30 June 2025

RE: Lot 2 (15) Dempster Street, Port Hedland – Beachfront Village Structure Plan

This submission has been prepared to satisfy Condition 22 of Approval 2022/191, which requires the preparation and submission of a Structure Plan (and supporting technical documentation) for the subject site by 1 July 2025.

Condition 22 states:
"In recognition of the fact that the land is in an area for which the preparation of a structure plan is required and that this approval represents a temporary land use pending redevelopment in accordance with an approved structure plan, the landowner is to submit a structure plan and supporting technical documents as required by the Town in accordance with the Department of Planning Lands and Heritage Structure Plan Guidelines, Local Planning Scheme No. 7 and the Planning and Development (Local Planning Schemes) Regulations 2015 on or before 1 July 2025."

The submitted Structure Plan responds to this condition as follows:

- Prepared in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015*, the Town's Local Planning Scheme No.7 ('the Scheme), and the Department of Planning Lands and Heritage Structure Plan Framework.
- Includes all supporting technical documents requested by the Town and as required under the Scheme, covering environmental assessment, infrastructure servicing, traffic and transport, bushfire management, coastal hazard risk and water management.
- Provides a robust planning framework to guide future land use, subdivision, and development, transitioning the site from its current temporary land use approval towards a planned, redevelopment-ready state.

The key features of the Structure Plan include:

- Flexible, staged redevelopment framework enabling a mix of residential, accommodation, and mixed-use outcomes responsive to Port Hedland's market and community needs.
- Designation of an Environmental Conservation Reserve over the ~8,200m² coastal hazard area, aligning with SPP 2.6, the Town's CHRMAP, and LPP/07 – Coastal Planning.
- Acknowledgement that permanent development within the reserve is prohibited unless supported by future coastal and geotechnical investigations.
- Provides for temporary, low-impact, and adaptable uses within the reserve (e.g., relocatable accommodation, seasonal commercial activities, passive recreation).
- Establishes clear land tenure and management pathways for the Environmental Conservation Reserve, including private ownership with land use restrictions, management agreements, or vesting in the Town—all subject to Town and State agency approval.
- Incorporates provisions for infrastructure upgrades, pedestrian connectivity, foreshore amenity, and bushfire protection consistent with State and local planning frameworks.

We trust the enclosed Structure Plan and accompanying technical documentation address the Town's requirements and satisfy Condition 22. Should the Town require clarification or wish to arrange a workshop session to review key elements we would be pleased to assist.

Thank you for your ongoing support and guidance on this project. Should you have any queries, please do not hesitate to contact me.

Regards

Regional Planner

BEACHFRONT VILLAGE

Local Structure Plan

Lot 2 (15) Dempster Street
Port Hedland

Table of Amendments

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

Endorsement Page

It is certified that this Structure Plan was approved by resolution of the Western Australian Planning Commission on:

[Insert 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: [Insert Date]

Date of Expiry: [Insert Date]

Executive Summary

The Beachfront Village Structure Plan has been prepared in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015* and the Town of Port Hedland Local Planning Scheme No. 7 (the Scheme). It applies to Lot 2 (No. 15) Dempster Street, providing a framework to guide future land use, subdivision, and development across the site.

The Structure Plan's primary objective is to establish a flexible and adaptive planning framework that responds to local context, evolving market conditions, and community needs. It supports a variety of residential and accommodation typologies, alongside opportunities for mixed-use development. The plan is structured to enable staged delivery, allowing development to progress in line with infrastructure availability, funding capacity, and the redevelopment of surrounding landholdings. Ultimately, it aims to facilitate vibrant and sustainable infill development, enhancing housing diversity and precinct activation.

A key feature of the plan is the designation of an Environmental Conservation Reserve over approximately 8,200m² of land seaward of the 2120 Coastal Hazard Setback Line, consistent with the Town's Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) and State Planning Policy 2.6 – Coastal Planning (SPP 2.6). This area is recognised as being at long-term risk of erosion and storm surge, and is reserved for low-impact, temporary, or adaptable land uses only.

Land use and development provisions have been carefully calibrated to respect the function of the reserve. Permanent development is generally not supported unless justified by site-specific coastal and geotechnical investigations that demonstrate a comparable or reduced level of risk. Acceptable land uses within this area include relocatable accommodation or workforce accommodation, seasonal or pop-up commercial and recreational activities, passive open space, and community uses, such as event spaces or removable structures. The foreshore interface has also been sensitively designed to promote public access, pedestrian connectivity, and amenity, in alignment with CHRMAP principles.

Land tenure and future management of the reserve will need to be resolved as part of any future subdivision or development application. While SPP 2.6 typically requires land within identified hazard areas to be ceded free of cost, it also allows for alternative land tenure and management models, subject to the support of the Town and relevant State agencies. These options may include:

- Retaining land in private ownership with appropriate restrictions.
- Establishing a formal management agreement.
- Vesting the land in the Town of Port Hedland via a management order.

These mechanisms support transitional activation of the site, while remaining consistent with broader coastal adaptation objectives.

The Structure Plan is structured in three parts:

- Part One outlines statutory provisions, including zoning and land use controls
- Part Two details the planning context, site analysis, and design rationale
- Part Three includes technical appendices and plans that support and inform the plan's recommendations

In summary, the Beachfront Village Structure Plan strikes a deliberate balance between environmental protection, development flexibility, and community benefit, delivering a practical and adaptable framework for foreshore infill growth in Port Hedland.

PART ONE
IMPLEMENTATION

Part One Contents

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IMPLEMENTATION

Version	Date	Changes	Authorisation
0	25.11.2024	Drafting of document	SOL
1.0	26.05.2025	Final Draft for Review	SOL
1.1	23.06.2025	Peer Review	MM
1.2	26.06.2025	Final	SOL

Project No.: J484
Project Name: Beachfront Village Structure Plan
Prepared For:

Project Team:

Leighton Drafting	Planning & Design
Coterra	Design & Drafting
Oversby Consulting	Environmental Assessment
Linfire	Local Water Management
Flyt	Bushfire Management
Porter Consulting Engineers	Traffic & Transport
Whitehaus	Infrastructure & Servicing
	Architecture & Design

1.1 Structure Plan Area

The Beachfront Village Structure Plan (the 'Structure Plan') applies to the land delineated by the inner edge of the boundary shown in **Plan 1**. This area is located within the Town of Port Hedland and is generally bounded by Dempster Street to the south, Lot 1227 Keesing Street; the former Recreation Centre site to the west, the Indian Ocean foreshore to the north, and Lot 510 (No.19 and No.17) Dempster Street to the east. The site is legally identified as Lot 2 (No. 15) Dempster Street, Port Hedland.

Lot	Plan	Vol/Folio	Address	Landowner
2	82673	1954/448	15 Dempster Street, Port Hedland	

Table 1 –Lot Details

Under the Town of Port Hedland Local Planning Scheme No. 7 ('the Scheme'), Lot 1227 Keesing Street and Lot 2 Dempster Street are collectively designated as the "Former Recreation Club and Detention Centre Structure Plan Area," and zoned 'Urban Development'. However, this Structure Plan specifically applies only to Lot 2 (No. 15) Dempster Street, representing a portion of the larger structure plan area identified in Table 7 and Schedule 2 of the Scheme.

It is anticipated that the broader structure planning area (Lot 1227 Keesing Street) will be developed in stages as the adjoining landowner progresses its plans. In the interim, the Structure Plan considers the interface and integration between Lot 2 and the adjoining areas, ensuring a cohesive and seamless approach to redevelopment as the area evolves in the future.

1.2 Operation

The Structure Plan has been prepared in accordance with Town of Port Hedland Local Planning Scheme No.7 – Clause 32, Table 7 and Schedule 2 of the *Planning and Development (Local Planning Schemes) Regulations 2015 – Deemed Provisions*. It aligns with the objectives of Liveable Neighbourhoods and relevant state and local planning policies, providing a framework for future zoning, reserves, land use, and supporting infrastructure.

Pursuant to the Deemed Provisions, a decision-maker assessing an application for development approval or subdivision approval must have due regard to the provisions of this Structure Plan, including the Structure Plan Map, Implementation Report, Explanatory Report, and Technical Appendices.

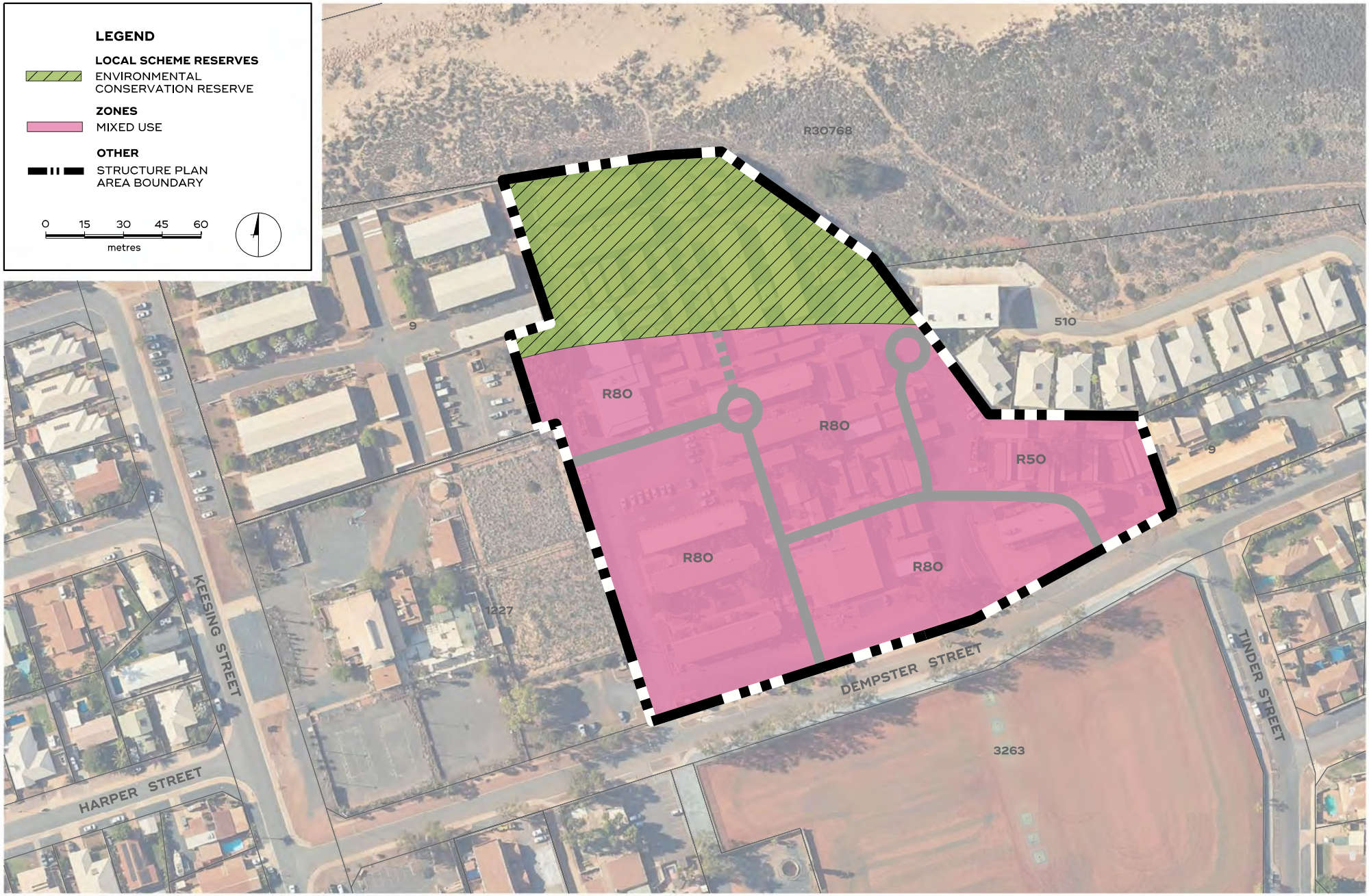
The plan is in effect from the date stated on the cover and for a period of 10 years (or for any other period approved by the Western Australian Planning Commission (WAPC)).

1.3 Structure Plan Content

The Structure Plan comprises:

- Part One – Implementation Report
- Part Two – Explanatory Report
- Part Three – Technical Appendices

Part One of the Structure Plan comprises the Map and supporting planning provisions. Part Two of the Structure Plan is the explanatory report component, which can be used to interpret and implement the requirements of Part One.



STRUCTURE PLAN MAP **PLAN 1**

1.4 Purpose

The purpose of this Structure Plan is to provide guidance on the subdivision and development of the former Detention Centre in Port Hedland at Lot 2 (No.15) Dempster Street, Port Hedland.

1.5 Staging

The delivery of development within the Structure Plan area is intended to be flexible and responsive, reflecting the cyclical nature of the Port Hedland economy and the importance of maintaining feasibility in an often-volatile market. Staging will be guided by landowner intentions, demand for different land uses, infrastructure availability, and the capacity to attract funding to deliver dwellings.

Unlike conventional structure plans that prescribe a singular, linear development pathway, this Structure Plan accommodates multiple development scenarios, ranging from medium-density residential to mixed-use and accommodation-led models. This enables the land to respond to shifting market conditions over time without requiring formal amendments to the plan.

Early stages of redevelopment will likely focus on areas that can leverage existing infrastructure and minimise upfront servicing costs. Future development stages will incrementally deliver key public realm enhancements, including improved pedestrian links, streetscape upgrades, and better integration with adjacent land uses and the foreshore reserve.

Importantly, the Structure Plan supports the continued interim operation of workforce accommodation facilities during early development phases. This ensures that an essential community asset remains available while long-term redevelopment is initiated and sequenced.

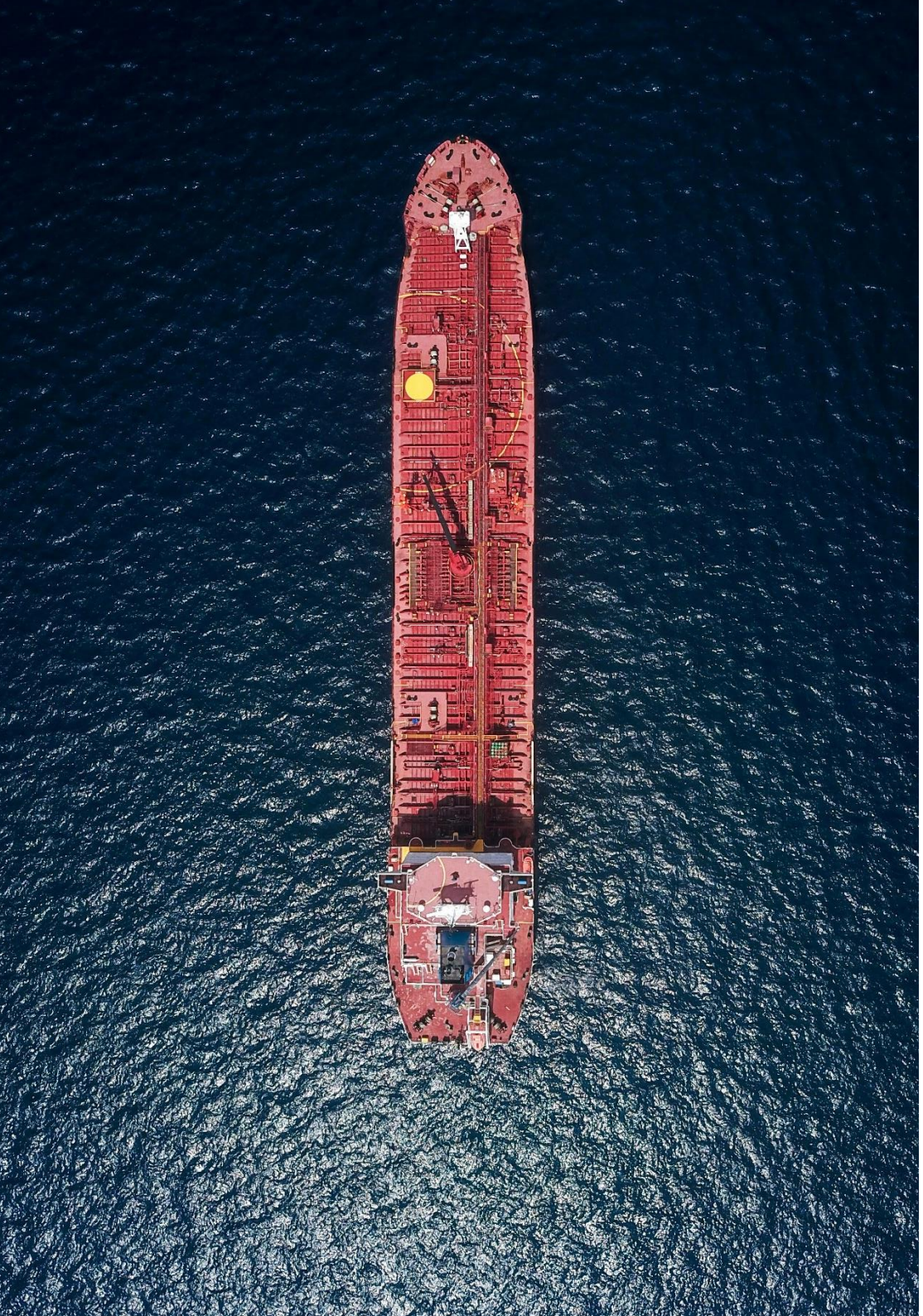
Each major development cell identified in the Structure Plan is expected to deliver:

i. New road and pedestrian connections in line with the Structure Plan's movement network.

ii. Improved interface treatments with adjoining land uses, particularly at residential boundaries and along Dempster Street.

iii. Publicly accessible elements such as activated frontages, shaded footpaths, or landscaped nodes that contribute to the broader amenity of the precinct.

Ultimately, staging will be refined and confirmed through subdivision and/or development applications, but the Structure Plan provides the flexibility needed to support both incremental and larger-scale redevelopment pathways, aligned with strategic objectives and community benefit.



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SUBDIVISION & DEVELOPMENT REQUIREMENTS

2.1 Zones and Reserves

Subdivision and development of land within the Structure Plan area shall be generally in accordance with the zones shown on the Structure Plan. Refinements to the extent of the zones shown are permitted at the subdivision stage subject to an appropriate level of technical justification being provided.

The Structure Plan proposes to apply two zoning/reserve categories to the site under the Scheme.

i. 'Mixed Use' zone, and

ii. 'Environmental Conservation' local scheme reserve.

Refer, Plan 1 – Beachfront Village Structure Plan Map

2.1.1 Mixed Use Zone

The 'Mixed Use' zone applies to the developable portion of the Structure Plan area. It enables a mix of residential, commercial and accommodation uses, subject to the objectives and provisions of the Scheme.

The objectives of the 'Mixed Use' zone under the Scheme, include:

- *To provide for a wide variety of active uses on street level which are compatible with residential and other non-active uses on upper levels.*
- *To allow for the development of a mix of varied but compatible land uses such as housing, offices, showrooms, amusement centres, eating establishments and appropriate activities which do not generate nuisances detrimental to the amenity of the district or to the health, welfare and safety of its residents.*

2.1.2 Environmental Conservation Reserve

The Environmental Conservation reserve applies to land located seaward of the 2120 Coastal Hazard Setback Line, as identified in the Town of Port Hedland Coastal Hazard Risk Management and Adaptation Plan (CHRMAP).

The objectives of the reserve under the Scheme, include:

- *To identify areas with biodiversity and conservation value, and to protect those areas from development and subdivision.*
- *To identify and protect areas of biodiversity conservation significance within National Parks and State and other conservation reserves.*

This area, approximately 8,200m², is intended to operate as a transitional zone, supporting interim or temporary uses until such time that coastal processes impact the land or further technical investigations justify a revised planning response. While State Planning Policy 2.6 – Coastal Planning typically requires land within identified hazard areas to be ceded free of cost at the time of subdivision, the policy also allows for alternative land tenure and management solutions, subject to the support of the Town of Port Hedland and relevant State agencies. Such alternatives may include:

i. Vesting the land in a public authority via a management order.

ii. Establishing a formal management agreement.

iii. Retaining the land in private ownership, subject to appropriate land use restrictions (e.g. conservation covenants or provisions in a Reserve Management Plan).

These arrangements ensure that site-responsive adaptation strategies can be applied, enabling continued use of the land in the short to medium term while maintaining consistency with the CHRMAP and SPP 2.6 objectives.

2.3 Land Use

Land use and development within the Structure Plan area shall generally be in accordance with the zones and reserves shown on the Structure Plan Map (Plan 1) and the provisions of the Scheme, unless otherwise provided for in this Structure Plan.

2.3.1 Mixed Use Zone

Land within the 'Mixed Use' zone is intended to support a combination of accommodation, residential, and compatible commercial uses, capable of responding to changing market conditions.

In addition to the land uses listed in the Scheme as permissible in the 'Mixed Use' zone, single houses and grouped dwellings may be considered as a 'D' use within this Structure Plan area where:

i. The development is of high design quality and delivers an appropriate interface with public and private domains.

ii. The development does not compromise the long-term intent for mixed-use outcomes.

iii. Adequate site planning, access and servicing can be demonstrated.

All proposals shall be consistent with the objectives of the zone and the intent of the Structure Plan to deliver a flexible and high-amenity precinct. It is anticipated that, upon incorporation of the Structure Plan into the Scheme (normalisation), single houses and grouped dwellings will be formally recognised as additional permissible uses.

2.3.2 Environmental Conservation Reserve

Land reserved for 'Environmental Conservation' under the Structure Plan corresponds with the area seaward of the 2120 Coastal Hazard Setback Line, as identified in the Town of Port Hedland Coastal Hazard Risk Management and Adaptation Plan (CHRMAP).

This ~8,200m² area is intended to function as a transitional zone, accommodating interim use until either coastal process render it unsuitable or further technical investigations are undertaken to reassess its suitability for development. While SPP 2.6 generally requires land identified within coastal hazard zones to be ceded free of cost at the time of subdivision, alternative approaches to land management may be considered where supported by the Town of Port Hedland and relevant state agencies. These alternatives may include vesting the land in a public authority through a management order or establishing a formal management arrangement to ensure the long-term temporary use of the land.

Where subdivision is not proposed over the affected portion of the site, the land may also remain in private ownership subject to appropriate land use restrictions, such as temporary land use and development and conservation covenants or limitations set out in a Reserve Management Plan. These options allow for site-responsive adaptation measures and the continued use of the site while maintaining alignment with the intent of the CHRMAP and State Planning Policy 2.6.

New development within this reserve shall be limited to non-permanent, low impact uses such as:

i. Temporary accommodation

ii. Temporary Workforce Accommodation

iii. Pop-up or seasonal commercial and recreational uses

iv. Passive recreation

v. Landscaping, shade structures, pathways and foreshore access infrastructure.

All proposals must be designed to be relocatable or capable of being decommissioned, in accordance with the Town's LPP/07 – Coastal Planning Policy.

2.4 Density and Development

Residential development within the Structure Plan area is to demonstrate a density distribution that aligns with **Plan 1 – Beachfront Village Structure Plan Map**. While the Structure Plan promotes higher density infill development, it also recognises the important role of accommodation in meeting the diverse housing and economic needs of Port Hedland.

Residential subdivision and development shall generally comply with the Residential Design Codes (R-Codes), except where validly varied through an approved Local Development Plan or development approval.

2.4.1 Density Allocation

The allocation of residential density within the Structure Plan is as follows:

i. An R80 applies to the central and south-western development sites, given their proximity to the central spine road and strategic frontage to Dempster Street. These areas are suited to higher density-built form, including apartment-style or hotel development, with potential for mixed use development at ground floor level to support street activation.

ii. A density code of R50 applies to the eastern development site, which is more suited to medium-scale residential or accommodation development. This designation ensures a sensitive interface with adjacent existing dwellings (also zoned R50) and supports a transition in built form scale across the site.

2.4.2 Minimum Dwelling Yield

In line with the Town of Port Hedland Local Planning Strategy, the Structure Plan seeks to deliver a minimum of 40 dwellings or an equivalent number of accommodation units across the Structure Plan area.

2.4.3 Finished Floor Levels

All new development within the Structure Plan must have finished floor levels 300mm above road and basin water levels and permanent structures must be above the coastal storm surge level of 78.8m AHD.

2.4.4 Lightspill

All future development is to proactively mitigate potential impacts of lightspill through lighting design which complies with Local Planning Policy 07 and the EPA Environmental Assessment Guideline No. 5 – Protecting Marine Turtles from Light Impacts.

2.5 Road Reserves

The proposed road network has been designed to improve permeability, access, and site integration across the Structure Plan area, as shown in **Plan 1 – Beachfront Village Structure Plan Map**. All internal roads are classified as 'Access Roads' in accordance with Liveable Neighbourhoods and are intended to support a low speed, pedestrian friendly environment, while maintaining functional vehicle access.

2.6 Public Open Space

No public open space (POS) is proposed within the Structure Plan area due to the site's constrained and isolated nature, which makes on-site POS provision impractical. The site adjoins the coastal foreshore, with approximately 8,200m² to be reserved for Environmental Conservation, providing direct access to high value coastal open space and supporting recreational and environmental amenity for future residents and the broader community.

2.7 General Requirements

2.7.1 Local Development Plans

At the subdivision stage, the WAPC may impose a condition of approval requiring the preparation of Local Development Plans for any part of the Structure Plan area to:

i. Provide coordinated guidance on built form, access, and other planning considerations for individual lots or groups of lots.

ii. Implement variations to State Planning Policy 7.3: Residential Design Codes (R-Codes) beyond those approved in this Structure Plan (as amended).

iii. Manage interfaces, particularly those adjoining the Environmental Conservation Reserve, interfacing with existing residential developments or Dempster Street.

The preparation of a Local Development Plan will be required as a condition of subdivision approval, where applicable.

2.7.2 Bushfire Protection

i. Development and subdivision on any part of the Structure Plan area that is identified as being bushfire prone on the map database maintained by the Department of Fire and Emergency Services (DFES) is required to comply with the relevant aspects of State Planning Policy No. 3.7: Planning for Bushfire-Prone Areas.

ii. No development is to occur within the 8-metre-wide Asset Protection Zone (APZ) which is to be established in accordance with the approved Bushfire Management Plan accompanying this Structure Plan, unless modified by a subsequent, approved Bushfire Management Plan.

2.7.3 Infrastructure Arrangements

Infrastructure necessary to service the subdivision and development within the Structure Plan area will be upgraded, modified, or extended, where applicable, as part of future subdivision and development.

2.7.4 Protection of Environmental Features

i. Any development within the Environmental Conservation reserve is to be in accordance with the Town of Port Hedland's Local Planning Scheme No.7 ('the Scheme') – Special Control Area No.7.

ii. Development within the reserve should be temporary in nature to prevent the establishment of permanent structures in areas susceptible to future coastal erosion, unless further technical investigations have been undertaken to determine otherwise.

iii. To minimise risks associated with coastal hazards, developments should be designed and sited to avoid areas identified as high risk in coastal vulnerability assessments. This may involve setting buildings back from identified hazard areas, elevating structures, or implementing protective measures.

iv. Subdivision and development proposals must ensure that infrastructure and services are designed to withstand potential coastal hazards. This includes considering the resilience of roads, drainage systems, and utilities to coastal inundation and erosion.

v. If new development is proposed that is not considered to align with the Town's adopted Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) and Local Planning Policy 07 – Coastal Planning, a CHRMP or other suitable technical investigations should be submitted to identify potential coastal hazards affecting the proposed development and outline

appropriate risk management and adaptation strategies to mitigate these risks.

vi. In respect of applications for subdivision of land, in accordance with Special Control Area No.7 of the Scheme, the Town shall recommend to the WAPC that a condition be imposed as part of a subdivision approval for a notification to be placed on the Certificate of Titles of applicable lots. The notification is to advise the following:

"Where subdivision applications are received within SCA 7, a notification pursuant to section 165A of the Planning and Development Act 2005 is to be placed on the Certificate(s) of Title of the subject land, at the cost of the landowner, advising that the lot is located in an area likely to be subject to coastal erosion and/or inundation over the next 100 years."

2.8 Additional Detail

The following provides detail of technical requirements at various approval stages.

Additional Information	Approval Stage	Responsible Agency
Urban Water Management Strategy/Urban Water Management Plan	Condition of subdivision approval.	Town of Port Hedland, Department of Water and Environmental Regulation (if required).
Environmental Conservation Reserve Management Plan	Condition of subdivision approval, or development approval (whichever comes first) for any part of the Structure	Town of Port Hedland
	Plan area abutting the Cooke Point foreshore.	
Bushfire Management Plan	In support of subdivision or development application.	Town of Port Hedland
Landscape Plan	Condition of development approval.	Town of Port Hedland
Construction Management Plan	Prior to commencement of subdivision or development site works.	Town of Port Hedland
Lighting Management Plan	Condition of subdivision approval, or development approval (whichever comes first).	Town of Port Hedland
Marine Turtle Management Plan	Condition of subdivision approval.	Town of Port Hedland, Department of Biodiversity, Conservation and Attractions (If required).
Geotechnical Report	Condition of subdivision approval.	Town of Port Hedland

Table 2 – Additional Technical Reports

PART TWO
EXPLANATORY REPORT

Part Two Contents

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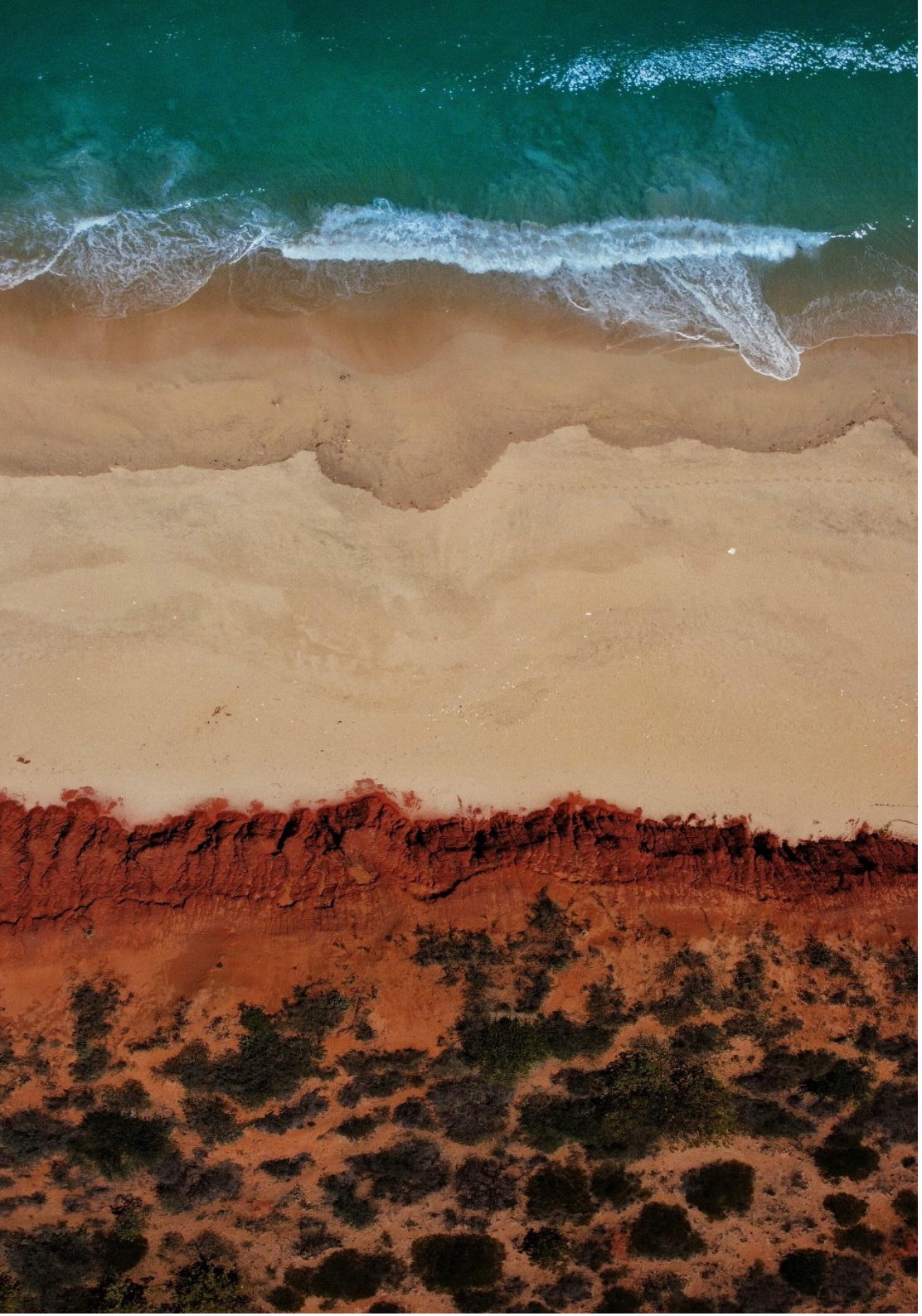


1

INTRODUCTION

The Beachfront Village Structure Plan (the 'Structure Plan') has been prepared on behalf of DA Campbell Property Holdings Pty Ltd for Lot 2 (15) Dempster Street, Port Hedland (the site). It has been submitted in accordance with the Town of Port Hedland Local Planning Scheme No. 7 (the Scheme), which requires a structure plan for land zoned 'Urban Development'.

The Structure Plan provides a coordinated planning framework to guide future subdivision and development, responding to the site's unique characteristics and broader strategic objectives. It aligns with the Western Australian Planning Commission's (WAPC) WA Planning Manual – Guidance for Structure Plans, and reflects the design principles of Liveable Neighbourhoods, the applicable policy for infill development.

The Structure Plan is presented in three parts:

Document	Purpose
Part One – Implementation Report	Includes the Structure Plan map and outlines the statutory planning provisions for subdivision and development assessment.
Part Two – Explanatory Report	Provides background analysis, key design outcomes, and a response to the site's opportunities and constraints.
Part Three – Technical Appendices	Contains supporting technical reports, plans, and studies.

Table 1 – Structure Plan Document

1.1 Purpose

This report provides the strategic and planning rationale for the Structure Plan, including:

- Analysis of the site's physical, environmental, and planning context.
- Identification of site opportunities and constraints.
- Summary of stakeholder engagement.
- Explanation of the design response and how it addresses the planning framework, site characteristics, and community feedback.

1.2 Background

The subject site at Lot 2 (No. 15) Dempster Street, Port Hedland, formerly operated as a workforce accommodation facility and later as an immigration detention centre, has remained largely underutilised since 2012. Acquired by DA Campbell Property Holdings Pty Ltd in 2022, the site was granted temporary planning approval in 2023 to accommodate workers (workforce accommodation) within existing buildings for a five-year period, expiring in 2028. This interim use has enabled the proponent to consolidate its operations while easing pressure on the local housing market by returning housing assets to market.

The Structure Plan has been prepared in response to the site's strategic location, its 'Urban Development' zoning under the Scheme, and the Town of Port Hedland's Local Planning Strategy, which identifies it as a short-term redevelopment priority. The Structure Plan facilitates a long-term vision for a mixed-use redevelopment that responds to site constraints, such as coastal hazard risks and ageing infrastructure, while supporting broader housing and economic demand in Port Hedland.

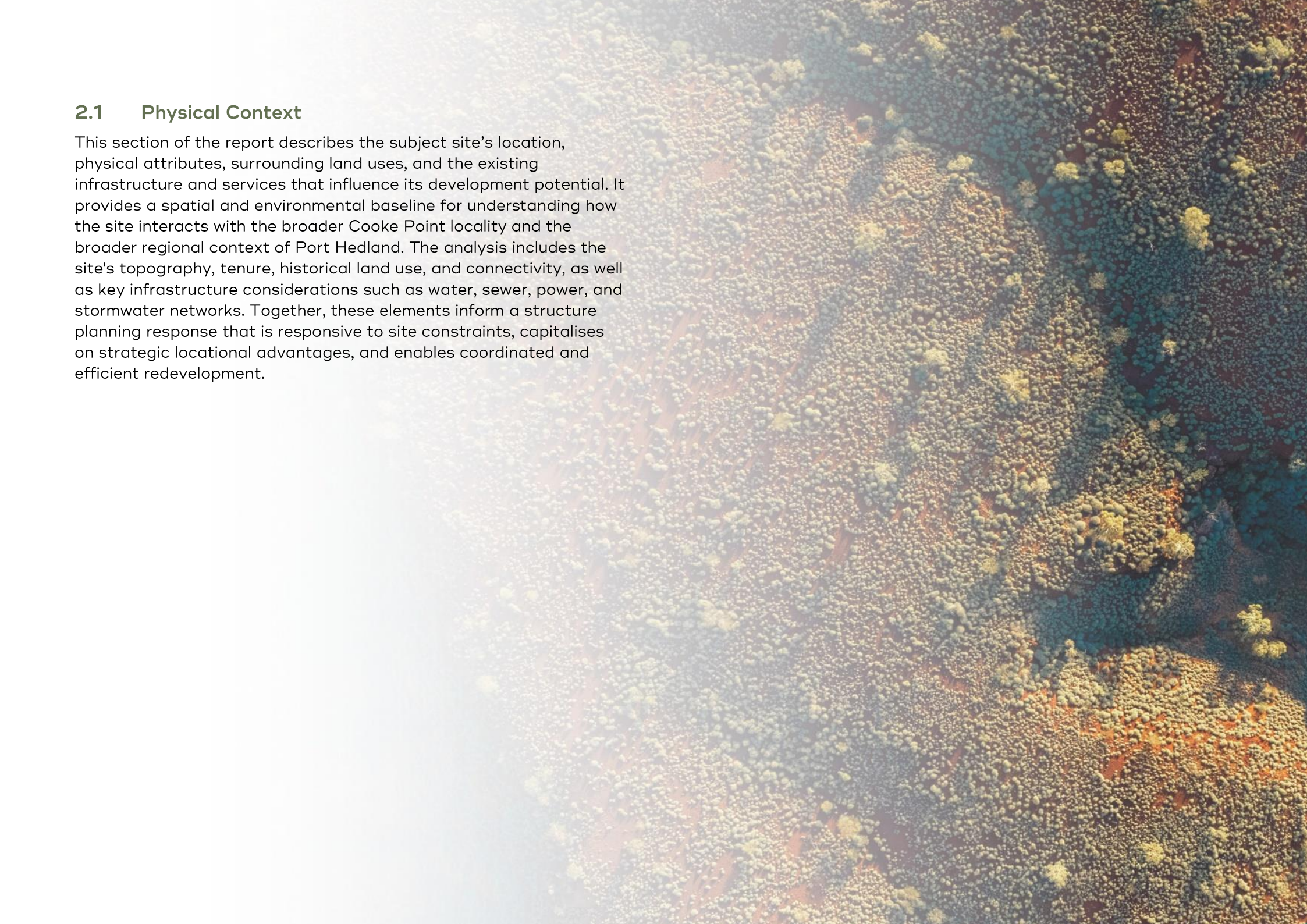
SITE PLAN **FIGURE 1**

2

SITE CONTEXT & ANALYSIS

2.1 Physical Context

This section of the report describes the subject site’s location, physical attributes, surrounding land uses, and the existing infrastructure and services that influence its development potential. It provides a spatial and environmental baseline for understanding how the site interacts with the broader Cooke Point locality and the broader regional context of Port Hedland. The analysis includes the site's topography, tenure, historical land use, and connectivity, as well as key infrastructure considerations such as water, sewer, power, and stormwater networks. Together, these elements inform a structure planning response that is responsive to site constraints, capitalises on strategic locational advantages, and enables coordinated and efficient redevelopment.



2.1.1 Location

The Structure Plan area is located at Lot 2 (No. 15) Dempster Street in the coastal suburb of Cooke Point, Port Hedland.

Regional Context

The site lies in Cooke Point, one of Port Hedland's two main residential centres. Located in Western Australia's Pilbara region, Port Hedland is a globally significant mining and logistics hub, centred around the world's largest bulk export port.

The site is:

- 1.5 km north-east of the Port Hedland town centre.
- 2.7 km north-east of the Boulevard Shopping Centre.
- 8 km north of Port Hedland International Airport.
- 17 km north of South Hedland, the Town's secondary centre.
- 6 km east of the Port of Port Hedland.

Despite its remote location, Port Hedland is a critical node in national and international supply chains. Its strategic role drives population fluctuations, infrastructure investment, and urban development. Regional planning frameworks (e.g. the Pilbara Planning and Infrastructure Framework and State Planning Strategy 2050) support densification in established centres like Cooke Point.

The site's coastal outlook, central location, and proximity to existing amenities make it well suited for residential infill, coastal accommodation, and urban renewal. Its adjacency to both long-term housing and strategic redevelopment sites reinforces its urban integration potential.

Site & Surrounds

The site comprises a single land parcel with a total area of 3.23 hectares. It features a 215 metre frontage to Dempster Street along its southern boundary and shares approximately 160 metre of boundary with the adjoining foreshore reserve to the north. Situated within a transitioning urban precinct, the site is surrounded by a mix of residential, community, recreational, and undeveloped land, reflecting Cooke Point's shift from institutional legacy uses to a modern urban infill area.

Direction	Context
North: Indian Ocean Foreshore (Crown Reserve R 30768)	Managed by the Town of Port Hedland for conservation and recreation. This area features vegetated dunes, informal walking tracks, and natural habitat, and is subject to coastal hazard constraints under Special Control Area 7 (SCA7). It provides opportunities for enhanced public access and passive recreation.
East: Established Residential Area	The eastern boundary adjoins two residential lots at No. 17 and 19 Dempster Street. These low-density homes set the context for privacy and amenity, guiding the scaling of density across the Structure Plan area to ensure appropriate interface.
South: Dempster Street Corridor	A local road with existing footpaths and on-street parking. Adjoining land uses include a mix of residential dwellings, vacant sites, and community facilities, some zoned Mixed Use. The street offers potential for activated frontages and walkable connections to surrounding amenities
West: Old Recreation Centre Site (Lot 1227 Keesing Street)	Currently vacant, this site is identified for future redevelopment. While outside the Structure Plan area, its adjacency is acknowledged through provision for future vehicle and pedestrian linkages to support integrated precinct planning.

Table 2 - Site Context.

This locational context positions the site as a logical infill area, with strong potential to deliver diverse housing, accommodation, and small-scale commercial development within a walkable, amenity rich coastal setting.

Source: National Museum of Australia

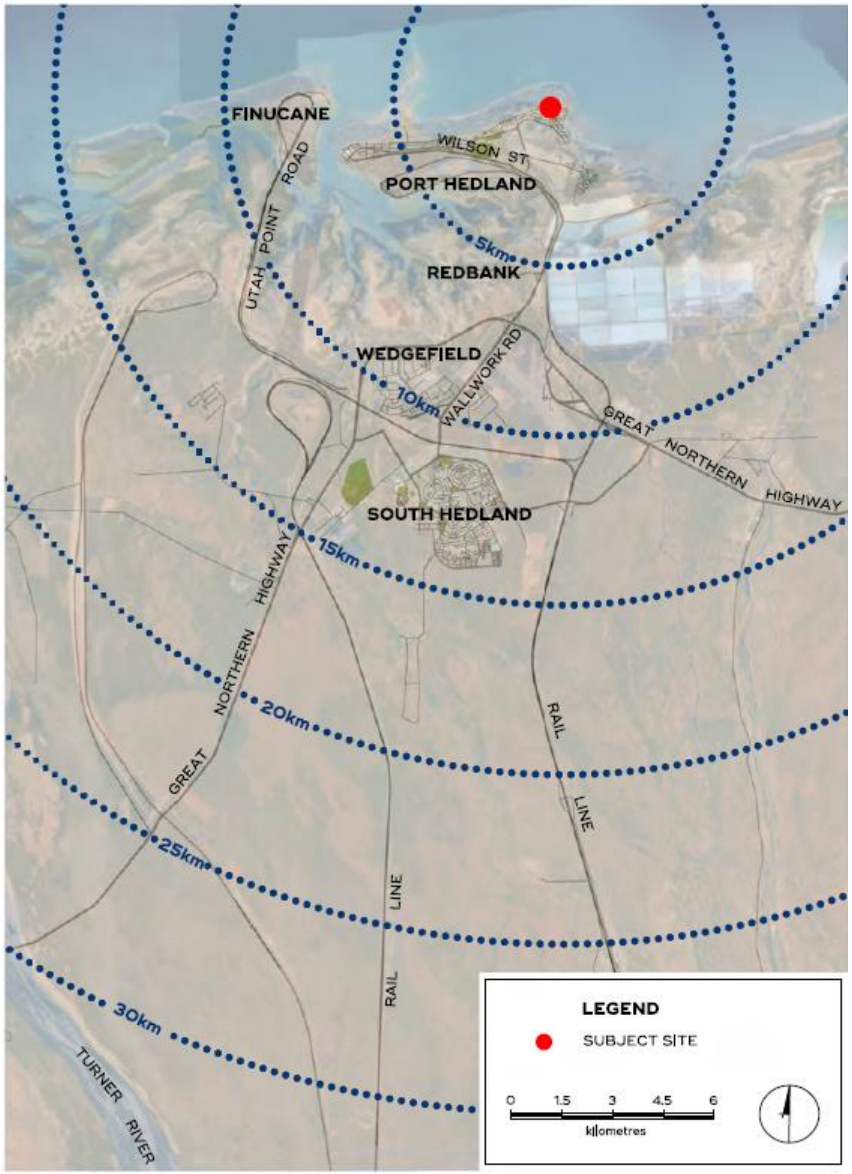


Figure 2 - Regional Location.

Site Tenure

The Beachfront Village Structure Plan applies to a single freehold lot—Lot 2 on Deposited Plan 82673, located at No. 15 Dempster Street, Port Hedland. The land is owned by DA Campbell Property Holdings Pty Ltd and is formally registered as follows:

Landowner	Lot No.	Diagram/Plan	Volume	Folio
DA Campbell Property Holdings Pty Ltd	2	D82673	1954	448

Table 3 – Title Details.

The land is zoned 'Urban Development' under the Town of Port Hedland Local Planning Scheme No. 7 ('the Scheme') and forms part of the Former Recreation Club and Detention Centre Structure Plan Area identified in the Scheme. While this Structure Plan applies solely to Lot 2, it considers adjoining land parcels to ensure coordinated integration and future staging.

Surrounding land ownership includes:

West: the former Port Hedland Recreation Centre (Lot 1227 Keesing Street), owned by a private entity Proprietor. Identified in the Local Planning Strategy as an infill opportunity and potential staging partner for redevelopment.

North: vested in the Town of Port Hedland for conservation and recreation. The reserve is within a designated coastal hazard Special Control Area (SCA7) and presents an important environmental and public interface.

East: privately owned R50-zoned residential lots that form a sensitive low-density residential interface requiring careful design consideration.

South: Fronting Dempster Street and directly opposite the site is a single, BHP-owned parcel that has been recently demolished and is currently vacant.

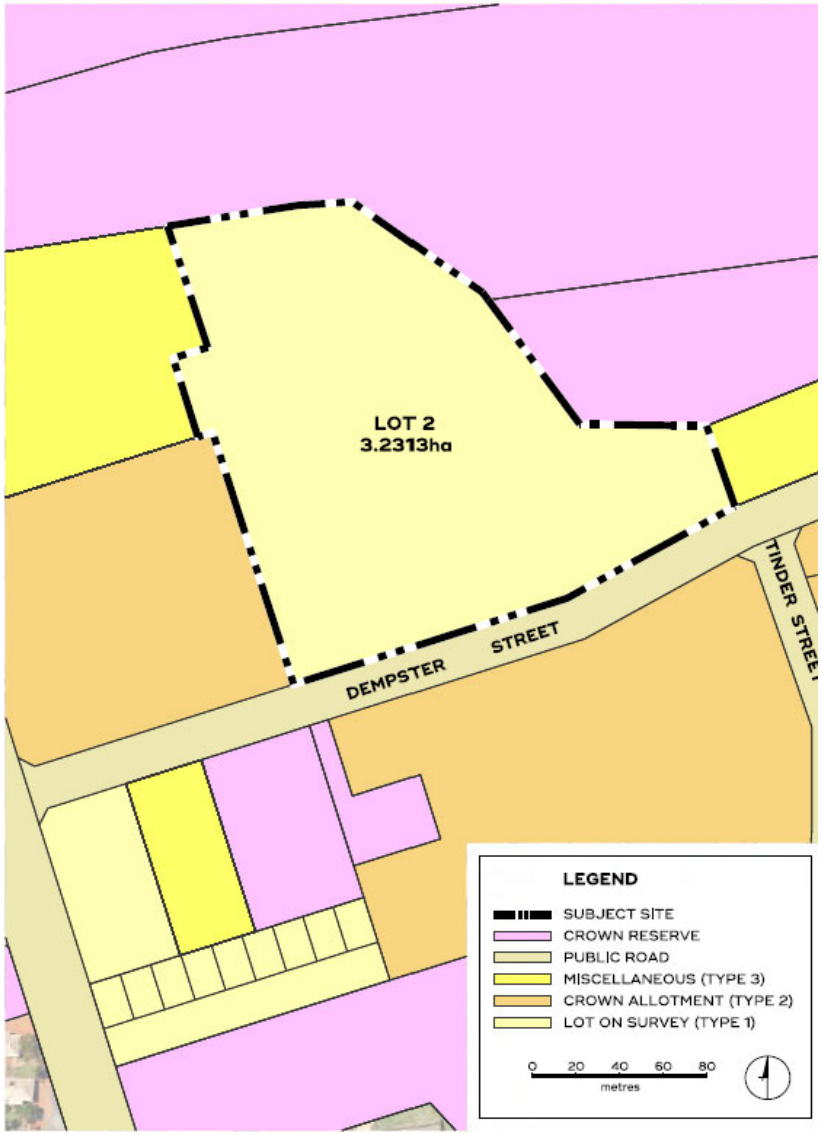


Figure 3 – Tenure Plan.

This tenure profile supports the standalone redevelopment of Lot 2, while also offering scope for future integration with adjoining sites, particularly Lot 1227. It reinforces the need for sensitive interface treatments, especially along the eastern residential edge and the northern foreshore reserve, to ensure compatibility and alignment with surrounding land uses.

Site History

The site has experienced multiple phases of use and redevelopment, reflecting broader socio-economic and institutional shifts in Port Hedland.

The site was initially cleared in 1969 to support Mount Newman Mining Company operations (now part of BHP) and developed as a single men's workforce camp. The built form consisted of basic besser block and corrugated iron buildings typical of remote resource industry accommodation of the time.

In 1991, the Australian Federal Government acquired the site and converted it into an immigration detention centre. Operated under lease by Auzcorp, additional prefabricated buildings ('dongas') and support facilities were introduced to accommodate a growing number of detainees. The facility was decommissioned in 2007, after which the site remained largely inactive.

In 2022, the property was purchased by DA Campbell Property Holdings Pty Ltd (Campbell Transport). A temporary development approval was granted in 2023, permitting the continued use of the site for workforce accommodation—primarily servicing the resource sector, including Campbell Transport staff and truck drivers—through to 2028.

This interim use supports the region's broader housing demand while the longer-term redevelopment for the site is planned.

The site's coastal location and proximity to Crown Reserve (R 30768), a foreshore area associated with the Indian Ocean and earmarked for environmental and recreational use, adds to its strategic importance. However, its institutional legacy, aging infrastructure, and interface with public land also pose design and redevelopment challenges.

The Structure Plan acknowledges this history by creating a framework that supports the site's transition into a vibrant, mixed-use precinct, while retaining capacity for interim accommodation during the earlier stages of development.

Source: National Museum of Australia

2.1.2 Environmental Considerations

The subject site is situated within a dynamic coastal landscape that is environmentally sensitive, geologically diverse, and shaped by both natural processes and previous human activity. An Environmental Assessment Report has been prepared by Coterra depicting the environmental attributes which have informed the Structure Plan's spatial design, land use distribution, and risk mitigation strategies.

Landform, Topography and Soils

The site is located within the littoral land system, characterised by coastal features such as mudflats, mangroves, samphire flats, sandy islands, dunes, and beaches. The site's topography is generally flat, with an elevation of approximately 10 metres AHD. The underlying geology is mapped as Qhy, comprising younger beach and dune shelly sand.

The site is mapped as having a moderate to low risk of acid sulfate soils (ASS) occurring within 3 metres of the natural soil surface. According to DWER guidelines, further investigation is only required if significant ground disturbance or groundwater alteration is proposed. As none of these activities are anticipated under the proposed structure plan, no further ASS investigation is required at this stage.

Contamination

A desktop review confirms that the site, historically used for accommodation and government functions, has not hosted known contaminating activities. The site is considered low risk for contamination. There are known or potential asbestos-containing materials on the site, which are being addressed under the current planning approval and are expected to be removed from the site prior to the cease of the use associated with that approval.

Flora and Vegetation

The site's historic land uses have resulted in no native vegetation remaining on-site. Vegetation throughout the site is limited to isolated, planted species including bougainvillea, palm trees, and other nonnative shrubs.

No flora species considered to be conservation significant (listed as a Priority species by the Department of Biodiversity Conservation and Attractions (DBCA) or as Threatened under either the *Biodiversity Conservation Act 2016* or *Environment Protection and Biodiversity Conservation Act 1999* were identified within the survey area. No Threatened or Priority ecological communities were identified within the survey area.

Fauna and Habitat

The site itself offers limited habitat value for native fauna due to the absence of intact vegetation, with more suitable habitat located in the adjacent foreshore reserve. A terrestrial flora and fauna assessment undertaken as part of the Town of Port Hedland's Coastal Foreshore Management Plan (2021) found the survey area to be relatively degraded, lacking key habitat features such as hollow-bearing trees, logs, and dense vegetative cover. Nevertheless, four migratory aerial species listed under the EPBC Act were recorded in the broader area: the Common Sandpiper, Lesser Frigatebird, Caspian Tern, and Eastern Osprey. No other conservation-significant fauna species were identified.

Cemetery Beach and Pretty Pool are regionally significant rookeries for the Flatback Turtle (Natator depressus), a species listed as Vulnerable under both State and Federal legislation. These beaches, located approximately 1.6 to 1.7 km from the site, continue to support a stable nesting population despite exposure to various human-related pressures such as artificial lighting and urban activity. Community consultation undertaken as part of the Town of Port Hedland's Coastal Foreshore Management Plan (CFMP) highlighted

the importance of turtle conservation, with specific actions identified to manage lighting and improve public education. Historical light spill assessments have not identified the subject site or its immediate surrounds as significant sources of visible light to either beach, with the most intense emissions associated with existing residential areas, recreational infrastructure, and industrial operations further afield. The highest nesting densities occur in more sheltered, low-light areas of the beaches, reinforcing the importance of light-sensitive development planning in nearby precincts.

Coastal Processes

The subject site is partially affected by long-term coastal hazard risks identified in the Town of Port Hedland's Coastal Hazard Risk Management and Adaptation Plan (CHRMAP), with a portion of the site intersecting the 2120 coastal hazard setback line and located within Special Control Area 7 (SCA7). Consistent with the objectives of State Planning Policy 2.6 – Coastal Planning and the Town's Local Planning Policy 07 – Coastal Planning, this portion of the site is considered unsuitable for new permanent development due to its vulnerability to future erosion and inundation. The CHRMAP adopts a precautionary approach, recommending managed retreat, the maintenance of public access, and avoidance of permanent built form in areas identified as high-risk beyond the planning timeframe. It is noted that this setback may be refined through future geotechnical and coastal hazard investigations, should such studies demonstrate, that coastal risks can be effectively mitigated.

Hydrology

A Local Water Management Strategy (LWMS) has been prepared by Oversby Consulting to support the Structure Plan. The LWMS notes that the site's hydrological profile has been altered due to past development, including historical earthworks and the installation of underground drainage infrastructure. The existing topography features gentle gradients, generally sloping east and north toward the foreshore and Dempster Street, with several localised depressions acting as trapped low points where stormwater collects during heavy rainfall events.

There are no natural watercourses or wetlands within the site boundaries; however, the proximity to the Indian Ocean (~110 metres north) and permeable sandy soils enables effective infiltration. The average groundwater level is estimated to be 7–9 metres below the surface and is likely tidally influenced due to the site's coastal location.

Stormwater generally infiltrates through onsite systems, with exceedance flows directed toward Dempster Street or the foreshore in extreme events. There are small external catchments (e.g., nearby residential and recreational areas) that may also contribute to stormwater inflows during higher rainfall events.

Bushfire Prone Area

The site is designated as bushfire prone due to adjacent coastal grasslands (Class G). A Bushfire Management Plan (BMP) has been prepared by Linfire Consultancy, confirming that compliant development is achievable via:

- Asset Protection Zones (APZs).
- BAL-29 design thresholds for buildings.
- Emergency egress routes and road standards.
- Site-specific construction and landscaping controls under AS3959.

Bushfire resilience is embedded in the urban layout, balancing public safety with environmental management.

Planning Implications and Opportunities	
Environmental Sensitivity	There are no conservation significant areas within the structure plan which require protection.
Coastal hazard	Land forward of the 2120 Coastal Hazard must respond to the requirements of SPP 2.6, the Town's CHRMAP and Local Planning Policy 07.
Flora and Fauna	Site planning should minimise clearing and include landscaping that enhances biodiversity, supports faunal movement into the foreshore, and integrates Priority Flora.
Water Management	Stormwater strategies should incorporate Water Sensitive Urban Design (WSUD) principles, with drainage infrastructure designed to manage flood risk and support gradual infiltration.
Bushfire Planning	Layout and design must ensure bushfire compliance through setbacks, internal access loops, and staged APZ implementation. BAL-29 thresholds should be a design benchmark.

Planning Implications and Opportunities	
Environmental Conservation Reserve	The foreshore interface presents an opportunity for low-impact, nature-based tourism or temporary accommodation uses that preserve scenic and ecological values.

Table 4 – Environmental Considerations.

Figure 4 – Bushfire Prone Area.

Source: PlanWA, 2025

2.1.3 Physical Infrastructure and Services

An assessment of the site's existing and planned infrastructure has been undertaken to inform redevelopment feasibility. This includes analysis of stormwater, wastewater, water supply, power, gas, telecommunications, and waste servicing based on technical inputs from Porters Engineering, Oversby Consulting, and utility agencies.

Stormwater and Flood Management

The site currently lacks formal drainage infrastructure, relying on natural overland flow and infiltration afforded by its permeable dune-based soils. During high rainfall events, minor ponding has been observed. The proposed drainage strategy includes:

- A 2,800m² infiltration basin within public open space.
- Lot levels raised 300mm above the basin's high-water mark.
- An overland flow path leading to the coastal reserve to manage exceedance events.

A detailed Urban Water Management Plan (UWMP) will be required at the subdivision stage to refine this approach and ensure compliance with the Town of Port Hedland's Local Planning Policy LPP/11 – Stormwater.

Wastewater Reticulation

A 150mm vitrified clay sewer traverses the site from the former recreation centre to Dempster Street. Additional Water Corporation sewers are located along the eastern boundary servicing the neighbouring Lot 510.

Water Reticulation

The site is currently serviced by a 100mm asbestos cement water main, connected to a 150mm Water Corporation water main located in the northern verge of Dempster Street.

Gas Reticulation

There is currently no reticulated gas network within the Structure Plan area or broader locality. It is not anticipated that a gas supply will be extended to this location in the short-to-medium term.

Power

High voltage (HV) and low voltage (LV) underground electrical cables are present along the Dempster Street verge. A transformer and switchgear are located on adjacent private land (Lot 1227), though access and capacity are not confirmed.

Telecommunications

NBN pit and pipe infrastructure exists within Dempster Street and is capable of extension throughout the site.

Planning Implications and Opportunities	
Stormwater Management	The site's natural infiltration capacity enables integration of water-sensitive urban design (WSUD) features, such as bio-retention basins fronting Dempster Street.
Wastewater Infrastructure	Existing sewer infrastructure requires local reconfiguration, but no significant constraints are expected to limit efficient servicing of the site.
Water Supply	Upgrading existing asbestos water mains will improve reliability and allow standard water servicing to support all proposed land uses.
Gas Absence	Support the inclusion of solar panels, battery storage (where possible) and passive design elements to improve efficiency and reduce electrical costs.
Power Supply	While network upgrades may be required, early coordination on transformer locations will support reliable and scalable electricity supply.

Planning Implications and Opportunities	
Telecommunications	Existing NBN coverage provides high-capacity digital connectivity, supporting smart infrastructure and future-ready development.

Table 5 – Servicing Considerations.

The servicing conditions support a flexible, staged approach to redevelopment that balances cost, efficiency, and sustainability. Integration of energy efficient, all electric design and robust servicing capacity will enable the site to accommodate a diverse mix of uses, including permanent and transient housing, with minimal technical constraints.

Source: Town of Port Hedland Local Planning Strategy

2.1.4 Movement Considerations

Flyt has prepared a Transport Impact Assessment (TIA) confirming that the local road network has sufficient capacity to support future development. The TIA notes the presence of modest pedestrian and cycling infrastructure and limited public transport services. The movement framework has been evaluated to guide access, walkability, and transport planning as redevelopment of the site progresses.

Existing Access and Movement Network

The site fronts Dempster Street, a 7.2 metre wide sealed access road within a 20 metre reserve, linking Goode and Keesing Streets. It connects to higher order roads such as Athol Street, Cooke Point Drive, and McGregor Street, and ultimately to regional routes including Port Hedland Road and the Great Northern Highway.

The street features nine existing on street parking bays and operates at a 50 km/h speed limit, reduced to 40 km/h during school hours due to nearby Port Hedland Primary School. No formal intersection treatments exist at nearby junctions, though crash data over the past five years indicates no reported incidents within or adjacent to the site, suggesting a safe traffic environment.

Traffic Volumes and Capacity

Recent traffic counts show low peak-hour volumes:

- Dempster Street: ~150 vehicles/hour
- Keesing Street: ~190 vehicles/hour
- Tinder Street: ~70 vehicles/hour

If the area is fully developed (on a highest and best use scenario), it's expected to generate up to 218 vehicle trips during peak times (like morning or afternoon rush hour). Traffic modelling shows that this increase would still use less than 40% of the capacity of surrounding roads, so no upgrades to nearby roads are needed to support the proposed development.

Pedestrian Infrastructure and Walkability

Pedestrian infrastructure is well established along key routes:

- 2.7 metre concrete footpaths on both sides of Dempster Street
- A 2.0 metre footpath on the eastern side of Keesing Street.

However, shade, seating, and rest infrastructure are limited. The area currently scores 12/100 on Walk Score, indicating high car dependency. That said, a 15-minute walk provides access to:

- Port Hedland Primary School.
- Colin Matheson Oval.
- Andrew McLaughlin Community Centre.
- Coastal reserves and beach access.

There are opportunities to enhance local walkability through landscaping, shade provision, and public realm upgrades.

Cycling Infrastructure

Cycling infrastructure is limited but improving:

- A 3.0 metre shared path on Sutherland Street provides foreshore access to westward recreational destinations.
- A missing 600 metre link along the site's northern boundary is identified in the Town's Active Transport Strategy 2023–2033 and the Long Term Cycle Network (LTCN).

This future connection will offer a safe, high amenity east–west coastal route for cyclists and pedestrians, directly supporting the Structure Plan's access and recreation objectives.

Public Transport

The site is served by TransHedland Route 870, which connects Port Hedland to South Hedland. Bus stops are located within 50 m of the site boundaries. However, service frequency is limited to:

- 4 weekday services per direction.
- 2 Saturday services.
- No service on Sundays or public holidays.

While stop proximity is excellent, the infrequency of services limits viability for transit-dependent residents and visitors.

Planning Implications and Opportunities	
Road Network	The existing road network has sufficient capacity to accommodate future development, with no upgrades to the surrounding roads anticipated to be necessary.
Pedestrian Access	Improve walkability through enhanced shade, safe crossings, and active street frontages to complement the site's existing footpath infrastructure.
Cycling Connectivity	Leverage planned Local Transport Cycle Network (LTCN) upgrades to connect the site into the broader regional active transport system.
Public Transport	While bus stops are well-positioned, limited-service frequency suggests redevelopment should prioritise walking and car-based access options.

Table 6 – Movement Network Considerations.

Figure 5 – Dempster Street cross section, looking west.

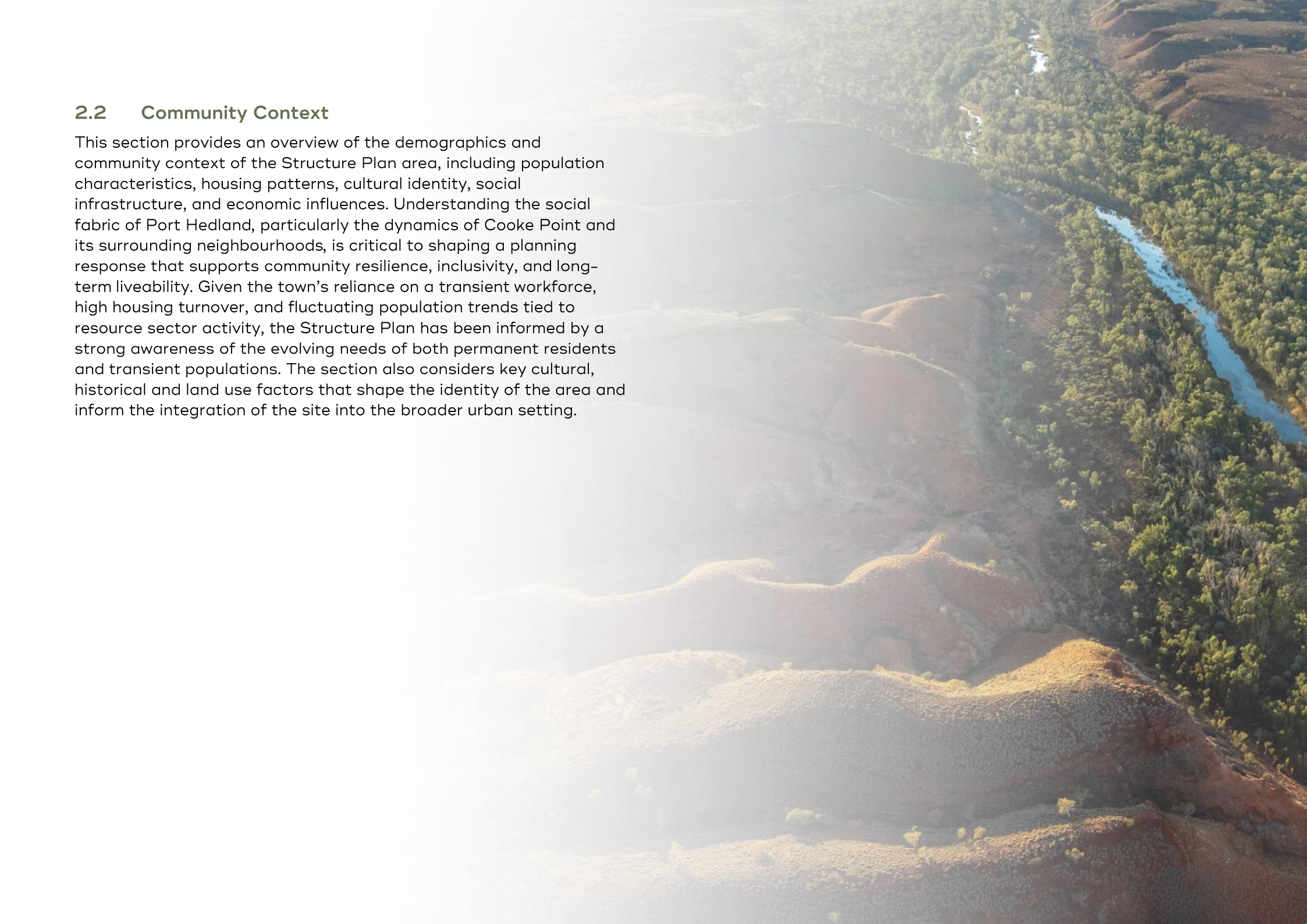
Source: Google Street View 2018

Figure 6 – Keesing Street cross section looking south.

Source: Google Street View 2018

2.2 Community Context

This section provides an overview of the demographics and community context of the Structure Plan area, including population characteristics, housing patterns, cultural identity, social infrastructure, and economic influences. Understanding the social fabric of Port Hedland, particularly the dynamics of Cooke Point and its surrounding neighbourhoods, is critical to shaping a planning response that supports community resilience, inclusivity, and long-term liveability. Given the town's reliance on a transient workforce, high housing turnover, and fluctuating population trends tied to resource sector activity, the Structure Plan has been informed by a strong awareness of the evolving needs of both permanent residents and transient populations. The section also considers key cultural, historical and land use factors that shape the identity of the area and inform the integration of the site into the broader urban setting.



2.2.1 People

Port Hedland is located on Kariyarra Country. The Kariyarra people's traditional lands extend west to the Sherlock River and south to the Yule River and include Aboriginal reserves, pastoral leases, and significant mining areas. The Kariyarra Aboriginal Corporation, established in 2016 as the Registered Native Title Body Corporate (RNTBC), manages native title rights and supports cultural heritage and community development. Native Title has been extinguished across a majority of Port Hedland, including the subject site it sits within the broader region of Kariyarra country and acknowledges this enduring cultural connection.

Population

Port Hedland is the second largest town in the Pilbara region with a 2021 population of 14,105 residents comprising approximately 9,800 in South Hedland and 4,305 in the Port Hedland townsite.[1] According to the 2024 Pilbara Economic Snapshot, the population is now estimated to have grown to 17,247. As with many Pilbara towns, population changes reflect the volatility of the resources sector, with growth during booms and contraction during downturns. Between 2016 and 2021, the town's population declined by 2.5%, mirroring a 3.0% drop across the broader Pilbara, despite a 7.8% increase across Western Australia overall.

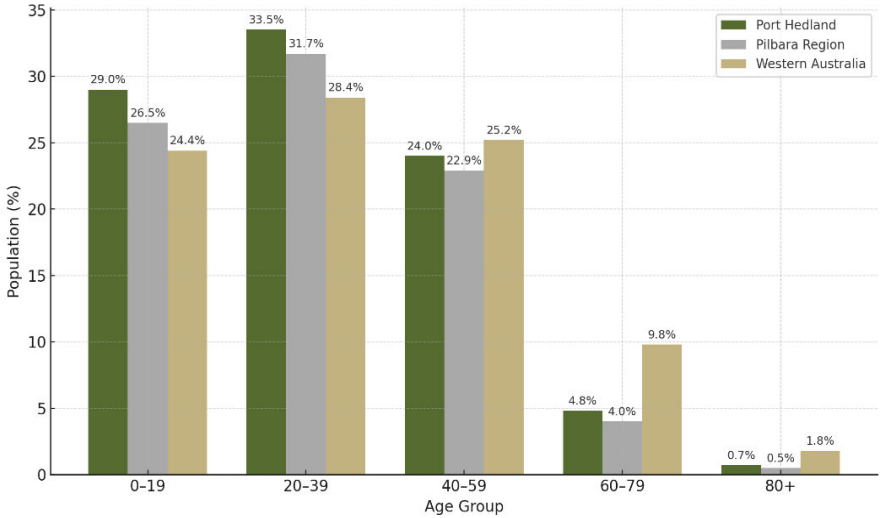


Figure 7 – Population in WA Context.

Port Hedland also experiences high population turnover, with around 18.5% of residents entering or leaving the region each year. This is largely linked to:

- The large FIFO (fly-in, fly-out) workforce servicing mining and port operations.
- Short-term infrastructure and civil projects with temporary labour demands.
- A relatively small pool of permanent, long-term residents, concentrated in the Cooke Point, Pretty Pool, and South Hedland localities.

[1] Data in the following sections has been sourced from ABS 2021 Census Profile, unless otherwise specified.

The demographic profile is younger (median age 31) than the state average and consists of smaller, mobile households, including contractors, key workers, and single-person renters.

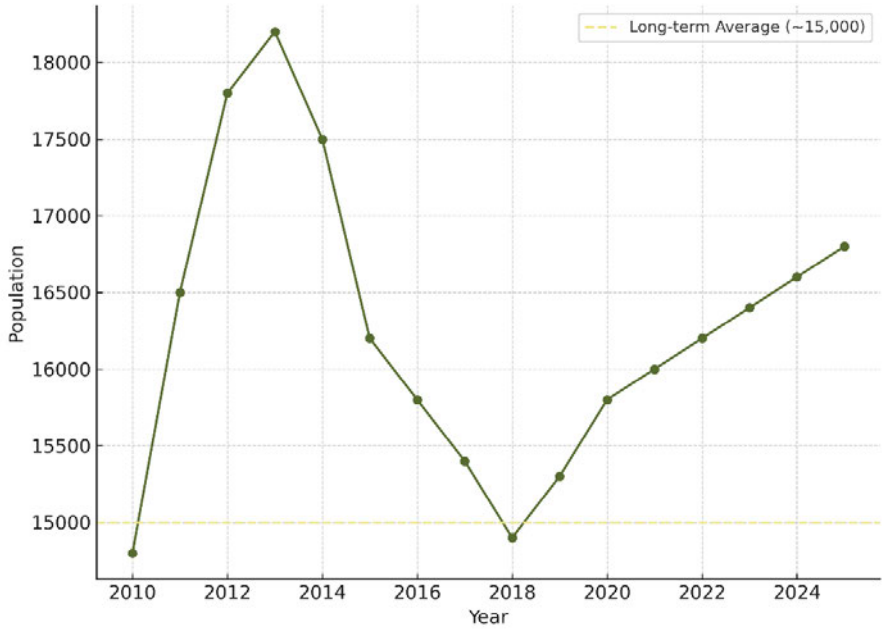


Figure 8 – Population Trends in Port Hedland (2010 – 2025).

2.2.2 Housing Supply & Demand

Port Hedland's housing market is characterised by high demand, limited supply, and ongoing affordability pressures, conditions typical of resource-based towns. The housing stock is predominantly made up of detached single dwellings, many constructed during earlier mining booms.

As of 2021, there were approximately 5,000 private dwellings in the town, with 55.9% of households renting—more than double the state average. Notably, a third of rental properties are employer-managed, reflecting the transient and workforce-driven nature of the population.

The Town's Local Planning Strategy projects population growth to between 21,700 and 24,150 by 2041, which will require an estimated 2,050 additional dwellings and around 120 new homes per year. With only 1,849 dwellings spread across 67 square kilometres, there is a marked undersupply of medium and high-density housing options to cater for smaller households, professionals, and temporary workers.

Adding to these pressures, the Port Hedland Voluntary Buy-Back Scheme (PHVBS) is gradually reducing the supply of housing in the West End by allowing residents to sell their properties at a government-guaranteed market price. As residents relocate, particularly to areas like South Hedland, the scheme has increased demand elsewhere in the town. This has further reinforced the need to deliver a diverse mix of housing to accommodate displaced residents and support long-term growth.

Residential Market Trends

Like population trends, Port Hedland's housing market is closely linked to the strength of the mining sector. Following a post-2011 downturn, the market has rebounded sharply in recent years. The median house price now sits at $818,335 which is a 11.8% increase over the past year. Median weekly rents have risen even more steeply,

reaching $1,400, up 40% in just 12 months and 81% since 2019. These increases far outpace trends in regional WA, highlighting a widening gap between housing supply and demand.

Housing Affordability and Cost of Living

Port Hedland is among the most expensive towns in the State for housing. According to the Regional Price Index (2021), the Pilbara records WA's highest housing costs. Rental stress is common, with some modest homes exceeding $1,400 per week. This affects a broad cross-section of the community, including essential workers.

To ease pressure, the Town of Port Hedland reduced residential rates by 5.1% in its 2023–24 budget. However, housing cost escalation remains a pressing issue—especially for infill planning areas like the Structure Plan area.

Housing Trends and Pressures

Port Hedland's housing market is dominated by detached dwellings, resulting in a lack of diversity and limited availability of housing types suited to the needs of a changing population. This presents challenges for:

- Single workers and contractors seeking short-term or shared accommodation.
- Smaller households seeking well-located, low-maintenance dwellings.
- Employers looking to secure suitable workforce housing.

The shortage of medium density and accommodation or short-stay housing is especially pronounced during periods of economic growth. In addition to limited diversity, high construction costs driven by regional supply chain constraints and labour shortages, continue to make it difficult to deliver affordable new dwellings. This affects both the feasibility of developing new housing and the ability to sell it at prices that meet local demand. These pressures contribute to a cycle of under-supply and rising prices, exacerbating housing stress and limiting options for residents and employers alike.

People Implications and Opportunities	
Housing Choice and Diversity	Enable a mix of housing types—including permanent residential, workforce accommodation, and transient dwellings—to meet the needs of a transient and diverse population.
Medium-Density Development Potential	Respond to projected demand by supporting medium- and high-density housing suited to smaller households, professionals, and temporary workers.
Affordability Pressures	Address housing stress caused by limited diversity, high construction costs, and insufficient supply—particularly during periods of economic growth.
Staging and Flexibility	Support a staged development approach that enables interim workforce accommodation while transitioning to permanent mixed-use and residential outcomes over time.
Strategic Urban Infill Opportunity	Leverage the site's coastal access, proximity to community infrastructure, and existing urban services to deliver infill development that enhances local housing supply and liveability.

Table 7 – Housing and Demographic Considerations.

2.2.3 Economic Considerations

Port Hedland holds national significance as the site of the world's largest bulk export port, underpinning a regional economy driven by mining, logistics, construction, and associated services. These industries are inherently cyclical, resulting in fluctuating and often unpredictable demands for housing, infrastructure, and workforce supply. The following section provides an overview of Port Hedland's economic context, highlighting key factors that influence future planning and development of the site.

Current Economic Climate

Port Hedland is currently experiencing a moderate economic rebound, supported by sustained iron ore export volumes and new investment in infrastructure, logistics, and construction projects. These trends are increasing pressure on:

- Workforce accommodation supply—particularly for contractors, FIFO workers, and transient teams.
- Short-stay tourism accommodation, with limited mid-range and coastal offerings.
- Local infrastructure, including roads, utilities, and essential services.

The economic growth is juxtaposed against ongoing challenges in housing supply, rental costs, limited land release in high-amenity locations, and affordability pressures. Flexible housing and affordable land solutions are critical to support economic participation and reduce housing stress in Port Hedland.[2]

Labour Force and Industry Profile

As of June 2024, Port Hedland supported approximately 10,985 jobs, with mining and port activities dominating the local economy.

The Port of Port Hedland generated $64 billion in export value in 2021 and supports around 74% of local employment, both directly and indirectly. A significant portion of the workforce is transient, including many Fly-In Fly-Out (FIFO) workers. Specifically, the Port Supply Chain alone accounts for 8,158 direct and indirect full-time equivalent jobs. This heavy reliance on non-resident workers highlights the critical need for adequate transient workforce accommodation (TWA) to sustain ongoing and future projects.

Despite high wages (Pilbara average weekly income is $2,480), the town experiences labour shortages across sectors including hospitality, retail, healthcare, and education, due to high housing/rental costs and lack of accommodation options for transient and non-resource sector workers.[3]

Education and Health

Port Hedland's education landscape is shaped by its remote location and the demands of its resource-driven economy. The town offers a range of educational institutions, including primary and secondary schools, as well as vocational training centres. Initiatives like the Town's "Shape Your Future" program provide full-time traineeships, aiming to equip residents with nationally recognised qualifications and career pathways. However, attracting and retaining qualified educators remains a challenge due to the aforementioned issues.

Healthcare in Port Hedland is primarily delivered through the Hedland Health Campus, which serves as the regional hub for medical services. Ongoing efforts to enhance healthcare delivery include investment in infrastructure and targeted programs to support and retain medical staff. However, consistent with broader workforce trends in non-mining sectors, attracting and retaining healthcare professionals remains a significant challenge.

Incomes

[2] Town of Port Hedland – Hedland Housing Solutions Summit, 2021

[3] Pilbara Development Commission – Pilbara Economic Snapshot, 2024

The resource sector's dominance in Port Hedland contributes to higher-than-average incomes. As of June 2024, the average weekly wage in the Pilbara region stood at $2,480, reflecting the lucrative nature of mining and related industries. However, this high-income environment also drives up the cost of living, particularly in housing, where rents have surged, making affordability a pressing issue for non-mining residents.

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Retail and Commercial Activity

The Wedge Street precinct serves as Port Hedland's primary commercial hub, offering a mix of retail, hospitality, and service-based businesses. Despite its central role, only 58% of the commercially zoned land has been developed, highlighting significant untapped potential. While there is an oversupply of retail floorspace overall, the town faces a shortage of built commercial tenancies—particularly office spaces—which constrains business growth and diversification.

Looking ahead, demand forecasts indicate a need for an additional 16,650m² of commercial and retail floorspace by 2041. However, efforts to diversify the local economy, as outlined in the Economic Development Road Map, are challenged by low population density and the ongoing impacts of the West End Voluntary Buy-Back Scheme. This scheme has led to the gradual withdrawal of residents and businesses from the West End, resulting in a reduced customer base and diminished vibrancy in the area.

Notably, key closures such as the Pier Hotel have further weakened the West End's commercial and social fabric, reducing hospitality options and community gathering spaces. These closures limit the town's overall community offer, affecting local employment opportunities and the appeal of the precinct as a destination for both residents and visitors. Addressing these impacts will be critical to supporting Port Hedland's broader economic and social resilience.

Tourism

While traditionally overshadowed by the mining sector, tourism in Port Hedland is gaining momentum. The town's unique coastal landscapes, rich Indigenous heritage, and industrial landmarks attract a growing number of visitors. Initiatives like the development of the Spoilbank Marina aim to enhance tourism infrastructure, providing amenities for recreational boating and waterfront activities. Additionally, the Town's Economic Development and Tourism Strategy outlines plans

to diversify the local economy by promoting tourism and cultural experiences.

Economic Implications and Opportunities	
Land Use Diversification	Deliver walkable, coastal urban development that supports tourism, recreation, and culture. Enable activation through mixed-use zoning with small-scale hospitality, entertainment, and community enterprises.
Community Amenity	Enhance local amenity via improved public realm, landscaping, and retail infrastructure to support businesses, improve quality of life, and attract residents and visitors.
Affordability and Workforce Attraction	Address high housing and rental costs that hinder attraction and retention of essential workers. Embed compact, affordable, and adaptable housing within the Structure Plan to promote workforce stability.
Commercial Viability	Respond to the under supply of built tenancy space, particularly offices, despite undeveloped commercial land. Support staged, mixed-use developments suited to micro-enterprises and professional services.

Table 8 – Economic Considerations.

2.2.4 Culture, Heritage and Identity

The site embodies a rich tapestry of cultural and historical significance, reflecting Aboriginal heritage, early European settlement, and more recent institutional uses. This diverse context guides a planning approach that is respectful, place-sensitive, and forward-looking. Historically, the site's use as a workforce camp, immigration detention centre, and commercial accommodation village has influenced both its physical character and public perception. The proposed redevelopment presents an opportunity to transform the site from an isolated enclave into an integrated, community-focused place that offers meaningful local connections.

Aboriginal Culture & Heritage

Located on the traditional lands of the Kariyarra people, the site sits within a broader landscape of cultural and ecological significance. While no registered Aboriginal sites are located on the site, the nearby foreshore and natural landforms are recognised as being important for:

- Hunting and gathering.
- Ceremonial and seasonal movement.
- Traditional environmental stewardship.

Though no built heritage exists onsite, intangible cultural values remain. Development will respect these values through continued engagement with the Kariyarra Traditional Owners and due diligence under the *Aboriginal Heritage Act 1972*.

European Culture and Heritage

While there is no heritage listed structures on the site, nearby civic buildings—such as the Old Courthouse and Post Office—reflect early European influence. The site however is listed on the Town of Port Hedland Heritage Inventory (2017) as the "Former Port Hedland Immigration Detention Centre," recognising its legacy as:

- A mining workforce camp (1960s–1990s).
- An immigration detention centre (1991–2007).
- A commercial accommodation facility (2007–present).

Though much of the built form is now temporary or degraded, the site's social and institutional legacy contributes to its identity and the Town's Heritage Inventory 2017 encourages the documentation of the site and acknowledgment of history and heritage in future design, interpretation, and naming initiatives.

Cultural Implications and Opportunities	
Cultural Recognition	Acknowledge Aboriginal and institutional histories through landscape design, interpretive elements, and engagement with Traditional Owners.
Heritage Interpretation	Opportunity to integrate heritage themes into public art, naming strategies, and built form responses to celebrate local identity.
Sensitive Redevelopment	Recognise the site's complex past by balancing redevelopment with opportunities for reflection and cultural storytelling.
Place Reintegration	Support a shift in public perception from exclusion and transience to openness, community, and long-term liveability.

Table 9 – Heritage Considerations.

2.2.5 Social Infrastructure and Services

The site is located within the established Cooke Point neighbourhood, offering convenient access to a range of education, community, recreation, and civic facilities. These assets support both permanent residents and transient populations, contributing to the area's liveability and social cohesion.

Key social infrastructure within walking distance includes:

- Port Hedland Primary School (700m south).
- Andrew McLaughlin Community Centre – directly opposite the site, offering early learning, childcare, and community programs.
- Colin Matheson Oval and Sports Complex approximately 500m south, supporting organised and passive recreation.
- Northern adjacent foreshore reserves, enabling informal recreation and cultural use.
- A library, places of worship, and medical clinics available in the nearby Port Hedland town centre.

These facilities support a wide demographic, including Aboriginal families, FIFO workers, and long-term residents.

While the locality benefits from a strong residential character and desirable coastal location, several service gaps constrain its capacity to accommodate more diverse and higher-density development. Healthcare access is limited, with few general practitioners, allied health providers, or culturally appropriate services available locally. Secondary and tertiary education facilities are also absent, with most offerings located in South Hedland. There is a lack of flexible community spaces to support youth programs, cultural initiatives, and local events. These service limitations directly affect the feasibility of delivering a broader mix of housing types and may deter uptake of higher density living without targeted investment.

Social Implications and Opportunities	
Proximity to Key Services	The site's location between the coast and nearby community facilities and green spaces presents an opportunity to establish a north-south connection that enhances accessibility between these key amenities.
Infrastructure Capacity	Service limitations constrain the delivery and uptake of diverse housing options, particularly higher-density living, highlighting the need for targeted investment in essential infrastructure to support a growing and varied population.
Cultural and Community Space	Planning should consider opportunities for multipurpose facilities or public realm upgrades that support cultural inclusion and community gathering.

Table 10 - Social Implications and Opportunities.

2.3 Governance Context

The Structure Plan is guided by a suite of interrelated State and local planning instruments that provide both strategic direction and statutory requirements for land use, infrastructure, environmental management, and urban form. This section outlines how the structure plan responds to those frameworks, demonstrating clear alignment and implementation pathways.

2.3.1 State Planning Framework

The Structure Plan aligns closely with key State Planning frameworks that guide sustainable growth, environmental protection, and resilient development in Port Hedland.

State Planning Policy 2050

This strategy recognises Port Hedland as a critical logistics and export hub within Western Australia. It supports the redevelopment of underutilised urban land through mixed-use and medium density housing in locations with existing infrastructure. The strategy emphasises climate-responsive design principles and flexible land use to promote liveability and economic diversification, which directly informs the Structure Plan's approach to land use mix and urban form.

Pilbara Planning and Infrastructure Framework

The Pilbara Planning and Infrastructure Framework (PPIF) guides coordinated land release and infrastructure investment across the region. It validates the Structure Plan's staged, flexible infill development approach to meet immediate housing needs while allowing for longer-term growth that can adapt to market conditions. The framework also highlights the importance of coastal hazard planning and connectivity to employment centres, reinforcing the Structure Plan's focus on risk management and the sites constraints in terms of the delivery of density within the context of employment centres.

Environmental Policy (SPP 2.0 and SPP 2.6)

State Planning Policy 2.0 – Environment and Natural Resources (SPP 2.0) and State Planning Policy 2.6 – State Coastal Planning (SPP 2.6) provide frameworks for conserving biodiversity, protecting natural coastal assets, and managing coastal hazards. The Structure Plan reflects these policies by designating land north of the 2120 Coastal Hazard Erosion Line as an Environmental Conservation Reserve. This restricts permanent development in hazard-prone areas and provides an opportunity to integrate adaptive public recreational interfaces that balance public access with environmental protection.

State Planning Policy 2.9 – Water Resources

State Planning Policy 2.9 (SPP 2.9) promotes an integrated approach to managing water resources, including stormwater, groundwater, and potable water supply. The Structure Plan supports sustainable stormwater management through the implementation of a Local Water Management Strategy (LWMS), which advocates for stormwater detention, treatment, and the minimisation of impervious surfaces consistent with Water Sensitive Urban Design (WSUD) principles.

Natural Hazard Planning (SPP 3.4 and SPP 3.7)

The site's exposure to natural hazards, including cyclones, coastal erosion, inundation, and bushfire risk, requires a risk-based management approach. State Planning Policy 3.4 - Natural Hazards and Disasters (SPP 3.4) and State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7) has guided the preparation of a Bushfire Management Plan (BMP), the establishment of Asset Protection Zones, and appropriate setbacks. The Structure Plan reserves hazard-prone land north of the coastal erosion line for conservation or temporary uses, while applying construction and access standards to improve community safety and resilience.

State Planning Policy 7.3 - Residential Design Codes

Residential development within the Structure Plan area is governed by the Residential Design Codes, which provide standards for single, grouped and multiple dwellings. The Structure Plan enables medium-density residential development consistent with the R-Codes and Town of Port Hedland Local Planning Policies, allowing flexibility for

future Local Development Plans (LDPs) to respond to site-specific conditions and housing needs.

Liveable Neighbourhoods

The Structure Plan aligns with the Liveable Neighbourhoods operational policy, which promotes compact, walkable, and well-connected communities. As one of the last remaining infill opportunities in Port Hedland, the site presents a unique chance to deliver a responsive urban design that enhances foreshore access, improves local connectivity, and contributes meaningfully to neighbourhood liveability in a Pilbara context. Section 5 of this report outlines how the Structure Plan applies the Liveable Neighbourhoods principles, addressing both the site's constraints and opportunities to create a resilient and integrated urban environment.

2.3.2 Local Planning Framework

Local Planning Strategy

The Town of Port Hedland Local Planning Strategy (the Strategy) provides the strategic framework for land use and development over a 15–20-year period. It outlines a coordinated approach to residential growth, infrastructure delivery, community services, and environmental protection.

The site is identified in the Strategy as one of six priority areas for short-to-medium term residential redevelopment. Its strategic value lies in its proximity to existing infrastructure, road networks, community services, and its location within the established Cooke Point neighbourhood. The Strategy supports the transition of the site from its former institutional use to a residential and mixed-use precinct, consistent with the broader strategic objectives to:

- Activate underutilised urban land within established townsites.
- Respond to housing demand through infill and medium-density development.
- Optimise access to essential infrastructure, services, and local amenities.

The Structure Plan directly aligns with this intent, providing a coordinated framework for the site's redevelopment into a mixed-use neighbourhood that accommodates a diverse range of housing options, accommodation, and local commercial activity, while addressing environmental and infrastructure constraints.

Local Planning Scheme No.7

The Town of Port Hedland Local Planning Scheme No. 7 (the Scheme), gazetted in January 2021, is the Town's principal statutory planning instrument, guiding how land is used, developed, and conserved. It provides the zoning, land use permissibility, development standards, and structure planning requirements that apply to the subject site.

Zoning and Scheme Provisions

The Structure Plan area, Lot 2 (No. 15) Dempster Street, is zoned 'Urban Development' under Clause 16 (Table 3) of the Scheme. The purpose of this zone is to require structure planning prior to subdivision or significant development, ensuring that urban development proceeds in a coordinated, serviced, and sustainable manner. In accordance with Part 4 of the *Planning and Development (Local Planning Schemes) Regulations 2015*, the Structure Plan:

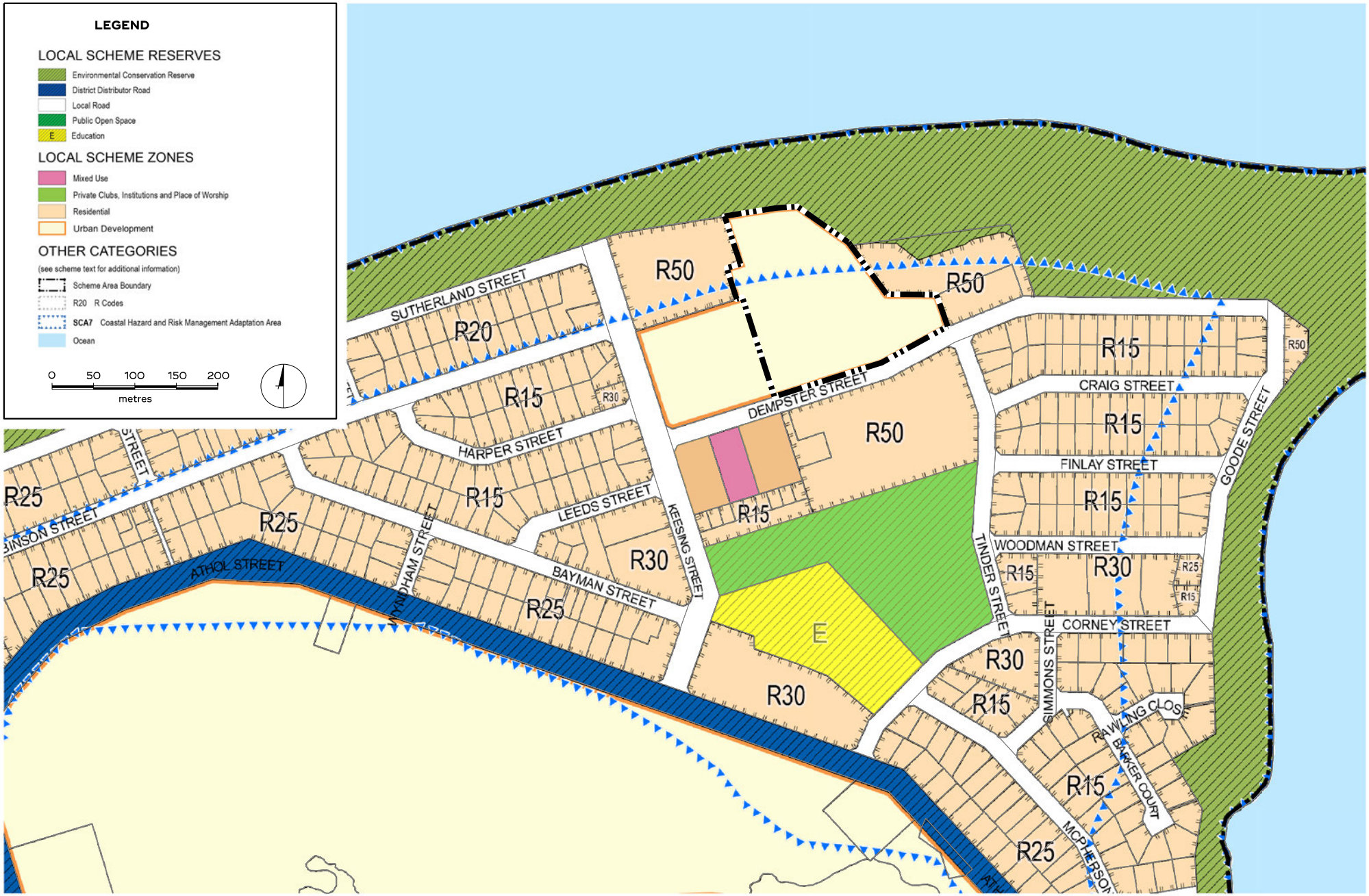
- Defines the zoning, land use classification, and density targets.
- Provides infrastructure planning and staging.
- Sets out implementation arrangements in support of future subdivision and development applications.

Clause 32 – Additional Site and Development Requirements

Clause 32 (Table 7) of the Scheme outlines additional requirements for identified land within the Scheme area. The following requirements specifically apply to the subject site and have informed the structure planning process:

Additional requirements that apply to the structure plan area		Reference in the Structure Plan
Built Form and Light Spill	Built form within the Structure Plan area must be restricted in height and design to prevent light spill onto Cemetery Beach and Pretty Pool Beach, critical marine turtle nesting areas.	Part One – Section 2.4.4 Part Two – Section 5.5.2
Coastal Hazard Mitigation	Development must demonstrate compliance with SPP 2.6 – State Coastal Planning Policy, including: • Adequate foreshore reserves. • Identification of the 100-year coastal erosion risk line. • Coastal adaptation measures aligned with the Town's CHRMAP.	Part One – Section 2.1.2/2.3.2/2.7.4 Part Two – Section 5.4.1
Land Use Compatibility	Land uses must be compatible with adjacent development and sensitive to the site's environmental and residential context.	Part One – Section 2.3
Housing Diversity	Lot sizes must be capable of accommodating a diverse range of housing typologies, with densities that respond to existing neighbourhood character and market needs.	Part One – 2.4 Part Two – Section 5.4
Integrated Movement Network	The road and access layout must allow for integration with Lot 1227 (the former Recreation Centre site), enabling a coordinated future redevelopment scenario across the precinct.	Plan 1 – Beachfront Village Structure Plan Part Two – Section 5.8
Public Open Space and Environmental Conservation	Land seaward of the 100-year coastal erosion line must be allocated as public open space or Environmental Conservation Reserve, preserving dune systems and enabling coastal access.	Part One – Section 2.6 Part Two – Section 5.7.1
Supporting Technical Reports and Management Plans	Applications for subdivision and/or development must be supported by technical documentation including: • Urban Water Management Plan (UWMP) – to DWER satisfaction. • Construction Management Plan – to local government satisfaction. • Acid Sulfate Soil Management Plan – where required. • Marine Turtle Lighting and Line-of-Sight Modelling – including a Lighting Management Plan compliant with EPA and Commonwealth guidelines. • Any other management plans as determined by referral agencies during assessment.	Part One – Clause 2.8

Table 11 - Clause 32 of Local Planning Scheme No.7



EXISTING ZONING PLAN

FIGURE 9

Special Control Area 7 - Coastal Hazard and Risk Management Adaptation Area

The northern portion of the Structure Plan area lies within Special Control Area 7 (SCA7), identified in the Scheme as being at risk of coastal erosion and inundation within a 2120 Coastal Hazard Erosion line. As detailed in section 2.1.2 of this report, this designation is based on the Port Hedland Townsite CHRMAP and aligns with SPP 2.6 which requires evidence-based risk avoidance, mitigation, and adaptation in hazard-prone areas.

The site falls within CHRMAP Planning Unit 5 – Spinifex Hill and Cooke Point, where key risks include shoreline retreat and storm surge. The CHRMAP outlines a staged adaptation pathway:

- To 2030: Dune management and public awareness.
- To 2060: Interim protection works and adaptation planning.
- To 2120: Managed retreat and buffer expansion.

The Town's Coastal Foreshore Management Plan (CFMP) further guides this approach, recommending limited development, asset retreat, and biodiversity protection within Management Unit 4 – Cooke Point.

The Structure Plan responds by:

- Reserving all land north of the 2120 Coastal Hazard Erosion line as Environmental Conservation.
- Limiting permanent development in hazard zones.
- Supporting temporary or relocatable land uses in vulnerable areas.
- Applying design measures such as elevated floor levels and landscape buffers.
- Retaining public access while embedding long-term adaptation into the planning framework.

The Structure Plan provides a forward-looking response to climate resilience, balancing ecological protection with adaptable land use planning in a high value coastal precinct. The following table provides a summary snapshot of how coastal planning has been considered in the Structure Plan.

Policy / Instrument	Key Objectives	Structure Plan Response
State Planning Policy 2.6 (SPP 2.6)	Manage coastal hazards through avoidance and adaptation.	Uses 100-year erosion line to limit permanent development,
Town of Port Hedland CHRMAP	Identify risk areas and recommend short, medium, and long-term responses.	Reserves hazard-prone land and enables managed retreat.
Town of Port Hedland CFMP	Protect foreshore biodiversity and manage human impacts.	Limits development in vulnerable foreshore areas; supports ecological resilience.

Table 12 – Coastal Policy Summary.

2.3.3 Other Relevant Local Policy Frameworks

In addition to the above statutory requirements under the Scheme, the Town of Port Hedland has adopted several Local Planning Policies, strategies and positions that provide guidance on specific land use and planning issues. The following documents have relevance to the Structure Plan and are considered below.

Draft Local Housing Strategy (2021)

The Town, in partnership with the Pilbara Development Commission, is developing a Local Housing Strategy to address critical housing

shortages and affordability challenges. Recognising housing as key to economic and social sustainability, the strategy focuses on:

- Delivering practical actions to increase affordable and sustainable housing.
- Coordinating government and industry to boost housing supply.
- Advocating for planning reforms and development incentives.
- Engaging the community to ensure housing solutions reflect local needs.

The Structure Plan supports strategic housing objectives by proposing a mix of housing types and densities suited to diverse income levels and lifestyle needs. It promotes the redevelopment of underutilised urban land to boost supply within serviced areas and embeds sustainability and resilience principles to deliver long-term, adaptable housing solutions.

Public Open Space Strategy (2019)

The Public Open Space Strategy (2019) guides the equitable and sustainable provision of public open space across the Town, with a focus on quality, accessibility, and community relevance. The Strategy identifies the Port Hedland foreshore as a key recreational and cultural asset, classifying it as an activated foreshore—valued for its community use and tourism appeal, although it is not included in formal public open space calculations under Liveable Neighbourhoods.

While the Structure Plan does not propose new formal public open space within the site, it supports the broader intent of the Strategy by preserving coastal land as Environmental Conservation Reserve, enhancing pedestrian and cycle connectivity between the foreshore and existing open spaces such as Colin Matheson Oval, and responding to long-term coastal hazard planning. This approach integrates environmental protection with improved public access and supports activation of the wider foreshore network.

Local Planning Policy

A series of Local Planning Policies are relevant to the site and have been given due regard.

Document	Overview	Relevance to Structure Plan
Local Planning Policy 04 – Percent for Public Art (LPP 04)	Requires certain developments to contribute 1% of total project value to public art, either through on-site delivery or a cash-in-lieu contribution.	• Future mixed-use or higher-density residential developments within the site may trigger this requirement. • Opportunities exist to integrate public art as part of placemaking along the foreshore and public open space areas.
Local Planning Policy 05 – Workforce Accommodation (LPP 05)	Sets design and locational expectations for workforce accommodation facilities, favouring integration into urban areas and transition to more permanent land uses.	• The Structure Plan supports continued use of existing workforce accommodation in the short term, with a long-term transition to mixed-use and residential development in line with this policy. • Design provisions will ensure future accommodation integrates with the surrounding neighbourhood.
Local Planning Policy 06 – Social Impact Assessment (LPP 06)	Applies to development proposals that may result in significant social change. Requires proponents to assess and mitigate social impacts.	• While a formal Social Impact Assessment is not required at the structure plan stage, future development applications—particularly those proposing workforce or tourist accommodation—may trigger this policy.

Document	Overview	Relevance to Structure Plan
Local Planning Policy 07 – Coastal Planning (LPP 07)	Implements CHRMAP recommendations and require all structure plans and development in Special Control Area 7 to address long-term coastal risks, including erosion and inundation.	• The Structure Plan has adopted the 2120 Coastal Hazard Erosion as future Environmental Conservation. Development is restricted in hazard-prone areas in accordance with this policy.
Local Planning Policy 11 – Stormwater Management (LPP 11)	Requires on-site retention of stormwater for 1% AEP (1-in-100-year) events and promotes WSUD practices.	• The Local Water Management Strategy (LWMS) prepared for the site complies with this policy, proposing infiltration basins and finished floor levels above stormwater high water levels.
Local Planning Policy 12 – Variations to the R-Codes – Volume 1 (LPP 12)	Allows local variations to R-Codes for medium-density development, including setbacks, open space, and dwelling orientation.	• Part One of the Structure Plan enables the use of Local Development Plans for medium-density lots (R30–R80), which may incorporate local variations consistent with LPP 12 to promote improved built form and climate-responsive design.

Table 13 – Local Planning Policy Framework.

Town of Port Hedland Heritage Inventory (2017)

The Town's Local Heritage Survey (former Heritage Inventory) identifies places of local cultural and historical significance, categorising them according to levels of protection, interpretive potential, and future planning considerations.

The site is included as the "Former Port Hedland Immigration Detention Centre", recognised for its role in the town's institutional and social history. The listing acknowledges the sites:

- Historic use as a workforce camp (originally constructed by Mount Newman Mining Co. in 1969).
- Operation as an immigration detention facility between 1991 and 2007 under Commonwealth jurisdiction.
- Continued relevance to discussions of identity, land use change, and the evolution of urban form in Port Hedland.

The listing does not afford statutory protection under the *Heritage Act 2018* or include the site on the State Register of Heritage Places, but it does signal the importance of considering heritage values in future redevelopment.

Workforce Accommodation Position Statement (2021)

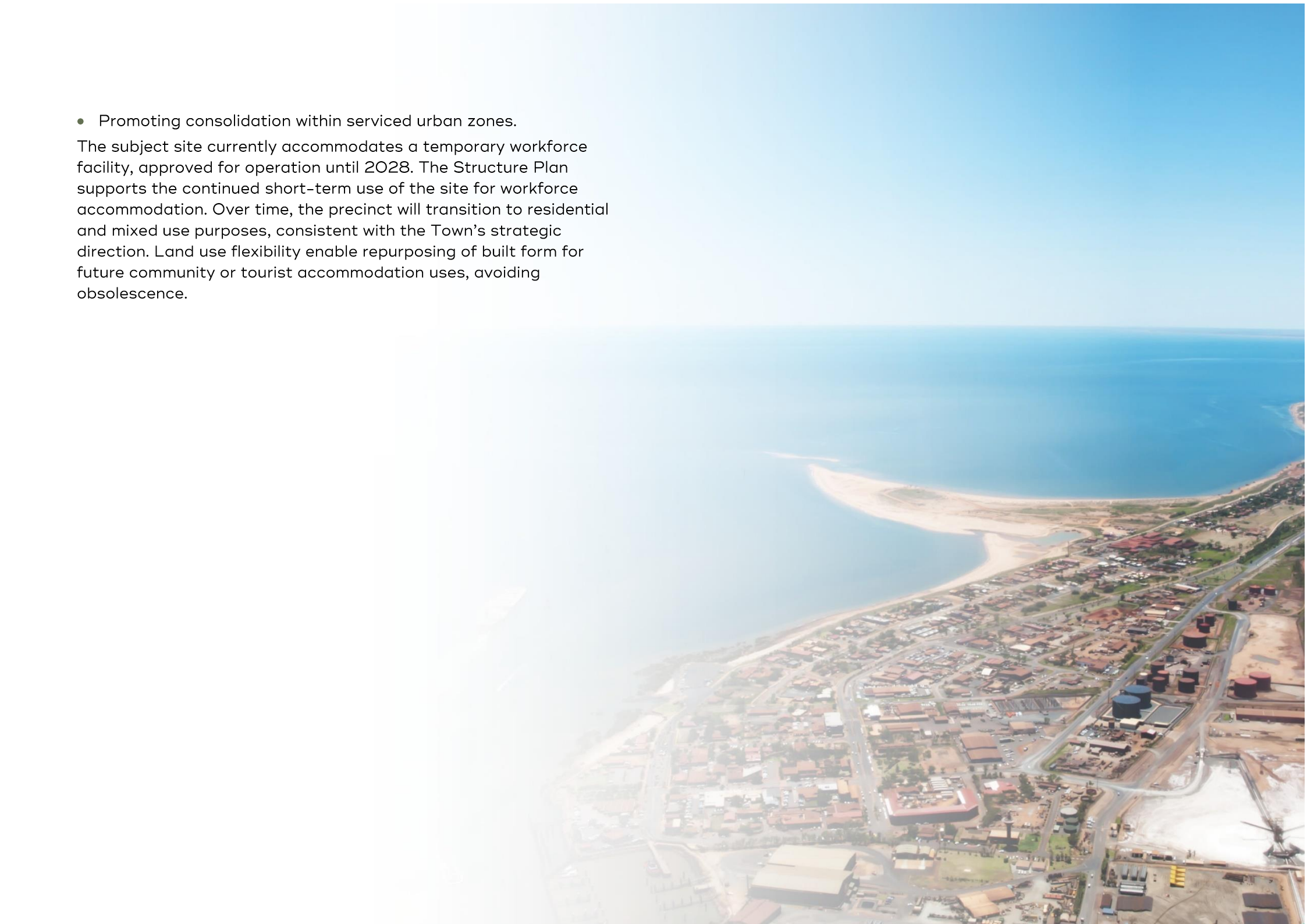
The Workforce Accommodation Position Statement sets out the Town's expectations for the location, integration, and long-term management of workforce accommodation developments. It acknowledges the important role that transient worker housing plays in supporting the resource sector but promotes a shift towards urban integration and adaptive reuse.

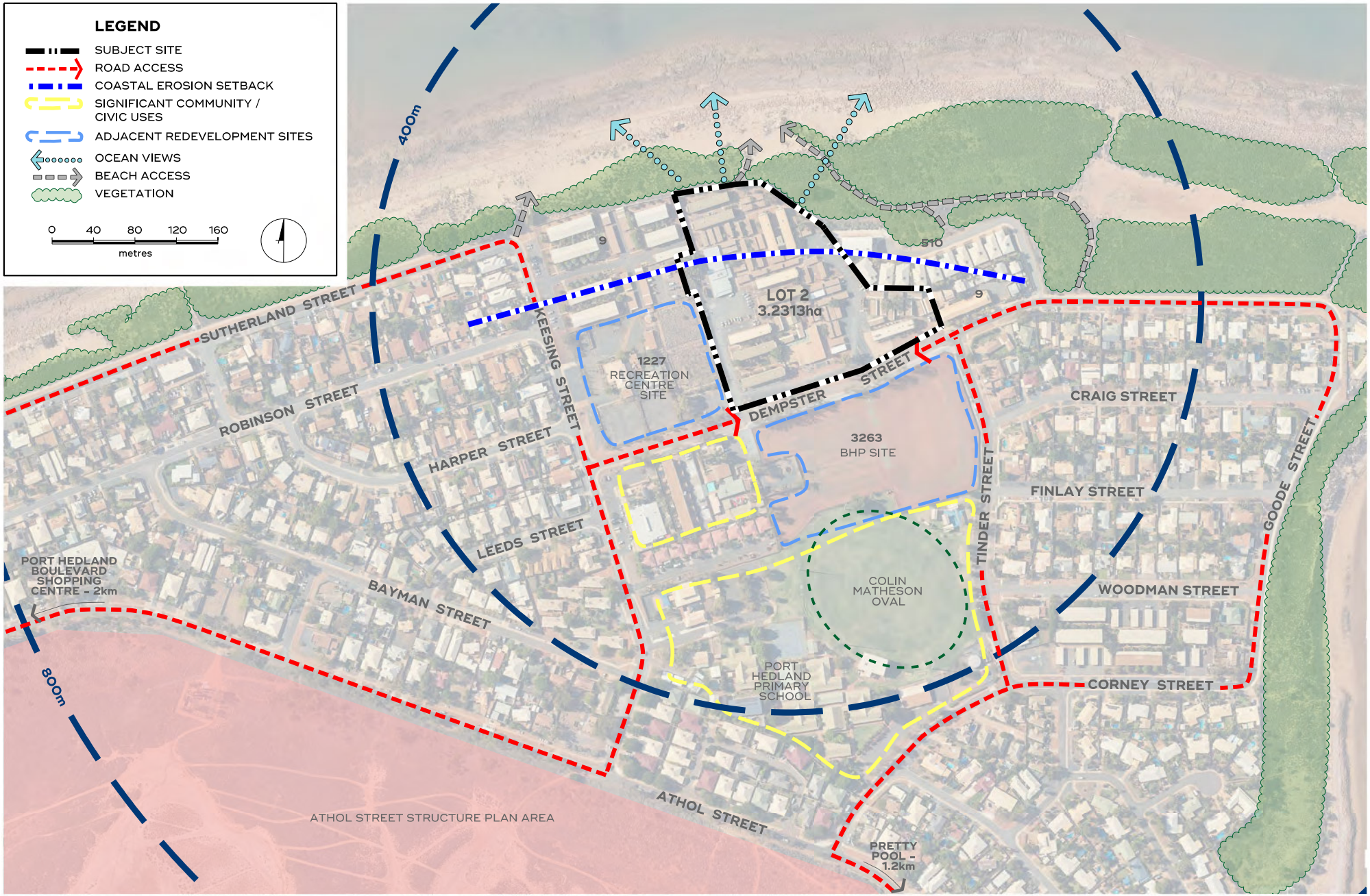
Key policy directions include:

- Discouraging isolated or standalone camps outside of urban areas.
- Prioritising adaptable, well-designed accommodation that can transition to permanent housing.

- Promoting consolidation within serviced urban zones.

The subject site currently accommodates a temporary workforce facility, approved for operation until 2028. The Structure Plan supports the continued short-term use of the site for workforce accommodation. Over time, the precinct will transition to residential and mixed use purposes, consistent with the Town's strategic direction. Land use flexibility enable repurposing of built form for future community or tourist accommodation uses, avoiding obsolescence.





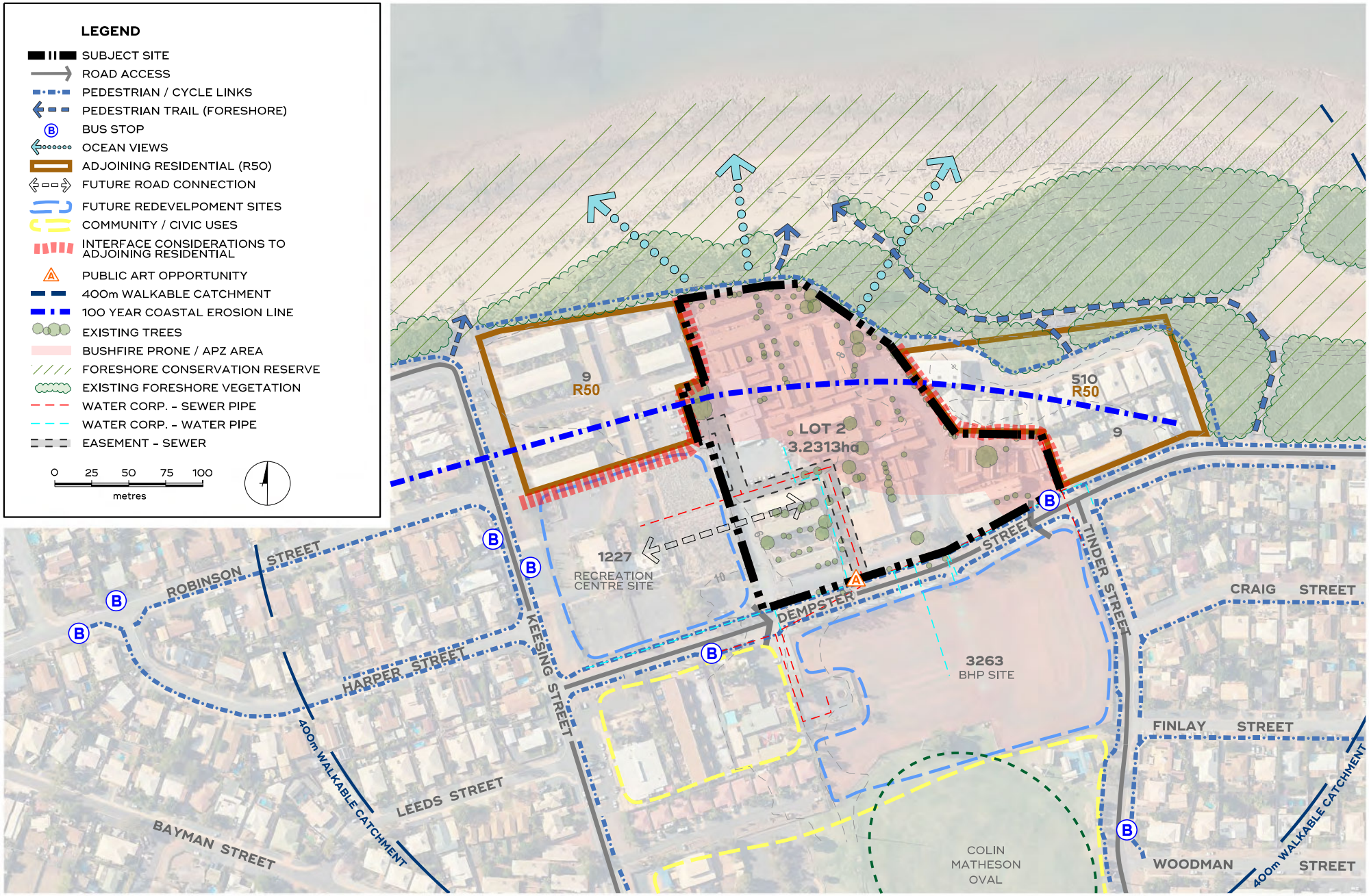
CONTEXT ANALYSIS **FIGURE 10**

3

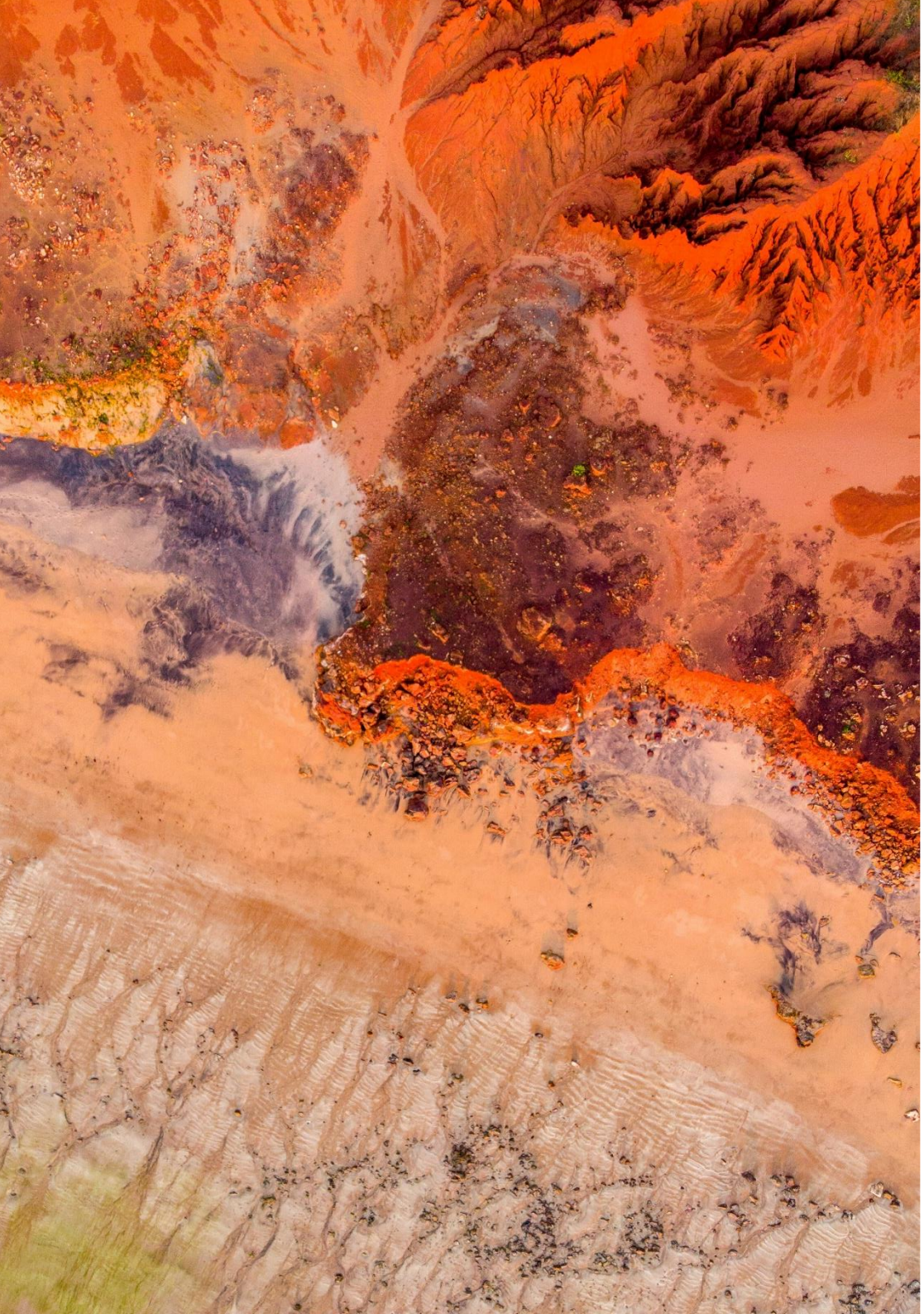
OPPORTUNITIES & CONSTRAINTS

The Structure Plan has been informed by a detailed site analysis, supported by the various technical reporting. A SWOT (strengths, weaknesses, opportunities and threats) analysis is provided below.

 Strengths	• Strategic coastal location, with direct access to the Indian Ocean foreshore. • Established road network providing efficient local and regional access. • Close to key community facilities including schools, early learning centres, and recreation areas. • Strong interface with adjacent residential areas, supporting integration and transition. • Access to existing services (water, sewer, power) enabling cost effective, staged development. • Transport network capacity up to 218 peak hour trips accommodated with no upgrades required. • No Threatened Ecological Communities (TECs); moderate condition vegetation contributes to biodiversity and passive cooling. • Flat, cleared site reduces construction complexity and earthworks.
 Weaknesses	• Legacy site layout requires demolition and reconfiguration to improve permeability. • Land within the 100-year erosion line and SCA7 area is undevelopable for permanent structures. • Incomplete active transport links and lack of pedestrian shading reduce external walkability. • Limited public transport access: Route 870 is infrequent and does not operate on Sundays. • Infrastructure upgrades required: asbestos water main removal, sewer realignment, no gas reticulation. • No retained heritage structures: interpretive design or reuse of materials will be required to honour site history.
 Opportunities	• Opportunity to create a mixed-use node. • R50–R80 supports diverse residential and accommodation options, including workforce housing. • Central landscape spine enhances amenity, walkability, and shade. • Foreshore interface offers potential for low impact development consistent with hazard adaptation policies. • Low traffic volumes and walkable internal road layout support safe circulation and bushfire compliance. • Place-making opportunities through heritage interpretation, naming, and public art. • Future integration with Lot 1227 allows for coordinated redevelopment and infrastructure delivery.
 Threats	• Presence of Priority Flora species may require management or environmental offsetting. • Sensitive eastern interface with R50 dwellings necessitates careful design transitions. • Moderate acid sulphate soil risk may require further geotechnical investigation and mitigation. • Site's bushfire prone status requires APZs, compliant access, and BAL-rated siting. • Servicing must be staged around ongoing workforce accommodation to maintain safety and continuity. • Need for improved policy frameworks and delivery models to support affordable housing outcomes. • Ongoing challenges in normalising FIFO worker accommodation and managing its social and economic impacts.



OPPORTUNITIES AND CONSTRAINTS MAPPING **FIGURE 11**



4

STAKEHOLDER ENGAGEMENT

A series of engagement with key stakeholders has informed the development of the Structure Plan. Further engagement will be undertaken as part of the formal Structure Plan process.

Stakeholder	Date	Purpose
Town of Port Hedland	13 March 2024	• Inception meeting with Town of Port Hedland. • Discussion around content of structure plan, proposed approach, required technical appendices, engagement approach, structure plan boundary.
	10 April 2024	• Confirmation from the Town of Port Hedland that evidence would be required of consultation with the adjoining landowner to support the approach to the structure plan boundary. • Confirmation the Town of Port Hedland is comfortable with a scenario approach laid out in the structure plan to ensure flexibility.
	29 August 2024	• Confirmed technical consultants being engaged and level of detail required in the Structure Plan. • Presented draft options. • Discussed the draft including no public open space. • Discussed the structure plan remaining flexible. • Discussed the use of the foreshore for temporary purposes as an interim approach.
Port Hedland Housing Steering Committee	29 August 2024	• Introduce structure plan concept and direction. • Introduce opportunities and constraints impacting the site design response.
Pilbara Development Commission	21 November 2024	• Introduce structure plan concept and direction. • Introduce opportunities and constraints impacting the site design response.
Department of Planning, Lands and Heritage	8 January 2025	• Introduce structure plan concept and direction. • Introduce opportunities and constraints impacting the site design response.
Department of Planning, Lands and Heritage and Town of Port Hedland	11 April 2025	• Confirm known constraints around market conditions and coastal erosion. • Confirm need for an Environmental Conservation Reserve forward of the coastal erosion setback line. • Confirmed the ability to continue to use the Environmental Conservation Reserve area for temporary and non-permanent land use and development. • Confirm support for a 'mixed use' for the remainder of the structure plan area and the inclusion of 'single' and 'grouped dwellings' as permissible additional uses. • Confirmed structure plan boundary only including 15 Dempster Street.

Table 14 – Summary of Stakeholder Engagement.

5

STRUCTURE PLAN RESPONSE

5.1 Vision and Principles

The Structure Plan establishes a framework for a compact, adaptable, and context-sensitive urban precinct that responds to the site's unique coastal setting, institutional history, and integration with the Cooke Point community. It promotes walkability, housing choice, landscape connectivity, and a flexible mix of residential, accommodation, and commercial uses while embedding long-term resilience to coastal hazards, infrastructure capacity, and shifting market conditions.

The vision of the Structure Plan is as follows:

"To create a future-ready precinct—adaptable to market needs, whilst being responsive to environmental risk, delivering diverse housing, and enhancing local amenity."

The Structure Plan has been guided by the following principles which will enable the vision to be fully realised.

 Flexibility	Guide the development of a precinct that can evolve over time, with a planning framework that supports staged delivery, adaptable land uses, and built form outcomes that respond to shifting market conditions and community needs.
 Community Integration	Promote the creation of a vibrant, mixed-use neighbourhood that reinforces Cooke Point's role as a growing local hub catering to residents, visitors, workers and tourists through a diverse and inclusive land use mix.
 Urban ecology	Embed green infrastructure and sustainable landscaping into the precinct design by strengthening canopy cover, enhancing public open space, and linking the foreshore with broader recreational and ecological networks.
 Diversity	Encourage a varied and adaptable accommodation offer that meets the changing demographic and lifestyle needs of the Port Hedland community, including permanent, transitional and visitor accommodation.

5.2 Design Objectives

The design objectives of the Structure Plan are:

1. Present flexible redevelopment pathways by illustrating a range of indicative development scenarios that could realistically be delivered based on prevailing market conditions. This approach ensures the structure plan can accommodate varied built outcomes without requiring amendment, providing long-term adaptability and reducing regulatory burden.

2. Respond to environmental constraints, including the CHRMAP-defined coastal hazard area, by limiting permanent development north of the 2120 setback line and reserving this land for temporary, low impact uses consistent with State and local coastal planning policy.

3. Enable large, developable land parcels with flexible zoning that supports a mix of land uses, including residential, accommodation, and mixed-use development, allowing landowners and developers to respond dynamically to shifting market demands.

4. Enhance public accessibility and walkability through the integration of a central spine road and pedestrian pathway that links the Indian Ocean foreshore with Colin Matheson Oval. This green connection promotes permeability through the site, invites broader community use, and repositions the precinct as a publicly connected extension of the Cooke Point neighbourhood.

5. Improve the Dempster Street interface by prioritising streetscape activation, landscaping, and passive surveillance through design measures such as street-oriented buildings, ground-level commercial opportunities, and legible pedestrian routes, contributing to a safer, more vibrant, and human scaled public realm.

The above objectives have been considered through the development of the indicative development scenarios and the Concept Master Plan.

5.3 Concept Evolution

The Structure Plan presents a series of flexible scenarios. This approach reflects the volatile and resource driven nature of the Port Hedland market, where development feasibility is shaped by shifting conditions in mining, infrastructure, and logistics sectors.

To ensure long-term adaptability and minimise the need for future amendments, the Structure Plan provides a robust planning framework that can accommodate a range of built outcomes. These scenarios respond to variations in market confidence, funding availability, construction costs, and accommodation demand, supporting development under both constrained and high-growth conditions.

All supporting technical assessments included in Part Three are based on a 'highest and best use' scenario, as illustrated in the Concept Master Plan. This reflects the site's maximum reasonable development potential in ideal market conditions. However, the Structure Plan does not mandate this outcome, instead enabling staged, market-responsive delivery aligned with local policy, infrastructure capacity and the objectives of the Structure Plan.

5.3.1 Indicative Development Scenarios

Scenario 1: Medium-Density Residential

This scenario reflects a conventional infill model, focused on permanent residential housing across the entire site. The scenario assumes strong housing demand and market feasibility for townhouse delivery. However, current construction costs and market conditions make this outcome unlikely without significant government subsidy or institutional delivery.

Key Features:

- R40 development across the site.
- 89 townhouse lots.
- ~2,000sqm of centrally located public open space.
- Assumes mitigation of coastal hazards to enable permanent development north of the erosion setback line.

Limitations:

- Lacks diversity in housing typologies.
- Minimal community benefit (e.g. no foreshore activation or mixed-use activity).
- Financial viability is highly uncertain under current market conditions.

Scenario 2: Accommodtion and Mixed-Use Activation

The concept positions the site as a mixed-use precinct, incorporating short-term accommodation, residential housing, and small-scale commercial uses. It responds to Port Hedland's need for more diverse housing options, particularly for transient workers while also enabling the future delivery of long-term residential product to the market.

The design has been developed to respect the 2120 coastal hazard line and considers opportunities to retain existing in-situ infrastructure to support redevelopment. Given current cost constraints, the feasibility of delivering residential lots is strongly dependent on securing government funding or similar support. Potential retail, food and beverage outlets, and other commercial spaces would contribute to local amenity and help activate the area for both residents and the broader community.

Key Features:

- ~400 hotel/accommodation rooms.
- ~3,000sqm of commercial space (retail, food & beverage, office).
- ~100 dwellings across various density.
- Retention of some existing buildings (addressing NCC wind load constraints).
- Enhanced connectivity between the foreshore and Colin Matheson Oval.

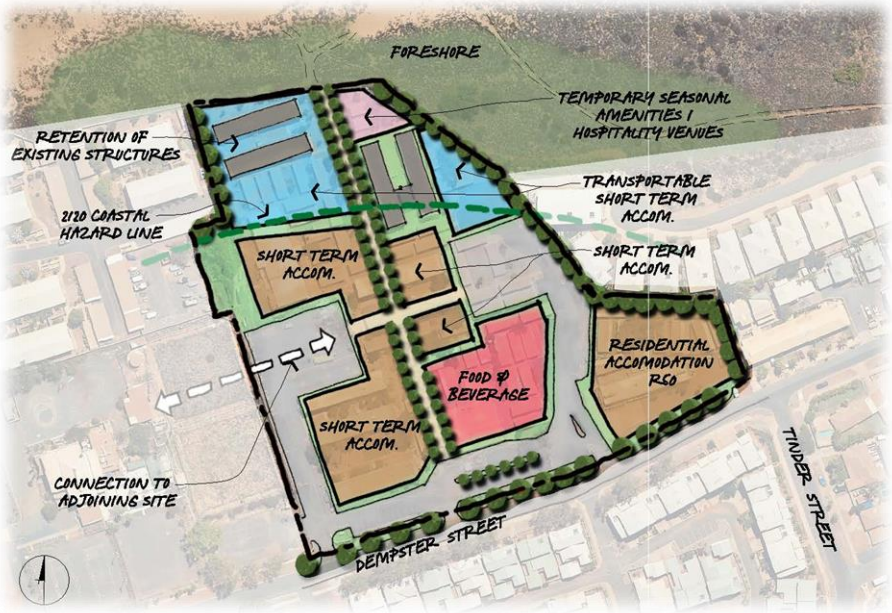
Limitations:

- Assumes adaptive reuse of existing assets is feasible.
- Coastal foreshore implications triggered if the site is subdivided.
- Difficulty in residential development in current market.

Scenario 3: Coastal Hotel-Led Redevelopment

This scenario offers a pragmatic response to the realities of the Port Hedland housing market. It presents a hotel and short stay led masterplan, supported by a mix of residential and commercial uses delivered through a staged development approach.

The design aims to retain existing in-situ buildings located within the 2120 coastal hazard line where practical, while also incorporating temporary or seasonal amenities that enhance public access and recreational use of the foreshore area. It acknowledges the pressing need for accommodation while prioritising design outcomes that improve site amenity, activate the Dempster Street frontage, and contribute to community benefit through a small-scale mixed-use component. Although the hotel element poses initial feasibility challenges, the broader mix of uses supports a flexible, staged rollout aligned with long-term growth in demand.



Key Features:

- ~250 room hotel
- Accommodation and retention of existing in-situ buildings in the Environmental Conservation Reserve.
- Opportunity for residential development.
- ~3,000sqm of ground-floor commercial space in the form of food & beverage.
- Active green spine connecting Dempster Street to the foreshore.
- Supports precinct scale staging and incremental redevelopment delivery.
- Redevelopment could occur without subdivision, as part of a full masterplan redevelopment.

Limitations:

- Less focus on the release of land to market for residential development.
- Environmental Conservation Reserve would need to be carefully planned.

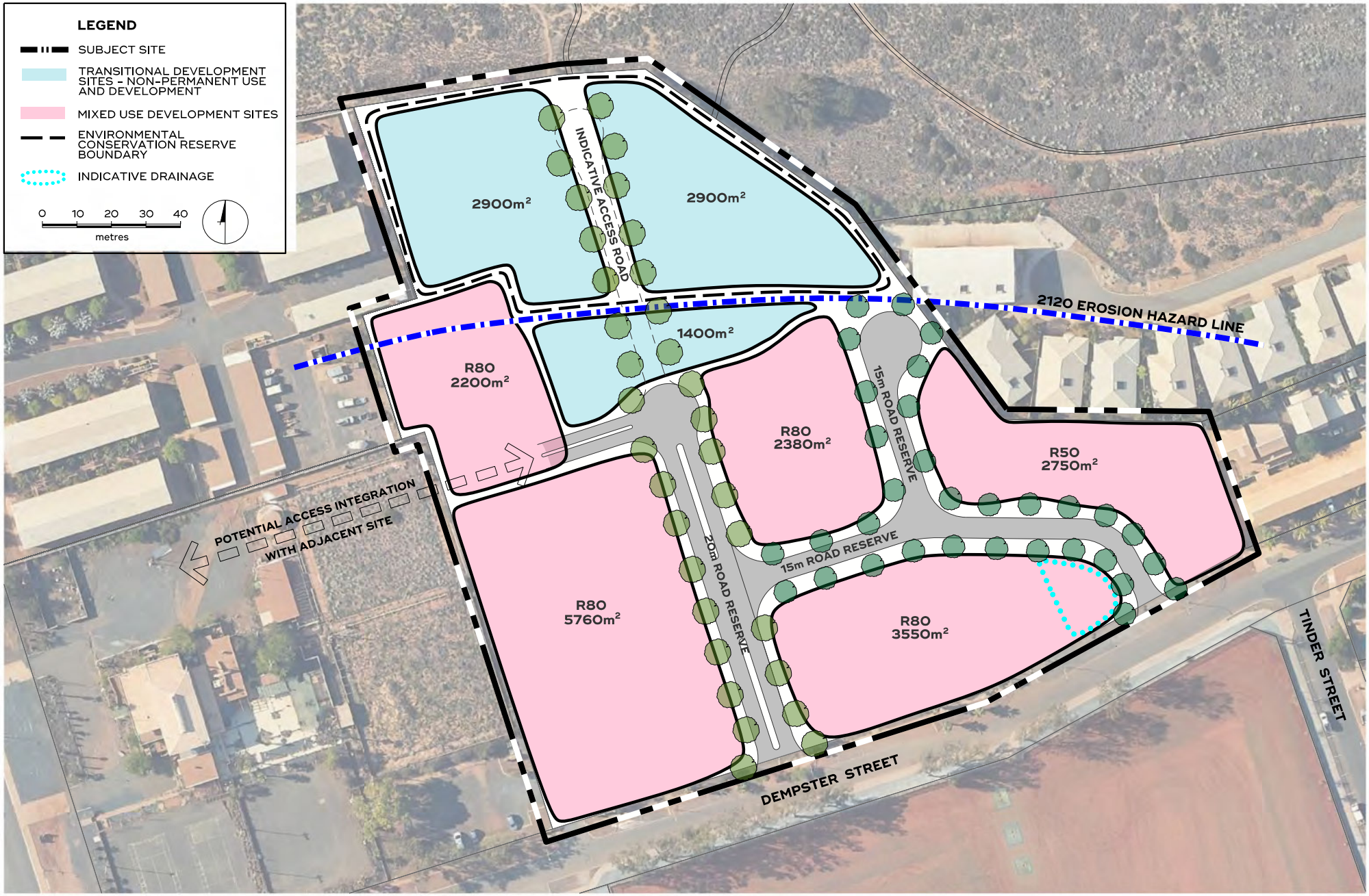
5.3.2 Concept Master Plan

A Concept Master Plan has been prepared to illustrate the intended layout and design approach for the Structure Plan area. It visually expresses the vision for the site, shaped by a detailed understanding of local conditions, environmental factors, planning requirements, and the broader urban context of Cooke Point.

The concept is based on a careful analysis of opportunities and constraints, including landform, vegetation, existing infrastructure, access points, coastal risks, and development feasibility. The goal is to deliver a flexible and site responsive layout that allows for staged redevelopment, supports a mix of residential and commercial uses, and integrates well with the surrounding neighbourhood.

Key features of the Concept Master Plan include:

- A central spine road and landscaped green corridor that forms a strong north–south link between Dempster Street and the foreshore, improving movement, visibility, and opportunities for public space activation.
- Development areas are located outside the coastal hazard setback, in accordance with State Planning Policy 2.6 and the Town's CHRMAP, ensuring new permanent buildings are avoided in erosion-prone areas.
- The plan allows for a variety of building types, including modular and two-storey forms, and supports retention of some existing buildings where suitable. This approach considers local cyclonic conditions and meets National Construction Code structural standards.
- Staged redevelopment is supported, with current temporary workforce accommodation able to continue in the short term, while enabling gradual transformation of the site.
- Mixed-use zoning encourages small-scale commercial uses that contribute to a more vibrant and active streetscape.
- The layout follows natural topography and drainage patterns, incorporating water-sensitive urban design and reducing the need for extensive earthworks.



CONCEPT MASTERPLAN

FIGURE 12

5.4 Urban Structure

The proposed urban structure for the Structure Plan has been developed to deliver a compact, legible and adaptable neighbourhood that reflects the planning principles of Liveable Neighbourhoods. The layout responds to the site's physical characteristics, coastal context, and surrounding land uses to support walkability, housing diversity, and appropriate land use integration.

5.4.1 Land Use

The Structure Plan provides a flexible and context sensitive land use framework that supports a mix of land use outcomes dependent on market conditions.

Mixed Use Zone

The Mixed Use zone is applied to the developable portion of the site located behind the 2120 coastal erosion hazard setback line and is considered the most appropriate mechanism to facilitate a flexible yet coordinated approach to land use and built form. It allows for a range of residential, commercial, and accommodation uses to be delivered in response to market conditions, without requiring multiple zone types across the site.

This area is intended to facilitate a diverse mix of uses including accommodation, residential development, and compatible commercial activities.

Key land use considerations include:

- Support for accommodation where it is well integrated and responds to site constraints.
- Provision for medium to high density residential development to diversify local housing supply.
- Flexibility for commercial, hospitality, and tourism related uses to support local employment and activity.
- Climate responsive built form that enhances Dempster Street and respects adjoining residential zones.

Although the Town's Scheme does not currently list single or grouped dwellings as permitted in the Mixed Use zone, the Structure Plan supports their consideration where:

- Development is of a high standard and complements the urban context.
- It does not compromise the zone's mixed-use intent or future adaptability.
- It responds to both transitional and permanent population needs.

Such proposals should be assessed on merit and demonstrate alignment with the Structure Plan objectives. When the Structure Plan has been fully realised and resolved into the Scheme, single or grouped dwellings will need to be incorporated into the Scheme as permissible uses for the structure plan area.

Environmental Conservation Reserve

The Structure Plan promotes long-term coastal resilience through alignment with the Town of Port Hedland's CHRMAP, State Planning Policy 2.6 – Coastal Planning, and LPP/07 – Coastal Planning. An Environmental Conservation Reserve has been applied to approximately 8,200m² of land seaward of the 2120 Coastal Hazard Setback Line, acknowledging the area's long-term susceptibility to erosion and storm surge.

Permanent development is prohibited in this reserve unless supported by detailed site specific coastal and geotechnical investigations that demonstrate an equivalent or greater level of risk mitigation. Any variation to the setback must be consistent with the precautionary principle and coastal adaptation objectives outlined in CHRMAP and SPP 2.6.

Until further technical studies are undertaken or coastal mitigation measures are implemented, the Structure Plan supports interim, low-impact, or adaptable land uses that can respond to evolving coastal conditions. All development must be reversible or decommissionable, protect ecological values, and preserve the ability to implement managed retreat over time.

Supported land uses within the Environmental Conservation Reserve include:

- Relocatable accommodation (e.g. eco pods or modular units).
- Temporary workforce accommodation.
- Seasonal or popup commercial and recreational activities (e.g. food, tourism).
- Passive open space, foreshore landscaping, shade structures, and seating.
- Community uses such as event spaces or removable coastal pavilions.

The interface between the foreshore and developed areas has been sensitively designed to ensure pedestrian connectivity and enhance public amenity, in accordance with CHRMAP principles. Given the site's proximity to marine turtle nesting beaches, a Lighting Management Plan will be required to minimise light spill, consistent with relevant environmental guidelines.

The reserve functions as a transitional zone, enabling flexible use while future coastal risk is clarified. Although SPP 2.6 typically requires affected land to be ceded free of cost at the time of subdivision, the policy allows for alternative tenure and management options, subject to endorsement by the Town of Port Hedland and relevant State agencies. These may include:

- Vesting the land in a public authority via management order.
- Establishing a formal management agreement.
- Retaining land in private ownership with land use restrictions (e.g. conservation covenant or Reserve Management Plan).

These mechanisms support continued, controlled use of the land while ensuring consistency with long-term coastal adaptation and environmental planning frameworks.

The Structure Plan ultimately achieves a balance between environmental conservation, public accessibility, and flexible interim activation, enabling the precinct to adapt over time to changing coastal conditions.

5.4.2 Density

The plan accommodates a range of residential densities and formats that reflect the site's orientation, proximity to amenity, environmental constraints, and interface considerations:

- R50 development site concentrated along the eastern edge of the Structure Plan area, facilitating a sensitive transition to adjoining lower density housing. These lots will support grouped or single dwellings and maintain neighbourhood character through compatible built form.
- R80 coded lots are applied centrally and to the west of the site, within walking distance of the proposed landscape spine, coastal edge, and mixed-use node. These higher-density lots support multiple dwellings and are intended to deliver housing diversity, optimise land efficiency, and promote urban consolidation.

5.4.3 Lot Yield and Floorspace

Under the proposed Concept Plan, indicative lot yields and commercial floorspace within the Structure Plan includes:

- A 5,760m^2 and a 2,200m^2 development lot being identified for potential future hotel/accommodation, catering to 150-200 rooms, including ground floor commercial and car parking.

- Two R80 development sites, with a combined area of 5,930m^2 which could achieve an indicative lot yield of ~79-118 multiple dwellings.
- One R50 development site, with an area of 2,750m^2 which could yield a total of 10 lots.
- Approximately 5,800m^2 of developable land within the Environmental Conservation reserve which may include a mix of accommodation, recreation and small-scale commercial activity.

5.4.4 Lot Configuration and Street Block

The Structure Plan layout has been designed to create a coherent and connected network of street blocks, supporting legibility, walkability, and a clear urban hierarchy. The internal layout reinforces the principles of neighbourhood structure and permeability, responding to the requirements of Liveable Neighbourhoods

The lot configuration promotes a flexible and adaptable framework for staged development, while supporting future integration with the neighbouring Former Recreation Centre (1227 Keesing Street). The following key elements underpin the street block layout:

- A central north–south spine road and green corridor is the primary organising feature of the layout, enabling strong pedestrian and vehicle permeability from Dempster Street to the foreshore reserve. This corridor establishes a key spatial axis and supports integration with surrounding neighbourhood character and green infrastructure such as the Colin Matheson Oval.
- Street blocks have been designed to facilitate large development parcels, enabling flexibility in housing typologies and future subdivision formats. This approach allows for responsive staging, integration with existing uses on site, and market responsive lot releases.
- The design supports clear sightlines and pedestrian movement between public open space nodes and Dempster Street, reinforcing visual connectivity and encouraging active transport.
- The combination of lot orientation, block geometry, and R80 density supports an improved interface with Dempster Street by enabling enhanced landscaping, increased building presence, frequent entries, and greater pedestrian activity—creating a more active, vibrant, and visually engaging streetscape that promotes safety and ground-level interest.

While standard Structure Plans generally do not include detailed built form provisions, this Structure Plan includes provisions in Part One to guide the preparation of Local Development Plans (LDPs) where additional built form direction may be required. LDPs may be prepared for specific lots or precincts to address variations to the Residential Design Codes (R-Codes) and provide site-responsive design guidance. These may include:

- Tailored built form requirements such as setbacks and height limits for development adjoining the Environmental Conservation Reserve.
- Design controls for the R50 site to manage the transition to existing residential areas.
- Built form provisions for development fronting Dempster Street to ensure a quality and well-integrated streetscape interface appropriate for the locality.

5.4.5 Interfaces and Integration

Foreshore and Natural Features

The Structure Plan responds to the natural topography and coastal hazard risk by aligning built form and public domain design with the Town's CHRMAP recommendations and SPP 2.6 requirements. Key strategies include:

- A defined foreshore edge north of the 2120 Coastal Hazard Setback Line is reserved as Environmental Conservation, preventing new permanent development within high-risk areas.
- Low impact accommodation and associated land uses are identified within the Environmental Conservation Reserve enabling temporary activation while preserving flexibility for long-term retreat or environmental restoration.
- The green spine and north-south pedestrian axis establish a functional and visual link to the coast, improving community connection to the foreshore.
- A potential requirement to prepare a Local Development Plan ('LDP') as a condition of subdivision approval to address any interface requirements, including building setbacks and fencing, if considered necessary.

The structure plan also proposes vegetated buffers and coastal compatible landscaping along key edges to reinforce ecological performance and contribute to Port Hedland's broader open space network.

Residential Interface

The Structure Plan supports the provision of an appropriate interface along the eastern and north-west boundary, abutting existing residential development, by way of incorporating the following:

- The application of a lower density of R50 to the eastern development block that supports the creation of larger lots that are consistent with the adjacent built form.
- A requirement for a Landscaping Plan to be prepared as a condition of subdivision approval, and thereafter implemented, detailing the way the lots will be developed/landscaped to provide an appropriate interface.
- A potential requirement to prepare a Local Development Plan ('LDP') as a condition of subdivision approval to address any interface requirements, including building setbacks and fencing, if considered necessary

5.4.6 Culture and Heritage

The Structure Plan integrates cultural identity and heritage through design, land use, and ongoing engagement. Key strategies include:

- Embedding interpretive elements, such as native planting, Kariyarra seasonal themes, and storytelling nodes, into public spaces.
- Applying culturally informed naming protocols, public art, and signage to reflect the site's layered Aboriginal and European history.
- Reinforcing traditional street alignments and promoting built form that acknowledges past uses through adaptive design.
- Maintaining ongoing consultation with Kariyarra Traditional Owners and community stakeholders during detailed design stages.

These initiatives align with the Town of Port Hedland's Community Strategic Plan, supporting inclusive, culturally resonant places that honour identity and belonging.

5.5 Managing Site Constraints

5.5.1 Bushfire Management

The Structure Plan is identified as being located within a designated bushfire prone area, as per the Department of Fire and Emergency Services (DFES) bushfire mapping. In response, a Bushfire Management Plan (BMP) has been prepared by Linfire Consultancy to guide site planning and ensure compliance with SPP 3.7. The BMP confirms that the site can be developed with appropriate bushfire mitigation measures, including compliant access, water supply, lot orientation and landscaping provisions.

Site Layout and Asset Protection Zones

- Development to be set back from vegetated areas to the north and east, allowing for the incorporation of compliant Asset Protection Zone (APZ) buffers between urban edges and bushfire hazards (**Refer, Figure 13**).
- All proposed building envelopes and lots can achieve a maximum Bushfire Attack Level (BAL) of BAL-29, provided that APZs are implemented through road reserves, lot setbacks and strategic landscaping.
- Areas subject to bushfire exposure, such as the north-eastern boundary, will need to be designed to incorporate low fuel landscape buffers or road separation.

Internal Access and Egress

- The internal road network incorporates a looped configuration with multiple access points to Dempster Street and Tinder Street, providing two-way emergency egress routes in accordance with bushfire policy requirements.
- Road widths (15-20m reserves) and turning paths meet the technical standards for emergency vehicle access and water supply access.

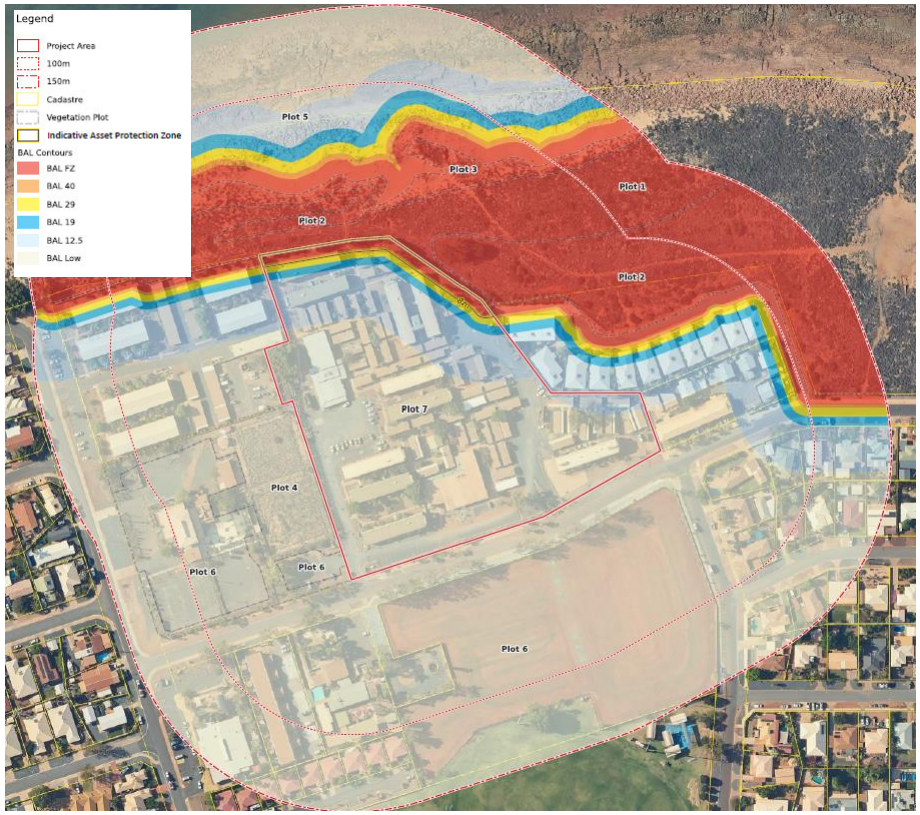


Figure 13 - Asset Protection Zone Area.

Source: Linfire, 2025

Staging and Ongoing Use

The BMP supports the retention of existing accommodation use on-site during early stages of redevelopment, provided that:

- Compliant emergency access and firebreaks are maintained.

- Emergency evacuation procedures are in place.
- Future subdivision applications align with bushfire performance standards.

Building and Landscaping Controls

- Dwellings and buildings will be subject to site specific BAL assessments at the development application or subdivision stage, ensuring construction methods align with AS3959 construction standards.
- Landscaping within the APZ areas will be maintained in a low-fuel state, with species selection and design informed by the BMP and any future Landscape Plan.

The Structure Plan demonstrates that the site can be developed in a manner that is consistent with SPP 3.7 and associated bushfire risk management frameworks. Through spatial separation, strategic design and appropriate road and lot configurations, the plan ensures that future residents and visitors will be accommodated safely and that bushfire resilience is embedded into the planning and development process from the outset.

5.5.2 Lightspill

Although the existing site structures were constructed prior to the introduction of environmental legislation, they have not been identified as sources of visible light emissions to the nearby turtle nesting beaches at Pretty Pool and Cemetery Beach. The Structure Plan provides an opportunity to improve environmental outcomes by replacing these older buildings with development that complies with current best-practice lighting standards to minimise light spill.

The proposed use of temporary, low-intensity development within the foreshore interface, combined with the site's natural topography, will help maintain a low lighting profile. The absence of permanent, multi-storey structures in this area will further minimise light spill, supporting the protection of nearby turtle nesting habitats.

In accordance with the National Light Pollution Guidelines for Wildlife (2023) and EPA (2010) recommendations, all future development within or adjacent to the Environmental Conservation Reserve will be required to prepare a Lighting Management Plan at the subdivision or development application stage. This plan will be prepared in consultation with the Town of Port Hedland and the Department of Biodiversity Conservation and Attractions (DBCA) and will include line-of-sight modelling to assess visibility of direct and indirect light from the site.

5.6 Urban Water Management

The LWMS sets out the framework to manage potable water, wastewater, stormwater, and groundwater in a sustainable, resilient, and integrated manner. A detailed Urban Water Management Plan (UWMP) will be prepared at the subdivision stage to refine strategies and design elements. The key design criteria and management objectives of the LWMS are outlined in the table below.

Element	Objectives & Strategies
Water Sustainability	
Potable Water	• Supplied by a 150mm Water Corporation main along Dempster Street. • Older 100mm asbestos main to be decommissioned and replaced.
Wastewater	• Connected to Water Corporation infrastructure. • Internal sewer realignment required to road reserves.
Water Efficiency	Landscaping will adopt Waterwise and Nutrient Wise principles, prioritising native, waterwise planting and minimising fertiliser.
Firefighting Water	Provision of hydrants to standard.
Sustainable Water Supply	No current groundwater extraction planned, though access to the Pilbara Alluvial aquifer remains available for future licensed use.
Stormwater Management	
Flood Protection	• Stormwater to be managed to the 1% AEP event level • Lots set 300mm above adjoining road levels' overland flow directed safely to discharge points.
Detention & Treatment	• All lots detain and infiltrate runoff via soakwells and bioretention systems at a target rate of $1m^3$ per $40m^2$ of impervious area. • Final basin and bioretention gardens designed to handle minor exceedances.
Serviceability	• Road runoff conveyed through piped and overland flow paths. • Designed to manage sheet flow from lots and roads without impacting infrastructure.
Ecological Protection	Treatment trains (biofiltration and infiltration) improve water quality before discharge, protecting the adjoining foreshore ecosystem.
Groundwater Management	
Separation & Infiltration	• Site has in addition of 6m separation from groundwater. • All infiltration systems (soakwells, bioretention) maintain a minimum 3m clearance.
Groundwater Quality Protection	• Pollutants filtered through soil and bio-retention media. • Use of slow-release fertilisers and restricted fertiliser zones to limit nutrient leaching.
ASS Risk Management	• Site is mapped as Moderate to Low ASS risk. • ASS management protocols only to be applied if deep excavation is undertaken (which is not anticipated).
Dewatering	No dewatering is anticipated due to depth, but protocols are in place should it occur.

Table 15 – Local Water Management Plan Objectives.

5.6.1 Stormwater Management Strategy

Stormwater will be managed through a decentralised, Water Sensitive Urban Design (WSUD) approach. Although no formal public open space is proposed, drainage requirements will be addressed using on-lot and street-based infrastructure such as soakwells, bioretention systems, swales, and overland flow paths. This approach supports flood mitigation, improves water quality, and integrates effectively with the urban layout—meeting the intent of the Town of Port Hedland's Local Planning Policy 11 (LPP/11) – Stormwater, without the need for a conventional drainage reserve.

As noted earlier, a 2,880 m² drainage basin is proposed adjacent to Dempster Street. This basin will detain and infiltrate stormwater on site via bioretention or a similar large-scale infiltration system, designed to manage runoff from events up to and including the 1% Annual Exceedance Probability (AEP) (**Refer, Figure 14**).

5.6.2 Groundwater Management Strategy

The groundwater strategy prioritises infiltration to support natural recharge while protecting groundwater quality through passive filtration. Adequate vertical separation avoids impacts on water tables, and ASS risks are low. No groundwater use is proposed but future access remains possible if required. Overall, the groundwater management approach ensures environmental protection and regulatory compliance throughout the life of the development.

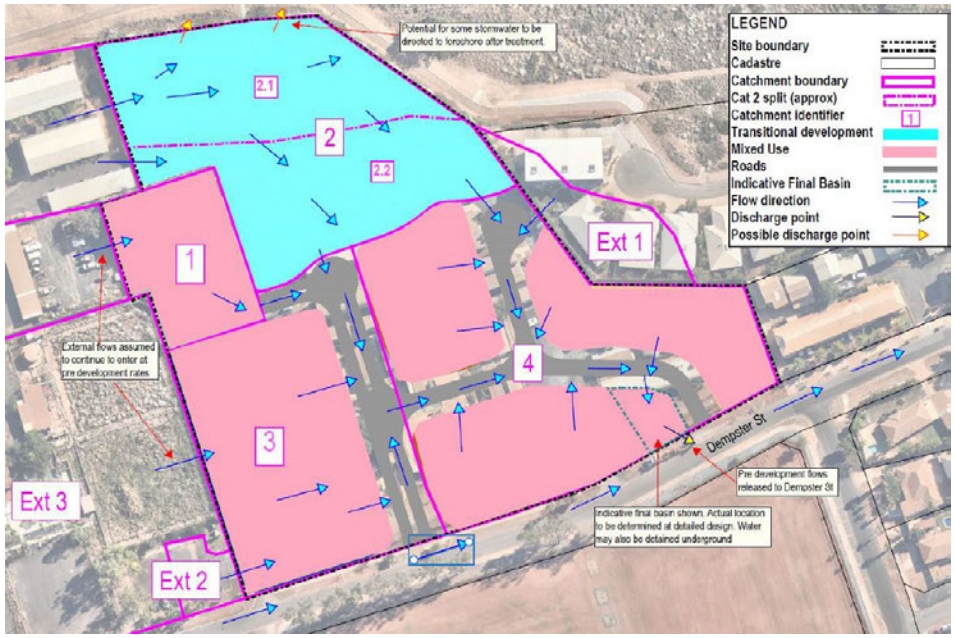


Figure 14 – Proposed Drainage Plan.
Source: Oversby Consulting

5.7 Green Spaces

The Structure Plan focuses on building upon the site's proximity to the coastal foreshore and existing green spaces within the locality, such as the Colin Matheson Oval, through improved north-south linkages.

5.7.1 Public Open Space

Due to the size of the Structure Plan area, combined with the sites immediately proximity to the coastal foreshore and the requirement for a large portion of the site to be reserved for environmental conservation purposes, no dedicated public open space is proposed However, approximately 8,200m^2 of Conservation Foreshore Reserve is proposed, which equates to approximately 25% of the gross subdivisible area.

In addition, a drainage area (approximately 2,800m^2) has been included in the structure plan to manage excess runoff generated during high intensity rainfall events. The drainage area also has the potential to function as a multipurpose space for passive recreation, incorporating landscaping to enhance local amenity. The detailed design of the drainage basin will be considered as part of the future Urban Water Management Plan and Landscape Plan.

5.7.2 Landscape Strategy

The proposed landscape strategy for the Structure Plan establishes a cohesive and contextually responsive public realm that integrates environmental protection, community amenity, and walkable neighbourhood principles. The proposed Landscape Masterplan (**refer, Figure 15**) reflects the intent to create a resilient, inviting and connected urban environment, with landscape interventions playing a key role in both visual identity and environmental performance.

The landscaping approach responds to the site's coastal setting, urban structure, and transitional land use mix, focusing on:

- Enhancing the Dempster Street interface.
- Defining a central landscape spine that links the urban core to the foreshore.
- Supporting ecological and recreational function within the Environmental Conservation Reserve.
- Increasing passive recreation opportunities through improved open space access and visual amenity.
- Promote walkability and cooling, contributing to improved microclimate across the site.
- Reinforce the coastal identity of the precinct through native and regionally appropriate planting palettes.
- Support staged development, with landscape corridors acting as early public realm interventions that can mature over time as built form evolves.

Landscaping will be guided by principles of water sensitive urban design (WSUD), turtle-sensitive lighting, and heritage interpretation, ensuring the precinct evolves as a resilient and community focused public realm.

Environmental Conservation Reserve

Land north of the 2120 Coastal Hazard Setback Line is reserved for conservation and managed foreshore use. Landscaping in this area will focus on low impact ecological enhancement, with planting to support dune stabilisation, manage erosion, and protect adjacent marine turtle habitat. An Environmental Conservation Management Plan will be required at subdivision or development stage (whichever comes first) and should detail the following:

- The use, protection, and long-term adaptation of land within the identified coastal hazard area.

- Address vegetation retention and rehabilitation, including vegetated buffers and coastal compatible landscaping along key edges to reinforce ecological performance.
- Lighting management to protect marine turtle nesting areas.
- Reconfirm land use controls to ensure only temporary or low-impact activities are permitted
- Establish monitoring, implementation responsibilities, and adaptive measures consistent with managed retreat principles.

North–South Landscape Spine

A landscaped pedestrian and cycling corridor will run through the centre of the Structure Plan area, connecting Dempster Street to the foreshore. This green link will include:

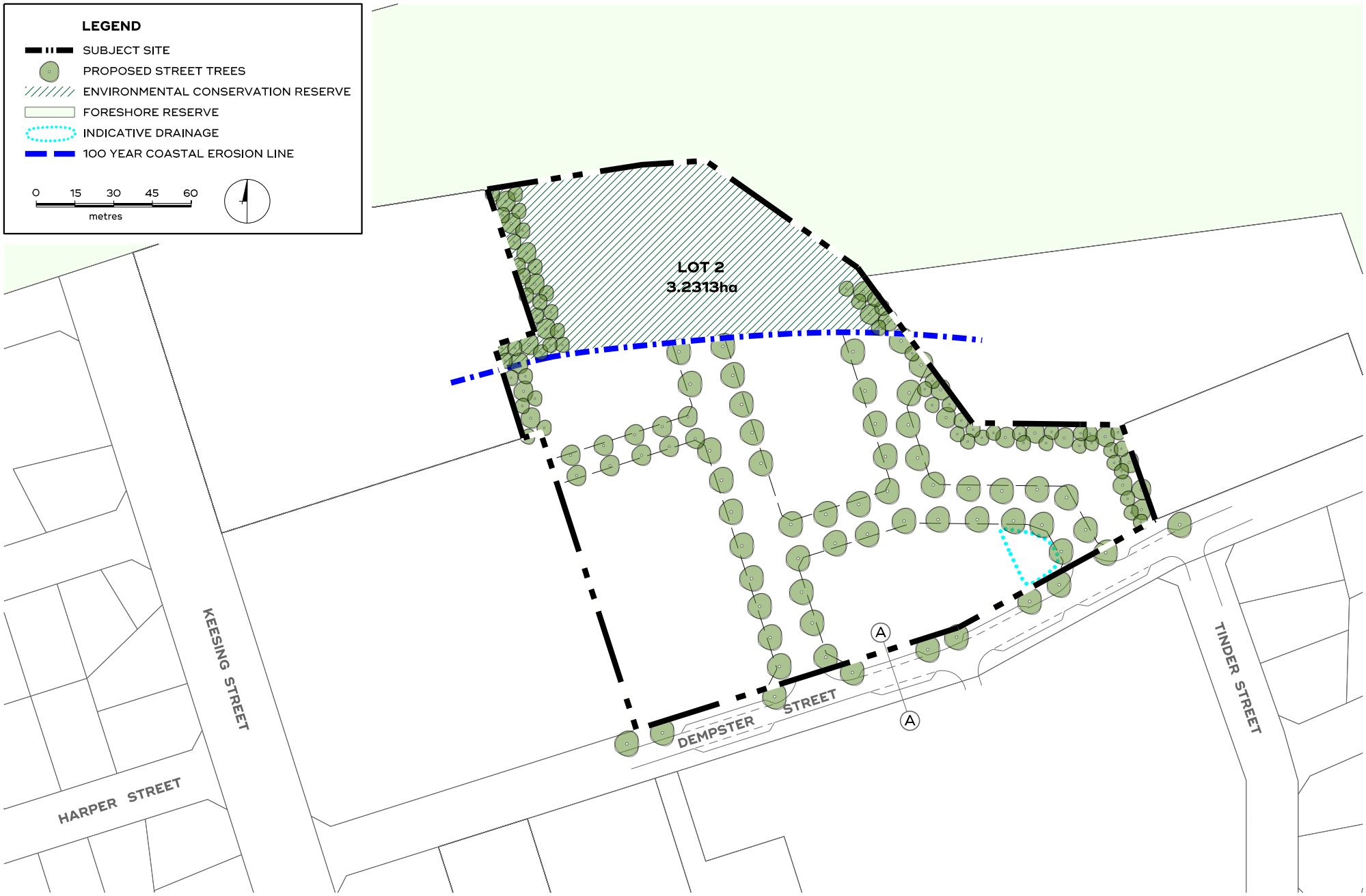
- Shaded footpaths and seating nodes.
- Native tree planting for shade and biodiversity.
- Stormwater swales with integrated planting and interpretive elements.
- Opportunity for public art and interpretive signage reflecting the site's heritage.

Dempster Street Interface

Streetscape improvements along Dempster Street will include:

- Landscape buffers to soften built form and support privacy between mixed use and civic interfaces.
- Tree planting within verge areas to provide shade and improve visual amenity.
- Enhanced pedestrian access with clearly defined crossings and wayfinding to open space nodes and coastal connections.

Source: South Hedland Town Centre Design Guidelines, 2023



LANDSCAPE MASTERPLAN

FIGURE 15

5.8 Movement Network

The proposed hierarchy of roads within the Structure Plan is illustrated in **Plan 1 – Structure Plan Map**, using the road hierarchy defined by Liveable Neighbourhoods.

5.8.1 Existing Road Network

The existing road network comprises of the following:

Dempster Street: A 7.2-metre-wide Access Road in a 20m reserve, running east–west. It includes on-street parking bays and 2.7 metre footpaths on both sides. School zone speed reductions apply during peak times.

Keesing Street: North–south Access Road with 7.2 metre pavement and limited shade or pedestrian comfort on the eastern footpath. Functions as a local connector.

Tinder Street: An Access Road with 7 metre pavement width. It includes embayed parking and a 2 metre concrete path on one side.

The existing road network carries low volumes, with Dempster Street at 140–150 vehicles per hour (vph), Keesing at 180–190 vph, and Tinder Street at 70 vph.

5.8.2 Proposed Road Movement Network

The internal road network has been designed to provide efficient circulation, support walkable neighbourhood structure, and enable future connectivity to adjoining development areas. All proposed roads are classified as Access Roads, consistent with the surrounding local network and the role of the Structure Plan area within the broader movement framework.

The road layout incorporates a simple but flexible grid, comprising:

- A central north–south spine road connecting Dempster Street to the site's northern boundary and curving westward to facilitate a future road link to the adjacent Lot 1227 (former Recreation Centre site).
- An east–west connector road linking Dempster Street to the central spine, supporting permeability and lot access within the Mixed-Use precinct.
- A short cul-de-sac in the north-eastern portion of the site, providing local access and potential emergency or pedestrian linkage to the Environmental Conservation Reserve, supporting bushfire egress and public access.

Road Classifications and Dimensions

The road hierarchy supports a clear and legible movement pattern, allowing for staged delivery and enabling adaptable subdivision layouts. It also ensures compliance with bushfire management requirements, provides access for service vehicles, and facilitates strong pedestrian and visual connections to Dempster Street and the foreshore. Key aspects include:

- The central spine road features a 20-metre road reserve with a 7.5-metre carriageway, designed to accommodate two-way traffic, on-street parking, landscaping, and pedestrian pathways.
- All other internal roads have 15-metre reserves with 6-metre carriageways, supporting local access and safe vehicle movement within residential and accommodation precincts.

The layout supports Liveable Neighbourhoods design objectives for internal connectivity, block permeability, and responsive edge treatment, with opportunity for public realm enhancements and shared path integration.

Proposed Intersections and Upgrades

No major intersection upgrades are required, as the traffic volumes anticipated under the proposed Structure Plan, despite reflecting the site's 'highest and best' use, are expected to remain well within the capacity of the surrounding road network. Two new priority-controlled T-intersections are proposed where internal roads connect to Dempster Street, while all internal intersections will be designed as three-way, priority-controlled intersections.

Proposed Pedestrian and Cycle Network

All internal roads will include a footpath on at least one side to support safe pedestrian movement. The central north–south access road will feature:

- A 2.5 metre shared path on the eastern side.
- A 2-metre footpath on the western side within the Mixed Use zone.

The shared path will link directly to a future 3 m wide shared path along the site's northern boundary, forming part of the Regional Long-Term Cycle Network (LTCN). This design enhances pedestrian and cyclist connectivity to key local destinations, including Port Hedland Primary School, the foreshore, and surrounding community facilities.

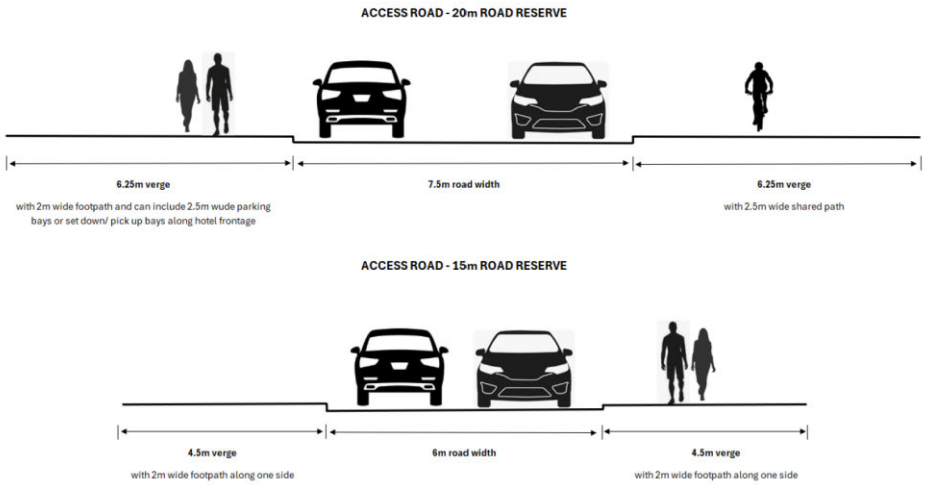
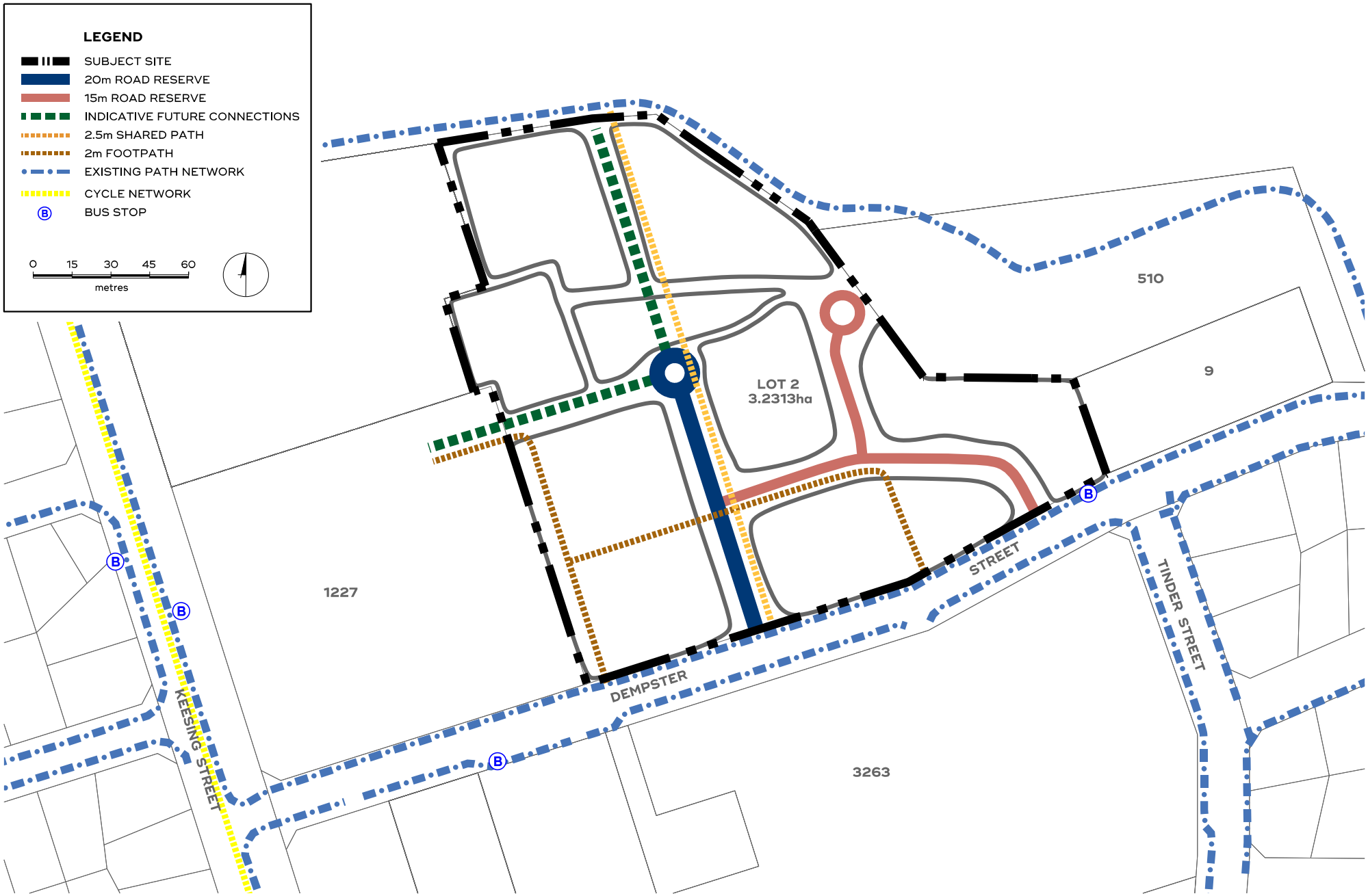


Figure 16 - Road Cross-Section

Source: Flyt



MOVEMENT NETWORK

FIGURE 17

5.9 Infrastructure and Servicing

Water Supply

Given the proposed development layout, the existing 100mm asbestos cement water main is expected to require removal and disposal in accordance with relevant asbestos management procedures. New Water Corporation water mains will be installed and extended throughout the development via the proposed road network.

Wastewater (Sewer)

The existing sewer servicing the recreation centre will require realignment to sit within the proposed road reserve. A general schematic of the proposed wastewater reticulation layout is provided in the report prepared by Porter's Consulting Engineers.

For the existing sewer along the eastern boundary of the site, early engagement with the Water Corporation is recommended to confirm whether retention of this asset in its current location would be supported. The Water Corporation typically permits sewers (with a 3-metre-wide easement) to be located within private lots only where the lot size exceeds 600m². Development to the Mixed Use – R50 development site should incorporate necessary setbacks to enable the retention of the existing sewer.

Based on the anticipated development density and projected dwelling yield, it is expected that DN150 and DN225 sewer mains will be required. These will be accommodated within the proposed road network.

Gas

New development will therefore rely on:

- Bottled LPG for domestic and hospitality uses, or
- All-electric design solutions, consistent with emerging best practice for emissions reduction and simplified servicing.

The absence of a gas network is not considered a constraint, given the increasing uptake of electric appliances and rooftop solar energy systems in new residential and mixed-use developments.

Electricity

Subject to the final development yield, 2 to 4 new transformers are anticipated. Horizon Power engagement is required through a Design Information Package (DIP) to confirm network capacity and connection arrangements.

Telecommunications

The existing NBN infrastructure will be extended and integrated into the development to provide broadband servicing.

6 Conclusion

The Beachfront Village Structure Plan offers a pragmatic and flexible framework to unlock the strategic redevelopment potential of a well-located, coastal infill site. It balances the delivery of new housing and commercial opportunities with strong environmental safeguards and public realm enhancements. By embedding long-term resilience, accommodating market variability, and enhancing community integration, the plan provides a sustainable roadmap for revitalising a key urban site in Port Hedland.

PART THREE
TECHNICAL APPENDICES

ENVIRONMENTAL ASSESSMENT REPORT

COTERRA
ENVIRONMENT

Environmental Assessment Report

15 Dempster Street Local Structure Plan

Rev 0 17 June 2025

CALIBRE | COMMITMENT | COLLABORATION

This report was prepared by: Coterra Pty Ltd trading as COTERRA ENVIRONMENT
ABN: ABN: 92 143 411 456
Our Ref: RFFDEM01
Author(s): W Oversby
Reviewer: K Choo
Report Version: Rev 0
Date: 17 June 2025

This report was prepared for:
Campbell Transport
5-7 McCook Street
Forrestdale, Western Australia

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1 Introduction

1.1 Background

DA Campbell Property Holdings Pty Ltd (Campbell Transport; the proponent) is seeking to progress a Local Structure Plan (LSP) over Lot 2 (No. 15) Dempster Street, Port Hedland (the site; Figure 1). The site covers approximately 3.23 hectares (ha) of land on Kariyarra country, and is bound by Dempster Street in the south, a foreshore reserve in the north, and residential and urban development in the west and east. Prior to its purchase by Campbell Transport in September 2022, the site was formerly owned by the Australian Federal Government and operated as an immigration detention centre.

1.2 Local Structure Plan

The proposed LSP (provided at Appendix 1), will provide for the long-term development of the site while also accommodating the potential continuation of its current use as a workers' accommodation facility if required. The LSP proposes two zones, being:

- Mixed Use zone to apply to land behind the 2120 Coastal Hazard Setback Line
- Environmental Conservation Reserve to apply to land seaward of the 2120 Coastal Hazard Setback Line.

While permanent development in the Environmental Conservation Reserve is not supported, temporary and low-impact land uses such as recreation, short-stay accommodation, and tourism may be considered, provided they align with the Town of Port Hedland Local Planning Policy 07 – Coastal Planning (see section 2.5).

Accompanying the proposed LSP is a Concept Masterplan (provided at Appendix 2), which presents an indicative development scenario based on the 'highest and best use' of the site, and which represents the maximum reasonable development potential of the site under ideal market conditions. All technical assessments undertaken of the site are therefore based on a peak-capacity model, thereby future-proofing the LSP against the need for unforeseen upgrades. Given the cyclical and often unpredictable nature of the Port Hedland Market, this approach provides a flexible and robust planning framework that can accommodate varying development outcomes over time.

1.3 Purpose and Scope of this Document

This Environmental Assessment Report has been prepared to accompany the LSP application documentation package to inform the regulatory authorities on the environmental values of the site, potential environmental impacts associated with the proposed development, and the design, management and mitigation strategies proposed to address these potential impacts.

2 Planning and Environmental Context

2.1 Land Use

The site was initially cleared of native vegetation in 1969, when the former Mount Newman Mining Company (now BHP Billiton Group) established a single men's workforce accommodation camp at the site. This comprised a complex of accommodation buildings of besser block, clad in corrugated iron with low pitched iron roofs (RFF 2022; HCWA 2020). The site was subsequently purchased by the Australian Federal Government in 1991 and repurposed as an immigration detention centre. The detention centre was later decommissioned in 2007 and leased to Auzcorp for use as a commercial accommodation facility. Prefabricated 'dongas' and a kitchen and diner building were added to the complex during this period (HCWA 2020). Following the lease's expiry in 2012 the site remained unused until its purchase by Campbell Transport in 2022. The site is currently utilised as a temporary workers accommodation facility in accordance with a development approval granted to Campbell Transport in May 2023.

The site is located immediately south of the Port Hedland foreshore reserve (R 30768), which is owned by the state of Western Australia and managed on the state's behalf by the Town of Port Hedland.

2.2 Town of Port Hedland Local Planning Scheme No. 7

The site is currently zoned as Urban Development under the Town of Port Hedland Local Planning Scheme No. 7 (LPS 7).

The northern portion of the site is subject to Special Control Area 7 (SCA7) – Coastal Hazard and Risk Management Adaptation Area, the objectives of which are to:

- Protect new development from the impacts of flooding, coastal erosion and inundation
- Provide for implementation of the Port Hedland Townsite Coastal Hazard and Risk Management Adaptation Plan
- Minimise the risks of coastal processes on community.

Scheme provisions which are applicable to SCA7 and which are relevant in the consideration of structure plans include:

1. Notwithstanding any other provisions of the scheme, all proposed development within SCA7 requires the approval of local government, unless the development is specified in a local planning policy as a type that does not require approval
2. In considering proposed structure plans, subdivision or development applications, due regard shall be given to –
    a. Port Hedland Townsite Coastal Hazard and Risk Management Adaptation Plan
    b. State Planning Policy 2.6 – State Coastal Planning Policy
    c. Relevant local planning policies

LPS 7 also includes scheme provisions specifically applicable to the site and the adjacent lot 1227 (No. 13) Keesing Street (collectively scheme area no. 14). Those provisions which are applicable to the consideration of structure plans and which are relevant to the environment include:

1. Subdivision and development shall have due regard to the requirements of a Structure Plan(s) approved by the Western Australian Planning Commission which shall address the following requirements:
    a. Land identified in the Structure Plan(s) will be restricted to a built height limit that prevents light spill onto Cemetery Beach and Pretty Pool Beach and adjacent area

b. The Structure Plan(s) shall address the relevant provisions of State Planning Policy No. 2.6 – State Coastal Planning Policy and demonstrate that future development of the site will incorporate adequate coastal erosion and inundation protection and management measures approved by the local government consistent with the Port Hedland Townsite Coastal Hazard Risk Management and Adaptation Plan (CHRMAP)

f. Provision of public open space or environmental conservation reserve seaward of the 100 year coastal erosion risk line

It is also noteworthy that the provisions for scheme area no. 14 state that the following documentation and management plans are required to be prepared prior to, supporting application for, or as a condition of subdivision approval:

- Construction Management Plan
- Urban Water Management Plan
- Marine Turtle Management Plan
- Acid Sulfate Soil Management Plan
- Line of Sight Modelling
- Lighting Management Plan

2.3 State Planning Policy 2.6 – Coastal Planning

State Planning Policy 2.6 – Coastal Planning (SPP 2.6) guides decision making within the coastal zone throughout Western Australia, on matters such as managing development and land use change, the establishment of foreshore reserves, and the protection, conservation, and enhancement of coastal values. The objectives of SPP 2.6 are to:

- Ensure that development and the location of coastal facilities takes into account coastal processes, landform stability, coastal hazards, climate change and biophysical criteria
- Ensure the identification of appropriate areas for the sustainable use of the coast for housing, tourism, recreation, ocean access, maritime industry, commercial and other activities
- Provide for public coastal foreshore reserves and access to them on the coast, and
- Protect, conserve and enhance coastal zone values, particularly in areas of landscape, biodiversity and ecosystem integrity, indigenous and cultural significance.

Recognising that coastal erosion and inundation risks are a key influence on the growth of Port Hedland, and in response to SPP 2.6, the Town produced the Port Hedland Townsite Coastal Hazard Risk Management and Adaptation Plan (CHRMAP). The CHRMAP identifies and considers coastal hazards and risks for the Port Hedland Townsite, and provides a recommended adaptation pathway to address these. To reflect the varied coastal processes across Port Hedland, the CHRMAP divided the study area into nine distinct planning units. The site is located within planning unit 5 – Spinifex Hill and Cook Point, which was identified as subject to erosion hazards. Localised adaptation recommendations for this planning unit include:

- Immediate term recommendations (2018 to 2030):
  - Implementation of soft passive measures including sand replenishment and dune maintenance; or
  - Respond to an erosion event (such as a storm event) that triggers the need for dune remediation.
- Medium term recommendations (2018 to 2060):
  - Managed retreat, with compensation paid to property owners, or

  - Interim protection through groynes with sand replenishment, or
  - Interim protection through an intertidal rocky platform with sand replenishment.

Discussion on the findings and recommendations of the CHRMAP, and how the LSP design responds to these, is provided in sections 3.4 and 4.1.

2.4 Town of Port Hedland Coastal Foreshore Management Plan

Building on the outcomes and recommendations of the CHRMAP, the Town of Port Hedland Coastal Foreshore Management Plan 2021 (CFMP) was prepared to provide a framework for actions to mitigate coastal hazard risks into the future, including coastal erosion, inundation of low lying areas during storms, increasing human impacts and threats to biodiversity. The CFMP divides the Port Hedland coastline into seven distinct management units, and prescribes a tailored management approach for each based on their respective conditions and management requirements.

A portion of the site and adjacent foreshore is located in management unit 4 – Cooke Point. Based on the existing conditions and underlying geomorphology of this area, an adaptation pathway of monitoring, managed retreat of coastal assets and avoiding new development has been recommended. Discussion on the alignment between this approach, the findings and recommendations of the CHRMAP and the LSP design and management response is provided in sections 3.4 and 4.1.

2.5 Local Planning Policy 07: Coastal Planning

To guide the Town of Port Hedland's development in alignment with the CHRMAP and CFMP, the Town has developed Local Planning Policy 07: Coastal Planning (LPP 07).

For strategic planning proposals (including local structure plans), the following provisions of LPP 07 apply:

- Strategic Planning Proposals shall reflect and implement the recommendations as identified in the endorsed CHRMAP (being the Port Hedland Townsite Coastal Hazard Risk Management and Adaptation Plan; GHD 2019)
- Future urban development shall plan for and manage the coastal hazard risk for the development's lifespan / timeframe in accordance with SPP 2.6
- Structure plans within coastal areas should consider the provisions of appropriate coastal foreshore reserves to be met at all stages of development.

2.6 Environmental Protection Act 1986

The *Environmental Protection Act 1986* (EP Act) is Western Australia's primary piece of legislation concerning environmental protection and impact assessment within the state. Part IV of the EP Act provides for the consideration and assessment of schemes and proposals by the Environmental Protection Authority (EPA) that may have a significant impact on the environment.

The site's current Urban Development zoning came into effect with the gazettal of LPS 7 in January 2021, which replaced the Town of Port Hedland LPS 5 as the Town's principal statutory planning document. LPS 7 was referred to the EPA for consideration under section 48A of the EP Act in 2020. On the 15th of June that year, the scheme was determined as not assessed – advice given – no appeals by the EPA (EPA reference CMS 17726), with the following environmental factors considered relevant:

- Marine Fauna
- Social Surroundings.

In considering potential impacts to marine fauna, the EPA noted that Lot 2 Dempster Street (and other lots) was proposed for zoning changes, and is located in an area with the potential for light spill on to Cemetery

Beach and Pretty Pool beach (each of which are known Flatback Turtle nesting beaches; section 3.6). The EPA therefore supported the inclusion of additional scheme provisions which require future development of the identified lots to be in accordance with *Environmental Assessment Guideline No. 5 Protecting Marine Turtles from Light Impacts* (EPA 2010) and *Commonwealth Light Pollution Guidelines for Wildlife – Including Marine Turtles, Seabirds and Migratory Shore Birds* (DEE and DBCA 2020, now DCCEEW and DBCA 2023).

The EPA concluded that the scheme can be managed to meet the EPA's environmental objectives through existing planning controls and the (then) proposed scheme provisions.

3 Existing Environment

3.1 Climate

The climate in Port Hedland is defined by hot, humid summers, with generally low average annual rainfall (less than 350 mm) (BoM 2025). The closest Bureau of Meteorology (BoM) weather station to the site is Port Hedland Airport (site no. 004032). Mean maximum temperatures in this location range from 27.4°C in July to 36.8°C in December through to March. Mean minimum temperatures range from 12.5°C in July to 25.7°C in January (BoM 2025).

Mean morning (9am) relative humidity ranges from 32% in September, to 60% in February. Mean afternoon (3pm) relative humidity ranges from 31% in August – September to 53% in February.

The majority of annual rainfall in Port Hedland occurs during the summer months in association with tropical storms and cyclones, however a secondary rainfall peak occurs in May and June as a result of tropical cloud bands that intermittently affect the area during this period (BoM 2025; Plate 1). Mean annual rainfall based on data from 1942 to present is 313.2 mm.

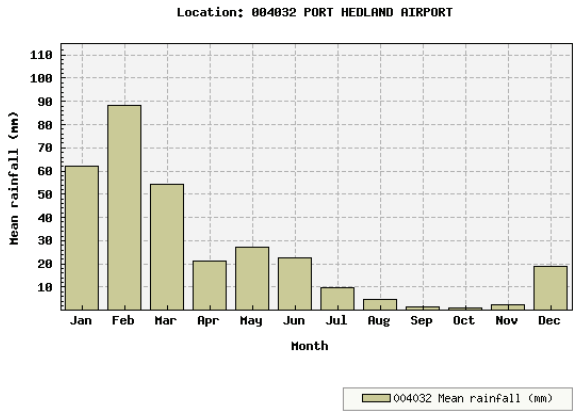

Plate 1: Mean rainfall (mm) recorded at Port Hedland Airport for years 1942 to 2025

Source: BoM 2025.

The northwest of Western Australia between Broome and Exmouth is considered to be the most cyclone prone part of Australia's coastline (BoM 2025b). The cyclone season officially runs from November to April, although few have occurred in November. Tropical cyclones typically produce destructive winds, heavy rainfall with flooding, and damaging storm surges that can cause inundation of low-lying coastal areas (BoM 2025b). All development of such areas should be undertaken in a manner which accounts for potential cyclonic conditions.

3.2 Landform, Topography and Soils

At a landscape scale, land systems of the Pilbara were classified and mapped by Van Vreeswyk et al. (2004) according to similarities in landform, soil, vegetation, geology and geomorphology. The site lies exclusively

within the littoral land system, which is described as 'bare coastal mudflats with mangroves on seaward fringes, samphire flats, sandy islands, coastal dunes and beaches'.

Generally, elevation across the site is relatively uniform at approximately 10 meters Australian Height Datum (mAHD) (Landgate 2025) (Figure 2).

Geology across the Pilbara was mapped by Hickman (1983). The site is mapped as representing the Qhy geological unit, which is described as younger beach and dune shelly sand (Figure 2)

3.2.1 Acid Sulfate Soils

The Department of Water and Environmental Regulation (DWER) Acid Sulfate Soils (ASS) risk mapping (DWER 2014) identifies the site as having a 'moderate to low risk' of ASS occurring within 3 m of the natural soil surface. For moderate to low-risk areas, the DWER's *Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes* (2015) states that prior to ground or groundwater disturbing works taking place, sites should be investigated for ASS where the following is proposed:

- Soil or sediment disturbance of 100 m^3 or more with excavation from below the natural water table
- Lowering of the water table, whether temporary or permanent
- Any dredging operations
- Extractive industry works
- Flood mitigation works in geologically recent areas

While it is recognised that the development of a dedicated Acid Sulfate Soil Management Plan is required for the site at subdivision stage pursuant to LPS 7, None of the above activities are anticipated to be required in order to facilitate future development that arises from the proposed LSP. Therefore, no further investigation for ASS is proposed at this stage.

3.3 Hydrology

The heavy rains and damaging storm surges typical of the wet season in the region results in varied surface water flows, with freshwater runoff typically occurring as sheet flow (SKM 2007). Based on the site's proximity to the coast, it is anticipated that the direction of this flow is north across the site toward the foreshore reserve.

The site is located within the Pilbara Proclaimed Surface Water Area and the Pilbara Proclaimed Groundwater Area pursuant to the *Rights in Water and Irrigation Act 1914* (RIWI Act). There are no surface or groundwater licenses within the site.

There are no surface water features within the site. The site's proximity to the coast indicates that superficial aquifers are likely to be saline.

The site is not located within or in proximity to a Public Drinking Water Source Area as mapped by the DWER.

To inform the water management approach of the LSP, a dedicated Local Water Management Strategy (LWMS) has been developed by Oversby Consulting. This LWMS should be read in conjunction with this Environmental Assessment Report.

3.4 Coastal Processes

Coastal processes at the site were considered as part of the Port Hedland Townsite CHRMAP. Specifically, the site is located within the CHRMAP's planning unit 5 – Spinifex Hill and Cook Point. This area was identified to be subject to erosion hazards, with key assets and values vulnerable to erosion identified as including a portion of Sutherland Street and the parks and recreation reserve between Crawford Street and Wodgina

Street. While erosion was not identified as an immediate risk to property, the CHRMAP notes that there is a limited buffer zone between active coastal processes and adjacent assets.

The site was mapped as being located outside of the area identified to potentially be at risk of erosion in 2060. However, a portion of the site intersects with the 'retreat zone' determined by the CHRMAP, and which corresponds to SCA7. This retreat zone includes both the area required for an extended foreshore reserve as well as 20 to 50 m to facilitate coastal recreation facilities.

3.5 Flora and Vegetation

The site's historic land uses have resulted in no native vegetation remaining on-site (section 2.1). Vegetation throughout the site is limited to isolated, planted species including bougainvillea, palm trees, and other non-native shrubs (RFF 2022).

To inform the development of the Town of Port Hedland CFMP, a terrestrial flora and fauna assessment was completed of the Town's coastal zone (Town of Port Hedland 2021). Generally, the vegetation of the survey area was considered to be in a highly disturbed and degraded condition, primarily due to extensive human activity. Vegetation immediately adjacent to the site in the foreshore reserve was identified as corresponding to the Dune 1 vegetation and fauna habitat type (Figure 3), which is described as a low and mostly open *Acacia stellaticeps*, *Acacia bivenosa* and *Acacia ampliceps* shrubland with lower shrubs of **Aerva javanica* over a *Triodia epactia* and *Cenchrus ciliaris* (with some *Spinifex longifolius*) open grassland over scattered *Gomphrena canescens*. Approximately 108 ha of this vegetation type was mapped within the 356.9 ha survey area.

No flora species considered to be conservation significant (listed as a Priority species by the Department of Biodiversity Conservation and Attractions [DBCA], or as Threatened under either the *Biodiversity Conservation Act 2016* [BC Act] or *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act]) were identified within the survey area. No Threatened or Priority ecological communities were identified within the survey area.

3.6 Fauna and Habitat

Generally, the absence of intact vegetation within the site is considered to limit the habitat opportunities available for native fauna. Remnant vegetation immediately adjacent to the site in the foreshore reserve may provide some habitat for native fauna however (Figure 3). A terrestrial flora and fauna assessment of this area and the broader Port Hedland coastal zone was undertaken to inform development of the Town's CFMP (Town of Port Hedland 2021). Based on the absence of large trees that provide hollows for large birds, hollow logs which provide shelter for ground-dwelling fauna, and relatively little vegetative cover, it was determined that the fauna habitat value in the survey area was relatively degraded.

Notwithstanding, four migratory, aerial species listed under the EPBC Act were identified during the survey, being (Town of Port Hedland 2021):

- Common Sandpiper (*Actitis hypoleucos*)
- Lesser Frigatebird (*Fregata ariel*)
- Caspian Tern (*Hydroprogne caspia*)
- Eastern Osprey (*Pandion haliaetus*).

No other fauna species of conservation significance were identified during the survey.

3.6.1 Marine Turtles

Areas of the Port Hedland coastal reserve, particularly Cemetery Beach and Pretty Pool are considered regionally significant as rookeries for the Flatback Turtle (*Natator depressus*), which is listed as Threatened

(Vulnerable) under both the BC Act and EPBC Act (Imbrica Environmental 2016). This species is known to only nest on northern Australian beaches, however, has been known to travel as far as the Indonesian archipelago and Papua New Guinea coast to feed (Department of Environment and Energy 2017).

The value of turtle nesting to the local community and as a key component of the foreshore experience was recognised in the development of the Town of Port Hedland's CFMP (Town of Port Hedland 2021). Through the Town's community engagement process for the CFMP, the protection, education and signage of turtle nesting areas was identified as a key issue / opportunity. Management actions of the CFMP applicable to the Cooke Point Management Unit (which includes the site) include:

- Investigate and plan a turtle sighting signage strategy, and
- Manage lighting with regard to turtle nesting habitat.

Despite the potential for anthropogenic impacts on Flatback Turtles through artificial lighting, dredging, boat strikes, pollution, and human disturbance, flatback turtles continue to return to Port Hedland in the summer to reproduce, and long-term monitoring and population modelling indicates that a relatively stable population is supported at Cemetery Beach (Imbrica Environmental 2016). At both Cemetery Beach and Pretty Pool, the greatest abundance of nesting was recorded on the eastern side of the beaches where dunes are higher and less exposed to onshore artificial light sources (Imbrica Environmental 2016).

In the context of the site, Cemetery Beach and Pretty Pool are located approximately 1.6 km and 1.7 km to the west and south-east of the site, respectively (Figure 1). Both rookeries are separated from the site by existing urban residential development, which has been identified generally as a source of light spill. For Pretty Pool specifically, sources of visible light from the beach were measured between 2009 and 2013 from the following locations, which did not include the site or immediately adjacent area (Imbrica Environmental 2016):

- Street and house lights along Goode Street and at the Cooke Point Caravan Park
- Street lights at the Pretty Pool BBQ area, Matheson Drive and three metal halide street lights on Counihan Crecent at the western extent of the beach to primary dune
- Glow from Pretty Pool residential area
- Glow from the BHP Billiton and port facilities.

In terms of sources of visible light from Cemetery Beach, these were measured as part of a dedicated light survey in 2013 (RPS 2013). The most intense light sources were observed to be Finucane Island to the west, and the McGregor Street Oval Lights to the south. Other, less intense light sources were identified, however none of these included the site or the immediately adjacent area.

3.7 Contamination

A search of the DWER Contaminated Sites Database (DWER 2025) did not identify the presence of known contaminated sites within or immediately surrounding the site. The nearest potentially contaminated site is located approximately 2.8 km south-west of the site, and is associated with a service station. This site is mapped as being Remediated for Restricted Use.

One structure within the site (namely the former Mess building and Maintenance Building since 2004) is known to be constructed with asbestos sheeting (HCWA 2020). Other structures within the site which were built between 1969 and 2003 may also have the potential to contain asbestos. Prior to the demolition of any structures which potentially contain asbestos, a Hazardous Materials (HAZMAT) assessment will be undertaken. Appropriate management will be implemented during the demolition and subsequent construction process based on the outcomes of the HAZMAT assessment.

3.8 Heritage

3.8.1 Aboriginal Heritage

The Kariyarra word for Port Hedland is Marapikurrinya, which refers to the hand like formation of the tidal creeks coming off the Port Hedland harbour (mara – hand, pikurri – pointing straight, and nya – a place name marker) (Town of Port Hedland 2025).

A search of the Department of Planning, Lands and Heritage (DPLH) Aboriginal Cultural Heritage Inquiry System identified that the site does not contain any known Registered Sites or Other Aboriginal Heritage Places (DPLH 2025). The nearest registered site is approximately 650 m southeast of the site and is listed as Artefacts / Scatter (Place ID 6021) (Figure 3).

3.8.2 Non-Aboriginal Heritage

The site is listed on the Town of Port Hedland Municipal Inventory as a Category 3 site (HCWA 2025; Place Number 18426; Figure 3). Category 3 sites are described as places of some cultural heritage significance to the Town of Port Hedland. The Town recommends encouraging the retention of the place, or to photograph and document the place if retention is not possible.

In 2020, the cultural heritage significance of the site was assessed by the Heritage Council of Western Australia to determine whether the site merited inclusion in the State Register under section 38 of the *Heritage Act 2018* (HCWA 2020). While it was concluded that the site is unique as an extant former immigration detention centre in Australia, specifically established to cater to the detention of unauthorised maritime arrivals, it was ultimately determined that the site does not have the cultural heritage significance required to meet the condition for entry into the State Register (HCWA).

3.9 Bushfire

The northern portion of the site intersects a mapped bushfire prone area, as designated by the Fire and Emergency Services Commissioner. These areas are defined as having the potential to be affected by bushfire. Bushfire prone area mapping divides the state into two areas. Area 1 (urban) comprises the built-up urbanised areas of Perth, Peel and Bunbury, where the risk posed by bushfire to people, property and infrastructure is lower. Area 2 covers the rest of Western Australia that is bushfire prone (WAPC 2025), and which includes the site.

To address the risk of bushfire to the site, a dedicated Bushfire Management Plan (BMP) has been developed by Linfire Consultancy (Linfire 2025). This BMP is being submitted in support of the proposed LSP, and should be read in conjunction with this Environmental Assessment Report.

4 Potential Impacts and Environmental Response

4.1 Coastal Processes

Development of the site to its highest and best use in accordance with the proposed LSP will allow for the development of temporary and low impact land uses such as recreation, short-stay accommodation and/or tourism within that portion of the site subject to SCA7 (Appendix 2). Pursuant to LPP 07, this approach is considered to reflect and implement the recommendations as identified in the endorsed CHRMAP, namely that land use within SCA7 should include an extended foreshore reserve and coastal recreation facilities. The CHRMAP also recommends that all new land use and development is to be located outside of the retreat zone to facilitate incremental relocation of private development over time. The potential continuation of this area's existing use (i.e. as short stay accommodation) is considered to align with this particular development control, and with the CHRMAP's recommendation that density increases or intensification of land uses should be avoided within SCA7. Further, implementation of the proposed LSP does not preclude other localised adaptation measures as recommended by the CHRMAP (including sand replenishment, dune maintenance and remediation, and other interim protection measures) from potentially being implemented by the Town of Port Hedland in the immediate and medium term.

It is noted that in response to community interest, the Town of Port Hedland through the CFMP has identified opportunity for the establishment of a coastal café within the site. Such built form development may only be feasible through the realisation of the proposed LSP.

Based on the above, development in accordance with the LSP is considered to align with LPP 07 and the scheme provisions, ensuring consistency with the Town of Port Hedland's planning framework.

4.2 Flora and Vegetation

The indicative concept plan (Appendix 2), which illustrates the highest and best use development scenario for the site, enhances and emphasises connectivity to the foreshore. While this approach is in accordance with community expectations for the foreshore area (Town of Port Hedland 2021), increased public access has the potential to result in indirect impacts to coastal vegetation.

The Town of Port Hedland CFMP identifies a lack of formal access as a potential cause of disturbance to the foreshore environment, particularly through four-wheel driving. Controlled access in contrast is recommended as an action to mitigate this disturbance, while also providing opportunities for education and awareness, as well as improved public facilities such as bins and signage at access points. In the context of the proposed LSP, this controlled access will be prioritised for areas as close as possible to adjacent roads, and with gravel road base pathways where appropriate pursuant to the recommended actions of the CFMP.

The above notwithstanding, it is recognised that there is no conservation significant flora or vegetation in proximity to the site, and that where present native vegetation is in a highly disturbed and degraded condition (section 3.5). On this basis, potential indirect impacts to flora and vegetation are not considered to be significant at a local or regional scale.

4.3 Marine Turtles

Based on light spill measurements taken at Pretty Pool and Cemetery Beach (section 3.6.1), existing structures within the site have not been identified as a source of visible light emissions to either beach. This is despite the existing structures having been constructed in the 1960's and 1970's, prior to the enactment of legislation affording protection to Marine Turtles from light impacts (namely the EP Act and EPBC Act), and associated light emissions guidelines.

In contrast, implementation of the proposed LSP affords the opportunity to replace existing structures on site with development which adheres to contemporary guidance, with the objective of minimising potential

light emissions impacts on turtles to the fullest extent practicable. In the context of the *National Light Pollution Guidelines for Wildlife* (DCCEEW 2023), this includes the design of lighting with due regard to the following principles:

- Only add light for specific purposes
- Use adaptive light controls to manage light timing, intensity and colour
- Light only the object or area intended – keep lights close to the ground, directed and shielded to avoid light spill
- Use the lowest intensity lighting appropriate for the task
- Use non-reflective, dark-coloured surfaces
- Use lights with reduced or filtered blue, violet and ultraviolet wavelengths.

For required lighting near turtle nesting beaches, the EPA (2010) recommends the following three-stage approach:

- Keep light off the beach and sea surface
- Reduce intensity
- Select wavelengths with appropriate spectral qualities.

To guide the lighting approach for the LSP area, and in accordance with the provisions of LPS 7, a dedicated Lighting Management Plan will be prepared to the satisfaction of the Town of Port Hedland, and in consultation with the DBCA. The Lighting Management Plan will be prepared to accompany future applications for subdivision and/or development approval. To inform the Lighting Management Plan, line of sight modelling will be undertaken to determine from what locations direct and indirect light (including skyglow) would be visible from Cemetery Beach and Pretty Pool.

Based on the above, it is anticipated that implementation of LSP will present an opportunity to reduce light emissions from the site when compared with the existing structures, to the benefit of nesting marine turtles at Cemetery Beach and Pretty Pool.

5 Conclusion

The site currently comprises a complex of structures built from 1969 onwards which have served various accommodation purposes, as well as an international detention centre. There is no native vegetation remaining within the site. While adjacent remnant (albeit degraded) vegetation in the foreshore reserve may be subject to indirect impacts associated with increased human access, the formalised nature of this access is considered to be in accordance with community values for the area, and provides opportunity for education and awareness, improved public facilities, and reduced likelihood of uncontrolled four-wheel drive activity.

The Spinifex Hill and Cook point coastal area (including the site) was identified through the Port Hedland Townsite CHRMAP to be subject to erosion hazards. While the site itself was mapped outside the area identified to potentially be at risk of erosion in 2060, a portion of the site intersects with the 'retreat zone', corresponding to SCA7. The CHRMAP recommends this area be utilised for an extended foreshore reserve and coastal recreation facilities, where the intensification of land uses and density increases should be avoided. The highest and best use of this area in accordance with the proposed LSP will allow for temporary and low-impact land uses such as recreation, short stay accommodation (consistent with the current use) and/or tourism. It is considered that these land uses reflect and implement the recommendations of the CHRMAP pursuant to LPP 07 as well as the scheme provisions, ensuring consistency with the Town of Port Hedland's planning framework.

The site is located approximately 1.6 and 1.7 km from Cemetery Beach and Pretty Pool respectively, each of which are known as significant rookeries for the Flatback Turtle. Although not identified as a source of visible light to either beach, the existing development within the site was constructed prior to the adoption of legislation and guidance which limits light emissions from sites in proximity to turtle nesting sites. Implementation of the proposed LSP therefore presents an opportunity to replace these existing structures with development which adheres to contemporary guidance and which is guided by dedicated lighting management plan/s and line of sight modelling, thereby potentially reducing light emissions from the site to below pre-development levels.

In closing, there are not considered to be any significant environmental impacts associated with development, provided it is done in accordance with the LSP. Rather, the highest and best use of the site has the potential for improved environmental outcomes, particularly from a marine turtle and foreshore access perspective, when comparted with the existing development on-site.

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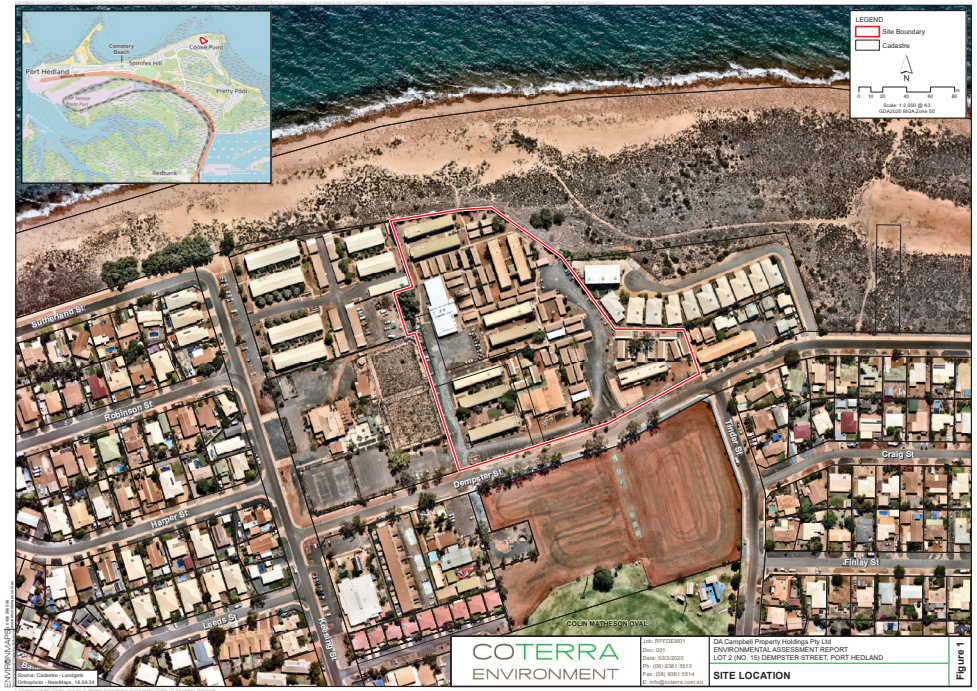
15 Dempster Street Local Structure Plan – Environmental Assessment Report

Figures



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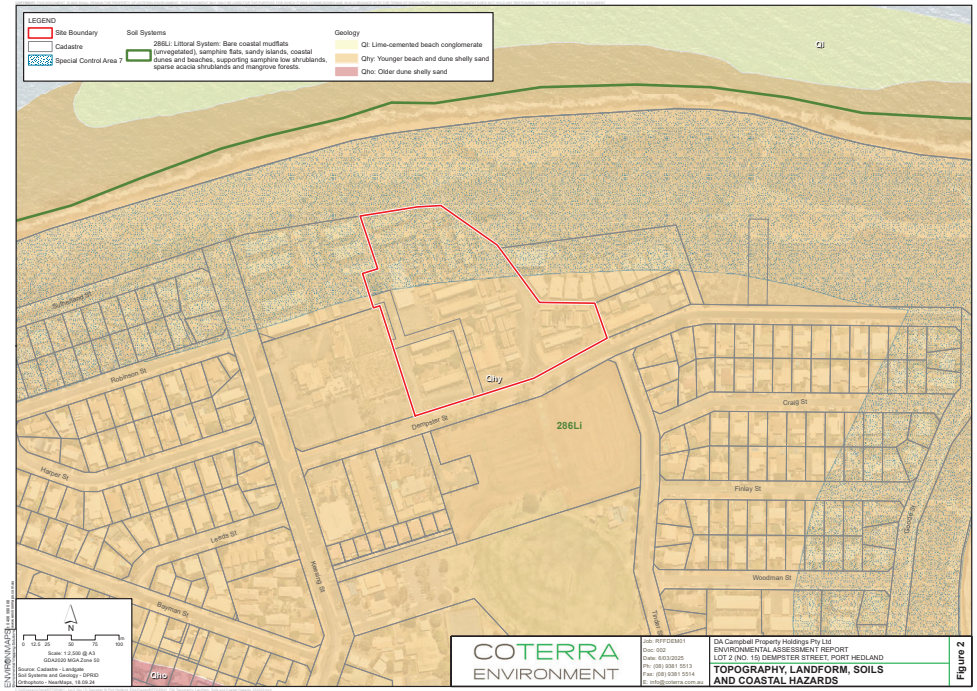
ENVIRONMENTAL ASSESSMENT REPORT
LOT 2 (NO. 15) DEMPSTER STREET, PORT HEDLAND

SITE LOCATION

Figure 1



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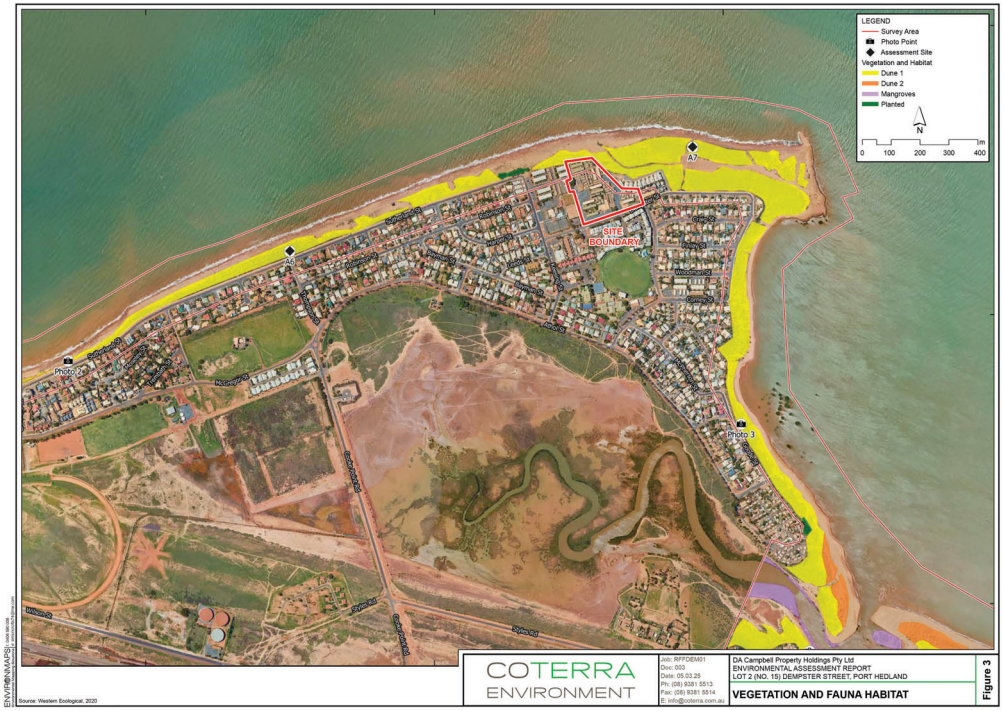
LOT 2 (NO. 15) DEMPSTER STREET, PORT HEDLAND

TOPOGRAPHY, LANDFORM, SOILS AND COASTAL HAZARDS

Figure 2



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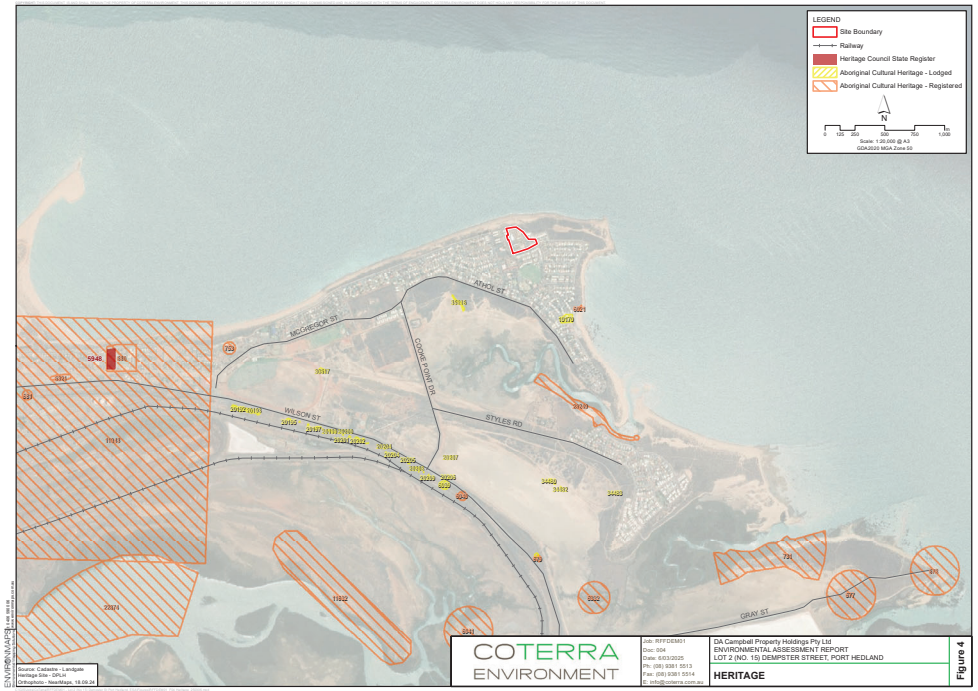
LOT 2 (NO. 15) DEMPSTER STREET, PORT HEDLAND

VEGETATION AND FAUNA HABITAT

Figure 3



Source: Cadastre - Landgate
Heritage Site - DPLH
Orthophoto - NearMaps, 18.09.24

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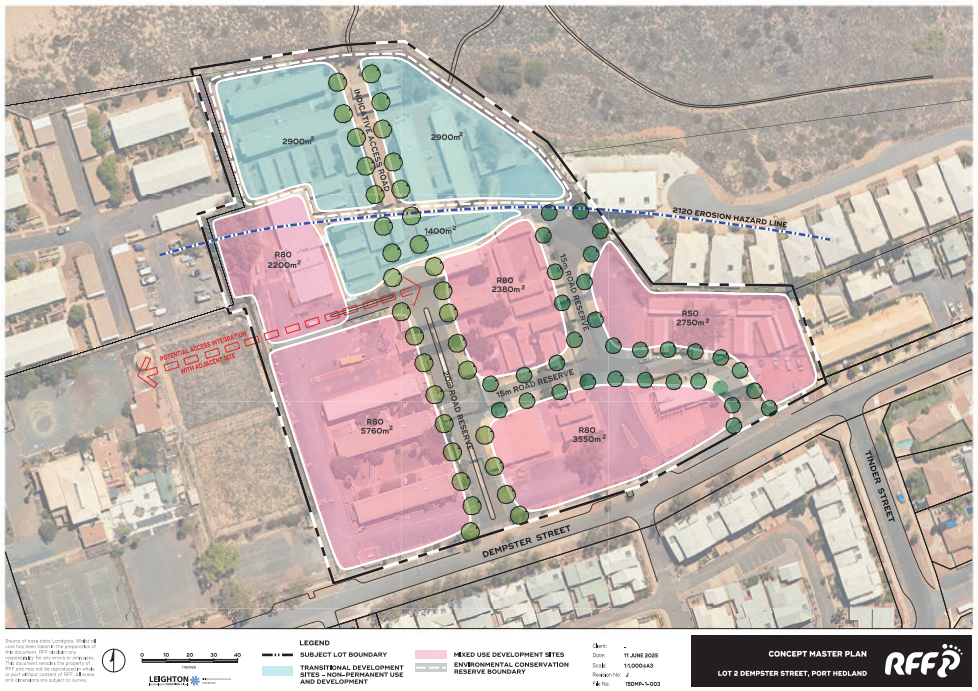
LOT 2 (NO. 15) DEMPSTER STREET, PORT HEDLAND

HERITAGE

Figure 4

Appendix 1 Proposed Local Structure Plan

Appendix 2 Concept Plan



LOCAL WATER MANAGEMENT STRATEGY

Lot 2 Dempster Street, Port Hedland

LOCAL WATER MANAGEMENT STRATEGY

B24029
Version 1
June 2025

DOCUMENT QUALITY CONTROL

Project Reference		**B24029**
Ver No.	**Purpose**	**Date**
Draft	Client Review	May 2025
V1	Submission for agency review and approval	June 2025

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CONTENTS

Figures

1 EXECUTIVE SUMMARY

This Local Water Management Strategy (LWMS) has been developed to accompany the Local Structure Plan for Lot 2 Dempster Street (the Site), within the Town of Port Hedland. The proposed development is for a Mixed Use area with an Environmental Conservation Reserve area within the northern portion. The subject land is bounded by Dempster Street to the south, residential lots and apartments to the southeast, ocean foreshore to the northeast and north, with the Cook Point Recreation Club and apartments to the west. The subject land is currently developed for commercial accommodation, with a portion of the Site being used for workforce accommodation, while the historical two storey buildings are presently unused. It contains a range of buildings and hardstand areas, with associated underground stormwater storage. The site and surrounds can be seen in Figure 1 and 2.

Stormwater generally flows through to the underground storage system, with overtopping to Dempster Street and potentially the coastal foreshore are when the onsite capacity is exceeded. The soil is considered dunal. The northern portion of the Site is within a mapped coastal hazard erosion risk area. The existing site features are shown on Figures 3 to 6.

The objective of this LWMS is to detail the best management practices approach to water management that will be undertaken for the development. This will include managing, protecting and conserving the total water cycle of the local environment and the greater catchment. The practices will involve:

- Stormwater management that incorporates the water sensitive urban design practices;
- Flood protection from onsite and adjoining localised stormwater.
- Taking into account coastal risks from erosion, storm surge and sea level rise
- Groundwater resource management;
- Protection of onsite and surrounding ecosystems; and
- Sustainable water servicing

Figure 1 Location Plan

The effectiveness, efficiency and benefits provided by the best management practices require a collaborative effort between local governments, developers and relevant regulatory authorities. The developers are committed to the concepts and outcomes outlined within the approved LWMS for the subject land. This includes the implementation, monitoring and maintenance of the best management practices for stormwater designed specifically for this site.

1.1 PLANNING SUMMARY

This Local Water Management Strategy (LWMS) has been prepared in support of the Beachfront Village Structure Plan for Lot 2 (No. 15) Dempster Street, Port Hedland. The Structure Plan predominantly zones the site as 'Mixed Use', enabling a flexible range of land uses including permanent residential dwellings, short-stay accommodation, hotel development, and compatible non-residential uses that align with the surrounding urban context and zoning objectives. The northern portion of the site, which lies within the 100-year coastal erosion hazard zone as identified in the Town of Port Hedland's CHRMAP and State Planning Policy 2.6, is reserved as Environmental Conservation under the Town's Local Planning Scheme. This area is excluded from any new permanent development and is intended to accommodate low-impact, temporary or relocatable uses and development, consistent with long-term coastal hazard adaptation and risk management strategies. The Local Structure Plan can be seen in Appendix D, which highlights these 2 zones.

A potential development scenario is shown in Figure 2 and has been used as the basis for water management analysis for the Site. The LWMS have been prepared based on a 'highest and best use' scenario, reflecting the maximum reasonable development potential of the site under ideal market conditions. This approach ensures that infrastructure servicing and drainage modelling is assessed against a peak-capacity or worst-case model. Given the cyclical and often unpredictable nature of the Port Hedland market, this strategy provides a robust, future-proofed planning framework that minimises the risk of unforeseen upgrade requirements while allowing the Structure Plan flexibly to respond to evolving development conditions over time, noting that the final subdivision configuration may be subject to refinement through future detailed design and planning approvals.

There is currently no District Water Management Strategy (DWMS) or local drainage strategy that applies to the Structure Plan area. Accordingly, this LWMS has been developed to guide the structure planning and subsequent subdivision process to ensure that development proceeds in a sustainable, water-sensitive, and policy-consistent manner, in line with the objectives of:

- Liveable Neighbourhoods (WAPC, 2015 – draft),
- The Department of Water and Environmental Regulation (DWER), and
- The Town of Port Hedland.

This document also establishes the water management framework and performance criteria that will inform the preparation of Urban Water Management Plans (UWMPs) or other detailed water-related documentation required as conditions of subdivision approval.

2 KEY ELEMENTS PLAN

Water management strategies for the subject land are based on best practice water sensitive urban designs that integrate sustainability and the provision of attractive communities. The strategies will be achieved through the synthesis of planning and designs to manage, protect and conserve the total water cycle. The plans and designs for the development are appropriate for the subject land's residential development, surrounding environment, former and future stages and local drainage characteristics.

A summary of the WSUD elements that will be implemented within the development to achieve best management practices are outlined below. The general strategies can also be seen in Figure 2.

Water Conservation and Servicing

- The Site is to be serviced with potable water from the Water Corporation's network.
- The Site wastewater is to be connected to the Water Corporation's network.
- Future landscaping is designed to be waterwise to minimise irrigation requirements.

Stormwater Management

- All lots are to detain and infiltrate their stormwater in line with The Town's minimum requirements and preferentially at a rate of 1m^3 of storage per 40m^2 of catchment area.
- Road runoff is to be collected in either a pit and pipe network for initial infiltration in soakwells or bioretention gardens.
- Excess runoff is to be detained and infiltrated in a bioretention basin or similar large infiltration device, so that all flows up to and including the 1% AEP generated on the Site are detained to at least the pre development flow rate.
- 1EY stormwater treatment is achieved through on lot detention and infiltration in conjunction with potential road runoff treatment through the bioretention gardens and basin.
- Existing flows from external areas are to be transferred through the Site, with the Site's stormwater detention network being able to accommodate this through flow.
- The drainage network is designed to discharge water to Dempster Street, as per the current design. The option to release at least part of the Site's flows to the adjoining foreshore have also been analysed.

Flood Protection

- All finished floor levels will be designed to be a minimum 300mm above the adjoining road gutter flows and the onsite basins as relevant.
- External flows are to be transferred through the Site via the internal road network and other designated flow paths as determined at detailed design.
- Internal flood flows generated within the Site will be managed to protect infrastructure and human safety, with the flows being controlled through the road and pipe network.
- All new buildings to be above the coastal storm surge level.
- All new permanent structures to be outside the coastal erosion hazard zone.

Groundwater Management

- Groundwater is managed via infiltration of stormwater throughout the Site, to replicate the current infiltration regime.
- The natural separation to groundwater provides suitable post development separation to groundwater.

Ecosystem Protection

- New ephemeral riparian habitat will be created within any bioretention systems by using native riparian species plantings suited to the local conditions and that complement the adjoining foreshore.
- The WSUD elements used within the Site will improve discharging water quality, assisting with protecting and enhancing downstream ecosystems.
- The landscaping will utilise nutrient and waterwise practices to minimise contamination of the groundwater and surface runoff to any sensitive ecosystems.
- All lots are to implement best practice water management to minimise leaching of contaminants into the groundwater or surface water system.

Coastal and Ocean Risk Management

- All new buildings to be above the coastal storm surge level.
- All new permanent structures to be outside the coastal erosion hazard zone.

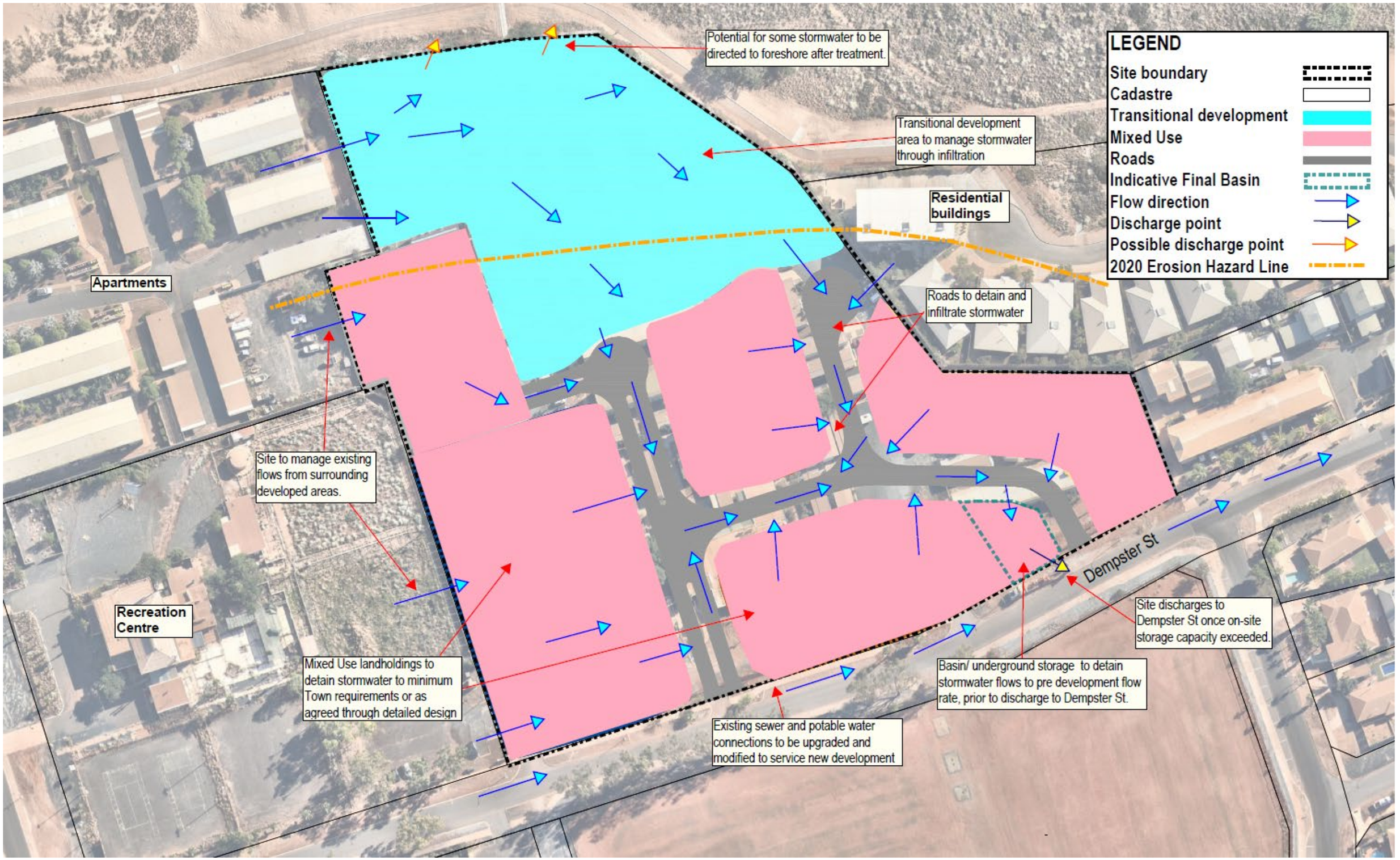

Figure 2 Key Elements Plan

3 LANDFORM

The Site has ben earthworked as part of its former development. This has resulted in a gentle general grade from west to east. The highest point is approximately 9.7mAHD. The southern portion of the Site falls to the far southeastern corner with a low at approximately 7.0mAHD. There are some small, trapped lows at approximately 7.6 – 7.8mAHD, which would likely hold water until they fill and overtop.

The central portion of the Site falls to a large trapped low on the central western boundary at approximately 7.2mAHD. This needs to fill by approximately 0.3m before flowing out to the southern portion.

The very northern portions likely falls to the north and east into the foreshore reserve, with the north boundary at approximately 8.5 – 8.3mAHD, and the eastern boundary at approximately 8.2 – 8.0mAHD. There is a small portion of the northern edge which also likely falls into the adjoining foreshore.

The buildings also influence the fall of the site, by creating localised high spots with water diverted around.

The general site characteristics and contours can be seen in Figure 3.

A survey of the site and a heat map can be seen in Appendix A.

4 GEOTECHNICAL

4.1 GENERAL GEOLOGY AND GEOMORPHOLOGY

Based on the Port Hedland Urban Geology mapping, the expected soil type is noted as:

Qhy: Beach and dune shelly sand

4.2 PHOSPHORUS RETENTION INDEX

The Phosphorus Retention Index for the sites soils is unknown however given it is an ocean worked sand, it is likely to be low.

4.3 PERMEABILITY

No onsite permeability testing has been undertaken. Given the mapped soil type, the soil is likely to be relatively free draining.

4.4 ACID SULFATE SOILS

The Acid Sulfate Soil (ASS) Risk Mapping shows that the Site is considered to be an area of Moderate to Low Risk within 3m of the surface. This may be due to historical estuarine soils beneath the Site, rather than the sand dune material or at the surface.

ASS should be considered if deep excavation is envisaged as part of future development.

4.5 CONTAMINATED SITES

The Department of Water and Environmental Regulation (DWER) contaminated sites database was searched for known contaminated sites (sites classified as Contaminated-restricted use, remediated for restricted use or Contaminated-remediation required) in proximity to the site. There is no recorded contamination within the Site.

5 GROUNDWATER

The following is a summary of the current groundwater characteristics of the site.

5.1 GROUNDWATER LEVELS

There has been no monitoring of groundwater levels for the Site. Given the closeness of the Site to the ocean, as well as it being on a peninsular, combined with the highly permeable sand and relatively low rainfall conditions, it is likely that the groundwater is highly correlated with sea levels. This would make the average groundwater approximately 7 – 9m below the surface. This groundwater level is also likely to move on a daily basis, in response to tidal conditions.

5.2 GROUNDWATER QUALITY

Groundwater quality monitoring has not been undertaken for the Site. The shallow groundwater quality is likely heavily influenced by the nearby ocean, making it highly saline

5.3 GROUNDWATER AVAILABILITY

The Site is within the Pilbara Proclaimed Groundwater Area. There are 3 aquifers noted as being under the Site that are subject to licensing. These are all within the Pilbara Groundwater Area and Ashburton Subarea. The aquifers are:

Pilbara – Coastal Saline

Pilbara – Alluvial

Pilbara - Fractured Rock,

As of May 2025, there is only allocation available in the Pilbara – Alluvial. There is no current groundwater license registered for the Site.

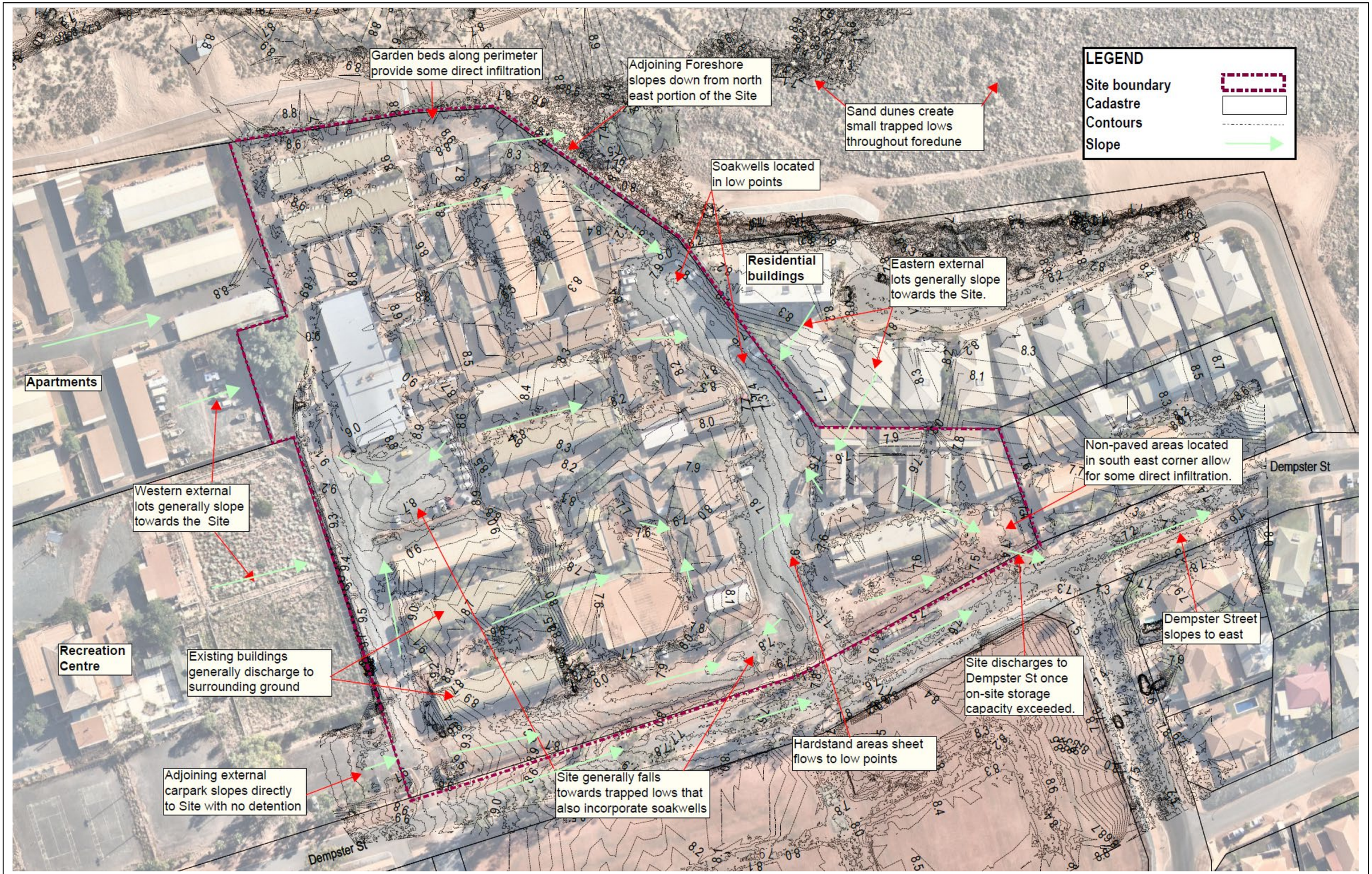

Figure 3 General site and surround characteristics

6 ENVIRONMENTAL CONDITIONS AND HERITAGE

6.1 ENVIRONMENTAL

The following is a summary of the environmental characteristics of the subject land, with relevant references to the surrounding areas. This information has been summarised from the Environmental Assessment Report, 15 Dempster Street Local Structure Plan (Coterra Environment 2025).

6.1.1 FLORA AND VEGETATION

There is no remnant native vegetation within this Site due to its historical uses. The current vegetation has been planted as part of former landscaping and includes bougainvillea, palm trees, and other non-native shrubs. The adjoining foreshore area was surveyed as part of the Town of Port Hedland CFMP, in 2021. Generally, the vegetation within the foreshore was considered to be in a highly disturbed and degraded condition, primarily due to extensive human activity.

The adjacent foreshore vegetation was identified as corresponding to the Dune 1 vegetation and fauna habitat type, which is described as a low and mostly open *Acacia stellaticeps, Acacia bivenosa* and *Acacia ampliceps* shrubland with lower shrubs of *Aerva javanica* (weed) over a *Triodia epactia* and *Cenchrus ciliaris (*with some *Spinifex longifolius*) open grassland over scattered *Gomphrena canescens*. This vegetation is not generally associated with waterways or wetlands.

No flora species considered to be of conservation significance as well as Threatened or Priority ecological communities were identified

The mapped surrounding vegetation can be seen in Figure 4.

6.1.2 FAUNA

Due to the absence of native vegetation within the subject land, it is unlikely that the site provides any significant habitat for native fauna. The adjoining foreshore reserve may provide some limited habitat, noting its disturbed status reduces its value for fauna. A fauna survey undertaken as part of the Town of Port Hedland CFMP in 2021, noted four migratory, aerial species listed under the EPBC Act. These were:

- Common Sandpiper (*Actitis hypoleucos*)
- Lesser Frigatebird (*Fregata ariel*)
- Caspian Tern (*Hydroprogne caspia*)
- Eastern Osprey (*Pandion haliaetus*).

No other fauna species of conservation significance were identified during the survey. These species are unlikely to utilise the Site, as they are mainly associated with the surrounding tidal flats and open water areas.

6.1.3 WETLANDS AND WATERWAYS

There are no natural wetlands or waterways within the Site. The adjoining foreshore reserve contains the littoral land system, which is described as ‘bare coastal mudflats with mangroves on seaward fringes, samphire flats, sandy islands, coastal dunes and beaches’, as classified by Van Vreeswyk et al. (2004). This landform grades northward into the open Indian Ocean, which is approximately 110m to the north of the Site.

6.2 HERITAGE SITES

6.2.1 ABORIGINAL HERITAGE

A search on the Aboriginal Heritage Inquiry System on the Department of Indigenous Affairs (DIA) website, indicated no Aboriginal Cultural Heritage places recorded within the Site

6.2.2 NON- ABORIGINAL HERITAGE

The site is listed on the Town of Port Hedland Municipal Inventory as a Category 3 site (HCWA 2025; Place Number 18426; Figure 3). Category 3 sites are described as places of some cultural heritage significance to the Town of Port Hedland. The Town recommends encouraging the retention of the place, or to photograph and document the place if retention is not possible.

In 2020, the cultural heritage significance of the site was assessed by the Heritage Council of Western Australia which determined that the site does not have the cultural heritage significance required to meet the condition for entry into the State Register.
Based on this heritage items should have no impact on the site’s water management.

7 COASTAL IMPACTS

The following is a summary of the coastal processes relevant to the Site. This information has been summarised from the Port Hedland Townsite Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) (GHD 2019). The site is located within the CHRMAP’s planning unit 5 – Spinifex Hill and Cook Point. This area was identified as subject to erosion hazards, with key assets and values vulnerable to erosion identified as including a portion of Sutherland Street and the parks and recreation reserve between Crawford Street and Wodgina Street. While erosion was not identified as an immediate risk to property, the CHRMAP notes that there is a limited buffer zone between active coastal processes and adjacent assets.

The site was mapped as being located outside of the area identified to potentially be at risk of erosion in 2060. However, a portion of the site intersects with the ‘retreat zone’ determined by the CHRMAP, and which corresponds to SCA7. This retreat zone includes both the area required for an extended foreshore reserve as well as 20m to 50m to facilitate coastal recreation facilities. The boundary line of the coastal erosion risk zone can be seen in Figure 2.

The flood level associated with the ocean storm surge was also determined. Table 1 outlines the Total inundation level to be experienced into the future at Port Hedland.

Table 1 Ocean storm inundation levels

Year	Likelihood								
	Almost Certain (1 yr ARI)			Possible (10 yr ARI)			Rare (500 yr ARI)		
	Storm Tide (m AHD)	Wave Setup (m)	Total (m AHD)	Storm Tide (m AHD)	Wave Setup (m)	Total (m AHD)	Storm Tide (m AHD)	Wave Setup (m)	Total (m AHD)
2010	3.6*	0	3.6	4.0	0.8	4.8	5.6	1.2	6.8
2060	3.9	0	3.9	4.3	0.8	5.1	5.9	1.2	7.1
2120	4.5	0	4.5	4.9	0.8	5.7	6.6	1.2	7.8

Figure 4 Vegetation and fauna habitats of surrounding areas

8 PRE DEVELOPMENT SURFACE WATER SITUATION

8.1 INTERNAL AND ADJOINING SURFACE WATER CHARACTERISTICS AND CATCHMENTS

There are no natural waterways or wetlands within or directly adjoining the subject land. The Indian Ocean is located approximately 110m to the north. The current 500yr ocean storm surge level is approximately 6.8mAHD, with this increasing to 7.8mAHD by 2100.

The modification of the Site has created internal sub catchments. For the drainage analysis the Site has been divided into 6 sub catchments. These catchments can be seen in Figure 5, with further details in Table 2.

There is a small external catchment which likely flows into the Site during all rainfall events of more than a few mm (Ext 2). There are also potentially 4 other larger catchments which likely flow into the Site during larger events. This includes 3 to the west (Ext, 3, 4.1 & 4.2) and 1 to the east (Ext 1). Liaison with the Town suggests that there is no current information available as to the storage capacity of surrounding developed areas. The approach therefore has been to assume that the surrounding developed areas retain stormwater to Town's minimum storage requirements, with flows in excess of this storage discharging onto the Site. The assumed storage for the internal catchments can be seen in Table 3 with the potential External catchment storage outlined in Table 4. Table 2 contains further information on each catchment, with their locations outlined in Figure 5.

Table 2 Predevelopment catchments

Catchment	Area (ha)	Discharge location	Comments
Internal			
A	0.9332	Predominately Cat E. Potentially some minor flows north to foreshore.	Northern portion of site. Many smaller buildings, with perimeter garden. Drainage pits in eastern corner. All water assumed to flow to Cat E for drainage analysis to be conservative.
B	0.4798	Cat C	Larger building and bitumen hardstand. Multiple drainage pits throughout.
C	0.3845	Cat E	Larger buildings and recreation areas/gardens.
D	0.392	Cat F	Larger building and internal road containing multiple drainage pits
E	0.5594	Trapped low then overtopping to Cat F.	Larger buildings and recreation areas/gardens drainage to internal road with multiple drainage pits within trapped low.
F	0.4801	Dempster St.	Larger buildings with non sealed ground surface. Discharge is in south east corner across unsealed driveway. Potential underground pipe connection but no data to support this.
Site Total	3.229		
External			
Ext 1	0.1828	Internal Cat E	Adjoining apartment area with gardens. Access road assumed not to flow onto Site. Assumed that lots detain water to Town requirements
Ext 2	0.0589	Internal Cat D	Small hardstand/parking area that slopes directly onto site with no significant detention.
Ext 3	1.696	Internal Cat B	Recreation Centre. Includes carparks, sealed playing courts and building areas as well as unmanaged low vegetated soil areas. Assumed that stormwater is detain to Town requirements
Ext 4.1	0.467	Internal Cat B	Apartments with internal parking and roads, with some gardens. Assumed that stormwater is detain to Town requirements
Ext 4.2	1.031	Internal Cat A	Apartments with internal parking and roads, with some gardens. Assumed that stormwater is detain to Town requirements
External total	3.194		

8.2 PRE DEVELOPMENT ASSESSMENT

As the site is already effectively modified to an urban landuse, the current drainage flows include the known storage within the Site. It also includes assumptions on the surrounding development areas. For the External areas, detention is assumed to be to the Town's requirement of 1 soakwell (1.8m diameter x 1.8m deep) for every 350m^2 of lot. It is likely that there is more storage on some of the developments, including some above ground storage within trapped lows. To be conservative however, only the standard storage rate has been assumed. Soakwell numbers were rounded up to the next whole number. A summary of the assumed soakwells and storage for the External areas can be seen in Table 4.

The modelled storage for the Site utilised the available survey that identifies drainage pit locations. Each drainage pit was assumed to have a single soakwell (1.8m diameter x 1.8m deep) below it. Depression areas above soakwells were also included, with the areas and volumes taken from the site survey. A summary can be seen in Table 3, with the trapped lows highlighted in Figure 6.

No internal connection pipes were assumed. It is also assumed that there is no pipe connection between the Site and Dempster Street.

The drainage for the current Site has been analysed to determine the likely storage and runoff rates to provide a minimum standard for any future works. The modelled flows can be seen in Section 8.4 and Table 5. The parameters and assumptions used in the modelling are outlined in Section 8.3.

8.3 MODELLING

The key pre development modelling assumptions and characteristics are as follows:

- Horton/ ILSAX drainage modelling method used.
- ARR 2016 methodology used.
- Soil type 1 (highly permeable sand) used for pervious areas.
- Port Hedland rainfall data used.
- Catchments were designed to be logical areas of stormwater capture and discharge and as per Table 2.
- All paved surface areas were assumed to conservatively be 90% impervious, with 10% of this indirectly connected.
- All buildings were assumed to conservatively be 100% impervious.
- Existing underground storage was assumed to be soakwells.
- Trapped low volumes were taken from available survey.
- Adjoining residential and commercial areas were assumed to detain flows to the Town's requirement of 1 soakwell (1.8m diameter x 1.8m deep) for every 350m^2 of lot (see Table 4).
- Drainage storage within the Site was taken from survey. A summary can be seen in Table 3.
- A conservative infiltration rate of 5m/day from the base of soakwells, with 10% from the sides, was assumed, based on the dunal sands.
- Directly connect impervious areas (eg roads, paved areas and rooves) had an assumed retardance coefficient of 0.01, while supplementary impervious areas eg footpaths or disconnected buildings discharging to the ground surface) had an assumed retardance coefficient of 0.013.
- Pervious surfaces (eg areas of unsealed ground and landscaping) were assumed to have an averaged retardance coefficient of 0.15.
- The final storms modelled were the 5min,10min,15min, 20min, 25min, 30min, 45, 1 hr, 1.5hr, 2hr, 3hr, 4.5hr, 6 h and, 9hr. Longer events were not modelled as the peak events were 4.5hr hours or less for flows leaving the site. These were modelled for the 1EY, 20%AEP, 10%AEP and 1%AEP.

Table 3 Assumed pre development storage- Site

Catchment	A	B	C**	D	E	F**	Total
Assumed soakwells*	3	12	1	5	8	1	30
Soakwell Volume (m^3)	13.74	54.96	4.58	22.9	36.64	0	132.82
Trapped low present	No	Yes	Yes	Yes	Yes	No	
Trapped Low volume (m^3)	0	104.3	12.9	37.7	105.3	0	260.2
Total storage volume (m^3)	0	159.26	17.48	60.6	141.94	0	379.28

*Note: *Soakwells assumed to be 1.8m diameter x 1.8m deep.*
***1 soakwell assumed, as none were noted on survey*

Table 4 Assumed pre development volume – External

Catchment	Ext 1	Ext 2	Ext3	Ext 4.1	Ext 4.2	Total
Assumed soakwells*	6	2	49	14	30	101
Soakwell Volume (m3)	27.48	9.16	224.42	64.12	137.4	462.58

*Note: *Soakwells assumed to be 1.8m diameter x 1.8m deep.*

8.4 PRE DEVELOPMENT FLOW

The pre development drainage analysis shows that stormwater discharges from the Site in all events, based on the assumed storage available. It is also noted that all the external catchments contribute flows in the 20% AEP and above. In the 1EY, all External catchments other then Ext 1 contribute flows. The peak flows are generally due to the short duration events where water is unable to infiltrate quick enough, resulting in the available storage filling and overflowing.

Table 5 Pre development flow rates

Catchment	1EY		20% AEP		10% AEP		1% AEP		Comments
	Rate (m^3/s)	Critical Event	Rate (m^3/s)	Critical Event	Rate (m^3/s)	Critical Event	Rate (m^3/s)	Critical Event	
Internal									
A	0.259	10min	0.406	5min	0.49	5min	0.799	5min	
B	0	NA	0.019	2hr	0.036	1.5hr	0.115	45min	
C	0.031	1hr	0.043	15min	0.104	15min	0.212	30min	Peak includes overflow from Cat B in 1% AEP
D	0.015	1.5hr	0.06	1hr	0.078	25min	0.167	20min	Includes flows from Ext 2 as connected carpark
E	0.076	1.5hr	0.233	1hr	0.304	45min	0.61	45min	Includes overflow from Cat A, B, C, D
F	0.105	1hr	0.32	1hr	0.436	45min	0.86	30min	Includes overflow from Cat A, B, C, D& E
Dempster St discharge *- no external inflows*	**0.105**	**1hr**	**0.32**	**1hr**	**0.436**	**45min**	**0.86**	30min	Assumes no external flows enter
Dempster St discharge *- with external inflows*	**0.159**	**1.5hr**	**0.554**	**1hr**	**0.777**	**45min**	**1.63**	**45min**	Includes modelled flows from external areas.
External									
Ext 1	0	NA	0.075	20min	0.12	15min	0.224	10min	
Ext 2	0.008	15min	0.017	15min	0.021	15min	0.035	5min	
Ext 3	0.021	4.5hr	0.225	20min	0.335	20min	0.732	10min	
Ext 4.1	0.063	1hr	0.084	20min	0.124	15min	0.229	10min	
Ext 4.2	0.026	1hr	0.184	20min	0.285	15min	0.505	10min	
**External total	**0.118**		**0.585**		**0.885**		**1.725**		

*Note: ** Total flow value does not consider the variation in timing from each catchment*

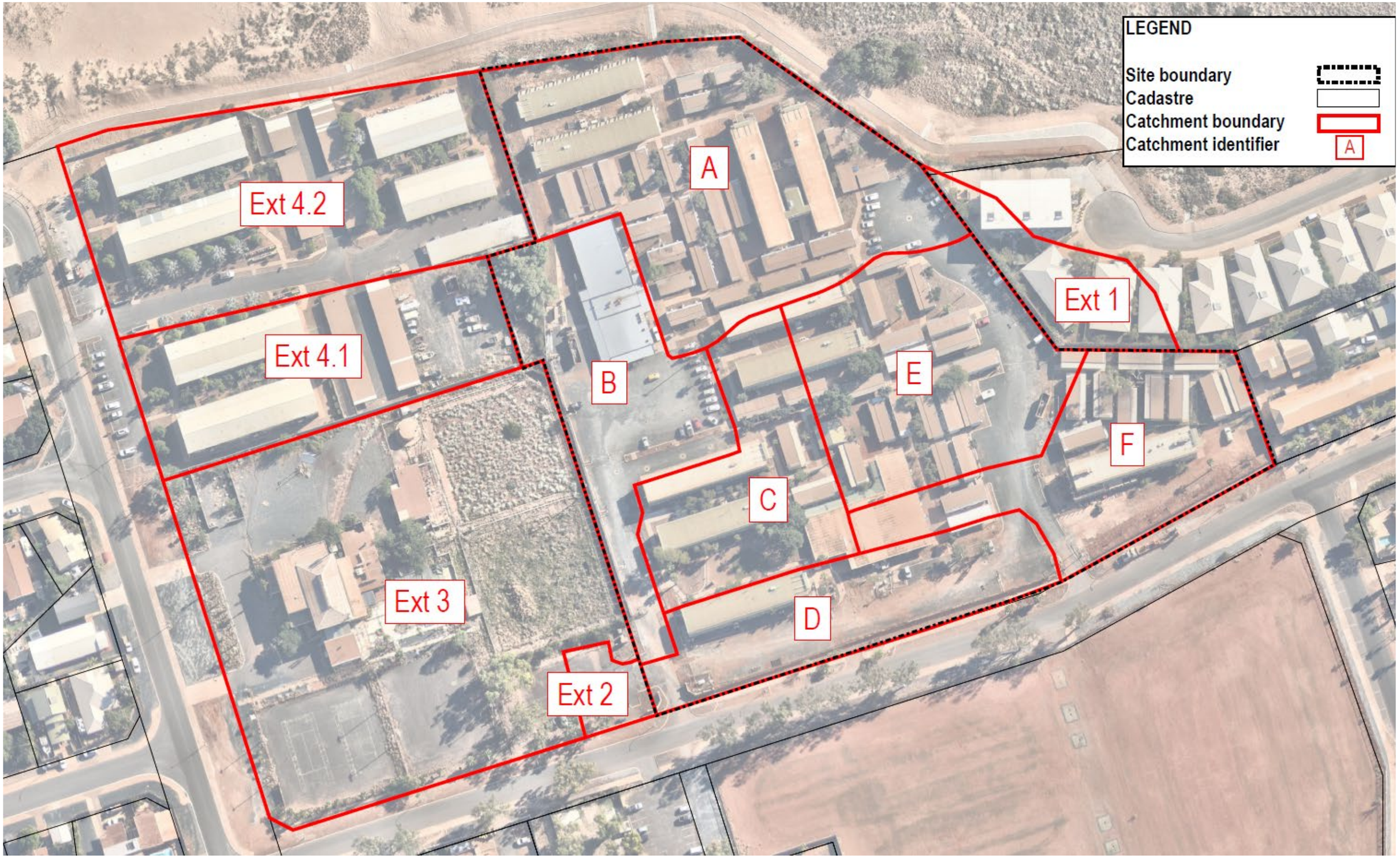

Figure 5 Site and external catchments

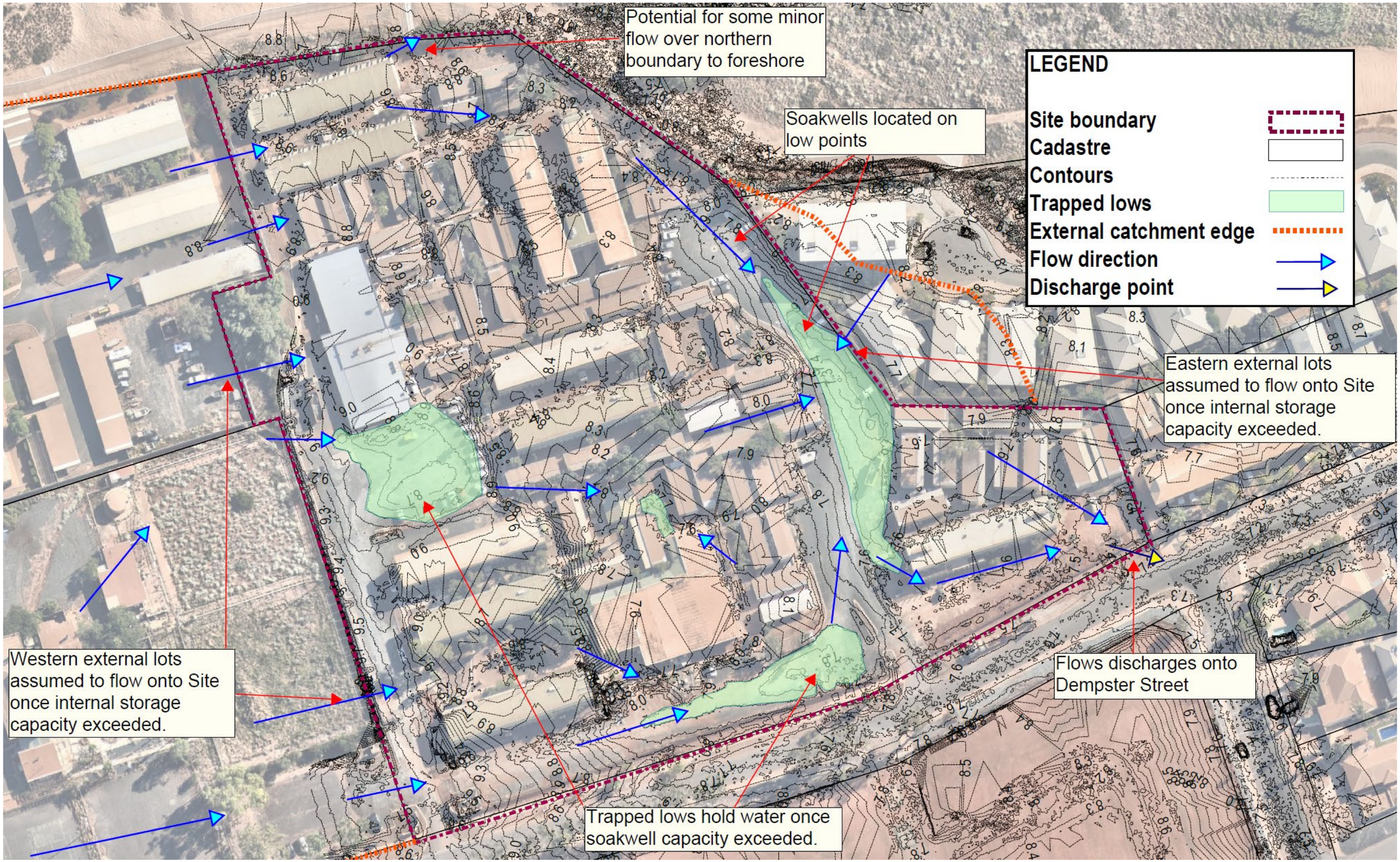

Figure 6 Site drainage details

9 DRAINAGE MANAGEMENT STRATEGY OVERVIEW

The aim of Drainage Management for the subject land is to generally manage the water flows so that water treatment is achieved and that the major storms are managed through the subject land.

The majority of the 1EY is to be treated to reduce nutrients, sediments and other contaminant prior to discharge offsite. Above the 1EY, the main function is to control the flow of drainage water throughout the subject land and its release from the subdivision in a controlled manner.

The following sections show in more detail how water is treated and conveyed in the different AEP scenarios,

7.4 – 1EY

7.5 – 10%AEP

7.6 – 1%AEP

The drainage network, including the indicative basin location can be seen in Figure 8. The drainage analysis below uses the layout and land uses as shown in Figure 8, with this layout containing a maximum development area. This means that the drainage assessment considered the likely highest runoff scenario for the Site. If less area is developed into buildings and other impervious surfaces, the stormwater requirement will likely decrease. Furthermore, at the point in time when the Environmental Conservation Reserve is no longer able to contain buildings, there is the potential to utilise some of this area for vegetated treatment and detention basins. Future detailed drainage analysis is to take the final land use into account to determine the most suitable detention, treatment and conveyance system for the Site, while also considering relevant external flows.

9.1 GENERAL DRAINAGE SUMMARY

The Site and potential External catchments have been assessed as part of the post development drainage modelling. The Site has been divided into 4 main internal catchments (1-4), with these further divided to reflect potential different land uses and water flow paths. For Catchments 3 and 4, this has resulted in a sub catchment split between roads and lots. For Catchment 2, a sub catchment split has been made to allow for the analysis of a potential discharge to the adjoining foreshore. Catchment 1 is assumed to be a parking area with associated landscaping and is treated as one entity. The Catchments can be seen in Figure 7, with further details in Table 6.

It was noted as part of the pre development analysis that the Town's minimum storage requirements of 1 soakwell (1.8m diameter x 1.8 deep) for every 350m^2 of catchment area was generally not suitable for detaining most short to medium duration events. Using this minimum storage rate resulted in an increase in flow from the pre development situation for the Site. An analysis was then undertaken at the rate of 1 soakwell per 290m^2 of catchment area (Town's minimum 10% AEP storage rate), which again resulted in an increased flow rate.

Based on this analysis, the storage rate was increased to 1m^3 of storage per 40m^2 of impervious area (approximately 183m^2 of catchment per soakwell). In combination with a final basin to collect minor additional flow, this resulted in a post development flow rate that matched or was lower than the current predevelopment flows generated within the actual Site. This detention rate is considered a standard detention rate for 10% AEP flow detention within many areas of Western Australia.

To allow for a comparison of storage types, 1 sub catchment area (Cat 2.1) was assumed to have its storage as a bioretention garden, rather than in soakwells. The bioretention garden parameters are as per Table 7. The garden would be landscaped with species suited to the local climate and the sporadic inundation during storm events. These species are likely to be similar to the flora of interdunal low points, which will complement the adjoining foreshore area.

A single discharge point has currently been modelled, with this to be refined as part of detailed design. At this discharge point, a final basin (or similar volume underground storage system) is also likely to be required, to reduce flows to the modelled current discharge (predevelopment) rate. This has been modelled as a 1.2m deep basin, with a weir at 1.0m. No pipe outlet has been assumed; however this may be added as part of detailed design to assist with managing smaller event discharge. This is also assumed to have a bioretention media base with suitable landscape planting. Alternatively, if a final basin is not suitable, a corresponding volume of storage can be provided as underground storage near the discharge point.

When the potential External flows were added, the final flows were also the same or reduced in all events, other than the 10% AEP and 1% AEP, where a slight increase was noted. This increase is due to the large events on the external catchments assumed to be unmanaged. As part of future detailed design, further investigation into the actual external storage and flow management of the potential contributing catchments is to be undertaken. This will allow for a refinement of any additional detention that may be required, noting that the current analysis is potentially assuming more flow from surrounding catchments, then is actually being generated.

To provide flexibility as part of the future design, a potion of Catchment 2 (2.1) was analysed as either flowing through to Dempster Street or alternatively discharging through to the adjoining foreshore. This catchment covers the northern area of the Site and borders the foreshore to the north and east. This option assist with reducing potential flood flows through to Dempster St. While a small flow is currently shown as potentially going through to the foreshore in the 20% event and above, this could be modified so that only events above the 20% flow out, with smaller events completely inundated.

9.1.1 MODELLING

The key post development modelling assumptions and characteristics are as follows:

- Horton/ ILSAX drainage modelling method used.
- ARR 2016 methodology used.
- Port Hedland rainfall data used.
- Soil type 1 (high permeable sands) used for permeable areas.
- Catchments were designed to be logical areas of stormwater capture and discharge and as per Table 6 and Figure 7.
- External catchments parameters are to remain the same as pre development.
- All road areas were assumed to be 80% impervious, with 10% of this indirectly connected.
- Mixed use lots were generally assumed to be 85% impervious with 5% of this indirectly connected.
- Catchment 1 is assumed to be 90% impervious with 10% of this indirectly connected.
- A conservative infiltration rate of 5m/day from the base of soakwells, with 10% from the sides, was assumed, based on the dunal sands.
- Directly connect impervious areas (eg roads, paved areas and rooves) had an assumed retardance coefficient of 0.01, while supplementary impervious areas eg footpaths or lot paving) had an assumed retardance coefficient of 0.013.
- Pervious surfaces (eg areas of unsealed verges and landscaping) were assumed to have an averaged retardance coefficient of 0.15.
- The drainage basin configurations are as per Table 7. The base was assumed to have an infiltration rate of 4m/day (conservative biofiltration rate) and 5m/ay from the sides. The sides were assumed to be sloped at 1:6.
- Soakwell and basin storage per catchment was as per Table 8, noting that to be conservative, this does not include any trapped low storage above the soakwell structures.
- The final storms modelled were the 5min,10min,15min, 20min, 25min, 30min, 45, 1 hr, 1.5hr, 2hr, 3hr, 4.5hr, 6 h and, 9hr. Longer events were not modelled as the peak events were 4.5hr hours or less for flows leaving the site. These were modelled for the 1EY, 20%AEP, 10%AEP and 1%AEP.

Table 6 Site Post Development Catchment Summary

Catchment	Area (ha)	Discharge location	Comments
1	0.2635	Cat 3 drainage/road network	Assumed to be a single high density development so no separate lot storage. Takes flow from Ext 4.1.
2.1	0.4666	Cat 2.2 drainage/road network	Potential for discharge to Foreshore
2.2	0.4666	Cat 4 drainage/road network	Takes flow from 2.1, if no flow to foreshore. Also takes flow from Ext 4.2
3 Lot	0.5872	Cat 3 verge	Lot soakwells will discharge to adjoining internal road gutter.
3 Rd	0.2346	Cat 4 drainage/road network	Takes inflows from Cat 1, and potentially a portion of Cat 2. Also takes Ext 3 and Ext 2.
4 Lot	0.898	Cat 4 verge	Lot soakwells will discharge to adjoining road gutter.
4 Rd	0.3129	Final basin	Takes flow from Ext 1 onto road. After roadside soakwells full, excess flow directed to final basin.
Site Total	3.2294		

Table 7 Basin Summary

Basin	Basin base area (m^2)	Top area (m2)	20% AEP water level area (m^2	20% AEP water level depth (m)	Weir height from base (m)	Volume to weir (m^3)	Total depth (m)	Volume at basin top (m3)	1% AEP storage area (m^2)	Comments
Cat 2.1 bio basin	35	494	435	0.44	0.4	73.2	0.5	110.1	510	Assumes 1% AEP spills slightly out of basin area (0.01m deep)
Final basin (Internal),	9	360	294	1.05	1	110.5	1.2	170.5	470 (approx)	Results assumes Internal flows only. Spills into surrounding area 0.1m deep in 1% AEP.
Final basin (Internal and external),	9	360	380	1.24	1	110.5	1.2	170.5	650 (approx)	Results assumes both external and internal flows. 20% AEP will spread just outside basin to 0.04m deep. 1% AEP will spread to surrounding area 0.26m deep

Note: Basin sides slopes are 1:6.

Table 8 Storage summary

Catchment	1	2.1	2.2	3 Lot	3 Road	4 Lot	4 Road	Final	Total
Assumed soakwells	15	0	25	32	13	49	17	0	151
Biogarden/basin	0	1	0	0	0	0	0	1	2
Storage volume (m^3)	68.7	110	114.5	146.56	59.54	224.42	77.86	170.5	972.08

9.2 1EY STORM EVENT AND WATER QUALITY

Key points of the minor drainage system strategy are as follows:

- On-lot storage systems will infiltrate the entire 1EY. This is achieved through the soakwells and/or bioretention gardens/basins.
- The infiltration of the stormwater through the bioretention garden/basins will assist with the removal of pollutants.
- Bioretention media to FAWB standards is to be utilised in the base and sides of the structures.
- There is no discharge from the site in the 1EY, even with external flows, with the minor incoming external flows infiltrated into the Site's storage, including the final basin/underground storage.

9.3 DRAINAGE MANAGEMENT PLAN – 20%/10%AEP

Key points of the 20%AEP / 10% AEP drainage system strategy are as follows:

- The final basin assists with reducing the final flow rates. It mimics the storage provided by the trapped lows designed into the existing development. The water storage is below 1.2m deep in the final basin, assuming no external flows. With potential external flows, the basin floods approximately 0.05m above the basin in the 20% AEP and 0.09m in the 10% AEP.
- The dispersed storage within the proposed Mixed Use and Transitional Development areas will detain flows below the current discharge rates for the 20%AEP, for both the internal Site discharge and with the addition of External flows.
- In the 10% AEP, the flow is below pre development for the internal Site's discharge. It is slightly increased when the modelled External flows are added. These results can be seen in Table 9 and 10.

9.4 DRAINAGE MANAGEMENT PLAN – 1%AEP

The Site has been designed to safely manage the 1%AEP flood event so that impacts within the Site and downstream are minimised.

Key points of the major drainage system strategy are as follows:

- The roads are graded to direct flow overland to the sub catchment detention areas and eventually through to Dempster St.
- Lots will discharge flows to the relevant road network via overland sheet flow.
- All basins have high flow weirs designed to manage the 1% AEP outflow and to allow for safe outflows
- The 1% AEP flow from the Site to Dempster St, is slightly below the current developed Site, when potential External flows are not included. The comparison can be seen in Table 10.
- The 1% AEP flow from the Site, is slightly above the current developed situation, when potential External flows are included. The comparison can be seen in Table 10. The actual storage and flows from adjoining lots should be refined as part of the detailed design analysis to determine if further storage is required to manage this potential increase, noting that this increase is due to the assumption that the External catchment's storage and management is not designed for the 1%AEP storm event currently.
- All lot infrastructure is to be set a minimum 300mm above the adjoining road kerb height to allow storm flows to move through the lot without flooding of key infrastructures. Final floor levels to be determined as part of detailed design.

9.5 OPTION TO SEND FLOWS TO FORESHORE

The northern portion of the Site has the potential to discharge its flow to the adjoining foreshore. To explore this option, scenario modelling was undertaken to direct a sub catchment (Cat 2.1) to the foreshore. This catchment area is 0.4666ha and represents approximately 14.5% of the overall Site.

This option reduces the potential flood risk to Dempster St. The results from this scenario modelling can be seen in Table 9 and 10. There is no release of water in the 1EY. In the 20% AEP the modelled peak flow is 0.024m³/s. Additional storage is able to be provided, should it be deemed that no flow is to enter the foreshore in the 20% AEP. Outgoing flows would be discharged as sheet flow, to allow for the water to disperse and soak into the sand dunes. Any flows released are to be undertaken in a manner to does not exacerbate any potential costal erosion

Table 9 Post development flow summary

Catchment/Discharge Point	1EY		20% AEP		10% AEP		1% AEP		Comments
	Rate (m³/s)	Critical Event	Rate (m³/s)	Critical Event	Rate (m³/s)	Critical Event	Rate (m³/s)	Critical Event	
Internal:									
1	0		0.025	1hr	0.043	1.5hr	0.099	20min	
2.1	0		0.025	1hr	0.047	45min	0.124	25min	Potential for discharge to Foreshore
2.2	0		0.062	1hr	0.108	45min	0.267	25min	Includes flow from 2.1, if no flow to foreshore.
3	0		0.064	1.5hr	0.104	3hr	0.224	25min	
4	0		0.232	1.5hr	0.395	45min	0.971	25min	Includes inflows from Cat 1, 2 and 3
No External flows									
Dempster St – Total site	0		0.18	2hr	0.383	3hr	0.876	25min	Assumes no external flows enter Site
Dempster St – Cat 2.1 to foreshore	0		0.16	2hr	0.317	3hr	0.782	30min	Assumes Cat 2.1 will flow to foreshore.
Discharge to Foreshore	0		0.024	1hr	0.046	45min	0.122	25min	Assumes Cat 2.1 discharges to foreshore after bioretention garden capacity exceeded. Potential to increase detention to reduce flow further into foreshore.
With External flows									
Dempster St – Total site	0		0.554	1hr	0.846	45min	1.85	25min	Includes modelled flows from external areas.
Dempster St – Cat 2.1 to foreshore	0		0.537	1hr	0.811	45min	1.76	25min	Includes modelled flows from external areas.
Discharge to Foreshore	0		0.024	1hr	0.046	45min	0.122	25min	Includes modelled flows from external areas.
External:									
Ext 1	0	NA	0.075	20min	0.12	15min	0.224	10min	Assumed to flow into Catch 4 cul-de-sac head.
Ext 2	0.008	15min	0.017	15min	0.021	15min	0.035	5min	Assumed to flow into Cat 3. May be able to be directed straight to Dempster St, subject to detailed design.
Ext 3	0.021	4.5hr	0.225	20min	0.335	20min	0.732	10min	Assumed to flow into Cat 3.
Ext 4.1	0.063	1hr	0.084	20min	0.124	15min	0.229	10min	Assumed to flow into Cat 1.
Ext 4.2	0.026	1hr	0.184	20min	0.285	15min	0.505	10min	Assumed to flow into Cat 2.
****External total**	**0.118**		**0.585**		**0.885**		**1.725**		

*Note: ** Total flow value does not consider the variation in timing from each catchment*

Table 10 Post development comparison to agreed rates

Discharge point	1EY	20% AEP	10% AEP	1% AEP
	Rate (m³/s)	Rate (m³/s)	Rate (m³/s)	Rate (m³/s)
Pre				
Dempster St - no external flows	0.131	0.337	0.454	0.878
Dempster St - with external flows	0.159	0.585	0.807	1.64
Post				
No External flows				
Dempster St - total site	0	0.18	0.383	0.876
Dempster St - with portion to foreshore	0	0.16	0.317	0.782
Foreshore	0	0.024	0.046	0.122
With External flows				
Dempster St - total site	0	0.554	0.846	1.85
Dempster St - with portion to foreshore	0	0.537	0.811	1.76
Foreshore	0	0.024	0.046	0.122

10 COASTAL AND OCEAN RISK MANAGEMENT

The Site is to be developed in accordance with the recommendations outlined in the current CHARMAP. From a water management perspective this means that all floor levels are to be a minimum of 7.8mAHD in keeping with the 2100, 1:500ARI storm surge level.

Furthermore, the northern portion within the coastal erosion risk area is to include no new permanent structures. Any detention systems are to be designed so that they can be removed in the future, should the area need to be cleared, prior to potential coastal erosion. The proposed bioretention garden is deemed suitable as this contains minimal hard infrastructure and the plants are suited to the foreshore conditions, meaning the actual detention area can likely remain in place as a vegetated area with foreshore flora, even after other hard infrastructure is remove.

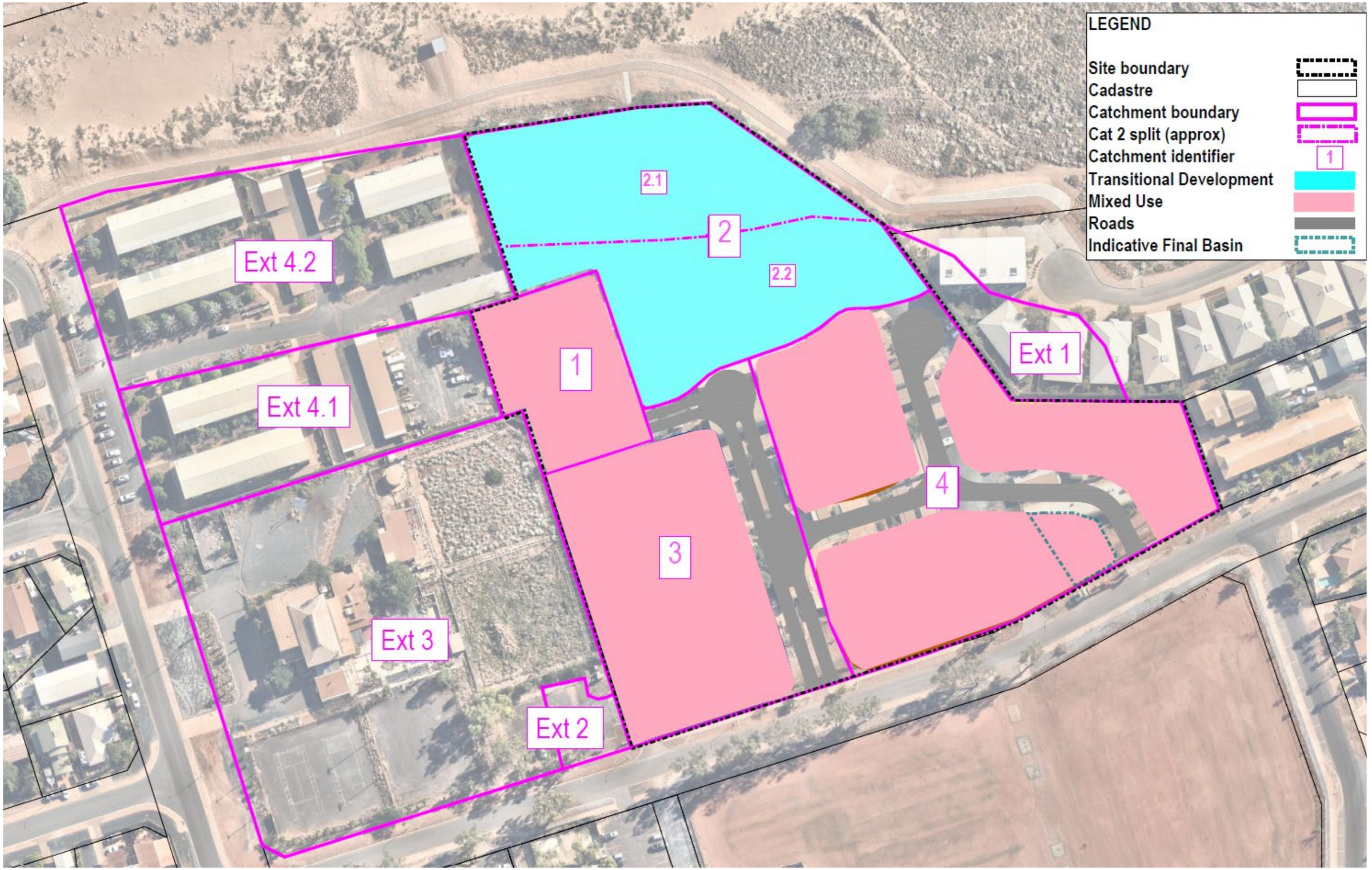

Figure 7 Post Development Catchments

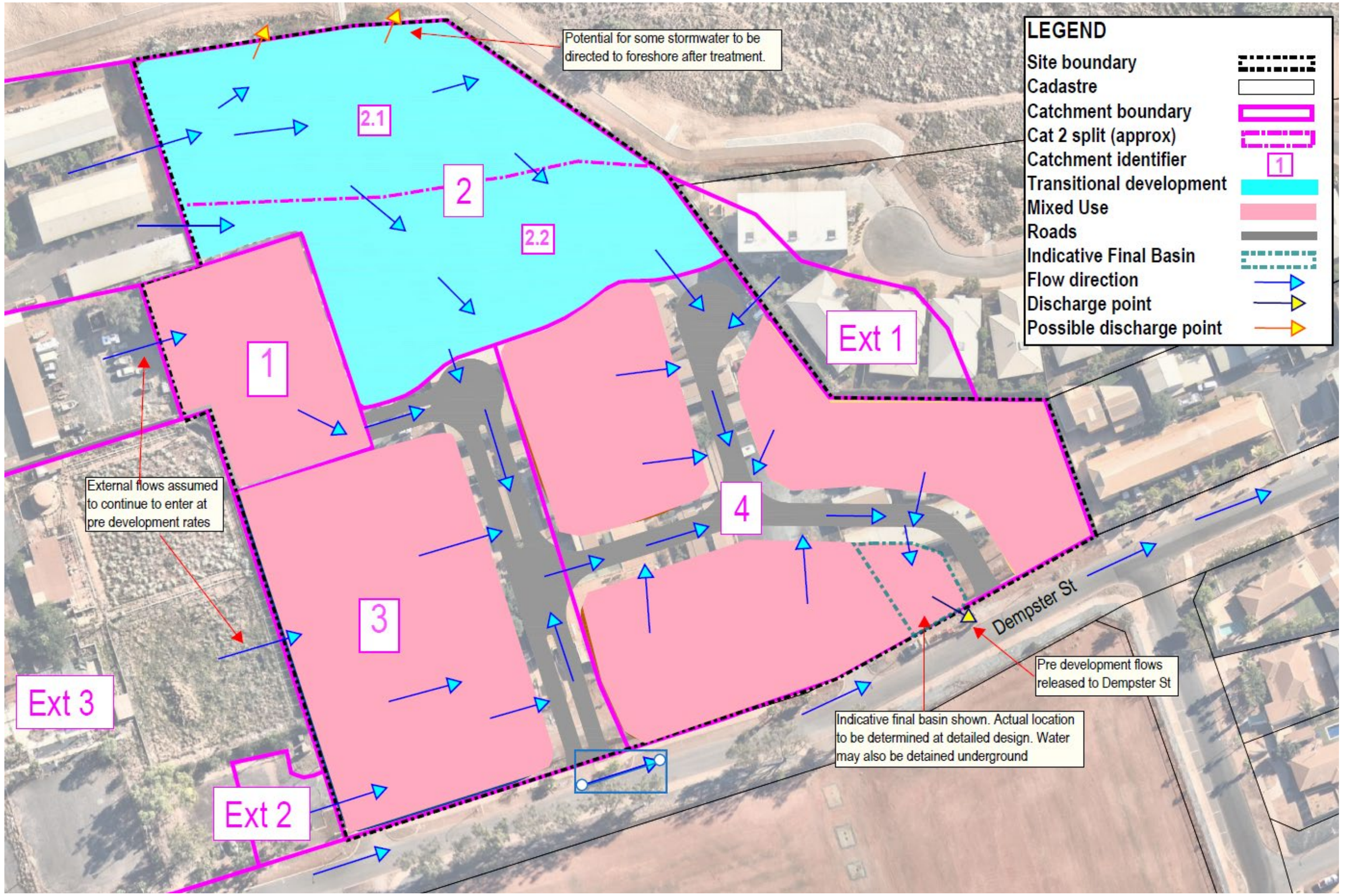

Figure 8 Drainage Plan

11 GROUNDWATER MANAGEMENT STRATEGY

The aim of groundwater management for the subject land is to maintain groundwater as close as possible to existing levels, while maintaining adequate separation from infrastructure. Furthermore, groundwater will be managed to maintain its current water quality. By maintaining the groundwater at a level similar to the current level and quality, the development will have minimal impact on any groundwater dependent ecosystems that exist down gradient of the subject land. Groundwater will still be fed through the soil profile at similar rates to the current situation. The following provides further information on how this will be achieved.

11.1 INFRASTRUCTURE SEPARATION

A vertical separation between significant infrastructure and the onsite groundwater is to be implemented. This is to be achieved primarily through the current separation to groundwater already present (likely 6+m).

All soakwells and basins will have a clear separation of at least 3m over the likely groundwater level. The sandy soils are also suitable to allow for rapid infiltration, with no perching directly below infiltration points.

Further details on the finished levels and the ultimate depth to groundwater to be determined at detailed design and reported in the UWMP.

11.2 QUALITY MANAGEMENT

The groundwater quality is managed by stormwater being infiltrated through the soil profile. The areas that will flow to the proposed bioretention garden and bioretention basin will also receive treatment as it infiltrates through the bioretention media and plant root zone, prior to entering the groundwater system. This will minimise nutrients and other contaminants from entering the superficial groundwater system. Additional bioretention gardens may be installed as part of the detailed design phase, to further assist with managing water quality entering the groundwater.

Fertiliser use across the Site is likely to be low, given the proposed small lots and mixed uses. Should there be a need for larger landscaped areas, such as within the Environmental Conservation Reserve, it is recommended that the fertiliser use adhere to Nutrient Wise principles and utilise slow release products, as necessary. This will reduce the total load of nutrients applied to the development area and minimise the risk for nutrient movement into the groundwater.

All commercial enterprises are to incorporate industry best practice so that any potential contaminants are captured and treated before they enter the soil profile (and potentially the groundwater system).

11.3 PROTECTION OF GROUNDWATER DEPENDENT ECOSYSTEMS

Potential threats to groundwater dependent ecosystems will be managed by:

- Waterwise landscaping and irrigated through water efficient system
- Infiltrating water close to the source to minimise hydrological changes (eg all water infiltrated within the Site in the 1EY)
- The bioretention gardens will assist with potential pollutant removal.

11.4 DEWATERING

It is unlikely that dewatering would be required for the development of the Site, due to the depth to groundwater.

Should it be required, a dewatering management plan is to be produced as part of detailed design. It is to cover the treatment and management of groundwater including but is not limited to pH monitoring and neutralisation, heavy metal monitoring and hydrocarbon analysis. The management plan is to set monitoring parameters so that levels are to remain within set guidelines and have contingency plans enacted if guidelines are exceeded. All dewatering effluent is to be infiltrated as close to source as possible to limit groundwater drawdown outside the area required for excavation.

11.5 GROUNDWATER USAGE

There is no proposed groundwater use as part of the development. Should there be a need for groundwater use for construction purposes, a groundwater license will be applied as part of the detailed design stage.

Individual lot owners may install groundwater bores to facilitate their own uses. All groundwater usage will be subject to licensing by DWER.

12 WATER SERVICING AND SUSTAINABLE USAGE STRATEGY

12.1 POTABLE WATER

There is an existing 150mm water main along the northern verge of Dempster Street, with the Site currently being serviced with a 100mm asbestos cement water supply main. It is expected that this 100mm asbestos cement water supply main will need to be appropriately removed and disposed of as per asbestos management procedures. It will be replaced with piping to Water Corporation standards. Further details are outlined in the Servicing Report (Appendix B).

12.2 WASTEWATER MANAGEMENT

There is an existing Water Corporation 150mm vitrified clay sewer pipe thar runs through the site from the former recreation centre towards Dempster Street. There is also Water Corporation sewers along the eastern boundary to service Lot 510 (#19 Dempster Street). The existing sewer from the recreation centre would need to be realigned and placed within the proposed road reservation.

For the existing sewer along the eastern boundary of the site, early discussions should be had with Water Corporation to confirm if they would support keeping this sewer in place.

A 150mm sewer mains will need to be installed throughout the development. Further details are outlined in the Servicing Report (Appendix B).

12.3 LANDSCAPING

Any landscaping undertaken as part of the future development is to implement Waterwise and Nutrient Wise principles. This should include the use of locally native plants suited to the Site conditions along with small/tubestock planting to minimise any watering requirements. The proposed bioretention basins and garden will receive part of their irrigation requirements from inflowing stormwater. Any proposed irrigation would likely be from the Water Corporation's main system or potentially from groundwater. The latter is unlikely given the small area of the proposed development and likely low irrigation requirement. Any groundwater usage will be subject to licencing by DWER at the time of application. It is noted that there is currently allocation available. There is the possibility of hand watering via a tanker during the first 2 years of establishment, subject to the seasonal conditions. More detail on the general landscaping and any irrigation requirements will be determined in the final landscaping plans at subdivision stage.

12.4 FIREFIGHTING WATER SUPPLY

Fire hydrants will be provided throughout, as per the relevant regulations.

12.5 GENERAL GROUNDWATER USAGE

Individual lots may utilise groundwater for on-lot uses. Any groundwater usage will be subject to licencing by DWER at the time of application. It is noted that there is currently allocation available within the Pilbara - Alluvial.

13 WATER DEPENDENT ECOSYSTEMS MANAGEMENT STRATEGY

13.1 EXISTING ECOSYSTEM PROTECTION

The treatment of water prior to it entering the groundwater and surface water flowing off the Site will assist with protecting any down gradient ecosystems. The strategies used to achieve this are outlined in Sections 9 and 10. The general reduction in nutrients and other contaminants will minimise impacts on any downgradient ecosystems.

13.2 NEW HABITAT CREATION

The proposed planted bioretention garden and basins will act as new ephemeral riparian habitat, due to the ephemeral inundation and locally native vegetation suited to these conditions. This may be complimented by the use of other native plants within the streetscape planting, allowing fauna linkage to the adjoining foreshore area.

13.3 DISEASE VECTOR AND NUISANCE INSECT MANAGEMENT

Due to the highly permeable sands and the corresponding ephemeral nature of basins and soakwells, the stormwater system will not offer a suitable habitat for mosquito breeding. The systems are designed to drain significantly quicker than the guideline of 96 hours after rain ceasing.

14 MONITORING & MAINTENANCE

14.1 SURFACE AND GROUNDWATER MONITORING

Surface water

As there are no natural surface water features on site, there will be no pre or post development surface water monitoring.

Groundwater

Due to the significant depth to groundwater and no adjoining wetland system within 50m, there will be no pre or post development groundwater monitoring

14.2 OTHER ITEMS - CONSTRUCTION PHASE

Installation of drainage control structures ahead of the construction phase of the subdivision development will be utilised. This will include the use of water sensitive urban design techniques such as sediment curtains, hydro mulching and temporary detention basins to maintain the quality of the water leaving the development area during construction.

Any temporary basins will be monitored for any damage, including compaction, sediment build up, oils and litter during and at the completion of construction to ensure the structure's effectiveness is not diminished.

Sediment and litter on roads will be monitored, with removal as necessary with street sweeping. Further details can be seen in Table 11.

14.3 OTHER ITEMS - POST-DEVELOPMENT

Compared to traditional engineered structures for stormwater runoff management, the WSUD elements will generally require routine maintenance that is generally of a landscape maintenance nature. The most common maintenance is the removal of weeds, debris and siltation. The most time intensive period of maintenance for a vegetated WSUD system is during plant establishment (which typically includes two growing seasons), when supplementary watering, plant replacement and weeding may be required.

It is recommended that vegetated WSUD elements are monitored by personnel with floristic knowledge and/or qualifications as they will be capable of identifying evasive species within the natively vegetated WSUD systems. Furthermore, personnel in charge of monitoring should have a good understanding of principles and the functional design of the WSUD elements and the treatment system. The maintenance activities prompted through monitoring activities will generally require coordination between landscape and civil services.

Maintenance inspections should be scheduled to be conducted after a significant storm event (mobilises sediments and coarse material). Inspections should focus on ponding time for the different systems, unequal surface flow distribution and scouring. As well as this, the maintenance will also include the factors outlined for the temporary basins above.

Performance monitoring of the basins will be undertaken to ensure the effective working of the system. Indicators will be used to provide cost effective methods to evaluate the adequacies of the operation and performance of WSUD elements. It can be assumed that if the WSUD elements operate in accordance with the designs, then it can be expected that they are delivering the desired management objectives.

The key aspects monitored will include:

- ensuring the inlet and outlet structures are free of debris;
- vegetative cover of the systems is maintained;
- sediment build up is not impeding the functionality;
- erosion is not present;
- soils are not compacted;
- litter is removed; and
- excessive hydrocarbons are not present in the system
- weeds controlled
- infiltration of stormwater is maintained

These are outlined further in Table 11.

Due to being in a large lot industrial estate, the roadside swales are likely to be composed of mowed grass for ease of maintenance. The monitoring is therefore focused on erosion and sediment control as well as maintaining a dense surface grass cover. The flow channel is to be kept free of any significant obstructions, which may include a need to mow and remove the clippings of any dense grass stands from time to time. Other soil and litter obstructions are also to be removed along with problematic weeds.

The drainage pit and pipe network is to be monitored for functionality. This includes blockages of pits or pipes, sediment accumulation, blockages of outlets and cracking of pipes.

Table 11 Monitoring and Maintenance Schedule

Function	Item to Monitor	Details Monitored	Trigger for Immediate Action	Maintenance Action Required	Monitoring Frequency during maintenance period	Responsible Authority (Timeline)
CONSTRUCTION PHASE & POST-DEVELOPMENT						
Drainage Management Systems (includes traditional and WSUD systems)	Structural Design	Systems are constructed to engineer detailed design specification	Systems constructed differs to design specifications.	Remedial work to rectify systems to meet design specifications.	During and after construction	Developer until handover to Local Authority
	Structural Effectiveness (inlets, traps and outlets)	Inspection for debris, litter and sediments surrounding structural components	Debris, litter or sediments causing blockages or impairing functions.	Remove any debris or blockages. Inspect systems for any erosion related issues.	Monthly	Developer until handover to Local Authority
	Erosion	Inspection for erosion.	Presence of severe erosion or erosion impairing functions.	Investigate, identify and rectify the cause of the erosion. Replace filter media as required.	Monthly	Developer until handover to Local Authority
	Sediment Build Up	Inspection for sediment accumulation within pits, on the surface of bioretention systems and within basins.	Accumulation of large volumes of sediments and/or silts in pits or on the surface (according to Shire standards).	Investigate, identify and stabilise cause of sediment source. Remove accumulated sediments and replace filter media or plants removed. Undertake street sweeping	Event based (mobilisation of sediments) and a minimum of every 3 months	Developer until handover to Local Authority
	Compaction	Inspection of filter media for compaction, could include being driven on.	Water remains ponding longer than designed in bioretention system after a storm event.	Investigate cause of compaction. If localised, remove top 500mm of filter media, break up the filter and then return to system without	Monthly	Developer until handover to Local Authority
	Weeds	Inspection for the presence of weeds.	Weeds are noxious or highly invasive or if weeds cover more than 25% of area.	Manual removal or targeting herbicide application, with waterway approved products.	Monthly	Developer until handover to Local Authority
	Plant Condition	Inspection of vegetation health and cover, and presence of dead plants.	Plants dying or a pattern of plant deaths.	Investigate cause of plant deaths and rectify. Infill planting may be required.	Monthly	Developer until handover to Local Authority
	Organic Litter	Inspection for the presence of organic litter (e.g.. leaves) on surface.	Organic litter coverage is thick or extensive, or detracting from the visual appearance of the system.	Investigate source of litter and undertake appropriate response e.g. alter landscaping maintenance practices, community education).Remove litter.	Monthly	Developer until handover to Local Authority
	Rubbish	Inspection for the presence of rubbish.	Rubbish is blocking structures or detracting from the visual appearance of the system.	Identify source of rubbish and undertake appropriate responses, including removal.	Every 3 months	Developer until handover to Local Authority
	Oil/Hydrocarbons	Inspection for the occurrence of oil on surface.	Oil coverage persists for more than 3 weeks.	Notify the EPA of the spill, if significant and clean up requirements.	Every 3 months	Developer until handover to Local Authority
	Infiltration/Standing water	Inspection of basins to determine if water is infiltrating after rain events in basins	Water is still present after 96 hours, excluding small volumes of groundwater inflow from subsoil	Check subsoil network and filter media is functioning as designed and repair/upgrade.	Every month over winter and spring	Developer until handover to Local Authority

15 IMPLEMENTATION PLAN

The developer is committed to undertaking the water management strategies outlined in this report. The following information details the actions and works to be undertaken by the developer and relevant authorities as part of the development of the subject land.

Implementation of the strategies outlined in this report will be undertaken prior to developmental works, as part of subdivisional works and into the post development phase. The relevant items are to be included in a UWMP. This is to include:

COMMITMENTS BY DEVELOPERS

- Refinement of drainage modelling including connections to surrounding catchments and the Dempster Street drainage networks.
- Refinement of any External incoming flows.
- Design and construction of overall drainage system including basins, pipe network and overland flow paths.
- Sediment control during construction.
- Street sweeping undertaken
- Maintenance during agreed maintenance periods of the stormwater drainage systems and infrastructure.
- Produce and implement Construction and Sediment Control reports.
- Construct the potable water systems.
- Construct the wastewater systems.
- Produce a waterwise detailed Landscape Management Plan including any irrigation requirements.
- Implementation of approved landscaping plans.
- Produce a Dewatering Management Plan, if required

REQUIREMENTS OF THE TOWN OF HEDLAND

- Review and provide input into the LWMS and approval of the UWMP
- Approval of drainage design and other water management works.
- Approval of on-lot stormwater detention systems.
- Responsibility for the maintenance of the road stormwater system after handover

REQUIREMENTS OF THE DEPARTMENT OF WATER AND ENVIRONMENTAL REGULATION

- Review and approval of the LWMS.
- Assist the Town in relation to assessing the UWMP as required.

REQUIREMENTS OF THE WATER CORPORATION

- Review and approval of potable water servicing.
- Manage the potable water service post handover.
- Review and approval of wastewater servicing.
- Manage the wastewater service post handover.

LOT OWNERS

- Installation and maintenance of on lot stormwater detention infrastructure.

16 REFERENCES

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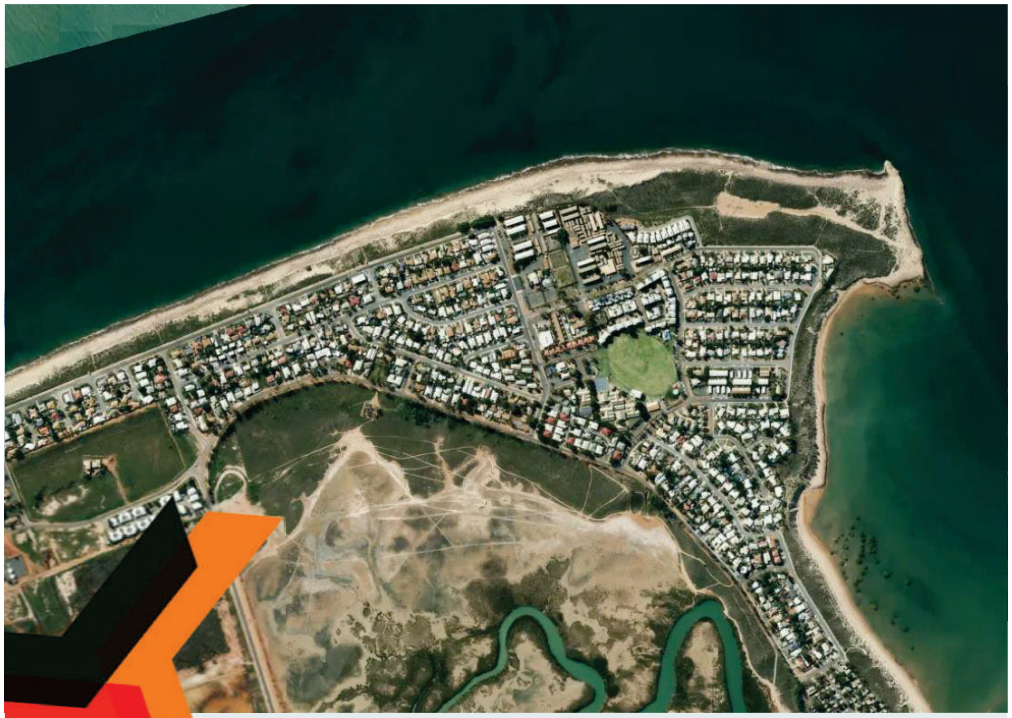
TRAFFIC IMPACT ASSESSMENT



Lot 2 Dempster Street
Local Structure Plan

TRANSPORT IMPACT ASSESSMENT

email: info@flyt.com.au twitter.com/flytplan web: www.flyt.com.au

PROJECT	81113-791-FLYT-TIA-0009			
Revision	**Description**	**Originator**	**Review**	**Date**
0	Draft	CXS	MDR	12/05/2025
1	Issue	CXS	MDR	16/06/2025

Contents

1. SUMMARY

Item	Response
Local Government	Town of Port Hedland
Kariyarra Aboriginal Corporation	Kariyarra Land
Site Lot(s)	Lot 2
Street Frontage	Dempster Street
Development Type(s)	Structure Plan
Relevant Planning Scheme	Town of Port Hedland Local Planning Scheme No. 7
Nearest Bus Route	Bus 870, 50m walk
Walk Score Ratings	Walkability – 12 out of 100 "car dependent"
External Intersections	2, priority controlled T-intersections
Parking Provision	Onsite parking for residential and hotel/commercial land uses with Mixed Use zone; dedicated car park within Environmental Conservation Reserve for workforce accommodation and short stay accommodation uses
Vehicle Trips Generated	238 vehicles in the AM and PM peak hour

2. INTRODUCTION AND BACKGROUND

2.1 Development Introduction

This Transport Impact Assessment (TIA) has been prepared by Flyt in support of the proposed Local Structure Plan at Lot 2 Dempster Street, Port Hedland.

The proposed structure plan is within the Cooke Point locality, approximately 6km east of the Port Hedland townsite. The subject site sits on Kariyarra Land as outlined by the Kariyarra Aboriginal Corporation. The location of the structure plan area is shown in Figure 1.

Figure 1 Development Site (source: MetroMap)

The Local Structure Plan proposes two zones:

- **Environmental Conservation Reserve**: The coastal setback area in the northern portion of the site is identified for future reservation as an Environmental Conservation Reserve, intended to accommodate only temporary development and land uses over the long term.
- **Mixed Use**: The southern portion of the site can be developed for a range of uses including (but not limited to) residential, short-stay accommodation, commercial, retail and tourism.

A copy of the Structure Plan is shown below in Figure 2.

Figure 2 Proposed Structure plan (source: RFF)

The site has an existing planning approval for 64 transportable buildings to accommodate a maximum of 208 people as part of employee accommodation for Campbell Transport. Flyt prepared a Traffic Impact Assessment in support of this development, predicting that the employee accommodation would generate 43 peak hour trips and 184 trips across a single day.

2.2 Transport Impact Assessment

This TIA has been prepared in accordance with the WA Planning Commission's (WAPC) Transport Impact Assessment Guidelines (Volume 2 – Planning Schemes, Structure Plans and Activity Centre Plans).

As stated by the WAPC guidelines the key objectives of a TIA for a structure plan are to:

- Assess the proposed internal transport network with respect to accessibility, circulation and safety for all modes;
- Assess the level of transport integration between the structure plan area and the surrounding land uses;
- Determine the impacts of the traffic generated by the structure plan area on the surrounding land uses;
- Determine the impacts of the traffic generated by the structure plan area on the surrounding transport networks.

2.3 Report Structure

The report is structured as required by the Transport Impact Assessment Guidelines, with the following sections:

- Structure plan outline
- Existing situation
- Internal transport networks
- External transport networks
- Integration with surrounding area
- Analysis of internal transport networks
- Analysis of external transport networks.

3. STRUCTURE PLAN OUTLINE

3.1 Regional Context

The structure plan has been prepared for Lot 2 Dempster Street, Port Hedland. The structure plan area is within the Cooke Point locality, approximately 6km east of the Port Hedland townsite. The regional context is demonstrated in Figure 3.

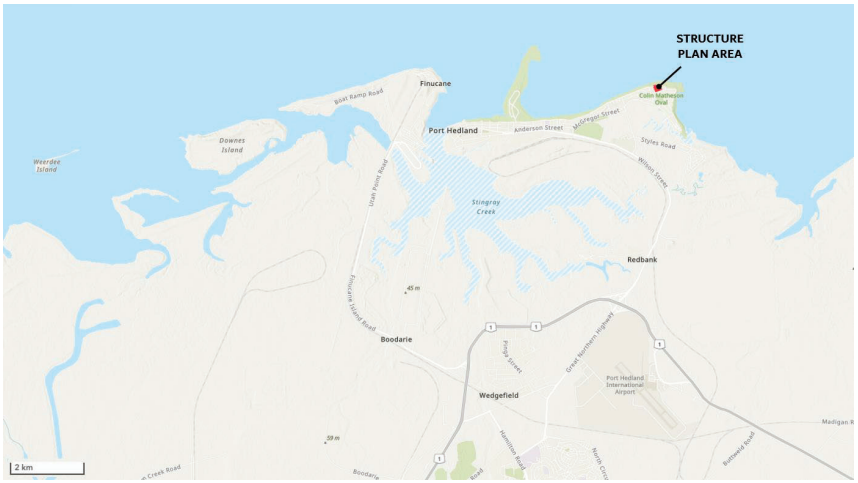


Figure 3 Regional context of Structure Plan area (source: Main Roads WA Road Information Mapping System)

The site is 3.23ha in size and is currently occupied by existing two-storey in-situ buildings, as well as several unoccupied historical buildings. The approved workforce accommodation includes approximately 60 portable units used for short-stay purposes, along with a mess hall and a reception building. The site abuts coastal reserve to the north, residential units to the west and east, and Dempster Street to the south. A library and early learning centre are located nearby the subject site on Dempster Street, while Port Hedland Primary School is approximately 700m to the south.

The site is zoned Urban Development under the Town of Port Hedland's Local Planning Scheme No. 7 (LPS). Land uses immediately surrounding the site are predominantly residential, zoned between R15 and R50. An excerpt of the Town of Port Hedland's Local Planning Scheme No. 7 Map 05 showing the Cooke Point- Port Hedland Locality is shown in Figure 4.

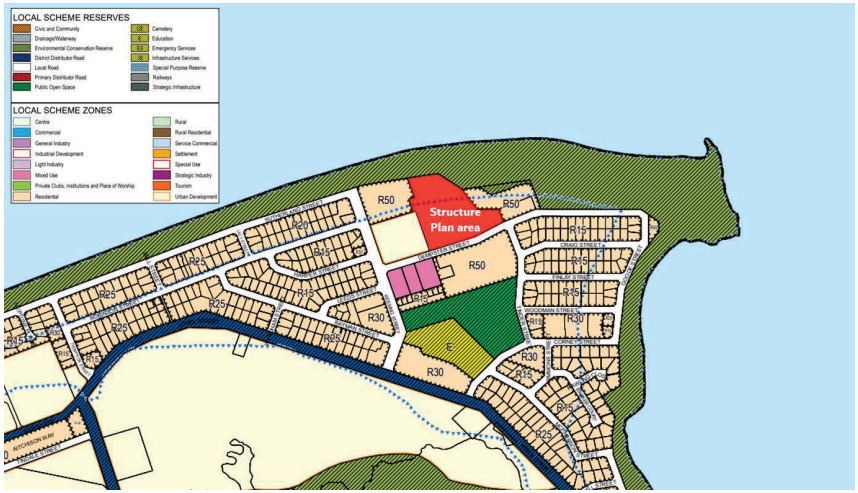


Figure 4 Town of Port Hedland Local Planning Scheme surrounding the development site (source: Town of Port Hedland)

3.2 Proposed Land Uses

The Structure Plan, as shown in Figure 2, proposes two zones, as follows:

- **Environmental Conservation Reserve**: The coastal setback area in the northern portion of the site is identified for future reservation as an Environmental Conservation Reserve, intended to accommodate only temporary development and land uses over the long term.
- **Mixed Use**: The southern portion of the site can be developed for a range of uses including (but not limited to) residential, short-stay accommodation, commercial, retail and tourism.

A possible development scenario is outlined in Figure 5. This represents a 'highest and best use' of the structure plan area, reflecting the maximum reasonable development potential of the site under ideal market conditions. This Traffic Impact Assessment assesses the 'highest and best use' to ensure the traffic generation is assessed against a worst-case model but does not necessarily reflect the ultimate development of the site, due to the flexibility of the Structure Plan.

Road access to the Structure Plan area will be via Dempster Street, with a potential future connection to Lot 1227 (to the west of Lot 2). Cycle access will be via Dempster Street and a connection to the recently constructed shared path along the northern boundary of the structure plan area.

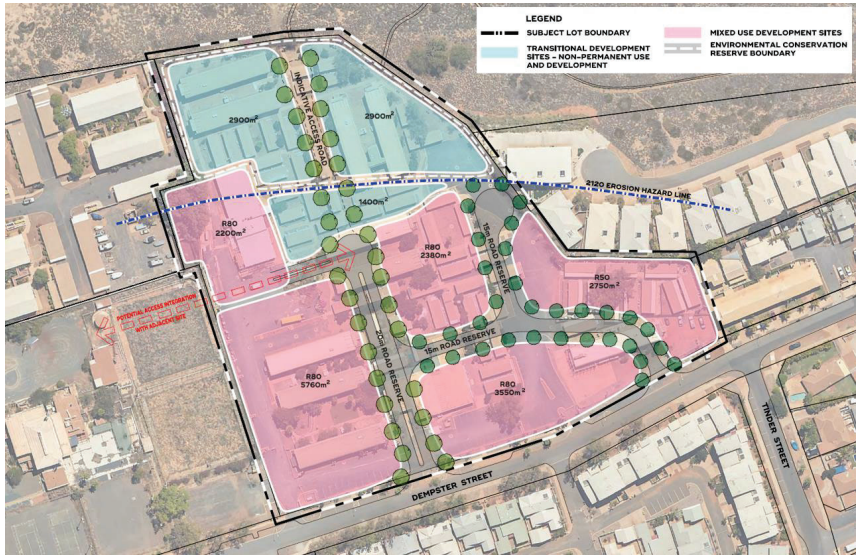


Figure 5 Potential highest and best land use concept sketch (source: RFF)

Potential land uses and yields under a scenario of highest and best use are:

- **Environmental Conservation Reserve**
  - Workforce Short stay accommodation 200 rooms (interim)
- **Mixed Use**
  - Hotel 200 rooms
  - Commercial 325m²
  - Residential 120 dwellings

4. EXISTING TRANSPORT NETWORK

4.1 Road Network

The Structure Plan area has good connectivity to both the local and regional road network. Road access to the Structure Plan area will be via Dempster Street, which is easily connected to local distributors (Athol Street, Coole Point Drive and McGregor Street) and to the regional road network via Port Hedland Road/Wilson Street from where the Great Northern Highway can be accessed.

The road hierarchy surrounding the Structure Plan area is shown in Figure 6 and the speed zoning is shown in Figure 7.

Figure 6 Road hierarchy surrounding development site (source: MRWA)

Figure 7 Speed zoning surrounding development site (source: MRWA)

4.1.1 Dempster Street

Dempster Street is classified as an Access Road, running east-west between Goode Street to the east and Keesing Street to the west. It is constructed to a width of 7.2m within a 20m road reserve. On street parking is permitted along Dempster Street with nine embayed parking bays located adjacent to the Structure Plan area.

A cross section of Dempster Street adjacent to the Structure Plan area is shown in Figure 8.

Figure 8 Dempster Street cross section, looking west past (source: Google Street View 2018)

The current speed limit along Dempster Street is 50 km/h, reducing to 40km/h between 7.30am and 9.00am and 2.00pm and 3.30pm on Monday to Friday during school terms due to proximity to Port Hedland Primary School.

There is a 2.7m concrete footpath along both sides of Dempster Street. On the northern side, the verge and on-street parking provide an adequate buffer for pedestrians from moving vehicles. On the south side, the footpath is located adjacent to the carriageway without an adequate buffer. The street trees located on the southern side provide some shade.

4.1.2 Keesing Street

Keesing Street is classified as an Access Road, running north-south between Sutherland Street to the north and Athol Street to the south. It is constructed to a width of 7.2m within a 20m wide road reserve. A cross section of Keesing Steet immediately south of the intersection with Dempster Street is shown in Figure 9.

Figure 9 Keesing Street cross section looking south (source: Google Street View 2018)

The posted speed limit is 50km/h, however the section of Keesing Street between Athol Street and 160m to the north has a 40km/h school zone speed limit at school start and finish times.

There is a 2m wide footpath located adjacent to the carriageway on the eastern side of Keesing Street only. The environment is hostile with no street trees provided for shade.

On-street parking is permitted and the wide verges located along the residential properties on the western side are often used for parking.

4.1.3 Tinder Street

Tinder Street is classified as an Access Road, running north-south between Dempster Street to the north and Corney Street to the south. It is constructed to a width of 7m within a 20m road reserve. On street parking is permitted in embayed parking bays along the western side of Tinder Street. A typical cross section is shown in Figure 10, looking north towards Dempster Street.

Figure 10 Tinder Street cross section view looking north (source: Google Street View 2018)

The speed limit along Tinder Street is 50 km/h, with sections of 40km/h school zone speed limit at school start and finish times.

There is a 2m wide concrete footpath along the western side of Tinder Street which abuts to kerb and embayed parking bays. The section of parking bays provides an adequate buffer for pedestrians from moving vehicles.

4.1.4 Traffic Volume Data

The most recent traffic counts for streets within 4km of the Structure Plan area were obtained from Main Roads WA's Trafficmap. The count sites are:

- Robinson Street (access street) east of Thompson Street
- McGregor Street (local distributor) west of Crawford Street
- Moore Street (access street) west of Jacoby Street
- Cooke Point Road (local distributor) north of Wilson Street
- Wilson Street (regional distributor) south of Cooke Point Road
- Wilson Street (regional distributor) west of Cooke Point Road
- Wilson Street (regional distributor) east of Short Street
- Wilson Street (regional distributor) west of Short Street

These counts were collected in 2022/2023 (except for Wilson Street south of Cooke Point Road which was collected in 2024/2025) and include traffic volumes, classification and speed data. Average daily traffic volumes and the split between heavy and light vehicle classes are displayed in Figure 11. This data shows that local streets typically have less than 10% heavy vehicles, while the primary distributor carries 15-20% heavy vehicles.

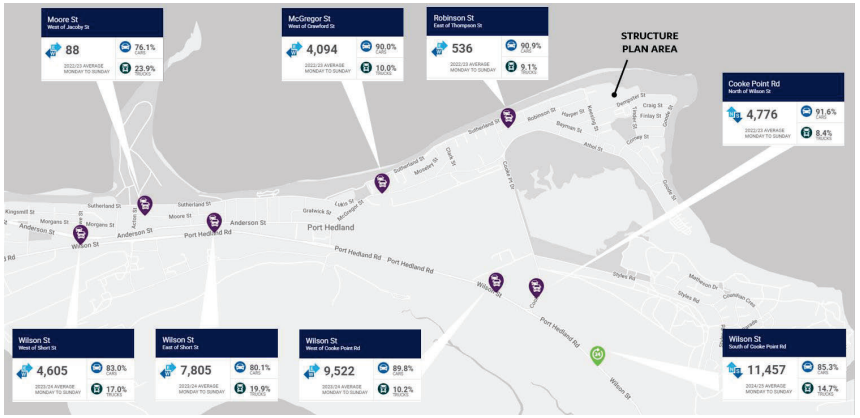


Figure 11 Average traffic volumes and heavy vehicle percentage in vicinity of Structure Plan area (source: Main Roads Trafficmap)

The variation weekday hourly traffic flow by direction for each count site is shown in Figure 12. This reveals that local streets typically have two distinct peak hours, an AM peak between 7am and 8am and a PM peak between 4pm and 5pm. Local streets also have a mini afternoon peak between 2pm and 3pm which is due to school pick up. The regional distributor has a different profile, with less distinct peak periods and relatively consistent traffic volumes between 5am and 6pm.

Figure 12 Hourly variation in weekday traffic volumes in vicinity of Structure Plan site (source: Main Roads Trafficmap)

The hourly variation in 85th percentile vehicle travel and a comparison to the posted speed limit are shown in Figure 13. For local streets 85th percentile speeds are typically 5-10km/h above the speed limit. For the regional distributor 85th percentile speeds are typically within 5km/h of the speed limit, except for Wilson Street west of Short Street where 85th percentile

speeds are 5-10km/h above the speed limit which can be explained by a 10km/h reduction in the speed limit 700m east of Short Street.

Figure 13 85th percentile speed comparison with speed limit in vicinity of Structure Plan site (source: Main Roads Trafficmap)

4.1.5 Intersection of Dempster Street / Keesing Street

The T-intersection of Dempster Street with Keesing Street is priority controlled as shown in Figure 14. Traffic along Dempster Streer must give way to traffic along Keesing Street. There is no signage or line markings.

Figure 14 Aerial image of Dempster Street/ Keesing Street Intersection (source: MetroMap)

4.1.6 Intersection of Dempster Street / Tinder Street

The T-intersection of Dempster Street with Tinder Street is priority controlled, with priority given to Dempster Street as the continuing road. There is no signage or line markings.

Figure 15 Aerial image of Dempster Street / Tinder Street Intersection (source: MetroMap)

4.1.7 Crash History

Intersection and mid-block crash history for the roads surrounding the Structure Plan area were obtained from Main Roads WA. The location of road crashes in the vicinity of the development site is shown in Figure 16. This data is for the five-year period ending December 31st, 2024.

In the five-year period there were no reported crashes at the intersections of Dempster Street with Keesing Street or Tinder Street., and no mid-block crashes along Dempster Street between Keesing Street and Tinder Street.

Further away from the Structure Plan area there was one reported hit object crash at the intersection of Sutherland Street and Keesing Street which involved parking. One right angle crash was recorded at the intersection of Keesing Street and Athol Street. There was one reported mid-block crash along Dempster Street, approximately 230m east of the structure Plan area eastern boundary that involved someone leaving a driveway. Another mid-block crash was reported along Keesing Street, approximately 90m north of the intersection with Dempster Street, also involving parking. All these reported crashes resulted in property damage only.

Figure 16 Crash data in vicinity of Structure Plan area (source: Main Roads WA)

4.2 Public Transport Services

The development site is serviced by bus route 870, which runs along Dempster Street on its journey between Port Hedland and South Hedland, as shown in Figure 17.

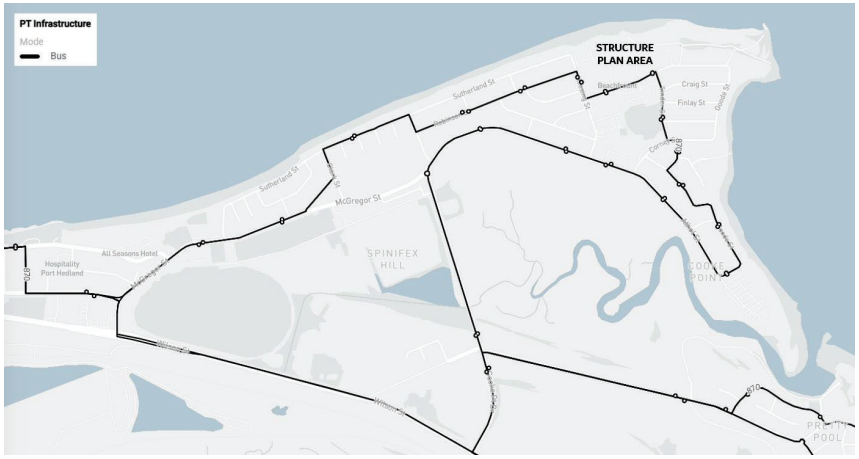


Figure 17 Port Hedland public transport services (source: Planwisely)

The closest bus stops are just 50m to the west of the Structure Plan area and at the eastern boundary of the Structure Plan area, as shown in Figure 18.

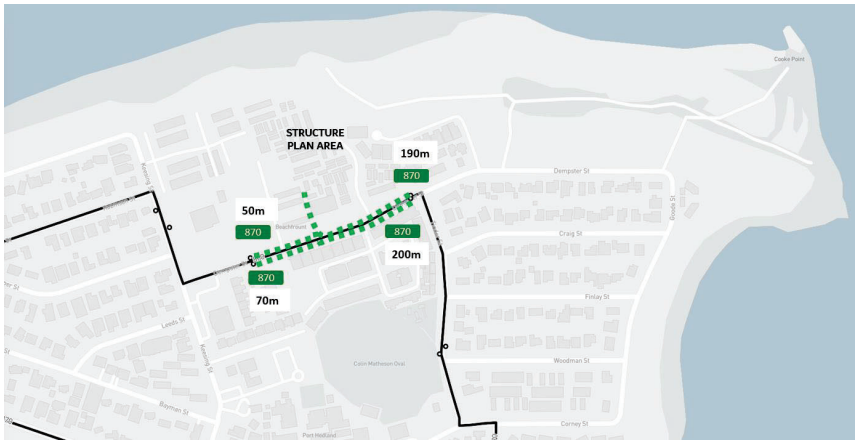


Figure 18 Location of bus stops (source: Transperth)

Bus route 870 services are infrequent, with 4 weekday services in each direction, and two services per direction on Saturdays. There are no services on Sundays and public holidays. A summary of bus services is provided in Table 1.

Table 1 Summary of bus services

Route	Direction	Weekday Services	Saturday services
870	To South Hedland	4 services 8:44am, 1:36am, 1:26pm, 5:31pm	2 services 11:34am, 3:34pm
	To Port Hedland	4 services 9:06am, 10:46am, 1:56pm, 4:46pm	2 services 9:04am, 12:54pm

4.3 Pedestrian Network

The pedestrian network surrounding the Structure Plan area has a good level of connectivity, with many streets in the area having footpaths on both sides.

There is a 2.7m concrete footpath along both sides of Dempster Street. On the northern side, the verge and on-street parking provide an adequate buffer for pedestrians from moving vehicles. On the south side, the footpath is located adjacent to the carriageway without an adequate buffer. The street trees located on the southern side provide some shade which would improve the walking environment. There are no places to stop and rest along Dempster Street.

The Walk Score walkability assessment tool considers the Structure Plan area to be "car dependent" with a score of 12 out of a possible 100, where almost all daily errands require a car. The 15-minute walkable catchment is shown in Figure 19,

which includes destinations such as Andrew McLaughlin Community Centre, Port Hedland Primary School, Colin Matheson Oval and direct access to the beach.

Figure 19 15 minute walking catchment around structure plan area (source: Planwisley)

4.4 Cycle Network

The site has a moderate level of cycle accessibility. The existing path network, as obtained from the Town of Port Hedland's Active Transport Strategy 2023-2033, is shown in Figure 20. This identified missing links in the network, including a 600m section of 3m wide shared path which was recently constructed along the northern boundary of the structure plan area.

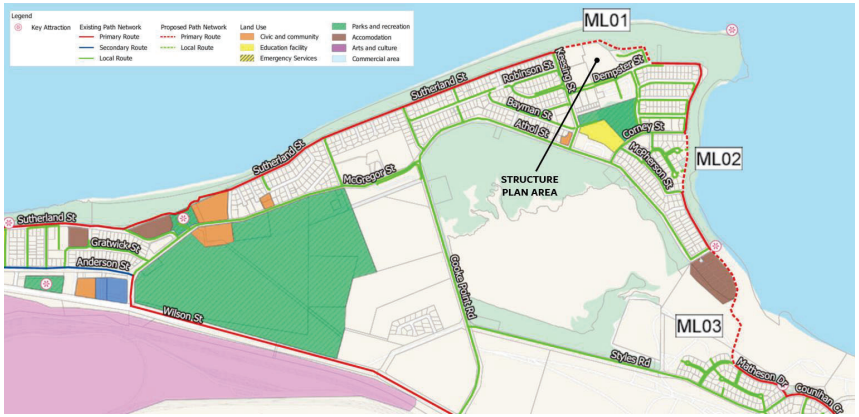


Figure 20 Existing and proposed path network in the vicinity of the structure plan area (source: Town of Port Hedland)

There is a 3m shared path along the northern side of Sutherland Street which travels west from Keesing Street and provides access to the Civic Gardens, Koombana Lookout, Gratwick Aquatic Centre, Cemetery Beach Park, Spoilbank Marina and further west to the Port Hedland townsite. Being on the northern side of the street along the foreshore means the path is not interrupted by side streets and driveways and therefore provides a direct, convenient, and safe route.

The 15-minute cycle catchment is shown in Figure 21.

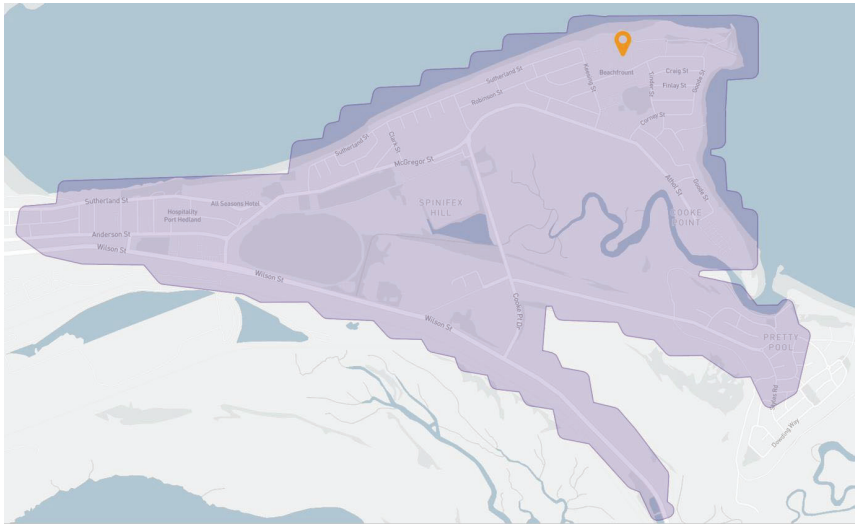


Figure 21 15 minute cycling catchment around structure plan area (source: Planwisley)

5. PROPOSED STRUCTURE PLAN NETWORK

5.1 Proposed Road Network

A proposed Structure Plan road network is outlined in the indicative concept plan, as shown in Figure 22.

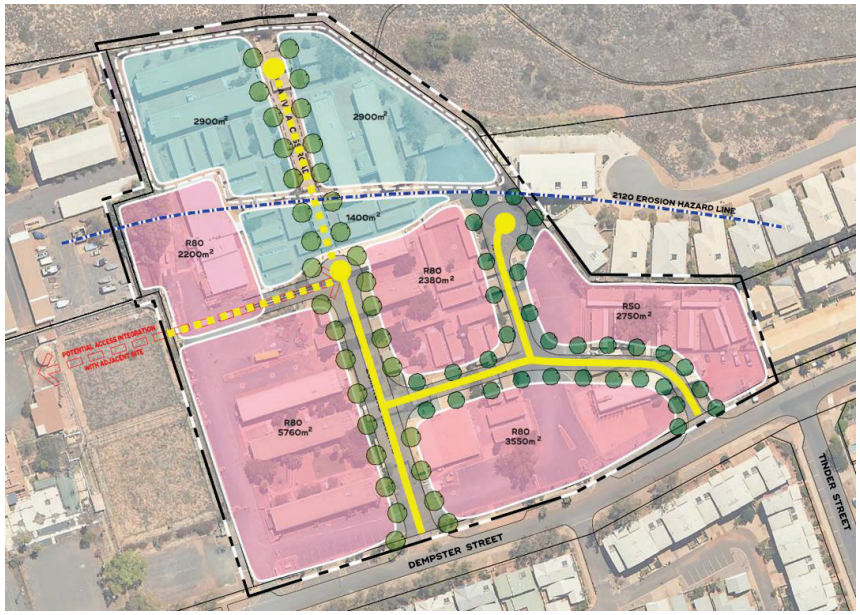


Figure 22 Road network within indicative concept sketch (source: RFF)

The road network includes a central road running north south between Dempster Street and the northern boundary. The section of road within the Environmental Conservation Reserve would be a private road in the interim time period.

A further connection to Dempster Street is proposed in the eastern area of the site, which then turns westward toward the central road.

The Structure Plan maintains flexibility for a possible east-west road connection between the central road and Lot 1227 (to the west of Lot 2).

5.1.1 Proposed road hierarchy and road reserve widths

All roads within the Structure Plan will be classified as Access Roads. The central road will be constructed within a 20m road reserve, with all other roads having 15m road reserve, as shown in Figure 23.

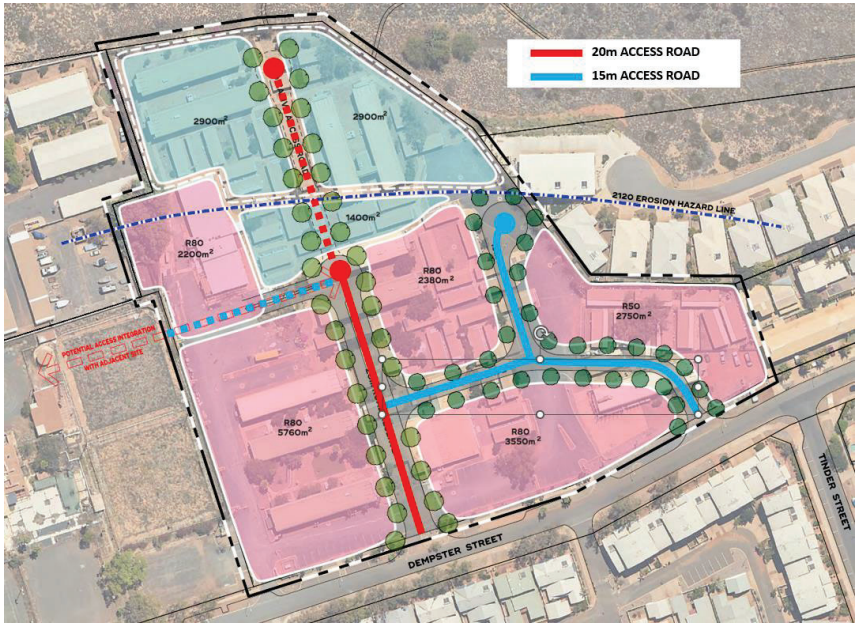


Figure 23 Proposed road hierarchy and road reserve within indicative concept sketch (source: RFF)

5.1.2 Cross sections

The proposed cross sections for the two road types are shown in Figure 24.

The access road within the 20m reserve is proposed with a 7.5m wide paved surface with 6.25m verges either side. A 2m wide footpath is proposed along the western verge, which can also accommodate 2.5m wide parking bays or set down /pick up bays along the frontage of the hotel site. A 2.5m shared path is proposed along the eastern verge.

The access road within the 15m reserve is proposed with a 6m wide paved surface with 4. 5m verges either side. A 2m wide footpath is proposed within one of the verges.

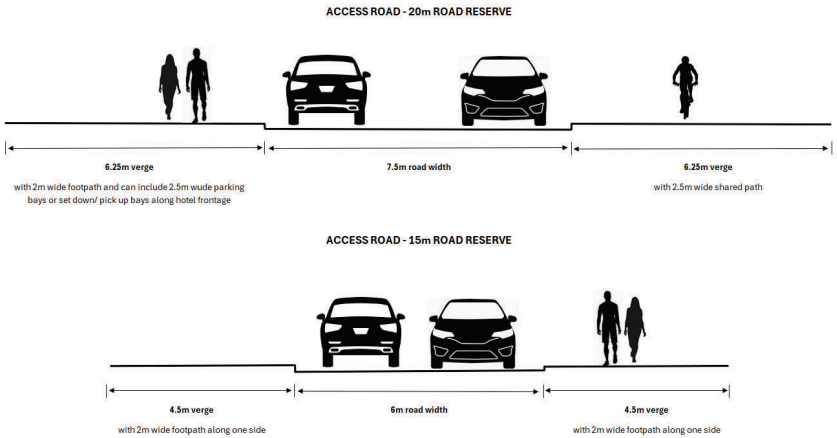


Figure 24 Proposed Structure Plan road cross sections

5.1.3 Intersection controls

All internal intersections within the Structure Plan area are 3-way intersections and are proposed to operate under priority control without signage or line marking.

There are two intersections proposed with the external road network along Dempster Street, both T-intersections. These intersections will operate under priority control without signage or line marking.

5.2 Proposed Pedestrian and Cycle network

A proposed Structure Plan pedestrian and cycle network to complement the road network outlined in the indicative concept plan is shown in Figure 25. All internal roads are proposed to have a footpath on at least one side, with the central road proposed to have a shared path along the eastern side, with a footpath along the western side within the mixed use zone. The shared path will connect Dempster Street to the recently constructed shared path along the northern boundary of the site.

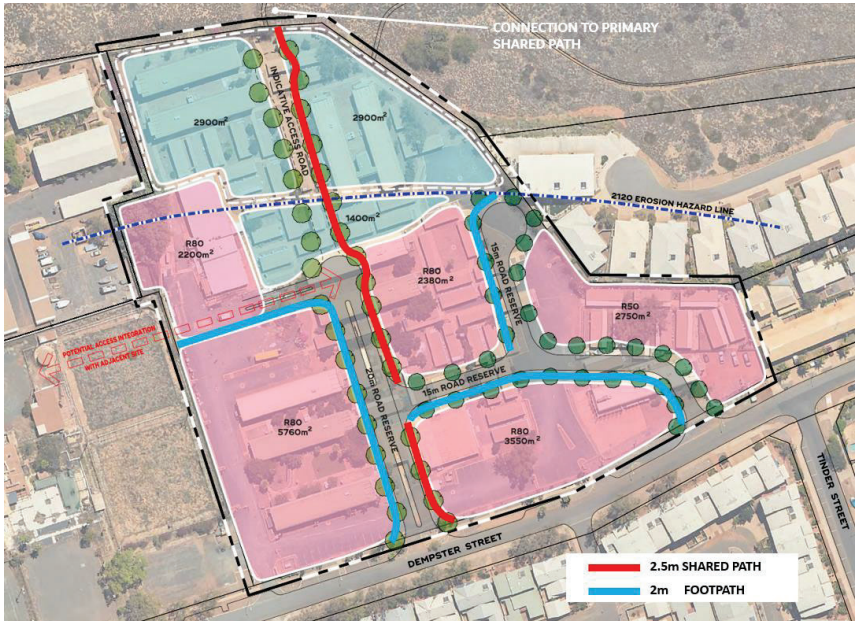


Figure 25 Proposed footpath and shared path network (source: RFF)

6. CHANGES TO EXTERNAL TRANSPORT NETWORK

6.1 Future Road Network

There are no proposed changes to local road network in the vicinity of the Structure Plan area.

6.2 Future Pedestrian Network

The Town of Port Hedland's Active Transport Strategy 2023-2033 outlined the priorities for the provision of new footpaths and shared paths. Within the vicinity of the Structure Plan area there are no proposals to provide new footpaths.

6.3 Long Term Cycle Network

The Town of Port Hedland's Active Transport Strategy 2023-2033 outlined the priorities for the provision of new footpaths and shared paths. Within the vicinity of the Structure Plan a 600m length between Sutherland Street and Dempster Street (including a portion along the northern boundary of the Structure Plan) was identified as a missing link in the shared path network. Construction began in 2024 and was completed in May 2025.

This section of shared path is hghlighted in the regional long term cycle network (LTCN) which was developed by the Department of Transport (DoT) in collaboration with the local government authorities in Western Australia. The LTCN identifies Dempster Street and Sutherland Street as primary routes and Wilson and Anderson Streets as secondary routes. A plan of the LTCN in the vicinity of the developmet site is provided in Figure 26 and shows the status of various sections and routes.

Figure 26 Long term cycle network in vicinity of Structure Plan area (source: DoT)

7. INTEGRATION WITH SURROUNDING AREA

This section assesses the level of integration of the proposed Structure Plan with the surrounding land uses. This assessment is concerned with links for pedestrians, cyclists, and public transport users.

7.1 Major Attractors and Generators

Major attractors and generators within 800m of the Structure Plan area are shown in Figure 27 and include:

- Beach and coastal reserve
- Colin Matheson Oval
- Port Hedland Early Learning Centre
- Andrew McLaughlin Community Centre
- Port Hedland Primary School

Figure 27 also includes all bus stops (bus route 870 between Port Hedland and South Hedland and vice versa) within the 800m radius.

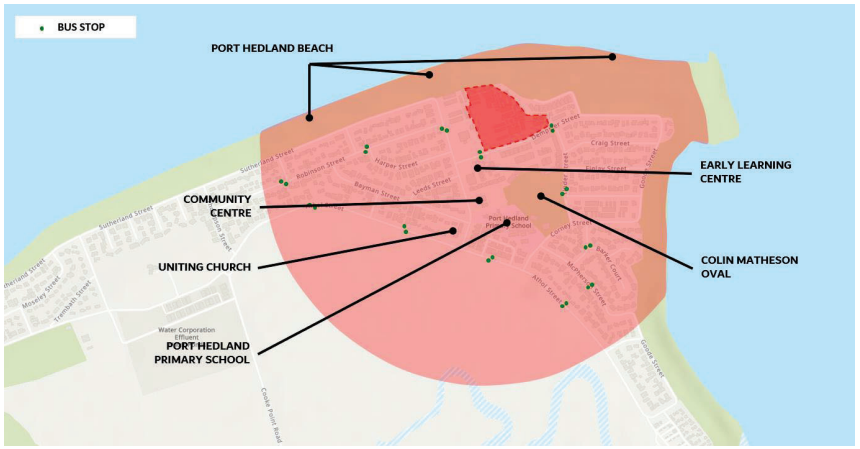


Figure 27 Major attractors and generators within 800m of Structure Plan area (source: Planwisely)

7.2 Desire Lines to Attractors and Generators

Reviewing the existing path network from the Town of Port Hedland's Active Transport Strategy 2023-2033 (shown in Figure 20), there are adequate footpath connections between the Structure Plan area and the attractors and generators, including all bus stops. The walkable environment could be improved by increasing street tree coverage to provide more shade and providing places to stop and rest.

8. ANALYSIS OF TRANSPORT NETWORKS

8.1 Internal Transport Networks

8.1.1 Traffic Generation

Potential Structure Plan land uses and yields under a scenario of highest and best use are:

- **Environmental Conservation Reserve**
  - Workforce Short stay accommodation 200 rooms (interim)
- **Mixed Use zone**
  - Hotel 200 rooms
  - Commercial 325m²
  - Residential 120 dwellings

These land uses represent a 'highest and best use' of the structure plan area, reflecting the maximum reasonable development potential of the site under ideal market conditions. The forecast traffic generation therefore represents a worst-case model but does not necessarily reflect the ultimate development of the site, due to the flexibility of the Structure Plan.

rips rates for the residential and commercial land uses are extracted from the WAPC's Transport Impact Assessment Guidelines Volume 5 – Technical Guidance, while rates for a hotel were sourced from the New South Wales Roads and Maritime Services "Guide to Traffic Generating Developments" which suggest a peak hour trip rate of 0.4 vehicle trips per hotel room, based on every hotel room having access to a parking bay and an overall occupancy rate of 85%. Trip generation rates are outlined in Table 2.

Table 2 Trip generation rates for the Structure Plan land uses

Land Use	Trip Generation Rates			
	AM In	AM Out	PM In	PM Out
Short stay accommodation (rooms)	0.1	0.3	0.27	0.13
Hotel (rooms)	0.27	0.13	0.18	0.22
Residential R80/R100 (dwellings)	0.1	0.3	0.27	0.13
Residential R30/R50 (dwellings)	0.2	0.6	0.54	0.26
Commercial (100m² floor area)	1.6	0.4	0.4	1.6

Peak hour trip generation for the highest and best use of the proposed Structure Plan is summarised in Table 3. This reveals a possible peak hour generation of 238 vehicles per hour (vph).

Table 3 Forecast peak hour trips for the Structure Plan land uses

Land Use	Forecast Trips (vph)			
	AM In	AM Out	PM In	PM Out
Short stay accommodation (200 rooms)	20	60	54	26
Hotel (200 rooms)	54	26	36	44
Residential (120 dwellings)	18	54	48	24
Commercial (325m² floor area)	5	1	1	5
Total	**97**	**141**	**139**	**99**

8.1.2 Forecast Traffic Volumes

Forecast peak hour traffic volumes for the proposed Structure Plan road network given the highest and best land uses are summarised in Figure 28.

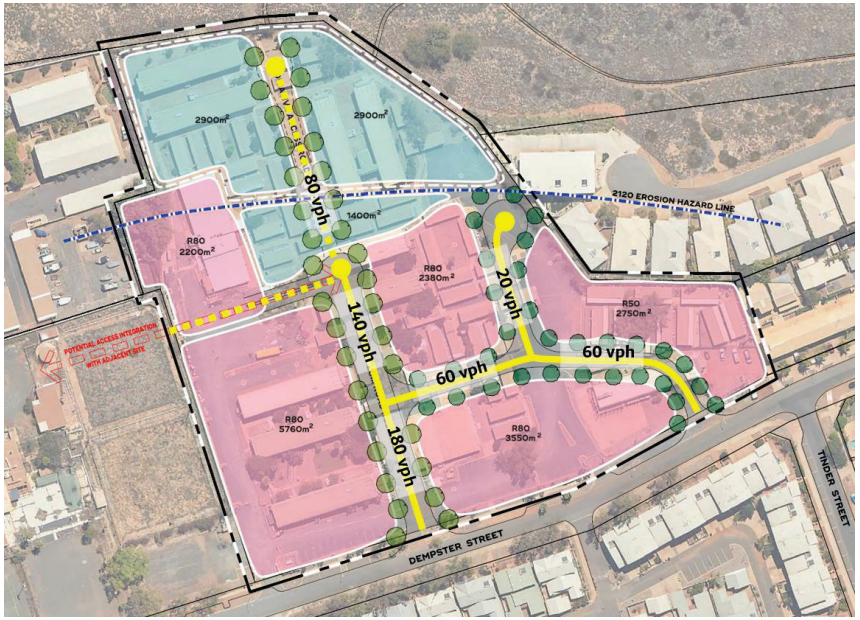


Figure 28 Forecast peak hour traffic volumes on Structure Plan road network given the highest and best land uses (source: RFF)

8.2 External Transport Network

Flyt has previously estimated peak hour traffic volumes along Dempster Street, Tinder Street and Keesing Street, as part of Traffic Impact Assessment reporting for on-site employee accommodation. The peak hour volumes are estimated as follows:

- Keesing Street 180 – 190 vph
- Dempster Street 140 – 150 vph
- Tinder Street 70 vph

The potential increase in peak hour traffic volumes due to development of the Structure Plan with the highest and best land uses is outlined in Table 4.

Table 4 Traffic impact on external transport network given the highest and best land uses

External Street	Existing peak hour volume	Potential Structure Plan traffic	Potential increase in peak hour traffic volumes
Dempster Street	140 – 150	30 – 210	20% – 140%
Keesing Street	180 – 190	210	110%
Tinder Street	70	30	40%

Peak hour traffic volumes could increase up to 140% on Dempster Street, up to 110% on Keesing Street and by 40% on Tinder Street. This is to be expected given the existing low volume of vehicles along these roads.

A mid-block capacity analysis was undertaken for Dempster Street, Keesing Street and Tinder Street using the projected peak hour volumes from Table 2. Typical mid-block capacities for undivided urban roads have been sourced from Guide to Traffic Management Part 3: Transport Studies and Analysis Methods table 6.1. The impact of the development shown in Table 5.

Table 5 Mid-block capacity of external road network

Street	Scenario	Two-way vph	One-way travel vph	One-way mid-block capacity	% of one-way mid-block capacity
Dempster Street	Existing	140	90	600	**15%**
	Existing + proposed	350	200	600	**33.3%**
	Difference	210	110	600	**18.3%**
Keesing Street	Existing	180	130	600	**21.7%**
	Existing + proposed	390	240	600	**40%**
	Difference	210	110	600	**18.3%**
Tinder Street	Existing	70	50	600	**8.3%**
	Existing + proposed	100	70	600	**11.7%**
	Difference	30	20	600	**3.3%**

The development of the Structure Plan to the highest and best land uses area could see peak hour traffic volumes on the local road network increase by up to 140%, however the resultant peak hour volumes would still be well within the traffic carrying capacity of the roads. Forecast traffic volumes on Keesing Street could reach 40% of the mid-clock capacity, with forecast traffic volumes on Dempster Street up to 33.3% of mid-block capacity. Tinder Street forecast traffic volumes could reach 11.7% of the mid-block capacity.

9. SUMMARY AND CONCLUSIONS

9.1 Assessment

This Transport Impact Assessment has been prepared in support of the proposed Local Structure Plan at Lot 2 Dempster Street, Port Hedland.

The Local Structure Plan proposes two zones. An Environmental Conservation Reserve in the coastal setback area in the northern portion of the site would maintain the existing land uses (workforce accommodation) while longer term this zone is proposed for a range of temporary land uses. The remaining portion of the Structure Plan area is identified for 'mixed use' development.

The Structure Plan area has good connectivity to both the local and regional road network. Road access to the Structure Plan area will be via Dempster Street, which is easily connected to local distributors (Athol Street, Coole Point Drive and McGregor Street) and to the regional road network via Port Hedland Road/Wilson Street from where the Great Northern Highway can be accessed.

The development site is serviced by bus route 870, which runs along Dempster Street on its journey between Port Hedland and South Hedland. The pedestrian network surrounding the Structure Plan area has a good level of connectivity, with many streets in the area having footpaths on both sides. The site has a moderate level of cycle accessibility. The Town of Port Hedland are continuing to upgrade their cycle network in line with the planned long term cycle network.

Peak hour trip generation for the highest and best use of the proposed Structure Plan is forecast at 238 vehicles per hour (vph). Peak hour traffic volumes could increase up to 140% on Dempster Street, up to 110% on Keesing Street and by 40% on Tinder Street. However, the resultant peak hour volumes would still be well within the traffic carrying capacity of these roads. Forecast traffic volumes on Keesing Street could reach 40% of the mid-clock capacity, with forecast traffic volumes on Dempster Street up to 33.3% of mid-block capacity. Tinder Street forecast traffic volumes could reach 11.7% of the mid-block capacity. These traffic forecasts represent a worst case scenario.

BUSHFIRE MANAGEMENT PLAN

Bushfire management plan /statement addressing the bushfire protection criteria coversheet

Site address: 15 Dempster Street, Port Hedland

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 26 Month February Year 2025

Report author or reviewer: Linden Wears

WA BPAD accreditation level (please circle):

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

If accredited please provide the following.

BPAD accreditation number: 19809 Accreditation expiry: Month June Year 2026

Bushfire management plan version number: Rev 1

Bushfire management plan date: Day 16 Month June Year 2025

If one or more of the following are selected, then these should be automatically referred to DFES	YES	NO
Strategic planning is required to address SPP 3.7 and the Guidelines	☑	☐
The application is a vulnerable land use	☐	☑

None of the Above ☐

If one or more of the following are selected, and the decision-maker requires input form DFES, then the application can be referred.	YES	NO
The BAL rating has been calculated by a method other than Method 1 as prescribed by AS 3959	☐	☑
An outcomes-based approach has been submitted to demonstrate compliance with the bushfire protection criteria	☐	☑

None of the Above ☑

Note: If a subdivision or development application meets all the acceptable solutions and does not otherwise trigger a referral as listed above, seeking advice from DFES on SPP 3.7 or other matters is at the discretion of the decision-maker.

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

Signature of report author or reviewer 

Date 16 June 2025

15 Dempster Street, Port Hedland

Bushfire Management Plan

Date: 16 June 2025

Prepared for: DA Campbell Property Holdings Pty Ltd

Linfire Ref: 20240424353RFF-BMP-001_1

Linfire Consultancy

ABN: 577 930 47299

Revision	Issue Date	Revision Description	Approved By
0	27 Mar 2025	Issued for Approval	Linden Wears (Level 3 BPAD 19809)
1	16 June 2025	Issued for Approval	Linden Wears (Level 3 BPAD 19809)

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2. errors or omissions in this report except where grossly negligent; and the proponent expressly acknowledges that they have been made aware of this exclusion and that such exclusion of liability is reasonable in all the circumstances.

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

Further, the achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which Linfire has no control. If the proponent becomes concerned about changing factors then either a review of the existing BMP, or a new BMP, should be requested. Linfire accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report and its supporting material by any third party.

15 Dempster Street, Port Hedland
Bushfire Management Plan

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1.0 Proposal details

1.1 Background

RFF Pty Ltd, on behalf of DA Campbell Property Holdings Pty Ltd (the Proponent), are seeking to lodge a Structure Plan (SP) application for the future development across at 15 Dempster Street, Port Hedland (the project area) in the Town of Porth Hedland (ToPH). Linfire Consultancy (Linfire) understand that the SP is required as a condition of DA, to detail the long-term planning/development of the site.

The proposed SP (see Figure 1A) includes two broad zones, namely mixed-use zone in the southern portion of the project area including future roads, and an Environmental Conservation Reserve in the northern portion of the site.

Accompanying the SP is an indicative concept plan (see Figure 1B), which has been prepared using a 'highest and best use' scenario, representing the maximum reasonable development potential of the site under ideal market conditions. This ensures that all technical assessments—covering road networks, infrastructure, and stormwater management—are based on a peak-capacity model, thereby future-proofing the SP against the need for unforeseen upgrades. Given the cyclical and often unpredictable nature of the Port Hedland market, this approach provides a flexible and robust planning framework that can accommodate varying development outcomes over time.

The mixed-use zone could include a mixture of commercial and residential land uses. The Environmental Conservation Reserve applies to land seaward of the 2120 Coastal Hazard Setback Line, as identified in the Town of Port Hedland's Coastal Hazard Risk Management and Adaptation Plan (CHRMAP). While permanent development in this area is not supported, temporary and low-impact land uses—such as recreation, short-stay accommodation, and tourism—may be considered, provided they align with the Town's Local Planning Policy LPP/07 – Coastal Planning.

Linfire understand that there are multiple development scenarios being reviewed for the future intensification of the project area, and while the concept plan provides one such scenario, there are others being considered.

1.2 Site description

The project area is approximately 32 ha in area, and is surrounded by (see Figure 2):

- Coastal dunes with a foreshore reserve to the north and north-east, with the Indian Ocean further past the beach in these directions
- Existing residential development to the east, with a new residential building currently under construction to the east of dongas 20-22.
- Dempster Street to the south, with existing residential development and the YMCA Early Learning Centre further south.
- Old recreation centre on 13 Keesing Street immediately to the west, with existing accommodation in the adjacent lot to the north-west.

Existing vehicular access to the project area is via two gated entrances from Dempster Street along the southern boundary.

Existing town main water supply is currently provided to the site, with reticulated water pipework and street hydrants are currently installed along the public road network, including along Dempster Street.

1.3 Purpose

The majority of the project area is designated as bushfire prone on the *Map of Bush Fire Prone*

Areas (DFES 2025; see Plate 1), and as such, the proposal is required to demonstrate compliance with *State Planning Policy 3.7: Bushfire* (SPP 3.7; WAPC 2024) and the *Guidelines for Planning for Bushfire Guidelines* (the WA Guidelines; WAPC 2024).

Given the SP has no finalised internal road or lot layout, the proposal will be assessed against Bushfire Protection Criteria 4 (Strategic Planning) of the WA Guidelines.

This Bushfire Management Plan (BMP) has been prepared to address requirements under Policy Measure 7(ii) of SPP 3.7 and Sections 2.2 and 4.4 of the WA Guidelines including:

- An assessment of the broader landscape.
- The identification of any environmental, biodiversity or conservation values on the subject site(s).
    - Where relevant, details on how the clearing of native vegetation specifically for bushfire mitigation to achieve the bushfire protection measures, can be avoided through the use of siting and design measures.
    - Where the clearing of native vegetation cannot be avoided, details on how the proposal will minimise the clearing are to be provided.
- A pre-development BHL assessment that demonstrates a BHL of predominantly moderate or low.
    - Where the pre-development BHL assessment results in areas with a predominantly extreme BHL, further detail should be provided on the level of native vegetation clearing that will be necessary to reduce the BHL to moderate or low
- The identification of any bushfire hazard issues arising from the assessment.
- Assessment against the bushfire protection criteria within BPC 4: Strategic Planning, demonstrating compliance via either the acceptable solutions, or through an outcomes-based approach.

1.4 Other plans/reports

A BMP and Bushfire Emergency Management Plan were previously prepared by Linfire, to accompany a development application in 2022, to temporarily reactivate the existing accommodation onsite for a further 5 years. Other than this bushfire reporting, Linfire is not aware of any other bushfire reports or assessments that have been prepared previously for the project area.

15 Dempster Street, Port Hedland
Bushfire Management Plan

Plate 1: Map of Bush Fire Prone Areas (DFES 2025)

Figure 1A: Structure Plan

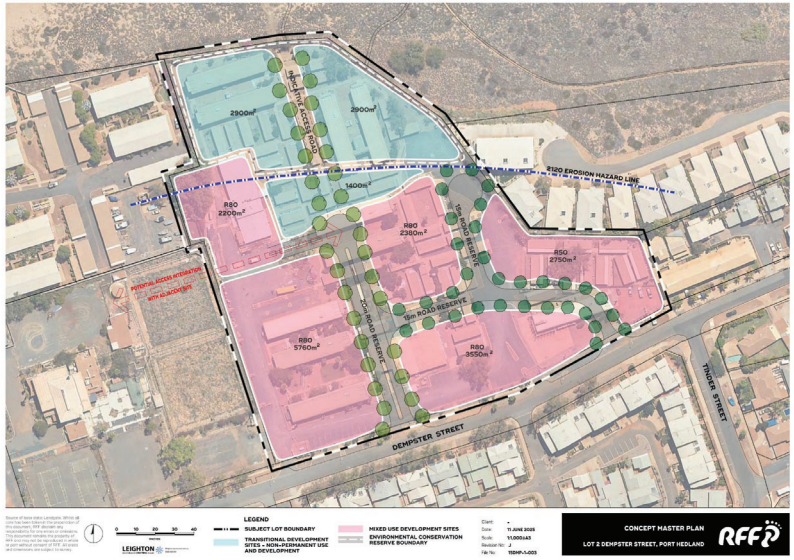
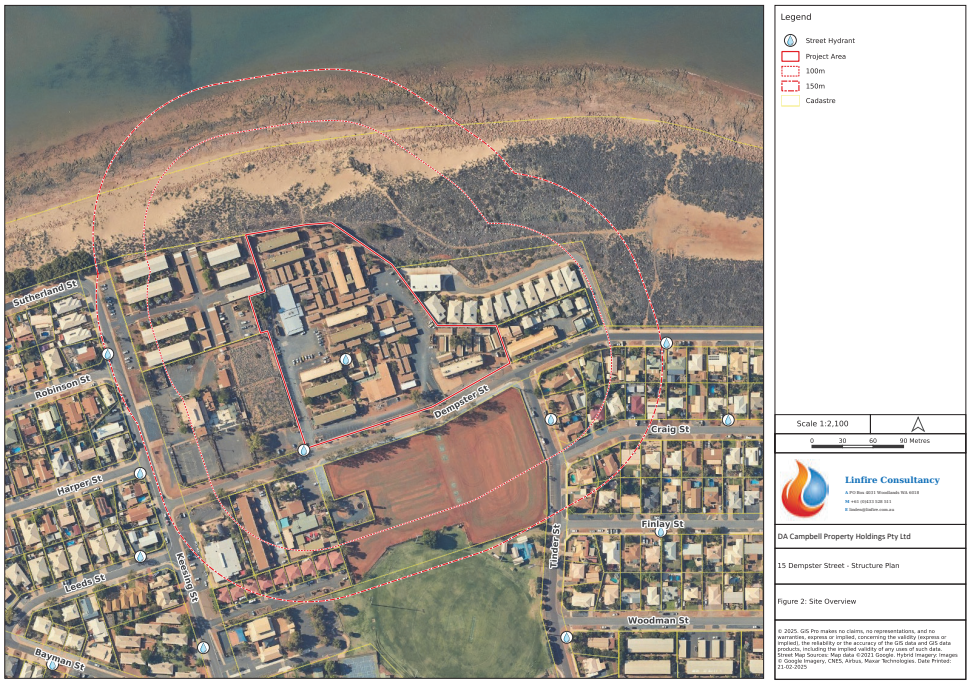


Figure 1B: Concept Plan



2.0 Environmental considerations

2.1 Native vegetation - modification and clearing

The project area has been cleared of most native vegetation, and it is expected that the site will need to be cleared to accommodate development as part of future planning applications. Table 1 provides a summary of a search of publicly available environmental data.

Linfire assumes that all relevant environmental and aboriginal heritage studies will be undertaken to support the project, and if any State and Federal environmental referrals and approvals are required, they will be sought prior to commencing on-site vegetation modification or clearing required to construct the development.

Table 1: Summary of environmental values

Environmental value	Not mapped as occurring within or adjacent to the project area	Mapped as occurring within or adjacent to the project area		Description
		Within	Adjacent	
Environmentally Sensitive Area	✓			No part of the project area is identified as being an Environmentally Sensitive Area, nor is any adjacent land.
Swan Bioplan Regionally Significant Natural Area	✓			No Regionally Significant Natural Areas were identified.
Ecological linkages	✓			No ecological linkages were identified.
Wetlands	✓			No wetlands are mapped as occurring within or adjacent to the project area
Waterways	✓			No waterways are mapped within the project area or in adjacent land however there is evidence of a waterway is located approximately 300 m to the east of the project area. This is not anticipated to be impacted by the proposed development.
Threatened Ecological Communities listed under the EPBC Act	✓			This layer is currently publicly available at a very coarse level but suggests that no Threatened Ecological Communities are mapped within or adjacent to the project area.
Threatened and priority flora	✓			No Threatened and Priority Flora are mapped as occurring within or adjacent to the project area
Fauna habitat listed under the EPBC Act	✓			No fauna habitat was mapped as occurring within or adjacent to the project area
Threatened and priority fauna	✓			No Threatened and Priority Fauna are mapped as occurring within or adjacent to the project area

Environmental value	Not mapped as occurring within or adjacent to the project area	Mapped as occurring within or adjacent to the project area		Description
		Within	Adjacent	
Bush Forever Site	✓			No Bush Forever Area is mapped as occurring within or adjacent to the project area.
DBCA managed lands and waters (includes legislated lands and waters and lands of interest)	✓			No DBCA managed lands and waters is mapped as occurring within or adjacent to the project area.
Conservation covenants	✓			No information has been provided by the client regarding Conservation Covenants.
Crown Reserves	✓			No Crown Reserves are mapped as occurring within or adjacent to the project area.
Aboriginal Heritage	✓			No Aboriginal Heritage Places are mapped as occurring within or adjacent to the project area.

2.2 Revegetation / Landscaping

No revegetation is currently being proposed within the project area, however it is noted that this is not yet finalised and would be a potential activity within the proposed Environmental Conservation Reserve.

Although the project area is currently mostly cleared of vegetation, almost all remaining vegetation is expected to be cleared as part of future development. Any revegetation within the proposed Environmental Conservation Reserve would need to consider bushfire impact on future and existing development within, and surrounding, the project area. Any required Asset Protection Zones (APZs) are to be either non-vegetated elements or landscaped in accordance with APZ Standards of the Guidelines (refer to Appendix 2). All other future onsite landscaping, especially in the mixed-zone is expected to comply with the requirements of AS 3959 Clause 2.2.3.2 (e) and (f) (refer to Appendix 3), and align with the principles of APZ Standards.

3.0 Bushfire assessment results

For strategic planning where the lot layout is still to be determined, the following bushfire assessment tools are required to be utilised:

1. ***Broader Landscape Assessment (BLA).***
    a. Given the project area within an area designated as Area 2 on the Map of Bushfire Prone Areas (see Section 1.3), it will require an assessment of the broader landscape to demonstrate compliance with Element 1: Location.
2. ***Bushfire Hazard Level (BHL) Map***
    a. Is required in accordance with Appendix A.2 of the Guidelines.

While not specifically required by SPP 3.7 and the WA Guidelines, a BAL contour assessment has also been produced to highlight the anticipated setbacks to future development across the northern interface that is exposed to bushfire hazard.

3.1 Broader Landscape Assessment

As detailed in Section 1.3, the majority of the project area is within the Area 2 designated bushfire prone land. As Element 1 has not been approved at previous planning stages under SPP 3.7 and the Guidelines, the proposal requires an assessment of the broader landscape.

The intent of the Broader Landscape Assessment (BLA) is to examine the landscape external to the planning proposal, to develop an understanding of the wider bushfire hazards and potential for landscape-scale bushfire behaviour, in addition to the broader road network, and proximity to townsites, urban areas and suitable destinations. Examination of the broader landscape provides important contextual information when considering whether a site is suitable for intensification of land use or development.

The outputs of the BLA are used to demonstrate compliance with Element 1: Location of Bushfire Protection Criteria 4 (BPC4).

3.1.1 Broader Landscape Assessment area

The BLA area extends to 2 km from the project area boundary, as required under the Guidelines.

An overview of the BLA assessment area is depicted on Figure 3, in addition to the broader vehicular access network and extent of designated bushfire prone land, to serve as a wider context plan. Figure 3 is useful for identifying suitable destinations that could be used in a bushfire emergency, with the closest ones to the project area being:

- Port Hedland townsite (approximately 7 km away)
- Wedgefield industrial area (approximately 13 km away)
- South Hedland townsite (approximately 14 km away)

In addition to the townsites noted above, there is also potential to consider use of the community centre and sports oval approximately 200 m south of the project area, none of which are designated bushfire prone, and are at least 150-200 m from any direct interface within unmanaged vegetation (mostly grassland).

3.1.2 Assessment of the Broader Landscape

3.1.2.1 Vegetation hazards

A desktop assessment has been undertaken within the BLA area to distinguish between different vegetation types, which is depicted on Figure 4. The vegetation types have been divided into three broad categories:

- Low threat vegetation and non-vegetated areas (in accordance with exclusions under

Clause 2.2.3.2 of AS 3959) including:

- Existing residential and commercial land uses and roads
- Non-vegetated beaches, ocean and waterways

- Unmanaged grassland (Class G Grassland)
  - It is noted that much of the grassland mapped to the south is low and sparse and bordering on non-vegetated in parts.
- All other types of classified vegetation (as a single category) including:
  - Scrub vegetation lining the waterway to the south of the project area
  - Small plot of woodland along a public road to the south.

In addition to the vegetation mapping, Figure 4 has been overlain with four map aspects (northeast, southeast, northwest and southwest) which are used to quantify the bushfire hazards present within the BLA area. Mapping of the quadrants will assist in determining whether the bushfire hazards in a particular direction have potential to exhibit landscape-scale bushfire behaviour and impact life, property and infrastructure assets.

3.1.2.2 Predominant vegetation patterns

The predominant vegetation patterns have been identified within the BLA area based on the vegetation types assigned above. The following vegetation patterns have been identified:

- Cleared vegetation (e.g. residential or urban zoned and developed land)
- A mosaic pattern of vegetation (including Class G Grassland, and vegetation within rural living precincts)
  - This has aligned with the “unmanaged grassland” extent depicted on the vegetation hazard mapping, other than the small plot of non-grassland vegetation along the public road.
- Large tracts of classified vegetation (e.g. contiguous vegetation within reserves or national parks)
  - This has aligned with the “all other classified vegetation” extent along the waterway, depicted on the vegetation hazard mapping

The predominant vegetation pattern mapping is depicted on Figure 5.

3.1.2.3 Road patterns and suitable destinations

The road hierarchy and road patterns is depicted on Figure 6, which also notes the proximity of suitable destinations to the project area (which is also visible on Figure 3).

3.1.2.4 Summary of the Broader Landscape Assessment

Table 2 provides a summary of the BLA for each of the four identified map aspects.

3.1.3 Determination of the Broader Landscape Type

The broader landscape type (BLT) is determined using the points-based system detailed in Table 3. The BLT applicable to the proposed development is **BLT A.**

Table 2: Broader Landscape Assessment Table

Quadrant	North-West	North-East	South-East	South-West

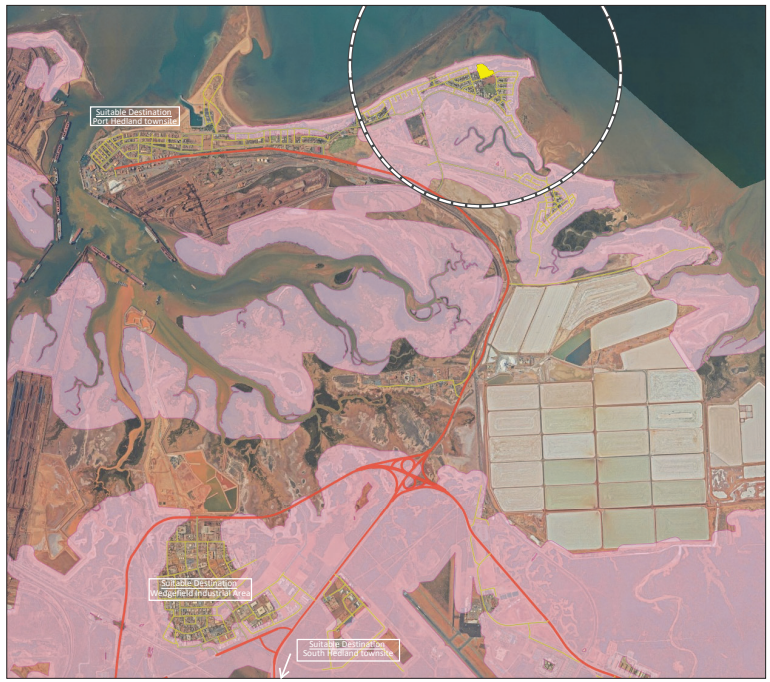
Vegetation Type	• Primarily non-vegetated
	• Minor extent of grassland in dunes adjacent to project area
		• Primarily non-vegetated
		• Minor extent of grassland in dunes adjacent to project area
			• Primarily non-vegetated
			• To SE, minor grassland in dunes 350 m from project area
			• To SSE, significant extent of grassland 375 m from project area, with localised non-grassland vegetation 800 m from site.
			  ○ It is noted that much of the grassland mapped to the south is low and sparse and bordering on non-vegetated.
				• Primarily non-vegetated
				• Significant extent of grassland 375 m from project area, with localised non-grassland vegetation 800 m from site.
				  ○ It is noted that much of the grassland mapped to the south is low and sparse and bordering on non-vegetated.

Vegetation Pattern	• Primarily non-vegetated • Minor extent of mosaic adjacent to project area with limited fire runs (30-50 m long)	• Primarily non-vegetated • Minor extent of mosaic adjacent to project area with moderate fire runs (100-600 m long)	• Primarily non-vegetated • To SE, minor mosaic 350 m from project area, with limited fire runs (50-100 m long) • To SSE, significant extent of mosaic with localised non-grassland vegetation, with longer fire runs (potentially kilometres long).	• Primarily non-vegetated • Significant extent of mosaic with localised non-grassland vegetation, with longer fire runs (potentially kilometres long)
Landscape-scale bushfire risk	• None	• None • Potential for fully developed grassland fire impact on project area	• None • Potential for fully developed grassland fire but no direct impact on project area	• None • Potential for fully developed grassland fire but no direct impact on project area
Road Network/Access to Suitable Destination	• No public road access in this direction	• No public road access in this direction	• Mixed road pattern	• Mixed road pattern • While there are a number of public roads, all lead to Athol St, that enable egress from the local area and to the suitable destinations.

Quadrant	North-West	North-East	South-East	South-West
			• While there are a number of public roads, all lead to Sutherland St and Athol St, that enable egress from the local area and to the suitable destinations	• It is acknowledged that there is some loop roads in this direction, and potential for travel along the peninsula, however this still provides access to Athol St which leads to the suitable destinations
Summary and Additional Comments	• There is no bushfire risk from this direction, with only very localised impact possible on proposed development. • Egress could be easily undertaken away from the direction of fire impact to suitable destinations, if it was even required.	• There is potential for fully-developed grassfire impact on the proposed development. • Egress could be easily undertaken away from the direction of fire impact to suitable destinations, if it was even required	• There is potential for fully-developed grassfire, however not for direct impact on the proposed development. • Egress could be easily undertaken away from the direction of fire impact, especially along Sutherland St, to suitable destinations, if it was even required	• There is potential for fully-developed grassfire, however not for direct impact on the proposed development. • Egress could be easily undertaken away from the direction of fire impact, especially along Sutherland St, to suitable destinations, if it was even required

Table 3: Broader Landscape Type Determination Table

BLA Criteria	5 points	2 points	1 points	Assessed Points	Comments
Proximity of the planning proposal to a suitable destination is:	>10 km	1 – 10 km	<1 km	***2 points***	Port Hedland townsite is within 10 km.
The road pattern from the planning proposal to a suitable destination is:	Complex and indirect (cul-de-sacs, and/or multiple intersections)	Mixed road patterns	Simple and/or direct (limited intersections)	***2 points***	Pattern is a mixed in places, however all roads lead to Sutherland St and Athol St, which connect directly to the suitable destinations. Travel is also largely through residential land, especially close to the project area, and the travel route to Port Hedland townsite.
The predominant vegetation pattern is:	large tracts of vegetation (contiguous vegetation)	A mosaic pattern of vegetation (e.g. vegetation within rural living precincts)	Cleared vegetation (e.g. clearing for residential zoned urban lots)	***2 points***	Mostly Class G grassland, other than some non-grassland vegetation, along the waterway which is 800 m from the project area.
Exposure of the planning proposal to an identified external bushfire hazard (excluding Class G Grassland) is from:	Three or four aspects	Two aspects	From nil or one aspect only	***1 point***	Only directly exposed to Class G grassland, capable of producing a fully-developed grassfire, along the north-eastern aspect. While there are minor amounts of grassland in the dunes to the north-west, given the very short fire run, there is no opportunity for a fully-developed grassfire to develop from this direction, with only very localised fire possible.
Total Points				**7 points**	
Broader Landscape Type (Type A is <12 points; Type B is >12 points)				**BLT A**	



Legend

- Subject Land
- 2km Assessment Buffer
- Primary Road
- Primary Regional Road
- Local Road
- Access Road

Bushfire Prone Area 2024

- Bushfire Prone Area 2

Scale 1:40,000

0 600 1,200 1,800 Metres

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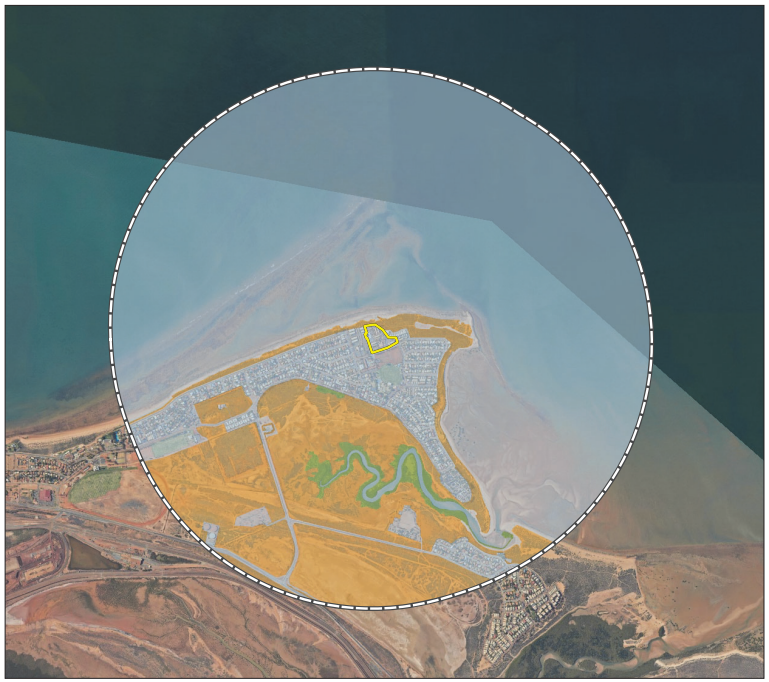
Figure 3: BLA Site Overview and Suitable Destinations



Legend

- Subject Land
- 2km Assessment Buffer
- Unmanaged Grassland
- All Other Classified Vegetation
- Low Threat Vegetation

Scale 1:20,000

0 300 600 900 Metres

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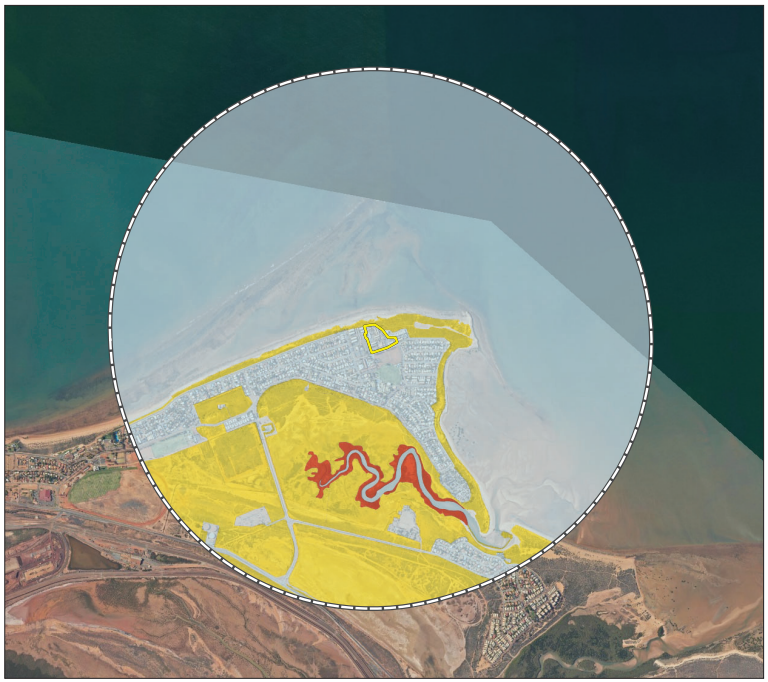
Figure 4: BLA Vegetation and Aspect Assessment



Legend

- Subject Land
- 2km Assessment Buffer
- Cleared Vegetation
- Mosaic Pattern
- Large Tracts of Classified Vegetation

Scale 1:20,000

0 300 600 900 Metres

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Figure 5: BLA Predominant Vegetation Pattern

Legend

- Subject Land
- 2km Assessment Buffer
- Primary Road
- Local Road
- Access Road

Scale 1:20,000

0 300 600 900 Metres

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Figure 6: BLA Vehicular Access Routes

3.2 BHL and BAL Contour Assessments

While the proposal is a strategic planning proposal that only requires a Bushfire Hazard Level (BHL) assessment to be undertaken in accordance with Section 4.4 of the Guidelines (see Section 1.3), in this instance, a BAL contour assessment will also be undertaken to provide detail regarding the necessary setbacks required along the northern interface, to inform future design development and planning.

3.2.1 Vegetation classification inputs

Linfire assessed classified vegetation and exclusions within 150 m of the project area through on-ground verification on 26 February 2025, supplemented by desktop review and previous site inspection information, in accordance with *AS 3959—2018 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2018) and the *Visual Guide for Bushfire Risk Assessment in Western Australia* (DoP 2016). Georeferenced site photos and a description of the vegetation classifications and exclusions are contained in Appendix 1, depicted in Figure 7 and summarised on Table 4.

Given the level of existing vegetation clearing within the project area, and the lack of information regarding the future use of the Environmental Conservation Reserve which could include a range of uses, the project area has been assumed to be entirely non-vegetated, managed low threat vegetation or otherwise excludable under AS 3959 Clause 2.2.3.2. Notwithstanding, should any revegetation within the proposed Environmental Conservation Reserve be proposed, it would need to consider bushfire impact on future and existing development within, and surrounding, the project area.

Vegetation adjacent to the project area is typically coastal grassland over the dunes, with occasional shrubs or trees and presents as Class G grassland.

Currently small portions of the adjacent 150 m assessment area can be excluded from classification, including:

- existing unmanaged vegetation within the adjacent lot (currently unused sports centre) is further than 100 m from other classified vegetation and is excluded under Clause 2.2.3.2 (a).
- existing non-vegetated areas devoid of vegetation including buildings, roads, footpaths and firebreaks, water bodies, beach excluded under Clause 2.2.3.2 (e)
- existing low threat vegetation including managed gardens/road verges, irrigated turf, street trees with managed understorey and non-flammable coastal succulent species excluded under Clause 2.2.3.2 (f).

Other exclusions that may be relevant for future development and planning applications are as follows, which may also have application for any future revegetation within the Environmental Conservation Reserve (if proposed):

- Clause 2.2.3.2 (c) isolated plots of unmanaged vegetation, that will be less than 2500 m^2 and will be located so it is further than 20 m from any proposed lots or any other classified vegetation
- Clause 2.2.3.2 (d) isolated plots of unmanaged vegetation, that will be less than 20 m wide and will be located so it is further than 20 m from any proposed lots or any other classified vegetation

Exclusions under Clauses 2.2.3.2 (e) and (f) used for all non-vegetated elements and managed vegetation proposed as part of the development, with Clauses 2.2.3.2 (c) and (d) potentially used to exclude vegetation associated with small plots of unmanaged vegetation such as future drainage areas, if required.

15 Dempster Street, Port Hedland
Bushfire Management Plan

3.2.2 Effective slope inputs

Linfire assessed effective slope under classified vegetation through on-ground verification on 26 February 2025 and desktop review, in accordance with AS 3959. Results were cross-referenced with Landgate 10m contour data and are depicted in Table 4 and Figure 7.

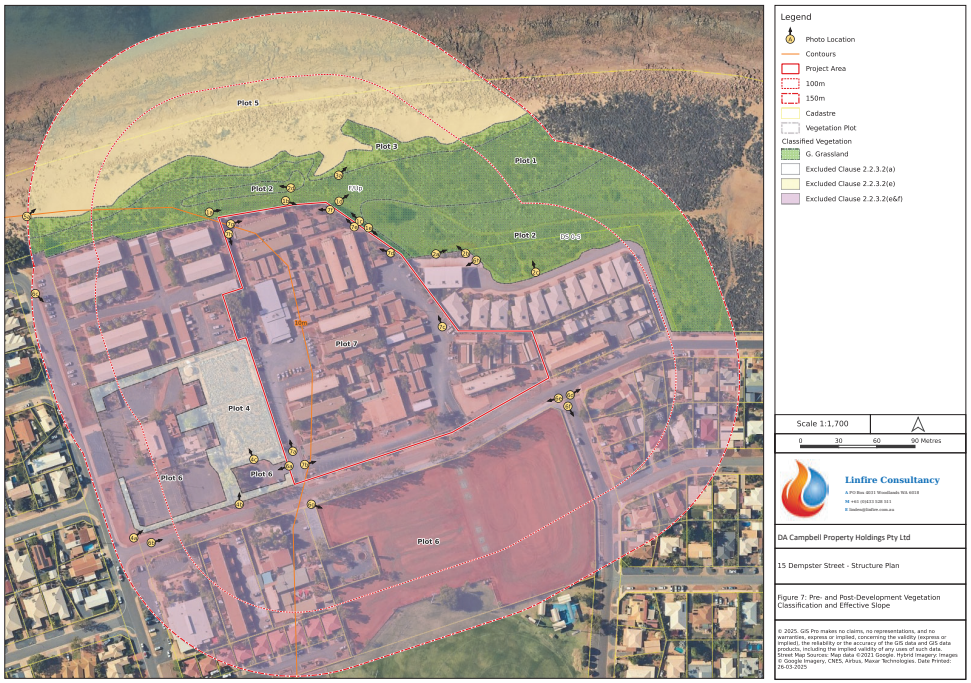
Site observations indicate that land north and east the project area undulates due to the coastal dunes, resulting in variable effective slopes beneath the grassland vegetation.

3.2.3 Summary of Pre- and Post-Development inputs

Table 4 summarises the current pre-development vegetation classifications and exclusions, which are expected to be the same as the post-development classification and exclusions following completion of development works. These pre- and post-development vegetation classifications/exclusions and effective slope are summarised in Table 4.

Table 4: Pre- and Post-development vegetation classifications/exclusions and effective slope

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class G Grassland	Flat/upslope (0°)	Coastal grassland over the dunes, with occasional shrubs or trees. Occurs mostly to the north and east of the project area.
2	Class G Grassland	Downslope >0–5°	
3	Class G Grassland	Downslope >15–20°	
4	Excluded – Clause 2.2.3.2 [a]	N/A	Existing unmanaged vegetation less than 1 ha in area and further than 100 m from other classified vegetation, within the unused sports centre in the lot west of the project area.
5	Excluded – Non-vegetated (Clause 2.2.3.2 [e])	N/A	Areas devoid of vegetation along the beach to the north of the project area
6	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	Existing non-vegetated elements (roads, paths, buildings) and low threat vegetation (managed gardens, maintain lawn) outside the project area
7	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	Existing non-vegetated elements (roads, paths, buildings) and low threat vegetation (managed gardens, maintain lawn) within the project area. This plot is to be maintained in a non-vegetated or low threat state, and any future modification is to enable ongoing exclusion, including within the Environmental Conservation Reserve. Any proposed revegetation within the Environmental Conservation Reserve would require consideration as part of future planning applications.



3.2.4 Bushfire Hazard Level (BHL) assessment

Pre- and post-development vegetation extents have been assigned a bushfire hazard level in accordance with the methodology detailed in Appendix A.2 of the Guidelines as outlined in Table 5.

Table 5: Bushfire hazard levels and characteristics

Bushfire hazard level	Characteristics*
Extreme	• Class A Forest • Class B Woodland • Class D Scrub • Any classified vegetation with a greater than 10° slope.
Moderate	• Class C Shrubland • Class E Mallee/Mulga • Class G Grassland, including sown pasture and crops • Vegetation that has a low hazard level but is within 100 metres of vegetation classified as a moderate or extreme hazard, is to adopt a moderate hazard level.
Low	• Low threat vegetation, which may include mangroves and other saline wetlands, areas of maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks. • Managed grassland in a minimal fuel condition, meaning there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example, short-cropped grass to a nominal height of 100 millimetres. • Non-vegetated areas, waterways, exposed beaches, roads, footpaths, buildings or rock outcrops.
*Vegetation classifications from AS 3959	

3.2.4.1 Pre- and Post-development BHL assessment

Linfire has mapped the pre-development Bushfire Hazard Levels, which align with the expected post-development BHLs, to demonstrate that the current and future bushfire hazard levels will be acceptable for future development to occur within the project area. The bushfire hazard levels have been assigned on the basis of the vegetation detailed on Table 4 and the expected vegetation extent within and surrounding the project area.

The BHL assessment (refer to Figure 8) demonstrate that all current, and future habitable development, will be located on land with be Moderate and Low bushfire hazard level.

3.2.5 Bushfire Attack Level (BAL) contour assessment outputs

Linfire has undertaken a BAL contour assessment in accordance with Method 1 of AS 3959 for the project area (see Figure 9). The Method 1 procedure incorporates the following factors:

- state-adopted FDI 80 rating
- vegetation classification
- effective slope
- distance maintained between proposed development areas and the classified vegetation.

The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by proposed future development and subsequently informs the standard of building construction and/or setbacks required for proposed habitable development to potentially withstand such impacts.

The BAL contours are based on:

- the pre- and post-development vegetation classifications and effective slope (which are to be the same), including the assumption that all vegetation within the Environmental Conservation Reserve is excludable under AS 3959 Clause 2.2.3.2.
- the proposed implementation of an 8 m wide Asset Protection Zone setback, as part of future planning.

The results of the BAL contour assessment are illustrated on Figure 9, with the following tables provided:

- Table 6 details the current BAL impact at the project area boundary, without any restrictions on future habitable buildings
  - The highest BAL applicable in this pre-development scenario is BAL–FZ or less
- Table 7 details the current BAL impact at the APZ setback, which would prevent future habitable buildings being constructed within 8 m of the northern boundary
  - The highest BAL applicable in this post-development scenario is BAL–29 or less

Table 6: BAL contour assessment results (to project area boundary)

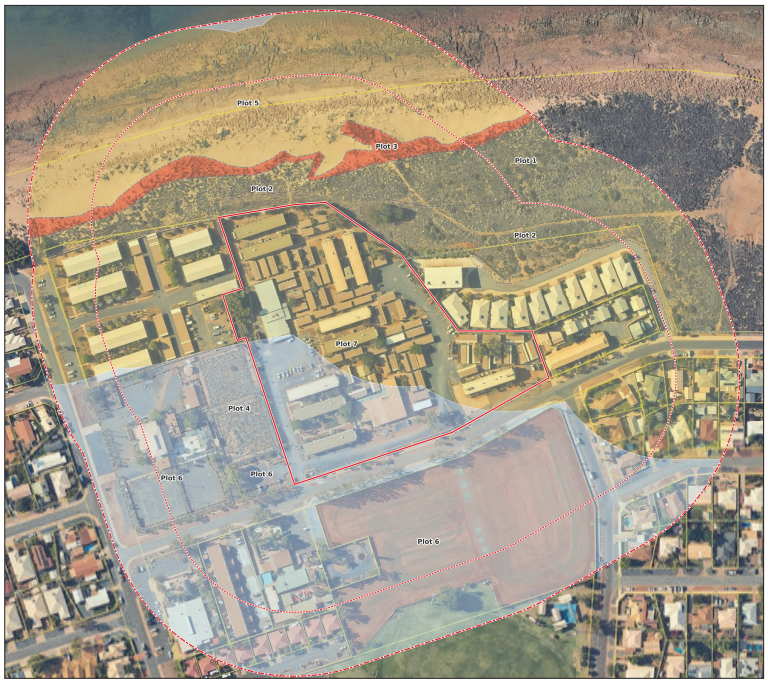
Method 1 BAL determination					
Plot	**Vegetation classification**	**Calculation method**	**Effective slope**	**Separation (m)**	**BAL**
1	Class G Grassland	Method 1	Flat/upslope (0°)	0 m	BAL–FZ
2	Class G Grassland	Method 1	Downslope >0–5°	4.0 m	BAL–FZ
3	Class G Grassland	Method 1	Downslope >15–20°	17.5 m	BAL–29
4	Excluded – Clause 2.2.3.2 [a]	N/A	N/A	N/A	N/A
5	Excluded – Non-vegetated (Clause 2.2.3.2 [e])	N/A	N/A	N/A	N/A
6	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	N/A	N/A	N/A
7	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	N/A	N/A	N/A

Table 7: BAL contour assessment results (to APZ setback)

Method 1 BAL determination					
Plot	**Vegetation classification**	**Calculation method**	**Effective slope**	**Separation (m)**	**BAL**
1	Class G Grassland	Method 1	Flat/upslope (0°)	8.0 m	BAL–19
2	Class G Grassland	Method 1	Downslope >0–5°	12.0 m	BAL–29
3	Class G Grassland	Method 1	Downslope >15–20°	25.5 m	BAL–19
4	Excluded – Clause 2.2.3.2 [a]	N/A	N/A	N/A	N/A
5	Excluded – Non-vegetated (Clause 2.2.3.2 [e])	N/A	N/A	N/A	N/A

Method 1 BAL determination					
Plot	**Vegetation classification**	**Calculation method**	**Effective slope**	**Separation (m)**	**BAL**
6	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	N/A	N/A	N/A
7	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	N/A	N/A	N/A

Should there be any changes in development design or classified vegetation extent that results in a modified BAL outcome, then the BAL contours will need to be reassessed.



Legend

- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot

Bushfire Hazard Level

- Extreme
- Moderate
- Low

Scale 1:1,700

0 30 60 90 Metres

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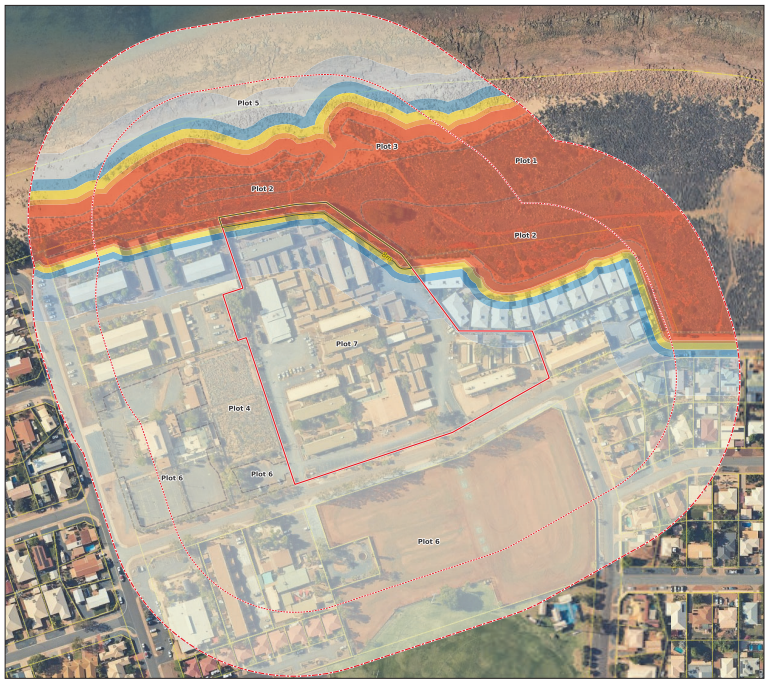
Figure 8: Pre- and Post-Development BHL Assessment



Legend

- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot
- Indicative Asset Protection Zone

BAL Contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low

Scale 1:1,700

0 30 60 90 Metres

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Figure 9: Pre- and Post-Development BAL Contour Assessment

4.0 Identification of bushfire hazard issues

4.1 Bushfire context

The project area is located adjacent to an existing built-up residential area, which is comprised of non-vegetated elements such as buildings, infrastructure, roads and managed low threat vegetation (e.g. POS, sports ovals etc), with bushfire hazards limited to isolated and fragmented patches of dune vegetation within the foreshore reserve to the north, north-east and east. The existing site is largely cleared of vegetation, the long vacancy resulting in some isolated regrowth and general lack of ongoing vegetation management. Additionally, the old recreation centre to the west also appears to have been vacant for a period of time, and there is evidence of vegetation regrowth there due to lack of ongoing management.

The greatest bushfire threat to the proposed development is from the coastal dune vegetation within the foreshore reserve to the north, north-east and east of the project area, where fires through low grassland vegetation can approach the site over very short to moderately long fire runs.

- A fire approaching the site from directly to the north of the site would only have a maximum fire run of 30-50m long, and much of the grassland vegetation is fragmented by interstitial sand and would be unlikely to support steady state bushfire behaviour, and would likely be a very small, localised fire that would have a very quick residence time.
- A bushfire approaching the site from the north-east or east could have a fire run of up to 600 m long, however while there is more of a continuous low grassland fuel load, there are significant non-vegetated areas about 275 m to the east that fragment the fuel load, and existing residential development to the east also restrict the head fire to 75-80 m wide. While a fire from the north-east or east has sufficient fire run to achieve steady state behaviour, it is unlikely to achieve the significant behaviour predicted by Method 1 from AS 3959 on the basis of the limited fuel load due to the low grass, the fragmentation from significant non-vegetated areas, and shielding by existing development restricting the head fire width. A bushfire in this vegetation is expected to be a more localised fire with a quick residence time, albeit larger than one igniting in vegetation directly north of the site.
- While the bushfire behaviour from grassland fires in the foreshore reserve is not considered likely to occur, and any bushfire that did occur would be likely relatively localised and not overly impactful nor prolonged, there is currently onsite vegetation along the north and north-eastern interfaces within the project area does currently promote potential fire spread from the reserve into the development, potentially impacting existing buildings along this interface.

Based on the above, bushfire impact on the proposed development is expected to be from the north, north-east and east, but impact would likely relatively short, given the quick residence time associated with bushfire spreading through the grassland plots. Linfire consider it unlikely that the discontinuous fuel structure would result in the peak bushfire behaviour anticipated by AS 3959, however, if left unprotected, the project area would be expected to receive moderate levels of radiant heat with little to no ember attack from a bushfire approaching the development, if not appropriately managed.

4.2 Bushfire hazard issues

Examination of strategic development design in accordance with the concept plan and pre and post-development bushfire hazards has identified the following bushfire hazard issues to be considered at future planning stages:

1. Based on the existing extent of vegetation outside the project area, parts of the proposed development would be subject to an initial BAL of BAL-FZ, if unmanaged. In order for the development to achieve a compliant rating of BAL-29 or less, sufficient separation need to be provided between habitable development and classifiable, unmanaged vegetation. Similarly, sufficient separation will also be required from any classifiable onsite vegetation (such as any revegetation within the Environmental Conservation Reserve, if not excludable under AS 3959 Clause 2.2.3.2), if any, to achieve BAL-29 or less.
2. Provision of a coherent internal vehicular access network to ensure occupants are able to egress away from bushfire, and fire brigade has appropriate and flexible access to habitable development and direct interfaces with unmanaged vegetation
3. Provision of a secure water supply for bushfire fighting activities.
4. Ensure the bushfire risk to any future vulnerable land uses is appropriately considered and mitigated.

4.3 Bushfire safety strategy

The following bushfire safety strategy is proposed to demonstrate compliance with the Bushfire Protection Criteria of the Guidelines at future planning stages, in order to address the bushfire hazards identified above:

1. Create sufficient separation between future habitable buildings and post-development classified vegetation outside the project area, to achieve BAL-29 or lower in accordance with AS 3959. All land within the project area is expected to be either non-vegetated or low threat landscaping, otherwise APZ will also be required from any classified vegetation within the project area (such as any revegetation within the Environmental Conservation Reserve, if not excludable under AS 3959 Clause 2.2.3.2). Internal APZ setbacks may be required within some lots to prevent development in areas of BAL-40/FZ.
2. Ensure vehicular access to and from the proposed development complies with the technical specifications of Guidelines.
3. Ensure a secure bushfire fighting water supply, most likely through use reticulated water supply and street hydrants.
4. Ensure a Bushfire Emergency Evacuation Plan accompanies the BMP for any future planning applications for vulnerable land uses.

Based on the above, Linfire considers the bushfire hazards within and adjacent to project area and the associated bushfire risks are manageable through standard management responses outlined in the Guidelines and AS 3959. These responses will be factored into proposed development as early as possible at all stages of the planning process to ensure a suitable, compliant and effective bushfire management outcome is achieved for protection of future life, property and environmental assets.

5.0 Assessment against the bushfire protection criteria

An acceptable solutions assessment against the Bushfire Protection Criteria 4 is provided in Table 8.

Table 8: Compliance with the Bushfire Protection Criteria 4 (Strategic Planning) of the Guidelines

Bushfire protection criteria		Development response	
Outcomes	**Acceptable Solutions**	**Method of compliance**	**Proposed bushfire management measures**
Element 1: Location			
Outcome O1 Avoid broader landscapes that present an unacceptable risk to life, property and infrastructure.	***Area 1 (Urban):*** Does not require assessment of Element 1: Location ***Area 2:*** Determine the Broader Landscape Type in accordance with Appendix A.1 and proceed with the following Acceptable Solutions A1.1 Location *A1.1a Broader Landscape Type A* The subject site is located in an area that is a Broader Landscape Type A. This location satisfies the policy outcome for Element 1:Location and no additional consideration is required. *A1.1b Broader Landscape Type B* The subject site is located in an area that is a Broader Landscape Type B which presents an unacceptable bushfire risk of a landscape scale bushfire resulting in impacts to people, property and infrastructure. This location does not satisfy the policy outcome for Element 1: Location. Where the practitioner considers that further analysis could demonstrate to the decision-maker that the risks can be appropriately managed, and/or mitigated, an outcomes-based approach should be prepared in accordance with policy measure 7.5 of SPP 3.7. Further explanatory notes are provided in Appendix B.1 of the Guidelines.	**Acceptable Solution**	The majority of the project area is sited in Area 2 designated bushfire prone area. A Broader Landscape Assessment has been conducted as detailed in Section 3.1. The determined Broader Landscape Type for the project area, is BLT A. On this basis, compliance is achieved with A1.1, with no additional consideration required.
Element 2: Siting and Design			
Outcome O2 Ensure siting and design solutions: • manage or mitigate the bushfire risk to people, property and infrastructure; and • avoid, or where unavoidable, minimises the clearing of native vegetation	***Area 1 (Urban):*** Does not require assessment of Element 2: Siting and Design ***Area 2:*** Proceed with the following Acceptable Solutions A2.1 Siting and Design The areas of the subject site(s) identified for intensification and/or the future development site(s) achieve a pre- or post-development bushfire hazard level of moderate or low	**Acceptable Solution**	The pre- and post-development BHL assessment has been undertaken (see Figure 8), which identifies that all developable land will comprise either a Low or Moderate bushfire hazard level. Additionally, a pre- and post-development BAL contour assessment has been conducted (see Figure 9) to provide further design development and planning guidance, and depicts that while BAL impact along the northern interface will be BAL-FZ, the implementation of an Asset Protection Zone setback for future habitable buildings, likely 8 m wide (to be finalised at later planning stages), should be sufficient to ensure habitable buildings can be sited in BAL-29 or lower. If any classified vegetation is proposed within the project area (such as any revegetation within the Environmental Conservation Reserve, if not excludable under AS 3959 Clause 2.2.3.2), then appropriately sized APZ would also be required to ensure habitable development occurs in areas of BAL-29 or lower.
	A2.2 Clearing of native vegetation The strategic planning proposal avoids, or where unavoidable, minimises the clearing of native vegetation.	**Acceptable Solution**	There is limited existing vegetation within the project area, mostly within managed gardens or as isolated trees. While it is expected that most vegetation will require clearing, it is unlikely there is any significant native vegetation within the project area. Notwithstanding, Linfire assumes that all relevant environmental studies will be undertaken to support the project, and if any State and Federal environmental referrals and approvals are required, they will be sought prior to commencing on-site vegetation modification or clearing required to construct the development.
Element 3: Vehicular access			

Bushfire protection criteria		Development response	
Outcomes	**Acceptable Solutions**	**Method of compliance**	**Proposed bushfire management measures**
Outcome O3 Ensure the design and capacity of vehicular access and egress provide: • for efficient and effective evacuation to a suitable destination(s) and/or • as a contingency measure for vulnerable land uses, an on-site shelter, where demonstrated appropriate, as a last resort option.	***Area 1 (Urban):*** Does not require assessment of Element 3: Vehicular Access ***Area 2:*** Proceed with the following Acceptable Solutions A3.1 Public Roads Public roads, including perimeter roads should meet the technical requirements in Appendix B.3, Table 10	**Acceptable Solution**	The existing public roads outside the project area are sealed two-way road that appear to be compliant with Guidelines, and are sufficient for occupant egress and emergency services access. The concept plan provided on Figure 1B depicts public roads within the project area as part of future development. All future public roads within the project area will be required to comply with the relevant technical requirements of the Guidelines for public roads (see Appendix 4). It is also noted that future planning applications will include requirements for perimeter roads where there is a direct interface with classified vegetation from adjacent properties, although there are potential dispensations where this is Class G grassland. In this instance, the existing bushfire hazard along the interface is grassland, so there may be an opportunity to avoid a perimeter road, however it is noted that the APZ setback will be required to avoid development in BAL-40/FZ (see Figure 9) if permitted within the Environmental Conservation Reserve, which would be best achieved through managed POS, internal private driveway or a public road, which enable fire appliance access in a bushfire emergency.
	A3.2 Access Routes Public road access should be provided in two different directions, to two different suitable destinations; and with an all-weather surface.	**Acceptable Solution**	The existing access to the project area via Dempster Road provides travel in different directions to different suitable destinations as follows: • West on Dempster Street to Keesing Street and north to Sutherland Street through residential areas to Port Hedland townsite approximately 6 km to the west of the project area. • West on Dempster Street to Keesing Street and south to Athol Street and Cooke Point Road, which enables travel to either Wedgefield or South Hedland approximately 8 -12 km to the south of the project area. • East on Dempster Street to Tinder Street, where travel can be south to Comey Street and then Athol Street, where travel can be west. In this regard, the proposed development is provided with at least two access routes which meets the requirements of Acceptable Solution A3.1. Two access routes are to be provided during staging of development.
	A3.3a No-through Roads If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the public road access is to be a maximum of 200 m from the subject site boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints, and the following requirements are met • the no-through road travels towards a suitable destination; and • the balance of the no-through road that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area, or is within Area 1 (Figure 29). A3.3b No-through Road Requirements A no-through road is to meet all the following requirements: • requirements of a public road (Appendix B.3, Table 10, Column 2); and • turn-around area/head (Figure 30).	**Acceptable Solution**	There are no existing no-through public roads providing access to the project area. The concept plan provided on Figure 1B depicts that future public roads within the project area could be configured as no-through roads. All future public roads within the project area will be required to comply with the relevant technical requirements of the Guidelines for public roads (see Appendix 4), and any no-through roads, are to comply with the requirements of A3.3a including: • being no greater than 200 m long to a point of choice (unless justification can be provided as per A3.3a) • having a compliant turnaround head or hammerhead arrangement.
Element 4: Water			
Outcome O4 Ensure that sufficient water is available and accessible for emergency services, to enable people, property and infrastructure to be defended from bushfire.	***Area 1 (Urban):*** Does not require assessment of Element 4: Water Supply ***Area 2:*** Proceed with the following Acceptable Solutions A4.1 Water Supply Evidence that a sufficient and accessible reticulated or non-reticulated water supply	**Acceptable Solution**	The existing development within the project area is connected to reticulated water supply (see Plate 2), and there are existing street hydrants are located along Dempster Street to the west, and Tinder Street to the south-east of the project area, the closet located adjacent to one of the site entrances (see Figure 2). In addition to the surrounding street hydrants, there are also existing above-ground hydrants installed onsite providing firewater supply within the site. Given the proximity to existing reticulated water supply, it is expected that the proposed future

Bushfire protection criteria		Development response	
Outcomes	Acceptable Solutions	Method of compliance	Proposed bushfire management measures
	for bushfire firefighting can be provided at the subdivision and/or development application stage, in accordance with the specifications of the relevant water supply authority or the requirements in Appendix B4: Water Supply dedicated for bushfire firefighting		development will also be connected to reticulated water supply in accordance with Water Corporations design standards (refer to Appendix 5). Should future public roads be constructed as part of future development, it is expected that additional street hydrants would be installed in accordance with Water Corporation design standards. In addition to the above, some of the proposed development may also trigger additional fire system requirements in accordance with the National Construction Code, which would be addressed at the relevant building licence stage.

Plate 2: Reticulated water pipe (blue line) and water meters (blue dots) (SLIP 2025)

6.0 Responsibilities for implementation and management of the bushfire measures

This 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. Aside from the preparation of future BMPs to accompany future subdivision and development applications where appropriate, there are no further items to implement, enforce or review at this strategic stage of the planning process.

Future BMPs prepared for subsequent subdivision and development applications are to meet the relevant commitments outlined in this strategic level BMP, address the relevant requirements of SPP 3.7 (i.e. Policy Measure 7.1 (ii)) and demonstrate in detail how the proposed development will incorporate the relevant acceptable solutions or meet the performance requirements of the Guidelines. Future BMPs are to include the following detailed information:

- Proposed development layout, including any lots, roads, POS/drainage areas, etc
- Detailed landscape plans for all POS, drainage and areas of revegetation or retention (especially within the Environmental Conservation Reserve), to confirm the final extent of classified vegetation (retained or revegetated) and exclusions (non-vegetated areas and low threat vegetation).
- Final determination of post development classified vegetation extent, exclusions and effective slope
- Final BAL contour map demonstrating that proposed development areas will achieve BAL–29 or lower (may require designation of building envelopes)
- Width and alignment of compliant APZs/setbacks
- Confirmation of how bushfire management will be addressed during development staging including consideration of low threat staging buffers and vehicular access (temporary no-through roads/EAWs)
- Proposed approach to fuel management throughout POS, vacant land, staging buffers, adjacent properties and road verges; or application of AS 3959 in response to classified vegetation
- Vehicular access provisions, including demonstration that a minimum of two access routes will be achieved for each stage of development (as required)
- Water supply provisions with regards to reticulated water supply provisions (including network of street hydrants), or static firewater tanks if required
- Demonstration of compliance with the relevant Bushfire Protection Criteria of the Guidelines
- Requirements for any proposed vulnerable land uses including provision of a BMP and Bushfire Emergency Evacuation Plan to accompany the development application
- Requirements for BMP compliance reports as a condition of subdivision
- Provisions for notification on Title for any future lots with a rating of BAL–12.5 or greater as a condition of subdivision
- Compliance requirements with the current local government annual firebreak notice, as amended or varied
- Construction of Class 1, 2, 3 or associated 10a buildings/decks, in accordance with National Construction Code to the assessed BAL rating
- Construction “certain Class 9” buildings, in accordance with the requirements of the National Construction Code
- Proposed implementation and audit program outlining all measures requiring

implementation and the appropriate timing and responsibilities for implementation.

On the basis of the information contained in this BMP, Linfire considers the bushfire hazards within and adjacent to the project area and the associated bushfire risks are manageable through standard management responses outlined in the Guidelines and AS 3959. Linfire considers that on implementation of the proposed management measures, the project area will be able to be developed with a manageable level of bushfire risk whilst maintaining full compliance with the Guidelines and AS 3959.

7.0 References

Department of Fire and Emergency Services (DFES) 2025, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from: https://maps.slip.wa.gov.au/landgate/bushfireprone/,

Department of Planning (DoP) 2016, *Visual guide for bushfire risk assessment in Western Australia*, Department of Planning, Perth.

Standards Australia (SA) 2018, Australian Standard *AS 3959–2018 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.

Western Australian Planning Commission (WAPC) 2024, *State Planning Policy 3.7: Bushfire*, Western Australian Planning Commission, Perth.

Western Australian Planning Commission (WAPC) 2024, *Planning for Bushfire Guidelines*, November 2024, Western Australian Planning Commission, Perth.

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Appendix 1 Vegetation plot photos and description

Photo ID: 1a

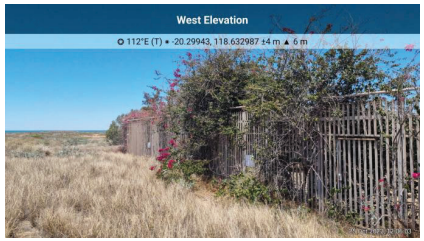

Photo ID: 1b

Photo ID: 1c

Plot number		Plot 1
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Grassland greater than 100 mm in height

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Photo ID: 1d

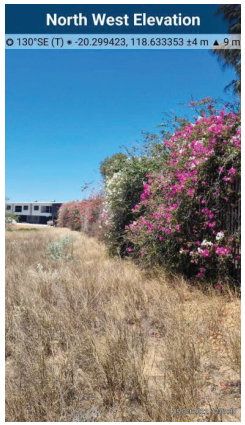

Photo ID: 1e

Plot number		Plot 1
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Grassland greater than 100 mm in height

Photo ID: 2a

Photo ID: 2b

Photo ID: 2c

Plot number		Plot 2
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Grassland greater than 100 mm in height

Photo ID: 2d

Plot number		Plot 2
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Grassland greater than 100 mm in height

Photo ID: 3a

Plot number		Plot 3
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Grassland greater than 100 mm in height

Photo ID: 4a

Photo ID: 4b

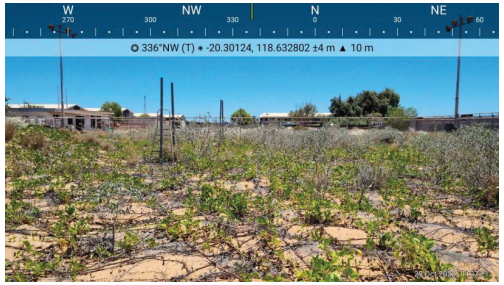

Photo ID: 4c

Plot number		Plot 4
Vegetation classification	Pre-development	Class C Shrubland
	Post-development	Excluded – Clause 2.2.3.2 [a]
Description / justification		Existing unmanaged vegetation less than 1 ha in area and further than 100 m from other classified vegetation

Photo ID: 6a

Photo ID: 6b

Photo ID: 6c

Plot number		Plot 6
Vegetation classification	Pre-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
	Post-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
Description / justification		Low threat cultivated gardens and maintained lawns within surrounding properties and non-vegetated areas including roads, footpaths, driveways and building footprints

Photo ID: 6d

Photo ID: 6e

Photo ID: 6f

Plot number		Plot 6
Vegetation classification	Pre-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
	Post-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
Description / justification		Low threat cultivated gardens and maintained lawns within surrounding properties and non-vegetated areas including roads, footpaths, driveways and building footprints

Photo ID: 6g

Photo ID: 6h

Plot number		Plot 6
Vegetation classification	Pre-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
	Post-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
Description / justification		Low threat cultivated gardens and maintained lawns within surrounding properties and non-vegetated areas including roads, footpaths, driveways and building footprints

Photo ID: 7a

Photo ID: 7c

Photo ID: 7e

Photo ID: 7b

Photo ID: 7d

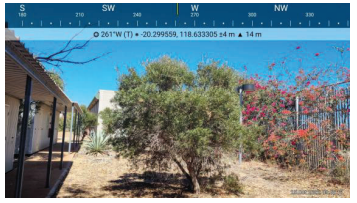

Photo ID: 7f

Plot number		Plot 7
Vegetation classification	Pre-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
	Post-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
Description / justification		Existing managed gardens and non-vegetated elements

Photo ID: 7g

Photo ID: 7h

Plot number		Plot 7
Vegetation classification	Pre-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
	Post-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
Description / justification		Existing managed gardens and non-vegetated elements

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Appendix 2 APZ standards (Schedule 1 of the Guidelines)

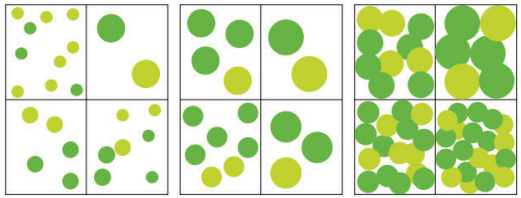
An APZ is a low fuel area maintained around a habitable building to increase the likelihood that it will survive a bushfire, by providing a defendable space and reducing the potential for direct flame contact, radiant heat exposure and ember attack. The APZ allows emergency services access and provides an area for firefighters and home-owners to defend their property.

An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that considers how existing and future mature vegetation, and combustible and non-combustible features interact with and affect the building's resilience to bushfire.

Vegetation management within an APZ should provide defendable space and be maintained to a low threat state, in perpetuity, in accordance with the requirements outlined below.

Table 9: Asset Protection Zone Technical Requirements

- **Trees* (> 6 metres in height)**
  - Trunks at maturity should be a minimum distance of six metres from all elevations of the building.
  - Branches at maturity should not touch or overhang a building or powerline.
  - Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation.
  - Canopy cover within the APZ should be <15 per cent of the total APZ area.
  - Tree canopies at maturity should be at least 5 metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ.



- **Shrub* and Scrub* (0.5 metres to 6 metres in height)**
  - Should not be located under trees or within three metres of buildings.
  - Should not be planted in clumps >5 square metres in area.
  - Clumps should be separated from each other and any exposed window or door by at least 10 metres.
  - Shrub and scrub >6 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height)**
  - Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load'.
  - Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
  - Ground covers >0.5 metres in height are to be treated as shrubs
- **Grass**
  - Grass should be maintained at a height of 100 millimetres or less, at all times.
  - Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.

Table 9: Asset Protection Zone Technical Requirements

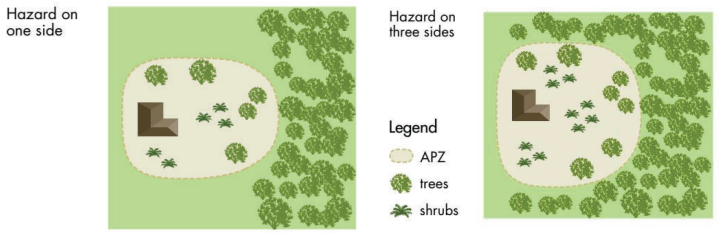
- **Fine Fuel load (combustible dead vegetation mater <6 mm in thickness)****
  - Should be managed and removed on a regular basis to be maintained as low threat vegetation.
  - Should be maintained at <2 tonnes per hectare (on average).
  - Mulches should be non-combustible such as stone, gravel, shells, rock or crushed mineral earth or wood mulch >5 millimetres in thickness.
- **Defendable Space**
  - Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
- **Fences within the APZ**
  - Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959)
- **LPG Cylinders**
  - Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building.
  - The pressure relief valve should point away from the house.
  - No flammable material within six metres from the front of the valve.
  - Must sit on a firm, level and non-combustible base and be secured to a solid structure.

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

*** Fine fuel load:*

- *is the combustible, dead or dry vegetation matter on the ground, near ground, or elevated. Fine fuel includes grass, leaves, bark and twigs less than six millimetres in diameter that ignite readily and are burnt rapidly when dry.*
- *Fine fuel should be maintained at less than 2t/ha (100gm/m^2 equates to 1t/ha).*
  - *To estimate a fuel load (in t/ha), collect the dry fine fuel from a representative one square meter and weigh (in grams using kitchen scales) and multiply the weight by 0.01.*

Figure 25: Design of an Asset Protection Zone



B.2.2 Designing an Asset Protection Zone

An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed

space that considers how existing and future mature vegetation, and combustible and non-combustible features interact with and affect the building's resilience to bushfire.

An APZ should provide the greatest level of vegetation management within at least three metres of a habitable building, to ensure adequate unobstructed defendable space for emergency services to operate. This area should contain minimal vegetation and be free of combustible materials and obstructions. Within the remainder of the APZ, planting of vegetation can increase as you move farther away from the building.

The placement of plants within an APZ is a key design technique. Separation of garden beds with areas of low fuel or non-combustible material will break up fuel continuity and reduce the likelihood of vegetation within an APZ supporting a bushfire. It is important to consider the plant density and final structure and form of plants in their mature state.

Strategic landscaping measures can be applied, such as replacing weeds with low flammability vegetation to create horizontal and vertical separations between the retained vegetation.

Mulches used within the APZ should be non-combustible. The use of stone, gravel, shells, rock and crushed mineral earth is encouraged. Very fine or light mulch (such as shredded pine bark, pine needles, or poplar woodchips) less than five millimeters in diameter should be avoided. It is recommended that wood mulch is used in garden beds or areas where the moisture level is higher by regular irrigation, and these areas are separated with non-combustible elements, such as pathways and open spaces.

Incorporation of landscaping features, such as masonry feature walls, can provide habitable buildings with barriers to wind, radiant heat and embers. These features can include noise walls or wind breaks. Use of Appendix F of AS 3959 for bushfire resistant timber selection or the use of non-combustible fencing materials such as iron, brick, limestone, metal post and wire is encouraged within an APZ

B2.3 Management of an Asset Protection Zone

Ongoing maintenance of an APZ is usually enforced through a condition of a development approval, which should refer to Table 9 APZ technical requirements within this Appendix.

In addition to regular maintenance of an APZ, further bushfire protection can be provided by:

- ensuring gutters are free from vegetation
- installing gutter guards or plugs
- regular cleaning of underfloor spaces, or enclosing them to prevent gaps
- trimming and removing dead plants or leaf litter
- pruning climbing vegetation (such as vines) on a trellis, to ensure it does not connect to a building, particularly near windows and doors
- removing vegetation in close proximity to a water tank to ensure it is not touching the sides of a tank
- following the requirements of the relevant local government firebreak notice, which may include additional provisions such as locating wood piles more than 10 metres from a building.

Preparation of a property prior to the bushfire season and/or in anticipation of a bushfire is beneficial even if your plan is to evacuate. Embers can travel up to several kilometres from a bushfire and fall into small spaces and crevices or land against the external walls of a building.

Best practice recommends objects within the APZ are moved away from the building prior to any

bushfire event.

Objects may include, but are not limited to:

- door mats
- outdoor furniture
- potted plants
- shade sails or umbrellas
- plastic garbage bins
- firewood stacks
- flammable sculptures
- playground equipment and children's toys.

B2.4 Plant Flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- **Fire resistant** – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- **Fire-retardant** – plants that can absorb more of the heat of the approaching bushfire without burning, compared to more flammable plants.
- **Fire wise** – plants that have been identified and selected based on their low flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire-retardant plant species that suit the environmental characteristics of an area.

When developing a recommended plant species list, local governments should consult with ecologists, land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

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Appendix 3 Low Threat Vegetation (AS 3959 Clause 2.2.3.2)

2.2.3.2 *Exclusions—Low threat vegetation and non-vegetated areas*

The following vegetation shall be excluded from a BAL assessment:

(a) Vegetation of any type that is more than 100 m from the site.

(b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified vegetation.

(c) Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other or of other areas of vegetation being classified vegetation.

(d) Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified vegetation.

(e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.

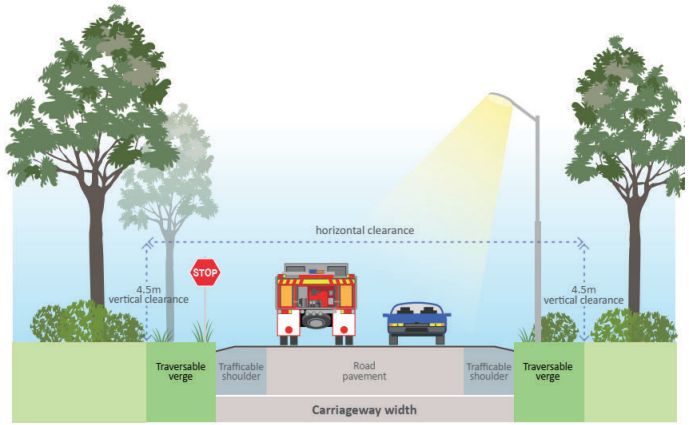
(f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.

NOTES:

1 Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm).

2 A windbreak is considered a single row of trees used as a screen or to reduce the effect of wind on the leeward side of the trees.

Appendix 4 Vehicular access technical standards of the Guidelines

Public Roads
Acceptable Solution A3.1
Public roads, including perimeter roads should meet the technical requirements in Appendix B.3, Table 10
Explanatory note B3.1
The Guidelines do not prescribe values for the carriageway width or the horizontal clearance for public roads (except for perimeter roads). Public roads should be in accordance with the class of road as specified in the Public Works Engineering Australasia (IPWEA) subdivision guidelines, Liveable Neighbourhoods, Austroads Standards, any applicable or relevant Main Roads standards, supplements, policies and any applicable or relevant local government standards or policies. However, it is important that public roads (and other forms of access) in bushfire prone areas, allow for emergency services vehicles to stop and operate on the side of the public road, specifically where the public road traverses large areas of classified vegetation. It is, therefore, recommended that public roads achieve a minimum six metres horizontal clearance. Perimeter roads require additional width. Where local or state government roads are proposed to be widened or modified by the proponent, as part of the structure planning process or at the subdivision stage, approval is required from the relevant government authority.
Definition
Horizontal clearance: The carriageway width (including the road pavement and trafficable shoulder) and traversable verge that provides for the movement and parking of vehicles and area required by emergency services to operate. Infrastructure and vegetation within the traversable verge should be frangible, however, non-frangible items can occur providing they do not restrict vehicular movement in the event of an emergency Figure 26: Area encompassing horizontal clearance and vertical clearance 

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Access Routes
Acceptable solution A3.2
Public road access should be provided in two different directions, to two different suitable destinations; and with an all-weather surface.
Explanatory note B3.2
Public vehicular access in at least two different directions to at least two different suitable destinations should always be the goal within bushfire prone areas. The more options available for evacuation and for emergency services to respond to the bushfire, the better the bushfire resilience of a development and/or a community. A suitable destination is likely to be an urban area, townsite or similar. This also includes any evacuation centre, dedicated by the local government, for use during a bushfire event. Where a planning proposal, such as a structure plan or subdivision, proposes a large number of lots, or where the structure plan or subdivision adjoins an urban area or townsite, this could potentially result in land that is more than 100 metres from classified vegetation (BALLOW). In this instance, an argument could be made that the suitable destination is within the subject site or within the adjoining urban area or townsite. For example, where coastal communities are limited to one public road servicing the community, there may be an existing managed area large enough to provide an area suitable for people to locate to before, during and after a bushfire event. There is no prescribed distance to a suitable destination as it is assumed that in the event of a bushfire, a person would travel any necessary distance to evacuate. A suitable destination should not be confused with an onsite shelter provided for tourism land uses. On-site shelters are a last resort option, purpose built and designed, and are supported in limited circumstances to facilitate tourism within remote and/or heavily vegetated areas. On-site shelters are not supported for residential land-uses.
Definition
Suitable destination: An area that is not designated as bushfire prone on the *Map of Bush Fire Prone Areas* or is greater than 100 metres from classified vegetation or 50 metres from Class G Grassland, as per AS 3959, and can provide protection during and after a bushfire event. A suitable destination is located within an urban area, townsite or similar. This also includes any evacuation centre, dedicated by the local government, for use during a bushfire event.

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No-Through Roads

Acceptable solution A3.3

Acceptable Solution A3.3a – No-Through Roads

If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the public road access is to be a maximum of 200 metres from the subject site boundary to an intersection where two-way access is provided.

The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints, and the following requirements are met:

- the no-through road travels towards a suitable destination; and
- the balance of the no-through road that is greater than 200 metres from the subject site is wholly within BAL-LOW, or is within a residential built-out area or within Area 1 (Figure 29).

Acceptable Solution A3.3b – No-Through Road Requirements

A no-through road is to meet all the following requirements:

- requirements of a public road (Appendix B.3, Table 10, Column 2); and
- turn-around area/head (Figure 30).

Figure 29: Example of a site on a no-through road greater than 200 metres but within 200 metres of BAL-LOW

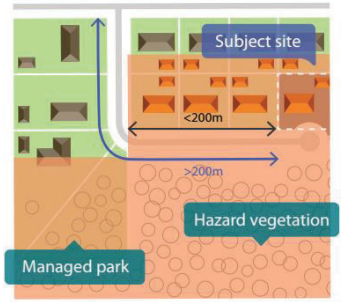
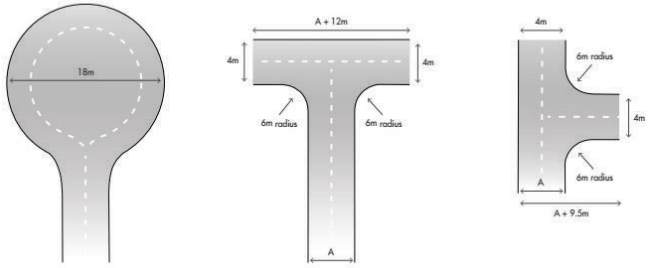


Figure 30: Design requirements for a turn-around area



LINFIRE
15 Dempster Street, Port Hedland
Bushfire Management Plan

No-Through Roads

Explanatory note B3.3

No-through roads reduce the legibility of a road network and options available for access and egress in the event of a bushfire emergency. The inclusion of new no-through roads within subdivision or structure plan designs, in the first instance, should be avoided in bushfire prone areas.

However, where it is demonstrated, to the satisfaction of the decision-maker that a no-through road cannot be avoided due to site or design characteristics, the inclusion of a new no-through road is to be treated as an acceptable solution, if it satisfies the prescribed maximum road length. Where this is not demonstrated, a decision-maker is able to request a redesign to remove the no-through road.

The acceptable solution for no-through roads in areas shown as Area 2 on the *Map of Bush Fire Prone Areas* includes a maximum of 200 metres from the lot(s) boundary to an intersection where two-way access is provided (**Figure 28**). There is no prescribed maximum length for no-through roads in areas shown as Area 1 (Urban) on the *Map of Bush Fire Prone Areas*.

B3.3.1 Outcomes-based approach – no-through roads

It becomes more challenging to comply with the acceptable solutions where the proposal includes existing no-through roads that exceed 200 metres. The 200 metres is a nationally accepted standard and support for development on existing no-through roads longer than the prescribed 200 metres, particularly within vegetation classified as Forest, should be considered carefully.

They should be the exception to the rule where it is demonstrated through an outcomes-based approach that the hazards and the road network within the broader landscape are such that, in the event of a bushfire, evacuation to a suitable destination is possible.

An outcomes-based approach should demonstrate the increase in length, and/or the proposed additional lots, on an existing non-compliant no-through road and should consider:

- the broader landscape
- size and scale of the development
- whether the no-through road travels away from the source of the bushfire hazard
- evacuation in the event of a bushfire scenario
- the vegetation within and adjoining the road reserve
- legibility of the broader road network
- whether the no-through road is straight and provides a line of sight
- any improvements to the bushfire resilience of the area, including improvements to the existing road network
- the precedent within the broader area that would be set by supporting development on a non-compliant no-through road.

Figure 28: Demonstration of a lot achieving two-way access within 200 metres

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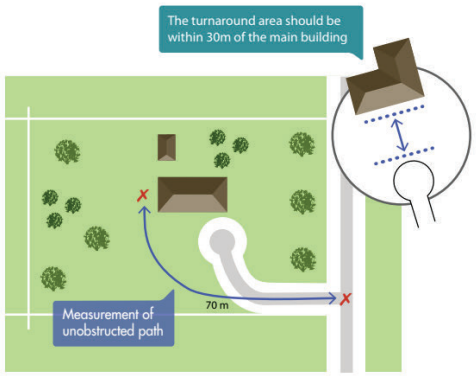
Private driveways
Acceptable Solution A3.1
There are no private driveway technical requirements (prescribed by these Guidelines) where the private driveway is within a lot serviced by reticulated water and is no greater than 70 metres in length between the most distant external part of the habitable building and the public road. In circumstances where the above conditions are not met, the private driveway is to meet all of the following requirements: • requirements in Appendix B.3 Table 10, Column 5; and • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional carriageway width of 2 metres • (i.e. the combined carriageway width of the passing bay and constructed private driveway to be a minimum 6 metres); and • turn-around area (Figure 30) and within 30 metres of the habitable building (Figure 38).
Explanatory note B3.8
Emergency services vehicles typically operate from the street frontage in areas serviced by reticulated water and where the distance from the public road to the farthest part of the habitable building is no greater than 70 metres. In the event the habitable building cannot be reached by hose reel from the public road, emergency services vehicles will need to gain access via the driveway to the property. Emergency services vehicles will also need to gain access to the property where access to water is provided by onsite water tanks. In these situations, the driveway and battle-axe access leg (if applicable) will need to be wide enough for access by an emergency services vehicle and a vehicle to evacuate. It is acceptable for a private driveway to have a carriageway width of four metres with a traversable verge of one metre on either side of the carriageway. Turn-around areas (**Figure 38**) should be available for conventional two-wheel drive vehicles and type 3.4 fire appliances and should be located within 30 metres of habitable buildings. Circular and loop driveway design may also be considered. Figure 38: Design requirements for a private driveway where required 

LINFIRE
15 Dempster Street, Port Hedland
Bushfire Management Plan

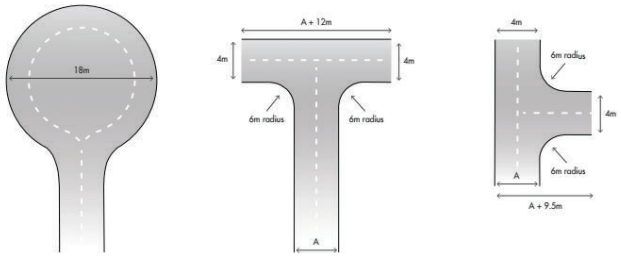
Private driveways
Figure 30: Design requirements for a turn-around area 

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Table 10: Vehicular access technical requirements

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

Notes:

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

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

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

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

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

Appendix 5 Water technical standards of the Guidelines

Appendix B.4 – Water Supply
B4.1 Construction and Design Technical requirements
• An above-ground tank and associated stand should be constructed of non-combustible material. • Below-ground tanks should have a 200 millimetres diameter access hole to allow tankers or emergency services vehicles to refill direct from the tank, with the outlet location clearly marked on the surface. • Above and below ground tanks may need to comply with AS/NZS 3500.1:2018. • An inspection opening may double as the access hole provided that the inspection opening meets the requirements of AS/NZS 3500.1:2018. • Where an outlet for an emergency services vehicle is provided, then an unobstructed, hardened ground surface is to be supplied within four metres of any water supply. B4.1.1 Pipes and Fittings All above-ground, exposed water supply pipes and fittings should be metal. Fittings should be located away from the source of bushfire hazard and be in accordance with the applicable section below, unless otherwise specified by the local government. B4.1.2 Fittings for above-ground water tanks • Commercial land uses: 125mm Storz fitting; or • Strategic water tanks: 50mm or 100mm (where applicable and adapters are available) male camlock coupling with full flow valve; or • Standalone water tanks: 50mm male camlock coupling with full flow valve; or • Combined water tanks: 50mm male camlock coupling with full flow valve or a domestic fitting, being a standard household tap that enables an occupant to access the water supply with domestic hoses or buckets for extinguishing minor fires. B4.1.3 Remote outlets In certain circumstances, it may be beneficial to have the outlet located away from the water supply. In instances in which a remote outlet is to be used, the applicant should consult the local government and DFES on their proposal.
B4.2 Use of Water Supply
• The combination of drinking water and water for firefighting purposes is not recommended, as stagnant water may alter the quality of the drinking water and the emergency services, by law, may not be able to take water from the water supply to suppress a bushfire. • Combining drinking water and water for firefighting purposes is contrary to provisions within clause 4.2.3 of AS/ NZS 3500.1:2021
B4.3 Independent Water and Power Supply
• Water tank/s are to be provided in accordance with Table 11, Water supply dedicated for bushfire firefighting purposes.
B4.5 Location of Water Tanks and Hydrants
• Surrounding vegetation should be considered when locating a water tank. • Avoid locations where the tank will be situated underneath existing vegetation or where vegetation will grow against or overhang the tank, (Figure 39). Where a tank is on the bushfire hazard side of a building, sufficient shielding for the protection of firefighters should be provided. In addition to the tank location, the fitting should be positioned and/or shielded from the bushfire hazard to allow access by emergency services

Figure 39: A good and bad example of landscaping around a water tank

Table 11: Water supply dedicated for bushfire firefighting purposes

SECTIONS FROM THE PLANNING FOR BUSHFIRE GUIDELINES					
SECTION 5[1] STRUCTURE PLANS AND SUBDIVISION APPLICATIONS		**SECTION 6[2] DEVELOPMENT – RESIDENTIAL**	**SECTION 7[1] DEVELOPMENT – COMMERCIAL & INDUSTRIAL**	**SECTION 8[1] – DEVELOPMENT – VULNERABLE LAND USES**	
One additional lot	10,000 litre water tank per lot	10,000 litre water tank per habitable building	For each habitable building - 10,000 litre per 1,500 m² of floor space up to 50,000 litre. Provided in a water tank	Camping ground	At the discretion of the local government
Three to 24 lots	10,000 litre water tank per lot[2] **or** 50,000 litre strategic water tank				
25 lots or more	50,000 litre per 25 lots or part thereof, provided as a strategic water tank(s) **and/or** 10,000 litre water tank per lot			Other vulnerable land uses	For each habitable building - 10,000 litre per 500 m² of floor space up to 50,000 litre. Provided in a water tank

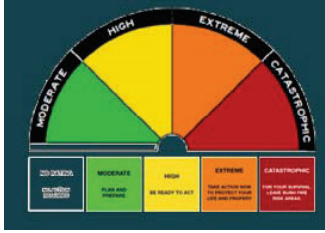
Notes:
[1] Evidence that the identified water supply amounts in either column denoted is to be provided at the relevant planning stage.
[2] where more than one habitable building is proposed, strategic water tanks are to be provided in accordance with Section 5 requirements and at the discretion of the local Government.

Appendix 6 Town of Port Hedland Firebreak Notice

Important Dates	
Variation to Firebreak Notice completed by	30 September
Variation to Firebreak Notice, as approved by Council to be complied with by	31 October
Firebreaks Installed by	31 October
Maintenance of Firebreaks ALL YEAR ROUND	1 November to 31 October

FAILURE TO COMPLY MAY RESULT IN A $5000 FINE

Fire Danger Rating describes the potential danger if a fire was to start.
See what action you should take:



Life-threatening Emergency	000
DFES Information Line	133 337
Bureau of Meteorology	9263 2222
Ranger Services	9158 9300
Horizon Power	132 351
State Emergency Service	132 500
Total Fire Ban Information	1800 709 355

Alerts and Warnings:
www.emergency.wa.gov.au

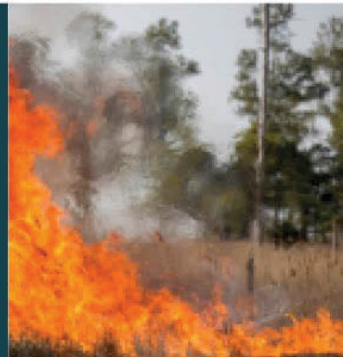
ARE YOU BUSHFIRE READY?

www.areyouready.wa.gov.au

Town of Port Hedland Civic Centre
13 McGregor Street, Port Hedland
PO Box 41 Port Hedland WA 6721

Mon – Fri: 8.00am – 4.00pm

t (08) 9158 9300
f (08) 9158 9399
council@porthedland.wa.gov.au
www.porthedland.wa.gov.au



Town of Port Hedland

Firebreak and Fuel Hazard Reduction Notice 2023-24

BUSH FIRES ACT 1954
TOWN OF PORT HEDLAND
Please read carefully
These are your legal requirements

This notice applies to all owners and/or occupiers of land within the Town of Port Hedland.

Pursuant to Section 33 of the *Bush Fires Act 1954* you are required to take action in accordance with this notice in your land category.

The following categories detail what you must do to comply, with no exemptions. Failure to comply may result in you being fined and/or Council entering your land to install firebreak works at the owner's expense.

This Notice and information has effect 1 October 2022. All previous Firebreak Notices are hereby cancelled.

By order of the Chief Executive Officer.

Your legal requirements

1. Land in townsites/rural residential zoned lots—including Mining, Transient Workforce or Construction Accommodation facilities

1a. Land less than 2000 square metres must:
- ☐ Cut all grass to less than 50mm in height
- ☐ Trim trees and bushes that overhang access ways, driveways, buildings

1b. Land more than 2000 square metres must:
- ☐ Install firebreaks that are:
- ✓ Immediately inside all external boundaries
- ✓ Mineral earth with a width of no less than 5 metres
- ☐ Trim trees and bushes that overhang access ways, driveways, buildings and firebreaks
- ☐ Maintain a 20 metre asset protection zone around dwelling and outbuildings

2. Land outside townsites/rural residential zoned lots—including Mining, Transient Workforce or Construction Accommodation facilities
- ☐ Install firebreaks that are:
- ✓ Immediately inside all external boundaries
- ✓ Mineral earth with a width of no less than 5 metres
- ✓ Mineral earth with a width of no less the 3 metres around all structures, outbuilding and haystacks
- ☐ Trim trees and bushes that overhang access ways, driveways, buildings and firebreaks
- ☐ Maintain a 20 metre asset protection zone around dwelling and outbuildings

2. Variation to Firebreak Notice must:
Apply in writing to the Town by 30 September requesting your variation and the reasons for your application. If approved, all firebreak conditions will be as per the variation and compliance will be for three years.

If your variation is not approved or on change of ownership, the variation is cancelled. The owner must comply with the Firebreak Notice requirements for the category of land.

Definitions

Firebreak
A strip of land that has been cleared of all flammable material, leaving bare mineral earth. This includes the trimming back of anything overhanging the fire break area. Mowed firebreaks are not acceptable

Flammable material
Any vegetation (bushes, grasses, trees, mulch and green waste), object or material that is likely to catch fire.

Asset Protection Zone (APZ)
An APZ is a low-fuel area immediately surrounding a building. It should include a defendable space adjacent to the building, which has minimal vegetation and is free from combustible items and obstructions.

Restrictions

Gazetted townsite of Port Hedland Backyard burning, burning off, and the use of incinerators are banned at all times.

Barbeques
Solid fuel BBQs (wood stoves etc) must only be used for the purpose of cooking. This cannot be done on days between fire danger ratings of High to Catastrophic.

Total Fire Bans
May be declared by the Department of Fire and Emergency Services (DFES), which will be advertised in local media, press, radio and television.

No fires are permitted when a Total Fire Ban is in place. **Please be aware that infringements may be issued or prosecution may commence as a result.**

Further legal requirements to this Firebreak Notice are available at web address.

LOCAL INFRASTRUCTURE AND SERVICING REPORT

LOT 2 (#15) DEMPSTER STREET, PORT HEDLAND
LOCAL INFRASTRUCTURE AND SERVICING REPORT

PREPARED FOR DA CAMPBELL PROPERTY HOLDINGS
ATF THE KDDA PROPERTY TRUST
C/O RFF AUSTRALIA PTY LTD

Porter
Consulting Engineers

REPORT PREPARED FOR

DA CAMPBELL PROPERTY HOLDINGS
ATF THE KDDA PROPERTY TRUST

C/O RFF AUSTRALIA PTY LTD

Prepared by	**Porter Consulting Engineers**
Postal address	PO Box 1036 Canning Bridge WA 6153
Phone	(08) 9315 9955
Email	office@portereng.com.au

Date	23 June 2025
Our reference	R014.25
Job Number	24-06-096
Checked	*SH*

HISTORY AND STATUS OF THE DOCUMENT

Revision	Date issued	Author	Issued to	Revision type
Rev A	20 June 2025	M. Cook	RFF Australia	1st submission
Rev B	23 June 2025	M. Cook	RFF Australia	2nd submission

CONTENTS

1.0 INTRODUCTION

Care of RFF Australia Pty Ltd, DA Campbell Property has engaged Porter Consulting Engineers (PCE) to prepare a Local Infrastructure Servicing Strategy to facilitate the proposed redevelopment of Lot 2 (#15) Dempster Street, Port Hedland.

The Site, Lot 2 (#15) Dempster Street, Port Hedland (see **Figure 1)** is located within the Town of Port Hedland, and is bound by coastal dunes to the north, a residential complex and the former Cooke Point Recreation Club to the west, Dempster Street to the south, and a residential complex to the east.

Figure 1: Lot 2 (#15) Dempster Street, Port Hedland (bound in blue)[1].

It is understood that the site was initially single men's quarters for BHP built circa 1960s, then requisitioned by the Australian Government in 1991 to use as the Port Hedland Detention Centre[2]. The detention centre was decommissioned in 2007 and then became a commercial accommodation facility, known as the Beachfront Village until 2012 and since is no longer in use.

[1] MNG Access, *MNG Access,* viewed 15 July 2024 (aerial image dated August 2023), <mngaccess.com.au>

[2] Government of Western Australia, *Heritage Council*, viewed 15 July 2024, <https://inherit.dplh.wa.gov.au/public/p/18426>

2.0 PROPOSED DEVELOPMENT

2.1 Proposed development layouts

A development layout and structure plan is presented in **Appendix A**, consisting of mixed use development sites and transitional development sites (non-permantent development).

2.2 Planning

Local Planning Scheme[3] No.7 indicates the site is currently zoned "Urban Development". This appears consistent with the redevelopment options.

3.0 LANDFORM

The site currently consists of approximately 60 modular buildings, 10 double storeys, a large communal dining area with a commercial kitchen, with asphalted car parking and concrete footpaths throughout the buildings.

Isolated groupings of trees are located amongst the buildings.

Based on the topographic survey[4] of the site, the site is considered generally flat with a slight falling gradient of 1.3% from the western boundary at 9.3m AHD to 7.3m AHD on the eastern boundary.

Based on the Port Hedland Urban Geology mapping[5] the expected soil type is noted as:

- Q_{hy}: Beach and dune shelly sand

As the site is less than 200m from the beach (Indian Ocean), it is expected that groundwater would be comparable to the sea water level (0m AHD).

A search of the Contaminated Sites Database[6] did not identify any known site contamination.

[3] Government of Western Australia, *Town of Port Hedland planning information*, viewed 22 March 2025 <https://www.wa.gov.au/system/files/2024-07/map6_porthedland_lps7_cooke_point_port_hedland_locality.pdf>

[4] Survey Group, *Camp Demster Street, Port Hedland (SGNVS23002-001-Dempster St camp FS, 25-05-2023)*

[5] Geological Survey of Western Australia, Geological Mapping Section, Department of Mines, *Port Hedland Urban Geology,* 2657 III First Edition 1983

[6] Department of Water and Environmental Regulation, *Find a known contaminated site*, viewed 15 July 2024, <https://www.wa.gov.au/service/environment/environment-information-services/find-known-contaminated-site>

4.0 COASTAL EROSION, INUNDATION AND FORESHORE MANAGEMENT

4.1 Coastal foreshore Management

In June 2021, the Town of Port Hedland adopted the Town of Port Headland Townsite Coastal Foreshore Management Plan[7] to provide a framework to help protect the coastal assets from the West End to Six Mile Creek including the foreshore area by Lot 2 (#15) Dempster Street which forms part of the Cooke Point Management Unit 4.

The Plan makes recommendations towards the management of the foreshore including but not limited to revegetation, a coastal pathway installation, limit illumination by turtle nesting habitat, education signage, and rationalising beach accesses. These recommendations should not impact the proposed development. The Town of Port Hedland is expected to be responsible for the costs and implementation of the Foreshore Management Plan.

4.2 Coastal Erosion Hazard

In 2019, the Town of Port Hedland adopted the Port Hedland Coastal Hazard Risk Management Plan (CHRMAP)[8] to provide a future framework for the Town to mitigate the risks associated with flooding and coastal erosion in the Port Hedland townsite. The CHRMAP also informed the Coastal Foreshore Management Plan.

The erosion mapping from the CHRMAP did not highlight immediate erosion risks to the site. However, the mapping for the year 2120 did indicate that the northern portion of the site is in an area of coastal erosion hazard as shown in **Appendix B**.

The portion of the site within the year 2120 coastal erosion hazard zone is intended to accommodate low-impact, temporary or relocatable uses or development, consistent with long-term coastal hazard adaptation and risk management strategies.

The CHRMAP also discusses various adoption options to manage the erosion risk including but not limited to dune maintenance, sand replenishment, protective groynes, and a retreat through expansion of the foreshore reserve, which would need to be considered by the Town.

4.3 Coastal Inundation Hazard

The CHRMAP also assessed the coastal inundation hazard likelihood for the townsite.

The inundation hazard mapping indicated that the eastern portion of the Site may be at risk of inundation in 2120 (current planning) based on modelling for a 1 in 500 year storm, plus allowance for sea level rise and uncertainty as shown in **Appendix C**. The modelling indicated the Site was not in the inundation hazard zone for the 1 in 10 year and 1 in 1 year storm.

Whilst the Site is shown to be within the 1 in 500 year storm inundation hazard extent, we do not expect the Shire to mandate minimum finished floor levels for dwellings in the development. Minor

[7] Town of Port Hedland, *Town of Port Headland Townsite Coastal Foreshore Management Plan*, Version 1.2, <https://www.porthedland.wa.gov.au/news/council-adopts-final-coastal-foreshore-management-plan/14785>

[8] GHD, *Port Hedland Coastal Hazard Risk Management Plan (CHRMAP),* April 2019, Revision 0.

filling to raise the finished ground levels at the eastern portion of the Site is likely to eliminate the risk of inundation during the 1 in 500 year storm.

The CHRMAP did not assess the 1 in 100 year storm event.

5.0 SERVICING

The existing asset mapping for the respective utilities is presented in **Appendix D**.

5.1 Demolition

The Development is exploring the opportunity to retain/refurbish some of the existing buildings within the 2120 coastal hazard setback line, whilst the remainder of the existing buildings are likely to be demolished or if possible salvaged for recycling or reuse offsite.

The vintage of some of the buildings are circa 1960's. A hazardous materials assessment[9] has been undertaken which identified asbestos in vinyl floor covering, non-metal window coverings, ceilings and walls. The hazardous materials should be appropriately removed prior to knockdown demolition works.

As part of the demolition works pavement, hardstand, foundations, existing underground assets (ie, drainage pits, grease traps, etc) and internal servicing pipes (ie, internal water, electrical, etc) should be chased out and removed.

It is expected that the demolition works will be undertaken as a separate advance contract ahead of the subdivisional development works.

5.2 Earthworks

As we do not expect the Shire to mandate minimum finished floor levels for dwellings, limited earthworks will be required to enable the formation of the roadway and lots. Subject to detailed designs, retaining walls are not expected to be required.

A geotechnical investigation should be undertaken to confirm the site's ground condition, site preparation requirements and the soil permeability characteristics to inform the detailed designs.

As there is no record of known contamination of the online Contaminated Sites Database, geotechnical site remediation is not expected to be required due to its previous land use.

As the expected soil is beach and dune shelly sand, a Class A or Class S site classification in accordance with AS2870 (2011) is expected to be readily achievable.

It may be possible to retain existing trees if they are appropriately located within the proposed lot.

[9] Emissions Assessments Pty Ltd, NVS Construction *Abestos Management Survey (report number 2324-027 Ver2.0, 29-09-2023).*

5.3 Electrical

There is existing underground HV and LV electrical cabling in the northern verge of Dempster Street. There also appears to be an existing transformer and switchgear in the neighbouring property of the former recreation club (Lot 1227) along the boundary of the site. However, this transformer and switchgear is setback and located within the private property of the recreation club (Lot 1227).

Whilst there is HV infrastructure in the area, there is uncertainty with regard to access and capacity. The feasibility of electrical servicing can only be confirmed with a more detailed assessment of the network via a Design Information Package request with Horizon Power. The Design Information Package should be requested as soon as possible, due to the long processing time in receiving responses (9-12 months).

Subject to the final dwelling yields and short-stay accommodation capacity, it is likely that two to four additional transformers may be required to facilitate the development.

5.4 Communications

There is existing NBN pit and pipe infrastructure in Dempster Street which will need to be extended and reticulated throughout the development.

5.5 Water

There is an existing 150mm water main along the northern verge of Dempster Street, with the site currently being serviced with a 100mm asbestos cement water supply main as shown in **Figure 2**.

Figure 2: Illustration of Lot 2 being serviced with a 100mm water supply main.

Due to the proposed development layouts, it is expected that this 100mm asbestos cement water supply main will need to be appropriately removed and disposed of as per asbestos management procedures.

Installation of new Water Corporation water mains to be reticulated throughout the development via the proposed gazetted road network.

5.6 Wastewater

There is an existing Water Corporation 150mm vitrified clay sewer pipe that runs through the site from the former recreation centre towards Dempster Street as shown in **Figure 3**. There is also Water Corporation sewers along the eastern boundary to service Lot 510 (#19 Dempster Street).

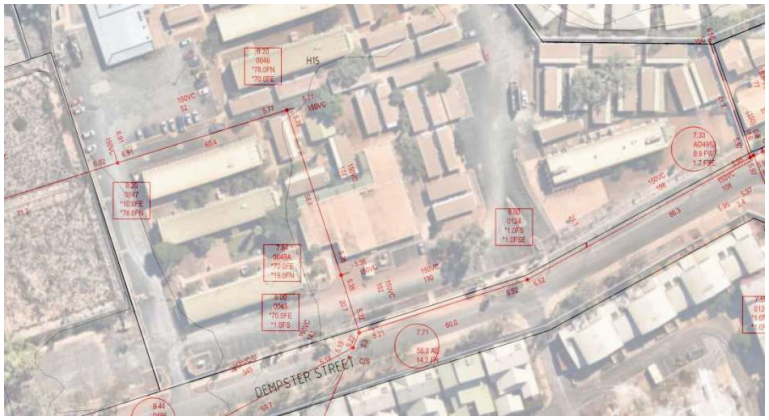


Figure 3:Existing Water Corporation sewers in Lot 2 (#15) Dempster Street (shown in red)

The existing sewer from the recreation centre would need to be realigned and placed within the proposed road reservation. A general layout schematic for the proposed wastewater reticulation is shown in **Appendix E**.

For the existing sewer along the eastern boundary of the site, early discussions should be had with Water Corporation to confirm if they would support keeping this sewer in place. The Water Corporation typically only allow sewers (with a 3m wide easement) to be within private lots larger than 600m^2 in area. Should the Water Corporation not support having this existing sewer in lots smaller than 600m2, consideration may need to be had to adjust the proposed R80 zoning of these lots.

Depending on the final development density and dwelling yields, it is expected that DN150 and DN225 Water Corporation sewers is likely to be required which will be installed in the proposed road reservations.

Due to the expected separation to groundwater, groundwater control is not expected to be required.

5.7 Roadworks

Dempster Street is an existing 7.2m wide asphalted roadway with on-street parking bays in the northern verge and a 2.1m wide footpath in each verge. Should proposed driveway access front Dempster Street, then consideration will need to be had to remove the existing on-street parking. No further modifications are expected to Dempster Street as the pavement and footpaths appear to be in sound condition.

It is expected that the proposed internal roads will be an asphalted 7.2m wide kerbed road with a 2.0m wide footpath to one verge.

5.8 Drainage

A Local Water Management Strategy[10] (LWMS) has been prepared which will outlines the stormwater management expectations that will inform in the future more detailed stormwater studies and designs.

As noted in the LWMS, in broad term the stormwater mangement strategies are:

Water Conservation and Servicing

- The Site is to be serviced with potable water from the Water Corporation's network.
- The Site wastewater is to be connected to the Water Corporation's network.
- Future landscaping is designed to be waterwise to minimise irrigation requirements.

Stormwater Management

- All lots are to detain and infiltrate their stormwater in line with The Town's minimum requirements and preferentially at a rate of 1m3 of storage per 40m2 of catchment area.
- Road runoff is to be collected in either a pit and pipe network for initial infiltration in soakwells or bioretention gardens.
- Excess runoff is to be detained and infiltrated in a bioretention basin or similar large infiltration device so that all flows up to and including the 1% AEP generated on the Site are detained to at least the pre-development flow rate.
- 1EY stormwater treatment is achieved through on-lot detention and infiltration in conjunction with potential road runoff treatment through the bioretention gardens and basin.
- Flows from external areas are to be transferred through the Site, with the Site's stormwater detention network assisting with reducing the final flow rate.
- The drainage network is designed to discharge water to Dempster Street, as currently happens. The option to release at least part of the Site's flows to the adjoining foreshore have also been analysed.

Flood Protection

- All finished floor levels will be designed to be a minimum 300mm above the adjoining road gutter flows and the onsite basins as relevant.
- External flows are to be transferred through the Site via the internal road network and other designated flow paths as determined at detailed design.

[10] Oversby Consulting, *Lot 2 Dempster Street, Port Hedland, Local Water Management Strategy (Draft B24029, May 2025)*

- Internal flood flows generated within the Site will be managed to protect infrastructure and human safety, with the flows being controlled through the road and swale network.
- All new buildings are to be above the coastal storm surge level.
- All new permanent structures are to be outside the coastal erosion hazard zone.

Groundwater Management

- Groundwater is managed via infiltration of stormwater throughout the Site, to replicate the current infiltration regime.
- The natural separation to groundwater in combination with any required filling of the site provides suitable post-development separation to groundwater.

Ecosystem Protection

- New ephemeral riparian habitats will be created within the bioretention systems by using native riparian species plantings suited to the local conditions and that complements the adjoining foreshore.
- The WSUD elements used within the Site will improve discharging water quality, assisting with protecting and enhancing downstream ecosystems.
- The landscaping will utilise nutrient and waterwise practices to minimise contamination of the groundwater and surface runoff to any sensitive ecosystems.
- All lots are to implement best practice water management to minimise leaching of contaminants into the groundwater or surface water system.

Coastal and OceanRisk Management

- All new buildings are to be above the coastal storm surge level.
- All new permanent structures are to be outside the coastal erosion hazard zone.

As part of ongoing design development, an Urban Water Management Plan (UWMP) will need to be prepared and approved as a requirement of subdivisional conditions to inform the preparation of detailed engineering stormwater civil design drawings.

5.9 Fencing

The security chainmesh fencing fronting Dempster Street has recently been replaced with 1.8m garrison fencing. As part of the proposed redevelopment works, any remaining security fencing as part of the former detention centre will be replaced.

5.10 Bushfire management

The online Map of Bushfire Prone Areas[11] indicates that the northern half of the site is within a bushfire prone area (see **Figure 4**) due to the nearby dunal vegetation, therefore a Bushfire Management Plan is expected to be required.

A Bushfire Management Plan[12] has been prepared which has identified the Bushfire Attack Levels and appropriate management measures.

[11] Department of Fire and Emergency Services, *Bushfire Prone Areas,* viewed 16 July 2024, <https://www.dfes.wa.gov.au/hazard-information/bushfire/bushfire-prone-areas>

[12] Linfire Consultancy, *15 Dempster Street, Port Hedland Bushfire Management Plan, 5 December 2022*

Consideration could be had to provide greater separation from the dunal vegetation to the proposed buildings which could be in the form of paths, roadways or drainage areas to reduce the bushfire attack level.

Figure 4: Bush Fire Prone Area (shaded in pink)

5.11 Irrigation and landscaping

Should any Public Open Space or street verge areas be landscaped / planted as part of the subdivisional works, consideration will need to be had to secure a water source, such as the following:

- From Water Corporation scheme water mains,
- Hand watering via a truck for the first 2 years until the plants are established,
- From a groundwater bore. The LWMS notes there are currently groundwater licence allocations available.

5.12 Developer Contribution Schemes

We are not aware of any Developer Contribution Schemes in place for the area.

A new WAPC Operational policy came into effect in December 2022 whereby a Primary School Education contribution is to be levied to any new subdivision development later than 5 lots in the Metropolitan, Peel or Bunbury Region Scheme areas. As this site is not within these scheme areas, the Primary School Education contribution is not applicable.

6.0 CONCLUSION

Based on the information reviewed, there does not appear to be any factors that would prevent the site from being redevelopment to support a residential development.

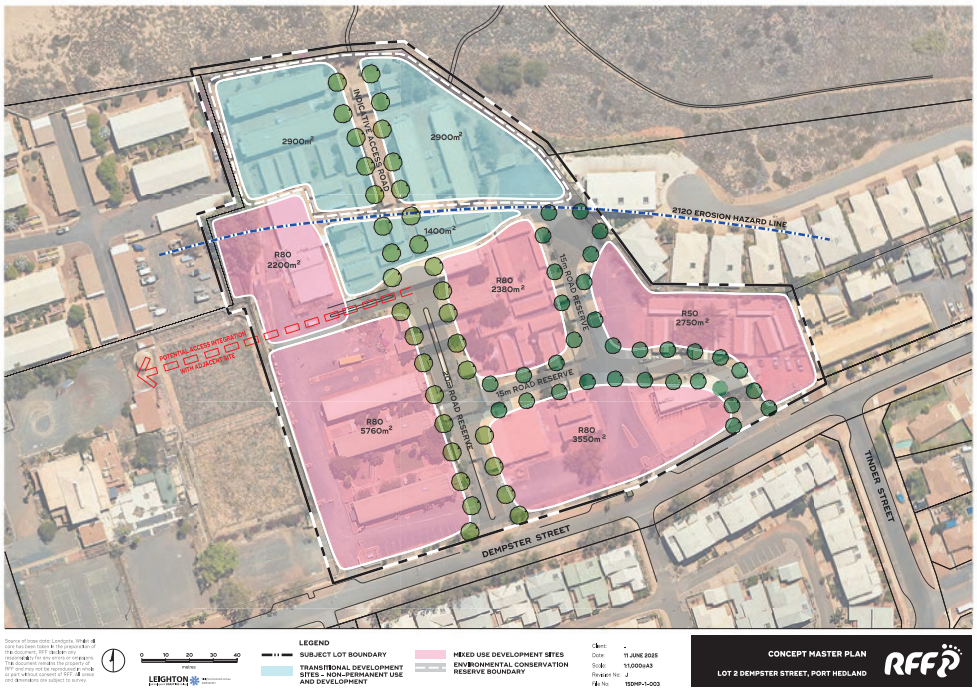
As part of ongoing design development, the following should be considered:

a) Obtain a feature survey with an existing services located survey to inform design documentation.
b) Utilising the LWMS, prepare a Urban Water Management Plan to inform civil engineering detailed designs.
a) Initiate early discussions with Horizon Power to confirm servicing requirements.
b) Initiate early discussions with the Town of Port Hedland to clarify erosion and inundation management expectations.
c) Initiate early discussions with the Water Corporation to confirm if the Corporation would support having sewers located in lots smaller than 600m^2. Or alternatively adjust the respective lots to be greater than 600m^2.
d) Consider a irrigation water source.

APPENDIX A - Proposed Redevelopment Options

- **Concept Master Plan (File 15DMP-1-003, Revision J, 11 June 2025)**

- **Extract from Port Hedland Coastal Hazard Risk Management Plan (CHRMAP)**



Paper Size ISO A3
0 70 140 210 280
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Town of Port Hedland
Port Hedland Townsite CHRMAP

Coastal Erosion Hazard Likelihood Map

Project No. 61-36239
Revision No. 0
Date 19/04/2018

Page 4 of 6 Pages

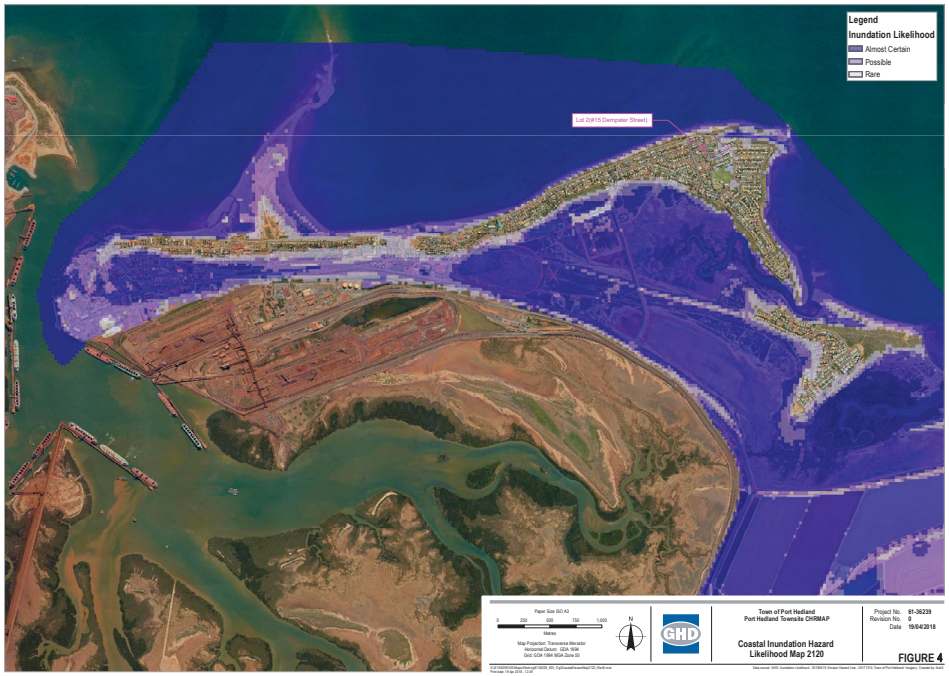
FIGURE 1

G:\61\36239\GIS\Maps\Working\61\36239_CoastalErosionHazardMap_WorkingA.mxd
Print date: 19 Apr 2018 - 14:01

Data source: GHD: Inundation Likelihood, Erosion Hazard Polygons - 20171214; Town of Port Hedland: Imagery Created by: lscl2

APPENDIX C - Coastal Inundation Hazard Likelihood Map 2120

- **Extract from Port Hedland Coastal Hazard Risk Management Plan (CHRMAP)**



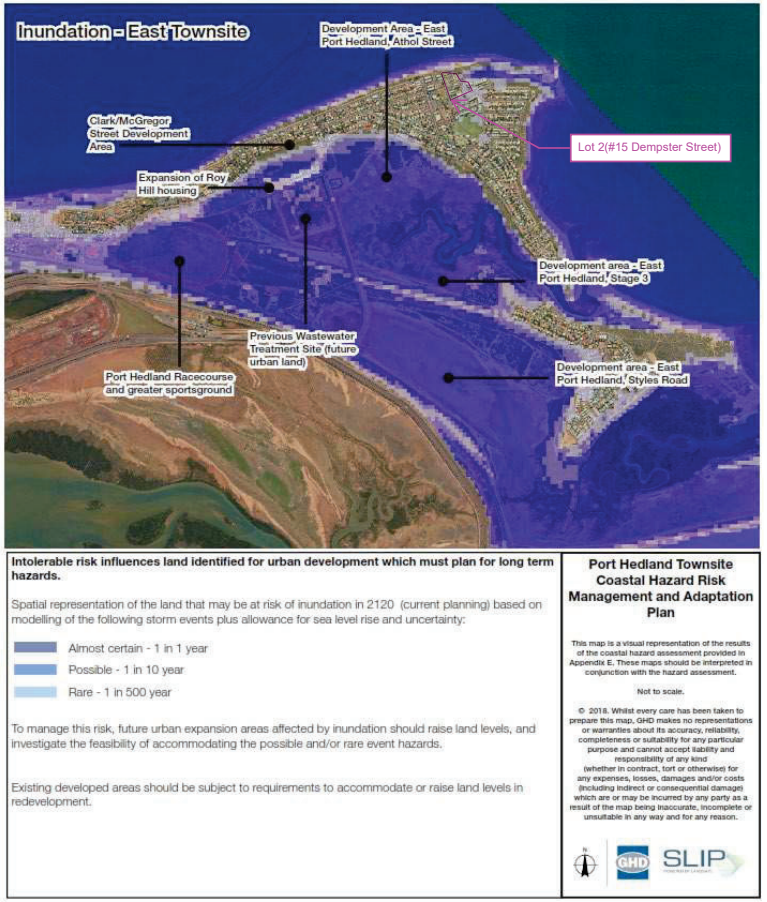


Figure 4-10 East Townsite inundation hazard and recommended adaptation

APPENDIX D - Before you Dig Asset Mapping

Job No 37133191

byda.com.au

Contact Details

Contact	Contact number	Company	Enquirer ID
MEL GASPAR	(08) 9315 9955	Porter Consulting Engineers	3003467

Email
mel@portereng.com.au

Address
58 Kishorn Road
Mount Pleasant WA 6153

Job Site and Enquiry Details

WARNING: The map below only displays the location of the proposed job site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.

Enquiry date	Start date	End date	On behalf of	Job purpose	Locations	Onsite activities
16/07/2024	16/07/2024	25/09/2024	Private	Design	Both Road, Nature Strip, Footpath	Planning & Design

Check that the location of the job site is correct. If not, you must submit a new enquiry.

If the scope of works change or plan validity dates expire, you must submit a new enquiry.

Do NOT dig without plans. Safe excavation is your responsibility. If you don't understand the plans or how to proceed safely, please contact the relevant asset owners.

User Reference	Address	Notes/description
15 Dempster Street	15 Dempster Street Port Hedland WA 6721	-

Your Responsibility and Duty of Care

- **Lodging an enquiry does not authorise project commencement.** Before starting work, you must obtain all necessary information from all affected asset owners.
- If you don't receive plans within 2 business days, contact the asset owner & quote their sequence number.
- Always follow the 5Ps of Safe Excavation (page 2), and locate assets before commencing work.
- Ensure you comply with State legislative requirements for Duty of Care and safe digging.
- If you damage an underground asset, you MUST advise the asset owner immediately.
- By using the BYDA service, you agree to the Privacy Policy and Term of Use.
- For more information on safe digging practices, visit www.byda.com.au

Asset Owner Details

Below is a list of asset owners with underground infrastructure in and around your job site. It is your responsibility to identify the presence of these assets. Plans issued by Members are indicative only unless specified otherwise. Note: not all asset owners are registered with BYDA. You must contact asset owners not listed here directly.

Referral ID (Seq. no)	Authority Name	Phone	Status
241924329	Horizon Power	(08) 6310 1601	NOTIFIED
241924330	NBN Co (WA)	1800 687 626	NOTIFIED
241924328	Public Transport Authority - Bus Stops	13 62 13	NOTIFIED
241924331	Telstra (WA)	1800 653 935	NOTIFIED
241924332	Water Corporation	13 13 95	NOTIFIED

END OF UTILITIES LIST

The 5Ps of Safe Excavation

Plan
Plan your job. Use the BYDA service at least one day before your job is due to begin, and ensure you have the correct plans and information required to carry out a safe project.

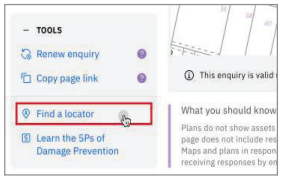
Prepare
Prepare by communicating with asset owners if you need assistance. Look for clues onsite. Engage a skilled Locator.

Pothole
Potholing is physically sighting the asset by hand digging or hydro vacuum extraction.

Protect
Protecting and supporting the exposed infrastructure is the responsibility of the excavator. Always erect safety barriers in areas of risk and enforce exclusion zones.

Proceed
Only proceed with your excavation work after planning, preparing, potholing (unless prohibited), and having protective measures in place.

Engage a skilled Locator



When you lodge an enquiry you will see skilled Locators to contact

Visit the Certified Locator website directly and search for a locator near you

dbydlocator.com/certified-locating-organisation

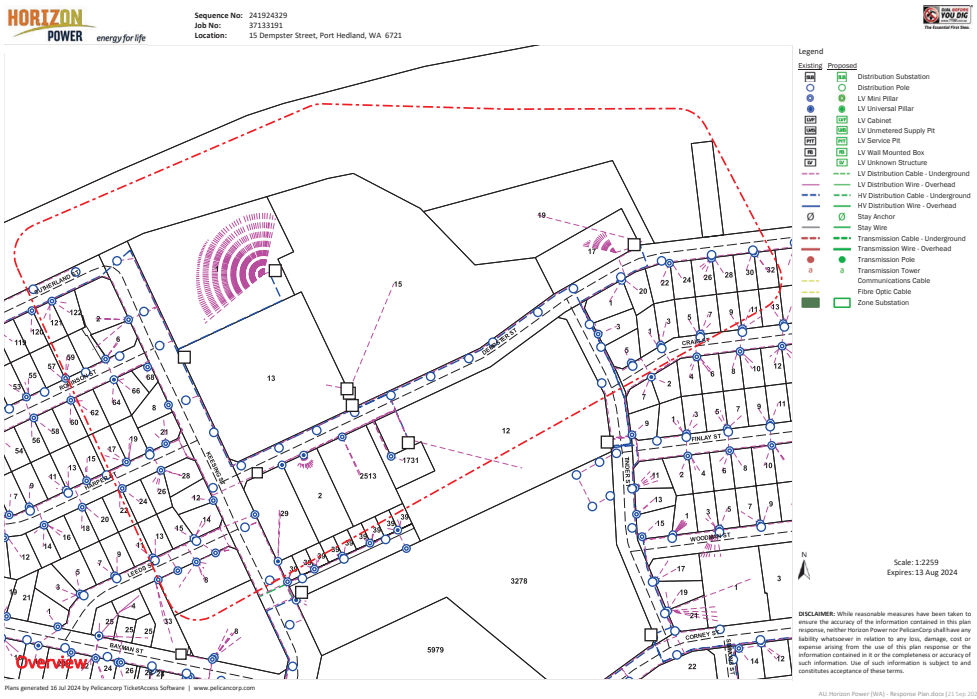
Book a FREE BYDA Session

BYDA offers two different sessions to suit you and your organisation's needs. The free sessions are offered in two different formats - online and face-to-face:

1. **Awareness Session:** Understand the role of BYDA, safe excavation practices, complying with asset-owner instructions, and the consequences of damages. Learn how to mitigate and avoid potential damage and harm and ensure a safe work environment.
2. **Plan Reading Session:** Develop the skills to interpret asset owners' plans, legends, and symbols effectively. Understand the complexities of plan interpretation to ensure smooth project execution.

To book a session, visit:
byda.com.au/contact/education-awareness-enquiry-form/

BOOK NOW



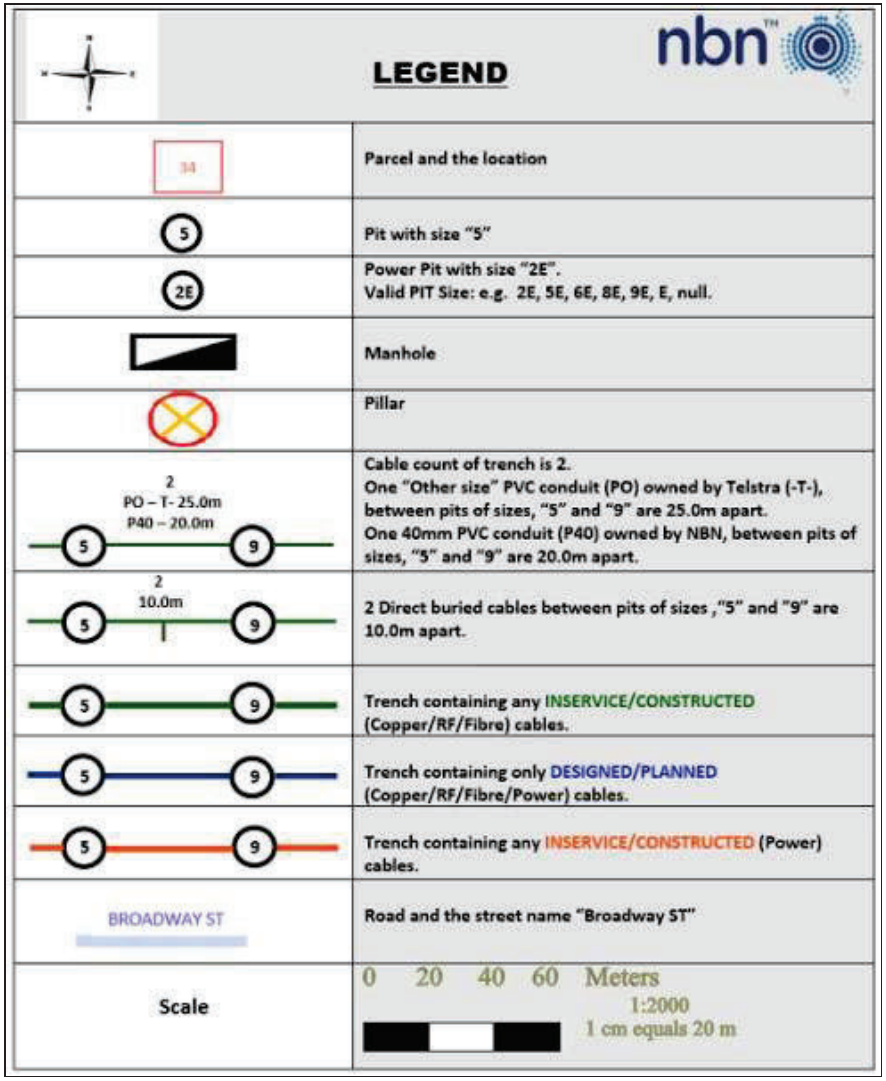
To:	MEL GASPAR
Phone:	Not Supplied
Fax:	Not Supplied
Email:	mel@portereng.com.au

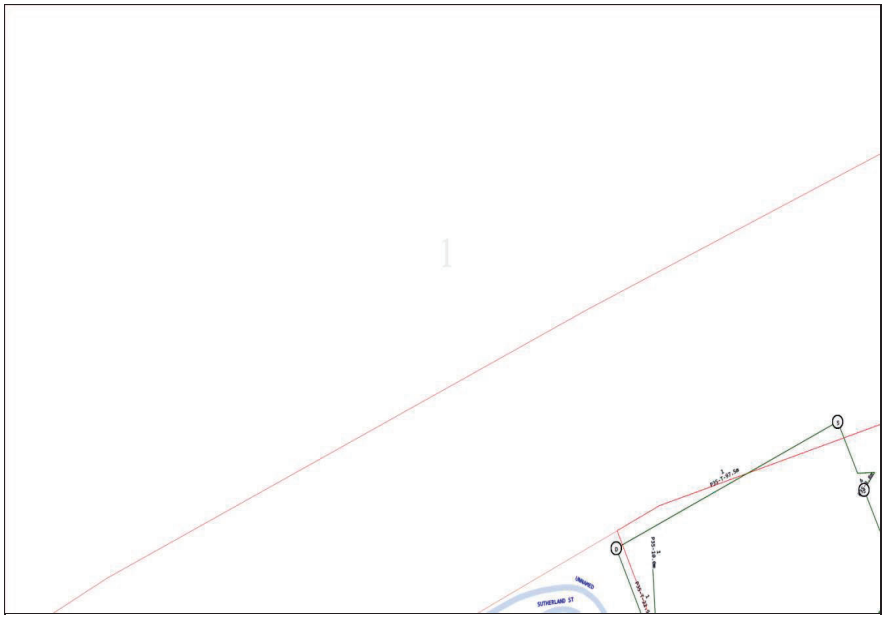
Dial before you dig Job #:	37133191
Sequence #	241924330
Issue Date:	16/07/2024
Location:	15 Dempster Street , Port Hedland , WA , 6721

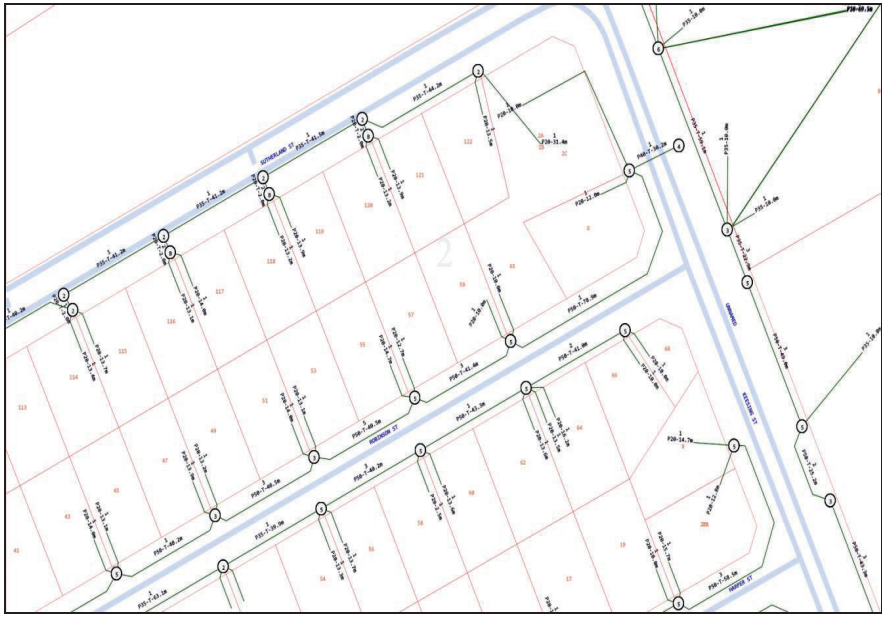
BEFORE YOU DIG www.byda.com.au Zero Damage - Zero Harm

Indicative Plans are tiled below to demonstrate how to layout and read nbn asset plans

1	4	7
2	5	8
3	6	9




1
SUTHERLAND ST
UNNAMED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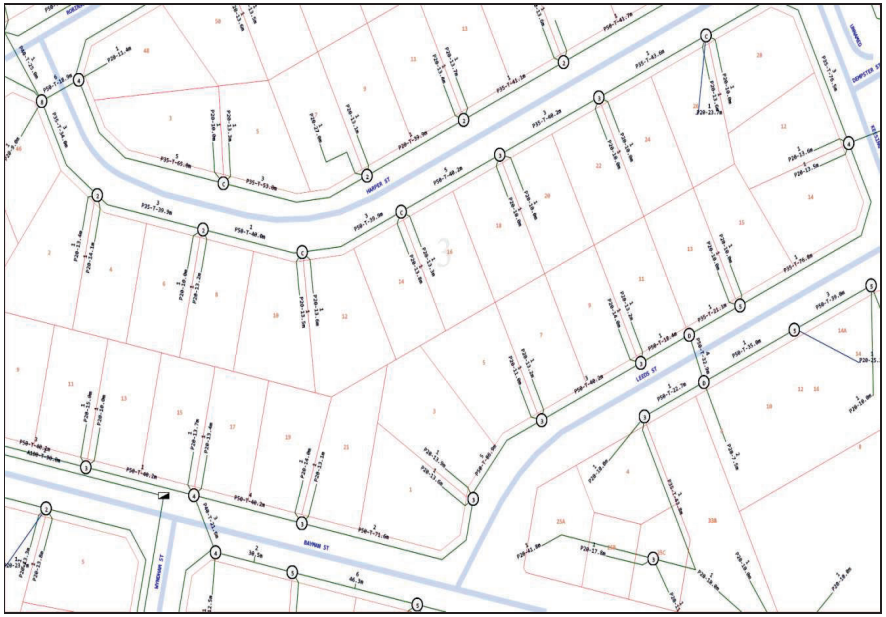
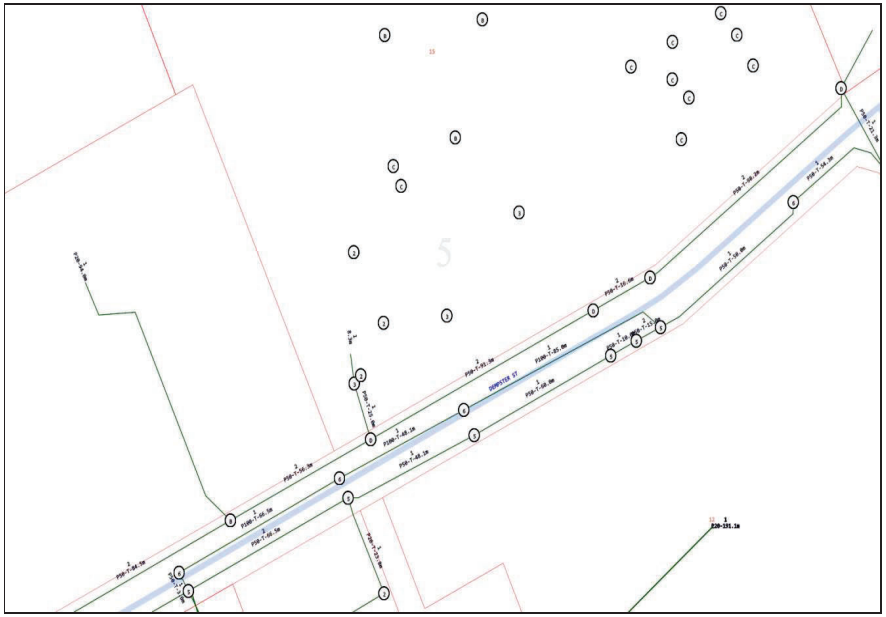
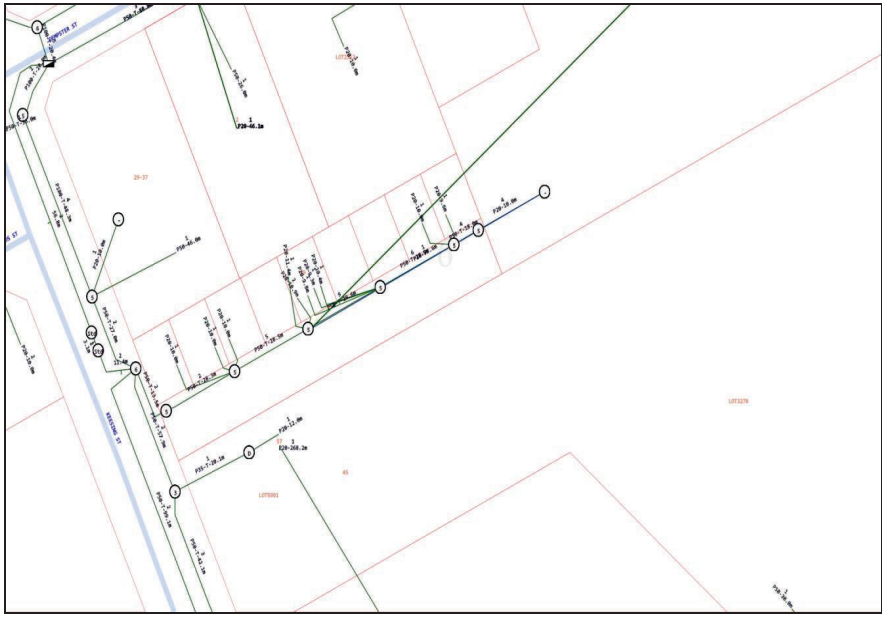
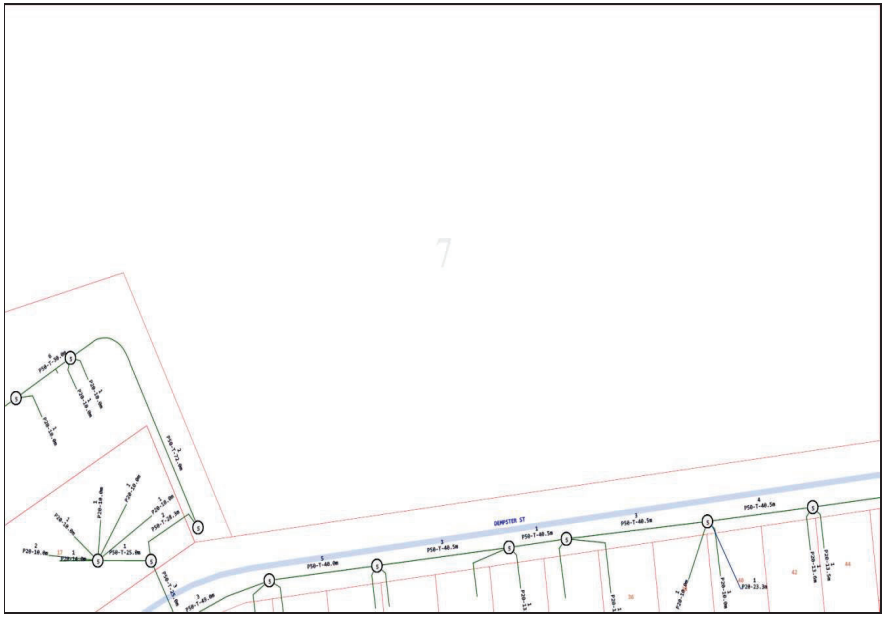
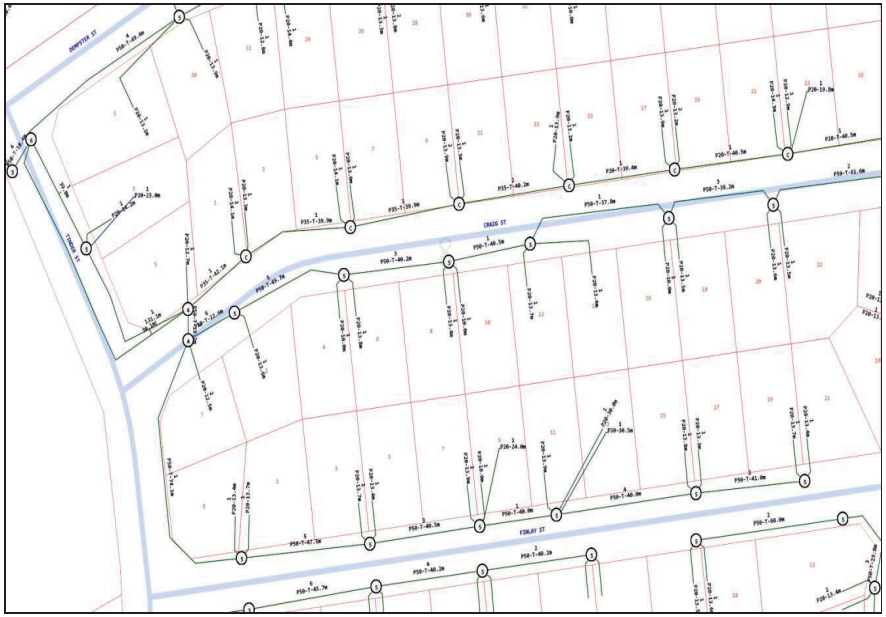
ROBINSON ST
UNNAMED
EDISON ST
HARRIS ST

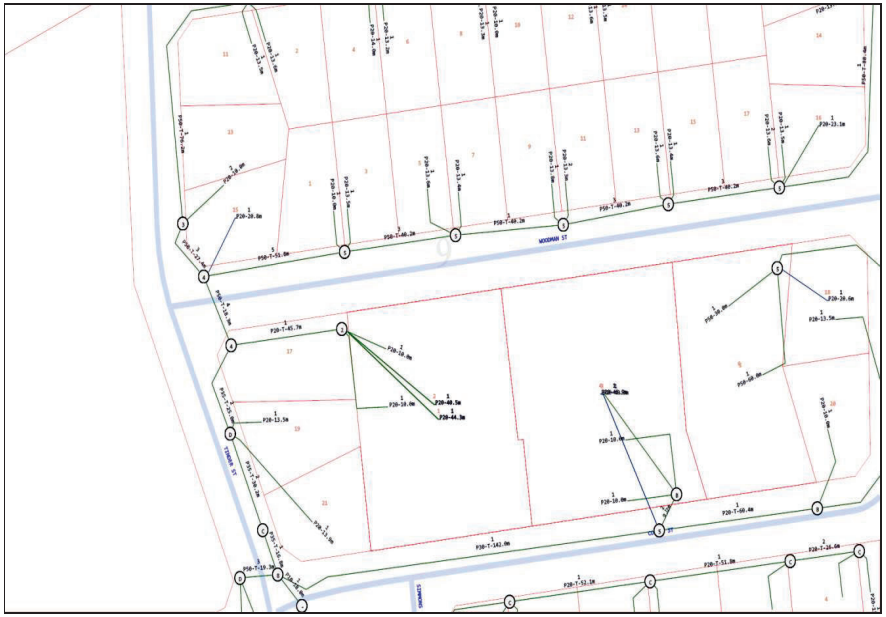






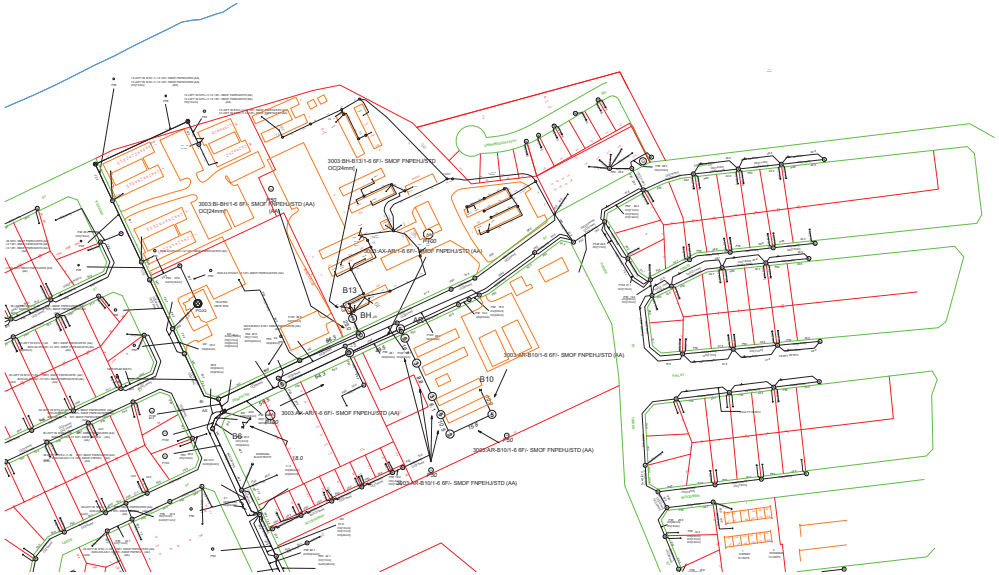

DEMPSTER ST


DEMPSTER ST
CRAIG ST
FINLAY ST



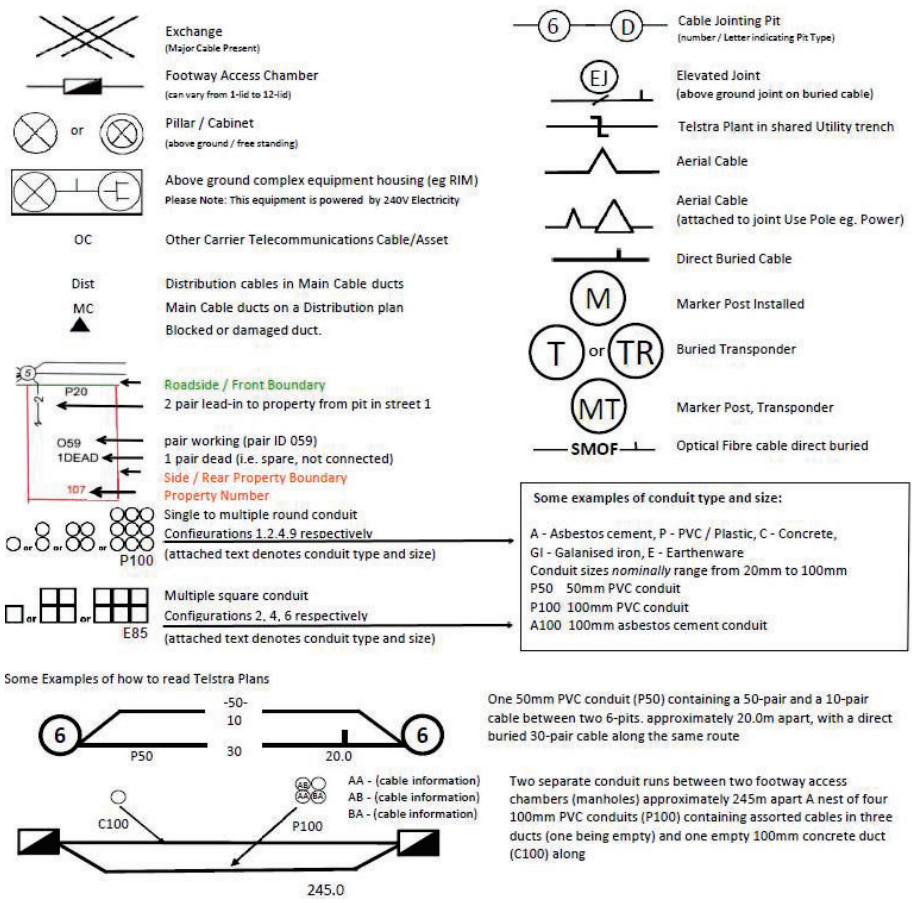
Emergency Contacts

You must immediately report any damage to the **nbn™** network that you are/become aware of.
Notification may be by telephone - 1800 626 329.



Telstra Map

LEGEND



Protect our Network:

by maintaining the following distances from our assets:

- 1.0m Mechanical Excavators, Farm Ploughing, Tree Removal
- 500mmVibrating Plate or Wacker Packer Compactor
- 600mm Heavy Vehicle Traffic (over 3 tonnes) not to be driven across Telstra ducts or plant.
- 1.0mJackhammers/Pneumatic Breakers
- 2.0m Boring Equipment (in-line, horizontal and vertical)

For more info contact a Certified Locating Organisation or Telstra Plan Services 1800 653 935

Michael Cook

From: BYDA - Public Transport Authority - Bus Stops <dbyd@1100.com.au>
Sent: Tuesday, 16 July 2024 1:00 PM
To: Mel Gaspar
Subject: BYDA - Job 37133191 - Referral 241924328 - 15 Dempster Street

This content was sent by email from Public Transport Authority - Bus Stops in response to your Before You Dig enquiry.

Original subject	DBYD JOB:37133191 SEQ:241924328 - 15 Dempster Street, Port Hedland, WA, 6721
Original sender	BusStops@pta.wa.gov.au
Received	16 Jul 2024 12:59:47pm AWST

Dear MEL GASPAR

DBYD Sequence Number: 241924328
Job Number: 37133191
Your reference: Not Supplied
Location details: 15 Dempster Street Port Hedland WA 6721

WORK IMPACTING ON BUS STOPS

You are receiving this letter because it has been identified that your proposed works may impact upon a public bus stop under the control of the Public Transport Authority of Western Australia (PTA).

The Disability Discrimination Act 1992 requires that all public bus stops must eventually comply with the Disability Standards for Accessible Public Transport 2002 (Disability Standards). Under section 32.1 of the Disability Standards, any party undertaking works which results in the substantial refurbishment or alteration of a bus stop passenger boarding area must rectify the passenger boarding area to achieve full compliance with the Disability Standards. All planned works or activities that may impact upon any of the areas or improvements detailed below will likely trigger this requirement:

- a bus stop passenger boarding area (i.e. the bus stop post and the area immediately near the bus stop where passengers wait to board a bus);
- a bus stop passenger boarding area kerb height (i.e. the height of the kerb relative to the road surface);
- a bus shelter or the hardstand area surrounding it; and/or
- a footpath or pedestrian pram ramp connecting a bus stop boarding area to the local footpath network.

If your planned works are likely to meet any of the above circumstances, please complete this Bus Stop Works Impact form and forward it to BusStops@pta.wa.gov.au.

If there is no physical impact, but safe access to the bus stop is affected or traffic management associated with the planned works requires services to deviate, then a notification should be sent to Transperth.ServiceDisruptions@pta.wa.gov.au detailing the scope of works, commencement date, duration and approved traffic management plan.

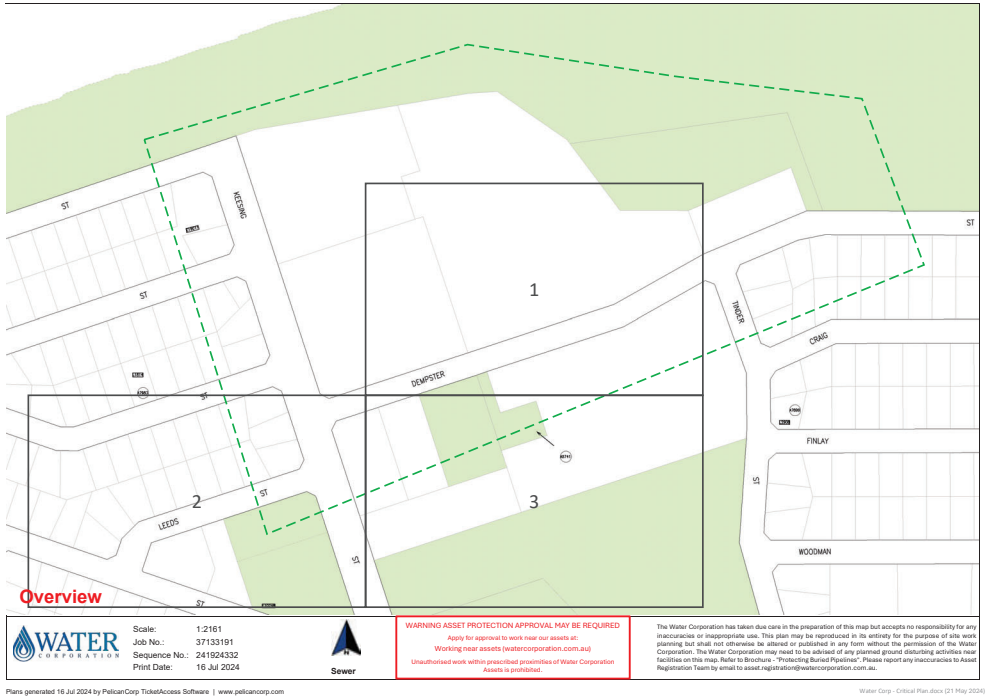
The PTA will assess the information provided and advise of any applicable fees, charges or bond arrangements payable prior to commencement of works. Should you elect to not engage with the PTA, a record of this correspondence will be kept on file. If, at a later time, the PTA identifies issues associated with your works, you may be held liable for the cost of any required rectification works.

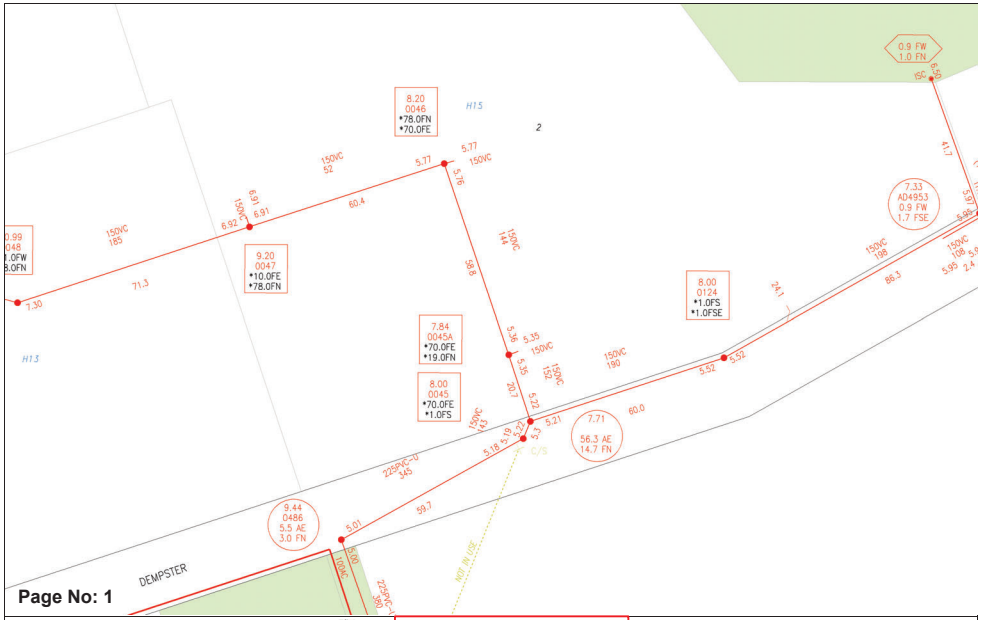
Yours sincerely

Brad Holden

MANAGER BUS STOP INFRASTRUCTURE AND INFORMATION

TRANSPERTH, REGIONAL TOWN AND SCHOOL BUS SERVICES





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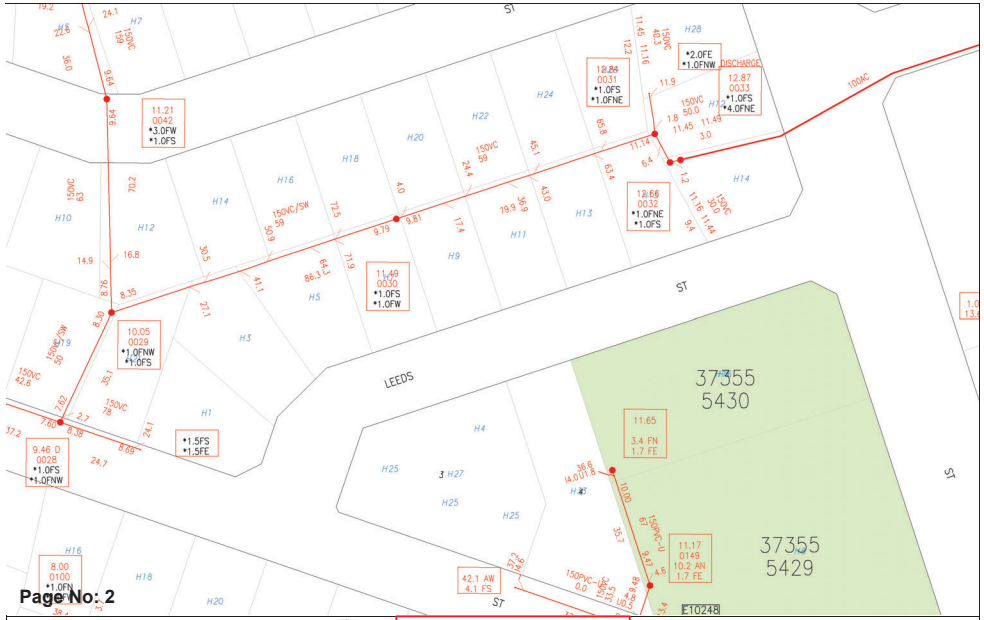

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WATER CORPORATION

Scale: 1:750
Job No.: 37133191
Sequence No.: 241924332
Print Date: 16 Jul 2024

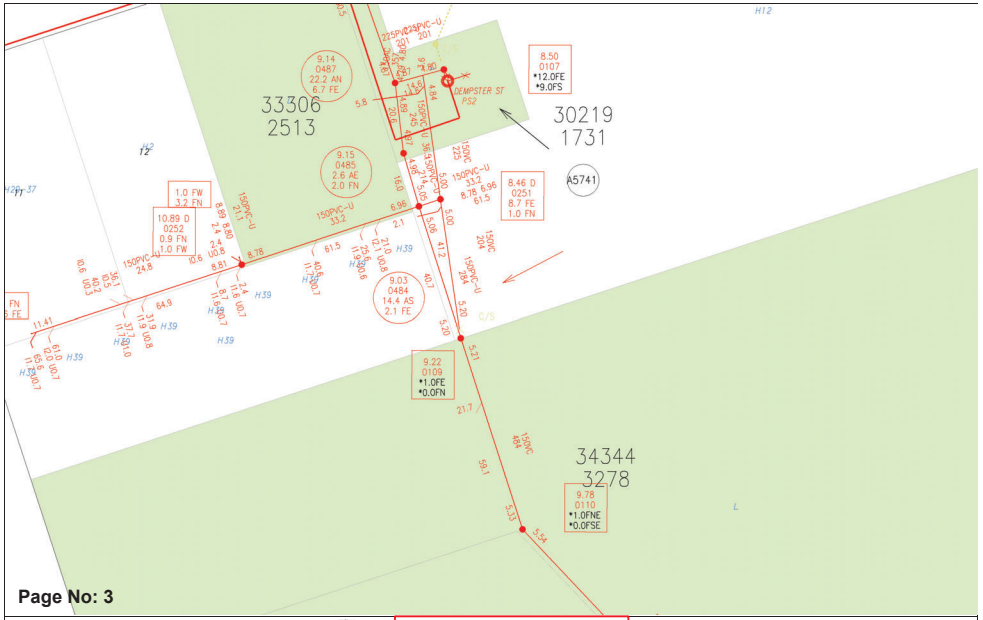
Sewer

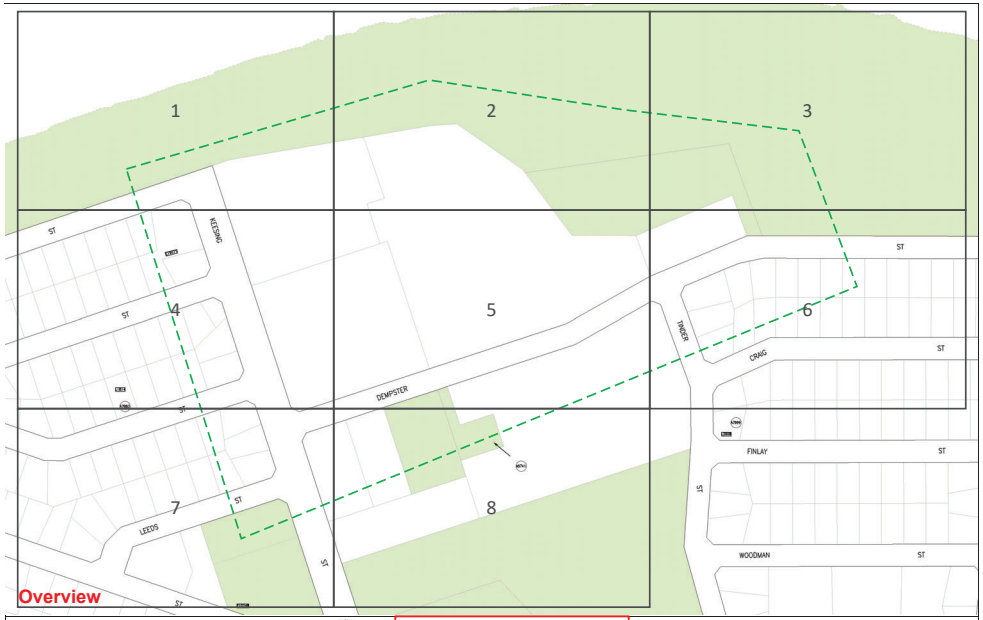
WARNING ASSET PROTECTION APPROVAL MAY BE REQUIRED
Apply for approval to work near our assets at:
Working near assets (watercorporation.com.au)
Unauthorised work within prescribed proximities of Water Corporation Assets is prohibited.

The Water Corporation has taken due care in the preparation of this map but accepts no responsibility for any inaccuracies or inappropriate use. This plan may be reproduced in its entirety for the purpose of site work planning but shall not otherwise be altered or published in any form without the permission of the Water Corporation. The Water Corporation may need to be advised of any planned ground disturbing activities near facilities on this map. Refer to Brochure - "Protecting Buried Pipelines". Please report any inaccuracies to Asset Registration Team by email to asset.registration@watercorporation.com.au.

Plans generated 16 Jul 2024 by PelicanCorp TicketAccess Software | www.pelicancorp.com

Water Corp - Critical Plan.docx (21 May 2024)





WATER CORPORATION

Scale: 1:750
Job No.: 37133191
Sequence No.: 241924332
Print Date: 16 Jul 2024

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WATER CORPORATION

Scale: 1:2306
Job No.: 37133191
Sequence No.: 241924332
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Water

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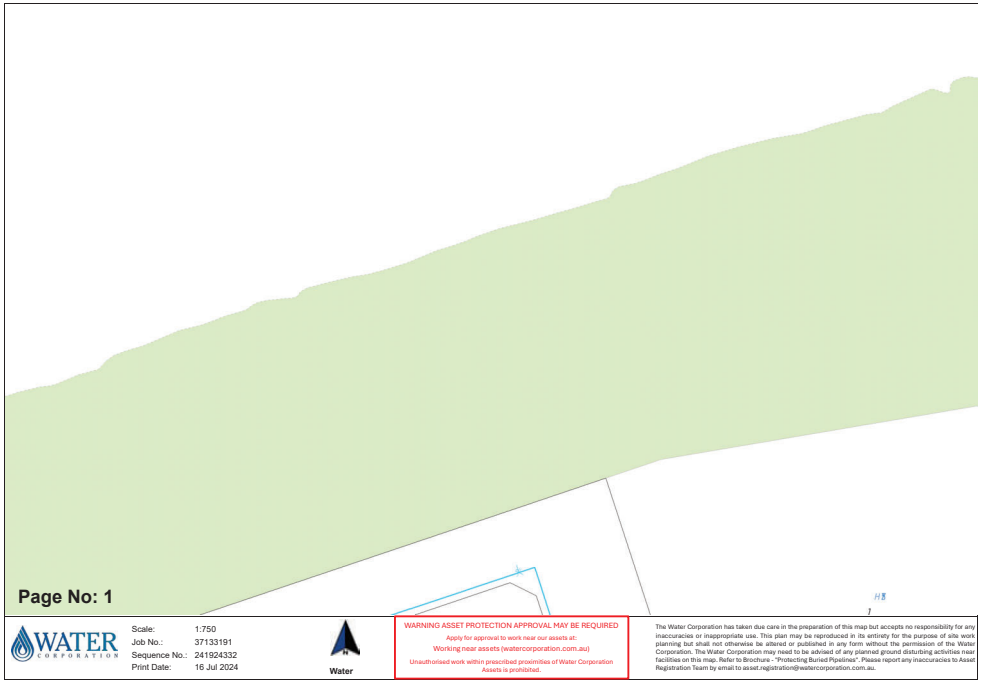

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WATER CORPORATION

Scale: 1:750
Job No.: 37133191
Sequence No.: 241924332
Print Date: 16 Jul 2024

Water

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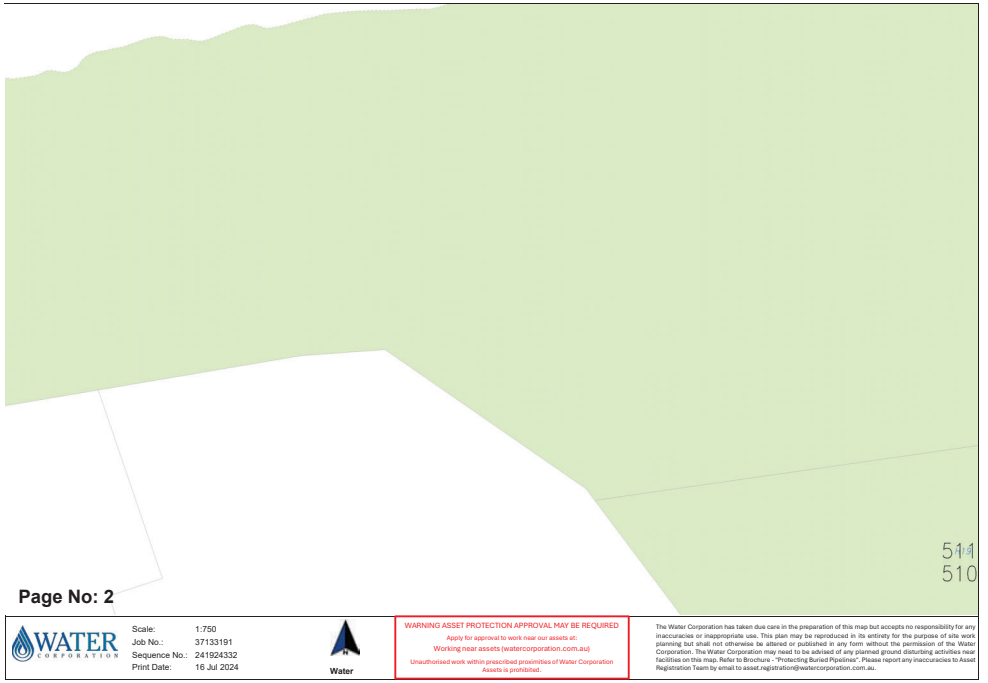

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WATER CORPORATION

Scale: 1:750
Job No.: 37133191
Sequence No.: 241924332
Print Date: 16 Jul 2024

Water

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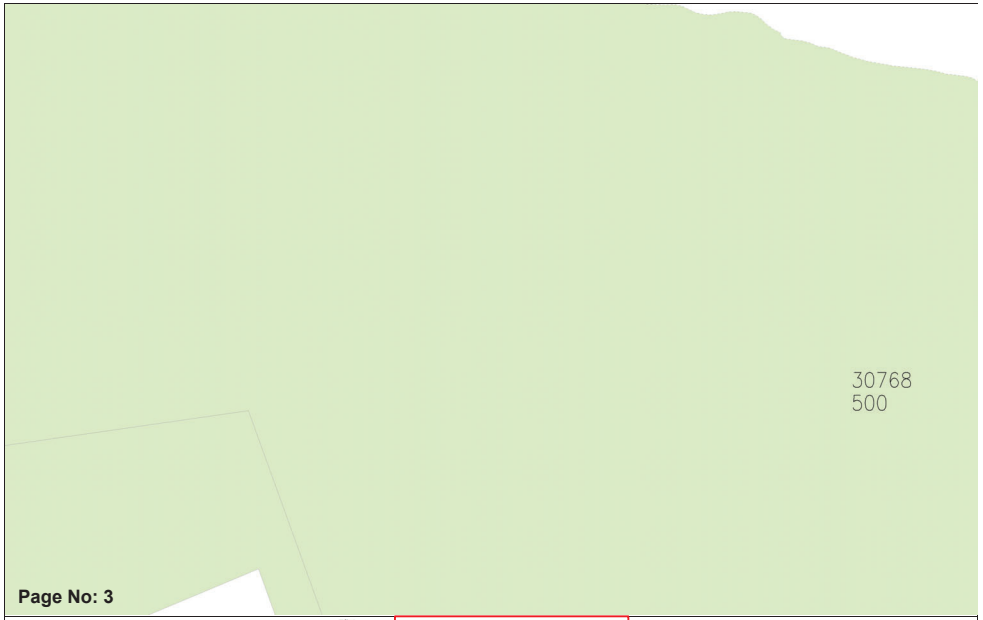
Water Corp - Critical Plan.docx (21 May 2024)



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WATER CORPORATION

Scale: 1:750
Job No.: 37133191
Sequence No.: 241924332
Print Date: 16 Jul 2024

Water

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Page No: 4

WATER CORPORATION

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Sequence No.: 241924332
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Water

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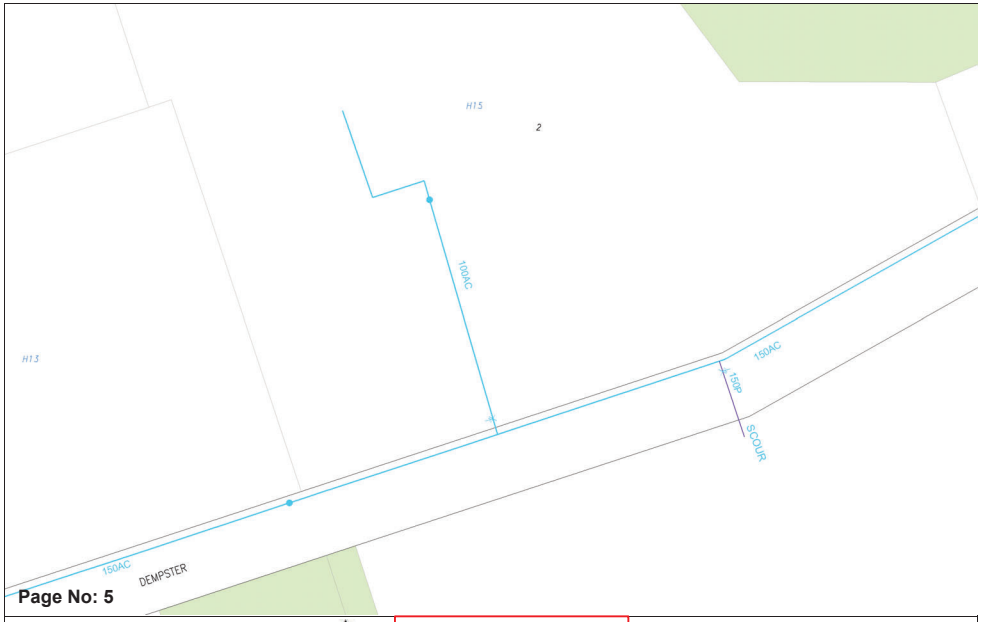

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WATER CORPORATION

Scale: 1:750
Job No.: 37133191
Sequence No.: 241924332
Print Date: 16 Jul 2024

Water

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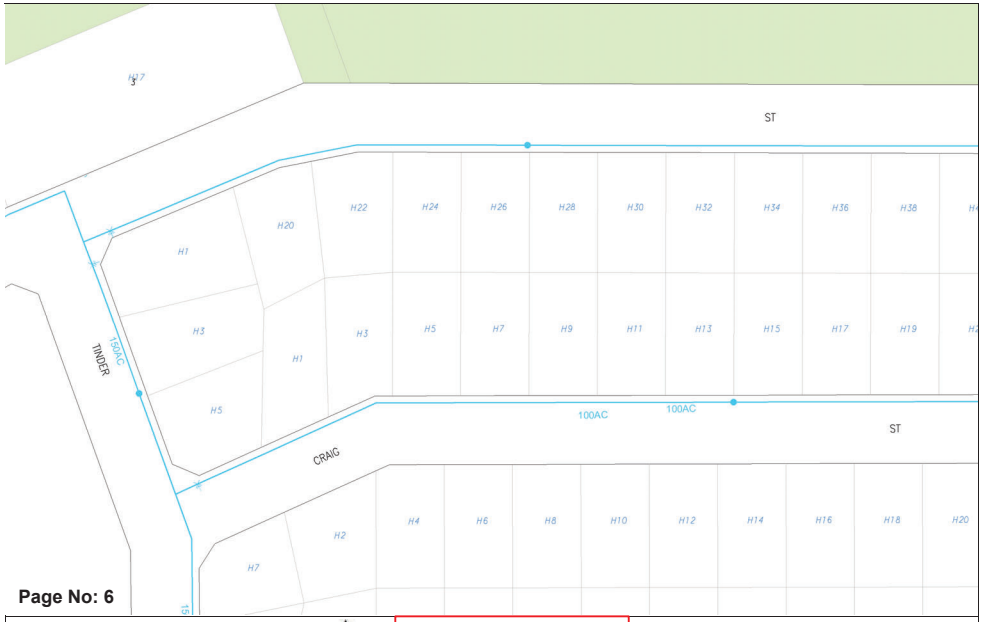

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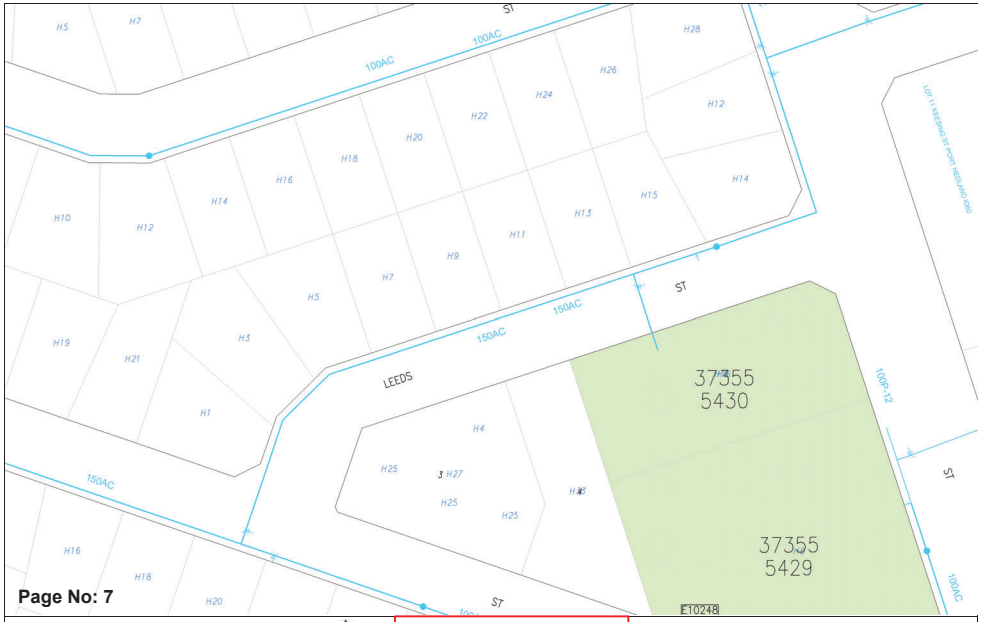

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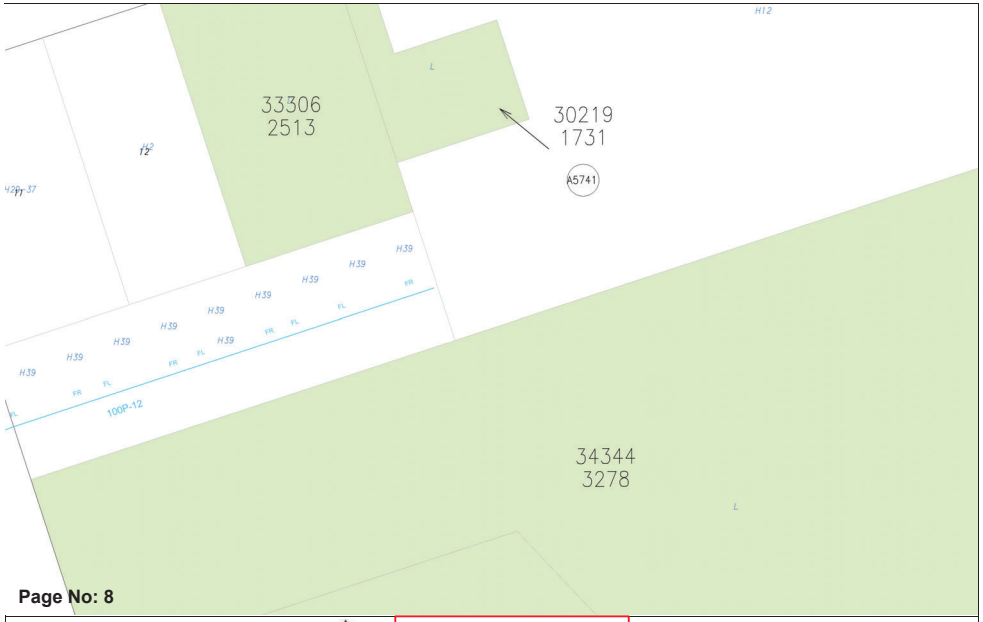

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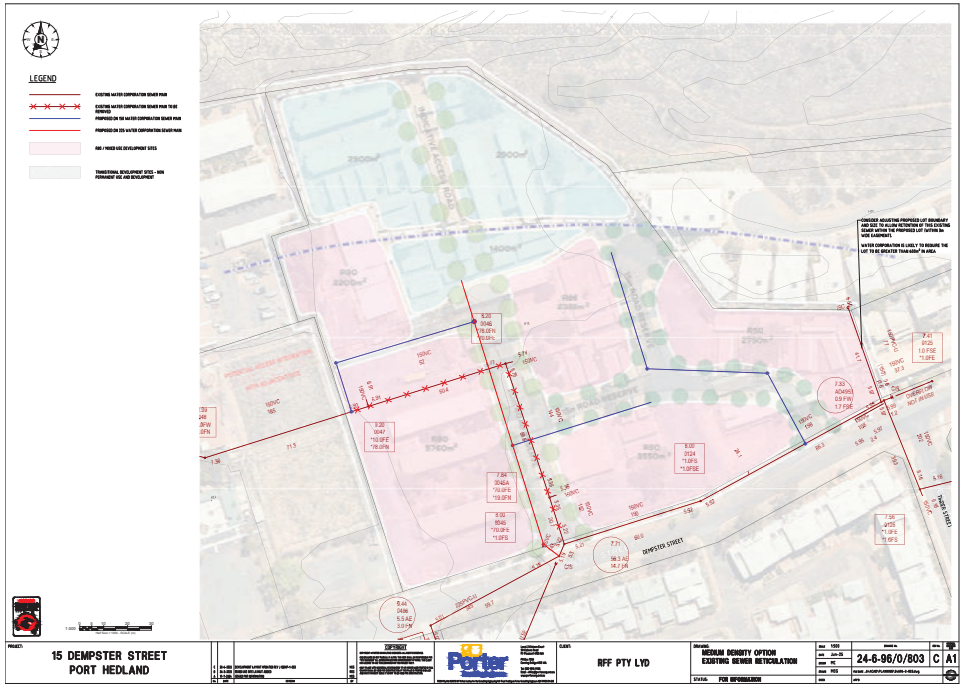
- **Porter Consulting Engineers drawing, 24-6-96/0/803 Rev B.**



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