bush Forever Site 356 – Lake Cooloongup, Lake Walyungup and Adjacent Bushland, Hillman to Port Kennedy. To provide for the protection of this wetland, it is important that development maintains predevelopment groundwater recharge rates through the promotion of maximised infiltration of stormwater within the site.

1.3.5 Groundwater

There is one groundwater licence (GWL No: 209233) that covers the entire study area, registered to Serenitas Communities Holdings Pty Ltd for an abstraction volume of 52,000 kL from the Superficial Aquifer, expiring in August 2033.

The volume of water included in this allocation is sufficient for irrigation of all existing and proposed open space within the study area.

Groundwater is more than 5m below ground level throughout the site and is therefore unlikely to represent any impediment to development.

1.3.6 Surface water – drainage

As detailed in Section 2.4, a review of as-constructed drainage information and site inspections were conducted to provide an assessment of the performance of existing drainage infrastructure on the site and to develop recommendations for future implementation.

Future stages of the development will need to include underground storage systems consistent with the strategy applied throughout the study area.

Formalisation of the vegetated storage area serving the RV Park and community garden area is recommended to prevent further erosion of hardstand edges.

1.3.7 Services

The site is currently connected to Water Corporation integrated water supply and sewerage systems. All future dwellings will be connected to the exiting and extended reticulation networks.

2 SITE CONTEXT

The existing environmental conditions in the study area define the opportunities and constraints for water management. A discussion of these conditions is provided in this Section.

2.1 Current and historic land uses

Figure 1 displays the current land uses within and surrounding the study area. The study area was historically used as a poultry farm and market gardens but has been developed as a lifestyle village since 2010. The surrounding environment and land use include:

- Oasis Baldivis, a recently completed residential development to the north.
- Christian Youth Camp Cooloongup to the south.
- Mandurah Rd directly west and Lake Cooloongup beyond.
- APA Parmelia Gas Pipeline to the east and other residential developments beyond. The pipe centreline is located around 10m east of the site boundary and the easement is estimated to measure around 32m (Creative, 2016).

2.1.1 Implications for future development

The current and previous uses of the study area and surrounds are considered unlikely to represent any significant challenges for development.

2.2 Climate

The climate for the study area is typical of the Southwestern region of Western Australia and is characterised by the Köppen Climate Classification as Dry Subtropical featuring mild and wet winters and hot to very hot summers. Most of the rainfall is experienced in the winter between May and September and the driest months are between December and March.

The rainfall record at the nearest Bureau of Meteorology weather station, Hopelands station no. 9253 approximately 9km to the east, has an annual average rainfall of 742.5 mm since 2000.

Evaporation data show evaporation exceeds rainfall between September and April, and from May to August rainfall exceeds evaporation.

Decreasing rainfall is noted in the *Selection of future climate projects for Western Australia* (DoW, 2015). Mean annual rainfall decreases projected by DWER, based on the 1961-1990 baseline, varies between -4% (wet scenario) and -25% (dry scenario) by 2050. This extends to -7% (wet) and -47% (dry) by 2090.

2.2.1 Implications for future development

It is important to consider historic, current, and future climate as an integral part of water management investigations and modelling to inform development and validation of strategies. This should include an understanding of the representativeness of local monitoring results and demonstrated understanding of how future changes are likely to impact on the total water cycle.

Water sensitive urban design is a key contributor to effective climate management and urban greening. It is important that strategies are implemented to maintain soil moisture through retention and infiltration of stormwater as close to source as possible.

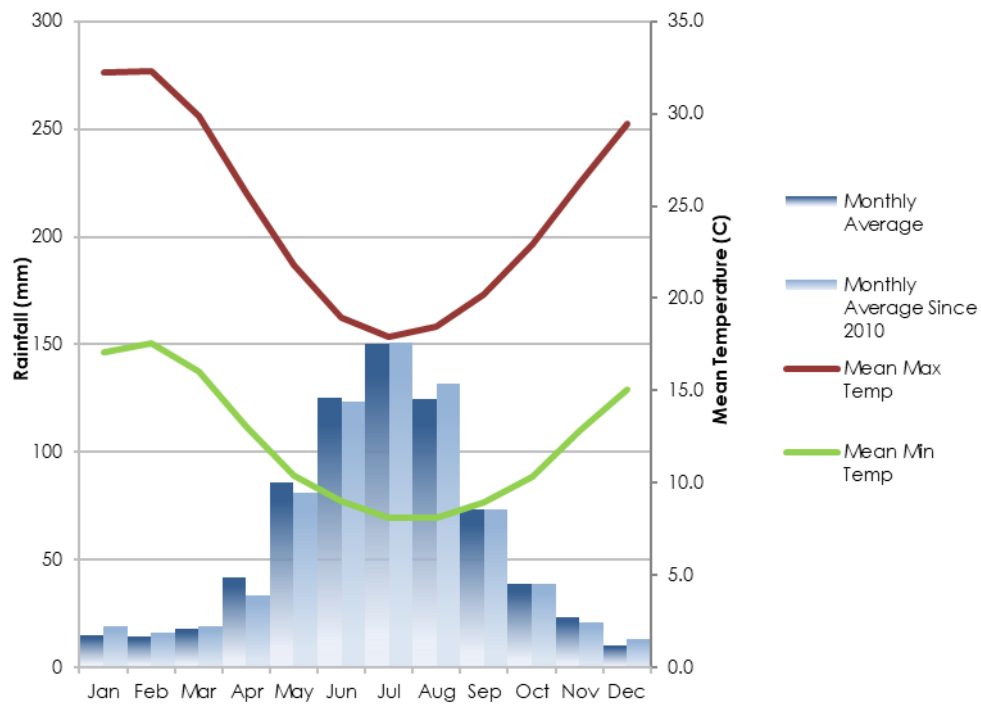


Chart 2: Climate summary data (BoM station no. 9253, BoM, 2026)

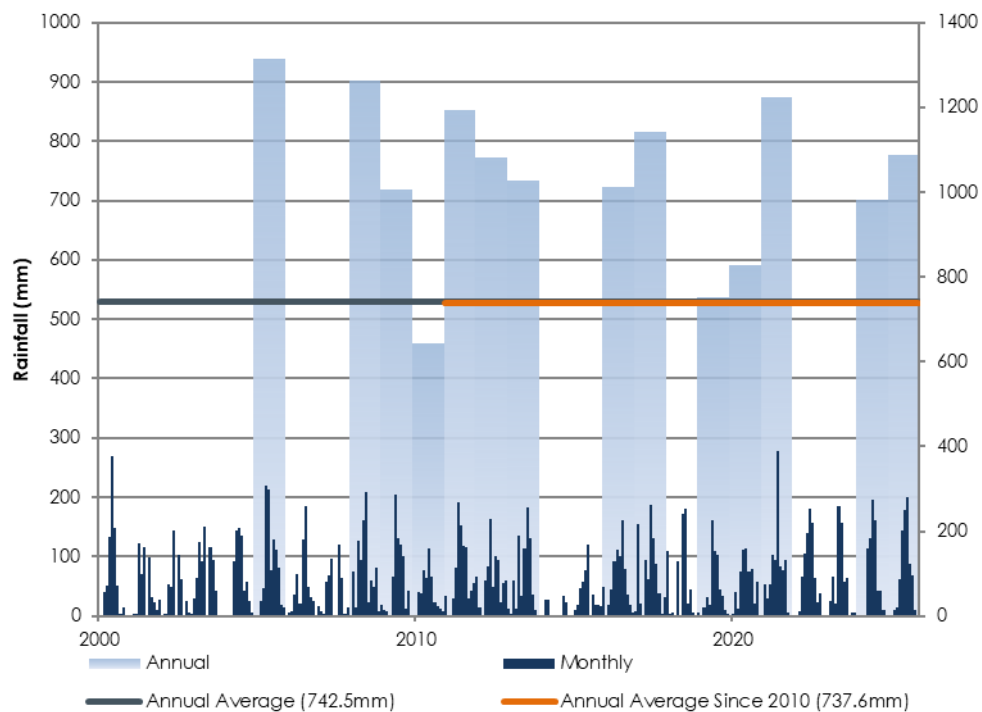


Chart 3: Rainfall summary data (BoM station no. 9253, BoM, 2026)

2.3 Topography, geology, and soils

The physical and topographical conditions for the study area influence the hydrological conditions including the ability to retain and infiltrate runoff. A summary is provided below based on regional mapping which are also presented in Figure 3.

2.3.1 Topography

Ground elevations vary across the study area from a maximum of around 32 m AHD atop a ridge running to the northeast from the south-central boundary of the site. The ground generally slopes down to the east and west from the ridge, reaching a minimum of around 4m AHD at the site's lowest point in the central-east part of the site and around 8m AHD along the western boundary at Mandurah Road.

The elevations shown in Figure 3 have been moderately altered for development with parts of the site raised with fill obtained from other areas of the site.

2.3.2 Regional soil mapping

The surface geology of the study area, shown in Figure 3, has been classified as Tamala Limestone (LS1) and Tamala Sand (S7) (Gozzard, 1983) as follows:

- LS1: Described as pale yellowish brown, fine to coarse-grained, sub-angular to well-rounded quartz, trace of feldspar, shell debris, variably lithified, surface kankar, of aeolian origin
- S8: Described as pale yellowish brown, medium to coarse-grained, sub-angular quartz, trace of feldspar, moderately sorted, of aeolian origin.

2.3.3 Geotechnical investigations

Geotechnical investigations undertaken in 2006 by Douglas Partners reported that the unsaturated permeability of the sand was 43.2 m/day (Douglas Partners 2006).

2.3.4 Acid sulphate soils

The study area is classified as having no known risk of developing Acid Sulphate Soils (ASS) (inset to Figure 3).

2.3.5 Contaminated Sites

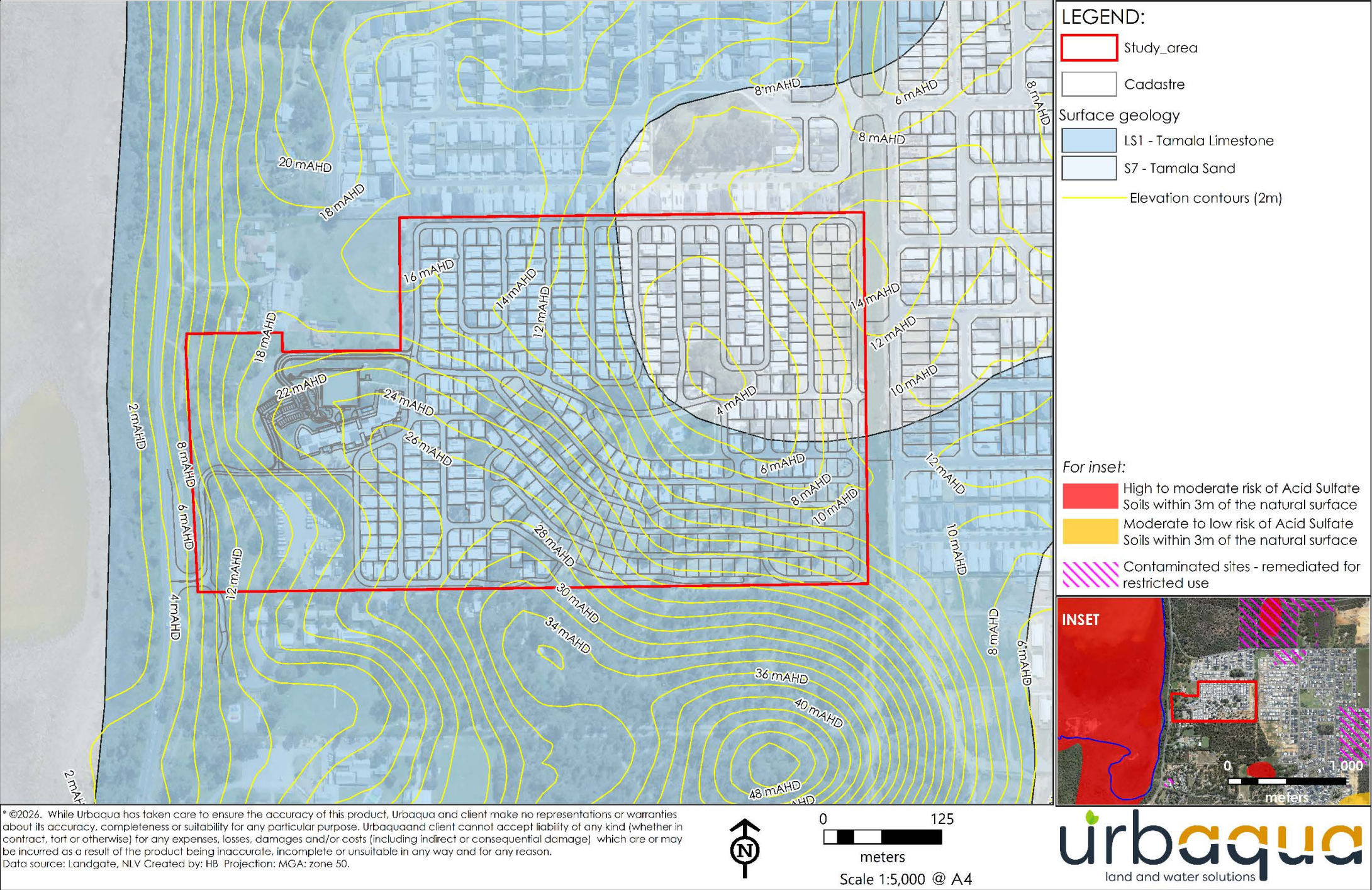
According to the DWER Contaminated Sites Database, the Study Area contains no registered contaminated sites. As shown in the inset to Figure 3, there are a number of sites classified 'remediated for restricted use' with the closest site located approximately 250m to the north-east. None of these sites are likely to represent any impediment to development.

2.3.6 Implications for future development

The nature of soils, particularly permeability, is a critical element in determining an appropriate drainage strategy. Highly permeable soils provide opportunities for on-site infiltration strategies to be applied to avoid any increases in peak flows to existing drainage systems and sensitive receiving water bodies and should be applied wherever possible throughout the study area.

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Figure 3 - Topography and Soils



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Data source: Landgate, NLV Created by: HB Projection: MGA: zone 50.

2.4 Vegetation and wetlands

Low vegetation coverage is a significant contributor to urban heat. As shown on Figure 4, the study area currently has vegetation cover of 10-15% within boundaries.

There are no mapped wetlands located within study area boundaries, however Lake Cooloongup, situated west of the site, is classified as a Conservation Category Wetland and is located within Bush Forever Site 356 – Lake Cooloongup, Lake Walyungup and Adjacent Bushland, Hillman to Port Kennedy.

Lake Cooloongup is a shallow, saline groundwater-dependent lake in Rockingham with water quality heavily influenced by seasonal evaporation, turning it brackish to salty. It serves as a local groundwater sink. Lake Cooloongup is part of the Rockingham Lakes Regional Park.

Lake Cooloongup has been monitored by the Department of Water and Environmental Regulation since the 1920s, finding that water levels have declined by up to 2 m since monitoring began.

2.4.1 Implications for future development

Lake Cooloongup, a shallow, saline groundwater-dependent lake adjacent to the study area, is classified as a Conservation Category Wetland and is located within Bush Forever Site 356 – Lake Cooloongup, Lake Walyungup and Adjacent Bushland, Hillman to Port Kennedy. To provide for the protection of this wetland, it is important that development maintains predevelopment groundwater recharge rates through the promotion of maximised infiltration of stormwater within the site.

2.5 Groundwater

Groundwater is a resource that provides opportunity and constraints for the development and is an environmental asset that requires protection.

2.5.1 Groundwater allocation

The study area is located within the Tamworth Swamp groundwater management subarea. The Department of Water and Environmental Regulation's (DWER) Water Register (DWER, 2026b) shows that there is groundwater available for allocation from the Superficial Aquifer while the Leederville Aquifer is 'Fully Allocated' and there is 'Limited Information' available for the Yarragadee Aquifer.

There is one groundwater licence (GWL No: 209233 – Appendix A) that covers the entire study area, registered to Serenitas Communities Holdings Pty Ltd for an abstraction volume of 52,000 kL from the Superficial Aquifer, expiring in August 2033.

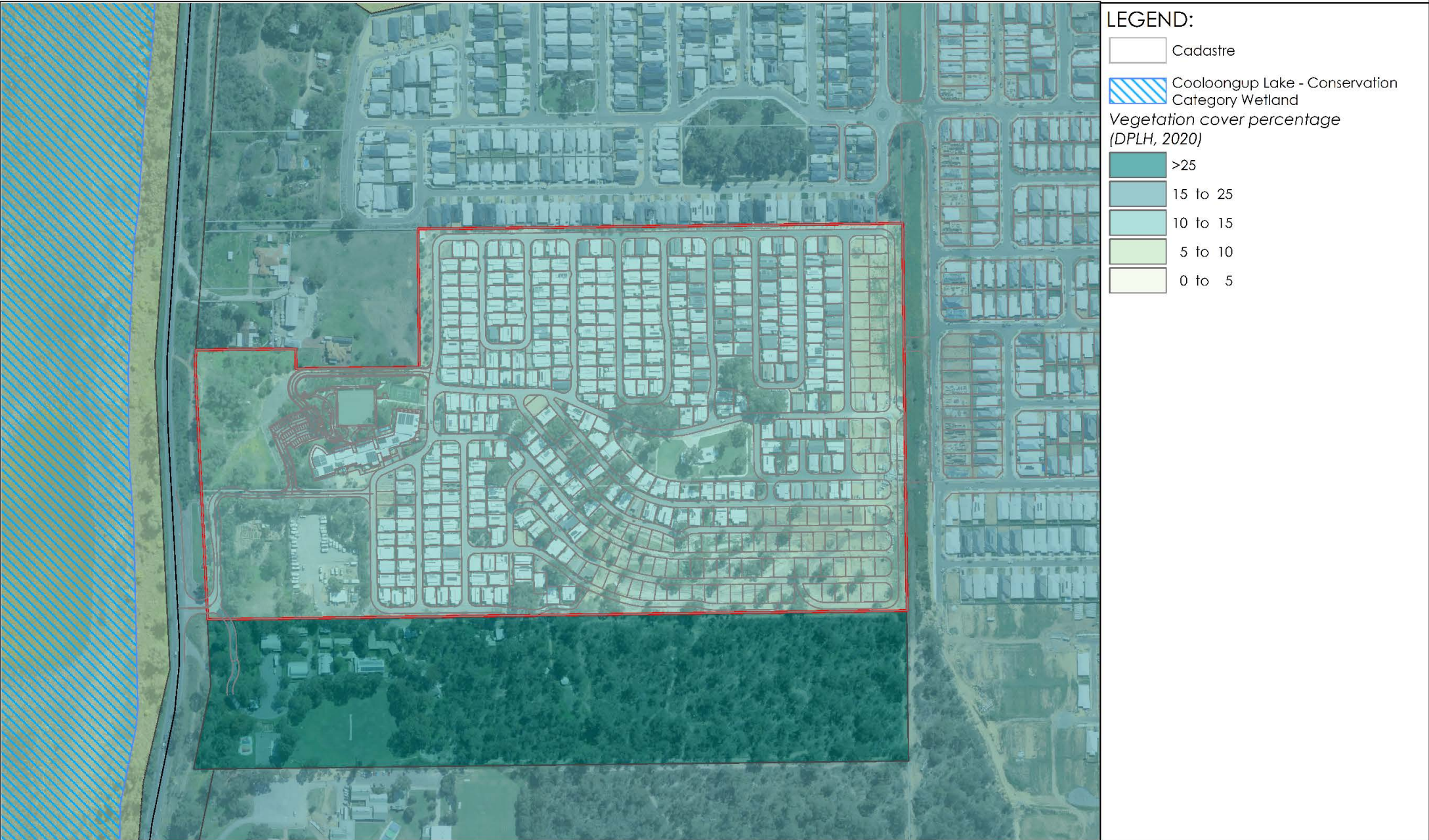
The volume of water included in this allocation is sufficient for irrigation of all existing and proposed public open space within the study area.

2.5.2 Groundwater levels

DWER regional groundwater mapping (DWER 2020) indicates that the maximum groundwater level within the site varies between 3 mAHD and 4 mAHD across the site as shown in Figure 5 which results in depths to the water table from approximately 5 m to 33 m.

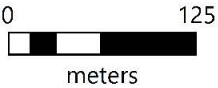
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Figure 4 - Vegetation and Wetlands



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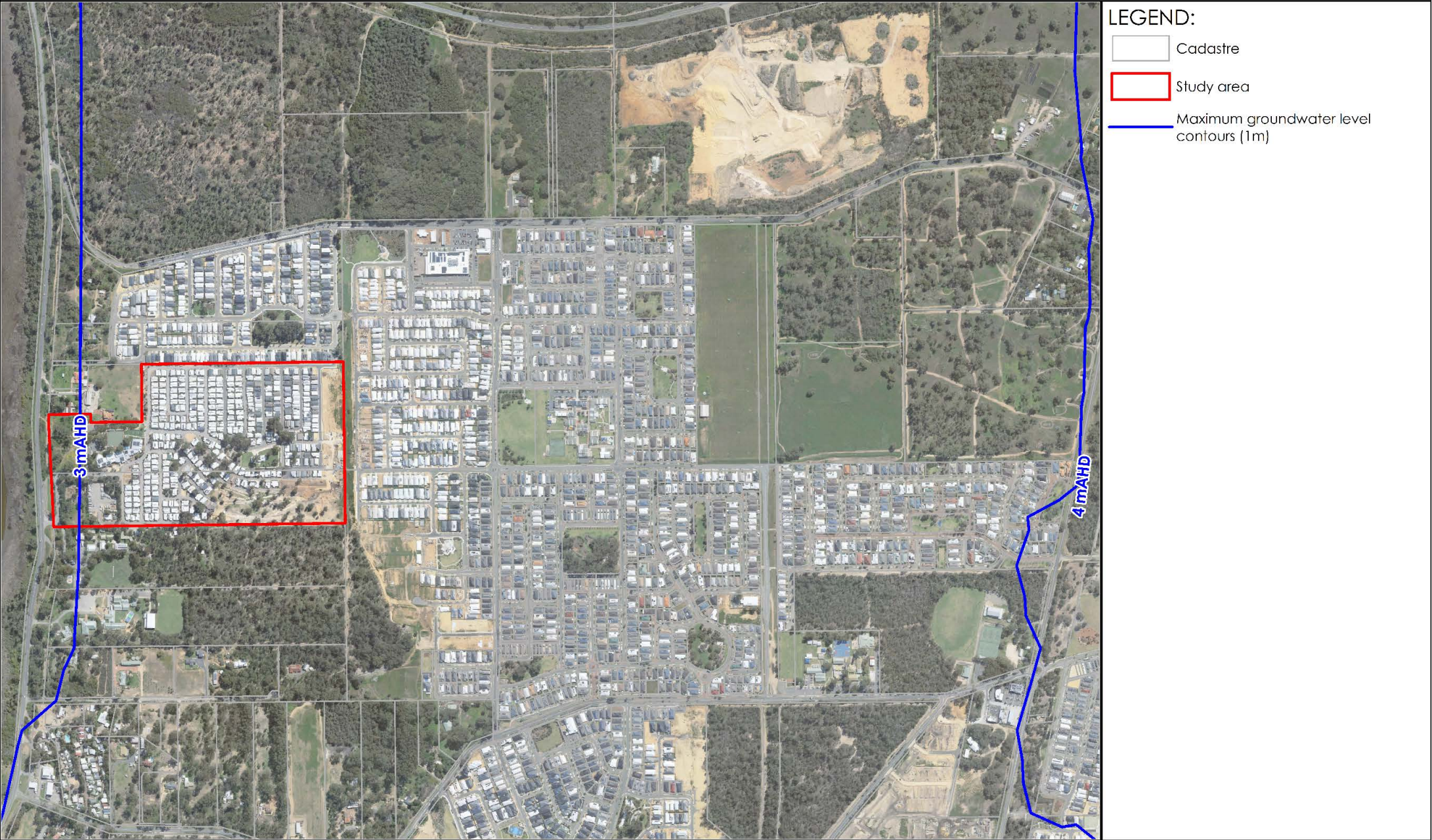
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Figure 5 - Groundwater



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meters
Scale 1:12,000 @ A4



2.5.3 Implications for future development

There is one groundwater licence (GWL No: 209233) that covers the entire study area, registered to Serenitas Communities Holdings Pty Ltd for an abstraction volume of 52,000 kL from the Superficial Aquifer, expiring in August 2033.

The volume of water included in this allocation is sufficient for irrigation of all existing and proposed open space within the study area.

Groundwater is more than 5m below ground level throughout the site and is therefore unlikely to represent any impediment to development.

2.6 Surface water, wetlands, and drainage

The study area contains no natural waterways or wetlands, however there is an existing network of local urban drainage across the study area.

2.6.1 Urban drainage system

There is an existing network of local urban drainage across and surrounding the study area, shown on Figure 6.

A review of as-constructed drainage information and site inspections were conducted to provide an assessment of the performance of existing drainage infrastructure on the site and to develop recommendations for future implementation.

Distributed underground infiltration systems have been provided within streets throughout the study area. In newer and lower lying stages of development, the underground storages are interconnected with piped drainage terminating in a drainage basin located at Bell Park.

All parts of the site are naturally internally draining, with very little risk of any offsite discharges, except for the western portion of the site including the main community buildings, visitor's carpark and driveway, RV Park and community garden area, Catalpa Drive and a portion of Woodbine Drive.

The main community building has been constructed with on-site soakwells which are able to overtop into surrounding pervious areas.

The visitor's carpark and driveway have been constructed with underground infiltration cells, which overflow into the driveway if capacity is exceeded. There are additional roadside swales provided alongside the main entrance driveway which capture any overland flows from these areas.

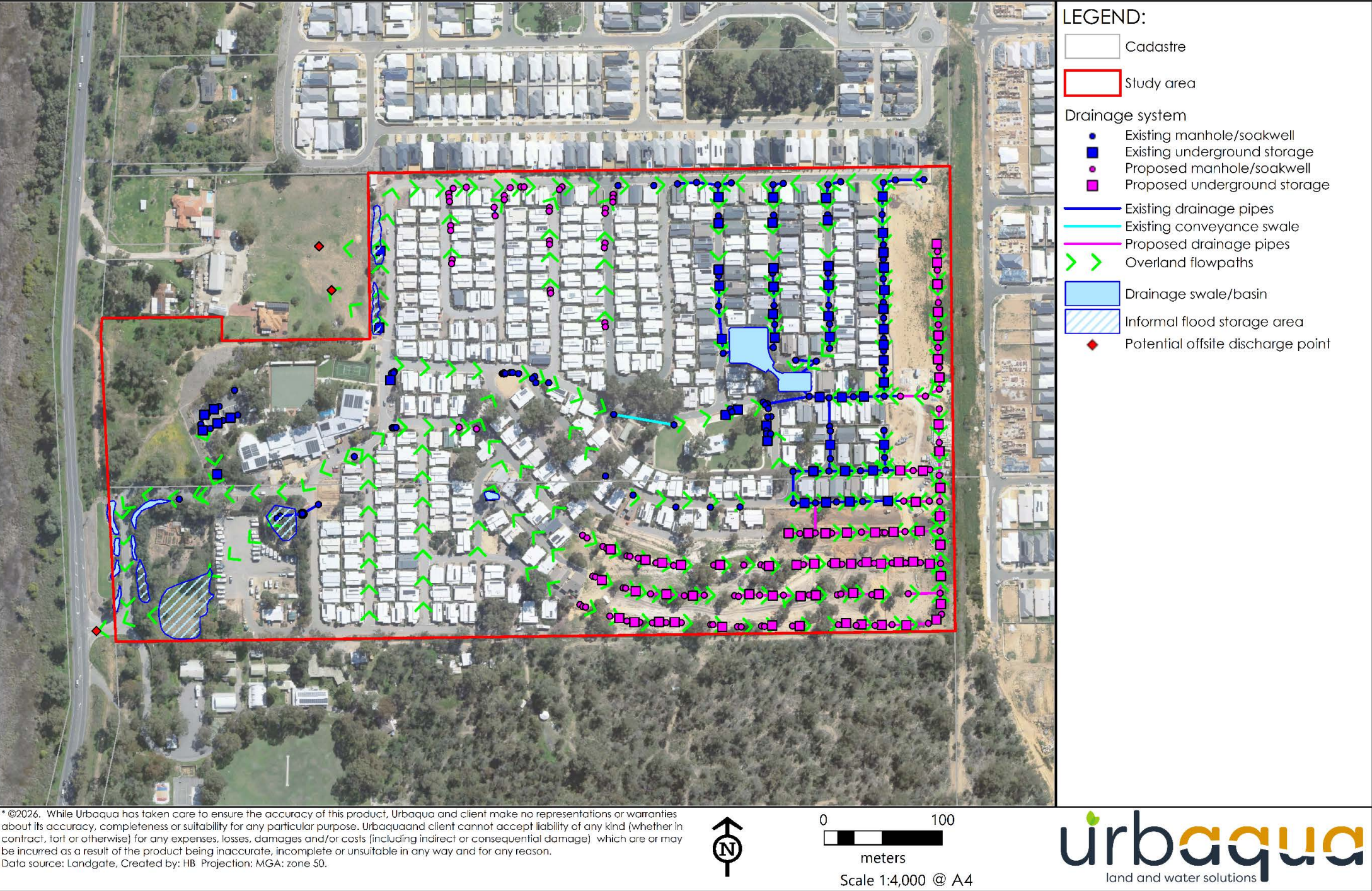
There are soakwells adjacent to Catalpa Drive, which can overflow into informal storage within the dog park area and then onto the RV Park in the event capacity is exceeded.

The RV Park and community garden area drain overland to an informal vegetated storage area located in vacant undeveloped land to the south of the community garden. Some erosion of hardstand edges at discharge points from the RV Park was noted during the site inspection and the site would benefit from some formalisation of these drainage flowpaths and downstream flood storage area.

The system has three identified potential offsite discharge points which are shown on Figure 6.

Serenitas Communities Holdings - Tuart Lakes Lifestyle Village Local Water Management Report

Figure 6 - Surface water and drainage



Hydrological and hydraulic modelling has been completed to assess catchment flows and storages for the development. A summary of modelling procedures and parameters is provided in Appendix B. Modelling has included extension of the current on-site drainage system including installation of all proposed soakwells and underground storage cells in newly constructed roads.

2.6.2 Implications for future development

“Proposed” soakwells and other drainage elements that remain unconstructed in existing parts of the study area have been included in modelling and should be constructed to prevent flooding of residential areas within the site.

Future stages of the development will need to include underground storage systems consistent with the strategy applied throughout the study area.

Formalisation of informal vegetated surface storage areas adjacent to Woodbine Drive and adjacent to the RV Park and community garden area is recommended to prevent further erosion of hardstand edges and minimise the risk of offsite discharges.

2.7 Water and Wastewater Services

Water Corporation supplies scheme water to the Tuart Lakes National Lifestyle Village. Potable water will be supplied to the proposed additional development as an extension of the existing infrastructure.

The Study Area is connected to the Water Corporation's integrated sewerage scheme. Each Property is connected to the reticulated sewer network and wastewater will be removed using this conventional system.

2.7.1 Implications for future development

The site is currently connected to Water Corporation integrated water supply and sewerage systems. All future dwellings will be connected to the exiting and extended reticulation networks.

2.8 Social and Heritage Values

No registered Aboriginal Sites within or adjacent to the Site were identified in a search of the Department of Planning, Lands and Heritage (DPLH) Aboriginal heritage enquiry system (2026).

There are no places listed in the Heritage Council's InHerit online mapping system.

3 WATER MANAGEMENT OBJECTIVES

The principles and strategies contained within this WMR will be implemented as part of detailed land use planning and development requirements and are consistent with the framework and requirements in *State Planning Policy 2.9 Water (SPP2.9)* and the *Planning for Water Guidelines* (WAPC, 2025).

The objectives in Table 1 have been developed to address the study area and planning context of the ECU redevelopment area consistent with the water management principles in SPP2.9. The objectives will be achieved through implementation of water sensitive urban design strategies as described in Sections 3 and 4.

Table 1: Water management objectives

Design Element	Objectives
Water sustainability	• Ensure the efficient use of all water resources in the developed urban form and aim to achieve highest value use of fit-for-purpose water. • Maintain opportunities for future generations by using water more efficiently.
Stormwater management	• Protect infrastructure and assets from flooding and inundation. • Protect receiving environments from the impacts of urban runoff. • Provide opportunities for urban greening, cooling and habitat creation through the application of water sensitive urban design principles.
Groundwater management	• Maximise infiltration close to source or high in the catchment to maintain predevelopment recharge characteristics. • Protect groundwater dependent ecosystems from the impacts of urban runoff.
Management of disease vectors and nuisance insects	• Limit the creation of new sites for breeding of nuisance insects. • Prevent long-term (>96 hrs) standing water in drainage infrastructure.
Implementation	• Provide a robust framework for delivering water management strategies, including measures during construction to prevent damage to existing infrastructure and receiving environments.

4 WATER SUSTAINABILITY INITIATIVES

Water sustainability measures including the supply of water and the treatment and disposal of wastewater for the residential lots is described below.

4.1 Water supply

The study area is located in an area served by the Water Corporation's integrated water supply scheme. All future development will be connected to the reticulated drinking water distribution network.

There is one groundwater licence (GWL No: 209233) that covers the entire study area, registered to Serenitas Communities Holdings Pty Ltd for an abstraction volume of 52,000 kL from the Superficial Aquifer, expiring in August 2033.

The volume of water included in this allocation is sufficient for irrigation of all existing and proposed open space within the study area.

The entire study area is to remain in private ownership and therefore the responsibility for management and irrigation of open spaces will remain with the landowner/developer.

4.2 Wastewater treatment and disposal

The study area is located in an area served by the Water Corporation's integrated sewerage scheme and all dwellings will be connected to the reticulated sewerage network.

4.3 Water efficiency measures

To reduce the consumption of scheme water newly constructed houses will be recommended to meet the Water Corporation's Waterwise homes and gardens criteria. That is:

- All showerheads installed will be better than the minimum WELS 3 Star rating.
- All taps installed will be better than the minimum WELS 4 Star rating.
- All toilets will be dual flush and exceed the minimum WELS 4 Star rating.
- All water using appliances installed are rated WELS 4 Star or above.

Water balance modelling undertaken by VDM (2009) estimated that water consumption is approximately 55 kL/year through the implementation of these water saving measures.

Throughout the lifestyle village, water efficiency is maximised in open space areas by using waterwise native plants, retaining existing trees (where possible) and use of water sensitive irrigation designs.

New areas of open space or entry statements will favour retention and planting of trees to improve shading and reducing urban heat effects.

5 SURFACE WATER AND GROUNDWATER MANAGEMENT

The water management plan for surface water and groundwater resources within the study area have been prepared based on guiding documents and site considerations (Section 2). These management measures address the design objectives (Section 3), including providing protection to the community and improving water quality.

5.1 Flood protection

The study area is not expected to be subject to flooding from the external area in a 1% AEP event. The on-site drainage system, road layout and earthworks design ensures that lots are located at a minimum of 0.3 m above the 1% AEP flood level in the adjacent roads and drainage infrastructure, and 0.5m above basins with no overflow relief (DWER, 2017). The predicted 1% AEP top water level in the Bell Park basin is 6.3m AHD.

5.2 Stormwater management

Measures to manage stormwater within the study area are outlined in the following sections and presented in Figure 7. Engineering drawings are provided in Appendix C

The key objectives for surface water management are:

- Protect infrastructure and assets from flooding and inundation.
- Protect receiving environments from the impacts of urban runoff.
- Provide opportunities for urban greening, cooling and habitat creation through the application of water sensitive urban design principles.

5.2.1 Frequent Events (1EY)

Development within the study area will retain at least the first 15 mm of rainfall within all private lots in accordance with the *Decision Process for Stormwater Management in WA* (DWER, 2017) and the City of Rockingham's on-site stormwater drainage criteria.

Road reserves within the development are designed applying water sensitive urban design principles to include passive watering of areas provided for trees and vegetation within road reserves. Remaining runoff generated by frequent events is managed on-site in existing and proposed drainage retention and infiltration systems.

5.2.2 Minor (20% AEP) and Major Events (1% AEP)

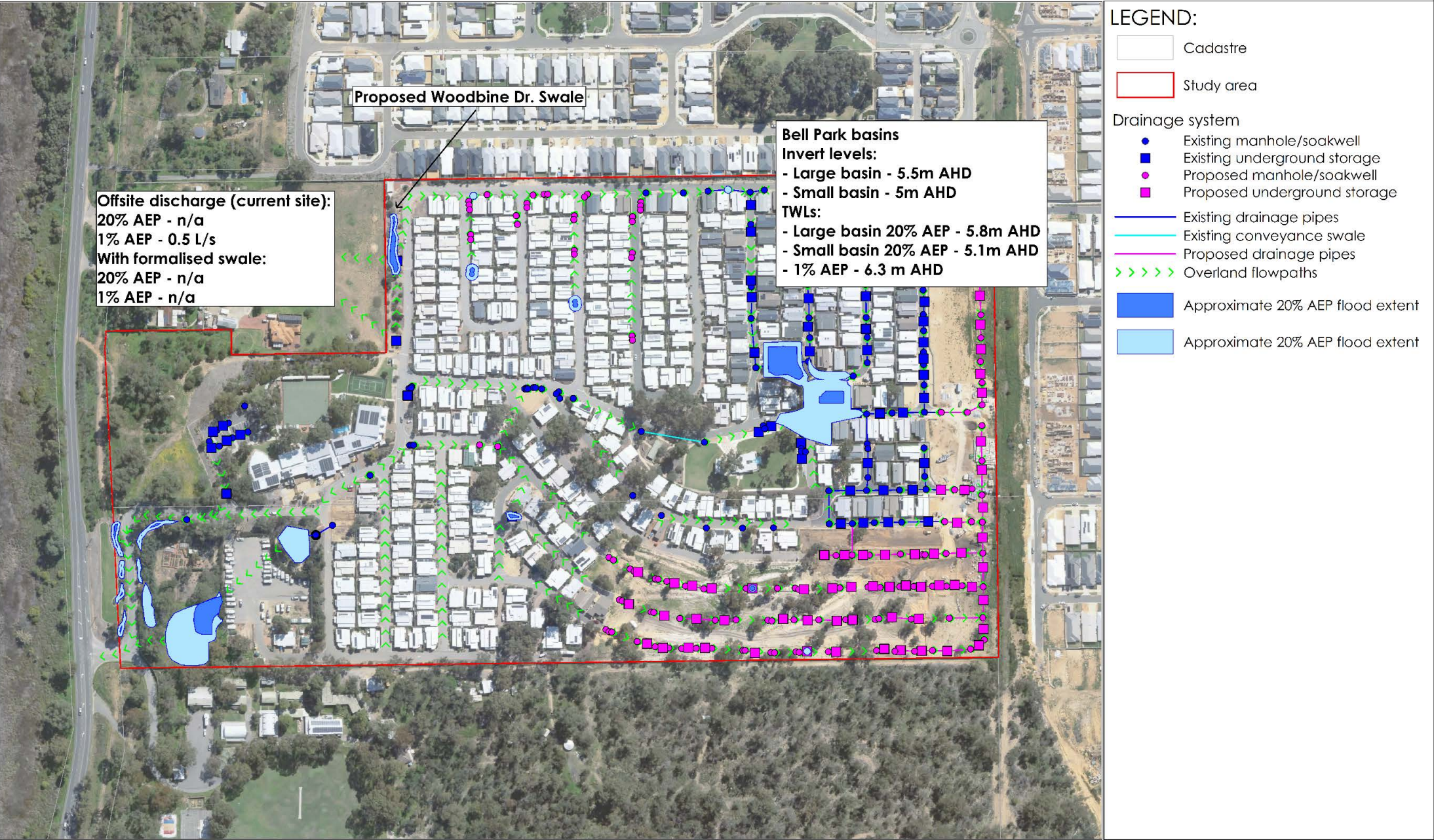
Stormwater management for the study area incorporates the use of on-site retention of all stormwater events as close to source as possible using underground infiltration systems that capture runoff from impervious surfaces.

5.2.3 Stormwater system modelling

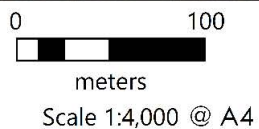
Hydrological and hydraulic modelling has been completed to assess catchment flows and storages for the development. A summary of modelling procedures and parameters is provided in Appendix B.

Serenitas Communities Holdings - Tuart Lakes Lifestyle Village Local Water Management Report

Figure 7 - Stormwater management plan



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Data source: Landgate. Created by: HB Projection: MGA: zone 50.



Modelling results and the size of the respective stormwater systems are provided in Table 2 and presented in Figure 7. The predicted 1% AEP top water level in the Bell Park basin is 6.3m AHD.

Table 2: Modelling results

Location	20% AEP	Critical duration	1% AEP	Critical duration
Bell Park basins	220	3 hours	1,233	3 hours
RV Park basin	6	6 hours	66	3 hours
Driveway swales	2	6 hours	100	6 hours
Underground storage systems	292	varies	776	varies
Total on-site storage volume (m ³)	520	varies	2,177	varies
Peak discharge flow from the study area (L/s)	0.0	-	0.71	1 hour

Based on modelling undertaken and presented in this report, the following actions will be implemented at the site:

“Proposed” soakwells and other drainage elements that remain unconstructed in existing parts of the study area have been included in modelling and will be constructed to prevent flooding of residential areas within the site.

Future stages of the development will include underground storage systems consistent with the strategy applied throughout the study area.

The informal above ground flood storage area adjacent to Woodbine Drive will be formalised to ensure that the currently predicted small offsite discharge (0.5L/s) from this location can be prevented. This will require establishment of a swale to provide approximately 20m³ additional storage capacity.

Formalisation of the informal vegetated surface storage areas adjacent to the RV Park and community garden area is also recommended to prevent further erosion of hardstand edges.

Locations for additional underground and above ground storage capacity will be investigated to improve internal drainage performance and reduce predicted flood levels at Bell Park.

5.3 Groundwater management

The key objectives for groundwater management are:

- Maximise infiltration close to source or high in the catchment to maintain predevelopment recharge characteristics.
- Protect groundwater dependent ecosystems from the impacts of urban runoff.

The following planning measures are adopted to achieve the above objectives:

- Ensure infiltration of stormwater runoff, consistent with existing conditions.
- Minimised use of nutrients applied as fertilisers to planted areas to maintain groundwater quality compared with the existing conditions.

The clearance between the existing surface and groundwater across the Study Area is estimated to be between 5 m and 33 m (Section 2.5). Significant cutting on the site is not

proposed (existing levels maintained where possible) and therefore direct management of groundwater, including installation of subsoil drainage is therefore not required.

Localised subsoil drainage for retaining walls and roads will be considered during the construction phase. Areas of shallow or perched groundwater are not anticipated however subsoil drainage may be required to alleviate any problematic soil moisture. Where these conditions are identified short length subsoil drains will be installed. To be cost effective and free draining, these drains will be connected to the nearest road drainage system, with water quality treatment provided downstream, consistent with City of Rockingham requirements.

5.4 Water quality management

Retention/infiltration of greater than the first 15mm of runoff will limit the mobilisation of pollutants to downstream environments. The retention and infiltration of runoff close to source through the various systems is supported by the existence of sandy soil and clearance to groundwater within the study area.

Road reserves within the development will be designed applying water sensitive urban design principles to include passive watering of areas provided for trees and vegetation within road reserves where possible. It is estimated that these design approaches will provide for management of the first 5mm of runoff from road reserves with the remaining runoff generated by frequent events being managed on-site in underground infiltration systems.

These structural controls will be complemented by non-structural controls targeted at improving behaviour and reducing sources of nutrients. Non-structural controls will include minimising the use of fertilisers in road reserves by using native plantings and street sweeping to reduce nutrient transport. Owing to the proposed land uses, particularly the low traffic on private roads and small garden areas within residential lots, it is not anticipated that nutrient application within the development will be significant.

5.5 Management of disease vectors and nuisance insects

The key objectives for management of disease vectors and nuisance insects are:

- Limit the creation of new sites for breeding of nuisance insects.
- Prevent standing water in drainage infrastructure.
- Improve water quality throughout the development.

Most stormwater management systems proposed within the study area will be underground infiltration systems which do not pose a risk for mosquito and nuisance insect breeding.

Landscaped areas within the study area that will receive runoff for passive watering and to maintain soil moisture will drain by infiltration through sandy soil with relatively high infiltration rate minimising standing water times and therefore limiting the risk of mosquito and nuisance insect breeding in these areas.

Should Mosquito and Chironomid Midges become a nuisance, pesticides (larvicides and/or adulticides) will be used as required to eliminate mosquito larvae in breeding sites.

6 IMPLEMENTATION

To achieve the water management objectives of this local water management report in a manner consistent with the water management principles in *State Planning Policy 2.9 – Planning for Water* (WAPC, 2025), the water management strategies described in Sections 4 and 5 will be delivered as part of future development including delivery of the following drainage elements:

- “Proposed” soakwells and other drainage elements that remain unconstructed in existing parts of the study area.
- Underground storage systems for future stages of the development consistent with the strategy applied throughout the study area.
- Formalised above ground flood storage swale (20m³ capacity) adjacent to Woodbine Drive sized to prevent overland flow to the adjacent property in the 1% AEP event.
- Additional underground or above ground storage capacity as required to improve internal drainage performance and reduce predicted flood levels at Bell Park.

In addition to the above items, formalisation of the informal vegetated surface storage area adjacent to the RV Park and community garden area is recommended to prevent further erosion of hardstand edges.

Noting that the study area will remain entirely in private ownership, including all roads and drainage systems, this LWMR contains sufficient detail to support all future planning and development decisions within the study area and therefore no further Water Management Report will be required in accordance with the Planning for Water Guidelines (WAPC, 2025).

6.1 Management of Construction Activities

The Construction Management Plan will address sediment control and maintenance works during construction and will consider runoff flow paths during and following construction to ensure no surface water is allowed to leave the study area or enter constructed parts of the drainage system without adequate treatment to manage water quality.

6.1.1 Sediment control

During the expansion works there is potential for sediment to be blown or washed off the construction site into existing drainage infrastructure and flow paths. The slope on parts of the site also presents a risk for erosion from concentrated flows. The contractor will be required to identify appropriate management practices and controls to prevent transport of sediment off site during subdivision works. As a minimum, the following measures will be undertaken:

- Minimising the area of the site which is disturbed.
- Install sediment fencing near areas of concentrated flow.
- Reinstate and/or stabilise completed parts of the sites in a timely manner.
- Ensure the site is stabilised prior to forecasted rainfall events.
- Establish dust management procedures to limit the transport of wind-blown sediment from the site including the use of water carts and installation of wind fencing.
- Control of vehicle access to the site using a limited number of stabilised access points to limit tracking of soil into sealed roads by vehicles.

Following construction of drainage infrastructure, temporary sediment traps may be required to prevent sedimentations and blockage prior to building construction on individual lots. Vegetated areas should also be inspected to remove any sediment build up or weeds.

6.1.2 Dewatering

Earthworks should ideally be undertaken during the drier summer period when groundwater is at its lowest and therefore it is unlikely that there will be a need for dewatering during the earthworks phase of the works. As the civil works progress, there may be a need for dewatering to enable construction of drainage and sewerage infrastructure. Any dewatering will be managed through a separate Dewatering Management Plan to be approved by the DWER (if required).

6.1.3 Acid sulfate soils

Onsite geotechnical testing indicated that the risk of ASS was no known risk. As the existing levels on the site will be maintained, no direct management of acid sulfate soils is required. Where excavation will be undertaken for installation of drainage and sewer infrastructure (below 3 m) for example, further testing may be required to determine the presence of acid sulfate soils.

6.2 Monitoring

No permanently inundated surface waterbodies are proposed within the site and therefore monitoring of surface water quality following development will not be required.

The development presents a very low risk to groundwater quality. Therefore, post-development groundwater monitoring is similarly not required.

6.3 Delivery

Key tasks, roles and responsibilities relating to delivery of urban water management objectives are outlined in Table 3 and a letter of undertaking from the landowner/developer is provided in Appendix D.

Table 3: Summary of roles and responsibilities

Task	Responsibility
Expansion earthworks and construction of service infrastructure including water, wastewater and drainage	Landowner/developer
Retrofitting of "proposed" soakwells and other drainage elements in existing streets	Landowner/developer
Landscaping of streetscape and open space	Landowner/developer
Sediment management during construction	Landowner/developer
Construction of lifestyle residences	Landowner/developer
Landscaping of private lots	Landowner/ Future lot owners
Sediment management during building	Landowner/developer
Maintenance of subdivision drainage	Landowner/developer

6.4 Maintenance Arrangements

Subdivision drainage structures will require regular maintenance to ensure efficient operation. Table 4 outlines the proposed maintenance schedule. As the study area will remain in private ownership, all maintenance activities are to be undertaken by the landowner/developer.

Table 4: Drainage infrastructure maintenance schedule

Maintenance task	Interval		
	Bi-Annually	Annually	As required
Sweep Roads (post-development)			✓ (Quarterly as a minimum)
Education of sediment and rubbish in manholes		✓	
Remove sediment and debris from vegetated swale system	✓		✓
Repair and replace mulch and vegetation in the vegetated swale system and retained basin			✓

7 REFERENCES AND RESOURCES

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Appendix A Groundwater license



LICENCE TO TAKE WATER

Granted by the Minister under section 5C of the Rights in Water and Irrigation Act 1914

Licensee(s)	Serenitas Communities Holdings Pty Ltd		
Description of Water Resource	Stakehill Perth - Superficial Swan	Annual Water Entitlement	52,000kL
Location of Water Source	LOT 1 ON PLAN 27568 - Volume/Folio 1385/81 - Lot 1 MANDURAH RD BALDIVIS		

Authorised Activities	Taking of water for	Location of Activity
	Dust suppression for earthworks and construction purposes	LOT 1 ON PLAN 27568 - Volume/Folio 1385/81 - Lot 1 MANDURAH RD BALDIVIS LOT 102 ON PLAN 54139 - Volume/Folio 2692/236 - Lot 102 MANDURAH RD BALDIVIS
	Irrigation of up to 5.6 ha of landscaped gardens	LOT 1 ON PLAN 27568 - Volume/Folio 1385/81 - Lot 1 MANDURAH RD BALDIVIS LOT 102 ON PLAN 54139 - Volume/Folio 2692/236 - Lot 102 MANDURAH RD BALDIVIS
Duration of Licence	From 23 October 2023 to 23 October 2033	

This Licence is subject to the following terms, conditions and restrictions:

- The annual water year for water taken under this licence is defined as 1 July to 30 June.
- The licensee shall not use water for sprinkler irrigation between 9 am and 6 pm except for the establishment of newly planted areas. For newly planted areas water may be used within these hours for a period of up to 28 consecutive days, commencing from the date of planting.
- Between 1 June and 31 August in any year, the licence-holder must not water a lawn, garden, or grass-covered area ("turf") by reticulation, provided always that this restriction shall not apply to watering with a hand held hose; or watering, by way of reticulation: newly planted areas for a period of up to 28 days from the date of planting; for renovating turf; or for maintenance of reticulation systems.

End of terms, conditions and restrictions

Appendix B Drainage Modelling

This appendix summarises the hydrologic and hydraulic modelling undertaken for this study.

Model construction and parameterisation

A 1-dimensional InfoWorks ICM model was constructed of the study area to facilitate a review of the existing drainage system design, provide sizing information for future drainage systems, and to demonstrate compliance with onsite retention requirements of the City of Rockingham.

In order to determine the requirements for minor (20% AEP) and major (1% AEP) rainfall event storage and infiltration, the hydrological and hydraulic model InfoWorks ICM was utilised, applying ensemble design rainfall analysis consistent with the procedures recommended by Australian Rainfall and Runoff (ARR2019).

Drainage network and subcatchment delineation

The drainage network consists of mainly overland flow to soakwells, or underground storages dispersed throughout the site.

The study area is represented by 159 subcatchments and 118 individual storage locations, consistent with the existing and proposed drainage system layout.

Modelling has assumed that all “proposed” drainage is to be installed as development proceeds.

Rainfall

Rainfall for design events were developed using *Australian Rainfall and Runoff* (ARR2019) and BoM (2016) IFD ensemble methodology resulting in an ensemble of 10 rainfall simulation events for each design storm. Ensembles were generated for 1EY, 20%, 10%, and 1% AEP events of 15min, 30min, 1hr, 3hr, 6hr, and 12hr durations.

Rainfall intensities were adjusted for the current (2030) climate as recommended by ARR2019.

Runoff parameterisation

ARR2019 provides spatially distributed recommendations for initial and continuing loss rates for application in pervious areas of rural catchments. For this study area, the recommended rates are:

- Initial loss – 31.5 mm (includes adjustment for 2030 climate – SSP3-7.0)
- Continuing loss – 3.1 mm/hr (includes adjustment for 2030 climate – SSP3-7.0)

Consistent with the recommendations of ARR2019, modelling of the study area includes three different surface types:

Effective Impervious Areas (EIA): These are Impervious areas that are directly connected to a modelled part of the drainage system, eg areas draining into pipes or direct into modelled storages. These areas are modelled with 2mm initial loss and zero continuing loss.

Indirectly Connected Areas (ICA): This includes a mix of pervious and impervious areas that are not directly connected to the drainage system – eg: public open spaces, community buildings with soakwells or footpaths that drain to adjacent pervious areas). These areas are modelled

with reduced initial losses consistent with improved in-situ drainage and 2.9mm/hour continuing loss consistent with site soil conditions and the recommendations of ARR2019.

Rural pervious areas: This surface type is reserved for undeveloped rural parts of the site.

Subcatchments have been parameterised applying these rates and a summary of parameters applied in this study is presented in Table 5.

Table 6 provides the breakdown of surface types applied to land uses in modelling.

Drainage basin infiltration rates

Geotechnical investigations undertaken in 2006 by Douglas Partners reported that the unsaturated permeability of the sand was 43.2 m/day (Douglas Partners 2006).

For onsite underground infiltration cells and basins, a reduced rate of 10m/day has been applied consistent with recommended adjustment factors to allow for spatial variability (0.5) and clogging (0.5).

Model results

The InfoWorks ICM model was used to assess discharge flows and storage volumes for the 20%, and 1% AEPs storm events.

A summary of modelling results and the size of the respective stormwater systems are provided in Table 7 and presented in Figure 7.

The model indicates that a small amount of overland flow to the adjacent lot (823 Mandurah Road) may occur from underground storages adjacent to Woodbine Drive in a 1% AEP event. This offsite discharge could be prevented with the installation of approximately 20m³ additional above ground storage capacity.

No other offsite discharges from any location were predicted to occur in model simulations up to and including the 1% AEP event.

The predicted 1% AEP top water level in the Bell Park basin is 6.3m AHD.

Table 5: Summary of model parameters

Parameter	Unit	
Catchment roughness (Manning's N)		
Effective impervious areas (EIA)	-	0.025
Indirectly connected areas (ICA)	-	0.030
Rural/undeveloped land	-	0.035
Hydraulic roughness (Manning's N)		
Vegetated open swales/drains	-	0.040
Culverts and piped drainage	-	0.015
Initial Loss		
Effective impervious areas (EIA)	mm	2
Indirectly connected areas (ICA)	mm	25.2
Rural/undeveloped land	mm	31.1
Continuing loss		
Effective impervious areas (EIA)	mm/hr	0
Indirectly connected areas (ICA)	mm/hr	3.1
Rural/undeveloped land	mm/hr	3.1
Infiltration rates		
Underground infiltration systems, swales & basins	m/day	10

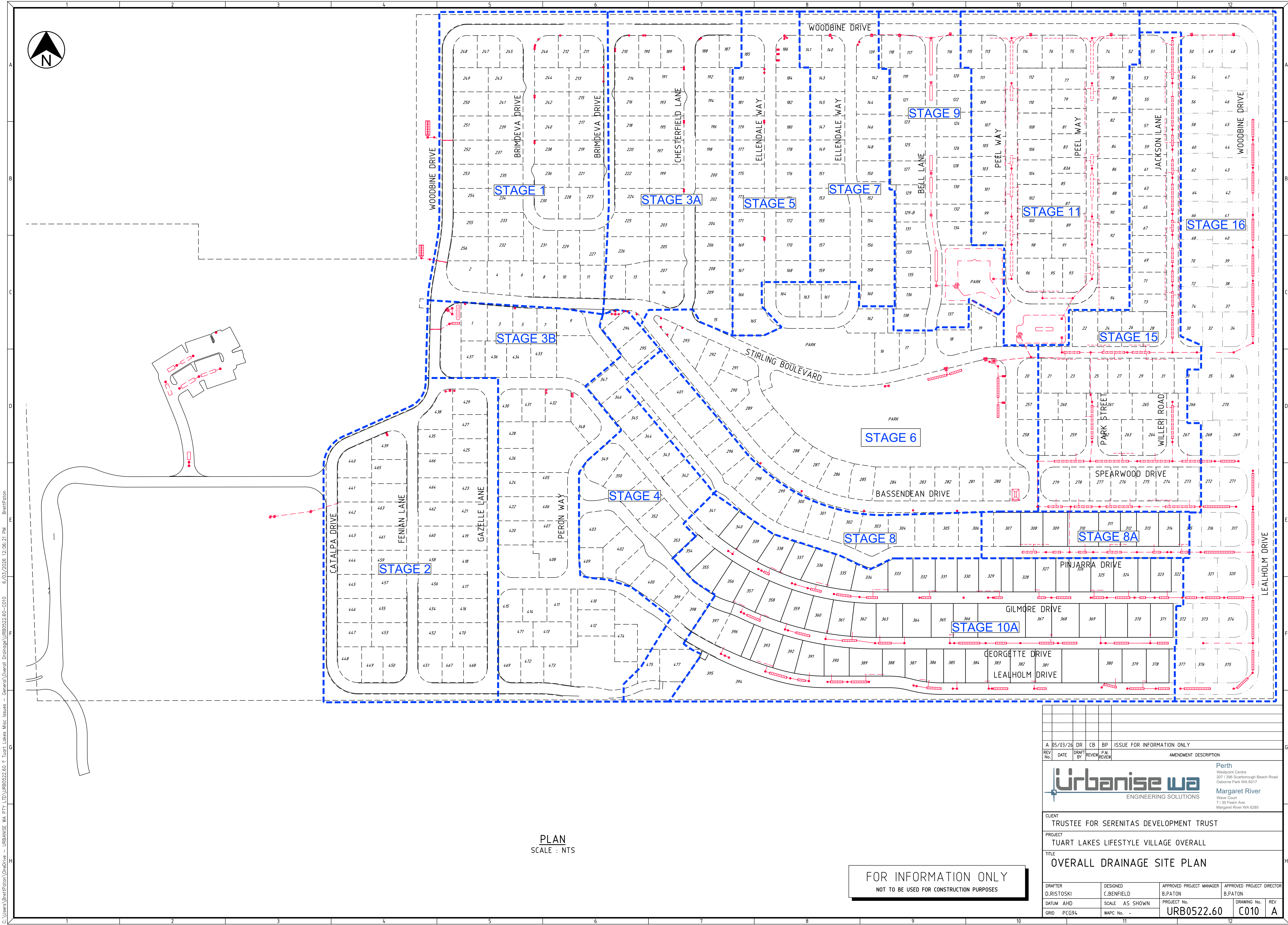
Table 6: Post development modelling parameters

Land use	EIA	ICA	Pervious	Comments
Residential lots	80%	20%	-	ICA includes garden areas only
Community hub	-	30%	70%	Assumes building includes soakwells
Roads	100%	-	-	
Open space areas	-	100%	-	

Table 7: Modelling results summary

Location	20% AEP	Critical duration	1% AEP	Critical duration
Bell Park basins	220	3 hours	1,233	3 hours
RV Park basin	6	6 hours	66	3 hours
Driveway swales	2	6 hours	100	6 hours
Underground storage systems	292	varies	776	varies
Total on-site storage volume (m ³)	520	varies	2,177	varies
Peak discharge flow from the study area (L/s)	0.0	-	0.71	1 hour

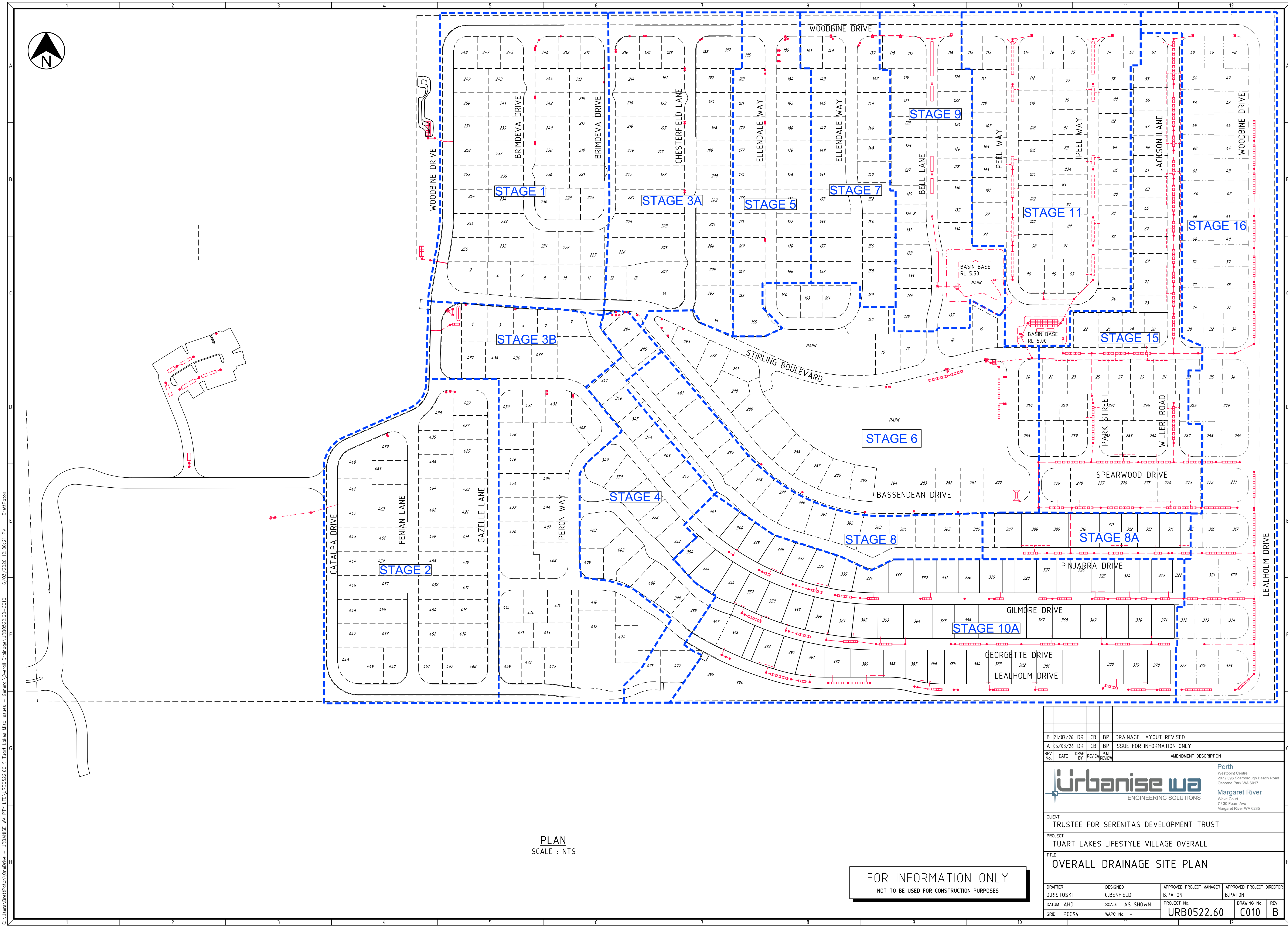
Appendix C Engineering drawings



PLAN
SCALE : NTS

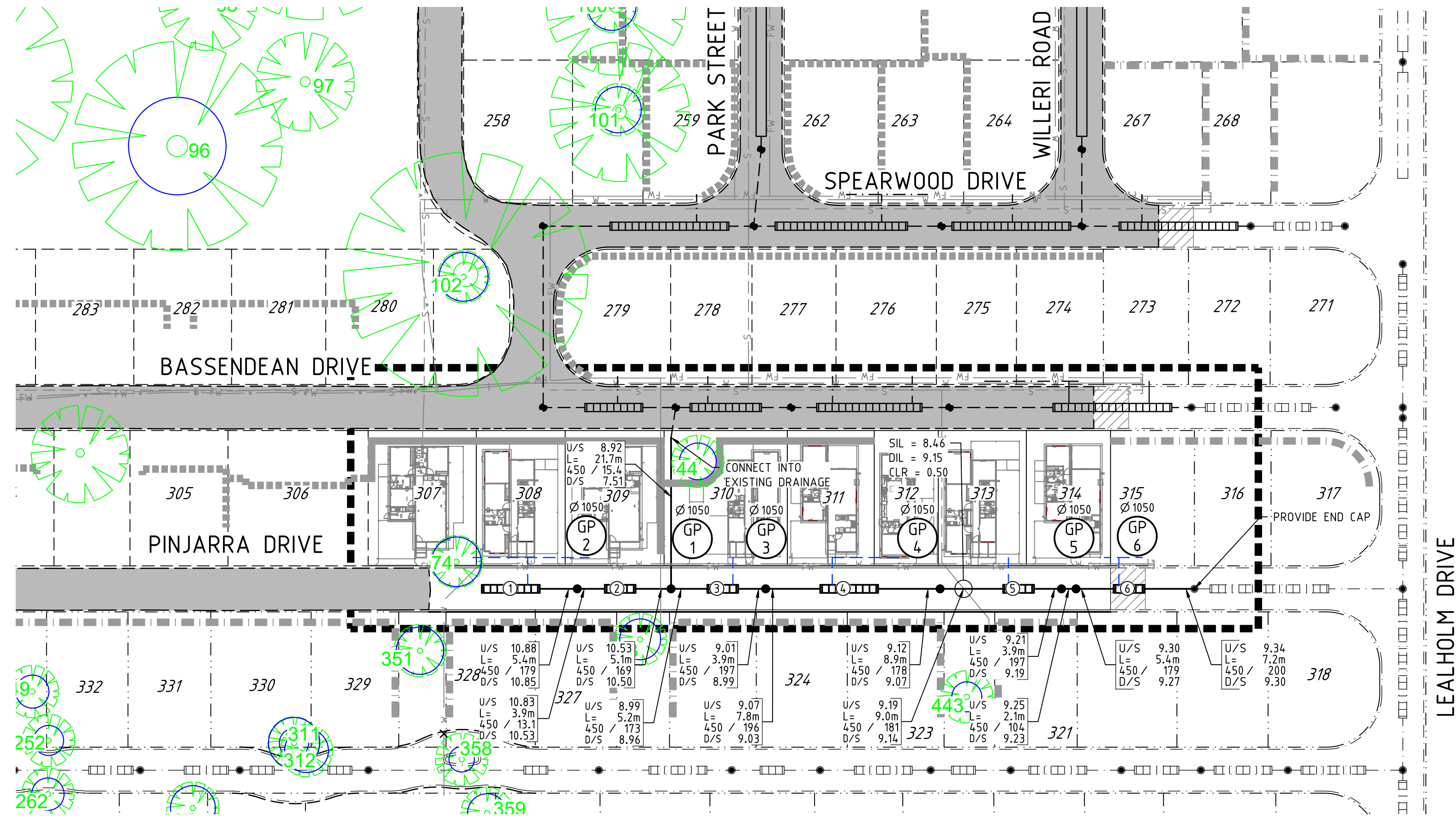
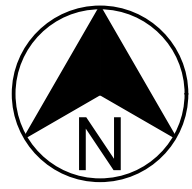
FOR INFORMATION ONLY
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FOR INFORMATION ONLY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

B	21/07/26	DR	CB	BP	DRAINAGE LAYOUT REVISED				
A	05/03/26	DR	CB	BP	ISSUE FOR INFORMATION ONLY				
REV No.	DATE	DRAFT BY	P.M. REVIEW	AMENDMENT DESCRIPTION					
					Perth Westpoint Centre 207 / 398 Scarborough Beach Road Osborne Park WA 6017				
					Margaret River Wave Court 7 / 30 Fane Ave Margaret River WA 6285				
CLIENT TRUSTEE FOR SERENITAS DEVELOPMENT TRUST									
PROJECT TUART LAKES LIFESTYLE VILLAGE OVERALL									
TITLE OVERALL DRAINAGE SITE PLAN									
DRAFTER D.RISTOSKI		DESIGNED C.BENFIELD			APPROVED PROJECT MANAGER B.PATON			APPROVED PROJECT DIRECTOR B.PATON	
DATUM AHD		SCALE AS SHOWN			PROJECT NO. URB0522.60			DRAWING No. C010	
GRID PCG94		WACP ..			..			B	



PLAN
SCALE 1:500

ECO Aid SET OUT DETAILS

ECO Aid CELL No.	ECO Aid TYPE	INVERT LEVEL	No. OF CELLS PLUS END CAPS
1	EC-1000	10.82	8
2	EC-1000	10.46	4
3	EC-1000	8.85	4
4	EC-1000	9.00	8
5	EC-1000	9.11	4
6	EC-1000	9.14	4

DRAINAGE NOTES:

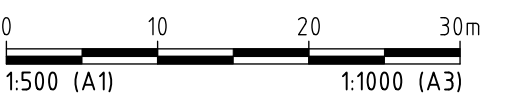
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CONTRACT DRAWINGS AND SPECIFICATION.
- THE CONSTRUCTION OF THE WORKS SHALL BE TO THE APPROVAL OF THE LOCAL AUTHORITY FOR ALL INTERNAL ROADS.
- ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE.
- ALL LEVELS SHALL BE DETERMINED FROM BENCHMARKS ESTABLISHED BY THE PROJECT SURVEYOR.
- DRAINAGE PIPE SHALL BE CLASS 2 UNLESS OTHERWISE NOTED.
- ALL TRENCHING, PIPE BEDDING AND BACKFILLING SHALL BE IN ACCORDANCE WITH AS3725.
- ALL JUNCTION PITS AND ENTRY PITS SHALL BE LOCATED AS SHOWN IRRESPECTIVE OF PIPE LENGTHS SHOWN ON THE DRAWINGS.
- AT LOW POINTS THE ENTRY PITS SHALL BE LOCATED AT THE LOW POINT OF THE ROAD PAVEMENT.
- THE JUNCTION PIT AND ENTRY PIT LIDS SHALL BE SET TO SUIT THE VERGE SLOPE, NOMINALLY 2% UPWARDS FROM THE TOP OF BACK OF KERB.
- WHERE A SEWER LINE INTERSECTS WITH STORMWATER DRAINAGE LINE AND THE SEWER PASSES OVER THE DRAIN THEN THE SEWER SHALL HAVE A TIMBER PILE AND KEEL PROVIDED FOR THE FULL EXTENT NECESSARY TO SUPPORT THE SEWER DURING EXCAVATION FOR THE DRAIN.
- THE CONTRACTOR SHALL LOCATE EXPOSE AND CONFIRM LEVELS OF EXISTING DRAINAGE AT CONNECTION POINTS PRIOR TO COMMENCEMENT OF WORKS.
- THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY DISCREPANCY OR CLASH WITH OTHER SERVICES TO THE SUPERINTENDENT.
- NO TREES SHALL BE REMOVED WITHOUT SUPERINTENDENT WRITTEN INSTRUCTIONS. REFER TO SPECIFICATIONS.
- IRRIGATION DUCTS TO BE DETERMINED ON SITE WITH SUPERINTENDENT.
- ALL KERBS SHALL BE MOUNTABLE KERBING U.N.O.
- ALL DRAINAGE PIPE CONNECTIONS TO BE CLOSED JOINTED WITH RUBBER RINGS.
- ALL DRAINAGE PITS TO BE $\phi 1.2m$ & MIN. 1.8m DEEP WITH A TRAPPED BASE UNLESS SHOWN OTHERWISE.

GENERAL LEGEND:

- EXTENT OF WORKS BOUNDARY
- EXISTING ROAD PAVEMENT
- PROPOSED ROAD PAVEMENT
- FUTURE ROAD PAVEMENT
- EXISTING RETAINING WALLS
- PROPOSED RETAINING WALLS
- FUTURE RETAINING WALLS
- TREE TAG NUMBER
- TREE TO BE RETAINED
- STRUCTURAL ROOT PROTECTION ZONE

DRAINAGE LEGEND:

- PROPOSED DRAINAGE PIPE
- EXISTING DRAINAGE
- FUTURE DRAINAGE
- PROPOSED ECO Aid STORMWATER AND INTERCONNECTING PIPEWORK REFER TO DRAWING URB0522.18-C901 FOR DETAILS
- PIT DIAMETER
- PIT TYPE
- PIT NUMBER
- GULLY PIT
- PROPOSED GULLY PIT
- UPSTREAM INVERT LEVEL
- PIPE DIA. / GRADE
- PIPE LENGTH (m)
- DOWNSTREAM INVERT LEVEL
- SEWER INVERT LEVEL
- DRAINAGE INVERT LEVEL
- CLEARANCE
- EXISTING / PROPOSED SEWER MAINS
- EXISTING SEWER PRESSURE MAIN
- EXISTING / PROPOSED WATER MAINS
- EXISTING / PROPOSED FIREWATER MAINS
- EXISTING / PROPOSED GAS MAINS
- DN150 PVC DRAINAGE PIPE CONNECTION INCLUDING TEE FITTING AND RISER TO BE 300mm ABOVE FINISHED EARTHWORKS LEVEL

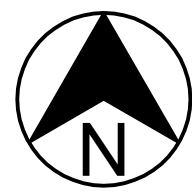


ISSUED FOR CONSTRUCTION

1	17/06/25	DR	CB	BP	MINOR AMENDMENTS
0	15/04/25	DR	CB	BP	ISSUED FOR CONSTRUCTION
REV No.	DATE	DRAWN BY	CHECKED BY	REVIEWED BY	AMENDMENT DESCRIPTION
Urbanise WA ENGINEERING SOLUTIONS Perth Westpoint Centre 207 / 398 Scarborough Beach Road Osborne Park WA 6017 Margaret River Wave Court 7 / 30 Fern Ave Margaret River WA 8285					
CLIENT TRUSTEE FOR SERENITAS DEVELOPMENT TRUST					
PROJECT TUART LAKES LIFESTYLE VILLAGE STAGE 8A					
TITLE STORMWATER DRAINAGE PLAN					
DRAFTER E.HYDE	DESIGNED C.BENFIELD	APPROVED PROJECT MANAGER B.PATON		APPROVED PROJECT DIRECTOR B.PATON	
DATUM AHD	SCALE AS SHOWN	PROJECT No. URB0522.18		DRAWING No. C350	REV 1
GRID PCG94	WAPC No. -				



THE LOCATION OF ALL EXISTING SERVICES SHOWN ON THIS DRAWING ARE APPROXIMATE ONLY.
NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THIS PLAN AND THE CONTRACTOR SHALL ENSURE THEY HAVE OBTAINED THE CURRENT BEFORE YOU DIG AUSTRALIA INFORMATION PRIOR TO COMMENCEMENT OF ALL BELOW GROUND WORKS.



CONTRACTOR TO INSTALL COMBINATION
SIDE ENTRY PIT AND 2 x Ø900 SOLID
SOAKWELLS WITH INTER CONNECTING (Ø300)
PIPEWORK DAMAGE TO EXISTING PAVEMENT TO
BE RECTIFIED TO ORIGINAL CONDITION

CONTRACTOR TO INSTALL COMBINATION
SIDE ENTRY PIT AND Ø900 SOLID
SOAKWELL WITH INTER CONNECTING (Ø300)
PIPEWORK DAMAGE TO EXISTING PAVEMENT TO
BE RECTIFIED TO ORIGINAL CONDITION

WOODBINE DRIVE

ELLENDALE WAY

PEEL WAY

PLAN
SCALE 1:500

NOTES:

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- ALL DRAINAGE PITS TO BE Ø1.2m & MIN. 1.8m DEEP WITH A TRAPPED BASE UNLESS SHOWN OTHERWISE.

GENERAL LEGEND:

- EXTENT OF WORKS BOUNDARY
- EXISTING TREES TO BE RETAINED
- EXISTING ROAD PAVEMENT
- PROPOSED ROAD PAVEMENT
- FUTURE ROAD PAVEMENT
- EXISTING RETAINING WALLS
- PROPOSED RETAINING WALLS
- FUTURE RETAINING WALLS

DRAINAGE LEGEND:

- PROPOSED DRAINAGE PIPE
- PROPOSED STORMTECH STORMWATER AND INTERCONNECTING PIPEWORK
- REFER TO DRAWING URB0522.06-C901 FOR DETAILS
- PIT DIAMETER
- PIT TYPE
- PIT NUMBER
- SW
- CSP
- GP
- BU
- PROPOSED SOAKWELL PIT
- PROPOSED COMBINATION SIDE ENTRY PIT
- PROPOSED GULLY PIT
- PROPOSED BUBBLE UP PIT - WITH MORTARED STONE PITCHING
- EXISTING / FUTURE DRAINAGE PIT
- DENOTES GUTTER FLOW DIRECTION
- UPSTREAM INVERT LEVEL
- PIPE DIA. / GRADE
- PIPE LENGTH (m)
- DOWNSIDE INVERT LEVEL
- SEWER INVERT LEVEL
- DRAINAGE INVERT LEVEL
- EXISTING / PROPOSED SEWER MAINS
- EXISTING SEWER PRESSURE MAIN
- EXISTING / PROPOSED WATER MAINS
- EXISTING / PROPOSED FIREWATER MAINS
- EXISTING / PROPOSED COMMUNICATIONS CONDUITS
- EXISTING UNDERGROUND POWER CONDUITS
- EXISTING HIGH VOLTAGE POWER CONDUITS
- EXISTING / PROPOSED GAS MAINS

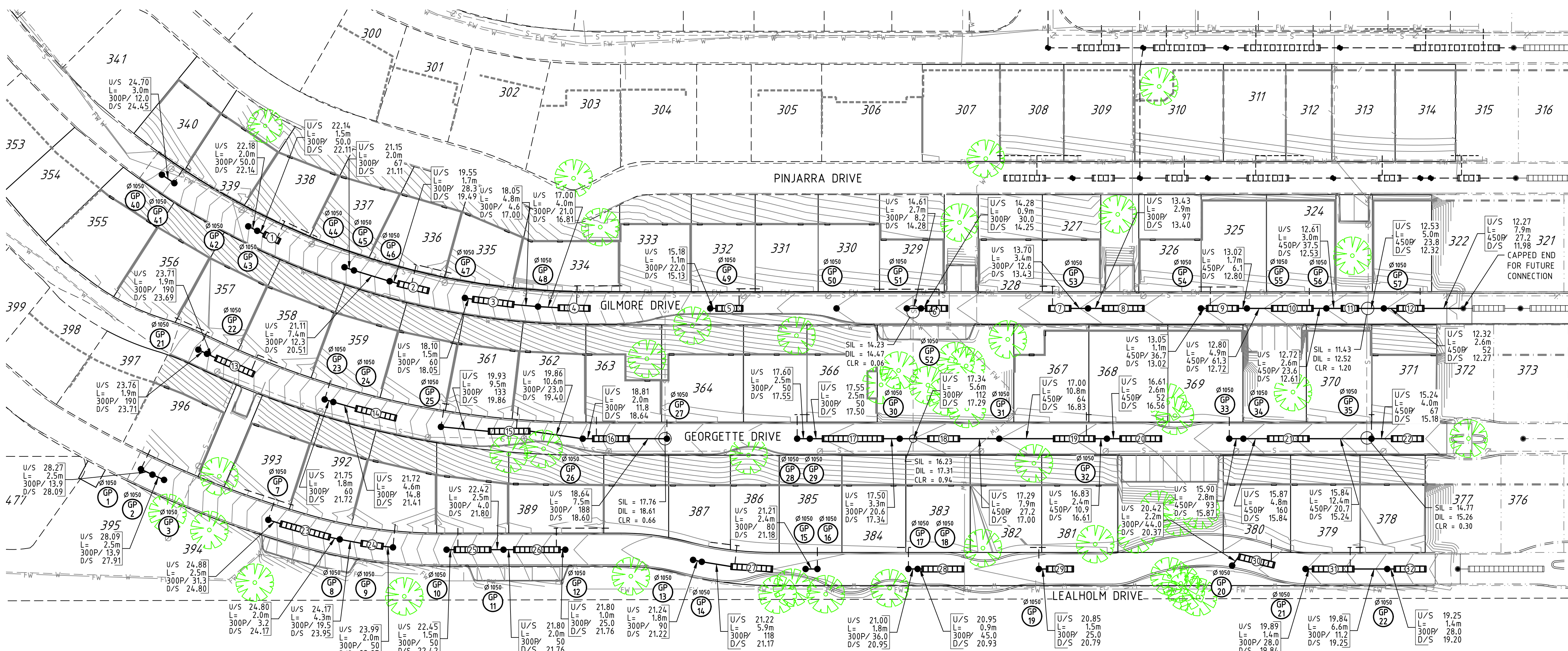
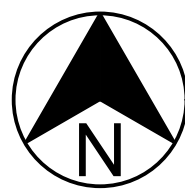
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1:500 (A1) HORIZONTAL 1:1000 (A3)

ISSUED FOR CONSTRUCTION

1	19/08/20	FL	FL	BP	CADASTRAL REVISED TO NEW HOME LAYOUT
0	24/07/20	FL	FL	BP	ISSUED FOR CONSTRUCTION
A	16/10/19	FL	FL	BP	ISSUED FOR TENDER
REV	DATE	DRAFT	DESIGN	APP'D	CHECK/REVIEW P.DIR.
AMENDMENT DESCRIPTION					
CLIENT					
TRUSTEE FOR SERENITAS DEVELOPMENT TRUST					
PROJECT					
TUART LAKES LIFESTYLE VILLAGE STAGE 9					
TITLE					
STORMWATER DRAINAGE PLAN					
DRAFTER	DRAFTING CHECK	REVIEWED	PROJECT MANAGER	APPROVED	PROJECT DIRECTOR
D.BULLINGHAM	B.PATON	24/07/2020	F.LOMBARDO	B.PATON	24/07/2020
DESIGNED	DESIGN REVIEW				
S.KENNEDY	F.LOMBARDO				
DATUM	AHD	SCALE	1:500	PROJECT No.	DRAWING No.
GRID	PCG94	WAPC No.	-	URB0522.06	C351
				REV	1



ALL COORDINATES SHOWN ON THIS DRAWING SHALL
BE VERIFIED BY CONTRACTOR PRIOR TO
COMMENCEMENT OF WORKS. ANY DISCREPANCIES TO
BE REPORTED TO THE ENGINEER IMMEDIATELY.



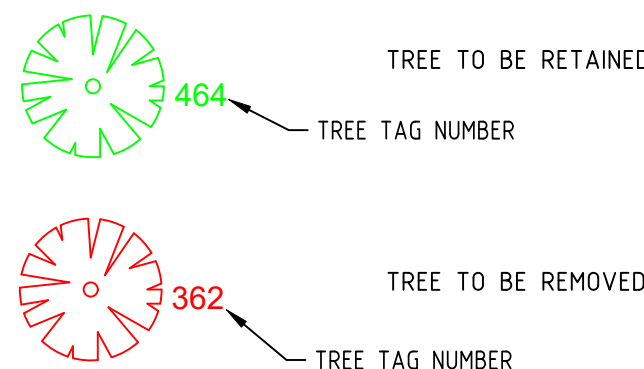
PLAN
SCALE 1:500

DRAINAGE NOTES:

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- ALL DRAINAGE PITS TO BE Ø1.2m & MIN. 1.8m DEEP WITH A TRAPPED BASE UNLESS SHOWN OTHERWISE.

GENERAL LEGEND:

	EXISTING ROAD PAVEMENT
	PROPOSED ROAD PAVEMENT
	FUTURE ROAD PAVEMENT
	EXISTING RETAINING WALLS
	PROPOSED RETAINING WALLS
	FUTURE RETAINING WALLS
	DESIGN CONTOURS (0.25m INTERVAL)



DRAINAGE LEGEND:

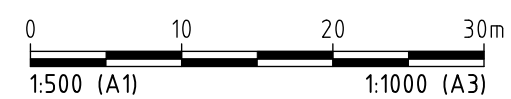
	PROPOSED DRAINAGE PIPE
	PROPOSED ECOAID STORMWATER WITH END CAPS AND INTERCONNECTING PIPEWORK. REFER TO DRAWING URB0522.19A-C901 FOR DETAILS
	DN150 PVC DRAINAGE PIPE CONNECTION INCLUDING TEE FITTING AND RISER TO BE 300mm ABOVE FINISHED EARTHWORKS LEVEL
	EXISTING DRAINAGE
	FUTURE DRAINAGE
	PIT DIAMETER
	PIT TYPE
	PIT NUMBER
	GULLY PIT
	PROPOSED GULLY PIT
	UPSTREAM INVERT LEVEL
	PIPE LENGTH (m)
	PIPE DIA. / GRADE
	DOWNSTREAM INVERT LEVEL
	SEWER INVERT LEVEL
	DRAINAGE INVERT LEVEL
	CLEARANCE (m)
	EXISTING / PROPOSED SEWER MAINS
	EXISTING SEWER PRESSURE MAIN
	EXISTING / PROPOSED WATER MAINS
	EXISTING / PROPOSED FIREWATER MAINS
	EXISTING / PROPOSED GAS MAINS

ECO Aid SET OUT DETAILS

ECO Aid CELL No.	ECO Aid TYPE	INVERT LEVEL	No. OF CELLS PLUS END CAPS
1	EC-1000	22.01	3
2	EC-1000	19.39	6
3	EC-1000	17.95	8
4	EC-1000	16.71	6
5	EC-1000	15.03	5
6	EC-1000	14.05	4
7	EC-1000	13.60	4
8	EC-1000	13.30	8
9	EC-1000	12.92	6
10	EC-1000	12.62	8
11	EC-1000	12.43	3
12	EC-1000	12.17	5
13	EC-1000	23.59	8
14	EC-1000	21.31	8
15	EC-1000	19.76	8
16	EC-1000	18.54	7
17	EC-1000	17.40	12
18	EC-1000	17.19	6
19	EC-1000	16.73	8
20	EC-1000	16.46	8
21	EC-1000	15.74	8
22	EC-1000	15.08	6
23	EC-1000	24.70	10
24	EC-1000	23.85	4
25	EC-1000	22.32	7
26	EC-1000	21.66	9
27	EC-1000	21.07	8
28	EC-1000	20.83	8
29	EC-1000	20.69	5
30	EC-1000	20.27	7
31	EC-1000	19.74	8
32	EC-1000	19.10	6

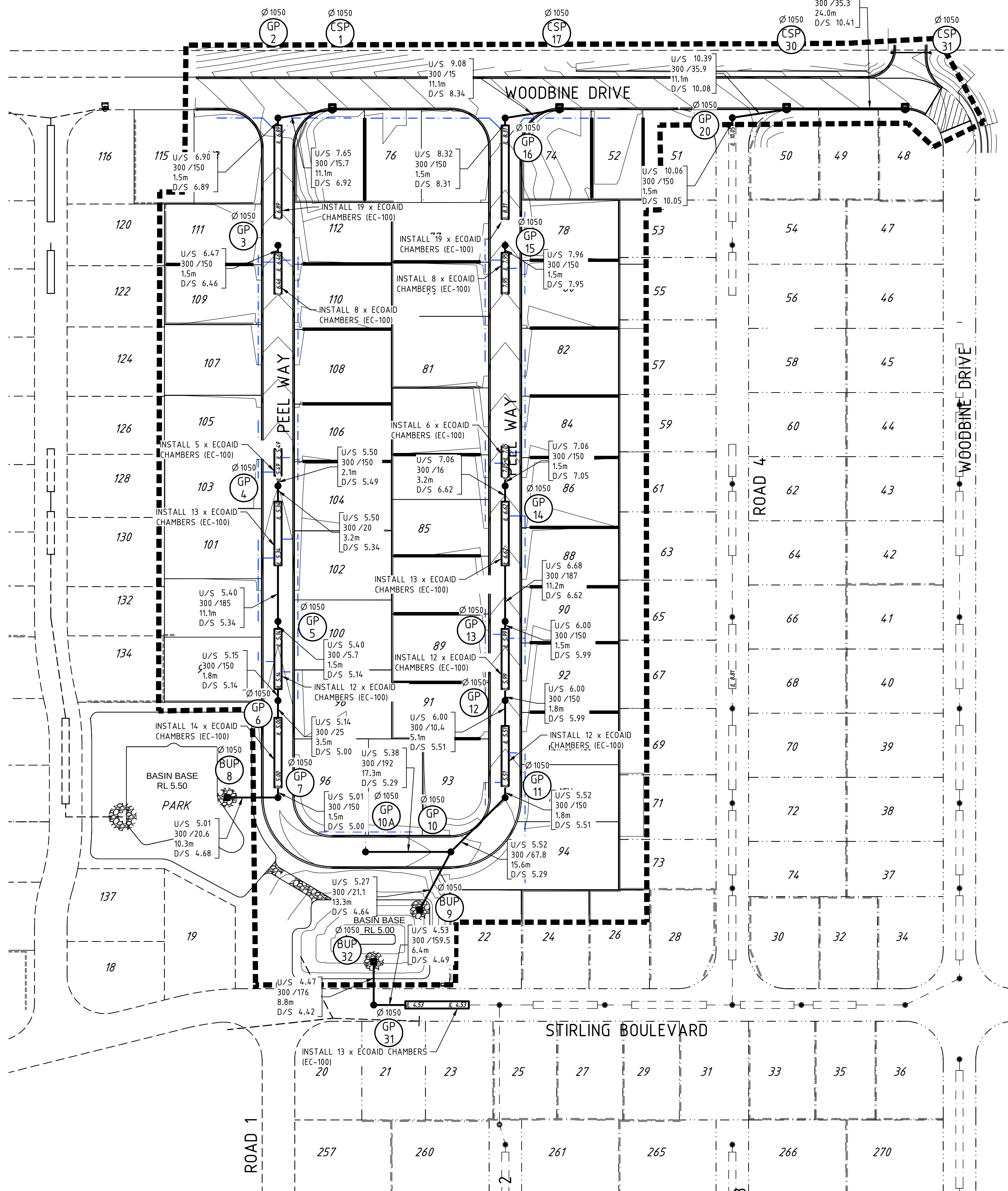
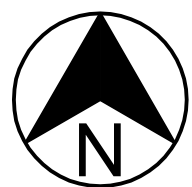
NOTE:

THIS PLAN SHALL BE READ IN CONJUNCTION WITH DRAWING URB0522.19-C051 FOR LOCATION AND EXTENT OF HAND EXCAVATION / HORIZONTAL BORING.



ISSUED FOR CONSTRUCTION

2	13/02/26	DR	CB	BP	PLAN VIEW AMENDED
1	22/01/26	DR	CB	BP	GP12 & GP13 AMENDED TO SUIT TREE REMOVAL
0	17/12/25	DR	CB	BP	ISSUED FOR CONSTRUCTION
REV No.	DATE	DRAWN BY	CHECKED BY	REVIEWED BY	AMENDMENT DESCRIPTION
Perth Westpoint Centre 207 / 398 Scarborough Beach Road Osborne Park WA 6017 Margaret River Wave Court 7 / 30 Fern Ave Margaret River WA 8265					
CLIENT TRUSTEE FOR SERENITAS DEVELOPMENT TRUST					
PROJECT TUART LAKES LIFESTYLE VILLAGE STAGE 10A					
TITLE STORMWATER DRAINAGE PLAN					
DRAFTER D.RISTOSKI	DESIGNED C.BENFIELD	APPROVED PROJECT MANAGER B.PATON		APPROVED PROJECT DIRECTOR B.PATON	
DATUM AHD	SCALE AS SHOWN	PROJECT No. URB0522.19A		DRAWING No. C350	REV 2
GRID PCG94	WAPC No. -				



PLAN
SCALE 1:500

GENERAL LEGEND:

- EXTENT OF WORKS BOUNDARY
- EXISTING ROAD PAVEMENT
- PROPOSED ROAD PAVEMENT
- FUTURE ROAD PAVEMENT

DRAINAGE LEGEND:

- PROPOSED DRAINAGE PIPE
- PROPOSED ECOAID (EC-100) STORMWATER AND INTERCONNECTING PIPEWORK
REFER TO DRAWING URB0522.11-C901 FOR DETAILS
- PIT DIAMETER
- PIT TYPE
- PIT NUMBER
- COMBINATION SIDE ENTRY PIT
- GULLY PIT
- BUBBLE UP PIT
- PROPOSED SOAKWELL PIT
- PROPOSED COMBINATION SIDE ENTRY PIT
- PROPOSED GULLY PIT
- PROPOSED BUBBLE UP PIT - WITH MORTARED STONE PITCHING
- EXISTING / FUTURE DRAINAGE PIT
- DENOTES GUTTER FLOW DIRECTION
- UPSTREAM INVERT LEVEL
PIPE DIA. / GRADE
PIPE LENGTH (m)
DOWNSTREAM INVERT LEVEL
- SEWER INVERT LEVEL
DRAINAGE INVERT LEVEL
- EXISTING / PROPOSED SEWER MAINS
EXISTING SEWER PRESSURE MAIN
- EXISTING / PROPOSED WATER MAINS
- EXISTING / PROPOSED FIREWATER MAINS
- EXISTING / PROPOSED GAS MAINS
- DN150 PVC DRAINAGE PIPE CONNECTION INCLUDING TEE FITTING AND RISER TO BE 300mm ABOVE FINISHED EARTHWORKS LEVEL

NOTES:

- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CONTRACT DRAWINGS AND SPECIFICATION.
- THE CONSTRUCTION OF THE WORKS SHALL BE TO THE APPROVAL OF THE LOCAL AUTHORITY FOR ALL INTERNAL ROADS.
- ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE.
- ALL LEVELS SHALL BE DETERMINED FROM BENCHMARKS ESTABLISHED BY THE PROJECT SURVEYOR.
- DRAINAGE PIPE SHALL BE CLASS 2 UNLESS OTHERWISE NOTED.
- ALL TRENCHING, PIPE BEDDING AND BACKFILLING SHALL BE IN ACCORDANCE WITH AS3725.
- ALL JUNCTION PITS AND ENTRY PITS SHALL BE LOCATED AS SHOWN IRRESPECTIVE OF PIPE LENGTHS SHOWN ON THE DRAWINGS.
- AT LOW POINTS THE ENTRY PITS SHALL BE LOCATED AT THE LOW POINT OF THE ROAD PAVEMENT.
- THE JUNCTION PIT AND ENTRY PIT LIDS SHALL BE SET TO SUIT THE VERGE SLOPE, NOMINALLY 2% UPWARDS FROM THE TOP OF BACK OF KERB.
- WHERE A SEWER LINE INTERSECTS WITH STORMWATER DRAINAGE LINE AND THE SEWER PASSES OVER THE DRAIN THEN THE SEWER SHALL HAVE A TIMBER PILE AND KEEL PROVIDED FOR THE FULL EXTENT NECESSARY TO SUPPORT THE SEWER DURING EXCAVATION FOR THE DRAIN.
- THE CONTRACTOR SHALL LOCATE EXPOSE AND CONFIRM LEVELS OF EXISTING DRAINAGE AT CONNECTION POINTS PRIOR TO COMMENCEMENT OF WORKS.
- THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY DISCREPANCY OR CLASH WITH OTHER SERVICES TO THE SUPERINTENDENT.
- NO TREES SHALL BE REMOVED WITHOUT SUPERINTENDENT WRITTEN INSTRUCTIONS. REFER TO SPECIFICATIONS.
- IRRIGATION DUCTS TO BE DETERMINED ON SITE WITH SUPERINTENDENT.
- ALL KERBS SHALL BE MOUNTABLE KERBING U.N.O.
- ALL DRAINAGE PIPE CONNECTIONS TO BE CLOSED JOINTED WITH RUBBER RINGS.
- ALL DRAINAGE PITS TO BE Ø1.2m & MIN. 1.8m DEEP WITH A TRAPPED BASE UNLESS SHOWN OTHERWISE.



ISSUED FOR CONSTRUCTION

1	05/09/23	EH	CB	BP	DRAINAGE CHAMBERS UPDATED
0	25/08/23	EH	CB	BP	ISSUED FOR CONSTRUCTION
REV No.	DATE	DRAWN BY	CHECKED BY	REVIEWED BY	AMENDMENT DESCRIPTION
Urbanise WA ENGINEERING SOLUTIONS Perth Westpoint Centre 207 / 398 Scarborough Beach Road Osborne Park WA 6017 Margaret River Wave Court Unit 7 / 30 Fern Avenue Margaret River WA 8265					
CLIENT TRUSTEE FOR SERENITAS DEVELOPMENT TRUST					
PROJECT TUART LAKES LIFESTYLE VILLAGE STAGE 11 & 13					
TITLE STORMWATER DRAINAGE PLAN					
DRAFTER E.HYDE	DESIGNED C.BENFIELD	APPROVED PROJECT MANAGER B.PATON		APPROVED PROJECT DIRECTOR B.PATON	
DATUM AHD	SCALE 1:500	PROJECT No. URB0522.11		DRAWING No. C350	REV 1
GRID PCG94	WAPC No. -				





DRAINAGE AND SEWER CLEARANCES

POINT No.	DIL	SIL	CLEAR
1	9.05	7.53	1.32
2	8.90	7.46	1.24
CLEAR = DIFF INV'S - PIPE Ø - 0.05			

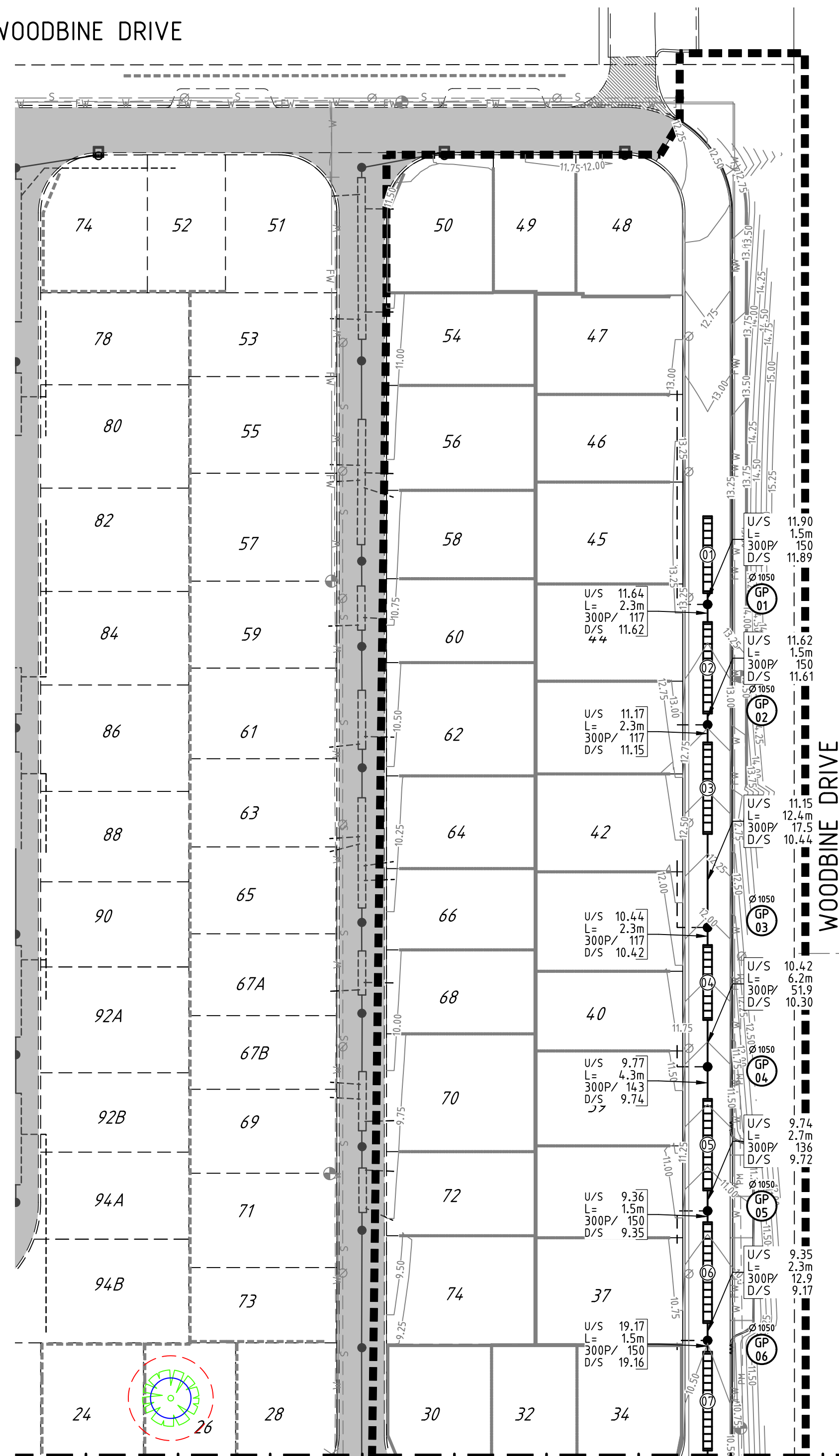
ECO Aid SET OUT DETAILS

ECO Aid CELL No.	ECO Aid TYPE	INVERT LEVEL	No. OF CELLS PLUS END CAPS
1	EC-1000	11.80	10
2	EC-1000	11.52	12
3	EC-1000	11.05	12
4	EC-1000	10.32	10
5	EC-1000	9.64	12
6	EC-1000	9.25	13
7	EC-1000	9.06	13
8	EC-1000	8.97	8
9	EC-1000	9.28	13
10	EC-1000	7.46	15
11	EC-1000	9.29	19
12	EC-1000	9.49	17
13	EC-1000	9.78	17
14	EC-1000	11.87	6
15	EC-1000	11.71	8
16	EC-1000	11.56	9
17	EC-1000	11.62	18
18	EC-1000	14.27	11
19	EC-1000	15.87	8
20	EC-1000	17.82	15

DRAINAGE NOTES:

- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CONTRACT DRAWINGS AND SPECIFICATION.
- THE CONSTRUCTION OF THE WORKS SHALL BE TO THE APPROVAL OF THE LOCAL AUTHORITY FOR ALL INTERNAL ROADS.
- ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE.
- ALL LEVELS SHALL BE DETERMINED FROM BENCHMARKS ESTABLISHED BY THE PROJECT SURVEYOR.
- DRAINAGE PIPE SHALL BE CLASS 2 UNLESS OTHERWISE NOTED.
- ALL TRENCHING, PIPE BEDDING AND BACKFILLING SHALL BE IN ACCORDANCE WITH AS3725.
- ALL JUNCTION PITS AND ENTRY PITS SHALL BE LOCATED AS SHOWN IRRESPECTIVE OF PIPE LENGTHS SHOWN ON THE DRAWINGS.
- AT LOW POINTS THE ENTRY PITS SHALL BE LOCATED AT THE LOW POINT OF THE ROAD PAVEMENT.
- THE JUNCTION PIT AND ENTRY PIT LIDS SHALL BE SET TO SUIT THE ROAD CROSSFALL, NOMINALLY 2% UPWARDS FROM THE TOP OF BACK OF KERB.
- WHERE A SEWER LINE INTERSECTS WITH STORMWATER DRAINAGE LINE AND THE SEWER PASSES OVER THE DRAIN THEN THE SEWER SHALL HAVE A TIMBER PILE AND KEEL PROVIDED FOR THE FULL EXTENT NECESSARY TO SUPPORT THE SEWER DURING EXCAVATION FOR THE DRAIN.
- THE CONTRACTOR SHALL LOCATE EXPOSE AND CONFIRM LEVELS OF EXISTING DRAINAGE AT CONNECTION POINTS PRIOR TO COMMENCEMENT OF WORKS.
- THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY DISCREPANCY OR CLASH WITH OTHER SERVICES TO THE SUPERINTENDENT.
- NO TREES SHALL BE REMOVED WITHOUT SUPERINTENDENT WRITTEN INSTRUCTIONS. REFER TO SPECIFICATIONS.
- IRRIGATION DUCTS TO BE DETERMINED ON SITE WITH SUPERINTENDENT.
- ALL KERBS SHALL BE MOUNTABLE KERBING U.N.O.
- ALL DRAINAGE PIPE CONNECTIONS TO BE CLOSED JOINTED WITH RUBBER RINGS.
- ALL DRAINAGE PITS TO BE Ø1.2m & MIN. 1.8m DEEP WITH A TRAPPED BASE UNLESS SHOWN OTHERWISE.

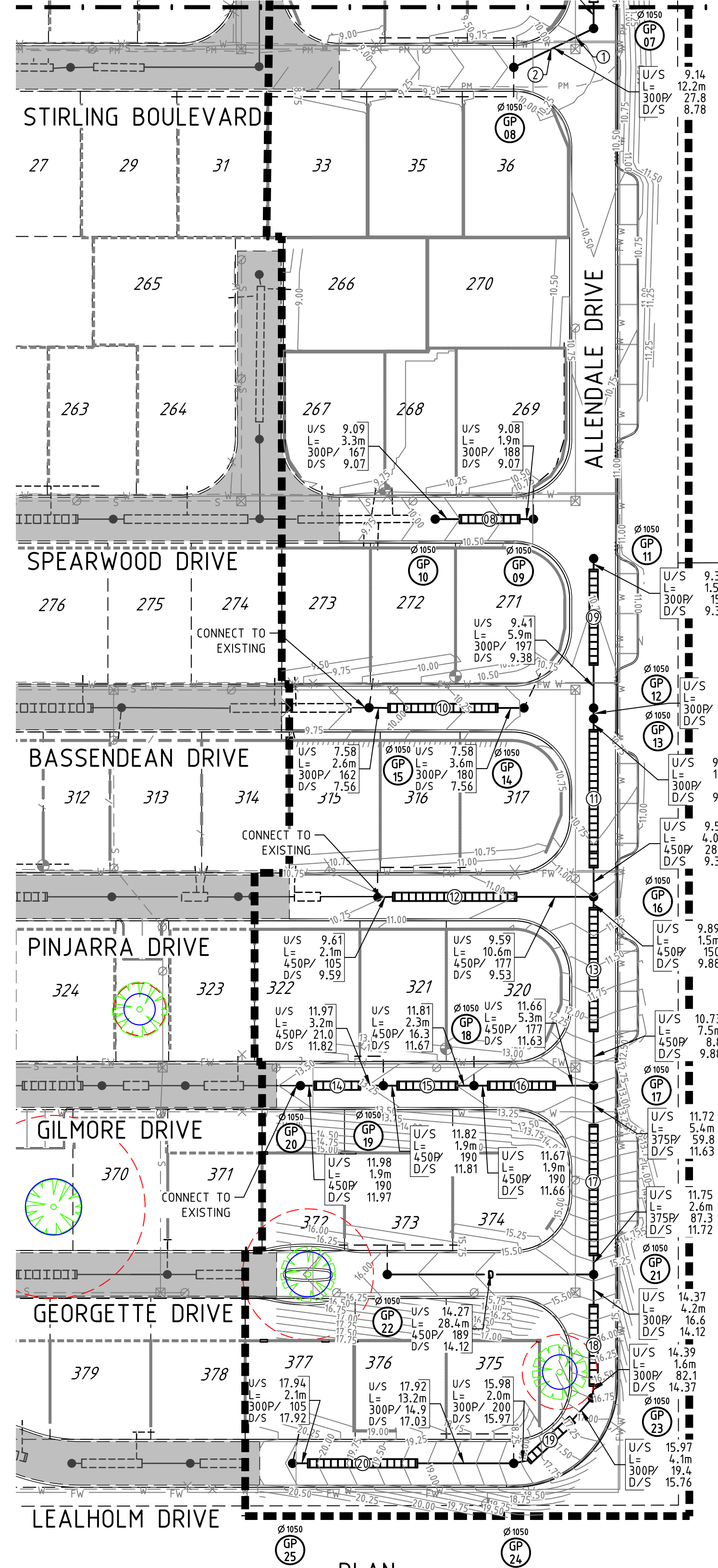
WOODBINE DRIVE



MATCHLINE A-A REFER RIGHT

PLAN
SCALE 1:500

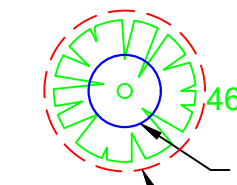
MATCHLINE A-A REFER LEFT



PLAN
SCALE 1:500

GENERAL LEGEND:

	EXISTING ROAD PAVEMENT
	PROPOSED ROAD PAVEMENT
	FUTURE ROAD PAVEMENT
	EXISTING RETAINING WALLS
	PROPOSED RETAINING WALLS
	FUTURE RETAINING WALLS
	DESIGN CONTOURS (0.25m INTERVAL)



TREE TO BE RETAINED
TREE TAG NUMBER
STRUCTURAL ROOT ZONE (SRZ BLUE)
TREE PROTECTION ZONE (TPZ RED)

DRAINAGE LEGEND:

	PROPOSED DRAINAGE PIPE
	PROPOSED ECO Aid STORMWATER WITH END CAPS AND INTERCONNECTING PIPEWORK. REFER TO DRAWING URB0522.16-C901 FOR DETAILS
	DN150 PVC DRAINAGE PIPE CONNECTION INCLUDING TEE FITTING AND RISER TO BE 300mm ABOVE FINISHED EARTHWORKS LEVEL
	EXISTING DRAINAGE
	FUTURE DRAINAGE
	PIT DIAMETER PIT TYPE PIT NUMBER
	GULLY PIT
	PROPOSED GULLY PIT
	UPSTREAM INVERT LEVEL PIPE LENGTH (m) PIPE DIA. / GRADE DOWNSTREAM INVERT LEVEL
	DRAINAGE/SEWER CROSSING POINT REFER CLEARANCE TABLE
	EXISTING / PROPOSED SEWER MAINS EXISTING SEWER PRESSURE MAIN
	EXISTING / PROPOSED WATER MAINS
	EXISTING / PROPOSED FIREWATER MAINS

0 10 20 30m
1:500 (A1) 1:1000 (A3)

ISSUED FOR TENDER
NOT TO BE USED FOR CONSTRUCTION PURPOSES

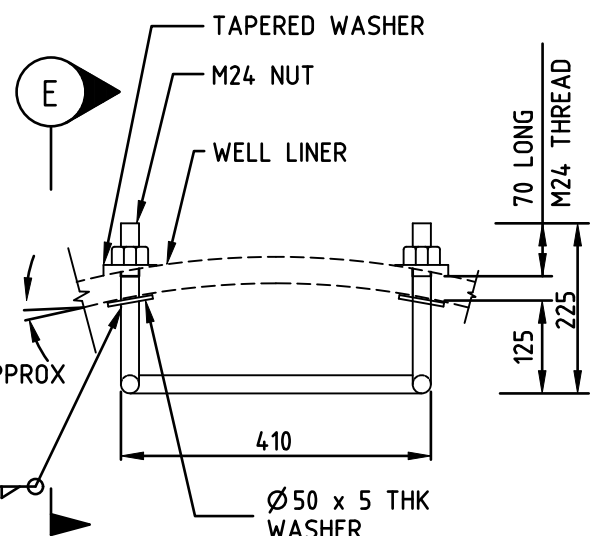
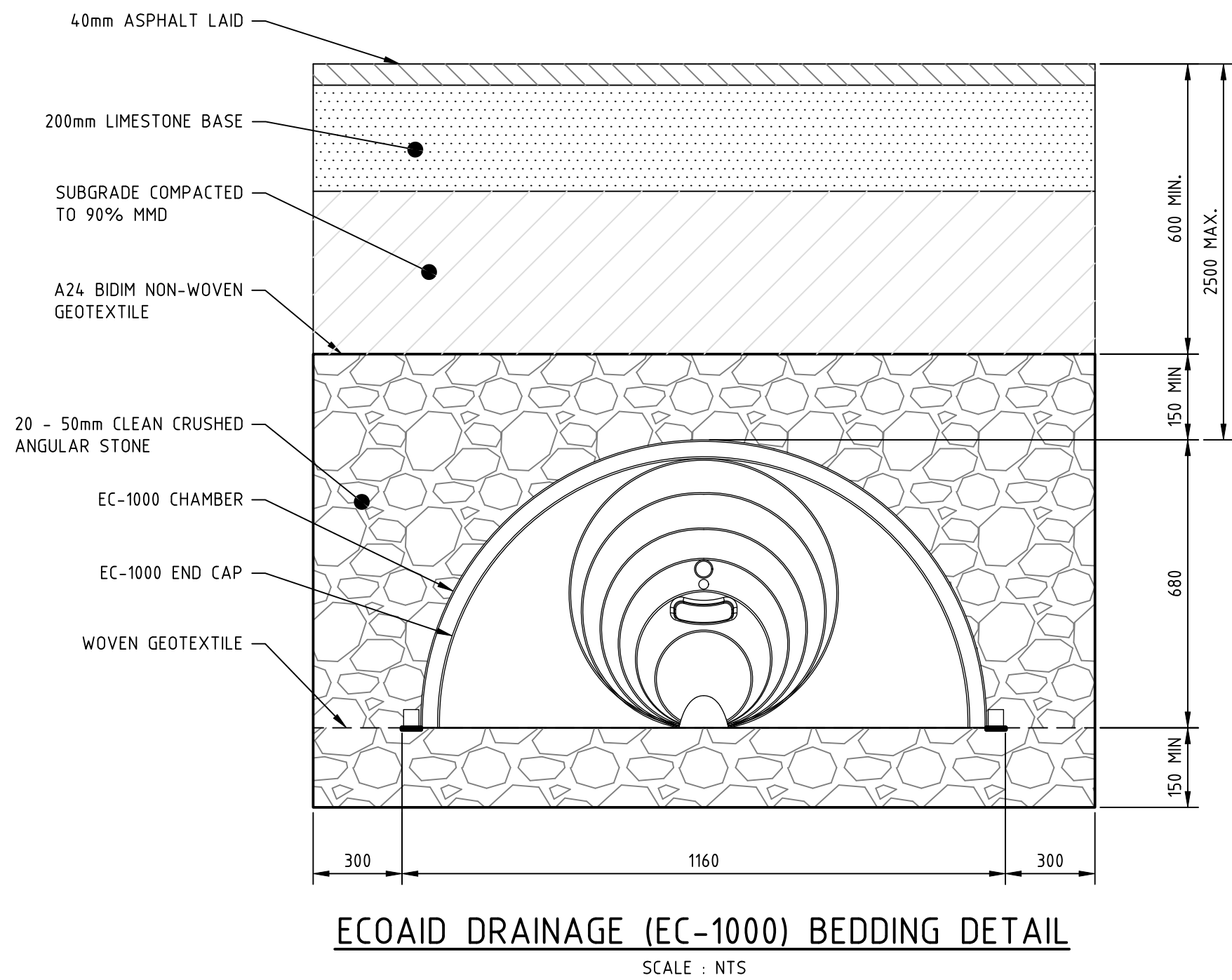
NOTE:

THIS PLAN SHALL BE READ IN CONJUNCTION WITH DRAWING URB0522.16-C051 FOR LOCATION AND EXTENT OF HAND EXCAVATION / HORIZONTAL BORING.

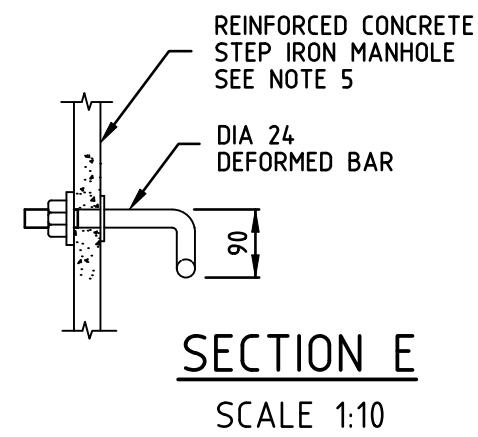
REV	No.	DATE	BY	REVIEW	AMENDMENT DESCRIPTION
C	18/05/26	DR	CB	BP	RE-ISSUED FOR TENDER
B	06/05/26	DR	CB	BP	ISSUED FOR TENDER
A	15/04/26	ZS	CB	BP	ISSUED FOR CLIENT REVIEW
Perth Westpoint Centre 207 / 398 Scarborough Beach Road Osborne Park WA 6017 Margaret River Wave Court 7 / 30 Fern Ave Margaret River WA 8285					
CLIENT TRUSTEE FOR SERENITAS DEVELOPMENT TRUST					
PROJECT TUART LAKES LIFESTYLE VILLAGE STAGE 16					
TITLE STORMWATER DRAINAGE PLAN					
DRAFTER	DESIGNED	APPROVED PROJECT MANAGER	APPROVED PROJECT DIRECTOR		
Z.SABATINO	C.BENFIELD	B.PATON	B.PATON		
DATUM	AHD	SCALE	AS SHOWN	PROJECT No.	DRAWING No.
GRID	PCG94	WAPC No.	-	URB0522.16	C350
				REV	C

C:\Users\DarkoRistovski\URBANISE WA PTY LTD\URB052218 - Tuart Lakes Stage 8A - General Deliverables\DWG\URB052218-C901

15/04/2025 11:47:36 AM DarkoRistovski



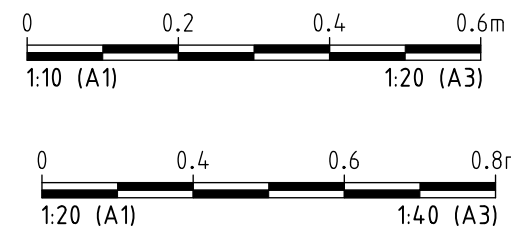
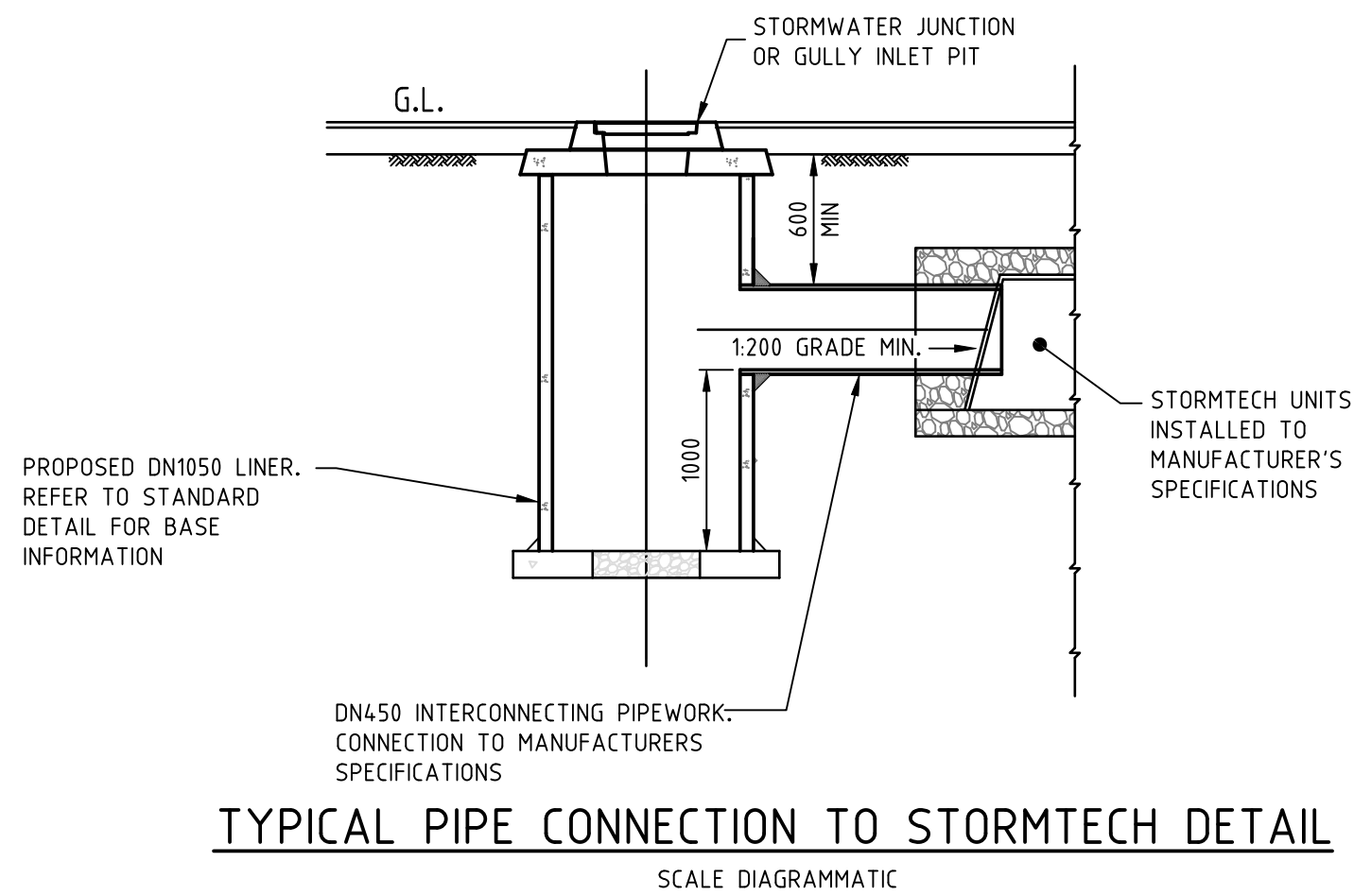
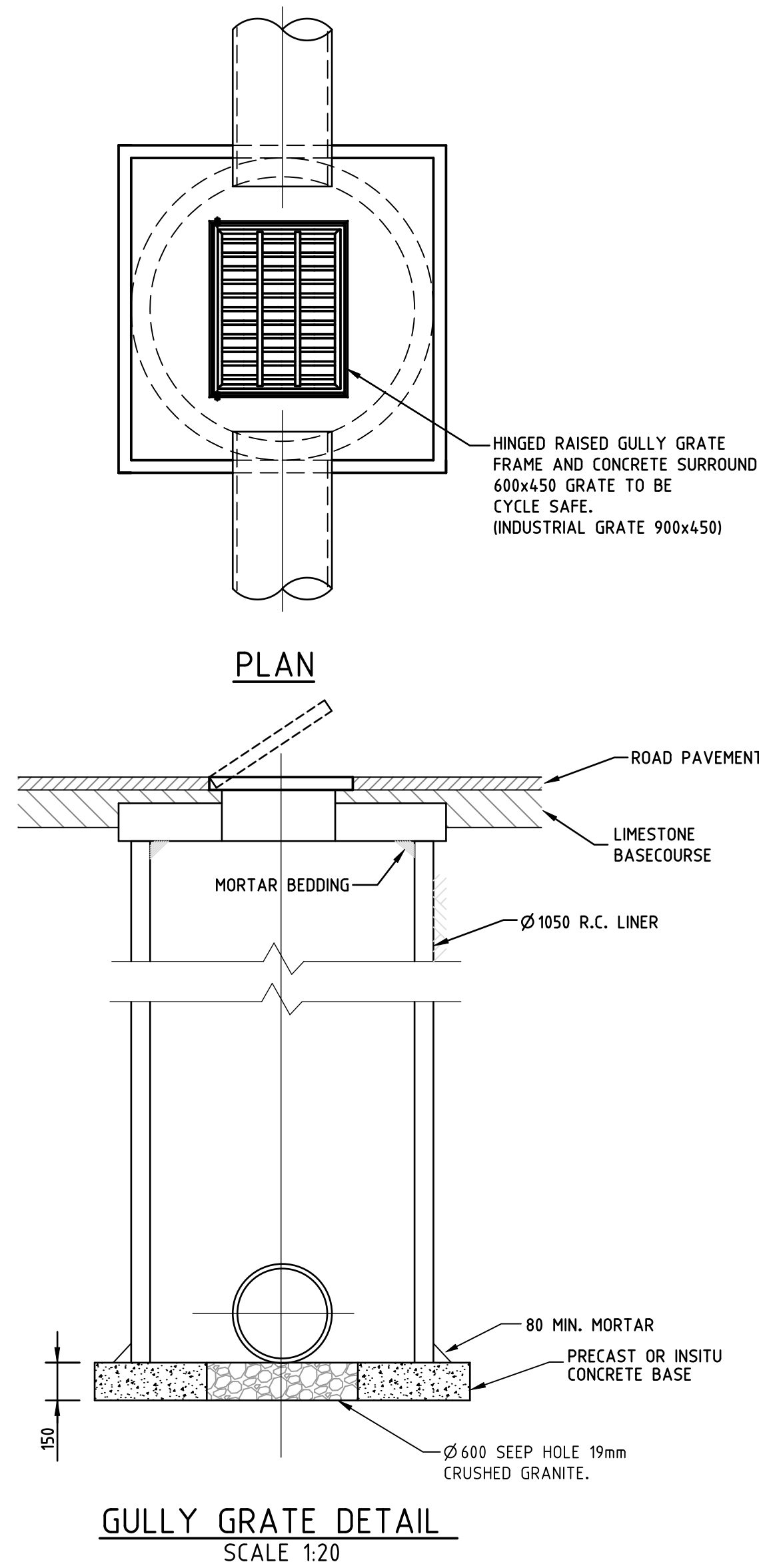
PLAN - STEP IRON TO
CONCRETE WELL LINER
SCALE 1:10



SECTION E
SCALE 1:10

STEP IRON NOTES

1. STEP IRONS NOT REQUIRED IN GULLIES WITH A LINER OF DEPTH 1200mm OR LESS
2. STANDARD GALVANIZED STEP IRONS TO BE USED WHEN THE DISTANCE BETWEEN THE MANHOLE BASE AND FINISHED GROUND LEVEL EXCEEDS 1.0m .
3. ALL COMPONENTS TO BE DESIGNED TO ACCEPT A14 LOADING NAASRA STANDARD.
4. ALL BASES TO BE BEDDED ON FIRM NATURAL OR COMPACTED SAND.
5. MORTAR SHALL BE 3:1 SAND:CEMENT MIXTURE.
6. MANHOLE SHALL BE INTERLOCKING JOINT EQUIVALENT TO CLASS S PIPE.



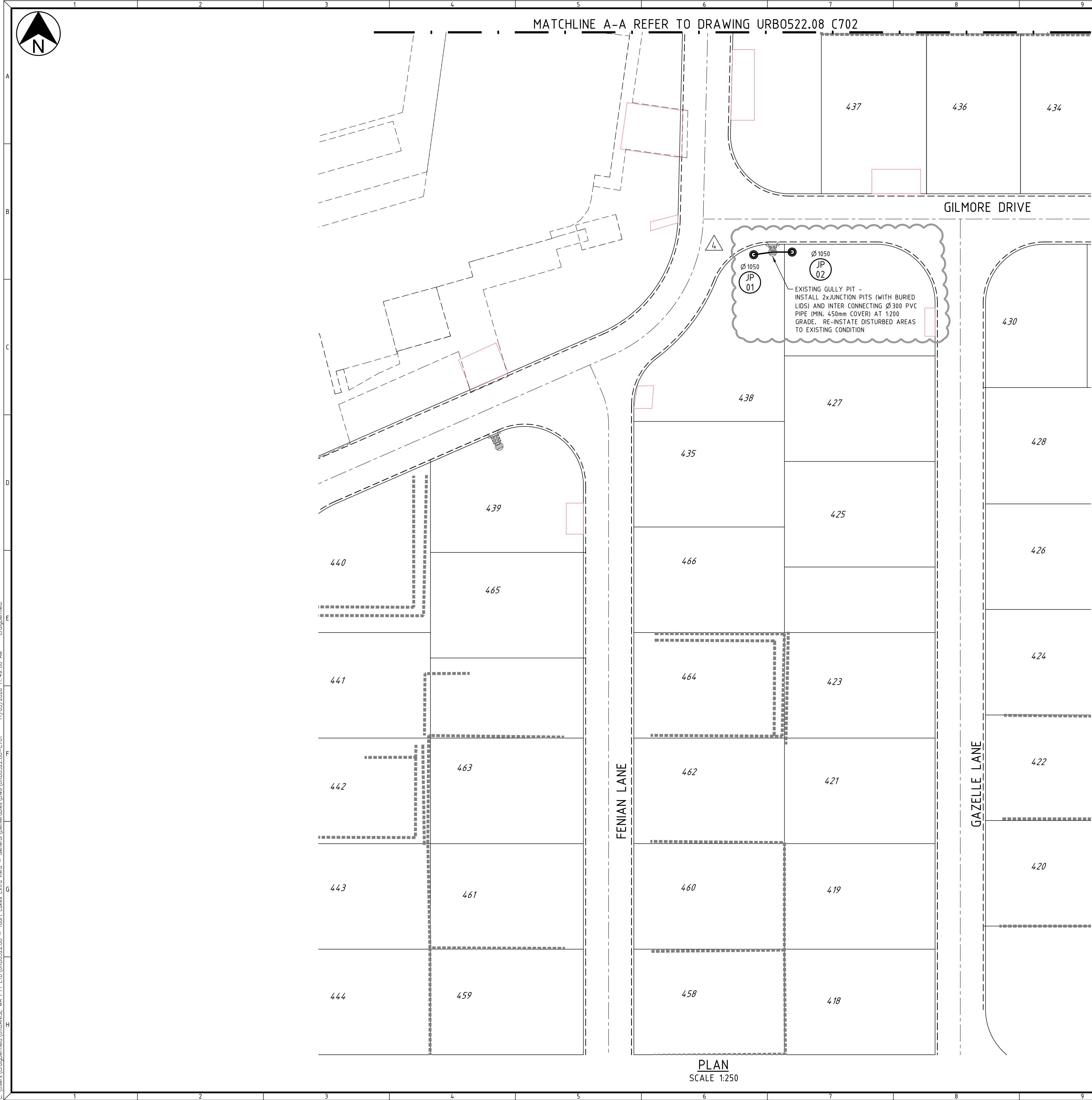
THE LOCATION OF ALL EXISTING SERVICES SHOWN ON THIS DRAWING ARE APPROXIMATE ONLY.
NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THIS PLAN AND THE CONTRACTOR SHALL ENSURE THEY HAVE OBTAINED THE CURRENT BEFORE YOU DIG AUSTRALIA INFORMATION PRIOR TO COMMENCEMENT OF ALL BELOW GROUND WORKS.

NOTES

1. GENERAL
- 1.1. ALL MEASUREMENTS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- 1.2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL CONTRACT DRAWINGS AND THE SPECIFICATION
- 1.3. ALL GRATES AND LIDS SHALL BE TRAFFICABLE CLASS 'D' IN ACCORDANCE WITH AS1554.1. ALL WELDS TO BE IN ACCORDANCE WITH AS1554.1 AND FRAMES TO BE GALVANISED IN ACCORDANCE WITH AS1650.
- 1.4. ALL ECOAID DRAINAGE INFRASTRUCTURE IS TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

ISSUED FOR CONSTRUCTION

0	15/04/25	DR	CB	BP	ISSUED FOR CONSTRUCTION
REV No.	DATE	DRAFT BY	REVIEW	P.M. REVIEW	AMENDMENT DESCRIPTION
Urbanise wa ENGINEERING SOLUTIONS					
Perth Westpoint Centre 207 / 398 Scarborough Beach Road Osborne Park WA 6017					
Margaret River Wave Court 7 / 30 Fern Ave Margaret River WA 8285					
CLIENT TRUSTEE FOR SERENITAS DEVELOPMENT TRUST					
PROJECT TUART LAKES LIFESTYLE VILLAGE STAGE 8A					
TITLE STANDARD DETAILS DRAINAGE					
DRAFTER E.HYDE	DESIGNED C.BENFIELD	APPROVED PROJECT MANAGER B.PATON		APPROVED PROJECT DIRECTOR B.PATON	
DATUM AHD	SCALE AS SHOWN	PROJECT No. URB0522.18		DRAWING No. C901	REV 0
GRID PCG94	WAPC No. -				



NOTES:

- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CONTRACT DRAWINGS AND SPECIFICATION.
- THE CONTRACTOR SHALL LIMIT THE MOVEMENT OF EQUIPMENT AND MANPOWER TO THE MINIMUM AREA NECESSARY AND PROTECT ALL VEGETATION ON SITE.
- THE CONTRACTOR SHALL PHYSICALLY LOCATE ALL OF THE SERVICES (IE WATER, SEWER, POWER, ETC) PRIOR TO WORKS COMMENCING AND PROTECT FOR THE DURATION OF THE WORKS. ANY DAMAGES TO SERVICES IS THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR IN ACCORDANCE WITH THAT SERVICE AUTHORITY REQUIREMENTS. ANY DETAILS OF EXISTING SERVICES SHOWN ON THE DRAWINGS ARE INDICATIVE ONLY.
- THE CONSTRUCTION OF THE WORKS SHALL BE TO THE APPROVAL OF THE LOCAL AUTHORITY FOR ALL INTERNAL ROADS.
- ALL DIMENSIONS ARE IN METRES UNLESS SHOWN OTHERWISE.
- PAVEMENT WIDTH SHALL BE AS SHOWN ON THE DRAWING AND SHALL BE MEASURED BETWEEN KERBS.
- ALL LEVELS SHALL BE DETERMINED FROM BENCHMARKS ESTABLISHED BY THE PROJECT SURVEYOR.
- ALL TRANSITIONS TO EXISTING WORK SHALL BE SMOOTH AND OF NEAT APPEARANCE.
- ALL DRAINAGE PIPES ARE TO BE INSTALLED AS PER THE DETAILS SHOWN ON DRAWING URB0522.08-C901, ENSURING A MINIMUM COVER OF 600mm IS ACHIEVED, CONTRACTOR TO REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT FOR DIRECTION, PRIOR TO CONSTRUCTION.
- ALL ECOAID CELLS ARE TO BE INSTALLED AS PER THE DETAILS SHOWN ON DRAWING URB0522.08-C901, ENSURING A MINIMUM COVER OF 750mm IS ACHIEVED, CONTRACTOR TO REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT FOR DIRECTION, PRIOR TO CONSTRUCTION.

ROADS LEGEND:

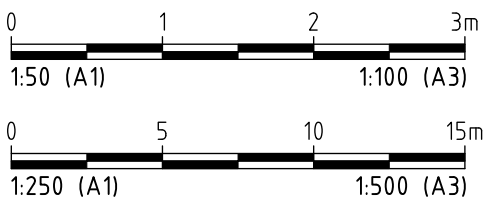
- EXISTING EDGE OF ROAD
- PROPOSED MOUNTABLE KERBING
- EXISTING RETAINING WALLS
- PROPOSED RETAINING WALLS
- FUTURE RETAINING WALLS
- COMMS/POWER PIT
- EXISTING DRIVEWAY
- EXTENT OF WORKS BOUNDARY

DRAINAGE LEGEND:

- PROPOSED DRAINAGE PIT
- EXISTING DRAINAGE PIT
- PIT DIAMETER
- PIT TYPE
- PIT NUMBER
- GULLY PIT
- TREE TO BE RETAINED
- STRUCTURAL ROOT PROTECTION ZONE

NOTE:

CONTRACTOR TO CLEAN OUT EXISTING DRAINAGE PITS WITHIN THE EXTENT OF WORKS



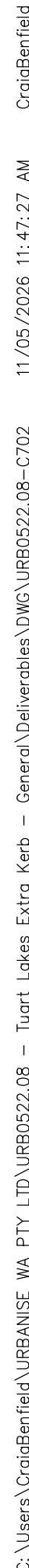
ISSUED FOR CONSTRUCTION

4	11/05/26	ZS	CB	BP	AS-CONSTRUCTED DATA ADDED, DRAINAGE AMENDED
3	18/02/26	ZS	CB	BP	ADDITIONAL DRAINAGE ADDED, RE-ISSUED FOR PRICING
2	26/05/25	ZS	CB	BP	NOTES AMENDED
1	11/03/25	ZS	CB	BP	DRAINAGE AT HOME 438 AMENDED
0	12/12/24	ZS	CB	BP	ISSUED FOR CONSTRUCTION
REV No.	DATE	DRAWN BY	REVIEWED BY	DATE	AMENDMENT DESCRIPTION
Urbanise wa ENGINEERING SOLUTIONS Perth Westpoint Centre 207 / 398 Scarborough Beach Road Osborne Park WA 6017 Margaret River Wave Court 7 / 30 Fernan Ave Margaret River WA 6285					
CLIENT TRUSTEE FOR SERENITAS DEVELOPMENT TRUST					
PROJECT TUART LAKES LIFESTYLE VILLAGE					
TITLE ROADS MODIFICATIONS PLAN (SHEET 1 OF 5)					
DRAFTER E.HYDE	DESIGNED C.BENFIELD	APPROVED PROJECT MANAGER B.PATON		APPROVED PROJECT DIRECTOR B.PATON	
DATUM AHD	SCALE 1:250	PROJECT No. URB0522.08		DRAWING No. C701	REV 4
GRID PCG94	WAPC No. -				



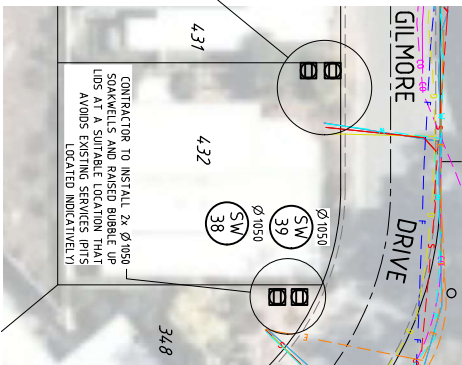
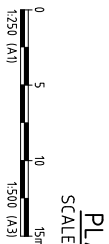
THE LOCATION OF ALL EXISTING SERVICES SHOWN ON THIS DRAWING ARE APPROXIMATE ONLY.

NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THIS PLAN AND THE CONTRACTOR SHALL ENSURE THEY HAVE OBTAINED THE CURRENT BEFORE YOU DIG AUSTRALIA INFORMATION PRIOR TO COMMENCEMENT OF ALL BELOW GROUND WORKS.





ISSUED FOR CONSTRUCTION

[illegible]

urbanise wa
ENGINEERING SOLUTIONS

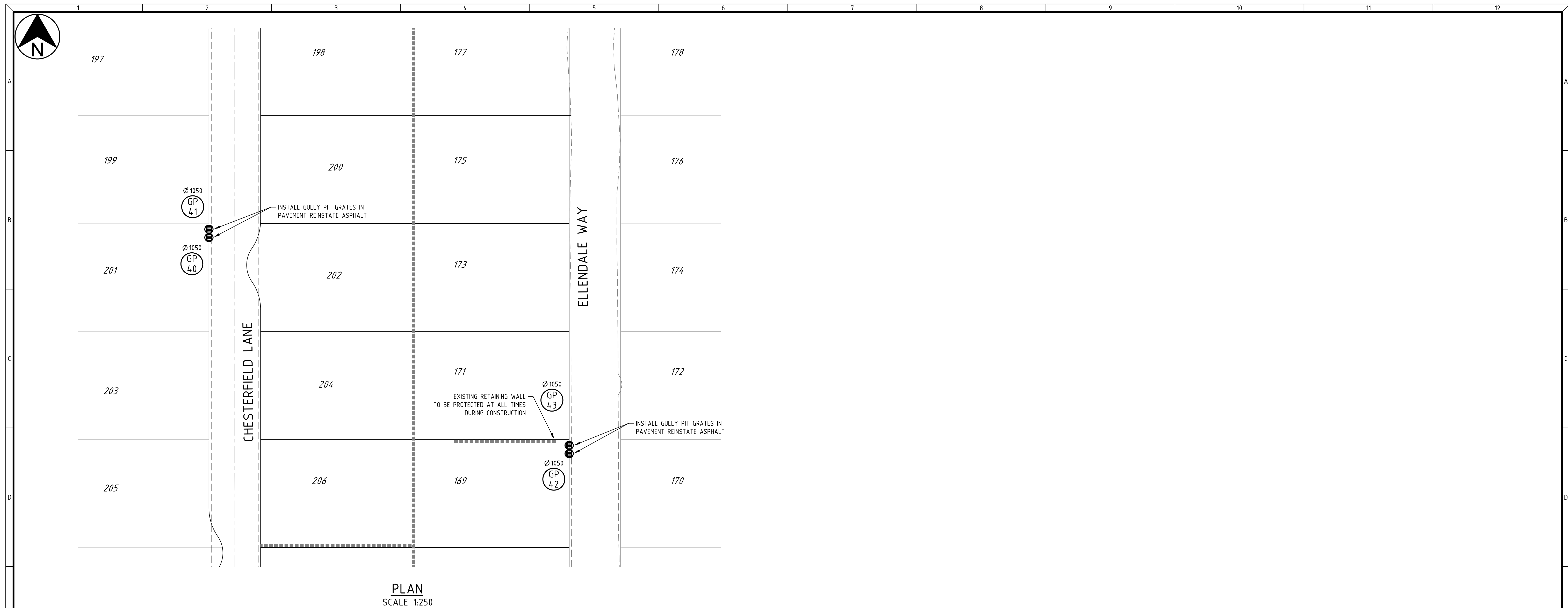
Margaret River
Westport Centre
207 / 266 Seatonight Beach Road
Osborne Park WA 6017
7145 6666
www.urbansolutions.com.au

CLIENT
TRUSTEE FOR SERENITAS DEVELOPMENT TRUST

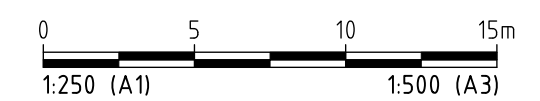
TUART LAKES LIFESTYLE VILLAGE

ROADS MODIFICATIONS PLAN

DRAFTER	DESIGNED	APPROVED PROJECT MANAGER	APPROVED PROJECT DIRECTOR
Z.SABATINO	C.BENFIELD	B.PATON	B.PATON
DATE/AID	SCALE 1/250	PROJECT No.	DRAWING No.
GRID PCG94	WPC No. -	URB0522.08	C704
			REV 6



PLAN
SCALE 1:250



ISSUED FOR CONSTRUCTION

[illegible]

NOTES:

1. REFER TO DRAWING URB0522-08-C701 FOR NOTES AND LEGEND



THE LOCATION OF ALL EXISTING SERVICES SHOWN ON THIS DRAWING ARE APPROXIMATE ONLY.

NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES ARE SHOWN ON THIS PLAN AND THE CONTRACTOR SHALL ENSURE THEY HAVE OBTAINED THE CURRENT BEFORE YOU DIG AUSTRALIA INFORMATION PRIOR TO COMMENCEMENT OF ALL BELOW GROUND WORKS.

Appendix D Letter of undertaking

8th July 2026

Chief Executive Officer
City of Rockingham
PO Box 2124
ROCKINGHAM WA 6967
By email: Min.Li@rockingham.wa.gov.au

Dear Ms Li,

**Tuart Lakes Lifestyle Village
Local Water Management Report – Letter of Undertaking**

We refer to the Local Water Management Report dated June 2026, prepared by Urbaqua on behalf of Serenitas, for the Tuart Lakes Lifestyle Village, located at 831 Mandurah Road, Baldivis.

We write now to confirm that all the stormwater drainage identified in Appendix C of the Local Water Management Report is either constructed already or will be constructed by Serenitas as part of the current civil works program.

We trust this letter is sufficient as a letter of undertaking to complete these works and we look forward to your approval of this Local Water Management Report for the Tuart Lakes Lifestyle Village.

Please contact me on 0414 151 567 or Helen Brookes from Urbaqua on 0439 096 472, should you have any queries.

Yours faithfully,



Simon Armstrong
Development Manager



Client: Serenitas Communities Holdings

Report	Version	Prepared by	Reviewed by	Submitted to Client	
				Copies	Date
Preliminary draft	V1	HBr	HBr	Electronic	March 2026
Final report	V2	HBr	SSh	Electronic	March 2026
Updated report	V3	HBr	SSh	Electronic	March 2026
Revised report	V4	HBr	SSh	Electronic	June 2026
Revised report	V5	HBr	SSh	Electronic	July 2026
Finalised report	V6	HBr	SSh	Electronic	August 2026

Urbaqua

land & water solutions

Suite 4/226 Carr Place

p: 08 9328 4663 | f: 08 6316 1431

e: info@urbaqua.org.au

www.urbaqua.org.au

Appendix 4

Original Bushfire Management Plan



PO Box 3489
MIDLAND WA 6936

☎ 08 6477 1144
✉ admin@bushfireprone.com.au

Bushfire Management Plan -BAL Contour Map

Tuart Lakes Lifestyle Village
Lot 102 Mandurah Road, Baldivis

City of Rockingham

Project Number: 168475

Assessment Date: 21 June 2016

Report Date: 4 July 2016

Report and BPAD Accredited Practitioner Details

BMP DA Template Version 1.0

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Plan Version	Submitted to	Submitted Date
Ver. 1.0	Proponent	5-Jul-16
Plan Version	Amendment Record	Submitted Date
Ver. 1.1	Update of plan from City of Rockingham comments	21-Oct-16
Ver. 1.2	Update of Lot numbers on figures	28-Feb-17

This Plan meets the requirements of both the *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas* (SPP 3.7) and the supporting *Guidelines for Planning in Bushfire Prone Areas* (WAPC 2015; the Guidelines).

Site Assessor/Document Author	Bushfire Planning and Design (BPAD) Accreditation Level	Number
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Document Review/Approval

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Reliance on the assessment and determination of the Bushfire Attack Level contained in this report should not extend beyond a period of 12 months from the date of issue of the report. If this report was issued more than 12 months ago, it is recommended that the validity of the determination be confirmed with the Accredited Practitioner and where required an updated report issued.

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Disclaimer

The measures contained in this Bushfire Management Plan are considered to be minimum standards and they do not guarantee that a building will not be damaged in a bushfire. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions. Additionally, the achievement of and level of implementation of bushfire management measures will depend, among other things, on the actions of the landowners or occupiers over which Bushfire Prone Planning has no control.

All surveys, forecasts, projections and recommendations made in this report associated with the project are made in good faith on the basis of information available to Bushfire Prone Planning at the time.

All maps included herein are indicative in nature and are not to be used for accurate calculations.

Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences (whether or not due to the negligence of their consultants, their servants or agents) arising out of the services provided by their consultants.

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1 Executive Summary

This Bushfire Management Plan (the Plan) has been prepared to accompany the BAL Contour map associated with the expansion of the Tuart Lakes Lifestyle Village at Lot 102 Mandurah Road, Baldivis within the City of Rockingham.

The BAL Contour map has been updated based on the future development of the remaining stages of the lifestyle village with respect to the gaining a clearing permit and the assessment of the development against the State Planning Policy 3.7- Planning in Bushfire Prone Areas (SPP 3.7) and the Guidelines for Planning in Bushfire Prone Areas (Guidelines).

The assessment of the Proposed Development against the Bushfire Protection Criteria of the Guidelines has determined that full compliance is able to be achieved against all four elements.

The clearing and management of the existing vegetation is planned for the whole site. All on site vegetation including planned retained trees are to be managed as low threat vegetation.

The proposed development can achieve BAL-29 or lower as shown on the BAL Contour map with the required vegetation management and appropriate separation distances. There are 2 lots on the southern boundary and numerous lots on the northern boundary that have a BAL-40 rating. At present the northern associated lots are not proposed to be developed until the vegetation associated with the BAL rating is removed or modified. The southern lots may be assessed in the future once an actual location of the building is finalised and BAL-29 or lower may be achieved.

The proposed land use is a 'vulnerable' land use and may require a Bushfire Evacuation (Response) Plan. The required information for the planning assessment is included in this Bushfire Management Plan.

2 The Requirement for a Bushfire Management Plan

The Bushfire Provisions: The Planning and Development (Local Planning Schemes) Amendment Regulations 2015 establishes the deemed provisions relating to bushfire risk management. These then work with State Planning Policy 3.7: Planning in Bushfire Prone Areas (SPP 3.7); Guidelines for Planning in Bushfire Prone Areas (Guidelines); Map of Bushfire Prone Areas; Building Regulations 2012; and the Building Code of Australia to guide planning and development proposals in bushfire prone areas.

Development Application and Planning Approval: The Planning and Development Act 2005, defines development as (a) any demolition, erection, construction, alteration of or addition to any building or structure on the land and (b) the carrying out on the land of any excavation or other works.

Planning legislation considers development to relate to not only physical works but to the actual use of any land or building.

This Bushfire Management Plan

For the proposed development, the visit to the site and the BAL assessment is demonstrated with a BAL Contour map. The bushfire planning provisions and requirements are demonstrated by the application of the Performance Criteria to the development to assist with planning approval.

To accompany the development application, the required bushfire assessments and supporting information are provided in the required format of a Bushfire Management Plan.

Determination of the Requirement for a Bushfire Management Plan

The proposed building work (or change of land use) requires planning approval under the Planning and Development (LPS) Amendment Regulations 2015.

The development application is to be accompanied by a Bushfire Management Plan addressing the requirements of State Planning Policy 3.7 (SPP 3.7) and the associated Guidelines.

Yes

The proposed building work (or change of land use) does not require planning approval under the Planning and Development (LPS) Amendment Regulations 2015.

However, it is a requirement of the relevant local government through their local/town planning scheme or special control area provisions, that a development application be submitted.

N/A

The same assessments and supporting information is required to accompany the application, as per the bushfire provisions.

3 Subject Site and Proposed Building Work

Is the development site in an area identified on the current 'Map of Bushfire Prone Areas' (DFES) as being subject to bushfire?

Yes

Subject Lot size (m²)

157,662 m²

Proposed Building Class (BCA)

Class 1a

Description of primary building work or works

Construction of a habitable building other than a single house or ancillary dwelling

Description of associated building work or works

N/A

Attached and Separated Structures (Class 10a building or deck)

The Requirement for the Application of Construction Requirements (*AS 3959-2009 Section 3.2.3*)

Attached Structure: Is the proposed Class 10a building or deck attached to a Class 1, 2 or 3 building or another 10a building that is required to comply with AS3959 (i.e. not separated by a fire resistant wall)?

-

Adjacent Structure: Is the proposed Class 10a building or deck adjacent to a building required to comply with the standard (i.e. within 6 metres of a Class 1, 2 or 3 building or another 10a building required to comply with AS3959 and not separated by fire resistant wall that meets specifications)?

-

The proposed Class 10a building or deck is attached or adjacent to a building that is required to comply with AS3959. It requires a BAL assessment and the application of bushfire construction standards. Does this apply?

-

Irrespective of AS3959 requirements, the local government require a BAL assessment for the proposed 10a building and the application of bushfire construction standards. Does this apply?

-

4 Assessment of Bushfire Risk

4.1 Vegetation Identification and Classification

4.1.1 Existing Vegetation

All vegetation within 100 metres of the site work has been identified and classified or excluded and presented in Table 4.1 This has been done with accordance with AS 3959-2009 and reference to the *Visual Guide for Bushfire Risk Assessment in WA* (WAPC February 2016).

The vegetation has been assessed as it will be in its mature state and where deemed appropriate, in its unmanaged state. The areas of classified vegetation that will determine bushfire risk are defined on the site assessment map Figure 4.1. Representative photos of each vegetation area are presented after the table.

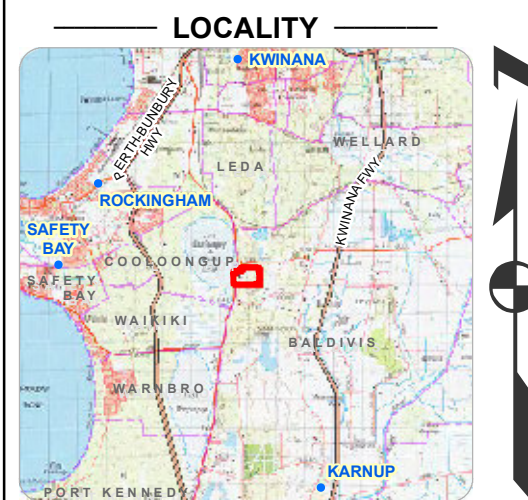
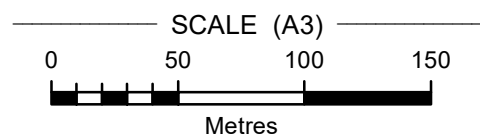
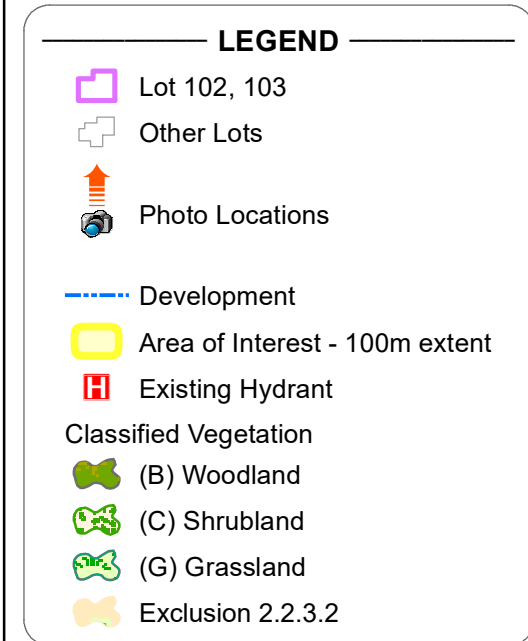
Table 4.1: Vegetation types identified, the applied classification and effective slope

All Vegetation Within 100 metres of Site			
Vegetation Area	Identified Types (AS3959) or Description if 'Excluded'	Applied Classification	Effective Slope Under Classified Vegetation (degrees)
1	Open Woodland B-06	Class B Woodland	1
2	Dense Sown Pasture G-25	Class G Grassland	1
3	Open Tussock G-23	Class G Grassland	1.6
4	Open Woodland B-06	Class B Woodland	0
5	Open Woodland B-06	Class B Woodland	0
6	Open Woodland B-06	Class B Woodland	8.8
7	Tussock Grassland G-22	Class G Grassland	1
8	Open Heath C-11	Class C Shrubland	0
9	Tussock Grassland G-22	Class G Grassland	0

Note: When more than one vegetation type is present each type is classified separately with the worst case scenario being applied. The predominant vegetation is not necessarily the worst case scenario.

Figure 4.1
Topography & Classified Vegetation

Lot 102, Mandurah Road
Baldivis



Assessment Date: 21/06/2016 Image Date: Feb 2016
Prepared By: Alex Aitken

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator



Vegetation Area 1

Classification Applied: Class B Woodland

Assessment Comment: offsite Tuart woodlands/grassland understorey/zamia palms, avg tree height 20m



Photo 1a



Photo 1b

Vegetation Area 2

Classification Applied: Class G Grassland

Assessment Comment: offsite unmanaged grassland



Photo 2a

Vegetation Area 3

Classification Applied: Class G Grassland

Assessment Comment: offsite open tussock, old market gardens, to be developed in future



Photo 3a



Photo 3b

Vegetation Area 4

Classification Applied: Class B Woodland

Assessment Comment: onsite banksia woodland, avg height 9m



Photo 4a



Photo 4b

Vegetation Area 5

Classification Applied: Class B Woodland

Assessment Comment: offsite banksia woodland with Tuart trees, avg tree height 15m



Photo 5a



Photo 5b

Vegetation Area 6

Classification Applied: Class B Woodland

Assessment Comment: offsite Tuart woodland with grass understorey



Photo 6a



Photo 6b

Vegetation Area 7

Classification Applied: Class G Grassland

Assessment Comment: offsite closed tussock grassland adjacent ephemeral lake



Photo 7a

Vegetation Area

Classification Applied: Exclusion AS3959-2009 2.2.3.2 (f)

Assessment Comment: onsite managed parklands, mulched managed garden areas



Photo 8



Photo 9

4.1.2 Vegetation Excluded from Classification

Certain areas and vegetation may be assessed as 'low threat or non-vegetated'. These are to be excluded from classification and are therefore rated BAL-LOW. They must be managed to maintain the specifications set out in AS3959-2009 s2.2.3.2 in perpetuity (refer to Appendix 3 'Vegetation Classification Exclusions').

Within the development there are areas of managed parklands that have been excluded as per AS3959-2009 s2.2.3.2(f). There are also areas offsite on the adjacent properties that have managed gardens and car park areas that have been excluded. As part of the previous development and establishment of the Tuart Lake Lifestyle Village there are areas of managed gardens with mulch beds and reticulated gardens that have been classified as low threat as per AS3959-2009 s2.2.3.2 (f), see photographs 8 & 9 above and locations indicated on Figure 4.1.

4.1.3 Expected On-site Vegetation Changes Due to Proposed Development

In assessing vegetation for bushfire threat, consideration must be given to possible future vegetation changes likely on the site that is being assessed and in particular those that would have the potential to increase the bushfire risk.

This may be due to growth of existing vegetation or growth of planned landscape plantings, including future roadside re-vegetation. In particular, there must be careful consideration of the creation of vegetation corridors where they join offsite vegetation and may provide a route for fire to enter an area of future development.

Looking forward and taking into account both the likely changes in vegetation management that will occur with the development and what is achievable within the lot boundary is included in the assessment with the entire development site to be managed as low threat vegetation with numerous trees to be retained within the development. These trees are a combination of old growth Tuart trees and large trees to be retained as part of the development approvals. Vegetation underneath these retained trees are to either managed as short cropped grass or mulch.

4.2 Bushfire Attack Level (BAL) - Analysis and Determination - Contour Map

A BAL CONTOUR MAP A Bushfire Attack Level (BAL) Contour Map is a scale map of a development site including the proposed lot layout, which identifies indicative BAL ratings across the development site and within the immediate surrounding area. A BAL Contour Map illustrates potential bushfire attack levels and radiant heat impacts in relation to any classified vegetation that will remain within 100 metres of the assessment area once development is completed. A BAL Contour Map identifies land suitable and unsuitable for development and guides the location of building envelopes within a development site (*WAPC Factsheet "BAL Contour Maps" Version 2 January 2016*)

THE ASSESSMENT A BAL Contour Map is based on an assessment of the development site and surrounding area as they will be when the proposed development is constructed i.e. when the land has been cleared and all the works have been undertaken. It needs to take into account any vegetation that will remain or will be introduced when the works are complete (*WAPC Factsheet "BAL Contour Maps" Version 2 January 2016*). Refer to Appendix 2 'Bushfire Risk Management – Understanding the Methodology', for a summary of the BAL assessment procedures.

INTERPRETATION The contour map will present different coloured contours constructed around the classified bushfire prone vegetation. These represent the different Bushfire Attack Levels that exist as the distance increases away from the classified vegetation. If any part of a subject area or building is or will be within a particular contour, it will be subject to that BAL rating (the highest BAL rating will apply to the area or building being assessed).

The width of each shaded contour is a result of calculations involving vegetation type, fuel structure, ground slope, and climatic conditions. These calculations generate the expectations of fire behaviour for the given situation.

INDICATIVE BAL's If the assessed BAL for a lot is stated as being 'indicative', then it is only an indication (usually given as a range) of what BAL's are achievable. Determining the actual BAL of any existing, proposed or future lot or building will be dependent on the extent of any classified vegetation modification or removal and/or the location of the building on the lot.

As a result, a BAL Certificate cannot be produced for buildings on such lots until the location of any future building has been identified and an onsite BAL assessment conducted. A BAL Compliance Report and Certificate for the proposed building can then be issued to accompany a building permit application.

DETERMINED BAL's If the assessed BAL for a lot or building is stated as being 'determined' then no additional assessment is required. It implies that classified vegetation is not required to be modified or removed to achieve the stated BAL – either for an existing lot, an existing building or for a future building located anywhere on an existing lot. The degree of certainty is more than sufficient to allow for any small discrepancy that might occur in the mapping of the contours.

However, the issuing of a BAL Certificate (based on the BAL Contour Map assessment) confirming the BAL, may still be required in applying for a building permit. If significant time has passed since the assessment and the requirement for a BAL certificate a new BAL assessment may be required for any particular lot or building.

Lot 102, Mandurah Road
Baldivis



4.2.1 BAL's as Indicated by the Contour Map

Figure 4.2 shows the proposed development with the vegetation managed within the development and based on the separation distance using the classified vegetation and Method 1 calculations based on the site visit.

The BAL Contour map indicates the required BAL ratings that each lot and future buildings are required to be constructed as per AS3959-2009.

Table 4.2.1: Indicative BAL for the Tuart Lakes Lifestyle Village

Indicative Bushfire Attack Level for Future Building on the Proposed Lots	
Relevant Fire Danger Index (AS3959-2009 Table 2.1)	80
BAL Determination Method	Method 1 as per AS 3959-2009 s2.2.6 and Table 2.4.3. Refer to Appendix 2 this Plan
Proposed Lots	Indicative BAL
20-29, 31, 65, 67, 69, 71, 89-100, 131-136, 154, 156, 158, 162, 258-265, 274-279, 298-301, 349-350	BAL-LOW
30, 32-33, 35, 55-64, 66, 68, 70, 72-73, 79-88, 101-110, 121-130, 144, 150, 148, 152, 266-268, 272, 302-340, 352-375, 396-400	BAL-12.5
34, 36-47, 53-54, 77-78, 111-112, 119-120, 142, 271, 269-270, 271, 390-395	BAL-19
376-377, 380-389	BAL-29
48-52, 74-76, 113-118, 139-141, 185-188, 378-379	BAL-40

4.2.2 Identification of Specific Issues Arising from BAL Contour Map

Onsite Vegetation

Vegetation onsite is within the control of the subject site's landowner and therefore can potentially be removed or modified to lower the bushfire risk, subject to any approval being required by a local government.

There is a minor percentage of trees to be retained as part of the development onsite and these trees and areas surrounding them will be maintained as low threat vegetation.

Offsite Vegetation

Generally, vegetation offsite is not within the control of the subject site's landowner and therefore the vegetation cannot be removed or modified by the landowner and as a result the assessed BAL's determined by this vegetation are unable to be reduced.

The classified vegetation to the north of the development is limiting the final development of buildings directly adjacent to the northern boundary. The requirement to construct to a higher standard could be undertaken for these lots or alternatively a delay in developing on these lots.

5 Bushfire Risk Management Measures

5.1 The Bushfire Protection Criteria – Assess and Demonstrate Compliance

State Planning Policy 3.7 Planning in Bushfire Prone Areas (Dept. of Planning and WAPC 2015) requires an assessment against the bushfire protection criteria requirements (contained in the ‘Guidelines’) to accompany any strategic planning proposal, subdivision application or development application.

Strategic planning proposals need to demonstrate that compliance can be achieved in subsequent planning stages. Subdivision and development applications must demonstrate compliance within the boundary of the subject site or provide justification for those criteria that are not able to be fully met.

The criteria are divided into four elements location, siting and design, vehicular access and water. Each element has an intent outlining the overall aim. The acceptable solutions provide examples of how that intent might be met. The performance principle allows for ‘alternative solutions’ to be developed where the acceptable solutions cannot be achieved”. Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2015 (s4.5 and Appendix 4)*.

Bushfire Prone Planning presents all components of the Bushfire Protection Criteria assessment as a separate table for each element. This includes the intent, the performance principle, a stated level of compliance with the acceptable solutions for each of the criteria and statements that demonstrate the compliance and provide justification for those that have not been fully met.

Summarised Outcome of the Assessment Against the Bushfire Protection Criteria

The Bushfire Protection Criteria Elements	The Planning Assessment – Proposed Basis of Assessment				The Proposal Satisfies All the Criteria and/or the Intent of the Element
	Acceptable Solutions	Performance Principle		Minor or Unavoidable Development	
		Variation on Acceptable Solution	Alternative Solution		
	Demonstrated compliance in following table	Presented and justified in following table and within this section of the Plan. Includes advice from the relevant referral authorities if applicable.		Required supporting statements presented in Section 5.	
Location	✓				Yes
Siting and Design of Development	✓				Yes
Vehicular Access	✓				Yes
Water	✓				Yes

Bushfire Protection Criteria - Element 1- Location

Intent: 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.

Performance Principle P1 (used to develop alternative solutions): The intent may be achieved where the strategic planning proposal, subdivision or development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low **OR** a BAL-29 or below applies **AND** the risk can be managed. For minor or unavoidable development in areas where BAL-40 or BAL-FZ applies, demonstrating that the risk can be managed to the satisfaction of DFES and the decision maker.

Acceptable Solution	Compliance	Explanation / Requirements	Demonstration of Compliance and/or Statements of Justification
A1.1 Development Location The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low OR The development is subject to BAL-29 or below.	Fully Complies	Land is most suitable for land use intensification where hazard levels are low. Where there is an extreme bushfire hazard level or requirements for use of BAL-40 or BAL-FZ construction standards, the land is not considered suitable for development unless it meets the definition of minor or unavoidable development (which requires WAPC, DFES and local planning approval).	The proposed development is located within a designated bushfire prone area. The proposed lots are compliant as they are subject to BAL-29 or below. There are 2 Lots on the southern boundary of the development and numerous lots on the northern boundary that are rated as BAL-40, these lots may not be developed/constructed on at this stage of development.

Bushfire Protection Criteria - Element 2 - Siting and Design of Development

Intent: To ensure that the siting and design of development minimises the level of bushfire impact.

Performance Principle P2 (used to develop alternative solutions): The intent may be achieved where the siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire risk that applies to the site. That it minimises the bushfire risk to people, property and infrastructure, including compliance with AS3959 if appropriate.

Acceptable Solution (either or both solutions to be met to the extent that it satisfies Element 1)	Compliance	Explanation / Requirements	Demonstration of Compliance and/or Statements of Justification
A2.1 Asset Protection Zone (APZ) Every building is surrounded by an Asset Protection Zone (minimum of twenty metres wide), depicted on submitted plans, which meets the defined requirements. OR Where a full 20 metre APZ is not possible the APZ should be sufficient enough to ensure the potential radiant heat impact of a fire does not exceed 29 kW/m².	Will Fully Comply	The APZ is a low fuel area immediately surrounding a habitable or specified building (refer to specifications in Appendix 4). All requirements in A2.1 are essential and must be achieved to ensure compliance. If the implementation of protection zones was to result in the loss of vegetation that is not acceptable or causes conflict with landscape and environmental objectives, then the development may need to be modified.	The proposed development meets the acceptable solution: • By establishing and maintaining an APZ that meets all specified requirements; • By incorporating an APZ, to the extent possible within the boundary of the lot, into the landscaping surrounding the any future building works and maintaining it to comply with specified requirements into the future; • The extent of the APZ will result in the potential radiant heat impact of a fire on the proposed buildings not exceeding 29kW/m²; and • By maintaining firebreaks and fuel loads as per the local government's annual firebreak notice issued under s33 of the Bush Fires Act 1954.

Bushfire Protection Criteria - Element 2 - Siting and Design of Development (continued)

Acceptable Solution (either or both solutions to be met to the extent that it satisfies Element 1)	Compliance	Explanation / Requirements	Demonstration of Compliance and/or Statements of Justification
A2.2 Hazard Separation Zone (HSZ) Every building and its contiguous APZ is surrounded by a Hazard Separation Zone (minimum of 80 metres wide), depicted on submitted plans, that meets the defined requirements. OR A HSZ may not be required if the proposed construction meets the standard appropriate to the BAL for that location and the determined BAL does not exceed BAL-29.	Fully Complies	Hazard separation should be provided between extreme bushfire hazards and buildings to create a combined separation distance of 100m (50m for unmanaged grassland) in order to protect them from burning embers, radiant heat and direct flame contact (refer to specifications in Appendix 4). The minimum hazard separation distance may be reduced by compliance with AS 3959 which requires that as the distance from the vegetation is reduced, the construction standard must be increased.	The proposed development meets the acceptable solution by: - The indicative BAL's do not exceed BAL-29 and any future buildings constructed will meet the construction standard corresponding to the determined BAL rating as per AS 3959-2009. - Maintaining firebreaks and fuel loads as per the local government's annual firebreak notice issued under s33 of the Bush Fires Act 1954.

Bushfire Protection Criteria - Element 3 - Vehicular Access

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

Performance Principle P3 (used to develop alternative solutions): The intent may be achieved where the internal layout, design and construction of public and private vehicular access and egress in the subdivision /development allow emergency and other vehicles to move through it easily and safely at all times.

Acceptable Solutions	Compliance	Explanation / Requirements	Demonstration of Compliance and/or Statements of Justification
A3.1 Two access routes	Fully Complies	Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents and the public at all times and under all weather conditions. Two-way access should be provided as a public road, however, where a public road cannot be provided (this will need to be demonstrated by the proponent providing justification) an emergency access way may be considered.	Mandurah Road provides safe access and egress to two different destinations. As a sealed public road it is available to all residents and the public at all times and under all weather conditions.
A3.2 Public Road	Fully Complies	A public road is to meet the technical requirements for this acceptable solution (refer to Appendix 5).	All internal roads are designed and constructed to comply with the guidelines.
A3.3 Cul-de-sacs (including dead-end roads)	Will Fully Comply	Should be avoided in bushfire prone areas. Where no alternative exists (i.e. the lot layout already exists and/or will need to be demonstrated by the proponent) they must be constructed to meet the technical requirements for this acceptable solution - including a maximum length of 200m (600m if cul-de-sacs are joined by an emergency access way and certain conditions are met). Refer to Appendix 5.	All cul-de-sacs will be designed and constructed to comply with the guidelines.

Bushfire Protection Criteria - Element 3 - Vehicular Access - (continued)			
Acceptable Solutions	Compliance	Explanation / Requirements	Demonstration of Compliance and/or Statements of Justification
A3.4 Battle Axe	N/A	Should be avoided in bushfire prone areas. If no alternative exists (this will need to be demonstrated by the proponent) they must meet the technical requirements for this acceptable solution (refer to Appendix 5).	
A3.5 Private Driveways	Fully Complies	Must be constructed to meet the technical requirements for this acceptable solution (refer to Appendix 5). Where a house site is further than 50m from a public road there are additional technical requirements 5.	The existing access to the development complies with the guidelines.
A3.6 Emergency Access Way	N/A	An access way that does not provide through access to a public road is to be avoided in bushfire prone areas. Where no alternative exists (this will need to be demonstrated by the proponent) an emergency access way is to be provided as an alternative link to a public road during emergencies (maximum length of 600m) and be constructed to meet the technical requirements for this acceptable solution (refer to Appendix 5).	
A3.7 Fire Service Access Routes (perimeter roads)	N/A	Fire service access routes are to be established to provide access within and around the edge of the subdivision and related development to provide direct access to bushfire prone areas for fire fighters and link between public road networks for firefighting purposes. They must be constructed to meet the technical requirements for this acceptable solution (refer to Appendix 5).	
A3.8 Firebreak Width	Fully Complies	Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level prescribed in the local firebreak notice issued by the local government.	The proposed development will comply with the requirements of the local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.

Bushfire Protection Criteria - Element 4 – Water

Intent: To ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.

Performance Principal P4 (used to develop alternative solutions): The intent may be achieved where the subdivision, development or land use is provided with a permanent and secure supply that is sufficient for firefighting purposes.

Acceptable Solutions	Compliance	Explanation / Requirements	Demonstration of Compliance and/or Statements of Justification
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 DFES.	Will Fully Comply	The Water Corporations 'No 63 Water Reticulation Standard' is deemed to be the baseline criterion for developments and should be applied unless local water supply authorities' conditions apply. Construction must meet the technical requirements for this acceptable solution (refer to Appendix 6). Additionally, any local government variation must be met (s8.4).	A reticulated water supply is available in the area of the subject site with numerous onsite above ground hydrants installed to the existing development. The installation of several hydrants will be required within the proposed development to DFES standards.
A4.2 Non-reticulated Areas The specification of the requirements for the proposal being assessed will be set by the water supply authority and DFES.	N/A	A procedure must be in place to ensure that water tanks are maintained at or above the designated capacity at all times, including home tanks on single lots. Construction must meet the technical requirements for this acceptable solution (refer to Appendix 6). Additionally, any local government variation must be met (s8.4). (Note: Acceptable solution A4.3 is only for use if creating one additional lot and cannot be applied cumulatively)	

5.2 Location and Siting of Buildings and Allowable BAL's

Future buildings on the lot are to be located in areas where an appropriate Bushfire Attack Level rating can be achieved and where minimal removal of valuable existing native vegetation is required to achieve this rating. The intent is to have the buildings located in an area where the bushfire hazard level is, or will on completion, be moderate or low or be subject to a maximum Bushfire Attack Level of BAL-29.

The proposed building work is unlikely to be approved if BAL rating is BAL-40 or BAL-FZ as it is unacceptable on planning grounds. The exception will be if it meets the definition of minor (for Class 1 buildings and associated Class 10a buildings or decks) or unavoidable development ('Guidelines' s5.4 and s5.7). If this applies the appropriate additional assessment and input from the relevant authorities, if required, is included in this Plan.

The proposed location of the proposed lots will result in them being subject to BAL-40 and below depending on the separation distance from the classified vegetation. As there are numerous lots currently rated as BAL-40 based on Figure 4.2 BAL Contour map these lots in the northern section of the development will not be constructed on until the vegetation offsite has been developed by an external party, resulting in a BAL of 29 or lower. The 2 lots (378-379) on the southern boundary are currently rated as BAL-40 and should be reassessed in the future once an actual building location is proposed as it may be achievable to get a BAL-29 or lower depending on the location of the building within the lot.

The remaining lots within the development of the Tuart Lakes Lifestyle Village can achieve a BAL-29 or lower as shown by Table 4.2.1.

5.3 Vegetation Management

It is the responsibility of the landowner to maintain the bushfire protection measures on their property. This includes maintaining:

- the required vegetation separation distance (see tables below);
- the areas of classified vegetation which they have control over;
- the asset protection and hazard separation zones; and
- compliance with the local government's annual firebreak notice issued under s33 of the Bush Fires Act 1954.

Ongoing Maintenance of Assessed Vegetation

1. Where any existing or planned re-vegetation has been assessed as "low threat" (meeting AS 3959-2009 Section 2.2.3.2 requirements) and excluded from classification, then this area will be managed to continue to meet those requirements (refer to Appendix 3) and enable the buildings to retain their determined BAL ratings;
2. Any classified vegetation that has directly contributed to the determined BAL rating for a given building, will be managed such as to not change that vegetation to a higher risk classification; and

Asset Protection Zone

Implementing an Asset Protection Zone (APZ) creates a low fuel area surrounding any current or future buildings. This will decrease the potential bushfire's intensity, minimise the likelihood of direct flame contact and reduce the exposure of the buildings to radiant heat. It will also be important for firefighter and occupant's safety during fire suppression activities.

The APZ must be maintained as either a non-vegetated area or as low threat vegetation managed in a minimal fuel condition as per AS 3959-2009 s2.2.3.2 (e) and (f). A minimal fuel condition is stated in the standard as meaning "there is insufficient fuel available to significantly increase the severity of the bushfire attack" and being "recognisable as short cropped grass for example to a nominal height of 100mm." Refer to Appendix 3 of this Plan for further detail with other technical requirements for an APZ set out in Appendix 4.

Hazard Separation Zone

Where possible a Hazard Separation Zone (HSZ) should also be established (refer to Appendix 4 for specifications).

The achievable BALs based on the BAL contour map indicate that BAL-29 or lower is achievable with vegetation management and the appropriate separation distances (into the future). Table 5.3.1 shows the required separation distances to maintain and achieve the applicable BALs.

Retaining the Determined BAL Rating

To retain the determined BAL rating stated in Section 4 'Assessment of Bushfire Risk', the area of land representing the minimum separation distances (refer to Table 5.3.1) must be maintained as either a non-vegetated area or as low threat vegetation managed in a minimal fuel condition as per AS 3959-2009 s2.2.3.2 (e) and (f). A minimal fuel condition is stated in the standard as meaning "there is insufficient fuel available to significantly increase the severity of the bushfire attack" and being "recognisable as short cropped grass for example to a nominal height of 100mm." Refer to Appendix 3 for further detail.

Table 5.3.1: Minimum separation distances to maintain

Minimum Separation Distances to be Maintained – Determined BAL				
Relevant Fire Danger Index (AS3959-2009 Table 2.1)				80
BAL Determination Method		Method 1 (as per AS 3959-2009 s2.2.6 and Table 2.4.3)		
Vegetation Area	Applied Vegetation Classification	Effective Slope (degrees)	Determined Bushfire Attack Level	Separation Distance Required (metres)
1	Class B Woodland	1	BAL-12.5	35
2	Class G Grassland	1		20
3	Class G Grassland	1.6		20
4	Class B Woodland	0		29
5	Class B Woodland	0		29
6	Class B Woodland	8.8		43
7	Class G Grassland	1		20
1	Class B Woodland	1	BAL-19	25
2	Class G Grassland	1		14
3	Class G Grassland	1.6		14
4	Class B Woodland	0		20
5	Class B Woodland	0		20
6	Class B Woodland	8.8		31
7	Class G Grassland	1		14
1	Class B Woodland	1	BAL-29	17
2	Class G Grassland	1		9
3	Class G Grassland	1.6		9
4	Class B Woodland	0		14
5	Class B Woodland	0		14
6	Class B Woodland	8.8		22
7	Class G Grassland	1		9
Note: If the particular classified vegetation area is vegetation that is offsite, then the owner of the subject land has no control over that portion of the required minimum separation distance that is also offsite. However, the onsite portion must be maintained along with being aware of any changes to the off-site portion and advocating for its maintenance where possible.				

5.4 Vehicular Access

It is the developer's responsibility to ensure that the development design allows for the bushfire protection criteria for vehicular access be met as per the 'Guidelines'. How this Proposal complies with the bushfire protection criteria is set out in s5.1, Element 3, with additional information and justification presented below if necessary.

There is adequate access for emergency service vehicles and public to move within the development area also provide access to and from the development.

5.5 Firefighting Water Supply

The intent is to ensure water is available to the development or land use to enable people, property and infrastructure to be defended from bushfire. This intent may be achieved where the development or land use is provided with a permanent and secure supply that is sufficient for firefighting purposes (refer to s5.1 Element 4). Additional information and justification is presented below if necessary.

There are numerous onsite hydrants available for emergency services to be utilised in the event of a bushfire. There will be numerous additional above ground hydrants to be installed within the proposed development. The inclusion of above ground hydrants is a higher standard of water source for a bushfire than is required by the Caravan Park & Camping Grounds Regulation 1997 Schedule 7.

The installation of the hydrants will not exceed the 200m spacing as per residential areas as per DS63 Water Corporation & DFES standards.

5.6 Building Construction Standards

5.6.1 Proposed Building Work

Any proposed residential building work (Class 1, 2, 3 and associated Class 10a buildings and decks) subject to a BAL rating above BAL-Low will be required to be constructed to the requirements corresponding to their determined BAL as set out in *AS 3959-2009 Construction of buildings in bushfire prone areas* or the *(NASH) Standard – Steel Framed Construction in Bushfire Prone Areas* (for Class 1a and 1b buildings only).

The exception will be if higher construction standards are to apply due to a local government requirement or as a part of an alternative solution that might be presented in this Plan to enable compliance with the Bushfire Protection Criteria.

Only residential buildings Class 1, 2 or 3 and associated Class 10a buildings and decks are required by the BCA to be constructed to the bushfire standards set out in *AS3959-2009* and as determined by their BAL rating. This standard is not applicable to Class 4 – Class 9 buildings unless imposed by the relevant local government.

However, determining the BAL ratings of proposed Class 4-9 buildings allows for them to be:

- Sited appropriately and have classified vegetation removed and /or managed such that their exposure to flames, radiant heat and embers is as low as is practically possible.
- Constructed to the standard corresponding to the BAL rating if the developer, owner or local government deem it is prudent and necessary.

All future buildings are to be constructed to the BAL rating as shown on Figure 4.2 BAL Contour map and as a minimum will be BAL-12.5.

5.6.2 Existing Buildings on Subject Site

Class 1, 2 and 3 buildings and Class 10a associated buildings and decks, constructed prior to the requirement to comply with bushfire performance requirements, do not need to meet these requirements.

Buildings of Class 4 to Class 9 are not required by the Building Code of Australia (BCA) to be constructed to comply with bushfire performance requirements.

The *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015)* state, “The policy measures of SPP 3.7 and these Guidelines are not to be applied retrospectively” (Guidelines s2.2). Further, the WA Building Commission ‘Building in Bushfire Prone Areas’ information note states “Building standards and regulations are generally not retrospective”.

Therefore, retrospectively upgrading a building to comply with the bushfire performance requirements can only be a recommendation.

As the existing buildings exist in a bushfire prone area and may be subject to a bushfire attack, it is recommended that some degree of upgrading be considered in order to improve the protection for occupants and the building’s survivability. At a minimum protection from ember attack should be considered (i.e. constructed to the standard required for BAL-12.5).

6 Environmental Considerations

“Many bushfire prone areas also have high biodiversity values. SPP 3.7 Policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values” (‘Guidelines’ s2.3).

6.1 Native Vegetation and Re-vegetation

Establishing development in bushfire prone areas can adversely affect the retention of native vegetation through clearing associated with the creation of Asset Protection and Hazard Separation Zones. Where loss of vegetation is not acceptable or causes conflict with landscape or environmental objectives, it will be necessary to consider available options to minimise the removal of native vegetation.

Options to Minimise Removal of Native Vegetation	Considered and Implemented in this Proposal
Reduce lot yield	No
Cluster development	Yes
Construct building to a higher standard as per BCA and AS 3959-2009	Yes
Modify the development location	No
Comments:	
Does this planning proposal satisfy bushfire protection requirements within the boundaries of the land being developed so as not to impact on the bushfire and environmental management of neighbouring reserves, properties or conservation covenants?	
	Yes

Where, as part of the Proposal, revegetation of waterway foreshore, wetland or coastal buffers is necessary for their protection or management, this bushfire management plan will need to assess the ability and practicality of maintaining vegetation separation distances corresponding to determined BAL's.

Re-vegetation of riparian and/or coastal areas is part of this Proposal. Can the required BAL separation distance be maintained into the future?	No
Have any other landscape plans applying to this Proposal been considered in assessing the potential change in bushfire risk into the future	Yes

If any of the above applies, further information is presented in Section 6 ‘Bushfire Risk Management Measures’.

7 Specific Land Uses

State Planning Policy 3.7 Planning in Bushfire Prone Areas (Department of Planning and WAPC 2015) sets out in policy measure 6.6 what is required for ‘vulnerable’ or ‘high risk’ land uses to be supported in bushfire prone areas subject to BAL-12.5 or higher.

7.1 Vulnerable Land-Use – Definition / Application / Requirements

Is this concise Bushfire Management Plan (BMP) to accompany a development application for building work associated with a land use that is considered a ‘vulnerable’ land use?	Yes
Is a Bushfire Evacuation (Response) Plan (BER Plan) for Proposed Occupants to be provided as a separate document and be considered as forming a part of this Bushfire Management Plan?	No
Is the required content of a Bushfire Evacuation (Response) Plan for Proposed Occupants to be provided as an addition to the proponents existing emergency evacuation plan?	Yes
In certain circumstances the required information to fully compile the BER Plan (e.g. position, names and contact numbers for responsible persons) is not available at the development application stage. In such a situation the responsibility to complete the required details prior to occupancy of the subject building will noted in the Landowner/Proponent Responsibilities section of this BMP. Does this situation apply to this application?	No

Information reference: SPP 3.7 *Planning in Bushfire Prone Areas* (Department of Planning and WAPC 2015 s6.6 and s7) and the *Guidelines for Planning in Bushfire Prone Areas* (WAPC 2015 s5.5):

Definition and Application

SPP 3.7 defines vulnerable land use as a land use where persons may be less able to respond in a bushfire emergency. The ‘Guidelines expand this and state that vulnerable uses of land are typically those that are considered to have occupants with a lesser capacity to respond in the event of a bushfire and that may present evacuation challenges.

Examples of ‘vulnerable’ land uses include (but are not limited to) hospitals, nursing homes and retirement villages, tourist accommodation including camping grounds and ecotourism, childcare centres, educational establishments, places of worship and corrective institutions. The definition may also encompass places of assembly, retail and office premises, as well as subsidiary uses of residential development, such as family day care centres or home businesses, and essential infrastructure such as energy, transport, telecommunications and other utilities.

In general terms the following scenarios might need to be considered as vulnerable land uses:

- a. Where persons are present that have a lesser physical/mental capacity to respond to emergencies;
- b. Where occupancy might be transient in nature;
- c. Where greater numbers of persons may be present at certain times;
- d. Where occupants are typically not fully familiar with the building or area.

Required Information

1. In areas where BAL-12.5 to BAL-29 applies, a subdivision or development application will not be supported unless it is accompanied by a Bushfire Management Plan (BMP) jointly endorsed by the relevant local government and the State authority for emergency services;
2. The BMP is to include an assessment against the bushfire protection criteria requirements demonstrating compliance within the boundary of the development site.
3. Subdivision applications are to make provision for emergency evacuation;
4. Development applications should include an emergency evacuation plan for proposed occupants; and
5. Where BAL-40 or BAL-FZ applies, applications will not be supported unless they meet the definition of 'minor' or 'unavoidable' development.

The Tuart Lakes Lifestyle Village is currently in operation. A review of any existing Emergency Evacuation plan is to be carried out with respect to incorporating the required content of a Bushfire Evacuation (Response) Plan for Proposed Occupants.

8 Responsibilities for Implementation & Maintenance

This section sets out the responsibilities of landowners/proponents (including future landowners), builders and local government in relation to the implementation and maintenance of the requirements of SPP 3.7 and the 'Guidelines'.

8.1 Landowner / Proponent Responsibilities

Implementation

- Ensure anyone listed as having responsibility under the Plan has endorsed it and is provided with a copy for their information. This includes the landowners/proponents, local government and any other authorities or referral agencies ('Guidelines' s4.6.3).
- Construction of private driveways must comply with the standards (Appendix 5 'Vehicular Access').
- Implement the low fuel Asset Protection Zone (APZ) as per s5.3 'Vegetation Management' and Appendix 4 'APZ and HSZ'.
- Ensure all future buildings the landowner/proponent has responsibility for, are designed and constructed in full compliance with the requirements of the WA Building Act 2011 and the referenced Building Code of Australia (BCA), and with any identified additional requirements of the relevant local government. This should include due consideration of constructing any Class 4-9 buildings to the standard corresponding to their determined BAL even though not required by the BCA.

For any Class 1, 2, or 3 buildings and associated Class 10a buildings or decks this will include compliance with AS 3959-2009 *Construction of Buildings in Bushfire Prone Areas* (2009 as amended) and/or the National Association of Steel Housing – (NASH) *Standard – Steel Framed Construction in Bushfire Prone Areas*, whereby construction standards corresponding to the assessed BAL will be applied (Appendix 2 'Bushfire Risk Assessment – Understanding the Methodology').

- There is an outstanding requirement created by this bushfire management plan; a bushfire evacuation plan that addresses the circumstance of bushfire will be required. This may form part of an existing overall emergency evacuation plan.

Maintaining Compliance

- Current and future landowners/proponents must continue to apply the bushfire management measures set out in this Plan. They must inform any builders (of future structures on the lot) of the existence of the Plan and the responsibilities it contains.
- Respond to and comply with fire protection or hazard management notices issued by the local government. This includes compliance with the City of Rockingham Fire Control Notice (the current requirements can be found on the City of Rockingham website), issued under s33 of the Bush Fires Act 1954 as directed by the 'Guidelines' s6.1 and referenced in this Plan s5.1 'Bushfire Protection Criteria' and Appendix 4 'APZ and HSZ'.
- Maintain the low fuel Asset Protection Zone (APZ) within the Lot boundary as per s5.3 'Vegetation Management' and Appendix 4 'APZ and HSZ'.
- The stated minimum separation distance (refer to the table in s5.3) from any classified vegetation, that corresponds to a particular lot's assessed BAL, must be maintained as either a non-vegetated area or as low threat vegetation managed in a minimal fuel condition as per AS 3959-2009 s2.2.3.2 (e) and (f). A minimal fuel condition is stated in the standard as meaning "there is insufficient fuel available to significantly increase the severity of the bushfire attack" and being "recognisable as short cropped grass for example to a nominal height of 100mm." Refer to Appendix 3 of this Plan for further detail.
- Where any existing or planned re-vegetation has been assessed as "low threat" (meeting AS 3959-2009 Section 2.2.3.2 requirements) and excluded from classification then this area will be managed to continue to meet those requirements and enable the buildings to retain their determined BAL ratings.
- Any classified vegetation that has directly contributed to the determined BAL rating for a given Lot or building, must be managed such as to not change that vegetation to a higher risk classification.

8.2 Builder Responsibilities

The builder (generally named on the building permit) is responsible for ensuring that the building or incidental structure to which a building permit applies is, on completion, compliant with the Building Code of Australia (BCA).

For Classes 1a, 1b, 2, 3 and associated 10a buildings or decks located in a designated bushfire prone area, compliance with the BCA requires that these buildings are constructed to the requirements corresponding to their bushfire attack level rating.

The construction standards for Class 1a and 1b buildings are contained in:

- *AS 3959 - 2009 Construction of buildings in bushfire prone areas; or*
- *National Association of Steel Housing – (NASH) Standard – Steel Framed Construction in Bushfire Prone Areas.*

The construction standards for Classes 2, 3 and associated 10a buildings or decks are contained in:

- *AS 3959 - 2009 Construction of buildings in bushfire prone areas.*

The building/s must also comply with any additional local government requirements.

For any Class 4-9 buildings the builder must comply with any construction requirements that are additional to those contained in the BCA. Of particular issue is any requirement, made by the relevant local government or the owner, to construct to the standard corresponding to the determined BAL for proposed buildings.

8.3 Local Government Responsibilities

Implementation

- Provide advice where the clearing of locally significant vegetation is proposed.
- Register this Bushfire Management Plan and keep a record of the sites referred to for the purpose of identify servicing and infrastructure gaps. ('Guidelines' s4.6.4).

Maintaining Compliance

- Develop and maintain district bushfire fighting services and facilities.
- Any existing and planned revegetation areas that have been assessed in this Plan to have:
 1. Met the Australian Standard *AS 3959-2009* s2.2.3.2 requirements and has been excluded from classification (refer to Appendix 3 'Vegetation Classification Exclusions');
 2. Has directly resulted in the assessed BAL-LOW rating and/or forms part of the minimum required classified vegetation separation distance that that corresponds to a particular structure's assessed BAL; and

3. Is an area whose maintenance is the responsibility of the Local Government (i.e. the subject land is vested in the control of the local government - 'Guidelines s6.2);

such areas of vegetation must be maintained to be low threat as specified in AS 3959-2009 Section 2.2.3.2 (refer to Appendix 3 'Vegetation Classification Exclusions').

- Any classified vegetation areas that has directly contributed to the determined BAL rating and are areas whose maintenance is the responsibility of the Local Government, must be managed such as to not change that vegetation to a higher risk classification.

9 Appendices

Appendix 1 Bushfire Prone Areas – Overview of the Building versus Planning Requirements

Building Application (Building Permit) and the Requirement for a Bushfire Attack Level (BAL) Assessment

The majority of development in WA requires the submission of a building application in order to obtain a building permit before construction can commence. The proposed construction must comply with the Building Code of Australia (BCA).

In a designated bushfire prone area, construction, renovation, alteration, extension, improvement or repair of residential buildings (Classes 1, 2, 3 and associated Class 10a buildings or decks), must comply with the bushfire construction requirements of the BCA.

The BCA references AS 3959-2009 'Construction of buildings in bushfire prone areas' and the NASH Standard 'Steel Framed Construction in Bushfire Areas', as providing deemed to satisfy solutions that achieve compliance with the BCA bushfire performance requirements.

A Bushfire Attack Level (BAL) assessment (using the methodology set out in AS 3959-2009) is required to determine the BAL rating of the proposed building work. The corresponding design and construction requirements are then able to be determined.

Class 4 to Class 9 buildings will also require a BAL assessment but are not required to comply with the bushfire performance requirements. However, the requirement to comply may be established by the relevant local government, by their local planning scheme and/or establishment of a special control area. The requirements might also be voluntarily adopted.

Development Application (Planning Approval) and the Requirement for a Bushfire Management Plan (BMP)

In the situations described in Section 2 of this Plan, a development application and subsequent planning approval is required before progressing to the building application process. In these situations, a Bushfire Management Plan that includes the BAL assessment and addresses the bushfire protection criteria is required to be submitted.

Other assessments and supporting documents may also be required and these are provided in or with the BMP.

Appendix 2

Bushfire Risk Assessment – Understanding the Methodology

In SPP 3.7 ‘bushfire risk’ is defined as “the chance of a bushfire igniting, spreading and causing damage to people, property and infrastructure.”

“Before a strategic planning proposal, subdivision or development application can be considered, it is necessary to understand the extent of the bushfire hazard and its potential to affect people, property and infrastructure. An assessment of bushfire risk is a key component of deciding whether a strategic planning proposal, subdivision or development application should be approved in an area with a potential bushfire threat (from the ‘Guidelines’).”

Policy measures in *SPP 3.7* (and the associated document *Guidelines for Planning in Bushfire Prone Areas WAPC 2015*) prescribe the various assessment tools to be used to assess bushfire risk in the planning context. These are:

- Bushfire Hazard Level assessment;
- Bushfire Attack Level (BAL) Contour Map;
- Bushfire Attack Level (BAL) assessment;
- Bushfire protection criteria; and
- Bushfire Management Plan

The intent of this Appendix ‘Bushfire Risk Assessment – Understanding the Methodology’ is to provide an overview of the methodology used in assessing the Bushfire Hazard Level and the Bushfire Attack Level.

Bushfire Hazard Level Assessment Methodology

“A Bushfire Hazard Level assessment provides a ‘broad-brush’ means of determining the potential intensity of a bushfire for a particular area. The Bushfire Hazard Level assessment assists in informing the suitability of land contained within strategic planning proposals for future subdivision and development. The Bushfire Hazard Level assessment categorises land within a designated bushfire prone area as having a low, moderate or extreme bushfire hazard level. Different hazard levels may be assigned to different parts of individual lots (‘Guidelines’ s4.1).”

The hazard levels are assessed primarily based on defined fuel characteristics. These characteristics include:

- Prevailing climatic conditions
- Vegetation threat type and area
- Effective ground slope under the vegetation threat
- Existing land use on and around the area being assessed

Bushfire Attack Level Assessment Methodology

The Australian Standard AS 3959-2009 *Construction of Buildings in Bushfire Prone Areas* defines a Bushfire Attack Level (BAL) as:

“A means of measuring the severity of a building’s potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts per metre squared, and is the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire.”

AS 3959-2009 defines six categories of Bushfire Attack Level (BAL) (AS 3959 Appendix G); provides the assessment methodology (AS 3959 s2 and Appendix B); and specifies constructions standards corresponding to each BAL (AS 3959 s3 Table 3.1). The BAL’s and corresponding descriptions of the predicted levels of exposure and heat flux exposure thresholds are contained in the table on the following page.

AS 3959-2009 provides two methods to calculate Bushfire Attack Levels:

1. **Method 1** - a simplified procedure that involves five procedural steps to determine the BAL. It is subject to some limitations of the circumstances in which it can be used.
2. **Method 2** - a detailed procedure using calculations to determine BALs where a more specific result is sought or site conditions are outside the scope of Method 1.

Method 1 – Summarised Procedure

- Determination of the area to be assessed
- Determine predominant vegetation type(s) within 100 metres of the site and classify
- Determination of distance of the site, building or building envelop from the classified vegetation type(s)
- Determination of the effective slope under the classified vegetation type(s)
- Determination of BAL’s - Forest Fire Danger Index (FFDI) of 80 is used for WA

Note: Separation Distance: *The distance from a subject site (or building) to a specific area of classified vegetation (i.e. the bushfire threat) is labelled in the tables of this Plan as a separation distance. This distance is measured to a point in the vegetation area represented by the “edge of the vegetation” as per AS 3959 -2009 s2.2.4 and the “base of the bushfire prone vegetation (not the canopy)” as per the BAL Assessment [Basic] Factsheet Version 1 December 2015 WAPC. The exact point of measurement is then decided by the assessor on the basis of the fuel structure and expected fire behaviour. If a precautionary approach is considered appropriate to a given situation the measurement will be taken at the canopy line.*

Bushfire Attack Level Definitions and Corresponding Sections Specifying Construction Requirements (Source: AS 3959-2009, Appendix G and Table 3.1)

Bushfire Attack Level (BAL)	Description of Predicted Bushfire Attack and Levels of Heat Flux Exposure	Construction Section of AS 3959
BAL - LOW	There is insufficient risk to warrant specific construction requirements but there is still some risk. There is risk of ember attack.	4
BAL - 12.5	The construction elements are expected to be exposed to a heat flux not greater than 12.5 kW/m ²	3 and 5
BAL - 19	There is a risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 19 kW/m ²	3 and 6
BAL - 29	There is an increased risk of ember attack and burning debris ignited by wind borne embers and a likelihood of exposure to an increased level of radiant heat. The construction elements are expected to be exposed to a heat flux not greater than 29 kW/m ²	3 and 7
BAL - 40	There is a much increased risk of ember attack and burning debris ignited by wind borne embers, a likelihood of exposure to a high level of radiant heat and some likelihood of direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux not greater than 40 kW/m ²	3 and 8
BAL - FZ	There is an extremely high risk of ember attack and burning debris ignited by wind borne embers, a likelihood of exposure to an extreme level of radiant heat and some likelihood of direct exposure to flames from the fire front. The construction elements are expected to be exposed to a heat flux greater than 40 kW/m ²	3 and 9



Appendix 3

Vegetation Classification Exclusions (AS 3959-2009 s2.2.3.2)

Certain vegetation can be excluded from being classified in which case the Bushfire Attack Level shall be rated as BAL-LOW and no bushfire specific construction requirements apply. Such vegetation is one or a combination of the following:

- a) Vegetation of any type that is more than 100m from the site.
- b) Single areas of vegetation less than 1ha in area and not within 100m of other areas of vegetation being classified.
- c) Multiple areas of vegetation less than 0.25ha in area and not within 20m of the site or each other.
- d) Strips of vegetation less than 20m in width regardless of length and not within 20m of the site or each other, or other areas of vegetation being classified.
- e) Non-vegetated areas, including waterways, roads, footpaths, buildings, and rocky outcrops.
- f) Low threat vegetation, including grassland managed in a **minimal fuel condition** (i.e. insufficient fuel available to significantly increase the severity of a bushfire attack – recognisable as short cropped grass to a nominal height of 100mm for example), maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks.

Appendix 4

Technical Requirements – Bushfire Protection Criteria (APZ & HSZ)

A vital and effective component of managing the potential bushfire risk to people, property and infrastructure is creating bushfire protection zones in which fire fuel loads are reduced and maintained. They are an integral part of subdivision and development design and appropriately designed will greatly assist with bushfire prevention and suppression operations.

The *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015, Appendix 4)* set out the requirements to create an Asset Protection Zone (APZ) and a Hazard Separation Zone (HSZ). The aim of these bushfire protection zones is to have a fire of diminishing intensity and flame length as it approaches development. These reduced fuel loads will reduce the intensity of radiant heat onto the buildings, thereby increasing their survivability.

The APZ is a low fuel area immediately surrounding a habitable or specified building and is designed to prevent direct flame contact with buildings and it improves safety for firefighters and occupants during fire suppression activities. Maintaining this zone in a minimal fuel condition is essential and firefighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation is unsafe.

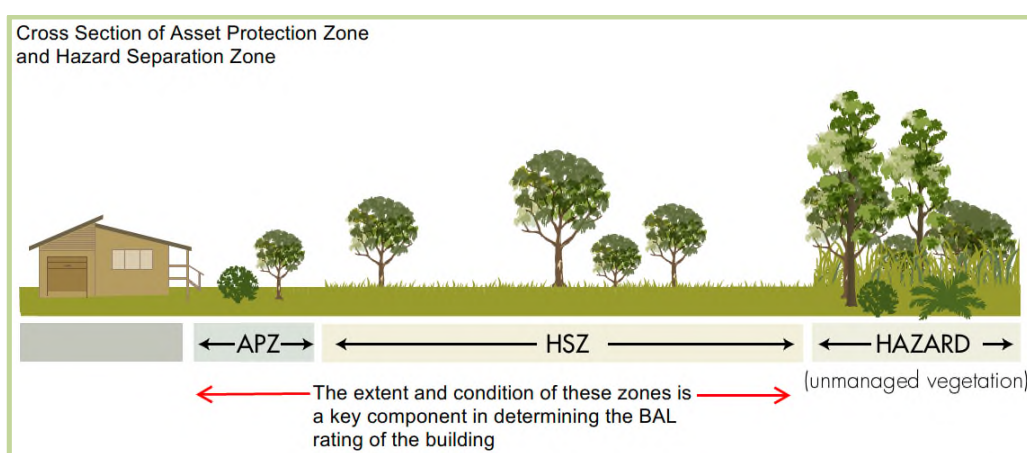
Note that individual local governments may vary their specifications of the APZ from those indicated below. These specifications will be contained in their Firebreak and Fuel load notices and are to be complied with.

Asset Protection Zone (APZ) Requirements (source: ‘WAPC Guidelines’)

- **Width:** 20 metres measured from any external wall of the building or building envelope. Where the slope increases above 10°, the APZ should be increased to ensure the potential radiant heat impact of a fire does not exceed 29 kW/m² (i.e. a BAL-29 rating on the building).
- **Location:** the APZ should be accommodated within the boundaries of the lot on which the building is situated. Where a full 20 metre APZ is not possible the APZ should be sufficient enough to ensure the potential radiant heat impact of a fire does not exceed 29 kW/m² (i.e. a BAL-29 rating on the building).
- **Fine Fuel Load:** reduced to and maintained at 2 t/ha. (DFES guidance-keep grasses short, remove leaves, twigs, dead material within shrubs and trailing bark, and prune branches to 2 metres above the ground).
- **Trees:** crowns are a minimum distance of 10 metres apart (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) and no crowns overhang the building.
- **Shrubs/Trees:** no tall shrubs or tree foliage within two metres of a building
- **Sheds and Fences:** within the APZ are constructed using non-combustible materials (e.g. iron, brick, limestone, metal post and wire) and sheds do not contain flammable materials.

Additional DFES Guidance

- Do not clump shrubs close to a building. Ensure there is a gap between shrubs and buildings of three times their mature height.
- Store firewood at least 20 metres away from the building.
- Keep gutters free of leaves and other combustible material.
- Roof mounted evaporative coolers to be fitted with ember screens.
- Gas cylinders to vent away from a building and be tethered to prevent falling over.
- Driveways and access ways must allow for safe passage of a fire appliance to all buildings on the land.
- Land owners/occupiers must maintain compliance with the local government's annual firebreak notice issued under s33 of the Bush Fires Act 1954.
- Barriers such as driveways, lawns, ovals, orchards and pathways surrounding dwellings can form part of a APZ. Locate them to maximise building protection.



Hazard Separation Zone (HSZ) Requirements (source: 'WAPC Guidelines')

The 'Guidelines' set out the requirement for a physical separation between extreme bushfire hazard areas and development in low and moderate hazard areas both around and within subdivisions.

- Width:** a minimum of 80 metres measured from the outer edge of the APZ for any vegetation classified in AS3959 as forest, woodland, closed shrub, open shrub, mallee/mulga and rainforest OR 30 metres, measured from the outer edge of the APZ, for unmanaged grassland.
- Location:** within the boundaries of the lot on which the building is situated or, where this is not possible or desirable, within the boundaries of the development precinct in which the building is proposed to be located.
- Fine Fuel Load:** dead material <6mm diameter and live material <3mm is to be reduced to and maintained at 5 - 8 t/ha for jarrah/marri dominated forest and woodlands, below 12 -15 t/ha in mallee heath and below 15 t/ha in karri forest.
- Exception** - a HSZ may not be required if the proposed construction meets the standard appropriate to the assessed BAL for that location/building and that BAL does not exceed BAL-29.

The intent is to create a combined minimum separation distance of 100 metres between the buildings and the hazard (50 metres if unmanaged grassland). This separation distance may be reduced if the development is compliant with AS 3959 (i.e. as the distance from classified vegetation is reduced, the construction standard must be increased) or by using a performance principle assessment.

Appendix 5

Technical Requirements - Bushfire Protection Criteria (Vehicular Access)

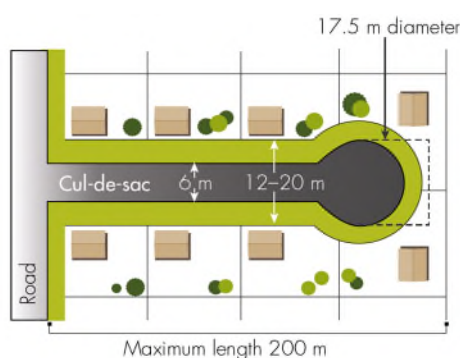
Vehicular Access – Technical Requirements of Acceptable Solutions - Part 1

Source: Guidelines for Planning in Bushfire Prone Areas WAPC 2015

Acceptable Solution 3.3 Cul-de-sacs (including a dead-end road)

Their use in bushfire prone areas should be avoided. Where no alternative exists then the following requirements are to be achieved:

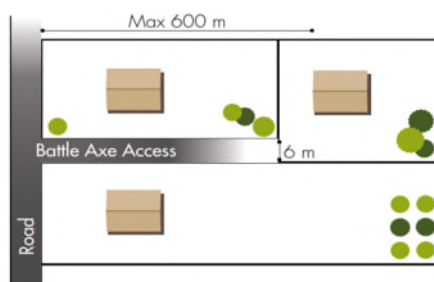
- Maximum length is 200m. If public emergency access is provided between cul-de-sac heads (as a right of way or public access easement in gross), the maximum length can be increased to 600m provided no more than 8 lots are serviced and the emergency access way is less than 600m in length;
- Turnaround area requirements, including a minimum 17.5m diameter head to allow type 3.4 fire appliances to turn around safely;
- The cul-de-sac connects to a public road that allows for travel in two directions; and
- Meet the additional design requirements set out in Part 2 of this appendix.



Acceptable Solution 3.4 Battle-axe

Their use in bushfire prone areas should be avoided. Where no alternative exists then the following requirements are to be achieved:

- Maximum length 600m and minimum width 6m; and
- Comply with minimum standards for private driveways.



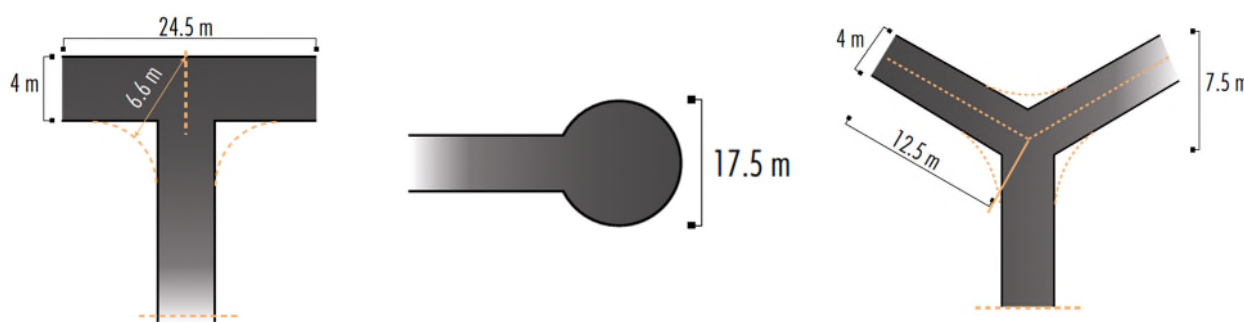
Acceptable Solution 3.5 Private Driveways

The following requirements are to be achieved:

- The design requirements set out in Part 2 of this appendix; and

Where the house site is more than 50 metres from a public road:

- Passing bays every 200 metres with a minimum length of 20 metres and a minimum width of two metres (ie combined width of the passing bay and constructed private driveway to be a minimum six metres);
- Turn-around areas every 500 metres and within 50 metres of a house, designed to accommodate type 3.4 fire appliances to turn around safely (ie kerb to kerb 17.5 metres);
- Any bridges or culverts are able to support a minimum weight capacity of 15 tonnes; and
- All weather surface (i.e. compacted gravel, limestone or sealed).



A3.8 Firebreak Width

Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three meters or to the level as prescribed in the local firebreak notice issued by the local government.

Vehicular Access - Technical Requirements of Acceptable Solutions - Part 2

Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2015*

Technical Component	Vehicular Access Types				
	Public Roads	Cul-de-sacs	Private Driveways	Emergency Access Ways	Fire Service Access Routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	4.5	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum cross-fall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5

* A six metre trafficable surface does not necessarily mean paving width. It could, for example, include four metres of paving and one metre of constructed road shoulders. In special circumstances, where 8 lots or less are being serviced, a public road with a minimum trafficable surface of four metres for a maximum distance of ninety metres may be provided subject to the approval of both the local government and DFES.

Appendix 6

Technical Requirements - Bushfire Protection Criteria (Water)

Source: *Guidelines for Planning in Bushfire Prone Areas WAPC 2015* and DFES website

Acceptable Solution 4.1 Reticulated Areas

The requirement is to supply a reticulated water supply, together with fire hydrants, in accordance with the specifications set by DFES and the relevant water supply authority (WA Water Corporation or Aqwest - Bunbury or Busselton Water). The Water Corporation's 'No 63 Water Reticulation Standard' is deemed to be the baseline criteria for developments and should be applied unless local water supply authority's conditions apply. Key specifications in the most recent version/revision of the design standard include:

- **Residential Standard** – hydrants are to be located so that the maximum distance between the hydrants shall be no more than 200 metres.
- **Commercial Standard** – hydrants are to be located with a maximum of 100 metre spacing in Industrial and Commercial areas.
- **Rural Residential Standard** – where minimum site areas per dwelling is 10,000 m² (1ha), hydrants are to be located with a maximum 400m spacing. If the area is further subdivided to land parcels less than 1ha, then the residential standard (200m) is to be applied.

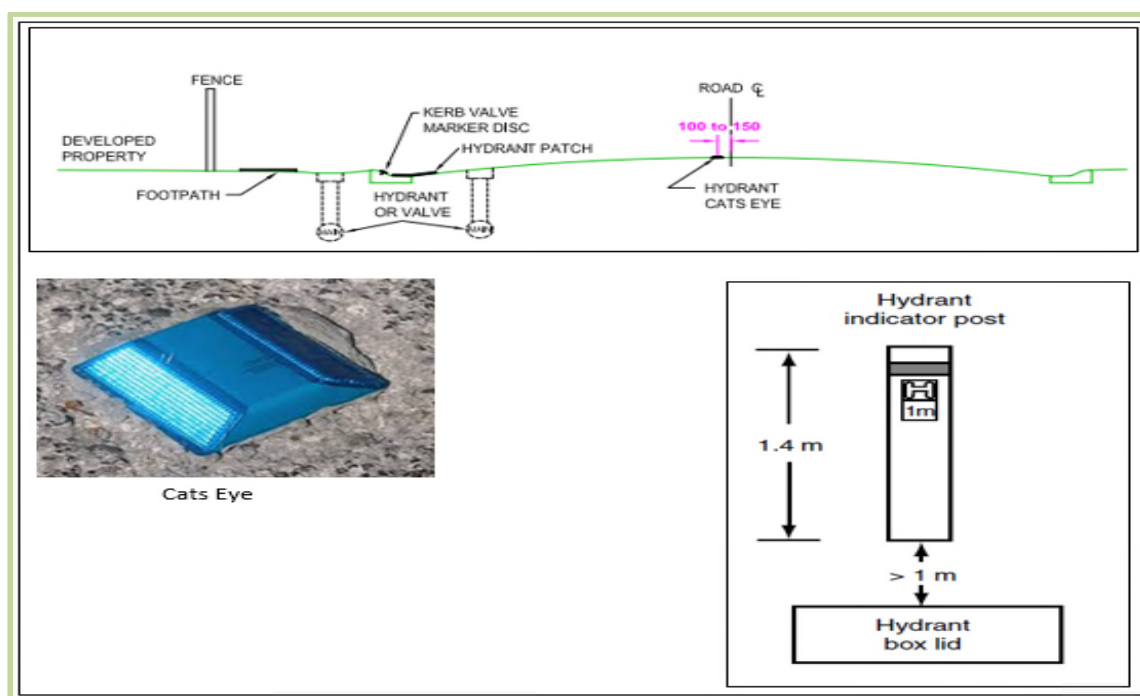


Figure A4.1: Hydrant Location and Identification Specifications

Acceptable Solution 4.2 Non-Reticulated Areas

Static water supplies are used by firefighters in areas where there is no reticulated water supply. Water tanks are the only acceptable static water source acceptable to meet Element 4 (Water) of the Bushfire Protection Criteria as per the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2015) Appendix 4*.

The requirements for the development being assessed can be increased by the relevant local government. If a variation applies it will be noted in the Plan.

Volume:	50,000 litres per tank
Ratio of tanks to lots:	1 tank per 25 lots (or part thereof)
Location:	No more than two kilometres to the furthestmost house site within the residential development to allow a 2.4 fire appliance to achieve a 20 minute turnaround time at legal road speeds.
Tank Construction:	Above ground tanks constructed using concrete or metal. Stands of raised tanks are constructed using non-combustible materials and heat shielding where applicable (required for metal stands).
Pipe Construction:	Galvanised or copper (PVC if buried 300mm below ground).
Access:	Hardstand and turnaround areas suitable for a 3.4 appliance (i.e. kerb to kerb 17.5metres) are provided within three metres of each tank.
Couplings:	Tanks are to be fitted with a full flow gate (not ball) valve and a 100mm cam-lock coupling of metal/alloy construction (source: DFES). Examples below:



Ownership and Responsibility:

Water tanks and associated facilities are vested in the relevant local government. A procedure must be in place to ensure that water tanks are maintained at or above designated capacity at all times. This could be in the form of an agreement with the local government and the fire service.

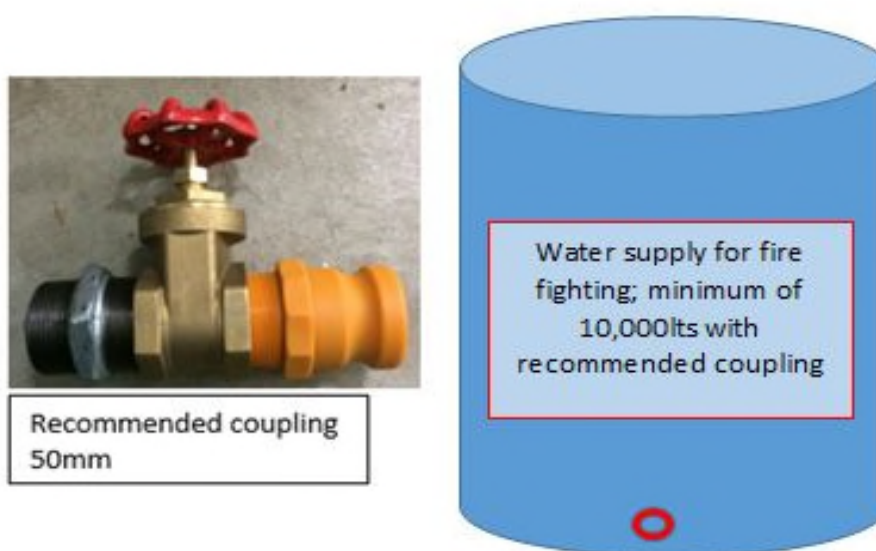
Acceptable Solution 4.3 Non-Reticulated Areas - Individual Lots

This solution is only for use if creating one additional lot and cannot be applied cumulatively (*Guidelines for Planning in Bushfire Prone Areas WAPC 2015 Appendix 4*).

Single lots above 500 m² need a dedicated static water supply on the lot that has an effective capacity of 10,000 litres (*Guidelines for Planning in Bushfire Prone Areas WAPC 2015*).

An Example Local Government Requirement:

Volume:	Minimum 10,000 litres (effective) per tank dedicated to firefighting purposes. The storage tank must not facilitate sharing the water for domestic use (danger of contamination).
Tank Construction:	Above ground tanks constructed using concrete or metal.
Pipe Construction:	Galvanised or copper (PVC if buried 300mm below ground).
Access:	Hardstand and turnaround area suitable for a 3.4 appliance (i.e. kerb to kerb 17.5metres) is provided at the tank.
Couplings:	Tanks are to be fitted with a full flow gate (not ball) valve and a 50mm or 100mm cam-lock coupling of metal/alloy construction. Examples below:
Responsibility:	A procedure must be in place to ensure that water tanks are maintained at or above designated capacity at all times. This could be in the form of an agreement with the local government and the fire service.



Appendix 5

Current Bushfire Management Plan

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 102 (831) and 1 (851) Mandurah Road			
Suburb:	Baldivis	State:	WA	Postcode: 6171
Local government area:	City of Rockingham			
Description of the planning proposal:	Development Application			
BMP / Reference number:	NLV TRT ZB	Version:	2	Date of issue: 23/2/2026
Client / Business name:	Serenitas Communities Holdings Pty Ltd			

Reason for referral to DFES ¹	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 an outcomes-based approach?	☐	☒
Strategic planning proposal (including rezoning applications)	☐	☒
Local planning scheme amendment containing supplementary provisions, additional to the deemed provisions for bushfire risk management	☐	☒
Where a bushfire local planning policy, or variation to the acceptable solutions or the APZ is proposed	☐	☒
Where there is a conflict of opinion between the decision maker and proponent	☐	☒
Expert technical advice on bushfire behaviour, emergency management, or other occasions where bushfire technical advice is required to support planning decision-making	☐	☒
Expert technical advice on bushfire matters referred to State Administrative Tribunal (SAT) or Development Assessment Panel (DAP)	☐	☒
Comments on future buildings' compliance with FES Commissioner's operational requirement guidelines	☐	☒
Decision maker discretionary referral, (e.g. renewable energy, hazardous materials, 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.)?

Method 2 Assessment undertaken.

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 Tom Hockley	Accreditation Level BPAD Level 3	Accreditation No. 39692	Accreditation Expiry 30/6/2026
Company Allerding & Associates	Contact No. 08 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

23/2/2026

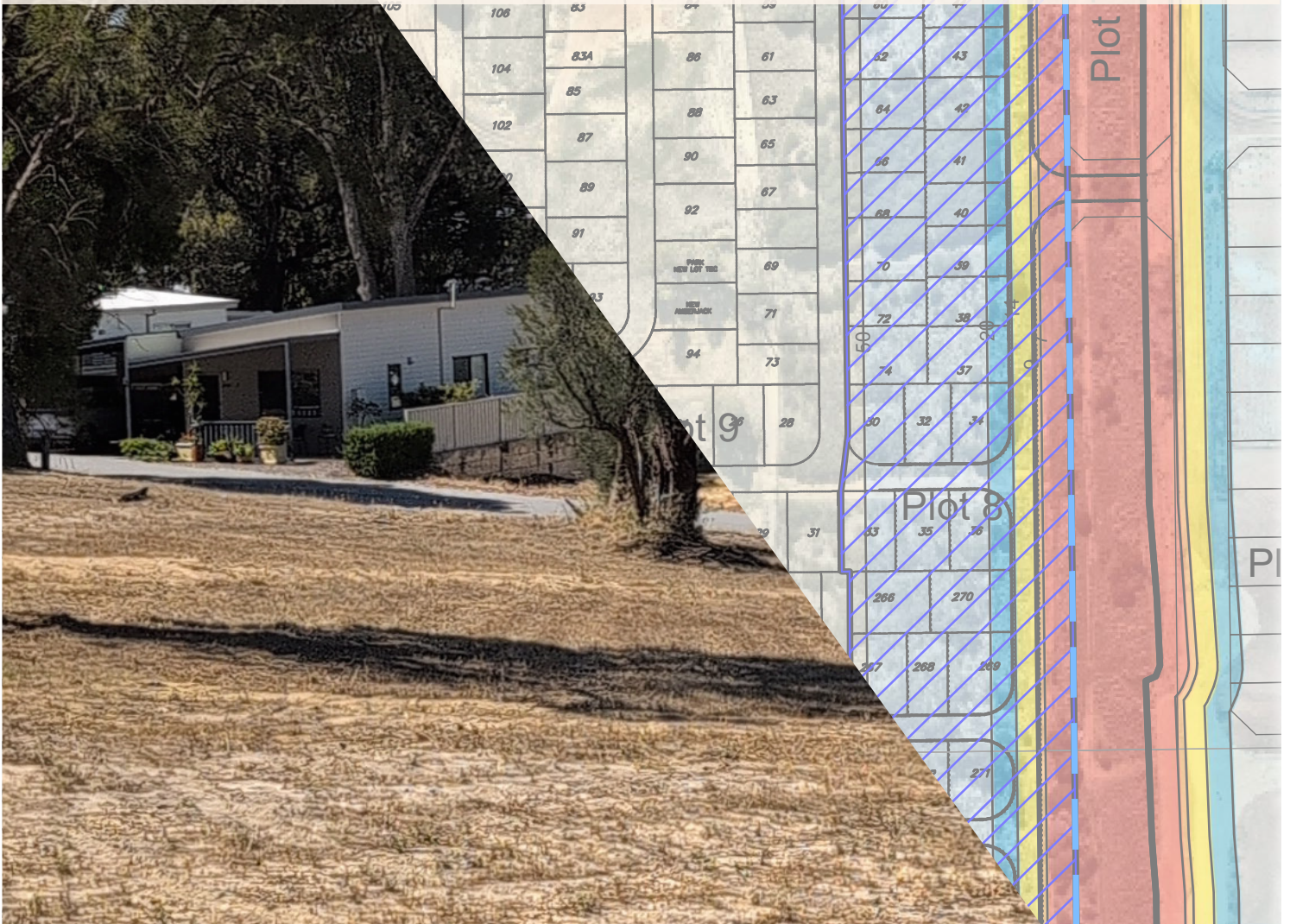
¹ For more information please refer to DFES [Referral to DFES Checklist](#)

Plot 5

Bushfire Management Plan

Stages 12, 14 and 16

Lots 102 & 1 (Nos. 831 & 851) Mandurah Road, Baldivis
City of Rockingham



Prepared for: Serenitas Communities Holdings Pty Ltd

Prepared by: Allerding and Associates

FEBRUARY 2026



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& Associates**

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APPENDIX 2 – LANDSCAPE PLAN

APPENDIX 3 – VEGETATION CLASSIFICATION (VEGETATION PLOTS IN EXISTING CONDITION)

APPENDIX 4 – BUSHFIRE MANAGEMENT PLAN MAPPING

APPENDIX 5 –CITY OF ROCKINGHAM FIRE CONTROL NOTICE 2025-2026

APPENDIX 6 –ASSET PROTECTION ZONE TECHNICAL REQUIREMENTS

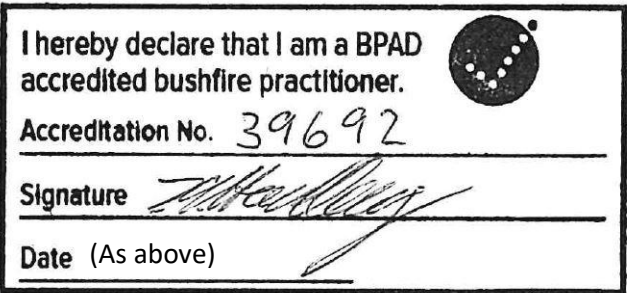
APPENDIX 7 – VEHICULAR ACCESS TECHNICAL REQUIREMENTS

TABLE 1 – SUMMARY OF VEGETATION CLASSIFICATION AND SLOPE

TABLE 2 – ASSESSED BAL FOR FUTURE DWELLINGS

TABLE 3 – ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA

- FIGURE 1 – MAP OF BUSHFIRE PRONE AREAS
 FIGURE 2 – DEVELOPMENT SITE
 FIGURE 3 – VEGETATION CLASSIFICATION
 FIGURE 4 – TOPOGRAPHICAL PLAN
 FIGURE 5 – FLAMESOL CALCULATION
 FIGURE 6 – BAL CONTOUR MAP
 FIGURE 7 – BUSHFIRE MANAGEMENT STRATEGIES MAP

Document ID: NLV TRT ZB / 2602						
Issue	Date	Status	Prepared by		Approved by	
			Name	Initials	Name	Initials
1	09.02.26	DRAFT	Tom Hockley	TH	Tom Hockley	TH
2	23.02.26	FINAL	Tom Hockley	TH	Tom Hockley	TH
3						
4						
5						
Site Inspection:		Undertaken by John Williamson on 28 November 2025 and 3 February 2026				
Approving BPAD Accredited Practitioner Details:						
Name:		Tom Hockley (Level 3 BPAD 39692)		 I hereby declare that I am a BPAD accredited bushfire practitioner. Accreditation No. 39692 Signature <i>[Signature]</i> Date (As above)		
Company Details:		Allerding & Associates 125 Hamersley Road Subiaco WA 6008				
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1.0 INTRODUCTION

This Bushfire Management Plan (BMP) has been prepared to accompany an application for development approval for Stage 16 of the existing Tuart Lake Lifestyle Village which has been prepared for the consideration of the City of Rockingham (the City). The BMP also updates the Bushfire Attack Level (BAL) Assessment for Stages 12 and 14 to accompany building permit applications for the release of these stages. Stages 12, 14 and 16 are located along the eastern and southern boundaries of Lots 102 (831) and Lot 1 (851) Mandurah Road, Baldivis (subject site). The purpose of the BMP is to assess whether the proposed development is capable of complying with the relevant planning controls based on the 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 Bushfire* (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 Clauses 4 and 7.1 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 *Planning for Bushfire Guidelines 2024* (the Guidelines) has been undertaken.

This BMP demonstrates that future development across the site can fully comply with the acceptable solutions of the Guidelines.

2.0 PROPOSAL DETAILS

2.1 Location

The development site is situated in the locality of Baldivis, approximately 39km south of the Perth CBD. The subject site falls within the local government area of the City of Rockingham.

The development site (representing Stages 12, 14 and 16) has an area of approximately 5.7 hectares and is predominantly cleared. The total land area of Nos. 831 and 851 Mandurah Road (inclusive of the development site) is 18.16 hectares and contains the existing Tuart Lakes Lifestyle Village which is nearing completion.

As outlined on the Department of Fire and Emergency Services (DFES) Western Australian Map of Bush Fire Prone Areas, portions of the subject site are designated as Bushfire Prone Area 2 (refer **Figure 1**).

2.2 Overview of Proposal

The delivery of Stages 12 and 14 and the proposed new Stage 16 will enable the continued development of homesites for the Tuart Lakes Lifestyle Village up to the rear boundary of 831 and 851 Mandurah Road.

The development site is included at **Figure 2**, with a copy also included in **Appendix 1**.

This BMP has been prepared to accompany development application for the Tuart Lakes Lifestyle Village prepared by Allerding & Associates.

The BMP for the development site has been prepared to address the provisions of SPP3.7 and the Guidelines.

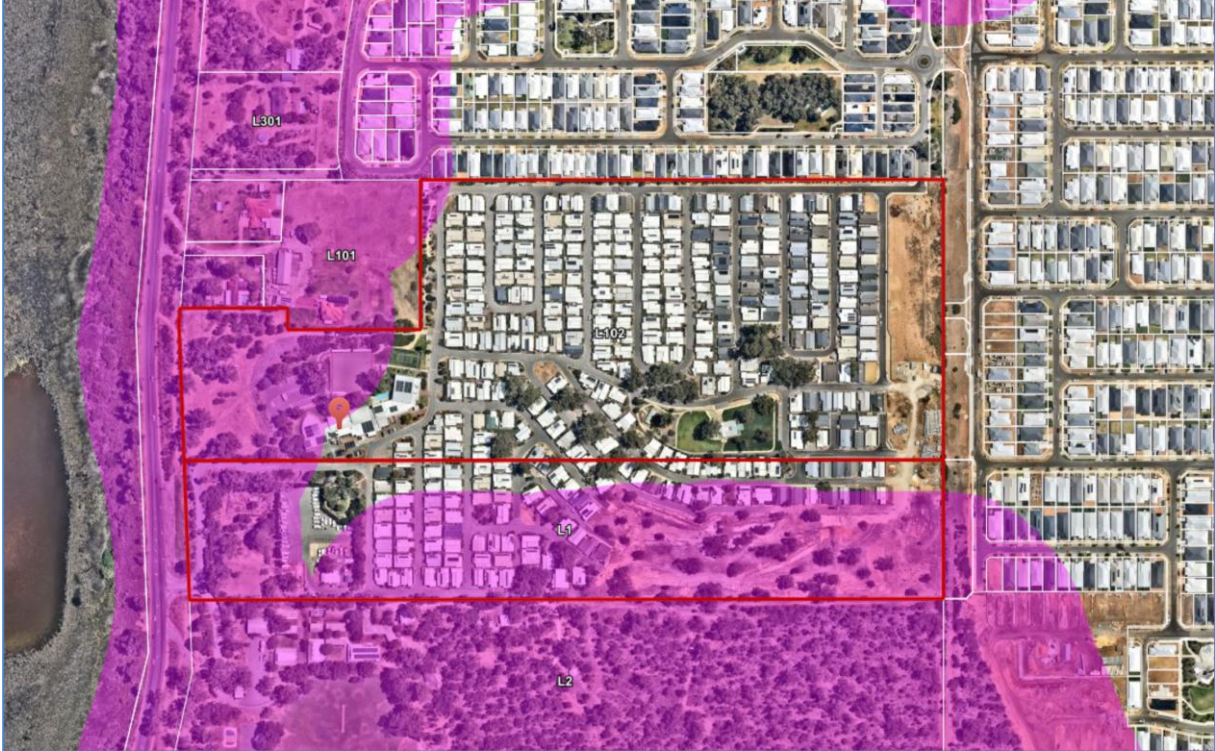


Figure 1 – Map of Bushfire Prone Areas (Source: MNG Maps 2025)

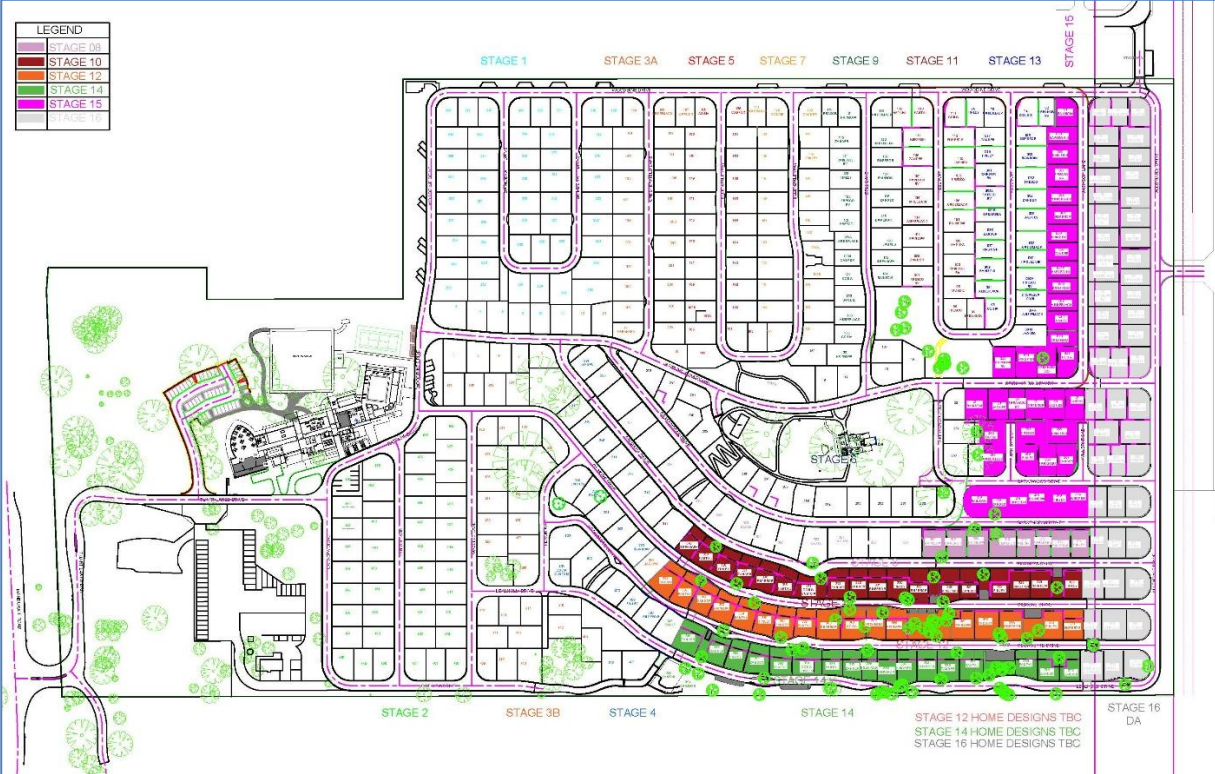


Figure 2 – Development Site

A BMP was previously prepared by Bushfire Prone Planning for the Tuart Lakes Lifestyle Village (dated July 2016). The BMP contemplated development in the location of Stages 12, 14 and 16 subject of the current development site identified within this BMP. The 2016 BMP addressed the relevant Bushfire Protection Criteria as contained within the *Guidelines for Planning in Bushfire Prone Areas* and outlined responsibilities in regard to vegetation management, vehicular access, fire fighting water supply and building construction standards.

As the village is existing and has been developed in accordance with the management measures outlined in the original 2016 BMP, the existing development will continue to be managed in accordance with the adopted BMP which sets out responsibilities for implementation which are consistent with current standards, including construction and maintenance of the internal road network (private driveways), construction of habitable buildings to Australian Standard AS3959 *Construction of buildings in bushfire prone areas* (AS3959), installation and maintenance of Asset Protection Zones within the property boundary and compliance with the City of Rockingham Fire Control Notice.

Since the preparation of the BMP in 2016, various revised Bushfire Attack Level (BAL) assessments have been undertaken across the Tuart Lakes Lifestyle Village site to inform construction standards for park homes in accordance with AS3959 as land has been progressively cleared both within the boundaries of the subject site and on neighbouring lots to the north and east. BAL Assessments have been undertaken in January 2020, June 2021, November 2022, June 2023 and November 2024 to provide updated BAL ratings as staged development has occurred.

In 2025 a BMP was prepared to accompany a structure plan amendment for the area identified as Stage 16 in the current BMP and assessed under the current version of the *Planning for Bushfire Guidelines* (November 2025). The 2025 BMP included an assessment under Section 5 of the Guidelines for structure plans and subdivision where the lot layout and internal road network is known.

This BMP has been prepared under Section 6 of the Guidelines for residential development and has also been prepared to review the assessment of classified Class A Forest vegetation to the immediate south of the development site and undertake a BAL Assessment using the Detailed Procedure (Method 2) as detailed in Appendix B of AS3959. A Method 2 BAL Assessment has been undertaken in this instance to consider the steep upslope effective slope to the south of the development site and review the applicable BAL based on adjusted inputs.

2.3 Access

Once the Tuart Lakes Lifestyle Village is fully developed, vehicular access will be available for emergency purposes in two locations, including:

- Existing main access from Mandurah Road to the west; and
- Existing access to Wellspring Road to the north.

Mandurah Road is a two way undivided road with a posted speed limit of 80km/hr, a carriageway width of approximately 11m and a horizontal clearance of approximately 16m.

Wellspring Road is a two way undivided local road with a carriageway width of approximately 6m and horizontal clearance of approximately 10m.

These roads provide connectivity to the north and west of the development site.

2.4 Water and Power Supply

The development site (and existing Tuart Lakes Lifestyle Village) has access to reticulated water and power. A network of fire hydrants has been constructed throughout the village.

3.0 ENVIRONMENTAL CONSIDERATIONS

The existing Tuart Lakes Lifestyle Village includes developed homesites and communal facilities in the central and western portions of the site. The eastern portion of the land (including the Development Site) contains parkland cleared areas which will accommodate future homesite development.

3.1 Native Vegetation – Modification and Clearing

The subject site will require limited targeted clearing to facilitate the required development. It is understood that all relevant approvals have been obtained for the targeted clearing required to facilitate development.

3.2 Revegetation and Landscape Plans

Landscaping is proposed along the eastern boundary of the Development Site as demonstrated in the Landscape Plan included at **Appendix 2**. This will include a combination of ground covers and low trees maintained in a low threat state, with non-permeable mulch.

4.0 BUSHFIRE ASSESSMENT RESULTS

A Method 2 procedure in accordance with AS3959 has been undertaken to inform this bushfire assessment.

4.1 Assessment Inputs

Table B1 of Appendix B of AS3959 provides the relevant input values used for modelling fire behaviour. The following input values are relevant to this assessment:

4.1.1 Fire Danger Index

For forests, woodlands, rainforests and other forest group vegetation classifications, Fire Danger Index (FDI) is determined in accordance with Clause 2.2.2 (Table 2.1) of AS3959 which identifies a FDI of 80 for Western Australia.

4.1.2 Vegetation Classification

The vegetation classification has been determined within and surrounding the subject site in accordance with Clause 2.2.3 of AS3959. Each distinguishable vegetation plot with the potential to determine the indicative BAL is identified in **Appendix 3** with the plots mapped in **Figure 3**. This information has been used to develop the BAL Contour Map at **Figure 6**.

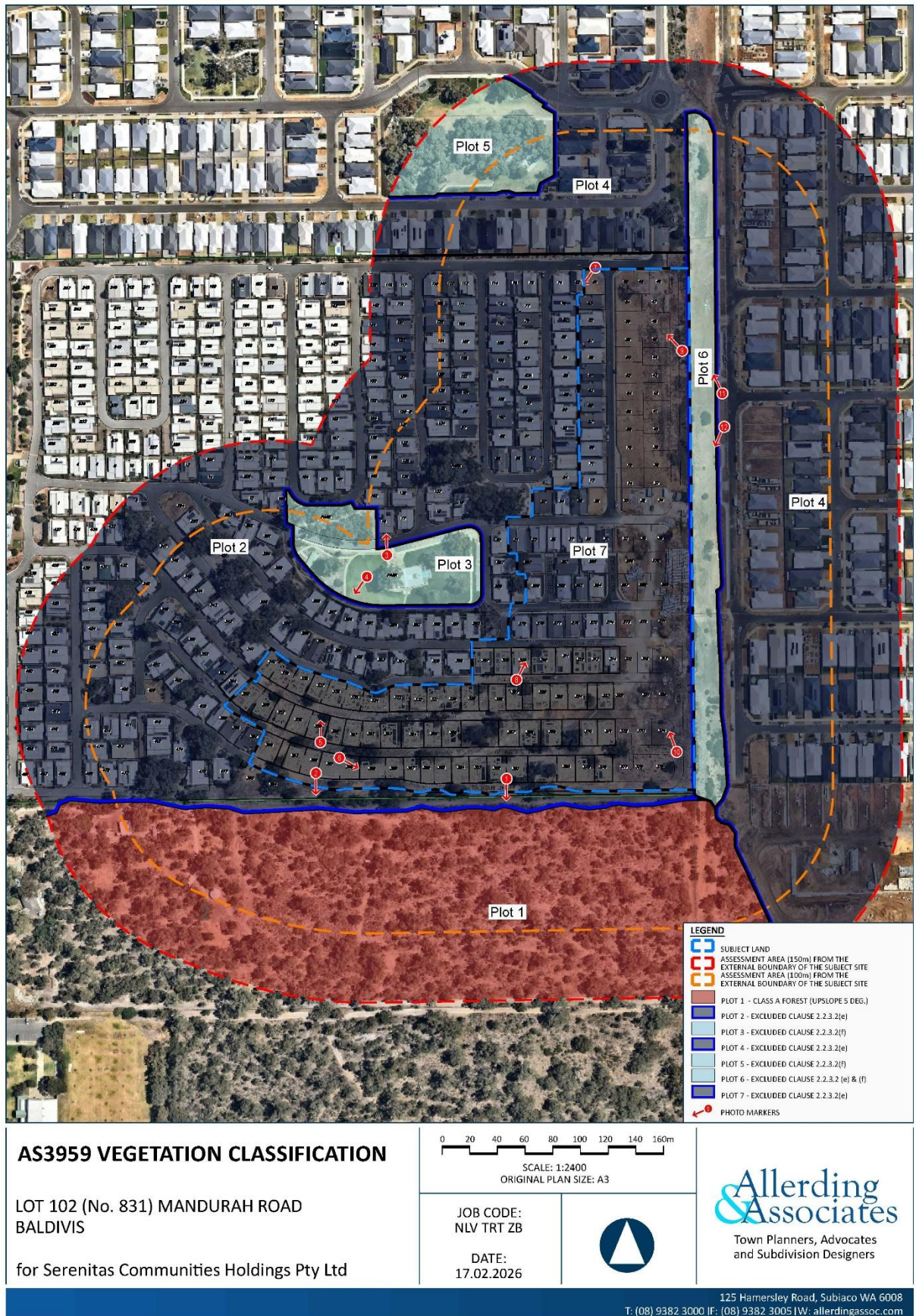


Figure 3 – Vegetation Classification

4.1.3 Effective Slope Under Classified Vegetation

The effective slope under classified Class A Forest vegetation (Plot 2) immediately south of the subject site has been assessed conservatively as 5 degrees upslope. **Figure 4** provides the applicable topographical transects used for the purpose of this calculation. In this instance, a steeper upslope effective slope would reduce the separation distance required to the classified vegetation in calculating the radiant heat impact. Therefore, while the actual slope south of the development site varies between approx. 7 and 9 degrees upslope (refer **Figure 4**), the effective slope of 5 degrees upslope has been applied as a conservative measure.

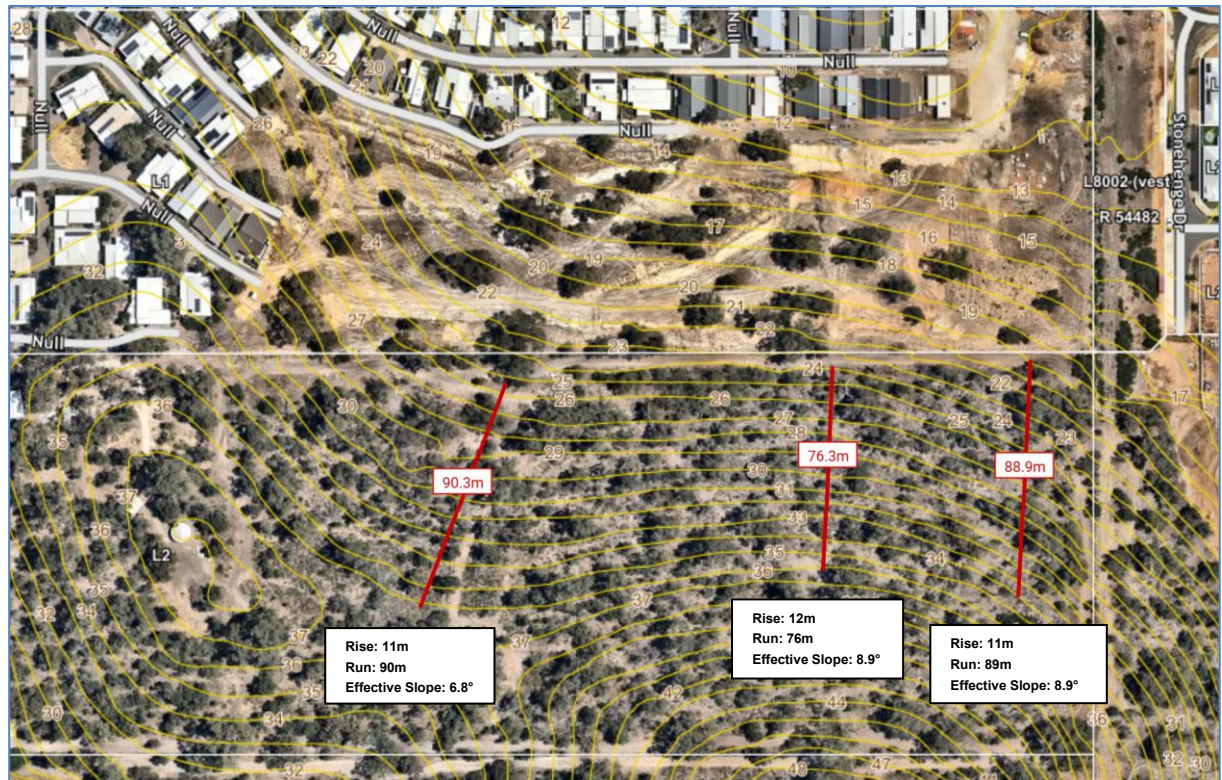


Figure 4 – Topographical Plan

4.1.4 Slope of Land Between Development Site and Classified Vegetation

The slope of land between the development site and the classified vegetation has been assessed based on Figure 2.2 of AS3959 as flat (0 degrees).

4.1.5 Summary of Vegetation Classifications and Slope

Table 1 provides a summary of the vegetation classification and slope as provided within the Vegetation Classification map in **Figure 3**, and **Appendix 4**.

Table 1: Summary of Vegetation Classification and Slope

Vegetation Plot	Vegetation Classification	Effective Slope under Classified Vegetation	Slope between Site and Classified Vegetation	Comments
Plot 1	Class A Forest	Upslope 5 degrees	Flat	Existing remnant bushland within the adjoining private property to the immediate south of the development site in natural state.
Plot 2	Excluded Clause 2.2.3.2 (e)	NA	NA	Permanently cleared and developed land throughout the existing lifestyle village containing roads, buildings and private gardens.
Plot 3	Excluded Clause 2.2.3.2 (f)	NA	NA	Managed parkland within the existing lifestyle village maintained in a minimal fuel condition.
Plot 4	Excluded Clause 2.2.3.2 (e)	NA	NA	Permanently cleared and developed residential land to the north of the village containing roads and dwellings.
Plot 5	Excluded Clause 2.2.3.2 (f)	NA	NA	Existing managed public parkland to the north of the lifestyle village maintained in a low fuel state.
Plot 6	Excluded Clause 2.2.3.2 (e) and (f)	NA	NA	Land along the eastern boundary of the development site containing cleared land planned for a maintained linear park along the gas pipeline easement.
Plot 7	Excluded Clause 2.2.3.2 (e)	NA	NA	Land throughout the development site containing recently cleared areas in a minimal fuel condition. The cleared land will ultimately be developed as part of the lifestyle village facility, as the staging is completed.

4.2 BAL Contour Map Outputs

4.2.1 Method 2 BAL Assessment

The BAL Assessment was undertaken in accordance with AS3959 Methodology 2 to determine the potential worst case scenario radiant heat impact on the prospective development. **Figure 5** provides the Flamesol calculation for minimum distances for the modelled scenario based on the following fire scenario:

1. Plot 1 (Class A Forest) with an effective slope under classified vegetation of 5 degrees upslope with fire advancing in a northerly direction towards the development site.

Based on the Flamesol calculations for minimum distances, the worst case BAL is outlined in **Table 2** and mapped at **Figure 6**.

Table 2: Assessed BAL for Future Dwellings	
Lot Number	Bushfire Attack Level
21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67A, 67B, 68, 69, 70, 71, 72A, 72B, 73, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279.	Low
307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 396.	12.5
393.	19
375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392.	29
—	40/FZ



Calculated January 16, 2026, 6:42 pm (MDc v.4.9)

Minimum Distance Calculator - AS3959-2018 (Method 2)			
Inputs		Outputs	
Fire Danger Index	80	Rate of spread	1.69 km/h
Vegetation Classification	Forest	Flame length	15.24 m
Understorey fuel load	25 t/ha	Flame angle	53 °, 63 °, 70 °, 75 °, 76 ° & 82 °
Total fuel load	35 t/ha	Elevation of receiver	6.08 m, 6.79 m, 7.16 m, 7.36 m, 7.39 m & 7.54 m
Vegetation height	n/a	Fire intensity	30,736 kW/m
Effective slope	-5 °	Transmissivity	0.871, 0.851, 0.825, 0.799, 0.786 & 0.725
Site slope	0 °	Viewfactor	0.599, 0.4473, 0.3016, 0.2051, 0.1668 & 0.0452
Flame width	100 m	Minimum distance to < 40 kW/m ²	12.6 m
Windspeed	n/a	Minimum distance to < 29 kW/m ²	16.8 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m ²	24.5 m
Flame temperature	1,090 K	Minimum distance to < 12.5 kW/m ²	34.3 m
		Minimum distance to < 10 kW/m ²	40.5 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

Figure 5 – Flamesol Calculations

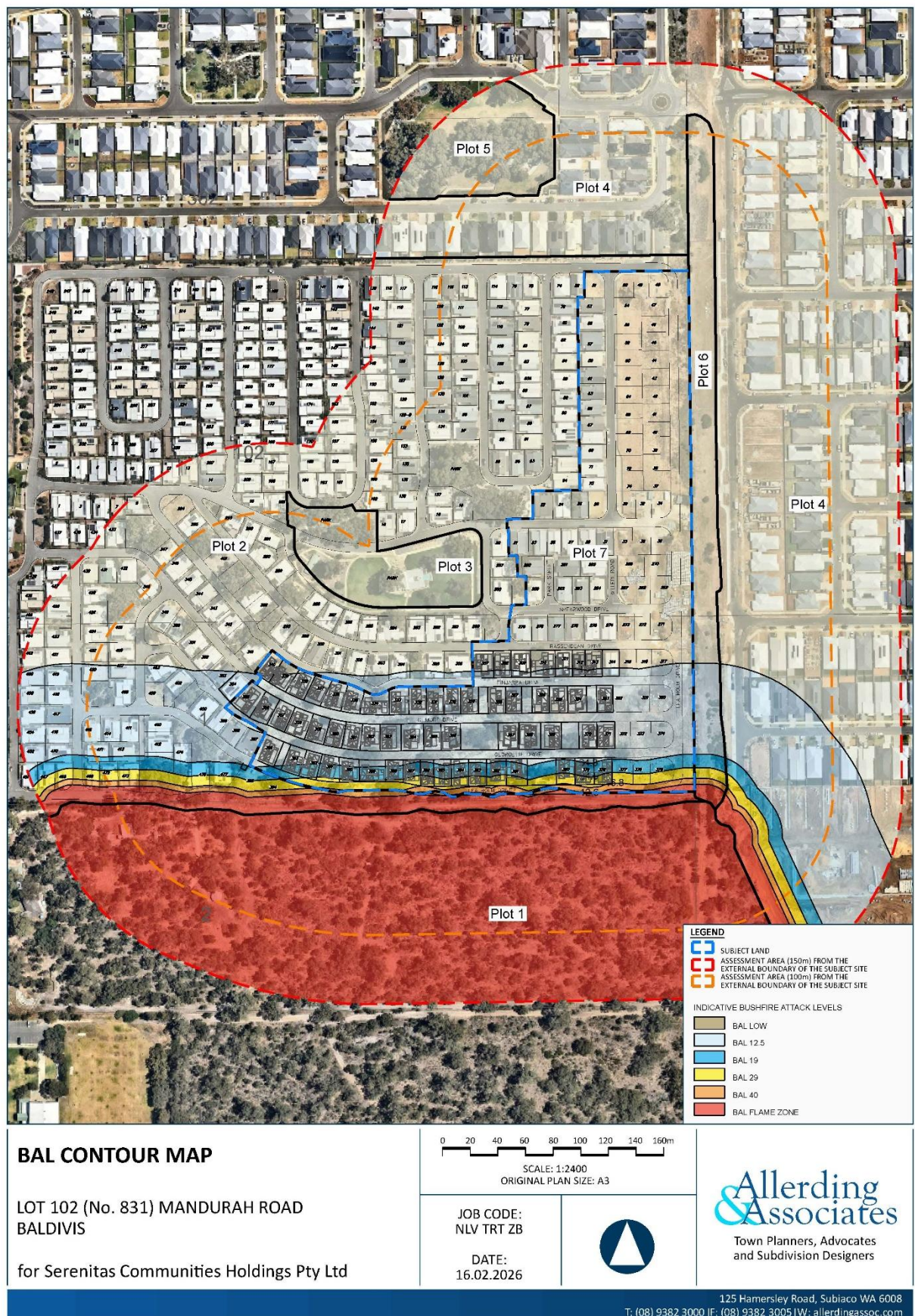


Figure 6 – BAL Contour Map

5.0 PROPOSAL COMPLIANCE AND JUSTIFICATION

Development applications in bushfire prone areas are required to comply with SPP3.7 and the Guidelines, as required under the following policy measures.

5.1 SPP 3.7 Policy Measures

5.1.1 Relevant provisions

The development has been assessed against the policy measures of Clause 7.1 for information to accompany planning proposals:

Policy Measure:	Response:
a. <i>an assessment of the broader landscape (where required);</i>	Not applicable.
b. <i>the identification of any environmental, biodiversity or conservation values on the subject site, including vegetation that may be impacted by any proposed clearing or modification, necessary to mitigate bushfire risk;</i>	Consideration has been given to environmental, biodiversity and conservation values on the subject site in Section 3.0 of this report.
c. <i>a Bushfire Hazard Level, Bushfire Attack Level (BAL), Contour Map or BAL assessment;</i>	A BAL Contour Map has been prepared as part of this BMP as provided in Figure 6 .
d. <i>the identification of any bushfire hazard issues arising from the assessment; and</i>	The recommended bushfire management measures are intended to address the bushfire hazards relevant to the proposal associated with the classified Class A Forest adjacent to the southern boundary of the Development Site.
e. <i>assessment against the bushfire protection criteria contained within the Guidelines, demonstrating compliance via either the acceptable solutions, or through an outcomes based approach.</i>	An assessment of the proposed development against the bushfire protection criteria of the Guidelines is provided in Section 6.0 of this report.

6.0 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA

An assessment of the proposal against the bushfire protection criteria of the Guidelines is contained in **Table 3** which demonstrates how the proposal meets the outcomes and acceptable solutions.

The following additional bushfire management measures supplement the response to the outcomes and acceptable solutions in **Table 3** by detailing how the proposal has been designed in relation to each element.

6.1 Bushfire Management Strategies

The bushfire management strategies have been recommended for guiding future planning and development stages associated with the proposal and are spatially demonstrated in **Figure 7**. These strategies are based on best practice in bushfire protection and reflect the guidance provided by SPP3.7 and the Guidelines.

6.1.1 Landscaping Works Along Eastern Boundary

The proposed landscaping along the eastern boundary of the Development Site (refer **Appendix 2**) is to be established and managed as Asset Protection Zone (APZs) in accordance with the requirements of Appendix B.2, **Table 9** – APZ technical requirements of the Guidelines (refer **Appendix 6**).

Landscaping treatments will include a combination of ground covers and low trees maintained in a low threat state, with non-permeable mulch.

6.1.2 Construction of Private Driveways

It is recommended that the proposed development provides for an internal network of private driveways which address the following requirements of Element 3 of the Guidelines:

- Designed in accordance with the requirements of Appendix B.3 Table 10, column 5 of the Guidelines (refer **Appendix 7**);
- Designed with a minimum trafficable carriageway of 6m; and
- Design with a turn-around area (pursuant to Figure 30 of Appendix B.3 of the Guidelines) and within 30m of the residential habitable building.

Recommended vehicle access arrangements are spatially demonstrated in **Figure 7** and the BMP mapping at **Appendix 4**.

6.1.3 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. Building construction standards based on determined BALs outlined in this BMP are recommended.

6.1.4 Notification(s) on Title

Pursuant to the Guidelines, in instances where land is identified within a designated bushfire prone area, it is recommended that notifications be placed on title to advise on bushfire risk management implementation measures, including:

- To advise that lots are located in a bushfire prone area;
- To advise that lots are subject to a Bushfire Management Plan; and
- To advise that additional planning and building requirements apply to development on the land.

6.1.5 Compliance with City of Rockingham Fire Control Notice 2025-2026

The City of Rockingham Fire Control Notice 2025-2026 (included at **Appendix 5**) contains land management practices for landowners to be complied with between 17 November 2025 and 31 May 2026. As the ultimate form of development on the site will comprise lots with areas less than 4,047m², the following requirements apply:

Owners/Occupiers of vacant land are required to:

- *remove accumulated fuel such as leaf litter, twigs, dead bush and dead trees capable of carrying a running fire*
- *have the entire vacant land clear of weed or long grasses by slashing, mowing or other means to a height no greater than 50 mm and maintained in this state.*

Owners/Occupiers of developed land are required to:

- *ensure driveways and access ways to all buildings are maintained at a minimum of three (3) metres in width and a vertical clearance height of four (4) metres, with all overhanging vegetation trimmed back to clear access.*

The bushfire risk management measures recommended to be implemented and maintained on the development site once development occurs, including the relevant bushfire protection criteria and the Firebreak Notice requirements, are spatially demonstrated in **Figure 7** and the BMP mapping at **Appendix 4**.

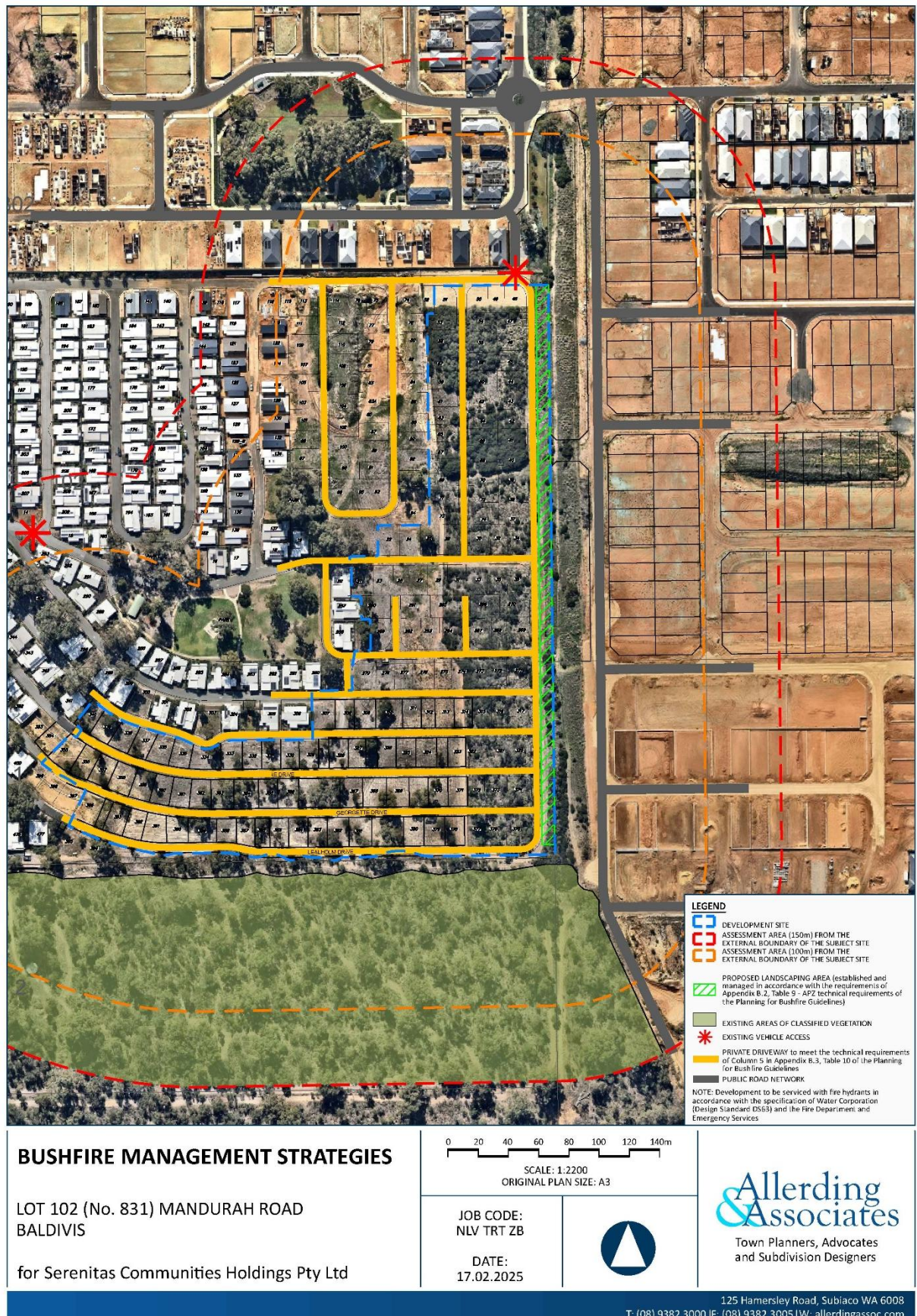


Figure 7 – Bushfire Management Strategies

6.2 Compliance Table

Table 3: Assessment Against the Bushfire Protection Criteria

Bushfire Protection Criteria	Outcomes	Method of Compliance	Proposed Bushfire Management Strategies	Response
		Acceptable Solutions		
Element 1: Location	Not Applicable	Area 1: Not applicable. Area 2: Not Applicable.	NA	NA
Element 2: Siting & Design	Ensure siting and design solutions: - Manage or mitigate the bushfire risk to people, property and infrastructure; and - Avoid, or where unavoidable, minimises the clearing of native vegetation.	A2.1a Siting and design Every residential habitable building achieves a radiant heat impact not exceeding 29 kW/m² (BAL-29).	On completion of the proposed development, future dwellings will be capable of being appropriately sited to achieve a maximum BAL of BAL29 pursuant to the provisions of A2.1a. Accordingly, the proposed development is appropriately located.	The proposal achieves acceptable solution A2.1a.
		A2.1b Siting in an area with a radiant heat impact exceeding 29 kW/m² (BAL-40 or BAL-FZ). The siting of a residential habitable building, with a radiant heat impact exceeding 29 kW/m² (BAL-40 or BAL-FZ), should only be considered where: - the lot was created prior to December 2015; and - there are demonstrated site characteristics and/or biodiversity or conservation values that prevent the achievement of a radiant heat impact not exceeding 29 kW/m² (BAL-29); and	NA	NA

Bushfire Protection Criteria	Outcomes	Method of Compliance	Proposed Bushfire Management Strategies	Response
		Acceptable Solutions		
		it is demonstrated that the reduction of the building footprint or a redesign to manage or mitigate the risk, is not practical or appropriate. If the provision of an APZ in accordance with acceptable solution A2.2 cannot be achieved, then the vegetation immediately surrounding the building is to be managed as defensible space in accordance with Appendix B.2, Table 9 – APZ technical requirements.		
		A2.2 Asset Protection Zone (APZ) Where a habitable building cannot be wholly within an area with a radiant heat impact not exceeding 29 kW/m² (BAL-29) in its pre-development state, an APZ is to be provided and meet the following requirements: Width – the APZ is to be measured from the external wall or supporting post or column of the building, and of sufficient size to ensure the radiant heat impact of a bushfire does not exceed 29 kW/m² (BAL-29) in all circumstances. Location – the APZ is to be contained solely within the boundaries of the lot, except in instances where: - the vegetation on the adjoining lot(s) is, and will continue to be, low threat as per Clause 2.2.3.2 of AS 3959 or the requirements of Appendix B.2, Table 9 – APZ technical requirements, or an		
			As outlined in Section 6.1.1, landscaping works along the eastern boundary are required to be maintained to APZ standards to achieve a compliant BAL impact of BAL-29 or lower and create safe defensible space around the development and reduce potential for direct flame contact, radiant heat exposure and ember attack. The proposed APZs are to be managed in accordance with the requirements of Appendix B.2, Table 9 – APZ technical requirements of the Guidelines (refer Appendix 6) and be wholly	The proposal achieves acceptable solution A2.2.

Bushfire Protection Criteria	Outcomes	Method of Compliance	Proposed Bushfire Management Strategies	Response
		Acceptable Solutions		
		alternative standard in a local planning scheme, on an ongoing basis in perpetuity; or - the adjoining land is, and will remain in perpetuity, non-vegetated. Management – the APZ is managed in accordance with the requirements of Appendix B.2, Table 9 – APZ technical requirements, or an alternative standard in a gazetted local planning scheme.	located within the boundaries of the subject site.	
		A2.3 Clearing of native vegetation The development avoids, or where unavoidable, minimises the clearing of native vegetation.	NA	NA
Element 3: Vehicular Access	Ensure the design and capacity of vehicular access and egress provide: for efficient and effective evacuation to a suitable destination(s) and/or	A3.1 Private driveways There are no private driveway technical requirements (prescribed by these Guidelines) where the private driveway is within a lot serviced by reticulated water and is no greater than 70 metres in length between the most distant external part of the habitable building and the public road. In circumstances where the above conditions are not met, the private driveway is to meet all of the following requirements: - requirements in Appendix B.3 Table 10, column 5; and - passing bays every 200 metres with a minimum length of 20 metres and a minimum	As outlined in Section 6.1.2, an internal network of private driveways will be constructed as part of the proposed development in accordance with the requirements of Acceptable Solution A3.1 and Appendix B.3 Table 10 , column 5 of the Guidelines.	The proposal achieves acceptable solution A3.1.

Bushfire Protection Criteria	Outcomes	Method of Compliance	Proposed Bushfire Management Strategies	Response
		Acceptable Solutions		
	as a contingency measure for vulnerable land uses, an on-site shelter, where demonstrated appropriate, as a last resort option.	carriageway width of 2 metres (i.e. the combined carriageway width of the passing bay and constructed private driveway is to be a minimum 6 metres); and turn-around area (Figure 30) and within 30 metres of the residential habitable building (Figure 38).		
Element 4: Water Supply	Ensure that sufficient water is available to enable people, property and infrastructure to be defended from bushfire.	A4.1 Water supply for residential habitable buildings Where a reticulated water supply is existing or proposed, a hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, a water tank(s) should be provided in accordance with the requirements of Appendix B.4, Table 11 – Water supply dedicated for bushfire firefighting.	The subject site is serviced by a reticulated water supply with hydrants proposed to be positioned throughout the site in accordance with the Water Corporation Design Standard DS 63 (refer to Figure 7).	The proposal achieves acceptable solution A4.1.

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	Install and maintain private driveways to the required surface condition and clearances as stated in the BMP.	Landowner / Developer	Prior to the occupation of future dwellings	Landowner / Operator	Ongoing
2	Notification on Title notifying that the site/lot is located in a bushfire prone area, is subject to a BMP and additional planning and building requirements.	Developer	Prior to issue of titles	NA	NA
3	BAL Assessment to be undertaken prior to development to confirm BAL29 can be achieved (if require).	Landowner / Developer	Prior to commencement of works.	NA	NA
4	Construction of new dwellings to AS3959.	Landowner / Developer	Prior to the occupation future dwellings	NA	NA
5	Install fire hydrants in accordance with the Water Corporation Design Standard DS 63.	Landowner / Developer	Prior to occupancy.	Landowner / Developer	Ongoing
6	Landscaping along the eastern boundary of the Development Site is to be established and managed as an APZ in accordance with the dimensions and standards stated in the BMP.	Landowner / Developer	Prior to the occupation of future dwellings	Landowner / Operator	Ongoing
7	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.	Landowner / Operator	Ongoing	Landowner / Operator	Ongoing

No.	Action	Implementation		Management	
		Responsible	Timing	Responsible	Timing
8	Inspection and compliance action.	NA	NA	Local Government	Ongoing
9	Future revisions / amendments to BMP.	NA	NA	Landowner / Operator	Prior to any future development outside the scope of this BMP.

8.0 REFERENCES

MNG 2025, *MNG Access*, <<https://app.mngaccess.com.au/>>.

City of Rockingham 2025, *Fire Control Notice 2025-2026*, <<https://rockingham.wa.gov.au/forms-and-publications/your-services/fire-and-bush/fire-control-notice-2025-2026>>.

Standards Australia Online 2018, *Construction of buildings in bushfire-prone areas*, AS 3959:2018.

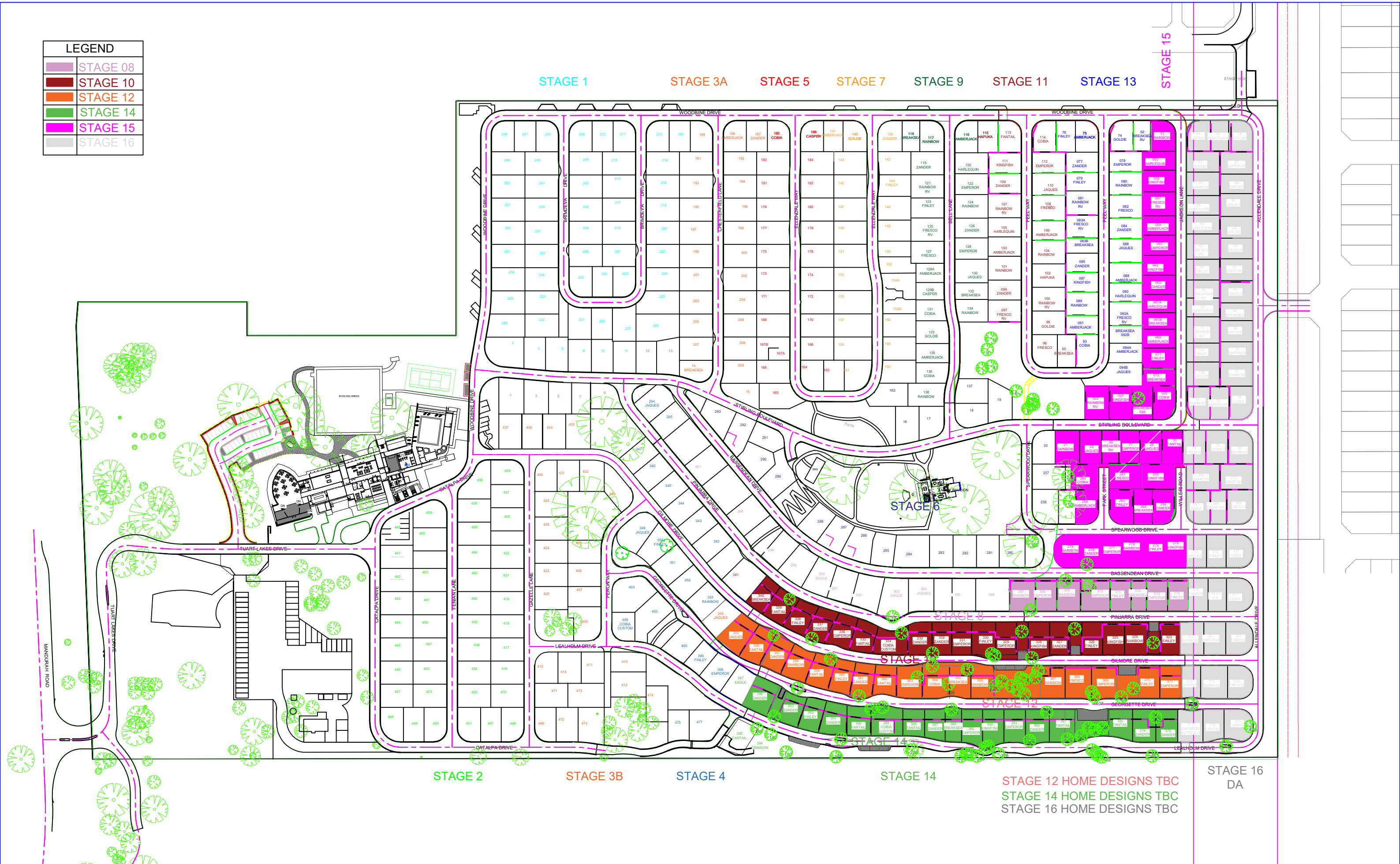
Western Australian Planning Commission 2024, *Planning for bushfire guidelines*, <https://www.planning.wa.gov.au/docs/default-source/policy/planning-for-bushfire-guidelines---for-the-implementation-of-state-planning-policy-3-7-bushfire.pdf?sfvrsn=25ba922f_2>.

Western Australian Planning Commission 2024, *State planning policy 3.7 bushfire*, <https://www.planning.wa.gov.au/docs/default-source/policy/spp-3-7-bushfire-2024.pdf?sfvrsn=630b433_6>.

APPENDIX 1

DEVELOPMENT SITE

LEGEND	
	STAGE 08
	STAGE 10
	STAGE 12
	STAGE 14
	STAGE 15
	STAGE 16



Rev	Date	Description	BY
V	06.01.2026	HATCHING ADDED TO STAGES 15, 8, 12, 12, 14 & 16	D.FOR
U	09.12.2025	LOT NUMBERS UPDATED	D.FOR
T	21.11.2025	PORTAL/FLAT LOT SITES NOTED STAGE 10, 12 & 14	D.FOR
S	16.07.2025	ROAD NAME ADDED TO EASTERN BOUNDARY ROAD	D.FOR
R	04.07.2025	ADDITIONAL LOTS NOTED 381, 395, 326 & 322	D.FOR

SCALE: 1000 @ A1
Drawn By: D.FOR
Designed By: D.FOR
Surveyed By: -
Checked By: D.FOR
Date: 14.07.2023

DRAWING TITLE
TUART LAKES LOT/STAGING LAYOUT

PROJECT
TUART LAKES VILLAGE
DRAWING NUMBER
TLB-S200
REV
V

APPENDIX 2

LANDSCAPE PLAN





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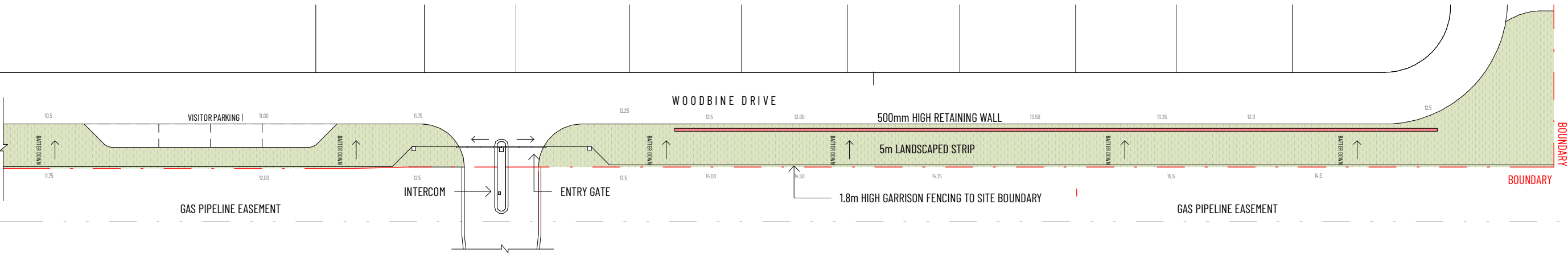
No.	Description	Date
A	PRELIMINARY ISSUE	26.03.2025
B	FINAL ISSUE	08.04.2025

TUART LAKES LIFESTLYE VILLAGE

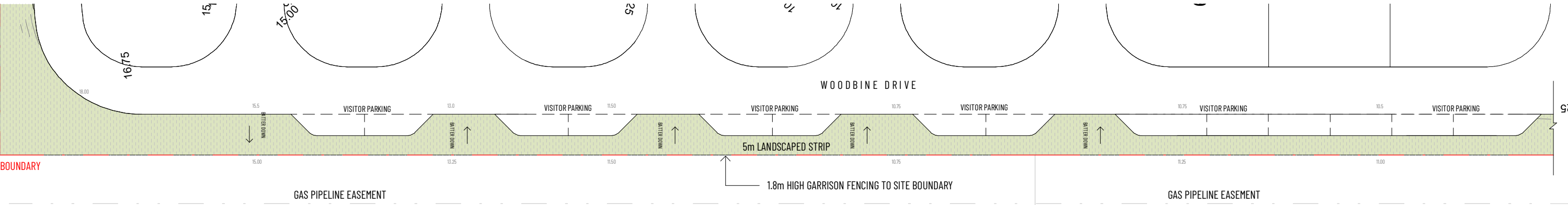
831 Mandurah RD, Baldivis, WA 6171

TUART LAKES - OVERALL MASTERPLAN

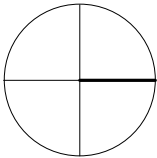
Project number	0001	A1.01
Date	08.04.2025	
Drawn by	RHA	
Checked by	RHA	
Scale @ A1		1 : 1000



TUART LAKES EASTERN BOUNDARY PART PLAN A | 1:500



TUART LAKES EASTERN BOUNDARY PART PLAN B | 1:500



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No.	Description	Date
A	PRELIMINARY ISSUE	26.03.2025
B	FINAL ISSUE	08.04.2025

TUART LAKES LIFESTLYE VILLAGE

831 Mandurah RD, Baldivis, WA 6171

EASTERN BOUNDARY PART PLANS

Project number	0001	A3.01
Date	08.04.2025	
Drawn by	RHA	
Checked by	RHA	Scale@A3
		1 : 500



EASTERN BOUNDARY ELEVATION
1:1000



EASTERN BOUNDARY ELEVATION - CALLOUT 1
1:200



EASTERN BOUNDARY STREETSCAPE - ARTISTS IMPRESSION



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No.	Description	Date
A	ISSUE FOR INFORMATION	31.03.2025
B	FINAL ISSUE	08.04.2025

TUART LAKES LIFESTLYE VILLAGE		EASTERN BOUNDARY - STREETSCAPE	
831 Mandurah Rd, Baldivis, WA 6171	Project number	0001	A3.02
	Date	08.04.2025	
	Drawn by	RHA	
	Checked by	RHA	Scale@A3 As indicated

- TREES - @8M SPACING
- MELALEUCA QUINQUENERVIA
 - EUCALYPTUS FOECUNDA

GROUND COVERS

TO MATCH PREVIOUS STAGES WITH
FEATURE ROCKS IN BETWEEN TREES
AS PER EXAMPLE PHOTOS



ADENANTHOS SERICEUS

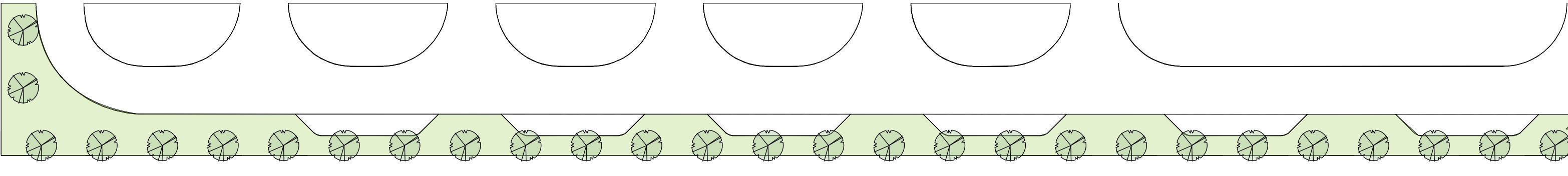
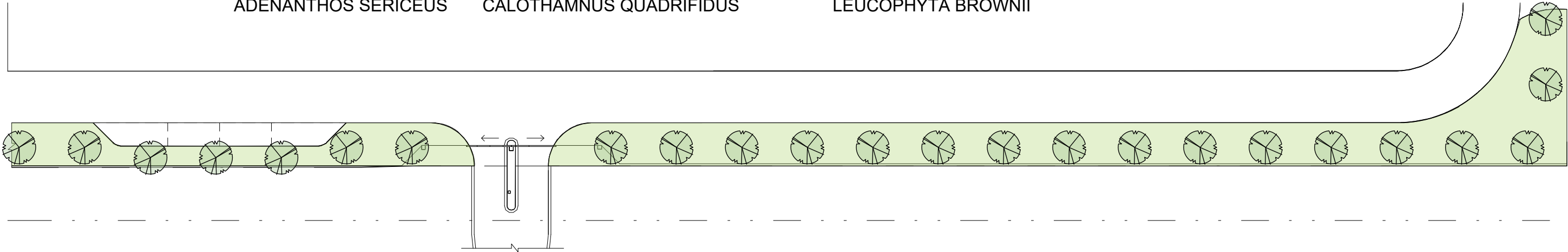


CALOTHAMNUS QUADRIFIDUS



LEUCOPHYTA BROWNII

PLANT LIST	Mature Size	Spacings - m2
Screening		
Adenanthos sericeus	3 metre	2
Calothamnus quadrifidus	1.5 metre	1.5
Ground Covers		
Acacia lasiocarpa	.5 metre	0.5
Grevillea thelmaniana	.5 metre	0.75
Adenanthos meisneri	1 metre	1.25
Leucophyta brownii	.5 metre	0.75
Olearia axillaris dwarf	1 metre	1
Grasses		
Dianella revoluta	.75 metre	0.5
Anigozanthus flavius	1 metre	0.5
Orthosanthus laxus	.4 metre	0.4



EXISTING VERGE WORKS EXAMPLE

ISSUE	DATE	REVISION	PROJECT #
PROJECT	DATE #	10/04/2025	L0241
CLIENT	SCALE @ A3	1:500	DWG #
DWG	DRAWN	XX	S03
	CHKD	XX	REVISION

APPENDIX 3

VEGETATION CLASSIFICATION

(VEGETATION PLOTS IN EXISTING CONDITION)

Vegetation Classification (Vegetation Plots in Existing Condition)

Photo ID	1	Plot	1
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 1 to the south of the subject site contains existing mature canopy trees with heights ranging from 10m to 30m and a foliage cover of around 70%. Understorey contains low trees and grasses in an unmanaged state.			
Photo ID	2	Plot	1
Vegetation Classification or Exclusion Clause			
Class A Forest			
Description / Justification for Classification			
Plot 1 to the south of the subject site contains existing mature canopy trees with heights ranging from 10m to 20m and a foliage cover of around 70%. Understorey contains low trees and grasses in an unmanaged state.			



Photo ID	3	Plot	2
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(e) Non Vegetated Areas			
Description / Justification for Classification			
Plot 2 within the existing lifestyle village to the west of the development site contains established lifestyle village residences within the National Lifestyle Village facility. Land throughout the plot is predominantly cleared and contains roads and buildings.			
Photo ID	4	Plot	3
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(f) Low Threat Veg			
Description / Justification for Classification			
Plot 3 within the existing lifestyle village to the west of the development site contains managed parkland including grass and trees maintained in a minimal fuel condition.			



Photo ID	5	Plot	7
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(e) Non Vegetated Areas			
Description / Justification for Classification			
Plot 7 representing the development site contains recently cleared areas in a minimal fuel condition. The cleared land will ultimately be developed as part of the lifestyle village facility, as the staging is completed.			
Photo ID	6	Plot	7
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(e) Non Vegetated Areas			
Description / Justification for Classification			
Plot 7 representing the development site contains recently cleared areas in a minimal fuel condition. The cleared land will ultimately be developed as part of the lifestyle village facility, as the staging is completed.			



Photo ID	7	Plot	2
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(e) Non Vegetated Areas			
Description / Justification for Classification			
Plot 2 within the existing lifestyle village to the west of the development site contains established lifestyle village residences within the National Lifestyle Village facility. Land throughout the plot is predominantly cleared and contains roads and buildings.			

Photo ID	8	Plot	7
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(e) Non Vegetated Areas			
Description / Justification for Classification			
Plot 7 representing the development site contains recently cleared areas in a minimal fuel condition. The cleared land will ultimately be developed as part of the lifestyle village facility, as the staging is completed.			



Photo ID	9	Plot	7
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(e) Non Vegetated Areas			
Description / Justification for Classification			
Plot 7 representing the development site contains recently cleared areas in a minimal fuel condition. The cleared land will ultimately be developed as part of the lifestyle village facility, as the staging is completed.			
Photo ID	10	Plot	7
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(e) Non Vegetated Areas			
Description / Justification for Classification			
Plot 7 representing the development site contains recently cleared areas in a minimal fuel condition. The cleared land will ultimately be developed as part of the lifestyle village facility, as the staging is completed.			

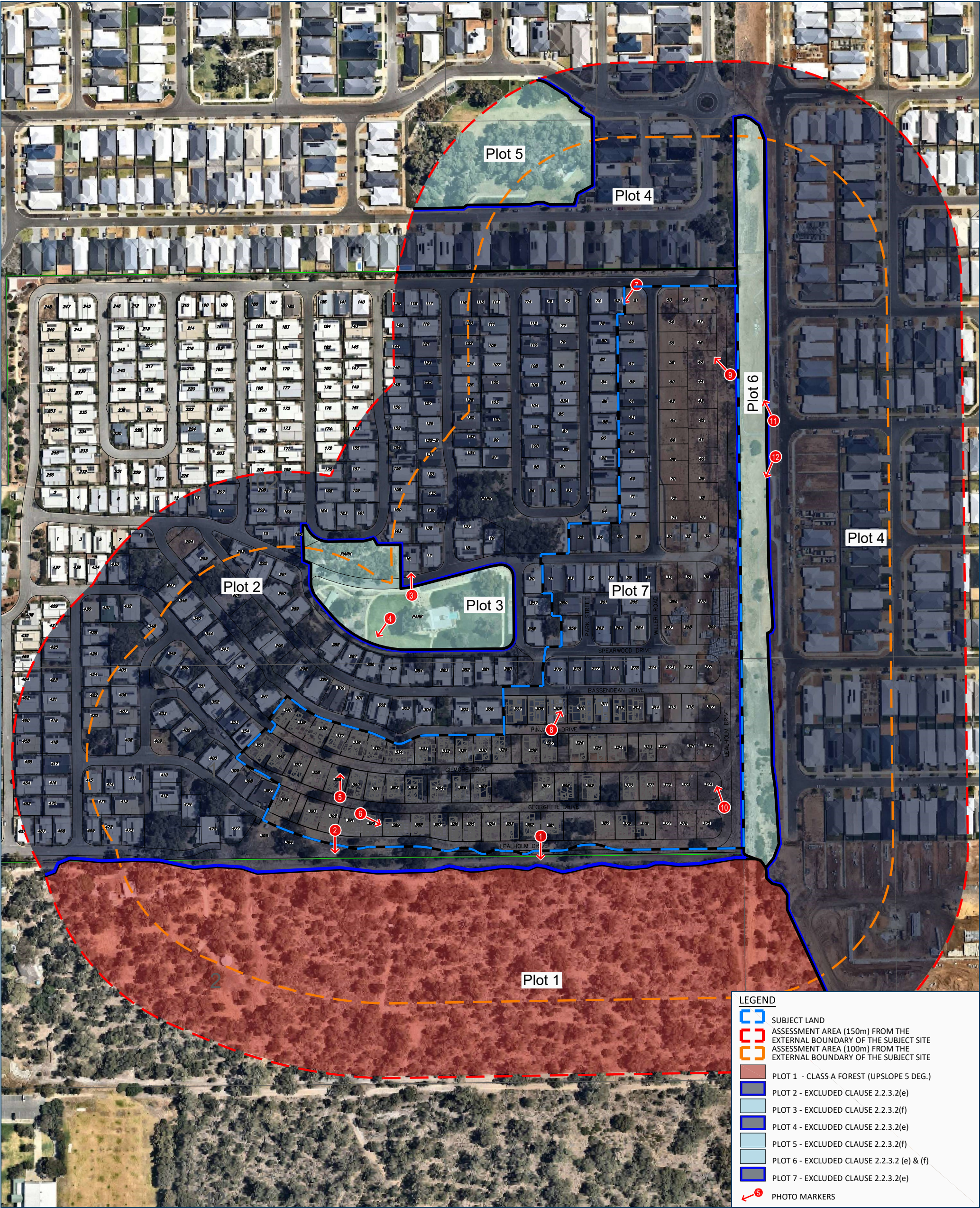


Photo ID	11	Plot	6
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(f) Low Threat Veg			
Description / Justification for Classification			
Plot 6 abutting the eastern boundary of the existing lifestyle village and to the east of the development site contains a cleared strip of land planned for a maintained linear park along the gas pipeline easement. Limited existing vegetation has been retained within the plot and will be incorporated into the managed parkland once established.			
Photo ID	12	Plot	6
Vegetation Classification or Exclusion Clause			
Excludable 2.2.3.2(f) Low Threat Veg			
Description / Justification for Classification			
Plot 6 abutting the eastern boundary of the existing lifestyle village and to the east of the development site contains a cleared strip of land planned for a maintained linear park along the gas pipeline easement. Limited existing vegetation has been retained within the plot and will be incorporated into the managed parkland once established.			



APPENDIX 4

BUSHFIRE MANAGEMENT PLAN MAPPING



AS3959 VEGETATION CLASSIFICATION

LOT 102 (No. 831) MANDURAH ROAD
BALDIVIS
for Serenitas Communities Holdings Pty Ltd



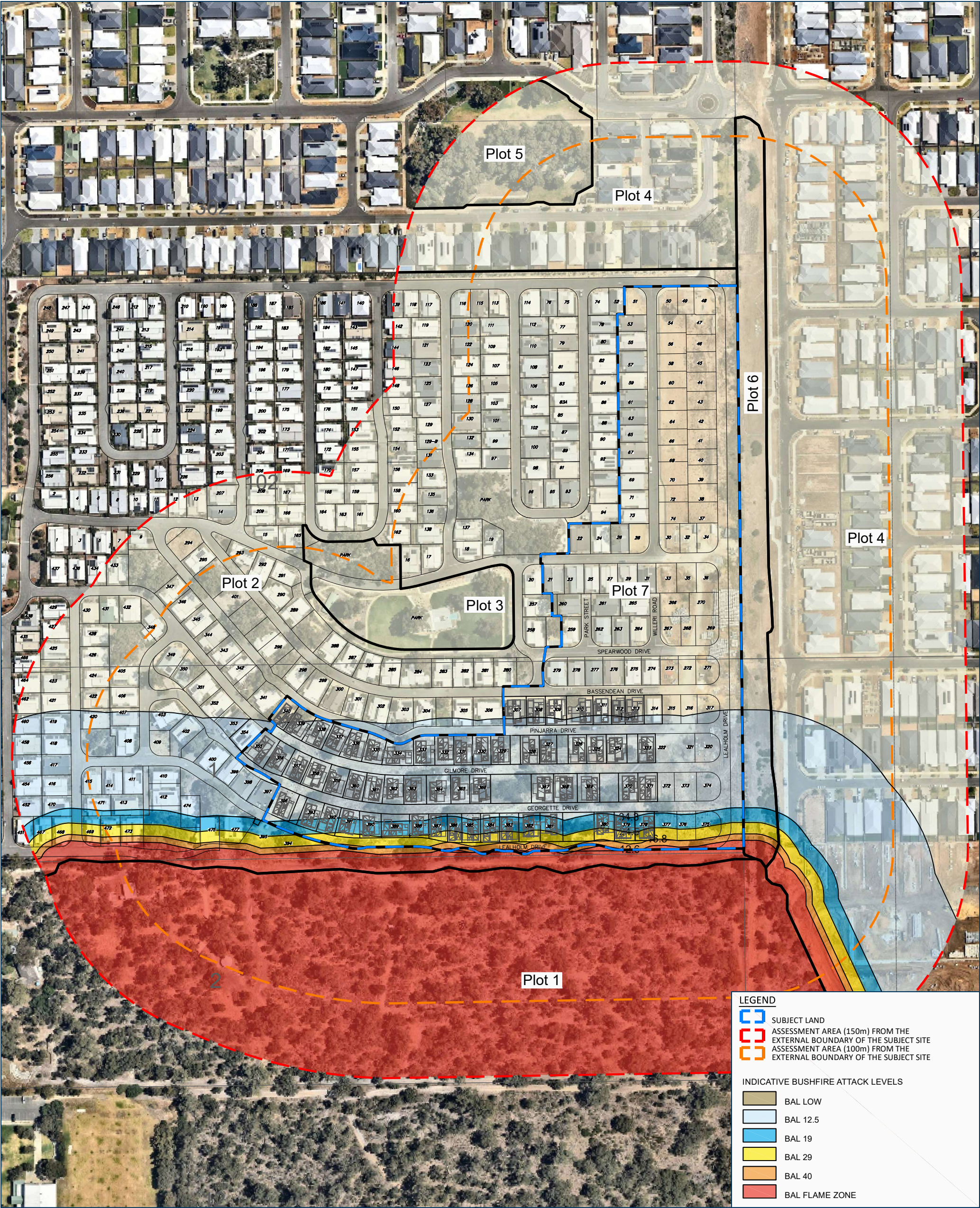
SCALE: 1:2400
ORIGINAL PLAN SIZE: A3

JOB CODE:
NLV TRT ZB

DATE:
17.02.2026



Allerding
& Associates
Town Planners, Advocates
and Subdivision Designers



BAL CONTOUR MAP

LOT 102 (No. 831) MANDURAH ROAD
BALDIVIS

for Serenitas Communities Holdings Pty Ltd

0 20 40 60 80 100 120 140 160m

SCALE: 1:2400
ORIGINAL PLAN SIZE: A3

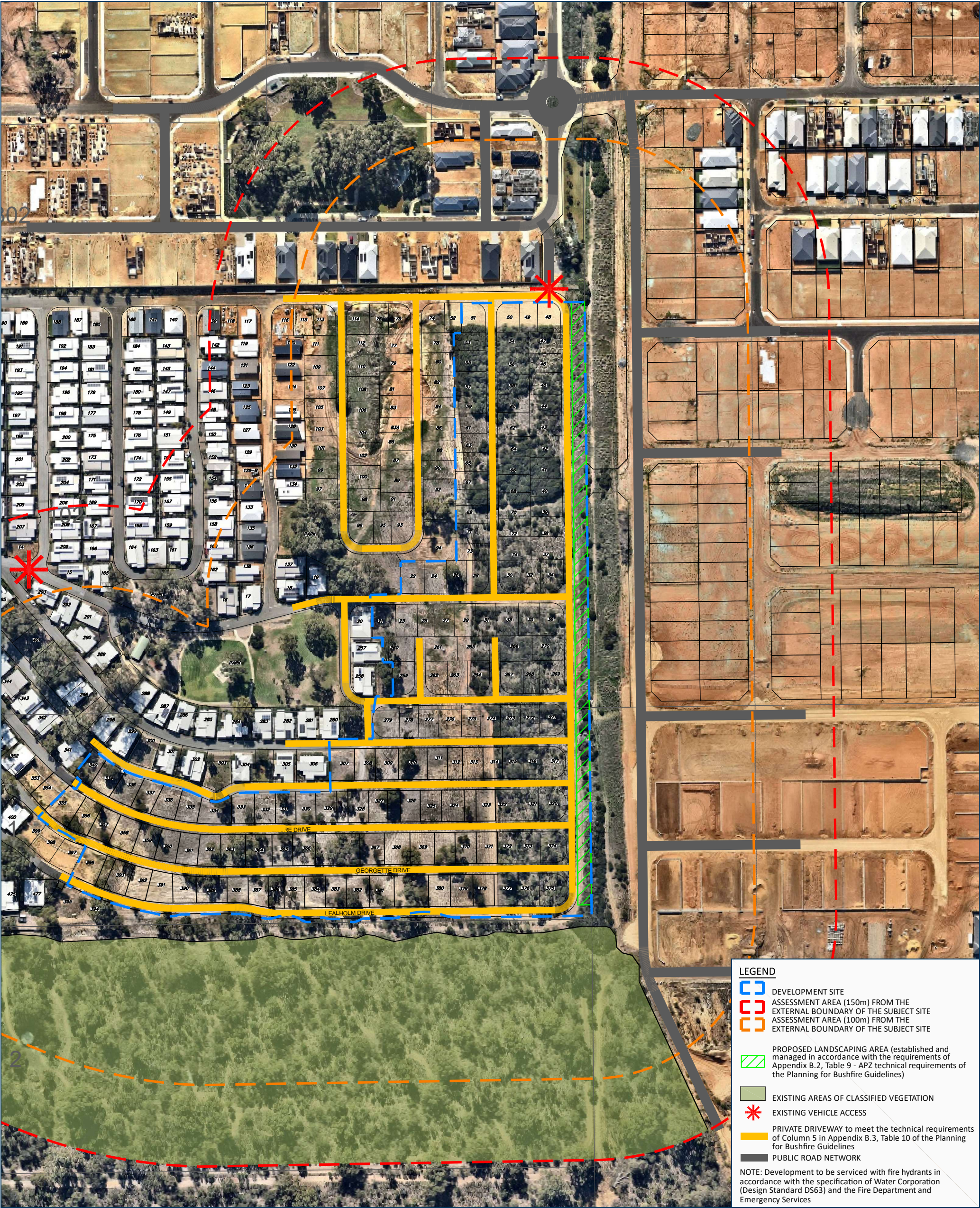
JOB CODE:
NLV TRT ZB

DATE:
16.02.2026



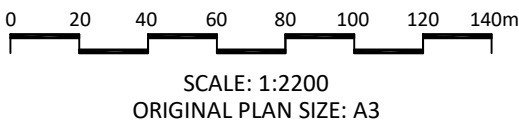
**Allerding
& Associates**

Town Planners, Advocates
and Subdivision Designers



BUSHFIRE MANAGEMENT STRATEGIES

LOT 102 (No. 831) MANDURAH ROAD
BALDIVIS
for Serenitas Communities Holdings Pty Ltd



JOB CODE:
NLV TRT ZB

DATE:
17.02.2025



Allerding
& Associates
Town Planners, Advocates
and Subdivision Designers

APPENDIX 5

CITY OF ROCKINGHAM FIRE CONTROL NOTICE 2025-2026

Fire Control Notice 2025 – 2026

Change of Compliance Date

Your property must comply
on **17 November 2025** and
be maintained through to
31 May 2026.

First and final notice to
Property Owners and
Occupiers pursuant to
section 33 of the
Bushfires Act 1954.

Penalties of up to \$5,000
for non-compliance.



rockingham.wa.gov.au



You have a legal requirement to carry out fire prevention works on your property.

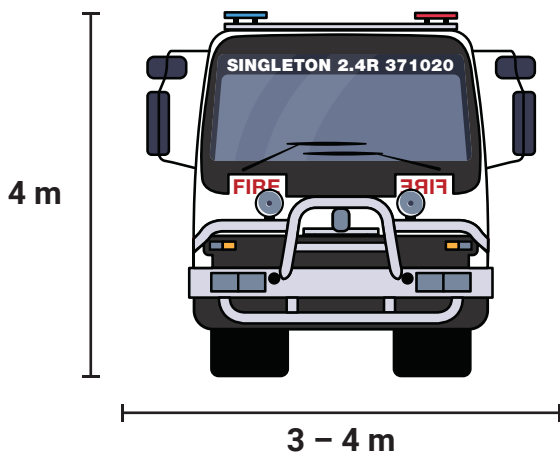
“Take notice that pursuant to **Section 33 (4) of the Bush Fires Act 1954**, where the owner and/or occupier of the land fails or neglects to comply with the requisitions of this Notice within the specified times, the City of Rockingham may, by its officers and with such servants, workmen and contractors, vehicles and machinery as the officers deem fit, enter upon the land and carry out the requisitions of this Notice which have not been complied with and pursuant to **Section 33 (5) of the Bush Fires Act 1954**, the amount of any costs and expenses incurred may be recovered from you as the owner and/or occupier of the land.”

Compliance inspections will commence on 17 November 2025.

Failure to comply with the City's Fire Control Notice may result in a penalty of up to \$5,000. Additional contractor and administration costs may apply.

Owners/Occupiers of developed and vacant land with an area of 4047m² or more (more than one acre) are required to:

- install and maintain mineral earth firebreaks as per firebreak specifications
- ensure driveways and access ways to all buildings are maintained at a minimum of three (3) metres in width and a vertical clearance height of four (4) metres, with all overhanging vegetation trimmed back to clear access.



Owners/Occupiers of vacant land with an area of less than 4047m² (less than one acre) are required to:

- remove accumulated fuel such as leaf litter, twigs, dead bush and dead trees capable of carrying a running fire
- have the entire vacant land clear of weed or long grasses by slashing, mowing or other means to a height no greater than 50 mm and maintained in this state.

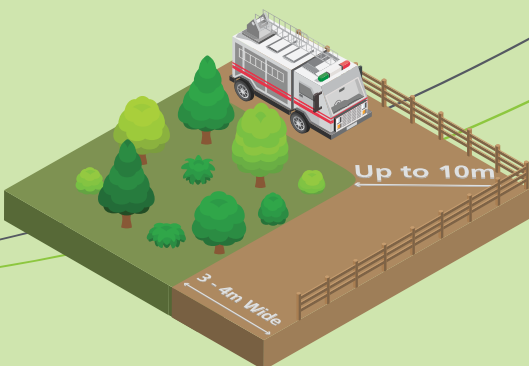
Owners/Occupiers of developed land are required to:

- ensure driveways and access ways to all buildings are maintained at a minimum of three (3) metres in width and a vertical clearance height of four (4) metres, with all overhanging vegetation trimmed back to clear access.

Firebreak Specifications

- must be no less than three (3) metres wide immediately inside and along all boundaries (including on boundaries adjacent to roads, rail and drain reserves and all public open space reserves)
- must be not more than four (4) metres wide (further width extensions may be considered upon written application for approval by the City)
- may have a corner turning radius of up to ten (10) metres
- must have a vertical clearance height of four (4) metres, with all overhanging vegetation trimmed back clear of the firebreak
- must be a mineral earth firebreak with a continuous trafficable surface for a 4WD vehicle, clear of any obstructions and must not terminate in a cul-de-sac (dead end)
- maintained and living lawns are acceptable in conjunction with, or in lieu of mineral earth firebreaks, provided that the same width and height requirements for a firebreak are maintained.

Firebreaks are intended to minimise the spread or extension of a bushfire and provide safe access for emergency response vehicles.



Additional Works

In addition to the requirements of this Notice, regardless of land size and location, you may be required to carry out further fire prevention works to reduce hazards considered necessary by the Fire Control Officer. Any further requirement would be specified by way of a “work order” forwarded to the address of the owner(s) and/or occupier(s).

Some examples of these could be:

- ensure roofs, gutters and walls of all buildings on the land are free of flammable matter
- remove accumulated fuel such as leaf litter, twigs, dead bush and dead trees capable of carrying a running fire
- reduce unmanaged grasses/weeds by slashing, mowing or other means
- reduce long grasses in areas not being grazed or cultivated by slashing, mowing, bailing or by other means
- reduce vegetation to a low threat state from the outer edge of the firebreak through to the property boundary (e.g. no long grass or overhanging branches)
- specific measures to reduce risks identified in the City's **Bushfire Risk Management Plan 2023-2027**



Variation to the Fire Control Notice

To request authorisation to use other methods of fire prevention on your land outside of this notice, please apply in writing together with an "Application to Vary Firebreaks" form (available on the City's website rockingham.wa.gov.au/firecontrol). Submit completed forms to the City of Rockingham no later than 15 October 2025. A submission for a variation is required annually for the duration of that year's Fire Control Notice period.

Hiring a Contractor

Any owner and/or occupier who engages a contractor to undertake works on their behalf is responsible for ensuring that the completed works meet the requirements of this Fire Control Notice.

Bushfire Management Plan

All properties that are subject to a Bushfire Management Plan as a result of a subdivision or development application or an approved treatment plan, must comply with the requirements of such plans in their entirety.

If you require further information or would like to talk with a Fire Control Officer, please call

9528 0333 or email

firecontrol@rockingham.wa.gov.au

Any Fire Control Notice previously published by the City of Rockingham in the Government Gazette or in any locally circulated newsprint is hereby revoked.

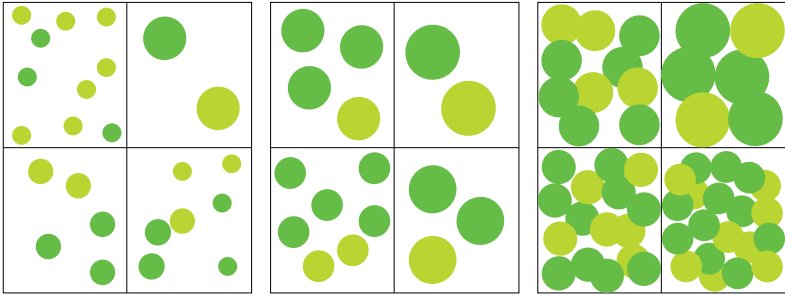
APPENDIX 6

ASSET PROTECTION ZONE TECHNICAL REQUIREMENTS

(Extracted from the *Planning for Bushfire Guidelines 2024*, Appendix B, B.2: Siting and Design, Table 9)



Table 9: Asset Protection Zone (APZ) technical requirements

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 less than 6 mm in thickness)	• Should be managed and removed on a regular basis to be maintained as low threat vegetation • Should be maintained at less than two tonnes per hectare (on average) • Mulches should be non-combustible such as stone, gravel, shells, rock or crushed mineral earth or wood mulch more than five millimetres in thickness.
Trees* (more than 6 m 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 less than 15 per cent of the total APZ area • Tree canopies at maturity should be at least 5 m apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided the total canopy cover within the APZ does not exceed 15 per cent and is not connected to the tree canopy outside the APZ. Tree canopy cover – ranging from 15 to 70 per cent at maturity  15% 30% 70%



OBJECT	REQUIREMENT
Shrub* and scrub* (0.5 m to 6 m in height). Shrub and scrub more than 6 m 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 more than five square metres in area • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground cover*(less than 0.5 m in height. Ground cover more than 0.5 m in height is to be treated as shrub)	• 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 more than 100 mm in height.
Grass	• Grass should be maintained at a height of 100 mm 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 cover, grass and non- combustible mulches as prescribed above.
Liquid petroleum gas cylinders	• Should be located on the side of a building farthest 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.

Notes:
* Plant flammability, landscaping design and maintenance should be considered – refer to following explanatory notes

Fine fuel load is the combustible, dead or dry vegetation matter on the ground, near ground, or elevated. Fine fuel includes grass, leaves, bark and twigs less than six millimetres in diameter that ignite readily and are burnt rapidly when dry.

Fine fuel should be maintained at less than 2t/ha. 100gm/m² equates to 1t/ha. To estimate a fuel load (in t/ha), collect the dry fine fuel from a representative one square meter and weigh (in grams using kitchen scales) and multiply the weight by 0.01.

APPENDIX 7

VEHICULAR ACCESS TECHNICAL REQUIREMENTS

(Extracted from the *Planning for Bushfire Guidelines 2024*, Appendix B, B.3: Vehicular Access, Table 10)



Table 10: Vehicular access technical requirements

	1		2		3		4		5	
TECHNICAL REQUIREMENTS	PERIMETER ROADS		PUBLIC ROADS		EMERGENCY ACCESS WAY ³		FIRE SERVICE ACCESS ROUTE ³		BATTLE-AXE & PRIVATE DRIVEWAYS ¹	
MAP OF BUSH FIRE PRONE AREAS DESIGNATION	Area 2	Area 1	Area 2	Area 1	Area 2	Area 1	Area 2	Area 1	Area 2	Area 1
Minimum horizontal clearance (metres)	12	8	See note 5		10	6	10	6	6	
Minimum vertical clearance (metres)	4.5									
Minimum weight capacity (tonnes)	15									
Maximum grade unsealed road ²	See note 5		See note 5		1:10 (10% or 6°)					
1:7 (14.3% or 8°)										
1:10 (10% or 6°)										
8.5										

Notes:

¹ Driveways and battle-axe legs to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision where not required to comply with the widths in this Appendix or the Guidelines.

² Dips must have no more than a 1 in 8 (12.5% - 7.1 degrees) entry and exit angle.

³ To have crossfalls between 3 per cent and 6 per cent.

⁴ For sealed roads only the maximum grade of no more than 1 in 5 (20 per cent) (11.3 degrees) for no more than 50 metres is permissible, except for short constrictions to 3.5 metres for no more than 30 metres in length where an obstruction cannot be reasonably avoided or removed.

⁵ As outlined in the Institute of [Public Works Engineering Australasia \(IPWEA\) subdivision guidelines](#), [Liveable Neighbourhoods](#), [Austroads Standards](#) Main Roads standard, supplement, policy or guideline and/or any applicable or relevant local government standard or policy.

Appendix 6

AS 2885 Risk Assessment Technical Note, APA correspondence and 2007 AS 2885 Risk Assessment

Technical Note

Subject	Tuart Lakes Pipeline Risk Assessment Review and Update		
Date	30 March 2020	Pages	10
To	Amanda Butterworth (Allerding & Associates)	From	Malcolm Pritchard  Malcolm Pritchard Mar 30 2020 3:11 PM
CC	Andrew Watkins (National Lifestyle Villages)		
Project no.	311012-00116	Doc no.	00-SR-REP-0001
Project	Pipeline Risk Assessment – Tuart Lakes Lifestyle Village		

1 Summary

A pipeline risk assessment [Ref. 2] was conducted in 2007 in accordance with AS 2885-1997 [Ref. 1] for the location now referred to as Tuart Lakes Lifestyle Village (TLLV). This document details the findings of a review of the 2007 risk assessment updated for the proposed extension of residential accommodation. The scope of the review was limited to the assessment of the proposed changes to the development and current status of the actions from the original risk assessment. It should not be viewed as a safety management study (SMS) in accordance with AS 2885.6 -2018 (the latest revision of the standard for high pressure gas pipelines).

As the construction of the proposed development is to be adjacent to the pipeline easement (previous assessment assumed at least 28m separation to the pipeline), it is important to manage the construction threats to the pipeline. The AS 2885 risk assessment carried out in 2007 [Ref. 2] proposed a fence, signs and site induction to ensure work does not occur on the easement. These actions remain relevant to the proposed TLLV modification. The construction contractor should be engaged to provide effective controls, such as a fence, to keep equipment off the easement. If this is not practical, then APA will have to provide written approval and supervision for any work on the easement.

A permanent fence was recommended to separate the residential development from the pipeline easement to protect against future construction risks. TLLV should review and agree with APA whether a fence on one side of the easement is required to control construction access, which can cause excessive loads over the pipeline, particularly if the cover is eroded.

It is recommended that a Safety Management Study in accordance with AS 2885.6-2018 is conducted involving APA, the developer and the construction contractor.

1.1 Assumptions

The AS 2885 risk assessment on the future development of the adjacent Lot 9006, which includes the pipeline easement, will determine satisfactory risk mitigation for all threats that are identified at that

time. This particularly includes construction risk as the current plans indicate road crossings of the pipeline easement and there may be underground service crossings.

This review of the proposed TLLV development and actions has not been conducted in a workshop as defined in safety management study validation [Ref. 1] and APA will incorporate the proposed development through a periodic operational review workshop, or similar.

The effectiveness of EIP controls assumes that a 20 t excavator with a 'tiger' tooth is the largest excavator the pipeline can resist.

Detailed construction methodology is not known. It is assumed that all grading / excavation and other activities that may involve removal and repositioning of soil and occur within the Lot 102 boundary.

1.2 Background

The proposed TLLV development is located at Lot 102 (831) Mandurah Road, Baldivis. Serenitas Development Pty Ltd (Serenitas) operates the lifestyle village. The location was known as National Lifestyle Villages at the time the original risk assessment [Ref. 2] was prepared.

To the east of the site is an easement for the Parmelia gas pipeline operated by the APA Group. The Parmelia pipeline easement and the parallel Alcoa of Australia easement are located on the adjoining Lot 9006. The site overview is shown in Figure 1. The Alcoa easement is outside the scope of this Technical Note.

1.3 Proposed Development for Review

Tuart Lakes Lifestyle Village has approval for a lifestyle village, with the rear portion of the site identified as Residential under a Structure Plan applicable to the Site. It is proposed to lodge a structure plan amendment with the City of Rockingham to allow the lifestyle village to extend up to the rear boundary of the site.

The original AS 2885 risk assessment [Ref. 2] was completed in 2007 for the development with at least a 28 m separation from the pipeline.

The indicative layout of the development extension up to the pipeline easement, subject to the structure plan amendment, is highlighted as Zone C in Figure 2.

APA has provided a response [Ref. 3] in relation to the proposed extension of the Lifestyle Village:

APA has revised the actions contained within the Risk Assessment and do not require an entirely new risk assessment to be undertaken. Given the extent of time that has passed since the preparation of the risk assessment, APA will require the preparation of a technical note that documents the modifications of the proposal and the current status of actions arising from the original risk assessment.

This Technical Note is prepared to document the modification and the current status of the actions from the original risk assessment.

1.4 AS 2885 Risk Assessment (2007)

The 2007 AS 2885 risk assessment [Ref. 2] has been reviewed as the basis for this technical note. A selection of relevant items from this risk assessment is provided here:

The pipeline runs 7 m from the eastern border of the property, and the proposed subdivision will introduce residential housing adjacent to the pipeline.

In addition, future construction of residential lots is planned some 28 m from the pipeline easement [the proposed development Zone C highlighted in Figure 2 will develop within 28 m of the easement].

It is understood that the Parmelia pipeline is designed for a R1/R2 rural [residential] location classification, and the proposed development will require it to be reclassified to [residential] T1.

The pipeline parameters were identified as shown in Table 1.

Table 1: Pipeline Parameters

Description	Parmelia
Pipe material	API 5L X52. (52000 psi -359 MPa yield)
Pipe Outside Diameter	355.6 mm (14")
Pipe Wall Thickness	5.56 mm
Pipe Max. Allowable Operating Pressure	7.5 MPag
Depth of Burial	~1.20 m indicative only
Coating	Yellow Jacket 1 – 3 mm thick HDPE
Pipe length passing by sub division	~170 m
Design Factor	50%
Design location classification	Residential T1 (due to development)
Isolation – Main Line Valves (MLV)	Pipe length between MLVs - ~9km. 3.5 km north to MLV 17 Kwinana 5.5 km south to MLV 18 Baldivis.
AS 2885.1 Resistance to penetration calculations	The largest excavator the pipeline can resist is a 20 tonne 'tiger' tooth excavator.

2 Review of Proposed Development

2.1 Revision of AS 2885 Standard

The AS 2885 standard has been revised since the 2007 assessment was undertaken. The standard has been restructured with the creation of AS/NZS 2885.6:2018, Part 6: Pipeline safety management [Ref. 1]. This Technical Note is prepared with reference to the current issue of the standard, AS/NZS 2885.6:2018.

The current revision of AS/NZS 2885 has a number of requirements for pipelines in high consequence areas (T1 location is a high consequence area) that were introduced since the 2007 assessment was undertaken using the 1997 revision of the standard, e.g. requirements outlined in AS/NZS 2885.1, Clause 4.9.

Planning Bulletin 87 (PB 87) [Ref 5] for high pressure gas pipelines in the Perth metropolitan region was issued in October 2007, after the March 2007 risk assessment [Ref. 2] was completed. The bulletin provides risk based setback distances from the edge of pipeline easement for different land uses. Residential setback (PB 87 Table 1) is shown as 65 m for the Parmelia Pipeline south of Caversham. Clause 3.1a (which may apply to the TLLV development) indicates that the following proposals are exempt from the setback distance:

Small-scale infill land uses, subdivisions or development which completes or rounds-off existing land use, subdivision or development that is already at a lesser setback distances from that defined in Table 1 other than sensitive developments as defined in part 5 of appendix 1.

2.2 Location Class

A Residential (T1) primary location class was assigned in the 2007 assessment and remains appropriate. No sensitive land use is proposed in the village [Ref. 4]. No land use is proposed that would require a secondary location class.

2.3 AS 2885 Threat Identification

The 2007 risk assessment reviewed a range of threat categories. These threat categories are directly comparable with those listed in AS/NZS 2885.6:2018, namely:

- (a) External interference.
- (b) Corrosion.
- (c) Natural events.
- (d) Faults in design, materials or construction.
- (e) Faults in operations, maintenance and management systems.
- (f) Intentional damage.

The external interference protection (EIP), which is the controls to prevent potential pipeline puncture or rupture, has been reviewed to clearly identify separation and resistance to penetration is compliant with the current revision of AS/NZS 2885.6-2018:

In T1 and T2 LOCATION CLASSES, PHYSICAL CONTROLS should include methods that provide both separation and resistance to penetration. Where the THREAT is such that only one of separation or resistance to penetration is practicable, failure analysis shall be done and the risk shall be assessed and managed in accordance with the SAFETY MANAGEMENT PROCESS.

The 2007 risk assessment identified the key threats as construction machinery and the neighbouring development.

The effectiveness of EIP controls assumes that a 20 t excavator with a 'tiger' tooth is the largest excavator the pipeline can resist. However, if the pipeline penetration resistance calculations (refer Table 1) were repeated using the current revision of the standard, it is anticipated that the maximum excavator size/ tooth combination would be smaller than indicated in Table 1.

Construction Machinery Threat

The 2007 risk assessment identified the main threat to the pipeline was construction machinery traversing over the pipeline and extra precautions should be put in place to prevent construction machinery accessing the pipeline easement. The threat was construction 28 m from the edge of the easement. Construction work on the easement is not included in the scope of the risk assessment. In the event that works or laydown extend onto the easement, APA has to approve all works within the easement. APA written approval may include conditions which ensure the protection of the pipeline.

The proposed construction is now adjacent to the pipeline easement.

Neighbouring Development Threat

The 2007 risk assessment noted that an AS 2885 Risk Assessment and appropriate risk reduction measures must be applied by the neighbouring developer to ensure that the risks are identified and mitigated both during and after any development on Lot 9006.

2.4 Action Status and Update

The status of the actions from the 2007 risk assessment is presented in Table 2.

Table 2: Action Status

Actions (2007 Risk Assessment)			2020 Action Status
Action	Action by	Action Due Date	
1 Road impact to be included in AS 2885 risk assessments conducted by developer of block to the east of the pipeline who will be constructing the road.	Developer of Lot 9006	Prior to road being constructed	No change due to TLLV proposed development

Actions (2007 Risk Assessment)			2020 Action Status
Action	Action by	Action Due Date	
2a Impact from any services to be installed across the pipeline to be included in AS 2885 risk assessments conducted by developer of block to the east of the pipeline.	Developer of Lot 9006	Prior to services being installed	No change due to TLLV proposed development . Appropriate controls may include APA attendance, limits on vibrating equipment, pot holing, hand digging.
2b APA will apply appropriate controls on this activity (also refer 2020 actions status).	APA		
3a Developer to provide induction to his contractors identifying risks impacting on Operators (e.g. access to easement) 3b Management plan to be submitted by Developer to operators for approval. 3c Erect additional barrier plus signage on the village boundary	TLLV	Prior to commencement of construction.	The fence and signage are not specified, but as per AS 2885, procedural controls shall be effective. TLLV shall ensure the construction contractor does not work on the easement. APA has to approve all works within the easement. APA to be approached for appropriate material for site inductions.
4a Erect (permanent) fence and signage on the village boundary.	TLLV	Prior to and during residential occupation of lots within conditional approval zone.	APA ongoing responsibilities include HP Gas Pipeline signs and monitoring depth of cover. TLLV to review with APA the necessity to provide a permanent fence on one side of the easement.
4b Monitor and Maintain depth of cover in compliance with AS 2885	APA		
5 Investigate re-sleeving if corrosion is indicated at field joints.	APA	Ongoing	No change due to TLLV proposed development
6 Coating inspection in compliance with AS 2885.	APA	Ongoing	No change due to TLLV proposed development

In reviewing the actions from the 2007 risk assessment, the proposed development does not change Actions 1 and 2, which will occur when Lot 9006 is developed, nor Action 5 and 6 which are ongoing responsibilities for APA.

Action 3a, 3b and 3c address the construction threats. The action requires a fence and signage to ensure construction and laydown would not occur on the pipeline easement. As the proposed development is now adjacent the pipeline easement, the construction contractor will have to be engaged to keep off the easement. Whatever combination of barriers, signs and inductions are

provided, the control must be effective. If construction does require access onto the easement, APA will have to provide written approval and supervision.

Action 4a and 4b address the threat from residential development adjacent to the pipeline. As there is no evidence of a permanent fence and in the expectation of future development of Lot 9006, TLLV should review and agree with APA the need for a permanent fence on one side of the easement. It is noted that as T1 pipeline, APA has the responsibility to provide HP Gas Pipeline warning signs for residential T1 location visible in either direction and at a maximum sign spacing of 100 m. For the construction threats it recommended that TLLV, communicate with APA whenever pipeline easement construction work is being undertaken to ensure that it is being supervised by APA.

3 Conclusions and Recommendations

A pipeline risk assessment of the TLLV was conducted in 2007 in accordance with the 1997 revision of the AS 2885.1. The developer now proposes changes to the development assessed in reference 2.

The key threats identified were:

- Construction machinery, where the control is to prevent access to the pipeline easement. If this is not practical for the proposed development, which is now immediately adjacent to the pipeline easement, APA written approval and supervision will be required for any work on the easement.
- Threats from the adjacent development (Lot 9006). No development plan has been approved for this adjacent lot and the threats of road and service crossings are unable to be assessed in any more detail than in the 2007 AS 2885 risk assessment.

It is expected that risk to public will increase as there will be more residences overall and residences will be built up to the pipeline easement. Compared with the 2007 review, the potential for construction activity on the easement is increased. The TLLV development does not currently anticipate excavation of the easement for installation of roads, utility services or drains. Any activity on the easement, which may include soil stockpiles and traversing construction machinery has to be approved by APA.

It is recommended that a Safety Management Study in accordance with AS 2885.6-2018 is conducted involving APA, the developer and the construction contractor.

4 References

1. Australian / New Zealand Standard, Pipelines – Gas and liquid petroleum, Part 6: Pipeline safety management. AS/NZS 25885.6-2018.
2. Proposed Rockingham Lifestyle Village AS 2885 Risk Assessment, WorleyParsons, Doc. ID. 450-13522-SR-RP-001, Rev 0, March 2007.
3. 'Lot 102 (831) and Lot 1 (851) Mandurah Road, Baldivis'. Letter from Glenn Skoien (APA) to Amanda Butterworth (Allerding & Associates), 8 November 2017.

4. 'Technical note to accompany AS 2885 Risk Assessment for Tuart Lakes Lifestyle Village', Email from Amanda Butterworth (Allerding and Associates) to Malcom Pritchard (Worley Advisian). 13 March 2020.
5. Planning Bulletin 87, High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region', Western Australian Planning Commissions, October 2007.

Attachment 1: Project Layouts



Figure 1: Site Overview



Figure 2: Proposed Extension to Lifestyle Village (Zone C)



8 November 2017

APA Reference: 439041
Your Reference: -

Amanda Butterworth
Senior Associate
Allerding & Associates
125 Hamersley Road
SUBIACO WA 6008

EMAIL OUT: amanda@allerdingassoc.com

Dear Amanda

RE: Lot 102 (831) & Lot 1 (851) Mandurah Road, Baldivis

APA Group (APA) is Australia's largest natural gas infrastructure business and has direct management and operational control over its assets and investments. APA's gas transmission pipelines span across Australia, delivering approximately half of the nation's gas usage. APA owns and operates over 15,000 km's of high pressure gas transmission pipelines across Australia.

APA is the Pipeline Licensee for the Parmelia Gas Pipeline. The Parmelia Gas Pipeline is located on the adjoining lot to the east, immediately abutting the subject site (shown in Attachment 1).

The Proposal

National Lifestyle Villages and Allerding & Associates have engaged with APA to discuss the potential of extending the existing development at Lot 102 (831) & Lot 1 (851) Mandurah Road, Baldivis.

It is understood that National Lifestyle Villages are seeking to alter existing development approvals to facilitate an extension of the Park Home Village. The proposal would extend the development further east. This will essentially replace the land within PD-DA30(a) Tuart Lakes Lifestyle Village Structure Plan currently shown as "Residential – R20" with Park Home Village.

APA's Role

As a Licensee under the Petroleum Pipelines Act 1969 (WA), APA is required to operate high pressure gas transmission pipelines (**HPGTP**) in a manner that minimises adverse environmental impacts and protects the public and property from health and safety risks. Once a HPGTP is in place, APA is required to constantly monitor both the pipeline easement and also a broader area within which we are required to consider land use changes and development and to assess what such changes means to the risk profile of the HPGTP.

APA has a number of responsibilities and duties to perform under a complex framework of legislation, standards and controls across Federal, State and Local Government landscapes. In particular, our HPGTPs are required to be operated in accordance with Australian Standard 2885 (Pipelines – Gas and Liquid Petroleum) (AS2885). In discharging our regulatory responsibilities, APA needs to

continuously review what is happening around its assets, what land use changes are occurring and what development is taking place to ensure it remains in a position to comply with applicable operational and safety standards and legislation whilst meeting its commercial obligations and imperatives.

Safety Management Study

AS2885 requires a Safety Management Study (**SMS**) to be undertaken whenever the land use classification of land within the ML. The purpose of an SMS is to assess the risk associated with a change in land use, including both construction risks and ongoing land use risks. The SMS will also develop appropriate controls to reduce risks to 'as low as reasonably practicable' (**ALARP**). SMS's are also known as Qualitative Risk Assessments.

An AS2885 Risk Assessment was undertaken for the proposed development by WorleyParsons in March, 2007 (Document Number: 450/13522/001). APA has revised the actions contained within the Risk Assessment and do not require an entirely new risk assessment to be undertaken. Given the extent of time that has passed since the preparation of the risk assessment, APA will require the preparation of a technical note that documents the modifications of the proposal and the current status of actions arising from the original risk assessment. This should be undertaken prior to the commencement of any newly approved development.

Conclusion

APA does not object to the proposed extension to the existing lifestyle village, subject to the preparation of a Technical Note to refresh the existing AS2885 Risk Assessment. It is requested that an ongoing dialogue between NLV and APA be maintained during this process, and that APA be engaged with through any formal planning processes moving forward.

For any further enquiries relating to this correspondence, please feel free to contact myself on (03) 8626 8459 or the Infrastructure Planning & Protection team at PlanningWA@apa.com.au.

Yours faithfully,



Glenn Skoien
Urban Planner
APA Group

Encl: 1x Location of Parmelia Gas Pipeline

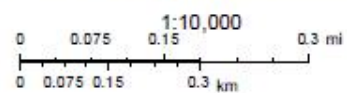
Attachment 1: Location of Parmelia Gas Pipeline

Parmelia Gas Pipeline



November 2, 2017

— Transmission - Natural Gas (inc. Operated)



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APA Group
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Proposed Rockingham Lifestyle Village

AS 2885 Risk Assessment

450/13522/001

1-Mar-07

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NATIONAL LIFESTYLE VILLAGES PROPOSED ROCKINGHAM LIFESTYLE VILLAGE AS 2885 RISK ASSESSMENT

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PROJECT 450/13522/001 - PROPOSED ROCKINGHAM LIFESTYLE VILLAGE

REV	DESCRIPTION	ORIG	REVIEW	WORLEY- PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
A	Issued for internal review	 M Lozyk	 P Sartory	N/A	7-Feb-07	N/A	
B	Issued for Client Review	 M Lozyk	 P Sartory	 P Sartory	9-Feb-07	N/A	
0	Issued as Final	 M Lozyk	 P Sartory	 P Sartory	1-Mar-07		



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PROPOSED ROCKINGHAM LIFESTYLE VILLAGE - AS 2885 RISK ASSESSMENT

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Appendices

Appendix 1 – Attendance List

Appendix 2 – Risk Assessment Worksheet

Appendix 3 – Project Information



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1. INTRODUCTION

1.1 General

An AS2885 pipeline risk assessment was conducted on 7 February 2007 for the section of the Parmelia Natural Gas Pipeline passing adjacent to the proposed Rockingham Lifestyle Village development.

This report details the findings of the assessment and provides a list of identified action items which require close out.

1.2 Background

The proposed Rockingham Lifestyle Village development encompasses Lots 3 and 703 Mandurah Rd in Baldivis.

National Lifestyle Villages (NLV) LTD has proposed to develop the existing rural land, which borders Mandurah Rd, into a residential village. A section of the Parmelia Natural Gas Pipeline runs parallel to the western border of the property. The pipeline runs 7m from the eastern border of the property, and the proposed subdivision will introduce residential housing adjacent to the pipeline. The land to the east of the lots contains the pipeline easement and is owned by Galati. This land will be developed in the future and is outside the scope of this report, however the activities associated with that development does have the potential to impact the risks to the residents of lots 3 and 703.

In addition, future construction (2009) of residential lots are planned some 28m from the pipeline easement and are within conditional development zone defined in WA Planning Commission, 2005, Planning and Development in The Vicinity of High Pressure Gas Pipelines, Draft Planning Bulletin, February 2006.

It is understood that the Parmelia pipeline is designed for a R1/R2 rural location classification, and the proposed development will require it to be reclassified to T1.

The existing structures on the lots, which are proposed to be demolished, are located on the eastern side of the property approximately 500m away and therefore not considered to be in close proximity to the pipeline.

The construction phase of the development will consist of civil works involving land clearing, earthworks, road construction, drainage construction and the installation of various services.

1.3 Study Scope and Objectives

The scope of work for this AS2885 Risk Assessment includes:

- The buried Parmelia Natural Gas Pipeline adjacent to subdivision
- Road and services (electricity, water, gas sewerage, drainage).



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- Demolition
- Civil construction works
- Future maintenance
- Other miscellaneous features of the subdivision

The intent of this Pipeline Risk Assessment is to identify and assess the possible threats to the pipelines and future residents of the proposed subdivision.



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1.4 Acronyms and Abbreviations

The following acronyms and abbreviations have been used in this report.

ALARP	As Low as Reasonably Practicable {risk level}
AS2885	Australian Standard AS2885 Pipelines – Gas and Liquid Petroleum
CP	Cathodic Protection
DOC	Depth of Cover
DoIR	Department of Industry and Resources
DOCEP	Department of Consumer and Employment Protection
HAZOP	Hazard and Operability Study
HDPE	High Density Polyethylene
KP	Kilometre Point {distance in kilometres along the pipeline from the start}
MAOP	Maximum Allowable Operating Pressure {of the pipeline as in AS2885}
MLV	Main Line Valve
OD	Outside Diameter
OP	Operating Pressure
QRA	Quantitative Risk Assessment
R1, R2, T1	Classification of pipeline location (AS2885.1 Clause 4.2.4.4)
Rev.	Revision
SCC	Stress Corrosion Cracking
SDV	Shut Down Valve
WAPC	Western Australian Planning Commission
WS&RM	WorleyParsons Safety and Risk Management
WT	Wall Thickness



2. AS2885 DESIGN RISK ASSESSMENT METHODOLOGY

2.1 General

The methodology for this risk assessment is outlined in AS2885 Part 1. AS2885 is the only international pipeline code for cross-country pipelines that is risk based and aimed at managing the specific threats to a pipeline. The standard focuses on the identification of all possible threats to the pipeline and the management of these threats, either by:

- physical and procedural external protection measures; or
- design and procedural measures to prevent the occurrence of loss of containment incidents.

2.2 Pipeline Specifications

	Parmelia
Pipe Material	API 5L X52. (52000 psi -359 MPa yield)
Pipe O/D	355.6 mm (14")
Pipe WT	5.56 mm (0.219")
Pipe MAOP	7.5 MPag (813 psig)
Pipe OP	Varies
Depth of Burial	~1.20 m indicative only
Coating	Yellow Jacket No. 1 – 3 mm. thick HDPE
Pipe length passing by sub division	~170 m
Design Factor	50%
Design location classification	Currently R2, proposed T1
Isolation	Pipe length between MLVs - ~9km. North to MLV 17 Kwinana & 5.5km south to MLV 18 Baldivis.
AS2885.1 Resistance to penetration calculations	The largest excavator the pipeline can resist is a 20 tonne 'tiger' tooth excavator.



2.3 Risk Identification

The AS2885 risk assessment methodology requires that a location and threats analysis be performed for the pipeline route. The intention of this phase of the work was to identify all the possible causes of failure of the pipeline and the mitigation measures which are in place.

The AS2885 risk identification process (see Figure 1) can be broadly defined into the following activities:

- Location analysis
- Threat analysis
- Mitigation by design and procedures
- Failure analysis
- Risk evaluation
- Risk management

2.3.1 Location Analysis

This process is the identification of the land use and activities, which take place adjacent to the pipeline route.

2.3.2 Threat analysis

This process is the identification of all possible threats, which may impact the pipeline. The analysis includes both location specific and non-location specific threats. Location specific threats could be external interference activities, such as deep furrow ploughing or excavation of adjacent services, or effects on corrosion protection from high voltage transmission lines. Non-location specific threats could be internal/external corrosion, pressures in excess of design pressure or natural disasters such as earthquakes or cyclones.

2.3.3 Mitigation by Design and Procedures

This process consists of the identification of the mitigation measures, which are required to reduce the risk of the identified threats to ALARP. The AS2885 code stipulates the number of mitigation measures, which should be in place for external interference protection and procedural/design prevention measures. There are also design requirements for corrosion, electrical protection and natural events.

2.3.4 Failure Analysis

Failure analysis combines the design features of the pipeline with the identified threats to determine the failure mode. Threats that have not been eliminated or reduced to acceptable levels must be subject to failure analysis.



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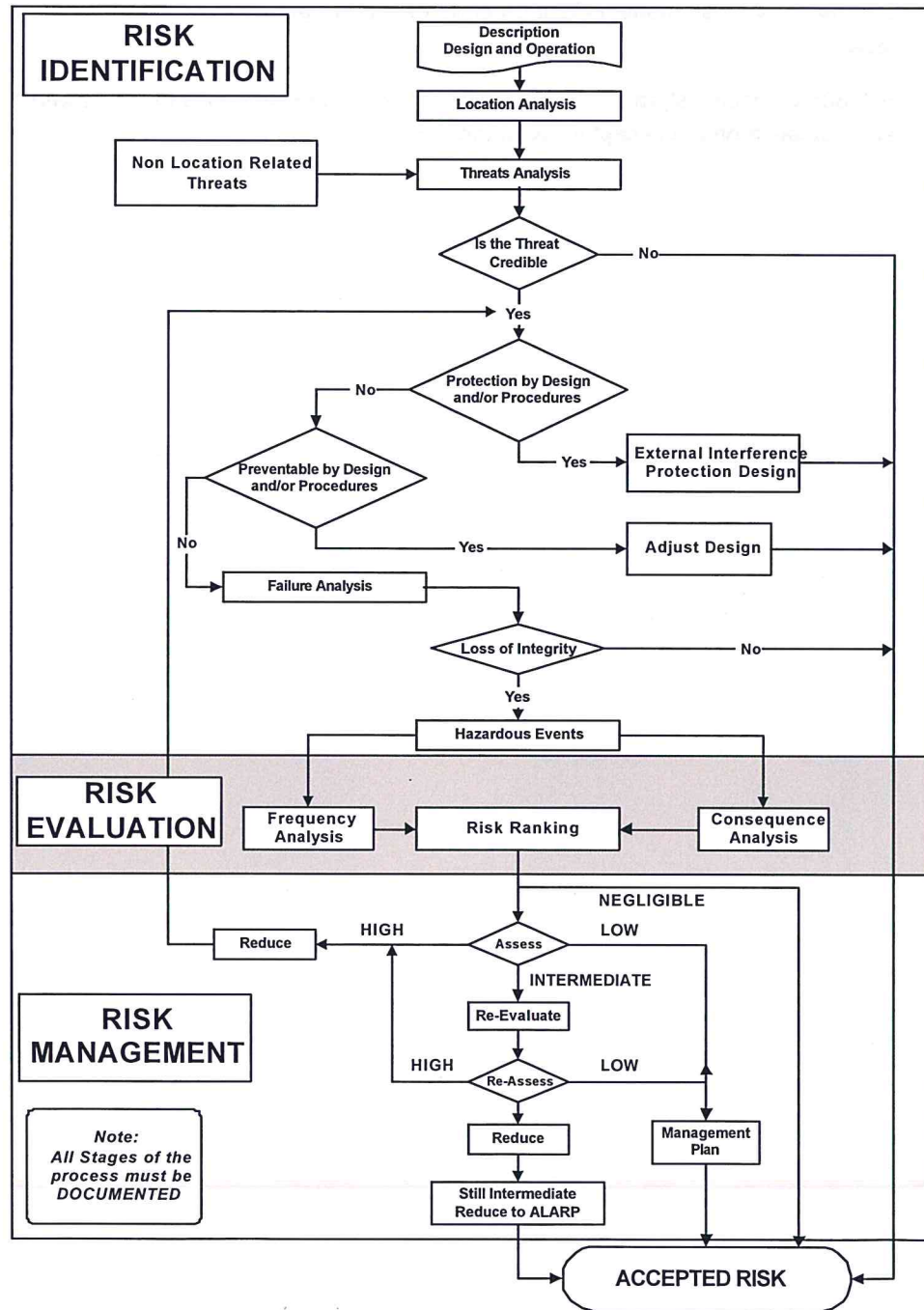
2.3.5 Risk Evaluation and Risk Management

Where the design and procedures are unable to reduce the risks to an acceptable level, a risk evaluation and risk management procedures can be put in place to reduce the risks to an acceptable level.

AS2885 contains risk ranking frequency and consequence tables to assist with assessment of the risk and guidance on the acceptability of the risk.



Figure 1 - The Pipeline Risk Assessment Process





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2.4 Risk Assessment Workshop

Contribution by the participants is critical to the success of the risk assessment study, and this was achieved as each participant brought specific knowledge, skill, experience and judgements to the workshop.

The assessment of threats to the pipeline was undertaken in consultation with the study group and projected onto a screen during the workshop. This provided an opportunity for the participant's to debate and agree on the decisions being made prior to recording in the assessment minutes.



3. PIPELINE RISK ASSESSMENT RESULTS

3.1 General

The methodology of the Risk Assessment was undertaken in accordance with the AS2885 process. The risk assessment workshop systematically assessed the threats to the pipeline within the proposed Rockingham Lifestyle Village subdivision. The threat list contained in AS2885 was used as a guide to assess location and non-location specific threats. The possible threats to the residential occupants were also assessed as part of the process.

The documentation available during the workshop included;

- Drawings of the proposed sub-division
- Aerial photographs
- Pipeline design information

3.2 Risk Assessment Study Team

The Pipeline Risk Assessment team was comprised of the following members. A signed attendance sheet is presented in Appendix 1.

Table 1 – Risk Assessment Team

Name	Company
Paul Sartory	WorleyParsons
Luke Badock	WorleyParsons
Myk Lozyk	WorleyParsons
Gerry Connell	Agility
Aidan Trend	Agility
Ian Nichol	NLV
David Wo	NLV
Ben Doyle	Planning Solutions



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3.3 Safeguards

AS2885 specifies that areas with a T1 location class should have the minimum external protection of two physical and two procedural measures. In comparison, a R1 or R2 location requires a minimum of one physical and two procedural measures.

For each of the pipeline threats, the design and procedural measures present were identified and assessed to determine if they were considered adequate or if additional mitigation measures were required.



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3.4 Actions

There were 6 actions identified in the workshop which are shown in Table 2 below

ID	Location	Location description	Threat	Threat analysis	Actions	Action by	Action due date
	Location Specific						
1	Sealed road identified on the plans parallel to the pipeline along the east side of the development on neighbouring land.	Not within control of RLV but actions identified for neighbouring developer (Galati)	Excavation for services traversing pipe	Excessive loads on pipe and erosion of pipeline cover	1. Road impact to be included in AS2885 risk assessments conducted by developer of block to the east of the pipeline who will be constructing the road.	1. Galati	Prior to road being constructed
2	Possibility of provision of services to the development from future development to east of pipeline across the pipeline.	Not within control of RLV but actions identified for neighbouring developer (Galati)	Excavation for services traversing pipe	Interaction with pipe and potential for penetration	1. Impact from any services to be installed across the pipeline to be included in AS2885 risk assessments conducted by developer of block to the east of the pipeline. 2. Agility will apply appropriate controls on this activity.	1. RLV 2. Galati 3. Agility	Prior to services being installed
5	Construction	All village construction activities are within the lot and approx 65m from pipeline. However potential for construction vehicles to access the easement	Construction vehicles traversing pipeline easement	Excessive loads on pipe and erosion of pipeline cover	1. Developer to provide induction to his contractors identifying risks impacting on Operators (eg access to easement) 2. Management plan to be submitted by Developer to operators for approval 3. Erect additional barrier plus signage on the village boundary	1,2,3 RLV	Prior to commencement of construction



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ID	Location	Location description	Threat	Threat analysis	Actions	Action by	Action due date
	Location Specific						
7	Future construction (2009) of residential lots within conditional development zone	Proposed additional lots within the conditional approval zone, 28m from edge of the easement.	Proximity of additional residential lots may	Exposure of residents to higher risk	1. Erect fence and signage on the village boundary 2. Monitor and Maintain depth of cover in compliance with AS2885	1. RLV 2. Agility	Prior to and during residential occupation of lots within conditional approval zone,
10	Non-location specific	Pipe wall	External Corrosion	Loss of thickness at field joints.	1. Investigate re-sleeving if corrosion is indicated at field joints	1. Agility	
27	Non-location specific	Non-location specific	Existing defect from unreported impact.	Unreported defect deteriorates over time.	1. Coating inspection in compliance with AS2885	1. Agility	



4. CONCLUSION

The AS2885 Risk Assessment workshop was conducted effectively to a professional standard using an accepted methodology. The participants from various disciplines possessed the appropriate skills, experience and knowledge required for an effective study.

The output of the Risk Assessment is presented in Appendix 2.

The key outcomes of the risk assessment are:

- As the main threats to the pipeline are construction machinery, extra precautions shall be put in place to prevent construction machinery accessing the pipeline easement. This must include the erection of additional barriers and warning signs on the village boundary, and a general induction to all construction personnel to raise awareness of the pipeline.
- An AS2885 Risk assessment and appropriate risk reduction measures must be applied by neighbouring developer (Galati) to ensure that the risks to the residential lots within conditional development zone remain ALARP during, and following, any development on their land adjacent to lots 3 and 703.
- All actions/recommendations from this report require monitoring to close out.



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5. REFERENCES

1. Standards Australia, 1997, "Pipelines – Gas and Liquid Petroleum, Part 1: Design and Construction" Standards Australia.
2. SAA HB105-1998 "Guide to pipeline risk assessment in accordance with AS 2885.1"
3. *Guidance for the Assessment of Environmental Factors* (in accordance with the Environmental Protection Act 1986) Guidance for Risk Assessment and Management: Off-site individual risk from Hazardous Industrial Plant No.2, WA EPA, July 2000.
4. WA Planning Commission, 2005, *Planning and Development in The Vicinity of High Pressure Gas Pipelines*, Draft Planning Bulletin, February 2006.



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Appendix 1 – Attendance List



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Meeting Attendance Record



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Date 7/2/07

Meeting topic AS2885 PRA ROCKINGHAM LIFESTYLE VILLAGE

Held by WSRM

Venue QVI LEVEL 6

NAME	SIGNATURE	POSITION	COMPANY
LUKE BADOCK		SCRIBE	WP
Paul SADDY		PRESENTER	WP
Ian Nichol		PM	NLV
GERRY CONNELL		LANDS OFFICER	Agility
AIDAN TREND		ENGINEER	Agility
Daniel Wos		Planning Manager	NLV
Ben Doyle		Senior Planner	Planning Solutions
Myk Lozyle		Engineer	WP

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Appendix 2 – Risk Assessment Worksheet

[illegible]

ID	Location	Location Class	Location description	Threat	Threat analysis	Is threat credible?	Safeguards - External Interference Protection	Safeguards - Procedural/ Design -Safeguards	Reduced to ALARP	Actions	Action by	Action due date	Frequency	Risk Assessment Severity	Risk	Comments
16	Non-location specific	T1	Pipe wall	Failure to define correct range of operating conditions	Potential loss of containment	No										
17	Non-location specific	T1	Pipe wall	Failure to specify required material characteristics	Potential loss of containment	No										
18	Non-location specific	T1	Pipe wall	Inadequate ITP plan to confirm acceptability of material	Potential loss of containment	No										
19	Non-location specific	T1	Pipe wall	Incorrect diameter	No loss of containment impact	No										
20	Non-location specific	T1	Pipe wall	Specify incorrect test procedures	Potential for incorrect test results	No										
21	Non-location specific	T1	Pipe wall	Stresses Exceed Allowable	Potential loss of containment	No										
22	Non-location specific	T1	Pipe wall	Temperature Exceeds Design	Potential loss of containment	No										
23	Non-location specific	T1	Pipe wall	Temperature Less Than Design	Potential brittle fracture	No										
External Interference																
24	Non-location specific	T1	Non-location specific	Blasting	Potential for loss of containment	No										
25	Non-location specific	T1	Non-location specific	Bogged Vehicles	External interference Bollarding provided to exclude recreational vehicles. Sand soils vs clay	Yes	1. Bollards 2. Depth of cover 3. Mechanical integrity of pipe wall thickness (based on pipeline design compliance with AS2885)	1. Pipeline warning signs (i.e., dial before you dig)	Yes							
26	Non-location specific	T1	Non-location specific	Ploughing to 900mm depth	Impact on pipeline	No										
27	Non-location specific	T1	Non-location specific	Existing defect from unreported impact.	Unreported defect deteriorates over time.	Yes	1. Depth of cover 2. Pipe wall thickness (safeguards protect pipeline from unreported incident)	1. Regular surveillance 2. Intelligent piggings 3. Signage. 4. Public awareness procedures leading to landowner reporting.	Yes	1. Coating inspection	1. Agility					Reporting of defects by landowner if aware (Galsit)
Intentional Damage																
28	Non-location specific	T1	Non-location specific	Malicious Damage	Potential to cause loss of containment. Not considered credible for buried pipeline in a residential area.	No										
29	Non-location specific	T1	Non-location specific	Sabotage	Potential to cause loss of containment. Not considered credible for buried pipeline in a residential area.	No										
30	Non-location specific	T1	Non-location specific	Terrorism	Potential to cause loss of containment. Not considered credible for buried pipeline.	No										
Natural Events																
31	Non-location specific	T1	Non-location specific	Cyclone - Flooding and Storm Surges	Potential for pipeline to float if ground is water saturated overstressing pipe material.	No										
32	Non-location specific	T1	Non-location specific	Cyclone - Flooding and Storm Surges	Potential for storm surges to expose buried pipeline.	No										
33	Non-location specific	T1	Non-location specific	Earthquake	Potential for ground movement overstressing pipe material.	No										earthquake risk contours referenced for AS2885 indicate this section of line designed to risk level.
34	Non-location specific	T1	Non-location specific	Ground Movement	Potential for ground movement overstressing pipe material.	No										
35	Non-location specific	T1	Non-location specific	Lightning	Induced voltages and step & touch potentials possibly causing fatality.	No										
36	Non-location specific	T1	Non-location specific	Bushfires/ intentional burning	No bush.	No										
Operation/Maintenance																
37	Non-location specific	T1	Non-location specific	Exceeding MAQP	Potential for loss of containment	No										
38	Non-location specific	T1	Non-location specific	Inaccurate Test Equipment	Potential for loss of containment	No										as concerns piggings
39	Non-location specific	T1	Non-location specific	Inadequate Servicing of Equipment	Potential for loss of containment	No										
40	Non-location specific	T1	Non-location specific	Inadequate / Incomplete Maintenance Procedures	Potential for loss of containment	No										
41	Non-location specific	T1	Non-location specific	Incorrect Operation of Control and Protective Equipment	Potential for loss of containment	No										
42	Non-location specific	T1	Non-location specific	Incorrect Piggings Operation	Potential for loss of containment	No										

Notes:

1. This risk assessment is based on the pipelines being compliant with AS2885
2. Any work occurring in the pipeline easement will require a Section 41 and Section 56 application.
3. "Pipeline easement" and "easement" refers to the currently proposed easement, which is 12m wide.
4. "OPS" and "operator" refer to pipeline operator Agility
5. TBD - To Be Determined



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Appendix 3 – Project Information



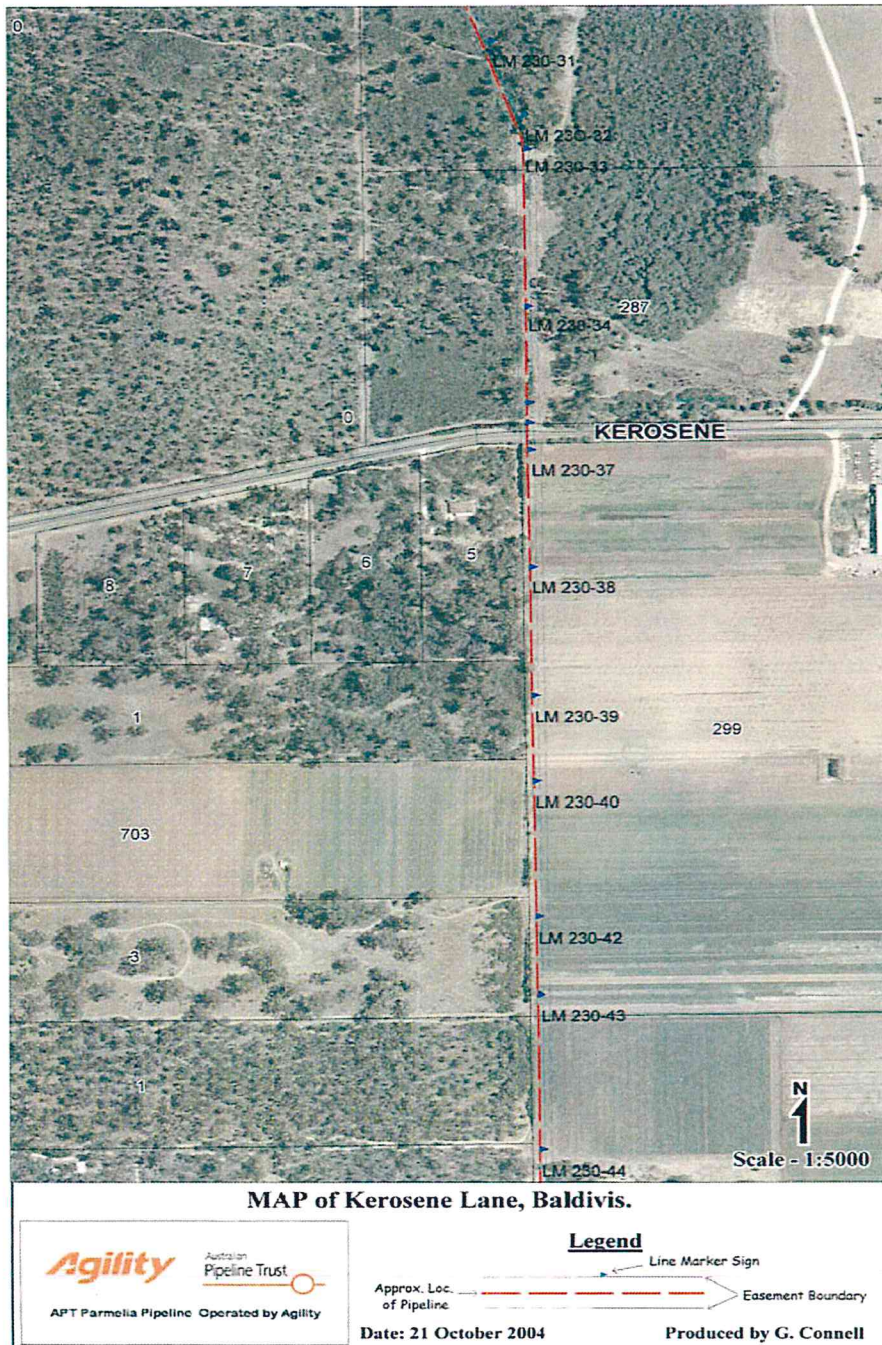
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Figure A 1 – Parmelia Pipeline location (Agility LTD)





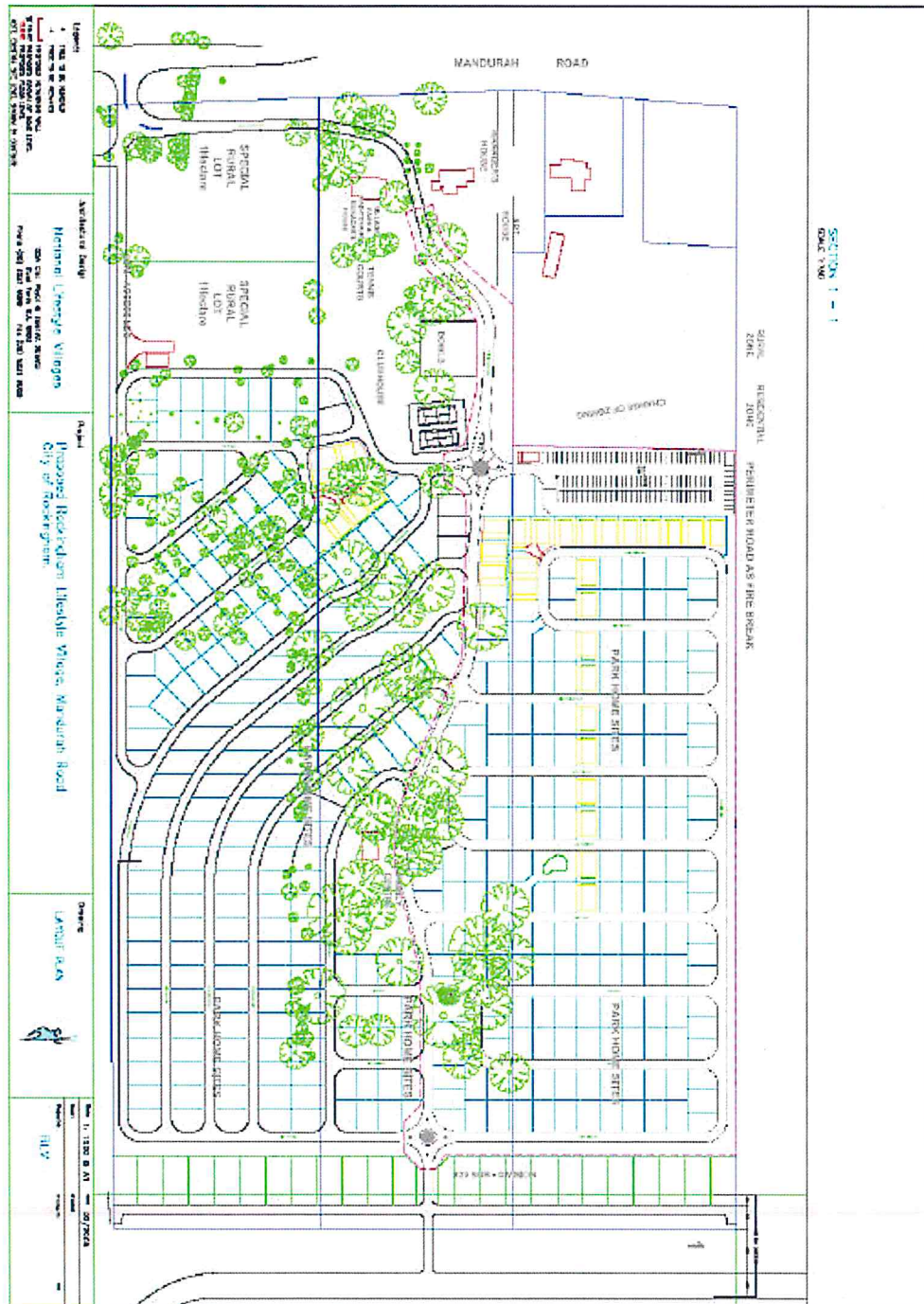
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Figure A 2 – Proposed Rockingham Lifestyle Village Subdivision Layout





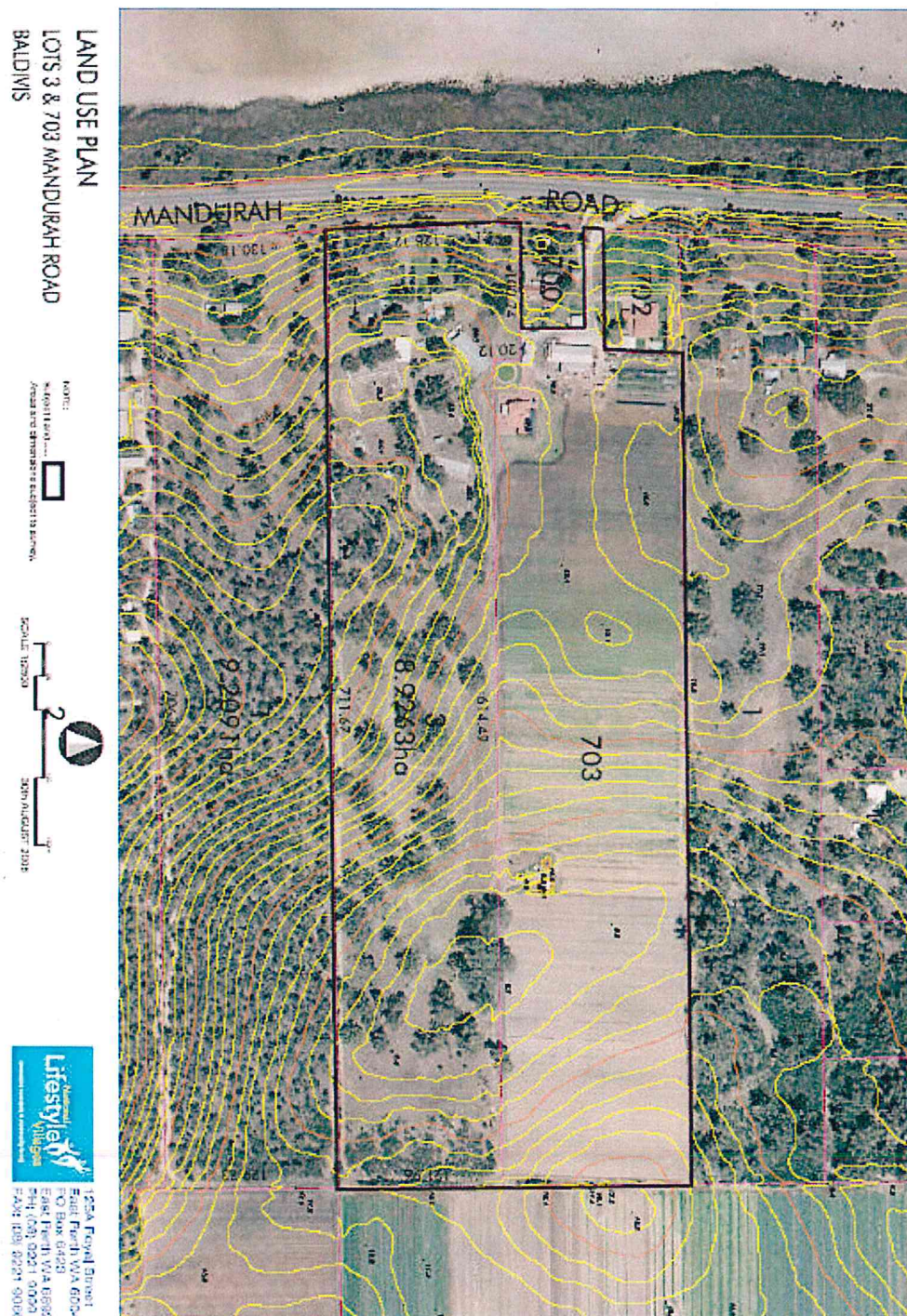
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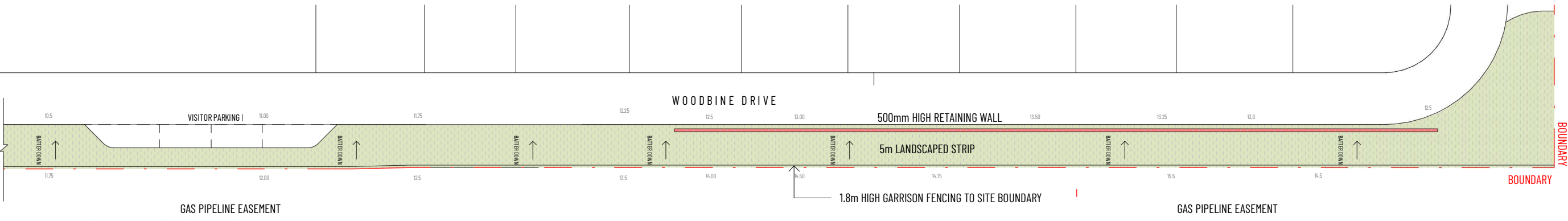
PROPOSED ROCKINGHAM LIFESTYLE VILLAGE - AS 2885 RISK ASSESSMENT

Figure A 3- Land Use Plan

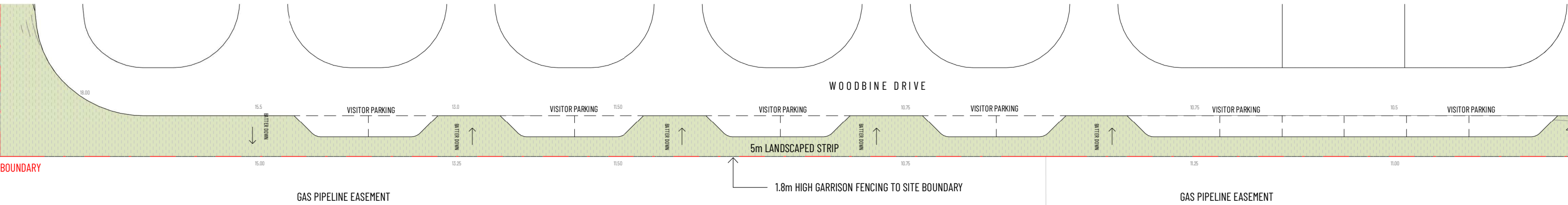


Appendix 7

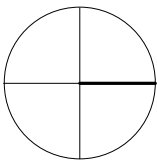
Landscaping and Fencing Concept Plan



TUART LAKES EASTERN BOUNDARY PART PLAN A | 1:500



TUART LAKES EASTERN BOUNDARY PART PLAN B | 1:500



RICHARD HAMMOND ARCHITECT
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No.	Description	Date
A	PRELIMINARY ISSUE	26.03.2025
B	FINAL ISSUE	08.04.2025
C	EASTERN ACCESS ROAD OMITTED	28.08.2025

TUART LAKES LIFESTLYE VILLAGE

831 Mandurah RD, Baldivis, WA 6171

EASTERN BOUNDARY PART PLANS

Project number	0001	A3.01
Date	28.08.2025	
Drawn by	RHA	
Checked by	RHA	Scale@A3
		1 : 500



EASTERN BOUNDARY ELEVATION

1:1000



EASTERN BOUNDARY ELEVATION - CALLOUT 1

1:200



EASTERN BOUNDARY STREETSCAPE - ARTISTS IMPRESSION



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No.	Description	Date
A	ISSUE FOR INFORMATION	31.03.2025
B	FINAL ISSUE	08.04.2025
C	EASTERN ACCESS ROAD OMITTED	28.08.2025

TUART LAKES LIFESTLYE VILLAGE		EASTERN BOUNDARY - STREETSCAPE	
831 Mandurah Rd, Baldivis, WA 6171	Project number	0001	A3.02
	Date	28.08.2025	
	Drawn by	RHA	
	Checked by	RHA	Scale@A3 As indicated





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No.	Description	Date
A	PRELIMINARY ISSUE	26.03.2025
B	FINAL ISSUE	08.04.2025
C	EASTERN ACCESS ROAD OMITTED	28.08.2025

TUART LAKES LIFESTLYE VILLAGE

831 Mandurah RD, Baldivis, WA 6171

TUART LAKES - OVERALL MASTERPLAN

Project number	0001	A1.01
Date	28.08.2025	
Drawn by	RHA	
Checked by	RHA	
Scale @ A1		1 : 1000

- TREES - @8M SPACING
- MELALEUCA QUINQUENERVIA
 - EUCALYPTUS FOECUNDA

GROUND COVERS

TO MATCH PREVIOUS STAGES WITH
FEATURE ROCKS IN BETWEEN TREES
AS PER EXAMPLE PHOTOS



ADENANTHOS SERICEUS

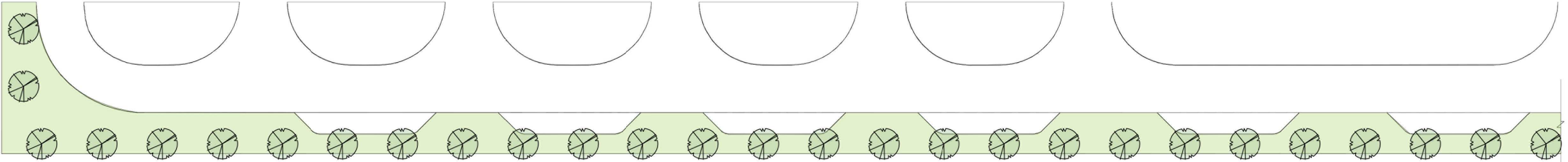
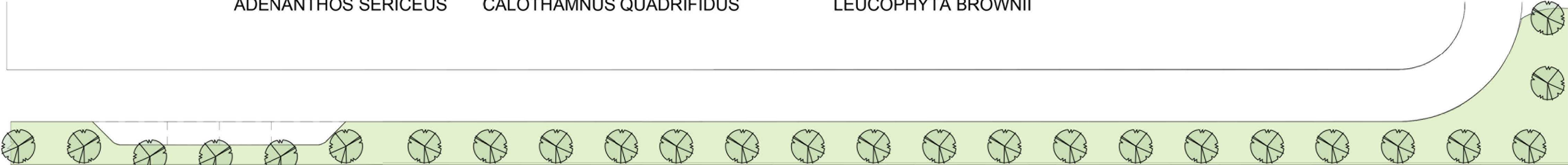


CALOTHAMNUS QUADRIFIDUS



LEUCOPHYTA BROWNII

PLANT LIST	Mature Size	Spacings - m2
Screening		
Adenanthos sericeus	3 metre	2
Calothamnus quadrifidus	1.5 metre	1.5
Ground Covers		
Acacia lasiocarpa	.5 metre	0.5
Grevillea thelmaniana	.5 metre	0.75
Adenanthos meisneri	1 metre	1.25
Leucophyta brownii	.5 metre	0.75
Olearia axillaris dwarf	1 metre	1
Grasses		
Dianella revoluta	.75 metre	0.5
Anigozanthus flavius	1 metre	0.5
Orthosanthus laxus	.4 metre	0.4



EXISTING VERGE WORKS EXAMPLE

ISSUE	DATE	REVISION	PROJECT #
PROJECT			L0241
TUART LAKES			
CLIENT	NVL	DATE # 28/08/2025	DWG #
		SCALE @ A3 1:500	S03
DWG	EAST BOUNDARY	DRAWN XX	
		CHKD XX	REVISION



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Appendix 8

Traffic Technical Note

Technical Note

Project: Tuart Lakes Lifestyle Resort

Subject: Vehicle Wellspring Road Full Movement Access

Client:	National Lifestyle Village		
Project No:	09412	Version:	C
Document Ref:	T_01	Author:	Rodney Ding
Date:	06/11/2025	Approved:	TM

I Introduction

The *National Lifestyle Village* (NLV) operated *Tuart Lakes Lifestyle Resort* at 831 Mandurah Road in Baldivis is currently proposing to expand its current number of residencies on site from the approximate 325 (out of 426 approved) to an estimated 480 dwellings. A development structure plan is being prepared to support the increase.

This development structure plan proposal includes an ultimate vehicle access to and from the site via both Mandurah Road (access is currently in operation) and a proposed new access to the east via Elderberry Drive.

However, following the lodgement of the development structure plan, the Department of Planning, Lands and Heritage (DPLH) provided clearance to the final stage of the adjoining subdivision to the east without the requirement for the adjoining landowner to construct the Bojar Road linkage to connect the existing resort to Elderberry Drive. Part of the engineering justification provided by the adjoining landowner's representatives to avoid constructing the Bojar Road linkage, which was accepted by DPLH in clearing the condition, included that the existing resort has existing secondary access to Wellspring Road to the north-east. It was argued that this existing access provides the resort with a point of constructed access across the Dampier to Bunbury Natural Gas Pipeline (DBNGP) to the north of the resort via Blissful Way, allowing residents of the resort to access shopping facilities and services to the north-east. That engineering advice assessed the existing access to the resort via Wellspring Road as full movement and concluded that under this arrangement the local road network would ultimately operate at an acceptable level.

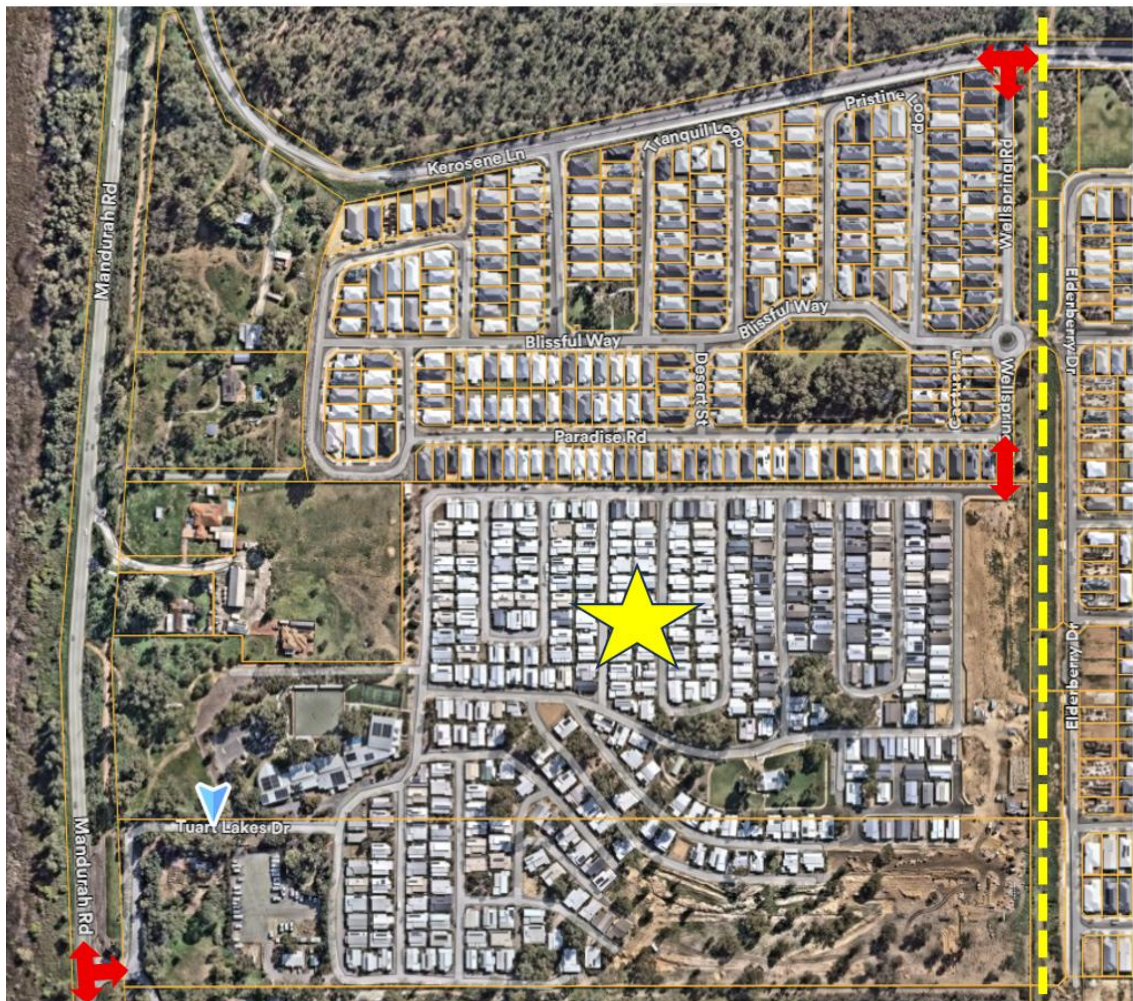
It is noted that approval for and construction of an access to Wellspring Road has been previously completed and has been in operation to provide additional exit only access to the expanding resort. This access is located in the NE corner of the resort, on the western side of the DBNGP. This provides access to Wellspring Road, also on the western side of the gas pipe line and then onto Kerosene Lane where Kerosene Lane currently provides a crossing of the gas pipeline.

This technical note documents the current and expected traffic flow conditions for the proposed resort expansion and whether the increased use of vehicles on a proposed full movement Wellspring Road access arrangement (modelled as a full movement in/out access) can support an expanded resort use into the future. It also investigates if any road upgrade works are required to the access arrangements without the requirement to construct any new roads across the gas pipeline.

2 Proposed Vehicle Accesses

The current site has a main access to/from Mandurah Road and a secondary access to/from Wellspring Road in the NE corner of the site, this then connects to Kerosene Lane.

Figure 1: Access Locations



The Mandurah Road access has channelisation for both right and left turns on Mandurah Road with Mandurah Road posted with a speed limit of 80km/h in this vicinity.

The Wellspring Road access connects to Kerosene Lane as a simple T-junction. Kerosene Lane has a 2.5m wide concrete median and 4.5m wide traffic lanes either side of this.

The Mandurah Road access is by far the preferred access for the report. As noted in the following sections, this access is used by over 99% of the resort traffic. It is located closest to the administration and is the access used by staff. The visitor parking is also located closest to this access and will be used by all visitors accessing and exiting the resort. Finally, the trailer parking is located closest to this access and is used by trailer users to easily gain access to and exit from the trailer parking area in the western side of the resort.

These access points are proposed to be retained, with the Wellspring Road access proposed to be converted to full movement and be utilised as the expansion of the resort is in the eastern portion of the current site nearer to this access.

Figure 1 above denotes these accesses and the balance of land available for the proposed development area within the resort.

3 Traffic Conditions Description

Mandurah Road is a key arterial road under the jurisdiction of the City of Rockingham and connects Kwinana to Mandurah. The section adjacent to the proposed vehicle access point is a single carriageway with channelisation as noted.

The road in this section features a central painted median of approximately 3m width, provides a right turn pocket from the south and a left turn pocket from the north assisting access into Tuart lakes Drive and then into the village.

Current traffic flows on Mandurah Road recorded by *Matrix Traffic & Transport Solutions* on 15/10/2025 for this project, notes the following:

- AM Peak (7:45am to 8:45am): 745vph NB / 410vph SB
- PM Peak (3:30pm to 4:30pm): 475vph NB / 790vph SB.

Based on these peak hour flows, it is estimated Mandurah Road currently carries in the order of 12,500vpd in this section.

Kerosene Lane is a Local Distributor road under the control of the City of Rockingham. It has a 2.5m raised concrete median with a single 4.5m wide traffic lane in each direction.

Current traffic flows on Kerosene Lane recorded by *Matrix Traffic & Transport Solutions* on 15/10/2025 for this project, notes the following:

- AM Peak (8:00am to 9:00am): 150vph EB / 250vph WB
- PM Peak (4:15pm to 5:15pm): 230vph EB / 258vph WB.

Based on these peak hour flows, it is estimated Kerosene Lane currently carries in the order of 5,000vpd.

Wellspring Road is a Local Access Street under the control of the City of Rockingham. The carriageway is 6m wide and allows for on-street parking on for residential dwellings on the western side and has embayed parking along its undeveloped eastern side. In this format, Wellspring Road has a capacity of about 2,000vpd.

Current traffic flows on Wellspring Road recorded by *Matrix Traffic & Transport Solutions* on 15/10/2025 for this project, notes the following:

- AM Peak (8:00am to 9:00am): 40vph NB / 30vph SB
- PM Peak (4:15pm to 5:15pm): 20vph NB / 45vph SB.

Based on these peak hour flows, it is estimated Wellspring Road currently carries in the order of 700vpd.

4 Current & Expected Resort Traffic Volumes

The lifestyle resort currently has 325 houses/dwellings on the site. These houses/dwellings are generating traffic flows to and from the site, accessing via both the Mandurah Road and Wellspring Road access points. To ascertain the current traffic generation and the distribution across the two accesses, Automatic Traffic Counters (ATCs observed as ‘twin black tubes’) were installed at the Tuart Lakes Drive access and the Wellspring Road accesses.

The ATC data lead to the following observations:

Mandurah Road access

Approximately 1,050vpd use this access with 76vph in the AM peak and 62vph in the PM peak. The peak use time of this access was found to be 122vph between 10am and 11am, this outside the peak period along Mandurah Road. Approximately 525vpd exit the resort using the access.

Wellspring Road access

Approximately 8vpd use this access with the busiest time being between 4pm and 5pm where 2 vehicles used the access. Approximately 4vpd exit the resort using the access.

Based on these observed actual traffic counts, less than 1% of the traffic exiting the resort use Wellspring Road and over 99% use Mandurah Road.

Based on these observations with a total of 1,058vpd generated by the site and the noted 325 houses/dwellings on the site, this allows a traffic generation rate of the current site to be derived:

- Daily 3.26 trips per unit evenly split entering and exiting
- AM peak 0.23 trips per unit with 60% exiting / 40% entering
- PM peak 0.19 trips per unit with 33% exiting / 67% entering

With an expanded (and fully developed, given this is all the balance of land available) it is expected that the lifestyle resort traffic generation rate and distributions would remain much the same as it is currently. When fully developed to 480 houses/dwellings, the site is expected to generate the following:

- Daily 1,565vpd (this approximately an additional 500vpd compared to current)
- AM peak 110vph with 60% exiting / 40% entering, this approximately an extra 34vph
- PM peak 90vph with 33% exiting / 67% entering, this approximately an extra 28vph

Given the location of the expansion area is on the eastern side of the resort it is expected that more traffic would use Wellspring Road as compared to the less than 1% current usage; however, for a conservative worst case scenario for Wellspring Road, we have assumed that 50% of this future traffic will use the Mandurah Road via Tuart Lakes Drive and the other 50% will use Wellspring Road. These vehicles are expected to be residents, with staff, visitors and trailers continuing to use the Mandurah Road access and exit.

5 Traffic Assessment – Assessment of Current Development

Based on the current traffic flows recorded at Mandurah Road access at Tuart Lakes Drive and the Wellspring Road access at Kerosene Lane, *SIDRA Intersection* analyses were undertaken to understand the current performance. These indicate the intersections operate a very good levels of service, with minimal delays and low degrees of saturation. The modelling also shows that this will also hold true in 2036 with no development.

Summaries of the *SIDRA analyses* for these intersections are shown below for their current operation and under a ‘without’ future development scenario. The performances are based on the critical movements at these intersections, this being the uncontrolled right turn movements.

Table 1: Mandurah Road/Tuart Lakes Drive Traffic Operation - 2025

Critical Movement	Performance Measure			
	Degree of Saturation (DoS)	Average Delay (s)	Level of Service (LoS)	95 th %ile Queue (m)
AM Peak				
Mandurah Road S RT	0.01	2	A	0.3
Tuart Lakes Dr LT	0.03	1	A	0.7
Tuart Lakes Dr RT	0.06	11	B	1
Intersection	0.06	11	B	-
PM PEAK				
Mandurah Road S RT	0.05	4	A	1
Tuart Lakes Dr LT	0.04	4	A	1
Tuart Lakes Dr RT	0.07	13	B	2
Intersection	0.07	13	B	-

Table 2: Mandurah Road/Tuart Lakes Drive Traffic Operation - 2036

Critical Movement	Performance Measure			
	Degree of Saturation (DoS)	Average Delay (s)	Level of Service (LoS)	95 th %ile Queue (m)
AM Peak				
Mandurah Road S RT	0.01	2	A	0.4
Tuart Lakes Dr LT	0.03	2	A	0.8
Tuart Lakes Dr RT	0.09	18	C	2
Intersection	0.09	18	C	-
PM PEAK				
Mandurah Road S RT	0.07	8	A	2
Tuart Lakes Dr LT	0.05	6	A	1
Tuart Lakes Dr RT	0.11	22	C	2
Intersection	0.11	22	C	-

For the Tuart Lakes Drive access at Mandurah Road, the critical right turn currently (2025) operates at a **LoS B** in the AM and PM peaks with very low DoS. In 2036, this intersection is expected to operate at **LoS C** in the peak periods. Both these measures are well within the capacity of the intersection and ‘without’ any future development of the resort.

The same time horizons were then tested for the Wellspring Road intersection with Kerosene Lane, with results summarised below in Table 3 and 4.

Table 3: Kerosene Lane/Wellspring Road Traffic Operation - 2025

Critical Movement	Performance Measure			
	Degree of Saturation (DoS)	Average Delay (s)	Level of Service (LoS)	95 th %ile Queue (m)
AM Peak				
Wellspring Road LT	0.01	4	A	0.2
Wellspring Road RT	0.03	5	A	0.8
Kerosene Ln W RT	0.002	6	A	0.1
Intersection	0.03	5	A	-
PM PEAK				
Wellspring Road LT	0.003	4	A	0.1
Wellspring Road RT	0.02	5	A	0.5
Kerosene Ln W RT	0.007	6	A	0.2
Intersection	0.02	5	A	-

Table 4: Kerosene Lane/Wellspring Road Traffic Operation - 2036

Critical Movement	Performance Measure			
	Degree of Saturation (DoS)	Average Delay (s)	Level of Service (LoS)	95 th %ile Queue (m)
AM Peak				
Wellspring Road LT	0.01	4	A	0.3
Wellspring Road RT	0.03	5	A	1
Kerosene Ln W RT	0.002	6	A	0.1
Intersection	0.03	5	A	-
PM PEAK				
Wellspring Road LT	0.003	4	A	0.1
Wellspring Road RT	0.02	6	A	0.5
Kerosene Ln W RT	0.007	6	A	0.2
Intersection	0.02	6	A	-

For the Wellspring Road access at Kerosene Lane, the critical right turn currently (2025) operates at a **LoS A** in the AM and PM peaks with very low DoS. In 2036, this intersection is expected to continue to operate at **LoS A** in the peak periods. Both these measures are well within the capacity of the intersection ‘without’ any future development of the resort.

The above assessed the operation of the key intersections using current traffic flows and forecast traffic flows expected in 2036 without any development to establish ‘base case’ or ‘without future development’ as a frame of reference for comparison purposes.

The traffic flows now and in the future without any development for the key road under assessment, Wellspring Road, is about 700vpd. This compares favourably with the indicative maximum traffic flow this road should carry, this being 2,000vpd. This traffic flow is based on a combination of this road being an Access Street D (with a traffic carrying ability of about of 1,000vpd) and an Access Street B (with a traffic carrying ability of about 3,000vpd). This flow was adopted as one side of the street allows for on-street parking whilst the other allows for embayed parking, along the high pressure gas line. If a more conservative value of 1,000vpd was to be adopted, this based on an Access Street D, traffic flows are expected to be within the capacity of such a street.

6 Traffic Assessment – Assessment of Future Development

To assess the impacts of the full development of the resort and use of the Wellspring Road and Mandurah Road access points *SIDRA Intersection* was again utilised.

As noted previously, the additional traffic flows for the future +155 dwellings (total of 480 dwellings) for the lifestyle resort are conservatively assumed to be evenly divided on both the Mandurah Road and Wellspring Road accesses.

Further to this, traffic flow is then expected to be evenly split in both directions at Mandurah Road and Kerosene Lane.

The following intersection assessments summaries are for 2026 where the resort is expected to be fully developed and then 2036, which is 10 years post full development of the resort.

A summary of the *SIDRA analysis* for these intersections are shown below for their current operation and expected ‘with’ development performance. The performances are based on the critical movements at these intersections, this being the uncontrolled right turn movements.

Table 5: Mandurah Road/Tuart Lakes Drive Traffic Operation – 2026 With Development

Critical Movement	Performance Measure			
	Degree of Saturation (DoS)	Average Delay (s)	Level of Service (LoS)	95 th %ile Queue (m)
AM Peak				
Mandurah Road S RT	0.02	2	A	0.5
Tuart Lakes Dr LT	0.03	2	A	1
Tuart Lakes Dr RT	0.08	12	B	2
Intersection	0.08	12	B	-
PM PEAK				
Mandurah Road S RT	0.06	6	A	2
Tuart Lakes Dr LT	0.04	4	A	1
Tuart Lakes Dr RT	0.08	14	B	2
Intersection	0.08	14	B	-

Based on the expected traffic flow distribution for the additional traffic generated by the full development of the resort at 2026, this intersection is expected to operate at **LoS B** in the AM peak and PM peak, this based on the critical right turn from Tuart Lakes Drive onto Mandurah Road.

Table 6: Mandurah Road/Tuart Lakes Drive Traffic Operation – 2036 With Development

Critical Movement	Performance Measure			
	Degree of Saturation (DoS)	Average Delay (s)	Level of Service (LoS)	95 th %ile Queue (m)
AM Peak				
Mandurah Road S RT	0.02	2	A	0.5
Tuart Lakes Dr LT	0.04	2	A	1
Tuart Lakes Dr RT	0.12	18	C	3
Intersection	0.12	18	C	-
PM PEAK				
Mandurah Road S RT	0.09	8	A	2
Tuart Lakes Dr LT	0.06	6	A	2
Tuart Lakes Dr RT	0.13	23	C	3
Intersection	0.13	23	C	-

Based on the expected traffic flow distribution for the additional traffic generated by the full development of the resort, +10 years to 2036, this intersection is expected to operate at **LoS C** in both the AM and PM peaks, this based on the critical right turn from Tuart Lakes Drive onto Mandurah Road.

Based on this, **the Mandurah Road intersection will be able to support the full development of the resort with no modifications required.**

The intersection of Wellspring Road and Kerosene Lane was also assessed in both 2026 and in 2036, 10 years post opening. The results are summarised in Tables 7 and 8 below.

Table 7: Kerosene Lane/Wellspring Road Traffic Operation - 2026 With Development

Critical Movement	Performance Measure			
	Degree of Saturation (DoS)	Average Delay (s)	Level of Service (LoS)	95 th %ile Queue (m)
AM Peak				
Wellspring Road LT	0.01	4	A	0.3
Wellspring Road RT	0.04	5	A	1
Kerosene Ln W RT	0.01	6	A	0.2
Intersection	0.01	5	A	-
PM PEAK				
Wellspring Road LT	0.01	4	A	0.2
Wellspring Road RT	0.02	5	A	0.6
Kerosene Ln W RT	0.01	6	A	0.3
Intersection	0.02	5	A	-

Based on the expected traffic flow distribution for the additional traffic generated by the full development of the resort, this intersection is expected to operate in 2026 at **LoS A** in the peak periods, this based on the critical right turn from Wellspring Road onto Kerosene Lane. In comparison to the current operation of this intersection in 2025, there is expected to be little to no difference, thus the impact is minimal and acceptable.

Table 8: Kerosene Lane/Wellspring Road Traffic Operation – 2036 With Development

Critical Movement	Performance Measure			
	Degree of Saturation (DoS)	Average Delay (s)	Level of Service (LoS)	95 th %ile Queue (m)
AM Peak				
Wellspring Road LT	0.01	4	A	0.4
Wellspring Road RT	0.04	5	A	1
Kerosene Ln W RT	0.01	6	A	0.2
Intersection	0.04	5	A	-
PM PEAK				
Wellspring Road LT	0.01	4	A	0.2
Wellspring Road RT	0.02	6	A	0.6
Kerosene Ln W RT	0.01	6	A	0.3
Intersection	0.02	6	A	-

Based on the expected traffic flow distribution for the additional traffic generated by the full development of the resort +10 years in 2036, this intersection is expected to continue to operate at **LoS A** in both the AM and PM peaks, this based on the critical right turn from Wellspring Road. In comparison to the operation of this intersection in 2026 at opening, there is expected to be little to no difference, thus the impact is also expected to be minimal and acceptable.

Based on this, **the intersection will be able to support the full development of the resort with no modifications required.**

The additional traffic expected to be generated with the full development of the lifestyle resort is expected to be approximately 500vpd, split evenly between the Mandurah Road access via Tuart Lakes Drive and Wellspring Road onto Kerosene Lane. Each access is expected to have an additional 250vpd with the previously noted 50% split.

As noted previously, Wellspring Road carries approximately 700vpd and the additional 250vpd expected with full development of the resort, to bring the ultimate traffic flows to 950vpd.

This will remain less than the indicative maximum traffic flow this road can carry, this being 2,000vpd for the combined Access Street B/D and less than the 1,000vpd for a simple Access Street D if assessed using that cross section only.

From a traffic carrying capability for this road, this is considered entirely acceptable.

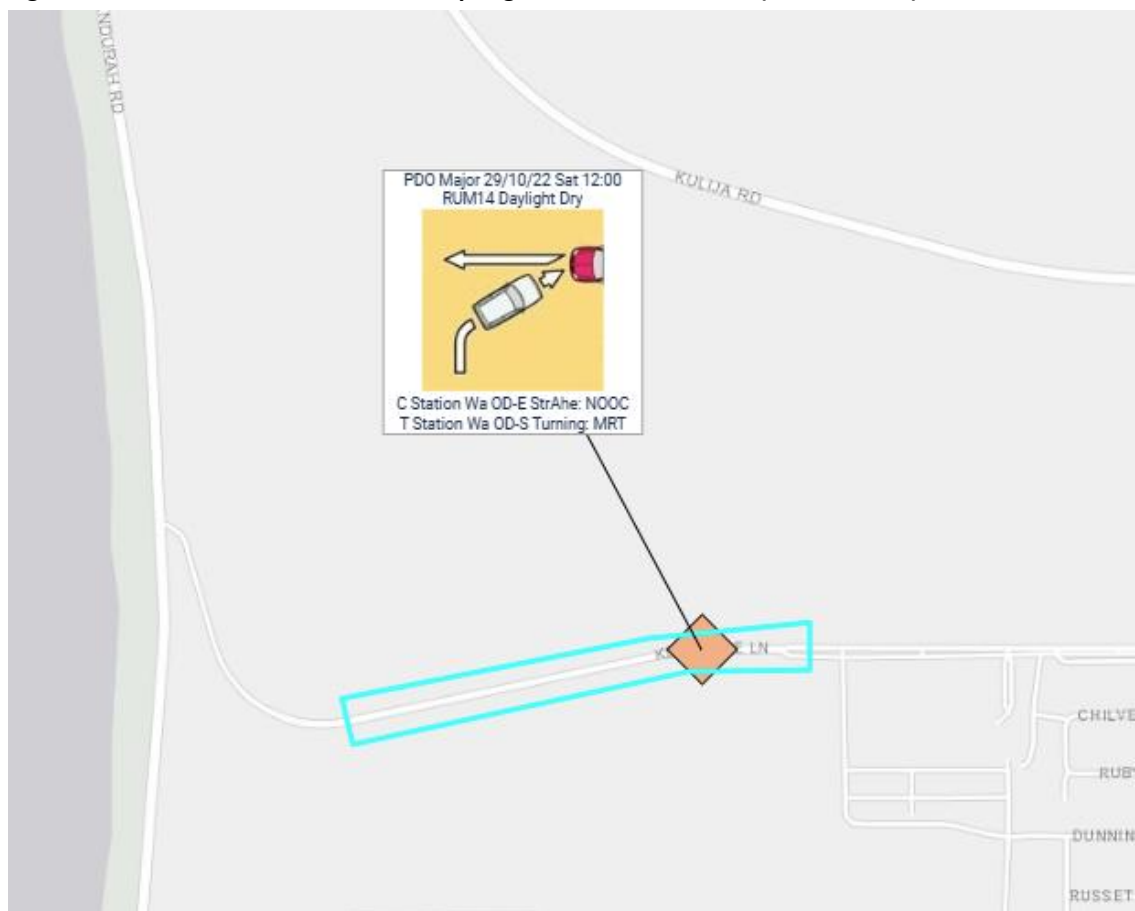
Noting both the traffic impacts expected at the key access intersections are well within acceptable levels of service and that traffic flows expected on Wellspring Road are expected to be well within capacity, it is concluded the full development of the lifestyle resort can be supported with use of the current accesses in an all movement two way manner.

7 Safety and Crash History

A review of Main Roads WA crash data indicates **no** recorded crashes at the intersection of Mandurah Road and Tuart Lakes Drive in the past five years to December 2024.

The intersection of Wellspring Road and Kerosene Lane has had **one** recorded crash in 2022 with a station wagon turning right from Wellspring Road being struck by a station wagon heading west along Kerosene Lane. This crash resulted in property damage only and no injuries. Figure 3 below summarises this crash.

Figure 2: Crashes at intersection of Wellspring Road/Kerosene Lane (2020 to 2024)



A desktop assessment of sight lines on the south east corner of this intersection notes them to be acceptable (via Streetview assessment only) from the Give Way line. However, Sight lines from the approach to the Give Way line are not clear as trees and vegetation across the corner reduce visibility. This crash may have been caused by “look but did not see” moment, rolling up to the intersection, and entering the intersection ‘without stopping’ to see if there was opposing traffic.

The additional traffic expected from the proposed additional houses/dwellings in the lifestyle resort should not exacerbate this issue, with the onus on each driver now and in the future of not entering the intersection unless they can see that it is clear to enter. However, vegetation at the intersection must be pruned so as not to obscure visibility.

8 Conclusion and Recommendation

This technical note has assessed the suitability of the existing access arrangements for the *Tuart Lakes Lifestyle Resort* in the context of its proposed expansion from 325 to 480 dwellings. The assessment has considered current and projected traffic volumes at 2025, 2026 and 2036 intersection performance, and road capacity, with the following key findings:

Traffic Generation: The fully developed resort including existing traffic is expected to generate approximately 1,565 vehicle trips per day (vpd), with an estimated +500 additional vpd compared to current conditions. This traffic is conservatively assumed to be evenly distributed between the Mandurah Road and Wellspring Road accesses.

Intersection Performance: SIDRA modelling indicates that both the Mandurah Road/Tuart Lakes Drive and Wellspring Road/Kerosene Lane intersections will continue to operate at acceptable Levels of Service (LoS A to C) under both 2026 and 2036 traffic scenarios. No intersection upgrades are required to accommodate the projected traffic volumes.

Road Capacity: Wellspring Road is currently carrying approximately 700vpd. With the additional 250vpd expected from the resort expansion, total volumes will remain about 950vpd, well within the indicative capacity of 1,000vpd for this road configuration, based solely on an Access Street D, a much more conservative measure compared to a more likely composite 2,000vpd.

Safety: Crash history review indicates no recorded crashes at the Mandurah Road access and one non-injury crash at the Wellspring Road/Kerosene Lane intersection over the past five years. Sight lines at this intersection are generally acceptable, subject to maintenance of vegetation, and no other specific safety interventions are warranted based on the projected traffic increase.

Recommendation: The existing access arrangements via Mandurah Road and Wellspring Road are considered sufficient to accommodate the full development of the *Tuart Lakes Lifestyle Resort*. No additional road connections, including the previous discussions of crossing of the *Dampier to Bunbury Natural Gas Pipeline*, are deemed required. It is recommended that the DPLH approve the continued and future proposed use of the current access configuration in an all movement two way use format.