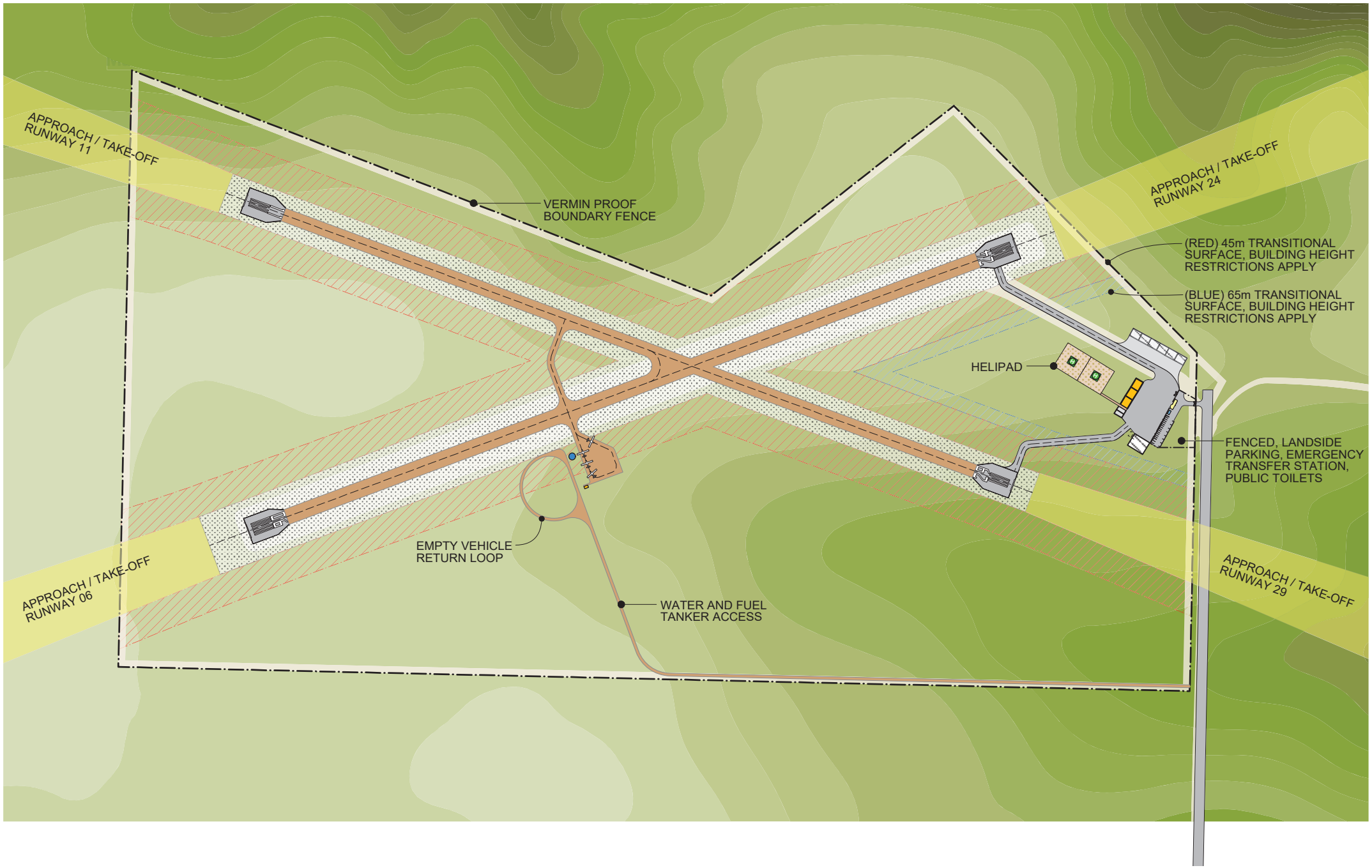
Bremer Bay Airfield Master Plan 2015

Prepared for the Shire of Jerramungup


Madeline
4/3/2015

Index



SHIRE OF JERRAMUNGUP. BREMER BAY.

AIRFIELD MASTERPLAN PROPOSAL

24 AUGUST 2015

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0 200 300 400 500 M

Slavin architects www.slavinarch.com.au

Recommendations

1. *The Bremer Bay Airfield Master Plan reflects the unique circumstances of the Bremer Bay region and future development centres on the community's sustainability, safety and security.*

2. *The Shire of Jerramungup as the managing entity of the airfield, promptly seek to place the Airfield in the ERSA (En Route Supplement Australia) publication and provide an update for the Country Airfields Guide. (www.flightace.com)*

3. *Training in Airfield Management, which is offered by private providers is undertaken by a Shire of Jerramungup staff member to ensure that the Shire's airfields are operated safely.*

4. *It is not recommended that Registration or Certification of the Bremer Bay Airfield is pursued until such stage that there is a regular and substantial increase in aviation traffic. However planned upgrades should meet the Civil Aviation Safety Authority's (CASA) Manual of Standards (which align with the Royal Flying Doctor Service standards).*

5. *New titles for the Farmlets and Rural Residential zone should reflect that they may be subject to aircraft noise.*

6. *As the safety, preservation of natural resources and wellbeing of the community is of primary importance to all, upgrades to the Bremer Bay Airfield will ensure that the needs of emergency services are addressed in works to the airfield.*

7. *The Shire of Jerramungup will update its website to contain all relevant information regarding a contact person. It should also contain correct airfield information, including the Common Traffic Advisory Frequency (CTAF). This information should also include a current plan of the airfield similar in format, but correct in scale, to that used in the Country Airstrip Guide.*

8. *The Shire provides regular updates to the Country Airfields Guide to ensure that pilots have up to date information.*

9. *The Airfield is listed with ERSA as an unregistered aerodrome. Application is made to Civil Aviation Safety Authority (CASA)/ Air Services Australia to designate a code of YBBY to the airfield.*

10. *Windsock visibility is improved by ensuring compliance with Subregulation 89(S) of the Civil Aviation Regulations (1998).*

11. *There is a need for a cross runway to the 06/24 runway to provide the most advantageous landing options at Bremer Bay Airfield. This runway is initially conduited in preparation for retrofitting lighting.*

12. *Future runway planning is to include larger paved turn-around/preflight areas at runway ends.*

13. *A noticeboard at the airfield provides information for assistance, pick-ups to and from town. Toilets and drinking water also need to be provided.*

14. *Suitable aircraft tie-downs at a hardstand area are provided.*

15. *An arrangement be made for a local fuel supplier, or mechanic, to supply Avgas or Mogas. This could either be stored at the airfield or delivered by trailer.*

16. *The ongoing problem with animals on the runway needs to be addressed.*

17. *The Shire identify an annual weekend for a fly-in with an identifying theme. The fly-in should be advertised on the Shire website and through other aviation calendar sources, such as www.aeroclub.com.au*

18. *The Shire of Jerramungup notes that an extension of runway will require land acquisition to ensure that a runway length of 1800 metres can be achieved.*

19. *The airfield fence is adjusted to ensure that airside security standards are met. A realigned fence which roughly follows contours will offer better vermin protection.*

20. *The provision of lettable hangars to provide storage for aircraft for visitors and locals. In an emergency, the hangars may be co-opted for Emergency Services as requested by the Department of Parks and Wildlife.*

21. *The Shire of Jerramungup identifies key personnel to monitor and drive the emerging grant and tourism opportunities for the area, including liaison with other local governments to further development of the Southern Aerial Circuit and other opportunities.*

1.0 The Bremer Bay Context

1.1 Introduction

The Shire of Jerramungup commissioned a Master Plan for the Bremer Bay Airfield in June 2015 with funding from the WA Department of Transport's Regional Airport Development Scheme (RADS) Grant.

Bremer Bay is located on the south coast, approximately 180km east of Albany.

Bremer Bay is a beautiful coastal town that offers numerous recreational pursuits for residents and visitors. The town has a primary school, general store, resource centre, health centre and a sports club/golf course, DFES facilities with several businesses also operating along Gnornbup Terrace.

Visitors are accommodated in the two caravan parks, the Bremer Bay Resort, Bed and Breakfast accommodation and in holiday homes scattered throughout the townsite and Point Henry. To the east of Bremer Bay is the Fitzgerald River National Park which contains 20% (1,800 species) of the state's described plant species and is one of the most diverse botanical regions in the world.

Although Bremer Bay is a relatively small town comprising approximately 250 permanent residents, the town experiences a significant influx of tourist during the holiday periods. Figures provided by the local police indicate as many as 9000-10,000 people visit and occupy Bremer Bay at any one day during the Christmas - New Year period.

Being a coastal settlement Bremer Bay is anticipated to grow steadily into the future. The Southdown magnetite mine being developed by Grange Resources lies approximately 90km west. That may eventually bring accelerated population growth to Bremer Bay in particular both during the construction phase and during full time operations afterward. Estimates for the Southdown Mine include up to 2000 workers during the construction phase and a permanent workforce of 650.

This Master Plan is funded by the Shire of Jerramungup and the Regional Airports Development Scheme (RADS). RADS is a State Government grant program delivered by the Department of Transport aimed at improving airport related infrastructure in regional Western Australia.

Western Australia was the first state to provide funding for airport infrastructure in regional areas. Some other Australian states have since developed similar programs.

2.0 The Bremer Bay Airfield

2.1 Site Analysis - Bremer Bay Airfield

Airfields are crucial in supporting communities in rural and isolated places. Access to the Royal Flying Doctor and other Emergency Services is often the decider for people staying in these areas. Knowing that these services can get to town is a comfort.

In 1998, Aerodrome Management Services was commissioned to examine a new and useful airport. The report stated:

> *"Bremer Bay has undergone considerable expansion in the last few years. It is a premier tourist location, attracting visitors from rural W.A., Perth and elsewhere. Interest has been shown by up to 18 people who would consider leasing hangar space to allow them to fly to Bremer. A new aerodrome would also attract the flying holiday-maker.*
>
> *The existing airstrip is short and very limited in its ability to handle all but the smallest of aircraft. It will not accommodate the aircraft used by the RFDS and normal aircraft used in the executive charter business."*

In 1998, two sites were examined - the current airfield site and another some 20 kilometres out of the townsite. The furthermostsite was discarded as unsuitable, however there is little detail of the reasons.

It was also noted in the 1998 report that the runway design was limited by access to pertinent and complete local weather data.

> *"A common dilemma for airport designers is that in arriving at the highest usability percentage, a cross-wind may exist on nearly all occasions. This is because there may be 15 days of the year when the wind will blow extremely strong from one direction but the usual mid-strength is from another. If the runway was sited into the extremely strong wind, the rest of the time the runway receives a mid-strength cross-wind, causing loss of comfort."*

This is the case for the Bremer Bay Airfield. Forward to 2015, the airfield is now the subject of a master planning process.

Throughout this study it was evident that the current runway alone is not sufficient for the needs of the emergency services and recreational pilots alike.

Currently the airstrip is used for RFDS and has been used for firefighting operations. The airfield is also used intermittently for skydiving.

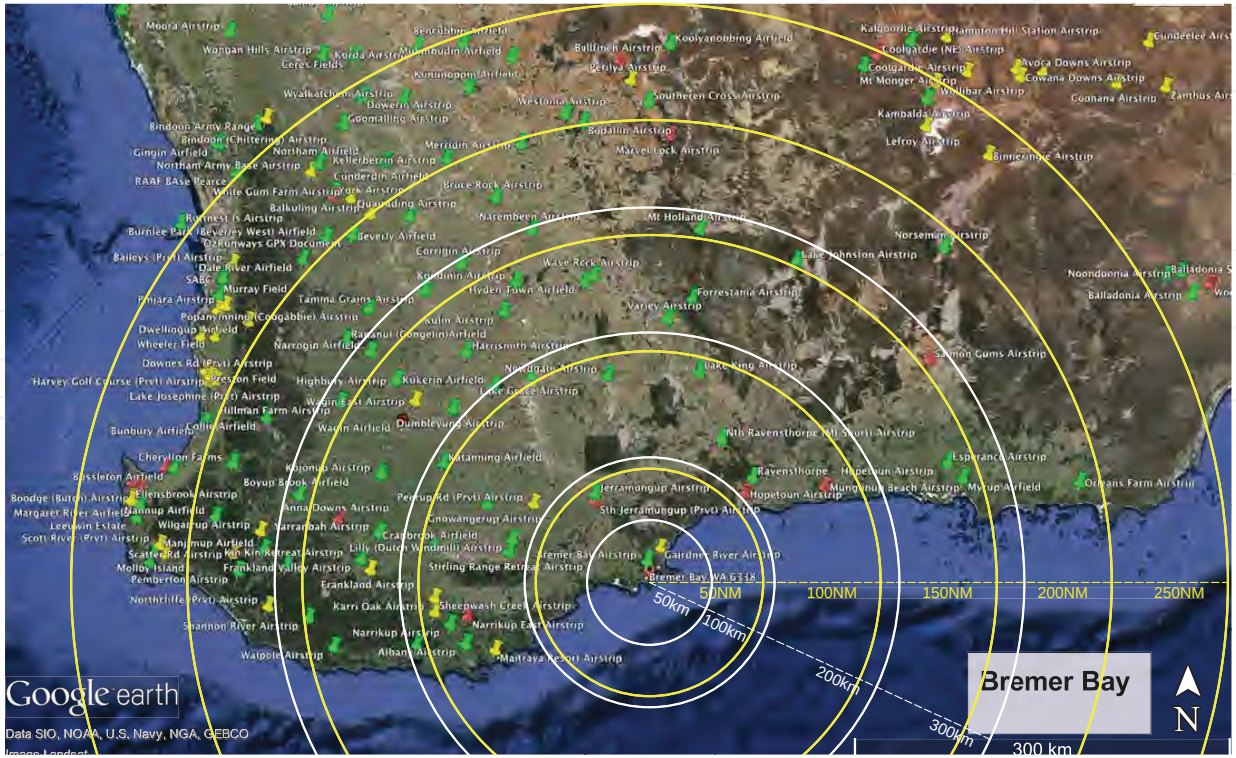
Increased activity is anticipated with the growth of tourism around the Bremer Canyon and the potential of increased tourism within the Fitzgerald River National Park, particularly demand from overseas.

This Study will look at the airfield, the works that may be required to improve its functionality and examine local opportunities that may benefit from a great airfield.

> *"There was another case recently where the flying doctor came into Bremer but was unable to land so had to go back to Perth. The casualty was then rushed to Albany and then flown by the flying doctors from Albany to Perth wasting crucial hours."*

Recommendation

1. *The Bremer Bay Airfield Master Plan reflects the unique circumstances of the Bremer Bay region and future development centres on the community's sustainability, safety and security.*



Distances from Bremer Bay in Nautical Miles

Location

The Bremer Bay Airfield is located to the north west of the Bremer Bay townsite on a 183 hectare site.

The site is Crown Land (Lot 1548 on Deposited Plan 194377) which is under the care, control and management of the Shire of Jerramungup for purposes of an Aerial Landing Ground.

The Airfield is located 6km from the centre of the Bremer Bay townsite and is accessed by the Bremer Bay-Borden Road and Don Ende Drive which is unsealed.

Forming the northernmost boundary of the site, Lizzie Creek is a major tributary of the Bremer River.

There is no requirement to fly over the town site on approach and take-off.

Runway

The 20m wide airstrip is a 1200m unsealed runway with an 06/24 alignment. The partially sealed semi circular taxiway is 10.5 metres minimum width. A 600 m taxiway leads to an apron with infrastructure dotting the edge. (See right)

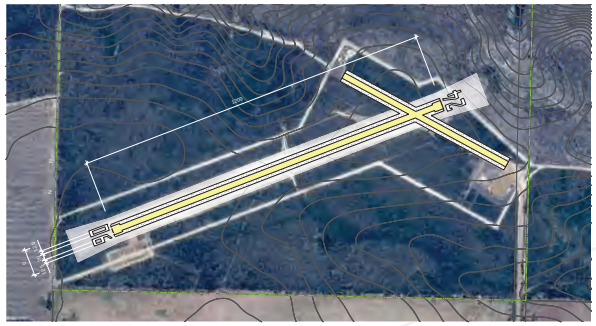
The strip is undulating, a sandy base with an overlay of gravel which has been laid and rolled by the Shire of Jerramungup staff.

The edge of the runway strip is marked with conical markers which are painted white. These are in fair condition.

Apron

Currently the following infrastructure is on the Airfield site.

1. Water Tank
2. Electrical Services
3. Container - Department of Parks and Wildlife Holds fire fighting equipment and supplies
4. Small shed - locked
5. Old container
6. Privately owned hangar



Windsock

Recently replaced, the white windsock is located on the western intersection of the runway and taxiway. The windsock does not appear to be as visible as is prescribed in CASA Regulations 1988, sub regulation 89(s).

It lacks a 15m black base outlined with a white ring or white cones.

Pilot Activated Airfield Lighting Control

The strip is lit by pilot-activated lights using the airfield's Common Traffic Advisory Frequency (CTAF) activation. Lights are placed 90 metres apart which complies with the Civil Aviation Safety Authority (CASA) Regulations.

Fencing

The airfield is fenced to prevent vermin on the runway, however this appears to be ineffective as there is evidence of kangaroos in the airfield area.

The airfield is locked and opening is managed by the Shire of Jerramungup's ranger.

Fuel

There is no fuel available onsite. There is no Avgas available in Bremer Bay, however Mogas (98 Octane Unleaded) is available at local suppliers. This fuel is used for Light Sports Aircraft, which are used by recreational aviators.

Information Board

There is no information at the airfield for pilots and crew arriving at Bremer Bay. There is no information available on the Shire of Jerramungup website or any other Bremer Bay tourism site.

The main reference that is currently available is in the Country Airfields Guide (see right). This is a print-based publication and there is little information on airport databases.

Amenities

There are no toilets or drinking water available.

Nearby Residences

A new home is currently nearing completion along Don Ende Drive and is not yet visible on aerial maps. This has been noted on subsequent planning and drawings.

More than a kilometre away, there are a couple of farm buildings to the west and south west of the Airfield site. None of these are directly in the path of Runway 06/24.

Alternatives to the Current Site

There are no available sites for an Airfield that were identified by the Shire of Jerramungup personnel. Given its proximity to the Bremer Bay townsite, the current site, despite its limitations, is a sound location.

Planned works

The Shire of Jerramungup has outlined works to be conducted include:

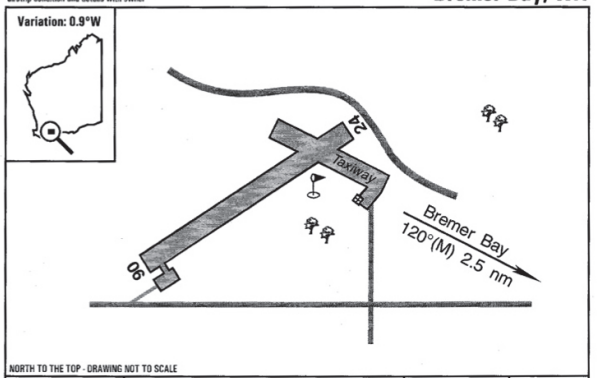
A patient transfer station for St John Ambulance and Royal Flying Doctor Service transfers.

Don Ende Drive is scheduled to be sealed in November-December 2015.

Department of Fire and Emergency Services are seeking a grant for a transportable building and a water tank for use by them.

Warning: It is a requirement to check airstrip condition and details with owner

Bremer Bay, WA



Elevation:	110 Feet AMSL	**Time Zone:**	UTC + 8
GPS Position:	34° 22.739' South 119° 20.214' East	**Area Forecast:**	63
WAC Chart:	Albany (3462)		
Owner/Operator:	Jerramungup Shire (08) 98351022, council@jerramungup.wa.gov.au		
Strip Directions:	06-24		
Strip Lengths:	1200 M		
Strip Surface:	Unsealed - gravel		
Windsock:	Yes		
Strip Markers:	White cones		
Lighting:	Pilot Activated Lighting - Runway 06-24 - VHF 120.05		
Fuel:	Nil		
Special Procedures And Remarks:	The old 12-30 cross strip is now a taxiway only. Caution: undulating airstrip. Vehicle access is restricted. Latest information: Ranger Dean Jolly 0429 351022 (mobile)		

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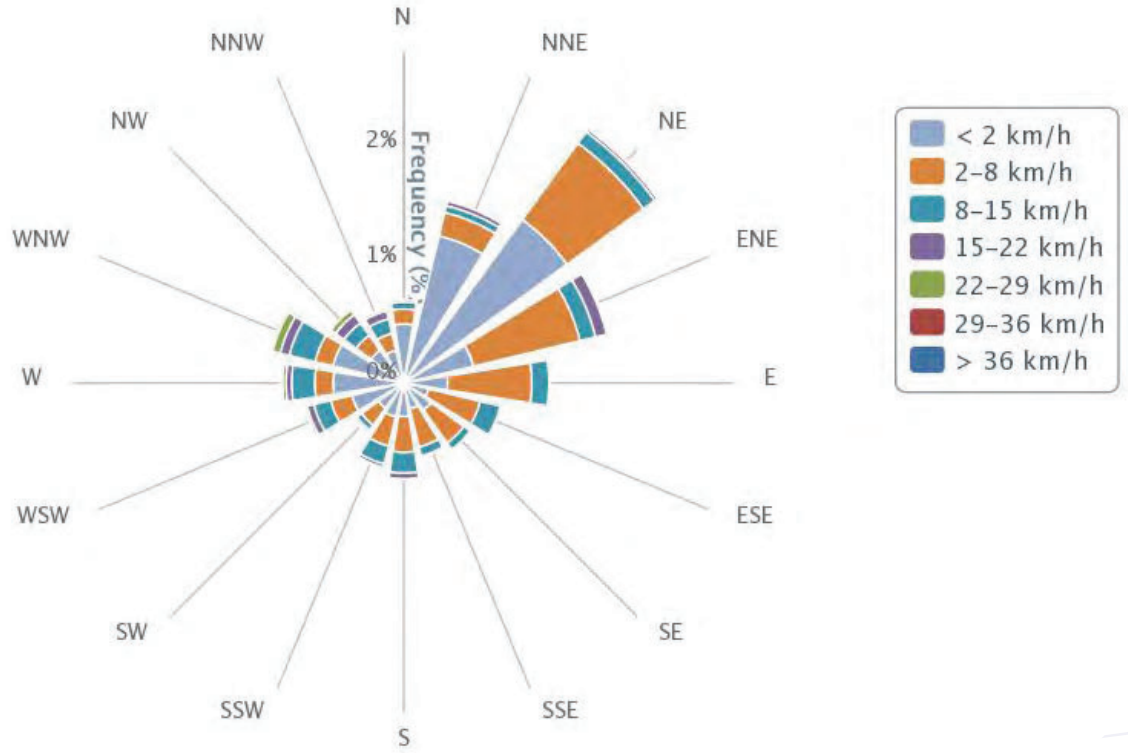
Bremer Bay, WA

Excerpt from the Country Airfields Guide (www.flightace.com)

Evidence of kangaroos on the runway at Bremer Bay Airfield.

Undulations on the runway

2.2 Climate Conditions at Bremer Bay



Climate data courtesy of Department of Agriculture and Food WA (Gairdner River)

Wind Analysis

Local pilots and DPAW suggest that the current runway alignment (06/24) can receive very strong cross-winds at certain times of the year.

The nearest BOM weather stations are situated at Hopetoun or Albany. The WA Department of Agriculture has a station at Gairdner, approximately 45km to the north-west.

Minute wind data was obtained from the Gairdner site, and although it is further inland than Bremer Bay it provides a better indication of the wind at Bremer Bay than those at Hopetoun or Albany.

Analysis of the wind data suggests that the current alignment has a 95.64% useability with a 10 knot crosswind. A runway aligned 11/29 has 96.48% useability with a 10 knot crosswind.

Although useability only increases slightly and the wind analysis shows wind of less than 10 knots for 91.5% of the time, the anecdotal evidence provided by users of the airport, particularly DPaW, has driven the decision to provide a second runway.

(Aerodrome Management Services)

2.3 Airfield Types and Accreditation

Registration and certification of an aerodrome

The Aerodrome registration and certification process is undertaken by Civil Aviation Safety Authority (CASA) and the process is outlined in the CASA Regulation 139 which is readily available on the CASA website. An accompanying Manual of Standards and registration process is also available. Registration requires a fee that is based on the CASA service required to inspect the Aerodrome. This is not a fixed fee, but set by CASA on a case-by-case basis.

Aerodrome categories under CASR Part 139

	Certified Aerodromes	Registered Aerodromes	Other Aerodromes - more than 9 but not more than 30 passengers	Other Aerodromes - operations under proposed CASR 135
Maximum level of service provided	RPT or frequent charter with more than 30 passengers	Same physical standards as certified aerodrome	Not certified or registered but served by RPT or by charter operations at least once per week.	
Who is responsible for certification/registration?	CASA	Approved Person	AOC Holder Responsibility ***	AOC Holder Responsibility ***
Where are the standards defined?	MOS **	MOS **	MOS **	MOS Chap 13 **
Is an aerodrome manual required?	Yes	No	No	No
Is a Safety Management System required?	Yes	No	No	No
Is an Aerodrome Technical Inspection required?	Yes	No	No	No
Is an Aerodrome Safety Inspection required?	No	Yes (if RPT or charter operations with more than 9 passenger seats.)	Yes	No
Is a Trained Reporting Officer required?	Yes	Yes	Yes	AOC Holder Responsibility
Are aerodrome details published in ERSA/NOTAM?	Yes	Yes	No	No
Is the aerodrome operator required to monitor obstacles?	Yes	Yes	AOC Holder Responsibility	AOC Holder Responsibility
Can non-precision instrument approach procedures be made available?	Yes	Yes	No	No

**RPT - Regular Public Transport **MOS - Manual of Standards (produced by CASA)*

****AOC - Air Operators Certificate*

Registration for Bremer Bay Airfield?

Discussions with CASA personnel have indicated that certification and registration of Bremer Bay Airfield is NOT recommended unless the use of the airfield changes dramatically.

A fully staffed airfield is required at a registered airfield. At this stage, this would be a great financial burden to the Shire of Jerramungup.

The CASA spokesperson did suggest that any upgrades are undertaken with the view to future registration, for example, power upgrades, lighting and runway standards. This is outlined in the Manual of Standards (MOS).

A short course for Aerodrome Reporting Officers is available. As airport managers, it is recommended that the Shire of Jerramungup ensures that a personnel undertake this training. While this is not mandatory, the core skills and knowledge would be advantageous to the Shire's airfield operations and safety.

Registered aerodromes in the south west include Bunbury, Cunderdin and Manjimup. Certified aerodromes include Esperance, Albany, and Ravensthorpe and Busselton, as there are passenger and charter flights making up the bulk of their operations.

Enroute Supplement Australia (ERSA)

The ERSA is a publication which contains information vital for planning a flight and for the pilot in flight. It includes graphical representations of all registered and certified aerodromes and is amended every 12 weeks. Other information includes aerodrome physical characteristics, hours of operation, visual ground aids, air traffic services, navaids, lighting, CTAF frequency, aerodrome operators' details and any changes applicable. The ERSA is available in spiral bound, loose leaf format or electronically.

It is recommended that the Shire of Jerramungup as the managing entity of the airfield, promptly seek to place the Airfield in the ERSA publication. This increases the safe operations and could reduce the liability of the shire in case of incidents. There may be increased liability if the information is not updated. It cannot be assumed that pilots will have the WA Country Airstrip Guide or that the Council staff are always available to convey the information. ERSA is the primary source for pilots.

Recommendation

2. *The Shire of Jerramungup as the managing entity of the airfield, promptly seek to place the Airfield in the ERSA (En Route Supplement Australia) publication and provide an update for the Country Airfields Guide. (www.flightace.com)*

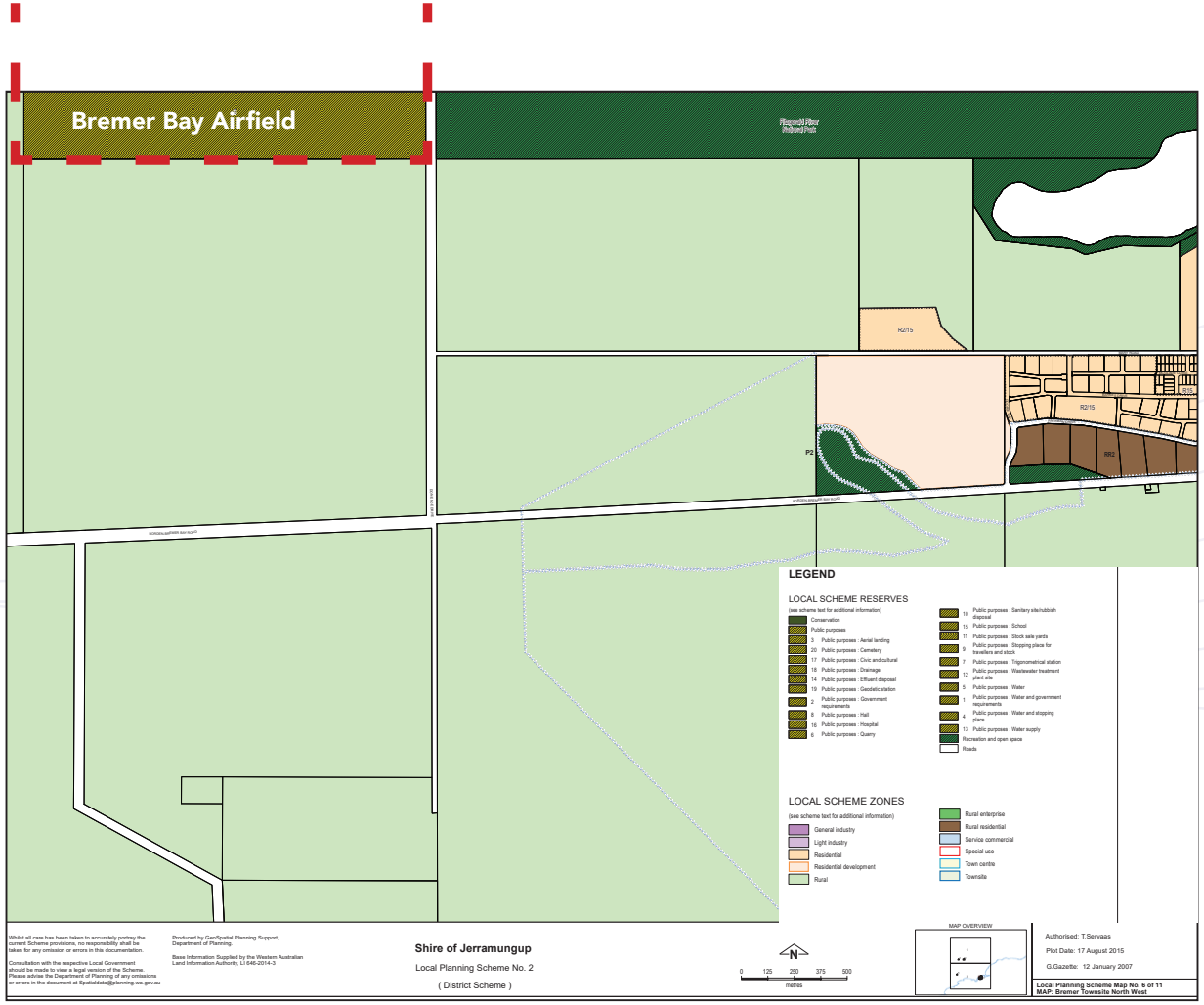
3. *Training in Airfield Management, which is offered by private providers is undertaken by a Shire of Jerramungup staff member to ensure that the Shire's airfields are operated safely.*

4. *It is not recommended that Registration or Certification of the Bremer Bay Airfield is pursued until such stage that there is a regular and substantial increase in aviation traffic. However planned upgrades should meet the Civil Aviation Safety Authority's (CASA) Manual of Standards (which align with the Royal Flying Doctor Service standards).*

2.4 The Local Planning Scheme and Local Planning Strategy

The Shire of Jerramungup's Local Planning Scheme No. 2 designates the Bremer Bay Airfield site as a Local Reserve zoned for Public Purposes - Aerial Landing Ground.

Areas to the north and east are zoned "Recreation and Open Space" and areas to the south and west are currently zoned "Rural."



Shire of Jerramungup Local Planning Scheme Map (LPS2)

The Shire of Jerramungup's Local Planning Strategy was endorsed by the Western Australian Planning Commission in October 2012. The Bremer Bay annotated plan from this document is featured on the next page.

The lots to the west of the Bremer Bay Airfield are designated as Farmlets and are labelled as Area 14.

The current 06/24 runway has the approach and take-off over this area. Should this runway be extended for any purpose, in particular for charter and small Regular Passenger Transport services, there may be a noise problem.

The lots to the south and south-east of the Bremer Bay Airfield have been designated as "Rural Residential" with the objective to provide a buffer to the water courses which feed the Bremer River and the Wellstead Estuary. The Rural Residential lots also provide a buffer for the Airstrip. It can be surmised that the Local Planning Strategy preceded the Bremer Bay fires for 2012 when the airfield was used for fire fighting operations.

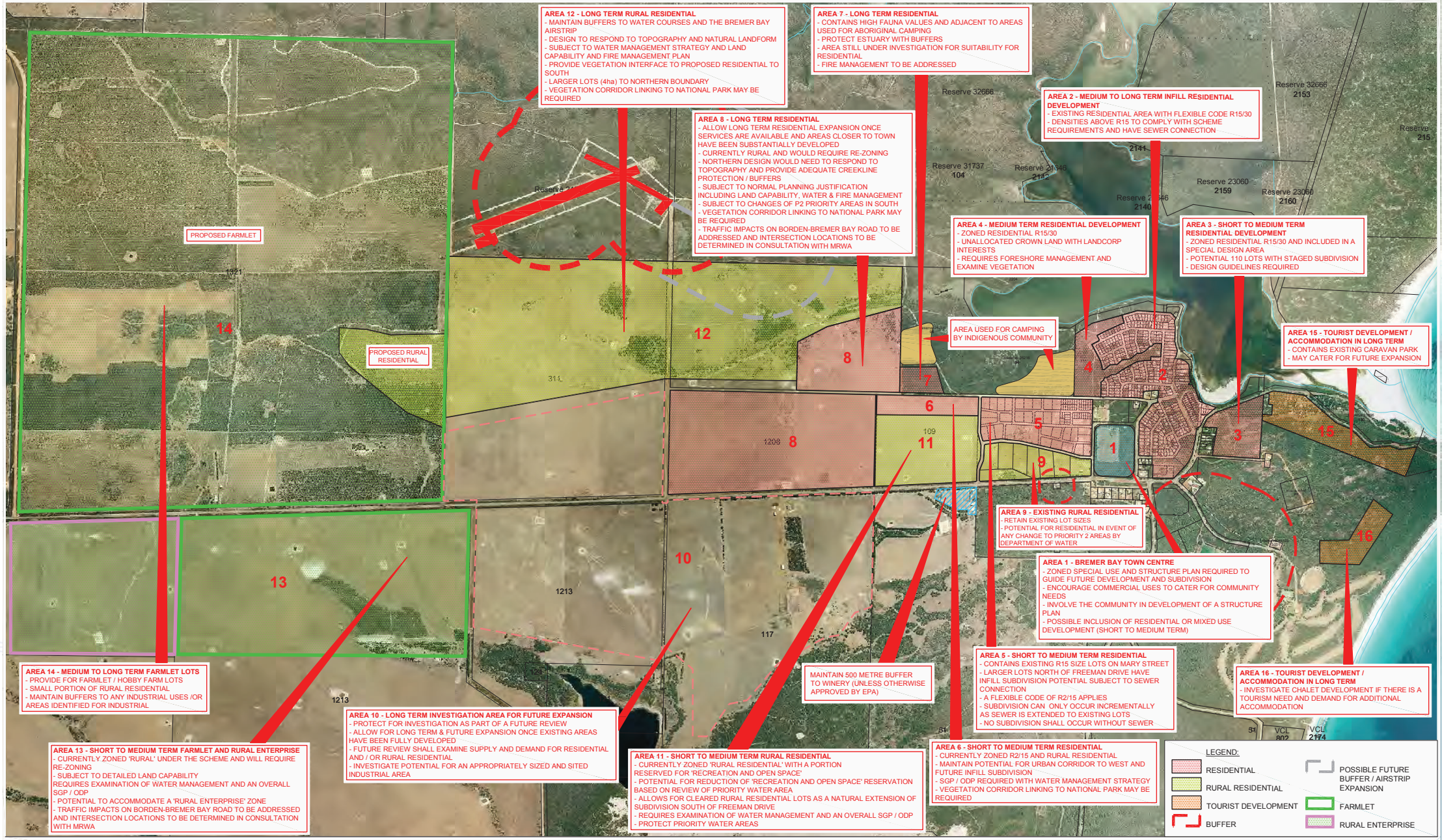
While an emergency such as fire may attract some tolerance of aircraft noise, an increasingly busy airfield for general purposes may not.

A buffer sits to the south east (dotted in grey) to identify a possible area for expansion of the airfield, which appears to extend the decommissioned runway into the adjoining reserve.

This location for the second runway was not favoured by this study as the topography would require a great deal of remediation to gain a CASA-compliant runway.

Recommendation

5. *New titles for the Farmlets and Rural Residential zone should reflect that they may be subject to aircraft noise.*



LOCAL PLANNING STRATEGY
BREMER BAY TOWNSITE AND SURROUNDS
SHIRE OF JERRAMUNGUP

NOTES:

1. All development in the Rural Residential Development Zone requires planning approval and specific provisions under the Shire of Jerramungup Local Planning Scheme No. 2.
2. There are significant areas zoned 'Recreation and Open Space' in Bremer Bay. Refer to the Shire of Jerramungup Local Planning Scheme No. 2 map for accurate zoning information.
3. Some recommendations in the Draft Strategy are dependent on potential outcomes and changes to priority water areas and their classifications.
4. Areas to be developed on an incremental frontal basis as services extend to the west and according to demand.
5. Priority will be given to development of existing zoned land which is serviced.

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Figure 19

GRAY & LEWIS
LAND USE PLANNERS
Suite 5, 2 Hardy Street
South Perth, WA 6151
T (08) 9474 1722
F (08) 9474 1172
perth@graylewis.com.au

JOB REFERENCE: 100797 DATE: 15th OCTOBER 2010 REVISED: December 2012 to include WAPC modifications dated 16 November 2012

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3. Master Plan Development

3.1 Gathering the Data

Consultation

Throughout this project many individuals have been consulted to ensure that this master plan meets the requirements of the community, and a range of organisations who currently use the airfield.

Future users, including recreational pilots were also canvassed for their views on providing a safer, more effective airfield.

Department of Parks and Wildlife (DPaW)
Brad Johnson, Fire Operations Officer
Mark Dixon, Aviation Consultant
Vince Hilder, Albany DPaW
John Iffla

Royal Flying Doctor Service
Michael Bleus, Chief Pilot
Dr Stephen Langford, Chief Medical Officer

St John Ambulance
Julian Smith
Angela Simpson
David Grimmond

Dunn Aviation
Dunn Aviation hold the contract for fire fighting services and deploy the Air Tractors - Water Bomber
Neville Dunn

Grange Resources
Limited response to a number of emails and calls.

Fly-in to Bremer Bay
Thanks to the Shire of Jerramungup Shire Officers for their unstinting support for this event.

Pilots, aviators and flying instructors throughout the state
The Fly-In at Bremer Bay, held on July 17 provided a number of real life examples of where the Bremer Bay Airfield can be improved.

Public Meetings 16 July 2015

Slavin Architects held a series of meetings on Friday 16 July to gauge public opinion on any future development of the airfield.

Three meetings were held:

- Shire Officers and emergency services personnel,
- Shire Officers, Shire President and Councillor,
- Community and business community members for Bremer Bay.

3.2 Fire Fighting in Bremer Bay

In December 2012, the Bremer Bay area experienced bush fires which threatened the town. The fire, started by a lightning strike 20 kilometres north of the town burned over 11,000 hectares, including crops.

The proximity to homes and the National Park, the isolation of the community and the latent fire risk to the area has driven the rationale to ensure that the airfield works effectively for Emergency Services.

Aerial Fire fighting in WA -a snapshot

There is a range of aircraft designed for spotting, air attack and bombers. Spotter aircraft are all owned and managed by DPaW, which holds an Air Operators Certificate (AOC). This fleet includes nine American Champion 8GCBC Scout, a two seater, single engine fixed wing aircraft which are located at a range of airfields around the state.

The Air Attack FIREBIRDS coordinate aerial firefighting operations, and can usually be seen circling high above firefighting aircraft. Some of these are managed by DPaW and operated by McDermott Aviation or Helicopter Logistics.

The Air Intelligence FIREBIRD 625 is a fire information resource for incident managers on the ground. It is managed by Department of Fire and Emergency Services and run by Heliwest.

Water Bombers include a fleet of Air Tractors operated by Dunn Aviation and managed by the Department of Parks and Wildlife.

Helitacs (Bell 600 Helicopters) are managed by the Department of Fire and Emergency Services (DFES) and run by MacDermott Aviation. They can transport up to 10 people as well as 2700 litres of water.

The Sikorsky S-64E Skycrane known as Georgia Peach is operated by Erickson Air-Crane, USA can carry up to 7000 litres of water.

Other aircraft from the Eastern States may also be used.

The Bremer Bay Experience

The fire season runs from November to May. This includes prescribed burns. There is a 7 day weather cycle evident in the area, which allows some prediction of fire fighting conditions. During the 2012 Bremer Bay fires, five aircraft were deployed to the location.

In the process of developing a new plan for the Bremer Bay Airfield, Department of Parks and Wildlife personnel were extensively consulted, due to their close involvement with the fire fighting effort.

Issues with the airfield that were identified included:

Runway

Alignment of the runway. The current taxiway provides a better alignment for take off and landing at Bremer Bay.

Dunn Aviation (using AT-802s in the last significant fire fighting operations) found it increasingly difficult to taxi re-fuelled aircraft along the current taxiway due to the significant incline. A paved start to the runway would assist with takeoff under load.

Combined with the loose gravel laid over the sand base of the airfield, there is an increased risk of aircraft propeller damage and other damage due to excessive strain on the aircraft.

Drainage from the runway may need to be addressed.

A helipad would be beneficial to separate traffic for airport safety.

Access to Water

Location of the water tanks for reloading and access for water trucks needs to be addressed. The extra time taken to taxi to the tanks or trucks is crucial in such emergencies.

Water supply for the reloading of fire fighting aircraft and helicopters needs to be addressed. The sole existing water reserve is a 12,000 litre polyethylene tank. There is an underground water supply believed to be of relatively high quality. Steve Wadsworth, the local ranger, believes that water is fit for human consumption. Water quality test will have to be conducted before using ground water for anything other than reloading water bombers.

Lotterywest funding for a 120,000 l water tank is currently under assessment. This was prepared by the Shire of Jerramungup in consultation with the Albany office of the Department of Fire and Emergency Services and the Bremer Bay Volunteer Emergency Services.

Fleet of Air Tractors (Dunn Aviation)

Care and provision of amenities for firefighters and support staff needed to be addressed prior to the next fire event. As these events are likely to coincide with the tourist season in Bremer Bay, facilities at the airfield such as toilets, showers, access to tea, coffee and temporary sleeping facilities would improve the wellbeing of fire fighting staff in an event.

The Airfield as a possible emergency and/or disaster muster point was questioned. This would ease evacuation procedures if required. Concerns were raised about the safety and security of the location due to surrounding natural fuel loads.

Fuel is required at times. This includes Jet A-1 and Avgas. For large scale events, a specialist aviation refueller will provide tankers and the Manjimup DPaW has a 5000 litre reserve fuel supply that may be accessed.

Recommendation

6. *As the safety, preservation of natural resources and wellbeing of the community is of primary importance to all, upgrades to the Bremer Bay Airfield will ensure that the needs of emergency services are addressed in works to the airfield.*

3.3 Royal Flying Doctor Service

Bremer Bay Airfield services the Royal Flying Doctor Service (RFDS) aircraft for medical emergencies. The requirements advertised on the RFDS website outline the minimum requirements.

The preferred runway size for RFDS aircraft to be able to land and take-off under almost all weather conditions is 1200 metres in length. The RFDS pilots are able to operate out of shorter runways but may be operationally restricted as a consequence reduced fuel load restricting range. The runway direction should be aligned with the prevailing wind direction.

To facilitate the RFDS aircraft landing both day and night, the width must be a minimum of 90 metres and should be clear of trees, stumps, saplings, ant hills or any other obstacles. If only day operations are anticipated, the width can be reduced to 45 metres but this is not recommended unless there is a night-capable airstrip nearby that can be used in a medical emergency.

The middle 18 metres (20 metres is preferred) which is used by the aircraft under normal operations must be a firm smooth surface which a heavily sprung vehicle can be driven over at a speed no less than 80 kilometres per hour without undue discomfort to the occupant - this will not impede the take off or landing of aircraft.

From the edge of the runway, the area each side out to 22.5 metres from the runway centre-line needs to be cleared to ensure minimal damage to an aeroplane if it were to run off the runway during take off or landing.

The remaining area outside 22.5 metres of each side may be flown over by an aircraft in the event of a missed approach or go-around. It should therefore be 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.
The areas at the ends of the runway which are over-flown by aircraft on approach and take-off must be clear of any obstructions such as trees, fences or power lines that would otherwise reduce the effective operational length of the runway and pose a safety hazard.

Ideally it should be possible to park the aircraft off the runway to avoid interrupting other operations and possible safety concerns. A parking apron should be constructed in a location which is both convenient to the runway and also readily accessible by ground transport, and at a distance from the runway such that aircraft and vehicles do not pose a hazard to any other aircraft using the runway.

A windsock is needed to indicate the wind strength and direction to our pilots when they are approaching the airstrip and this ideally is located adjacent to the parking apron.

The runway strip, apron and any taxiways needs to be marked so that all are clearly visible to pilots, particularly when they are coming into land.

Lighting of the runway, taxiway, windsock and parking apron is also required for night operations.

An interview with the Chief Pilot, Michael Bleus and Chief Nurse John Howes clarified a number of issues.

The Royal Flying Doctor Service has landed at Bremer Bay safely in the past and a cross runway would ensure a safer alternative landing for some conditions. Preparation for lighting of a cross runway needs to be considered.

Location proposed on the east against existing hardstand is suitable.

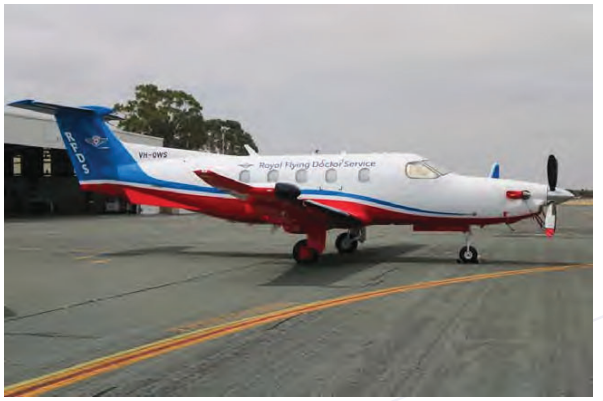
There is no requirement for aircraft preflight run-up however as for DPaW, RFDS prefers paved start to runways to ease turning and reduce fuel usage.

There is no requirement for fuel on site, the RFDS aircraft carry 2,000lbs of fuel which is sufficient for return flight to Jandakot or Kalgoorlie.

The greatest need is for a patient transfer station and airfield facilities. The RFDS does not require anything too elaborate. Transfers take place from ambulance to patient transfer and then to the aircraft. An area of 6m x 4m would provide sufficient room to transfer a patient to one of the new bariatric stretchers. This will require extra wide doors.

The RFDS recommends an all-weather drive through for an ambulance, toilet facilities that are cleaned and well maintained, hot and cold water, and tea and coffee making facilities.

During the Bremer Bay site visit, local St John Ambulance personnel suggested that the current transfer apron was insufficient and did not make for a smooth transfer. A patient transfer station is currently planned for the site.



Royal Flying Doctor Service's Pilatus PC-12 Photo by David Eyre

A brief for a patient transfer station was taken from the Royal Flying Doctor Service personnel. Concept designs are included with this report.

Bariatric stretcher now used by the RFDS.

3.4 Engaging the local community

A range of meetings were held with the Shire of Jerramungup councillors and Shire officers, local Department of Parks and Wildlife personnel, Emergency Services personnel and community members on Friday 17 July.

The objective was to determine how the Bremer Bay Airfield can best support the economic, environmental and social sustainability of the community.

Fresh in the minds of many were the bush fires of 2012, which identified many of the shortfalls of the current airfield configuration. These inadequacies raised at the meeting with Emergency Services and Shire personnel included:

- There is limited security on site and although there have been no issues around this yet it is something that will have to be considered for future town growth.
- A second airstrip will be required address the prevailing wind conditions of the site.
- Bitumen / Hard stands located at ends of runways with turn around area. Hard stands should also be located at the plane storage area for start up procedures.
- A single access road to the airfield site is inadequate.
- The integrity of the runway during varying weather conditions is questionable due to it consisting of a light gravel topping with a light sand base.

A meeting with the Shire President, CEO and Shire officers identified the drivers behind the Airfield Master Plan.

- The bigger picture for Bremer Bay is town growth. The council wishes to see the airport as a facilitator for growth. Ideas that resonated included industry and commercial opportunities, tourism, air parks and the like.
- Year-round community sustainability presents itself as a constant battle for Bremer Bay. Tourism opportunities mid year are beginning to surface. An operational airfield has potential supporting irregular season tourism industries.

A range of community members were specifically invited, along with a general invitation to outline their current and future needs. **The outcomes are listed on this and the following page.**

Current uses

- Facilities for the Royal Flying Doctor Service, Department of Parks and Wildlife and the Department of Fire and Emergency Services.
- Important for a small number of recreational users
- Opportunity for businesses

What could the airport mean to you in the future?

- Tourism opportunities (Bremer Canyon Flights, Skydiving, and passenger planes)
- Stimulate the local business economies e.g.: new ventures, new residents.
- A refurbished airfield would enable planes to land in a range of weather conditions.
- Accessibility: For Tourists, for consultants, for investors and for FIFO workers
- A Safe town with the improvement of access for health and emergency services
- Airfreight for producers
- An option to travel out of Bremer Bay for local residents whether it be for business or holidays

What are the seasonal changes in demand for Airfield services?

- Emergency Services required all year round
- Summer time occupancy swells with travellers and people on vacation
- August – October whales and wild flowers attract numbers into Bremer Bay

"A minimum of 50 years projection needs to be allowed for. It is unreasonable to design for aircraft like the Fokker 50 now however with in the master plan there should be margins for future expansion. There seems little reason in designing an area that has no prospect of further expansion past what has been drawn. "

Community Issues (continued)

A summary of the proceedings of the community meeting held on Friday 17 July 2015.

What are the current issues with the Airfield?

- Current runway length and direction are limiting
- Rough access roads are proving it hard for ambulance and other emergency services to access the airfield
- Crossing the taxiway with water refuelling trucks is hazardous
- Lighting and communication is limited or non-existent
- No amenities is not ideal for personnel during emergency operations or for recreational pilots use.
- Infrastructure
- Flight path noise concerns
- Vermin on airstrip
- Acceptance of community
- Financial constraints

What are the most important issues for you?

- Better access for the Royal Flying Doctor Service and Emergency Services
- Infrastructure to support larger aircraft for cheaper import and export opportunities
- Tourism
- Services for DPAW /DFES and the like. Water refuelling tanks and/or reservoirs, permanent power supplies.
- Communications
- Shelter, facilities and amenities
- Improved lighting of the Airfield
- Access and turn-around for ambulance and water tankers
- Volunteer and personnel parking

General group discussion on Airfield development

- Isolation should be drawn upon as offering a unique destination for tourists.
- Hop-stop flying (There is potential for aero-clubs to extend their hospitality to neighbouring clubs, providing transport and possibly accommodation for visitors.)
- The Community Resource Centre needs to be the Hub for communications and dispersal of information.
- The town needs a Chamber of Commerce. Small businesses can then negotiate and coordinate airfreight in an effort to offset maximum cost.
- There is potential for a coordinated effort from local businesses to supply fuel to planes in need. A line of communication needs to be introduced and a method of deliverance established.

Bremer Bay Airfield infrastructure

Junior planespotters

3.5 Bremer Bay Airfield Fly -in

The inaugural Bremer Bay Fly-in was held on 17 July, 2015. Nine planes arrived from Esperance, Hopetoun, Albany, Busselton and Bunbury. Both General Aviation and Recreation Aviation registered aircraft, pilots and crew contributed to an information gathering for further understanding of pilot needs.

Advertising for the event included entry into the Aeroclub event database at www.aeroclub.com.au, plus emails and calls to aeroclubs.

The first plane arrived around 9.50 am. The Shire of Jerramungup's hospitality and the display from the Bremer Bay Community Resource Centre were well received.

With variable flying conditions in previous days, it was uncertain whether the event would go ahead. Pilots are an intrepid bunch, as attested by the rough landings in the cross breeze.

At the end of the event, all of the pilots took off from the decommissioned 600m taxiway, rather than the designated runway.

During the event, pilots and crew were canvassed on their requirements and suggestions for the Bremer Bay Airfield.

The requirements include:

- **A cross strip of at least 1000 metres - sealed if possible - noted by all pilots**
  Busselton club looks for overnight locations and places with good length runways.

- Orange / fluorescent windsock for better visibility (6)
  White windsock is camouflaged by the white sand underneath. (A white wind indicator on a black background is mandatory in the CASA Regulations)
- Access to a toilet and drinking water (8)
- Transport option to town; a pick-up for a meal in town(6)
- Avgas availability
- Aircraft tie downs (2)
- Shelters or terminal buildings
- Airport information on the website including contact person
- Promotion on aviation club websites.
- Bigger turn around area for lighter planes
- Follow up contact from some of the attendees elicited a recommendation that the Bremer Bay Airfield is given a four letter designation code - YBBY has been suggested. This needs to be undertaken through Air Services Australia and its publication Enroute Supplement Australia (ERSA). Entry into ERSA as a unregistered airfield would aide pilots wishing to fly into Bremer Bay.

"The parking area is not particularly aircraft friendly with all those loose stones ready to seriously damage propellers. I would suggest that the parking area, at least, be properly sealed, preferably with asphalt. This should also do away with the need for a separate run-up pad or area.
I think the RFDS and other light twin operators in particular would have serious concerns about operating their aircraft on the parking area in its present state."

"I very highly commend the shire for putting on the day. Very progressive. So many airports are hostile to pilots – especially small GA aircraft. This is a more welcoming initiative."

"The existing airfield is a good basis for future development. Any expansion and improvements will be beneficial to the local community and I encourage the shire council to move forward with this project."


Local planespotters


Cessna 172 (General Aviation)
Albany


Van's RV-7 (General Aviation)
Bunbury


Van's RV-9A (General Aviation)
Albany


Van's RV-7 (General Aviation)
Esperance

Types of Aircraft and Aviation in Australia

General Aviation in Western Australia

General aviation is defined by the type of aircraft or flying activity and is made up of many groups and individual with a common interest in the operation of small aircraft. This study will focus on non-scheduled activities, excluding the public transport operations.

Aircraft with a VH- prefix are registered with the Civil Aviation Safety Authority (CASA) which handles commercially produced and amateur built aircraft, manned balloons, helicopters and gliders.

The trend towards Light Sports Aircraft (LSA)

In examining the trends of aircraft ownership and registration in WA it appears that the future of aviation will change markedly due to the cost benefit of owning and running a Light Sports Aircraft.

A light sport aircraft is an aircraft, other than a helicopter, that has:

- A maximum take-off weight of 600 kg or 650 kg for an aircraft intended and configured for operation on water or 560 kg for a lighter-than-air aircraft.
- A maximum stall speed in the landing configuration (Vso) of 45 knots CAS.
- Maximum two person, including the pilot.
- Fixed landing gear. A glider may have retractable landing gear. (For an aircraft intended for operation on water, a fixed or repositionable landing gear)
- A single, non-turbine engine fitted with a propeller.
- A non-pressurised cabin.

The types of aircraft that may satisfy these criteria are 3-axis aeroplanes, powered parachutes, weight-shift control aeroplanes (trikes), gliders, balloons, airships and gyroplanes.

What is not an LSA?

The types of aircraft that do not fit in this category are:

- Hang gliders
- Paragliders
- Multi-engine aircraft
- Helicopters
- Complex aeroplanes with retractable undercarriages or turbine engines

Administration

A Light Sports Aircraft may operate under either a sport and recreational aviation organisation such as Recreation Aviation Australia (RA-Aus), or under CASA.

Recommendations

These recommendations were generated through the range of consultations held in Bremer Bay during events held 16 and 17 July, 2015.

7. *The Shire of Jerramungup will update its website to contain all relevant information regarding a contact person. It should also contain correct airfield information, including the Common Traffic Advisory Frequency (CTAF). This information should also include a current plan of the airfield similar in format, but correct in scale, to that used in the Country Airstrip Guide.*

8. *The Shire provides regular updates to the Country Airfields Guide to ensure that pilots have up to date information.*

9. *The Airfield is listed with ERSA as an unregistered aerodrome. Application is made to Civil Aviation Safety Authority (CASA)/ Air Services Australia to designate a code of YBBY to the airfield.*

10. *Windsock visibility is improved by ensuring compliance with Subregulation 89(S) of the Civil Aviation Regulations (1998).*

11. *There is a need for a cross runway to the 06/24 runway to provide the most advantageous landing options at Bremer Bay Airfield. This runway is initially conduited in preparation for retrofitting lighting.*

12. *Future runway planning is to include larger paved turn-around/preflight areas at runway ends.*

13. *A noticeboard at the airfield provides information for assistance, pick-ups to and from town. Toilets and drinking water also need to be provided.*

14. *Suitable aircraft tie-downs at a hardstand area are provided.*

15. *An arrangement be made for a local fuel supplier, or mechanic, to supply Avgas or Mogas. This could either be stored at the airfield or delivered by trailer.*

16. *The ongoing problem with animals on the runway needs to be addressed.*

17. *The Shire identify an annual weekend for a fly-in with an identifying theme. The fly-in should be advertised on the Shire website and through other aviation calendar sources, such as www.aeroclub.com.au*

Cessna 172 (General Aviation)
Hopetoun

CT-SW (Light Sports Aircraft)
Busselton

Foxbat (Light Sports Aircraft)
Wannanup

Jabiru-J120 (Light Sports Aircraft)
Esperance

Savannah V9 (Light Sports Aircraft)
Hopetoun

3.6 Engineer's Report

Design Rationale

The largest aircraft that are likely to use the airport, in its current guise, are the Beechcraft Kingair/Pilatus PC-12 (RFDS) and Airtractor AT802 (DPAW). Both of these aircraft are Code 1B for the purposes of design.

MOS139 requires Code 2 runway strip standards for night operations. This means that the new runway (11/29) is designed to Code 1 whilst the existing runway strip (06/24) should be upgraded to Code 2, even if the runway is Code 1. Further, as a Code 3 strip is only 10m wider than a Code 2 strip then some minor additional clearing could be carried out at the present time, in case of future upgrades. It should be noted that the RFDS also request a 90m (Code 3) strip for night operations.

Given that the required runway widths of 18m for Code 1, 20m (recommended) for RFDS and 23m for Code 2, consideration should be given to upgrading the runway to full Code 2 compliance (23m runway width) at the same time as other work is being carried out. This will then allow compliant operations for aircraft such as the Metro II.

As the AT802 is greater than 5,700kg when fully loaded, then MOS 139 should be applied as the controlling standard, unless the RFDS requirements are more stringent.

CAO 20.7.1B refers to twin-engined aircraft, and if some minor additional allowances are made for this then Runway 06/24 will be able to be fully utilised by Code 2 aircraft such as the Metro II.

No instrument approach was allowed for.

It should be noted that during detailed design Runway 11/29 may have to be slightly reorientated due to the Bremer Bay wind turbine which is approximately 5.5km away. Detailed earthworks design may also dictate a minor realignment.

Design Parameters

The following design parameters were used.

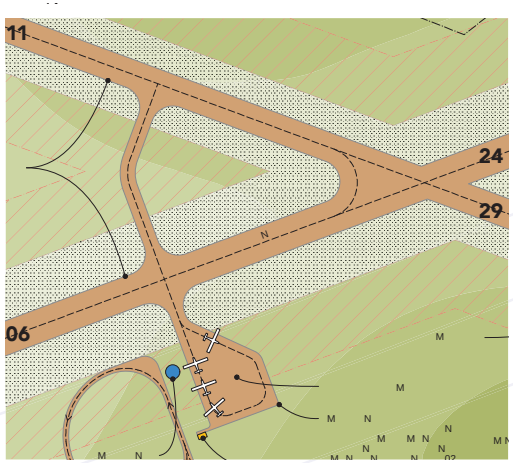
Parameter	Existing (06/24) Code 2B with some Code 3 elements	New (11/29) Code 1B (day only)
Runway Length	1,200m	1,200m
Runway Width	23m	20m (RFDS Standard)
Runway Strip (Graded)	90m (RFDS Standard)	60m
Take-Off Surface Distance from Runway End	60m	30
Take-Off Surface Initial Width	90m (CAO 20.7.1B)	60m
Take-Off Surface Splay	12.5% (CAO 20.7.1B)	10%
Take-Off Surface Slope	3.33% (RFDS)	5%
Take-Off Surface Length	2,500m	1,600m
Transitional Surface	20%	20%
Inner Horizontal Height Above Runway	45m	45m
Inner Horizontal Radius	2,500m	2,000m
Conical Height	55m	35m
Conical Slope	5%	5%
Taxiway Width	10.5m	10.5m

The approach surfaces are co-incident with the take-off surfaces so have not been shown in this table.

DPAW requested a 40m radius turning area at the runway ends, which was been allowed for by the inclusion of turning nodes. These are to be sealed to allow run-up by the AT802 as an unsealed runway would be damaged by this operation.

DPAW also requested rapid-exit taxiways to facilitate fast turn-around of their firefighting aircraft, allowing them to vacate the runway at higher speeds and not have to slow to complete a 90° turn. This was investigated and it was found that the runway is too short for these to be designed safely and efficiently.

A short taxiway between the northern end of Runway 29 and the western end of Runway 24 has been allowed for. This will enable aircraft to exit any runway at a distance of 700m from the threshold and taxi to the apron, as per the table (right):



Runway and taxiway configuration for fire fighting operations

Runway in Use for Fire-fighting Operations	Action
06	Exit the runway to the north, at the intersection of the runways, backtrack along Runway 11 and enter the taxiway linking the two runways, then cross Runway 06 to the apron taxiway
11	Exit the runway to the west, at the intersection of the runways, backtrack along Runway 06 and turn south into the apron taxiway
24	Exit the runway to the south, at the apron taxiway
29	Exit the runway to the west, at the taxiway linking the two runways, then cross Runway 06 to the apron taxiway

If more than 700m is required on landing, then aircraft should taxi to the end of the runway and turn there.

3.7 Future Planning - Engineer's Report

Cost Implications

Preliminary design using 12D modelling software and the 2m contours provided by the Shire give an estimated cut to fill volume of 57,000m3. Detailed survey and design will provide a more accurate figure.

The runway was assumed to be of a structure including 250mm of natural gravel complying with MRWA standards. Geotechnical analysis of the existing material at site should be carried out, to determine the strength of pavement foundations. It is assumed that no royalties are required for winning the gravel, and it is within a 20km haul of the site.
The runway ends and water-fill apron area are to be surfaced with a prime, two coat and sand seal to allow run-up of the Air Tractor aircraft without damage to an unsealed surface and creating a dust hazard.

Clearing of the runway strip areas as well as shaping and compaction of these has been allowed for.

Airside furniture such as marker cones and additional windsocks (unlit) and minor changes to the existing runway lighting (such as the addition of blue edge lights at the turning nodes at the runway ends) has also been allowed for.

Linemarking should be provided on sealed areas, and lead-in lines on the fire-fighting apron to ensure wing-tip clearances are met.

It is assumed that the existing airport fencing is suitable and as the new extents remain within the existing boundaries, no additional fencing is required.

Cost Estimate

Activity	Quantity	Unit	Unit Cost	Cost
Preliminaries				
Survey	1	LS	6000	6000
Geotech	1	LS	10000	10000
Detailed Design	1	LS	20000	20000
Earthworks and Pavement				
Mob/Demob	1	LS	50000	50000
Clearing	166000	m2	0.25	41500
Cut To Fill	57000	m3	3	171000
Subgrade Preparation	31850	m2	1	31850
Runway Pavement (250mm)	25600	m2	11	281600
Taxiway Pavement (250mm)	4250	m2	11	46750
Apron Pavement (250mm)	2000	m2	11	22000
Grade and Compact Runway Strips	175800	m2	0.5	87900
Surfacing				
Runway Surfacing	5560	m2	10	55600
Apron Surfacing	2000	m2	10	20000
Ancillary				
Windsocks (Unlit)	2	ea	6000	12000
Cones/Markers	1	LS	15000	15000
Changes to Runway Lighting	1	LS	20000	20000
Linemarking	1	LS	10000	10000
Grand Total				**$901,200**

Prepared by Aerodrome Management Services
Cost Estimate + /- 20%

Passenger and Charter Services

For larger passenger aircraft operations, consideration should be given to protecting areas for up to Code 3C turboprop aircraft (including the Metro 23, E120 Brasilia, Fokker 50 and the Code 2C Dash 8 100/300).

This would involve a wider and longer runway (30m and 1,800m respectively), and provision of Runway End Safety Areas (RESA) at each end of the runway strip. This could only be achieved on Runway 06/24, where there is room to expand to the south-west.

Parameter	06/24 Code 3C
Runway Length	1,800m (TBC by aircraft operator)
Runway Width	30m
Runway Strip (Graded)	90m
RESA	60m x 60m
Take-Off Surface Distance from Runway End	60m
Take-Off Surface Initial Width	90m
Take-Off Surface Splay	12.5%
Take-Off Surface Slope	2%
Take-Off Surface Length	15,000m
Transitional Surface	14.3%
Inner Horizontal Height Above Runway	45m
Inner Horizontal Radius	4,000m
Conical Height	75m
Conical Slope	5%
Taxiway Width	15m

Other considerations would be apron size and runway lighting requirements. These are outside the scope of this document as there are no plans for this upgrade at present. The areas provided are for consideration of future zoning/land acquisition purposes.

If aircraft with greater than 30 seats were to operate from the airport, it would also require certification by CASA. This would involve development of an Emergency Plan, a Safety Management System, ongoing compliance checks and the requirement for Aerodrome Reporting Officers (AROs).

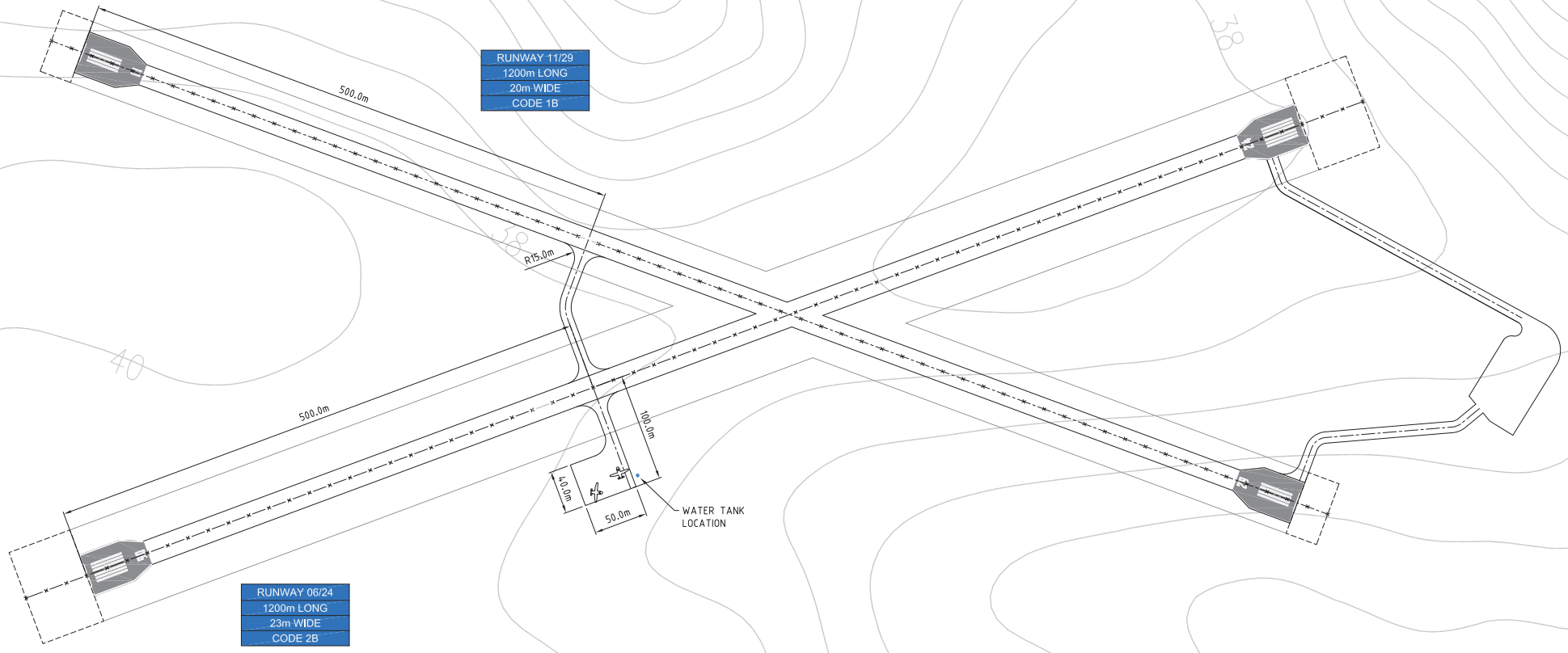
Recommendation

18. *The Shire of Jerramungup notes that an extension of runway will require land acquisition to ensure that a runway length of 1800 metres can be achieved.*

3.8 Runway Drawing

NOTES:

1. DESIGNED IN COMPLIANCE WITH THE 'MANUAL OF STANDARDS PART 139 - AERODROMES' (MOS 139).
2. DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
3. CONTOURS SUPPLIED BY THE SHIRE OF JERRAMUNGUP.



PRELIMINARY
NOT FOR CONSTRUCTION

40 20 0 40 80 120 Metres
SCALE 1 : 2,000

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
B	18/08/15	EXTRA FILLETS ADDED		
A	17/08/15	ISSUED FOR DISCUSSION		

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CLIENT

	BY	DATE
DRAWN :	A.B.	14/08/15
DESIGNED :		
CHECKED :	F.S.	17/08/15
ORIGINATOR :		
COMPANY :		
APPROVED :		

TITLE
BREMER BAY AERODROME
WESTERN AUSTRALIA
PROPOSED CROSS RUNWAY
GENERAL ARRANGEMENT

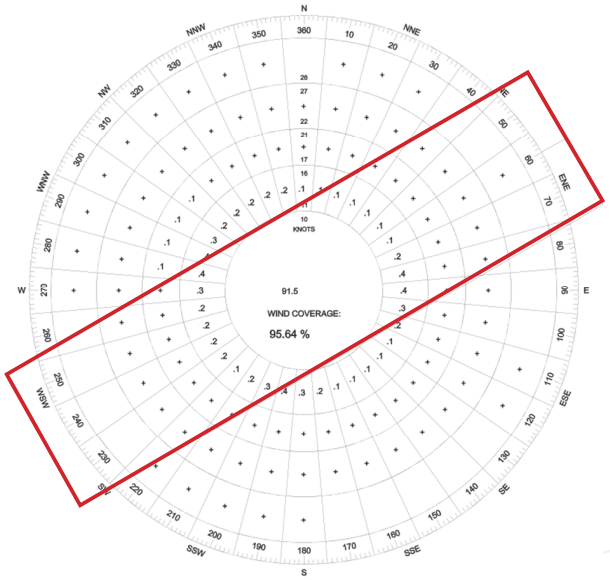
SCALE
1:2,000 @ A1

DRAWING No. YBMR-SK-002

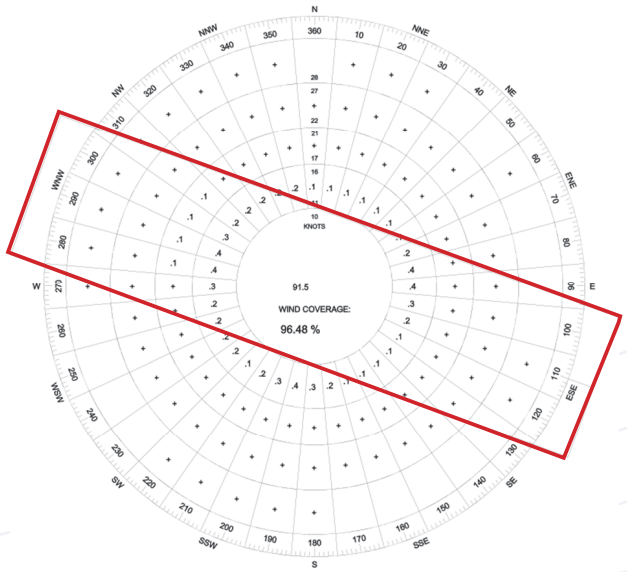
REV B

3.9 Wind Rose Analysis

Wind Rose – Current Runway Alignment (06/24)



Wind Rose – Proposed New Runway Alignment (11/29)



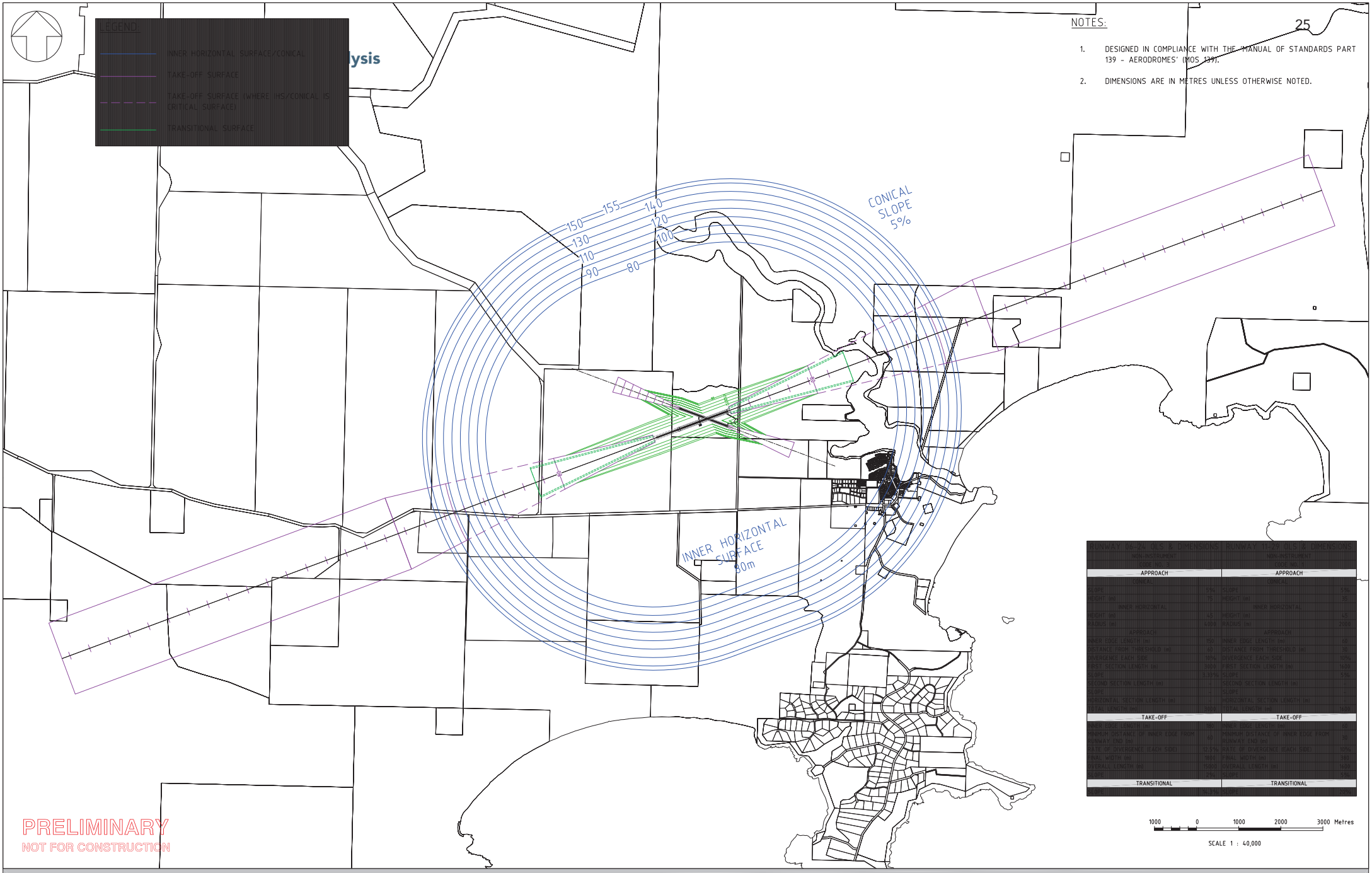
Wind analysis for the existing runway and the proposed 11/29 Runway.
(AMS Australia)

LEGEND:

- INNER HORIZONTAL SURFACE/CONICAL
- TAKE-OFF SURFACE
- TAKE-OFF SURFACE (WHERE IHS/CONICAL IS CRITICAL SURFACE)
- TRANSITIONAL SURFACE

NOTES:

1. DESIGNED IN COMPLIANCE WITH THE 'MANUAL OF STANDARDS PART 139 - AERODROMES' (MOS 139).
2. DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.



1000 0 1000 2000 3000 Metres

SCALE 1 : 40,000

PRELIMINARY

NOT FOR CONSTRUCTION

REV	DATE	AMENDMENTS	DRG. NO.	REFERENCE DRAWING
A	19/08/15	ISSUED FOR DISCUSSION		

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DESIGNED :		
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ORIGINATOR :		
COMPANY :		
APPROVED :		

TITLE

BREMER BAY AERODROME
WESTERN AUSTRALIA
MASTER PLAN
ULTIMATE OBSTACLE LIMITATION SURFACES - CODE 3

SCALE: 1:40,000 @ A1

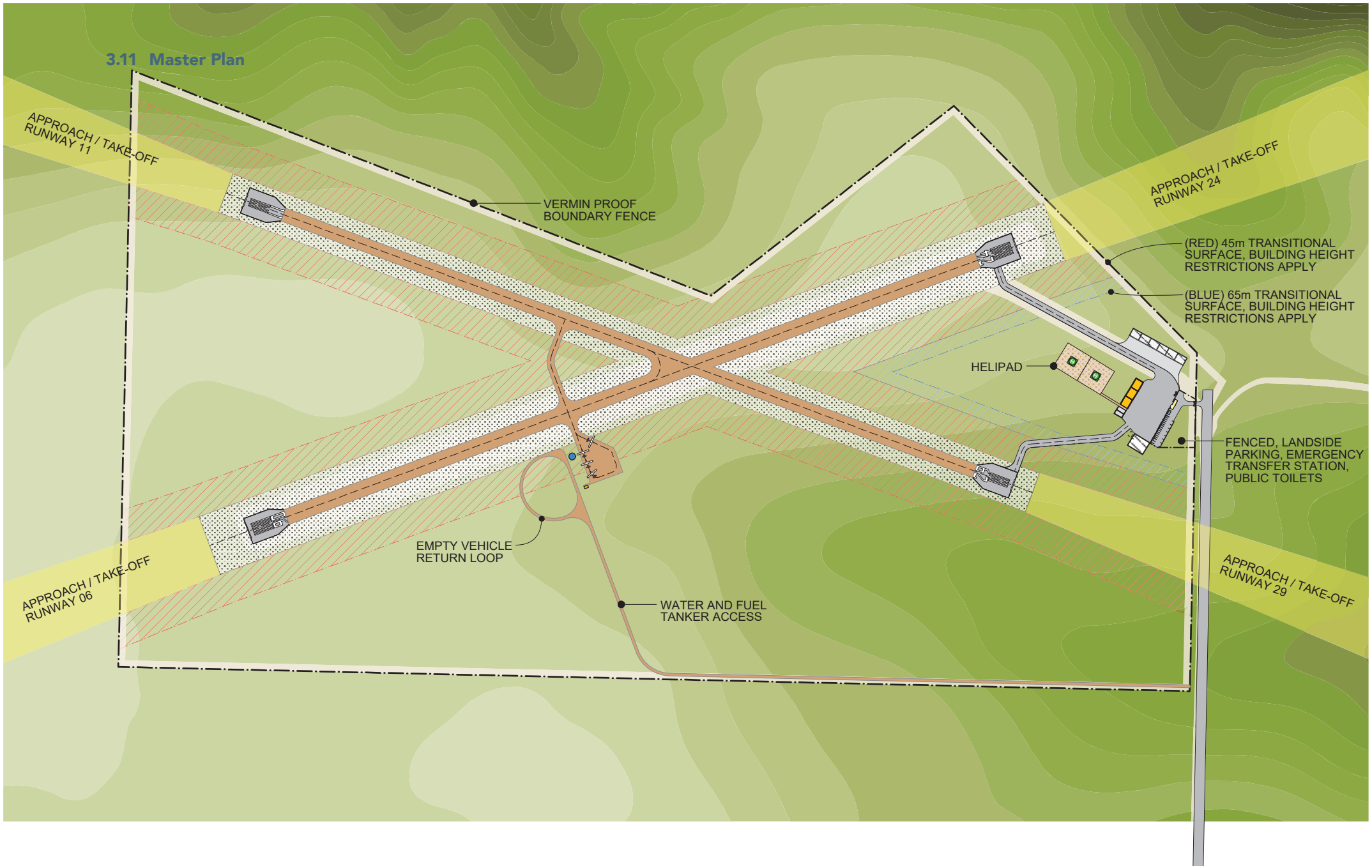
DRAWING No.: YBMR-SK-005

REV: A

Cad File: S:\Aerodromes\Bremer Bay\Drawings\Cad\YBMR-SK-003.dwg 19-Aug-15 - 03:46:06 PM

A1 Border v1.4

3.11 Master Plan



SHIRE OF JERRAMUNGUP. BREMER BAY.

AIRFIELD MASTERPLAN PROPOSAL

24 AUGUST 2015

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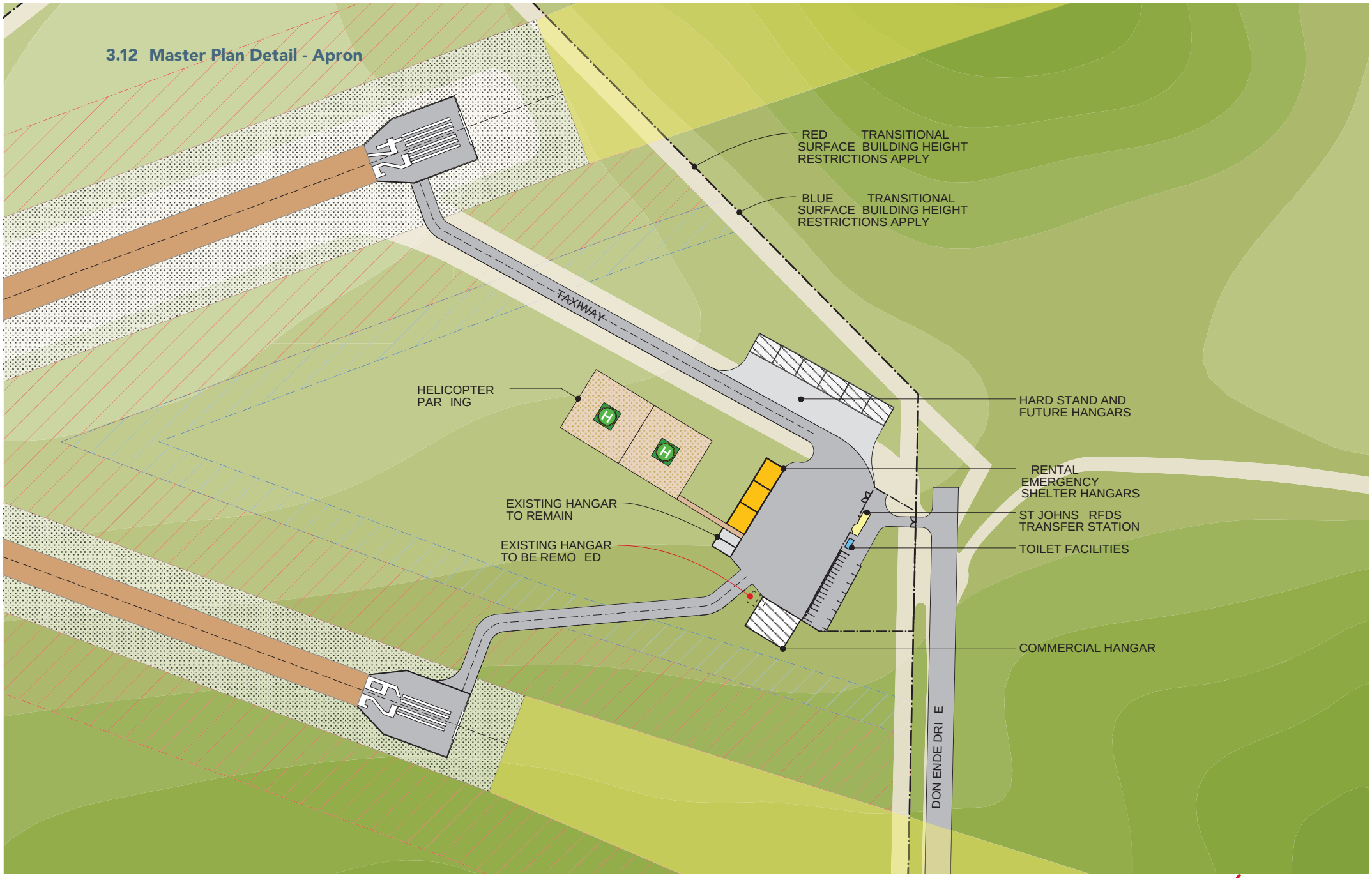
3.12 Master Plan Detail - Apron



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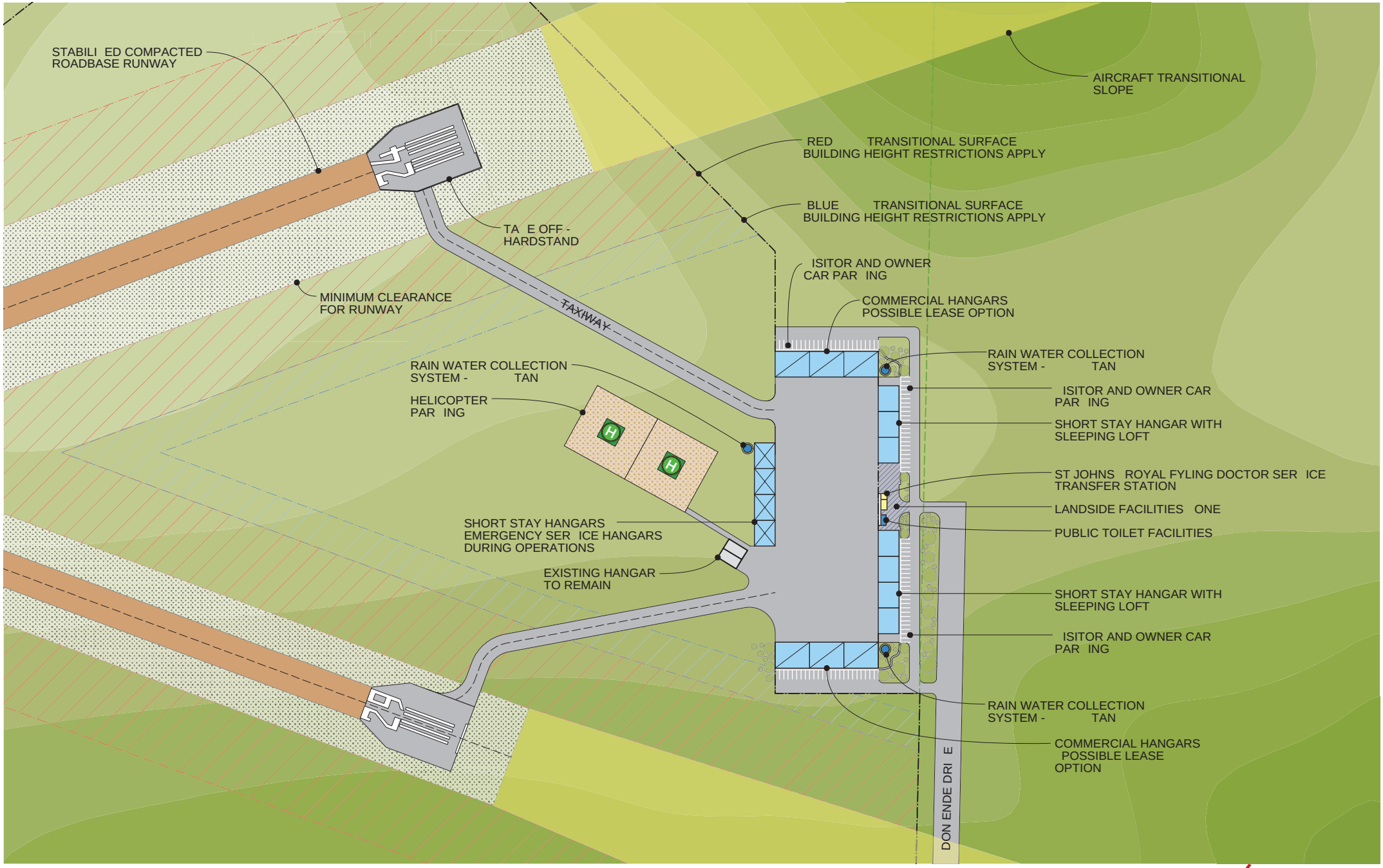
ALTERNATI E HANGAR HARDSTAND PROPOSAL



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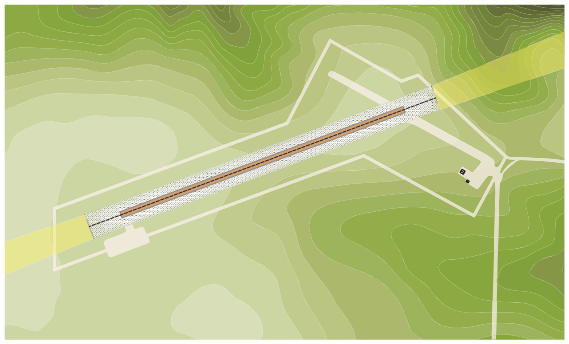
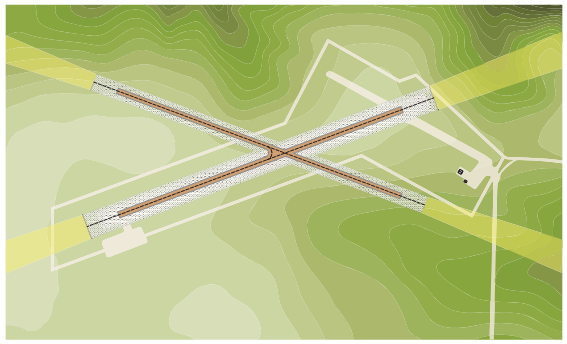
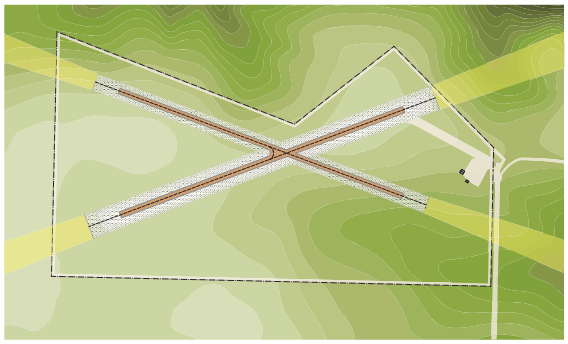
3.15 Staging the Development



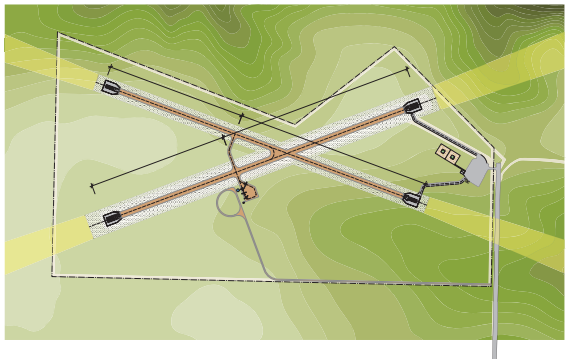
1. Existing.



2. 11/29 Cross runway cleared and formed.

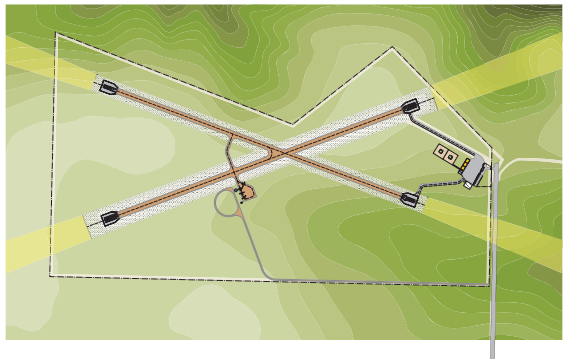


3. Vermin-proof fence is installed to ensure that it encompasses the airfield and that offers good airside security. By roughly following land contours, the fence can be constructed to offer better vermin protection.

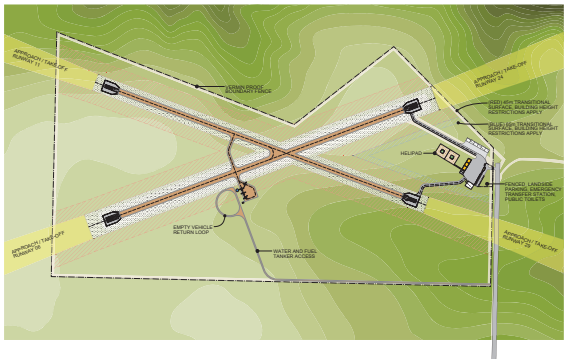


4. Taxiways and emergency services exclusion zones.
Seal taxiways, beginning of runways.
Mark out piano keys.

Large water tank and donga for aerial water bombing.
Helipad at eastern car park.



5. Stage 1 Hangars to the east of main car park. These may be leased to visitors and locals on the understanding that in an emergency, these will be co-opted for Emergency Services use.



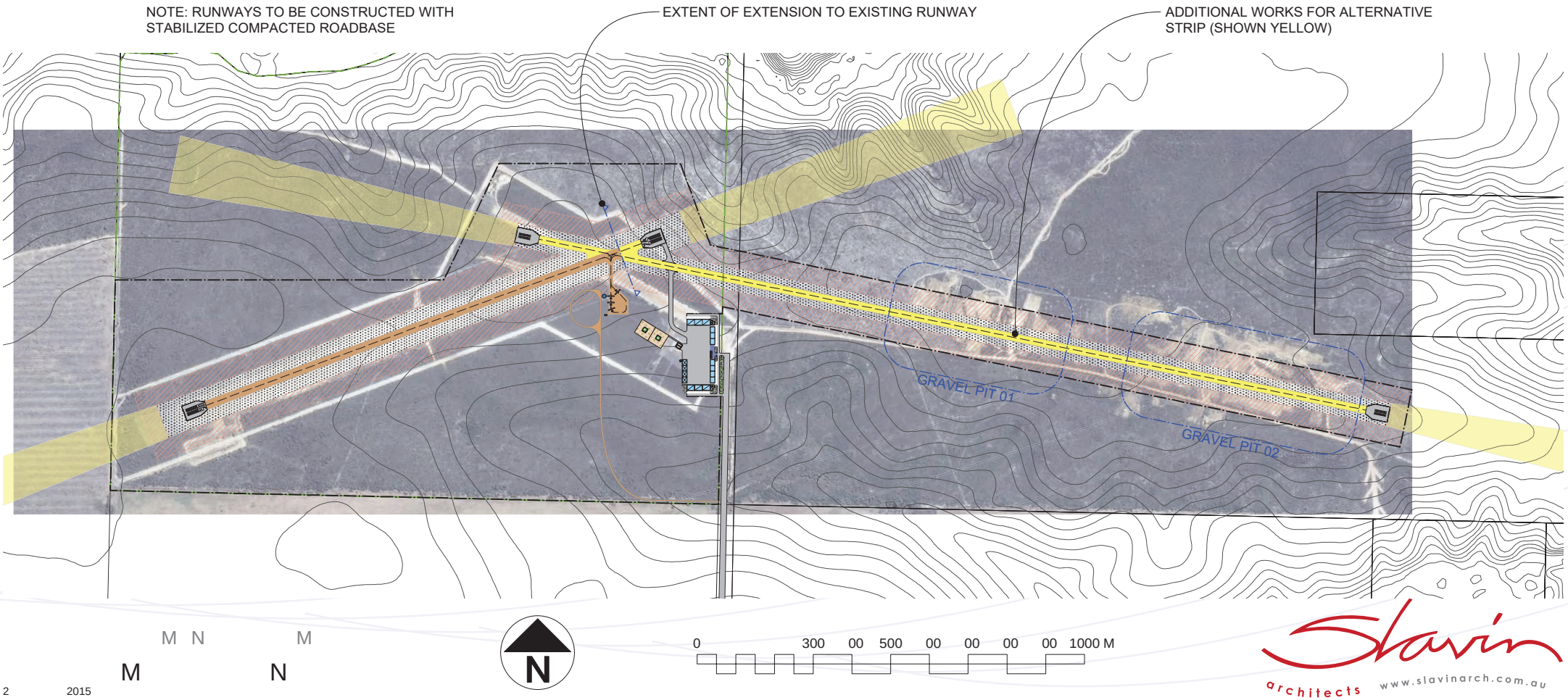
6. Stage 2 Hangars with optional sleeping loft.

Recommendations

19. *The airfield fence is adjusted to ensure that airside security standards are met. A realigned fence which roughly follows contours will offer better vermin protection.*

20. *The provision of lettable hangars to provide storage for aircraft for visitors and locals. In an emergency, the hangars may be co-opted for Emergency Services as requested by the Department of Parks and Wildlife.*

3.16 Alternative Airstrip Orientation



Background

During the consultation process, an alternative runway proposal emerged from a community member who had investigated this in the past. The current runway is shown above in orange.

The alternative second airstrip crosses the road reserve and is continued through degraded land on the adjoining Class A Nature (Fitzgerald River National Park) Reserve 31737.

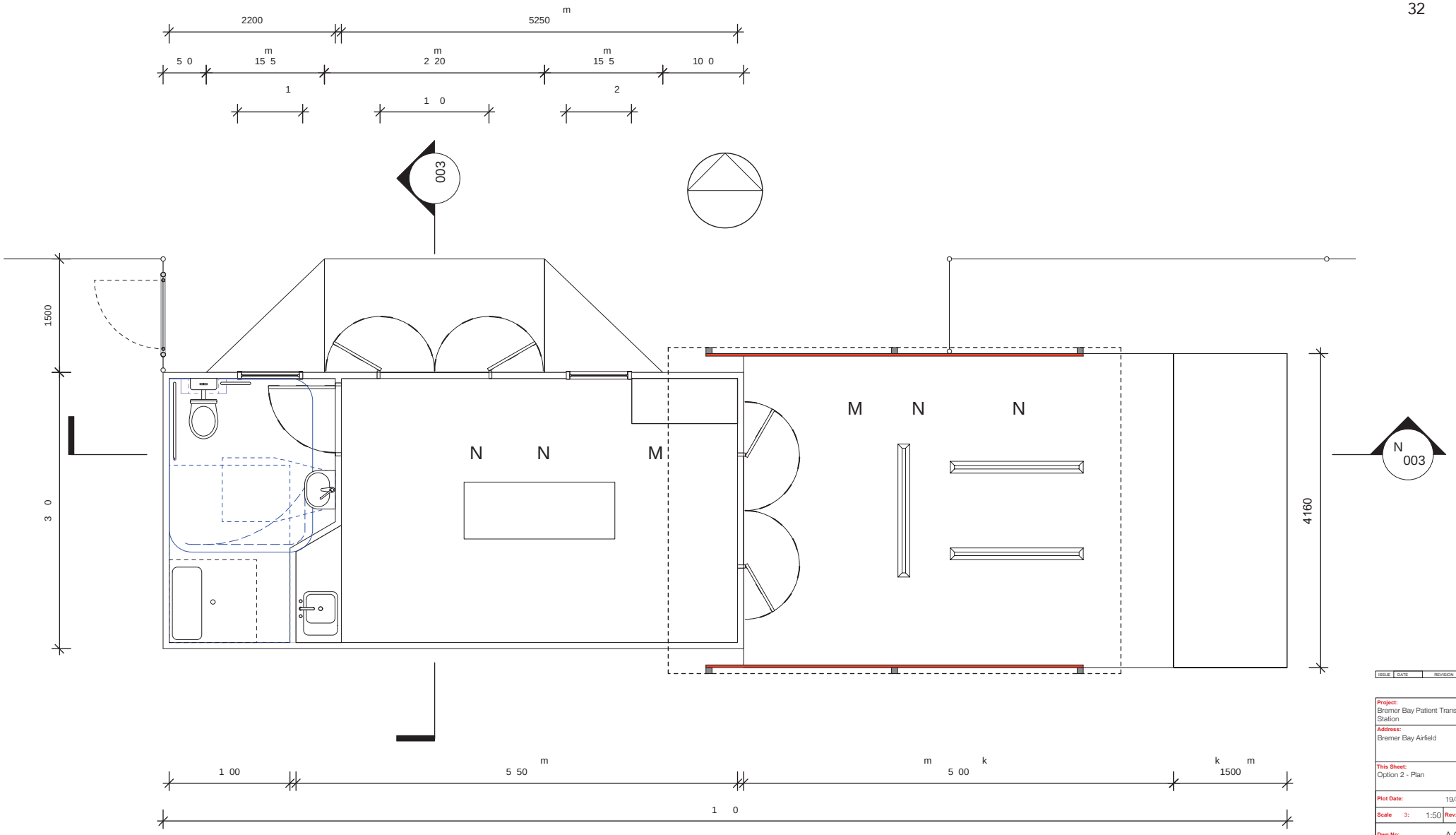
This proposal requires minimal cut and fill and provides a potentially longer runway than the preferred second runway alignment as shown on page 25.

Acquisition of the Class A Reserve is a major hindrance to this runway alignment. A high risk process involves public advertising in a state-wide newspaper. The change must then be laid before both Houses of Parliament.

Either House can disallow the proposed change if a Member of Parliament gives a notice of disallowance within 14 sitting days and the notice is passed within 30 sitting days.

Acquisition of the adjoining reserve is likely to be protracted and could be fruitless.

3.17 Concept Design - Patient Transfer Station



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ISSUE	DATE	REVISION

Project: Bremer Bay Patient Transfer Station

Address: Bremer Bay Airfield

This Sheet: Option 2 - Plan

Plot Date: 19/8/15

Scale 3: 1:50 **Rev:**

Dwg No: A.001

Proj No: 14032

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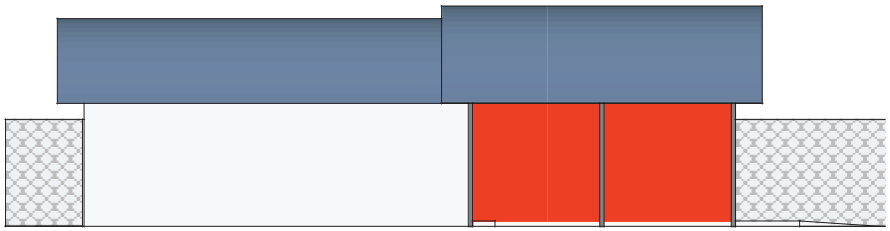

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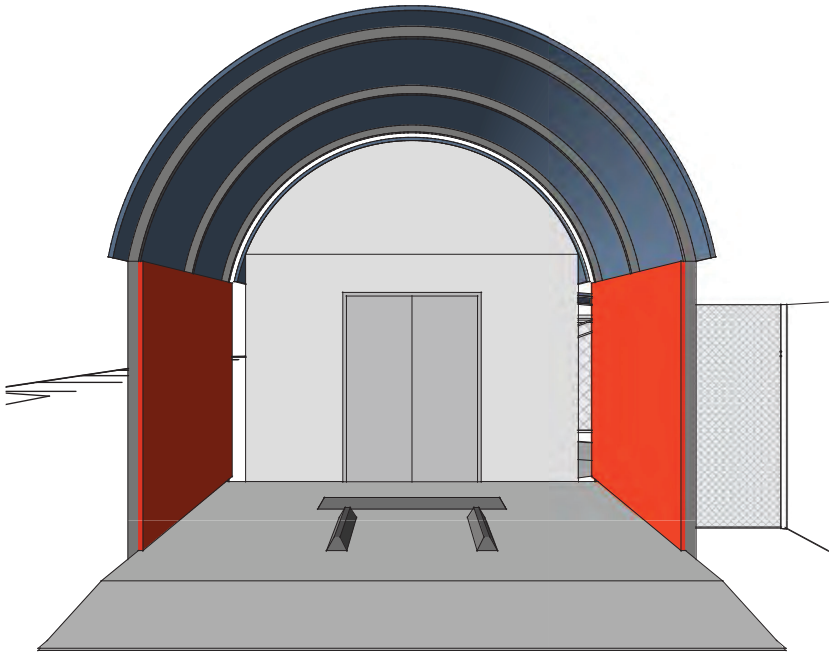

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ISSUE	DATE	REVISION

Project: Bremer Bay Patient Transfer Station

Address: Bremer Bay Airfield

This Sheet: Option 2 - Elevations

Plot Date: 19/8/15

Scale 3: as noted **Rev:**

Dwg No: A.002

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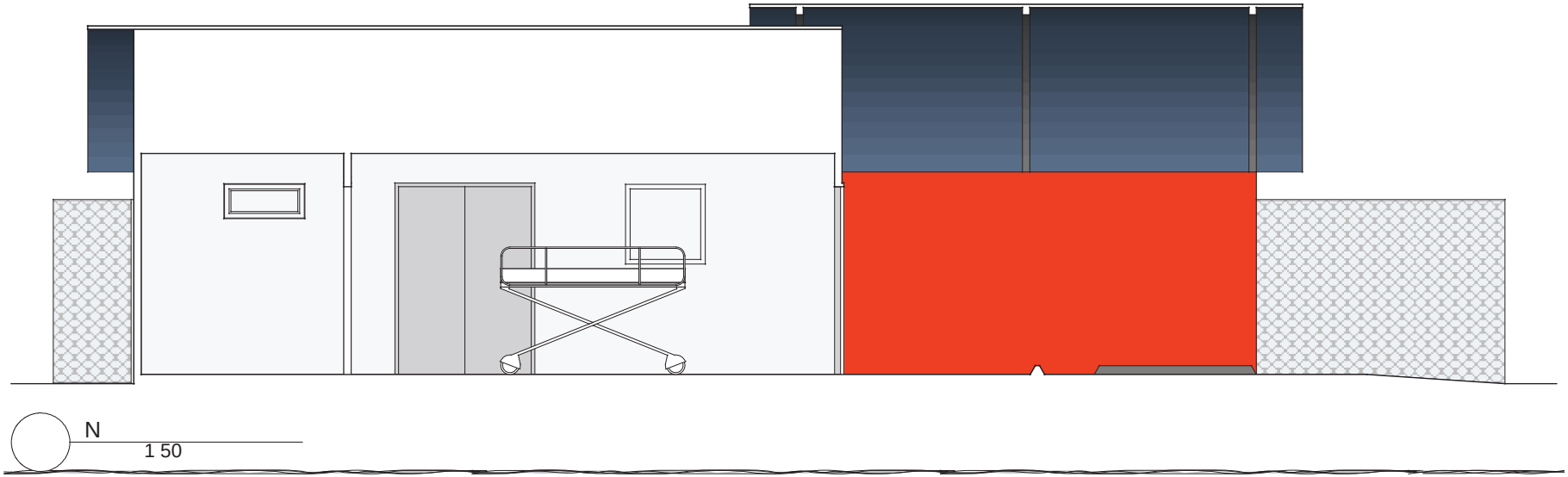

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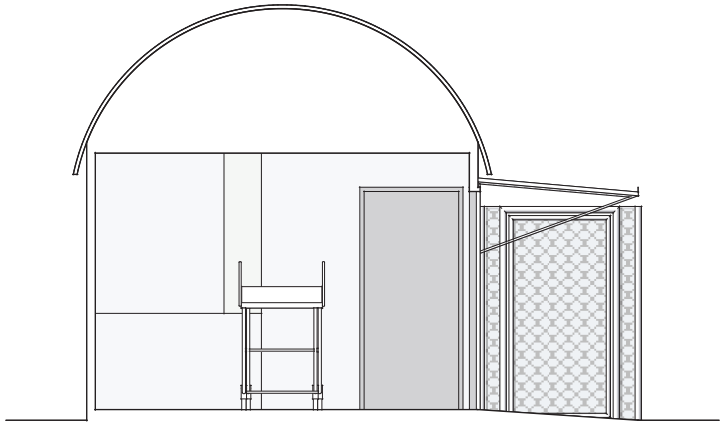
Notes:
This design for a Royal Flying Doctor/St John Ambulance patient transfer station was developed with the advice and assistance of both organisations.

A prebuilt structure features a covered decanting area, with a well sealed internal space with an Universal Access Toilet, shower and sink, with tea and coffee making facilities.

External to this is a toilet and handbasin for use for other airfield visitors. This is not detailed on the plan.



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ISSUE	DATE	REVISION

Project:
Bremer Bay Patient Transfer Station

Address:
Bremer Bay Airfield

This Sheet:
Option 2 - Sections

Plot Date: 19/8/15

Scale 3: as noted Rev:

Dwg No: A.003

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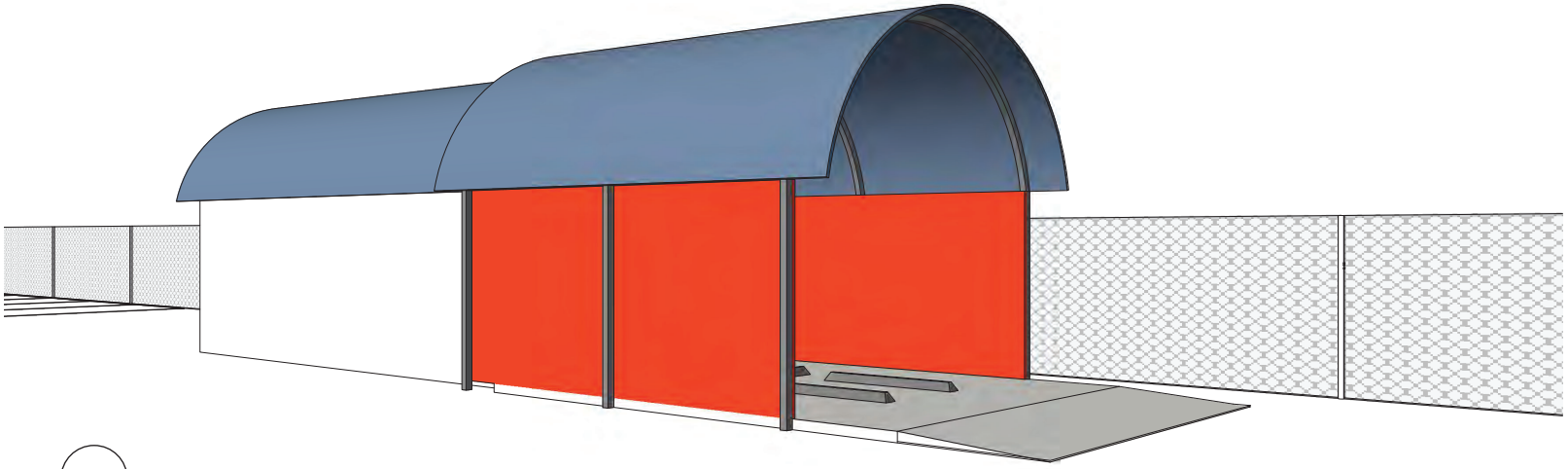

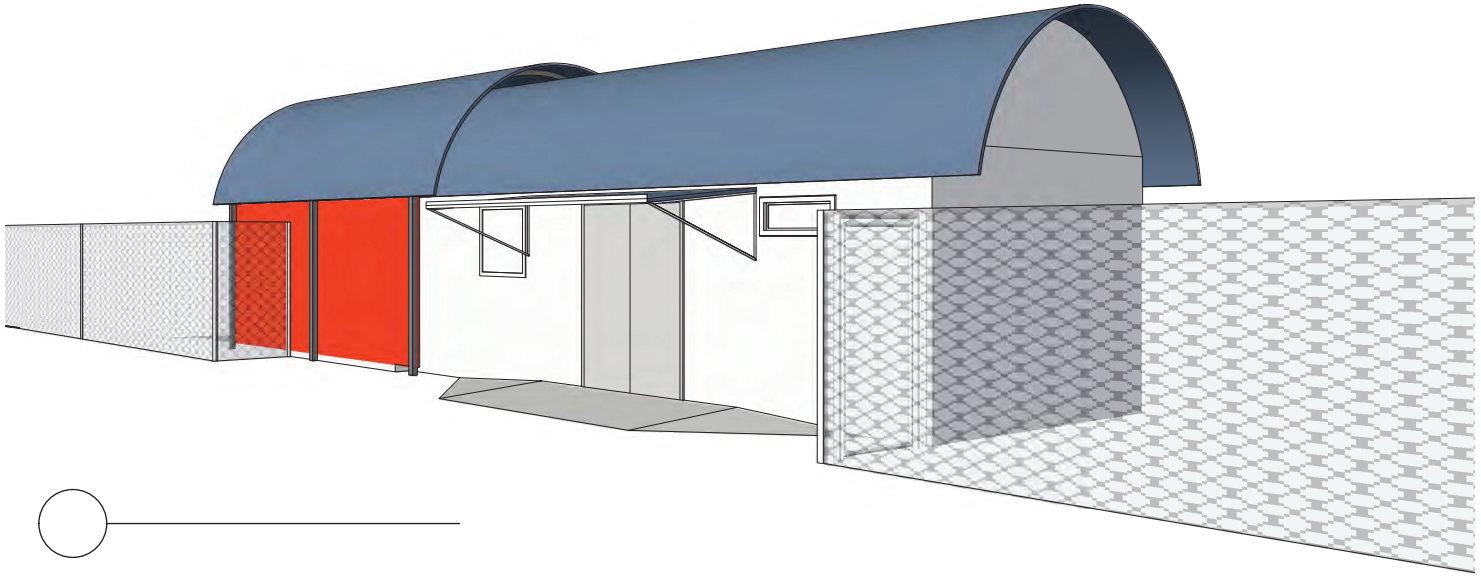

ISSUE	DATE	REVISION

Project:
Bremer Bay Patient Transfer Station

Address:
Bremer Bay Airfield

This Sheet:
Option 2 - Perspectives

Plot Date: 19/8/15

Scale 3: as noted **Rev:**

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4. Opportunities

The impetus for any development of the airfield is its role in enhancing the community's economic, environmental and social sustainability.

There are existing industries which have potential to be enhanced by the development of a highly functional airfield. These include fish processing, abalone farming and tourism.

4.1 Tourism

The tourism potential of the community has emerged as a major industry for the community. Summer recreation is the major event, with boating, camping and fishing as the major drawcards to the area.

The proximity to the Fitzgerald River National Park and the recently discovered Bremer Bay Canyon offer unrivalled rewards for the nature tourist.

A collection of existing and new opportunities may in turn encourage more tourists arriving by air. The airfield is not equipped for Regular Passenger Transport (RPT).

Conversely, supporting those who arrive by air within the town needs to be addressed. As witnessed at the fly-in organised in Bremer Bay, recreational pilots can contribute to the economic sustainability if well supported.

Tourism - Land

Situated in the Esperance Plains bio-geographical region, the Fitzgerald River National Park offers much outside of the peak periods with a wildflower season, a range of walks and camping sites, all accessible from the western side of the park. The National Park has over 75 unique species, found nowhere else in the world and was classified a Biosphere Reserve under the UNESCO Man and the Biosphere Programme in 1978.

Fitzgerald Coast Tourism Association's brochures focus on Ravensthorpe and Hopetoun as the launching point of expeditions of the park. The Park's Management Plan (2010) aims to support increasing tourism for the Hopetoun and Ravensthorpe area.

There is an opportunity for the community to lobby for greater recognition of the Bremer Bay gateway to the Fitzgerald River National Park.

As it is closer to larger population centres, Bremer Bay is a logical access point to the park.

While the threat of Dieback lingers within the park, development of responsible tourism programs and education offers potential benefit to the Bremer Bay region.

Eco tourism

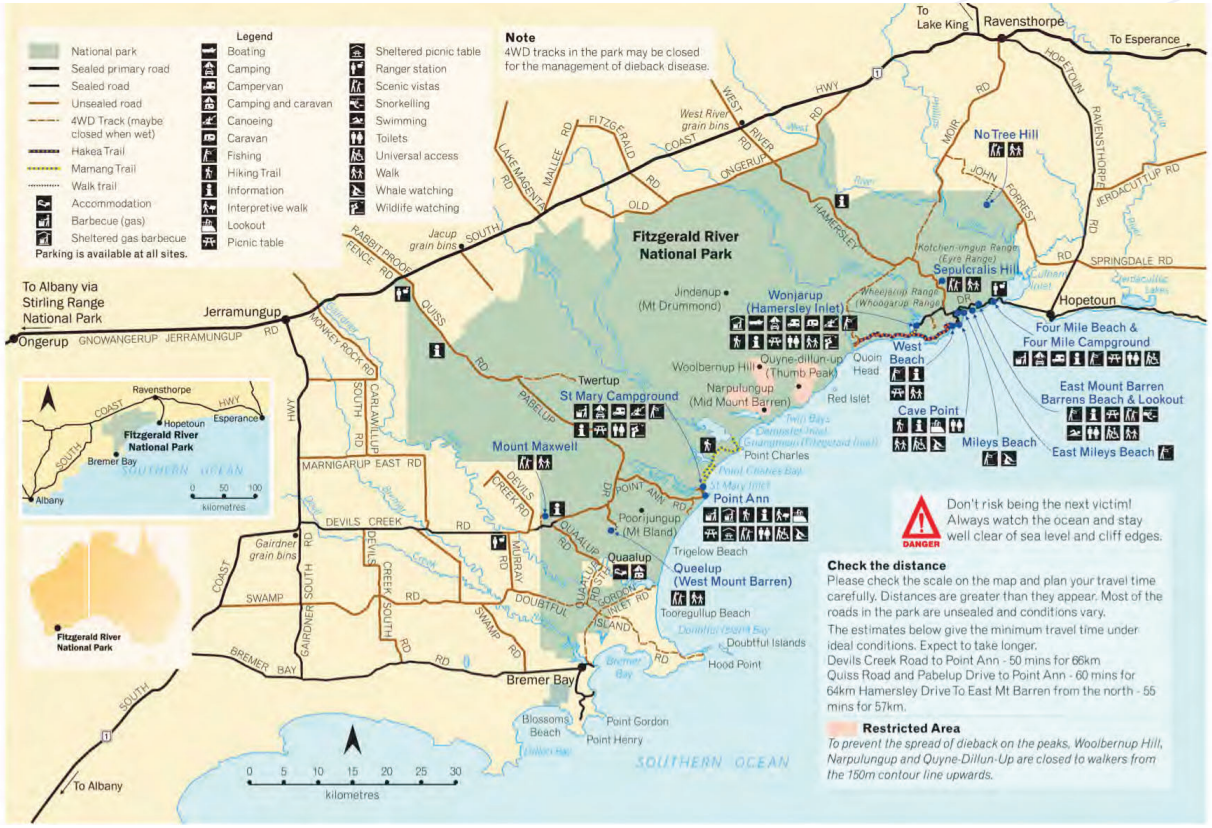
The international Eco-Tourism Society defines eco tourism as:

"responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education. Education is meant to be inclusive of both staff and guests."

There are a number of tour groups that offer visits to the National Park, but few use Bremer Bay as a staging point. One tour offered by Luxury Outback Tours has an overnight stopover at Bremer Bay, however many of the tours stay in the Hopetoun/ Ravensthorpe area.

Quad Bike tours are offered by Crystal Marron Farms with a 2 hour trek through bushland to Dillon Bay.

The existing Quaalup Homestead Wilderness retreat offers a unique opportunity to stay within the park and is accessed close to Bremer Bay.



Fitzgerald River National Park -Map (Department of Parks and Wildlife)

The Department of Parks and Wildlife offers licences to commercial operators in WA. Examples of the types of operations that may be conducted commercially on DPaW-managed land may include, but is not limited to:

- vehicle tours or safaris
- guided walks
- charter tours
- adventure operations such as canoeing and rock climbing
- minor facilities and services such as food vending
- corporate or commercial training

Local business, Xpedition Out There is completing accreditation for tour licensing under Tourism WA. With a background in wildlife photography and documentaries, the owner plans to offer full package tours of the area, including high end accommodation for those interested in the flora and fauna of the area in particular the Fitzgerald River National Park.

Currently Birdlife Australia conducts excursions to the area for its members.

Hakea victoria, unique to the Fitzgerald River National Park

Tourism - Sea

Discovery of the Bremer Canyon, a deep water ecosystem which is unique for its abundance of wildlife. It is suspected to be the result of a fissure in the ocean floor which is releasing hydrocarbons. In the summer months, when the Leeuwin current eases, orcas are seen in proliferation. Considered a northern hemisphere species, a community of 50-100 orcas can be viewed from a charter vessel that runs tours through the summer months. Currently the extremely popular tours are being run by Naturaliste Charters and take at least 4 hours.

In the winter months, the Southern Right Whales and Humpback Whales are visible along the coast. Visitors to the Fly-In held in July talked of pods of whales seen from the air along the coast. Whales are frequently seen in the bays by locals in the winter months.

Bremer Bay Canyon wildlife

Bremer Bay's sheltered marine environment ensures a small temperature range, and along with pristine waters and is a dive spot with great potential. A range of Southern Ocean species flourish. A local dive shop offers equipment hire and sales, lessons and guided dives.

Bremer Bay's appeal has long stemmed from its access to recreational fishing, including beach and boat based fishing. While the hobbies usually appeal to those who drive into the area and have access to a vehicle and equipment that is carried in, deep sea fishing is one activity for which local based boats many be suited and has potential in the Bremer Bay area. At this stage, charters are not readily available, though charter companies have operated in the past.

The potential of flying in to Bremer Bay to take part in these activities is untested. These activities may appeal to the recreational pilot who wants to land in Bremer Bay and enjoy water based tourism in the short term, however the long term, fly-in charters for marine based activities may be feasible.

Tourism - Sky

There is no organised aerial tourism apparent in the Bremer Bay area, with no discernible charter operators or joyflights over the region.

Given the tourist potential of the area, operators may find a seasonal market in the area, either during whale season, when the Bremer Bay Canyon conditions are favourable, or during the peak summer season.

Passenger Services

Passenger and charter flights require a Civil Aviation Safety Authority (CASA) registered or certified airport. Conditions for accreditation, upkeep and running costs are onerous and are not feasible nor warranted in the short term. It is possible with a greater tourist population and the development of other industries in the area, that accreditation of the airfield is pursued.

Spotting over Bremer Bay

OUR very old friend Ladies and Ladies writes about Bremer Bay: We have been building a cottage at Bremer Bay (about half way between Esperance and Albany), just doing it in patches, between good fishing days with friends.

This place has certainly gone ahead, it is really on the map these days with a plane spotting for fish, to take to the surrounding districts of Narrogin, Katanning and Gnowangerup. And do the people enjoy the fresh catch? The pilot offers air-rides for £1, the view is pretty good I imagine, but I did not go up. Mrs. Watts and her helpers put on a barbecue for the visitors at Easter, the proceeds went to the Flying Doctor fund.

And now the school is open, it is the first school to be available to the folk living on farms around the Bay. This area has improved beyond expectations lately, especially in salmon fishing time.

10 days, going night and day on two tractors. Luckily we have light land so preserved the moisture till we got it all in.

My daughter-in-law had to go to hospital, so I was called from the Bay to look after the family. It seemed strange after 14 years to be coping with safety pins and such like, I remembered that Philip used to throw things out of the cot.

But I soon got into the routine of meals and the young man learnt to walk a few steps while I was in charge. He is going to be a rover, always wanting to be off somewhere. I used to take him in the girls' doll pram to collect eggs. He is 16 months old and his daily conversation is

The Western Mail 1 July 1954 p. 59

CASA **certified** airports are able to be used by Regular Passenger Transport (RPT) or charter aircraft with more than 30 passenger seats.

CASA **registered** airports have been checked and verified by a qualified person approved by CASA for use at least once a week by RPT or charter aircraft with more than 9 but not more than 30 passenger seats.

There has been a declining trend in the number of regional airports with RPT services over the last two decades. Since 2005, RPT services have ceased at 45 regional airports (mainly on lower density routes), while 25 airports have gained new RPT services.

Small scale charters and joy flights are not impacted by these regulations.

Recreational Aviation

As noted during the Bremer Bay Fly-in held in July 2015, one of the untapped markets is the recreational aviator, who is looking for a destination or a stopover. Currently there are active flying clubs in Albany, Denmark, Bunbury, Esperance, Hopetoun, Narrogin, Katanning and Wagin. These towns are within a leisurely jaunt to Bremer Bay.

Like the Sunday drive of old, aviators enjoy arriving at a destination, exploring, having a meal or a snack, maybe staying the night and then flying home the next day. The opportunity to undertake a unique experience such as those offered in the Bremer Bay region would be an added bonus.

While Bremer Bay is unrivalled as a destination, the opportunity to actively attract recreational pilots and their crews requires some local organisation and commitment.

There is a further opportunity, together with other communities, to create a local circuit and co-ordinate activities within the region. Given the absence of a local aero club, such a project would need to be championed by community members and local businesses.

A regional initiative, such as the described has considerable potential for Bremer Bay and environs.

Kimberley Aerial Highway

As part of the Kimberley Science and Conservation Strategy, the Kimberley Aerial Highway has been operating for three years. With the support of Tourism WA and Royalties for Regions, this selection of airfields, pastoral station landing strips, tour operators and tour companies are developing a range of activities to showcase the Kimberly region.

Tour operators will take charters, undertake specialist tours between airfields or flyovers significant sites. There is an opportunity to undertake a self-fly tour. Apart from the tour operators, currently there is no centralised site for information, however there are individual strips and places where the locals welcome visitors arriving by air.

Along the Gibb River Road, places such as Mt Hart offer accommodation and hospitality. With prior arrangement, Avgas can be purchased at some of these stops.

One tour operator, Byron Bay Microlights, was charging over $15,000 for a 28 day tour and a similar amount for a fly-along tour for pilots with aircraft. The Kimberley Aerial Highway has been extensively and glowingly reviewed in international newspapers.

A similar experience could be generated along the Southern Coast region to experience its natural wonders.

Kimberley Aerial Highway

Southern Aerial Circuit

Following in the vein of the Kimberley Aerial Highway, the following circuit has been devised as a starting point to offer self fly holidays throughout the region.

The airfields have been initially chosen for their flying proximity, and their tourist potential. There may be other places that offer a range of experiences and to enrich the circuit, however as a basic tour, the following places have been recommended.

Serpentine YSEN

Bunbury - YBUN

Augusta - YAUG

Denmark - YDEK

Bremer Bay -YBBY (suggested)

Hopetoun - YHPE

Myrup (Esperance) - YMYU

Norseman - YNSM

The tour may be tackled in either direction.

Some of the interesting highlights:

Denmark

The town of Denmark's airfield is actively promoted by the Denmark Aviation Association. They maintain an active website, which contains much of the information on the airfield, presented in a welcoming and informative manner.

The webpage also contains local tourist information

The site is at www.fly-denmark.com.au

Augusta

Located within walking distance to town and is also known as Tallinup Airfield.

Hyden

The Wave Rock Airport is a private airport which is located adjacent to the Wildflower shop at Wave Rock. Details are available on the Wave Rock website with links to the Visitor Centre and the Hyden Hotel which provides lifts to town or car hire. Currently there is a $10 landing fee.

Hopetoun

Hopetoun Aeroclub has an active membership with big plans. They are currently relocating the old Catholic Church to serve as a clubhouse near the airfield. The Wavecrest Tavern is a short walk away, though the owner will pick up and return pilots and crew.

The Hopetoun Motel also provides transport to and from the airfield.

Myrup

This airfield has an adjoining Airpark or Fly-in Estate and an active aero-club. They host an annual fly-in and competitions which showcase aircraft and the local community.

Proposed Southern Aerial Circuit Route, including Bremer Bay.

Southern Skydivers

Southern Skydivers has held annual events during the summer in Bremer Bay in the past, most recently in January 2015.

Recommendation

21. *The Shire of Jerramungup identifies key personnel to monitor and drive the emerging grant and tourism opportunities for the area, including liaison with other local governments to further development of the Southern Aerial Circuit and other opportunities.*

Supporting tourists who arrive by air

Before arrival
Pilots need to know the about the runways, the local CTAF (Common Traffic Advisory Frequencies), lighting and any local conditions and a contact for on-the-ground conditions.

This information should be located

- Council website
- Update on Country Airfields Guide
- ERSA as an unregistered airfield

On Arrival
Once an aircraft has touched down, pilots and their crew may wish to visit or stay overnight in the community. Aircraft may need to be refuelled and the aircraft need to be secure overnight.

Information is available from:

- An up-to-date information board with contact numbers, transportation and information about fuel availability
- Shire website for up to date information

Local businesses who are willing to pick up pilots with prior arrangement. This will require some local level co-ordination.

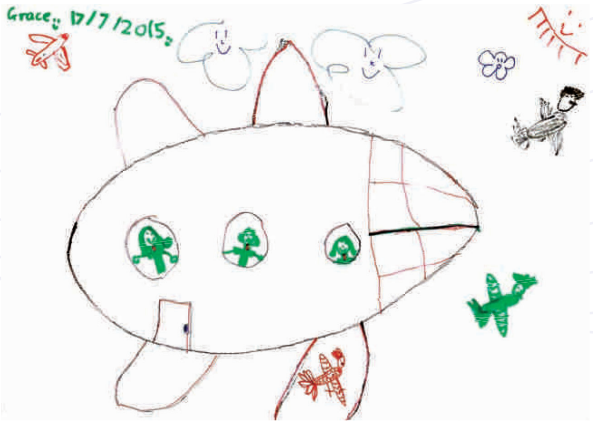
Locks to get out of the airfield

At the Airfield
- For the stopover, toilets, and drinking water are required
- Tie downs for overnight stays and bad weather
- Hangars that are available for hire, lease or purchase.
- Fuel is available. Avgas in particular will need to be specially sourced and available for transportation to the Airfield. A drum on a trailer is the best option. MoGas or High octane (premium unleaded fuel) can be used in some smaller aircraft.

Locks
Use of a numeric lock using the CTAF as the code is a common method of ensuring that pilots can leave the airfield if the ranger is not available.

Hangars
Regular visitors to the area may wish to purchase or rent a hangar in which to store their aircraft.

One of the issues that emerged during the 2012 Bremer Bay bushfire was that there was nowhere for fire fighting crews to rest during the incident. These hangars can be co-opted for this purpose, as the fire fighting season usually coincides with the peak tourist season and there is little space in town.



Drawing by Grace, Community Consultation, Bremer Bay

The map below outlines current fuel availability in WA from BP. This does not include Aeroclubs who have private arrangements.

5. Appendices

AERODROME PTY LTD ACN 073780668

BREMER BAY AIRPORT

SHIRE OF JERRAMUNGUP

INITIAL SITE INSPECTION

April 1998

Aerodrome Management Services Pty Ltd
29 Glenlea Drive
Helena Valley WA 6056

Tel: 08 9255 2994
Fax: 08 9255 2997
Mobile: 041 793 7153

AERODROME PTY LTD ACN 073780668

CONTENTS

Jerramungup Shire President, Councillor Geoff McGrath, invited Kevin Thomas of Aerodrome Management Services Pty Ltd to visit Bremer Bay for discussions regarding the opportunities for a new and useful airport.

Bremer Bay has undergone considerable expansion in the last few years. It is a premier tourist location, attracting visitors from rural W.A., Perth and elsewhere. Interest has been shown by up to 18 people who would consider leasing hangar space to allow them to fly to Bremer. A new aerodrome would also attract the flying holiday-maker.

The existing airstrip is short and very limited in its ability to handle all but the smallest of aircraft. It will not accommodate the aircraft used by the RFDS and normal aircraft used in the executive charter business.

The visit was merely to view the possible sites and provide some guidance in the process of airport construction. This report is commensurate with the time spent on site and the remuneration for this part of the consultancy. The report is more of a position statement rather than any form of proper assessment.

Conclusion

The two sites identified by Council are constructible:

Site A: more visible with no major engineering concerns

Site B: 20 kilometres from town but may have hidden problems that can only be identified with proper survey and testing.

Full investigation, design and costing is required before Council can be properly guided in the selection of the best site.

Wind analysis showed a preferred runway sited between 045□and 090□

Possibly the most important part of airport construction is to decide on the design aircraft as the design of the airport is dependent upon that factor. A 'fictitious' aircraft can be selected, i.e. selecting parameters from a number of different aircraft to provide the best possible solution.

Aircraft are assigned code numbers (based on wing span and wheel base) and code letters (based on runway length requirements).

Using those codes, the airport designer can then consider each component of the airport against the requirements set out in *Rules and Practices for Aerodromes*, derived from the International Civil Aviation Organisation's recommendations.

Aircraft commonly used in W.A. are:

✈ RFDS	Beech Kingair 200	Code 1B
	Cessna Conquest 441	Code 1B
	Piper Chieftain	Code 1A
✈ Skywest	Fokker F50	Code 3C
	Jetstream	Code 3C
✈ National Jet	Dash 100	Code 2C
✈ Skippers Aviation	Metro 23	Code 3C
	Beech Kingair	Code 1B
	Cessna Conquest	Code 1B
✈ Great Western Aviation	Beech 1900C	Code 2B
✈ other	Cessna 310	Code 1A
	Beech B55	Code 1A

The above aircraft are all propeller-driven, The Cessna 310, Beech B55 and Piper Chieftain are Avgas powered (combustion engine) with the remainder being Avtur power (jet turbines driving the props).

The Fokker 50 and the Dash 8 are aircraft with 46 and 36 seat capacity respectively, flight attendants and on-board toilets.

The Beech 1900 and Jetstream are smaller with 19 seat capacity, no flight attendants or toilets.

The minimum design aircraft that Council should consider is the Beech Kingair 200. This aircraft is used by the RFDS and the majority of executive and politicians' charters.

Ideally, the design aircraft should be the Dash 8 which can bring economic payloads of tourists. It is outside the scope of this report to assess demand, but economies can be gained at initial construction against upgrading the strip later. For the purposes of discussion this report will tabulate both the Kingair and the Dash 8 for design purposes.

The major components of airport design are-

Runway Runways are the only place aircraft can land. They are either 10, 15, 18, 23, 30 or 45 metres wide depending on aircraft. Length is determined by the aircraft performance charts. Variables affecting the performance charts are:

- elevation
- temperature
- slope on the runway
- runway surface
- wind
- loaded weight of the aircraft

Airport designers work closely with aircraft operators to select the correct runway length. Pavement thickness depends upon:

- weight of aircraft
- tyre pressures
- in situ sub-grade strengths
- quality of pavement material.

Runway strip The runway strip is an area outside the runway for the accidental run-off of aircraft. It is made up of a graded width and a cleared area called the flyover area. The widths are decided by the type of operation and the width of the runway.

Clearways These are areas at the end of the immediate end of the runways. They extend the take-off distance of the aircraft without the expensive cost of the runway. The length of the clearway is determined by the aircraft performance and the type of operation.

Take-off areas Cleared areas out from the ends of the clearways to allow for obstacle free take-offs. The length is determined by the formula (approximate) *70 times the height of the obstacle,* i.e. if trees in the area are 6 metres tall, clearing should then be carried out to 420m. They also widen each side by 1 metre for every 8 metres from the end of the clearway.

Taxiways Taxiways link the runway to the apron and vary in width and length to suit the design aircraft.

Aprons Aprons are constructed large enough to suit the parking and manoeuvring of aircraft. Special design should incorporate hangar and terminal placement.

Lighting The lights are powered by approved single core cable looped back to the mains isolating transformer. At each light there is a secondary transformer to step down the power from 600V 6 amp to 24V DC. Lights can be switched on by the pilot by radio or at the control box on the ground. Normally 3-phase power is required, although 1-phase will suffice.

Fencing A good vermin-proof fence is recommended. A 14 strain ring lock 1.5m tall has worked in the past. Any lesser fence is a waste of time and money.

Wind Indicator Necessary, and should be lit.

Markers Markers made of fibre cement will be required.

Telephone Recommended.

It is recommended that consideration be given to design to a Fokker 50 / Dash 8 standard.

Following is a table of aircraft versus airport requirements:

Bremer Bay Masterplan Fly-in

Local and Visiting Pilot Feedback and Conclusions

Saturday, 18 July 2015

Name	Address	Email	Phone	Aircraft			Comments & Suggestions	Slavin Architects Comments & Recommendations
				Model	Registration	Aircraft Owner		
Marc Stubbs	5 Barbara Street, Bremer Bay WA 6338	Valmarc@iinet.net.au	0418901700	-	-	-	• "The existing airfield is a good basis for future development. Any expansion and improvements will be beneficial to the local community and I encourage the shire council to move forward with this project."	This comment reflects the almost universal feedback from respondents. **There is apparent, strong and encouraging support for the improvement and expansion of the airfield.**
Peter Vermeersch	Box 1339 Esperance 6450	pjvermeersch@gmail.com	0428786050	Vans RV-7	-	Yes	• Transport options from airfield • Avgas • Toilets	The need for transport options from the airfield have been addressed earlier. There is an issue of supply regarding both Avgas and Mogas. Local service stations were approached and did say they would be prepared to provide the latter. Avgas is a separate matter – there is none carried in town. Fuel supply is an issue at most small airfields. It is clear from the initial enquiry from fliers that a simple arrangement such as this may attract many more aircraft than at present. **An arrangement be made for a local fuel supplier, or mechanic, to supply Avgas or Mogas. This could either be stored at the airfield or delivered by trailer.** See earlier comments about toilets and other facilities
David Ford	PO Box 1123 Esperance 6450	Dwf177@bigpond.com	0407036173	Jabiru J120	-	Yes	• Reinstate runway 11/29 • Toilet facilities • Transport to town • Aircraft tie downs • Shelters or terminal buildings • The parking area is not particularly aircraft friendly with all those loose stones ready to seriously damage propellers. I suggest that the parking area, at least, be properly sealed, preferably with asphalt. This should do away with the need for a separate run-up pad or area.	See earlier comment regarding cross runway See earlier comment regarding toilet facilities See earlier comment regarding transport to town **Provide suitable aircraft tie-downs at a hardstand area.** The issue of shelters was discussed at length at both the workshop and the fly-in – the latter being held in Tony White's hangar. There were a number of issues that came out of the meetings, and earlier meetings with DPAW and DFES: **The Shire will investigate the ownership of the shed/small hangar adjacent to that of Tony White. It may be that this can be used for general aviation use** **Discussions will continue with DPAW and DFES regarding the use of a multi-hangar facility for emergency accommodation When not in use for emergencies, they could be hired out at nominal rates for private, temporary fly-in visitor use.** **A paved hard stand area will be provided for aircraft run-up in addition to paved runway turnabouts**
Hermanus Lochner	Banksia Road, Hopetoun	hermanus@westnet.com.au	0418498919	Savanha V9	-	Yes	• Bigger air sock / more visible • Transport – No contact numbers for town • Getting a link to town for a meal	Visibility of the sock has been identified. It would be useful to see the extent to which visibility will be enhanced by the placement of a darker background. See earlier comment regarding transport to town

Bremer Bay Masterplan Fly-in
Local and Visiting Pilot Feedback and Conclusions
Saturday, 18 July 2015

Name	Address	Email	Phone	Aircraft			Comments & Suggestions	Slavin Architects Comments & Recommendations
				Model	Registration	Aircraft Owner		
Mark Craig	19 Masthead Loop, Port Geographe, Busselton WA 6280	Bettina7@bigpond.com	0419952136	CTSW	24-8336	Yes	Cross strip 1000m, Busselton club looks for over night locations and places with good length runways.	Given the wind rose evidence, a proper functioning cross strip would provide for safer landing and take-off conditions Regarding the length: 1000m is adequate although the Workshop identified the future potential to bring larger aircraft in – Fokker 50's were mentioned. We understand that 20-seat aircraft have been in from time to time for DPAW emergencies. While this may appear to be a long-shot, at least designing for an extension as a provision would seem logical. **If there is a potential for future use by larger passenger aircraft, provision should be made in selecting the topography that will allow for the future extension of at least one runway to around 1600m.**
Dave Polette	26 Water Road, Albany WA 6330	Davepolette@live.com	0439955657	Cessna 172	VH-VV0	No	• Cross airstrip upgrade • Orange / Fluro windsock • Toilet / Drinking water • Transport to town	Wind conditions on the day of the fly-in were gusting 10-15 knots most of the day. Some aircraft landed and departed on what used to be the 12/30 strip – now designated as a taxiway only. Under the wind conditions, and given good visibility, it was a reasonable choice in terms of risk management. **There is a need for a cross runway preferably perpendicular to 06/24 to provide the most advantageous landing options** There were a couple of complaints about the sock and the ground contrast. **The Shire will be placing a consolidated gravel base below the wind sock for better visibility.** There are no facilities on the site and the suggestion was that this be addressed as a multi-use facility. **Construct an RFDS-standard centre with water and toilet facilities.** Transport to town is one of the key issues raised by fliers and others. **The Shire is considering options for transport, including a small bus.**
James Perry	70 Hunton Road, Albany WA 6330	James.perry@westnet.com.au	98464831	Vans RV-7	-	No	• Needs a cross strip	
Bob Main	7 Boyona Place, Boyanup WA 6237		97315153 0439949469	Vans RV-7	-	Yes	• Cross strip needed (sealed if possible) "I very highly commend the shire for putting on the day. Very progressive. So many airports are HOSTILE to pilots – especially small G.A. aircraft. This is a more welcoming initiative." • Re open the closed strip	It is apparent that a cross-strip would provide the necessary safety margins that are currently lacking. It's clear that there is a strong recognition within the community of the value of a fully-functioning airfield. **The community recognises the value of the airfield. Apart from the obvious use for the potential boom in tourism given the deep channel discovery and the movement of orcas and whales, it could also be used for export of produce in the future – such as fresh abalone and other seafood.** While the closed strip was of value on the day, its topography and length limits its use under most conditions. It would be more advantageous to design a new cross runway that will have greater margins of safety

Bremer Bay Masterplan Fly-in
Local and Visiting Pilot Feedback and Conclusions
Saturday, 18 July 2015

Name	Address	Email	Phone	Aircraft			Comments & Suggestions	Slavin Architects Comments & Recommendations
				Model	Registration	Aircraft Owner		
Richard Peetoom	585 Frenchman Bay Road, Little Grove 6330		98444594	RV-9A	-	No	-	
Dave Maxtan	128 Bayonet Head Road, Albany 6330	david.maxton@y7mail.com	0429183666	-	-	-	• Wind sock hard to see from the air as white sand camouflages white windsock • Possibly change to an orange windsock or blackout, or darken background (sand)	Good suggestions – it may be that the darker background will address this problem.
Hans Vermeulen	181 Laithwood Circuit, Albany 6330	Hmv3@omninet.net.au	0417172996	Van RV-9A	-	Yes	• Bigger turn around area for lighter planes • Toilets • Means to get to towns	DPAW would like a larger turn-around at the end of the runway – and for it to be paved. This would allow for faster turn-around and less wear and tear for their aircraft. While their turbo-prop aircraft don't require much by way of preflight, it would be of definite value to traditional engines. **Future runway planning to include larger paved turn-around/preflight areas at runway ends.** See earlier note about ground transport
Rhett Mitchell	32 Beachview Court, Wannanup 6210	info@tmkits.com.au	0409835192	Foxbat	-	Yes	• Need N/S cross strip • High visibility windsock • Airport information on the website including contact person • Tie down points for aircraft for overnights • Promotion on aviation club websites.	See earlier notes about the cross strip See earlier notes about the windsock **The Shire will update its website to contain all relevant information regarding a contact person. It should also contain correct airfield information, including the common traffic advisory frequency (CTAF) This information should also include a current plan of the airfield similar in format, but correct in scale, to that used in the Country Airstrip Guide.** See earlier note regarding tie down points. There was discussion about promotion of the airfield and the possibility of regular fly-ins were discussed **The Shire identify an annual weekend for a fly-in with an identifying theme. (Wagin developed 'Flyorama' designed to coincide with their 'Woolorama') The fly-in should be advertised on the Shire website and through other aviation calendar sources, such as aeroclub.com.au**

TIE ME AIRCRAFT DOWN, SPORT

Tie down tips to keep your aircraft secure

Mike Smith

Of all the skills pilots learn, tying down an aircraft at the end of a flight is one of the simplest. It's surprising, then, that a casual inspection of just about any flight line will reveal such a variety of techniques – some effective, some not.

Unsecured: Reports of storm damage to unsecured aircraft often exceed $50,000

Ineffective tie-down can cost you thousands of dollars in aircraft damage. Even moderate winds can cause an aircraft lift and hit the ground with damaging force. In high winds the damage can be severe. Reports of storm damage to parked aircraft exceeding $50,000 are not uncommon.

To secure your aircraft, park it as close as possible into the prevailing wind and tie it down. The spacing of tie-downs should allow for ample clearance between aircraft. This is generally equal to the major axis (wingspan or fuselage length) plus 3 metres. Use wheel chocks rather than rely on the aircraft's parking brake, particularly if the aircraft is to be left for more than an hour or so, or if the brakes are still hot from a hard application. Most light aircraft brakes are hydraulically operated and they can lose effectiveness for parking as a result of fluid temperature changes. Also, if you set a parking brake with a still-hot brake rotor it could cause warping of the rotor on some types.

Installed cables: Many aerodromes have installed tie-down or mooring cables made of wire rope with U-bolt anchors along their lengths, and fastened at each end. To use a tie-down cable, position the aircraft so the underwing tie-down points are directly over the cable, place your tie-down line vertically between the aircraft and the cable. This kind of vertical anchor significantly reduces the impact loads that can occur during gusty conditions.

◆ When strong winds, storms or cyclones are forecast, the best defence is to get the aircraft into a hangar or fly it out of the area altogether (if it is safe to do so).

You can secure the line to the wire with a clove hitch and then attach the line to the aircraft's tie-down point with a bowline. The clove hitch is strong and easy to untie and is suitable in this case because it is strong under tension. You should tie the vertical line under tension raising the cable slightly off the ground.

Chains alone should generally not be used as tie-down lines as they lack elasticity. They are good, however, when used with wire rope cables because the flex in the wire rope absorbs a lot of the impact load in gusty conditions. Use straight link chain with a round-pin shackle or a carabineer at each end. Secure the chain by looping it through the tie-down point so the chain itself takes most of the load.

If fixed cables or tie-down points are not available you should picket your aircraft to secure it.

When strong winds, storms or cyclones are forecast, the best defence is to get the aircraft into a hangar or fly it out of the area altogether (if it is safe to do so). If you need to secure an aircraft outside in these conditions, there are some additional precautions that can minimise damage. Start by making sure the fuel tanks are full to increase the aircraft's weight. Floatplane owners might consider partially flooding the aircraft's floats.

You should try to find a sheltered place to do this, such as the lee of a building or belt of trees. Ask the locals, as they should be able point out the most protected areas. If a sheltered place cannot be found, think about parking a truck or tractor in front of the aircraft, and use it as an extra tie-down point.

The aerodynamic effects of strong winds can be reduced by the use of spoiler boards secured span-wise along the top of the wing about a third of the way back from the leading edge. These can be made from lengths of 50 x 50 mm softwood with some foam rubber or carpet glued along the side that will be in contact with the aircraft surface. Position the boards and hold them in place with some nylon cord or bungee straps.

If your aircraft has been parked outside during a storm you should take care with your pre-flight inspection. Look for any structural damage around control hinges or wing skins at points where high loads collect. Check all hinges and controls for unusual slackness.

Tie-down kit: There are many occasions when a permanent tie-down fixture is not available, so you might like to consider getting a portable tie-down kit made for you, or making one yourself.

To make a kit, cut a Star® Post into three 400 mm lengths and grind a point onto the two that don't have points, matching the profile of the factory supplied point. Drill a hole in the top section of each picket and use a D shackle to secure the line. To make up a portable tie-down kit, place the above items in a sturdy drawstring bag along with a 1 kg mallet.

The Star® Post is very strong and is easily driven into even the toughest ground. If you pull them back and forth a few times they will pull out of even the toughest ground easily.

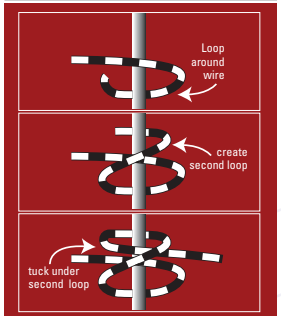
Another very effective tie-down design consists of a triangular piece of steel plate (around 6-8 mm thick) with three holes drilled in a triangular pattern and with a U bolt attached inside the triangle for attaching the line. The plate is fixed to the ground by hammering steel pins made from 7 or 8 mm thick rod and at least 400 mm long through the holes at an angle.

If you use this kind of system, arrange it so the pull is not straight up – angling the tie down points increases their resistance to being pulled out of the ground.

Commercially available screw-type tie-downs look, at first glance, like they might do the job. They work well in grass-cov-

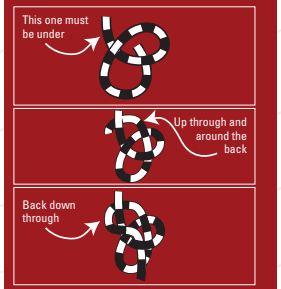
KNOT KNOWLEDGE

CLOVEHITCH



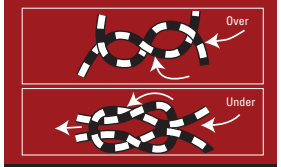
To tie the line to a wire use a clovehitch. You can add one or two half hitches on the standing line for a more secure attachment.

BOWLINE

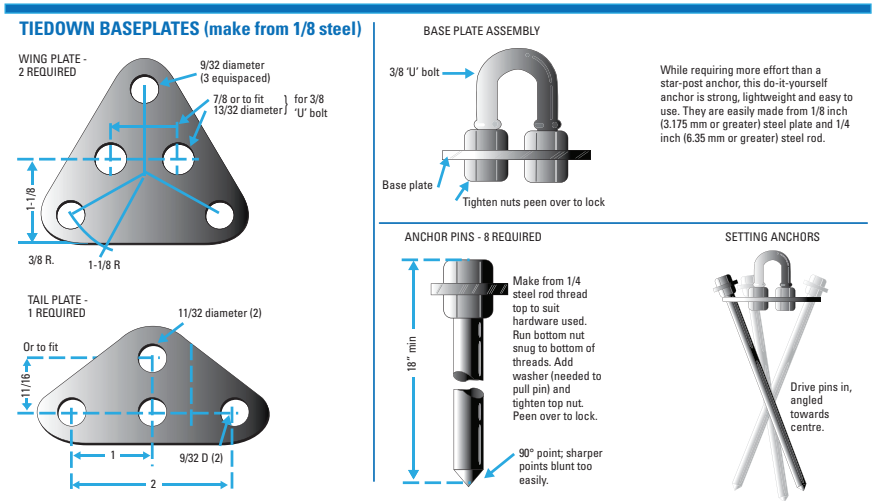


The bowline can be used to attach a line to an aircraft tie-down point. It has a tendency to work loose, so you might like to add a "stopper knot".

REEF KNOT



The reef knot will not jam, so it is always easy to untie. A useful alternative to the bowline for attaching to an aircraft tie-down point.



ered sandy ground, but are almost impossible to screw into the harder ground that is so common at Australian aerodromes.

Knot on: The choice of ropes is important too, as is tying good knots. For single-engine aircraft, tie-down ropes should have a tensile strength of 1,500 kg; 2,000 kg is recommended for light twins. The best ropes to use are ultraviolet resistant braided nylon or Dacron. Manilla and hemp ropes are generally unsuitable as they deteriorate easily, especially in damp conditions. The most suitable knots are the bowline, clovehitch and the reef or square knot as illustrated.

There are differing opinions as to whether tailwheel aircraft should be tied down tail into wind. Remember, aircraft are designed to meet airflow head-on, and control surfaces can easily be damaged if control locks are not in placed when aircraft are parked tail into wind.

Tailwheel aircraft also have a tendency to turn into the wind. Therefore, if your aircraft is parked that way (and not properly secured), it could be blown over as it is rotated into wind by a sudden gust.

Aeroplanes should be tied down with only 20 or 30 mm of movement in the ropes. Too much slack allows the aircraft to jerk against the ropes, which could cause structural damage or pull the stakes out of the ground. Tie-downs tied too tight can impose inverted flight loads that many aircraft are not designed to withstand.

On tricycle undercarriage aircraft, secure the middle of a length of rope to the tie-down ring under the tail section then pull each end of the rope away at an angle of 45 degrees and secure to your ground anchors. If extreme weather is expected, tie down the nosewheel as well.

No matter how long you're leaving your aircraft, it's vital the controls are protected from the wind with proper control locks. Locking the control column (and rudder peddles where possible) is generally adequate for short-term parking.

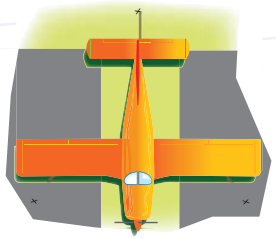
Longer term you should consider the external types of control surface clamps which provide improved protection for the control surfaces and limit the loads placed on cables, pulleys, bell cranks, rods and brackets which make up the control system.

Finally, make sure you include the tie-down kit in your weight and balance calculations and that it is well secured in the aircraft before flight.

Remember, for the protection of your aircraft, and those parked around you, always tie your light aircraft down. It's not only a sensible measure against the weather, but it can help secure your aircraft against other aircraft pilots who might inadvertently have their prop driven machine with the wind blast pointing straight at your pride and joy.

Adapted and updated from an article that first appeared in Vector, September-October 2001.

SPREAD THE TIEDOWNS



Spread out: Spread the tiedowns so pull in not straight up. You will need longer ropes, but angling the tiedown points will increase their resistance to being pulled out of the ground.

VH. SET

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Aerodrome Frequency Response Unit
Operation Manual.

(Revised J.F. 13/03/02)

Contents.

120.05 mhz.

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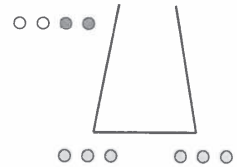

1.1 SYSTEM OVERVIEW.

This unit has been designed to offer increased safety and piece of mind, as well as a useful radio test tool, in MBZ and CTAF situations.
Whenever a transmission of 2 seconds or greater has been received by the beep back unit, it will broadcast a recorded message response (eg. "Airport CTAF"), if no signal has been received in the past 5 minutes. If a signal has been received in the last 5 minutes the unit will respond with a beep only.
This will indicate to the pilot that the radio is switched to the correct RF frequency, the transmitter is working, the receiver, headset, squelch, etc. is working.
The pilot can, if unsure of the identity of the unit to which he is listening, re-enable the recorded speech message by way of 3 X PTT activation's. (As per below key sequence)

In the optional PAL activation mode, 2 relay outputs are available to activate runway lighting. 1 for runway lighting circuit, and 1 for the wind sock circuit.
PAL lighting (when enabled) will be activated by 3 consecutive PTT activation's, of the same timing as per re-set for the AFRU on the MBZ or CTAF radio channel, whilst it is dark. This PTT activation sequence is different to the old PAL key up sequence. A minimum pulse width of 0.25 of a second, and a maximum of 1.2 seconds (values can be adjusted & stored in system set-up memory) will correctly initiate a re-set for the AFRU and the key up for PAL. EG.

1 sec on	*1 sec off*	*1 sec on*	*1 sec off*	*1 sec on*

With the remote control and monitoring, a telephone modem or direct PC access is used to monitor up to 6 analog inputs. EG. Wind speed, wind direction, temp. etc, etc. Status of the system can be continuously monitored at any time via this modem port, as can alteration of the critical timing parameters. All of the adjustable (programmable) timing settings are stored in non-volatile memory and will not be lost in the event of a power out or a re-set situation.

All of the settings and the speech message are stored in non-volatile memory that will retain data for 100 years even without power applied.

To access the control printed circuit board, the top of the rack unit must be removed.

1.2 OPERATION SWITCHES.

5 switches are provided on the control printed circuit board. These are to provide for local control of the system. 1 external input is provided so as to enable or disable the beep-back facility (if switched on)

PWR. This switches power on or off to the electronics of the unit. It will not interrupt the power to the battery. This is so the battery will be charged at all times.

BEEP. This enables the beep-back mode of operation . This may be left on, but beep-back can be disabled (switched off) by way of an external input. This external disable can be over-ridden by way of modem or PC control.

PAL. This switch enables Pilot Activated Lighting, if this option is fitted.

REC. This switch activates the record mode of operation. The message to be recorded will be as per message selected in the set-up menu.

TEST. This switch enables user to transmit the recorded message & beep signals for test purposes. The test message sent will as per message selected in the set-up menu.

Provided by the Shire of Jerramungup - operational manual for runway lighting

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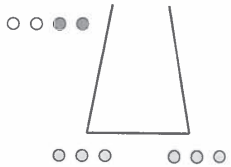

BEEP BACK INHIBIT (External Input) This input when closed will prevent the beep-back unit from functioning as a beepback device. It is so a manual or timer switch can be provided to disable the beepback in times of an aerodrome operator being active. This inhibit can be over-ridden, if forgotten, by remote modem control.

2.1 INDICATOR LIGHTS.

LED's are provided so as to indicate current status of the system.

COMPUTER RUN. Microcontroller is running OK.

BEEPBACK MODE. The beepback is active. Any valid signal received will be responded to.

ALERT / FUNCTION. A fault has occurred, or the unit is busy in record mode, or is communicating with a host (user) via the communications serial port. (programming mode, or aerodrome conditions monitoring, etc.) This indicator will flash if the controller has determined that it is dark and PAL has been enabled, if PAL option fitted.

5 MINUTE TIMER. A message or beep has occurred in the last 5 minutes, and the 5 minute timer is running. (the time left to run is reported via the communication port at 1 minute intervals)

CARRIER DETECT. A signal is being received by the radio and is being recognised by the microcontroller in the system. This LED will reflect the controllers recognition of carrier NOT actual squelch open. This is because of the programmable CD off realise time parameter (50ms intervals)

TRANSMIT ACTIVE. The system is sending a signal to air. This could be a "beep" or a "message".

BATTERY MODE. The battery is providing the power to run the unit.

MAINS OK. Power is being provided by the mains. The battery is also being charged.

RECORD / EOM. (on printed circuit inside case) Unit is recording a message, or playback has just completed.

2.2 RECORDING.

If PAL option is fitted, before recording, first determine which message is be recorded. This is then selected via the set-up menu by using a terminal or PC.
To record a message for respond playback, simply hold down the record switch. The "ALERT" indicator will light. After 1 second, the "record" indicator will light. When the record indicator has illuminated speak clearly in a normal voice into the microphone on the printed circuit board (about 1/2 to 1 meter away). When you have completed the message release the record button. Recording is now complete and can be tested by pressing the "TEST" button and listening on an appropriate radio receiver.

2.3 TEST PLAY BACK.

To provide a transmit test press this switch. The transmitter will key on and the outgoing message will be sent to air with the normal timing parameters. The beep will also be sent immediately after the message play.
The voice message sent will be as per message selected in the set-up menu, if PAL fitted. Otherwise it will only be the normal response message.

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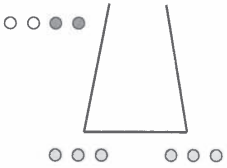


2.4 LEVEL ADJUSTMENTS.

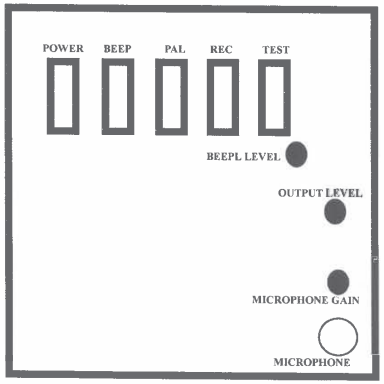
3 adjustments are provided on the printed circuit board. They will normally not need to be re-adjusted in service.

MIC. Adjustment of the on-board microphone gain. (clock-wise to increase)

OUT. Adjustment for overall level out to the radio transmitter. (clock-wise to increase)

BEEP. Adjustment of the beep level. This adjustment is only done when the speech level has been set by way of the OUT. adjustment. (anti clock-wise to increase)

3.1 CONTROL & ADJUSTMENT LAYOUT.



3.2 SERIAL INPUT & OUTPUT, RS-232 I/O, TEST & SET-UP MODE..

Access via Programmes\Accessories\Communications\Hyper Terminal on WIN3.1 and later software.
The RS-232 port on the unit has been internally set to 9600bps, N,8,1.
The port is presented in 2 forms. I/O 1 is for direct interface to a PC. I/O 2 is for interface to a telephone modem.
Telephone modem initialisation string is given to this port on power up. ATZ ATS0=2 ATS37=9 <CR>.
This will enable your modem to auto answer an incoming call, and connect at 9600 bps only.

3.2.a PROGRAMMING UNIT VIA COMM. PORT.

All of the critical timing parameters are stored in non-volatile memory. These parameters are accessible and changeable via this port.
To access this control function connect to PC, either direct or by modem. When connected press ENTER. The unit will then ask for a password. When the correct password has been entered a help menu will be displayed.
The default password is 123

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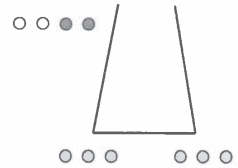

3.2.b PROGRAMMING COMMANDS.

```
r ead inputs.
e xit no save.
s ave & exit.
i nhibit over-ride 1=on 0=off    0
p rogram password    wag
1 CD off realisation time X 50ms    02
2 TX key-up lead time X 50ms    04
3 Reset time min. X 125ms    03
4 Reset time max. X 125ms    09
5 Normal CD realise time X 1s.    02
m essage to record (1 to 4)    1
t transmit holdoff time X 50ms    00
l lighting ON time total X 1 minutes    30
```

To program any values simply type in the first menu character, then the value to be entered.

If no key is pressed within 30 seconds this mode will time out. The system will then return to the mode that was operational before port was accessed. Also, if no password is entered, the system will "time out" back to the last operational mode.

If an incorrect key or statement is issued the unit will simply re-display the menu screen and prompt for an entry.

- "**r**" Will return all of the remote aerodrome monitoring conditions and values in plain English EG. Wind 320/12. Temp. 22C. Battery 13V. (Only if this option is enabled)
- "**e**" Will exit the set-up mode without storing the change to memory.
- "**s**" Will exit the set-up mode AND store the changes into memory.
- "**i**" Enables over ride of the beep back inhibit / disable input. This may be needed if system is inadvertently left in the disabled condition. The current value is displayed next to the menu function.
- "**p**" Enables alteration of the password used to gain access to the set-up mode. This can be any 3 characters EG. !@# or 123 or WeD or wag, etc. The current password is displayed next to the menu function.
- "**1**" Enables alteration of the Carrier Detect realise time. This adjustment is in 50 millisecond increments from 00 to 99 (IE. 0.00 to 247.5 seconds). This is the time taken from actual carrier drop off until the unit will go to transmit, or log a timer value (for a possible re-set). This is so that erratic mute closing and opening (noisy signal) can be filtered out therefore enabling smooth operation without unwanted reporting if signal disappears only for a very short time. This timer value also applies for Carrier Not Detected in the case of the carrier off time between carrier's in the re-set sequence. The current timer value is displayed next to the menu function.
- "**2**" Enables alteration of the transmitter lead in delay. This is the time from the radio transmitter key up until the beep or message is sent. Different radio units will require different times from key-up due to PLL settling and other switching factors. Also this allows for the aeroplane's radio receiver to become fully un-muted before the beep or message is sent. This adjustment is in 50 millisecond increments (1/20th second) from 00 to 99 (IE. 0.00 to 247.5 seconds). The current timer value is displayed next to the menu function.

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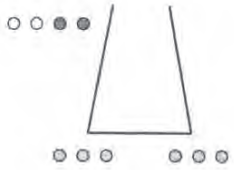
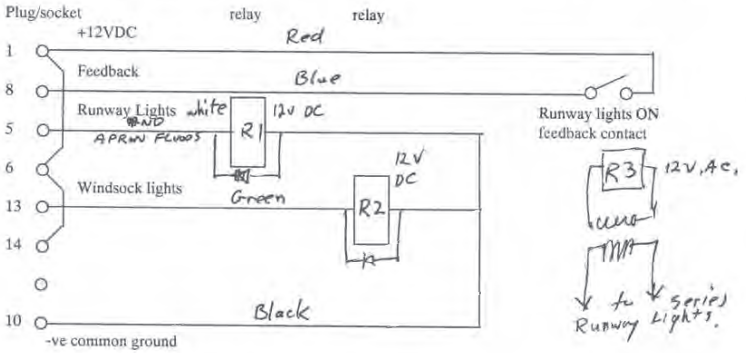
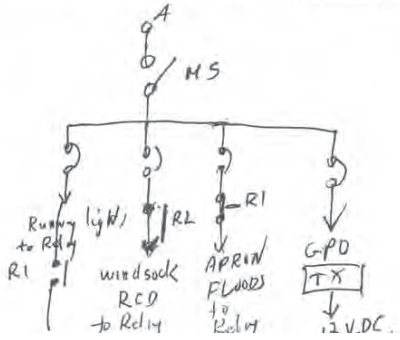




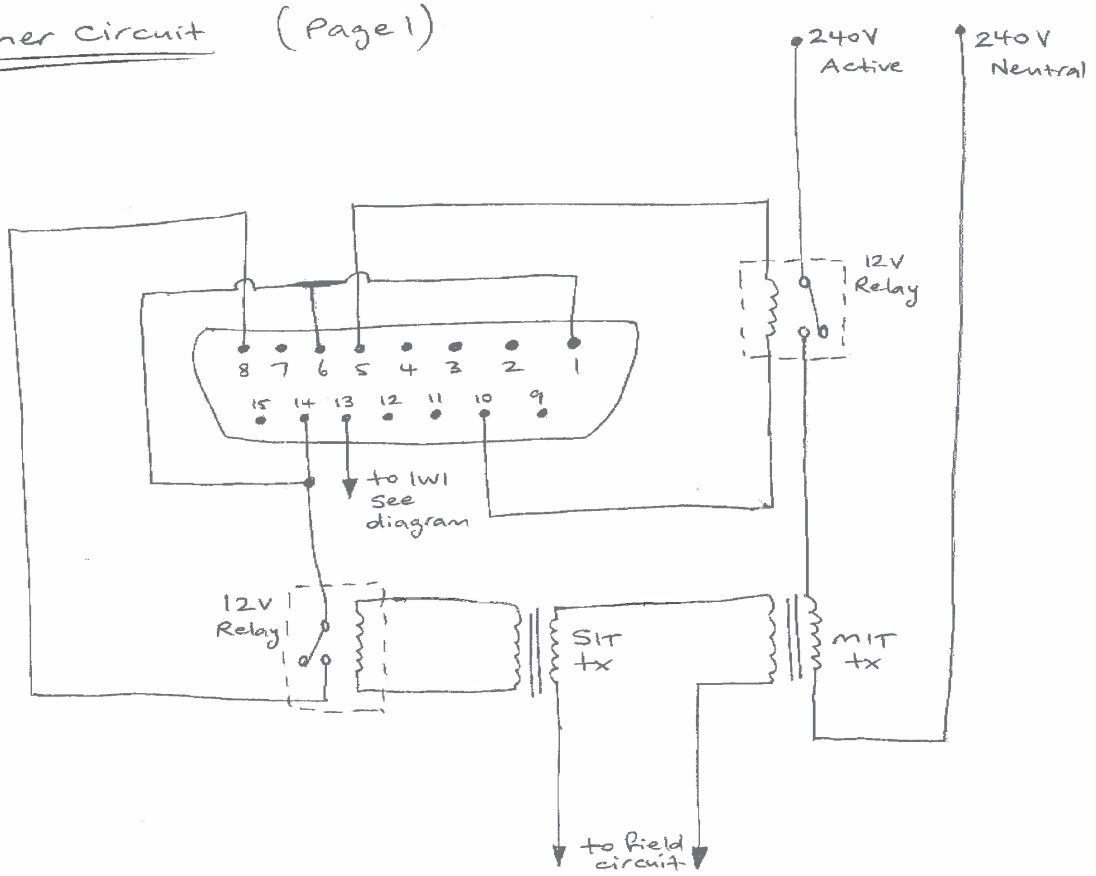
Note: Both relays require back EMF suppression diodes.
Both relays are 12VDC.

6.3. Some Important Notes.

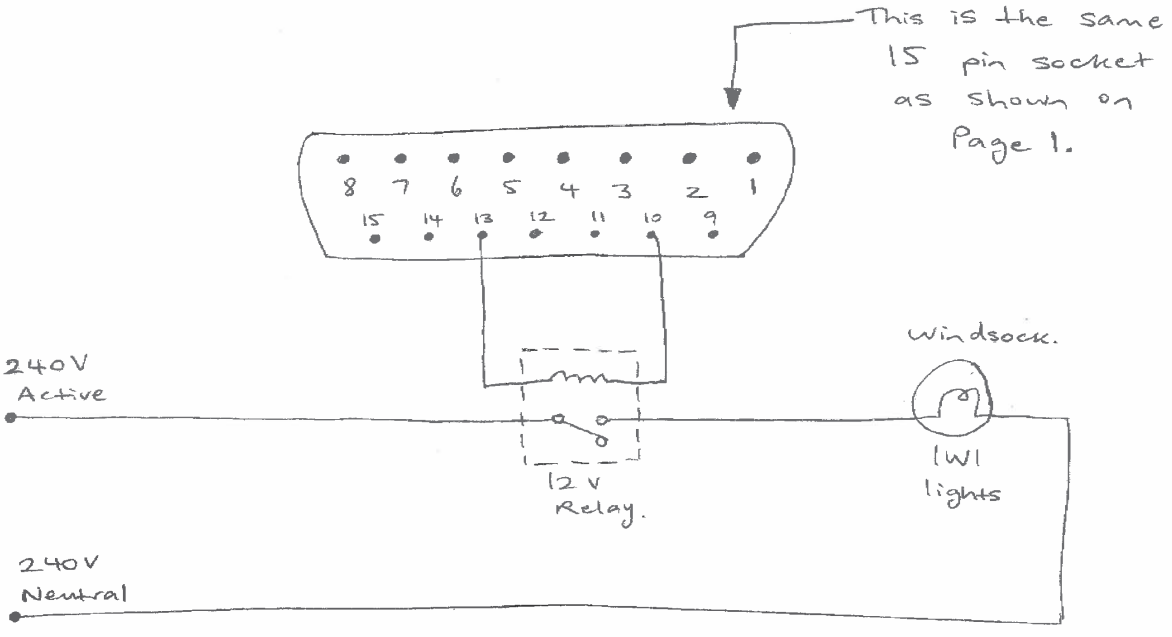
- Installation of the light sensor, by plugging it into the matching socket on the AFRU/PAALC chassis, will prevent the unit from operating as a PAALC by day.
- To allow the unit to operate as remote switch both day and night, simply do not connect the light sensor.
- If the sensor is used, it must be covered to test the PAALC operation in daytime.
- The device is fail safe. This means that when the PAALC is OFF, 12V is present to energise the relays. When the PAALC operates, 12V is removed, and the relay de-energises to operate the lighting system.
- Connections to the relay must me made to NORMALLY CLOSED contact sets. Otherwise the lights will be ON at all times, only turning OFF when the PAALC is operated.
- 12VDC relays are not supplied with the equipment.
- For confirmation of correct system operation, a feedback contact closure is required. This must be sensed from the final circuit in order to be effective. It may be a current sense relay, or a 12VAC relay connected to a standard series isolation transformer connected into the circuit within the control cubicle.



Bremer Circuit (Page 1)



WINDSOCK IWI CIRCUIT. (Page 2)



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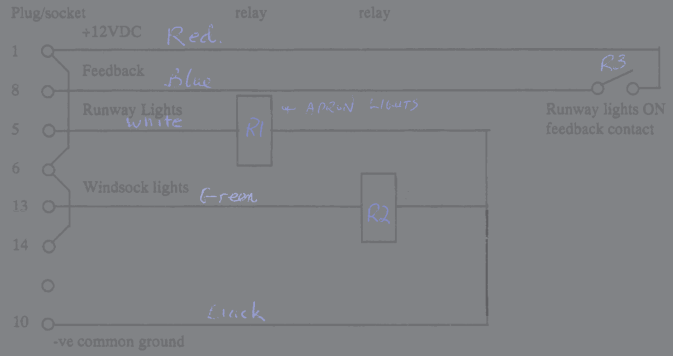

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- 12VDC relays are not supplied with the equipment.
- For confirmation of correct system operation, a feedback contact closure is required. This must be sensed from the final circuit in order to be effective. It may be a current sense relay, or a 12VAC relay connected to a standard series isolation transformer connected into the circuit within the control cubicle.

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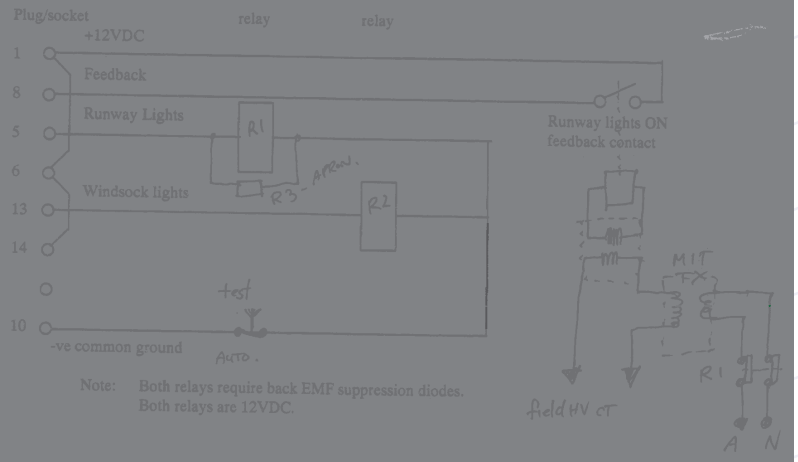

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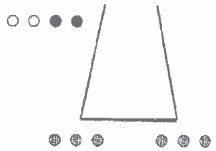


To : Naylor Contractors

Attention : Wally Naylor

Fax No : 08 9837 4106

Page : 1 of 1

Date : 23rd July 2002

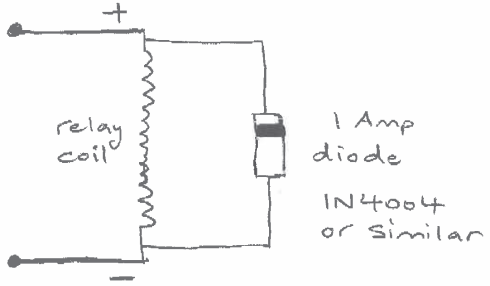
Subject : Bremer Bay

Dear Wally,

As discussed, diodes are required in the PAALC external circuit. A diode needs to be connected across each of the 12 Volt relay coils to suppress the back EMF caused by the field collapsing when the relay is de-energised.

A 1 Amp rated diode is required. A typical suitable diode would be IN4004. They cost about 50 cents each.

The band on the diode goes to the +ve end of the relay coil. Connect as per the diagram below -:



Regards,

G. P.

Glenn Paraman

Email address : glenn@airportlighting.com.au

Quality Endorsed Company

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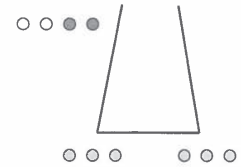

- "**3**" Enables alteration of the minimum time taken for a PTT ON application, and PTT OFF for the system to perform a re-set of timer and re-send of the recorded message. This is so as filtering of erratic Carrier Detection prevents inadvertent system re-set and speak. This adjustment is in 125 millisecond increments (1/8th second) from 00 to 99. The current timer value is displayed next to the menu function.
- "**4**" Enables alteration of the maximum time taken for a PTT ON application, and PTT OFF for the system to perform a re-set of timer and re-send of the recorded message. This is so as filtering of erratic Carrier Detection prevents inadvertent system re-set and speak. This adjustment is in 125 millisecond increments (1/8th second) from 00 to 99. The current timer value is displayed next to the menu function.
- "**5**" Enables alteration of the normal Carrier Detection time that the unit will wait before it realises that it must, on release of that carrier, perform a beep back or speech message play. This adjustment in 1 second increments from 00 to 99. The current timer value is displayed next to the menu function.
- **"m"** Selects the message to be recorded or to be played back if the test button is pressed. 1 = normal AFRU message. eg. "Airport MBZ". 2 = lights not operational message eg. "Negative Lights". 3 = lights are operational. eg. "Lights OK". 4 = lights have only 5 minutes to go. eg. "Lights Five Only". This message selection menu is only functional if the PAL option is fitted to your AFRU system.
- **"t"** Enables a delay to introduced to the system so as to prevent immediate beep or voice transmission. This feature is to stop two conflicting signals when two aerodromes are in close proximity. Aerodrome 1 will be delayed by aerodromes 2's voice message.
- **"l"** Allows for alteration of the total lights ON time. Valid times are 20,30,40,50,60,70,80,90.

3.2.c MONITORING & LOGGING SYSTEM ACTIVITY.
At all times that the beepback unit is active status will be reported to the communications port. This in no way slows or alters system performance in any way. Reports are listed below.

```
CD
NCD
TMR.RESET
TMR.CLR
TMR=4
BEEP
SPEAK
LIGHTS OFF
LIGHTS 5 MINS
LIGHTS AFFIRM
LIGHTS NEGATIVE
```

"CD"	signal received from radio.
"NCD"	signal ceased being received from radio.
"TMR.RESET"	5 minute timer has just been re-set to 5 minutes.
"TMR.CLR"	5 minute timer has elapsed. (next valid carrier will trigger speech)
"TMR=4"	5 minute timer has 4 minutes to go till elapsed.
"BEEP"	A beep has just occurred.
"SPEAK"	A speech ID has just occurred.
"LIGHTS AFFIRM"	Pilot Activated Lighting has been activated, and has come on OK.
"LIGHTS NEGATIVE"	Pilot Activated Lighting has been activated, but has failed to come on.
"LIGHTS OFF"	Pilot Activated Lighting has de-activated
"LIGHTS 10 MINS	Pilot Activated Lighting has only 10 minutes to run.

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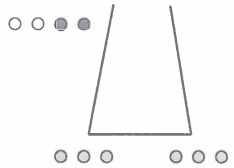

3.2.d REMOTE AERODROME MONITORING FACILITY.

This made is accessed via the set-up mode. When this mode is accessed (enter, then password, menu list) a "r" is sent to the system.
If this option is installed up to 6 variable parameters can be reported.
The resolution of these conditions is to 256 places, and could include details such as voltage, temperature, wind direction, wind velocity, etc, etc.
When a report is concluded the menu screen is re-displayed. From there operation is as per normal programming mode of operation.

4.1 PILOT ACTIVATED LIGHTING.

To enable this function (if fitted) the PAL switch must be placed to the "ON" position. Ambient light level conditions are provided by way of a remote light level sensor.
Output is by 2 separate relay contact closures. These are normally internally jumped to 12 volts DC. This will provide 12 VDC @ 1 amp. This voltage is used to provided switched power to external relay devices (N/C contacts) for the actual lighting circuitry. **NOTE *The out put is "fail-safe" in as much as it is actually a "hold-off" signal. 12 VDC is apparent at all times and drops to 0 VDC when lights are activated. This is so in case of a fault in the unit or wiring the lights will be ON rather than OFF.***
The lighting for the AD runway can be activated by the Pilot by simply pressing his transmit button 3 times in the normal AFRU re-set sequence on the MBZ or CTAF radio channel. The lights will come on for 30 minutes total. 10 minutes before lights off, the windsock light will flash at a 1 second rate, so as to indicate imminent lights off.
All lighting operations will be confirmed to the pilot by way of voice messages on the MBZ or CTAF. When the lights are switched on, the system will analyse if power has *actually* been switched to the lighting circuitry. If power is present the "affirm lights" message will be sent. If no power is sensed, the "lights negative" message will be sent.
So as to prevent PAL, unless it is dark, a remote ambient lighting sensor is provided to determine that it is in fact dark. So as to provide adjustment for this sensor a control knob is provided, and is located inside the cabinet of the system, so as to prevent accidental mal-adjustment.
If the unit "thinks" that it is dark the ALERT / FUNCTION LED will flash.

5.1 TAPE RECORDER INTERFACE OPTION.

This option will provide for the tape recording of all radio transmissions on the aerodrome radio frequency.
Using the provided lead, connect your tape recorder (with remote pause facility). The recorded volume level is adjusted by the Icom ICA-200 radio, volume control. Several test recordings may be necessary to optimise this record audio level.
The tape recorder is placed in the record mode and left on. When any receive signal is sensed by the AFRU unit, the tape recorder will be automatically UN-paused, and recording will take place. At any reasonable time the tape can be replayed for billing, or monitoring of aerodrome activity, etc.

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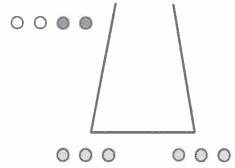

5.2 SPECIFICATIONS. ***(subject to improvement & change without notice)***

- Optional PAL lighting control. (Full failsafe switching!)
- Optional tape recorder output.
- Optional aerodrome remote monitoring. Monitor temperature, wind direction, wind speed, etc. via computer and modem from anywhere in the world with standard telephone modem & PC.
- Supplied as a control unit to be connected to existing VHF communications radio, or as a stand alone complete system.
- Stand Alone complete unit comes with type approved radio modified for AFRU operation (ACR272A or ACR203A base station spec.)
- Internal battery backup supply for 48 hour operation. (Less backup time can be offered at a reduced cost)
- Rack mount case, powder coated. (W = 480mm, H = 90mm, D = 350mm)
- Simple programming with single record & playback test press buttons.
- All timing parameters are adjustable (program via modem or PC) and are stored in non-volatile memory. (password protected)
- Record microphone supplied in cabinet.
- Recorded message test playback with optional monitor speaker.
- 20 second transmit carrier time out timer with alarm lamp indicator. (extra safe 1 min. TOT as well on request.)
- In battery back-up mode indicator lamp.
- Mains power indicator lamp.
- Microcontroller running OK indicator lamp.
- Carrier received indicator lamp.
- Transmit ON indicator lamp.
- Automatic P.A.L. (On MBZ / CTAF or on separate PAL radio channel)
- Up to 16 seconds of high quality speech.
- 1 KHZ beep tone for 300 milliseconds.
- Programmable transmit response time (00 to 99 X 50 milliseconds)
- Programmable transmitter lead in delay time (00 to 99 X 50 milliseconds)
- Programmable carrier off realise time (00 to 99 X 50 milliseconds)
- Programmable Speech re-trigger timer for minimum and maximum button press duration(01 to 99 X 125 milliseconds)
- Programmable transmit holdoff time timer in case of close proximity CTAF's. (00 to 99 X 50 milliseconds)
- Speech message replayed after 5 minutes of radio silence & receipt of carrier of > =2 seconds (programmable 1 to 99 seconds).
- Speech message re-played and 5 minute timer re-set if 3 sequential carrier bursts (3 X PTT clicks) received.
- Beep tone only transmitted after any 2 second, or more transmission received in the previous 5 minutes.
- Microprocessor watchdog & brown out detection and correction.
- Remote control & monitoring of 6 analog or digital inputs 8 bit resolution (0 to 256 increments) via modem port. (9600BPS, modem is not included)
- Antenna's & antenna cabling, etc. can be provided to suit and will be quoted on to suit needs.

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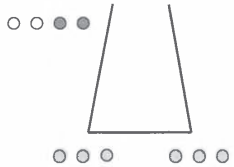
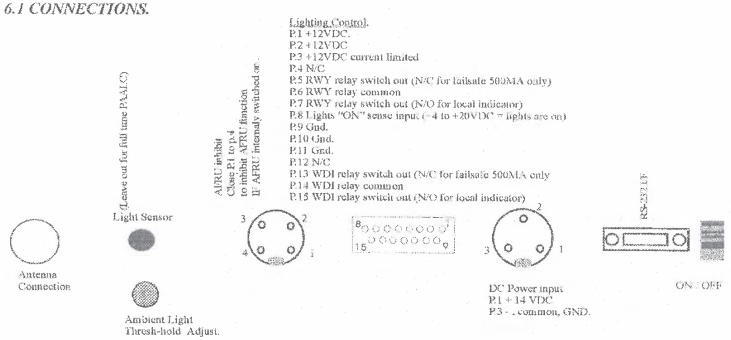


6.1 CONNECTIONS.



CONNECTIONS AS VIEWED FROM THR REAR OF THE RACK

6.2 COMMISSIONING & INSTALLATION OF UNIT.

- Crimp antenna connector to coaxial cable. Measure with ohm meter so as to ensure no short circuits. Open circuit should be evident from pin to body of connector.
- Connect antenna cable to antenna socket on top of case.
- Open case, by removing top cover.
- Locate positive (red) battery lead and remove black protective insulation tape from end.
- Turn "ON" the switch on the rear panel.
- Push positive battery cable clip onto positive battery terminal. "Battery mode" indicator will light.
- Connect switch mode power supply unit to power connector on side of case, and plug into 240 Volts mains supply. "Mains OK" indicator will light and "battery mode" indicator will extinguish.
- Switch unit on by switching the power switch down. Power switch is located on the printed circuit board module and is the left most switch on the unit. The "computer run" indicator will flash. "Beepback mode" indicator will light. All other lights, except "mains OK" should be off, unless unit is receiving or transmitting.
- Close case. Unit is now operational.
- If the unit or unit antenna is placed too close to some computer systems interference may result. Unit will need to be repositioned.
- Ensure position of unit is not subject to extremes of heat and weather. Reports of units in steel sheds in very hot weather have shown temporary heat failure due to temperature exceeding 60 degC.
- Ensure back EMF diodes are in place across relay coils, & no common / gnd. potential differences.

Lighting Control Lights IWI