



DATE 12 March, 2015

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Draft

Moruya Airport | Master Plan 2015

For Eurobodalla Shire Council

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Revision	Date	Description	Author	Signature	Verifier	Signature	Approver	Signature
0	23/01/15	PRELIMINARY	BJH		-		BJH	
1	23/02/15	DRAFT	BJH		BFW		BJH	
2	03/03/15	FINAL DRAFT	BJH		BFW		BJH	
3	12/03/15	FINAL DRAFT	BJH		BFW		BJH	

1.0 INTRODUCTION

REHBEIN Airport Consulting was commissioned by Eurobodalla Shire Council to prepare the Moruya Airport Master Plan 2015.

This Master Plan forms part of the Concept Phase of the Moruya Airport Redevelopment project. In that context it is an umbrella document which draws together and builds upon a number of subsidiary reports, specifically:

- The *Moruya Regional Airport Operational Plan* (currently Draft September 2014 – Version 2), prepared by Eurobodalla Shire Council, which addresses key common-user aviation operational considerations and infrastructure requirements;
- A *Pavement Assessment Report*, the key finding of which will be incorporate into future update of the operational plan; and
- The *Moruya Airport Passenger Service Plan* Stage 1 of which incorporates an analysis of the existing airline services. Stage 2 will provide an assessment and plan for growth in passenger traffic.

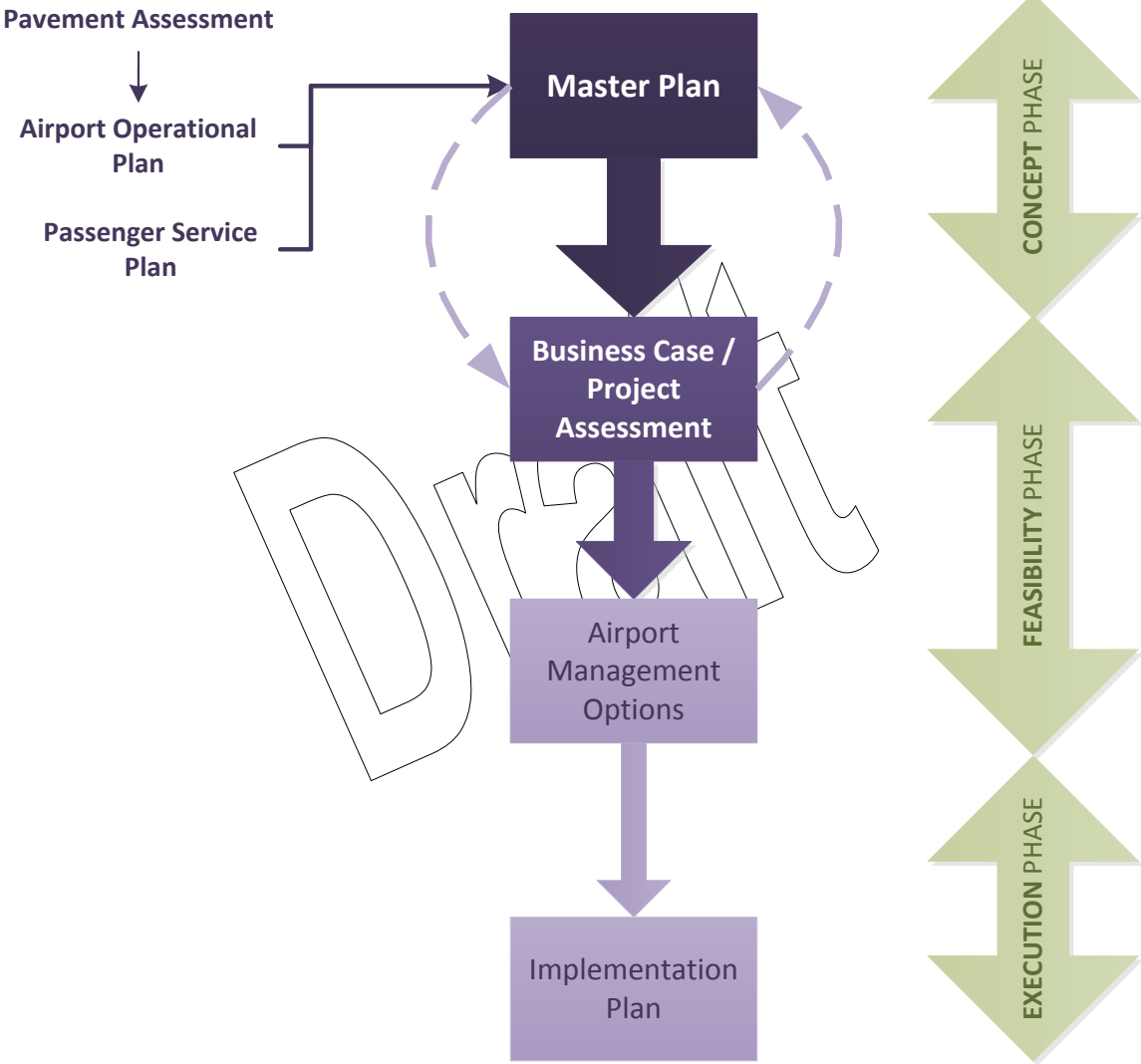
It is envisaged that the Master Plan, once adopted, will form the basis of a subsequent Feasibility Phase of the redevelopment project. This phase would build upon the high level research conducted to prepare this Master Plan, and will enable a greater level of certainty on the costs and benefits of particular developments in order to confirm the business case, appropriate scope and timing of redevelopment stages.

These elements are all part of the wider *Moruya Airport Redevelopment Project Plan*, which incorporates a Communications Plan detailing each step of public consultation.

Council is progressing some aspects of the feasibility phase in parallel with finalisation of this Master Plan, in order to accelerate the overall timeline for the airport redevelopment, whilst acknowledging that there is a high degree of interaction and dependency between these two elements in particular and that this might result in adjustments to the feasibility work once the Master Plan is confirmed and adopted.

Figure 1 below illustrates the relationships between the Master Plan and the other project documents.

Figure 1: Moruya Airport Redevelopment Project Elements



2.0 CURRENT AIRPORT STATUS

2.1 EXISTING FACILITIES

The existing Moruya Regional Airport infrastructure and facilities are described in detail in the *Moruya Regional Airport Operational Plan*. The key aspects are:

Runways

- Primary runway 18/36 which is 1,523m long and 30m wide, surveyed and built to Code 3C instrument non-precision approach standards;
- Secondary runway 04/22 which is 827m long and 18m wide. This runway is surveyed to Code 2 non-instrument standards and provided with a runway strip meeting Code 2 non-instrument requirements. The maintained width of 18m is suitable only for Code 1B aeroplanes, which is adequate for the current GA light aircraft which use this runway.

Taxiways and aircraft parking

- A main apron compliant in size for a single SAAB 340 sized aircraft and connected by a short taxiway to the Runway 18 threshold;
- Parking for general aviation aircraft and helicopters is on grassed areas adjacent to the apron and on grassed areas in the GA area.
- An aviation fuel facility which has a self-service fuelling system for both Jet A1 and AVGAS aviation fuels including two 20,000 litre fuel tanks.
- There are numerous other leased buildings erected on the airport to service the various businesses and aviation activities including 12 individual hangars that accommodate over 39 local aircraft. All of these businesses are established to the south of Runway 04/22 and west of runway 18/36. The leased sites are accessed via a sealed taxiway connecting to Runway 04/22.

Navigation Aids

- A non-directional beacon (NDB) which is a ground-based navigation aid system is located on the western side of the airport. This system is owned and operated by Airservices Australia with Council maintaining the area surrounding the tower. As part of changes to Airservices navigation aid network the NDB will be switched off in May 2016 and subsequently decommissioned.
- The aerodrome also has published satellite-based GNSS circling arrival procedures for all runways and a runway aligned RNAV-Z (GNSS) approach to Runway 18.

Terminal and Landside

- A small terminal building was built in the 1960's and is of concrete block and timber construction.

- A formalised, bitumen sealed car park is located to the east of the terminal which provides for 28 parking spaces including one designated disabled space. There is also provision for short term drop off adjacent to the terminal;
- The current access road is Bruce Cameron Drive which runs off George Bass Drive to the south of the airport and serves the terminal and campground. The existing general aviation development is accessed by a partially sealed road.
- There are no sealed access roads to the western side of the airport. There are various unsealed tracks that provide some access to and from areas to the west including the NDB and secondary (northern) windsock.

Services

- Services such as electricity and telecommunications are provided to all existing buildings and facilities on site. Electricity is single phase only. Water and sewer are managed by on site systems.
- There are no services provided to the western side of the airport precinct.

2.2 HISTORICAL TRAFFIC

2.2.1 PASSENGERS

Historical annual passenger numbers are presented in the Moruya Airport Operational Plan and summarised in **Chart 1**.

Annual growth since 1995-96 averages approximately 3.5%. Since the replacement of 19-seat Metroliner aircraft in 2004-05 with 34-seat SAAB 340 aircraft operated by Regional Express, at which point annual passenger numbers increased by around 50%, growth has averaged just 1.6% per year.

2.2.2 AIRCRAFT MOVEMENTS

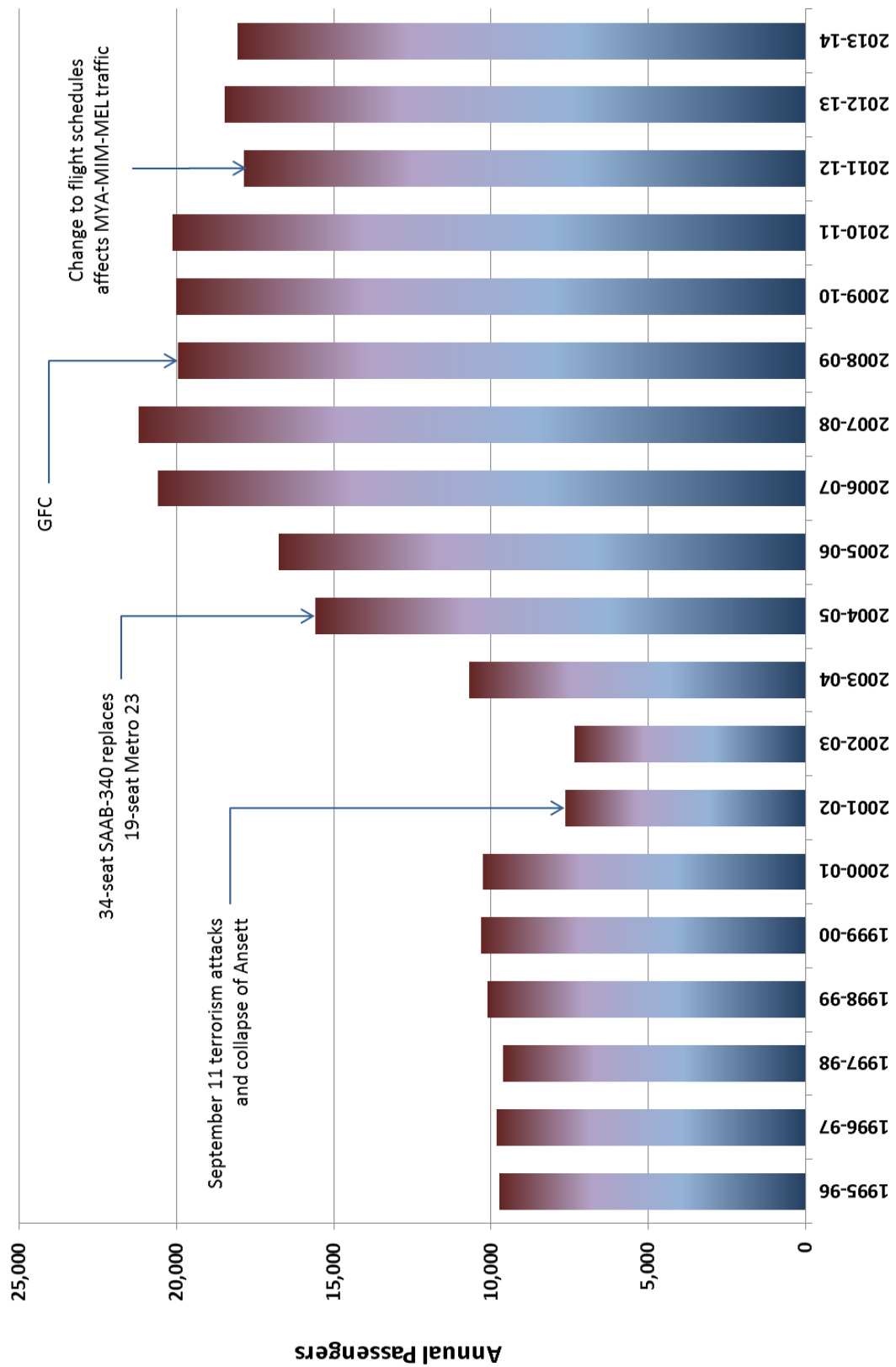
Historical annual aircraft movement numbers for the period 2004 through 2014 are summarised in **Chart 2**.

Regular Public Transport (RPT) movements have remained at a relatively constant over this period, being a function of the passenger demand, aircraft size and operating schedule.

General Aviation (GA) movements have increased significantly, more than doubling over the last 10 years from around 3,200 in 2004 to approximately 6,700 in 2014. This represents a compound annual growth rate (CAGR) of 7.6% for the 10 year period. This contrasts extremely favourably with national and global trends in general aviation activity which are generally static or, in many sectors, declining.

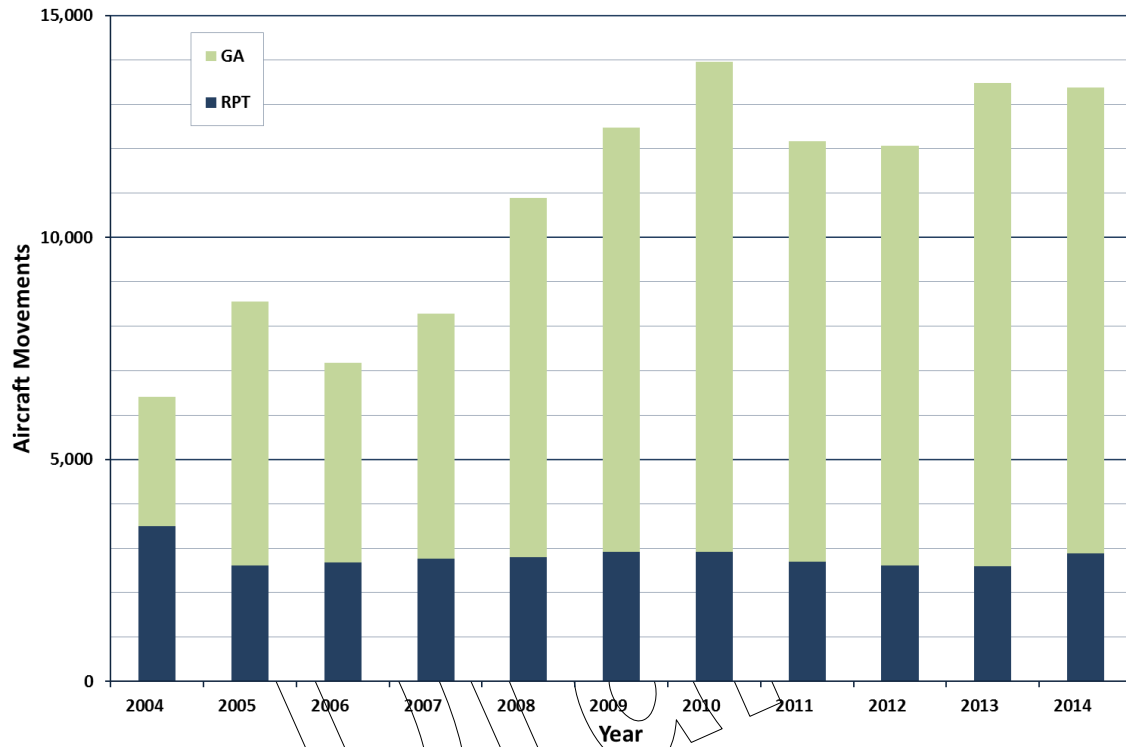
Chart 3 illustrates the number of aircraft movements by month, as an average over the years 2004 – 2014. January and December tend to be the busiest months, and June the quietest. This reflects both peak tourism seasons and typical weather patterns.

Chart 1: Historical Annual Passengers



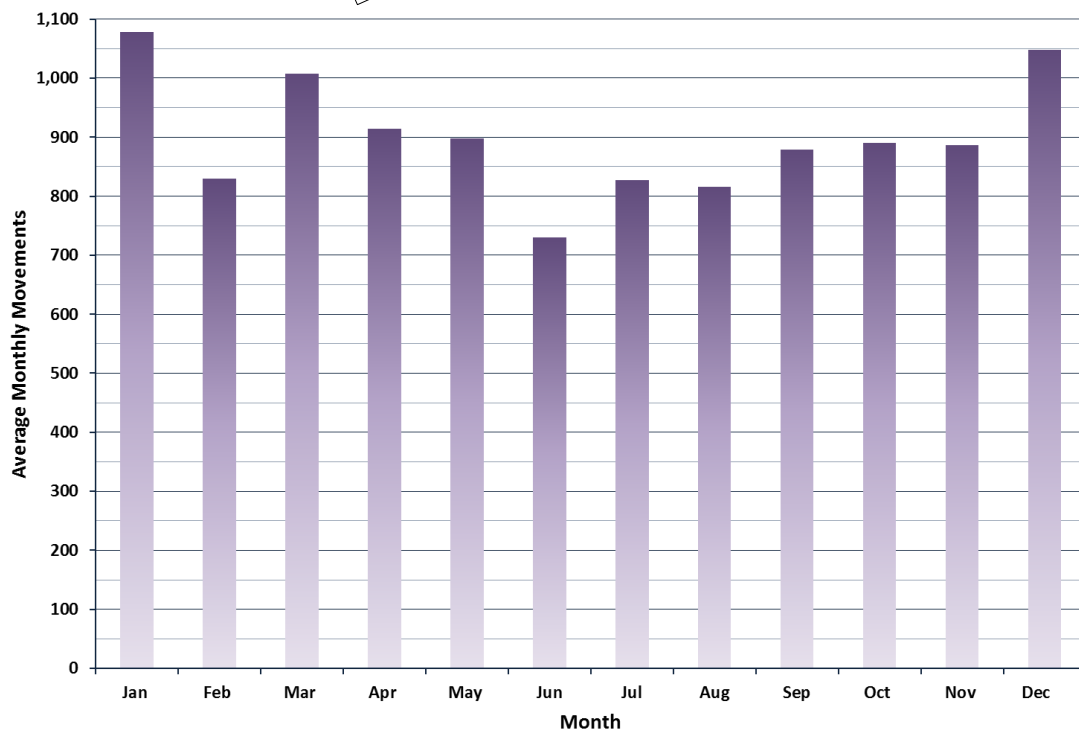
Source: Eurobodalla Shire Council

Chart 2: Historical Annual Aircraft Movements 2004 – 2014



Source: Eurobodalla Shire Council, BITRE

Chart 3: Aircraft Movements by Month 2004 – 2014



Source: Eurobodalla Shire Council

2.3 AVIATION BUSINESSES

The aerodrome enjoys a vibrant aviation business community. There are several local businesses that rely on the aerodrome to maintain viability, including the following.

Skydive Oz

A successful skydive business which operates tandem skydives from Merimbula, Canberra and around 20 towns and cities in regional NSW, in addition to Moruya. In Moruya Skydive Oz offers sport skydiving for qualified skydivers, week-long solo skydiving courses and a series of shorter courses. The company also offers professional skydiver training. It is one of only a handful of organisations on the east coast to do offer skydiving courses. Skydive Oz operates out of a purpose-built facility adjacent to the Moruya Aero Club. It is the busiest operator on the airport currently in terms of aircraft movements and employs 11 people.

Merit Aviation

Merit Aviation offers charter flights including a range of scenic tours, and also provides pilot training to RPL, PPL, CPL and instructor level. The proprietor is also Chief Flying Instructor for Moruya Aero Club Aviation, the flight training school of the Moruya Aero Club and coordinates the rental of short-term hangarage space. Merit Aviation has previously developed proposals for a multi-purpose facility providing flying training, aircraft storage, educational and conference areas and a café.

Sea Breeze Aviation

Sea Breeze Aviation is run by a qualified Licenced Aircraft Maintenance Engineer (LAME). The company services and maintains a range of light aeroplanes, float planes and helicopters. Installation of a paint spray booth is proposed which will operate as a standalone business creating an additional 2-3 jobs on the airport. 3-phase power is a critical enabler for this venture.

South Coast Seaplanes

Recently established at Moruya, South Coast Seaplanes offers a range of pleasure flights focussing on value-add products such as restaurant transfers, picnics and air taxi services.

The operation of float planes has some unique facility requirements, including a practical means of access between the aerodrome and the boat ramp, which are essential to the success of the business and which the company hopes Council will be able to accommodate.

Other operators with a significant presence on airport are the Moruya Aero Club and Westpac Surf Lifesaver helicopter base.

The Rural Fire Service (RFS) also operates regularly from Moruya during the bushfire season and has temporary facilities established to the north of the terminal and aviation fuel storage.

In addition to the aviation operators, Hertz operates a car, bus and truck hire business from the airport which also serves as the local office for customers not utilising the airport. This enhances the services provided to assist flying passengers. They occupy a service counter within the terminal building and an external car wash/garage facility adjacent to the terminal. Approximately 30% of customers are not airport users and therefore the aviation side of the business supports an additional car hire service to the wider community that may not be viable otherwise. Storage of hire vehicles is supplemented by using the airport car park.

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3.0 VISION AND STRATEGIC DIRECTION

3.1 AIRPORT VISION AND OBJECTIVES

The vision and strategic direction for Moruya Regional Airport is drawn from the approved *Eurobodalla Shire Council Moruya Airport Redevelopment Project Plan*¹.

“Under the Community Strategic Plan, the following objectives are relevant to the redevelopment of Moruya Airport:

- *5.1 Plan for and develop the right assets and infrastructure; and*
- *5.2 Support the growth of our business community.*

Within the delivery program 2013-17, under Business Activities, consideration of airport development supports the goal of ‘Manage Council’s activities to achieve a return for the Community’. Council wishes to explore opportunities for vacant land surrounding the airport’s operations to be developed for commercial and potential residential investment. Development of these lands will assist the continuing viability of the airport as an important regional air transport link and help fund airport infrastructure ... into the future.”

3.2 OPERATIONAL PLANNING

3.2.1 FORECAST PASSENGER NUMBERS

The *Moruya Airport Operational Plan* sets out lower and upper passenger growth rates of 1.6% and 3.7% respectively to estimate future passenger numbers. Demand for passenger services is based on a wide variety of factors including population base, the local economy, employment opportunities, tourism potential, alternative travel modes and ticket price.

Stage 2 of the *Moruya Airport Passenger Service Plan*, currently in preparation, will provide a detailed assessment of future passenger traffic. However, for the purposes of this Master Plan, some general observations about passenger growth can be made.

Tourism-focussed destinations in northern NSW, in particular Coffs Harbour and Ballina, experienced large increases in passenger numbers in the period 2005-2010, primarily as a result of the introduction of low-cost leisure-oriented airline services with one-way fares typically under \$100. Moruya Airport is currently not capable of accommodating the types of aircraft (Code 4C aeroplanes such as the Boeing 737 and A320) that low-cost airlines would need to operate in order to offer similar fare structures to the north coast NSW destinations. However, there are other factors than airport infrastructure which dictate the appropriate operating aircraft type. Port Macquarie is perhaps the most comparable with Moruya, although there remain some significant differences as the catchment population for Port Macquarie (both inbound and outbound) is

¹ Project Management Guide Moruya Airport Redevelopment E13.7122 8 August 2014 Version Number 1.1

substantially larger than that for Moruya. Port Macquarie is served by 68-seat ATR-72 and 74-seat Q400 aeroplanes.

3.2.2 CRITICAL AIRCRAFT

The critical passenger aircraft for the Moruya Airport for the short to medium term (10–20 years) is the 34 seat SAAB 340 which is currently in use. Beyond this period (20–30 years) it is likely that larger turbo-prop passenger aircraft such as the 74 seat Dash-8-Q400 currently operated by Qantas or the 68-seat ATR -72 currently operated by Virgin Australia will be in use. Beyond this, it is considered that there is a remote possibility 100–120 seat regional jet aircraft such as the Fokker 100 Boeing 717-200 or Embraer E170 might operate to Moruya in the long-term.

Although they vary substantially in size and capacity, the SAAB-340, Q400, ATR-72, F100, B717 and E170 are all Code 3C aircraft. From a planning perspective, this supports the adoption of Code 3C as the critical design aircraft for the airport in terms of the spatial configuration of aerodrome infrastructure. Major upgrades to pavement strength and lighting on Runway 18/36, the main taxiway and apron would be required to accommodate any aircraft larger than the current SAAB-340 operations. The cost of these upgrades would be substantial.

To achieve the requirements for Code 4C aeroplanes, which are even larger still, would be impractical on the current site without inhibiting any future development and would also require removal of almost all existing development and vegetation in order to accommodate the applicable safety clearance requirements.

In terms of general aviation, Code 2B is considered to be the appropriate reference code for planning purposes, with some taxiway and parking areas restricted to Code A light aircraft only.

3.2.3 RUNWAYS

The operational planning for runways described in the Moruya Airport Operational Plan will meet the requirements of the critical aircraft categories set out in **Section 3.2.2** above. The potential extension of Runway 18/36 to 1,800m should be protected to ensure the full range of code 3C aeroplanes can be accommodated at Moruya in future if passenger growth demands.

3.2.4 AIRSPACE PROTECTION

A set of Obstacle Limitation Surfaces (OLS) associated with a Code 3C instrument non-precision approach Runway 18/36 1,800m long and a Code 2B non-instrument Runway 04/22 maintained at the existing length has been prepared and is shown in **Figure C**.

In addition to the OLS, Eurobodalla Shire Council must also protect the PANS-OPS surfaces for existing and future non-precision instrument approaches. These include visual segment surfaces which are more restrictive than the Code 3C non-precision approach OLS over certain areas close to the runway.

4.0 STAKEHOLDER CONSULTATION

4.1 COMMUNICATIONS AND CONSULTATION

Eurobodalla Shire Council has engaged in discussions with stakeholders regarding the future development of the Moruya Regional Airport over recent years. In addition to drawing on these discussions, further consultation was undertaken on 8 and 9 December 2014. The following organisations and representatives engaged in the most recent discussions:

Paul Smith	Skydive Oz
Brian Cowden	Moruya Jockey Club
Gary Green	Recreational aircraft owner
Ted Radcliffe	T-hangar owner
Dave Fardell & Brad Avis	Moruya Aero Club
Tim Gilbo	South Coast Seaplanes
Nutsy & Natalie Fairweather	South Coast Seaplanes & Sea Breeze Aviation
Simon May	NSW Rural Fire Service
Sheldon Jones	Merit Aviation

4.2 STAKEHOLDER FEEDBACK SUMMARY

The following is a summary of the key feedback points raised during the stakeholder consultation. Points specific to individual businesses are identified in **Section 2.3**. Some points raised within the stakeholder consultation are considered commercial-in-confidence or otherwise confidential and are therefore not stated in this document.

- Growth in passenger operations beyond 70-seat turbo-prop aircraft operations is considered highly unlikely.
- The ability for short-term accommodation associated with commercial aviation businesses is essential to the viability of these businesses to operate at Moruya.
- This is a fantastic airport for recreational pilots. Nonetheless it should not be a drain on Council's financial resources and there is no expectation that private aviation should be subsidised by ratepayers.
- Lease conditions historically offered by Council have been impractical and overly onerous for both private tenants and commercial businesses. This is seen as the most significant impediment to development of the airport. Many users have sought to engage with Council to negotiate more commercially feasible terms in order to prepare a viable business case for potential investment. However to date Council has seemed unwilling or unable to participate in meaningful discussions and this has resulted in a perception among many

users that Council's processes discourage development at the airport. A 40-50 year lease is considered necessary for small businesses to obtain reasonable finance terms².

- Council must be realistic in the assumed value that may be realised from the sale of any residential lots. Figures which have been floated in the recent past have seemed unrealistically high.
- Provision of basic infrastructure including 3-phase power is a higher priority for existing businesses than an upgrade of the terminal facilities which are functional, although there is acknowledgement that an improvement in terminal facilities would be welcome including café facilities which might be utilised by campground occupants.
- Deciding on a final master plan is laudable, but it will be essential that Council also has the appropriate policies and processes to ensure development opportunities are realised.
- There are significant and commercially viable opportunities to develop private aircraft storage hangars, with reported cost of over \$10,000 per year at Canberra Airport to park an aircraft on grassed areas and aircraft owners displaced from Goulburn following issues there.
- A semi-industrial area, not necessarily aviation related, could be considered.

² It is acknowledged that legal restrictions in NSW require formal subdivision of land for lease periods longer than 5 years. For this reason, a number of regional airports in NSW have historically offered 5-year lease terms since their transfer to local government ownership in the 1990s. However, the standard leases offered by the Federal Airports Corporation (FAC) were for 25 years with 40 year tenure available for special developments. A number of regional airports are now considering 20 years as a minimum lease period, often with extension options, and accepting that the costs associated with formal subdivision are a necessary enabler for economic and business development.

5.0 DEVELOPMENT OPPORTUNITIES

5.1 PASSENGER OPERATIONS

5.1.1 PASSENGER TRAFFIC FORECASTS

At the time of drafting the Moruya Airport Master Plan, the Moruya Airport Passenger Service Plan was under preparation. The Passenger Service Plan will provide additional detail in relation to airline route viability, future markets and air service destinations, and expected operating aircraft types.

Phase 1 of the Passenger Service Plan entailed a detailed assessment of the current and recent historical performance of Regional Express Airlines' (Rex) Sydney-Moruya route³. This assessment was conducted in order to provide Eurobodalla Shire Council with an objective, balanced and detailed understanding of the viability of ongoing services to Moruya. The assessment found that the Sydney-Moruya/Merimbula services appear to be both viable and one of Rex's strongest regional routes in New South Wales. However, this does not mean that the route is highly profitable for Rex; the analysis also found that the profit margin of this route is likely to be limited to approximately 5% of total route revenues.

The Moruya/Merimbula route performs well in part due to strong overall demand relative to capacity, resulting in relatively high load factors on the route. Moruya accounts for approximately one in every three of Rex's South Coast passengers, with Merimbula traffic accounting for two-thirds of demand. While Moruya's share of overall traffic has increased, overall demand is still dominated by traffic to and from Merimbula. The assessment also identified that Moruya is relatively well-served by frequencies to and from Sydney, and Rex is uniquely positioned in the Australian market to offer this (high) level of frequency, and alternative airlines would likely have an inferior offering in this market.

Pending completion of Phase 2 of the Passenger Service Plan, the Moruya Airport Operational Plan includes predictive passenger numbers for the next 30 years based on upper- and lower-bound annual growth rates of 3.7% and 1.6% respectively. Based on this assessment the Moruya Airport Operational Plan concludes that:

- The Sydney-Moruya route is likely to remain below the current threshold for NSW regulated routes of 50,000 annual passengers for the next 30 years and therefore will continue to be operated by a single airline; and
- The current SAAB 340 operating aircraft type probably has at least 10-20 years of economic operating life remaining.

³ Moruya Airport Commercial Service Assessment Phase One, Final Draft, Ailevon Pacific Aviation Consulting.

More optimistic growth scenarios by comparison with regional centres such as Port Macquarie suggest that regular operations by 50-70 seat turboprop aircraft might occur in the 10-20 year timeframe.

Continuing to work with other local RPT airports, especially Canberra and Merimbula, to examine potential new passenger service routes will be important in ensuring growth opportunities are fully realised.

5.1.2 PASSENGER TERMINAL FACILITIES

Some expansion of the existing apron and terminal facilities will be required over time. Optimistic growth might require a terminal footprint of 1,000m² and 200 – 200 car parking spaces. Apron parking for up to two (2) Q400/ATR 72 and two (2) smaller SAAB 340 aircraft might be required. Although this is considered unlikely as a simultaneous parking demand, provision for this scenario would also accommodate lower frequency operations by 70-120 seat regional jet aircraft types such as the E170, F100 or B717.

5.2 COMMERCIAL AVIATION BUSINESSES

Through consideration of the characteristics of Moruya Regional Airport and general trends in the aviation industry, the following key opportunities have been identified.

Skydiving The current skydive operator has a successful business which also operates throughout NSW and interstate. It is one of only a few companies offering skydive training. Combined with Moruya's attractive setting and desirability as a leisure destination, this offers considerable potential for growth and for synergies with other tourism operators.

Pilot Training Pilot training can be separated into two broad groups. Airline academies provide high-intensity training to large volumes of mostly international cadets each year. These academies usually throughput 200 or more graduates per year, with around 150 on site at any time, and require an integrated campus incorporating accommodation, education, training and maintenance facilities occupying several thousand square metres. Such academies generate high-intensity flying operations with large volumes of touch-and-go circuits needing to be completed as efficiently as possible. Such academies are generally incompatible with significant volumes of other aviation activity and are increasingly concentrated at major metropolitan GA airports such as Bankstown in Sydney, Moorabbin in Melbourne, Parafield in Adelaide and Jandakot in Perth. These airport each handle several hundred thousand aircraft movements per year, the majority of which are related to the training of commercial airline pilots. In the case of Moruya, RPT operations would limit the availability of airspace for pilot training, which when it did occur would most likely restrict the ability to perform skydive drops to the airport.

On the other hand, recreational and private pilot training, or independent training of individuals towards commercial licences, is generally a more relaxed affair. The location of Moruya Airport would make it extremely attractive to trainee pilots in these categories as a place to combine training activities with other pursuits and enjoyment of the local area. Given that there are also increasing pressures (both commercial and operationally) for non-intensive pilot training businesses to relocate from the major metropolitan GA airports, it is considered that there are significant opportunities for such businesses to establish or relocate their operations at Moruya.

Charter and Merit Aviation and South Coast Seaplanes already offer scenic flights and a range of other leisure-

Pleasure flights	<p>based charters and pleasure flight opportunities. There is evident potential for growth in this sector in combination with increased tourism visitation in general and airport-based tourism in particular.</p> <p>Users of charter and pleasure flights by their nature tend to have relatively high disposable incomes, and so subsidiary opportunities for businesses serving impulse opportunities would seem to also have high potential. Restaurant and café offerings taking advantage of the scenic river and coastal location would seem to be an obvious possibility.</p>
Fixed-base operator	<p>Somewhat distinct from a charter operator, although potentially part of the same business operation, a fixed base operator (FBO) offers servicing for itinerant private, corporate and charter aircraft. In addition to aeronautical services such as re-fuelling, aircraft cleaning, line maintenance, and aircraft parking/storage this can include the provision of basic auxiliary services to pilots, flight crew and passengers. Again, catering to high-end visitors and in combination with the associated tourism draws to generate the itinerant aircraft demand, it is likely that the need for a FBO would develop over time.</p>
Aircraft maintenance	<p>As the number of aircraft based on the airport grows, and as the amenities available to visiting pilots increase, opportunities for the expansion of existing aircraft maintenance services will increase. As this grows, the viability of subsidiary specialist services such as avionics and aircraft interiors (seats & upholstery) will also grow.</p>

Some immediate and tangible opportunities for the expansion of existing aviation businesses and establishment of new ones were identified through the stakeholder consultation. These include:

- Sea plane charter tourism operations, to be operated by South Coast Seaplanes;
- A multi-use facility incorporating pilot training, small aircraft charter, educational and meeting facilities and a café; and
- Additional communal hangar facilities.

These operations would provide additional business to existing on-airport maintenance businesses and increase the viability of additional similar businesses establishing at Moruya.

In the longer-term (subject to obtaining funding) the Rural Fire Service (RFS) has indicated a desire to establish a fire base facility at Moruya, similar to recent development undertaken at Wagga Wagga. This would include an office building with administration, operational and crew facilities, water and fire retardant storage tanks and an aircraft refilling pad. Although more likely to occur over a 5-10 year timeframe, this development could be a staged approach with interim facilities located to suit a longer-term development.

5.3 PRIVATE AIRCRAFT STORAGE

A tangible and immediate demand for hangar storage space for light aircraft was also evident from the stakeholder consultation. The manner for delivery of this might be through the lease of individual lots to aircraft owners, or through a commercial arrangement whereby a developer leases a larger lot and constructs the hangar then charges users to occupy space. Both models are likely to be in demand and would serve distinct sectors of the market with differing needs.

Demand for hangarage from aircraft owners at Canberra and Goulburn airports is reportedly apparent, and this is expected to continue as there are very few practical alternatives.

5.4 AVIATION TOURISM

The location and aspect of Moruya Regional Airport is unique among similar facilities in Australia. When combined with the existing tourism-focussed aviation businesses operating from the airport the prospects for future growth of these businesses, and the opportunities for attracting further tourism-related activity to the airport, it is considered that a significant opportunity exists to develop tourism facilities which are geared towards the aviation activity at the airport. In fact, various concepts in this vein have been proposed since the 1960s.

The potential development could include holiday units at various levels of luxury with the option to park or hangar aircraft adjacent. Potential users of such facilities might include:

- Customers of aviation businesses including skydiving and pilot training;
- Light aircraft owners wishing to fly-in and stay overnight, or for a longer holiday;
- Private, business or corporate aviation users making short visits to Moruya; and
- Whilst the primary objective would be to serve aviation users, the accommodation could also be made available to non-aviation guests subject to demand in order to maximise the viability of the venture.

The nature and breakdown of the accommodation offer will need to be defined in detail and will include a mix of accommodation types be based on best commercial return. However it is considered that with the appropriate market research there could be potential for several broad levels of accommodation ranging from powered camping sites; motel-style units; self-contained apartments and/or luxury eco-cabins, or even medium density 'airpark' style chalet development.

The level of demand for such an offer is not proven, as it is a relatively innovative proposition with limited precedent against which to benchmark. However, Moruya Airport is one of a very small number of airports in Australia which offers the factors considered necessary for such an idea to succeed. It is therefore considered that if such a proposal proves not to be viable at Moruya, then it is unlikely to be so anywhere. On this basis the proposals are considered to warrant further detailed investigation and definition through the feasibility stage. At a qualitative level there was broad support for such a concept across the stakeholders consulted.

5.5 RESIDENTIAL AIRPARK

Airparks provide direct access to airfields and runways alongside residential dwellings. The demand for hangar accommodation combined with residence is becoming increasingly popular in Australia and can, in general, be considered an important growth sector. A number of factors however contribute to the success of an airpark development, including resident demographics, facilities and safety standards.

There are several successful airparks within Australia and these include the Whitsunday Aviation Village Estate, Gatton Airpark in Queensland, Yarrawonga in Victoria and Temora in New South

Wales. The Whitsunday Aviation Village Estate and Temora Park incorporate residential and commercial precincts. The Gatton Airpark is residential only, however, the residents own the airpark. There are airparks in planning stages located in Gympie, Queensland, and Denmark, Western Australia.

Airparks appeal to a certain demographic, which generally includes: aviation enthusiasts, charter businesses and holiday-makers. Key motivations for choosing to live in an airpark include:

- Sharing a common interest with like-minded people;
- A ready availability of aviation infrastructure; and
- The high level of security and convenience provided.

Airport-related amenity issues, such as potential noise from aircraft, are understood and are expected by residents.

According to a study of airparks in the USA, the estates generally consist of people, aged over 50 who are semi-retired professionals, with significant assets and moderate to high disposable income. They also have time available to fly and maintain their own aircraft. This selective demographic may also be attracted to the investment potential of airparks because there are few parks and property values within them are high, relative to similar property. No such studies are available in relation to Australian airparks, although there is no reason to suggest the findings would be different.

At a minimum, airparks must adhere to the relevant Civil Aviation Safety Authority (CASA) guidelines in relation to infrastructure, technical support and resident-use amenity. However, there is no requirement for airparks to be licensed. It should be noted however that none of the existing airpark developments are at airports which also serve airline operations and therefore the requirements in relation to segregation and control of airpark users with respect to safety and security have never been fully tested in Australia. Generally, resident access to the runway, taxiway and terminal areas has to be monitored and this requires a security system that can be accessed via a key pad or swipe card together with a limited number of taxiway connections to the airfield proper.

Lot size differs and depends on the location of the airpark, but general lot size falls between 800m² and 2,500m². The price of lots also varies, depending on the location and the facilities offered on site and the surrounding areas.

Uncontrolled and uncongested airspace is often a consideration among many potential airpark residents. The ability to incorporate both recreation and commercial facilities within an airpark also contributes to its success. These facilities may include businesses of the type currently established at Moruya such as scenic flying tours, charter flying, flight training and aircraft maintenance.

Anecdotal reports regarding the potential demand for residential airpark lots at Moruya is mixed, with suggestions that up to 40 lots were 'sold' off plan when the concept was mooted in the 1990s. However other feedback suggests that there is a general disdain for the idea. One important factor

to consider is to ensure that any development is in keeping with aspirations regarding nature and quality of the airport development as a whole, and that development guidelines are suitably clear on what is acceptable.

For a variety of reasons, long-leasehold arrangements provide greater power to ensure users comply with safety, security and general behavioural requirements. However, to encourage the investment needed to achieve a quality development freehold tenure may be necessary.

5.6 ADJACENT DEVELOPMENT

A major redevelopment of the Moruya Jockey Club facilities adjacent to the airport on the western side of George Bass Drive is proposed, subject to availability of grant funding, to develop an equestrian events centre. The development is expected to include around 80 powered camping lots for use by event attendees.

There are opportunities to promote synergies between the airport and the events which might take place at the equestrian centre, including packages for instance to include skydiving or float plane activities.

If this development proceeds it will essentially create a wider activity precinct centred on George Bass Drive on the western side of the airport. The Jockey Club development has the potential to create additional demand for non-aviation services and commercial offers in the adjoining parts of the airport land.

6.0 LAND USE PRECINCT CONCEPT PLAN

A land use precinct concept plan has been prepared to guide the redevelopment of Moruya Regional Airport in the short-, medium- and long-term. The land use precinct concept plan is presented at **Figure A** (refer Appendix A).

The adjacencies and relationships between precincts indicated on the land use precinct concept plan should be maintained to preserve the intent of the Master Plan. However, the plan incorporates flexibility with respect to the precise boundaries between some of the precincts, to allow for uncertainties in relative demand for various uses. In particular, the boundaries between land uses in the north-west of the airport should be subject to review as development proceeds. Staging is discussed further in **Section 7.1** but should be undertaken so as to maintain the maximum possible flexibility to adjust the relative extents of various land uses over time.

It should be noted that the layout of lots within the land use precinct concept plan is indicative at this stage. Although spatial proving has been undertaken based on relevant aviation clearances and typical road reserve widths, detailed design of road alignments has not been completed. Fire overlays, setbacks, native vegetation and biodiversity area requirements, and other specific constraints which may need to be considered at the detailed planning stage may affect the precise arrangement and number of lots which may be feasible in each precinct.

Access to George Bass Drive will be via a single intersection with appropriate turning lanes. An appropriate vegetated buffer would be retained between George Bass Drive and any development as identified in the biocertification analysis.

6.1 PASSENGER OPERATIONS PRECINCT

Background and Need

Previous development concepts have identified the development of a precinct dedicated to passenger operations on the western side of the airport. This has been in response to an expected need for terminal, apron and car parking facilities to expand in response to increasing passenger movements and the introduction of larger aircraft.

Although relocation of the terminal, car park and associated activity from the existing location is not considered absolutely essential for the purposes of accommodating likely passenger operations, some expansion of the existing apron and terminal facilities will be required over time. Constraints imposed by the adjacent campground will cause pressure on facilities such as car parking and are therefore likely to cause any expansion in the existing location to be sub-optimal. Should any of the more optimistic scenarios in relation to airline traffic occur then the facilities required to accommodate these would not be possible in the current location. A passenger operations precinct has therefore been identified on the western side of the airport in the medium to long term.

Precinct Objectives

- To provide high-quality terminal, apron and car parking facilities appropriate to realistic prospects for airline and larger charter aircraft operations in the medium-term, whilst ensuring flexibility to cater for any long-term potential passenger traffic scenarios.
- To enable Eurobodalla Shire Council to maximise the commercial viability of the airport by enabling a range of appropriate value-adding commercial activities, that will enhance the amenity to all airport users.

Location and Development Considerations

In order to accommodate parking of aircraft up to Code 3C size (with tail heights up to 9m which must be clear of the OLS), terminal, associated airport operations areas, car parking and road access, significant distance between the runway and any site boundary is required. The proposed location of this precinct is within the widest section of the western side of the airport, thereby offering the greatest flexibility to accommodate the necessary facilities associated with passenger operations.

The central location also enables this precinct to form a hub around which other development occurs, helping to achieve a critical mass of activity which can contribute to the viability of non-aviation businesses supporting general activity on the airport.

The passenger operations precinct makes allowance for the following:

- An apron capable of accommodating in its ultimate arrangement two (2) Q400 or ATR-72 in addition to two (2) SAAB 340 aircraft;
- A terminal footprint of approximately 1,000m² (nominally 40m x 25m), should this be required to incorporate the passenger and checked baggage security screening requirements associated with larger aircraft;
- Up to 6,000m² of car parking (approximately 250 spaces);
- An airport operations zone for safety vehicles, ground servicing equipment, electrical switchboards, airfield lighting control emergency generator and other essential airport operational facilities;
- An aviation fuel storage compound with access from landside and airside for refuelling trucks (for Jet A-1 users) and a taxi-up capability for AVGAS bowser;
- Ten (10) lease lots of between 750-1,200m² suitable for commercial use such as offices, service station, mini-mart, car rental services, travel agent or other tourism-related or airport-related businesses; and
- The opportunity to provide a wide boulevard entry to the airport along an axis approximately representing the previous east-west runway running through to the terminal and main apron beyond.

Development on such a scale, and relocation of the existing (functional) terminal facilities is not currently justified on economic grounds. Even when development of this precinct does occur, it is

envisaged that a staged approach will be adopted, commensurate with levels of demand and a suitable business case.

Council has plans for a minor terminal upgrade on the current site, and this will improve the facilities for passengers to a modest degree in the immediate term. By undertaking some modest alterations and additional to the existing terminal now, expected passenger growth for the short- to medium-term can be accommodated in an economical and affordable way. The possible triggers for relocation of the passenger operations facilities from the current location are considered to be:

- Growth in passenger numbers beyond that currently expected, or the introduction of larger operating aircraft types which cannot be accommodated by the existing facilities;
- A commercial imperative because of the value of aviation tourism development on the current terminal site (see **Section 6.4**); or
- Commercial benefits as a result of generating a 'critical mass' of activity on the western side of the airport, in conjunction with adjacent development. Such critical mass might mean that there are synergies in concentrating demand for airport-related services (e.g. rental cars, food and beverage offers, convenience retail, other commercial sites) rather than splitting this into geographically separate zones.

Beyond the current plans for modest enhancement of the existing terminal facilities, further significant investment in the current passenger facilities may be more economically beneficial if diverted towards establishing the relocated Passenger Operations Precinct. The business case for such relocation should be therefore be kept under continual review and routinely assessed prior to proceeding with any investment relating to passenger terminal or apron facilities, to ensure the most economically advantageous timing for relocation of facilities is implemented.

6.2 COMMERCIAL AVIATION BUSINESS PRECINCT

Background and Need

Tangible opportunities have been identified through the stakeholder consultation for potential development of further commercial aviation businesses on the airport, subject to the availability of suitable lease lots. In addition, it is expected that increasing pressure on airports such as Bankstown and the uncertainty associated with the long-term future of Camden Airport, will lead to other opportunities to attract aviation businesses to locate at Moruya.

Precinct Objectives

- Provide adequate opportunities for aviation businesses to establish at Moruya Regional Airport.

Location and Development Considerations

For a range of reasons, it is desirable from an operational perspective to separate active aviation businesses from recreational aircraft storage. Lot sizes adequate to accommodate aircraft of various sizes from small single engine aircraft to 18-seat twin turboprop types are needed as commercial operators often utilise or service a range of different aircraft types. Operational hangars

need to accommodate offices and workshops and provide sufficient room to work around aircraft in addition to providing basic shelter. Wider taxiway routes to accommodate the larger aircraft. All of this means that greater space is generally required for a commercial aviation subdivision than for private aircraft storage.

A dedicated precinct for commercial aviation operations is proposed adjacent to the passenger operations precinct. In order to take full advantage of the deeper parts of the available site, and to emphasise the commercial viability of the passenger operations precinct as a hub for all airport operations, the commercial aviation business precinct is proposed on both sides of the passenger operations precinct.

The southern section of the precinct would logically be developed first, as it is the closest to existing utilities connections. This allows the area to be developed independently of any relocation of the terminal operations. The southern section itself could be developed in sub-stages and ultimately provides:

- Approximately 20 direct airside accessible lots of 1,500-1,700m² in size and suitable to accommodate an operational hangar and leased external aircraft parking area for Code B aeroplanes (up to 24m wingspan);
- One (1) larger airside lot of around 4,000m² total area that would be suitable for an RFS aerial fire-fighting operations base;
- One (1) larger airside lot of around 6,000m² with direct frontage to George Bass Drive that would be suitable for a premium business operation;
- Approximately five (5) lots without airside access between 1,250m² and 2,200m² in size, which would be suitable for light industrial use by businesses supporting aviation business but not requiring direct access to the airfield.

The northern section could accommodate a further twelve (12) standard 35m wide by 50m deep lots suitable to accommodate an operational hangar and leased external aircraft parking area for Code B aeroplanes.

6.3 PRIVATE AIRCRAFT STORAGE PRECINCT

Background and Need

Regardless of whether the manner of satisfying this opportunity is commercial in nature or directly with private individuals, the operational requirements of private aircraft users are different from the needs of commercial aircraft operators. This type of use therefore warrants a distinct precinct where private aircraft storage can be concentrated.

Precinct Objectives

- To provide an area where a range of different private aircraft storage facilities can be provided, whether by individuals for their exclusive use, in consortia, or through a developer.

Location and Development Considerations

Whilst it is considered that demand for sites usable for private aircraft hangarage is immediate, the private aircraft storage precinct should be located taking into account the preferred location of the commercial aviation business precinct.

Aircraft storage hangars have a lesser imperative for servicing than commercial businesses. Whilst mains power is desirable, it is possible to provide this by other means such as solar or by generator. Likewise potable water is not essential and users can install individual tanks for any washing facilities they may require. Generally other than access to a common ablutions block, there is no requirement for sewer. However, the level of servicing to be provided to these lots and the timing of its provision would be a development decision to be taken by Council consistent with the needs of users, financial and commercial considerations.

This precinct ultimately provides for approximately 30 individual hangars each capable of accommodating a single light aircraft of up to 12m wingspan. However, greater space efficiencies may be realised by merging individual lots to provide for multi-bay hangars within which space can be allocated to particular users according to need. Therefore, it is envisaged that within a nominal 15m deep hangar lease strip, individual lot boundaries could be adjusted to suit demand for the construction of hangar structures with varying widths.

6.4 AVIATION TOURISM PRECINCT

Background and Need

The primitive campground serves an important need for tourism accommodation in the region. Its adjacency to the airport provides a unique opportunity, as does the location of the airport. However, it is considered that there may be other accommodation markets which are not served by the campground. Moreover there is currently no connectivity between the airport users and the excellent natural environment. There is a clear opportunity to take advantage of this situation to maximise the outcomes for the Shire, airport and campground users.

Precinct Objectives

- Maximise the linkages between aviation and other tourism activities in the area, including those established on the airport.
- Enable the provision of a range of airside-accessible accommodation offers which would be attractive to a variety of aviation-related users.

Location and Development Considerations

The ocean view and beach aspect of the eastern side of the airport is ideally suited to tourism accommodation. The success of the primitive campground is testament to this. It is imperative that such development occur in this zone if it is to achieve the objectives.

However, there are environmental restrictions on much of the land to the north of Runway 04/22. There are also obstacle limitation surface clearances and issues such as building generated windshear to be mindful of. Furthermore, to achieve the precinct objectives there would need to be

a level of permeability between the airfield, campground and the beach provided by easy landside as well as airside access. Nevertheless, with careful design which is sensitive to these matters, these difficulties are not considered insurmountable.

The mix of accommodation offer(s) needs to be defined in more detail following appropriate market research and involvement by the prospective operator(s) in order to determine what product will provide the best commercial return.

6.5 RESIDENTIAL AIRPARK PRECINCT

Background and Need

A residential airpark precinct has been part of the overall vision for Moruya Airport for many years. Given the airport's location, there is a view that land on which owners could build a hangar/house dwelling would be in demand and that the sale of a portion of the airport land could generate revenue to help fund other development. This is not unreasonable and has reportedly been proven in the past.

Airpark development in Australia has had mixed results. There are several commercially successful developments. However, the quality of the resulting community varies greatly. The viability of an airpark development at Moruya needs greater proving at a feasibility level. However, implemented carefully, it is considered to have sufficient potential to include in the overall Master Plan.

Precinct Objectives

- Provide an area where prospective airpark residents can construct a dwelling with integral hangar facilities and with access to the airfield.
- Ensure any airpark development is not to the detriment of airport operations or the future flexibility to accommodate other development.

Location and Development Considerations

For reasons associated with aerodrome safety, security and ease of compliance with civil aviation regulations, maintaining the greatest separation between residential airpark lots and any passenger or commercial aviation business operations is necessary. Given the probable need to offer a freehold tenure or a 99-year leasehold, the land occupied by the airpark should be that which otherwise makes the least contribution to the airport operations. The area in the north-west of the airport meets these requirements. Given its shape, this area is effective only for relatively small and/or irregularly shaped lots which are not attractive to commercial aviation businesses and therefore suitable for private hangar storage or a combination of hangar and home.

The area identified on the Master Plan allows for:

- Around 19 lots of between 875m² and 1,200m² in area, and of dimensions suitable to accommodate a hangar for a typical single-engine private aircraft and a modest 2-3 bedroom home with garage;
- Road access inside the western perimeter of the airport;

- A cul-de-sac taxiway arrangement with a single central access point to the airfield which could be controlled.

The precinct would need to be serviced and the cost of achieving this would need to be factored into any business case. An alternative approach might be for Council to engage with a local developer in order to finalise the plans and approach the market.

6.6 EXISTING OPERATIONS PRECINCT

Background and Need

This precinct accommodates all of the businesses currently operating on the airport. The majority of these are satisfied with the current location and there is no reason to relocate them. This precinct should therefore continue to provide for these existing operations.

The public boat ramp on the Moruya River is currently accessed via airport land. This brings users of the ramp into contact with the airport facilities and offers obvious commercial opportunities. The operation of float planes in particular requires easy access to the boat ramp as well as the airfield and practicalities dictate that float plane business would desire to locate in close proximity to both.

Precinct Objectives

- Provide for the continued operation of existing users who wish to remain in their current location;
- Continue to provide for public access to the boat ramp; and
- Facilitate the operation of float planes by ensuring practical connectivity between the boat ramp and the airfield.

Location and Development Considerations

The location of this precinct is defined by its pre-existing use. However some improvements to the provision of services (in particular, 3-phase power) and road access are needed.

To the north of Bruce Cameron Drive is an area suitable for additional airside access lots. One or more of these would be suitable as a base for float plane operations, which require regular access to and from the existing boat ramp location.

Any development to the south of Bruce Cameron Drive would need to respect the applicable zoning, which is currently E2 Environmental Conservation.

6.7 OTHER OPPORTUNITIES

6.7.1 TOURISM SUPPORT

Although the majority of future development is anticipated to be on the western side of the airport, development of the Aviation / Marine Precinct and the Aviation Tourism Precinct will generate additional activity and visitation to the southern portion of the site. In conjunction with the campground this may generate viability for some small scale amenity such as a café/kiosk, bar/restaurant, or mobile food van, to serve the needs of visitors, aviation operators and others.

The land to the north of the Aviation / Marine Precinct and west of the Existing Operations Precinct may warrant further investigation to identify which, if any, of these opportunities might be compatible with the relevant constraints on development in this area, which include identified conservation and biocertification objectives and obstacle clearance requirements to Runway 18/36.

6.7.2 ECO-TOURISM

The current extent of the Aviation Tourism precinct north of Runway 04/22 is limited by the constraints on development to the north of the existing airfield perimeter fence. This land is designated as conservation area and serves important biocertification purposes.

Nevertheless, this area offers one of the unique juxtapositions of airfield and coastal environment in Australia. The possibility of enhancing an ecologically-focussed tourism offering, at some point in the future, by appropriately integrating sustainable accommodation facilities within the vegetated area is a potentially attractive one from an economic viewpoint.

Accordingly, this may warrant further investigation and determination of the precise constraints on development – geographically in terms of acceptable level of impact – to ascertain if there is any possible scope for permeability of this boundary to take advantage of the unique natural setting.

7.0 IMPLEMENTATION

7.1 STAGING AND SEQUENCING

Implementation of the development will need to occur in accordance with generated demand for each of the land use types indicated on the land use precinct concept plan. In accordance with prudent investment practice, each distinct development stage should be subjected to a detailed business case prior to proceeding, to be prepared once further information has been gathered through the feasibility phase in accordance with the current project plan.

The development concept has been prepared such that the sequencing of development can, to a large extent, be undertaken in a flexible manner which can respond to the relative demand for each precinct. Nevertheless, an indicative sequence of development has been identified, based on current understanding of the level, timing and likelihood of demand for the various precincts. This indicative staging concept plan is shown in **Figure B** (refer Appendix A). The conceptual staging envisaged is as follows.

- Stage 1** The first stage of development would incorporate the Aviation / Marine Precinct and Phase 1 of the Commercial Aviation Business Precinct.
- Immediate and real demand was identified during the stakeholder consultation for potential developments that would be suitable for each of these precincts. Subdivision of these areas represents the logical immediate development opportunity, being the most cost-effective to service with engineering utilities. Utility supply would progress from south to north, whilst the internal access road and a new intersection with George Bass Drive would be provided.
- Stage 2** The next most viable development is considered to be the commencement of the Private Aircraft Storage Precinct. At least one stakeholder indicated that they feel there is currently sufficient demand for both short- and long-term private aircraft storage space to justify an investment.
- Stage 3** The third stage of development is considered to be Phase 1 of the Aviation Tourism Precinct. This stage can be completed without the need to relocate the existing terminal or apron facilities. Servicing and road access are relatively straightforward with connections from the existing terminal and camp ground utilities.
- The level of demand for this precinct is yet to be fully proven, however this development is expected to have relatively low facilitation costs thereby maximising the prospects for a viable commercial proposition – at least in relation to the development south of Runway 04/22 – and the scale of development can be cost-effectively adjusted to suit actual demand.
- Stage 4** Development of the Residential Airpark Precinct is expected to form the fourth stage of development, although subject to confirmation of demand a business case could potentially be formulated to undertake this development in parallel with or even prior to the Aviation Tourism Development.
- The residential lots would most economically be subdivided, serviced and accessed from the southern end progressing in a northerly direction subject to demand.

Stage 5 Once development of the Commercial Aviation Business Precinct, Private Aircraft Storage Precinct and Residential Airpark precinct are sufficiently established, consideration might be given as to whether relocation of the terminal facilities to a Passenger Operations Precinct would be beneficial. This would tie together the other developments and help to create a 'critical' mass of activity. Such relocation would also vacate the area required in Stage 8 for Phase 2 of the Aviation Tourism Precinct.

The trigger for this relocation is likely to be a combination of increasing passenger numbers requiring larger aircraft, commercial desire to service other aviation businesses on this side of the airport, and the opportunity to undertake Phase 2 of the Aviation Tourism Precinct to generate commercial and economic benefits to the Shire.

Whilst relocation is not entirely contingent on larger aircraft, the new infrastructure would sensibly be developed to accommodate the larger Q400 or ATR72 turboprop aircraft types following relocation. An upgrade to pavement strength on Runway 18/36 in addition to the costs identified for this stage also needs to be taken into account.

Stage 6 As demand for Commercial Aviation Business Precinct lots grows, development of the additional ten (10) lots within Stage 6 can be quickly facilitated. The addition of a landside access road will enable subdivision of five lots, and provision of a taxiway will provide access to a further block of five. Servicing can be connected to Phase 1 of this precinct, or via the Passenger Operations Precinct dependent on respective costs.

Stage 7 The final stage in development of the eastern side of the airport is expected to be provided by Phase 3 of the Commercial Aviation Business Precinct.

Provided that development adjacent to this area has occurred by this time, infrastructure for this precinct can be incrementally expanded from the surrounding development.

Stage 8 Phase 2 of the Aviation Tourism Precinct requires the relocation of the terminal facilities and cannot therefore occur prior to Stage 5. However, it may proceed at any time once the new Passenger Operations Precinct has been established, whether or not the need for additional tourism development is a trigger for the terminal relocation. Whether this is in parallel with or prior to Stages 6 and 7 will be dependent on relative demand. Servicing of this precinct is expected to be straightforward and of minimal cost at the time the development is undertaken.

Whilst the sequence above provides an approximate guide to the likely sequence of development, there are several areas where it is acknowledged that areas may be developed in parallel, or staging may be adjusted in order to suit demand. In particular, Stages 1 through 4 may proceed in parallel, or in alternative sequencing permutations, as the demand for the various areas is not necessarily linear in nature due to the distinct uses envisaged within each precinct.

7.2 INDICATIVE COSTS

An indicative estimate of costs associated with road access, utilities and airfield movement area facilities, has been prepared for each of the concept stages outlined in **Section 7.1** above. These are summarised in **Table 1**.

When considering these costs, it is important to understand the limitations inherent within cost estimates prepared at the master planning stage. Given the minimal level of design information

available at this point these indicative costs should be treated as being to a level of accuracy of no greater than +/- 50%, pending preparation of preliminary design information.

Table 2: Indicative Cost Estimates

Stage	Base Costs (Ex. GST)			Allowances	Total Indicative Cost (inc. GST)
	Roadworks	Utilities	Airfield		
Stage 1	\$1.00 million	\$1.18 million	\$0.47million	Preliminaries 15% Contingency 30% GST 10%	\$ 4.3 million
Stage 2	\$0.24 million	\$0.17 million	\$0.55 million		\$ 1.6 million
Stage 3	\$0.35 million	\$1.30 million	\$0.24 million		\$ 3.1 million
Stage 4	\$0.61 million	\$1.55 million	\$0.32 million		\$ 4.0 million
Stage 5 ⁽¹⁾	\$0.62 million	\$0.10 million	\$3.00 million		\$ 6.1million
Stage 6	\$0.07 million	\$0.20 million	\$0.11 million		\$ 0.7 million
Stage 7	\$0.12 million	\$0.29 million	\$0.09 million		\$ 0.9 million
Stage 8	-	-	\$0.11 million		\$ 0.2 million

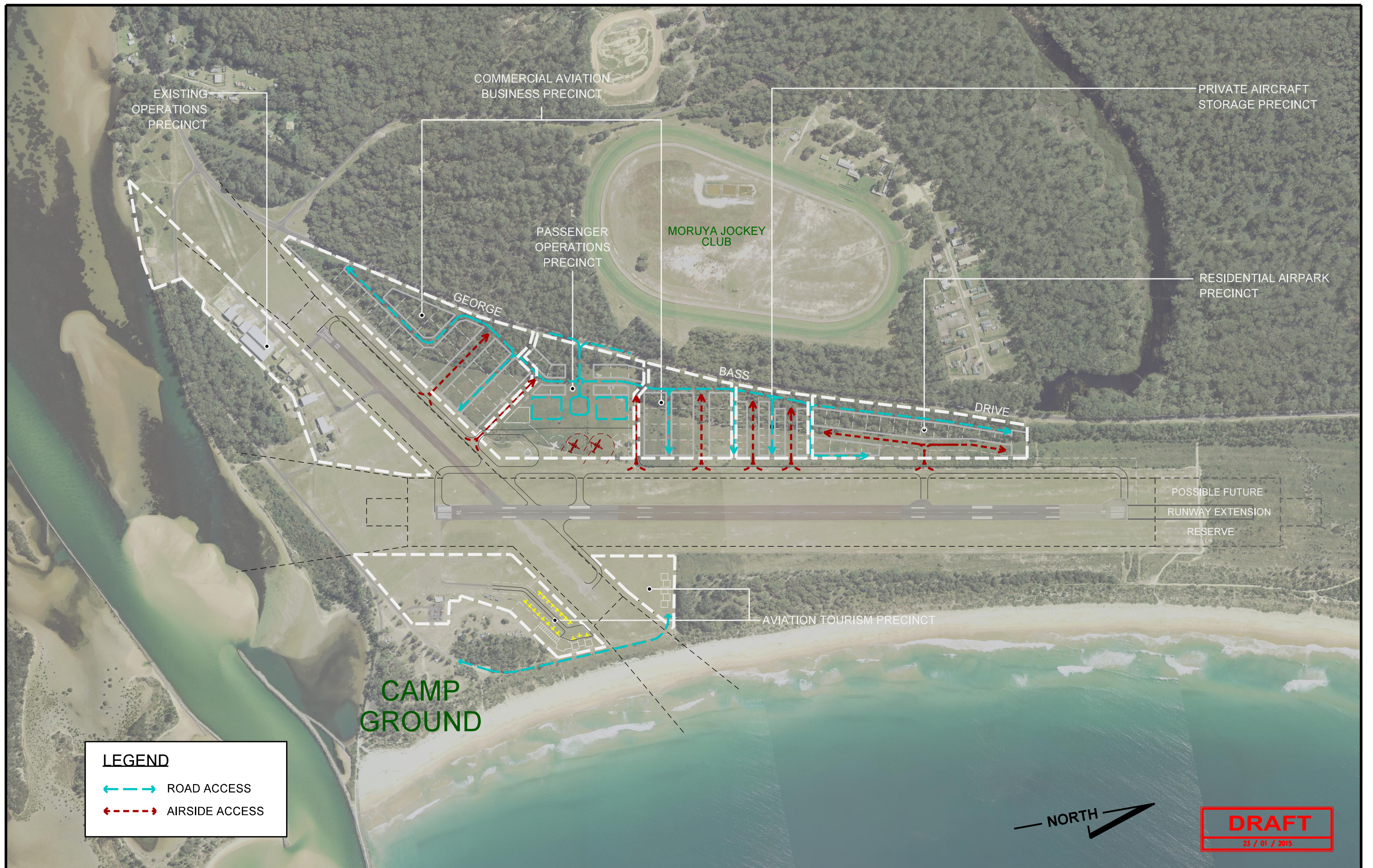
Notes:

- (1) Stage 5 includes nominal allowance of \$1.5 million for terminal building, and includes for new taxiway and apron pavement areas to sufficient size and strength to accommodate 1x Q400/ATR72 and 1x SAAB 340 aircraft parking positions and approximately 3,000m² of car parking. This represents approximately half of the ultimate development infrastructure envisaged within the Passenger Operations Precinct, which would only be developed in response to further increases in demand and would add a further \$3.8 million. Costs of strengthening the existing Runway 18/36 pavement are however excluded from this indicative cost.
- (2) All rates based on generic rates for typical base cost items listed. No specific locational allowance or regional weighting has been incorporated.
- (3) Costs have been prepared in the absence of feature and level survey or preliminary design.
- (4) Capacity of existing utility services has not been assessed and cost of upgrading the existing supply network is not included.
- (5) Total costs are rounded up to the next \$0.1 million
- (6) All costs are indicated in 2015 dollars.

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APPENDIX A

FIGURES



LEGEND

- ← - - - → ROAD ACCESS
- ← - - - → AIRSIDE ACCESS

Project: MORUYA REGIONAL AIRPORT
MASTER PLAN

Client: EUROBODALLA SHIRE COUNCIL

Title: **LAND USE PRECINCT
CONCEPT PLAN**

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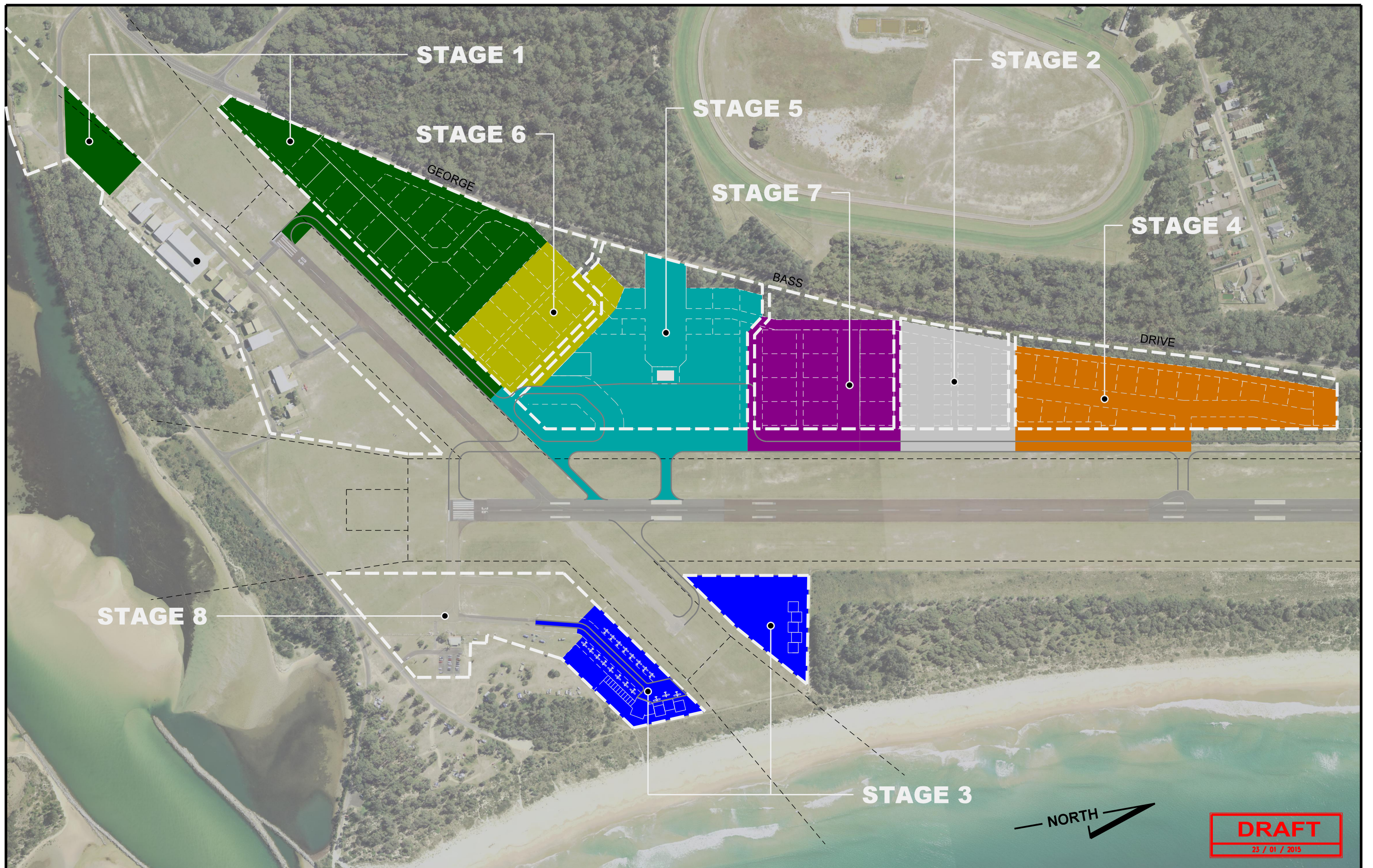
Rev Date

Figure No:
FIGURE A

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File Ref: B14387

A3
Sheet Size



Project:	MORUYA REGIONAL AIRPORT MASTER PLAN	Client:	EUROBODALLA SHIRE COUNCIL			<div>REHBEIN</div> <div>Airport Consulting</div> <div><div><div><div></div></div><div>The Association of Consulting Engineers Australia</div></div></div> <div><div>CBD HOUSE, Level 3 120 WICKHAM STREET FORTITUDE VALLEY QLD 4006 A C N 126 939 768 TELEPHONE (07) 3250 9000 FACSIMILE (07) 3250 9001 EMAIL mail@air.net.au</div></div>			Figure No:	
		Title:	STAGING CONCEPT PLAN				FIGURE B			
				1	12 03 15	Scale 1:5000		A3		
				0	23 02 15	File Ref: B14387				
		Drawn: ND	Checked: BJH	Approved: BJH	Rev	Date	Sheet Size			

RUNWAY CLASSIFICATION / CODE		
RUNWAY	APPROCH	TAKE OFF
04	CODE 2 NON-INSTRUMENT	CODE 2
22	CODE 2 NON-INSTRUMENT	CODE 2
18	CODE 3 INSTRUMENT NON-PRECISION	CODE 3
36	CODE 3 INSTRUMENT NON-PRECISION	CODE 3

APPROACH SURFACES									
RUNWAY	ELEVATION AT INNER EDGE	LENGTH OF INNER EDGE	DISTANCE FROM THRESHOLD	DIVERGENCE EACH SIDE	FIRST SECTION LENGTH	SLOPE	SECOND SECTION LENGTH	SLOPE	HORIZONTAL SECTION LENGTH
04	4.8	80	60	10%	2500	4%			
22	3.9	80	60	10%	2500	4%			
18	5.1	150	60	15%	3000	3.33%	3600	2.5%	8400
36	4.8	150	60	15%	3000	3.33%	3600	2.5%	8400

TAKE OFF SURFACES							
RUNWAY	ELEVATION AT INNER EDGE	LENGTH OF INNER EDGE	DISTANCE FROM THRESHOLD	DIVERGENCE EACH SIDE	FINAL WIDTH	OVERALL LENGTH	SLOPE
04	3.9	80	60	10%	580	2500	4%
22	4.8	80	60	10%	580	2500	4%
18	4.8	180	60	12.5%	1800	15000	2%
36	5.1	180	60	12.5%	1800	15000	2%

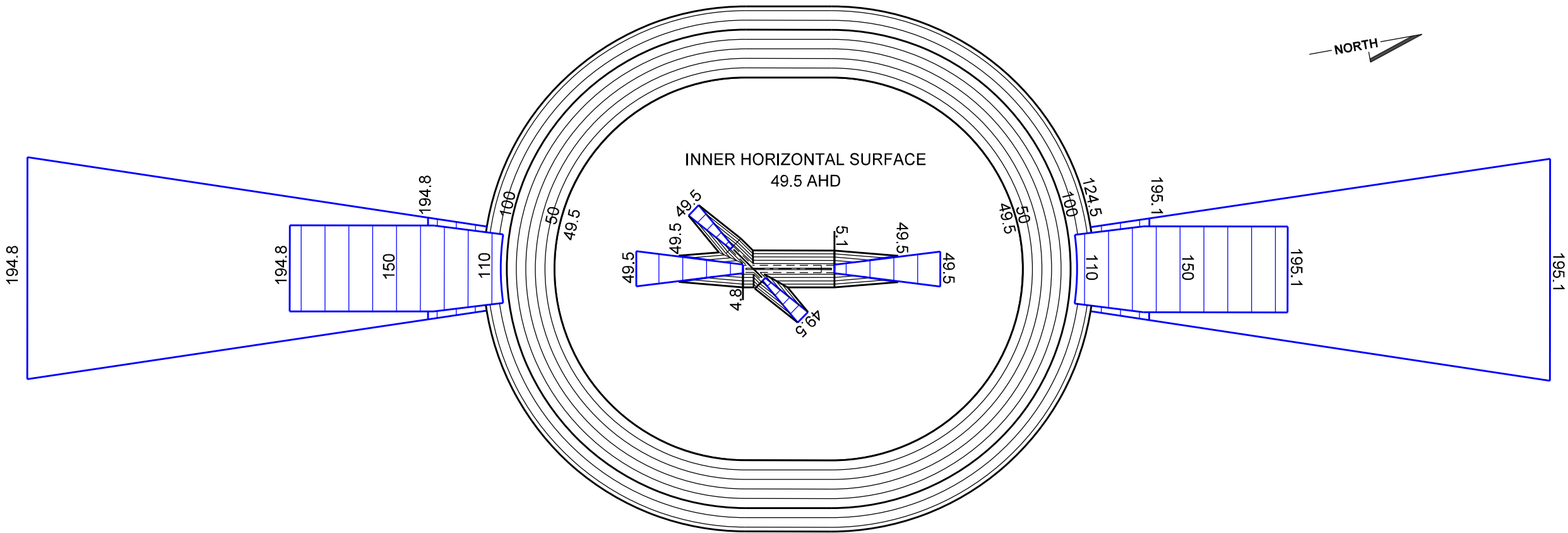
NOTES: 1. ALL DIMENSIONS AND DISTANCES ARE IN METRES
2. ELEVATIONS BASED ON AUSTRALIAN HEIGHT DATUM (AHD)
3. HP DENOTES HORIZONTAL PLANE

TRANSITIONAL SURFACE	
RUNWAY	SLOPE
04 / 22	20%
18 / 36	14.3%

INNER HORIZONTAL SURFACE		
RUNWAY	ELEV.	RADIUS
04 / 22	49.5	2500
18 / 36	49.5	4000

CONICAL SURFACE		
RUNWAY	SLOPE	HEIGHT
04 / 22	5%	55
18 / 36	5%	75

ARP / RED	
ARP ELEVATION	4.5
REFERENCE ELEVATION DATUM	4.5



Project: MORUYA REGIONAL AIRPORT
MASTER PLAN

Client: EUROBODALLA SHIRE COUNCIL
Title: **OBSTACLE LIMITATION SURFACES**



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Figure No: **FIGURE B**

Scale 1:100,000

File Ref: B14387

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