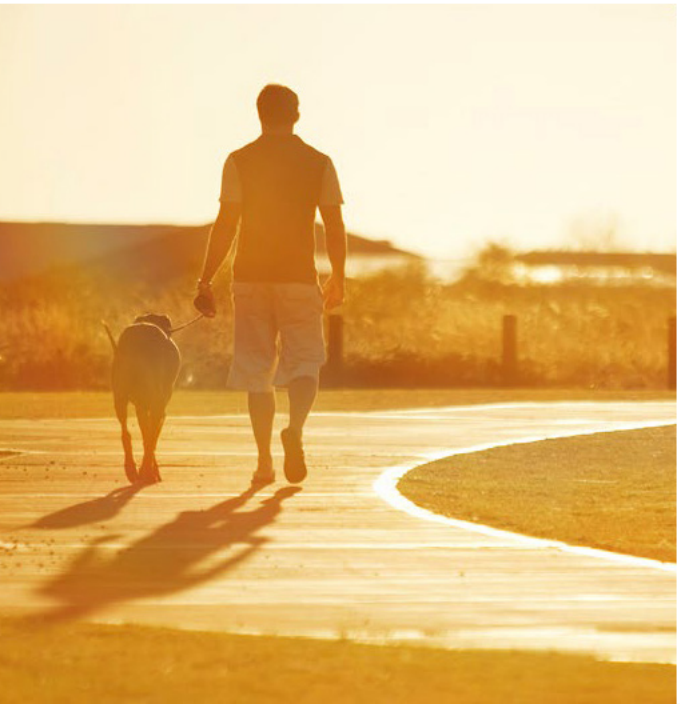


Proposed Amendment to Development Area 12 – Bayton Madigan Road (East)

Structure Plan (formerly Lot 500 Madigan Road Development Plan)

Prepared on behalf of DevelopmentWA

March 2026 | 20-172

element. | PART OF SLR

Acknowledgement of Country

We acknowledge the Ngarluma Aboriginal Corporation as the Traditional Owners of the Karratha Townsite. We acknowledge and respect their enduring culture, their contribution to the life of this city, and Elders, past and present.

Document ID:
https://slrgroup.sharepoint.com/:w:/r/sites/ElementProjects2020/_layouts/15/Doc.aspx?sourcedoc=%7BA9183DB0-1B72-4915-872A-5A242318AC4A%7D&file=20-172%20Baynton%20Madigan%20Road%20East%20LSP%20D2%20250625.docx&action=default&mobileredirect=true

Issue	Date	Status	Prepared by	Approved by	
			Name	Name	Signature
1	250917	Draft	Cale Otter		
2	260326	Draft	Cale Otter	Claire Willey	CW

Element Advisory Pty Ltd (Element Advisory)
Whadjuk Country. L1, 500 Hay Street. Subiaco WA 6008
www.elementadvisory.com.au © Element Advisory

Contents

Record of Endorsement 1
Table of Amendments 2
Table of Density Plans 2
Executive Summary 3
Technical Appendices 5

Part One: Implementation 1

1. Structure Plan Area and Operation 2
2. Purpose 3
3. Staging 4
4. Subdivision and Development Requirements 5
4.1 Land Use Zones and Reserves 5
4.1.1 Residential Precinct 5
4.1.2 Mixed Use Precinct 6
4.1.3 Road Reserves 7
4.1.4 Public Open Space 7
4.1.5 Public Purpose (Primary School) 8
4.2 Land Use Permissibility 9
4.3 Density and Development 11
4.3.1 Density and R-Codes 11
4.3.2 Local Development Plan 11
4.3.3 Aboriginal Heritage 11
4.4 Other Requirements 12
4.4.1 Bushfire Protection 12
4.4.2 Acoustic Mitigation 12
4.4.3 Public Reservations: Open Space, Drainage and Public Purpose – Primary School 13
4.4.4 Stormwater Management 13
4.4.5 Transmission Corridor 13
Plan 1 - Amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan 15

Part Two: Explanatory Section 1

1. Introduction and Purpose 2

1.1 Background 2

1.1 2012 Development Plan 2

1.2 Requirement for a Structure Plan 4

2. Site and Context Analysis 5

2.1 Location and Context 5

2.2 Surrounding Area and Land Use 8

2.3 Tenure and Land Ownership 9

2.4 Environment 11

2.4.1 Natural Resources 11

2.4.2 Climate 11

2.4.3 Vegetation 11

2.4.1 Conservation Significance of Vegetation 11

2.4.1 Flora 11

2.4.1 Fauna 13

2.4.2 Site Topography 14

2.4.3 Contaminated Sites 14

2.4.4 Subsoil Conditions and Geotechnical Considerations 14

2.4.5 Acid Sulphate Soils 14

2.4.6 Hydrology 15

2.5 Heritage 15

2.6 Physical Infrastructure and Services 16

2.7 Existing Movement Network 17

2.7.1 Public Transport 17

2.7.2 Pedestrian and Cycle Access 18

2.7.3 Madigan Road Bypass Project 19

3. Governance Context 20

3.1 Zoning and Reservations 20

3.2 Regional Planning Framework 21

3.2.1 Pilbara Infrastructure and Planning Framework 21

3.2.2 Regional North Land Capacity Analysis City of Karratha 22

3.2.3 WA Regional Development Framework 22

3.3 State Government Planning Strategies and Policies 23

3.3.1 State Planning Strategy 2050 23

3.3.2 State Planning Policy 23

3.3.3 Development Control Policy 2.3 – Public Open Space in Residential Areas (DC 2.3) 24

3.3.4 Operational Policy 2.4 – Planning for School Sites 25

3.3.1 Residential Design Codes 25
3.3.2 Liveable Neighbourhoods 25
3.4 Local Planning Framework 25
3.4.1 City of Karratha Local Planning Strategy 25
3.4.2 Karratha City of the North Plan (2010) 27
3.4.3 Karratha City Growth Plan (2010) 27
3.4.4 City of Karratha Strategic Community Plan 2020-2030 28
4. Stakeholder and Community Engagement 30
5. Design Response 31
5.1 Project Objectives 31
5.2 Design Rationale 31
5.3 Community Design 32
5.3.1 Population and Residential Densities 32
5.4 Movement Network 33
5.4.1 Proposed Street Network 33
5.4.2 Public Transport 37
5.4.3 Pedestrian and Cyclist Facilities 37
5.4.4 Preliminary Traffic Modelling 38
5.4.5 Updated Trip Generation and Distribution 39
5.4.6 Projected Daily Volumes 39
5.4.7 Proposed Intersection Treatments 40
5.4.8 Intersection Analysis 41
5.5 Lot Layout 42
5.5.1 Climate Responsive Design 43
5.5.2 Public Parkland 43
5.5.3 Open Space 44
5.5.4 Landscaping Strategy 45
5.6 Urban Water Management 48
5.7 Bushfire 50
5.8 Utilities 50
5.8.1 Water Supply 50
5.8.2 Wastewater 50
5.8.3 Electricity Supply 51
5.8.4 Telecommunications 51
5.8.5 Gas 51
5.8.6 Flooding 52
5.8.7 Stormwater Management 52
5.8.8 Earthworks 53
5.8.9 Road Noise 53

5.9 Activity Centres and Employment 55
5.9.1 Type of Centre 55
5.9.2 Land Use Distribution 55
5.9.3 Employment Rates and Opportunities 55
5.10 Primary School 56

Technical Appendices 1

Appendix A – Extension of Approval Period - Lot 500 Madigan Road Development Plan 2
Appendix B – Local Water Management Strategy prepared by JDA March 2011 (as amended 2025) and Madigan Creek Flood Study prepared by JDA March 2020 3
Appendix C – Transport Impact Assessment: Transcore January 2025 4
Appendix D – Bushfire Management Plan: Ecological May 2025 5
Appendix E – Acoustic Report: ND Engineering Consulting Engineers 20 March 2026 6
Appendix F – Geotechnical Report: Coffey Geotechnics November 2010 7
Appendix G – Engineering Services Report: Cossill Webley February 2021 8
Appendix H – Indicative Tree Species List 9

This page has been left blank intentionally.

Record of Endorsement

This Structure Plan Amendment is prepared under the provisions of the City of Karratha Local Planning Scheme No. 8 and in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015*.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN AMENDMENT NO. 1 TO DEVELOPMENT AREA 12 – BAYTON MADIGAN ROAD (EAST) STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON:

..... Date

Signed for and on behalf of the Western Australian Planning Commission:

.....

an officer of the Commission duly authorised by the Commission pursuant to section 16 of the Planning and Development Act 2005 for that purpose, in the presence of:

.....Witness

.....Date

..... Date of Expiry of this Structure Plan Amendment

Table of Amendments

Amendment No.	Summary of Amendment	Amendment Type	Date Approved by the WAPC
1.	Rezoning portions of Residential R-AC2, R60, R30/R60, R25/R60, R20 and Public Open Space reserve to Public Purpose (Education) and Public Open Space. Rezoning of Residential R-AC 2 to Mixed Use R-AC 2 and rationalisation of Residential R-AC 2 zone. Modifying selected residential coded areas from R20, R25/R60 and R30 to R20/R60. Reconfiguration of street blocks to accommodate the Public Purpose (Education) Reserve and alignment of the transmission corridor to a road reserve. Modified LDP requirements on alignment with modified street blocks. Replace the Dampier Road northern 'left in-left out' turn with a roundabout. Modifications of intersection treatments to roundabouts to support the proposed Public Purpose (Education) Reserve. Rezoning from Residential R60 to Public Open Space reserve in accordance with Amendment 21.	Major	

Table of Density Plans

Density Plan No.	Area of density plan application	Date Approved by the WAPC

Executive Summary

This proposal seeks to amend Development Area 12 – Bayton Madigan Road (East) Structure Plan formerly known as Lot 500 Madigan Road Baynton Development Plan.

The Structure Plan guides the development of a 67.7 hectare land parcel in the suburb of Baynton in Karratha. The Structure Plan area is located approximately 6km west of the Karratha City Centre and is generally bound by Dampier Road, Madigan Road, Madigan Creek and the Karratha Hills. It is identified as Development Area 12 and zoned for 'Urban Development' under the City of Karratha Planning Scheme No. 8.

The Structure Plan was approved in 2012 with Local Development Plans approved in 2019 guiding the early development. The northern portion of the Structure Plan area has been partially subdivided for residential purposes, with construction predominantly consisting of low density (R20) dwellings. The southern portion of the site remains vacant and undeveloped. Land east of Madigan Creek and north of Dampier Road has also been developed as new residential neighbourhoods in recent years.

An amendment to the Structure Plan was lodged in May 2021 which proposed a number of changes including the introduction of a 4ha Primary School site, down coding of residential densities, reconfiguration of the local road network and minor modifications of the drainage and public open space network. However, following public advertisement, the 2021 amendment was not progressed.

This Structure Plan Amendment consolidates the existing development principles and incorporating components proposed by the 2021 amendment in a modernised format that responds to the present day planning policy framework.

This Structure Plan Amendment also focuses on the continued southward development of the site generally for residential purposes. Additional provision has been made for a Primary School and co-located Public Open Space, along with additional open space and drainage reserves and a rationalised mixed use commercial and retail local centre, commensurate to the future neighbourhood's anticipated needs.

It considers existing and planned development within and adjacent to the site as well as future utilities, traffic and drainage infrastructure requirements. The Structure Plan Amendment is intended to support future climate responsive housing that is sensitive to the Karratha vernacular and integrates appropriately with its surrounds. The Structure Plan Amendment is informed by updated technical studies and investigations.

This Structure Plan Amendment complies with the manner and form policy approved by the Western Australian Planning Commission, comprising:

- An Executive Summary
- Part One – Implementation including the amended Structure Plan Map
- Part Two – Explanatory Section
- Technical Appendices

Table 1:Summary of amended Local Structure Plan Details Table (i) - Summary of LSP details

Item	Data		Structure Plan Reference
Total area covered by the structure plan	67.7 hectares		Part 2, Section 1.1
Land Use Breakdown			
Residential	34.75 hectares	656 Lots	Part 2, Section 3.3
Mixed use	0.97 hectares	69 Lots	
Total Lot yield	725 Lots		
Number of Dwellings and estimated residential density:	726 dwellings	10.72 dwellings per hectare	
Estimated population	1,814		
School sites	1 primary school		Part 2, Section 3.10
Estimated commercial floor space	1,000m^2		Part 2, Section 3.9
Public Open Space			
Total Open Space	7.11 hectares	12.5% of the structure plan area	Part 2, Section 3.5.3
Unencumbered Open Space	3.69 hectares	6.5% of the structure plan area	

Technical Appendices

Appendix A: Extension of Approval Period

Appendix B: Local Water Management Strategy (amended 2025)
Madigan Creek Flood Study (2020)

Appendix C: Transport Impact Assessment (2025)

Appendix D: Bushfire Management Plan (2025)

Appendix E: Acoustic Report (2026)

Appendix F: Geotechnical Report (2010)

Appendix G: Engineering Services Report (2021)

Appendix H: Indicative Tree Species List

Part One: Implementation

1. Structure Plan Area and Operation

This proposed amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan, (Structure Plan) applies to the land contained within the inner edge of the line denoting the structure plan boundary on the Local Structure Plan map (Plan 1). The Structure Plan Amendment is in effect from the date stated on the cover [_____] and for a period of 10 years, or for any other period approved by the Western Australian Planning Commission (WAPC).

Refer to Plan 1 – Amended Development Area 12 – Bayton Madigan Road (East) Structure Plan

The Structure Plan was approved by the WAPC in 2012 as Lot 500 Madigan Road Baynton Development Plan, for a period of 10 years pursuant to section 16 of the *Planning and Development Act 2005*.

In accordance with Schedule 2, Part 4, clause 28 (4) of the *Planning and Development (Local Planning Schemes) Regulations 2015 (**Regulations**),* the Structure Plan is taken to be approved on 19 October 2015 for the purpose of calculating approval duration. Pursuant to clause 28(1) of the *Regulations*, the Structure Plan was valid until 19 October 2025.

On 17 October 2025 the WAPC extended the approval period pursuant to Clause 28 (2), Part 4, Schedule 2 of the *Regulations*. The Structure Plan will now expire on 19 October 2030.

Refer to *Appendix A: Extension of Approval Period - Lot 500 Madigan Road Development Plan.*

This Structure Plan Amendment comprises the following sections:

Part One – Implementation; includes the amended Structure Plan (Plan 1) and outlines the requirements that will be applied when assessing subdivision and development applications over the land to which the Structure Plan Amendment relates.

Part Two – Explanatory Section; is to support the Structure Plan Amendment contained in Part One by providing the background and explanatory information used to prepare the Structure Plan Amendment.

Technical Appendices – contains all technical and specialist reports prepared in support of the Structure Plan Amendment.

2. Purpose

The purpose of this Structure Plan Amendment is to guide high quality subdivision and development of the Structure Plan area to meet residential housing demand in Karratha.

The Structure Plan Amendment provides for staged development within an overarching framework, allowing the ultimate built form to be incrementally and independently achieved.

All future subdivision and development applications are to be in accordance with the Structure Plan objectives being to:

- Provide residential development in accordance with the City of Karratha Strategic Growth Plan (SGP).
- Facilitate housing diversity.
- Provide for an urban form that focuses on the public realm.
- Facilitate local employment services and amenities.
- Optimise land use; and
- Facilitate climate responsive and sustainable approach to development.

This Structure Plan Amendment varies the Structure Plan approved in 2012. It consolidates the existing development principles in a modernised format that responds to the present day planning policy framework.

3. Staging

The Structure Plan Amendment allows for the gradual release of lots in stages where each stage can operate independently. The internal road network and access arrangements allow each stage to be accessed without impeding on the use or development of surrounding land in the Structure Plan area.

Figure 1 Development Area 12 – Bayton Madigan Road (East) Structure Plan Staging Plan

4. Subdivision and Development Requirements

4.1 Land Use Zones and Reserves

The Structure Plan Amendment identifies several land use precincts that are generally characterised by a predominant land use purpose. It is however intended that the Structure Plan Amendment be treated in a flexible manner that allows other compatible uses where appropriate. The proposed land use precincts include:

- Residential
- Mixed Use Commercial/Retail
- Public Open Space and Drainage
- Public Purpose (Primary School)

Detailed descriptions of these precincts are provided below.

4.1.1 Residential Precinct

Statement of Intent

The intent of the Residential Precinct is to provide a high quality, environmentally sustainable, residential environment providing a range of living options to cater for a diverse population and sense of community.

Development within the Precinct will provide for pedestrian friendly streetscapes with passive surveillance of the public domain. Local employment generated through viable and suitable home-based business and a primary school is also encouraged.

Development Standards

Subdivision and development of the land is to be undertaken in accordance with Plan 1 – Amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan Map and the residential densities as outlined in Section 5.3 Community Design and Section 5.5 Lot Layout.

Development standards to be satisfied for the Residential Precinct include:

a) The provisions of the Residential Design Codes of Western Australia (R-Codes) shall apply to residential development unless otherwise specified.

b) A Local Development Plan (LDP) is required to be prepared in accordance with section 4.3.2. Variations to Deemed-to-Comply provisions of the R-Codes shall be allowed where prescribed by the LDP. The LDP may also reference design principles from the Madigan Estate Design Guidelines which support the establishment of climate response design and the Karratha vernacular.

c) In the case of land subject to a split residential coding, a minimum lot size of 2,500m^2 or an entire street block is required for development at the higher density code (R60).

d) The subdivision and development of land abutting Public Open Space or drainage reserves shall be designed to interface and activate these areas.

e) Multiple dwelling development is not permitted except for areas coded R60 and R-AC2, or areas subject to a split density code where the upper density code (R60) is achievable.

f) Building height shall not generally exceed 2 storeys, or 3 storeys in areas coded R-AC2, unless otherwise permitted in an approved LDP prepared in accordance with section 4.3.2.

g) Quiet House Design acoustic treatments for noise sensitive development proposed within proximity to Madigan Road (lots that are approximately 125.7m from the centreline).

Land Use Permissibility

Land use permissibility shall be in accordance with the Land Use Permissibility Table in Section 4.2 in Part One.

Refer to Plan 1 – Amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan Map, Section 5.3 Community Design and Section 5.5 Lot Layout.

4.1.2 Mixed Use Precinct

Statement of Intent

The intent of the Mixed Use Precinct is to develop a mixed use area comprising a diversity of retail and commercial uses at street level, such as office/consulting rooms which generate day and evening activity and are compatible with residential development at the upper levels.

A high standard of 'Main Street' built form incorporating environmentally sustainable design, active edges and attractive façades is envisaged to provide visual amenity and interaction, pedestrian friendly streetscapes and passive surveillance of the public realm. This Precinct is intended to accommodate active retail and restaurant uses at the street edge, with adjoining commercial office/consulting room uses. Any ground level residential development is to maintain a ceiling height to allow it to transition to ground floor commercial over time.

Development Standards

Subdivision and development of the land is to be undertaken in accordance with Plan 1 – Bayton Madigan Road (East) Structure Plan Map and Section 5.9 Activity Centres and Employment

Development standards to be satisfied for the Mixed Use Precinct include:

a) The provisions of the R-Codes shall apply to residential development in this Precinct unless otherwise specified.

b) An LDP is required to be prepared in accordance with section 4.3.2. Variations to Deemed-to-Comply provisions of the R-Codes shall be allowed where prescribed by the LDP.

c) The maximum combined NLA of all non-residential shall not exceed 1000m^2 unless varied by an LDP prepared in accordance with section 4.3.2.

d) The maximum height of development shall not exceed 3 storeys in height unless varied by an approved LDP prepared in accordance with section 4.3.2.

e) The maximum retail floorspace for an individual tenancy shall not exceed 500m^2 NLA unless varied by an LDP prepared in accordance with section 4.3.2. A retail tenancy includes a 'shop' and/or 'market'.

f) Non-residential development is only permitted on the ground floor.

g) Multiple dwelling development is encouraged above ground level.

h) Non-residential development shall have a minimum ground level floor to ceiling height of 3.2m to enable future conversion to commercial uses.

i) Acoustic treatments for non-residential development in the Mixed Use Precinct must achieve internal noise levels consistent with AS 2107-2016 Acoustics - Recommended design sound levels and reverberation times for building interiors.

Land Use Permissibility

Land use permissibility shall be in accordance with the Land Use Permissibility Table in Section 4.2 in Part One.

Refer to Plan 1 – Amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan Map, Section 5.9 Activity Centre and Employment.

4.1.3 Road Reserves

Statement of Intent

This Structure Plan Amendment provides an interconnected street network that facilitates safe and efficient internal connectivity and access to the surrounding area for vehicles, cyclists and pedestrians. The design of the street network provides clear physical distinctions between neighbourhood roads and local roads, ensuring a high level of legibility and robustness.

Development Standards

Road reserves are to be provided within the Structure Plan area generally in accordance with Plan 1 – Amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan, with cross-sections generally in accordance with the WAPC's Liveable Neighbourhoods operational policy requirements and as provided for in Appendix C.

Refer to Plan 1 – Amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan, Section 5.4 Movement Network and Appendix C - TIA.

4.1.4 Public Open Space

Statement of Intent

The Structure Plan Amendment is to provide a minimum of 6.5% of Gross Subdivisible Areas as Public Open Space in accordance with Plan 1 – Amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan, the requirements of Liveable Neighbourhoods and the Public Open Space Schedule (Table 12) in Part Two. The intent of the Public Open Space Precinct is to provide high quality public open spaces that offer residents and visitors passive and active recreation opportunities whilst facilitating stormwater conveyance particularly in cyclonic events.

Development Standards

The development standards to be satisfied for the Public Open Space and Drainage Precinct include:

a) The size and location of Public Open Space shall be in accordance with the Plan 1 – Amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan and Section 3.5.3. Open Space.

b) The design of Public Open Space shall ensure the protection and enhancement of indigenous heritage sites.

c) The design of Public Open Space shall ensure appropriate provision for stormwater drainage management; and

d) The landscaping of Public Open Space areas shall be suitable for an arid climate having regard to minimising maintenance and water use whilst providing areas of highly aesthetic and functional amenity.

e) The timing for the delivery of Public Open Space will be in accordance with the staged release of residential lots during each respective subdivision.

Refer to Plan 1 – Amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan Map, Section 5.5 Lot Layout and Public Open Space Schedule (Table 12).

4.1.5 Public Purpose (Primary School)

Statement of Intent

Following detailed discussions with the Department of Education and the City of Karratha, a primary school site is proposed within the southern half of the Structure Plan area in response to future demand resulting from the growing residential catchment. A 6 ha Primary School site comprises a 3.5 ha Public Purpose (Education) reserve including a co-located 2.5 ha Public Open Space is proposed.

Development Standards

Consistent with the requirements of the WAPC Operational Policy 2.4 – Planning for School Sites and Liveable Neighbourhoods the primary school site will:

- Occupy a 3.5ha area given Public Open Space is co-located and incorporates sport or recreational facilities.
- Ensure:
    - facilities and infrastructure essential to the functioning of the Public Open Space are to be fully incorporated and contained on a separate adjoining open space lot or Crown reserve, supported by a shared use agreement between the Department of Education and the local government as to outline shared use, management, and maintenance obligations and cost sharing.
    - the balance of the school site will be a POS reserve that will be vested in the Local Government. T
    - he primary school oval will be of sufficient size to accommodate a standard junior football oval (118m x 84m including overrun).
- Achieve a regular rectangular shape that maximises useable space.
- Limit the encroachment of the oval into the school site to 1,385m^2.
- Maintain a gentle slope, is geotechnically sound, does not contain any features requiring excessive fill or earthworks or vegetation clearing and can be managed for flood and bushfire risk.
- Be located centrally to the neighbourhood it services.
- Be serviced by four gazetted roads, with the northern boundary interfacing with an east-west arterial road (20.5m) and being serviced by cycle and pedestrian networks in accordance with section 3.5 of the Operational Policy.
- Avoid common boundaries with residential lots and no commercial land uses directly interface.

Refer to Plan 1 – Amendment to Development Area 12 – Bayton Madigan Road (East) Structure Plan, Section 5.10 Primary School.

4.2 Land Use Permissibility

The following table describes the permissible land uses for each Land Use Precinct.

Table 2 - Land Use Permissibility

Land Use	Residential	Mixed Use
Residential		
Aged or Dependent Person's Dwelling	D	D
Ancillary Accommodation	P	X
Caravan Park	X	X
Caretaker's Dwelling	I	D
Grouped Dwelling	P	A
Home Business	P	D
Home Occupation	P	D
Hotel	X	A
Motel	X	A
Multiple Dwelling	P	D
Park Home Park	X	X
Residential Building	A	A
Short Stay Accommodation	A	A
Single House	P	X
Tourist Resort	X	A
Workforce Accommodation	A	A
Industry		
Storage Facility/Depot/Lay Down Area	A	X
Commerce		
Animal Establishment	X	A
Display Home	D	X
Dry Cleaning Premises	X	D
Market	X	P
Motor Vehicle and/ Marine Repair	X	X
Motor Vehicle and/or Marine Sales & Hire	X	X
Motor Vehicle and/or Marine Service Station	X	X
Motor Vehicle Wash	X	X
Office	X	P
Outdoor Display	X	X
Reception Centre	X	D
Restaurant	X	P
Restricted Premises	X	A
Shop	X	P
Showroom	X	X
Take-away Food Outlet	X	P
Vehicle Store	X	X

Land Use	Residential	Mixed Use
Warehouse	X	X
Health, Welfare and Community Services		
Car Park	I	A
Child Care Premises	A	D
Community Use	A	A
Consulting Rooms	X	P
Emergency Services	X	A
Funeral Parlor	X	X
Hospital	X	X
Medical Centre	X	A
Nursing Home	A	X
Place of Public Meeting, Assembly or Worship	A	D
Minor Utility Organisation	A	D
Utility Organisation	A	A
Veterinary Centre	X	D
Entertainment, Recreation and Culture		
Entertainment Venue	X	A
Private Recreation	A	D
Public Recreation	D	D
Tavern	X	A

4.3 Density and Development

4.3.1 Density and R-Codes

The Structure Plan Amendment indicates the Residential Density Coding that applies to land zoned 'Residential' pursuant to clause 5.2.3 of the Scheme and assigns the following densities:

- R20
- R20/R60
- R25
- R25/R60
- R30
- Mixed Use R-AC2

Plan 1 – Amended Development Area 12 – Bayton Madigan Road (East) Structure Plan designates the R-Codes applicable to subdivision and development in the Structure Plan area. Residential development shall be in accordance with the R-Codes unless varied by a local planning policy or LDP.

Land subject to a split residential coding requires a minimum lot size of 2,500m^2 or an entire street block to achieve development at the higher density (R60).

4.3.2 Local Development Plan

An approved LDP shall be prepared by the developer, a landowner or the City of Karratha and adopted by Council to guide future development.

The LDP will enhance, elaborate and expand the details and provisions contained in this Part, identify approved variations to the R-Codes 'Deemed-to-Comply' provisions and incorporate climate responsive and local character design objectives provided under the Madigan Estate Design Guidelines. The LDP will additionally address the following matters:

a) Acoustic Attenuation (where applicable).
b) Non-residential land uses, size and location (where applicable).
c) Building envelopes.
d) Setbacks.
e) Interfaces with Public Open Space and drainage areas.
f) Distribution of land uses within a lot (mixed use lots).
g) Vehicular access and parking.
h) Loading and unloading areas, storage yards and rubbish collection closures.
i) The location, orientation and design of buildings and the space between buildings; and
j) Such other information considered relevant by the City of Karratha.

4.3.3 Aboriginal Heritage

Three (3) heritage sites (8959, 8960, 8961) and the associated 20m buffer are located within the Structure Plan area. These sites are to be located within Public Open Space areas and will be managed and protected during construction in accordance with the 2011 Cultural Heritage Management Plan for the Madigan Road Residential Estate, Karratha, prepared in consultation with Ngarluma Aboriginal Corporation and Landcorp, now DevelopmentWA.

It is envisaged that public open spaces will be designed around the heritage buffers to avoid disturbance of the heritage sites. However, should disturbance occur, approval will be required under section 18 of the *Aboriginal Heritage Act 1972* (WA).

4.4 Other Requirements

4.4.1 Bushfire Protection

The Bushfire Management Plan identifies the Structure Plan area as a bushfire prone area.

A Bushfire Management Plan will need to be prepared in accordance with the provisions of State Planning Policy 3.7 Bushfire (SPP 3.7) and the associated Guidelines to assess bushfire risk for:

- Subdivision where the proposed lots intersect with bushfire prone area.
- Development applications for vulnerable land uses (i.e. childcare centres, aged care premises, etc) where the building footprint intersects with the bushfire prone area.
- Development applications where the building footprint will be subject to a Bushfire Attack Level (BAL) rating of BAL-40 or BAL-FZ.

Future development applications achieving BAL contour of BAL-29 and below may be submitted with an accompanying BAL Assessment prepared by a suitably qualified practitioner confirming the determined BAL level and relevant construction standards outlined in the *Australian Standard 3959-2018 Construction of buildings in bushfire-prone areas* (AS3959).

A notification, pursuant to section 165 of the *Planning and Development Act 2005*, is to be placed on the certificate(s) of title of the proposed lot(s) with a BAL rating of 12.5 or above, advising of the existence of a hazard or other factor.

The notification is to state:

> "This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and is subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land."

4.4.2 Acoustic Mitigation

It is understood through consultation with Main Roads WA that the treatment of the northern end of Madigan Road adjacent to the Structure Plan area will be modified by Main Roads WA from a 14mm single chip single seal to a Dense Graded Asphalt which has a +0.0 noise correction factor.

Accounting for the treatment of Madigan Road along with existing and predicted traffic volumes and road speed, future residential development proximate to Madigan Road requires the implementation of Quiet House Design treatments in accordance with SPP 5.4 Road and Rail Noise and its associated Guidelines.

Graduated Quiet House Design Packages, modified from SPP 5.4 Road and Rail Noise, have been prepared by ND Engineering Consulting Engineers. Two Quiet House Design Packages A and B have been developed to guide the construction of dwellings with appropriate acoustic ratings, depending on whether the built form is facing, side-on or opposite Madigan Road.

- Quiet House Package A.
- Quiet House Package B.

Non-residential uses are required to demonstrate internal noise levels accord with *AS 2107-2016 Acoustics – Recommended design sound levels and reverberation times for building interiors,* as demonstrated via an Acoustic Report provided as part of a future Development Application.

A notification, pursuant to Section 165 of the *Planning and Development Act 2005* is to be placed on the certificate(s) of title of the future lots affected by transport noise. The notification is to state:

"This lot is situated in the vicinity of a transport corridor and is currently affected, or may in the future be affected by transport noise. Additional planning and building requirements may apply to development on this land to achieve an acceptable level of noise reduction."

4.4.3 Public Reservations: Open Space, Drainage and Public Purpose – Primary School

The Structure Plan area makes provision for Public Open Space, Drainage and Public Purposes (Education) reserves.

The proposed reserve(s) once created through subdivision approval will be vested in the Crown under section 152 of the *Planning and Development Act 2005*, whereby such land will be ceded free of cost and without any payment of compensation by the Crown.

In respect of Public Open Space and Drainage reserves, arrangements will be made for the subdivider to prepare and implement an approved landscape plan. Landscaping will be undertaken to a minimum standard and maintained for two summers in accordance with the approved landscape plan. Such landscaping requirements will be imposed as a condition of subdivision approval. In respect of the Public Purpose (Education) reserve, a 6 ha site has been located and designed in the southern half of the Structure Plan area following consultation with the Department of Education. The site has four (4) road frontages and includes co-located Public Open Space amounting to 2.5 ha.

4.4.4 Stormwater Management

Stormwater management will be implemented at the subdivision stage under an Urban Water Management Plan (UWMP) which is to be prepared in accordance with:

- The Local Water Management Strategy (LWMS) dated March 2011 as amended in 2025.
- The revised Madigan Creek Flood Study dated October 2020, both prepared by prepared by JDA.

Once approved, the UWMP is to be implemented by the subdivider, including the construction of the identified stormwater management systems.

Key principles for surface water management include:

- Managing up to the 100 year ARI flood event within the development.
- Use of swales throughout the development with the aim to minimise velocity.
- Swales to be sized to minimum 5 year ARI, with larger events flowing across the road reserve.
- Where there are identified impacts on significant ecosystems, desirable environmental flows and / or hydrological cycles consistent with Department of Water and Environmental Regulation (DWER) requirements are to be maintained or restored.

4.4.5 Transmission Corridor

The Structure Plan Amendment includes a future 40m wide easement which will be required to accommodate existing 132 kV transmission line that traverses the southern portion of the site from east to west. The corridor is mostly located within the proposed road reserve but will interface with portions of future residential lots.

The creation of an easement will be required as a future subdivision condition. The easement should be made to the specifications of the licensed service provider and in the location shown on the approved plan of subdivision.

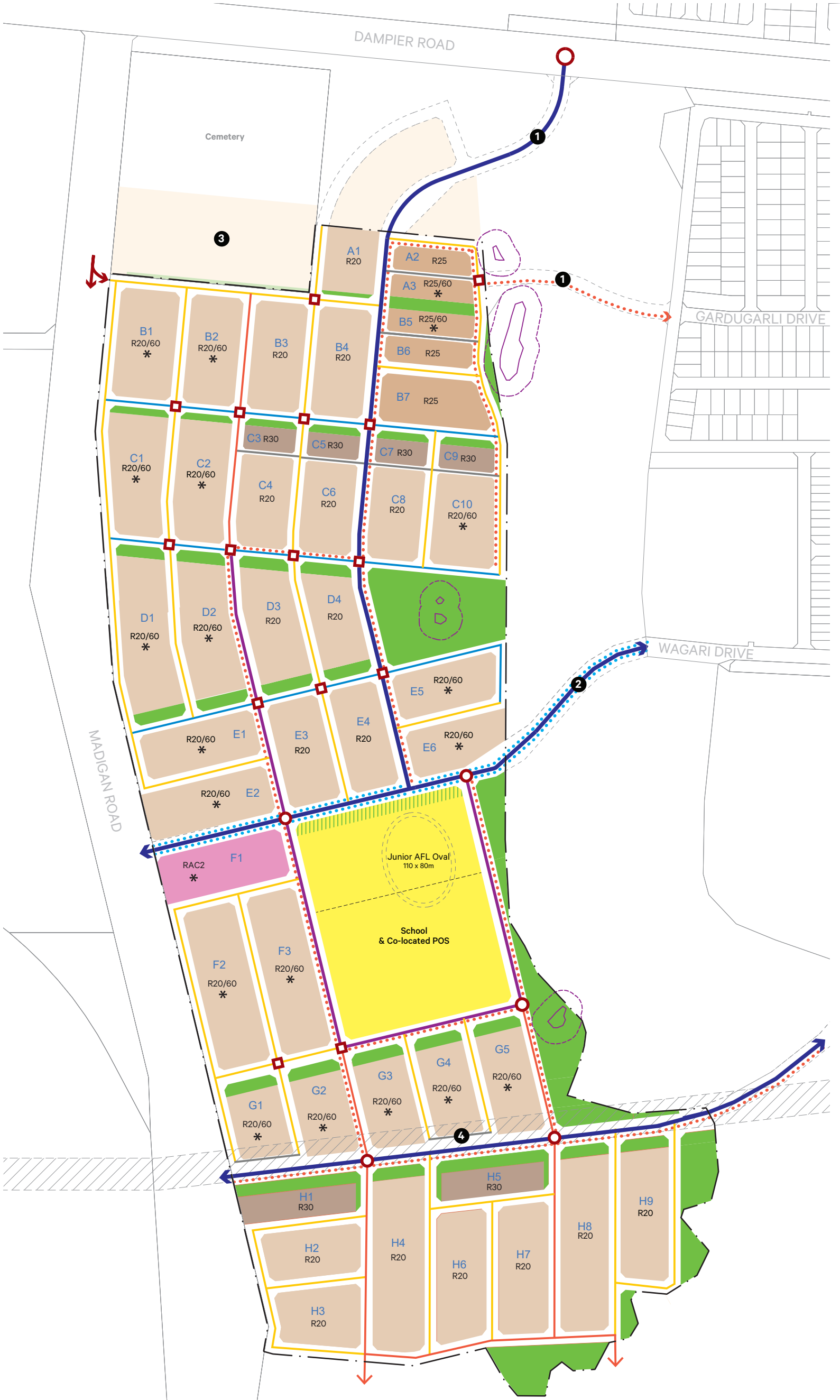
4.5 Additional Details

At subdivision application stage to the WAPC, the City of Karratha or other government agencies, will request that the WAPC. Impose conditions requiring the preparation and/or implementation of technical reports. The table below provides guidance as to the likely supporting technical

documentation requirements at the subdivision application stage, and during the subsequent clearance of conditions of the subdivision approval.

Additional Information	Approval Stage	Responsible Agency (Consultation Required)
Bushfire Management Plan (Review) and / or Bushfire Attack Level Contour Plan Assessment	Subdivision Application	City of Karratha Department of Fire and Emergency Services
Acoustic Modelling Report	Subdivision Application	City of Karratha Department of Water and Environmental Regulation
Engineering Servicing Report	Subdivision Application	City of Karratha
Urban Water Management Plan	Subdivision Application	City of Karratha Department of Water and Environmental Regulation
Residential Density Code Plan	Subdivision Application	City of Karratha
Local Development Plan (as required)	Condition Clearance	City of Karratha Department of Planning Lands and Heritage (dependant on site design variations sought)
A Section 165 Notification is to be placed on each Certificate of Title for Lot's within 300m of the edge of the Madigan Road carriageway. The notification will advise that the lot is situated in the vicinity of a transport corridor and is currently affected or may be in the future affected by transport noise, and that additional planning and building requirements may apply to development on this land to achieve an acceptable level of noise reduction.	Condition Clearance	Department of Planning Lands and Heritage
A Section 165 Notification is to be placed on each Certificate of Title within the AS3959 construction zone, advising purchasers and successors of obligations under the Bushfire Management Plan and bushfire construction requirements (only applicable to lots affected by BAL other than BAL-LOW as shown in the Bushfire Management Plan attached to this Structure Plan).	Condition Clearance	Department of Planning Lands and Heritage

Plan 1 – Amended Development Area 12 – Bayton Madigan Road (East) Structure Plan



Legend

Land Use and Density

- Structure Plan Boundary
- R20 — Residential R20
- R20 / 60 — Residential R20 / 60
- R25 — Residential R25
- R25 / 60 — Residential R25 / 60
- R30 — Residential R30
- R-AC2 — Mixed Use (Ground Floor Retail / Commercial)
- Public Purpose: School
- Public Open Space and Drainage
- Future Residential
- Future Public Open Space
- Indicative Drainage Area

Other

- Future Easement Requirement For Existing 133Kv Power Lines – 40m
- Heritage Site and 20m Buffer
- * Local Development Plan required for R60 Development
- Roundabout
- Intersection Treatment
- Restricted Movement Intersection (Left In Only)
- Arterial Road (20.5m)
- Local Road (17.9m)
- Local Road (16m)
- Local Road (15m)
- Local Road (12m)
- Access Lane (6m)
- Future Road Connection
- Dual Use Path
- Cycle Path

Notes

1. Flood Crossing
2. All Weather Crossing
3. Potential future development sites subject to zoning changes
4. Existing power lines shall remain in situ and incorporated as part of the future east-west road reserve

DevelopmentWA

Structure Plan

Madigan Road, Karratha

0 50 100m

Date: 2 Oct 2025 Scale: 1:5000@ A3 File: **19-314 ST-1 C** Staff: MD GW Checked: MD

element.
Level 18, 191 St Georges Terrace, Perth Western Australia 6000.
PO Box 7375 Cloisters Square, Perth Western Australia 6850.
T. +61 8 9289 8300 | **E.** hello@elementwa.com.au **elementwa.com.au**

Part Two: Explanatory Section

1. Introduction and Purpose

This Structure Plan Amendment has been prepared on behalf of DevelopmentWA to facilitate the coordination of ongoing development of a residential neighbourhood that extends southward from the corner of Dampier Road and Madigan Road, Baynton to the Karratha Hills.

Currently, the Structure Plan area is zoned "Urban Development" under the City of Karratha's Local Planning Scheme No. 8 (LPS 8) which generally requires the preparation of a structure plan prior to the subdivision and development of the land.

1.1 Background

The development of the Structure Plan area has been guided by the Structure Plan and subsequent subdivision approvals for Stages 1 and 2 covering the northern portion of the site.

An amendment to the Structure Plan was submitted in 2021 to affect minor modifications to:

- Expand the designation of the split residential density code R20/R60.
- Allow for minor consequential reconfiguration and reorientation of street blocks to optimise street layout and introduce of a primary school site.
- Convert the R-AC2 code to Mixed Use R-AC2 and consolidate the mixed use / retail precinct to the south-western side of the main east-west Arterial Road.
- Rezone portions of residential land to include a new 3.5 ha primary school site with co-located Public Open Space to the north-western side of the east-west Arterial Road.
- Replace the existing 'left in/ left out' intersection on Dampier Road to a three-way roundabout.
- Extend the 10 year approval under clause 28(1A) of the Deemed Provisions of Schedule 2 of the *Regulations.*

Whilst the proposed amendment was advertised, the application was not finalised. This Structure Plan Amendment contains the earlier 2021 amendments in a modified format, reflective of subsequent stakeholder engagement and policy requirements.

On 17 October 2025 the WAPC extended the approval period for the Structure Plan pursuant to Clause 28 (2), Part 4, Schedule 2 of the *Regulations* and will now expire on 19 October 2030. .

1.1.1 Existing Development Area 12 - Baynton Madigan Road (East) Structure Plan

The Development Area 12 - Baynton Madigan Road (East) Structure Plan formerly known as Lot 500 Madigan Road Baynton Development Plan is the statutory document that currently guides development within the Structure Plan area. It is a comprehensive master plan that aims to create a sustainable and affordable urban area with a range of lot sizes and diversity of housing types as well as a small local centre and set aside land for public open space and drainage purposes.

The Structure Plan is included as Figure 2 below:

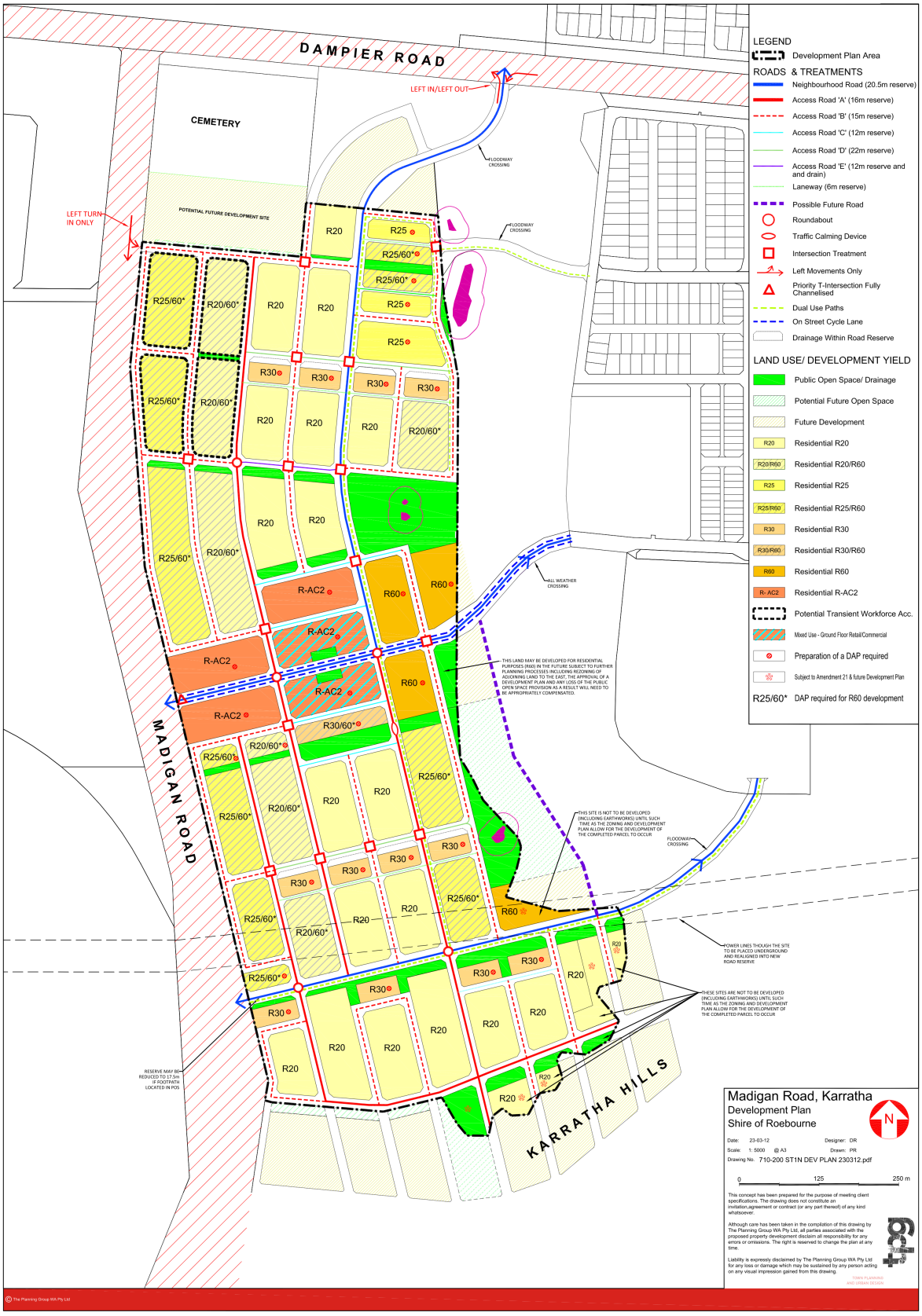


Figure 2 – Development Area 12 - Baynton Madigan Road (East) Structure Plan formerly known as Lot 500 Madigan Road Baynton Development Plan

1.2 Requirement for a Structure Plan

A structure plan is generally required to be prepared and approved prior to subdivision and development where identified under a local planning scheme and in accordance with the Deemed Provisions of Schedule 2 of the *Regulations.*

The Structure Plan area is currently zoned 'Urban Development' under the LPS 8 which triggers the requirement for a structure plan to be prepared prior to subdivision or development approval.

The Structure Plan, as amended, is informed by a comprehensive review of town planning, environmental and engineering considerations and has been prepared in accordance with *Regulations.*

This report addresses relevant planning considerations being traffic, acoustic, environmental and engineering matters and is informed by the following technical reports appended to this report:

- *Appendix B: Local Water Management Strategy prepared by JDA dated March 2011 (as amended 2025) and Madigan Creek Flood Study prepared by JDA dated March 2020.*
- *Appendix C: Transport Impact Assessment prepared by Transcore dated January 2025.*
- *Appendix D: Bushfire Management Plan: Local Structure Plan prepared by Ecological dated May 2025.*
- *Appendix E: Acoustic Report prepared by ND Engineering Consulting Engineers dated 20 March 2026.*
- *Appendix F: Geotechnical Report prepared by Coffey Geotechnics dated November 2010.*
- *Appendix G: Engineering Services Report prepared by Cossill Webley dated February 2021.*
- *Appendix H: Indicative Tree Species List prepared by TPG Town Planning and Urban Design.*

2. Site and Context Analysis

2.1 Location and Context

The Structure Plan covers an approximate area of 67.7 hectares bound by Madigan Road to the west, the Karratha Cemetery and Dampier Road to the north, a drainage creek line stemming from the Karratha Hills to the east and the Karratha Hills to the south.

The Structure Plan area is located at the western end of the Karratha City Centre, being 6km east of the town centre and represents the continuation of the current residential development front. The creek line separates the site from the Baynton West residential development to the east.

The Structure Plan area is currently accessed via Madigan Road to the west, Dampier Road to the north, and the broader Baynton locality to the east. Madigan Road and Dampier Road presently accommodate heavy haulage traffic for between North West Coastal Highway and the broader Karratha-Dampier region. Refer to Figure 3 – Structure Plan Area, Figure 4 – Location Plan and Figure 5 – Local Context Plan.

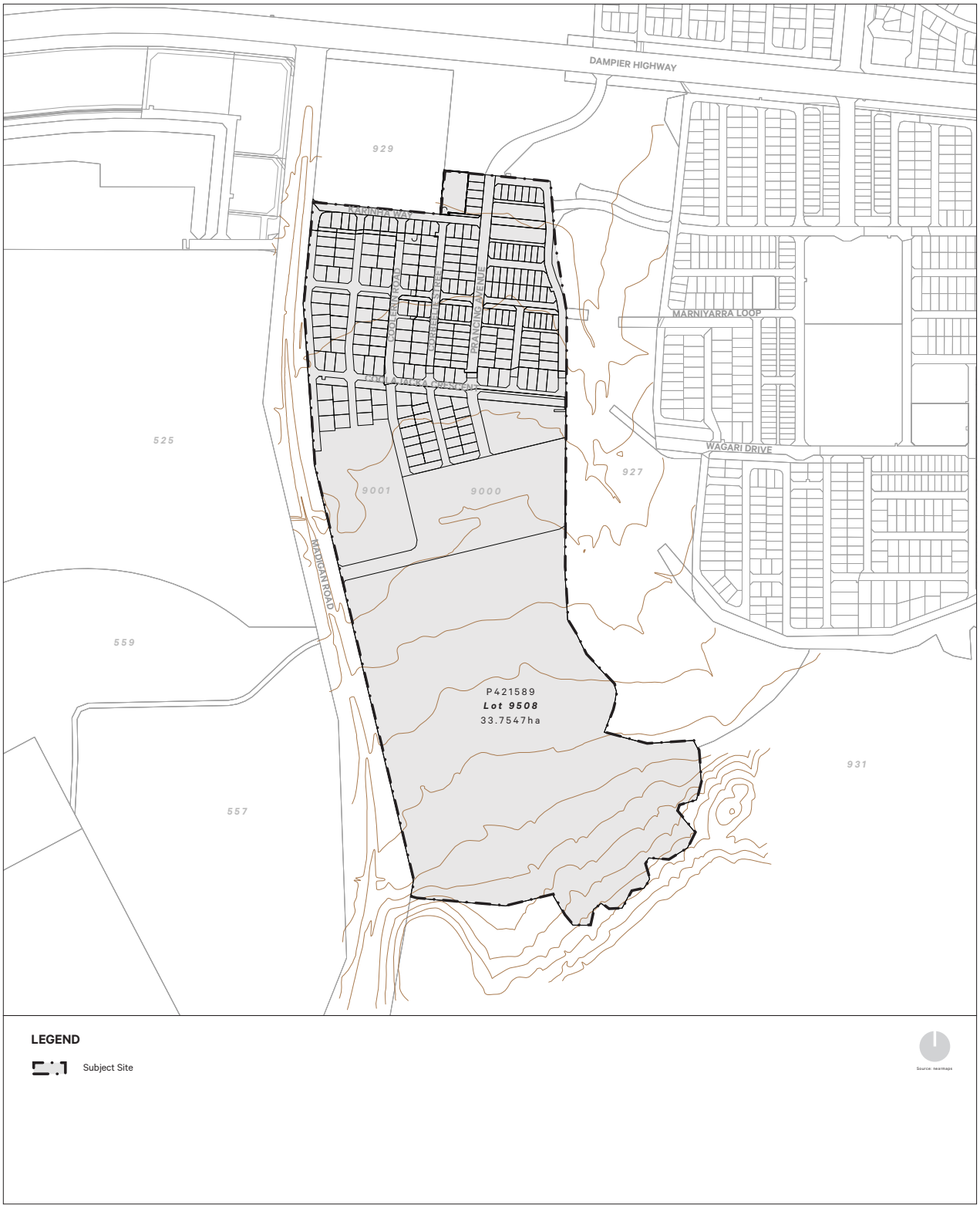


Figure 3 – Structure Plan Area

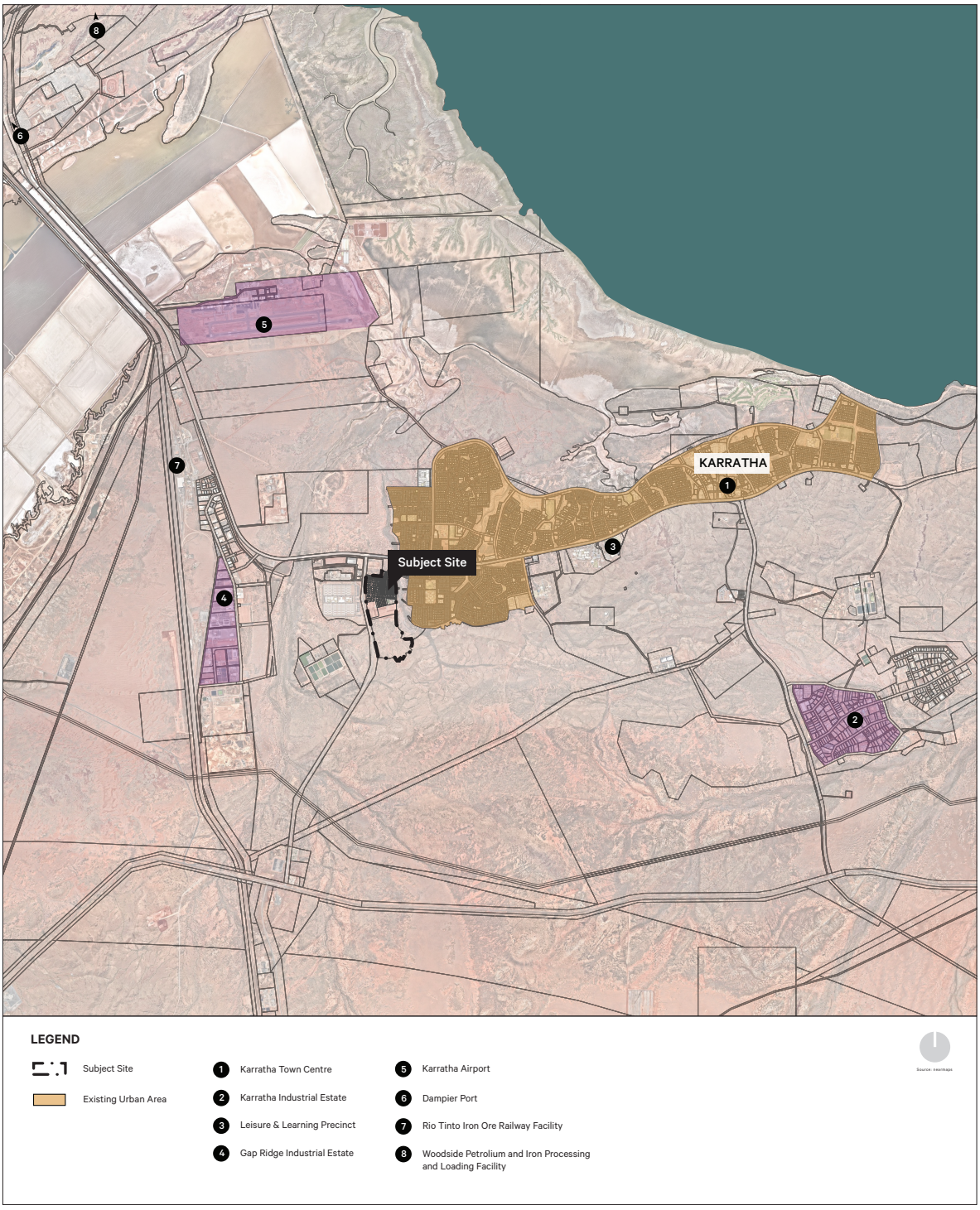


Figure 4 - Location Plan

Figure 5 - Local Context Plan

2.2 Surrounding Area and Land Use

Land uses surrounding the Structure Plan area predominantly comprise existing and future residential areas to the east and north, a workforce camp on the western side of Madigan Road (situated on land identified for future urban purposes), undeveloped land located within a 500 metre buffer associated with the wastewater treatment plant (WWTP) to the south-west and the natural landscape comprising the western extents of the Karratha Hills to the south.

Abutting the entire eastern boundary is land reserved for parks and recreation and drainage purposes. To the east of this reserve is the Baynton West residential neighbourhood, which was developed in accordance with an approved Development Plan. The Development Plan identifies a development density of predominantly 'Residential R17.5' with a pocket of low density development ('Residential R10') along the southern extent adjacent to the Karratha Hills and several areas of

higher density development adjacent to open space and community facilities (ranging from 'Residential R30' to 'Residential R80').

Abutting the site to the north-west and fronting Dampier Road is the Karratha Cemetery and land reserved public open space and drainage purposes. To the north of Dampier Road, there are several residential areas being developed in accordance with approved Development Plans (being Nickol West and Tambrey). The Development Plans generally identify the land predominantly for 'Residential R17.5' purposes with some areas of higher density development adjacent to areas of open space (generally up to a density of R30) and several group housing sites (up to a density of R40).

A Large Format Retail precinct is located to the west of the site, at the south-western corner of Dampier and Madigan Roads. The precinct currently includes Pilbara Motor Group, with three additional lots under development by a private consortium. These works will deliver a Bunnings, BCF, Sydney Tools, Supercheap Auto and other complementary large format retail uses.

Existing community facilities include the Tambrey Primary School situated on Balmoral Road approximately 1km to the northeast of the Structure Plan area and the Baynton West Primary School.

The Tambrey Tavern and Tambrey Pavilion is situated on Tambrey Drive approximately 1.5km northeast of the Structure Plan area. A district retail shopping centre has recently been developed at the corner of Bathgate Road and Dampier Road comprising an IGA supermarket (trading as The Good Grocer) and Hungry Jacks.

2.3 Tenure and Land Ownership

Since the Structure Plan was approved in 2012, residential development has commenced incrementally from the north via staged subdivision and individual development approvals, together with associated Public Open Space and drainage reserves. Figure 3 depicts the lots created through recent residential subdivision. Figure 6 depicts recent the extent of staged subdivision approvals in the northern half of the Structure Plan Area.

Refer to Figure 3 – Structure Plan Area and Figure 6 - Indicative Staged Subdivision Plan.

The balance of the Structure Plan area, to the south, remains vacant and undeveloped. There are no improvements onsite other than the 132kV transmission lines and poles which traverse the southern portion from east to west.

The northern half of the Structure Plan area is comprised of various lots in fragmented private landownership, whilst the southern half of the Structure Plan area has yet to be subdivided and developed and is under the ownership of the State of Western Australia.

The site and property details for the southern half of the Structure Plan area is provided below in Table 3.

Table 3 - Property Details (Southern Half of the Structure Plan area)

Lot	Street	Deposited Plan	Volume/Folio	Status Order/Interest	Registered Owner
9508	N/A	P421589	3175/66	Unallocated Crown Land	State of Western Australia

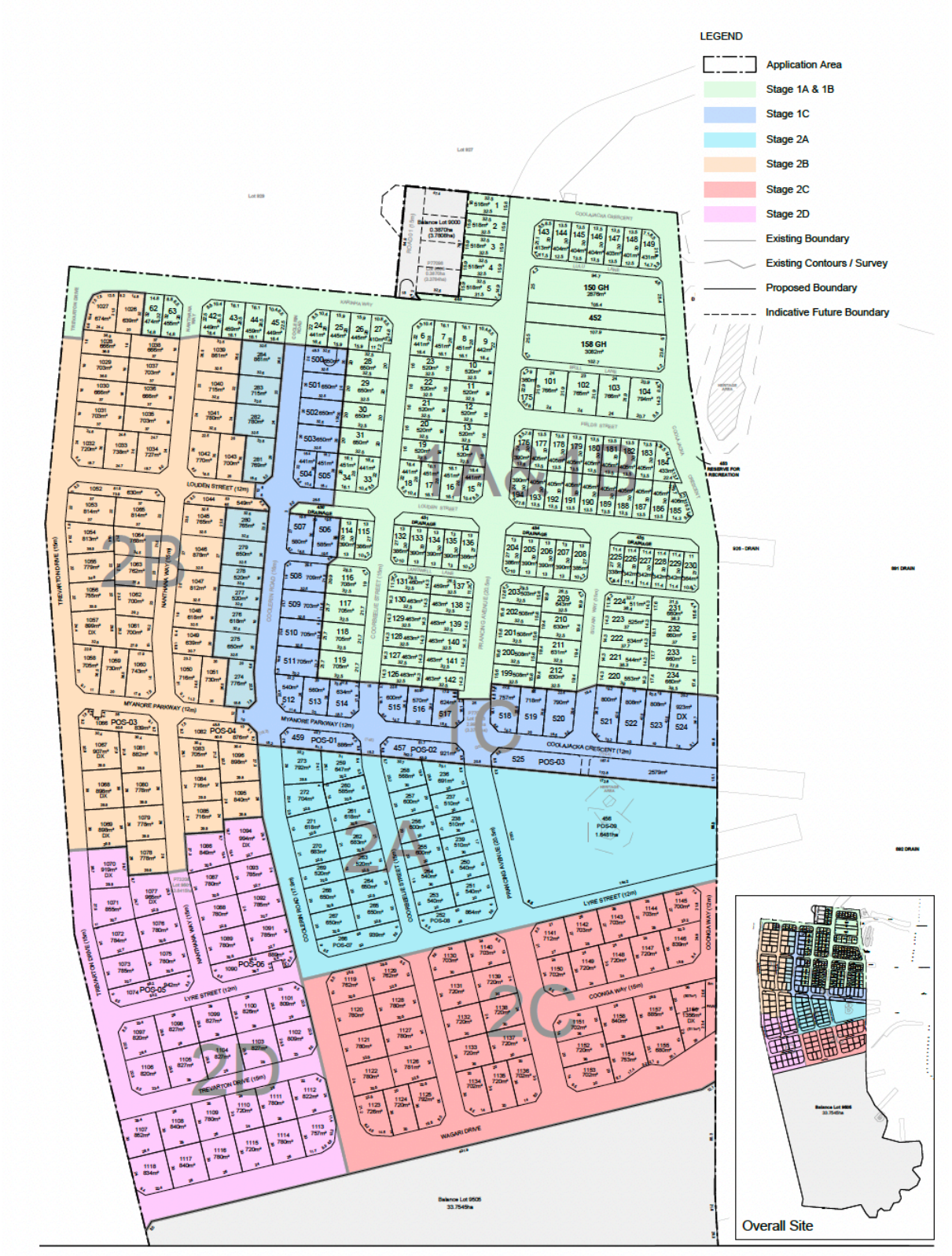


Figure 6 –Staged Subdivision Plan

2.4 Environment

2.4.1 Natural Resources

Mining Tenements (Exploration Licences) are granted partially over the Structure Plan area. As the site is within the boundary of the Karratha Townsite, written consent is required from the Minister for Mines and Petroleum before any mining activity may occur. Mining Tenement holders are generally only interested in exploration outside of the Townsite.

2.4.2 Climate

The climate of the Pilbara region in WA is characterised by arid tropical with summer rain (Beard, 1990). Cyclone season extends from 1 November to 30 April. Mean maximum daily temperatures recorded at Karratha vary from 36.1°C in January and 26.1°C in July, and mean minimum daily temperatures vary from 26.8°C in January and February to 13.6°C in July (Karratha airport weather station, BoM, 2010).

The site is characterised by dominant easterly winds in winter and westerlies in summer. Average wind speeds in both seasons vary from 10-20km/hr and sustained periods of winds to 35km/hr can occur, particularly in winter. Stronger winds, in excess of 300km/hr, occur in association with tropical cyclones between November and April (GHD, 2009).

Prevailing westerly winds occur early in the day in spring and summer and become north to north westerly in the afternoons. During winter and autumn, morning winds are east to south easterly becoming north to north easterly in the afternoon. Wind speeds average between 14.4 and 18.8km/hr in the mornings (0900 hours) and between 20.1 and 29.2km/hr in the afternoons (1500 hours) (GHD, 2009).

Annual rainfall is approximately 277mm with an average of 20 rain days per year. Most of the rainfall occurs during January and June (BoM, 2010) and the average annual evaporation rate exceeds rainfall by as much as 2,500mm (GHD, 2009).

2.4.3 Vegetation

Coffey Environments undertook a site inspection on 4 May 2010 and a targeted search for conservation significant flora on 14 October 2010.

The vegetation on the Madigan site is uniform and consisted of a shrub steppe community of Acacia and Triodia wiseana. Dominant Acacia species were included A. pyrifolia and A. bivenosa. Other native grasses were also present including Eragrostis xerophila.

The drainage channel to the east of the site contained similar species to the plains, although several different Acacia species including A. coriacea were also identified. The condition of the vegetation ranged from Degraded in the northern section where Buffel Grass (Cenchrus ciliaris) was prevalent and the density of Acacias was low. The majority of the vegetation in the southern two-thirds of the site was generally in Very Good condition with some evidence of human disturbance in the form of tracks, and little to no weed invasion.

2.4.1 Conservation Significance of Vegetation

A search of the Department of Biodiversity, Conservation and Attraction's (DBCA) Threatened Ecological Communities (TEC) database was undertaken by Coffey Environments. One Priority Ecological Community (PEC) was listed as occurring in the vicinity of the site, this being the 'Stony Chenopod association of the Roebourne Plains area' (Priority 1). The vegetation present on the site is not considered to represent any known TECs or PECs, and therefore the vegetation present is not regarded to be of local, state or national significance.

2.4.1 Flora

A search of the following databases was undertaken to ascertain the potential presence of conservation significant flora on the site:

- The DBCA 'Threatened Flora' database.

- The DBCA 'Declared Rare and Priority Flora List' which contains species that are Declared Rare (Conservation code R or X for those presumed to be extinct), poorly known (Conservation codes 1, 2 or 3) or require monitoring (Conservation Code 4); and
- The Western Australian Herbarium specimen database

No records of any conservation significant species within the site were identified. However, a total of 19 species were identified as potentially occurring within the vicinity of the site, these are presented in the table below.

Table 4 - Flora Survey Results

Species	Conservation Category	Preferred Site Characteristics	Flowering Period
Acacia NLAucocaesia	P3	Red loam, sandy loam, clay. Floodplains	Jul – Sep
Atriplex lindleyi subsp. conduplicata	P3	Crabhole Plains	-
Eragrostis lanicaulis	P3	Red sandy clay. Flats	Mar – May / Aug – Oct
Eriachne semiciliata	P3	Shallow soils over rock, red sand, sandy clay. Ridges, sand dunes	Mar – Apr
Eriochloa fatmensis	P3	-	-
Gomphrena cucullata	P2	Red sandy loam, clayey sand. Open floodplains	Feb – May
Gomphrena leptophylla	P3	Sand, sandy to clayey loam, granite, quartzite. Open flats, sandy creek beds, edges salt pens & marshes, stony hillsides	Mar – Sep
Gomphrena pusilla	P2	Fine beach sand. Behind foredune, on limestone	Mar – Jun
Goodenia pallida	P1	Red soils	Aug
Gymnanthera cunninghamii	P3	Sandy soils	Jan – Dec
Helichrysum oligochaetum	P1	Red clay. Alluvial plains	Aug – Nov
Ipomoea sp. A Kimberley Flora (L.J. Penn 84)	P1	Shallow soils on sandstone	Jun
Rhynchosia bungarensis	P4	Pebbly, shingly coarse sand amongst boulders. Banks of flow line in the mouth of a gully in a valley wall	-
Schoenus punctatus	P3	Watercourses	Aug
Stackhousia clementii	P3	Skeletal soils. Sandstone hills	-
Tephrosia bidwillii	P3	-	May / Aug
Terminalia supranitifolia	P3	Sand. Among basalt rocks	May – Jul / Dec. Sand
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	P3	Red clay. Clay pan, grass plain	Aug
Vigna sp. Rock Piles (R. Butcher et al. RB 1400)	P3	-	-

Of the 19 species of flora, many are highly unlikely to be present on the site due to the absence of specific habitat requirements. To confirm the presence/absence of conservation significant flora, Coffey Environments undertook a targeted survey of the site. Although the timing of the targeted survey was not optimal, the conservation significant species that were most likely to be found on the site would have been readily identifiable at the time of the survey. No conservation significant

species or Priority Flora were present on the site at the time of the targeted survey. A clearing permit will be lodged for approval prior to any clearing or earthworks taking place.

2.4.1 Fauna

A search of the DBCA's Threatened and Priority Fauna database and the Western Australian Museum database was undertaken to identify potential scheduled and threatened species in the region. A search of the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* database was also undertaken to identify species of national environmental significance.

Table 5 – Fauna Survey Results

Species	Status under Wildlife Conservation Act	Status under Cwth EPBC Act	Potential to be found in the project area
Northern Quoll (Dasyurus hallucatus)	Schedule 1	Endangered	Occasionally found in the region, though generally prefers rocky outcrops containing dens which were not identified during the site visit.
Pilbara Olive Python (Liasis olivaceus barroni)	Schedule 1	Vulnerable	Occasionally found in the region and potentially could utilise the site, though unlikely to rely on the site for its survival due to the degraded condition of the habitat on the site.
Peregrine Falcon (Falco peregrinus)	Schedule 4		Occasionally may overfly the site, though unlikely to rely on the site for its survival because of its ability to forage over a large area.
Little North-Western Mastiff Bat (Mormopterus loriae cobourgiana)	Priority 1		Highly unlikely to be present on the site due to an absence of the species preferred habitat (mangroves).
Australian Bustard (Ardeotis australis)	Priority 4		Occasionally found in the region and potentially could utilise the site, though unlikely to rely on the site for its survival as it is a highly mobile species that would move to adjoining areas if disturbed.
Bush Stone-curlew (Burhinus grallarius)	Priority 4		Unlikely to be present on the site.
Pebble-mound Mouse (Pseudomys chapmani)	Priority 4		Potentially present in the Karratha hills area, though the Pebble-mound Mouse occurred on the Burrup Peninsula in the past, but has not been recorded recently.
Lakeland Downs Mouse (Leggadina lakedownensis)	Priority 4		Highly unlikely to be present on the site owing to the degraded habitat present on the site.
Ghost Bat (Macroderma gigas)	Priority 4		May infrequently visit the site, though unlikely to reside on the site due to the absence of caves.
Eastern Curlew (Numernius madagasca-eriensis)	Priority 4		Unlikely to be present due to an absence of the species preferred habitat.
Flock Bronzewing (Phaps histrionica)	Priority 4		Highly unlikely to be present as this species relies on mature native grasslands. The habitat present on the site is degraded, and if present, the species would move to adjoining areas if disturbed.

Based on the habitat present on the site it is unlikely that many of the species listed in the table above would be significantly impacted by development of the Madigan Road site due to the following reasons:

- Habitat condition is degraded in comparison to other nearby areas.

- Some species habitat preferences are absent from the site.
- If disturbed by site activity, some species would move to adjoining areas; and
- Some species may visit the site but are unlikely to rely on the site for their survival as they are able to forage over a wide area.

2.4.2 Site Topography

The site is relatively flat, sloping gently from the Karratha Hills situated to the south down towards Dampier Road. The site levels range from a height of approximately 25m to 26m Above Height Datum (AHD) abutting Dampier Road.

2.4.3 Contaminated Sites

A contaminated site is defined in the *WA Contaminated Sites Act 2003* as "land or water [surface and groundwater] containing a substance above background concentrations that presents or has the potential to present a risk of harm to human health or the environment". In other words, the contaminated site has the potential to cause risk to human health, the environmental value or to the environment.

A search of the Department of Biodiversity, Conservation and Attractions Contaminated Sites Register shows that there are no registered sites within or proximate to the Structure Plan area.

2.4.4 Subsoil Conditions and Geotechnical Considerations

The site is situated over the Pilbara Craton Formation which comprises a mid- Archaean granite-greenstone terrane and an overlying late-Archaean volcano sedimentary sequence called the Hamersley Basin. The site is mapped as Unit Ayx, which is described as 'Granophyric dyke' (GSWA, 2001).

Subsurface profile over the majority of the site is most likely to comprise varying thicknesses of high plasticity clayey sands/ sandy clays overlying highly weathered Basalt and Granite at depth of about 2m.

The 1:50,000 Urban Geology Series map (Karratha) shows the northwest corner of the site to be covered by Aeolian sand and the southeast corner of the site is shown to be bordering a ridge of Archaen aged Chert and clas tic sediments.

Based on AS2870-1996 (Residential Slabs and Footings), the site would be classified as Class H-D and should be designed to resist cyclones in a cyclone designated area. It should be noted that the classification of the site may be improved if appropriate remedial actions are taken. On balance it is considered Class M-D can be achieved.

It is noted that the ground conditions at the site are inferior to the Baynton West site (the soils interface is close to the alignment of the watercourse to the east of the site) and most of the Karratha townsite but are nevertheless suitable for land development so long as dwellings are provided with an appropriate footing system.

Refer to Appendix F: Geotechnical Report prepared by Coffey Geotechnics November 2010.

2.4.5 Acid Sulphate Soils

Acid Sulphate Soils (ASS) typically comprise wetland soils and unconsolidated sediments that contain iron sulphides which, when exposed to atmospheric oxygen in the presence of water, form sulphuric acid. When disturbed by excavation or dewatering, these soils are prone to produce sulphuric acid and thereby mobilise arsenic, aluminium, iron, manganese and other heavy metals from the soil profile into groundwater which can be detrimental to biota, human health and built infrastructure.

A desktop analysis indicates that a majority of the Structure Plan area has no known risk of ASS occurring generally at depths less than 3m. A strip along the eastern boundary of the Structure Plan area is mapped at having a moderate to low risk of ASS occurring generally at depths less than 3m.

This increased risk is associated with the proximity of the Structure Plan area eastern boundary to the adjacent creek line.

2.4.6 Hydrology

Surface Water

One drainage line occurs to the east of the site. Retention of this feature in its natural condition is recommended with the minimal amount of engineering works to accommodate increased storm water from surrounding development. Another smaller drainage line occurs west of the site along the existing Madigan Road. No wetlands are present on the site.

Groundwater

The DWER Hydrogeological Atlas (DWER, 2010a) describes the hydrogeology of the site as volcanic and sedimentary rock in greenstone belts, and shows there is a single aquifer beneath the site.

The Pilbara Fractured Rock aquifer consists of Precambrian granite-greenstone terrain overlain by surficial sediments in the river valleys. The water table is generally within 5m to 10m below the surface in the granitic areas. There are not considered to be any major regional groundwater resources in the Pilbara fractured rock (DWER, 2010a).

The groundwater beneath the site is considered brackish having total dissolved solids (TDS) of 1000-3000 mg/L (DWER, 2010a). A search of the DWER WIN database revealed that there are two DWER bores 1km west of the site, however neither of these bores have had sufficient monitoring events to establish any trends in groundwater levels.

The DWER Geographic Data Atlas (DWER, 2010b) indicates there is no Public Drinking Water Source Area beneath or near the site. As groundwater beneath the site is brackish to saline and there are no major rivers located in close proximity to the site where fresh water could be sourced, potable water could potentially be sourced from current Karratha sources; the Hardling Dam and the Millstream borefield.

Wastewater Treatment Plant Buffer

The Water Corporations Wastewater Treatment Plant No. 2 is located on the western side of Madigan Road. The Plant has a 500 metre radius around the Plant which is reflected by the Plant's cadastral boundary. The Structure Plan area is well recessed from the wastewater treatment plant.

2.5 Heritage

Native Title

Ngarluma Aboriginal Corporation is the prescribed body corporate and the confirmed Traditional Owners of the Karratha Townsite. Native Title benefits are described under the Burrup Maitland Industrial Estate Agreement (BMIEA) governed by the State and Murujuga Aboriginal Corporation.

Heritage Council of Western Australia

A search of the HCWA database showed no state listed properties (buildings or places) on either the interim or permanent register.

National Trust

A search of the National Trust database showed no listed properties (buildings or places) on the Trust register.

Municipality Inventory

There are no significant sites of European heritage located within the site and listed on the local Municipal Inventory.

A Heritage Survey prepared by Anthropos Australis Pty Ltd & Context Anthropology Pty Ltd dated 2010 identified three registered Aboriginal heritage sites have been identified within the Structure Plan area and two additional sites outside the Structure Plan boundary but in close proximity. Refer to Table 5 below.

Table 6– Registered Aboriginal sites in the Structure Plan area

Site ID	Status	Access	Site Name	Site Type	Coordinate (MGA Zone 50)
8959	S	O	Karratha West Access Road / Madigan Road 01	Artefacts / Scatter	478039mE, 7705655mN
8960	S	O	Karratha West Access Road / Madigan Road 02	Artefacts / Scatter	DIA Register: 477900mE, 770500mN Site File: 477900mE, 7705000mN
8961	S	O	Karratha West Access Road / Madigan Road 03	Hidden / Scatter	DIA Register: 477939mE, 7704955mN Site File: 477800mE, 7704800mN

The identified sites with the Structure Plan area are proposed to be retained and protected within public open space areas. The management and protection of these sites both during construction and post development is managed in accordance with the approved 2011 Cultural Heritage Management Plan for the Madigan Road Residential Estate, Karratha, prepared in consultation with Ngarluma Aboriginal Corporation and Landcorp, now DevelopmentWA.

Unless the sites are disturbed as part of future subdivision works, it is not envisaged that approval under section 18 of the *Aboriginal Heritage Act 1972* will be required.

2.6 Physical Infrastructure and Services

The Structure Plan area is located within the current boundary of the Water Corporation's Water Supply Scheme. Overall planning has made provision for future residential development in the Structure Plan area. The Structure Plan area also falls within an existing sewer reticulation area and is located within the wastewater catchment area for the existing Wastewater Pumping Station (**WWPS**) located at Seven Mile Creek along Dampier Road (Karratha WWPS No. 10 – Dampier Road).

New underground power distribution, both high voltage (**HV**) and low voltage (**LV**), will need to be installed throughout future stages of subdivision to service each lot in the subdivision.

Early subdivision approval in the Structure Plan area included the installation of NBN Co pit and pipe network which will continue to be extended throughout the Structure Plan area on a staged basis. NBN assets were constructed to Dampier Road where fibre infrastructure was extended to the site with the remainder of the Madigan Estate located within NBN's rollout mapping. New stage agreements will be entered to facilitate subsequent staged connection works.

There is limited reticulated gas supply and demand within the Karratha region for residential consumption and reticulated gas was not installed in the early subdivision stages.

The site naturally sits about a metre below Baynton West to the east and when the watercourse, Madigan Creek, that separates the two sites floods from time to time and in significant events it inundates parts of the site.

In 2020, revised flood modelling indicated that on average the 1% AEP flood level of Madigan Creek is generally 100mm lower than previously modelled.

In the early subdivision stages of the Structure Plan area, provision has been made for the conveyance of stormwater through the road carriageway. Stormwater is conveyed from lots and road reserves to open drains which in turn convey water to Madigan Creek then through Nickol Bay. Consistent with pre-development catchments and optimising earthworks for the estate, a minor portion of the Structure Plan area will drainage west to Madigan Road in accordance catchments agreed with Main Roads WA

In order to develop the site, sufficient open drains at each development stage are required to grade and convey stormwater towards Madigan Creek. Open drains created in drainage reserves through the subdivision approval are cost effective in conveying stormwater drainage and decreasing the

extent of earthworks required to ensure the development site sits above the 1% AEP flood level of Madigan Creek.

Earthworks will be required to provide suitable grades for the Site's drainage requirements. Import fill will be required to raise the site above the 1% Annual Exceedance Probability (AEP) event from the adjacent Madigan Creek. Earthworks levels in the northern part of the Structure Plan area generally range from RL16-18m AHD and have mostly been raised to clear flood levels from the adjacent Madigan Creek.

2.7 Existing Movement Network

Dampier Road, located north of the Structure Plan area, is a dual carriageway, four lane divided road with a solid median in the vicinity of the Structure Plan area. It is classified as a Regional Distributor road in the Main Roads WA (MRWA) *Functional Road Hierarchy to the east of Madigan Road* and operates under the speed limit of 70km/h. Dampier Road, to the west of Madigan Road, is under the care and control of Main Roads WA. To the east of Madigan Road, Dampier Road is under the care and control of the City of Karratha. Dampier Road provides direct or indirect access to major local industrial, transport and tourism nodes including Burrup Industrial Area, Burrup Peninsula, Karratha Industrial Estate, Dampier Salts, Rio Tinto Railway Terminal and Karratha Airport.

Madigan Road forms the western boundary of the Structure Plan area and is a single carriageway road in the vicinity of the Structure Plan area. It is classified as a Primary Distributor road in the Main Roads WA Functional Road Hierarchy and operates under a speed limit of 80km/h in the vicinity of the Structure Plan area.

Madigan Road connects North West Coastal Highway (NWCH) with Dampier Road and at present provides a freight route for traffic traveling from NWCH to Burrup Peninsula and Dampier bypassing the Karratha town site. It is constructed to 7m wide, single carriageway standard with 1m sealed shoulder and wide gravel shoulders.

Currently, there is a 'left in and left out' turn onto Dampier Road which provides access and egress to the northern portion of the Structure Plan area. The 'left in, left out' turn is to be converted into a roundabout by Main Roads at the end of 2026. The intersection of Madigan Road and Dampier Road is a signalised intersection. A restricted movement left-in, left-out turn also exists south of the cemetery on Madigan Road.

2.7.1 Public Transport

Whilst bus routes connect different parts of Karratha to the City Centre, the Structure Plan area does not currently have convenient access to the public transport services. A high frequency bus service is however being considered to connect the eastern and western sides of the Karratha urban area and pass through the city centre. This new bus service aims to connect the newer emerging residential areas including Madigan Estate to the west and Mulataga to the east.

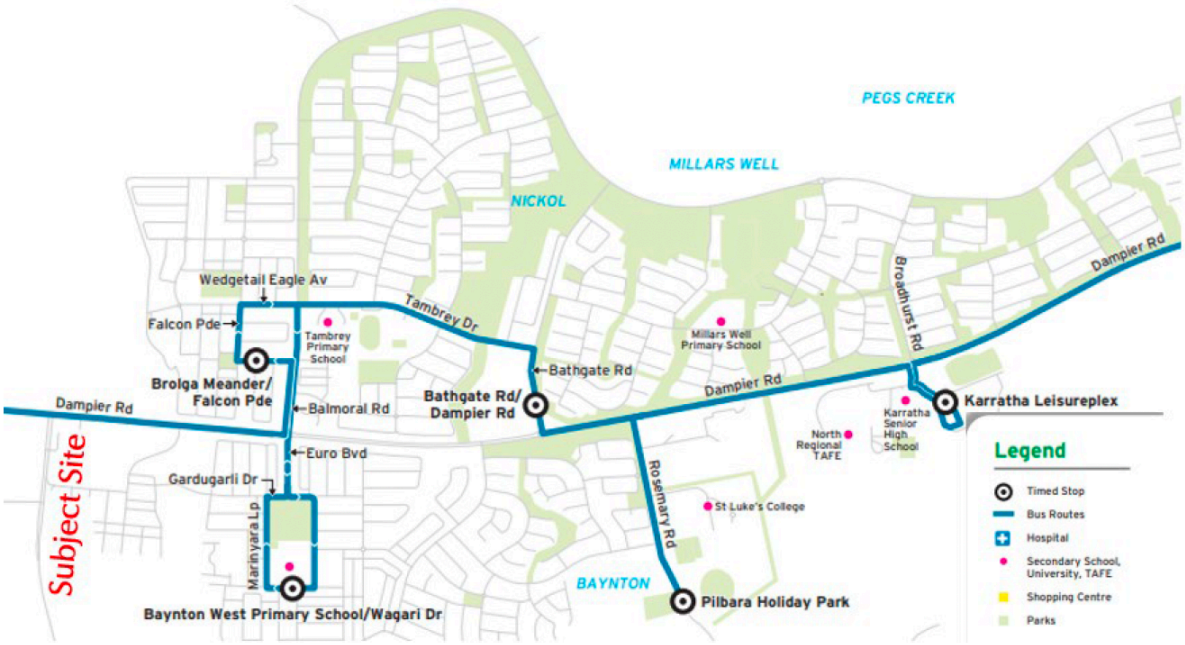


Figure 7 - Existing Public Transport Bus Routes

2.7.2 Pedestrian and Cycle Access

Figure 8 identifies the existing pedestrian paths constructed along Dampier Road and in the internal road network of Baynton West locality since 2013. It is expected that the proposed pedestrian and cycle paths of the Structure Plan area would also connect to the surrounding paths once fully developed.

Figure 8 – Cycle Access

2.7.3 Madigan Road Bypass Project

The Madigan Road Bypass is a planned heavy vehicle route incorporated in Main Roads WA long-term planning. The proposed alignment is proposed to connect NWCH (west of the existing NWCH / Madigan Road intersection) and Dampier Road (west of Seven Mile Creek Bridge).

The Karratha Regional Land Supply Assessment (August 2020) report indicates several key road upgrades or construction projects by 2035 including construction of Karratha Western Bypass (Dampier Road to Madigan Road) which would be constructed as 2- lane road to reduce heavy vehicle traffic on the corresponding section of Madigan Road in Karratha townsite. The bypass will reduce the exposure of the Structure Plan area to future traffic noise on Madigan Road.

3. Governance Context

3.1 Zoning and Reservations

The City of Karratha Local Planning Scheme No. 8 (LPS 8) is a land use based statutory scheme, which was prepared, based on the Karratha Area Development Strategy (1998), and gazetted in 2000.

The principal functions of LPS 8 are to reserve and zone land, and control development reserved and zoned land. The scheme prescribes zoning and a 'Use/Class' table which permits, prohibits and provides Council discretion to approve certain land uses depending on the purpose, intent and objective of the zone.

The Structure Plan area is zoned 'Urban Development' under LPS 8, of which the general development requirements are set out as follows:

5.4.1 Before considering any proposal for subdivision or development of land within the Urban Development zone, a structure plan may be prepared in accordance with Part 4 of the deemed provisions.

5.4.2 The local government shall, when it considers subdivision and development in an area the subject of a structure plan has proceeded to an extent where detailed zones and reservations can be defined, amend the Scheme to indicate these zones and reservations.

5.4.3 Where residential development guidelines have been adopted and included in the Policy Manual in accordance with Part 2 of the deemed provisions, development within the Urban Development zone should be in accordance with the intent of these guidelines, unless the local government resolves, for a particular development application, to vary this intent.

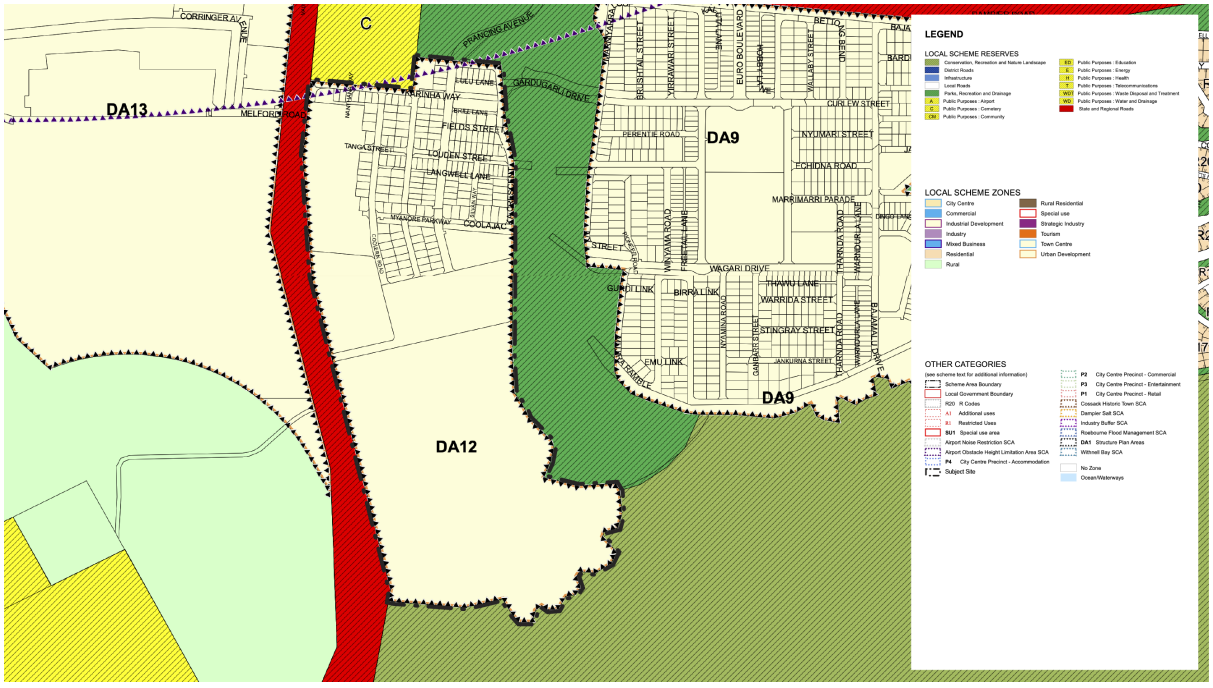


Figure 9 – City of Karratha LPS 8 Zoning Plan

The Structure Plan area is affected by a Special Control Area relating to Development Plans. The site is identified as 'Development Area 12' (DA12), summarised under Appendix 5 of LPS 8 and in the table below.

Table 7 - City of Karratha LPS 8 Appendix 5 Extract

Development Area	Description of Land	Base Zoning	Special Conditions
DA12	Baynton Madigan Rd (East)	Urban Development	1. An approved structure plan together with all approved amendments shall apply to the land in order to guide subdivision and development. 2. To provide for residential, commercial, community and recreation. 3. Retail floor space shall be commensurate with a Local Centre. 4. Provision shall be made for a public bus transport linkage.

As outlined by special condition 1, a structure plan is necessary to facilitate the further subdivision and development. This Structure Plan Amendment updates the existing Development Area 12 - Baynton Madigan Road (East) Structure Plan formerly known as Lot 500 Madigan Road Baynton Development Plan which expires on 19 October of 2030.

3.2 Regional Planning Framework

3.2.1 Pilbara Infrastructure and Planning Framework

The Pilbara Infrastructure and Planning Framework (PIPF), published in 2012, sets out the strategic direction for the future of the region over the next 25 years. It addresses the scale and distribution of future population growth and housing development, as well as identifying strategies for dealing with economic growth, environmental issues, transport, infrastructure, water resources, tourism and the emerging impacts of climate change.

The PIPF outlines the intended role and future development character for the Karratha townsite, which including that:

- Karratha will serve a 'Pilbara City' function which includes providing facilities as a regional centre to Onslow, Cape Preston, Anketell and Pannawonica as well as closer settlements including Dampier, Wickham and Roebourne.
- The overall population of Karratha is expected to expand to 50,000 by 2050.
- The form of residential development in Karratha City will change significantly with more townhouses and other forms of higher density development. To meet demand permanent dwelling stock is expected to increase from 4,950 (2006) to 19,230.

To assist in meeting these aspirations, the PIPF provides strategic direction in the form of objectives which will guide the ultimate outcome for settlements within the Pilbara region. These objectives include:

- To develop the region's settlements to be sustainable and liveable communities.
- To provide choice, quantity and affordability in housing provision.
- To create sustainable, well defined, cohesive settlements, with a strong sense of place and high quality urban design that is climate responsive.

The detailed planning and development of the Structure Plan area has been guided by the above strategies.

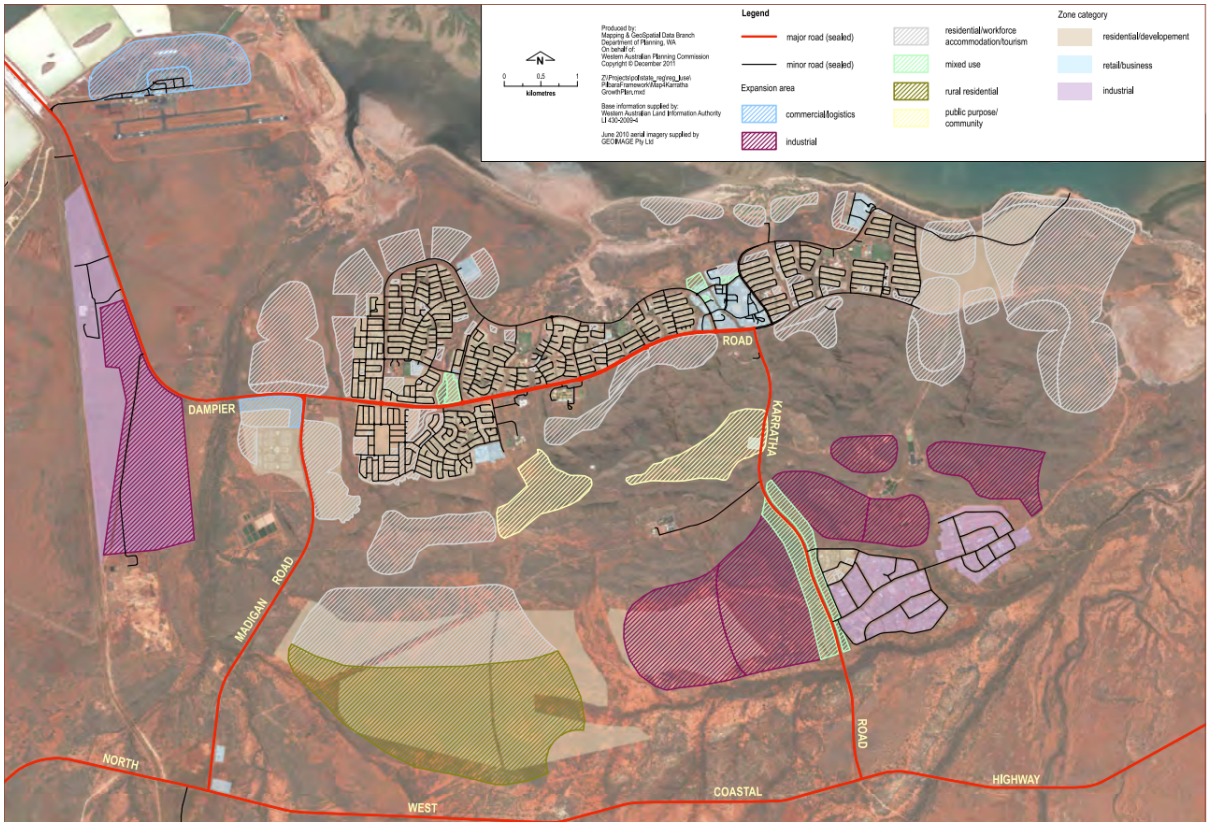


Figure 10 – Karratha Growth Plan

3.2.2 Regional North Land Capacity Analysis City of Karratha

The Regional North Land Capacity Analysis provides a regular overview of existing and future land capacity based on forecast population growth for the settlements in the City of Karratha. In particular, it examines the land identified for residential, rural residential, commercial and industrial use that is capable of substantial further development.

Based on the current extents of zoned residential land and land identified for future residential purposes, this analysis suggests that there is a sufficient amount of land capable of substantial further development to cater for the population growth anticipated in the Western Australia Tomorrow 2031 population forecasts for the City of Karratha. This is inclusive of undeveloped land earmarked for residential development such as the Structure Plan area.

3.2.3 WA Regional Development Framework

The vision for regional WA under the WA Regional Development Framework 2023 is for WA to be sustainable, vibrant and liveable regional communities, supported by strong and prosperous economies. The framework has five focus areas which respond to regional need and align with Government priorities and our legislative framework. These include regional liveability which means "making our regions good places to live is critical for the wellbeing of regional residents and underpins labour market and community resilience." The Structure Plan Amendment will contribute to the realisation for of the Framework's vision by providing high quality housing with a range of densities to support the growing Karratha community with a built form that embodies the Pilbara character and is climate responsive.

3.3 State Government Planning Strategies and Policies

3.3.1 State Planning Strategy 2050

The *State Planning Strategy* provides a strategic context and basis for the integration and coordination of land-use planning and development across State, regional and local jurisdictions.

The Structure Plan Amendment is consistent with the strategic vision set out in the Strategy, in particular it will assist with assisting with the delivery of quality new housing to the region.

The document identifies a series of strategies to achieve the above vision, which are based on the principles of community, infrastructure, economy, regional development, environment and governance. These strategies include:

- Developing Karratha into a city where people choose to settle on a permanent basis.
- Achieving affordable living through housing diversity and compact settlements.
- Maintaining and growing Western Australia as the destination of choice for responsible exploration and resource development.
- Ensuring the sustained supply, use and development of land.
- Enabling liveable, inclusive and diverse communities.
- Creating places and spaces that foster culture, liveability, enterprise and identity.
- Encouraging active lifestyles, community interaction and betterment.
- Conserving biodiversity, achieve resilient ecosystems and sustainably measure the State's natural resources.

The detailed planning and development of the Structure Plan area has been guided by the above strategies.

3.3.2 State Planning Policy

3.3.2.1 State Planning Policy 3.0 Urban Growth and Settlement

State Planning Policy 3.0 (SPP 3.0) Urban Growth and Settlement sets out the principles and considerations that guide the development of new urban growth and settlements. It focuses on consolidation in areas with good access to employment, services and transportation, minimised environmental impact and efficient use of suitable land and infrastructure. The Structure Plan Amendment supports the ongoing realisation of the Karratha grow plan already established under the existing Structure Plan. The Structure Plan Amendment will result in a sustainable pattern of development rounding out the suburb of Baynton and providing ready access to the local transport network, schools, services and employment for the future community.

3.3.2.2 State Planning Policy 3.4 Natural Hazards and Disasters

State Planning Policy 3.4 (SPP 3.4) Natural Hazards and Disasters identifies the need for the planning of urban areas to consider natural hazards including flooding, bush fire, landslides, earthquakes, cyclonic activity, coastal erosion, severe storms, storm surge and tsunamis. The risk of cyclones and flood is particularly relevant. The Structure Plan Amendment responds to SPP 3.4 through the open space and drainage and stormwater design, as well as via climate responsive design principles will be incorporated into the Madigan Estate Development Guidelines and LDPs to promote built form that is climate sensitive, energy efficient and responsive to local character. The climate responsive aims of the Structure Plan Amendment are to:

- Reduce the need for mechanised, energy dependent air-conditioning devices.
- Sustain and increase thermal comfort for occupants.

- Maximise liveability through access to natural light, natural ventilation and natural climate control.
- Preserve and enhance the relationship between internal and external living areas.

3.3.2.3 State Planning Policy 3.7 Bushfire

State Planning Policy 3.7 (SPP 3.7) and the associated Planning for Bushfire Guidelines (the Guidelines) seek to implement effective, risk-based land use planning and development which in the first instance avoids bushfire risk, but where unavoidable, manages bushfire risk through a set of acceptable outcomes outlined by the Guidelines.

The Structure Plan area is located within land designated bushfire prone (Area 2) by the Western Australia State Map of Bush Fire Prone Areas, which triggers an assessment of the Structure Plan Amendment against the provisions of SPP 3.7 and the associated Guidelines.

As such, an updated Bushfire Management Plan (BMP) has been prepared and assesses the Structure Plan Amendment against *Bushfire Protection Criteria 5: Structure plans and subdivision applications*.

Subsequent planning stages of subdivision and development will also require assessment against the relevant Bushfire Protection Criteria outlined in the Guidelines.

3.3.2.4 State Planning Policy 5.4 Road and Rail Noise

State Planning Policy 5.4 (SPP 5.4) is primarily concerned with minimising the adverse impact of transport noise on noise-sensitive development.

The Policy is applicable where noise-sensitive development is proposed in proximity to major roads and/or railways. In this regard, Madigan Road is identified as a 'State Freight Road' for which transport noise may affect sensitive land uses.

The policy sets out the indoor and outdoor noise criteria that apply to new noise-sensitive development. The noise levels are measured at a distance of 1 metre from the most exposed, habitable façade of the proposed building, at each floor level, and within at least one outdoor living area on each residential lot.

Generally, where the noise target is likely to be exceeded for outdoor areas, a detailed noise assessment and/or the implementation of mitigation measures may be required by the developer to achieving the target levels.

This Structure Plan Amendment is informed by an updated Acoustic Report prepared in March 2026.

3.3.2.5 State Planning Policy 7.0 Design of the Built Environment

State Planning Policy 7.0 (SPP 7.0) addresses design quality and built form outcomes in Western Australia. It seeks to deliver broad economic, environmental, social and cultural benefits that derive from good design outcomes and supports a consistent and robust design review across the State.

This Structure Plan Amendment has been informed by the ten (10) Design Principles set out in SPP 7.0.

3.3.3 Development Control Policy 2.3 – Public Open Space in Residential Areas (DC 2.3)

Development Control Policy 2.3 – Public Open Space in Residential Areas (DC 2.3) seeks to ensure that residential development is supported by adequate provision of public open space which contributes to the amenity of a place. DC 2.3 typically requires the provision of 10 percent of the gross subdivisible area to be provided as public open space, corresponding to the requirements of Liveable Neighbourhoods. Public Open Space is to be ceded by the subdivider 'free of cost' to the Crown as a Reserve for Recreation. The Structure Plan Amendment provides for 6.5% of Gross Subdivisible Area as Public Open Space in landscaped parkland, drainage reserves, and active and passive spaces.

3.3.4 Operational Policy 2.4 – Planning for School Sites

Operational Policy 2.4 (OP 2.4) sets out the general locational criteria and configuration requirement and design standards for the provision of government and non-government primary and secondary school sites. OP 2.4 intends to assist in addressing issues that may arise in residential areas between schools and their surroundings, particularly for traffic and noise generating activities.

The proposed primary school site needs to respond to the relevant provisions of OP 2.4, which include:

- Appropriate area, configuration, physical site requirements, servicing and access to be provided in accordance with OP 2.4 and on advice from the Department of Education.
- Movement network and road safety considerations.
- Relationship to nearby land uses.

The location and design of the school site proposed under this Structure Plan Amendment has been chosen based on careful consideration of OP 2.4 requirements, engagement with Department of Education and the City of Karratha.

3.3.1 Residential Design Codes

The R-Codes provides a comprehensive basis for the control of residential development throughout Western Australia. The R-Codes aims to address emerging design trends, promote sustainability, improve clarity and highlight assessment pathways to facilitate better residential design outcomes.

This Structure Plan Amendment has responded to the residential development opportunities and constraints that are associated with the site and its context.

3.3.2 Liveable Neighbourhoods

Liveable Neighbourhoods 2009 (LN) is an operational policy, adopted by the WAPC, for the design and assessment of structure plans and subdivision in metropolitan area and regional centres, on greenfield and urban infill sites.

The policy is a performance-based code which advocates the structure of new urban areas be formed by clustering compact, walkable neighbourhoods around a centre that comprises a range of compatible uses, including retail to service a variety of daily needs and provide a community focus.

LN promotes a range of residential densities and a variety of housing types that increase towards the centre, and an interconnected street network that focuses on the centre and provides good access for vehicles, cyclists and pedestrians in a pleasant, efficient and safe manner is also advocated.

Additionally, the policy states the WAPC may accept a minimum of five (5) per cent of the gross subdivisible area for Public Open Space for new development in regional areas subject to the support of the local government, the open space being developed to a minimum standard and for the widest possible use of the community and public open space being readily available in the community.

This Structure Plan Amendment adopts LN policy initiatives.

3.4 Local Planning Framework

3.4.1 City of Karratha Local Planning Strategy

The City of Karratha's Local Planning Strategy (LPS) was endorsed by the WAPC on 2 February 2021. The strategy sets goals focused on realising the City's vision to be *Australia's most liveable regional City*.

The strategy outlines a population projection for the City of 26,045 residents by 2031, with 19,705 residing within the Karratha townsite itself (a population increase of over 2,500 from the 2021 census). The concentration of growth within the Karratha townsite demonstrates is the primary focus

for urban growth within the broader City. As such, the LPS seeks to ensure adequate infrastructure and residential land supply is in place to support the anticipated growth in population.

This focus informs the broader vision, objectives and goals for the City which include:

- Efficient and effective land and residential development to accommodate future growth.
    - To identify a settlement strategy to meet the needs for a population of 26,045 by 2031, whilst allowing for and considering an ultimate population of over 50,000.
    - To provide appropriate Pilbara housing options to accommodate a range of demographic groups.
- To enable community services and spaces that contribute to attracting people to the City and retaining people in the locality.
    - Provide a variety of community services, facilities and recreational areas that contribute to maintaining a desirable lifestyle, promote liveability whilst enhancing the public health of the community.
- Provide public open space for the purpose of drainage as it is a vital consideration of urban design in the Pilbara environment, which is subject to severe rainfall patterns, cyclonic events and coastal inundation.
- Despite the City meeting/exceeding benchmark requirements for the provision of Public Open Space, the continued rapid growth of the City will necessitate provision of new Public Open Space. The LPS notes the requirement for new playing fields in Baynton East.

The purpose of this Structure Plan Amendment is to unlock further residential development and community services which is wholly within the broader objectives and outcomes identified by the LPS.

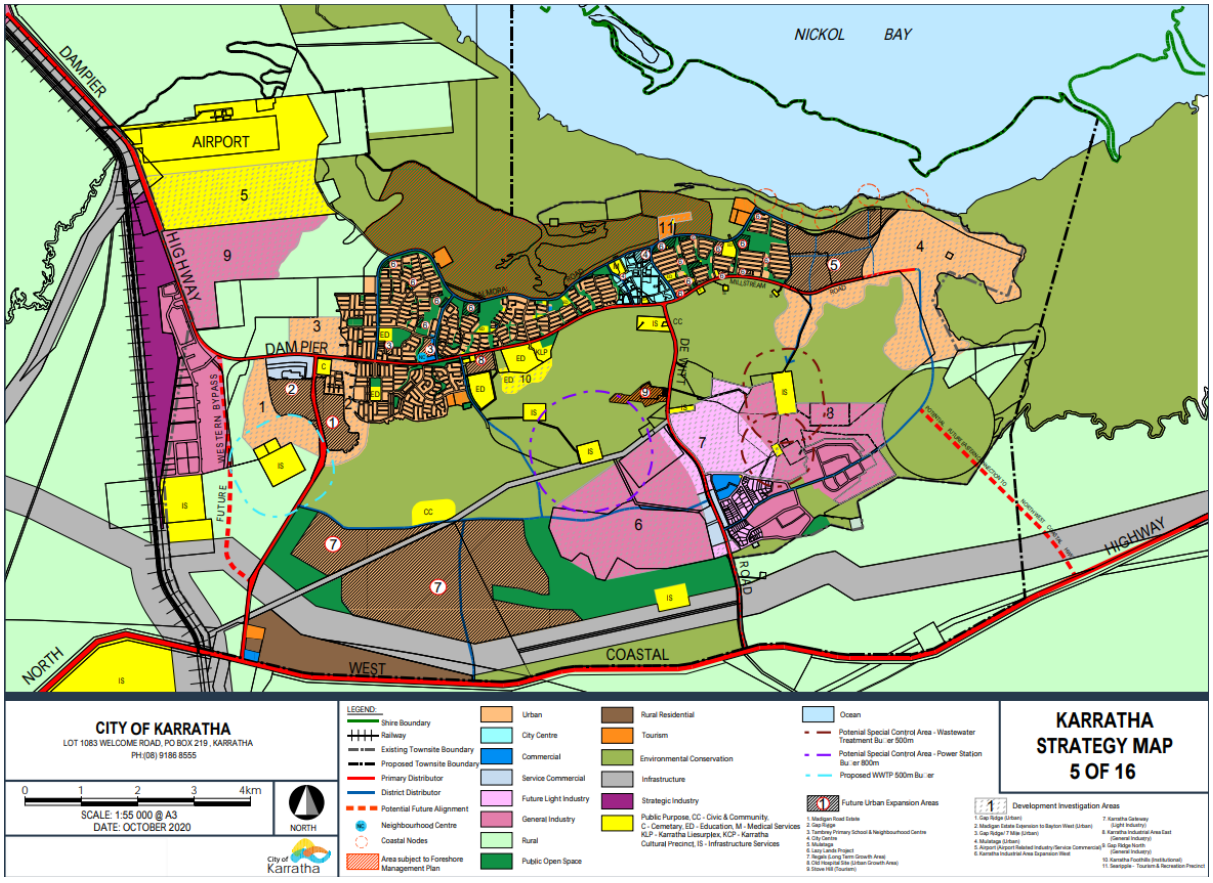


Figure 11 - City of Karratha Local Planning Strategy Map

3.4.2 Karratha City of the North Plan (2010)

The Karratha City of the North Plan (KCNP), adopted by the Shire of Roebourne on 18 May 2010, comprises a series of documents being the Karratha City Growth Plan, the Karratha City Centre Master Plan and the Implementation Blueprint. Together, these documents identify a range of spatial and non-spatial requirements to guide the future growth of Karratha into a regional city of 50,000 residents

The KCNP informed the and still informs decision makers in assessing rezoning, subdivision and development applications as well as the provision of infrastructure and community facilities and informs the consideration of this Structure Plan Amendment.

3.4.3 Karratha City Growth Plan (2010)

The Karratha City Growth Plan (CGP) is a city– wide strategy to guide the future development of Karratha into a city of 50,000 residents. Specifically, the CGP will guide the future spatial and non-spatial development requirements for the growth of Karratha, identifying the need for land supply, housing diversity, open spaces, commercial nodes, entertainment and retail areas, as well as the provision of community and servicing infrastructure.

The CGP identifies Karratha as a series of neighbourhood precincts. Each precinct is described in terms of its desired urban character, land use and urban structure as well as identifying key assumptions and planning considerations requiring further resolution.

The site is situated within the 'Gap Ridge/Seven Mile Precinct' and identified as a 'New Residential Neighbourhoods' (refer to Figure 12 – City Growth Plan). The general design intent of the Precinct is for the development of a site responsive, walkable and connected residential neighbourhood that provides good pedestrian and vehicular connectivity within and to and from existing residential areas.

The CGP envisaged:

- Residential development on the site to be consistent with an average density of R40 with some areas of R60 around centres of activity.
- A new east-west road incorporating a future bus route linking Madigan Road with new residential development to the east is identified through the centre of the site.
- A local activity centre, situated on Madigan Road just to the north of this link road, is also identified with the potential to comprise a delicatessen and local community facilities up to 350m^2.
- Dampier Road and Madigan Road are identified as key gateway roads, which should be designed to provide those entering the town with a sense of arrival and place.
- The existing cemetery is proposed to be retained within the Precinct however is to be limited to its current size.
- Stormwater modelling for residential development adjacent to natural drainage lines.
- Extension of water distribution mains and new sewer pumping stations north and south of Dampier Road and possible connection to a 3rd pipe recycled water network.
- Extension of underground power from upgraded existing network, new Telstra infrastructure to include high speed optic fibre connection.
- Reservation or easement for existing power transmission line and water network.
- Additional land area and buffer needs for Wastewater Treatment Plant No 2.

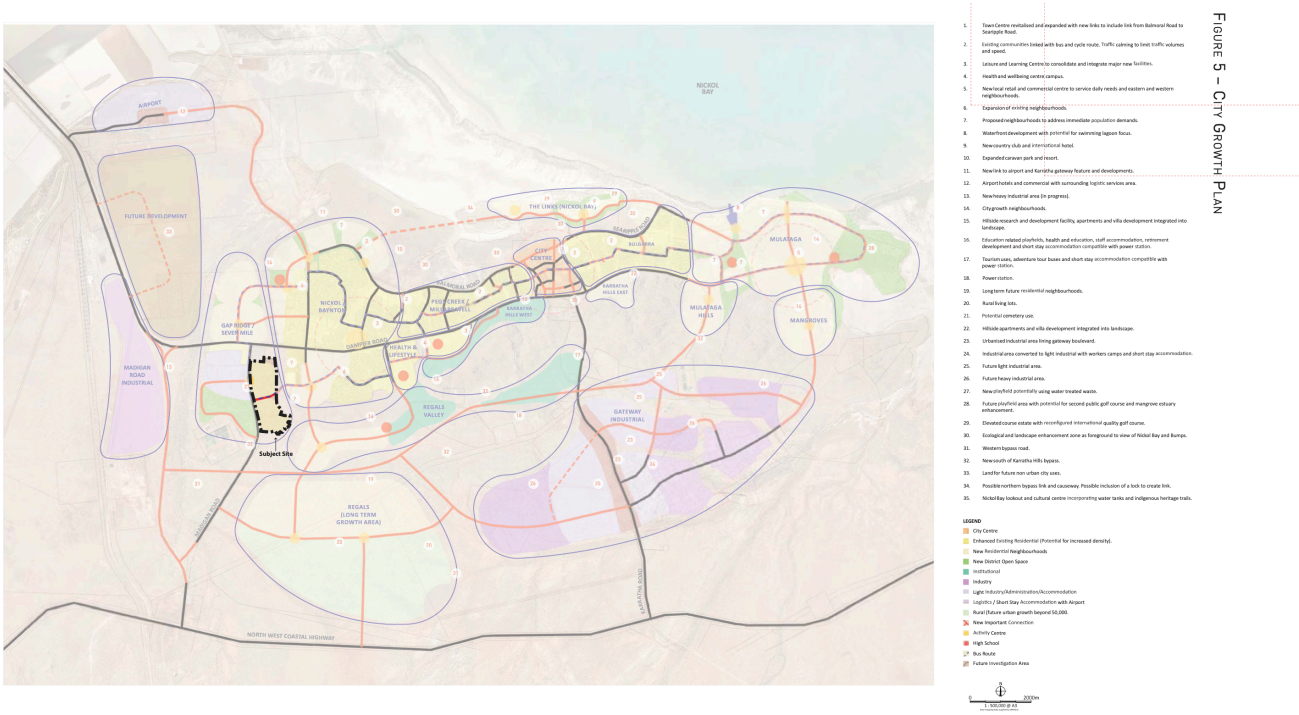


FIGURE 5 – CITY GROWTH PLAN

Figure 12 – City Growth Plan

This Structure Plan amendment remains consistent with the Karratha CGP.

3.4.4 City of Karratha Strategic Community Plan 2020-2030

The objective of the Strategic Community Plan (SCP) is to engage the community in planning for the future of the local government area. It involves setting priorities with the community for the future by aligning the community's vision with a clear strategic direction for the City. The SCP has been separated into four strategic themes, being 'our community', 'our economy', 'our environment' and 'our leadership'.

The SCP outlines outcomes and responses which align with these four themes that act as objectives and aims. The outcomes and responses that inform the Structure Plan Amendment include to:

- Plan and develop new facilities and infrastructure to meet future community need and industry best practice.
- Activate neighbourhoods and public open spaces.
- Land and infrastructure is available for a variety of business investment purposes.
- Position the City as an attractive place for employees.
- Recognise and protect the natural environment.

The City of Karratha is currently in the process of publishing their updated SCP for 2025-2035, which broadly align with the objectives outlined above. However, there are key additions which are relevant to the development of Madigan Estate which include to:

- Provide sport, recreation, cultural and leisure facilities and year-round activities, for all ages and abilities.
- Improve accessibility of the City of Karratha's facilities, places, spaces, events and infrastructure for all abilities.
- Provide high amenity, well-maintained foreshores, parks, playgrounds, toilet amenities and streetscapes.

- Provide a complete network of well-maintained infrastructure assets.
- Plan for future development that enables growth while respecting local identity.
- Advocate for, facilitate and support the provision of affordable housing choices.
- Support increased education and training opportunities.

The detailed planning and development of this Structure Plan area has been guided by the above strategies.

4. Stakeholder and Community Engagement

The Structure Plan, formerly 2012 Lot 500 Madigan Road Baynton Development Plan, along with Detailed and Local Development Plans approved between 2013 and 2019, have evolved in response to the needs and strategic development directions of the locality.

This Structure Plan Amendment consolidates the established principles and supports the continuation of subdivision and development in line with the existing Structure Plan.

The background stakeholder engagement activities that informed the preparation of the existing Structure Plan remain relevant to the design response outlined in Section 3 below.

Furthermore, this Structure Plan Amendment has been informed by extensive engagement between DevelopmentWA, City of Karratha and the Department of Education in respect of modifications to include a Primary School with co-located Public Open Space within the Structure Plan area.

5. Design Response

The following section of this report provides a description of the Structure Plan Amendment, its design rationale and land uses, estimated population and residential densities, movement networks, servicing considerations and built form design considerations.

5.1 Project Objectives

The project objectives that have guided the design and development of this Structure Plan Amendment are informed by the original Karratha Growth Plan (2010) and include:

- Long term residential development and supporting non-residential services.
- Facilitating housing diversity.
- Providing for an urban form that focuses on the public realm.
- Facilitating local employment services and amenities.
- Optimising land use.
- Facilitating climate responsive and sustainable development.

5.2 Design Rationale

The design of this Structure Plan Amendment is based around the provision of an interconnected street grid network that provides good permeability and connections with the site's surrounding natural assets and the existing urban fabric, whilst facilitating opportunities for good climate responsive development.

The design and orientation of the street network maximise east-west lot orientations ensuring new development capitalises on the prevailing breezes to assist with natural cooling in winter months and maximises shading by ensuring only the narrow frontages face lower morning and summer sun.

The orientation of the street network also facilitates views towards the Karratha Hills from within the development as well as vistas to new internal public open space areas and the public open space area abutting the site to the east, thereby providing significant amenity and a strong sense of place.

The design and location of open space provide opportunities to facilitate pedestrian movement between residential areas and supports the site's drainage requirements. Indigenous cultural and heritage sites have also been integrated within open space areas, thereby ensuring the protection and conservation of these elements.

Optimal integration with the Baynton West development will be achieved through the establishment of new at-grade and grade separated roads across the adjacent open space area.

A local mixed use ('Main Street') precinct is proposed to provide local convenience retail and commercial service needs and serves as a community focal point for the development. The local centre is centrally located at the intersection of the key north-south and east-west neighbourhood roads and adjacent to the primary school site, ensuring a significant proportion of new residences are within a short walking distance of the centre. The precinct is intended to provide ground floor active uses with upper floor residential apartments.

The primary school site has been sited in the southern half of within the Structure Plan area to respond to future population need and development of the southern portion of the Structure Plan area. The school site is dimensioned and orientated in accordance with the WAPC Operational

Policy Planning for school sites and in consultation with the Department of Education. It occupies an area of 3.5ha and has been co-located with 2.5 ha of Public Open Space which can accommodate a junior football oval. The primary school site has a frontage to four local roads including the main east-west connector connecting Madigan Road to Baynton West.

This Structure Plan Amendment appropriately interfaces appropriately to the cemetery site located at the north-west of the site through new road frontages. These new roads can facilitate access into the cemetery or allow for residential development to extend into the cemetery site should it be considered suitable in the future.

5.3 Community Design

This Structure Plan Amendment will facilitate the provision of a sustainable, coherent and attractive neighbourhood offering a wide choice of housing, local identity and sense of place, a range of recreational opportunities, and promote local self-containment.

It will also facilitate sustainable urban development through the north-south orientation of street blocks, maximising the potential for climate responsive lot design and local services through the provision of a local centre which will provide for local convenience and business needs. Climate responsive design principles will also be incorporated into the Madigan Estate Development Guidelines and LDPs to promote built form that is climate sensitive, energy efficient and responsive to local character.

The Structure Plan Amendment provides for a range of accommodation and living options through the provision of a diverse mix of residential densities and housing types. Areas of higher density residential development potentially incorporating apartments within low rise development have been located around high amenity areas including the local centre and open space.

It fosters a sense of place and local identity by responding to the site's context and characteristics, protecting key natural and cultural assets. The urban form facilitates views towards the Karratha Hills as well as towards the Burrup Peninsula with public open space areas located to act as focal points within the development.

Legibility and sense of place is also provided via an integrated movement network comprising a clear street hierarchy and shared path network which will facilitate safe and efficient movement for pedestrians, cyclists and vehicles. The design of the movement network ensures good internal connectivity and external linkages to the surrounding area.

The design effectively integrates the neighbouring residential neighbourhood of Baynton West through a movement network and urban form which promotes a coherent and integrated urban structure.

5.3.1 Population and Residential Densities

This Structure Plan Amendment ensures a diversity of residential options within residential development ranging in density from R20 to R-AC2. Residential density has been distributed such that higher densities are provided around the local centre, proximate to the primary school, and overlooking high amenity public open space areas.

The range of residential densities will assist with meeting current and future market demand for residential housing. Approximately 46% of the Structure Plan area or approximately half of the lots yielded will have an R20 density code, which is generally consistent with the character of existing residential densities within Karratha. A further 6% are identified for medium density development (R25, R30) with up to 2% identified for higher densities (R-AC2). Lots identified for low and medium densities (R20 and R30) are envisaged to be developed as single residential dwellings, facilitating a range of lot sizes to cater for large family homes and smaller terrace style dwellings. Land subject to the higher density coding (R60 and R-AC2) are envisaged to comprise predominantly multiple dwelling developments facilitating apartment style residential living for single persons or couple households.

To provide sufficient flexibility to respond to market demand, several areas within the Structure Plan area have a split residential coding in which a higher residential density (R60) may be permitted.

However, the Structure Plan Amendment incorporates provisions limiting development at the higher density on land which has a minimum of 2,500m² lot area, or comprises an entire street block. Notwithstanding this, any residential development at the higher density will still be limited to 2 storeys, ensuring it is consistent with that of adjacent development developed at a lower density.

Table 8 – Residential Development Area Summary

Land Use	Land Area (ha)	Percentage of Structure Plan area
Residential R20	14.82	21.9%
Residential R20 / 60	16.17	23.9%
Residential R25	1.41	2.1%
Residential R25 / 60	0.60	0.9%
Residential R30	1.75	2.6%
Mixed Use R-AC2	0.97	1.4%
Public Open Space and Drainage	6.79	10.0%
School	5.89	8.7%
Roads	19.34	28.6%
Total	67.74	

Table 9 – Estimated Dwelling Yield and Population

Residential Types	Estimated No. Dwellings	Estimated population[1]
Residential R20*	484	1,210
Residential R25	30	75
Residential R30	38	95
Mixed Use R-AC2**	69	174
Total	726	1,554

1. Based on an average household size for a normalised Australian city of "2.5 persons" (KCNP Summary, p34)

(*Assuming application of R20 density coding over areas with a split coding of R20/R60)

(**Assuming an average density of 125m² per dwelling (R80))

5.4 Movement Network

5.4.1 Proposed Street Network

This Structure Plan Amendment provides for an interconnected street network that facilitates safe and efficient internal connectivity and access to the surrounding area for vehicles, cyclists and pedestrians. The design of the street network provides clear physical distinctions between neighbourhood roads and local roads, ensuring a high level of legibility and robustness.

The street network is characterised by three neighbourhood roads which form the backbone to the design and serve as the main access points to the proposed development. A north-south neighbourhood road is proposed through the site which connects with Dampier Road. Two east-west neighbourhood roads are proposed through the site providing connections with Madigan Road and the Baynton West residential area, facilitating access and connectivity to the Baynton West primary school and community facilities, as well as promoting community cohesiveness. An additional

access road is proposed to the Baynton West residential area at the northern end of the development.

Several local access roads connect to these neighbourhood roads, servicing the proposed development with laneways providing access to smaller lots fronting open space areas. The layout of the road system ensures that development will front all streets and Public Open Spaces.

The design of streets incorporates a number of principles that facilitate pedestrian safety, efficiency of vehicular/cycle/pedestrian movement and sustainable urban stormwater management in an attractive environment.

Specifically, the proposed street network hierarchy comprises the following:

- Neighbourhood Connectors (Arterial Roads) – The two proposed east-west roads and the main north-south road within the amended SP area are classified as Neighbourhood Connector roads with 20.5m reserves.
- Access Streets (Local Roads) – The majority of the proposed internal roads are classified as Access Street C (16m) or Access Street D (12m and 15m) roads. The typical cross section of these Access Streets would entail 4.5m verges on both sides, with embayed parking provided in the verges as appropriate, such as for visitor parking for rear loading lots.
- The access streets abutting the proposed primary school are recommended to be constructed to the 17.9-metre Access Street B cross-section standard, which allows for on-street parking.

The proposed street hierarchy is described in Figure 13.

Indicative street cross sections for the above road types and drainage are provided in Figure 14 and 14.

Whilst the future development of the Structure Plan area shall generally conform to the street network layout identified, it is envisaged that the alignment of the lower order roads (14m road reserve width or less) may be varied (or removed) where it is considered necessary to achieve a desired built form outcome.

LN requires that “Development along integrator B and neighbourhood connector streets with ultimate vehicle volumes over 5,000 vehicles per day should be designed either so vehicles entering the street can do so travelling forward, or are provided with alternative forms of vehicle access. Wider lots with paired driveways and protected reversing areas in the parking lane may be used on streets with up to 7,000 vehicles per day.”

In addition, this Structure Plan Amendment also proposed changes to the surrounding road network including the installation of a new roundabout on Dampier Road and two priority-controlled T-intersections on Madigan Road.

Figure 13 – Proposed Road Hierarchy Plan

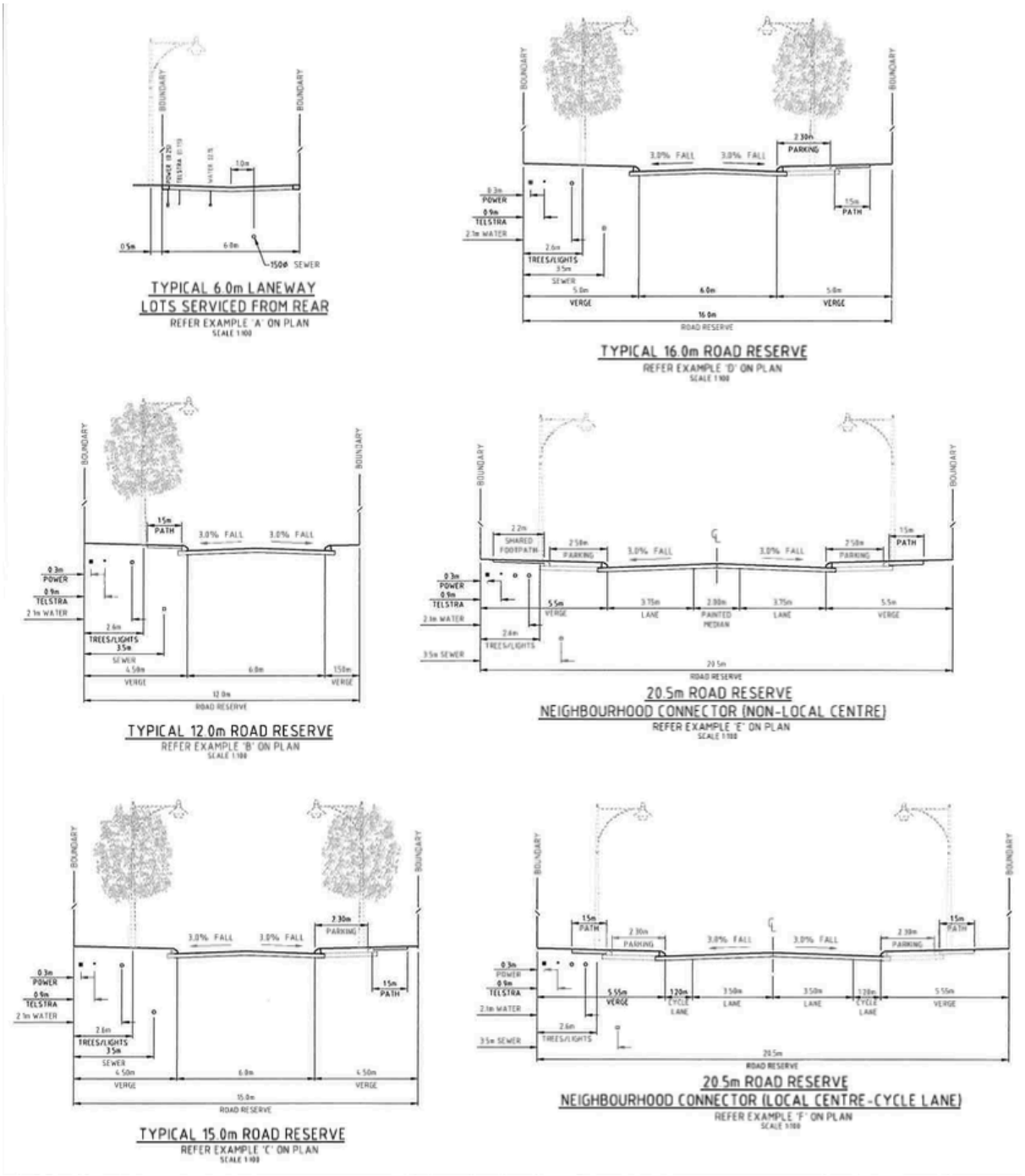


Figure 14 – Indicative street cross sections

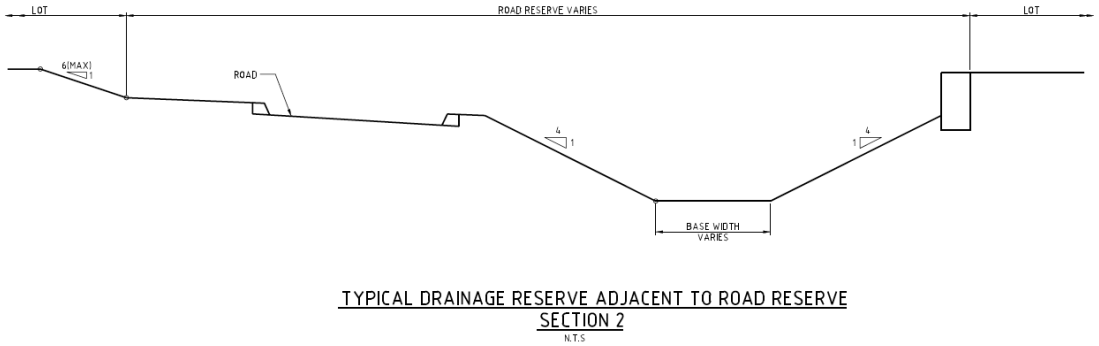


Figure 15 – Indicative Street Cross Sections (Drainage)

5.4.2 Public Transport

The standard of the two proposed neighbourhood connector roads which connect to the existing road network of Baynton West locality would be able to accommodate any future buses within the amended Structure Plan area subject to the justified demand.

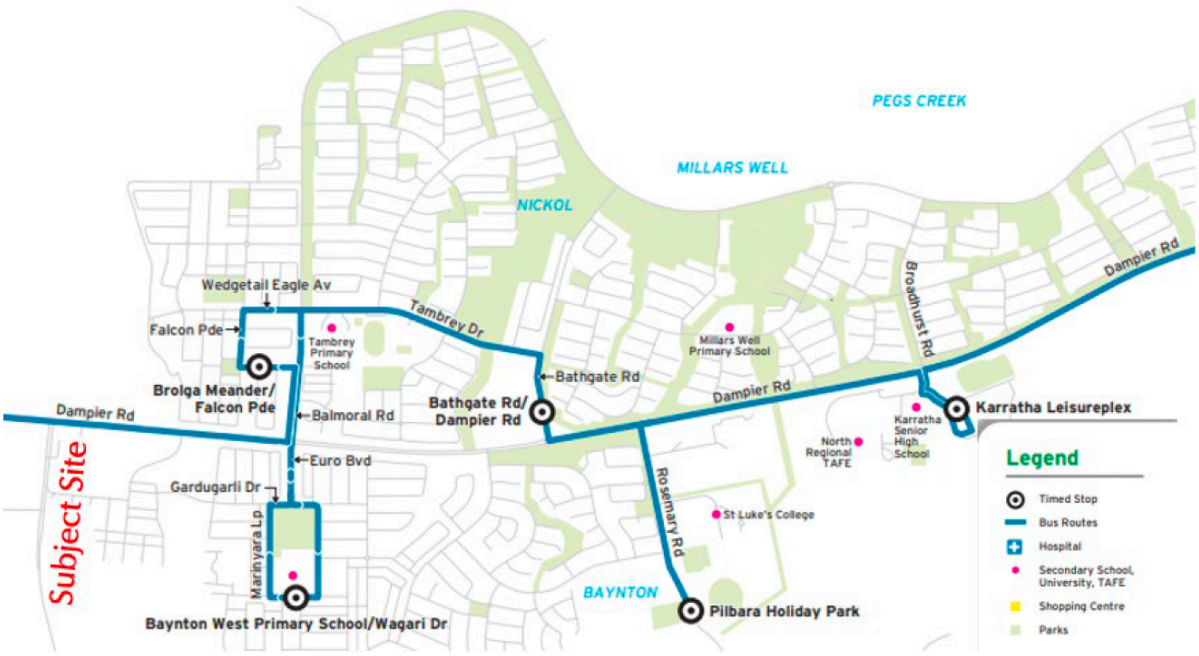


Figure 16 - Existing Bus Services

5.4.3 Pedestrian and Cyclist Facilities

This Structure Plan Amendment ensures considerable emphasis is provided on the provision of safe and efficient pedestrian and cycle access. It provides for a strategic network of dual use paths which provides strong north-south and east-west linkages between neighbourhood focal points and key attractions such as the Mixed Use precinct, local and regional open space areas, the Primary School site as well as linkages with the Baynton West residential area.

The maximum street block proposed in the Structure Plan Amendment is approximately 240 metres in length, thereby ensuring good permeability and legibility for pedestrians.

In accordance with LN, shared paths are proposed on one side of the neighbourhood connector roads with a footpath on the other side. Shared paths (dual use paths) are also provided along the Access Street B roads which forms the boundary of the proposed primary school site.

Proposed shared paths (dual use paths) provide strong north-south and east-west linkages between neighbourhood focal points and key attractions such as the local centre, local and regional open space areas as well as linkages with the Baynton West residential area and the proposed primary school site.

Streets have been designed to formalise and maximise on street parking and allow for tree planting. The formalisation of parking should limit any parking across footpaths and on street parking and tree planting should assist with traffic calming and improved comfort for pedestrians.

Figure 17 illustrates the proposed cycle and footpath network for the Structure Plan area.

Figure 17 Cycle and footpath network

5.4.4 Preliminary Traffic Modelling

The provision of safe and equitable access for all users has been a key consideration in the development of the movement network. The interconnected grid movement network promotes clarity, permeability and ease of access to enable intuitive movement for all users throughout the Structure Plan area. Integration of drainage corridors with the movement network and public open space provide high amenity landscape links with opportunities to strengthen pedestrian and cycling networks.

In order to investigate access options for existing Structure Plan, Transcore's EMME3 traffic model developed for the Gap Ridge Industrial project and further developed and expanded for the Karratha Revitalisation Project were sourced. Also, additional preliminary desktop modelling and analysis was undertaken for each stage of the Structure Plan and is further supported by an updated Transport Impact Statement (TIS) prepared by Transcore as part of this Structure Plan Amendment. The updated TIS concluded that the projected generation had not significantly deviated from the traffic assessment under the existing Structure Plan.

Refer to Appendix C - Transport Impact Statement.

The existing Structure Plan access system and internal road network coded in the EMME3 model included:

- The main access point of the Structure Plan area is proposed to be on Madigan Road.

  According to the information obtained from Main Roads WA the minimum required distance for the intersection spacing between the main access intersection on Madigan Road and the Workers Camp access intersection (west of the Structure Plan area) should be approximately 300m in the interim scenario (before the construction of the Madigan Road Bypass). In the ultimate scenario, when the Madigan Road Bypass is constructed, the intersection spacing can be reduced to approximately 110m.

  On this basis the main access intersection on Madigan Road is planned at approximately 300m south of the Workers Camp access intersection on Madigan Road in the interim scenario and will be shifted north at the ultimate scenario. This is because with the ultimate development of the Structure Plan area, the main east-west spine road through the local

centre is aligned to connect with the Baynton West subdivision to the east. This alignment results in an intersection on Madigan Road approximately 110m south of the Pluto site access intersection.

- A second Madigan Road access intersection is proposed towards the southern section of the Structure Plan area.
- A service road will be constructed parallel to Madigan Road to serve the western lots of the Structure Plan area fronting Madigan Road. This service road will be constructed from the southern boundary of the cemetery via a left turn deceleration lane into the development from Madigan Road. Main Roads WA (MRWA) does not currently support a service road within the Madigan Road reserve however once the Madigan Road Bypass is in place this option could be revisited.
- A restricted (left in/left out) access intersection is also proposed on Dampier Road to ensure good permeability of the Structure Plan area and to reduce traffic impacts on the Baynton West subdivision and the intersection of Dampier Road/Madigan Road,

  This restricted access point is proposed to be located approximately 300m east of the intersection of Madigan Road/Dampier Road. As part of the provision of this link, it is envisaged that the existing access to the cemetery from Dampier Road would be relocated such that it is accessed from new roads within the site, thereby maintaining the current number of access points onto Dampier Road.

  The access system for the Structure Plan has been discussed with MRWA who provided written confirmation supporting the proposed 'left-in/ left-out' access arrangement onto Dampier Road.
- Three link roads are proposed to connect into Baynton West subdivision to improve access and permeability.

  A central neighbourhood road, forming the primary east-west link through the site, is proposed to connect with the existing central neighbourhood road within the Baynton West residential area. This access road is envisaged to be constructed such that it is grade separated from the drainage and public open space area ensuring all weather access into and out of the area.

  Two other access points are proposed to the Baynton West residential area at the northern and southern ends of the development, and which would be 'floodway' roads constructed to be at-grade with the existing public open space area.

5.4.5 Updated Trip Generation and Distribution

The Structure Plan area is expected to generate approximately 7,743vpd external trips assuming:

- Daily traffic generation rates used for this transport assessment are 8.5 vehicle trips per day (vpd) per dwelling and 1 vehicle per hour (vph) per dwelling.
- 1.0 vph per student during the school peak periods (typically 8-9am and 3-4pm) and 2vpd per student overall for 430 students primary school generating traffic flows of 860vpd.
- 765vpd adopting the trip rates sourced from RTA NSW trip generation guideline for the proposed retail area of up to 500m^2 NLA and commercial area of up to 500m^2 GFA within the Structure Plan area.

5.4.6 Projected Daily Volumes

The 2035 weekday peak hour traffic volumes at the key intersections were established by utilising the 2035 daily traffic projections and converting the daily traffic volumes to peak hour volumes. For the conversion of the daily traffic volume to peak hour volumes, it was assumed that the in/ out traffic split for the residential component of the traffic would be approximately 70%/ 30% during the weekday PM peak hour and reverse for the weekday AM peak hour.

The 2035 projected traffic volumes on Dampier Road and Madigan Road have been established by applying 2% traffic growth per year to the existing traffic counts on these roads.

Figure 18 – Anticipated daily traffic volumes

5.4.7 Proposed Intersection Treatments

Based on the projected traffic volumes and the proposed road hierarchy, the suggested intersection treatments for the amended Structure Plan are shown in Figure 19.

A roundabout is proposed at the existing left in/ left out intersection on Dampier Road to improve traffic circulation and traffic operations.

The northern intersection on Madigan Road is constructed as a left in only intersection as per the approved SP. The central and southern intersections on Madigan Road are proposed to operate as

priority-controlled T-intersections with appropriate turn lanes on Madigan Road. The posted speed limit along Madigan Road in the vicinity of the LSP central intersection on Madigan Road is 80kmh. The SIDRA layout modelled for the central intersection on Madigan Road includes left and right turn lanes of 125m which satisfies Austroads requirements for the design speed of 90kmh.

Roundabouts are recommended for the intersections adjacent to the local centre and also for the major intersections within the Structure Plan area. These roundabouts will provide for effective circulation and the control of speed along the major roads.

There are also several 4-way intersections within the amended Structure Plan that do not warrant the provision of the roundabouts. For these intersections, suitable threshold treatments including signage and line marking similar to the existing constructed 4-way intersection within the existing subdivisions are recommended on the minor roads.

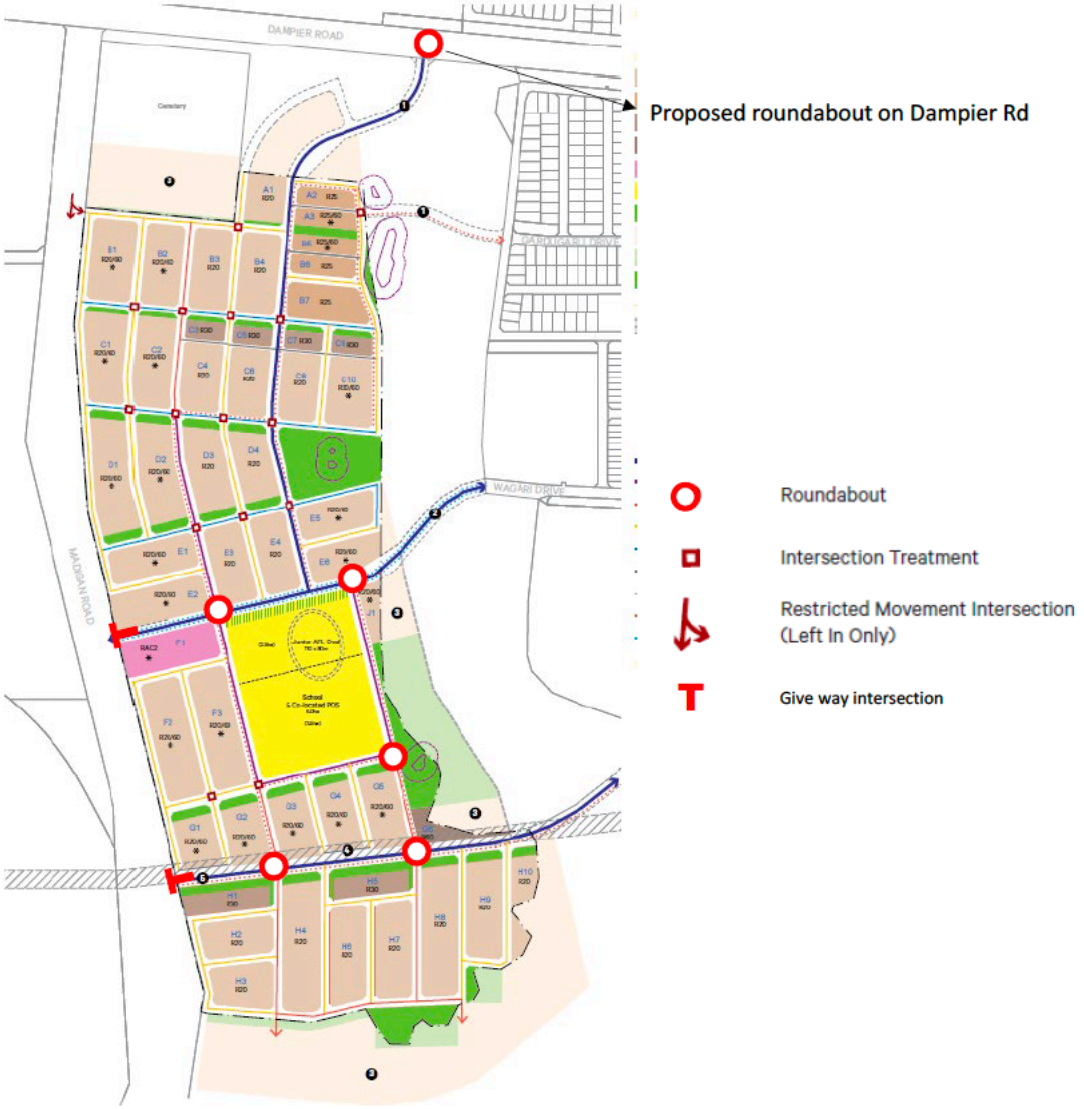


Figure 19 – Intersection treatments

5.4.8 Intersection Analysis

SIDRA intersection analysis was undertaken to assess the performance of the main access intersection on Dampier Road and Madigan Road at the ultimate stage of the development. The key intersections were analysed for the weekday AM and PM peak hours in 2035 being the year in which full development of the Structure Plan area will be attained.

SIDRA is an intersection modelling tool commonly used by traffic engineers for all types of intersections. SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- Degree of Saturation (DoS): is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for varied traffic flow up to one for saturated flow or capacity.
- Level of Service (LoS): is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- Average Delay: is the average of all travel time delays for vehicles through the intersection.
- 95% Queue: is the queue length below which 95% of all observed queue lengths fall.

The SIDRA analysis results indicate that the roundabout intersection on Dampier Road would operate satisfactorily with overall level of service A during the AM and PM peak hours in 2035 with minimal queues and delays on all approaches of the roundabout intersection.

The SIDRA analysis results indicate that the main intersection on Madigan Road (central intersection) would operate satisfactorily at an overall LoS A or B in 2035 during the AM and PM peak hours and with minimal queues and delays on all approaches of the intersection. The southern intersection on Madigan Road is also expected to operate satisfactorily as it would carry less traffic than the central intersection. However, the same intersection layout is also proposed for the southern intersection on Madigan Road.

5.5 Lot Layout

This Structure Plan Amendment provides diverse residential lot types and sizes to cater for a range of household types and lifestyles. Generally, lot types have been distributed based on providing higher densities around the local centre, primary school and high amenity Public Open Space areas.

The design of the amended Structure Plan ensures lots will front onto and overlook public realm areas facilitating passive surveillance and assist in creating a safe and attractive pedestrian oriented urban environment. Lots fronting open space and drainage areas are generally serviced via front loaded lots, however there are a small number of park-fronted lots which are accessed from rear laneways.

The allocated density provides for diverse residential lot types and sizes to cater for a range of household types and lifestyles. The following table identifies the lot configurations envisaged under each density code for single residential lot development.

Table 10 – Proposed lot configuration

Density	Average Area Required	Average Area Provided
R20	450m²	560m²
R25	350m²	427m²
R30	300m²	337m²
R60	150m²	141m²

The following table summarises the potential lot yield that may be generated under the Structure Plan Amendment. In the case of split coded sites, the potential lot yield has been calculated based on development at the lower density (as development at the higher density (R60) is presumed to be

multiple dwelling development contained on a single strata titled lot). Land parcels coded R60 and R-AC2 has been assumed as individual lots.

Table 11 – Proposed single residential lot configurations

Density	Lot Type	Potential Number of Lots
R20	Single Dwelling	484
R25	Single Dwelling	30
R30	Single Dwelling	38
R-AC2	Multiple Dwelling	1

5.5.1 Climate Responsive Design

The amended Structure Plan design is influenced by DevelopmentWA's *Climate Responsive Design Policy* for the North-West of Western Australia which also informs the principles adopted under the Madigan Estate Design Guidelines which was developed in 2019.

The climate responsible design aims under the Structure Plan Amendment are to:

- Reduce the need for mechanised, energy dependent air-conditioning devices.
- Sustain and increase thermal comfort for occupants.
- Maximise liveability through access to natural light, natural ventilation and natural climate control.
- Preserve and enhance the relationship between internal and external living areas.

Several principles contained within the document have been incorporated into the design and development of the plan with particular consideration given to ensure a good site responsive lot orientation is achieved.

The north-south orientation of the street network allows for predominantly east-west oriented lots which can facilitate house designs that capture Karratha's cooling breezes from the west, north-west in the summer evenings and the east, north-east winter breezes.

In addition to good lot orientation, several other climate responsive design principles are incorporated within the design guidelines and the LDPs to guide new development. These include the provision of appropriate setbacks and the location of outdoor spaces to assist with capturing breezes and cross ventilation of dwellings and the provision of adequate shading through elements such as eaves and landscaping treatments.

5.5.2 Public Parkland

The provision of parkland within the existing Structure Plan was originally informed by the Karratha CGP and Liveable Neighbourhoods. The design recognises the floodway to the east and the Karratha Hills to the south will be protected as regional open space. District playing fields are proposed to the west under the CGP and formal active space is co-located with the primary school. The amenity afforded by these areas has been captured and integrated into the development through the creation of a street and open space network that link directly to these spaces.

Public Open Space within the development is arranged to complement these areas whilst providing easy pedestrian access across the community. The Public Open Space and Drainage corridors form a linear park system that provides a network of paths linking areas of activity.

Public Open Space within the development will be landscaped to provide for an appropriate mix of active and passive recreational opportunities within easy reach of residents. Drainage swales will be landscaped to provide visual interest whilst conveying water during storm events.

The landscape approach to development of parks will be to provide a low water use, low maintenance and management environment that will accommodate passive and more formalised active recreation within a self-sustaining vegetation structure.

5.5.3 Open Space

This Structure Plan Amendment proposes a combination of landscaped parklands, open space corridors and active spaces comprising 7.11ha of the site, representing 12.5% of the Gross Subdividable Area. This is either reserved for Public Open Space or drainage purposes or co-located with the Primary School.

The Public Open Space has been designed and located to act as focal points within the development, enhancing local identity and sense of place. Some of these areas include a small drainage function deducted from the POS calculations) and are located:

- A parkland of approximately 1.12ha situated to the north-east of the development abutting the open space reservation to the east to act as a buffer to an archaeological site.
- A parkland of approximately 2.39ha abutting the open space corridor to the east of the site.
- A group of parks of approximately 1.17ha situated to the south-east of the development and abutting the open space corridor to the east of the site.

The various open space corridors throughout the development have been strategically located to provide visual connections to the parklands. These areas will be landscaped to provide passive recreational opportunities and facilitate pedestrian movement through the area in addition to facilitating the conveyance of stormwater through the site. Given the shallow depth (500mm) of these drainage areas it is anticipated that they will provide a passive recreational purpose for most of the year when they will be dry. These open space corridors will incorporate best practice urban water management principles in accordance with LN.

The overall the amount of open space provided in the Structure Plan area amounts to 7.11ha or 10.5% of the Structure Plan area. The amount of open space reserved as Public Open Space amounts to 3.69ha, whilst the amount of open space required for drainage reserves amounts to 3.42 ha.

Since Public Open Space comprises 3.69ha or 6.5% of the Gross Subdivisible Area, the development complies with the permitted regional variation of a minimum of 5% unconstrained open space under Element 4, R34 of the LN requirements. Element 4, R34 of LN allows for a minimum Public Open Space contribution of 5% of the Gross Subdivisible Area for regional areas subject to:

- The Public Open Space being designed developed and located for the widest possible use of the community, readily available for day and night use and developed to a minimum standard (full earthworks, reticulation etc) in accordance with a landscaping plan.
- Adequate areas provided elsewhere for drainage and flooding.
- The Public Open Space does not contain any restricted uses.

The Public Open Space contribution provided under the Structure Plan Amendment meets these requirements for the following reasons:

- The total Public Open Space contribution comprises 6.5% of the gross subdivisible area.
- The 51.9% Public Open Space contribution is unencumbered by drainage and/or areas of land for flooding, which have been provided elsewhere as additional open space areas within the development.
- The public open space contains archaeological sites which restrict uses but still greater than 5% unencumbered POS area is provided. The POS will be designed and developed to a high standard for the widest possible use of the community.

The following table summarises the Public Open Space contribution for the site.

Table 12 – Schedule of Public Open Space Contributions

Density	Ha	Ha
Site Area		67.74
Deductions		
Public Purpose – Primary School	5.89	
Transmission Corridor (Easement)	1.70	
Drainage	3.42	
Total		11.01
Gross Subdivision Area		56.73
Public Open Space @ 5% (as per Element 4, R34)		2.84
Total Public Open Space Provided		3.69
Percentage of Gross Subdivisional Area		6.5%

5.5.4 Landscaping Strategy

The landscape approach to the development of parklands provides for low water usage and a low maintenance and management environment that will accommodate passive and more formalised active recreation within a self-sustaining vegetation structure.

Objectives for the new landscape include to:

- Create a liveable place.
- Create a sustainable lasting landscape (principal issues - water and management).
- Create new diverse urban landscapes that reinforce sub neighbourhood characteristics.
- Retain vegetation wherever practical.
- Promote the use of native, low water demanding plants.
- Provide strategies for the new landscape.
- Establish landscape corridors, links and greenways.
- Establish primary landscape character areas.
- Establish primary infrastructure and development levels that maximise the potential retention of vegetation.
- Pursue water harvesting, passive irrigation and integrated urban irrigation.
- Use natives as a dominant species in Public Open Space and public realm infrastructure.
- Minimise and discourage irrigated lawns and thirsty exotics.

The Landscape Approach

The development of the site will be a community living within a potentially harsh natural setting. The planning and design approach to landscaping will be to create an “enhanced natural” character of the site providing shade and “softening” vegetation throughout the area. The area will have distinctive landscape character sub-precincts created by street tree planting and the parks. The linear park system that incorporates the drainage links will be designed as an extension of the natural ephemeral flood route to the east of the site.

The approach to landscaping falls into two broad categories, “Public Open Space” and “Streetscapes”. The open spaces will form the dominant feature of the community with parks designed to provide recreational space and facilities within a strong vegetation structure. The streetscapes will present a different character and will include some drought tolerant non-local tree

planting in key locations as a highlight. The street planting will consist of individual plantings combined with groups of trees with shrub vegetation to side of end lots for wind reduction and aesthetics.

Public Open Space – the Parks

The Public Open Spaces are arranged to ensure the community has easy and direct access to parks. The linear park system accommodates a series of walks and cycle routes that link to provide diverse recreational routes and circuit walks throughout the community by providing paths along the drainage routes and streets connecting to parks.

The landscape design for the open spaces will adopt a landscape strategy of "Strings, Beads and Settings" to the provision of public open space.

- Strings being maintained movement routes.
- Beads, the intensively developed sites; and
- Setting, the native vegetation providing overall structuring element.

This approach limits maintenance and management while providing an achievable aesthetic that will provide attractive spaces throughout the community.

This strategy will deliver a maintainable, manageable, quality landscape that focuses maintenance and water requirements to key areas, creating an environmentally responsible landscape.

Strings

The maintained corridors will be paths and trails that ensure that residents have a safe series of recreational and destination routes. The linking of natural parkland will be well observed from adjacent housing that will afford a high level of natural surveillance. The strings will create "cool corridors" – shade walks around the community. The character of these linear spaces will draw on the native bush but will be presented with contemporary detailing of incidental seating areas and structures and the presentation of native vegetation in a bold and dramatic way. Linear features such as ephemeral streams will lead linear park users from one area to the next. Such features accept and celebrate the seasonal landscape changes. The plan provides a series of linking linear spaces that will be developed as extensions of the existing floodway, creating shady corridors that carry informal walking and cycling routes around the community, linking other park activity spaces.

Beads

The beads are nodes of maintained and developed parkland providing destinations and local facilities. The specific facilities will be determined with the local authority but they will range from local play areas and activity areas to more active open kick-a-bout areas and will incorporate furniture such as seating and shade structures. The parklands may incorporate limited areas of usable managed lawns and introduced species that accept the conditions but are not locally native.

Setting

The major component of the open space network will be the setting, which will create the dominant landscape of the community. The setting will comprise new areas of recreated native landscapes that are planned and designed to provide a quality aesthetic. The setting will be low maintenance, with the more intensive maintenance and irrigation being focused only on the strings and beads. The landscape will create a strong visual and physical indigenous landscape that uses native plants and local materials counterbalanced with contemporary design and a bold use of colours drawn from the inherent colour palette of the local environment. Wherever practical, drainage will be integrated within the landscape to provide passive irrigation.

The landscape approach recognises the importance of the native vegetation and the value that a strong "enhanced natural" landscape structure creates as a recreational, aesthetic and functional local environment. It is anticipated that the design of these areas will incorporate a natural approach to the ground and utilise stones and gravels as mulches and finished surfacing.

Streetscapes

In addition to the structuring open space landscape, the streetscape of the development areas will play a critical role in defining the neighbourhood identity. The structuring streetscape will also utilise native species augmented in selected locations with Australian natives and in some areas selected exotics.

The plant range will be drawn from species that are tolerant of the local site conditions, and which are low water users.

A diverse streetscape hierarchy is proposed that creates distinctive places ranging from informal street planting to formal avenues of large trees with monocultures of native ground covers. The need to facilitate solar access to selected streets and spaces will dictate species selection. It is intended that each sub neighbourhood within the development has a distinctive character that is created from the relationship to open space and street tree planting.

The landscape treatment of the streets will reinforce the hierarchy of roads. Species, planting types and verge treatments will create a diverse range of experiences and integrate drainage within the landscape.

Water Harvesting, Passive Irrigation and Integrated Urban Irrigation

A water supply strategy for the new landscape is considered essential as without having a strategy for the delivery of water to the area for landscape purposes, the development will be bound into a non-sustainable approach to the production of the new public realm environment.

All public realm landscapes require water. To ensure that adequate water is available for the establishment and ongoing health of the new urban landscape, two strategic responses are proposed:

- water harvesting and passive irrigation.
- integrated urban irrigation.

These two engineering approaches will complement the use of native and low water demanding species as the dominant landscape trees in the urban landscape.

Water Harvesting and Passive Irrigation

Within the Structure Plan area, the planning of surface water drainage at the local development plan level incorporates drainage management techniques that facilitate the passive seasonal irrigation of public open space and verges. The management of drainage and infiltration measures should be designed to allow for the passive irrigation of general amenity grass areas and structural landscape planting.

Integrated Urban Irrigation

The development of a coordinated urban irrigation strategy using water that is produced by the urban community is considered essential for this location. The opportunity exists to reuse wastewater on a district level and to plan this in from the beginning. District level urban irrigation utilising a reticulated recycled water supply to public landscapes will be pursued as a strategy. Interim provision of water may be required until an integrated system is achieved.

Natives as a Dominant Species in Public Open Space and Public Realm Infrastructure

It is proposed that low water use native vegetation will form the dominant species in all public realm landscape. Species will not generally be local provenance types as the existing species on site may not be appropriate for the urban situation where shade and stature are characteristics that are sought. Other native but not local species, appropriate to the modified urban environment are capable of creating a sustainable vegetative structure across the site. The dominant native structuring landscape will be contrasted around activity nodes and on key streets with species that are aesthetically contrasting but still capable of establishing in the prevailing environment.

The harsh environment limits the landscaping approach quite significantly. Plants will need to be largely native in order to survive the conditions of the area, and to reduce the need for irrigation.

Refer to Appendix H: Indicative Tree Species List prepared by TPG Town Planning and Urban Design.

5.6 Urban Water Management

A detailed Local Water Management Strategy (LWMS) has been prepared by JDA Consultant Hydrologists, as amended in 2025, and is attached as Appendix B.

Refer to Appendix B – Local Water Management Strategy (as amended in 2025) and Revised Flood Study

JDA has updated the previous Madigan Creek Flood Study, originally prepared in 2012. The revised flood study incorporates updated Australian Rainfall and Runoff (ARR2019) methodology and revised Bureau of Meteorology Intensity-Frequency-Duration (IFD) data.

The revised flood modelling indicates that on average the 1% Annual Exceedance Probability (AEP) flood level of Madigan Creek is generally 100mm lower than previously modelled. These levels are to be adopted for further detailed earthwork and drainage design during subdivision and be presented in an Urban Water Management Plan.

The DWER previously expressed its support for this revised version of the Madigan Creek Flood Study being suitable for understanding the impact of the proposed development (as modelled) on flood behaviour in Madigan Creek and for consideration of appropriated development levels within the Structure Plan area.

The amendment to the LWMS prepared in 2025 confirm that minor amendments to the existing Structure Plan, such as the incorporation of the primary school site, will result in only a minimal change in rainfall runoff and will not therefore alter the principles and objectives of the LWMS or stormwater runoff management.

The document includes the principles, objectives and requirements of total water cycle management and a detailed description of the environmental conditions of the site. The capacity of the site to sustain development, including consideration of acid sulphate soils, impacts from groundwater and surface water, impacts on ecosystems and biodiversity and impacts on existing infrastructure is also examined.

The following table provides a summary of key elements of the proposed water management strategy for the site, with an assessment of the strategy in relation to Department of Water (2007) principal objectives for stormwater management in Western Australia (Section 1.2.4).

Table 13 – LWMS Key Principles and Elements

Principle	Key LWMS Elements
Water Quantity To maintain the total water cycle balance within development areas relative to the pre-development conditions	Maintain flow paths for existing catchments. Maintain 5yr, 20yr and 100yr ARI peak flows from the Study Area at or below current discharge levels. No lowering of groundwater levels. Maximise infiltration opportunities where possible.
Water Quality To maintain or improve the surface and groundwater quality within development areas relative to pre-development conditions	Use of treatment train approach to stormwater management. Application of source controls – including education to reduce nutrient application, use of native plantings and vegetated swales. Application of structural controls – retention/detention areas and vegetated swales.
Ecosystem Health To retain natural drainage systems and protect ecosystem health.	Maintain 5yr, 20yr and 100yr ARI peak flows from the Study Area at or below current discharge levels to the Madigan Creek east of the site.
Economic Viability To implement stormwater systems that are economically viable in the long term.	Use of proven structural Water Sensitive Urban Design (WSUD) technology. Use of source control techniques to minimise cost of nutrient management.
Public Health To minimise the public risk, including risk of injury or loss of life to the community.	Design in accordance with relevant design standards, best management practices, council regulations and government agency requirements.
Protection of Property To protect the built environment from flooding.	Identification of 100yr ARI flood levels for Study Area and ensuring lot levels are above this level. Protection of downstream areas by restricting stormwater discharge to existing levels for storm events up to 100yr ARI.
Social Values To ensure that social aesthetic and cultural values are recognised and maintained when managing stormwater.	Use of swales within public areas for stormwater conveyance. Integration of drainage and POS functions.
Development To ensure the delivery of best practice stormwater management through planning and development of high quality developed areas in accordance with sustainability & precautionary principles.	Urban water management in accordance with Better Urban Water Management (WAPC, 2008). Development of the LWMS in accordance with government agency guidelines and best management practice recommendations.

Implementation of the LWMS will be undertaken through the preparation of a detailed Urban Water Management Plan (UWMP) under relevant conditions of subdivision. The UWMP will be submitted by the developer to the DWER and the City of Karratha as required and will address:

- Detailed stormwater management design including the size, location and design of swales, integrating major and minor flood management capability, landscape plants for the swales as related to stormwater function, specific details of local geotechnical investigations and their impact on stormwater design.
- Detail measures to reduce velocity of stormwater discharge to prevent erosion and sediment transportation.
- Management of groundwater levels, and if any proposed dewatering is necessary.
- Agreed/approved measures to achieve water conservation and efficiencies of use including sources of water for non-potable uses and detailed designs, controls, management and operation of any proposed system.

- Management of sub-divisional works (management of soil/sediment including dust).
- Implementation plan including monitoring program, roles, responsibilities, funding and maintenance arrangements. Contingency plans should also be indicated where necessary.

5.7 Bushfire

Eco Logical Australia has prepared a Bushfire Management Plan (**BMP**) in support of the proposed Structure Plan Amendment. The BMP notes that the entire Structure Plan area is within a designated bushfire prone area as per the Western Australia State Map of Bush Fire Prone Areas (DFES 2024) which triggers bushfire planning requirements under State Planning Policy 3.7 Bushfire.

Refer to Appendix D – Bushfire Management Plan

The BMP has been prepared as a strategic guide to demonstrate how development compliance will be delivered at future planning stages in accordance with the guidelines. The BMP outlines a range of bushfire protection requirements (acceptable solutions) including:

- All buildings to be located in areas subject to a BAL of BAL-29 or below.
- Nine proposed vehicular access points throughout the Structure Plan area (well in excess of the minimum of two).
- Connection to reticulated water supply.
- No battleaxe lots or emergency accessways are proposed as part of the development.

A BAL assessment has been undertaken, and the report notes that as clearing will be undertaken within the site for development purposes, pre-development BALs are subject to change.

The current on-site vegetation extent is not considered to present a bushfire hazard post-development, as such hazards can be managed through a staged clearing process, adequate separation of built assets from classified vegetation and ongoing fuel management.

The BMP concludes that the bushfire hazards within and adjacent to the Structure Plan area are readily manageable through standard management responses and compliance with acceptable solutions as outlined.

5.8 Utilities

5.8.1 Water Supply

The Structure Plan area is located within the current boundary of the Water Corporation's Water Supply Scheme and overall planning for the scheme has made provision for future residential development in the Structure Plan area.

Reticulation size pipework was extended to the site as part of the Stage 1 subdivision, extending from Dampier Road and Gardugarli Drive (Baynton West) to service the initial stages of subdivision of the site. Further upgrades to the water supply network will be progressively required to facilitate the broader stages to the completion of the estate. Water reticulation extensions will be required including the extension of DN200 water reticulation main in Wagari Road across Madigan Creek and a 370m extension of the DN150 water reticulation main in Madigan Road to the proposed Madigan Road and Wagari Road intersection.

5.8.2 Wastewater

The Structure Plan area falls within an existing sewer reticulation area and is located within the wastewater catchment area for the existing Wastewater Pumping Station (**WWPS**) located at Seven Mile Creek along Dampier Road (Karratha WWPS No. 10 – Dampier Road).

Infrastructure for the wastewater pumping station includes a 300mm diameter gravity sewer crossing Madigan Road which was constructed simultaneously with Stage 1 subdivision works connecting the

northern part of the Structure Plan area and WWPS. Karratha WWPS No. 10 and pressure main was commissioned in 2016 and has sufficient capacity to facilitate the projected wastewater flows.

The Water Corporation's broad strategy for this catchment is to extend the existing 300mm diameter gravity sewer from Stage 1 through to future stages in order to service the remainder of the Madigan Estate.

5.8.3 Electricity Supply

The anticipated power requirement for the proposed residential subdivision is in the order of 6 MVA based on 600 lots and After Diversity Maximum Demand (ADMD) power allowance of 10kVA/lot. Based on the ADMD of 10kVA/lot in general one 630kVA transformer substation will be required to provide power services to 45 – 50 lots.

Substation finish ground level must be 1m above the 100-year flood level. This requirement may necessitate the substation area to be increased to incorporate batters or retaining walls around some substations to achieve the required level.

New underground power distribution, both high voltage (HV) and low voltage (LV), will need to be installed throughout future stages of subdivision to service each lot in the subdivision.

It is envisaged that based on a total electrical load in the order of 6 MVA this will require a minimum of two new dedicated HV feeders to be extended into the Structure Plan area from the Horizon Power zone substation. The nearest zone substation is Pegs Creek Substation.

The early stages of subdivision and development approvals within the Structure Plan area have resulted in the extension of a looped HV network off 400mm HV feeder cables in Dampier Road and additional extensions of HV underground power in anticipation of further staged development of the residential estate.

All power to the proposed subdivision will be underground and fed from transformers located strategically within the Structure Plan area. Approximately 4.7 kVa per residential lot is required plus a minimum 250kVa for a primary school.

Further reinforcement of the power network may be ultimately required to achieve full development of the Estate which can be reviewed at the subdivision stage.

There are also existing 132 kV transmission lines and poles that traverse the southern portion of the proposed development site in an east – west corridor. An appropriate easement will need to be established for the transmission lines which are mostly located within the proposed road reserve, but will interface with portions of future residential lots. This Structure Plan Amendment makes provision for an approximate 40 metre wide easement to accommodate the 132kV transmission lines, the creation of which is expected to be a requirement of a future subdivision stage.

5.8.4 Telecommunications

Early subdivision approval in the Structure Plan area included the installation of NBN Co pit and pipe network which will continue to be extended throughout the Structure Plan area on a staged basis. NBN assets were constructed to Dampier Road where fibre infrastructure was extended to the site with the remainder of the Madigan Estate located within NBN's rollout mapping. New stage agreements will be entered to facilitate subsequent staged connection works.

Future extension of pit and pipe infrastructure will occur to NBN requirements and enable NBN Co to draw fibre through the infrastructure. NBN Co will cover the cost of fibre deployment and any additional off-site extensions required to service the site, should it be required.

5.8.5 Gas

There is limited reticulated gas supply and demand within the Karratha region for residential consumption. Reticulated gas was not installed in the early subdivision stages of the Structure Plan area. It is not anticipated reticulated gas will be installed in the balance of the Structure Plan area.

5.8.6 Flooding

The site naturally sits about a metre below Baynton West to the east. The watercourse, Madigan Creek, that separates the two sites floods from time to time and in significant events it inundates parts of the site.

The areas subject to inundation can be filled such that they are above flood level but such filling may affect the dynamics of the currently projected flood mapping and may have an impact on the Baynton West site.

Significant flooding takes place east of the cemetery and part of this land would need to be filled if a road connection is made to Dampier Road. This filling may have a negative effect on available flood storage and could also impact on the Baynton West and flood levels in the Structure Plan area.

At the time of the existing Structure Plan approval, comprehensive flood modelling of Madigan Creek pre and post development was undertaken to determine likely flood and fill levels and to ensure the project does not impact on any existing developments. Flooding allowances of Madigan Creek allow for combinations of events such as 1% AEP, storm surge and anticipated sea level rise

The flood modelling study reviewed the benefits of providing additional culverts under Dampier Road and on land downstream of Dampier Road to reduce the amount of flooding upstream of Dampier Road.

Some of the benefits of providing additional culverts under Dampier Road were:

i) Reduced fill levels in the Madigan Road site and a reduction in the cost of imported fill.

ii) Land east of the cemetery being less flood-prone and therefore more suitable to possible future residential development.

In 2020, JDA updated the Madigan Creek Flood Study. The revised flood modelling indicated that on average the 1% AEP flood level of Madigan Creek is generally 100mm lower than previously modelled. These levels are to be adopted for further detailed earthworks and drainage design during subdivision and presented in an Urban Water Management Plan.

The approach adopted in the early subdivision stages of the Structure Plan area is to make provision for the conveyance of stormwater through the road carriageway. Stormwater is conveyed from lots and road reserves to open drains which in turn convey water to Madigan Creek then through Nickol Bay. Consistent with pre-development catchments and optimising earthworks for the estate, a minor portion of the Structure Plan area will drainage west to Madigan Road in accordance catchments agreed with Main Roads WA

In order to develop the site, sufficient open drains at each development stage are required to grade and convey stormwater towards Madigan Creek. Open drains created in drainage reserves through the subdivision approval are cost effective in conveying stormwater drainage and decreasing the extent of earthworks required to ensure the development site sits above the 1% AEP flood level of Madigan Creek.

5.8.7 Stormwater Management

As part of the development of the site, it is recommended the following be undertaken.

i) A drainage system be developed that will collect and convey stormwater with minimal nuisance, danger or damage which meets DevelopmentWA's objectives of being financially, socially and environmentally acceptable to the community as a whole. The system should also limit flooding of property, both within the catchment and downstream to acceptable levels.

ii) The retention of the natural watercourse east of the site in its existing state.

iii) The establishment of a range of road cross- sections and verge treatments throughout the project which are safe, aesthetically pleasing and have the capability of conveying stormwater with the overall objective of minimising the length of wide, 'engineered', open channels.

Some wide open channels will inevitably be required but the objective should be to minimise the prevalence of these. It is considered this could potentially be achieved by increasing the distance over which stormwater must travel, prior to arriving at more substantial drainage infrastructure, by increasing the capacity of the road system to carry water through the use of landscaped, shallow swale drains and the like.

The current approach to drainage is very cost effective and any alternative is likely to be more expensive and potentially require more land to be set aside for road reserves. However, the additional cost should be weighed up against the benefits it will bring to the community as a whole.

Considerable design inputs will be required to develop revised drainage treatments which take into consideration erosion, scouring, siltation, maintenance, cost, landscape, hydraulic and safety matters.

It should also be recognised that there are drainage guidelines which are intended to limit the depth and rate of flow of stormwater and road reserves for the convenience and safety for pedestrians and vehicles. As a guide the product of the average velocity and average flow depth for the design flow rates should be less than 0.4m^2/sec.

The approach adopted in the early subdivision stages of the Structure Plan area is to make provision for the conveyance of stormwater through the road carriageway. Stormwater is conveyed from lots and road reserves to open drains which in turn convey water to Madigan Creek then through Nickol Bay. Consistent with pre-development catchments and optimising earthworks for the estate, a minor portion of the Structure Plan area will drainage west to Madigan Road in accordance with catchments agreed with Main Roads WA

In order to develop the site, sufficient open drains at each development stage are required to grade and convey stormwater towards Madigan Creek. Open drains created in drainage reserves through the subdivision approval are cost effective in conveying stormwater drainage and decreasing the extent of earthworks required to ensure the development site sits above the 1% AEP flood level of Madigan Creek.

5.8.8 Earthworks

The proposed earthworks strategy aims to manage site constraints such as flood requirements both internally and adjacent Madigan Creek, sewerage constraints and tie-in levels with surrounding existing infrastructure whilst minimising fill requirements. Flood levels within the site are the major constraint in the future development of the Structure Plan area and have accordingly determined the majority of the lots finished surface levels. Necessary siteworks will comprise clearing, earthworks and importation of structural fill to raise levels and construct residential lots above flood levels.

Earthworks will be required to provide suitable grades for the Structure Plan area drainage requirements. Import fill will be required to raise the site above the 1% Annual Exceedance Probability (AEP) event from the adjacent Madigan Creek. Earthworks levels in the northern part of the Structure Plan area generally range from RL16-18m AHD and have mostly been raised to clear flood levels from the adjacent Madigan Creek.

In order to ensure built form efficiencies and reduce overall housing construction costs, the earthwork strategy seeks to create flat level lots with minimal retaining wall terracing only where necessary.

The supply of import fill material within the Karratha region has a significant impact future subdivision and development. Typically, site classifications within Karratha will be Class M or Class H in accordance with AS2870-2011.

5.8.9 Road Noise

Madigan Road is classified under SPP5.4 as a 'State Freight Road' and accordingly, it is a potential source of road noise that impact on future residential and non-residential development in the Structure Plan area.

SPP 5.4 requires that the following noise targets be met for noise-sensitive land-use and or development within 300 metres of the road carriageway edge.

Table 14 - SPP 5.4 Noise Targets

Table 2: Noise targets

Proposals	New/upgrade	Noise targets		
		Outdoor		Indoor
		Day (L_{Aeq}(Day) dB) (6 am–10 pm)	Night (L_{Aeq}(Night) dB) (10 pm–6 am)	(L_{Aeq} dB)
Noise-sensitive land-use and/or development	New noise-sensitive land-use and/or development within the trigger distance of an existing/proposed transport corridor	55	50	L_{Aeq} (Day) 40 (living and work areas) L_{Aeq} (Night) 35 (bedrooms)

ND Engineering were commissioned to undertake the original acoustic assessment of the Structure Plan area and have prepared an updated Acoustic Report in March 2026.

Refer To Appendix E - Acoustic Report prepared by ND Engineering Consulting Engineers March 2026.

The revised 2026 report indicates that acoustic treatments are required for residential development in the Structure Plan area located proximate to Madigan Road.

It is understood through consultation with Main Roads WA that the treatment of the northern end of Madigan Road adjacent to the Structure Plan area will be modified by Main Roads from a 14mm single chip single seal to a Dense Graded Asphalt treatment which has a +0.0 noise correction factor.

Accounting for the treatment of Madigan Road along with existing and predicted traffic volumes and road speed, future residential development proximate to Madigan Road requires the implementation of Quiet House Design treatments in accordance with SPP 5.4 Road and Rail Noise and its associated Guidelines.

Graduated Quiet House Design Packages, modified from SPP 5.4 Road and Rail Noise and the associated Guidelines, have been prepared by ND Engineering Consulting Engineers. Two Quiet House Design Packages, Package A and Package B have been developed to guide the construction of dwellings with appropriate acoustic ratings, depending on whether the built form is facing, side-on or opposite Madigan Road.

The Quiet House Design packages will be referenced in the LDP prepared for the Structure Plan area. Where alternative mitigation is proposed, it is expected that applicants will provide noise impact assessment that demonstrates appropriate noise mitigation can be achieved.

Non-residential uses are required to demonstrate internal noise levels accord with *AS 2107-2016 Acoustics – Recommended design sound levels and reverberation times for building interiors,* as demonstrated via an Acoustic Report provided as part of a future Development Application.

A notification, pursuant to Section 165 of the *Planning and Development Act 2005* is to be placed on the certificate(s) of title of the future lots affected by transport noise. The notification is to state:

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

5.9 Activity Centres and Employment

5.9.1 Type of Centre

This Structure Plan Amendment proposes a small local centre, serving as a central community focal point for the development. The centre intends to provide local retail and other services to serve some of the requirements of local community and facilitate local employment generation.

The local centre maintains a number of features important to ensuring the success of a local commercial centre as identified under LN being:

- a central location within a 400-500m walkable catchment.
- a location on an intersection of relatively busy streets with good through traffic levels.
- a location generally along the key traffic artery in the Structure Plan area.
- a location in close proximity to residential land uses, home-based business opportunities and the primary school.
- good on-street parking opportunities.

The centre has been strategically location along the primary east-west neighbourhood road and proximate to the primary school site, ensuring high visibility and good access.

The centre is envisioned to comprise a high standard 'Main Street' built form along the southern side of the road, incorporating environmentally sustainable design, active edges and attractive façades to provide visual amenity and interaction, pedestrian friendly streetscapes and passive surveillance of the public realm. Short term customer parking is envisaged to occur on the street with longer term customer and employee parking envisaged to be located to the rear of development with shared access arrangements.

5.9.2 Land Use Distribution

The land uses anticipated in the proposed local centre will be lower order commercial and retail uses which are typically located outside of a District Centre and will not compromise the development of the Tambrey District Centre or the efficient distribution of commercial services within the district.

The distribution of land uses within the centre has been structured around the creation of a Mixed Use Precinct. This Precinct is envisaged as an active focus for the community with a diversity of local retail, consulting rooms, entertainment and main- street commercial office uses that generate day and evening activity. To assist with maximising local vitality, upper floors of development will prioritise residential dwellings. Non-residential floorspace within the Precinct is proposed to be limited to 1000m^2 NLA with individual retail tenancies limited to a maximum floorspace of 500m^2 NLA. A 1000m^2 retail/ commercial floorspace limit is proposed to support limited fine-grained retail uses such as a small deli/supermarket, cafes and restaurants that can serve residents and local businesses within the Structure Plan area without competing with the Karratha City Centre or the Tambrey Neighbourhood Centre.

Buildings fronting the Main Street will be required to have a minimum ground floor ceiling level of the ground level of 3.2m at ground level to promote sustained commercial uses in the precinct. The mechanism to confront this timing is proposed to be via a LDP approved by the City of Karratha.

5.9.3 Employment Rates and Opportunities

The local centre will ultimately provide opportunities to facilitate local employment generation to assist in achieving a level of employment self-sufficiency within the development as well as contributing to diversifying Karratha's economy and employment base. Employment rates within the local centre are expected to be low primarily consisting of local business owners and employees.

In addition, the development will provide an additional population base which will support existing services and facilities within Karratha, as well as ensuring the continued economic growth of Karratha's primary commercial and retail centres.

5.10 Primary School

Following ongoing discussion with the Department of Education and the City of Karratha, a primary school site is proposed within the Structure Plan Amendment. The provision of land for a primary school site will accommodate future demand as a result of the growing residential catchment.

The school site is 3.5ha in area and will have frontage to four local roads. Public Open Space comprising a 2.5ha parcel of land will be co-located with the school site.

The school site accords with the requirements of the WAPC OP 2.4 – Planning for School Sites and LN on the following grounds:

- The school site is permitted to occupy a 3.5ha area given Public Open Space is co-located and incorporates sport or recreational facilities.
- Facilities and infrastructure essential to the functioning of the public open space are to be fully incorporated and contained on a separate adjoining open space lot or Crown reserve, supported by a shared use agreement between the Department of Education and the local government as to outline shared use, management, and maintenance obligations and cost sharing.
- The balance of the school site will be a POS reserve that will be vested in the Local Government. The primary school oval will be of sufficient size to accommodate a standard junior football oval (118m x 84m including overrun). The encroachment of the oval into the school site amounts to 1,385m^2.
- The school site is regular in shape and rectangular, maximising useable space.
- The topography has a gentle slope, is geotechnically sound, does not contain any features requiring excessive fill or earthworks or vegetation clearing and can be managed for flood and bushfire risk.
- The site is located centrally to the neighbourhood it services.
- It is serviced by four gazetted roads, with the northern boundary interfacing with an east-west arterial road (20.5m) and being serviced by cycle and pedestrian networks in accordance with section 3.5 of the Operational Policy.
- The site has no common boundaries with residential lots and no commercial land uses directly interface.

The following condition is expected to be imposed as a condition at the relevant future subdivision stage:

The landowner/applicant making a pro-rata contribution to the Department of Education towards the provision of land for a public primary school site(s) in accordance with the Western Australian Planning Commission's Operational Policy 2.4. This shall include arrangements being made:

a) for the transfer of land free of cost to the Crown for the provision of a public primary school site(s) as shown on the approved Structure Plan or within the proposed balance lot in future stages of subdivision. Arrangements being made for the transfer of land free of cost to the Crown for the provision of a public primary school site(s) as shown on the approved Structure Plan or within the proposed balance lot in future stages of subdivision.

Technical Appendices

Appendix A – Extension of Approval Period - Lot 500 Madigan Road Development Plan

Appendix B – Local Water Management Strategy prepared by JDA March 2011 (as amended 2025) and Madigan Creek Flood Study prepared by JDA March 2020

Appendix C – Transport Impact Assessment: Transcore January 2025

Appendix D – Bushfire Management Plan: Ecological May 2025

Appendix E – Acoustic Report: ND Engineering Consulting Engineers 20 March 2026

Appendix F – Geotechnical Report: Coffey Geotechnics November 2010

Appendix G – Engineering Services Report: Cossill Webley February 2021

Appendix H – Indicative Tree Species List