ONSLOW TOWNSHIP VILLAGE LANDSCAPE

Mineral Resources Limited
PER21030.00



ASPECT Studios

ONSLOW TOWNSHIP VILLAGE

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1.0 Introduction

The landscape design for the Onslow Township Village, has been prepared by ASPECT Studios in collaboration with Milieu Creative. The design responds to the scale, form and function of the architecture and local context in order to create a dynamic and engaging sequence of landscape spaces.

With the striking Pilbara landscape as a backdrop, the landscape design will showcase a mix of natives, exotic, and sensory plant species to support the proposed accommodation, sports fields, play, recreation and amenity spaces.

The landscape concept responds to the site's larger contextual relationship to the coastal landscape situated adjacent to Onslow Township , celebrating the vibrant, textured tones and layered vegetation.

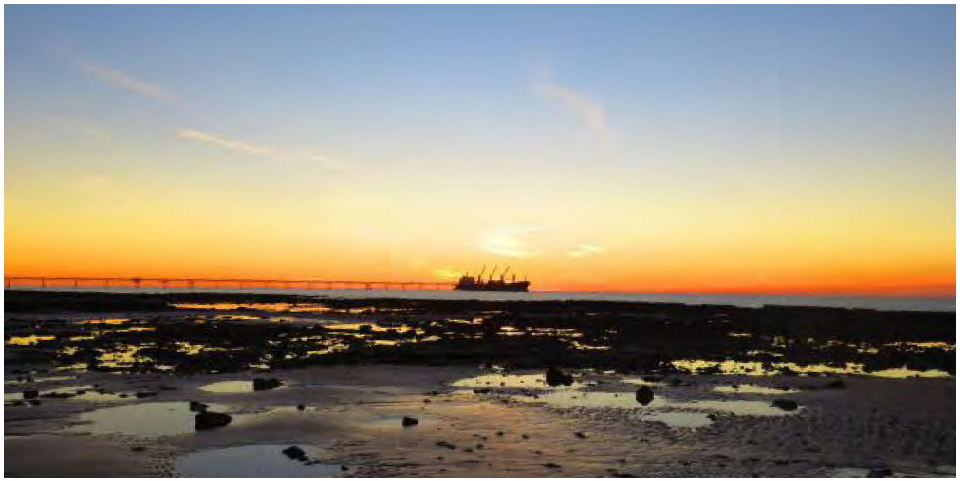
The public landscape spaces have been designed to provide a place where the community can gather for play and recreation catering for the needs of residents, visitors and the broader community.

The following general principles form the landscape approach to the site:

- Use high quality landscape design to integrate the proposed sporting development with broader active and passive recreational offerings;
- Develop a legible network of spaces that fully integrate with and connect to the surrounding context;
- Create spaces with varying characters and identities.
- Design spaces that will become activated and vital.
- Maximise opportunities for social interaction through arrangement of seating and views.
- Create a robust landscape made from proven materials and planting species, integrating bold forms that can be managed and maintained.
- Selection of local and native plant species that benefit surrounding ecologies.
- Ensure structural elements read as an extension of the architectural material palette and are integrated with the planting compositions.

The design of landscape considers the architectural design by Milieu Creative in both concept and materiality, with the intention of creating a cohesive transition from internal to external spaces.





1.1 Vision

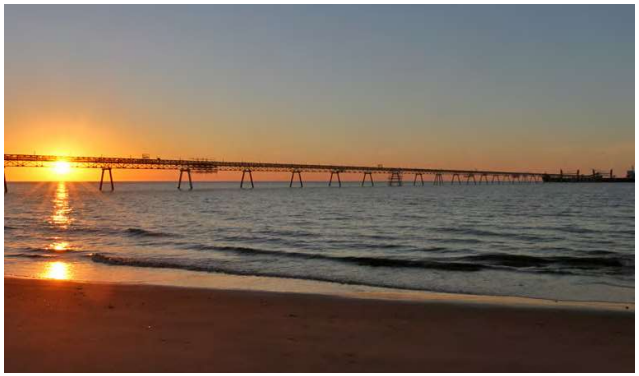
Set on the western edge of Australia, Onslow Township Village will be a world class accommodation facility that contributes to the community and economic growth of the region.

The village will be designed as a high quality facility that sets a new benchmark for accommodation that promotes a healthy, active and sustainable lifestyle for workers and the local community.

Inspired by the unique coastal landscape and sense of place the village will be designed to respond to the future vision of Onslow Town Centre and leave a lasting legacy for future generations.








1.3 Landscape Principles

The following design principles have been developed to guide the design of the village and surrounding landscape. Throughout the design process these principles will continue to inform and develop the landscape repsonse.

Celebrate the Site

- Celebrate the unique character of the site.
- Maximise visual, physical and symbolic connectivity to the local context.
- Touch the ground lightly

Connecting Community

- Create strong connections to community and the environment.
- Design to support social interaction and relationship building.

Healthy Active by Design

- Design comfortable and safe connections to promote incidental physical activity and access to nature.
- Provide formal or informal, natural and man-made landscape areas to support recreational, sporting and social activities.

Leave a Legacy

- Contribute to the "... Community vision that Onslow be a vibrant, sustainable and prosperous place for work, living and leisure - for both residents and visitors."
- Future proof the site for the next generation of users.

1.4 Landscape Approach

The landscape approach responds to the immediate context of the development area. A series of strategies have been developed that focus the development of the landscape design around key views, local character, the existing topography and integrating the architecture into the landscape.

Celebrate the Views

- Maximise the sites existing topography to retain the best views out to the horizon.
- Develop a strategy to ensure the accommodation and the common-use amenity retain views to significant vistas

Respond to the Local Character

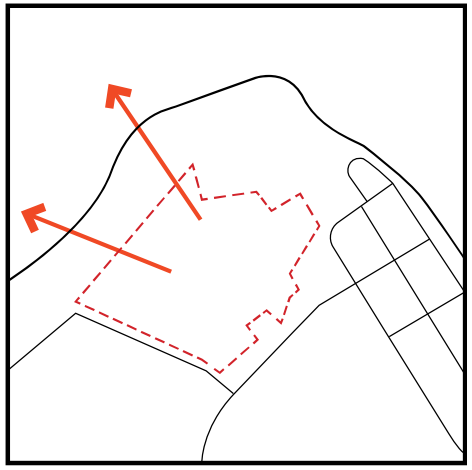
- Respond to the immediate social and environmental influences surrounding the site. Including the beach, Onslow townsite and cultural histories.

Touch the ground lightly

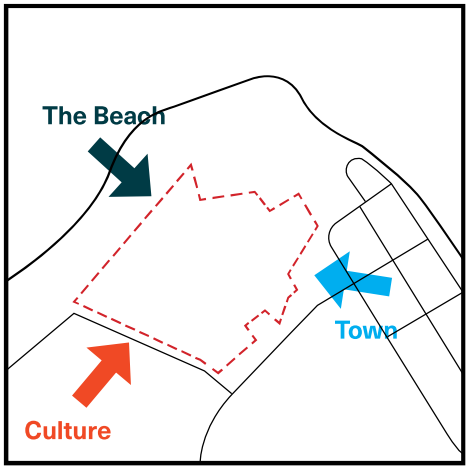
- Develop a strategy for pedestrian networks, accommodation pods and built amenity to minimize disturbance to the existing natural topography and ecologies of the site.

Integrate Landscape and Architecture

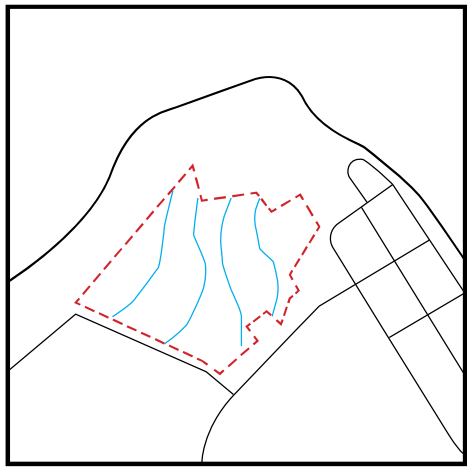
- Create a landscape-driven site response that informs the siting and location of proposed built infrastructure within the site.



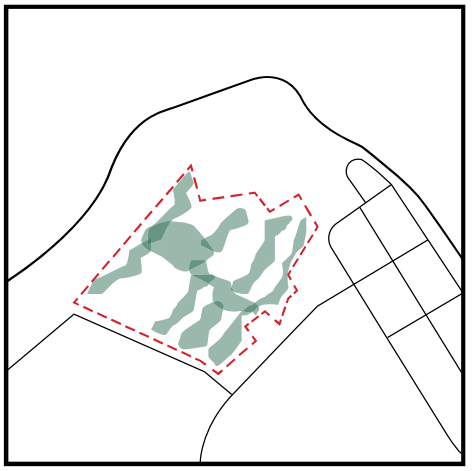
Celebrate the views



Respond to local character



Touch the ground lightly



Integrate landscape and Architecture

2.0 Landscape Plan

PROGRAM

1	Bus Stand (Pickup/Dropoff)
2	Dedicated Dropoff (Small Vehicle, Short Term)
3	Main Car Park
4	Terraced Entry Plaza
5	Pool
6	Recreation Turf
7	Outdoor Gym
8	Cricket Nets & Beach Volley Ball
9	Relax Zone (BBQ, Hammocks, Furniture, Shade Structure)
10	Mini Golf
11	Pedestrian / Maintenance Vehicle Access (with shade structures and comfort nodes)
12	Alfresco Deck With Terraced Embankment
13	Security Fence
14	Entry Statement Wall
15	Outdoor Sports and Recreation Zone - Basketball, Yoga, Gym, Furniture, Shade Structure

GENERAL

- Site Boundary

SURFACES

- Pedestrian Access Paving
- Plaza Paving
- Asphalt (Carppark)
- Asphalt (Maintenance Access)
- Composite Timber Boardwalk
- Stabilised Gravel
- Pool

PLANTING

- Lawn
- Native Dune Mix Planting - Managed Sparse
- Native Swale Mix - Managed Sparse
- Native Shrub Mix - Managed
- Proposed Native Tree

- Refer to Civil Engineers drawings for grading plan



2.2 Amenity and Recreation Areas

The Amenity and Recreation Areas are characterised by a mix of high quality landscape surface treatments and softscape palette that lead guests and staff through the main amenities areas. Key vistas out to the ocean are celebrated through elevated landscape terracing, alfresco areas and the entry plaza. The design of the carpark incorporates WSUD principles to ensure large planted areas with tree planting occurs.

LEGEND

1	Carpark (Designed to Water Sensitive Urban Design principles)
2	Dropoff/Pickup Bays
3	Entry Plaza
4	Pool
5	Terraced Embankment With Universal Access
6	Alfresco Dinning
7	Outdoor Sports and Recreation Zone - Basketball, Yoga, Gym, Furniture, Shade Structure











2.3 Outdoor Amenity Areas

The outdoor amenities area provides guests and staff with a range of health and fitness opportunities in an outdoor setting. Universal access is provided through a network of high quality paved surfaces that link to the accommodation and administration areas.

The landscape design provides the following list of outdoor amenity;

LEGEND	
1	Outdoor Gym
2	Beach Volley Ball
3	Relax Zone (including hammocks and furniture in a garden setting)
4	BBQ and Shade Structures
5	Turf Kick-About Area
6	Cricket Nets
7	Mini-Golf
8	Basketball Court











2.4 Accommodation Areas

The accommodation area has been designed to respond to the existing topography and ecology of the site. Minimising disturbance to the existing levels through a considered architectural and landscape response. An elevated boardwalk system extends through the area forming pedestrian circulation route that touches the ground lightly. Along the boardwalk network a series of comfort nodes are included to provide social spaces to experience the raw landscape in comfort. A hierarchy of boardwalks are achieved through primary access routes that provide direct linkages to the key extents of the accommodation, Secondary boardwalks provide more intimate linkages to guests accommodation.

A service and maintenance track doubles as a fitness and well-being loop for guests and staff to exercise by running or walking through the landscape.

LEGEND

1	Pod Accommodation
2	Primary Access - asphalt on grade (4m wide)
3	Secondary Boardwalk (2.5m wide)
4	Comfort Node with Furniture and Shade Structure
5	Comfort Node with Furniture - No Shade Stucture
6	Laundry Service dropoff/pickup











3.1 Landscape Materials

Materials Strategy

A refined palette of robust and low maintenance materials are proposed that are in keeping with the project context and Architecture. The proposed landscape scheme will use a palette of high quality materials, selected to reinforce the identity of the spaces.

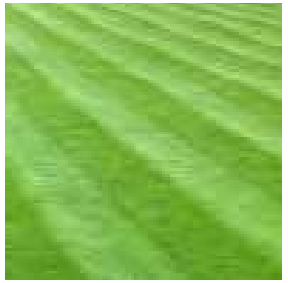
Materials have been selected that are sympathetic to the local context and are appropriate to their location and use. The materials detailed here form a structured palette that are coordinated to create visual unity and integrity within the landscape and the surrounding the Onslow neighbourhood.

The Material strategy will:

— Use materials that are sympathetic to the local context and are appropriate to their location and use.
— Create visual unity and integrity within the landscape but allow for variations in texture and colour that can be used to define function and character.
— Give consideration to long-term performance, durability and maintenance requirements.
— Consider impact on the environment and sourcing, cost and project sustainability.


Large format stone paver

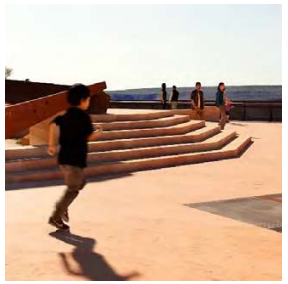

Concrete paving


Turf


Stabilised pindan gravel


Composite timber


Stone boulders


Concrete steps


Asphalt


Concrete walls


Concrete inlay


Informal Seating

3.2 Planting Strategy

Planting Strategy

The planting scheme for the project is designed to add a strong well-vegetated character to the site and present a response that interfaces with neighbouring frontages and contributes to greater site ecologies. Landscape will be used to create identity through a series of contextually appropriate planting palettes. Guests and Staff will be able to experience the harshness and fragility of the Pilbara Coastal landscape through considered planting design.

Endemic plants will feature throughout the village which will help to restore and improve the health of degraded landscape areas within the development.

Entry and Recreation Areas

As guests enter the village they will be greeted with a tree lined access route that leads them to the arrival point at the administration and recreation area. Water Sensitive Urban Design principles are used throughout the entry and Recreation Areas and will feature low water demanding irrigated landscape areas. Bush fire Asset Protection Zones are strategical placed around the perimeter of the site with densities of trees, shrubs and ground covers in the locations designed to reduces the effect of bush-fires.

Accommodation Areas

The Accommodation areas are characterised by a mix of dunal vegetation that is characteristic of the immediate ecologies of the site. The planting intent is to restore the local vegetation complexes that exist within the dunal systems surrounding Onslow. This area will be irrigated with a mix of drip and spray irrigation. Other incentives within the accommodation areas include sswale planting within the low points of the site to maximise the filtration of overland water-flows

Low to mid-level planting to the perimeter of the site within the bush fire Asset Protection Zone will be designed to reduce the effect of bushfires while also blending the visual appearance between the development and the surrounding vegetation.

Water Efficient Irrigation System

Trees and plants will be irrigated by a water efficient irrigation system. The irrigation water demand volumes will not be excessive, however, a constant and uninterrupted supply must be maintained especially during dry and hot periods.

Where possible, plants will be hydro- zoned according to water requirements. This allows the reticulation to the endemic plantings to be separately controlled and greatly reduced following their establishment period.

The automated irrigation system can be designed to include monitors to detect malfunctions so that rapid response rectification can be programmed before the planting is detrimentally affected by a disruption to water supply.

A holistic irrigation strategy will be prepared for the project that aims to include the following initiatives:

- Aqua monitoring to record and display water usage
- Hydro-zoning of plants
- Waterwise planting and use of local species
- High quality and improved soils with good moisture and nutrient holding capacity







3.3 Planting

Indicative Species List

Endemic		
Key	**Botanical Name**	**Common Name**
TREES		
Taller than 10m		
	Acacia coriacea	Wirewood
	Adansonia gregorii	Boab
	Brachychiton obtusifolia	
	Eucalyptus camaldulensis	River Gum
	Eucalyptus vitrix	Smooth Bark Coolibah
	Eucalyptus xerothermica	
TREES		
Up to 10m		
	Acacia ampliceps	Salt Wattle
	Acacia citrinoviridis	Mulga Tree
	Bauhinia cunninghamii	Jigal Native Bauhinia
	Grevillea wickhamii	Wickham's Holly Grevillea
	Pittosporum phylliraeoides	Native Olive
LARGE SHRUBS		
Up to 4m		
	Acacia ancistrocarpa	Fitzroy Wattle
	Acacia bivenosa	Two Vein Wattle
	Acacia dictyophleba	Sandpaper Wattle
	Acacia trachycarpa	Minni Ritchi
	Capparis lasiantha	Spit Jack
	Capparis spinosa	Caper Bush
	Crotalaria cunninghamii	Green Bird Flower
	Eremophila fraseri	Varnish Bush
	Eremophila maculata	Spotted Emu Bush
SMALL SHRUBS		
Less than 2m		
	Acacia hilliana	Tabletop Wattle
	Acacia gregorii	Gregory's Acacia
	Eremophila cuneifolia	Pinyuru
	Eremophila microtheca	Heath-like Eremophila
	Indigofera monophylla	Indigo Plant
	Ipomoea yardiensis	Yardie Morning Glory
	Ptilotus exaltatus	Tall Mulla Mulla
	Ptilotus obovatus	Cotton Bush
	Scaevola crassifolia	Thick leaved Fan Flower
	Solanum lasiophyllum	Bush Tomato/ Flannel Bush
	Senna notabilis	Cockroach Bush
GROUND COVERS		
Less than 600mm		
	Gomphrena canescens	Bachelors' Buttons
	Ipomoea pes-caprae	Coastal Morning Glory
	Enchylaena tomentosa	Barrier Saltbush
	Ptilotus clementii	Tassel Top
	Solanum horridum	Wild Gooseberry
	Swainsona formosa	Sturt Desert Pea
	Swainsona maccullochiana	Ashburton Pea
Climbers		
	Canavalia rosa	Wild Jack Bean
	Ipomoea costata	Bush Potato
	Ipomoea pes-caprae brasiliensis	Goat's Foot Morning Glory
	Ipomoea muelleri	Poison Morning Glory
Grasses		
	Aristida contorta	Wind Grass
	Panicum decompositum	Native Millet


















Stantec

Memo- Sustainability

Enquiries: Prasanna Suraweera
Project No: 301250498

To: Adrian Dhue (Rowe Group)

From: Prasanna Suraweera Date: 31/05/2022

Subject: Onslow Township Village – Sustainability Statement of Intent

This memorandum aims to confirm the sustainability objectives and targets for the proposed Onslow Township Village project.

The following sustainability commitment is made for the project inline with minimum statutory requirements:

- National Construction Code (NCC 2019) – Section J Energy Efficiency Requirements

The sustainability team is led by Prasanna Suraweera, who is an experienced sustainability professional, and Senior Engineer within the Sustainability department at Stantec Australia.

In this regard, we confirm that Stantec Australia will coordinate the Sustainability initiatives required to achieve the minimum NCC 2019 Section J Energy Efficiency requirements.

The proposed deliverables for this requirement are as follows:

- **Development Application Phase Deliverables:**
  - Statement of Intent (this documents) with confirmation of the proposed deliverable at each key milestone
- **Building Permit Phase Deliverables:**
  - NCC 2019 Section J Report outlining façade requirements which have been integrated to achieve compliance.
  - Certification by Stantec that the project has achieved NCC 2019 Section J compliance.
- **Clarifications:**
  - No other deliverables or commitments (i.e. sustainability benchmarks or rating tools or the like) are proposed.

I trust this satisfies your requirements; please contact me should you have any further queries.

Yours sincerely,



Prasanna Suraweera

for **Stantec Australia Pty Ltd**

encycle consulting

waste less, achieve more

ONSLOW Township Village
Lot 300 Back Beach Rd, Onslow

Waste Management Plan

3 May 2022

Rev_3

Mineral Resources Limited



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Glossary of terms and acronyms

Cart	Wheeled, open top bin often used for bulky items such as cardboard
Clinical & Related Waste	Clinical waste is waste that has the potential to cause disease, sharps injury or public offence and includes sharps, human tissue waste, laboratory waste, animal waste, and any other relevant waste specific to an establishment.
Commingled recycling	Common recyclables, mostly packaging; such as glass, plastics, aluminium, steel, liquid paper board (milk cartons). Commingled recycling may include paper but often, and particularly in offices, paper and cardboard are collected separately.
General Waste	Material that is intended for disposal to landfill (or in some States, incineration), normally what remains after the recyclables have been collected separately.
MGB	Mobile Garbage Bin – A wheeled bin with a lid often used for kerbside collection of waste or recyclables. (Often called a 'wheelie bin').
MRB	Mobile Recycling Bin – A wheeled bin ("wheelie" bin) with a lid often used for kerbside collection of recyclables (similar to an MGB). Generally have a different colour body and/or lid to MGBs.
Organic waste	Separated food and/or 'green' material (e.g. grass clippings or vegetation prunings).
Recyclable	Material that can be collected separately from the general waste and sent for recycling. The precise definition will vary, depending upon location (i.e. systems exist for the recycling of some materials in some areas and not in others).
Recycling	Where a material or product undergoes a form of processing to produce a feedstock suitable for the manufacture of new products.
Reuse	The transfer of a product to another user, with no major dismantling or processing required. The term "reuse" can also be applied in circumstances where an otherwise disposable item is replaced by a more durable item hence avoiding the creation of waste (e.g. using a ceramic coffee mug in place of disposable cups).

1 Introduction

This high-level Waste Management Plan (WMP) has been prepared for Mineral Resources Limited for the Development Application for the proposed Onslow Township Village at Lot 300 Back Beach Rd, Onslow. The WMP sets out the broad intention for waste management at the village.

The proposed development will consist of 500 accommodation pods, a full commercial restaurant with internal and external dining areas, tavern, mobile coffee station and shop, entertainment zones, village shop, juice bar, administration areas, training, medical, physiotherapy, wellness centre, gymnasium, swimming pool, multipurpose area, indoor cricket, golf simulation, recreation and gaming, cinema, library, computer area and external BBQ areas. This WMP has been prepared based on the following information:

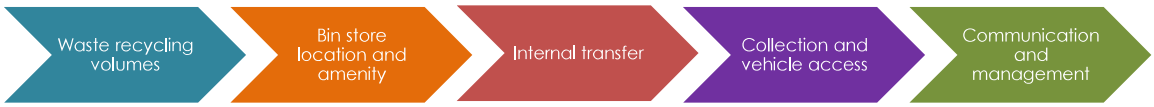
- Site Master Plan_D dated 20 August 2021 and floor plan of the Restaurant and Tavern (DA200) dated 20 August 2021
- ONS Functional brief Rev B dated 26/07/21
- Project Definition Plan Rev A (Milieu Creative) 25/06/21
- MRL Onslow Iron Project Facilities Requirements (OIP-0000-GE-SOW-0001 dated 12/02/2021)
- WALGA Commercial and Industrial Waste Management Plan Guidelines (2018)
- Conversation with representatives at the following organisations regarding waste and recycling services in the Shire (15/07/21):
    - Waste Officer at Shire of Ashburton
    - Operations Manager, Cleanaway Industrial Waste Services, Karratha
    - Owner, North West Recycling

1.1 Context

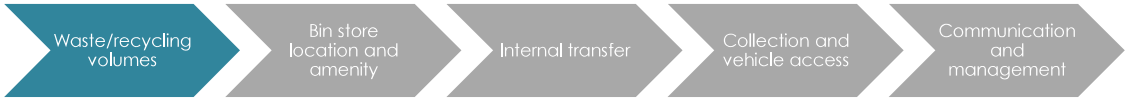
For efficient and effective waste management, the collection and centralisation of waste and recyclables should be carefully considered at the building design phase. Key factors to consider at the design phase include:

- The volumes of waste and recyclables likely to be generated during operation
- Safety for all operatives involved in waste management
- Access to bins and storage areas from within the relevant buildings
- Access for trucks for waste collection
- Local council requirements
- The ongoing management of waste and recycling services

1.2 Key components of the WMP



2 Estimated waste and recycling volumes



2.1 Local government requirements for waste volumes and bin type

The Shire of Ashburton do not have published waste generation rates to apply to new developments. Therefore, the WALGA waste generation rates are used here as a guide in addition to Encycle's experience and knowledge of other similar FIFO accommodation facilities to calculate the generation of waste, recyclables and organic waste.

Waste generation has been calculated for the accommodation and facilities within the village based on best practice waste management initiatives to avoid as much waste as possible from going to landfill.

Encycle have taken into consideration the availability of local recycling services when determining the recycling streams, bin systems and equipment to be incorporated into the design.

2.2 Waste and recycling services and assumptions

Cleanaway are the main contractor providing waste services in Onslow. They typically only provide general waste services but are also able to provide a cardboard collection service for this site. North West Recycling are able to undertake other recycling services (in partnership with Cleanaway).

2.2.1 General waste

Cleanaway currently only provide the collection of general waste using front-lift vehicles or using open skips collected by flat-bed or hook-lift vehicles. Cleanaway are able to service 1100 L general waste bins that have been modified for collecting by front-lift vehicles. Cleanaway do not currently have a rear-lift collection vehicle, but are hoping to add one to their fleet in the future.

2.2.2 Cardboard

Cardboard will be baled using a bale press in the restaurant/tavern bin store. Bales will either be collected directly from this bin store or transferred to the bin store in the maintenance area using a pallet jack. The bales would be serviced using a flat-bed truck and a fork lift will be load the bales onto the truck. Cardboard would be transported to Cleanaway's Karratha facility for consolidation before being shipped to Perth for recycling.

2.2.3 Container Deposit Scheme containers (not glass)

The WA Container Deposit Scheme (CDS) was introduced to allow consumers to take empty eligible beverage containers to a refund point. The Scheme is aimed at consumers to primarily reduce litter. Eligible containers include aluminium, glass (excluding wine/spirit bottles), plastic, steel and liquid paperboard beverage containers between 150 ml and 3 L.

North West Recycling (NWR)[1] operate Containers for Change[2] refund points in the Pilbara Region and are able to facilitate a commercial arrangement[3] for the collection of eligible containers from commercial venues and the funds raised can be donated to a local charity.

NWR will establish a commercial Refund Point at the MRL village for capturing eligible containers. Cleanaway would service these bins on a fortnightly basis. NWR provide the following types of bins: 240 L or wire cages (1.2 m^3) and these are serviced by swapping the whole bin or wire cage with an empty one using a flat-bed truck and trailer (with ramps).

2.2.4 CDS (eligible glass containers)

Glass will be generated by the restaurant, café and function rooms. 240 L bins will be used for the collection of glass as larger bins will become too heavy to move and service. Glass is collected and taken to Karratha for sorting and transfer.

2.2.5 Soft plastics (Redcycle)

Soft plastics will be generated at the loading dock from deliveries. NWR can provide 240 L bins for the collection of soft plastics that are accepted by the RedCycle website). Soft plastics are taken to Karratha for consolidation before being shipped to on-shore markets.

2.2.6 Food waste

There is potential for large quantities of food waste generated from the restaurant and tavern.

Food waste will be treated on-site at the village using a dehydration machine (e.g. 'GaiaRecycle' dehydration machine). The dehydrator heats the food waste to high temperatures and the steam is condensed (which can be collected for reuse on-site) and the dehydrated, pasteurised solid material can be blended with other organic materials such as live compost and used a soil conditioner for use on landscaped areas. The volume of food waste treated by the machine is reduced by up to 85%. The food waste dehydrator would be located in the restaurant/tavern bin store.

2.2.7 Cooking oil

A 800 L storage unit for used cooking oil will be provided in the restaurant/tavern bin store.

[1] https://www.nwrecycling.com.au/
[2] https://www.containersforchange.com.au/wa/
[3] https://www.nwrecycling.com.au/commercial-opportunities

2.2.8 Clinical and Related Waste

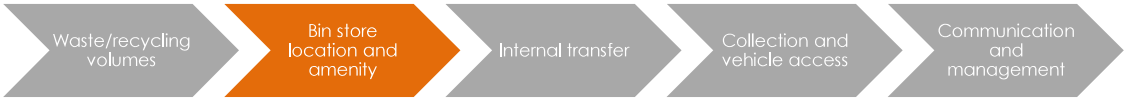
A small amount of clinical waste (sharps) will be produced in the medical/first aid room. A small (20 L) container will be located in this room and serviced directly by a controlled waste service provider.

2.2.9 Maintenance Waste

The waste streams expected to be generated by the activities in the maintenance shed include: general waste, oils/hydrocarbons/chemicals, grass/green waste, cardboard/plastic packaging, pallets, etc.

Any hazardous wastes will need to be stored separately at the maintenance shed. Green waste (clippings and prunings) will be disposed of in a front lift bin. Other waste streams can be transferred to the relevant bins in the bin store at the maintenance area.

3 Bin store locations and design



3.1 Bin store locations

The site will have three bin stores for the purposes of:

1. Storing full waste and recycling bins prior to collection (at the maintenance area)
2. Restaurant and Tavern waste and recycling (to store several days' worth of waste and recycling) prior to recycling bins being transferred to the bin store in the maintenance area
3. A temporary bin store near the recreation centre for cleaners to use for containing waste and recycling from the accommodation pods, prior to being transferred to the bin store in the maintenance area

Figure 1 shows the broad location of where the 3 bin store areas will be located. Figure 2 shows the location of the bin store at the restaurant.



Figure 1: Master plan showing location of the 3 bin store areas



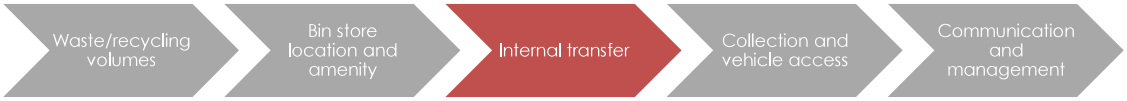
Figure 2: Location of the restaurant/tavern bin store

3.2 Bin store design

All bin stores will be fully enclosed with a roof and lockable doors. A fully enclosed design prevents access to rain and wind to minimise release of wind-blown litter and bins becoming filled with rainwater. Enclosed bin stores also prevent access to birds, vermin and other pests.

The bin stores will be designed with impermeable walls and floors, and have running water to allow for cleaning.

4 Internal transfer



4.1 Transfer of waste/recycling from accommodation pods

Cleaners will service the accommodation pods and keep waste segregated from recycling. Waste and recycling will be placed in bins located in the temporary bin store near the recreation centre. When bins are full, they will be transferred to the bin store in the maintenance area for storage and collection.

4.2 Transfer of waste from restaurant/tavern bin store to bin store in the maintenance area

Facilities Management staff from the village will transfer cardboard bales and full recycling bins from the restaurant/tavern bin store to the bin store at the maintenance area for collection.

4.3 Waste/recycling from other areas

Cleaners will transfer waste and recycling from other areas such as the administration and wellness/recreation facilities to bins in the maintenance area bin store.

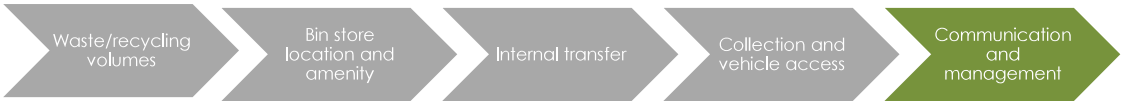
5 Collection and vehicle access



A private service provider (likely to be Cleanaway) will service the full range of bins. Unless a rear-lift vehicle is available, a front-lift vehicle will service the general waste bins on a daily basis. Flat-bed vehicles will collect baled cardboard and recycling bins on a fortnightly basis and separate tanker vehicles will service the used cooking oil storage unit and grease traps on an as-required basis.

Please refer to the Traffic Impact Statement for further details regarding vehicle access to the site.

6 Ongoing communication and management



6.1 Management

The village operator will be responsible for overseeing the waste management systems. Facilities Management personnel will be trained and informed about their responsibility to work closely with the private service provider regarding the schedule for collection and presentation of bins. The staff member will be responsible for maintaining the bin stores in a clean and tidy condition at all times and ensuring bins are washed regularly.

6.2 Communication

All operational staff will be made aware through an Operational Waste Management Plan (OWMP) of the waste and recycling systems and how they should be used. The OWMP will be suitable for presenting to building users, including how the plan should be communicated will be developed and implemented during both the initial occupation and ongoing management of the village.

The operator will be responsible for the continuing education of FIFO workers and village staff and contractors on correct segregation of waste and recyclables and usage of bins and dehydration machine to ensure successful performance of the systems at the village.

Onslow Township Village - Lot 300 Back Beach Road, Onslow

TRANSPORT IMPACT STATEMENT
FOR AMENDED DEVELOPMENT APPLICATION

Uloth & ASSOCIATES

FINAL - 28 April 2022

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1. INTRODUCTION

Mineral Resources Limited is preparing for the Onslow Iron Project, which is located within the existing Pilbara Port Authority boundaries at the Port of Ashburton, approximately 12 kilometres south-west of Onslow. To accommodate the workers required for the proposed project, a 500-bed 'Resort Style FIFO Accommodation' facility is also proposed, at Lot 300 Back Beach Road, Onslow, which is located at the north-western end of the Onslow Townsite as shown in the Locality Plan in Figure 1.

A Development Application for the proposed 'Onslow Township Village' was conditionally approved by the Regional Joint Development Assessment Panel on 23 December 2021. However, an amended Development Application is now being prepared by the project team, and Uloth and Associates has been appointed to update the previous Transport Impact Statement (dated 25 November 2021), in response to the amended plans.

1.1 STUDY OBJECTIVES

The overall study objective is to identify the existing situation in the immediate vicinity of the proposed development site and to prepare a Transport Impact Statement to address the various traffic access, parking, and servicing requirements in support of the amended development application.



Locality Plan and Proposed Development Site

LOT 300 BACK BEACH ROAD, ONSLOW

FIG. 1

2. EXISTING SITUATION AND PROPOSED DEVELOPMENT SITE

Onslow is located approximately 1,400 kilometres north of Perth in the Pilbara region, within the Shire of Ashburton. The existing situation within and around the Onslow Townsite is described in this chapter, together with additional detail in the vicinity of the proposed development.

- It can be seen in the Locality Plan in Figure 1 (in Chapter 1) that access for the Onslow Townsite is to/from the south via Onslow Road (which links to North West Coastal Highway approximately 75 kilometres to the south-east). It can also be seen that Onslow Road continues north to the western end of the Townsite (along the Onslow ring road, which was constructed in around 2016), with the former alignment of Onslow Road (now McAullay Road) providing access to the eastern end of the Townsite.

- Onslow Road is a 2-lane undivided road, which is identified as a Primary Distributor Road under the Main Roads WA functional road hierarchy up to the intersection of Back Beach Road where it continues as Simpson Street, a local Access Road. It has a speed limit of 80 kilometres per hour from south of McAullay Road to approximately 400 metres south of Back Beach Road where it drops to the default built-up area limit of 50 kilometres per hour.

- Traffic counts obtained from the Main Roads WA Trafficmap website show that Onslow Road carried up to 500 vehicles per day in 2019, approximately 10 kilometres south of McAullay Road.

- McAullay Road is also a 2-lane undivided road, which was downgraded to an Access Road under the Main Roads WA functional road hierarchy after the continuation of Onslow Road. It has an initial speed limit of 80 kilometres per hour from Onslow Road but drops to 60 kilometres per hour as it approaches the Townsite once past Onslow Airport.

- Second Avenue, the main street through the commercial area of the townsite, is identified as a Local Distributor road under the Main Roads WA road hierarchy, while all other roads in Onslow are identified as Access Roads, with a speed limit of 50 kilometres per hour (except for Seaview Drive which has a speed limit of 70 kilometres per hour).

- The existing road network within the overall Townsite is shown in the aerial photograph in Figure 2, while further detail in the vicinity of the proposed development site is shown in Figures A.1 and A.2 in the Technical Appendix.

- It can be seen in Figure 2 that the proposed development site is conveniently located at the northern end of the Townsite, within walking distance of commercial and local community facilities. The site is currently vacant and is bordered by Back Beach Road at the southern end, Simpson Street, First Street and Third Avenue on the eastern end, and by coastline along the remaining property boundary. The site is currently classed as Conservation, Recreation and Nature Landscape Land Use under Shire of Ashburton's Local Planning Scheme No.7.

- Figure A.1 (in Chapter A.1 in the Technical Appendix) then shows that most roads in the vicinity of the site are sealed roads. However, First Street west of Third Avenue and Third Avenue north of First Street, are both currently unmade, as also shown in Figure A.2.

- Onslow is not serviced by regular public transport. However, there are footpaths on at least one side of most roads in the vicinity of the proposed development, as shown in Figure A.3 in the Technical Appendix, providing good walking connectivity throughout the Townsite and convenient access to local amenities.



Existing Road Network

OVERALL ONSLOW TOWNSITE

FIG. 2

3. ONSLOW TOWNSITE EXPANSION STRUCTURE PLAN

The Onslow Townsite Expansion Structure Plan was prepared in 2016, around the time of construction of the Onslow ring road (now Onslow Road), to facilitate a strategic long-term population target of 3,500 people.

- The overall Structure Plan is shown in Figure A.4 in the Technical Appendix, identifying growth areas for residential development between Onslow Road and McAullay Road, together with the proposed road hierarchy and pedestrian/cyclist paths throughout the overall Townsite.

- It can be seen in Figure A.4 that the currently proposed development site, at the northern end of the Structure Plan area, is identified as 'Area Subject to Further Investigation'.

- The plan also identifies the full length of Onslow Road plus Simpson Road up to Second Avenue as an Arterial/Primary Distributor Road, while McAullay Road and Second Avenue are both identified as Neighbourhood Connectors.

- It can also be seen that both Onslow Road - Simpson Street and Second Avenue are identified as part of the 'Shared Path Network', ensuring good pedestrian and cyclist accessibility throughout the Townsite.

4. PROPOSED DEVELOPMENT

Details of the proposed development are described in this chapter, together with calculations of overall parking requirements and trip generation.

4.1 OVERALL SITE PLAN

- The proposed Masterplan for the Onslow Township Village is shown in Figure A.5 in Chapter A.3 in the Technical Appendix, as prepared by architects Milieu Creative. Figure 3 then shows the proposed development plan superimposed on an aerial photograph, identifying the proposed development in the context of the adjacent road network. The proposal includes construction of 500 accommodation pods, plus Administration and Training facilities (including a Creche), a Medical Centre, a Restaurant and a Tavern, as well as recreational facilities including a Swimming Pool, Gym and Sports Hall.

- It can be seen in both Figure 3 and Figure A.5 that the accommodation pods are primarily located in the southern part of the site, while the administration and other facilities are located in the northern part adjacent to the proposed car park. Access for the site is proposed at the north eastern corner of the property, from the currently unmade extension of Third Avenue, following a detailed review of alternative access options affected by Aboriginal Heritage issues, risk of Coastal Inundation, and impacts on overland flow of stormwater.

- It can also be seen that on entering the site, the main access driveway curves around to provide direct access to the proposed car park, or to allow buses to proceed into the bus pick-up/drop-off area which then loops back onto the main access driveway. Paved walkways are then proposed throughout the various facilities, providing access also for motorised carts and maintenance vehicles (as well as for fire access), with elevated boardwalks providing further access into the accommodation areas.

- It is also important to note that to align with the Onslow Townsite Expansion Plan, it is proposed that both the Restaurant and Tavern will be made partially available to the local community.

- It is expected that the development will remain as Transient Workforce accommodation for a minimum of 20 years, for the duration of the mining project. Post operation, there is potential to convert the site into a permanent resort, reducing the number of accommodation pods to perhaps 100 units (with public access to on-site facilities continuing as currently proposed).

4.2 PROPOSED FACILITIES AND PARKING REQUIREMENTS

- Details of the proposed facilities are provided below in Table 1, together with calculations of Planning Scheme parking requirements and applied reductions to reflect the expected usage of each component. Initial parking requirements are based on the Table in Appendix 8 of Shire of Ashburton's Local Planning Scheme No. 8, except for the Public Recreation land uses, which have been based on detailed individual requirements currently utilised by City of Stirling (and deemed to be appropriate here).

- Parking calculations for the Restaurant and Tavern are both based on the Shire of Ashburton's requirement of 1 space per 6 square metres of Dining Space. However, taking into account the indicative seating arrangements shown in the floor plans, it is conservatively estimated that the indoor seating areas (for parking calculation purposes) equate to approximately 40 percent of the indoor 'Dining' areas and 50 percent of the outdoor 'Alfresco' areas (due to the layout of walkways, buffet tables, pool tables, etc).

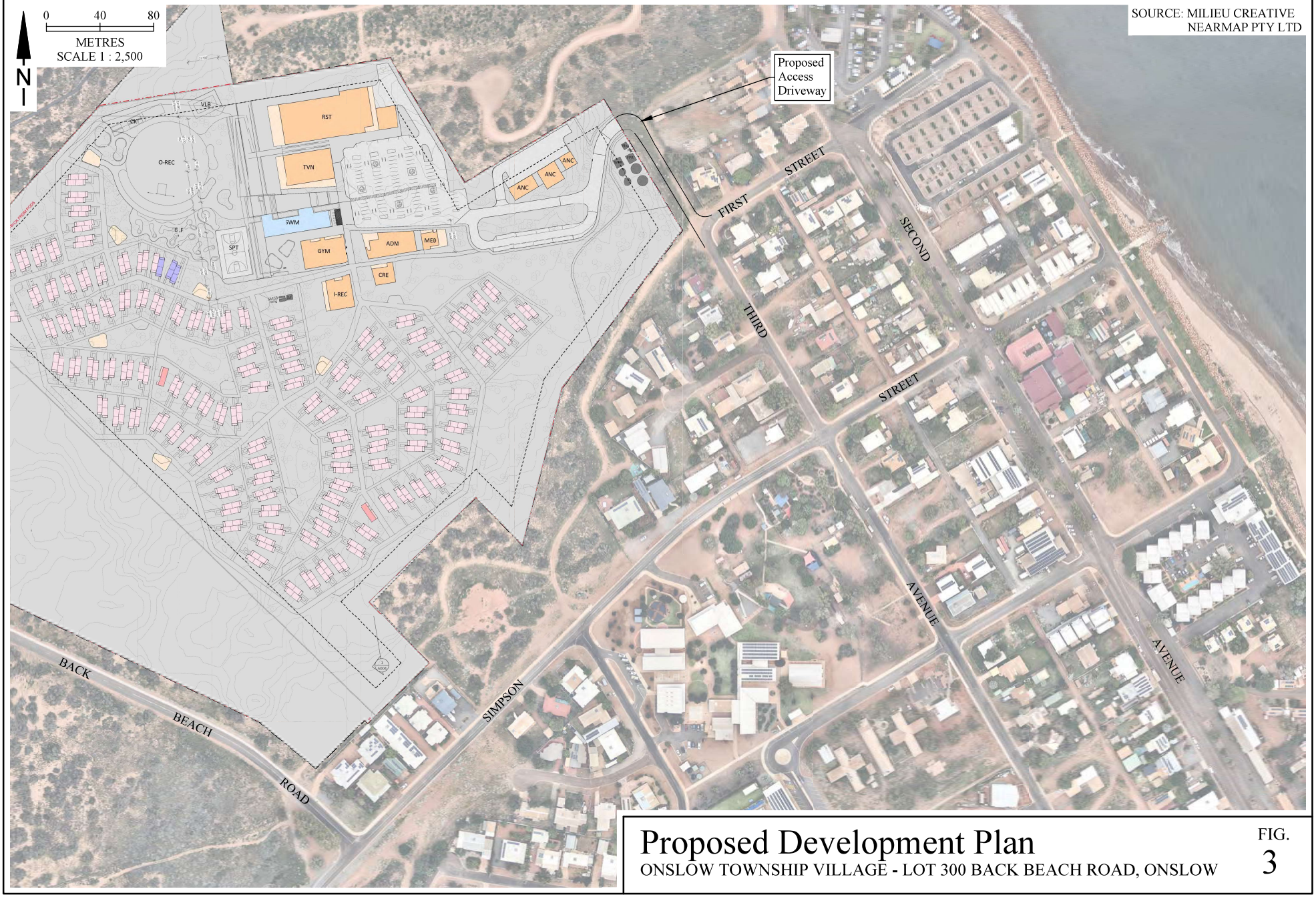
- It can be seen in Table 1 that an overall parking provision of 57 spaces is recommended, allowing for a 90 percent reduction for the accommodation units (to account for buses being used to transport most workers), a 70 percent reduction for Administration/Training and Medical Centre (to account for use predominantly by on-site staff, but allowing for some local staff) and a 70 percent reduction for the Restaurant and Tavern (to account for an intended 30 percent public-use for each of these facilities), and a 100 percent reduction for the Recreation facilities (as these will only service the on-site population). It is also assumed that the Creche will not contribute to any additional parking requirements, based on 100 percent usage by workers, staff and visitors.

TABLE 1
PARKING REQUIREMENT CALCULATIONS
PROPOSED ONSLOW TOWNSHIP VILLAGE

PROPOSED LAND USE	PLANNING SCHEME REQUIREMENTS		PARKING REQUIREMENTS	
	Parking Ratio	No. of Spaces	Assumed Operations	No. of Spaces to be provided
• Accommodation Units - 500 Units, but max. 250 occupied at one time	2 per 3 units + 1 Oversize Veh. per 10 units	167 car spaces + 25 oversize spaces	90 percent to travel only by Bus	17 car spaces + Bus/Coach spaces [1)]
• Administration and Training - 252m^2 [2)]	1 per 30m^2 NLA	8 spaces	70 percent reduction for on-site operations	3 spaces
• Medical Centre - Assume 3 Rooms, with 6 employees	4 per Room for 1st 2 Rooms + 1 per Room thereafter + 1 per max. employees on-site	15 spaces	70 percent reduction for on-site operations	5 spaces
• Restaurant - 352m^2 Dining Area [3)]	1 per 6m^2 of Dining area	59 spaces	70 percent reduction for on-site operations	18 spaces
• Tavern - 267m^2 Dining Area [3)]	1 per 6m^2 of Dining area	45 spaces	70 percent reduction for on-site operations	14 spaces
• Public Recreation [4)] - Swimming Pool: 618m^2 - Gym: 317m^2 - Sports Hall: 819m^2	1 per 4 Swimmers [5)] + 1 per 20m^2 public gym area + 1 per 20m^2 Sportshall GFA	81 spaces	100 percent reduction for on-site operations	0 spaces
Total Parking Requirements				57 car spaces + Bus/Coach spaces

Notes:
1) Assumed combination of 50-seat coaches and 22-seat buses, as advised by Mineral Resource Limited
2) Includes Reception, Managers Offices, Open Plan Office, Meeting Room and Kitchen/Staff Break Room, plus Training Rooms.
3) Dining Area equals 40 percent of Indoor Areas plus 50 percent of Outdoor Areas.
4) Car parking calculations based on City of Stirling requirements.
5) Assumes 72 swimmers maximum at any one time.

Source: Uloth and Associates, March 2022



Proposed Development Plan

ONSLOW TOWNSHIP VILLAGE - LOT 300 BACK BEACH ROAD, ONSLOW

FIG. 3

4.3 VILLAGE OPERATIONS AND RESULTING TRAFFIC GENERATION

Details regarding traffic generation for the proposed development are separated into 'Airport Transfers and Worksite Operations' and then 'Village Operations and Public Facilities'.

4.3.1 Airport Transfers and Worksite Operations

- All workers accommodated at the proposed Village will be Fly-in/Fly-out (FIFO) workers, with a maximum occupancy of 250 minesite workers plus 50 village staff accommodated at any one time.

- Transport to/from the Airport from the Village will occur 7 days per week, with staff from inbound flights arriving around 9am, and staff for outbound flights departing at around 4pm daily. Airport transfers will be serviced by one 22-seat bus plus one light vehicle for each flight, resulting in a total of 8 vehicle trips per day.

- The mining worksite will operate 24 hours per day, 7 days per week, with two 12-hour shifts each day. Of the 250 workforce, it is expected that 150 will work the day shift from 6 am to 6pm, with the remaining 100 working night shift from 6pm to 6am.

- Provision has been made on site for pick-up and drop-off of workers via 4 coach sized Bus Bays (on the left-hand side of the 1-way Bus loop), in addition to 4 layover bus bays on the right-hand side. However, it is expected to utilise a maximum of two to three 55-seat coaches plus two to three 22-seat buses to transport workers to the work site for the start of each shift, before returning to the village with workers that just completed their shift. Together with an assumed 10 percent of workers driving ancillary vehicles, it is therefore estimated that a maximum of perhaps 70 to 80 vehicle trips per day will be generated by this component of the proposed development, with a proposed travel route via Third Avenue, Simpson Road and Onslow Road, as indicated in Figure 4.

4.3.2 Village Operations and Public Facilities

- In addition to Fly-in/Fly-out workers, it is also expected that the resort operational staff could include perhaps up to 10 staff that live locally, who will therefore travel to and from the site each work day for standard day-time shifts between 7am and 5pm.

- Service and delivery vehicles will also access the site, as follows:
  - General Waste Disposal: 1 Truck per Day
  - Other Waste/Recycling: 1 Truck per Week
  - Delivery Truck: 1 Truck, 2-3 times per Week
    (Food, General Supplies & Disposables)
  - Maintenance: 1 Light Vehicle, 2 times per Week
  - Resort Cleaning: 1 Light Vehicle per Day

- Public access to on-site facilities is proposed as follows, noting that the hours of public-use availability have now been reduced in response to community concerns:
  - Restaurant: Breakfast 8 - 10.30am, Lunch 12 - 3pm
  - Tavern: 9am - 5pm

- For traffic generated by members of the public using the on-site facilities, standard trip generation calculations have been carried out with a similar methodology to the parking calculations identified above in Table 1, including reductions to account for on-site operations.

- Based on industry-standard trip generation rates for 'High-turnover Sit-Down Restaurant' and 'Drinking Place', it is estimated that the external-use component of the proposed on-site facilities will generate a maximum of 41 vehicle trips (in and out combined) during the overall peak hour. This would typically translate to an estimated 460 vehicle trips per day under normal commercial operations. However, with the proposed restriction of public-use availability, it is estimated that the

maximum flow of 41 vehicle trips accessing the site during the overall peak hour will translate to a maximum of approximately 210 vehicle trips per day.

- The anticipated travel routes and estimated daily traffic flows accessing the proposed public-use facilities are therefore as shown in Figure 5, with a traffic distribution based on expected travel routes to and from the existing residential areas, noting that only 30 vehicles per day are expected to travel past Onslow Primary School (with most of these outside of School pick-up and drop-off times).

4.3.3 Total Trip Generation and Traffic Impacts

- On the basis of the above calculations and assumptions, the total trip generation for the proposed development is 330 vehicle trips per day, with 45 vehicle trips per day during the critical afternoon peak hour, broken down as follows:
  - To/from Airport: 10 vpd (4 in peak hour)
  - To/from Worksite: 80 vpd (0 in peak hour)
  - Locally-Based Staff: 20 vpd (5 in peak hour)
  - Service Vehicles: 10 vpd (0 in peak hour)
  - Public Use of Facilities: 210 vpd (41 in peak hour)
  - Total: 330 vpd (50 in peak hour)

- This also equates to an estimated total of 130 vehicle trips per day along Simpson Street adjacent to the school, including 12 vehicle trips per hour during the afternoon peak hour (or an average of just 1 vehicle per 5 minutes), which will not have any discernible impact on overall traffic operations or safety.

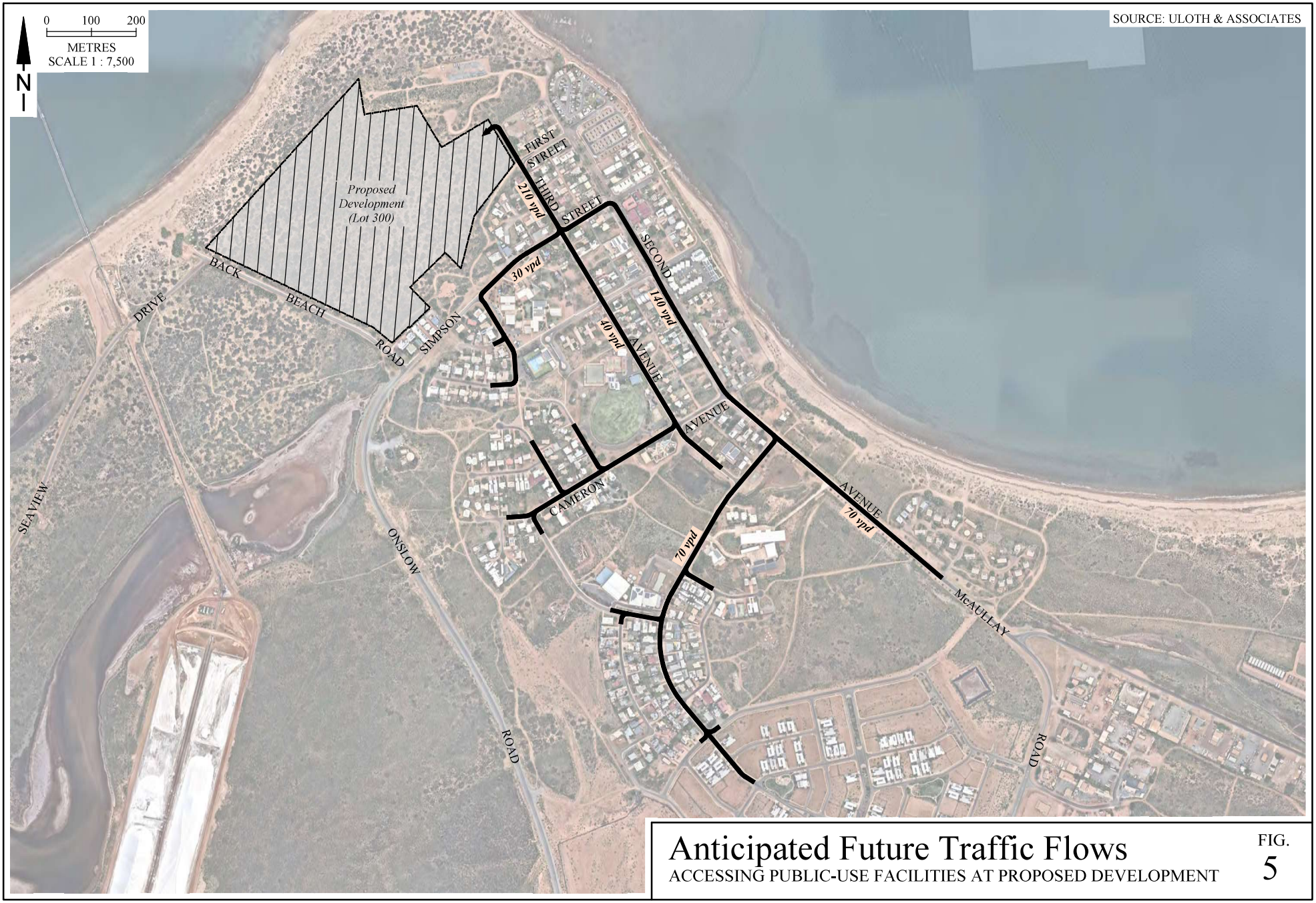
- Noting that the above calculations are based on just 10 percent of staff travelling to/from the worksite in private vehicles, a number of sensitivity tests have also been carried out. This analysis shows that if the proportion of staff travelling by private vehicle increases to 30 percent, then the overall trip generation of the site will increase to 430 vehicle trips per day (but still with just 50 vehicle trips during the critical PM peak hour, since there are no worksite trips during the peak hour).

- Even if the proportion of staff travelling via private vehicle increased to 50 percent, the total traffic generation of the overall site would only increase to 530 vehicle trips per day, but still with just 50 vehicle trips per hour during the PM peak hour.



Proposed Transport Route
TO AND FROM THE WORK SITE

FIG. 4



Anticipated Future Traffic Flows

ACCESSING PUBLIC-USE FACILITIES AT PROPOSED DEVELOPMENT

FIG. 5

5. ACCESS ARRANGEMENT, PARKING AND SERVICING

The recommended car park layout and access arrangement is shown in Figure 6 in Chapter 7 Overall Conclusions and Recommendations, while the recommended concept plan for access off Third Avenue is shown in Figure 7.

- Access to the development site is proposed via an extension of Third Avenue within the existing road reserve at the eastern edge of the development site. A 2-way internal road will then provide access to/from the centrally located parking area (with 76 car bays proposed), noting that the car park has been designed to allow all vehicles to both enter and exit all parking bays in forward gear, without the need to reverse. Access is also provided to a 1-way bus pick-up/drop-off area (on the south side) and a maintenance area (on the north side), as shown in Figure 6.

- Access to the proposed service yard, adjacent to the proposed restaurant at the northern end, is then also provided via the car park access road, which will also provide access to the proposed ambulance bay (adjacent to the Medical Centre), while also catering for Fire and Emergency Services access to the paved pathways that extend throughout the site.

- The recommended concept plan for access off Third Avenue (as shown in Figure 7 in Chapter 7) shows the layout required to accommodate a 12.5 metre Heavy Rigid Vehicle accessing the site at the same time as passing a B99 Car, as confirmed by the swept path diagrams in Figure A.6 in Chapter A.4 in the Technical Appendix.

- Figure A.7 in the Technical Appendix then shows the swept paths for Buses accessing the proposed pick-up/drop-off area, while Figure A.8 shows the swept path for a 12.5 metre Heavy Rigid Vehicle accessing the proposed service yard next to the restaurant, and Figure A.9 shows the swept paths for a 10-metre rubbish truck accessing the Bin Stores within both the service yard (next to the Restaurant) and the maintenance yard. Figure A.10 then confirms the swept paths for a Medium Rigid Vehicle accessing the proposed Maintenance Area and the Fire Access route via the internal pathways.

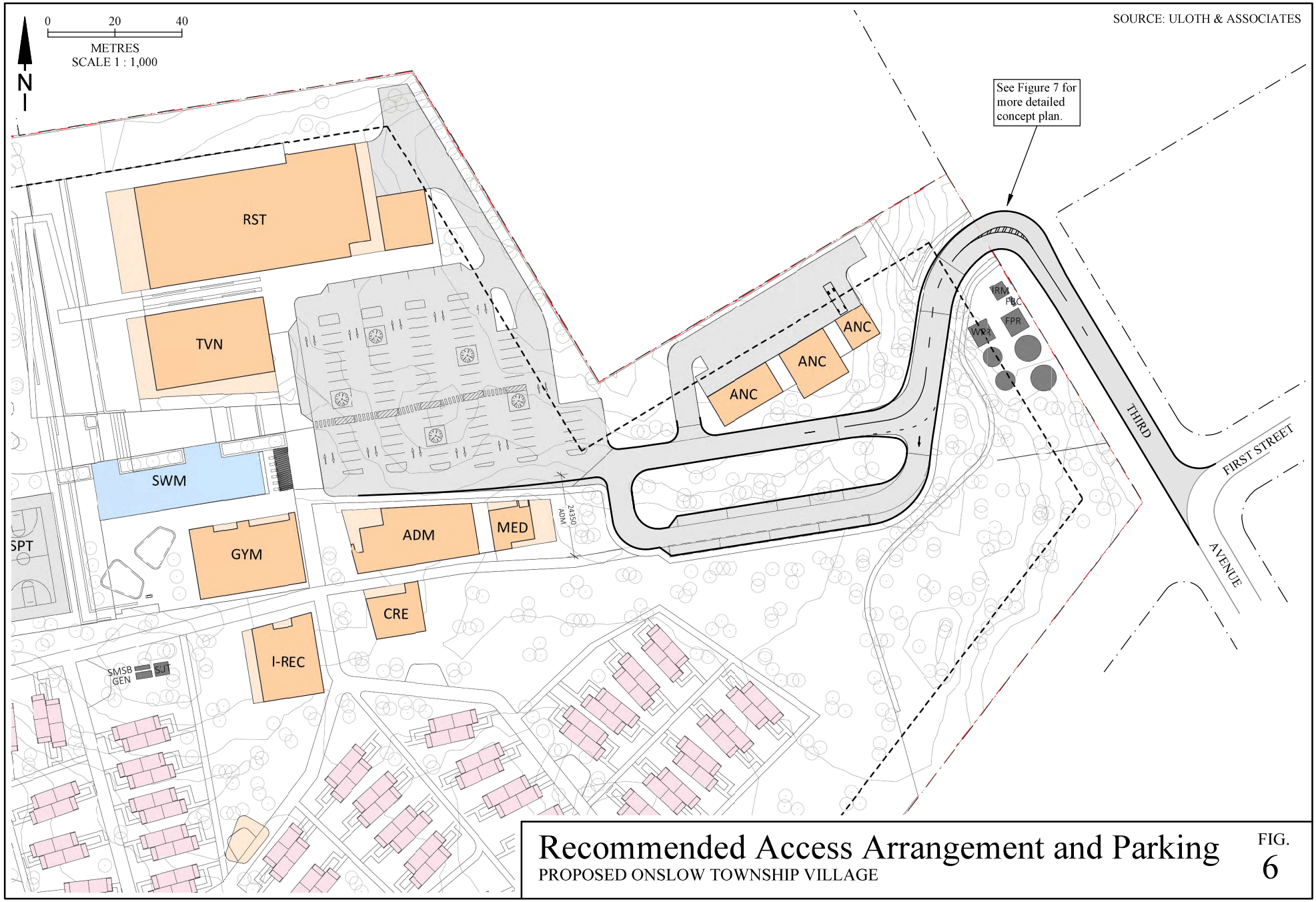
6. PEDESTRIANS AND CYCLISTS

To take advantage of the proposed development's proximity to the Onslow townsite, it is recommended to provide footpaths along the main access roadway and the extension of Third Avenue to connect with existing footpaths as identified in Figure A.3 (in Chapter A.1 in the Technical Appendix). It is also proposed to provide a footpath from the recreational buildings and accommodation areas to an alternative access at the corner of First Street and Third Avenue. The recommended future pedestrian/cyclist path network is therefore as shown in Figure 8 in Chapter 7, including connections to the 'future Shared Paths' identified within the Townsite Expansion Structure Plan.

7. OVERALL CONCLUSIONS AND RECOMMENDATIONS

The overall conclusions and recommendations regarding the proposed development are detailed in this chapter, on the basis of the study findings and conclusions presented and discussed above in Chapters 2 to 6, and the additional information in the Technical Appendix, as follows:

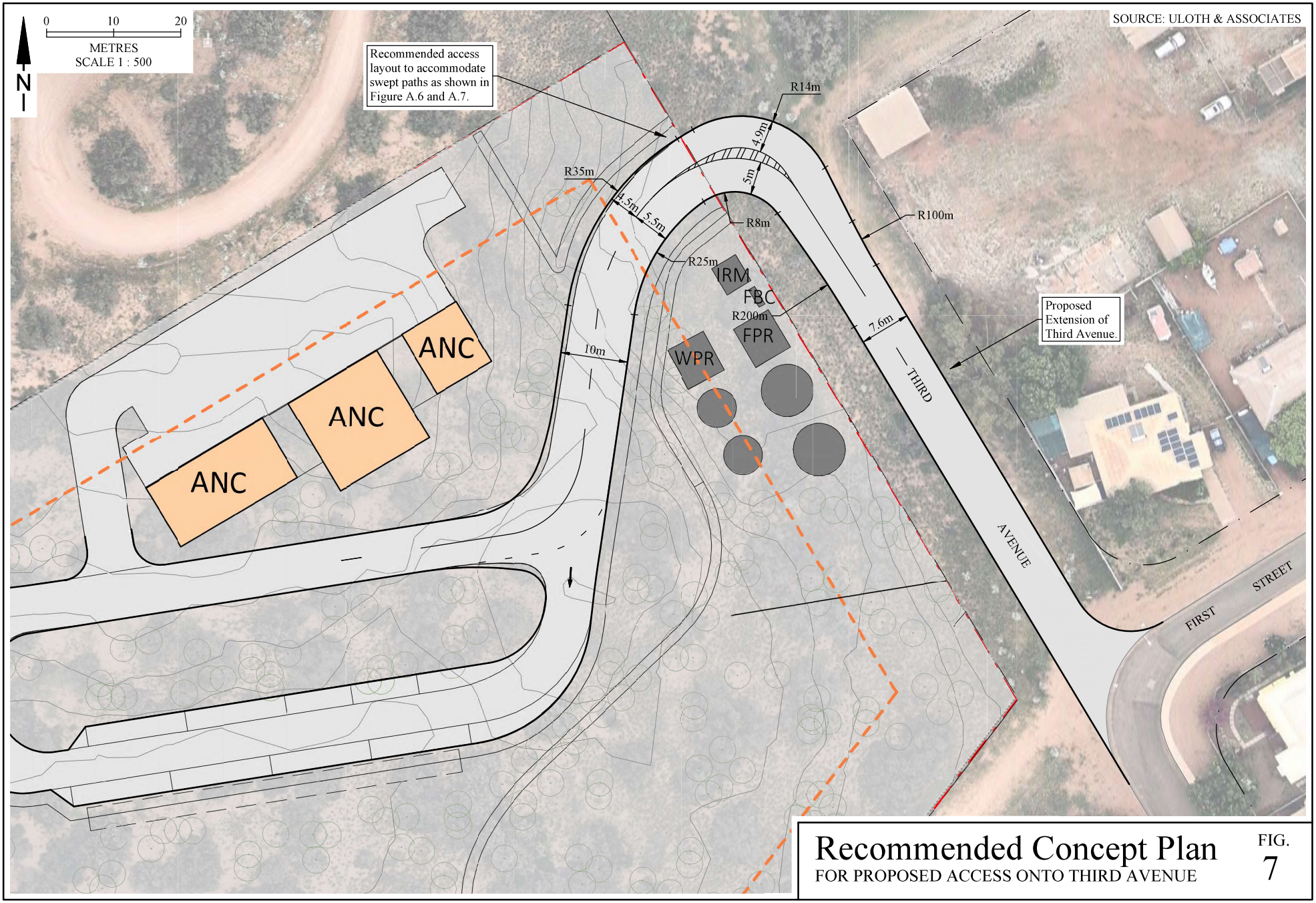
- It is recommended to provide a minimum of 57 car parking spaces for the proposed operation of the Onslow Township Village as calculated in Table 1 in Chapter 4, in addition to parking for Buses transporting workers to and from the worksite.
- The recommended car park layout and internal access roads are as shown in Figure 6, including the proposed Bus pick-up/drop-off area, and the proposed service yard and maintenance area.
- It is recommended to provide access to/from the site via an extension of Third Avenue north of First Street, as also indicated in Figure 6, with a more detailed layout as shown in the concept plan in Figure 7.
- It is recommended to also construct footpaths along the proposed extension of Third Avenue, to provide connections to the existing and proposed paths within the adjacent areas, resulting in the future pedestrian/cyclist path network as shown in Figure 8.
- With most of the workforce population to be transported to/from the work site by bus, the proposed workforce operations are only expected to generate up to 70 or 80 vehicle trips per day, which will not have any significant impact on the adjacent roads and intersections.
- Additional traffic will also be generated by members of the public accessing the shared on-site facilities, with an estimated maximum of 41 vehicle trips (in and out combined) during the overall peak hour, and an estimated maximum of 210 vehicle trips per day.



Recommended Access Arrangement and Parking

PROPOSED ONSLOW TOWNSHIP VILLAGE

FIG. 6



Recommended Concept Plan

FOR PROPOSED ACCESS ONTO THIRD AVENUE

FIG. 7



Future Pedestrian / Cyclist Paths
IN THE VICINITY OF THE PROPOSED DEVELOPMENT

FIG. 8

TECHNICAL APPENDIX

The Technical Appendix documents the existing situation and the Townsite Expansion Structure Plan, as well as the proposed development plan and swept path diagrams.

A.1 EXISTING SITUATION

Figure A.1 shows the existing situation in the vicinity of the proposed development site, while Figure A.2 shows the existing roads and intersections immediately adjacent to the site.

Figure A.3 then shows the existing footpaths in the vicinity of the proposed development.



Existing Situation

IN THE VICINITY OF THE PROPOSED DEVELOPMENT

FIG. A.1



Existing Roads and Intersections

ADJACENT TO THE PROPOSED DEVELOPMENT

FIG. A.2



Existing Footpaths

IN THE VICINITY OF THE PROPOSED DEVELOPMENT

FIG. A.3

A.2 OVERALL STRUCTURE PLAN

Figure A.4 shows the Onslow Townsite Expansion Structure Plan, as endorsed by Western Australian Planning Commission in 2016.

STRUCTURE PLAN REQUIREMENTS

Residential Precinct

a) The provisions of the Residential Design Codes of Western Australia (R-Codes) shall apply to residential development in this Precinct unless otherwise specified under a Loca Planning Policy or Residential Design Guidelines.

b) Development is to be in accordance with the density coding identified on the Structure Plan.

c) Sites identified as grouped housing sites as part of any subsequent subdivision applications may be developed to a maximum density of R40 and the Shire may require the preparation of a Local Development Plan (LDP) to be prepared prior to the development of that site.

d) No development or subdivision shall occur within the Waste Water Treatment Plant buffer until the buffer is removed or reduced.

e) All use, subdivision and development shall be in accordance with relevant Structure Plan.

f) In accordance with the EPA Guidance Statement No.3, for any subdivisions within the 500m of the Onslow Salt operations, notifications are to be placed on the certificate of title of each new subdivided lot to notify prospective purchasers of the potential noise impacts.

g) In accordance with the EPA Guidance Statement No.3, for any new dwellings within 1km of the Onslow Salt operations, the facades of the buildings fronting or perpendicular to the Onslow Salt operations are to incorporate architectural treatments to minimise noise impacts

Watson Drive Precinct

a) For the Watson Drive Precinct development standards are defined in Part A, section 4.1.2.1 of the Structure Plan report.

Large Live Work Lot Precinct

a) The development of the residential portion of the lot that faces a residential area in the Large Live-Work Lot Precinct shall be in accordance with the provisions of the Residential Design Codes of Western Australia (R-Codes) unless otherwise specified in this section.

b) The development of the non-residential portion of the lot that faces non-residential areas in the Large Live-Work Lot Precinct shall be in accordance with the provisions of the Home Business Standards under the Shire of Ashburton Scheme in regards to employment, amenity, vehicles and car parking and servicing needs.

c) Non-residential development in the Large Live-Work Lot Precinct shall be adequately landscaped and screened to maintain a lifestyle land use appearance as opposed to a commercial or industrial land use appearance.

d) A Local Development Plan (LDP) shall be prepared identifying basic design requirements within this precinct, including building envelopes, types of land uses etc.

Public Open Space and Drainage

a) The size and location of public open space shall be in accordance with the Structure Plan.

b) The design of public open space areas shall assist in the protection and enhancement of indigenous and european heritage sites (where applicable).

c) The design of public open space areas shall ensure appropriate provision for stormwater drainage management.

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

e) The design of these areas shall maximise the provision of shading to enhance amenity and promote social capital and walkability.

Education

a) The development of the Education Precinct shall be in accordance with the meaning of an Education Establishment as defined under the Shire of Ashburton Local Planning Scheme.

b) The external frontages of the Education Precinct shall be developed to a standard consistent with adjacent residental areas with regards to bulk and scale, streetscape, setbacks and landscaping.

c) The architectural style of any proposed buildings within this precinct are to be reflective of the Onslow Vernacular.

Area Subject to Further Investigation

a) The provisions of the Residential Design Codes of WA (R-Codes) and Clause 4.1.1 of this report shall apply to areas suitable for residential development in this Precinct subject to approval of the Shire of Ashburton and WAPC

b) For areas not suitable for development in this Precinct the provisions of the Public Open Space and Drainage Precinct shall apply including:

i. The design of public open space areas shall ensure the protection and enhancement of indigenous heritage sites.

ii. The design of public open space areas shall ensure appropriate provision for stormwater drainage management.

iii. The landscaping of public open space areas shall be suitable for an arid climate having regard to minimising maintenance and water use whilst providing areas of highly aesthetic and functional amenity.

c) The area within the WWTP Buffer shall be subject to a Local Development Plan (LDP) being prepared to the satisfaction of the Shire, prior to any development.

Land Use Permissibility

Land use permissibility shall generally be in accordance with the Land Use Permissibility Table, as shown in Part A of the Onslow Townsite Expansion Structure Plan report.

Local Development Plans

A LDP may be required (by the developer, an owner of the land or the Shire) by Council prior to any subdivision and/or substantial development and used as the basis for the determination of all development applications to the Shire of Ashburton.

The LDP will enhance, elaborate and expand the details and provisions contained in this Part as well as supplement the provisions of the Scheme and the R-Codes. LDP's are required to address the following:

a) building envelopes;

b) setbacks;

c) interfaces with public open space and drainage areas;

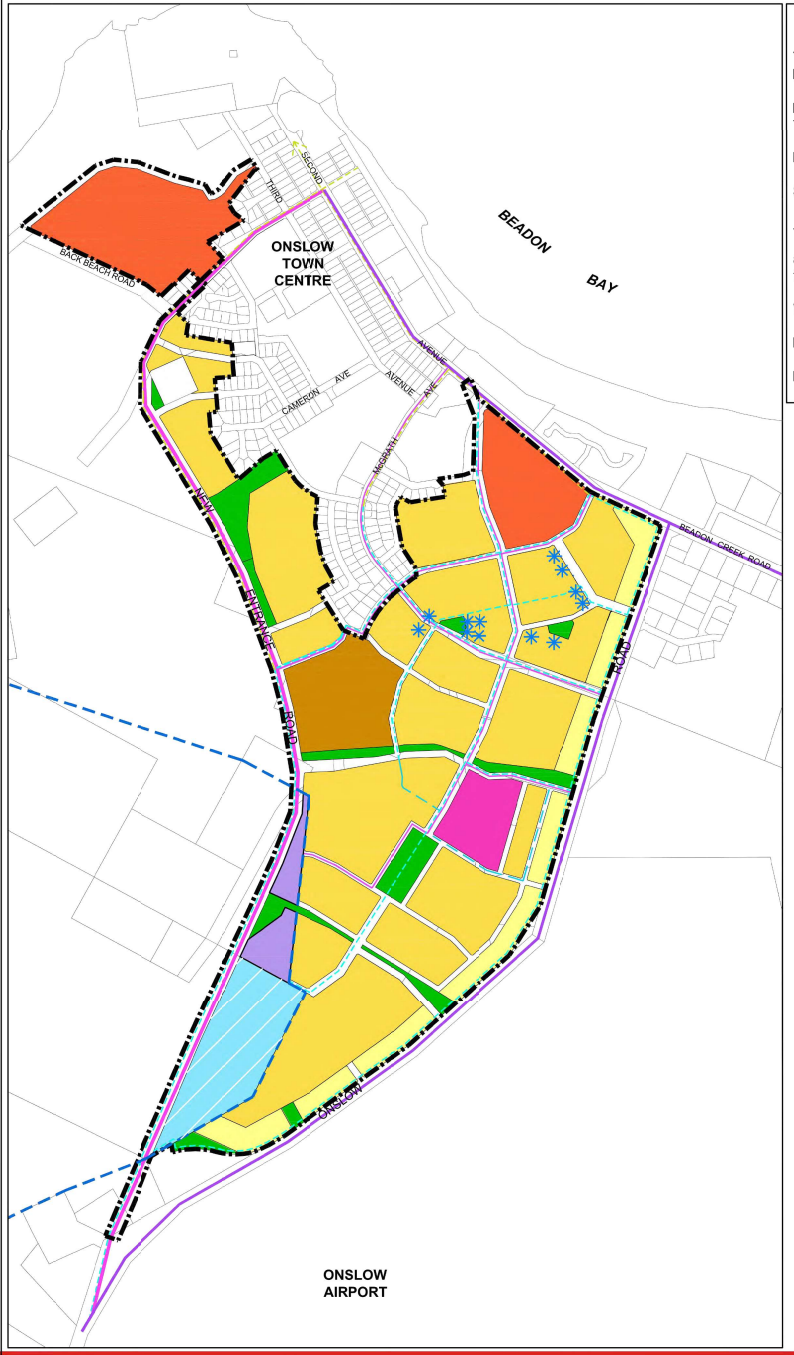
d) distribution of land uses within a lot (Large Residential Lifestyle lots);

e) vehicular access and parking;

f) loading and unloading areas, storage yards and rubbish collection closures;

g) the location, orientation and design of buildings and the space between buildings; and

h) such other information considered relevant by the Shire of Ashburton. Variations to the provisions of the R-Codes other than density shall be allowed.



CERTIFICATION OF STRUCTURE PLAN

This Structure Plan is prepared under the provisions of the Shire of Ashburton Town Planning Scheme No. 7

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

Date.....

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

.....

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

Witness.....

Date.....

Date of Expiry.....

LEGEND		OVERALL YIELDS	
	STRUCTURE PLAN AREA	199.1363ha	100%
	RESERVE (PARKS, RECREATION & DRAINAGE)	10.1354ha	5.0%
	EDUCATION	4.7324ha	2.4%
	SPECIAL USE (WATSON DRIVE PRECINCT)	9.0000ha	4.5%
	SPECIAL USE (LARGE LIVE WORK LOTS)	14.0680ha	7.1%
	RESIDENTIAL R30	91.9028ha	46.1%
	AREA SUBJECT TO FURTHER INVESTIGATION	21.8990ha	11.0%
	AREA SUBJECT TO FURTHER INVESTIGATION - NON RESIDENTIAL	3.4960ha	1.8%
	RESERVE (INFRASTRUCTURE) - WATER CORP UTILITIES SITE COMPATIBLE LAND USES ONLY	10.7086ha	5.4%
	ROADS	33.1941ha	16.7%
	BUFFER FROM TOWN WWTP	N/A	N/A
	EXISTING CADASTRE	N/A	N/A
	TOTAL	199.1363ha	100%

ROAD HIERARCHY

- ARTERIAL/ PRIMARY
- NEIGHBOURHOOD CONNECTOR
- ACCESS STREET (HIGHER ORDER)
- GROUP HOUSING SITES

PEDESTRIAN AND CYCLE PATHS

- SHARED PATH NETWORK AND FOOTPATH
- FOOTPATH BOTH SIDES
- SHARED PATH NETWORK BY OTHERS

FIG.
A.4

ONSLOW TOWNSITE EXPANSION STRUCTURE PLAN

This concept has been prepared for the purpose of meeting client specifications. The drawing does not constitute an invitation,agreement or contract (or any part thereof) of any kind whatsoever.

Although care has been taken in the compilation of this drawing by The Planning Group WA Pty Ltd, all parties associated with the proposed property development disclaim all responsibility for any errors or omissions. The right is reserved to change the plan at any time.

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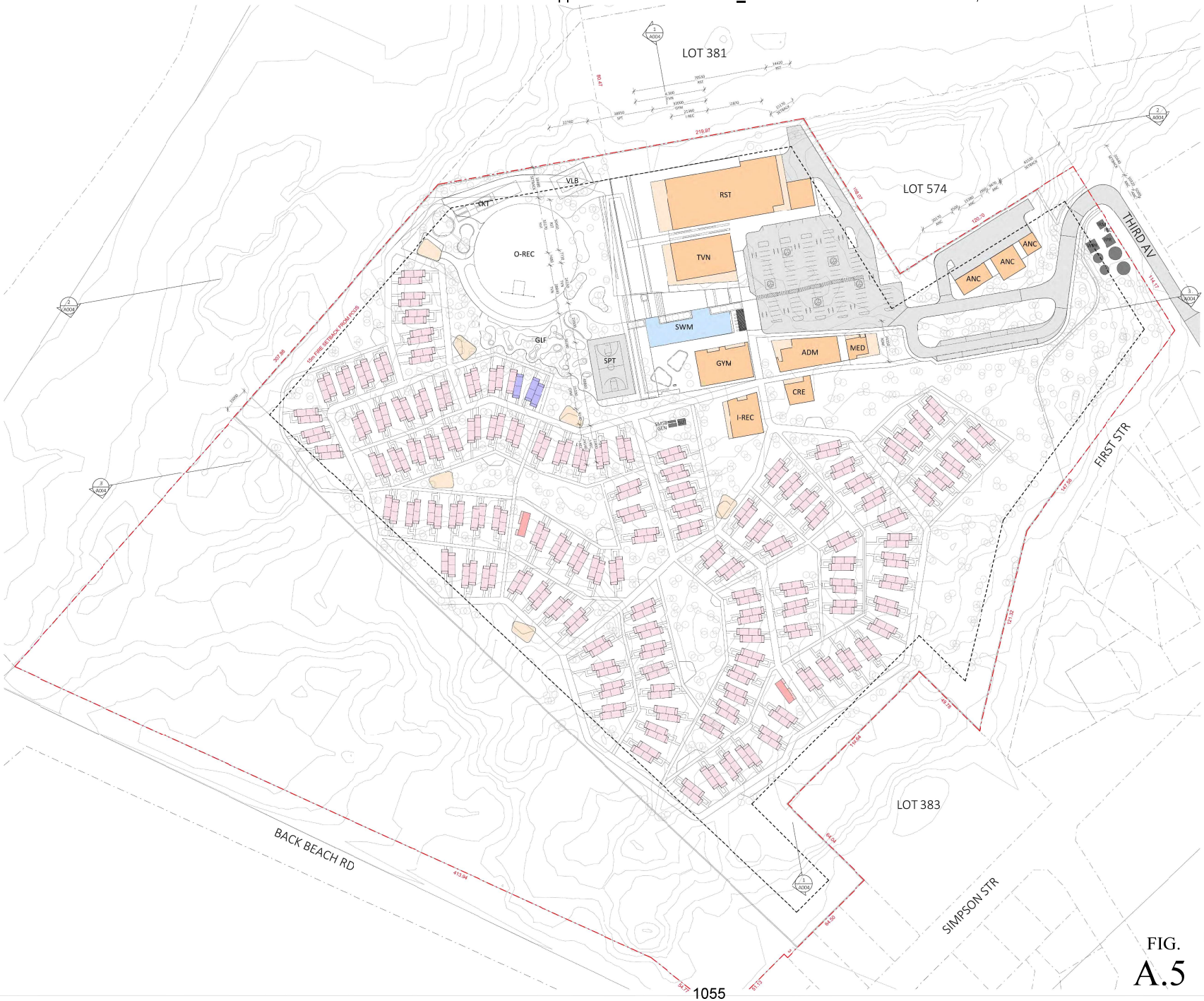
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0 250m 500 m

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A.3 PROPOSED DEVELOPMENT PLAN

Figure A.5 shows the overall Masterplan for the proposed Onslow Township Village, as prepared by Milieu Creative.



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SYMBOL LEGEND

- SITE BOUNDARY
- BUILDING
- COVERED OUTDOOR SPACE
- UNCOVERED OUTDOOR SPACE
- SERVICES
- WATER BODY
- ROAD/CAR PARK
- FIELD STORE (WITH LAUNDRY)
- ACCOMMODATION PODS (SLEEPS 4)
- ACCESSIBLE ACCOMMODATION PODS (SLEEPS 2)
- EXISTING WATER CONNECTION POINT
- EXISTING SEWER CONNECTION POINT
- PLANTING - REFER LANDSCAPEDRAWINGS FOR DETAILS
- 15m FIRE SETBACK FROM POS

CODE LEGEND

ADM	ADMINISTRATION
AMN	AMENITIES
ANC	ANCILLARY - GATE HOUSE, SURVEILLANCE HUT & STORES
CKT	OUTDOOR CRICKET
CRE	CRECHE & COWAYS
FBC	FIRE BOOSTER CABINET
FPR	FIRE PUMP ROOM
GEN	GENERATOR
GLF	MINI GOLF
GYM	GYMNASIUM & SWIMMING FACEITY
INS	TRAINING & INDUCTIONS
IRM	INTAKE RING MAIN
I-REC	INDOOR RECREATION
LDR	LAUNDRY, CLEANING & STORE
MED	MEDICAL & WELLNESS
O-REC	OUTDOOR RECREATION
RST	RESTAURANT
SMSB	SITE MAIN SWITCH BOARD
SPT	MULTI-PURPOSE COURTS
SUT	STEP UP TRANSFORMER
SWM	SWIMMING POOL
TVN	TAVERN
VLB	OUTDOOR VOLLEYBALL
WPR	WATER PUMP ROOM

NO.	DATE	DESCRIPTION
K	08/03/22	REVISED DA ISSUE
J	17/02/22	REVISED FOR VALUE ENGINEERING
I	11/02/22	REVISED FOR VALUE ENGINEERING
H	27/12/21	ISSUE FOR INFORMATION
G	08/12/21	ISSUE FOR STAGING
F	24/11/21	REVISED FOR DEVELOPMENT APPLICATION
E	31/08/21	DA ISSUE
D	30/08/21	ISSUE FOR INFORMATION
C	28/08/21	ISSUE FOR PRICING
B	10/08/21	DRAFT DA ISSUE
A	04/08/21	ISSUE FOR INFORMATION

ISSUE
DEVELOPMENT APPLICATION

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milieucreative.com

PROJECT
LOT 300, BACK BEACH ROAD
ONSLOW WA 6710

PROJECT NAME
ONSLOW TOWNSHIP VILLAGE

DRAWING
SITE MASTER PLAN

milieu

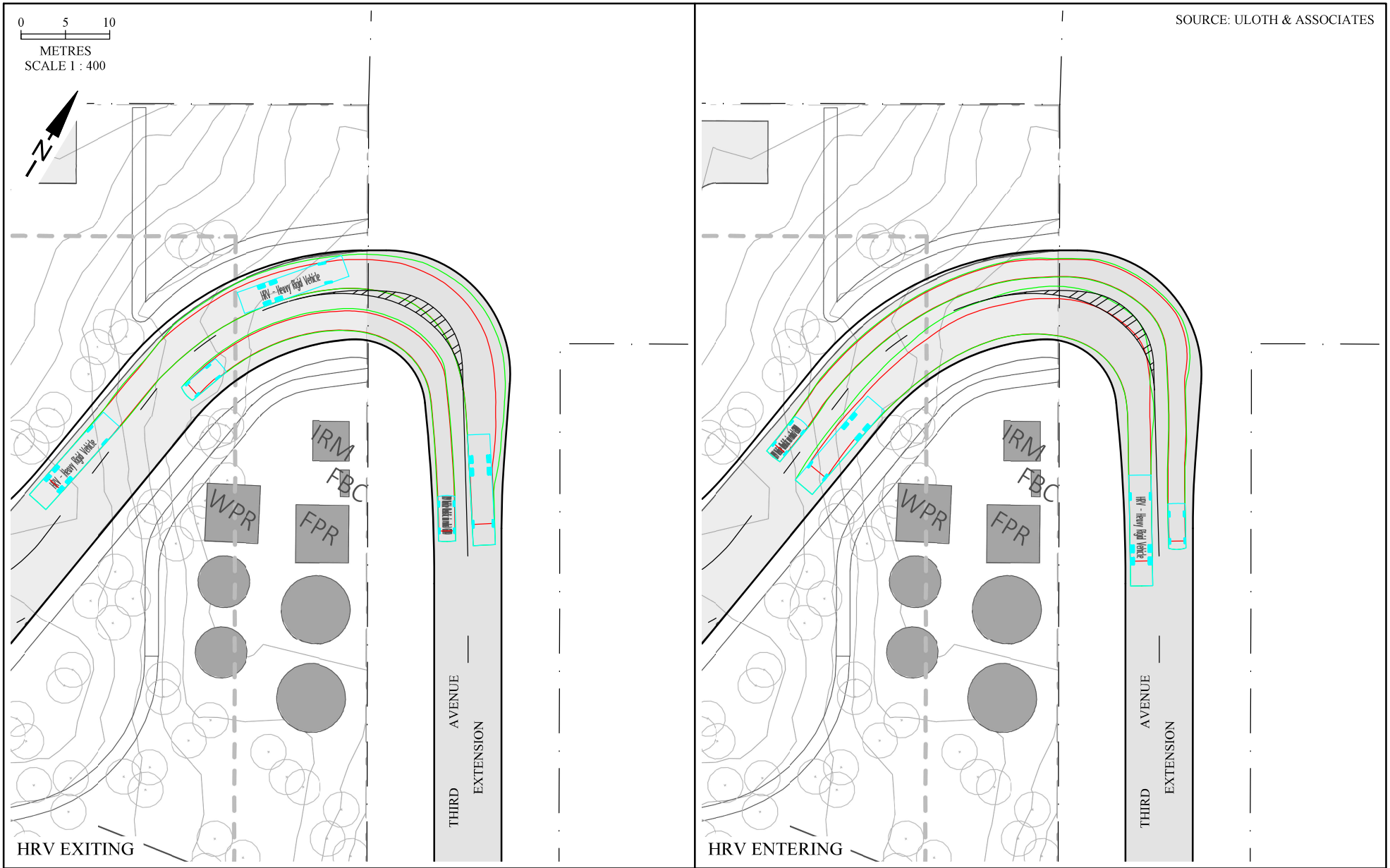
DRAWN	Author	SCALE 1 : 1000	DATE 03/31/22	REVISION K
CHECKED	Checker	SHEET A1	PROJECT NO 210603	DA002

FIG.
A.5

A.4 SWEPT PATH ANALYSIS

Figures A.6 to A.10 show a number of swept path diagrams, confirming the overall access arrangements and servicing requirements for the proposed development, as follows:

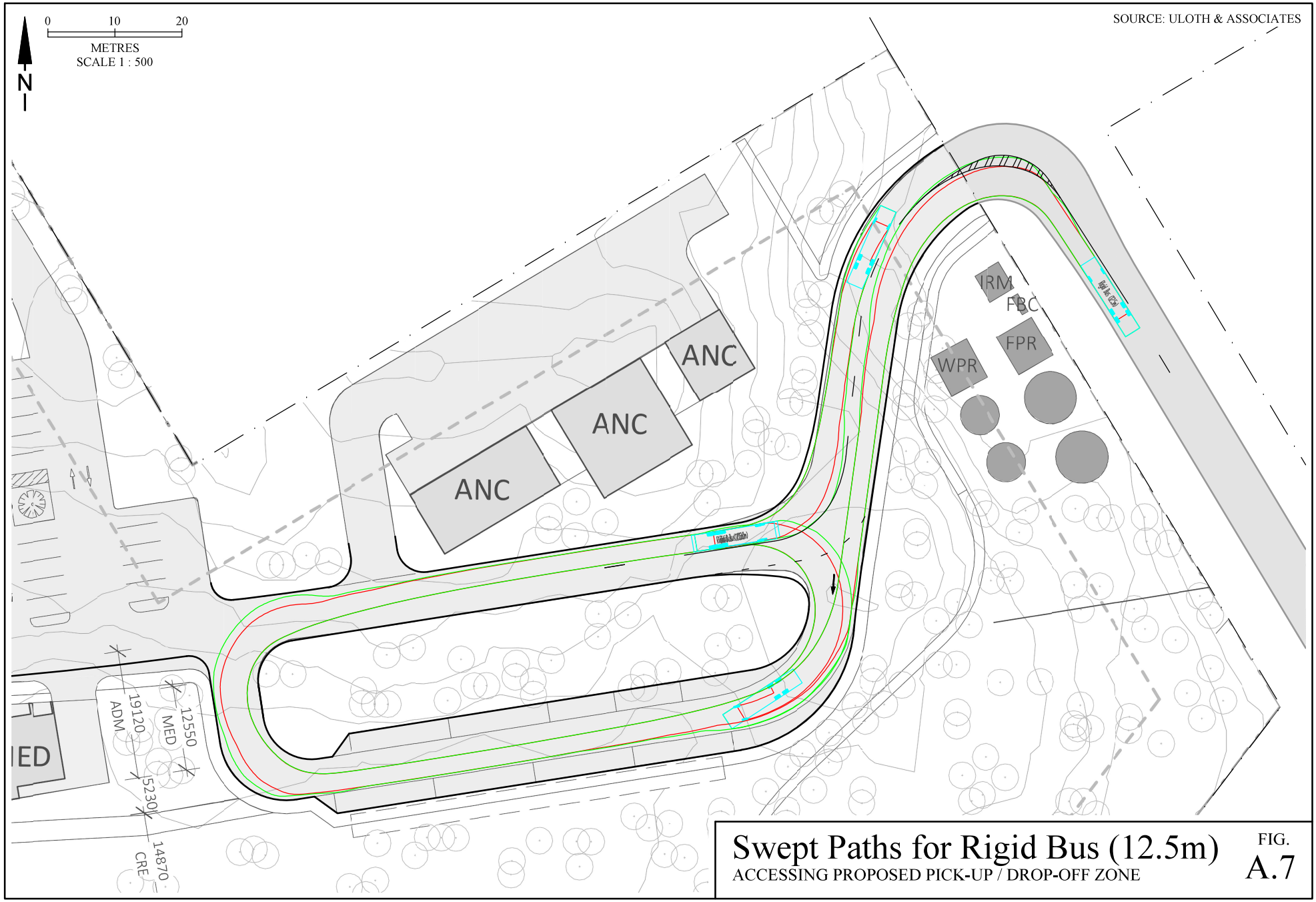
- Figure A.6 shows the swept paths confirming that the recommended concept plan for access off Third Avenue can accommodate a 12.5 metre Heavy Rigid Vehicle accessing the site at the same time as passing a B99 Car.
- Figure A.7 shows swept paths for a 12.5 metre Bus accessing and circulating around the proposed pick-up/drop-off zone, while Figure A.8 shows the swept paths for a 12.5 metre Heavy Rigid Vehicle accessing the proposed service yard and loading dock adjacent to the Restaurant.
- Figure A.9 then shows the swept paths for a 10-metre Rubbish Truck accessing the proposed service yard for bin collection adjacent to the Restaurant, before proceeding to the Maintenance Area for further collections.
- Figure A.10 then shows the swept paths for an 8.8 metre Medium Rigid Vehicle accessing the proposed Maintenance Area, and the proposed Fire Access route along the internal pathways.



Swept Paths for HRV (12.5m) and B99 Car (5.2m)

ACCESSING THE SITE OFF THIRD AVENUE

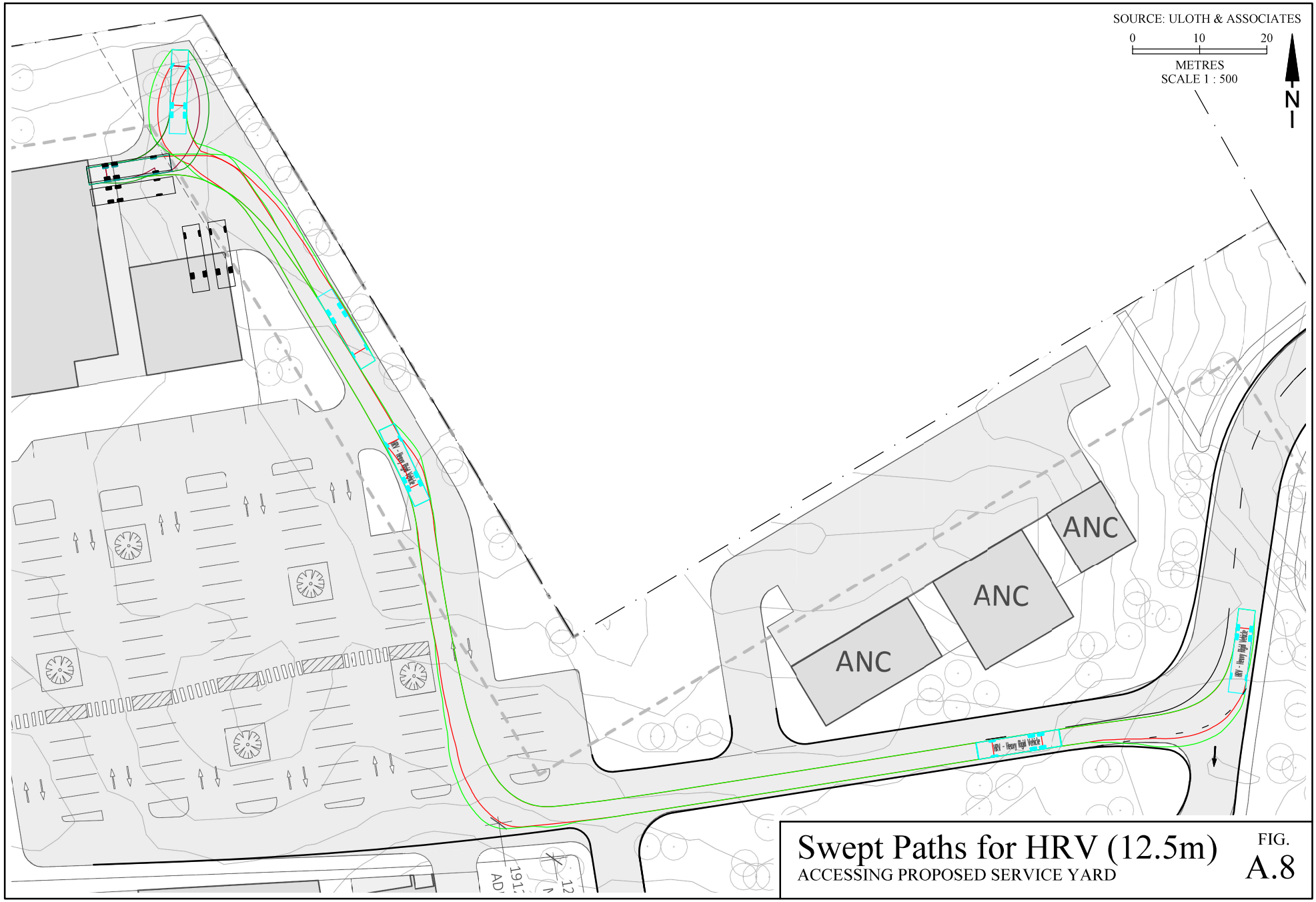
FIG. A.6

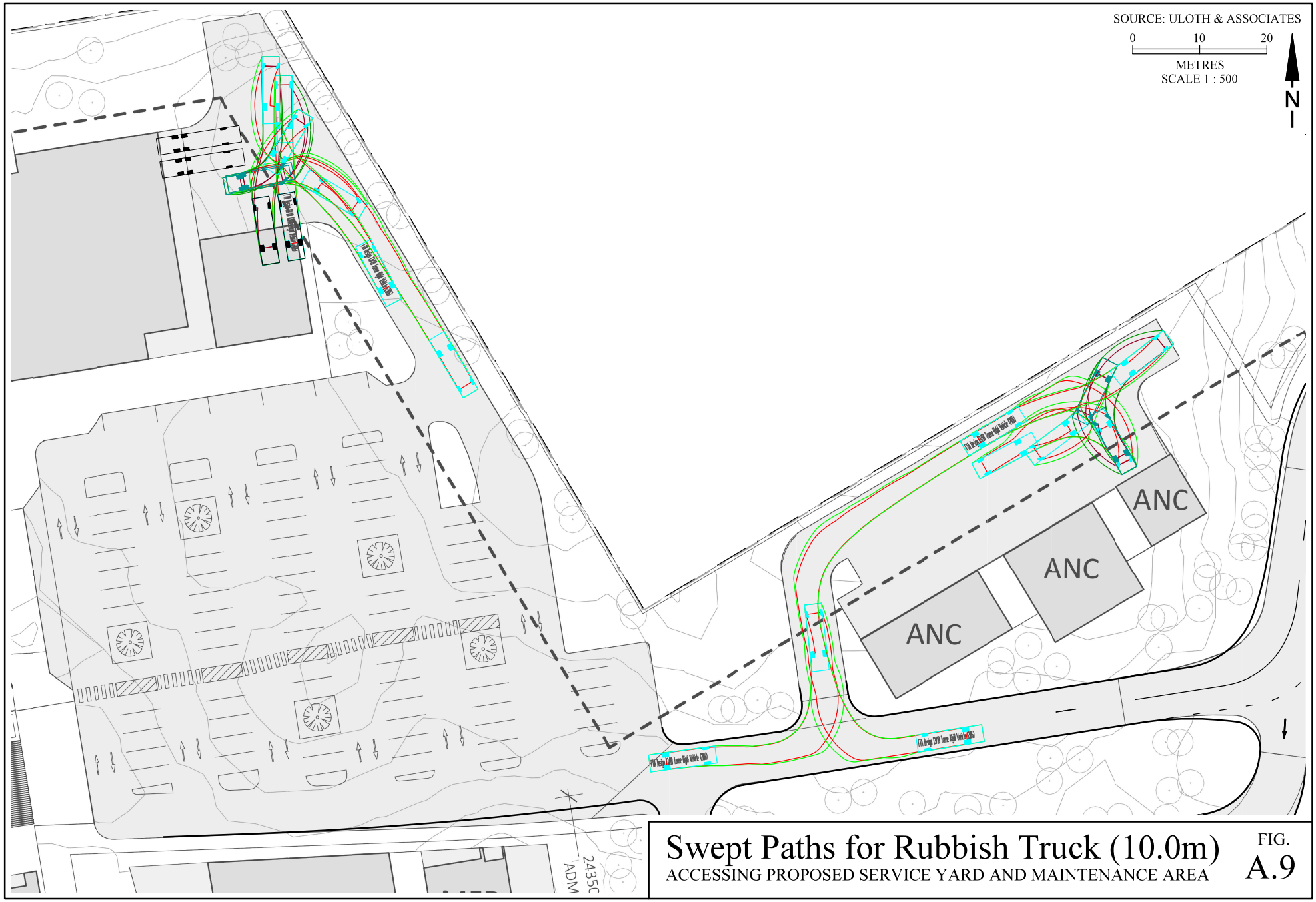


Swept Paths for Rigid Bus (12.5m)

ACCESSING PROPOSED PICK-UP / DROP-OFF ZONE

FIG. A.7

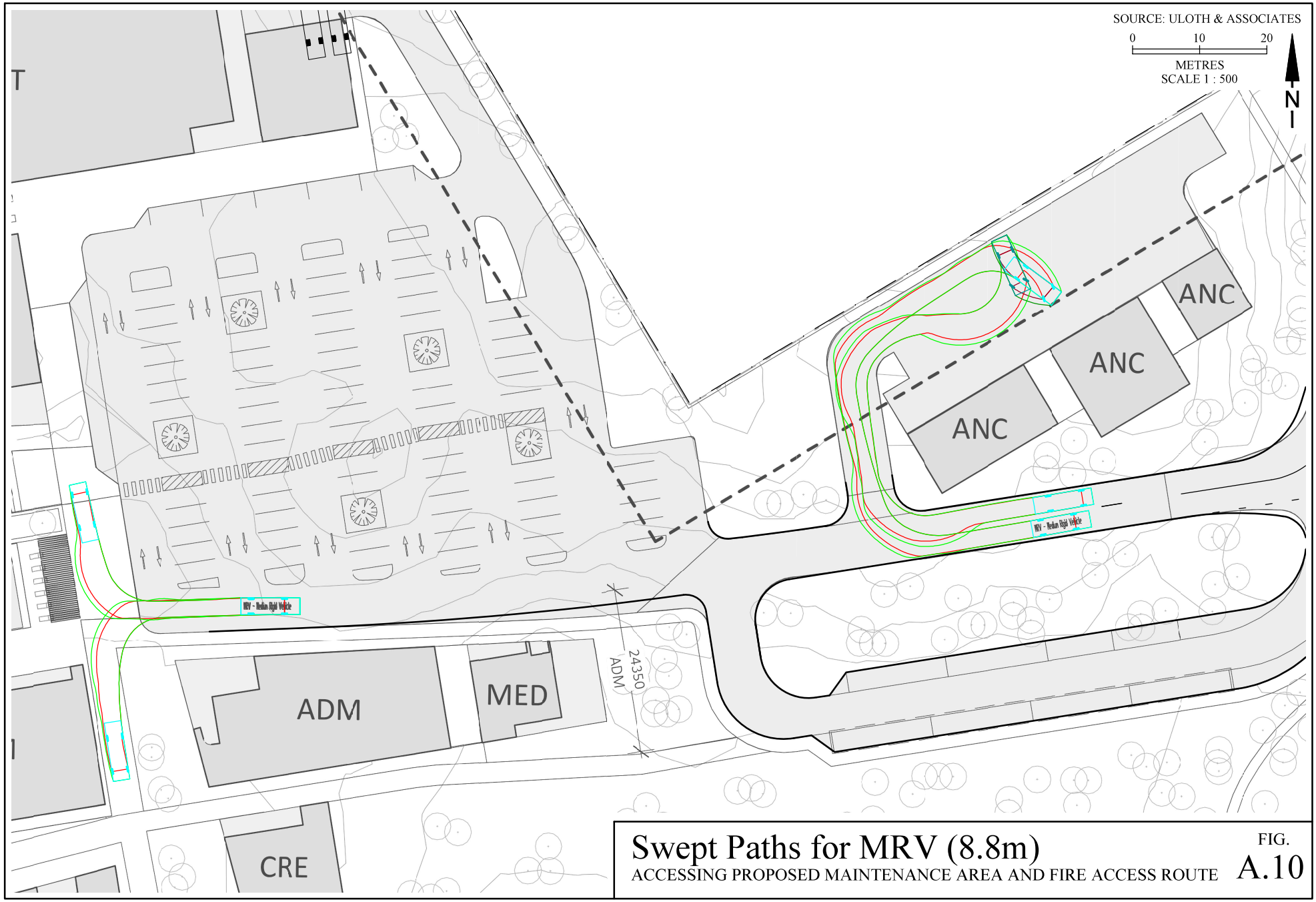

SOURCE: ULOTH & ASSOCIATES
0
10
20
METRES
SCALE 1 : 500
N
ANC
ANC
ANC
HRV - Heavy Rigid Vehicle
HRV - Heavy Rigid Vehicle
HRV - Heavy Rigid Vehicle
Swept Paths for HRV (12.5m)
ACCESSING PROPOSED SERVICE YARD
FIG.
A.8



Swept Paths for Rubbish Truck (10.0m)

ACCESSING PROPOSED SERVICE YARD AND MAINTENANCE AREA

FIG. A.9



Swept Paths for MRV (8.8m)

ACCESSING PROPOSED MAINTENANCE AREA AND FIRE ACCESS ROUTE

FIG. A.10

Onslow Township Village

Engineering Servicing Report

Project No: 21-195



pritchard francis
civil and structural engineering consultants

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2.2 Topography/Earthworks Concept 5
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2.4 Contamination 5
2.5 Bushfire Risk 6
3 Infrastructure 6
3.1 Stormwater Drainage 6
3.2 Wastewater Reticulation 6
3.3 Water Reticulation 7
3.4 Fire 7
3.5 Gas Supply 7
3.6 Electrical Supply 7
3.7 Communications 7
4 Conclusion 7

Appendix One: Architectural Plan

Appendix Two: Geological Series Map

Appendix Three: Lidar Survey

Appendix Four: Civil Concept Plan

Appendix Five: Landscape Concept Plan

Appendix Six: Modelled Catchments

Appendix Seven: 1% AEP Inundation Extent

Appendix Eight: 360 Environmental Technical Note to Appendix Six and Seven

Appendix Nine: Wastewater Plan

Revision	Description	Author	Date
0	Issued For Review	Andrew Tucker	05/08/2021
1	Issued For Review	Andrew Tucker	27/08/2021

2	Issued For Review	Andrew Tucker	25/03/2022
3	Issued For Review	Andrew Tucker	05/05/2022

1 Introduction

At the request of Milieu Creative, on behalf of the Mineral Resources Pty Ltd team lead by Rowe Group, Pritchard Francis have prepared this engineering servicing report to identify existing site conditions, existing services and potential upgrades required in order to facilitate the development of the Onslow Township Village.

The nominated development area, part of Lot 300 Back Beach Road, is located within the Shire of Ashburton, situated on the western side of the Onslow town centre. The proposed site is bordered by Lookout Point to the north, First Street to the east, Back Beach Road to the south and the Ian Blair Memorial Boardwalk/beach to the west. It is noted that part of the area facing Back Beach Road is being separated for potential use as a cultural centre.

Please refer to Appendix 1 for the Concept Plan prepared by Milieu Creative.



Figure 1 – 2020 Aerial photograph of Lot 300 Back Beach Road

1.1 Report Qualifications

In line with this report, Pritchard Francis make the following qualifications:

- This report was prepared exclusively for the Mineral Resources. Unless otherwise stated, the use of this report by third parties is not permitted.
- The information provided in this report may be considered valid for three (3) months from the date of the report.
- The information provided in this report is based upon the information and documentation provided by the consultant team and project architect. Pritchard Francis have relied on such information and documents. Where we are uninformed of developments outside of this report, Pritchard Francis cannot be held responsible or liable for any problems or issues that may arise as a consequence.
- Assumptions have been made which, if incorrect, have the potential to impact the recommendations of this report. Major development implications existing through avenues which cannot be assured at the time of this report, including the upgrading and provision of utility services, WAPC Conditions, DA Conditions, Local Authority Scheme Requirements, timing of adjacent developments, etc.
- Unless otherwise stated, the capacity of existing services has not been verified via engineering calculations. Where required, external consultants may need to be engaged to provide accurate assessments of existing and future servicing capacity.
- A site visit has not been conducted as part of this desktop study. An underground service scan has not been completed and information containing existing service information may differ from the physical service locations. Where possible, Pritchard Francis recommend verifying existing service locations and conditions.
- The civil designs presented in this report are conceptual in nature, and by no means depict the ultimate design solution. Detail design and documentation will be necessary to validate all design levels and gradients to ensure compliant with the client brief, Australian Standards, Austroads and relevant authority guidelines.

2 Site Conditions

2.1 Geology

The Australia 1:250,000 Geological Series map of Onslow (SF50-5) classifies the site as 'Qs: Beaches and coastal dunes – Light grey, unconsolidated and poorly consolidated quartzose calcarenite'.

The previously undertaken Golder Desktop Study indicates greenfill in the location of the proposed township. Proof rolling will be undertaken where possible. It is assumed that standard building footings for the area will be adequate after site preparation. Some infiltration is expected based on the geological series of the area.

Further geotechnical testing would be required to confirm site characteristics such as infiltration rate and site classification.

Please refer to Appendix 2 for the Geological Series Map of Onslow.

2.2 Topography/Earthworks Concept

The site generally falls from the north-east to the south-west, with levels undulating significantly within the bounds of the high points of approximately RL 17.0m and the low points of approximately RL 3.0m.

Pritchard Francis, in coordination with the Architect and Landscape Architect have implemented a design such that impact on existing topography is minimised in order to maintain the natural characteristics of the site. Natural contours and have been utilised in the development of the stormwater concept plan.

Limited site disturbance will be achieved by localising necessary changes to areas with key structures, access carpark and bus bay.

Review of the Lidar survey and concept plan indicate that earthworks (cut/fill) can be balanced on site, eliminating the need for import and/or export of fill.

The development will share a border with a proposed cultural centre to the south. The cultural centre will be bound by the Iron Ore township on the northern side, and Back Beach Road on the southern side. The access track shall double as a wellness track to achieve vehicle access for bushfire compliance purposes.

Please refer to Appendix 3 for the Lidar survey, Appendix 4 for the Pritchard Francis Earthworks, and Appendix 5 for the Landscape concept plan.

2.3 Groundwater Levels

It is not expected that groundwater levels will impact earthworks on site. Groundwater levels may impact the sewer discharge upgrade during construction and may need to be managed at such time.

2.4 Contamination

The Department of Water and Environmental Regulation contaminated site database indicates that no sites within the land development area are registered as contaminated sites. The publicly available database lists classified sites under the categories 'Remediated for restricted use', 'Contaminated – remediation required' and 'Contaminated – restricted use'.

DFES has placed the site under the UXO category 'Slight Potential', citing 'Anti-aircraft artillery live firing practices using high explosive ammunition during WWII. Aerial bombing also highly likely'.

The site is listed as not impacted by contamination according to Landgate.

2.5 Bushfire Risk

The Department of Fire and Emergency Services (DFES) bushfire risk mapping indicates that the site is within a bushfire prone area.

Reporting has been completed by Linfire, and the findings used as part of the overall submission.

Pritchard Francis has made provisions for relevant vehicle access requirements and duplicated the function as part of the perimeter wellness track under section *A3.5 Private driveway longer than 50 metres* of *SPP 3.7*.

3 Infrastructure

3.1 Stormwater Drainage

Stormwater is to be managed primarily via overland flow. The proposed development aims to minimise changes to the existing site and as such, overland flow paths have been chosen to utilise the existing depressions in the topography.

Based on the minimal disturbance intended, the catchment areas have not been changed despite the addition of impervious areas.

Please refer to Appendix Six for the Modelled Catchments and Appendix Seven for the 1% AEP Inundation Event plans. Note: Please refer to Appendix Eight for the Technical Note to Appendix Six and Appendix Seven.

All stormwater flows from vehicle access ways shall be captured and treated as part of the first flush. All other run-off from impervious areas within Catchment C will be directed via overland flow to Storage C for infiltration and discharge.

Minor event (20% AEP) and Major Event (1% AEP) events will be managed via overland flow to the existing natural depressions for storage and infiltration. Refer to the 1% AEP Inundation Event for storage locations.

The pods orientated around the main buildings will require confirmation of free drain discharge for 1% AEP events.

Please refer to the 360 Environmental Urban Water Management Plan Report for more information.

3.2 Wastewater Reticulation

The Water Corporation esinet data obtained on 20 July 2021 indicates there is wastewater servicing potential around the site. Wastewater services are viable from two locations near First St, on the eastern side of the site:

- Ø150mm at the intersection of First St and Third Avenue.
- Ø150mm on Simpson St, IL 0.93, near the intersection of First St and Simpson St.

Pritchard Francis believe the most efficient option to be the connection point within Simpson St. This location enables servicing of the main facility and pods with adequate cover and allows for a main sewer line. This will enable connection of the minor lines before discharging at Simpson St. This strategy compliments the natural topography and will minimise excavation.

Servicing of the internal sewer has been validated in accordance with AS3500 by Stantec to achieve gravity discharge.

Please refer to Appendix Eight for the Wastewater Plan.

Water Corporation has advised that it is expected to have treatment capacity for the increased demand (nominated above the likely ultimate use). Pritchard Francis are awaiting advice regarding potential need for in line upgrades to the McGrath Ave pump station and associated pressure main and whether this will be completed under headworks or customer funded works agreements.

3.3 Water Reticulation

The Water Corporation esinet data obtained on 20 July 2021 indicates that the development can be served by the following services;

- 250AC water reticulation main located within the 'Lookout Point' on the north-eastern boundary of the site.
- 150AC Water reticulation main in the Simpson Street road reserve, accessible from First St.

A concept plan based on utilisation of the Third Ave service. Connection to the site is expected to have a tank to buffer peak flows. Capacity of the service is to be coordinated with Water Corporation. The intent would be to disguise this in the landform or via screening.

3.4 Fire

Hardstand and fire appliance accessway shall be provided in accordance with the BCA and shall be designed and constructed in accordance with AS2419.1 and has been provided for.

3.5 Gas Supply

There is currently no available gas service in proximity to the site.

3.6 Electrical Supply

Pritchard Francis is awaiting confirmation of availability of electrical services from the electrical consultant. It is expected that capacity will need to be made available generation capacity and that of the existing network.

3.7 Communications

There is nearby Telstra cabling located in Simpson St and Third Ave on the eastern side of the development site.

NBN access mapping confirms the site is serviceable.

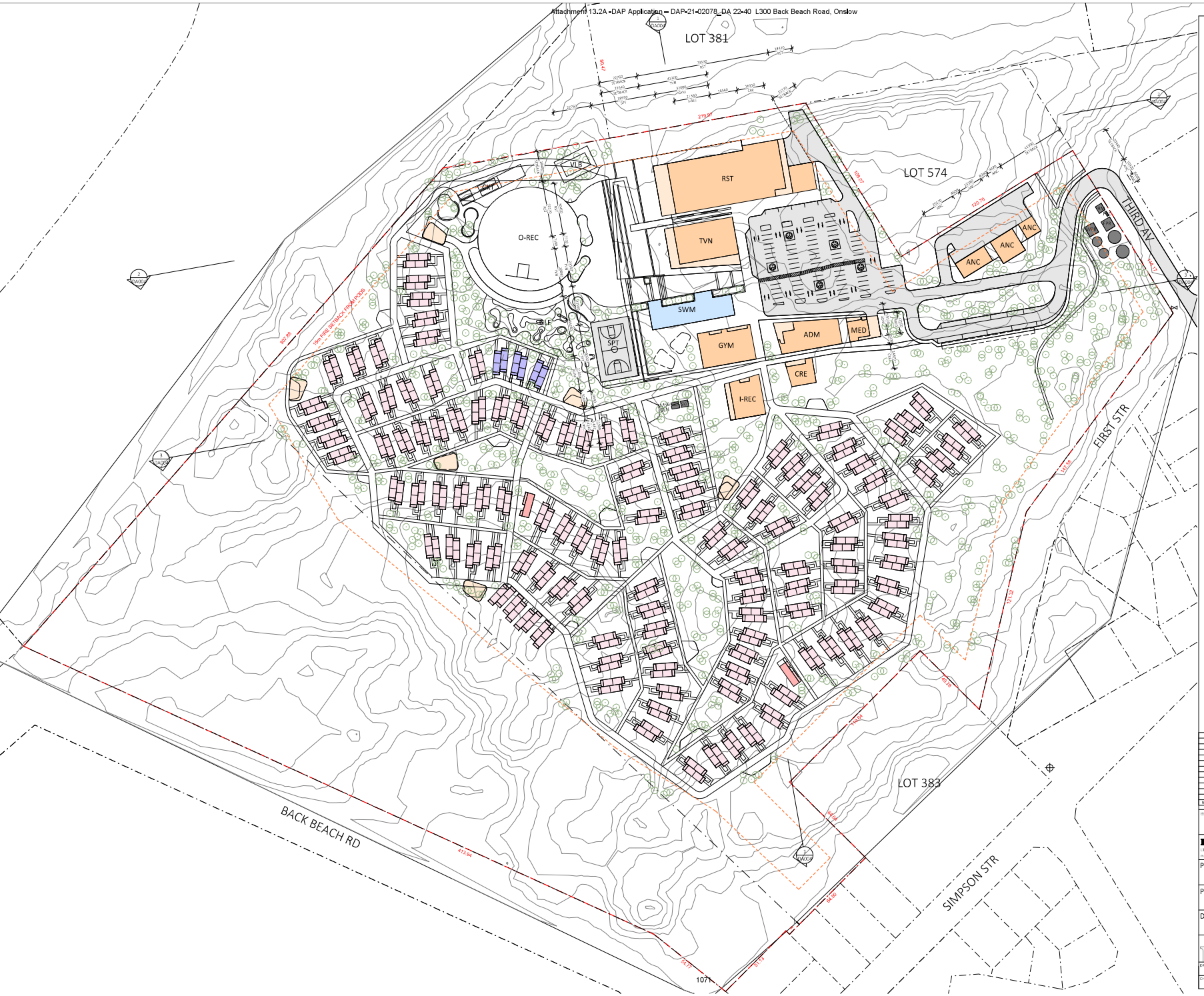
4 Conclusion

This report outlines the existing physical conditions and existing road/infrastructure capable of servicing the proposed development site. Pritchard Francis confirm that the site is accessible and can be served with roads, electrical, water, sewer, stormwater drainage and communications infrastructure.

Appendices

Appendix One:	Architectural Plan
Appendix Two:	Geological Series Map
Appendix Three:	Lidar Survey
Appendix Four:	Civil Concept Plan
Appendix Five:	Landscape Concept Plan
Appendix Six:	Modelled Catchments
Appendix Seven:	1% AEP Inundation Extent
Appendix Eight:	360 Environmental Technical Note to Appendix Six and Seven
Appendix Nine:	Wastewater Plan

Appendix One: Architectural Plan



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A	04/08/21	ISSUE FOR INFORMATION

ISSUE

DEVELOPMENT APPLICATION

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milieucreative.com

PROJECT
LOT 301, BACK BEACH ROAD
ONSLOW WA 6710

PROJECT NAME
ONSLOW TOWNSHIP VILLAGE

DRAWING
SITE MASTER PLAN

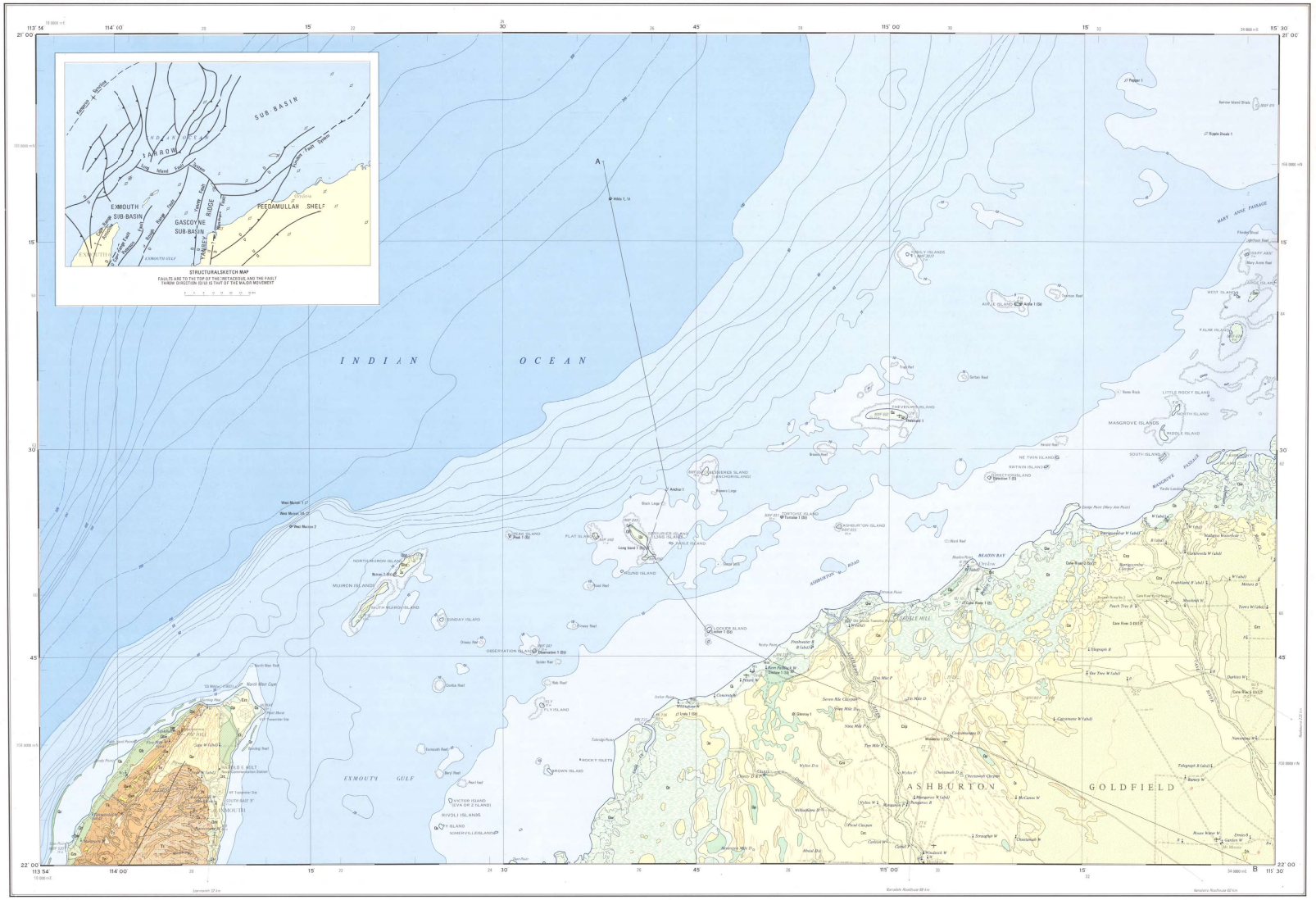
DRAWN	SCALE	DATE	REVISION
MC	1 : 1000	25/02/2022	K
CHECKED	SHEET	PROJECT NO	
JC	A1	21060	

DA002

Appendix Two: Geological Series Map

Attachment 13.2A - DAP Application – DAP-21-02078_DA 22-40 L300 Back Beach Road, Onslow

ONSLOW



Compiled and published by the Geological Survey of Western Australia. Cartography by the Geological Mapping Section, Department of Mines. Topocraphic base from compilations by the National Mapping, Canberra, A.C.T.

Copies of this map may be obtained from the Geological Survey of Western Australia, 66 Adelaide Trc., Perth.

Printed by the Government Printing Office, Perth.

FLIGHT DIAGRAM

Air photography (scale 1:85 000) by National Development, Canberra, A.C.T. November, 1967.

HON. P.V. JONES, M.L.A.
MINISTER FOR MINES

A.F. TRENDALL, DIRECTOR, GEOLOGICAL SURVEY

SCALE 1 : 250 000

0 5 10 15 20 25 30 Kilometres

TRANSVERSE MERCATOR PROJECTION
AUSTRALIAN NATIONAL SPHEROID ZONE 50
Tints inside the sheet edge represent 1000 metre intervals if the Australian Map Grid

RELIABILITY DIAGRAM

R Numerous traverses with air photo interpretation
C Air photo interpretation

INDEX TO ADJOINING SHEETS

SF 49 - 4	BARROW ISLAND SF 50 - 1	SAMPIRES SF 50 - 2
SF 49 - 8	ONSLOW SF 50 - 5	YARRALOOLA SF 50 - 6
NINGALOO SF 49 - 12	FANCY SF 50 - 9	WYLOO SF 50 - 10

Geology by M.J.C. van de Graaff, P.D.Denman, A.M. Hocking 1975

DECLINATION DIAGRAM

DIAGRAMMATIC SECTION

NATURAL SCALE

SECTION A - B

G-T Quaternary – Tertiary
T Tertiary
K Cretaceous
J Jurassic
Tr Triassic
P Permian
P - C Permian – Carboniferous
UC Upper Carboniferous
pE Precambrian

REFERENCE

CAINOZOIC

QUATERNARY

Qr Ningaloo Reef – living coralgal reef
Qs Beaches and coastal dunes – light grey, unconsolidated and poorly consolidatedquartzose calcarenite
Qse Intertidal flats and mangrove swamps – calcareous clay, silt and sand
Qt Supratidal flats – calcareous clay, silt and sand with authigenicgypsum and superficial algal mats and salt crusts
Qa Claoyeie – poorly sorted clay, silt, sand and minor pebbles

PLEISTOCENE TO HOLOCENE

Qe Longitudinal and network dunes and residual sand plains – reddish-brown to yellowish quartz sand

BUDDERA CALCARENITE

Qbe Five to medium-grained calcarenite with interstadial Tralcrete soils eolian; dune shapes mostly preserved

Qbt **Tortoiseshell Member:** calcarenites and calcirudites,coralgal reef deposits; shallow marine and minor eolian

Qbn **Nnodoweva Conglomerate Member:** limestone pebble conglomerate and minor coralgal reef deposits; shallow marine to stromtolitic

Qbj **Jurabi Member:** coralgal reef deposits, minor calcarenite and calcilutite; shallow marine and minor eolian

PLEISTOCENE

EXMOUTH SANDSTONE

Undifferentiated: quartzose calcarenites with intercalated Tralcrete soils,eolian and minor shallow marine; dune shapes poorly preserved

Qem **Mayering Member:** well-sorted, medium-grained, rose-bedded quartzose calcarenite, coarse-grained quartzose calcarenite, minor pebble conglomeratic; eolian and shallow marine

Qen **Meinon Member:** well sorted, medium grained, cross-bedded quartzose calcarenite, coarse-grained calcarenite; eolian and shallow marine

QUAT. TO ? PLIOCENE

Qrk Calcrete – lumpy to nodular cemessive, authigenic limestone, locally silicified
Qca Alluvium – clay, silt, sand and rravel, partly calcreted
Qrc Colluvium – poorly sorted clay silt, sand and gravel; formed on plains and slopes by sheet flood and deflation; includes minor laterite exposed in south east of sheet area
Qsp Claoyan-dominant terrain – claoyere with longitudinal and rectanas, and/or flt definition lag surfaces; clay, silt, sand and gravi

LEIGHTON LOWER TO MIDDLE MIOCENE

Tx Tr **VLAMING SANDSTONE:** well sorted, medium-grained, cross-bedded quartzose calcarenite with calcrete soils; eolian

Tp Tp **PILGRAMUMA FORMATION:** quartzose cross-bedded calcarenite and coralgal limestone; shallow marine

Tk Tr **THEVALLA LIMESTONE:** calcarenite to calcirdite with coralgal limestone; shallow marine

Tk **TU.KU LIMESTONE:** reddish to yellowish, partly clayey foraminiferal calcareniticpackstone; shallow marine

SYMBOLS

Geological boundary
Anticlinal axis
Bedding, inclined
Joint, vertical
Type section locality
Current direction from cross-bedding

Formed road
Track
Townsite, gazetted
Population 1 000 - 10 000
less than 1 000
Homestead
Airfield
Landing ground
Horizontal control: major, minor
Bench mark, height accurate

Watercourse, intermittent
Race
Well
Windpump
Dam
Pool
Bathymetric contour line, depth in metres
Lighthouse
Reef, exposed – rocky and/or living coralgal reef
Rock, subject to wash
Wreck, exposed
Abandoned

Sand dunes
Contour line, height in metres

Petroleum exploration wells
Dry hole, abandoned
Stratigraphic well
Show of oil and gas, abandoned
Show of gas, abandoned

Mineral prospect
Heavy mineral sands
Sulphur, native

QUATERNARY ROCK RELATIONSHIPS

CAPE RANGE AREA

pre-Quaternary

EASTERN PORTION

? Qrk ref Crc

pre-Quaternary

PRE-QUATERNARY ROCK RELATIONSHIPS

Q Quaternary
Tm Mandu Calcarenite
TB Carnarvon Group and Giralia Calcarenite
TJ Tertiary
TJ Eocene Calcarenite Tryphinga Calcirudite
Kg Gearle Siltstone
Km Windalia Radiolarite
Kms Muderong Shale
Ks Birdrong Sandstone
Kmp Neocomian Formation and Yarraloola Conglomerate
K-Jb Barrow Formation
Jl Dingo Claystone
Tmu Mungaroo Formation
TrL Locker Shale
Pk Upper Permian: Kennedy Group
Pl Lower Permian: Lyons Group, Moogooree Group and Byro Group
C Carboniferous, unnamed
D Devonian, unnamed
pE Precambrian, probably Proterozoic
Fault
Unconformity

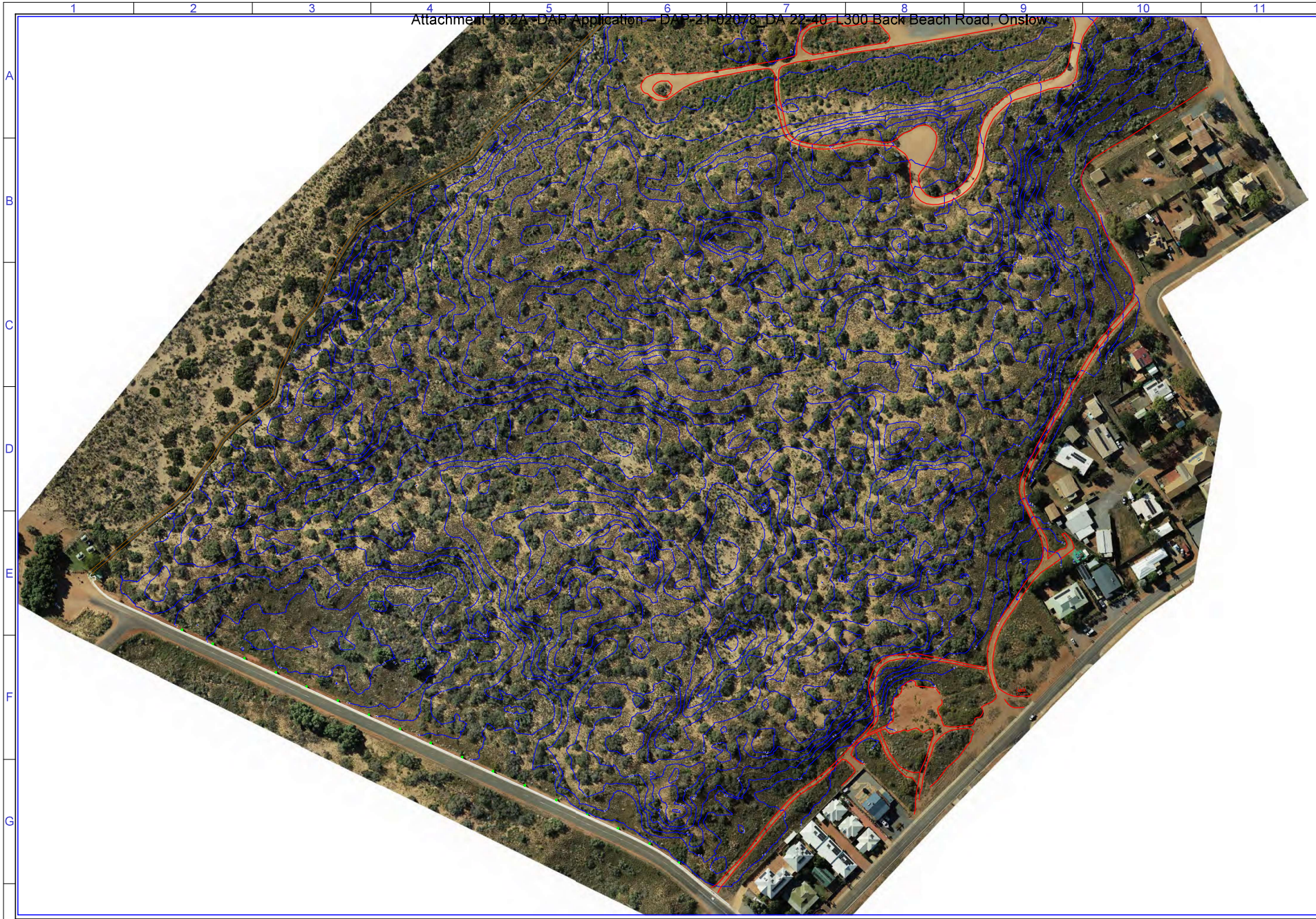
ONSLOW
SHEET SF 50 - 5 AND PART OF SHEET SF 49 - 8

FIRST EDITION 1981

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ARG0053257

Appendix Three: Lidar Survey



REV	AMENDMENTS	APP'D	DATE
0	FOR REVIEW	RME	19/07

GENERAL NOTES / REFERENCES

Benchmark Surveys

PROJECT LOCATION
PROJECT TYPE
PROJECT SITE

1075

MINERAL RESOURCES

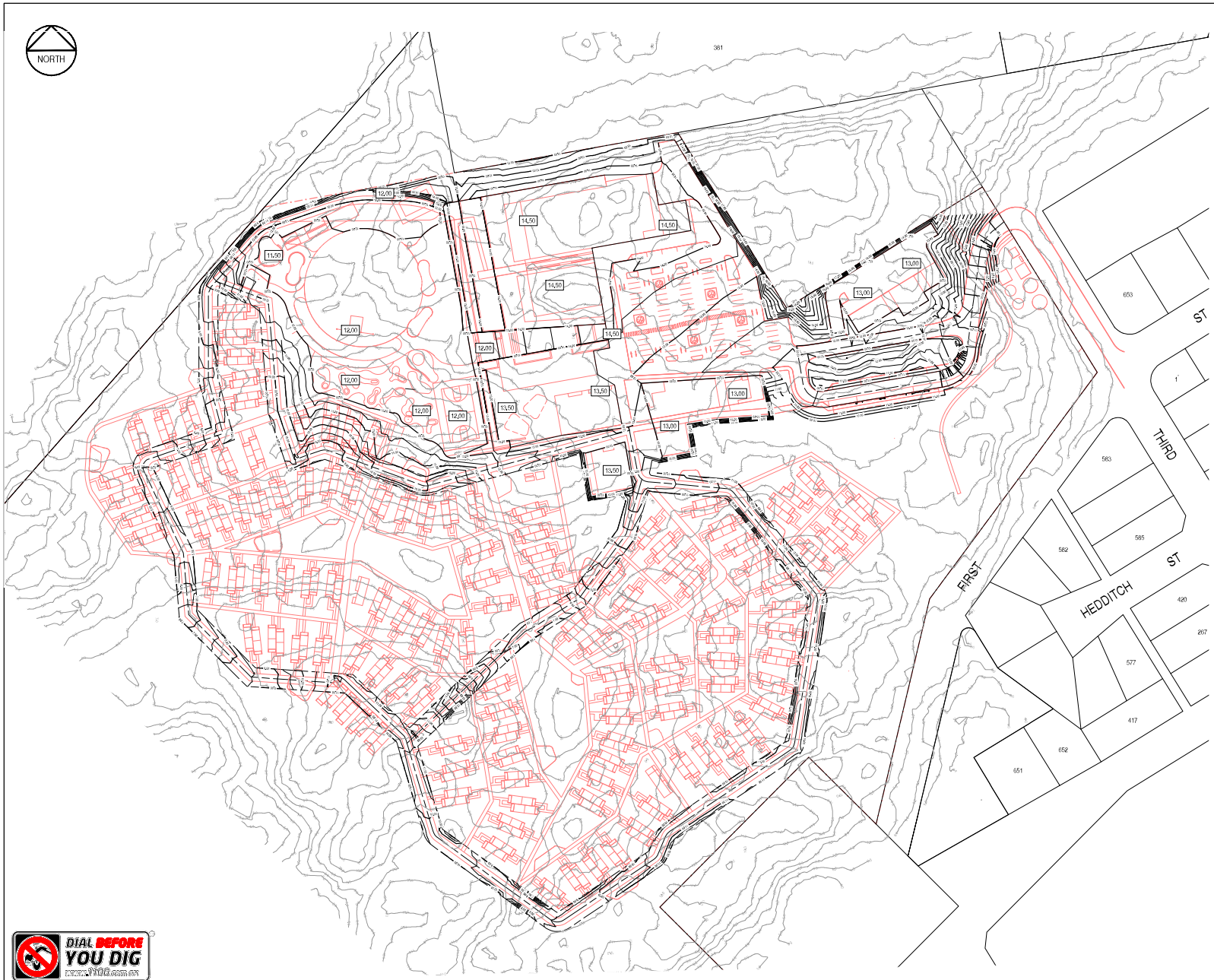
DRAWN / SURVEYED BY: RME
CHECKED BY:
VERIFIED BY:
COORD SYSTEM / HEIGHT DATUM: MGA94 | AHD

PLOT DATE: 19/07/2021 LOCATION: Onslow
Lot 300 Survey
Feature Survey

DRAWING STATUS: Information
DRAWING NO: BMS-MRL-D101-FS-DG-102
REV: 0

DWG LOCATION: C:\Onslow\Reporting\Benchmark TitleBlock A1- MRL.dwg

Appendix Four: Civil Concept Plan



NOTES

1. ALL DIMENSIONS SHOWN ARE IN METRES U.S.O.
2. ALL CO-ORDINATES AND LEVELS SHOWN ON THIS DRAWING SHALL BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT WITHIN SEVEN DAYS.
3. SURVEY INFORMATION SUPPLIED BY BENCHMARK SURVEYS W.A..
4. ALL HEIGHTS ARE TO AUSTRALIAN HEIGHT DATUM (AHD) AND ALL LEVELS SHALL BE DERIVED FROM ESTABLISHED BENCHMARKS.
5. ALL BENCHMARKS ARE TO BE PROTECTED AND PRESERVED UNLESS NOTED ON PLANS.
6. FINISHED CONTOURS AND VOLUMES ARE TO ROAD BOXOUT.
7. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATION AND ALSO THE REQUIREMENTS OF THE SHIRE OF ASHBURTON.
8. THE CONTRACTOR SHALL LIAISE WITH ALL RELEVANT AUTHORITIES TO LOCATE ALL EXISTING SERVICES WITHIN THE CONTRACT AREA PRIOR TO THE COMMENCEMENT OF WORK. SERVICES INFORMATION SHOWN ON THE DRAWINGS IS INDICATIVE ONLY AND MAY NOT BE COMPLETE, WHERE EXISTING AND PROPOSED WORKS CONFLICT, LEVELS ARE TO BE TAKEN AND SUPPLIED TO THE SUPERINTENDENT IMMEDIATELY.
9. CONTRACTOR SHALL OBTAIN COUNCIL APPROVAL AND PAY ALL FEES/BONDS PRIOR TO COMMENCEMENT OF WORKS.
10. CONTRACTOR SHALL NOTE THAT NON-TRAFFICABLE SUBTERRANEAN STRUCTURES (SOAKWELLS ETC.) MAY EXIST ON SITE, PRIOR TO EARTHWORKS COMMENCING. CONTRACTOR SHALL LOCATE ANY SOAKWELLS, SEPTIC TANKS, DELETERIOUS MATERIALS AND OTHER SUBTERRANEAN STRUCTURES. THESE MATERIALS AND STRUCTURES ARE TO BE REMOVED AND THE LOCATION BACKFILLED IN ACCORDANCE WITH PROCEDURES SET OUT IN SPECIFICATION (IF APPLICABLE). THE SUPERINTENDENT IS TO BE ADVISED OF ANY UNUSED PIPE WORK ENCOUNTERED.
11. THE CONTRACTOR SHALL PROVIDE TEMPORARY FENCING TO EXISTING LOTS AS REQUIRED.
12. THE CONTRACTOR SHALL PREPARE A DUST MANAGEMENT PLAN IN ACCORDANCE WITH THE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (D.E.C.) GUIDELINES SITE CLASSIFICATION 3 AND OBTAIN APPROVAL FROM THE LOCAL AUTHORITY FOR THE DUST MANAGEMENT PLAN.
    DUST SUPPRESSION METHODS SHALL BE APPLIED BY THE CONTRACTOR DURING EARTHWORKS OPERATIONS IN ACCORDANCE WITH THE APPROVED MANAGEMENT PLAN.
13. NO CLEARING TO OCCUR UNTIL SUPERINTENDENT HAS IDENTIFIED TREES TO BE RETAINED.
    13.a. ALL TREES TO BE RETAINED SHALL BE FENCED OFF FOR THE DURATION OF THE WORKS.
    13.b. ALL TREES AND VEGETATION NOT FOR RETENTION SHALL BE MULCHED AND STOCKPILED FOR REUSE OR REMOVAL AS NOTED.
14. THE CONTRACTOR SHALL MAINTAIN PROPER SITE DRAINAGE TO ALL AREAS THROUGHOUT THE CONSTRUCTION PERIOD AND SHALL BE RESPONSIBLE FOR MAINTAINING EXCAVATIONS IN A SAFE AND STABLE CONDITION AT ALL TIMES.
15. TOPSOIL IS TO BE STRIPPED AND MANAGED IN ACCORDANCE WITH THE SPECIFICATION OR AS NOTED ON THE DRAWINGS.
16. ALL ROOTS, BOULDERS AND ANY OTHER DELETERIOUS MATERIAL SHALL BE TOTALLY REMOVED TO A DEPTH OF 600mm BELOW THE LOWER OF THE NATURAL/CUT SURFACE.
17. MINOR AMENDMENTS TO THE EXTENT OF EARTHWORKS MAY OCCUR TO PRESERVE IDENTIFIED TREES.
18. ALL BATTERS TO BE NOMINALLY 1 IN 6, OR FLATTER, UNLESS SHOWN OTHERWISE (U.S.O.).
19. ALL FILL SHALL BE CLEAN AND BE FREE FROM DELETERIOUS AND/OR ORGANIC MATERIAL.
20. FILL MATERIAL TO BE TESTED BY A REGISTERED MATERIALS TESTING LAB AND RESULTS PROVIDED TO THE SUPERINTENDENT PRIOR TO THE IMPORTATION AND PLACEMENT OF MATERIAL.
21. PENETROMETERS USED FOR TESTING MUST BE CALIBRATED FOR SITE AND RECALIBRATED FOR IMPORTED FILL AS REQUIRED.
22. ALL FILL SHALL BE PLACED IN UNIFORM LAYER NOT EXCEEDING 300mm THICKNESS AND COMPACTED TO A DENSITY NOT LESS THAN 95% M.A.D.D. REFER TO SPECIFICATION FOR DETAILED INFORMATION.
23. CONTRACTOR TO COMPLETE ALL BACKFILLING AND EARTHWORKS REQUIRED TO ACHIEVE LEVELS SHOWN.
24. THE SITE IS TO BE LEFT CLEAN AND FREE OF RUBBISH/DEBRIS UPON COMPLETION OF WORKS.
25. TIE INTO ADJACENT BOUNDARIES AND FEATURES TO BE SEAMLESS.
26. 'AS CONSTRUCTED' DRAWINGS ARE TO BE PREPARED IN ACCORDANCE WITH THE SPECIFICATION AND PROVIDED TO THE SUPERINTENDENT PRIOR TO PROCEEDING TO THE NEXT STAGE OF WORKS.

LEGEND

- 15.00 — PROPOSED EARTHWORKS CONTOUR (1.0m)
- 15.50 — PROPOSED EARTHWORKS CONTOUR (0.50m)
- EXISTING SURFACE CONTOUR
- 15.60 — FINISHED PAD LEVEL

DIAL BEFORE YOU DIG 1100.com.au
The Essential First Step.

REV	DATE	DESCRIPTION	BY	CHKD
B	24/03/22	SITE LAYOUT AMENDED	JS	AT
A	22/03/22	INITIAL ISSUE	JS	AT

pritchard francis

430 Roberts Road
Subiaco WA 6008
PO Box 2150
Subiaco WA 6904
Telephone: (08) 9382 5111
admin@pfeng.com.au

Drawing status: NOT FOR CONSTRUCTION			Project & Job: MINERAL RESOURCES ONSLOW TOWNSHIP VILLAGE
Date: MARCH 2022	Grid: MGA	Datum: AHD	Title: EARTHWORKS CONCEPT OPTION 3
Designed: JS / Drawn: JS / Checked: AT / Approved: AT			
Plotted: N/A	Scale (A1): 1:1000 @	Sheet size: A1	Original: 21195-C9-SK-06 / Revision: B

Appendix Five: Landscape Concept Plan

2.0 Landscape Plan

PROGRAM

1	Bus Stand (Pickup/Dropoff)
2	Dedicated Dropoff (Small Vehicle, Short Term)
3	Main Car Park
4	Terraced Entry Plaza
5	Pool
6	Recreation Turf
7	Outdoor Gym
8	Cricket Nets & Beach Volley Ball
9	Relax Zone (BBQ, Hammocks, Furniture, Shade Structure)
10	Mini Golf
11	Pedestrian / Maintenance Vehicle Access (with shade structures and comfort nodes)
12	Alfresco Deck With Terraced Embankment
13	Security Fence
14	Entry Statement Wall
15	Outdoor Sports and Recreation Zone - Basketball, Yoga, Gym, Furniture, Shade Structure

GENERAL

- Site Boundary

SURFACES

- Pedestrian Access Paving
- Plaza Paving
- Asphalt (Carppark)
- Asphalt (Maintenance Access)
- Composite Timber Boardwalk
- Stabilised Gravel
- Pool

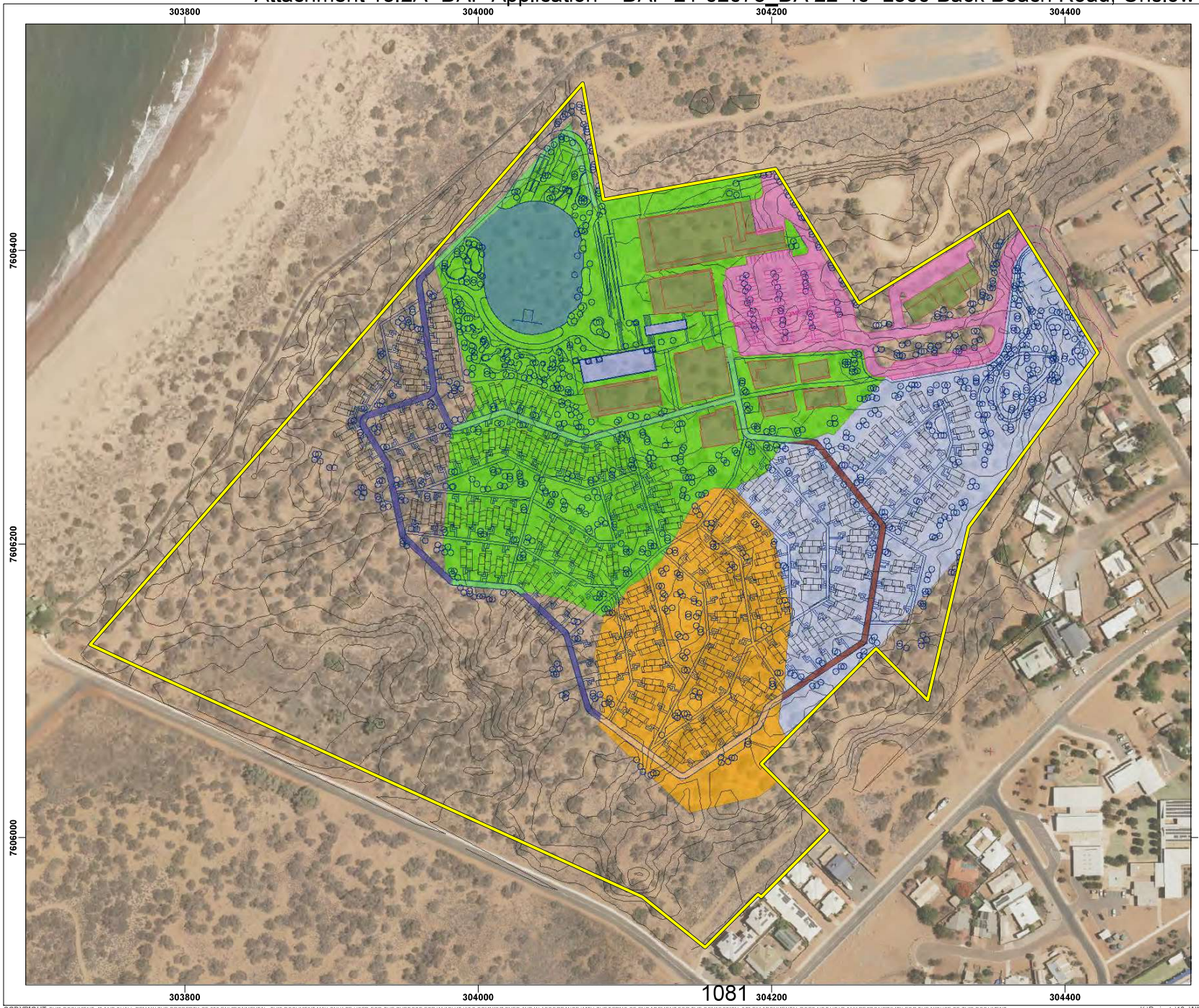
PLANTING

- Lawn
- Native Dune Mix Planting - Managed Sparse
- Native Swale Mix - Managed Sparse
- Native Shrub Mix - Managed
- Proposed Native Tree

- Refer to Civil Engineers drawings for grading plan



Appendix Six: Modelled Catchments



Legend

- Survey Area Boundary
- Catchment A
- Catchment B
- Catchment C

Sub Catchments

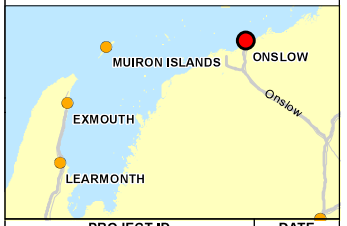
- Access Track
- Building
- Oval
- Road
- Road A
- Road B
- Road C
- Swimming Pool

360 environmental
a 10 Bermondsey St, West Leederville, 6007 WA
t (08) 9388 8360
f (08) 9381 2360
w www.360environmental.com.au

0 40 80 120 Meters
1:3,500 @ A4

N

LOCALITY MAP



PROJECT ID	DATE
4757	27/08/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	NC	NC	0

Rowe Group c/o Mineral Resources Limited
Lot 300 Back Beach Road, Onslow

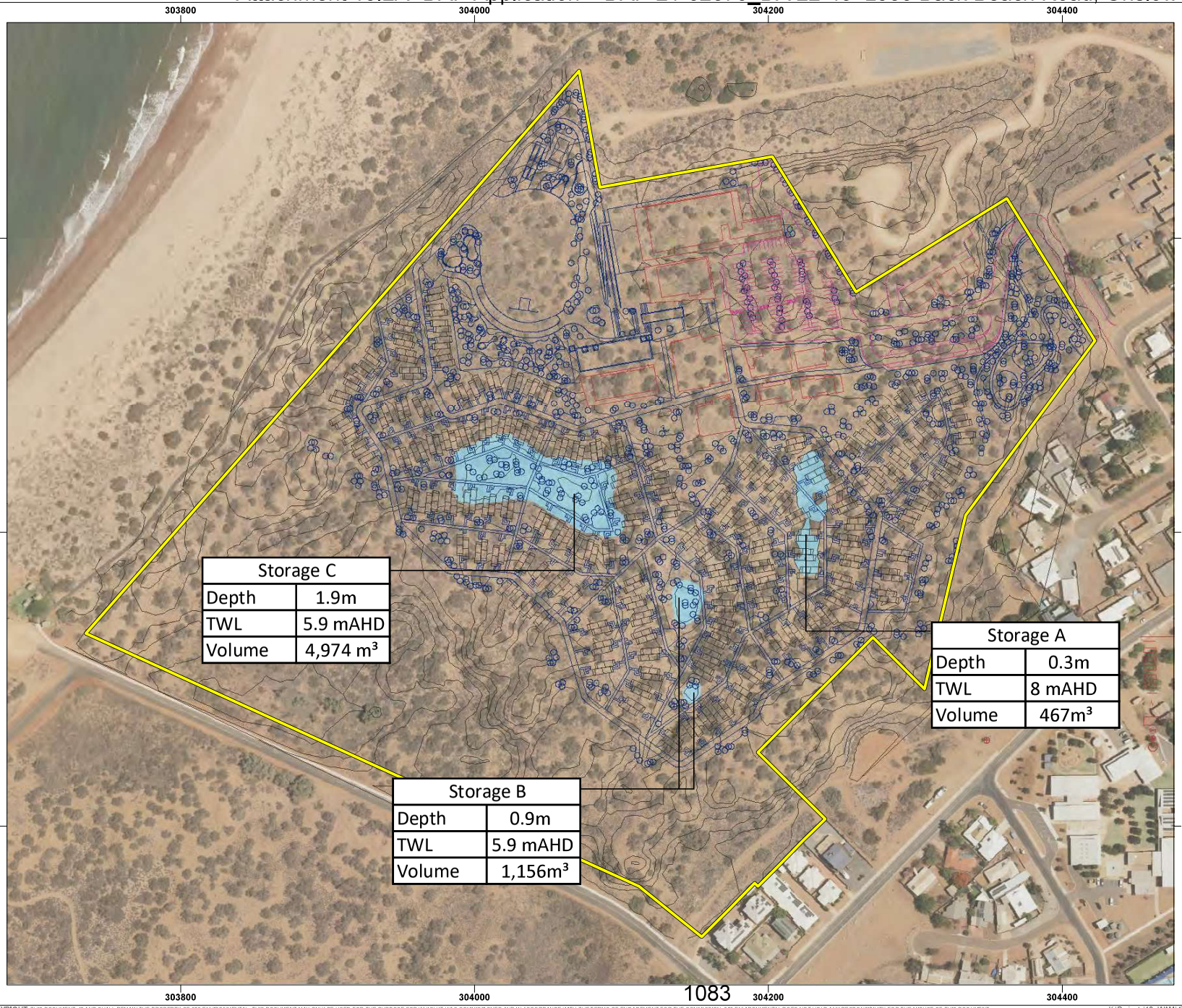
Urban Water Management Plan

Figure 7
Modelled Catchments

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K:\Projects\10. WAM\4757 Lot 300 Back Beach Rd, Onslow\4757 F07 Modelled Catchments.mxd

Appendix Seven: 1% AEP Inundation Extent



Legend

- Survey Area Boundary
- 1%AEP Inundation Extent

Indicative Site Master Plan

- Access and Parking
- Landscaping
- Accomodation Pods
- Buildings
- Major Topographic Contour

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w www.360environmental.com.au

0 40 80 120 Meters
1:3,500 @ A4

N

LOCALITY MAP



PROJECT ID	DATE
4757	27/08/2021

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LF	PD	PD	0

Rowe Group c/o Mineral Resources Limited
Lot 300 Back Beach Road, Onslow

Urban Water Management Plan

Figure 9
1% AEP Inundaton Extent

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K:\Projects\10. WAM\4757 Lot 300 Back Beach Rd, Onslow\4757 F09 1% AEP Inundation Extent.mxd

Appendix Eight: 360 Environmental Technical Note to Appendix Six and Seven

Date	21 March 2022	**Job Number**	4757
Project	Lot 300 Back Beach Road Onslow UWMP		
To:	Mineral Resources Limited Pty Ltd		
From:	Nick Cahill, 360 Environmental		
Subject	Lot 300 Back Beach Road Onslow UWMP – Technical Note: New Master Plan Design Stormwater Criteria Compliance		

This technical note provides a review of the updated master plan layout for the development of Lot 300 Back Beach Road, Onslow. The updated Master Plan is shown in Attachment A. The purpose of this technical note is to demonstrate that the changes to the master plan do not constitute significant changes to the site, that would require an update to the Lot 300 Back Beach Rd, Onslow Urban Water Management Plan (UWMP) (360 Environmental, 2021), and to demonstrate further that the updated master plan will comply with the design criteria established within the currently approved Lot 300 Back Beach Rd, Onslow UWMP (360 Environmental, 2021).

Background

Mineral Resources Limited (the proponent) commissioned 360 Environmental Pty Ltd (360 Environmental) to produce an Urban Water Management Plan (UWMP) to support the development of Lot 300 Back Beach Road, Onslow (the site) into a transient workforce accommodation and associated uses.

The site covers an area of 20.45 ha and is located in the Shire of Ashburton. Back Beach Road bounds the site to the south and the Indian Ocean coast to the west. Residential development borders the site to the east and the Onslow Memorial Park to the north.

A stormwater management strategy was developed, which demonstrates that the site can effectively manage stormwater generated during the small, minor, and major rainfall events.

The design criteria for the management of stormwater for the site are:

- Maximise the retention of stormwater generated from the site during frequently occurring events
- Establish storage invert levels no lower than seasonal maximum groundwater levels

- Use infiltration systems for frequently occurring events to minimise mosquito breeding opportunities
- Implement non-structural controls
- Design a road drainage system so that roads are passable in the 20% Average Exceedance Probability (AEP) storm event
- Provide safe conveyance during the 1% AEP storm event from the site
- Set the habitable building floor levels at 0.5 m above 1% AEP flood levels.

The stormwater criteria for the site were met through the following management approach:

- First flush from the roads and car park will be treated at source or as close to the source as possible, using Water Sensitive Urban Design (WSUD) throughout the car parks and paved areas
- All other runoff from impervious areas will be directed, via overland flow paths, to natural depression storage throughout the site, as shown in the Lot 300 Back Beach Rd, Onslow UWMP
- On-site depression storage will maintain a minimum 500 mm clearance from the top water level (TWL) in the 1% AEP to the minimum habitable floor level of 6.4 m AHD as shown in the Lot 300 Back Beach Rd, Onslow UWMP (360 Environmental, 2021).

Changes to the Master Plan

The master plan for the site is shown in Attachment A. The red hatched areas of the plan indicate the areas of the site that were previously impervious (roofs, hardstand, etc.), which have been replaced with pervious areas of the site.

The change to the land use areas of the site and the percentage difference is shown in Table 1.

Table 1: Impervious area comparison

Land use type	Approved plan (ha)	Updated plan (ha)	Difference (%)
Impervious	2.65	2.37	-12%
Pervious	9	9.28	3%

As shown in Table 1, there is a reduction in impervious surfaces across the site of 12% and a 3% increase in the pervious areas of the site.

Results of Changes to the Master Plan

The results of the reduction in impervious areas of the site will be to:

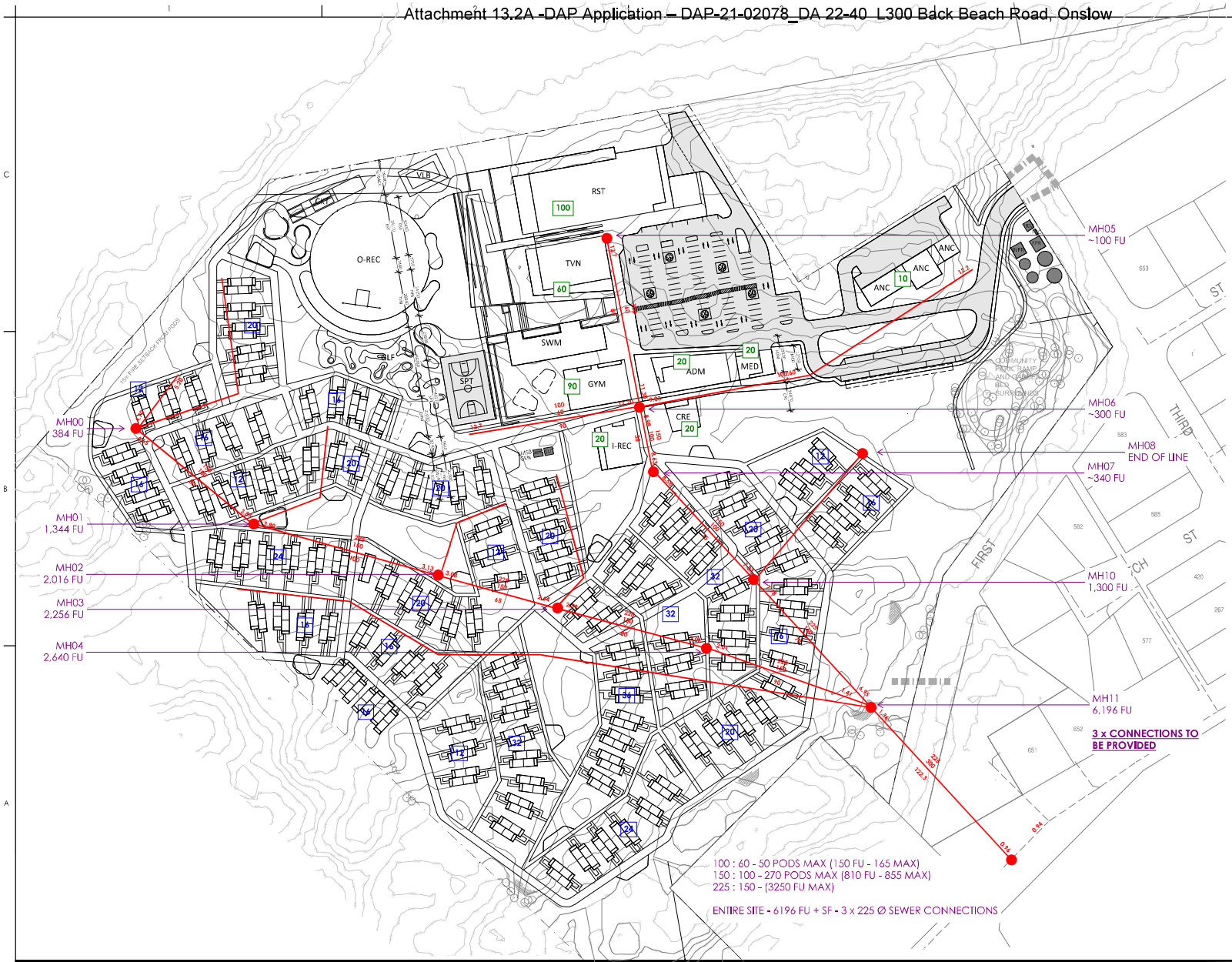
- Reduce runoff
- Increase infiltration at source
- Reduce TWLs in natural depression storage across the site

- Reduce the volume of overflow from natural depression storage to the downstream receiving environment during the major storm event
- Reduce flow rates from the natural depression storage to the downstream receiving environment during the major storm event.

Conclusion

Based on the analysis of the changes to the master plan for the proposed development at Lot 300 Back Beach Road, Onslow, the site will still comply with the stormwater design criteria stipulated in the approved Lot 300 Back Beach Rd, Onslow UWMP (360 Environmental, 2021). Therefore, no proposed changes or updates to the existing approved UWMP are recommended.

Appendix Nine: Wastewater Plan



Revision	By	Appd	YYYY.MM.DD
D REVISED DA ISSUE 2022	ISV	ISV	2022.03.18
C REVISED DA ISSUE	TSV	ISV	2021.08.25
B ISSUED FOR FINAL	TSV	ISV	2021.08.05
A ISSUED FOR PRELIMINARY REVIEW	ISV	ISV	2021.07.30

ORIGINAL SHEET - ANSI A

Issue Status

PRELIMINARY

NOT FOR CONSTRUCTION

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Notes

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226 Adelaide Tce
Perth WA 6000
08 6222 7000
www.stantec.com

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Client/Project Logo

milieu creative

Client/Project
ROWE GROUP

ONSLOW TOWNSHIP VILLAGE

File Name:

Dwn. | Dsgn. | Chkd. | YYYY.MM.DD

Title
SITE PLAN
SEWER SERVICES

Project No.
301250498

Scale
1:1000

Revision
D

Drawing No.
HY-1-00

360 environmental

Onslow Township Village

Environmental Assessment Report

Prepared for

Mineral Resources Limited

May 2022

people • planet • professional

1090

Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
					Copies	Date
4755AA_Rev0	Internal Draft	V. Mugabe / G. Abolis	T. Smith	-	-	-
4755AA_Rev1	Client Draft	V. Mugabe / G. Abolis	T. Smith	LI	1x electronic	06/08/2021
4755AA_Rev2	Client Report	V. Mugabe / G. Abolis	T. Smith	LI	1 X Electronic	27/08/2021
4755AA_Rev3	Internal Draft	G.Abolis	T.Smith	NC	1 x electronic	25/11/2021
4755AA_Rev 4	Client Report	G. Abolis	T.Smith	RH	1 x electronic	08/04/2022

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Executive Summary

360 Environmental Pty Ltd (360 Environmental) was commissioned by Mineral Resources Limited (MRL) to provide environmental and bushfire support for the development of short stay worker accommodation at Lot 300 Back Beach Road, Onslow (referred within as Onslow Township Village). Onslow Township Village is referred within as the site. The site covers 20.45 hectares and is located within the Onslow townsite in the Pilbara Region of Western Australia.

This Environmental Assessment Report (EAR) is supplemented with a Preliminary Contamination Assessment, Flora and Fauna Survey and Urban Water Management Plan (UWMP) prepared by 360 Environmental and a Bushfire Management Plan (BMP) and Bushfire Emergency Management Plan (BEMP) to demonstrate the opportunities and constraints to development of Onslow Township Village.

Onslow Township Village is currently undergoing extensive master planning to consider design and environmental impacts associated with the proposed development in this locality.

The site will be cleared and constructed for the purpose of short stay workforce accommodation. Preliminary investigations identified that some native vegetation would be cleared to facilitate the proposed development however native vegetation is proposed to be retained for open space and surrounding accommodation pods. The EAR focuses on the environmental issues and management measures associated with the proposed development and its relationship to Onslow townsite and surrounding land uses.

The environmental issues identified in the EAR do not pose a significant constraint to development of the site. All environmental features can be managed through further technical investigations and/or the implementation of a Construction Environmental Management Plan (CEMP) for the proposed development during the construction phases of the development. Aboriginal heritage approvals are being sought separately to the development approval process.

Table of Contents

1 Introduction 1
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1 Introduction

1.1 Background

360 Environmental Pty Ltd (360 Environmental) was commissioned by Mineral Resources Limited (MRL) to provide environmental and bushfire support for the development of short stay worker accommodation at Lot 300 Back Beach Road, Onslow (referred within the Onslow Township Village). Onslow Township Village is referred within as the site. The site covers approximately 20.45 hectares and is located within Onslow townsite in the Pilbara Region of Western Australia (Figure 1).

This environmental assessment report (EAR) is supplemented by the following:

- Preliminary Contamination Assessment (360 Environmental)
- Detailed Flora and Fauna Assessment (360 Environmental)
- Urban Water Management Plan (360 Environmental) (including Technical Note)
- Bushfire Management Plan (BMP) (Linfire Consultancy)
- Bushfire Emergency Management Plan (BEMP) (Linfire Consultancy).

1.2 Environmental Assessment Objectives

The EAR highlights the key environmental and bushfire issues associated with the proposed short stay workforce accommodation at the site. High level environmental advice will be incorporated into the EAR to support the proposed master plan for the short stay workforce accommodation at Onslow Township Village.

1.3 Scope of Works

The scope of work includes a review of desktop information for the site including government databases and search tools and online reports available for the site. The desktop environmental assessment included the following:

- NatureMap database search.
- Searches of the Federal Department of Agriculture, Water and Environment's (DAWEs) *Environment Protection and Biodiversity Conservation Act 1999* Protected Matters Search Tool.
- Review of publicly listed ecological information where available (previous reports and any relevant scientific literature).
- Review of applicable environmental legislation, policies and guidelines and their relevance to the site.
- Topography, soil, and potential acid sulfate soils.
- Groundwater levels, groundwater protection areas, surface water and geomorphic wetlands.
- Review of regional vegetation association and complex mapping (Beard and Heddle).

- Fauna and habitats: Desktop and habitat assessment, DBCA NatureMap and DAWE MNES PMST databases for recorded species and their habitats within the vicinity of the site and a likelihood assessment (based on mapped habitat) of these species potentially occurring on site.
- Heritage sites (Aboriginal and non-Aboriginal) that may be located within or nearby the site. Search of the Department of Planning Lands and Heritage (DPLH) Aboriginal and State and Local Heritage databases.
- Identification of environmental constraints and opportunities associated with the site.
- Site inspection familiarization and identification of environmental constraints and opportunities associated with the site.
- Preparation of this report summarizing the existing ecological and heritage information for the site.
- Preparation of figures supporting the desktop information.

Further assessments and surveys to address bushfire management, contamination, flora and vegetation, fauna, and urban water management applicable to the proposed development have been undertaken. The recommendations and environmental issues and associated mitigation measures raised in these reports have been included within the EAR.

2 Key Environmental Legislation

2.1 International Agreements

Australia has three bilateral agreements for migratory birds, including the Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA) and the Republic of Korea-Australia Migratory Bird Agreement (RoKAMBA). Each of these agreements provides for the protection and conservation of migratory birds and their important habitats.

2.2 Commonwealth Legislation

2.2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the central piece of environmental legislation which protects Matters of National Environmental Significance (MNES). Environmental Assessments under the EPBC Act are undertaken to enable environment and heritage protection and biodiversity conservation. An action should not be undertaken that has, will have or is likely to have a significant impact on any MNES, or other protected matters without a pre-action referral to the Australian Government's Minister for the Environment.

2.3 State Legislation

The *Environmental Protection Act 1986* (EP Act) is the key legislative tool for environmental protection in Western Australia. It is administered by EPA and the Minister for the Environment. Under Part IV of the EP Act, the EPA undertakes environmental impact assessment of development proposal and schemes. The environmental impact assessment process provides an orderly and systematic evaluation of a proposal and its potential impact on the environment. A critical component of the assessment is the consideration of ways in which the proposal, if implemented, could avoid, or reduce any potential impact on the environment.

Table 1 provides a summary of the key State legislation and regulations relevant to the site.

Table 1: Key State Legislation and Regulations

Key Legislation	Responsible Government Agency	Aspect
Aboriginal Heritage Act 1972	Department of Aboriginal Affairs	Archaeological and ethnographic heritage
Biodiversity Conservation Act 2016	Department of Biodiversity Conservation and Attractions	Listing of and protection of native species, threatened species, ecological communities, fauna, critical habitat, and threatening processes
Biosecurity and Agriculture Management Act 2007	Department of Primary Industries and Regional Development	Weeds/pests/diseases

Key Legislation	Responsible Government Agency	Aspect
Bush Fires Act 1954	Department of Fires and Emergency Services	Bush fire control
Conservation and Land Management Act 1984	Department of Biodiversity Conservation and Attractions Department of Agriculture	Flora and fauna/habitat/weeds /pests/diseases
Conservation and Land Management Regulations 2002	Department of Biodiversity Conservation and Attractions Department of Agriculture	Flora and fauna/habitat/weeds /pests/diseases
Contaminated Sites Act 2003	Department of Water and Environmental Regulation	Management of contaminated soils and water
Environmental Protection Act 1986	Environmental Protection Authority Department of Water and Environmental Regulation	Part IV – Environmental Impact Assessment Part V – Works Approvals and Licences, Clearing Permits
Environmental Protection (Clearing of Native Vegetation) Regulations 2004	Department of Water and Environmental Regulation	Clearing of native vegetation
Heritage Act 2018		Provides for the identification and documentation of places of cultural heritage significance in Western Australia, and for the conservation, use, development, and adaption of such places.
Planning and Development Act 2005	Department of Planning, Lands and Heritage	Structure planning and subdivision approval
Rights in Water and Irrigation Act 1914	Department of Water and Environmental Regulation	Governs management of the use, service and health of water and watercourses (including beds and banks) Water licensing is required in all proclaimed areas and for all artesian groundwater wells throughout the state.

2.4 Relevant Standards, Guidelines and Policies

Clearing and development is subject to compliance with applicable standards, guidelines and policies developed by the State's regulators to assist proponents in understanding the minimum requirements for environmental protection. Table 2 details the key standards, guidelines, and State Planning Policies relevant to clearing and development of the site.