



Exmouth Aerodrome Master Plan
(Final Draft)

Prepared for the Shire of Exmouth
November 2020

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(Council Decision 03-0621)

AMS Aerodrome Management Services Pty Ltd



Design - Engineering - Construction - Electrical - Management - Inspections - Training - Security

Executive Summary

Exmouth Aerodrome is an unregulated Aircraft Landing Area (ALA) owned and operated by the Shire of Exmouth. It is located 13 kilometres south of the town of Exmouth. The aerodrome is comprised of a single runway 02/20 which is 1260 metres in length and 30 metres wide. The runway surface is primarily gravel with a central sealed section, approximately 211 metres in length. There are five hangars located on the northern, central and southern aprons; four are currently utilised for commercial operations. Whale shark and humpback whale spotting, joyflights and microlight training are the primary commercial operations of local aviation businesses, utilising single piston engine aircraft and microlights. Regular itinerant aircraft also utilise the facilities for charter and police airwing operations, primarily light piston twin aircraft and the Police airwing Pilatus PC12, a single engine turboprop.

The Exmouth community is also serviced by the larger Learmonth Airport, located 37 kilometres south of the Exmouth town and 14 kilometres south of Exmouth Aerodrome. A portion of this military base is leased from the Department of Defence by the Shire of Exmouth for civil operations, that include regular passenger jet services from Perth and offshore helicopter transfers.

Land allocated for the Exmouth Aerodrome comprises just over 494 hectares of crown land situated near the tip of the North West Cape, between the Cape Range and the Exmouth Gulf. The North West Cape holds both cultural and environmental significance. It is fringed by the Ningaloo Reef, Australia's largest fringing coral reef, and the Ningaloo Coast holds UNESCO¹ World Heritage status.

Exmouth Aerodrome is situated between the Cape Range and the Exmouth Gulf in a floodplain area that is impacted by moderate rainfall events. These topographical features are important considerations in the planning for any future development of the aerodrome.

The Exmouth Aerodrome Master Plan supports the vision for the aerodrome, which is:

1. To maintain a safe and user-friendly aerodrome – *that supports the local community through the provision of facilities suitable for a range of users; and*
2. To develop the aerodrome and its facilities based on specific demand and cost benefit analysis – *assessed through ongoing review and stakeholder engagement with future development being conducted within appropriate financial constraints to ensure the aerodrome remains accessible to local businesses and the wider Exmouth community.*

The Shire of Exmouth has established key criteria² for future outcomes of the Exmouth Aerodrome Master Plan:

1. General Aviation – improved facilities to service the growing tourism industry sector, spotter services for the marine industry, microlight flights and general charter services.
2. Helicopter operations – expansion of current facilities to enable offshore providers to be based in Exmouth.
3. Royal Flying Doctor Service (RFDS) – upgraded facilities to ensure a second airstrip is available for aero medical evacuations.
4. Air transport passenger operations – the potential for turboprop aircraft to operate scheduled flights or charter services into the aerodrome in the future.
5. Additional use – facilitating the establishment of new aviation related businesses and community activities at the aerodrome.

The Master Plan provides a development framework for the aerodrome that is based on economic indicators and strives to limit the impact on the environment and surrounding community. The Plan also provides guidance to ensure legislative compliance is achieved. A staged implementation process for the Master Plan is outlined for outcomes over the next 10 years, with a focus on short and medium term strategies to achieve outcomes for the next 5 years. Actions for immediate consideration are highlighted to ensure regulatory compliance for current operations. Recommendations for ongoing stakeholder engagement and regular review of the Master Plan have also been made.

¹ UNESCO – United Nations Educational, Scientific and Cultural Organisation

² Shire of Exmouth, Ordinary Council Meeting Minutes, 28 November 2019

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FINAL DRAFT

1 Methodology

The purpose of an Airport Master Plan is to define and coordinate the on-airport and off-airport planning objectives and provide a framework for future development³. The Exmouth Aerodrome Master Plan was developed through research and consultation with current and potential stakeholders of the aerodrome with a particular focus on:

- the role of the aerodrome and why it exists;
- the importance of the aerodrome to the region;
- assessment of competition from other airports in the region;
- current site conditions, including assessment of existing infrastructure and facilities;
- existing aviation and non-aviation activities on the site;
- the surrounding land, including topography, land use and zoning;
- environmental and heritage constraints, including Native Title;
- the regulatory and policy context;
- a review of previous and current plans relating to the aerodrome;
- the establishment of key criteria for future outcomes; and
- the development of an implementation plan.

2 Situation Analysis

2.1 Aviation Facilities

Exmouth is located near the tip of the North West Cape in the Gascoyne region of Western Australia (WA), 1,270 kilometres north of Perth. The town is directly serviced by two airports, Exmouth Aerodrome and Learmonth Airport. Exmouth Aerodrome is an unregulated Aircraft (or Aeroplane) Landing Area (ALA) owned and operated by the Shire of Exmouth, while Learmonth Airport is a military facility that supports civilian use under a lease agreement between the Department of Defence and the Shire of Exmouth.



Figure 1: Location of Exmouth Aerodrome and Learmonth Airport (Source: Google Maps)

2.1.1 Exmouth Aerodrome

Exmouth Aerodrome is the closest airport to Exmouth, located 13 km south of the town. It has been managed by the Shire of Exmouth since 1974 and was renamed in 2012 after being previously known as the Exmouth Light Aircraft Strip. From Exmouth the aerodrome is accessible via the sealed Minilya-Exmouth Road and a short gravel access road approximately 500 metres in length.

The aerodrome is located on Crown Land at Lot 73 Minilya-Exmouth Road, North West Cape (Landgate reference: Reserve 32867, DP 211885). Lot 73 includes an area of 494.7096 hectares and is demarcated by the red line in Figure 2.



Figure 2: Location of Exmouth Aerodrome (Source: Landgate)

³ Australian Airports Association, Regional Airport Master Planning Guide, 2014

The Cape Range is situated to the west of the aerodrome. It consists of rugged limestone with sparse vegetation and its eastern flanks drain across the coastal plains to the Exmouth Gulf to the east. The natural drainage course following the Shothole Canyon into Shothole Creek to the east and south of the aerodrome is clearly visible in Figure 3 below.



Figure 3: Shothole Canyon Drainage (Source: Google Maps)

Lot 73 is bordered directly by Crown Land to the west and south. The Minilya-Exmouth Road runs along the eastern border with the Cape Wilderness Estate subdivision situated between the road and the Exmouth Gulf. Lots allocated for subdivision are located to the north with a triangular 10-hectare area of Crown Land directly adjacent to a small section of the northern boundary. The lots adjacent to the aerodrome are detailed in Figure 4.

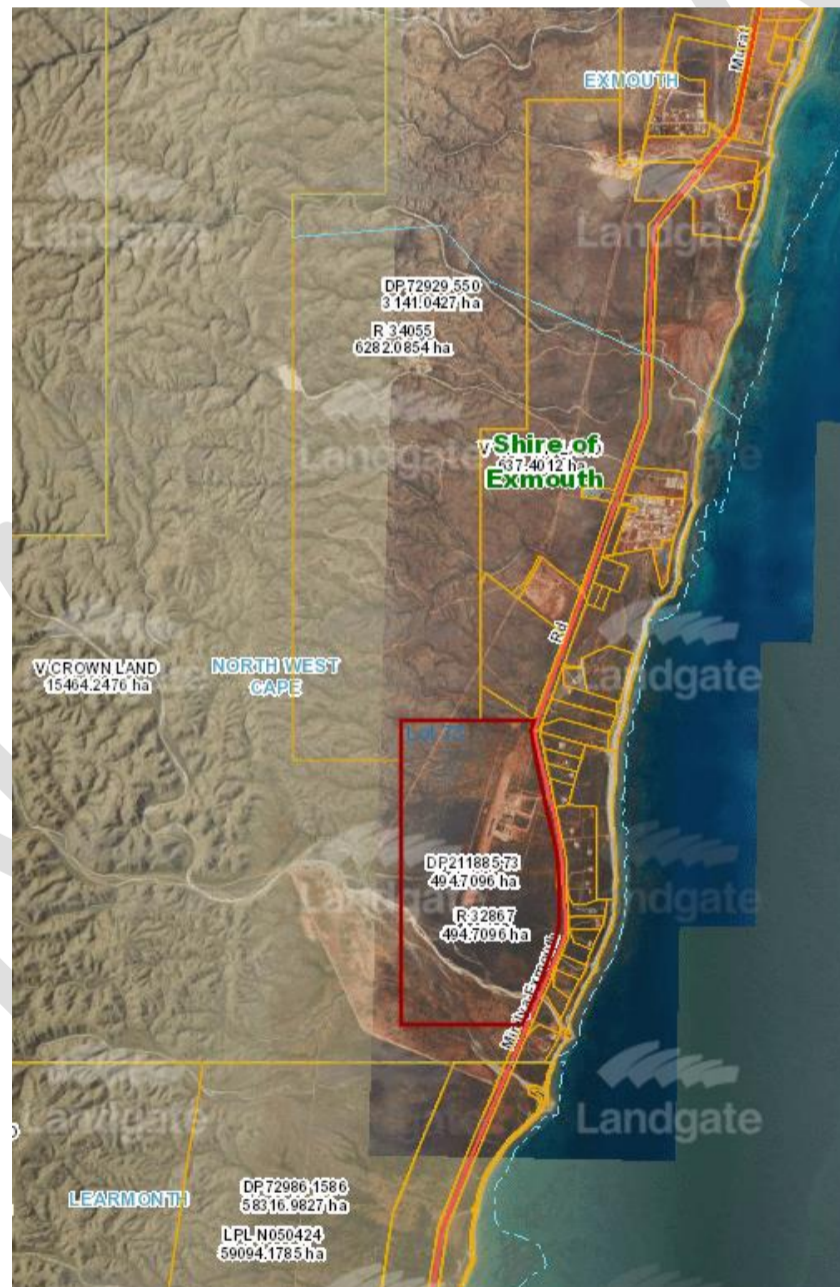


Figure 4: Allocation of Land Surrounding Exmouth Aerodrome (Source: Landgate)

The runway has a general north/south orientation (runway designation 02/20). Considerations for aircraft traffic include the rising ground of the Cape Range to the west and the current and proposed subdivisions to the east and north.

The specifications of the current aerodrome are illustrated in Appendix 1. Further information about the physical characteristics of the aerodrome and its facilities can be sourced from the Aeronautical Information Publication (AIP) En Route Supplement Australia (ERSA). A copy of the Exmouth entry is included at Appendix 2 with the pertinent data summarised in Table 1 below.

ICAO [^] designator	Runway Length (metres)	Runway Width (metres)	Runway Strip Width (metres)	Runway Surface	Lights	Instrument Approach	Fuel
YEXM	1260	30	Not specified	Unsealed gravel with 211m central sealed section and parking area.	1. Solar lighting HN [^] . Runway 02/20 white on sides, green approach, red at ends, blue taxiway lights – IWI [^] . 2. Runway edge light spacing: 02/20: 60m.	No	No
Pavement strength	Unrated. AIP Australia AD 7.4 ⁴ applies for determination of runway strength suitability; aircraft may operate on an unrated pavement provided the aircraft gross mass and tyre pressure do not exceed certain parameters. See Figure 10.						
Other	<ul style="list-style-type: none"> • Prior permission required, contact ARO[^] • Strip closed after heavy rain. • Fuel is not available. • Aerodrome unfenced. Animal hazard likely. • Helicopter operations 24 hours. • Airfield is used by Microlights. <p>[^]ICAO – International Civil Aviation Organisation; HN – sunset to sunrise; IWI – illuminated wind indicator; ARO - Aerodrome Reporting Officer</p>						

Table 1: Summary of Exmouth Aerodrome Specifications⁵

The pavement strength of the runway is unrated. Aircraft are permitted to operate on an unrated pavement provided the gross mass of the aircraft and its tyre pressure do not exceed the limits determined from the graph in AIP Australia AD (Aerodrome) 7.4, which is reproduced in Appendix 3.

A windsock is located on the western side of the runway. There is no air traffic control at the aerodrome and radio communication is conducted on a CTAF (Common Terminal Area Frequency), except when the Learmonth control zone and associated restricted areas are active.

A culvert, 450mm in diameter and approximately 76 metres long, runs beneath the northern section of the runway in the area of a small creek (see Figure 5).

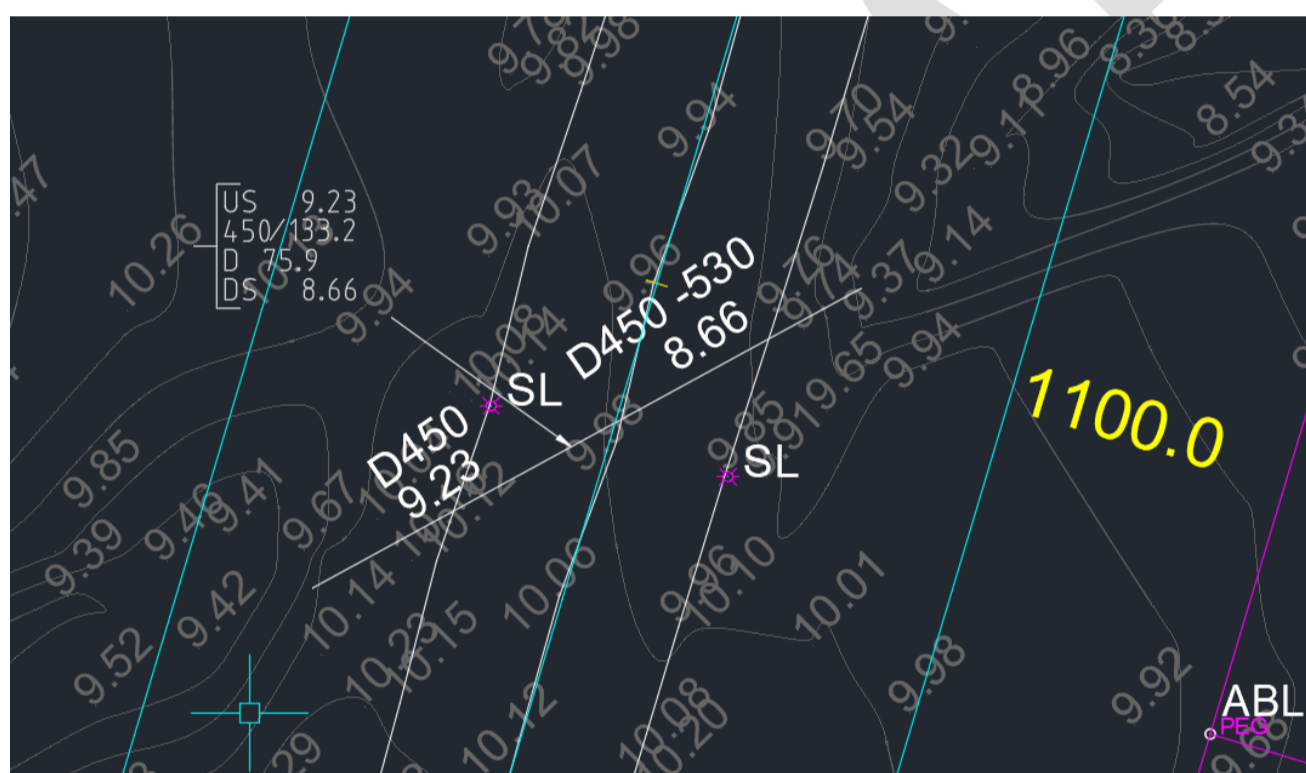


Figure 5: Specifications of Runway Culvert

The most recent development at the aerodrome includes the installation of solar airfield lighting in 2013, a public toilet facility in 2014 and expansion of the northern apron in 2015 with the uptake of two additional leases and subsequent hangar developments. An animal exclusion fence was erected in 2016 but ongoing technical issues with the automatic gate across the access road has resulted in the gate being permanently open. The runway is therefore not completely protected from incursions by ground animals such as kangaroos and emus.

The aerodrome is currently utilised by several local aviation companies operating microlights and single engine, fixed wing aircraft for both private and commercial operations. The primary commercial activity is the provision of aerial spotting services for tourist boat operators during the whale shark season from March to August. A trial conducted by the Parks and Wildlife Service⁶ allowing commercial interaction with humpback whales since 2016 has extended the spotting season through to October each year.

Trial Introductory Flights (TIFs) and microlight flying training are also offered. Other General Aviation (GA) operators from the region utilise the aerodrome, with monthly flights into Exmouth for the West Australian Country Health Service and the Magistrates Court of WA conducted in a light twin engine aircraft. The Police Air Wing (PAW) fly their Pilatus PC 12 aircraft to Exmouth on a semi regular basis (averaging one visit per month) and prefer to use Exmouth Aerodrome over Learmonth due to the former's proximity to the town.

Historically, helicopter operators conducting offshore transfers for passengers arriving at Learmonth Airport based their aircraft at Exmouth Aerodrome. The two companies currently servicing these offshore contracts, however, ferry their helicopters daily from their facilities in Karratha. The current amount of helicopter traffic at Exmouth Aerodrome is therefore not significant, although itinerant helicopters do utilise the aerodrome and those conducting the offshore flights transit the airspace overhead Exmouth Aerodrome.

The RFDS provides essential emergency medical evacuation flights for residents and visitors to the Exmouth region but utilise Learmonth Airport due to its facilities that support all weather and night operations, including a paved runway and instrument approaches.

⁴ AIP Australia – Aerodrome, AD 7.4, 05 November 2020, p. AD 1.1 - 48

⁵ AIP ERS, 27 February 2020

⁶ Department of Biodiversity, Conservation and Attractions – Parks and Wildlife Service, Draft Management Program for Managing Interactions with Humpback Whales along the Ningaloo Coast, 2020

The Shire of Exmouth collects revenue from the users of Exmouth Aerodrome through lease fees and landing fees, the latter being charged on a self-reporting basis. Aircraft and passenger movement numbers are not collated by the Shire.



Figure 6: Exmouth Aerodrome – Apron and Access Roads (Source: Google Maps)

Figure 6 illustrates the current layout of the apron and the associated infrastructure at the aerodrome. The infrastructure closest to the runway is a hangar constructed by Birds Eye View Ningaloo, a commercial microlight operator. It utilises the Ningaloo High hangar on the opposite lot to the north to conduct their maintenance. The most recent hangar construction is the dome hangar on the north east apron owned by Ningaloo Aviation. This commercial operator utilises Cessna 152 and Cessna 172 aircraft for joyflight and spotting operations.

Bristow Helicopters Australia maintained a base at the aerodrome from the 1990s until 2017 during a long-term contract with multinational oil and gas companies to provide personnel transfers to offshore platforms. Bristow still holds a lease and owns the large maintenance hangar (currently not in use) that is situated at the centre at the central apron area. The adjacent sealed section of apron is also located on the lot that Bristow leases from the Shire.

The most southern end of the apron is allocated for parking of itinerant aircraft. The hangar and fuel tanks immediately north of this area are owned by Corseair Aviation. During the whale shark season two Cessna 172 aircraft, owned by a Shark Bay based company, utilise these facilities. The fuel facility is the only fixed fuel storage unit at the aerodrome with the other local operators utilising temporary fuel stores in the form of drums or small tanks. There is no public fuel facility, so fuel is not available for itinerant aircraft. Jet A1 fuel is available at the nearby Learmonth Airport, a flight distance of 12 nautical miles (nm). The closest Avgas facility for piston engine aircraft is located at Karratha (169 nm to the north east) or Carnarvon (171 nm to the south).

There is no public transport facility operating regularly from the aerodrome, although individual arrangements can be made with local hire car companies and taxi services.

2.1.2 Learmonth Airport

The main aviation gateway to the area is Learmonth Airport which is located 37 km south of the Exmouth town, 14 km south of the Exmouth Aerodrome and 116 km north of Coral Bay. It is a civil facility located within the RAAF Learmonth Base and is situated on Commonwealth land. Learmonth Airport is owned by the RAAF under the Department of Defence but is operated by the Shire of Exmouth which leases the airport under a Deed of Operation. The RAAF are planning a significant capital spend in the “unspecified near future” to upgrade the runway, taxiways and other infrastructure at the airport to support the operation of KC30 aircraft⁷.

The civil airport facilities are located to the east of the runway and are highlighted in the image below.

⁷ Shire of Exmouth, Ordinary Council Meeting Minutes, 28 November 2019

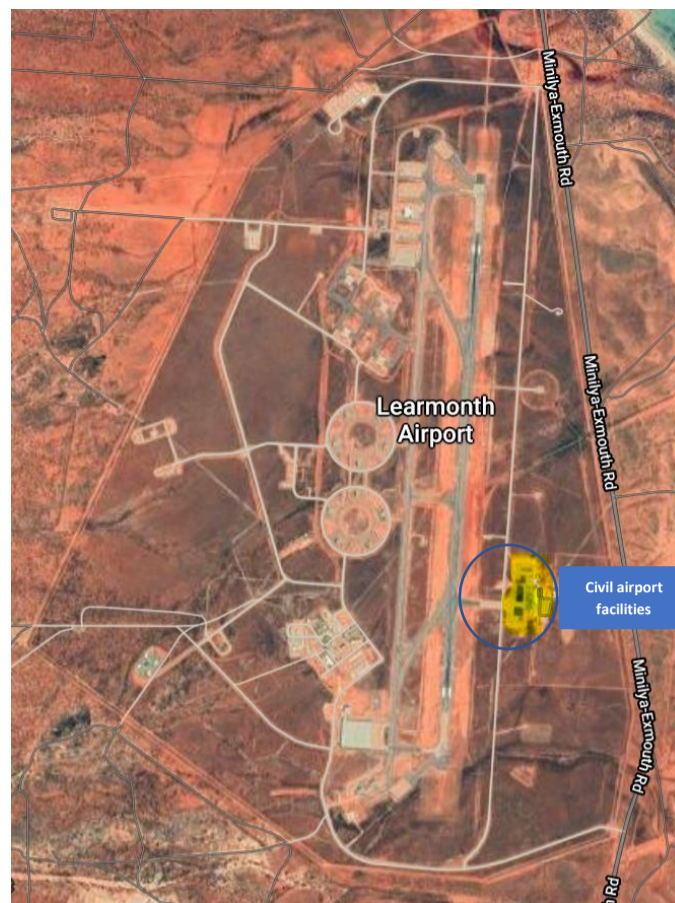


Figure 7: Learmonth Airport (Source: Google Maps)

Details of the aerodrome, including facilities and restrictions, are detailed in the ERSA and included at Appendix 4. Pertinent information is summarised in Table 2.

ICAO designator	Runway Length (metres)	Runway Width (metres)	Runway Strip Width (metres)	Runway Surface	Lights	Instrument Approach	Fuel
YLPM	3047	45	150	Sealed	Yes (refer to AIP ERSA for details)	Yes (refer to AIP DAP for details)	Jet A1
Pavement strength	PCN* 43/F/A/1750 (254PSI)/U PCN 43/ Pavement type - Flexible pavement / Subgrade strength High Strength / max allowable tyre pressure 1750 kPa / 254 psi / Evaluation method U = using aircraft experience						
Other	<ul style="list-style-type: none"> No GA operations outside 0800-1600 local, except RFDS. Parking restrictions Further information detailed in the AIP ERSA 						

Table 2: Summary of Learmonth Airport Specifications⁸

Learmonth Airport is a Classification 3 Security Controlled Airport (SCA) under the Federal Aviation Transport Safety Security Act 2004. It is approved for domestic Regular Public Transport (RPT) and charter flights and can be utilised for international charter flights by arrangement. Several international airlines have approval from the Department of Defence to nominate Learmonth as an alternate to Perth for weather or emergency planning requirements. The operator of non-scheduled flights into Learmonth Airport must submit a Movement Request Form⁹ with at least 24 hours' notice and receive approval from the Department of Defence.

The Perth to Learmonth route is a non-regulated¹⁰ RPT air route but is currently only serviced by Qantas. A new passenger terminal was opened in 1999 and the airport processed 86,000 passengers¹¹ in the 2018/19 financial year. The airport is also used by the RFDS for aero medical flights, in addition to a range of GA companies providing ad hoc charter services from Perth and other regional centres. The Police Air Wing utilises the airport when weather conditions require an instrument approach or Exmouth Aerodrome is unserviceable.

The old terminal building was modified into a heliport facility to support passenger processing for helicopter transfers to offshore platforms. Management of the heliport was transferred from private enterprise to the Shire in 2012. The heliport processed 16,495 passengers in the 2018/19 year.

Public facilities include a car park with approximate capacity for 120 cars, and a café, public toilets and hire car kiosks located within the terminal.

Due to the proximity of Learmonth Airport, and the quality and sophistication of its infrastructure and services, its civil facilities are important economic and strategic considerations in the development and ongoing review of the Exmouth Aerodrome Master Plan. The sealed runway, instrument approach capability, the type of lighting installation and availability of fuel all provide significant advantages for turboprop aircraft that could utilise Exmouth Aerodrome in its current configuration. The additional road travel time from the town is relatively inconsequential compared to the significantly lower risk profile offered by Learmonth Airport. Conversely, the proximity of Exmouth Aerodrome to the town and its lower security requirements hold more weight for smaller GA aircraft and microlights, not only for those operators already based at the aerodrome but also for potential new users.

⁸ AIP ERSA, 27 February 2020

⁹ Learmonth Airport Movement Request Form published on the Shire of Exmouth website

¹⁰ Air routes in WA with insufficient passenger demand to support airline competition are regulated by the State Government by granting monopoly rights to a single airline. The Perth-Learmonth route is not regulated (Department of Transport).

¹¹ Shire of Exmouth Annual Report for the Financial Year 2018/2019, p.18

2.2 Historical Context

The first aircraft landing strip was constructed during the Second World War on the western side of the Exmouth Gulf to support United States (US) and Australian operations. The site was redeveloped in the 1950s as a Royal Australian Air Force (RAAF) base, RAAF Learmonth. By 1992, both US and Australian defence forces withdrew their military personnel and civilian contractors took responsibility for managing the facilities. This marked a significant change in the makeup of the town's population and triggered the development of the tourism industry in the region. Tourism continues today as the primary contributor to the Exmouth economy¹².

By 1973, Learmonth had been developed into one of the RAAF's three 'bare bases' in Australia. The bare base concept enables rapid operational readiness for defence requirements or military exercises, without requiring the base to be manned by military personnel at other times. The base is currently utilised for periodic military training and staging exercises that run in tandem with the ongoing function of the civil airport facility.

2.3 Climate

Exmouth is situated in a subtropical climate zone and experiences hot, dry summers and temperate winters (see Figure 2). The average annual rainfall is 278 mm¹³. The town and surrounding areas can be affected by tropical cyclones between November and April, with the potential of damaging winds, heavy rainfall with flooding and storm surge causing inundation of low-lying coastal areas.

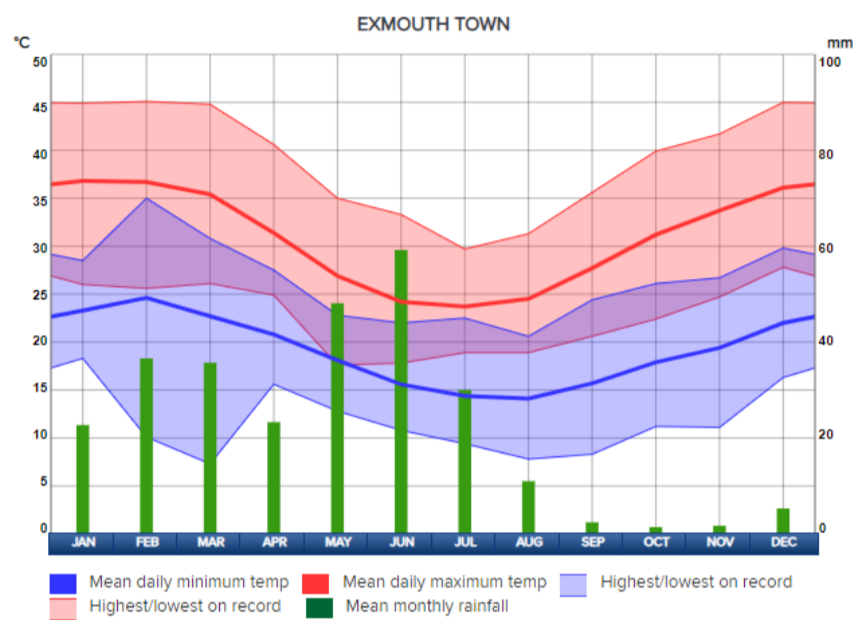


Figure 8: Exmouth - Annual Temperatures and Rainfall¹⁴

2.4 Significance of the Region

The North West Cape holds both cultural and environmental significance. The Jinigudira people (part of the West Thalandji people) are the traditional owners of the area and were part of a group that received Native Title recognition in December 2019 under the Gnulli Native Title claim¹⁵. The Native Title determination area¹⁶ includes portions of the Cape Range and Kennedy Range National Parks, the Ningaloo Marine Park and waters in the Exmouth Gulf and Ningaloo Marine Park.

The Ningaloo Reef is Australia's largest fringing coral reef and the Ningaloo Coast received UNESCO¹⁷ World Heritage status in 2011. The site covers 705,015 hectares, encompassing the Ningaloo Marine Park (Commonwealth and State waters), the Muiron Islands Marine Management Area, Jarabi and Bundegi Coastal Parks, the Cape Range National Park and the Learmonth Air Weapons Range.

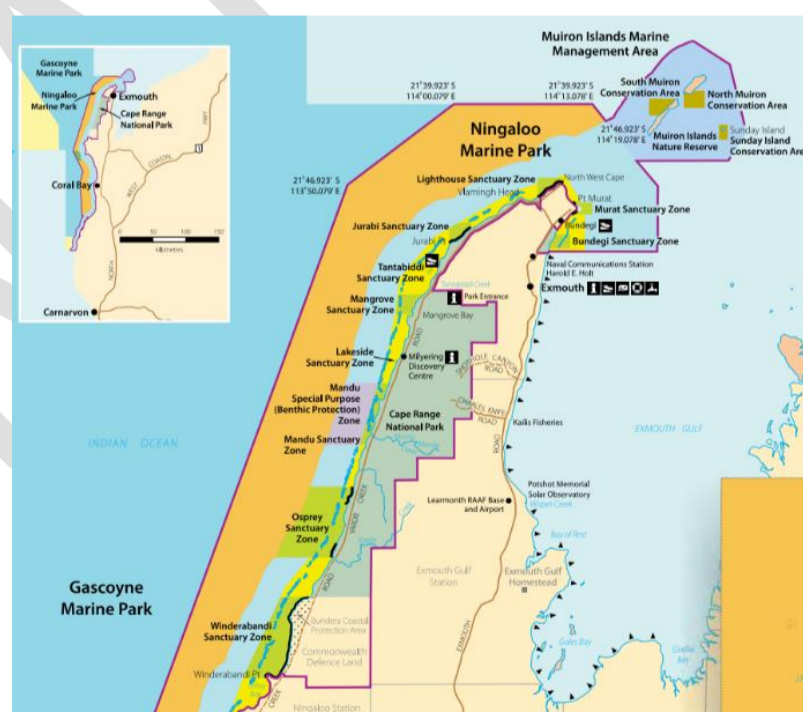


Figure 9: Ningaloo Coast World Heritage Area – Northern Section (Source: DPAW¹⁸)

¹² Ningaloo Visitor Centre website

¹³ Weatherzone website

¹⁴ Weatherzone website

¹⁵ Detailed on the Yamatji Marlpa Aboriginal Corporation website

¹⁶ National Native Title Tribunal

¹⁷ UNESCO – United Nations Educational, Scientific and Cultural Organisation

¹⁸ DPAW – Department of Parks and Wildlife

2.5 Socio-Economic Considerations

Exmouth is located within the Gascoyne region of Western Australia which covers about 5.5 per cent of WA's total land area and is home to approximately 4 per cent of the state's permanent population. The Exmouth Local Government Area (LGA) is governed by the Shire of Exmouth through its local Council.

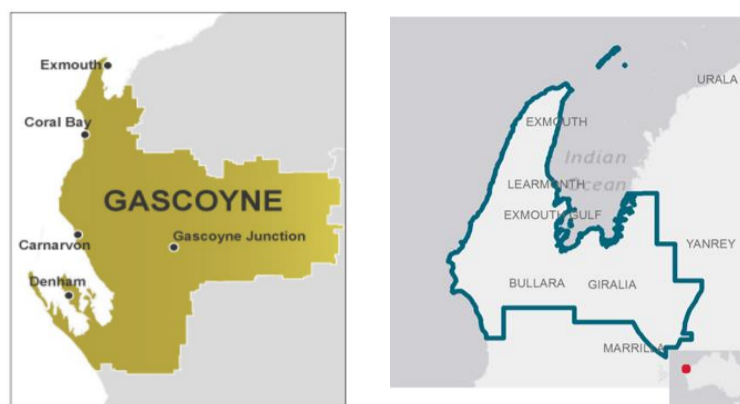


Figure 10: Gascoyne Region¹⁹ and Exmouth LGA²⁰

Tourism is the largest industry in the Shire, with defence, offshore oil and gas, agriculture, aquaculture and fishing also making significant contributions to the local economy. The peak tourist season runs from April to September, influenced by the local climate and the migration patterns of humpback whales and whale sharks, both being significant draw cards to the area. Prior to the impact of COVID-19, both domestic and international visitor numbers had continued to rise (see Figure 11), supported by significant infrastructure investments in the town, including the \$32 million Ningaloo Visitor's Centre and development of the Exmouth Marina.



Figure 11: Exmouth LGA Overnight Visitor Trends – Rolling Three Year Average²¹

In October 2020, Tourism WA published an overview of overnight visitors and their spend in the Coral Coast region (see Figure 12), which illustrated negative growth for the year ending (YE) June 2020 compared to the previous 12 months. However, anecdotal reports from local operators in the region indicate there has been a significant increase in visitors in the months following the lifting of intrastate travel restrictions at the end of May, which is not captured in the published survey.

	YE Jun-19	YE Jun-20	% Change YE Jun-20 – YE Jun-19	3 Year AAGR ^A
Total				
Spend (\$m)	657	600	-8.7%	-5.7%
Visitors	1,064,700	1,004,100	-5.7%	-2.2%
Nights	5,339,400	5,013,800	-6.1%	-7.8%
Domestic Total				
Spend (\$m)	560	500	-10.7%	-7.5%
Visitors	969,800	911,800	-6.0%	-3.1%
Nights	4,362,300	4,150,500	-4.9%	-8.5%
International				
Spend (\$m)	97	100	3.1%	4.8%
Visitors	94,900	92,300	-2.7%	8.6%
Nights	977,100	863,300	-11.6%	-4.3%

^AAAGR – Average Annual Growth Rate

Figure 12: Australia's Coral Coast – Overnight Visitation Summary¹¹

The most recent data for the Exmouth LGA published by the Australian Bureau of Statistics (ABS) is from 2018 and is summarised in Table 3 below. Although the permanent population is less than 3,000 it is estimated the local Exmouth area accommodates over 7,000 people²² at the peak of the tourist season.

¹⁹ Department of Primary Industries and Regional Development

²⁰ Australian Bureau of Statistics

²¹ Tourism WA

²² Shire of Exmouth, Annual Report 2018/19

Permanent Population	2,836
Median age	38.7
Working age population (15 – 64 years) %	67.6
Median income (excluding government pension and allowances)	\$47,781
Total number of businesses	277
Main employing industry: Accommodation and food services	11.7%

Table 3: Exmouth LGA Statistics 2018 (Source: ABS)

Assuming current underlying growth trends continue, population forecasts published by the WA Planning Commission²³ for Exmouth in 2026 through to 2051 are summarised in Table 4.

Scenario	2026	AAGR [^] 2016-26	2051	AAGR [^] 2026-51
Median forecast	2,880	1.0%	3,687	1.0%
High growth forecast	3,330	2.5%	6,129	2.5%
Aspirational population	4,367	5.3%	7,105	2.0%
Estimated peak population	13,135	N/A	19,857	N/A

[^]AAGR – Average Annual Growth Rate

Table 4: Population Forecast for the Exmouth LGA (Source: WA Planning Commission)

Major drivers for future growth in the area are likely to include the proposed expansion of the boat harbour²⁴, aimed to support the tourism and fishing industries as well as the oil and gas sector. Together with the Ningaloo Centre, additional economic stimulation is expected from the planned Munderoo Foundation Exmouth Research Laboratory²⁵ and the proposed \$85 million redevelopment of the Lighthouse Caravan Park²⁶ into a luxury eco-resort.

2.6 Regulatory and Policy Context

The Gascoyne Regional Development Plan²⁷ delivers a ten-year plan for the future growth of the region, supported by the Gascoyne Development Commissions' annual Resource Infrastructure Review²⁸. and Gascoyne Regional Investment Blueprint²⁹. These documents highlight population growth, expansion of the tourism industry and improved air services as key priorities for the region. The Exmouth Marine Infrastructure Project³⁰ is also of significance with the planned deep-water port likely to provide increased economic opportunities for the area with flow on effects to other sectors, including aviation.

2.7 Environmental Considerations

• Humpback Whale Trial

A population of humpback whales migrates annually from their Antarctic feeding grounds to the warm waters off the north west coast of WA for breeding. The Department of Biodiversity, Conservation and Attractions (DCBA) conducted a trial of in-water interactions with humpback whales³¹ by licensed commercial boat operators in the Ningaloo Marine Park (State waters) and the Muiron Islands Marine Management Area from 2016 to 2019. This provided a flow-on economic benefit for local aviation operators who expanded their aerial spotting activities to support the commercial tourist boats. The migratory behaviour of the humpbacks also extends the traditional marine spotting season in the area by up to 6 weeks. Following the success of the trial, the intention is for in-water humpback interactions to be a licensed industry commencing from the 2021 season. Of note, humpback whale spotting requires one aircraft per boat compared to one aircraft being able to support up to four boats for whale shark interactions. While this raises environmental considerations, it does provide an economic opportunity for local aviation businesses.

• Critical Ecological Sites

A Critically Endangered Threatened Ecological Community (TEC) containing small aquatic and terrestrial animals, known as the Cameron's Cave Troglitic Community³², is located approximately 8 km north of the aerodrome site. It is unlikely any potential flood management or water diversion work undertaken to support development of the aerodrome would impact this site, but it should be considered in future development plans.

• Flood Plain Management

Exmouth is located on a coastal plain with rainfall runoff from the Cape Range moving eastward towards the Exmouth Gulf. Coastal dunes impede the flow of water into the Gulf in some areas. Major flooding events occurred in Exmouth in 1999 (Cyclone Vance) and in 2002 and 2014 when just over 200mm of rain fell within 24 hour periods. These events caused significant damage and cut off access to the town from the south. Regular users of Exmouth Aerodrome report the northern end of the runway and apron are susceptible to flooding and standing water after moderately heavy rainfall events, with the gravel access road into the aerodrome from the Minilya-Exmouth road also becoming unusable.

Flood plain management is as an important consideration due to the location of Exmouth Aerodrome within the Shothole Creek catchment area (see Figure 13).

²³ WA Planning Commission, Gascoyne Coast Sub-regional Strategy, 2018

²⁴ Economic Benefits Assessment of Exmouth Marine Infrastructure Project, Final Report, November 2019

²⁵ Munderoo Foundation, Flourishing Oceans Initiative

²⁶ Tattarang

²⁷ Gascoyne Regional Development Plan 2010 - 2020, issued February 2010

²⁸ Gascoyne Regional Infrastructure Review, Gascoyne Development Commission

²⁹ Gascoyne Regional Investment Blueprint, 2015

³⁰ Economic Benefits Assessment of Exmouth Marine Infrastructure Project, Final Report, November 2019

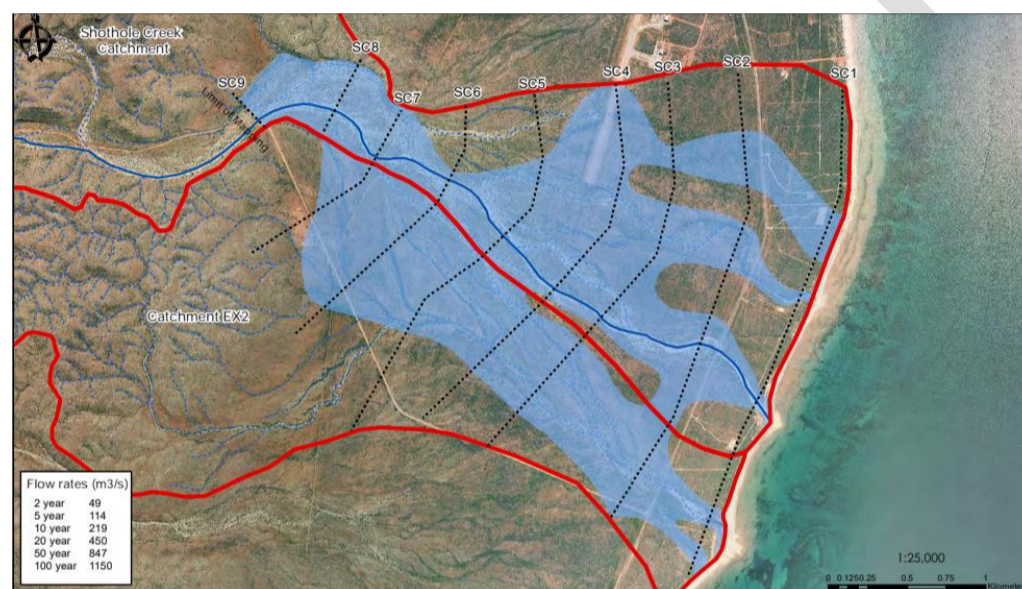
³¹ Parks and Wildlife Service, Draft Management Program for Managing Interactions with Humpback Whales along the Ningaloo Coast, 2020

³² DPAW List of Threatened Ecological Communities 2018



Figure 13: Key Catchments and Water Courses (Hyd2o, 2014)

Although Shothole Creek has a clear outlet to the coast that is not blocked by coastal dunes, modelling from a hydrological study completed in 2014³³ indicated the southern end of the runway lies within the floodplain (see Figure 14). Regular users of Exmouth Aerodrome report the northern end of the runway and apron are susceptible to flooding and standing water after moderately heavy rainfall events, with the gravel access road into the aerodrome from the Minilya-Exmouth road also becoming unusable.



Note: Model Flood Height SC4 - 13.5mAHD, SC5 - 17.1mAHD³⁴

Figure 14: Estimated 100 year floodplain (Hyd2o, 2014)

- **Noise Management**

Aircraft noise is a key environmental consideration for communities in close proximity to aerodromes and their take-off and approach paths, or those situated beneath airspace where repetitive activities, such as circuit training, are conducted. The Cape Wilderness Estate subdivision to the east of the aerodrome is located beneath the standard circuit for runway 20 and the final approach for this runway tracks above land to its north that has been designated for future housing development. The planning for land use around airports should avoid developments that may result in adverse conditions for occupants and also lead to conflict with aircraft operations.

2.8 Heritage Considerations

- **Native Title**

The WA government and Gnulli Native Title claimants are currently negotiating an indigenous land use agreement that will ensure the Ningaloo coastal reserves are created in accordance with the Commonwealth Native Title Act 1993. It is understood the Exmouth Aerodrome is not included in the area under deliberation.

- **Heritage Sites**

Three heritage locales in the Exmouth area are included on the State Register of Heritage Places³⁵. A Municipal Heritage Inventory³⁶ is also published on the Shire website. There are no identified Aboriginal or European heritage sites or artefacts located within the Exmouth Aerodrome precinct, however the rich history of the local area means there is potential for unknown sites or items of significance to exist. This should be further assessed during the formulation of any development proposal.

The Ningaloo World Heritage Site is significant in both size and importance. Although the aerodrome does not encroach on the Site, the impact of any development that encourages an increase in visitors and/or utilisation of the area should be considered and monitored under the Master Plan.

2.9 Shire Governance

The Exmouth LGA is governed by its elected council which is charged to represent the interests of local residents. In accordance with the Local Government Act, the council is responsible for setting the strategic long-term plan for the local community and developing the policies to achieve those goals. The council also appoints the Chief Executive Officer of the Shire, who is responsible for the implementation of policy and overseeing the administration of the LGA. At the Shire of Exmouth, the Aviation Services Team is comprised of the Executive Manager - Corporate and Commercial, the Aviation Manager, Aerodrome Reporting Officers, Heliport Manager and other operational personnel who support the services provided at Learmonth Airport. Members of the aviation management team attend the Exmouth Aerodrome site on an 'as required' basis.

³³ Hyd2o Hydrology

³⁴ mAHD – metres above Australian Height Datum

³⁵ Department of Planning, Lands and Heritage, State Register of Heritage Places

³⁶ Municipal Heritage Inventory, O'Brien Planning Consultants, 1998

2.10 Local Planning

The Strategic Community Plan Exmouth 2030³⁷ was adopted by the Exmouth Council in June 2018. Implementation of this plan is facilitated by the Shire’s Corporate Business Plan and both can be viewed on the Shire’s website³⁸. The current 2018-2022 Business Plan³⁹ outlines a budget of \$370,000 over three years for the Exmouth Aerodrome for new infrastructure, upgrade of the runway and extension of the apron.

The Shire of Exmouth Local Planning Scheme No. 4⁴⁰ was gazetted on the 12th of March 2019. Special Control Area (SCA) 4 and Special Use (SU) Area 3 (highlighted in Figure 15 below) relate to Exmouth Aerodrome. Adjacent areas of note include Floodplain SCA5 to the southeast and Minilya-Exmouth Road SCA 6 along the eastern boundary.

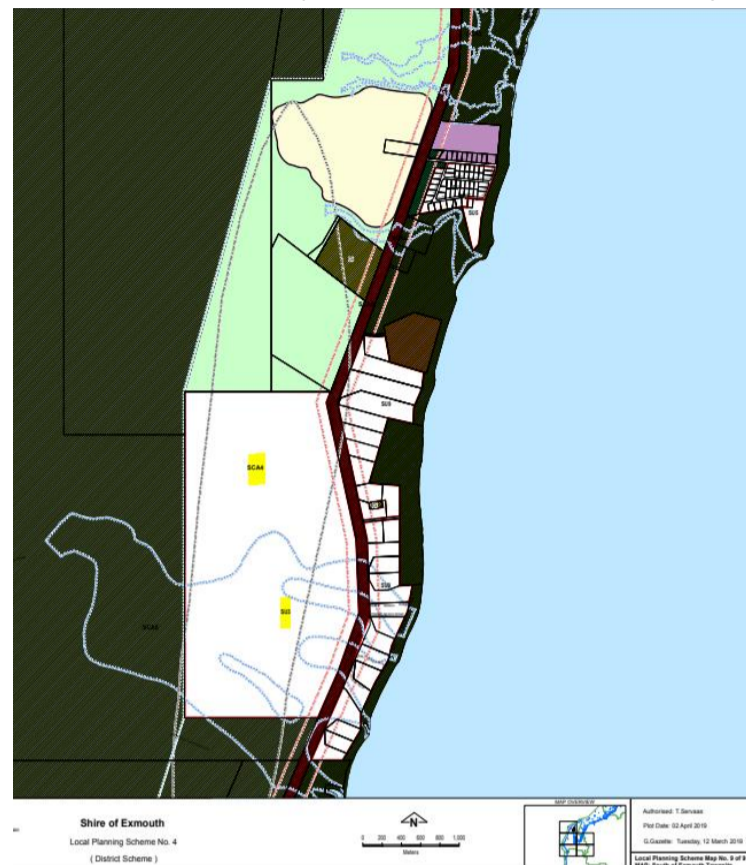


Figure 15: Exmouth Aerodrome Special Control Area SCA4 and Special Use Area 3 (Source: Department of Planning, Land and Heritage⁴¹)

The objectives of SCA4 are “...to protect the use of the Exmouth Aerodrome for the operation of private, recreational or commercial aircraft and associated functions ...and to ensure that development in the vicinity of the Exmouth Aerodrome is compatible with any existing development and operation of the aerodrome” (Local Planning Scheme No.4, 2019, p.47).

The objectives of SU Area 3 are : “(a) to set aside land for the development of airport or aviation facilities and industry and (b) to provide guidance on the built form to ensure that it does not conflict with the safe and secure operations of the aerodrome” (Local Planning Scheme No.4, 2019, p.68).

The full requirements of SCA4 and SU3, including provisions for fencing, crossover restrictions, car parking, utilities and the maximum height of infrastructure dependent on its set back from the eastern edge of the runway strip, are contained within the Local Planning Scheme document. The document also includes a detailed schematic of SU3, outlining the current and proposed access road, leasehold lots, taxiways and fuel precinct (see Figure 16). It indicates the plan to clearly separate the area into GA, helicopter and commercial precincts and provides for a new fuel facility location.

³⁷ Shire of Exmouth, Strategic Community Plan Exmouth 2030

³⁸ Shire of Exmouth website www.exmouth.gov.au

³⁹ Shire of Exmouth Corporate Business Plan 2018-2022, October 2019

⁴⁰ Department of Planning, Lands and Heritage, Shire of Exmouth Local Planning Scheme No.4, gazetted 12 March 2019

⁴¹ Department of Planning, Lands and Heritage, Shire of Exmouth Local Planning Scheme No.4, gazetted 12 March 2019, Map 09 Exmouth South of Exmouth Townsite

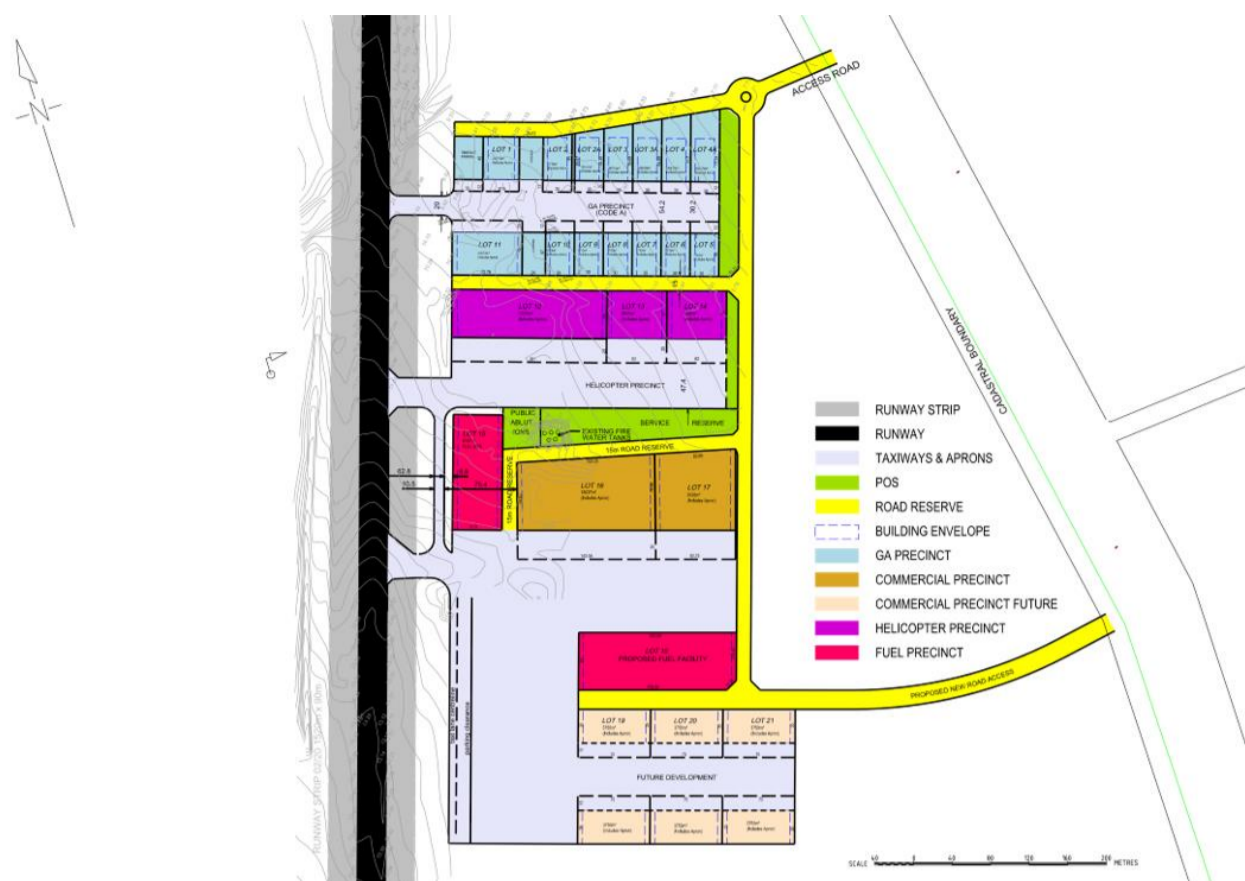


Figure 16: SU3 – Exmouth Aerodrome Locality Site Plan (Local Planning Scheme No. 4, p. 109)

2.11 Aviation Governance

The governance of civil aviation in Australia falls under the jurisdiction of the Federal government through the Civil Aviation Act 1988. The Civil Aviation Safety Authority (CASA) holds responsibility for the regulation and oversight of the industry. Australia is a member state of the International Civil Aviation Organisation (ICAO), the United Nations agency established to manage the administration and governance of the Convention on International Civil Aviation (the Chicago Convention).

2.12 Regional Aviation Policy

In 2015 the WA State Government moved towards a more active role in the aviation sector with the release of the first State Aviation Strategy. The draft WA Aviation Strategy 2020⁴² acknowledges the importance of general aviation and the vital role that regional and remote airports play in supporting "...tourism charters, pilot training, sport and recreational aircraft activities, services to resource and pastoral sectors and important emergency services such as patient transfer facilities for the Royal Flying Doctor Service" (WA Aviation Strategy 2020 - Supporting Documents WA Airports, 2020, p.51).

The main objectives outlined in the Draft Strategy 2020 are:

1. affordable airfares;
2. connected communities;
3. fit for purpose airport infrastructure; and
4. being informed and future ready, through better data analysis and planning.

2.13 Aerodrome Regulation

The Civil Aviation Safety Authority (CASA) holds responsibility for the regulation and oversight of the aviation industry in Australia. Requirements for aerodromes utilised for air transport passenger operations in Australia are prescribed in the Civil Aviation Safety Regulations 1998 (CASRs), specifically CASR Part 139 - Aerodromes⁴³ and the Part 139 (Aerodromes) Manual of Standards (MOS) 2019⁴⁴ (the MOS). Significant changes to CASR Part 139 and the MOS came into effect on the 13th of August 2020, amending the classification and management of regulated aerodromes.

Aerodromes fall into one of two broad categories – regulated or unregulated. Aerodromes that support a Terminal Instrument Flight Procedure (TIFP) must be certified; other aerodromes without a TIFP can also "opt-in" to certification. All Certified Aerodromes are regulated by CASA. All other aerodromes are unregulated, and although CASA provides advisory information regarding their management, these recommendations are not mandatory.

The compliance responsibilities of different aerodrome categories are summarised in Figure 17 below. It is the responsibility of the aerodrome operator of a Certified Aerodrome to ensure the facilities meet certain physical characteristics and that specific management processes are in place. The required management processes are dependent on both the annual number of air transport passengers [as published by the Bureau of Infrastructure and Transport Economics (BITRE)] and the annual aircraft movements at that aerodrome. ALAs (unregulated aerodromes) are not required to meet these same standards and safety and technical inspections are not mandated. The responsibility for determining if the runway and facilities meet certain requirements and are suitable for the safe conduct of their flights is shouldered by the aircraft operator (the Air Operator Certificate (AOC) holder) and the Pilot in Command (PIC).

⁴² WA Department of Transport, Draft WA Aviation Strategy 2020, February 2020

⁴³ Civil Aviation Safety Authority (1998). Civil aviation safety regulations 1998

⁴⁴ Civil Aviation Safety Authority (2020). Part 139 (Aerodromes) Manual of Standards 2019

	Certified Aerodromes	Previous Registered Aerodromes - Deemed Certified	Aircraft Landing Areas and Certain Other Aerodromes
Maximum level of service provided	RPT or frequent charter with more than 30 passengers		
Who is responsible for certification?	CASA and the operator	CASA and the operator	Unregulated facility – use is in accordance with Aircraft Operators Certificate and/or pilot's responsibility to determine suitability of the facility
Where are the standards defined?	MOS	MOS	Guidance in CAAP 92-1
Is an aerodrome manual required?	Yes	No	No
Is a Safety Management System required?	Yes (scaled in accordance with passenger numbers or aircraft)	Yes (scaled in accordance with passenger numbers or aircraft movement numbers)	No
Is an Aerodrome Technical Inspection required?	Yes	Yes	Regular inspection by suitably qualified person(s) is recommended
Is an Aerodrome Safety Inspection required?	No	This inspection type is being phased out	Recommended
Is a Trained Reporting Officer required?	Yes	Yes	Recommended
Are aerodrome details published in ERSA/NOTAM?	Yes	Yes	Airservices Australia may publish basic information for aerodromes that were previously regulated
Is the aerodrome operator required to monitor obstacles?	Yes	Yes	Pilot's responsibility to determine suitability of the facility
Can non-precision instrument approach procedures be made available?	Yes	Yes	No

Figure 17: Aerodrome Categories under CASR Part 139 (Source: CASA⁴⁵)

The recent regulatory reform for Certified Aerodromes does not directly impact ALAs. As CASA continues its reform process, however, changes to other types of operations are scheduled to take effect in late 2021. The drivers of these further changes to operational requirements are the move to amalgamate charter and RPT operations into one category of air transport operations (with medical air transport operations also to be included), and for their operation to be demarcated on the basis of aircraft size and/or passenger seats rather than by the type of operation. Changes to the requirements for scenic and joy flight operations are still under consultation, however they are most likely to be the same or less restrictive⁴⁶ than the requirements for air transport operations.

Exmouth Aerodrome is classified as an ALA and is therefore an unregulated aerodrome. Although standards for unregulated aerodromes are not mandated by CASA, it does make recommendations through Advisory Circulars (ACs) and Civil Aviation Advisory Publications (CAAPs).

To future proof Exmouth Aerodrome, this Master Plan considers how the new Part 139 MOS will affect the aerodrome if it is developed in the future to accommodate larger aircraft and support operations under the Instrument Flight Rules (IFR). If the development strategy includes the commissioning of a non-precision instrument approach (such as an RNAV approach), under the new regulations the aerodrome would require certification. The required standards of the aerodrome facilities would be determined by the aerodrome reference code that is chosen by the aerodrome operator (in this case, the Shire). This decision would be driven by the aircraft types and operations the Shire wants the aerodrome to have the capability of accommodating. A 1,600 metre Code 2C runway with non-precision instrument approach has been proposed, which could support the operation of aircraft such as the Bombardier Dash 8-300. Preliminary technical drawings have been completed to illustrate the requirements for an aerodrome meeting these specifications, including Obstacle Limitation Surfaces (OLS) (see Appendix 5, 6 and 7). The current infrastructure at the aerodrome does not infringe the OLS for this category of facility. Careful consideration should be given to all new proposals for development at the aerodrome to ensure the OLS is protected for future proofing an upgrade of the runway and its instrument capability in the future.

3 Consultation Process

3.1 Stakeholder Engagement

A broad range of local and external stakeholders were consulted during the development of the Master Plan, including aviation operators, government services, emergency services, tourism operators and other community groups. Recurring topics raised by stakeholders included:

- the suitability of the aerodrome for current operations;
- development requirements for future use, including runway dimensions and surface;
- lighting, utilities and other facilities;
- identified risks or hazards;
- opportunities for growth; and
- the cost sensitivity of current users.

3.2 Key Findings

Physical Characteristics

- Runway length – current length is suitable for regular users of the aerodrome but minimum extension to 1600m required for external turboprop operators. This would facilitate aircraft such as the Beechcraft B1900, Metroliner 23 and Dash 8 aircraft (excluding the Dash 8 Q400). If the Shire sought to replicate the Learmonth facility for the purpose of redundancy or future proofing, jet aircraft such as the Fokker F100 would require a minimum of 1,800 m (up to 2,000 m) and for the runway to be sealed.
- Runway width – suitable for current users.
- Runway strip – adequate width for current users but requires removal of vegetation.

⁴⁵ Civil Aviation Safety Authority (2020). Aerodrome categories under CASR part 139

⁴⁶ Summary of Consultation, Proposed rules for air transport operations – smaller aeroplanes, CASA, April 2019

- Flyover area – requires removal of vegetation.
- Runway surface – suitable for current users except after moderate rainfall. Some operators of VH registered aircraft would benefit from the runway being sealed, even for operations in dry conditions. The lack of regular maintenance and the partial sealing of the runway has resulted in an undesirable transition between the paved and gravel surface which may contribute to aircraft damage. Sealing would also assist future operators of turboprop operators to increase their payload. Microlight operators require a gravel surface or cross strip due to crosswind handling characteristics. If either of these were not available, there is potential for these aircraft to utilise the gravel runway strip or a gravel taxiway.
- Taxiways – suitable for current users though some would benefit from taxiways being sealed and/or the construction of a parallel taxiway. Taxiway width to accommodate outer main gear wheel span (OMGWS) and wingtip clearance requires assessment for potential turboprop operators.
- Taxilanes – the position of the taxilane on the northern apron does not provide sufficient clearance from the adjacent hangar to meet the regulatory requirements of Civil Aviation Order (CAO) 20.9⁴⁷.

Lighting

- Current local operators rarely conduct night operations.
- The ERSA advises operators and pilots that runway and taxiway lighting is available, however the current infrastructure is not maintained.
- Consideration should be given to apron lighting with any future development of the aerodrome.

Fuel

- Overwhelming support by current and potential users for a public fuel facility.
- The immediate priority is for an Avgas facility as most current local operators operate piston engine aircraft. The closest public Avgas facilities are located at Karratha and Carnarvon airports which imposes a significant barrier to piston engine aircraft visiting Exmouth.
- As Jet A1 is currently available at Learmonth Airport, access to fuel is not a prohibitive barrier for larger turboprop aircraft that may be able to utilise Exmouth Aerodrome in its current configuration. Consideration for the provision of Jet A1 fuel could be included in future feasibility studies for upgrading the aerodrome.
- Overwing Avgas refuelling equipment would be suitable for piston engine aircraft.
- Overwing Jet A1 refuelling equipment would be suitable for most turboprop aircraft. Jet aircraft would require underwing pressure refuelling.

Aerodrome leases

- New lots have been released without a power supply, requiring users to bear the connection costs.
- Water is not supplied to the leases. Tenants utilise rainwater tanks and/or truck water in to replenish their tanks.
- There has been inconsistent earthwork preparations when lots are released.
- Tenants would like the opportunity for more flexible lease agreements, including longer terms, to assist with risk mitigation in relation to their infrastructure investment.

Opportunities for Growth

- Learmonth is a significant competitor to the current Exmouth Aerodrome with respect to air transport and aero medical operations utilising small and large turbo prop aircraft, including the RFDS. Conversely, Exmouth Aerodrome holds advantages due to its closer proximity to town and lack of security restrictions making it more convenient for ad hoc flights that occur at short notice. Future development at Exmouth Aerodrome may therefore be more sustainable if it centres around general aviation activities and does not attempt to compete with Learmonth Airport.
- Local stakeholders expressed support for an Air Park concept at the aerodrome.
- Anecdotal support for skydiving and heli-fishing operations.
- In kind support expressed for facilitating larger flying schools from capital city and regional centres to use the aerodrome either as a semi-permanent base or for navigation exercises.
- Mixed opinion regarding the viability of a permanent flying school based on the current population and demographics.

Future Considerations

- Separate aircraft types and/or different categories of operations in future developments.
- Stakeholders are concerned about the financial impact on their businesses if the Shire pursues a ‘user pays’ model to fund any upgrade or expansion of the runway and facilities. Most stakeholders currently leasing lots at the aerodrome are small business owners and their clientele are particularly price sensitive (being mainly tourists rather than large commercial organisations).

4 Future Direction

The current strategic position of Exmouth Aerodrome and a proposed development for its facilities were considered as part of a risk analysis prior to considering the future direction for the aerodrome. A SWOT analysis was completed and is summarised in Appendix 8.

The Exmouth Aerodrome Master Plan supports the vision for the aerodrome, which is:

1. **To maintain a safe and user-friendly aerodrome – that supports the local community through the provision of facilities suitable for a range of users; and**
2. **To develop the aerodrome and its facilities based on specific demand and cost benefit analysis – assessed through ongoing review and stakeholder engagement with future development being conducted within appropriate financial constraints to ensure the aerodrome remains accessible to local businesses and the wider Exmouth community.**

This vision for the aerodrome complements the vision for the wider Exmouth community identified in the Strategic Community Plan 2030:

“To be a prosperous and sustainable community living in harmony with our natural environment.”

The four objectives designed as the pillars to support this community vision are Economic, Environment, Social and Leadership. The Strategic Community Plan 2030 outlines several outcomes to measure the achievement of each objective and the Shire has identified the outcomes applicable⁴⁸ to the Aerodrome Master Plan, which are detailed below.

⁴⁷ CAO 20.9 Air Service Operations – Precautions in refuelling, engine and ground radar operations (2011)

⁴⁸ Shire of Exmouth, Ordinary Council Meeting Minutes, 28 November 2019

1. **Economic Objective:** To diversify and grow the economy in a manner that provides year-round employment opportunities.
Outcome 1.3 – Enable the provision of essential infrastructure that will support investment and diversify the economy.
2. **Environmental Objective:** To protect and value the unique natural and built environment as the community grows the economy.
Outcome 2.3 – Advocate and promote opportunities for the development of environmentally sustainable essential infrastructure and services.
3. **Social Objective:** To be a vibrant, passionate and safe community valuing the natural environment and unique heritage.
Outcome 3.1 – Explore opportunities to deliver services and facilities that attract and retain people living in the Shire.
Outcome 3.2 – Promote facilities/services that enhance public health and safety.
4. **Leadership Objective:** To provide open transparent, accountable leadership working in collaboration with the community.
Outcome 4.1 – To provide proactive, collaborative and transparent leadership.

4.1 Key Criteria

The Shire has established key criteria⁴⁹ for future outcomes of the Exmouth Aerodrome Master Plan:

1. General Aviation – improved facilities to service the growing tourism industry sector, spotter services for the marine industry, microlight flights and general charter services.
2. Helicopter operations – expansion of current facilities to enable offshore providers to be based in Exmouth.
3. RFDS – upgraded facilities to ensure a second airstrip is available for aero medical evacuations.
4. Air transport passenger operations – the potential for turboprop aircraft to operate scheduled flights or charter services into the aerodrome in the future. This may facilitate an additional market of visitors to the area and would also assist in future proofing transport into the town in the event civil access to Learmonth Airport was rescinded.
5. Additional use – facilitating the establishment of new aviation related businesses and community activities at the aerodrome.

5 Strategy Development

Predicated on the key criteria, stakeholder feedback and an initial inspection and survey of the aerodrome, strategies for the Aerodrome Master Plan were identified.

1. Assess all utilities provided at the aerodrome, including power and water, to determine their adequacy and compliance for current users. Upgrade utilities to support current utilisation and to support further development at the site.
2. Relocate the taxiway/taxilane on the northern apron to achieve regulatory compliance.
3. Repair the main access gate to ensure the integrity of the aerodrome's perimeter fence.
4. Assess the culvert located under the northern section of the runway and repair and/or upgrade as required.
5. Conduct maintenance of the current runway, runway strip, flyover area and taxiways in accordance with CASA's recommendations for ALAs.
6. Complete repairs to the runway and taxiway lighting.
7. Establish a formal line of communication between aerodrome users and the Shire's Aviation Services Team.
8. Establish a process to ensure the ERSA entry is reviewed and updated at least annually.
9. Establish a regular serviceability inspection and maintenance program.
10. Develop a detailed plan for the release of future aerodrome lots that includes restrictions on the type of aircraft for each apron. This should reflect regulatory requirements and compatibility with business activities already established at the site.
11. Establish a process for the preparation of future lots with regards to earthworks and the provision of utilities.
12. Regulate standard terms and conditions for leases to ensure consistency.
13. Assess planned infrastructure prior to approval to ensure it will not infringe on the OLS applicable to both the current aerodrome design and potential upgrade of the aerodrome in the future.
14. Prior to extending the runway, complete a detailed hydrology study and survey to determine the suitability of the site.
15. Restrict the release of housing lots immediately north of the aerodrome and any expansion of the aerodrome until a noise exposure forecast has been completed.
16. Conduct an annual review of the Aerodrome Master Plan.

6 Implementation Plan

Immediate – within the next 2 months:

- Formalise communication channels between aerodrome leaseholders and the Shire's Aviation Services Team.
- Address any safety or compliance issues raised during the aerodrome site visit and survey.
- Relocate the northern taxiway/taxilane. A draft plan compliant with CAO 20.9 requirements is included at Appendix 9.
- Conduct assessment of current electricity transformer capability.
- Remediate the electrical access for Lot 1.
- Complete maintenance on the current runway, taxiways and flyover areas to bring the facilities in line with the recommendations of CAAP 92-1(1) (see Appendix 10). This advisory publication provides information on the recommended physical characteristics for ALAs, including the width and surface of the landing area and obstacle clearance gradients. It refers to operations utilising aircraft with a maximum take-off weight (MTOW) of less than 5,700 kg for private, aerial work (with some flying training exceptions) or charter operations. Technical plans for the aerodrome based on these recommendations are included at Appendix 11 and 12.
- Repair runway lighting.

Short Term – within the next 12 months:

- Aerodrome Inspection to be completed by a CASA approved Aerodrome Inspector.
- Remediate any issues identified during the Aerodrome Inspection.
- Repair or replace gate on the aerodrome access road.
- Apply for additional grant funding to support the aerodrome upgrade program and minimise the financial impact on cost sensitive local users.
- Establish an aerodrome serviceability and inspection program.

⁴⁹ Shire of Exmouth, Ordinary Council Meeting Minutes, 28 November 2019

- Establish a runway maintenance program.
- Complete a detailed assessment of the current culvert and upgrade if required to prevent or minimise flooding of the northern section of the runway.
- Seal the access road.
- Establish building envelopes for the apron to ensure OLS protection under future developments.
- Determine aircraft types suitable for the northern apron based on regulatory requirements (including OMGWS and wingspan), type of operation and the interface with existing users prior to releasing further lots. Ensure this information is detailed in future lease agreements.
- Trial portable Avgas tanker fuel facility to assess viability of permanent facility.
- Develop bore with solar pump to provide permanent water supply for all leaseholders.
- Upgrade fixed firefighting equipment.
- Call for expressions of interest regarding Air Park lots to establish future viability.
- Establish a formal process for an annual review of the Exmouth Aerodrome Master Plan that includes local stakeholders.

Medium Term – within the next 5 years:

- Install Avgas bowser with credit card/fuel card facilities.
- Complete apron development, including underground power lines, apron floodlights.
- Allocate Air Park lots (if demand is confirmed).
- Market Air Park lots.
- Establish an aero club with facilities that could be utilised on a ‘user pay’ basis for itinerant aircraft. This could include hangar facilities and/or short-term accommodation owned by the Shire and leased to users. Investigate sources of grant funding.
- Evaluate options for extension of the runway. This should include a detailed hydrology assessment and a predicted noise contour assessment utilising the Australian Noise Exposure Forecast (ANEF) system.
- Complete runway extension.
- Seal runway and/or taxiway(s). Due to the inherent maintenance challenges of a runway that has both paved and unpaved sections, it is recommended the runway be sealed once any extension has been completed, rather than sealing in stages. Ensure microlight operations are protected through provisions for landing on a gravel taxiway or the runway strip.
- Upgrade runway and taxiway lighting.
- Obtain aerodrome certification under the Part 139 MOS. Even without a terminal instrument approach procedure or utilisation of the aerodrome by aircraft types that require it, consideration should be given to certification due to the safety benefits. Certification would also be a valuable precursor to a proposed instrument approach.

Long term – within the next 10 years:

- Develop a commercial precinct at the aerodrome based on specific demand.
- Complete design and commission of non-precision instrument approach (based on user demand).

7 Realising the Master Plan

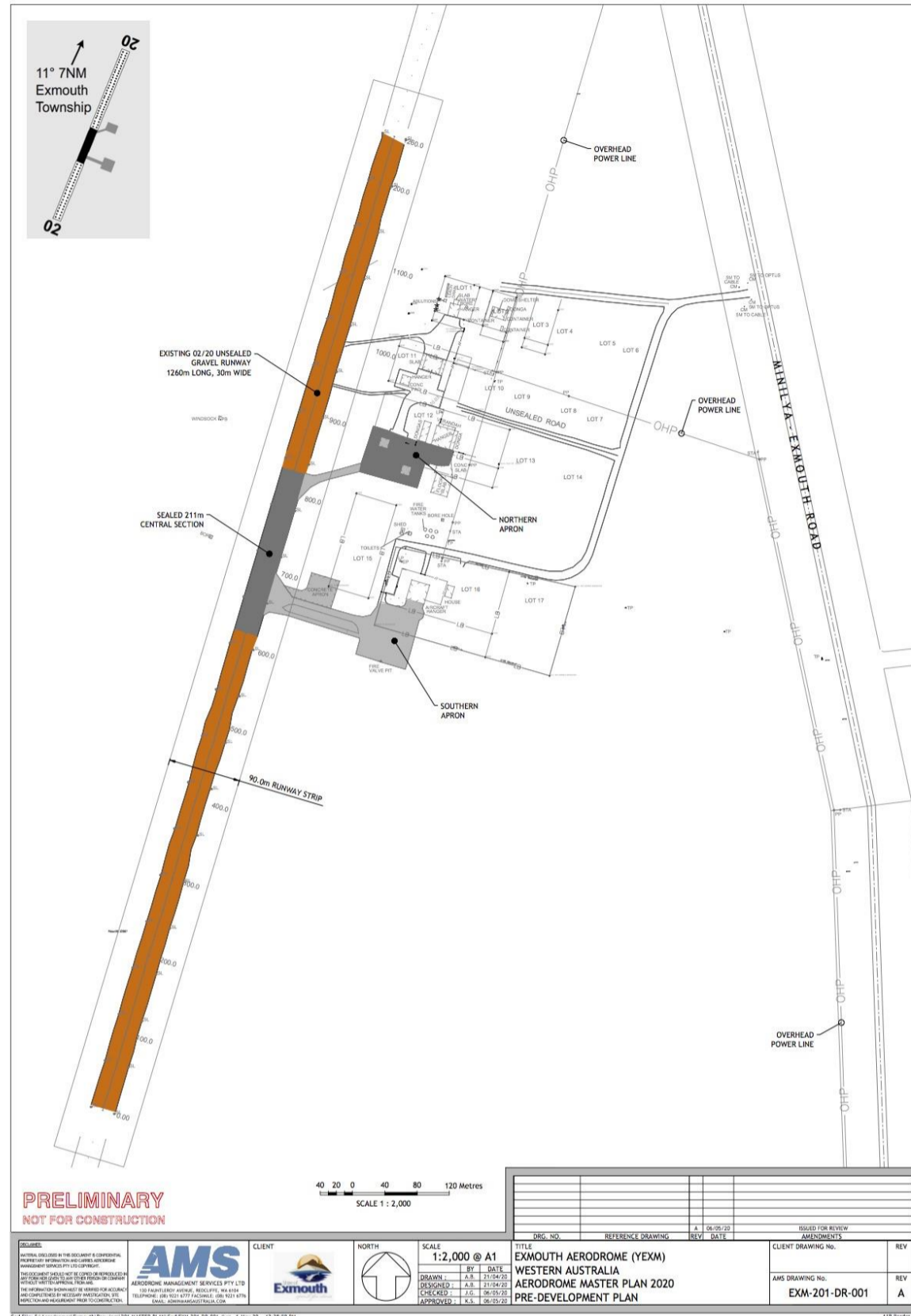
The success of the Exmouth Aerodrome Master Plan is dependent on stakeholder ownership. Ongoing stakeholder engagement that directs the review and update of the Master Plan should be conducted, at a minimum, on an annual basis.

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Appendix 1: Exmouth Aerodrome – Pre-development Plan



EXMOUTH

Appendix 2: AIP ERSAs – Exmouth ALA

AIP Australia

05 NOV 2020

FAC YEXM - 1

EXMOUTH

ELEV 10

FULL NOTAM SERVICE NOT AVBL



WA
220229S 1140608E
AD OPR Shire of Exmouth, PO Box 21, Exmouth or Maidstone Crescent, Exmouth, WA, 6707. PH AD 08 9949 1326. ARO 0407 494 419 (H24). Fax 08 9949 1840.

UTC +8 YEXM
VAR 0 DEG E UNCR

REMARKS

1. PPR CTC ARO.
2. Strip closed after heavy rain.

HANDLING SERVICES AND FACILITIES

Fuel is NOT AVBL.

PHYSICAL CHARACTERISTICS

RWY 02/20, 1260M, unsealed gravel with 211M central sealed section and parking area. WID 30M.

AERODROME AND APPROACH LIGHTING

1. Solar lighting HN. RWY 02/20 white on sides, green APCH, red at ends, blue TWY lights - IWI.
2. RWY edge light spacing: 02/20: 60M.

ATS COMMUNICATIONS FACILITIES

FIA MELBOURNE CENTRE 125.9 On Ground

CTAF 118.3

Except when Learmonth CTR and restricted areas are active.

ADDITIONAL INFORMATION

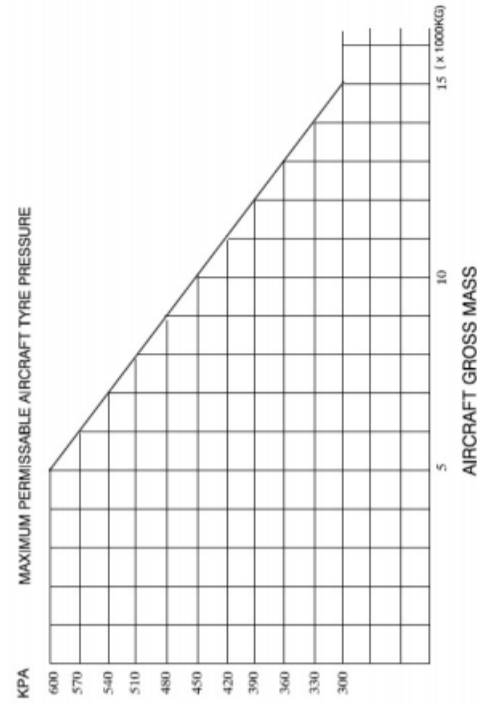
1. AD unfenced. Animal hazard likely.
2. HEL OPS H24.
3. Airfield is used by Microlights.

CHARTS RELATED TO THE AERODROME

WAC 3229.

FINAL

Appendix 3: Aircraft Suitable for Unrated Pavements⁵⁰



FINAL DRAFT

⁵⁰ AIP Australia – Aerodrome, AD 7.4, 27 February 2020, p. AD 1.1 - 48

Appendix 4: AIP ERSA – Learmonth Airport

AIP Australia

05 NOV 2020

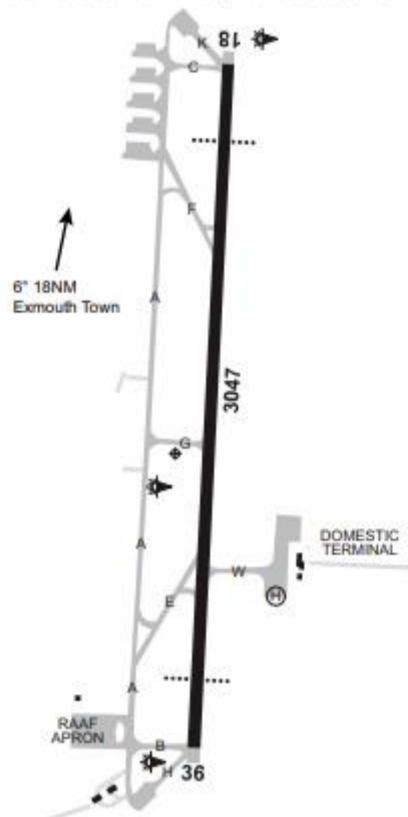
FAC YPLM - 1

LEARMONTH

ELEV 19

AVFAX CODE 6805

WA
221408S 1140519E UTC +8 YPLM
VAR 0 DEG E MIL
AD OPR Department of Defence (Air Force Headquarters), Shire of Exmouth, PO Box 21, Exmouth or Maidstone Crescent, Exmouth, WA, 6707. PH 08 9949 3000: Fax 9949 3050. ARO Civil AD OPR Duty ARO PH 08 9949 1326, Mobile 0407 494 419, Fax 08 9949 1840.



REMARKS

1. MIL ACFT require 24HR PN. Support REQ is to be advised to RAAF Caretaker, Phone 08 9947 9286, Mobile 0429 450 662, Fax 08 9947 9130. OIC RAAF Learmonth, Phone 0477 358 965, Email: lmo.ops@defence.gov.au.
2. MIL International flights are not to plan to enter Australia through Learmonth without prior approval of Customs and AQIS.
3. Civil ACFT require 24HR PN. A MVT REQUEST must be submitted to the Shire of Exmouth DUTY ARO, Phone 08 9949 1326, AH Mobile 0407 494 419, Fax 08 9949 1840, Email: ro.leaairport@westnet.com.au. MVT request form www.exmouth.wa.gov.au/Assets/Documents/YPLM_Mvt_Req_Form.pdf.
4. Civil Operators nominating Learmonth as an ALTN and INTL ALTN are to gain approval FM Air Force HQ through the ARO via formal request. INTL ALTN: Customs and AQIS PN. Refer General Planning Australia.
5. This AD is a security Controlled Airport.
6. AD Charges: All ACFT.
7. YPLM not to be used on AFTN.
8. Aircrew and Personnel airside access gate located at the northern end of terminal building. Access code can be obtained by contacting DUTY ARO.
9. Photography is prohibited (*Section 82 of the Defence Act*).

Information may be continued on the next page: PTO

FINAL

HANDLING SERVICES AND FACILITIES

RAAF Refueller. MIL movements only. Contact RAAF Caretaker Phone 08 9947 9286, after HR 0429 450 662, Fax 08 9947 9130.

ACFT crew or SQN maintenance will be required to refuel ACFT as only tanker driver provided. Civil Refueller: World Fuel Services, Phone 08 9949 1590, Mobile 0417 955 167. AVGAS not AVBL. JET A1 - dedicated tanker truck. Normal HR 0730-1630 Local. AH fee applies. PN required. Replenishment supplies for transiting ACFT. LOX and LHOX not AVBL.

APRONS AND TAXIWAYS

1. DOM terminal APN and TWY W - PCN 43/F/A/1750 (254PSI)/U.
2. TWY W WID 23M.
3. GA APN AVBL to code B ACFT only.

SURFACE MOVEMENT GUIDANCE

HEL OPS restricted to concrete aprons.

AERODROME OBSTACLES

Unlit mast 433FT AMSL BRG 200 DEG MAG/6.7NM FM ARP.

METEOROLOGICAL INFORMATION PROVIDED

1. TAF CAT A, METAR/SPECI.
2. AWIS Phone 08 6216 2623 - Report faults to BoM.

PHYSICAL CHARACTERISTICS

18/36 184 100a PCN 43 / F / A / 1750 (254PSI) / T 259M N end WID 45 RWS 150 concrete, 228M S end concrete.

RWY MAX shoulder WID 3.5M.

AERODROME AND APPROACH LIGHTING

RWY 18/36 HIRL(1) PAL+AFRU 118.3 SDBY PWR AVBL
 RWY 18/36 PAPI(1) PAL+AFRU 118.3 3.0 DEG50FT
 RWY 18 HIAL-CAT I

(1) PAL status confirmed on FREQ. PAL cycle 30 MIN with last 10 MIN indicated by IWI flashing continuously.

LGT for Civil OPS AVBL on 60MIN PN through reporting agent.

ATS COMMUNICATIONS FACILITIES

FIA	MELBOURNE CENTRE	125.9 On Ground
APP	LEARMONTH APPROACH	120.5 261.4
SMC	LEARMONTH GROUND	259.3
TWR	LEARMONTH TOWER	118.3 257.8

APP, TWR and Learmonth airspace activated by NOTAM.

RADIO NAVIGATION AND LANDING AIDS

DME	LM	112.4/ 71X	221405.4S	1140538.3E	(4)
NDB	LM	396	221429.5S	1140544.7E	Range 90 (HN 50) (2)
VOR	LM	112.4	221405.4S	1140538.9E	(1)
TAC	LMO		221328.2S	1140532.8E	(3)

(1) 082/0.3 TO ARP. VOR UNREL in Sector B at 2300FT beyond 21NM. (Sector B inbound 016 degrees clockwise to 195 degrees).

(2) 318/0.4 to ARP.

(3) Portable FAC, ACT as REQ by MIL authorities. Channel assignment and ACT by NOTAM.

(4) Antenna ELEV 33FT. DME UNREL in Sector B at 2300FT beyond 23NM. (Sector B inbound 016 degrees clockwise to 195 degrees).

LOCAL TRAFFIC REGULATIONS

1. Civil ACFT not permitted to use TWY A BTN TWYs E, F or G. Civil ACFT ABV 100,000KG MTOW not permitted to use RWY for 180 turns, TWY turning loops must be used - TWYs E, A and B, or TWYs F, A and C or TWYs H or K.
2. Civil Apron parking restrictions:
 - a. RPT apron not AVBL to ACFT ABV code 4C.
 - b. Bays 1, 2 and 3 not AVBL for overnight PRKG without approval.
 - c. Non RPT ACFT code B and under, park on GA APN, 24HR PN with PPR.



3. General Aviation Requirements.
 - a. Charter GA OPS PPR 24HR PN. ARO or Ground Handling Agent to be present.
 - b. No General Aviation OPS outside the HR of 0800-1600 Local, except Royal Flying Doctor Service (RFDS) FLT or by prior arrangement.
 - c. General Aviation OPR must be in possession of a current Airside Identification (ASIC) Card as this is a security controlled AD.
 - d. MIL personnel will not act on behalf of Shire for General Aviation or Charter.
 - e. MIL TWY are restricted.
 - f. MIL hardstands and parking areas are restricted.

FLIGHT PROCEDURES

Due to sensitive instrumentation associated with a solar observatory position 221309S 1140611E (BRG 042DEG MAG/1.2NM FM Learmonth ARP), ACFT are to avoid low level overflight of that site. Normal circuit height OPS permitted.

CTAF - AFRU 118.3

Except when Learmonth CTR and restricted areas are active.

NOISE ABATEMENT PROCEDURES

Due to MIL domestic areas position 221431S 1140459E (BRG 210DEG MAG/0.32NM FM Learmonth ARP) ACFT are not to overfly that area.

ADDITIONAL INFORMATION

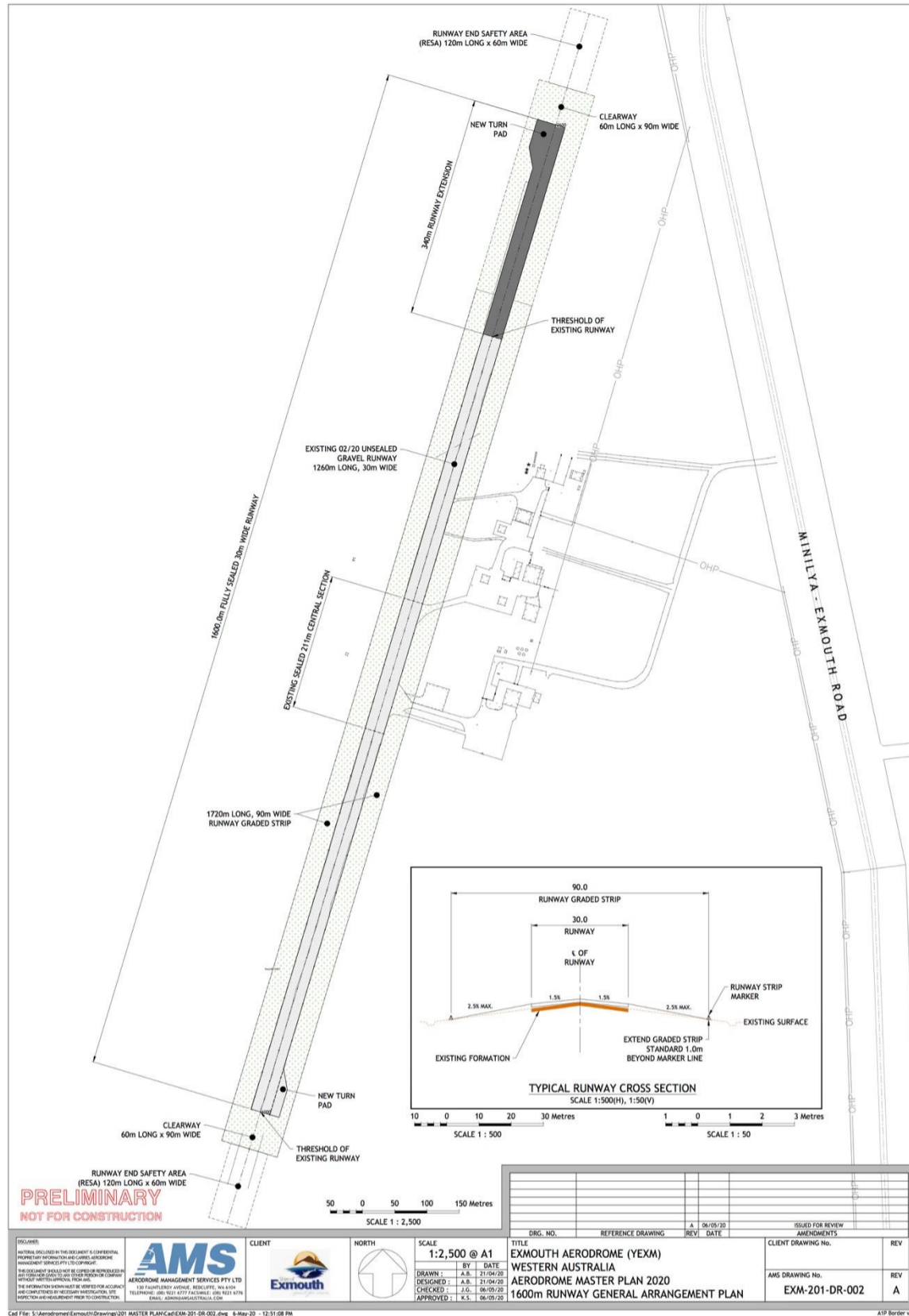
1. Animal and increased bird hazard exists. Australian bustards with RWS. Migratory birds around AD.
2. Weather balloon launch APRX 1115, 2315 UTC FM 1KM E ARP. Launches may occur at other times.
3. Erosion with RWY strip E side of RWY 18/36 N of TWY W.
4. Caution: Restraining link situated N side of TWY KILO 10FT square X 3FT deep with 230MM steel ring.

CHARTS RELATED TO THE AERODROME

1. WAC 3229.
2. MIL Aerodrome Obstruction Chart Type A: JAN 2018.
3. Also refer to AIP Departure and Approach Procedures.

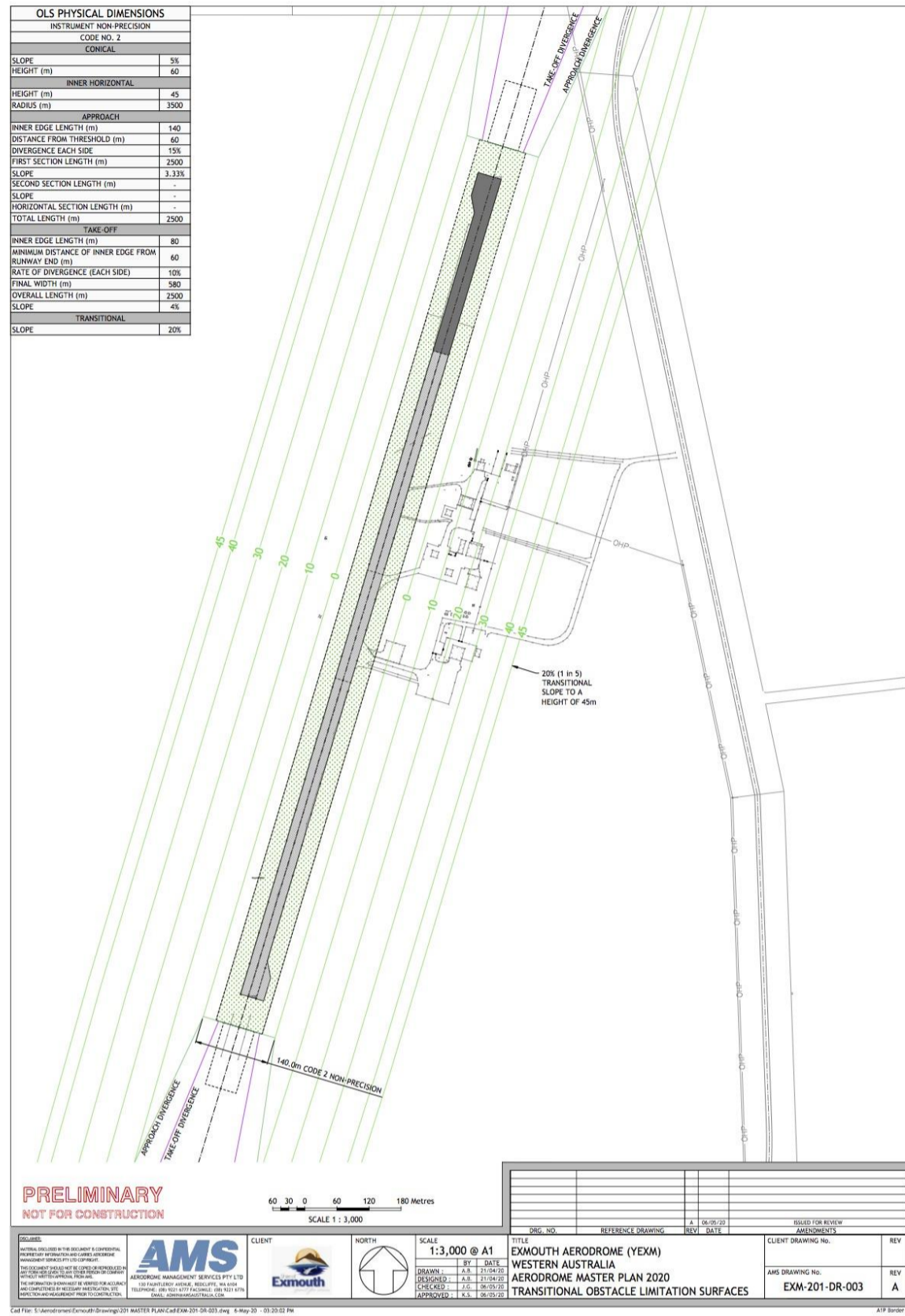
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Appendix 5: 1600m Runway General Arrangement Plan



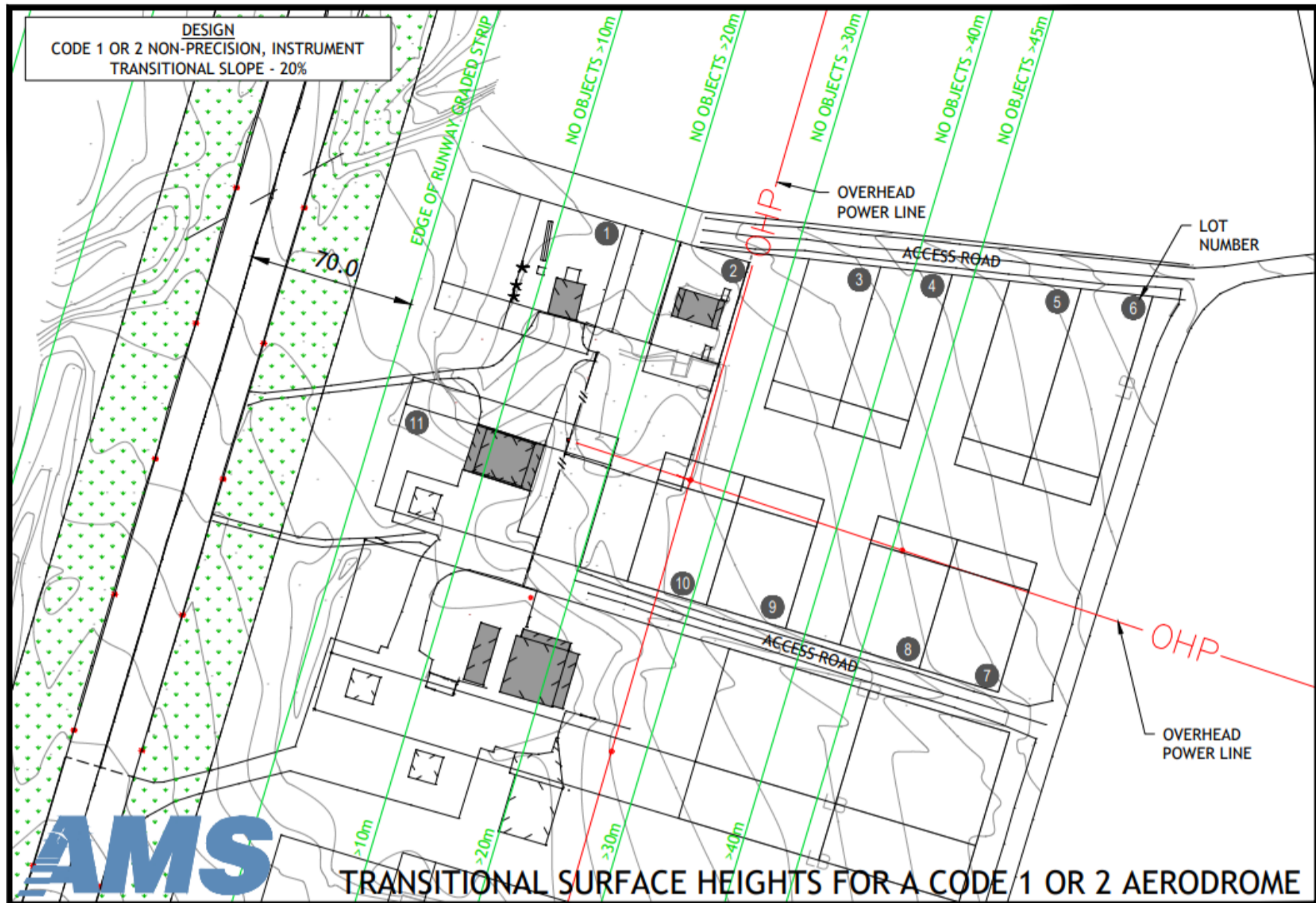
EXM-201-DR-002

Appendix 6: Transitional OLS with Runway Extension to 1600 m



EXM-201-DR-003

Appendix 7: Transitional Surface Heights for Code 1 or 2 Non-precision Instrument Aerodrome



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Appendix 8: Exmouth Aerodrome – SWOT Analysis

Strengths

- Aerodrome is under local control so have certainty (as opposed to the lease of Learmonth Airport being controlled by the Department of Defence).
- Proximity to the town.
- The Shire’s aviation management structure is already in place.
- Not a security-controlled airport, providing simpler access for users.
- Smaller, more relaxed environment for tourists.
- Relatively low fees for users compared to Learmonth Airport.
- Small local aviation cohort with anecdotal evidence of a collaborative approach and effective radio communication leading to safe separation of different types of aircraft, particularly in the circuit area where they are operating at different speeds.

Weaknesses

- Historical planning issues have contributed to some current non-compliance issues (taxilane design on the northern apron and temporary electrical cables).
- Aerodrome perimeter not fully secured from ground animals with potential for runway incursions.
- Unsealed runway and access road cause the aerodrome to be closed after heavy rain.
- Lack of planned maintenance schedule leading to degradation of runway surface and damage to aircraft.
- Aerodrome Safety and Technical inspections not being conducted. They are not a regulatory requirement, but their conduct would assist with risk identification and mitigation.
- Fixed firefighting facilities are not user friendly and impede rapid response.
- Runway dimensions and surface are prohibitive to larger aircraft.
- Lack of a public fuel facility discourages utilisation by itinerant aircraft, particularly smaller piston engine aircraft requiring Avgas with the closest facility being 170 nm away.
- Lack of instrument approach procedure means the aerodrome is unsuitable in certain conditions for some operators, including the RFDS.
- Utilities – underground water supply not currently available to all users.
- Utilities – overhead power lines may infringe future OLS or restrict the location of infrastructure development.
- Proximity to Learmonth Airport and its considerable facilities may impede the commitment of some stakeholders to invest at a secondary airport.
- Local topography/drainage provisions cause northern apron and runway to flood or retain standing water after rainfall events.

Opportunities

- Aftermath of the COVID-19 pandemic may see an increase in domestic travel, including interstate visitors who may utilise the aerodrome.
- Low air traffic density and weather conditions provide an ideal environment for flying training and the development of a flying school.
- Significant numbers of tourists already visit the area and may support additional aviation activities.
- Fuel provider identified who would supply a temporary facility to establish a sustainable market prior to the Shire investing in permanent infrastructure.
- Location on the coast, the significant natural attractions in the area and relative proximity to other airports in desirable tourist locations support the aerodrome as an “air tour” destination.
- Proposed development of a deep-water port to support cruise ship docking.
- Approval granted in September 2019 for the revised Local Development Plan for the Vlamingh Head precinct⁵¹, providing a framework for the proposed eco-resort redevelopment of the Ningaloo Lighthouse Caravan Park by the Minderoo Group.
- Approval granted in April 2020 to Woodside for the \$11 billion development of the Scarborough gas field (located off the Exmouth coast) and Pluto LNG expansion.

Threats

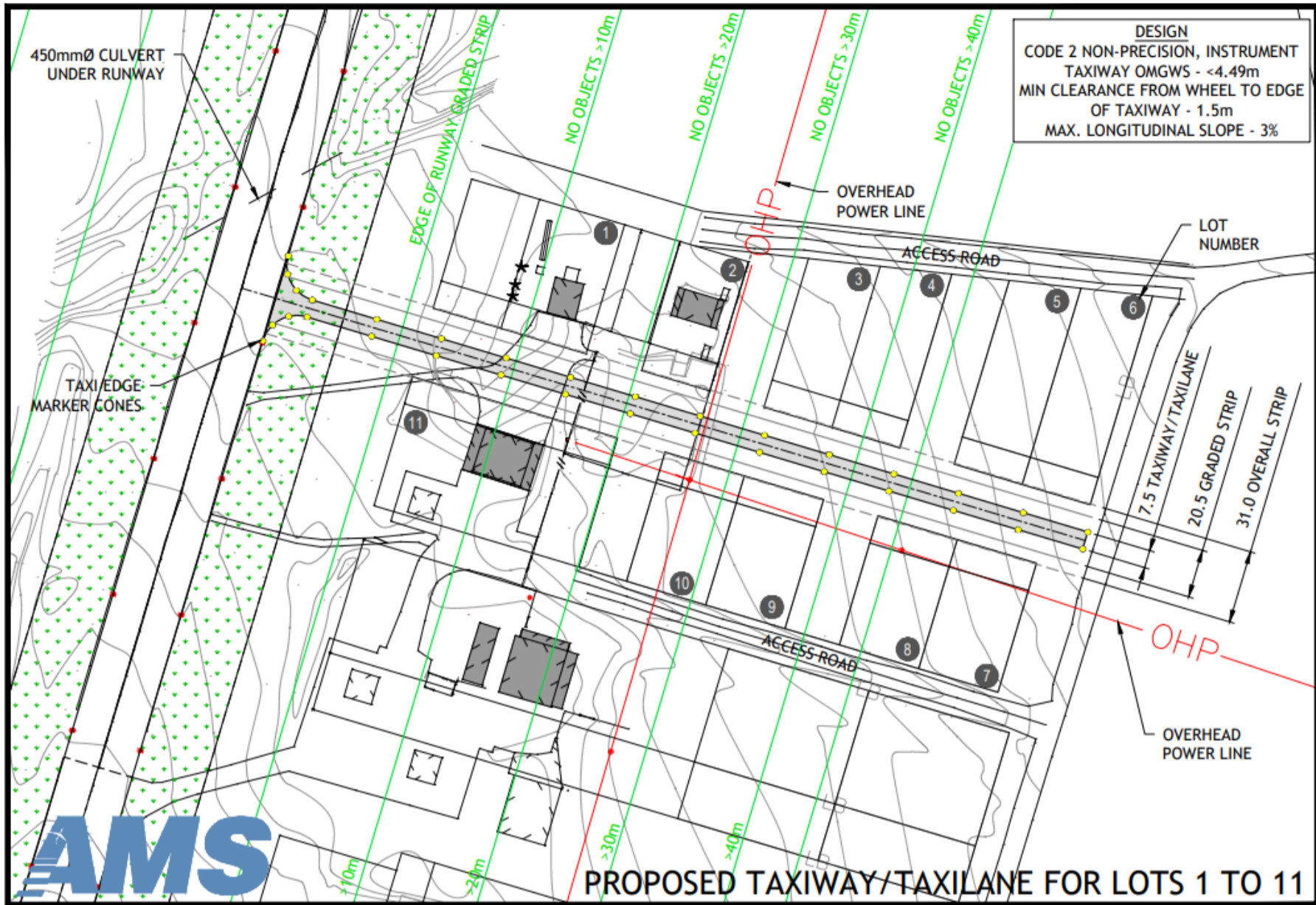
- Reliance on access to Learmonth Airport which could be revoked if there was a change in military requirements or Australian Defence Policy, with the current Exmouth Aerodrome facility inadequate to cope with larger aircraft and significant passenger numbers.
- Airspace proximity to restricted areas, requiring flight path modification when areas are active for military operations.
- When restricted areas are active, civil aircraft (including helicopters) departing to the north from Learmonth are required to maintain low altitude in order to remain outside the restricted airspace, which can place them at the same altitude as GA aircraft and ultralights operating in the Cape area.
- Nearby land subdivisions may be affected by aircraft noise if the aerodrome is further developed.
- Impact on the environment resulting from developing the site and facilitating broader development and population in the Exmouth area.
- Topography challenges of the location – potential for flooding; suitability for runway development.
- Potential for the Cape Wilderness Estate to be impacted if flooding risk is managed by water diversion.
- If the aerodrome is developed to accommodate larger aircraft, existing infrastructure may impinge on the OLS. Initial survey indicates the location of current infrastructure would not impede the OLS requirements for a Code 2C non-precision instrument aerodrome, however a full survey should be conducted prior to proceeding with this option.
- Upgrading the aerodrome to large jet capability would require considerable cost (and most likely be prohibitive) when the risk that access to Learmonth would be withdrawn is considered to be very low. The most likely reason for access to be prohibited at short notice would be an imminent military threat, in which case Exmouth Aerodrome would likely also be unsuitable for civil operations due to its proximity to Learmonth Airport and the coastline. Other reasons for withdrawing access to Learmonth are likely to allow for a longer lead-in time, providing the Shire with the opportunity to explore options for developing Exmouth Aerodrome only when actually required, rather than on a speculative basis. In that event, consideration should be given to whether or not the current Exmouth Aerodrome site is suitable for a major airport.
- Similarly, upgrading the aerodrome to a Code 2C non-precision approach instrument aerodrome to accommodate larger turboprop aircraft and support RFDS operations has significant financial implications for the Shire and, consequentially, the current aerodrome users. Pre-emptive expansion of the aerodrome based on possible future demand therefore carries significant risk. A considered, staged approach based on clearly identified demand is recommended.
- Impact of the COVID-19 pandemic – already significant loss of revenue for both the Shire and local aviation operators with the possibility some businesses may fail. The Shire’s Special Council Meeting on the 23rd April 2020 highlighted an expected revenue shortfall of \$1.5 million in fees and charges in the current budget to June 2020. Once restrictions are lifted the pandemic may have a significant impact on the cruise industry, affecting the proposed development of the Exmouth Port and its contribution to local tourism.
- Location in cyclone region – potential for damage to aerodrome infrastructure.
- Floodplain located to southeast with natural water course from Shothole Canyon.

⁵¹ Element, Local Development Plan, Ningaloo Lighthouse Holiday Park

- Current building restrictions with gradients outlined in SU 3 may not be adequate to protect the OLS for runway redevelopment under the new MOS 139.
- Seasonal nature of tourism means lack of consistent revenue for aviation operators, threatening business viability.
- High cost of construction due to the regional location and the requirement for cyclone rated structures.
- Exmouth enjoys a regular and affordable jet aircraft service, due largely to high utilisation by personnel working in oil and gas. If this industry declined, the availability of RPT flights for tourists may reduce leading to a reduction in visitor numbers and therefore revenue for the Shire to fund future developments. Current indications report at least another 10 years of supply from current activity in the Exmouth Basin and the Scarborough project is expected to commence in 2021.
- High cost of town accommodation may be prohibitive for flying school students.
- The impact of significant events (such as another pandemic) on longer term tourism and economic sustainability.
- Competition for financial and strategic resources for other local projects, including the proposed development of the Exmouth Port.
- Change in policy or strategic direction. Council elections are held every two years with the next election due in October 2020. The Strategic Community Plan 2030 is reviewed after each Council election and a full review, including a comprehensive community consultation process, is to be conducted in November 2022. The Corporate Business Plan is reviewed annually as part of the budget process.

FINAL DRAFT

Appendix 9: Proposed Taxiway/Taxilane – Northern Apron



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CIVIL AVIATION AUTHORITY

**CIVIL AVIATION
ADVISORY PUBLICATION**

Date: July 1992 No: 92-1(1)

SUBJECT: GUIDELINES FOR AEROPLANE LANDING AREAS

IMPORTANT

The information in this publication is advisory only. There is no legal requirement to observe the details set out in this publication. The Civil Aviation Regulations set out the legal requirements that must be complied with in relation to the subject matter of this publication. There may be a number of ways of ensuring that the requirements of the Civil Aviation Regulations are met. This publication sets out methods that may be used and which experience has shown should, in the majority of cases, ensure compliance with the Regulations. However, before using the information in this publication the user should always read the Civil Aviation Regulations listed in the reference section below to ensure that he or she complies with the legal obligations of the Regulations.

PURPOSE

Civil Aviation Regulation 92 (1) states that: "An aircraft shall not land at, or take-off from, any place unless: ... (d) the place...is suitable for use as an aerodrome for the purposes of the landing and taking-off of aircraft; and, having regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions), the aircraft can land at, or take-off from, the place in safety."

Regulation 92 (1) does not specify the method of determining which "circumstances", other than the prevailing weather conditions, should be considered in any particular case. These matters are the responsibility of the pilot

in command and, in some circumstances, are shared with the aircraft operator.

These guidelines set out factors that may be used to determine the suitability of a place for the landing and taking-off of aeroplanes. Experience has shown that, in most cases, application of these guidelines will enable a take-off or landing to be completed safely, provided that the pilot in command:

- (a) has sound piloting skills; and
- (b) displays sound airmanship.

CANCELLATION

This is the second issue of CAAP 92-1, and supersedes CAAP 92-1(0).

REFERENCES

This publication should be read in conjunction with: Civil Aviation Regulations 92 (1), 93, 233 and 235; Civil Aviation Orders; and the Aeronautical Information Publication.

HOW TO OBTAIN COPIES OF THIS PUBLICATION

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 (08) 334191
 (03) 342 2000

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CAAP 92-1(1)

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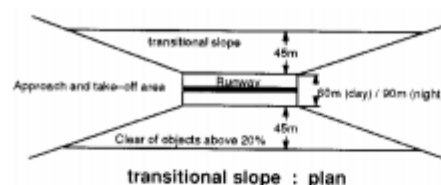


Figure 1 - Transitional Slope

1 - DEFINITIONS

1. In these guidelines, unless the contrary is stated:

“clearway” means an area in which there are no obstacles penetrating a slope of 2.5% rising from the end of the runway over a width of 45m;

“float plane” means any aeroplane designed for landing or taking-off from water;

“fly-over area” means a portion of ground adjacent to the runway strip which is free of tree stumps, large rocks or stones, fencing, wire and any other obstacles above ground but may include ditches or drains below ground level;

“landing area” (LA) means an area of ground suitable for the conduct of take-off and landing and associated aeroplane operations under specific conditions;

“lateral transitional slope” means a desirable area around all LA's which provides greater lateral clearance in the take-off and landing area and may reduce wind-shear when the runway is situated near tall objects such as trees and buildings. The dimensions of a suitable lateral transitional slope are shown in the following diagram;

“obstacle free area” means there should be no wires or any other form of obstacles above the approach and take-off areas, runways, runway strips, fly-over areas or water channels;

“runway” means that portion of the landing area which is intended to be used for the landing or take-off of aeroplanes;

“runway strip” means a portion of ground between the runway and fly-over area which is in a condition that ensures minimal damage to an aeroplane which may run off a runway during take-off or landing;

“water alighting area” means a suitable stretch of water for the landing or taking-off of a float plane under specific conditions.

2 - CONVERSION TABLE

2. Landing area gradients and splays expressed as a percentage, in accordance with ICAO practice, may be converted into ratios or angles using the following table:

Percentage	Ratios	Degrees & Minutes
1	1:100	0 34'
2	1:50	1 09'
2.5	1:40	1 26'
2.86	1:35	1 38'
3	1:33.3	1 43'
3.33	1:30	1 55'
5	1:20	2 52'
12.5	1:8	7 08'
20	1:5	11 18'

3 - WHICH AIRCRAFT MAY USE A LANDING AREA?

3. Use of landing areas other than aerodromes is not recommended for aircraft with a MTOW greater than 5700 kg.

4 - WHICH TYPES OF OPERATIONS MAY BE CONDUCTED FROM A LANDING AREA?

4. Aeroplanes engaged in the following operations may use a landing area:

- (a) private;
- (b) aerial work—excluding student solo flying and student dual flying prior to successful completion of the General Flying Progress Test; and
- (c) charter.

5 - RECOMMENDED MINIMUM PHYSICAL CHARACTERISTICS OF LANDING AREAS AND WATER ALIGHTING AREAS

5.1 Runway Width. For other than agricultural operations, a minimum width of 15 metres is recommended although aeroplanes with a MTOW below 2000kg can be operated safely on runways as narrow as 10 metres provided there is no or only light cross-wind. For agricultural operations, a 10 metre wide runway is the recommended minimum.

5.2 Runway Length. For other than agricultural operations by day, a runway length equal to or greater than that specified in the aeroplane's flight manual or approved performance charts or certificate of airworthiness, for the prevailing conditions is required (increasing the length by an additional 15% is recommended when unfactored data is used). For agricultural day operations, the minimum runway length is the greater of 75% of the take-off distance specified in the aeroplane's flight manual or approved performance chart for the prevailing conditions with the balance as clearway or the landing distance so specified.

5.3 Longitudinal Slope. The longitudinal slope between the runway

ends should not exceed 2%, except that 2.86% is acceptable on part of the runway so long as the change of slope is gradual. For agricultural operations, the slope should not exceed 12.5% for day and 2% for night operations: where the overall slope exceeds 2% the runway should only be used for one-way operations — downhill for take-off and uphill for landing.

5.4 Transverse Slope. The transverse slope between the extreme edges of the runway strip should not exceed 2.5% or 12.5% upward slope over the fly-over area. For agricultural day operations, the transverse slope should not be more than 3% over the runway and 5% over the runway strip.

5.5 Other Physical Characteristics. Both ends of a runway, not intended solely for agricultural operations, should have approach and take-off areas clear of objects above a 5% slope for day and a 3.3% slope for night operations. Other recommended landing area physical characteristics are shown on the following diagrams:

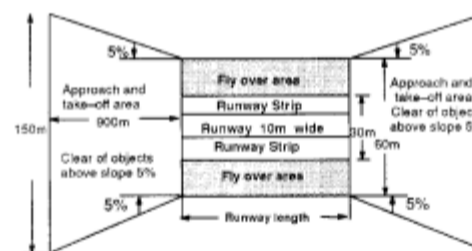


Figure 2A - Single engine and Centre-Line Thrust Aeroplanes not exceeding 2000 kg MTOW (day operations)

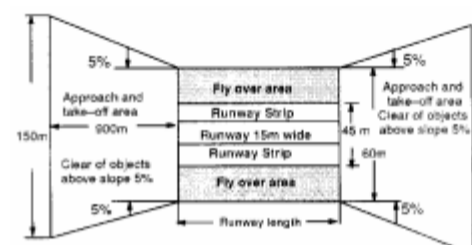


Figure 2B - Other Aeroplanes (day operations)

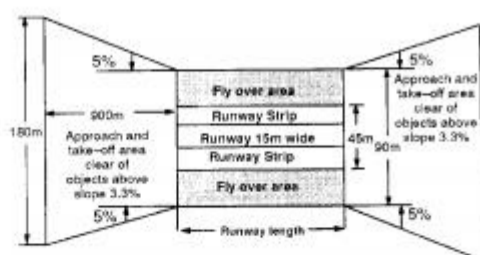


Figure 3 - Dimensions (night operations)

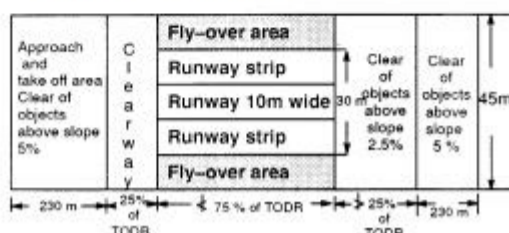


Figure 4 - Dimensions - agricultural day operations

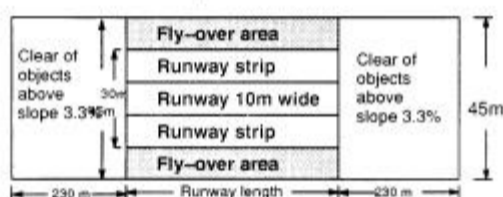
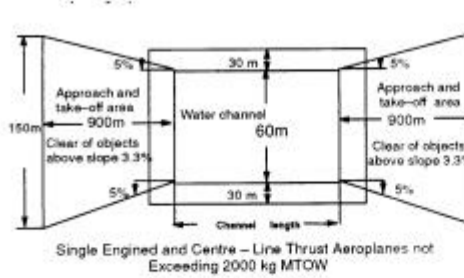
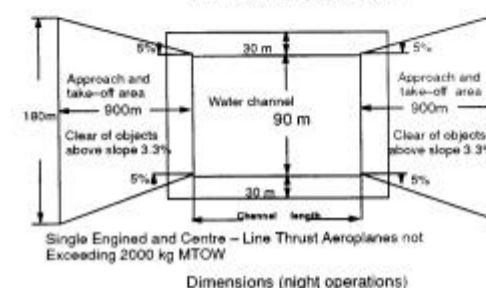


Figure 5 - Dimensions - agriculture night operations

5.6 Float plane lighting areas. For water operations, a minimum width water channel of 60 metres for day operations and 90 metres for night operations is recommended. The depth of water over the whole water channel should not be less than 0.3 metres below the hull or floats when the aeroplane is stationary and loaded to maximum take-off weight. An additional area, as shown in the following diagrams, provides a protective buffer for the water channel but need not consist of water. Where the additional area consists of water then it should be clear of moving objects or vessels under way. The centre line of a water channel may be curved, provided that the approach and take-off areas are calculated from the anticipated point of touchdown or lift-off.



Single Engine and Centre-Line Thrust Aeroplanes not Exceeding 2000 kg MTOW
Dimensions (day operations)



Single Engine and Centre-Line Thrust Aeroplanes not Exceeding 2000 kg MTOW
Dimensions (night operations)

Figure 6 - Float planes

6 - MARKING OF LANDING AREAS

6.1 Where extended operations are expected to be conducted at a landing area, the owner/operator is encouraged to provide markings similar to those found at government and licensed aerodromes. If markings are provided, they should follow the colours and specifications set out in AIP AGA. A suitable layout is shown at Figure 7.

6.2 Where runway markers are provided which are not flush with the surface, they should be constructed of a material that is not likely to damage an aircraft.

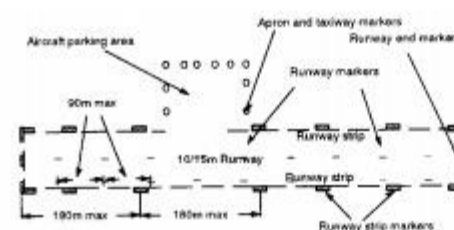


Figure 7 - Typical ALA layout and marking

7 - LIGHTING FOR NIGHT OPERATIONS

7.1 The recommended minimum lighting and layout is as follows:

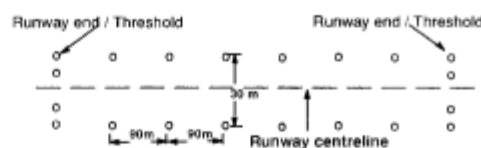


Figure 8 - Lighting for Night Operations

7.2 The lights should, under the weather conditions prevailing at the time of the flight, be visible from a distance of no less than 3000 metres.

7.3 Substitution of runway lights with reflectorised markers is permitted but not recommended by the Authority.

7.4 The different types of reflectorised markers vary in efficiency. Their luminosity can be affected by a number of factors, including equipment cleanliness/layout, the position/strength of the aircraft landing light(s) and meteorological conditions — especially cross winds on final.

7.5 The following lights should not be substituted by reflectorised markers:

- (a) runway end/threshold corner lights;
- (b) lights 90m from each runway end/threshold; and
- (c) lights nearest to the illuminated runway mid-length point.

8 - OTHER FACTORS THAT SHOULD BE CONSIDERED PRIOR TO USING A LANDING AREA

8.1 A pilot should not use a landing area or have an aeroplane engine running unless the aeroplane is clear of all persons, animals, vehicles or other obstructions.

8.2 A pilot should not use a landing area without taking all reasonable steps to ensure the physical characteristics and dimensions are satisfactory. For aerial work and charter operations the operator should provide evidence to the pilot on the suitability of a landing area prior to its use.

8.3 Runway lengths calculated for take-offs and landings should be increased by 50% for agricultural operations on one-way runways at night.

8.4 **Geographic Location.** A landing area should not be located:

- (a) within the area or in such close proximity as to create a hazard to aircraft conducting a published instrument approach, excluding the holding pattern; or
- (b) within any area where the density of aircraft movements makes it undesirable; or
- (c) where take-off or landing involving flight over a populated area creates an unnecessary hazard.

8.5 Except in an emergency, the consent of the owner/occupier is required before a landing area may be used.

8.6 If the proposed landing area is located near a city, town or populous area or any other area where noise or other environmental considerations make aeroplane operations undesirable, the use of such a landing area may be affected by the provisions of the *Commonwealth Environment Protection (Impact of Proposals) Act 1974* and parallel State legislation as well as other legislation. It is the responsibility of the pilot and/or operator to conform with these requirements.

8.7 A method of determining the surface wind at a landing area is desirable. A wind sock is the preferred method.

8.8 The surface of a landing area should be assessed to determine its effect on aeroplane control and performance. For example, soft surfaces or the presence of long grass (over 150mm) will increase take-off distances while moisture, loose gravel or any material that reduces braking effectiveness will increase landing distance.

9 - SURFACE TESTING OF A LANDING AREA

9.1 **Rough Surfaces.** The presence of holes, cracks and ruts will degrade aeroplane performance and handling and increase the possibility of structural damage. The smoothness of a runway

can be tested by driving a stiffly sprung vehicle along the runway at a speed of at least 75 kph. If this is accomplished without discomfort to the occupants, the surface can be considered satisfactory.

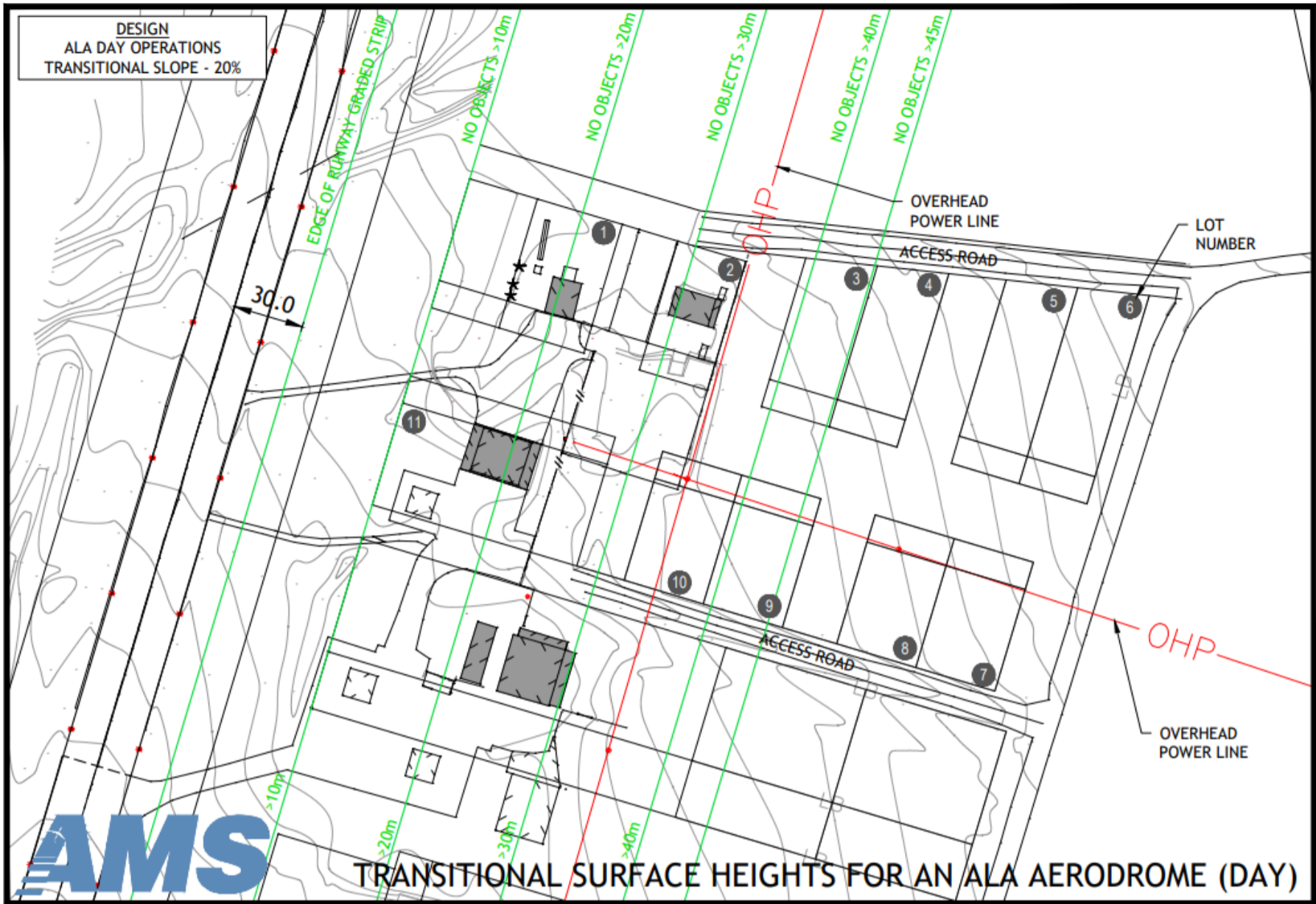
9.2 Soft, Wet Surfaces. A test vehicle as indicated in the table below should be driven in a zig-zag pattern at a speed not exceeding 15 kph along the full length and width of the runway. Particular attention should be paid to suspect areas with possibly three passes over these areas. If tyre imprints exceed a depth of 25mm the surface is not suitable for aircraft operations represented by the test vehicle. Experience may prove that for a certain type of aircraft (eg, an aircraft with small

wheels or high tyre pressure) operations are unsafe with a lesser imprint. Testing with a crowbar should also be done in several places along the runway to ensure that a dry surface crust does not conceal a wet base.

USER AIRCRAFT WEIGHT	SUGGESTED VEHICLE TO BE USED FOR TEST
1. MTOW not exceeding 2000kg	Fully laden utility, Landrover, station sedan.
2. MTOW 2001 kg to 3400kg	Fully laden 1.5 tonne truck or lightly laden 3 tonne truck.
3. MTOW 3401 kg to 5700kg	Fully laden 3 tonne truck

Attention should also be given to the remainder of the strip as this area is provided for run-off in the event of an abnormal take-off or landing.

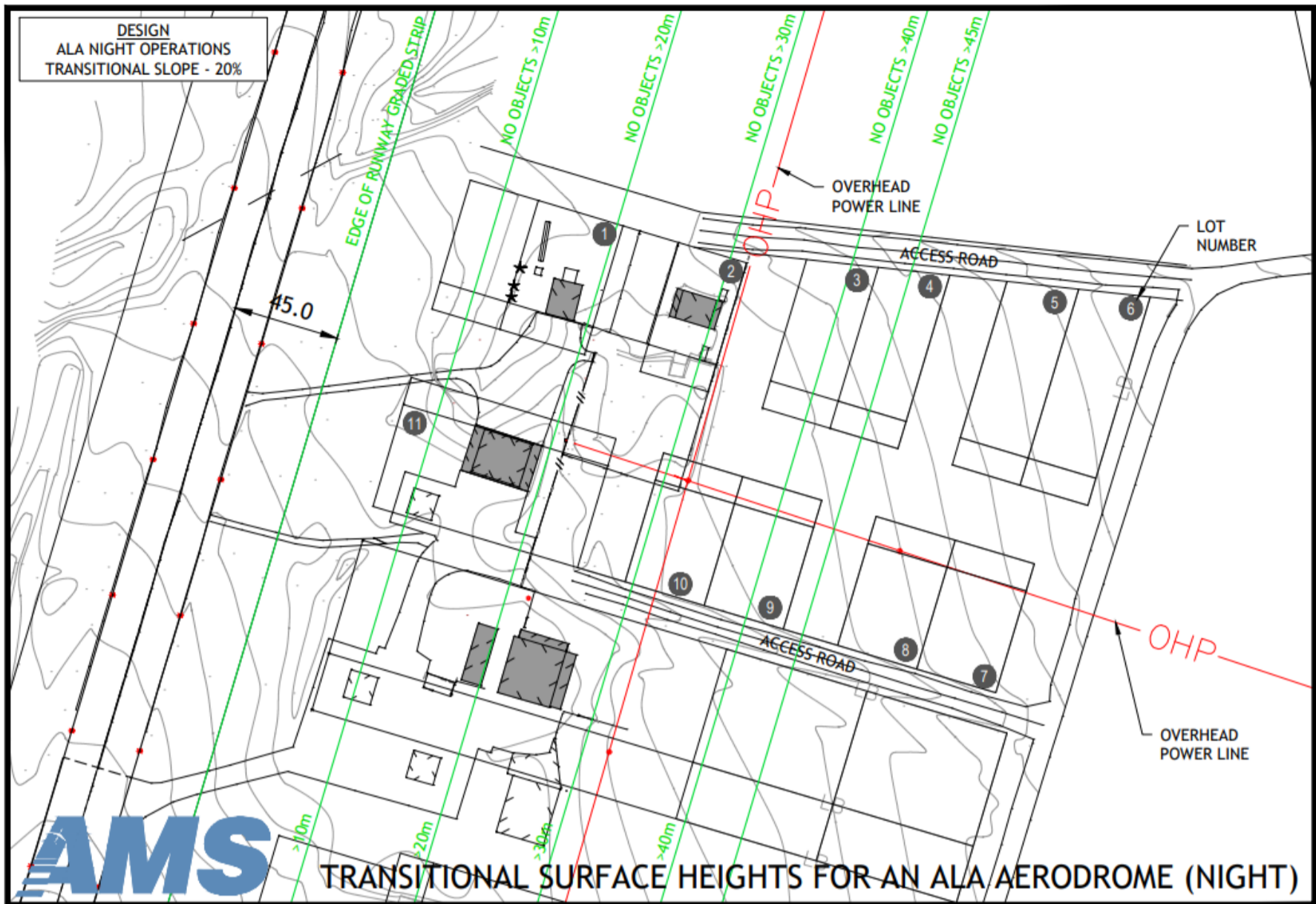
Appendix 11: Transitional Surface Heights for Exmouth ALA (Day)



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Appendix 12: Transitional Surface Heights for Exmouth ALA (Night)



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