

REHBEIN AIRPORT CONSULTING

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Port Hedland International Airport
Redevelopment Program Review
for Town of Port Hedland

EXECUTIVE SUMMARY

The Town of Port Hedland, which owns and operates the Port Hedland International Airport, has made a commitment to transform the airport precinct into a modern and well-serviced facility that provides a welcoming gateway to the North West.

This commitment is based on the Port Hedland International Airport Master Plan which was finalised in March 2012 and incorporates work undertaken by various consultants across a period of two to three years.

The Town commissioned REHBEIN Airport Consulting to undertake a strategic review of the development proposals in the context of the Master Plan. The principal objective of the review was to ensure that existing plans will meet future growth needs and regional requirements to position Port Hedland as a vibrant city of 50,000 people by 2035.

The review has been structured to cover five themes: airside planning, land use, passenger terminal, car park/ground transport and the freight/logistics zone. Specific objectives relating to each aspect of the review included:

- The need to validate previous plans, in order to:
 - Ensure future growth and regional needs are met
 - Verify the timing for infrastructure delivery; and
 - Maximise the economic, social and environmental benefits of the upgrade;
- Ensure an integrated, holistic approach; and
- Provide a sound basis for investment.

Extensive consultation with key internal and external stakeholders through data gathering and design workshops was undertaken, as well as participation in 'placemaking' workshops. Workshops were held in Port Hedland on 3 and 4 September 2013 and in Port Hedland and Perth during the week of 28 October to 1 November 2013. The final design concepts were ultimately informed by stakeholder and community feedback and the workshop outcomes.

Revised forecasts of passenger and aircraft movements were developed by Tourism Futures International (TFI) – these update previous projections on which the Master Plan was based. TFI considers it likely that the mining investment growth phase will peak by 2015 at around 500,000 to 600,000 passengers and stabilise around 400,000 to 500,000 passengers depending on the future mix of resident and fly-in/fly-out (FIFO) employment. Additional mining projects and construction of additional port facilities could increase these passenger numbers by more than 50,000. TFI's upper limit estimate for passenger traffic at Port Hedland by 2033 is 730,000 passengers.

Challenges in accurately forecasting future traffic for Port Hedland and other mining-driven airports are acknowledged within the TFI report. An alternative growth projection based on a compound annual growth rate of 5% per annum was developed by REHBEIN to provide a sensitivity check. This growth, if it occurred, would result in approximately 1.36 million passengers by 2033. While this level of traffic may represent a longer-term proposition, it is considered to form an appropriate basis for the planning of passenger terminal facilities when taken in the context of a building life of 40 plus years.

The review has tested the previous concepts and identifies appropriate refinements to meet the previously noted objectives and accommodate 1.36 million passengers. The key outcomes are intended to inform the subsequent detailed design process and are summarised as follows:

Airside Planning

- The proposed concepts (contained in the Master Plan) for airfield and airside infrastructure expansion offer logical, rational and sensible solutions which are appropriate to expected future aeronautical requirements.
- The change from power-in/power-out to power-in/push-back operations and implementation of new aircraft parking arrangements is endorsed, however it is recommended that the proposed concrete aircraft parking positions are omitted to preserve maximum flexibility.
- A number of principles from these concepts are fully endorsed including:
 - Future expansion of the Southern Apron to the south-west, running adjacent the boundary with Precinct 2;
 - Provision of a future Code F taxiway connecting the Southern Apron and expansion to Taxiway B2 and Runway 14/32;
 - Expansion of the general aviation (GA) apron to the north and widening to increase its capacity including for helicopter operations; and
 - Flexibility for apron and terminal facilities to respond to concurrent international and domestic operations.

Land Use

- The proposed non-aeronautical land-use strategy set out in the Master Plan is considered to be generally sound and the proposed lot layouts and land uses within Precincts 2, 3 and 4 are mostly reasonable.
- The lot layout within Precinct 2 should be reviewed in relation to preserving the capability for ultimate expansion of freight and other major aviation support activities once Precinct 1 is fully occupied.
- The stakeholder consultation revealed a widespread consensus that there is a potential opportunity in the short to medium-term to develop an international freight hub at the airport and that existing proposals for a freight and logistics subdivision within Precinct 1 should be modified if necessary to accommodate this.
- Relocation of the existing freight facilities is essential in order to facilitate the expansion of the terminal to the east.
- The proposed lot layout of the freight/logistics zone needed to be rationalised to facilitate common user international airfreight facilities.

Passenger Terminal

- The existing passenger terminal location should be retained.
- The existing facility is undersized in relation to current peak period traffic levels, operationally inefficient, and lacks the passenger comfort and amenities associated with modern airport terminal facilities.

- Expansion in a single phase to a total footprint of approximately 11,930m² is recommended (8,800 m² internal and 3,130 m² external).
- Incorporation of international departures facilities would be best on a mezzanine to maximise flexibility for concurrent international and domestic operations.
- A covered walkway to the apron face of the terminal should be provided.
- An extensive plaza area connecting terminal to ground transport arrangements will assist with proposals to generate a sense of place and smooth the transition between transport modes.

Car Park/Ground Transport

- Provision of a shared-use pick-up/drop off zone and reconfiguration of the existing short-term car park entry and exit arrangements is recommended.
- Incorporation of a permanent mini-bus and coach parking area to the north of the short-term car park, to address front-of-house security concerns and resource company requirements for transit of employees.
- Development of expanded short-term parking to the north of the existing, and formalisation and expansion of the rental car parking area to the south of the existing long-term parking. The boundary between these areas should be of a flexible nature so that relative number of spaces for each use may be easily adjusted in the future to suit actual demand.
- Retention of the existing long-term parking area without alteration.
- Extension of the existing service road to facilitate further hangar development in this area and a new intersection with the main airport access road.
- Provision of staff parking spaces to the south of the Polar Aviation hangar.
- Development of a new two-way access to the freight and logistics subdivision to facilitate connectivity between the rental car ready-bays and the storage lots in the subdivision.

Freight/Logistics Zone

- Retain the existing layout of Lots 1-8.
- Adjust the road layout creating direct airside access from the Air BP site.
- Develop a new area immediately north of the Air BP site for consolidation of airport operations activities.
- Consolidate proposed Lots 9/10 and 12/13 to provide larger lots with airside access.
- Identification of four lots with direct landside and airside access suitable for development of international and domestic freight hub facilities, individually or in various combinations.

There are a number of matters for consideration for each of the program areas and these are explored further in the report.

As the redevelopment of the airport precinct will be undertaken within and around a live operating airport, there are a number of project sequencing issues that need to be addressed. The key steps in the development sequence are as follows.

- Provision of services (water, wastewater, electricity) and establishment of road access to the proposed lots in the Freight/Logistics Zone.
- Construction of the northern GA apron expansion and provision of additional hangar sites, which will enable relocation of existing general aviation tenants within the airport operations zone.
- Relocation of the existing freight operations to the new freight hub and rental car facilities to the logistics zone.
- Reconfiguration of the short-term car park to accommodate the proposed expansion of the terminal to the north.
- Demolition of the existing building to the west of the terminal.
- Construction of the proposed terminal extension in stages commencing with a new check-in hall at the eastern end.

Indicative costs for key elements of the redevelopment along with appropriate contingencies have been identified for budget purposes and are provided within the report.

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APPENDIX A

DRAWINGS

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1.0 INTRODUCTION

1.1 BACKGROUND

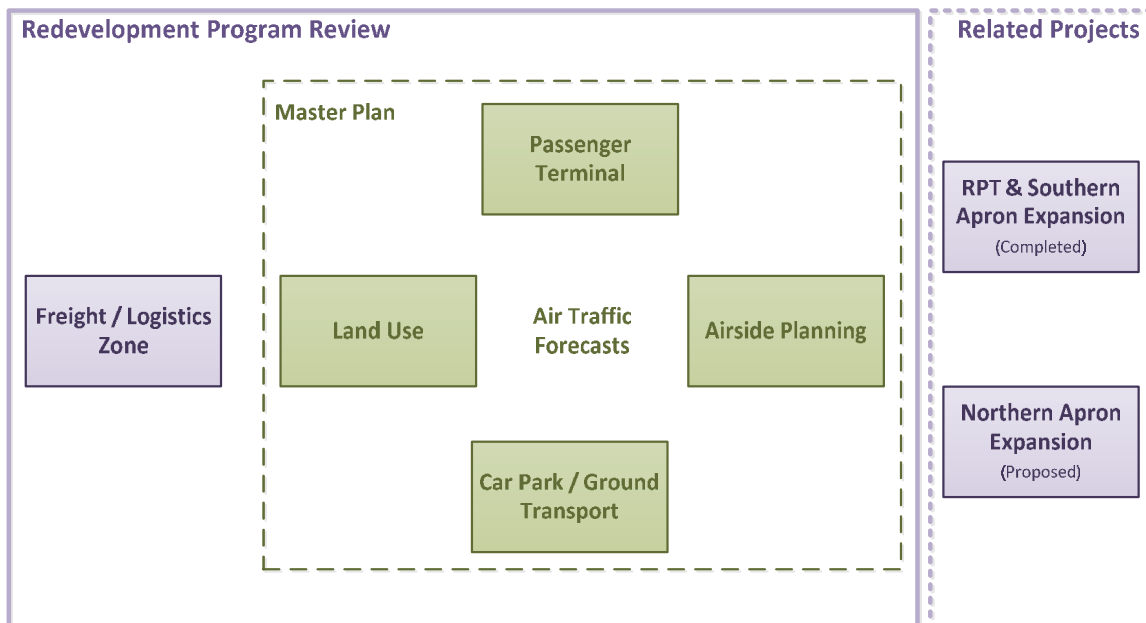
The Town of Port Hedland, which owns and operates the Port Hedland International Airport, has made a commitment to transform the airport precinct into a modern and well-serviced facility that provides a welcoming gateway to the North West.

This commitment is based on the Port Hedland International Airport Master Plan which was finalised in March 2012 and incorporates work undertaken by various consultants across a period of two to three years.

The Town commissioned REHBEIN Airport Consulting to undertake a strategic review of the development proposals in the context of the Master Plan. The principal objective of the review was to ensure that existing plans will meet future growth needs and regional requirements to position Port Hedland as a vibrant city of 50,000 people by 2035.

The review focusses on the main elements of the Master Plan. It assesses the requirements for each element in more detail and takes into account how each element will interface with the others. Related projects, outside the review scope but with the potential to impact on or be impacted by the redevelopment proposals, are also considered. Figure 1 illustrates the various components of the review.

Figure 1: PHIA Review Elements



In preparation for the investment of more than \$70 million over the next five years, to transform the airport into a modern, well-serviced facility that will provide a welcoming gateway to the North West, the Town of Port Hedland (The

Town) commissioned REHBEIN Airport Consulting to undertake a strategic review of the development proposals in the context of the Master Plan.

1.2 REVIEW OBJECTIVES

The principal objective of the review was to ensure that existing plans will meet future growth needs and regional requirements to position Port Hedland as a vibrant city of 50,000 people by 2035.

The review was structured to cover four themes established by previous detailed studies: airside planning, land use, passenger terminal and car park/ground transport. A fifth aspect – freight facilities – was subsequently incorporated following initial stakeholder workshops.

Specific objectives relating to each aspect of the review included:

- The need to validate previous plans, in order to:
 - Ensure future growth and regional needs are met
 - Verify the timing for infrastructure delivery; and
 - Maximise the economic, social and environmental benefits of the upgrade;
- Ensure an integrated, holistic approach; and
- Provide a sound basis for investment.

The review has tested the previous concepts and identifies appropriate refinements to meet these objectives. The key outcomes are intended to inform the subsequent detailed design process.

1.3 BACKGROUND MATERIAL

The review has made reference to relevant background material, which includes:

- Port Hedland International Airport Master Plan, March 2012, prepared by Airbiz¹;
- Port Hedland Airport Terminal Plan Stakeholder Consultation, 8 December 2010, Prepared by Airbiz;
- Port Hedland International Airport Master Plan, January 2011, prepared by Whelans Town Planning and Parsons Brinckerhoff;
- Air Traffic Forecasts for Port Hedland Airport, Draft Report, March 2011, prepared by Tourism Futures International;
- Port Hedland International Airport Terminal Redevelopment Concept Master Plan, July 2011, prepared by Thinc Projects, Sandover Pinder and Rider Levitt Bucknall;
- Port Hedland Airport Car Parking Study, November 2010, prepared by Cardno Eppell Olsen;
- Port Hedland Airport Terminal Plan Commercial and Retail Demand, 24 November 2010, prepared by Airbiz;

¹ This document will be referred to hereafter as the Master Plan. Other background documents will be identified by their full name, date and organisation. Some of these background documents were also appended to the Master Plan.

- Port Hedland Airport Car Park Redevelopment Concept, Drawings PE_WAPH0012(2), June 2011, prepared by Opus;
- Port Hedland International Airport Hire Car and Freight Area, Proposed Construction of Earthworks, Roads, Drainage, Waste Water, Water and Associated Works, Town of Port Hedland, June – 2013 (WAPC No 145870), prepared by Parsons Brinckerhoff;
- Drawing No. 2346-A-031/B Port Hedland International Airport Apron Extension Aircraft Marking Plan Push Back – Sequence 1 prepared by Enesar Pty Ltd.

1.4 ENGAGEMENT AND CONSULTATION PROCESS

The review has included extensive consultation with key internal and external stakeholders, through a series of workshops. Key workshop sessions were held at the commencement of the review process, and again once initial concepts had been prepared.

Participation in community and stakeholder ‘placemaking’ workshops, conducted as part of a complementary Town of Port Hedland initiative, was also undertaken. The ideas generated within these workshops and the subsequent recommendations from the placemaking consultancy, have provided important guidance in relation to several of the concept elements.

Feedback from these reviews and workshops has formed an essential element in guiding the development of the concepts and testing these against future requirements and existing constraints.

Key workshops were held in Port Hedland on 3 and 4 September 2013, and in Port Hedland and Perth during the week of 28 October to 1 November 2013.

1.5 AIR TRAFFIC FORECASTS

Revised forecasts of passenger and aircraft movements have been developed for the Town of Port Hedland by Tourism Futures International (TFI) as part of the redevelopment strategy review. The forecasts are set out and described in the TFI report *Air Traffic Prospects for Port Hedland Airport, Final Report October 2013*. These forecasts review and update the previous projections prepared by TFI in 2011 on which the Master Plan was based.

1.5.1 HISTORICAL GROWTH

Table 1-1 shows the annual passenger and RPT aircraft movement traffic at Port Hedland for selected years since 2005. Growth in passengers has resulted in a sustained compound annual growth rate of almost 25% since 2005.

Table 1-1: Port Hedland International Airport Traffic Growth

Year	2005	2010	2012	2013 Estimated
Passengers	100,430	296,810	473,979	513,000
RPT Aircraft	2,791	3,477	5,450	5,800

Source: TFI, 2013

Growth in aircraft movements has lagged somewhat, but substantial increases over the last three years have resulted in a compound annual growth rate of around 20% over the period since 2005. Weekly return services increased from 45 in 2011 to 58 in 2013. This increase has been almost entirely attributable to an increase in Qantas and QantasLink services.

1.5.2 PROJECTED TRAFFIC

The 2011 TFI forecasts projected annual traffic rising rapidly to between 450,000 and 610,000 by 2014 and between 424,000 and 700,000 by 2031. In its 2013 update of the air traffic forecasts, TFI considers it likely that the mining investment growth phase will peak with a year or so if it has not done so already. Following a peak of around 500,000 to 600,000 passengers, TFI expects the level of passenger traffic to stabilise in the range of 400,000 to 500,000 passengers depending on the mix of resident to FIFO employment in the future. Additional mining projects and construction of additional port facilities could add a further 50,000+ passengers in the years of construction, again depending on the resident/FIFO mix. Based on this projection, passenger traffic at Port Hedland may already be at its peak levels. TFI's upper limit scenario for traffic in 2033 is 730,000 passengers.

Whilst it is recognised that the TFI forecasts are based on extensive research and consideration of a comprehensive range of relevant factors, the challenges in accurately forecasting future traffic for Port Hedland and other mining-driven airports are acknowledged within the TFI report. Similarly, whilst it is important that infrastructure be provided, as far as possible in line with demand, the downside risks associated with planning long-term redevelopment around a particular passenger traffic forecasts are also significant. If an upgrade of the existing facilities is to be undertaken, it is essential that sufficient capacity and flexibility are built in to the development proposals to ensure that any unforeseen future surges in traffic growth can be accommodated without unacceptable operational impacts.

An alternative growth projection was developed by REHBEIN Airport Consulting. This projection was based on a compound annual growth rate of 5% per annum. This growth, if it occurred, would result in approximately 1.36 million passengers by 2033. In light of the TFI report, it is acknowledged that this level of traffic may represent a longer-term proposition than a 20-year horizon. Nonetheless, when taken in the context of a building life of 40+ years, it is considered to form an appropriate basis for the planning of passenger terminal facilities. Bearing in mind that a new terminal is unlikely to be fully operational before 2015, and allowing for a 30-year life beyond that prior to additional expansion, 1.36 million passengers by 2045 would require an average annual growth of just 3% per year which is relatively modest in terms of global air traffic forecasts.

Table 1-2 summarises the various growth forecasts to 2030

Table 1-2: Port Hedland International Airport Traffic Growth Forecasts

Forecast	2010	2015	2020	2025	2030	2045
TFI 2011	297,000	610,000	641,000	671,000	702,000	N/A
TFI 2013	297,000	523,000	573,000	648,000	709,000	N/A
5% p.a. on 2013	297,000	566,000	722,000	921,000	1,175,000	2,444,000
3% p.a. on 2013	297,000	544,000	631,000	731,000	848,000	1,321,000

2.0 KEY REVIEW FINDINGS

A desktop review of the Master Plan and associated background material was undertaken by REHBEIN Airport Consulting. The findings of this review were then tested in a series of workshops with internal and external stakeholders. The key findings of these reviews in relation to each element of the redevelopment program are summarised in the following sub-sections.

2.1 LAND USE

- The proposed non-aeronautical land-use strategy set out in the Master Plan² is considered to be generally sound.
- Proposed lot layouts and land uses within Precincts 2, 3 and 4 are mostly reasonable. The suggestion that a wind farm could be accommodated in Precinct 4 or anywhere in the vicinity of the airport is considered to be unacceptable given the associated risks to aircraft safety.
- The lot layout within Precinct 2 should be reviewed in relation to preserving the capability for ultimate expansion of freight and other major aviation support activities once Precinct 1 is fully occupied.
- Relocation of the existing freight facilities is essential in order to facilitate the expansion of the terminal to the east. The existing facilities are aged and in urgent need of replacement.
- The stakeholder consultation revealed a widespread consensus that there is a potential opportunity in the short-to medium-term to develop an international freight hub at the airport and that existing proposals for a freight and logistics subdivision within Precinct 1 should be modified if necessary to accommodate this.
- The lot layout within Precinct 1 should be reviewed in light of recent developments and reconsidered in detail as part of this review.
- The stakeholder feedback highlighted that the current infrastructure to support airport operations is spread across several locations. Operations personnel are housed in facilities that were generally not designed for, and are not optimal for, the required purpose.

2.2 AIRSIDE PLANNING

- The proposed concepts for expansion of airfield and other airside infrastructure set out in the Master Plan are considered, in general, to offer logical, rational and sensible solutions which are appropriate to expected future aeronautical requirements.
- The proposals within the Master Plan are based on the majority of passenger traffic in future being served by Code C passenger aircraft such as Boeing 737-800/A320 size aircraft, with the potential for some services to operate using larger Code E aircraft such as Airbus A330-200. This was confirmed as an appropriate planning strategy by stakeholders.

² Port Hedland International Airport Master Plan, January 2011, Whelans Town Planning / Parsons Brinckerhoff (incorporated at Appendix II of the 2012 PHIA Master Plan)

- The Master Plan makes provision for dedicated freight operations by aircraft up to Code F (Antonov AN-224) size
- A number of principles from these concepts are fully endorsed and adopted by the review, including:
 - Future expansion of the Southern Apron to the south-west, running adjacent the boundary with Precinct 2;
 - Provision of a Code F taxiway connecting the Southern Apron and expansion to Taxiway B2 and Runway 14/32;
 - Expansion of the GA apron to the north and widening to increase its capacity including for helicopter operations;
 - Flexibility for apron and terminal facilities to respond to coincident international and domestic operations.
- The most influential development associated with this review is the proposed change from power-in/power-out to power-in/push back operations on the RPT apron. This change is proposed as part of the apron expansion project whose design predates the review, but is consistent with the concept set out in the Master Plan. This change will require agreement with the airlines and ground handling contractor in relation to the arrangements for procurement and operation of the necessary ground support equipment (GSE), as well as appropriate provision for GSE staging, storage and maintenance.

2.3 PASSENGER TERMINAL

- The Master Plan retains the existing passenger terminal location and reserves provision for future expansion.
- The existing terminal is over 40 years old and whilst it has remained functional until this point it is undersized in relation to current peak period traffic levels, is operationally inefficient, and lacks the passenger comfort and amenities associated with modern airport terminal facilities. Stakeholder feedback offered no argument for retaining or attempting to re-use any of the existing building structure.
- The stakeholder consultations identified a number of operational issues which the terminal redevelopment concept needs to consider.
- Several previous terminal redevelopment concepts were reviewed as part of the desktop study and initial drafts of alternative concepts were put forward for stakeholder feedback.
- Space requirements and underlying assumptions were re-considered in light of stakeholder input, especially that resulting from the industry workshops and parallel community placemaking process.
- The layout and interrelationship of the different functional areas within the terminal was reviewed and tested for interaction with adjacent internal and external areas including the apron and car park.
- As a result of the above reviews, a number of changes were made to the internal concept layout of the terminal.

2.4 CAR PARK / GROUND TRANSPORT

- The Master Plan had identified a location immediately to the east of the short-term car park to be dedicated for the use of shuttle buses utilised to transport resource company personnel. Mixed feedback was received from

stakeholders in relation to the most appropriate way to accommodate buses within the constraints posed by aviation security requirements, the operational and HR considerations of resources companies, and community 'sense of place' aspirations.

- Airport front-of-house security requirements make it necessary to limit the size and number of vehicles permitted access to the terminal kerbside and dictate enforcement of waiting time restrictions. At the same time, emergency vehicle access as close as possible to the terminal needs to be facilitated in the event of fire.
- In conjunction with the long-term bus parking arrangements, the construction of interim facilities to accommodate buses away from the terminal kerbside whilst the redevelopment program is implemented is proposed by the Town of Port Hedland.
- Rental vehicles form a large proportion of transport demand at the airport. However rental car companies find it challenging to provide estimates of future demand as this is fundamentally driven by resource company shift patterns. This tends to exacerbate the need for additional ready-bays in close proximity to the terminal during peak flight periods. Some flexibility in the number of rental vehicle ready bays provided is therefore suggested.
- General feedback was received that the single boom gate exit from the existing short-term car park was inadequate and could lead to lengthy queues to exit the car park at peak times.
- Clear feedback was received from organisations who have operations in and around the passenger terminal of the need for safe, accessible and cost-effective car parking to be available for the use of their employees.
- Convenient access to the rental car storage lots and servicing facilities proposed within the freight and logistics subdivision of Precinct 1 is important.

3.0 RECOMMENDED DEVELOPMENT PROPOSALS

Drawing B13341-A-001 at Appendix A shows the key elements of the redevelopment proposals resulting from the review. The proposals are divided into four separate but inter-related areas:

- Freight and Logistics Subdivision;
- Airside Planning;
- Passenger Terminal Expansion; and
- Ground Transport.

The recommended development proposals for each area are summarised in the following sub-sections. Further background and rationale for the proposals, along with key matters which require further consideration in the subsequent detailed design phase, is provided in Sections 4.0 through 7.0 following.



3.1 FREIGHT / LOGISTICS ZONE

The recommended concept layout for the Freight and Logistics Subdivision is shown on Drawing B13341-A-002 at Appendix A. Key development proposals include:

- Development of the previously approved subdivision lot layout for eight (8) lots to the north of Roads 1 and 2;
- Adjustment to the proposed road layout thereby creating direct airside access from the Air BP site;
- Development of a new lot immediately to the south of the existing Air BP site;
- Consolidation of some previously approved lots; and
- Identification of four (4) lots with direct landside and airside access that would be suitable for development of international and domestic freight hub facilities, individually or in various combinations.

3.2 AIRSIDE PLANNING

As a result of the findings of the review, development proposals in relation to airside planning have been limited to consideration of the ultimate aircraft parking layout and future expansion of the Southern Apron. A concept layout showing the envisaged ultimate apron arrangement for RPT and freight operations is shown on Drawing B13341-A-003 at Appendix A. Key development proposals include:

- Implementation of currently designed aircraft parking arrangements, but omission of the proposed concrete hardstands at aircraft parking positions in order to preserve maximum flexibility for the future; and
- Future provision of a Code F taxiway access linking the Southern Apron to Taxiway B2 and Runway 14/32; and

- Ultimate freight apron development to the south west in general accordance with Master Plan proposals.

3.3 PASSENGER TERMINAL

The recommended concept layout for the passenger terminal expansion is shown on Drawing B13341-A-004 at Appendix B. Key development proposals include:

- Expansion in a single phase to a total internal area of footprint of approximately 8,800m², capable of handling an estimated 1.35 million passengers per year;
- Incorporation of international departures facilities on a mezzanine level to maximise flexibility in timing of international and domestic services;
- Provision of an extensive plaza area connecting the terminal to ground transport arrangements; and
- Provision for a covered walkway to the apron face of the terminal.

3.4 CAR PARK / GROUND TRANSPORT

A concept layout for car parking and ground transport facilities is shown on Drawing B13341-A-005 at Appendix A. Key development proposals include:

- A shared-use pick-up/drop off zone, reconfiguration of the existing short-term car park entry and exit arrangements;
- Incorporation of permanent mini-bus and coach parking area in the location identified for interim facilities;
- Development of expanded short-term and rental car parking areas to north and south of the bus/coach parking area, with a flexible boundary so that relative number of spaces for each use may be easily adjusted in the future to suit actual demand;
- Retention of the existing long term parking area without alteration;
- Dual, well-defined and relatively direct north-south pedestrian access routes;
- A new seagull intersection with an extension of the existing service road serving the northern apron hangars, facilitating further hangar development in this area;
- Provision of staff parking spaces to the south of the Polar Aviation hangar, accessed via the service road; and
- Provision of a new two-way access to the freight and logistics subdivision, passing to the north and east of the airport personnel houses.

4.0 FREIGHT / LOGISTICS ZONE

4.1 PREVIOUS PROPOSALS

The Master Plan proposes the development of facilities for freight and logistics uses within Precinct 1, in an area to the south and east of the terminal. An area reserved for Airport Operations uses was also identified to the east and north of the terminal.

The layout within the July 2011 Land Use Master Plan was subsequently modified during the detailed design process in an attempt to maximise the value of the subdivision and increase the number of lots with direct airside access. The resulting arrangement of 13 lots, three with direct airside access, was submitted and approved by the Western Australia Planning Commission (WAPC)³.

Valuable and significant feedback on airport operational uses was obtained during the stakeholder consultation process undertaken as part of the review. In particular the extent of space and facilities necessary for the storage and maintenance of the significant items of ground support equipment (GSE) was identified by airport operations and ground handling representatives.

Additional GSE will be generated as a result of:

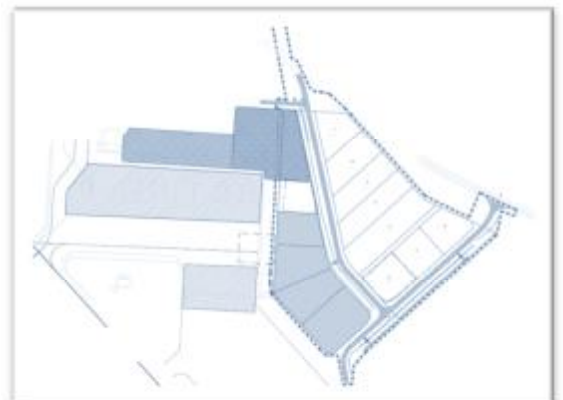
- The proposed change to power-in/push-back operations on the RPT apron; as well as
- The potential for handling wide-body aircraft including unit load devices (ULDs), dollies and loaders.

Additionally, ground handling agents indicated a need for adequate floor space within the terminal to accommodate a number of facilities such as manager's office, training room, lunch room and operations area. By nature of the constraints on the available terminal footprint, it may not be feasible to accommodate all of these internally in the passenger terminal building. It is likely to prove more efficient to provide these facilities separate, but located in close proximity to, the terminal itself.

4.2 RECOMMENDED CONCEPT LAYOUT

The proposed layout of the freight and logistics subdivision is indicated on Drawing B13341-A-002 at Appendix A. The layout:

- Retains the existing layout of Lots 1-8 in accordance with plans previously approved by WAPC;
- Removes the previously proposed publicly accessible Road 3 immediately adjacent the airport perimeter fence between the existing Air BP fuel facility and proposed Lots 9 and 10;
- Consolidates the previously proposed Lots 9/10 and 12/13 to provide larger lots with airside access;



³ Port Hedland International Airport Hire Car and Freight Area, Proposed Construction of Earthworks, Roads, Drainage, Waste Water, Water and Associated Works, Town of Port Hedland, June – 2013 (WAPC No 145870)

- Retains the existing Air BP facility but provides for direct airside access onto the existing apron taxiway; and
- Modifies the alignment of Road 2 to remain east of the drain, before continuing north to connect with the proposed rental car ready-bay parking area.

The area to the north of the existing Air BP facility has limited access to the airside due to the location immediately adjacent the RPT Apron. This area would therefore be best suited for the consolidation of airport operations activities including an airport operations centre, emergency operations facilities, GSE storage and maintenance, administration and support.

Proposed Lots 9, 10, 11 and 12, individually or in combination, comprise the logical location for international and domestic freight facilities. This area offers convenient access to dedicated freight operations on the existing Southern Apron and any future expansion of this to the south-west, as well as for handling of belly-hold freight in passenger aircraft on the RPT apron.

4.3 MATTERS FOR CONSIDERATION

- Road access to Lots 9-12 would be required across a substantial drain. It will need to be determined whether access is provided by the Town, or to be provided by the lot developer to suit their own layout and operational arrangements.
- An alternative location will need to be found for the proposed pump station.
- The exact location of the airside boundary, lot lease boundaries and associated responsibility for the construction and maintenance of pavement tie-ins and access to edge of existing apron pavement will need to be addressed. It is suggested that an airside road be provided along the eastern perimeter of the airside to provide connectivity for operational vehicles to the RPT apron.

5.0 AIRSIDE PLANNING

5.1 PREVIOUS PROPOSALS

The Master Plan indicates a concept layout for the RPT apron development to accommodate a mix of Code C and Code E aircraft, a Code F connection from the Southern Apron to Taxiway B2 and Runway 14/32 with ultimate expansion to the south-west parallel to the boundary with Precincts 1 and 2.

As part of the RPT and Southern Apron Extension project, which was underway at the commencement of the review, a more detailed design layout for aircraft parking on the expanded apron was also developed⁴.

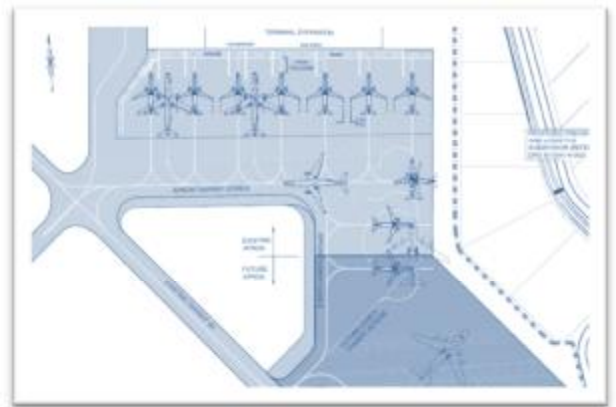
5.2 RECOMMENDED CONCEPT LAYOUT

The current design layout is considered appropriate for the aircraft parking needs at Port Hedland in the short-term. The review concludes that the aircraft parking arrangements as designed should be implemented as planned.

As part of the review, REHBEIN Airport Consulting undertook an assessment to determine the likely maximum capacity of the extended apron.

This review tested the ability of the apron extent to accommodate potential future parking needs with respect to the following:

- The mix of RPT aircraft that could be accommodated on power-in/push-back positions adjacent the terminal;
- Interaction between passenger movements, GSE operations and the interface with the terminal;
- Push-back operational arrangements; and
- Freight aircraft parking arrangements and the interface with the freight hub facilities.



The ultimate apron concept layout is illustrated in Drawing B13341 A-003 at Appendix A and accommodates the following features:

- Power-in/push-back parking adjacent to the passenger terminal for up to seven (7) B737-900 size aircraft, or three (3) B737-900 plus two (2) A330-200 aircraft;
- A330-200 positions are limited to the western end of the terminal due to push-back interaction with aircraft parked on the Southern Apron;
- Provision for a covered passenger walkway adjacent the terminal face, head-of-stand airside road, tug zone and equipment staging areas;
- A Code E apron edge taxiway with sufficient clearance to form a complete loop back to Taxiway B2;

⁴ Enesar Pty Ltd Drg. No. 2346-A-031/B Port Hedland International Airport Apron Extension Aircraft Marking Plan Push Back – Sequence 1

- Power-in, power-out positions on the Southern Apron for two B737-800 aircraft or one wide-body aircraft up to AN-224 Code F;
- Future Code F taxiway linking the Southern Apron with Taxiway B2 and Runway 14/32; and
- Future freight apron expansion adjacent to the Freight and Logistics Subdivision and continuing to the south west adjacent to Precinct 2.

It is, however, recommended that the proposed concrete pads located on aircraft parking positions not be constructed. These would limit the ability of the apron to be reconfigured in future to suit changing demands.

5.3 MATTERS FOR CONSIDERATION

- The Town could consider bringing forward the future Code F taxiway connection to allow a full Code E apron loop in conjunction with some minor extension to the Southern Apron. The taxiway loop is potentially useful to maximise capacity and minimise delays on the RPT apron when multiple aircraft are operating in cul-de-sac arrangement.
- Future expansion of the Southern Apron to the south west beyond the boundary of Precinct 1 could result in interface issues, in relation to interaction with Precinct 2. As a result, land uses proposed for landside areas within Precinct 2 adjacent to the future apron should take into consideration the potential need for apron access.

6.0 PASSENGER TERMINAL

6.1 PREVIOUS PROPOSALS

The Master Plan identified a terminal reserve to the west, east and south of the existing terminal, and also proposed two phases of expansion. Phase I expansion reflects the short- to medium-term market potential of four busy hour domestic narrow body aircraft and an international wide body service. Expansion of the terminal to accommodate this would occur within a footprint of approximately 10,000m². Phase II of the expansion would increase the terminal to a total footprint of approximately 11,000m² and is based on the ultimate demand scenario envisaged by the Master Plan (the Master Plan does not indicate a particular level of traffic associated with this scenario).

Detailed planning work was undertaken in parallel with the preparation of the Master Plan⁵. This work resulted in a proposed concept plan for the terminal which formed the starting point for discussion with stakeholders. Whilst the high-level concept appears sound, the desktop review conducted by REHBEIN Airport Consulting concluded that some aspects of the layout proved sub-optimal. The redevelopment review process therefore identified a number of potential improvements that could be made to provide additional confidence that the integrity of the final concept can be maintained through the detailed design process.

In addition to this concept, a preliminary terminal upgrade concept plan⁶ prepared in-house by the Town of Port Hedland was provided for consideration.

6.2 RECOMMENDED CONCEPT LAYOUT

6.2.1 CONSTRAINTS

Several potential constraints to the expansion of the terminal were identified during the initial desktop review and stakeholder workshop phase of the review. These were:

- i) Extensive existing in-ground services running in the verge between the existing front-of-terminal road and the short-term car park, which would be costly to relocate. This effectively sets the northern limit of the new building façade line to the kerb line between the verge and the terminal road. This is approximately 12m north of the existing façade.
- ii) As part of the RPT and Southern Apron Extension project, the existing apron floodlighting poles are to be moved to the south sufficiently to accommodate a 15m extension of the terminal. Although there is potential for these lights to be moved further south in conjunction with further apron expansion in the future, this effectively sets the limit on the southern façade of the terminal building.
- iii) The existing Polar Aviation hangar lease area to the north and west of the terminal presents a potential constraint on access to the western end of the northern façade of the terminal, depending on the extent of construction.

⁵ Port Hedland International Airport Terminal Redevelopment Concept Master Plan, July 2011, Thinc Projects, Sandover Pinder and Rider Levitt Bucknall

⁶ Designtech Drawing. No. 1224-M-0001/1 – Port Hedland International Airport Main Terminal Building Upgrade Plan

- iv) The existing building housing airport operations and other Town personnel immediately to the west of the existing terminal presents a potential constraint. Given its age and condition, there is little value in the retention of this facility other than in the short term. Provision is to be made for alternative Airport Operations facilities as part of the redevelopment program. However, alternative accommodation would need to be found for the various occupants of this building in a timeframe which fits with the redevelopment program.
- v) The existing hangar facility to the east of the existing freight shed (currently occupied by Russell Aviation, previously Golden Eagle Airlines) presents a potential constraint to the expansion of the terminal to the east. The Town has negotiated a clause in the lease agreement requiring the lessee to relocate if necessary as part of the redevelopment program. However, timing and availability of an alternative location would need to be considered. Expansion of the Northern Apron currently represents the only suitable site for relocation.

The existing freight shed immediately to the east of the terminal is not considered a constraint. However, these facilities would need to be relocated and so an alternative location, permanent or temporary, would need to be made available.

Constraints (i) and (ii) above effectively limit the depth of the terminal to approximately 55-60m. However, a width of over 200m is potentially available if required.

6.2.2 CONCEPTUAL PLANNING PRINCIPLES

The conceptual planning of the terminal expansion has adopted the following key principles, which were developed through reference to the overall objectives of the review set out in Section 1.2, as well as taking into account stakeholder and community feedback obtained through the consultation process. The principles were:

- Redevelopment of the terminal within an expanded footprint in the same location as the existing facilities, but assuming that all existing building structure will be removed as part of the redevelopment;
- Establishment of a terminal concept capable of accommodating potential long-term growth in traffic, beyond the 20-year forecasting period;
- Provision of a high quality of service and passenger experience, and the flexibility to incorporate aspects contributing to a strong sense of place for the benefit of local residents and visitors to Port Hedland; and
- The ability to facilitate efficient operations to minimise the impacts of FIFO workforce transfer through airport on the operations of the attendant resource companies.

6.2.3 DESIGN PARAMETERS

Design Traffic Loading

Passenger terminals consist of several distinct functional areas where core processing of departing or arriving passengers or baggage is conducted.

A number of approaches exist for estimating the relevant design loading on various elements the common fundamental principle is that each of these processes can be analysed in terms of the number of users (passengers or bags) demanding 'service' over a period of time, the capacity of the facilities and personnel to serve this demand.

At a conceptual level, the 'busy-hour rate' is often used to approximate the complex and often highly variable flow of passengers through a terminal. At relatively high overall flow rates, the busy-hour rate used in combination with an assumed dwell time can provide a reasonable representation of passenger demand. However in cases where flows vary significantly over shorter time periods, this simplification can under-estimate the necessary space required to deliver a particular passenger perception of service quality. Furthermore, due to interactions between sequential processes, a single busy-hour rate does not necessary apply to all of the functional areas. For these reasons, in relation to Port Hedland, some additional consideration of likely flow patterns and the consequential peak demand loading on individual functional areas can offer a more robust approach.

Previous planning work had identified several scenarios with numbers of assumed busy-hour passengers varying from 410 – 544 passengers in the peak hour⁷. In order to validate the spatial planning undertaken previously, REHBEIN Airport Consulting developed a notional future peak-period flight schedule. The schedule was based on the existing weekly flight schedule, with the number of flights and size of some aircraft increased in order to deliver the long-term traffic projection of approximately 1.3 million annual passengers as discussed in Section 1.5. The assumed peak hour demand on the terminal facilities is indicated in Table 6-1.

In order to translate these peak hour nominal flight schedules into assumed design loadings on the processes within the terminal, relevant assumptions are made about how passengers will move from one functional area to another. These assumed flows dictate the demand and service rates which need to be accommodated in order to meet defined queuing time parameters. This in turn determines the maximum number of waiting passengers to be accommodated.

⁷ At Port Hedland, due to flight scheduling characteristics the peak period corresponds sufficiently closely to a one hour period that the term 'peak hour' is in fact a valid description.

Table 6-1: Assumed Peak Hour Terminal Demand

Aircraft Type	Number	Seats	LF	Pax
A330-200 ⁽¹⁾	2	278	70%	389
B737-800	2	168	80%	269
B717-200	1	117	90%	105
Total	5	1009	76%	763

(1) In terms of design loading this is equivalent to three 168-seat B737-800 aircraft operating at a load factor of 80%

Level of Service

As described by IATA⁸, Level of Service can be considered as an assessment of the ability of supply to meet demand. Level of Service is measured as a range of values from A to F and can be applied to individual processes and the areas dedicated to them to accommodate passengers. This provides an indication of the conditions experienced by passengers subjected to each process and allows comparison between different processes and areas.

Level of Service C is recommended as the minimum design objective by IATA and is described in the IATA Airport Development Manual as:

‘Good level of service. Conditions of stable flow, acceptable delays for short periods of time and adequate levels of comfort.’

Based on the conceptual design principles set out above, a minimum Level of Service C in relation to the long-term design loading is considered appropriate. This will provide a much higher level of service in the early years of service of the terminal, until actual traffic reaches the assumed design level.

Spatial requirements for each functional area are defined by IATA with reference to the desired Level of Service and the number of design passengers.

Other Design Assumptions

In order to estimate spatial requirements for key functional areas, a number of other assumptions regarding the design operating day characteristics and service quality parameters need to be made. These assumptions have been established from a combination of reference to previous planning reports, experience in relation to other airports, the expected characteristics of traffic at Port Hedland, and the aspirations of the project with respect to passenger comfort.

There is a relatively large degree of uncertainty in relation to several of these assumptions, many of which require large datasets to accurately determine. Several parameters are also subject to likely changes in technology and process requirements over the life of the terminal, the impacts of which are hard to predict with accuracy. The general approach in these situations has been to adopt assumptions which lead to slightly conservative estimation of space requirements, in order to preserve maximum flexibility for changes which can be expected to occur over time.

Key design assumptions adopted in the development and validation of the passenger terminal concept are summarised in Table 6-2.

⁸ Airport Development Reference Manual, 9th Edition 2004, International Airport Transport Association (IATA)

Table 6-2: Key Design Assumptions for Spatial Concept Planning

CHECK-IN	
Proportion of pax using mobile/web check-in	10%
Proportion of pax using kiosk only (no bag drop)	15%
Proportion of pax utilising bag-drop	75%
Average processing time at bag drop	1 min/pax
Maximum queue time at bag-drop	15 mins
Average no of well-wishers per pax	0.2
Minimum no of bag-drop desks	10 ⁽¹⁾
Service desks	2
PASSENGER SECURITY SCREENING	
Service rate	3 pax/min/lane
Maximum queue time	10 mins
No of screening lanes	4
DEPARTURES (DOMESTIC)	
Maximum no of pax	531 ⁽²⁾
Proportion of pax seated	80%
Proportion of food and beverage outlet seating @ average 2.1m ² per pax ⁽³⁾	70%
Proportion of gate lounge seating @ average 1.7m ² per pax	30%
Proportion of pax standing @ average 1.2m ² per pax	20%
Occupancy Level	65%
Retail tenancy area	400m ²
Airline lounge area	1,000m ² ⁽⁴⁾
Airline lounge occupancy	250 pax ⁽⁵⁾
Amenities	150m ²
DEPARTURES (INTERNATIONAL)	
Outwards immigration service rate	80 pax/hour/desk
No of immigration desks	2
Maximum immigration queue time	15 mins
Maximum pax in waiting lounge	209 ⁽⁶⁾
Proportion of pax seated	80%
Proportion of food and beverage outlet seating @ average 2.1m ² per pax ⁽³⁾	0%
Proportion of gate lounge seating @ average 1.7m ² per pax	100%
Proportion of pax standing @ average 1.2m ² per pax	20%

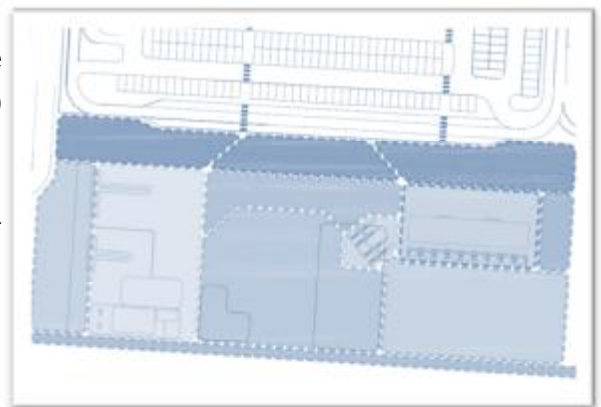
Retail tenancy area	150m ² (7)
Amenities	50m ²
ARRIVALS	
Number of Carousels	2
Carousel presentation length	1 x 30m + 1 x 45m
Maximum passengers at carousels	185
No of primary line desks	4
Average primary line service rate	1 pax/min/desk
Maximum primary line queue length	160 pax

Notes:

- (1) The minimum desk requirement assumes common-user desks and common queuing. In order to take account of permanently allocated desks to carriers, and allow for segregation of each carrier's passengers into premium and non-premium service areas, additional desks will be required. A total of 16 desks have been allowed for.
- (2) Includes an allowance for an additional 5% of well-wishers. In terms of 'busy-hour rate' analysis, this maximum occupancy is equivalent to an assumed busy-hour rate of 763 passengers per hour and an assumed average dwell time in departures of around 40 minutes prior to boarding. .
- (3) Average space per passenger includes allowance for food and beverage back-of-house preparation area
- (4) Based on advice from airlines of 400m² and 600m² respectively
- (5) Based on an assumed 4m² per passenger in airline lounges which would be typical of capital city ports. Suggested occupancy figures provided by airlines indicate that an average space provision of 1.6 - 2.7m² per pax might be acceptable in peak periods.
- (6) Based on long-term 278-seat A330-200 at 75% load factor.
- (7) Allowance of 100m² for duty free and 50m² for retail/food and beverage

6.2.4 CONCEPT LAYOUT

A number of concept layout variations were developed in the course of the review. This included the testing of an option which sought to arrange the various functional elements in a manner which minimised the cost impact of relocating costly elements such as amenities and baggage handling infrastructure. Due to the scale of expansion required, it was not considered possible to achieve a workable solution in terms of operational or passenger flow arrangements, nor would it have met the Town's objective for a modern, well-serviced and efficient facility.



The concept layout which is proposed and recommended takes into account the functional area space requirements necessary to accommodate the design principles, the constraints to expansion, and parameters set out in the preceding sections. The recommended concept layout is indicated on Drawing B13341-A-004 at Appendix A.

The concept adopts a spatial configuration which is considered to be optimal in terms of the available terminal site, interactions with adjacent airport activities, and the operational requirements particular to Port Hedland, and incorporates the following elements:

- A check-in area at the eastern end of the terminal. This places the departures entry door at the start of the terminal kerbside, which is a standard arrangement at single-level airport terminals and typically understood by travellers. It also allows for interaction of airline and ground handling personnel between the check-in and baggage make-up areas, which is where the majority of operational workload takes place, with the adjacent airport operations area. The check-in area is nominally sized to accommodate 16 standard check-in/service desks or bag drop counters;
- An area for checked baggage screening and make-up of baggage loads for outbound flights, located behind check-in to minimise baggage flow paths. The area maximises the flexibility to accommodate a baggage storage and circulation carousel, and enable access and egress of baggage tugs and barrows from the eastern end of the building to minimise interaction with passenger access to and from aircraft.
- A landside concourse area, where travelling passengers can dwell to use amenities or farewell friends, family and colleagues prior to passing through to the secure departures areas. Non-travelling airport users may also use the concourse to partake in food and beverage or retail offerings, while awaiting arriving flights or visiting the airport for other purposes. This area also functions as general circulation between the check-in and arrivals spaces for passengers and operational personnel.
- A passenger security screening point, located between the check-in and concourse areas and oriented towards the check-in area, in order to offer direct access to the primary flow of departing passengers for ease of wayfinding.
- A departures lounge in which passengers dwell awaiting the departure of their domestic flight or prior to passing through further international security and immigration checks. The departures lounge is located centrally, in order to maximise allowable ceiling height within the applicable aerodrome obstacle restrictions. It provides direct connection to the apron and balances the width of apron frontage for passenger boarding gates with sufficient depth to allow comfortable circulation, provision of an appropriate level of retail and food and beverage offer, and space for airline premium lounges – all subject to relevant commercial arrangements.
- A mezzanine area to accommodate additional security screening and outward immigration processes for international departures, and a waiting lounge with apron views. The mezzanine is conceptually located to the east side of the departures area so as to minimise the impact on full-height views of the apron from within the departures lounge as well as the potential for visual connectivity through from the landside concourse area. It is anticipated that vertical transportation to the mezzanine and back to apron level would be located adjacent the eastern wall.
- A covered passenger arrivals/departures walkway allowing passenger flows across the terminal apron face while minimising interaction with vehicle operations on the apron.
- Domestic arrivals via a dedicated corridor directly to the baggage reclaim area. This minimises counter-flows and congestion which can occur if arriving passengers pass back through the departures lounge.
- International arrivals through an adjacent corridor with dedicated space for duty free collection, primary line queuing and inwards immigration processes. A swing arrangement allows baggage collection from one of the reclaim carousels. Passengers then pass through a dedicated area for secondary examination processes which

will incorporate offices and specific facilities for the use of the border protection agencies before re-entering the domestic arrivals corridor.

- A baggage breakdown area at the western end, allowing baggage tugs and barrows to enter and exit from the north-west corner of the RPT apron, minimising the conflicts with passenger movements across the face of the terminal.
- An external plaza areas to connect the terminal with the drop-off/pick up area and through to the short-term car park, rental car and shuttle bus zones and the long-term car parking beyond. It is envisaged this area will be appropriately shaded, and that the central portion in particular will be activated and connected to the internal concourse.

6.3 MATTERS FOR CONSIDERATION

Although the concept layout is considered to have comprehensively addressed the fundamental requirements of the terminal, there remain a number of matters which require more detailed consideration and resolution during the detailed design development process. Many of these relate to the architectural form of the building, engineering, provision of mechanical and electrical services, interior design of spaces and external landscaping. However, the following key operational details will need to be incorporated as the design of these aspects progresses.

- The concept layout is based on an ultimate passenger traffic level of approximately 1.35 million passengers even though the timing of this level of traffic is uncertain from the detailed passenger traffic projections which have been developed for the next 20 years. Staging of the building footprint is not recommended, however consideration should be given in the detailed design to the potential for cost-efficiencies to be introduced with respect to the initial development, whilst preserving the option to quickly and easily expand the fit-out as required. For example, areas not required for functional processing initially might be used as offices or meeting facilities until such time as demand dictates they be reallocated.
- The layout of retail and food and beverage facilities should be in accordance with specialist recommendations in relation to passenger flows and behaviour. This is especially the case within the departures lounge where these elements are likely to compete with other demands for particular elements of the space, such as airline premium lounges.
- Airline premium lounge locations need to be agreed. Airlines have expressed a preference for these to be located on the ground floor of the departures lounge, however care should be taken not to detract the functionality, comfort or experience within the public area. This includes the potential to establish visual connectivity between passengers and well-wishers in the concourse, passengers in the departures lounge, and the aircraft on the apron.
- The baggage make-up area should ideally incorporate a baggage make-up loop consisting of carousel fed from the checked baggage screening via overhead conveyor feed to allow baggage tug and barrow circulation. Provision for simultaneous make-up of up to six flights, with a further flight may be required in the long-term peak period.

- The baggage make-up area and baggage system should also allow for the circulation of baggage dollies and universal load devices (ULDs) used on wide-body aircraft. These are generally more manoeuvrable than open barrows, but are significantly higher, so ceiling heights will need to take account of this in design.
- Ground handling agents and airline representatives have indicated that compliance and training requirements have increased significantly during the past five years. Adequate floor space is required for these purposes and a number of other essential activities including space for housekeeping of proof documents. It may be necessary for some of this space to be located outside the terminal itself, for reasons of both practicality and cost.
- Connectivity for authorised personnel between the check-in area, airline and ground handling administration offices, baggage make-up area and related facilities to be located in the adjacent airport operations area will need to be properly understood and provided for to maximise operational efficiency.

7.0 GROUND TRANSPORT

7.1 PREVIOUS PROPOSALS

The Master Plan sets out a broad concept for car parking and ground transport. It placed short-term and rental parking immediately to the north of the terminal reserve, long term parking further north, and bus parking to the east of the terminal access road.

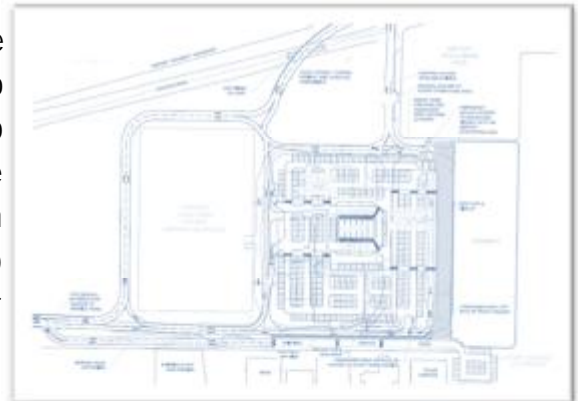
The present car park was developed in 2011 when new short and long-term car parks were constructed and paid-parking introduced. Actual development has followed a slightly different path from the original proposal as the new long-term parking was developed further to the north, in accordance with proposals developed by Opus⁹. The ultimate development of the Opus concept culminates with in-fill of the area between the short-term and long-term parking with rental car and staff car parking. This area currently accommodates some rental car parking, in a somewhat ad-hoc manner, along with car rental company facilities and existing fire service water storage tanks.

The Opus concept sets out a one-way clockwise circulatory system, with the parking separated into three distinct areas by transverse connections. Bus parking is indicated in a linear fashion adjacent the northern edge of the short-term parking in contrast to the Master Plan. The Opus concept also does not make allowance for the expansion of the terminal to the north towards the short-term parking.

The concept proposed a roundabout intersection at the northern extent of the car park area to allow access to the existing service road. It envisages that all access to the freight and logistics subdivision will be via the existing left-turn intersection to the north-east of the terminal.

7.2 RECOMMENDED CONCEPT LAYOUT

The Opus concept is generally considered to be appropriate. The concept recommended as a result of the review therefore aims to maintain and re-use existing infrastructure as far as possible, to maximise the cost-effectiveness of this element of the redevelopment program and allow expenditure to be focussed on other areas. However some adjustments are recommended to address some of the issues raised during the stakeholder workshops and to maximise the practicality of implementation.



⁹ Port Hedland Airport Car Park Redevelopment Concept, Drawings PE_WAPH0012(2), June 2011

The recommended concept layout is shown on Drawing B13341-A-005 at Appendix A and the key points are outlined below.

- Relocation of the pick-up/drop off zone to the north to accommodate terminal expansion. Access is to be co-located with the entry to the short-term car park and controlled via a boom gate and terminal.
- Reconfiguration of the existing short-term car park entry and exit arrangements to provide for direct access to the short-term parking from the pick-up/drop off area for users that exceed the permitted free time allocation, or those who wish to drop off passengers prior to parking.
- Provision of dual exit gates from the short term parking to alleviate congestion and queuing during peak periods.
- Incorporation of permanent mini-bus and coach parking area in the location identified for interim facilities, to minimise the re-work required and to better address resource company requirements for transit of employees.
- Removal of the transverse circulation roadway to the north of the existing short-term car park. This removes the constraint on relocation of the short-term parking to accommodate terminal expansion and the need for pedestrians transiting to and from the rental car and bus parking areas to cross any significant roadways.
- Development of expanded short-term parking to the north of the existing, and formalisation and expansion of the rental car parking area to the south of the existing long-term parking. Whilst the full development requires relocation of the existing car rental facilities and fire water storage tanks, sub-stages of this development in accordance with the overall concept could be considered.
- The concept layout provides initially for 185 short-term public car park spaces and 265 rental car ready-bay spaces.
- The boundary between the short-term public and rental car ready bays is to be of a flexible nature, utilising relocatable bollards or other 'soft' barriers rather than hard form such as kerbs, so that relative number of spaces for each use may be easily adjusted in the future to suit actual demand.
- Location of access and egress to the rental car and bus/coach parking from the existing transverse road to the south of the long-term parking.
- Retention of the existing long term parking area without alteration.
- Dual, well-defined and relatively direct pedestrian access routes linking the terminal plaza with a central node surrounding the bus and coach parking and northwards to the long-term parking.
- A new seagull intersection to enable extension of the existing service road serving the northern apron hangars to be aligned more closely to and parallel with the main terminal egress. This facilitates further hangar development in this area.
- Removal of staff parking from the main paid car parking areas with provision of staff parking spaces to the south of the Polar Aviation hangar, accessed via the service road.
- Provision of a new two-way access to the freight and logistics subdivision passing to the north and east of the airport personnel houses to facilitate connectivity between the rental car ready-bays and the storage lots in the subdivision, in particular for vehicles travelling to the ready bays.

7.3 MATTERS FOR CONSIDERATION

- As a result of the terminal expansion, the existing airside access gate to the east of the terminal between the existing freight facility and the Golden Eagle hangar may need to be relocated, and access to this will need to be provided via the adjacent airport operations area.
- Landscape and street-furniture treatments for the pick-up/drop-off area, short-term parking, area around the bus/coach parking area and the pedestrian paths linking these areas will need to be determined appropriately to ensure the desired placemaking objectives are successfully achieved.

8.0 SEQUENCING AND INDICATIVE COSTS

8.1 SEQUENCING

As the redevelopment of the airport precinct will be undertaken within and around a live airport operation which must remain functional, safe and secure throughout the works, there are a number of project sequencing issues that need to be addressed. An indicative program schedule and project sequence has been developed by the Town. The key steps in the development sequence are as follows.

- Provision of services (water, wastewater, electricity) and establishment of road access to the proposed lots in the Freight/Logistics Zone.
- Construction of the Northern General Aviation Apron expansion and provision of additional hangar sites, which will enable relocation of existing general aviation tenants within the airport operations zone.
- Relocation of the existing freight operations to the new freight hub and rental car facilities to the logistics zone.
- Reconfiguration of the short-term car park to accommodate the proposed expansion of the terminal to the north.
- Demolition of the existing building to the west of the terminal.
- Construction of the proposed terminal extension in stages commencing with a new check-in hall at the eastern end.

It is recognised that there will be overlap between some of these key activities, with some stages able to commence prior to the completion of preceding steps.

8.2 INDICATIVE COSTS

Indicative costs have been developed in relation to the passenger terminal expansion and ground transport elements of the redevelopment program review. These are summarised in Table 8-1.

Table 8-1: Indicative Terminal and Car Park Redevelopment Costs

Element	Quantity	Unit	Rate	Indicative Cost
Major Road (2 lanes) pavement, kerbs, drainage and lighting	7,800	m ²	\$400.00	\$3.12m
Circulation Road (2 lanes) pavement, kerbs, drainage and lighting	2,100	m ²	\$300.00	\$0.63m
Service Road (2 lanes) pavement, kerbs, drainage and lighting	1,300	m ²	\$300.00	\$0.39m
Car park pavement, kerbs, drainage and lighting	18,000	m ²	\$300.00	\$5.40m
Drop-off/Pick-up area pavement incl kerbs, drainage and lighting	1,100	m ²	\$155.00	\$0.71m
Bus pedestrian waiting area	1,200	m ²	\$195.00	\$0.23m
External plaza	2,200	m ²	\$225.00	\$0.50m
Terminal – single story internal conditioned	7,000	m ²	\$4,250.00	\$29.75m
Terminal – mezzanine	800	m ²	\$5,425.00	\$4.34m
Terminal – internal unconditioned	1,800	m ²	\$1,250.00	\$2.25m

Element	Quantity	Unit	Rate	Indicative Cost
Terminal – external service areas	950	m ²	\$400.00	\$0.38m
Baggage system and specialist terminal equipment	1	Item	\$850,000	\$0.85m
Service relocation and protection	1	Item	\$750,000	\$0.75m
Contract Preliminaries	1	Item	20%	\$9.86m
Subtotal				\$59.2m
Design Contingency	1	Item	15.0%	\$8.88m
Escalation	1	Item	12.5%	\$8.51m
Expected Contract Value				\$76.6m
Design and Project Management Fees	1	Item	7.5%	\$5.75m
Construction Contingency	1	Item	10.0%	\$7.66m
TOTAL PROJECT COST ESTIMATE				\$90.0m

The indicative costs are based on typical unit rates for elements of work, adjusted to suit the Pilbara market, but are necessarily based only on the available conceptual designs. Contingency allocations have been made in order to cover the high level of uncertainty with respect to the conceptual level of the design detail and existing conditions, pending proper investigation of these aspects during the design development. They are considered suitable for the establishment of project budget, however further detailed investigation and design work is required to increase the level of confidence in these cost estimates as the design and scope are defined. It is expected that opportunities will eventuate to ensure the cost-effectiveness of the overall redevelopment, without sacrificing the intent of the concepts set out in this review, through regular and appropriate evaluation of the design as it develops.

Costs for the freight/logistics zone subdivision have not been re-estimated, however the proposed changes to lot and road layout should not result in significant changes from the previous detailed design elements. A major component of the cost of this element of the works relates to the servicing of the subdivision.

Given the timeframes for future apron expansion these works are not recommended immediately nor are they anticipated in the short- or medium term and therefore have not been estimated at this stage.

9.0 CONCLUSION

The Town of Port Hedland, which owns and operates the Port Hedland International Airport, has made a commitment to transform the airport precinct into a modern and well-serviced facility that provides a welcoming gateway to the North West.

This review of the redevelopment proposals has tested the previous concepts for airside planning, land use, passenger terminal and car park/ground transport facilities. The process involved detailed desktop review and extensive consultation and engagement with a wide range of stakeholders. As a result of the review, a number of the previous concept proposals have been validated against the Town's objectives. Appropriate refinements to the other proposals have been made to ensure the redevelopment meets the key requirements.

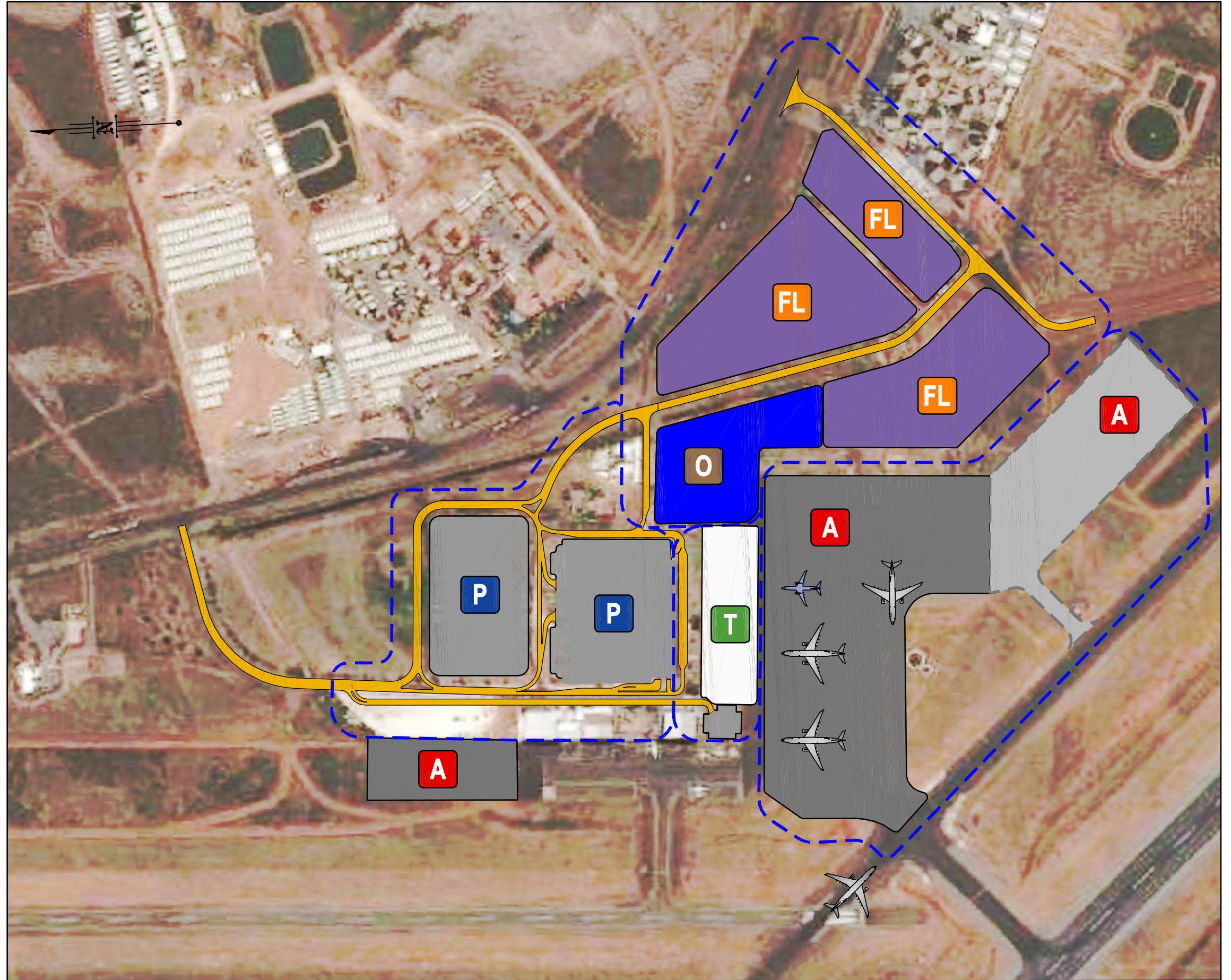
The key outcomes of the review are presented with this report which is intended to inform the subsequent detailed design process. The concepts developed as a result of this review offer a holistic solution to the Port Hedland International Airport's requirements in the medium and long-term. It is recommended that they form the basis for the preparation of detailed design documentation which will be required to procure the construction of the various elements of the redevelopment.

APPENDIX A

DRAWINGS

LEGEND

- P CARPARK EXPANSION
- FL FREIGHT & LOGISTICS SUBDIVISION
- T TERMINAL EXPANSION
- A APRON EXPANSION
- O AIRPORT OPERATIONS



0 40 80 120 160m



SCALE 1 : 4000

No.	Date	By	Amendment	Checked
2	19/12/13	MJ	FINAL	BJH
1	10/12/13	SJ	DRAFT	BJH
0	05/12/13	MJ	DRAFT FOR COMMENT	BJH



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EMAIL mail@lar.net.au ABN. 77126939768

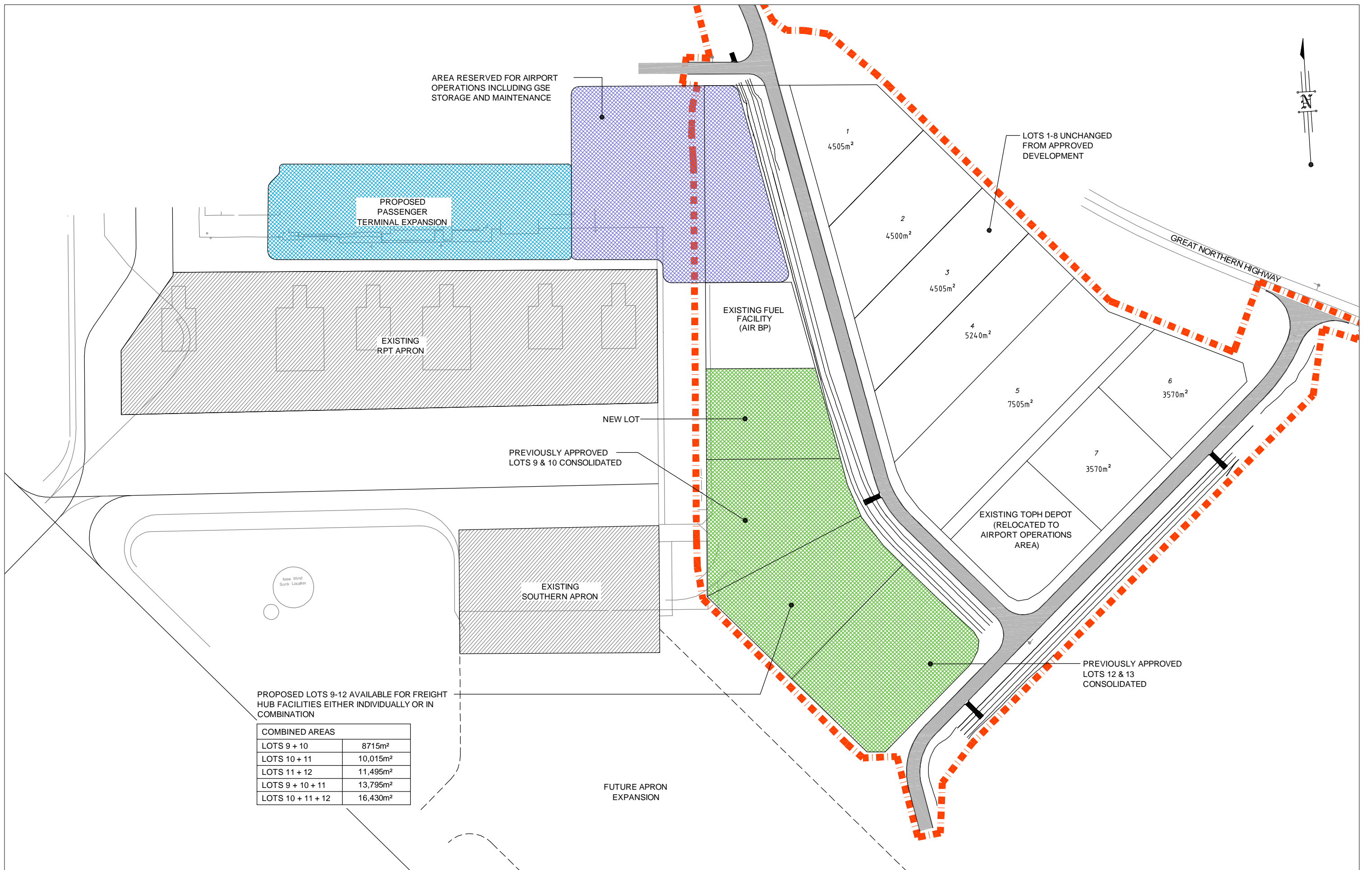
Project: PORT HEDLAND INTERNATIONAL AIRPORT REDEVELOPMENT PROGRAM REVIEW

Title: OVERALL CONCEPT LAYOUT

Client: TOWN OF PORT HEDLAND

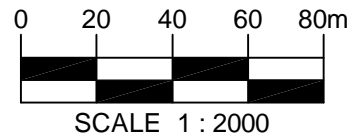
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Designer: LT	Approved:		
Scale: 1:4000	Date: 02/12/13		

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PROPOSED LOTS 9-12 AVAILABLE FOR FREIGHT HUB FACILITIES EITHER INDIVIDUALLY OR IN COMBINATION

COMBINED AREAS	
LOTS 9 + 10	8715m ²
LOTS 10 + 11	10,015m ²
LOTS 11 + 12	11,495m ²
LOTS 9 + 10 + 11	13,795m ²
LOTS 10 + 11 + 12	16,430m ²



No.	Date	By	Amendment	Checked
2	18/12/13	MJ	FINAL	BJH
1	10/12/13	SJ	DRAFT	BJH
0	27/11/13	LT	DRAFT FOR COMMENT	BJH

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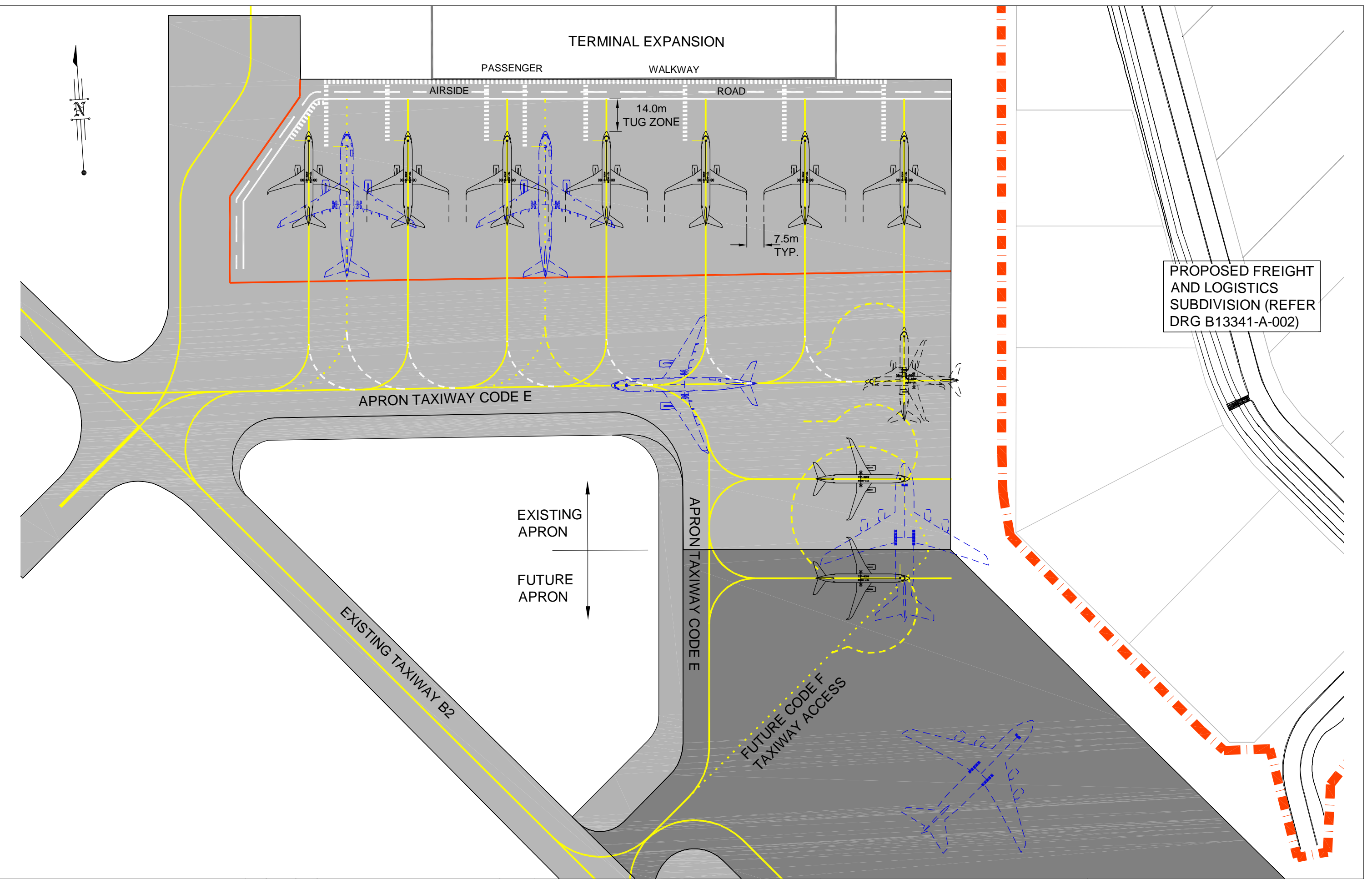
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 EMAIL mail@lar.net.au ABN. 77126939768

Project: **PORT HEDLAND INTERNATIONAL AIRPORT REDEVELOPMENT PROGRAM REVIEW**

Title: **FREIGHT/LOGISTICS ZONE CONCEPT LAYOUT**

Client: TOWN OF PORT HEDLAND		Sheet Size: A3	Drawing No.: B13341-A-002
Draftsperson: LT	Checked: BJH	Scale: 1:2000	Date: 20/10/13
Designer: LT	Approved: BJH		
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PROPOSED FREIGHT AND LOGISTICS SUBDIVISION (REFER DRG B13341-A-002)

0 15 30 45m



SCALE 1 : 1500

No.	Date	By	Amendment	Checked
2	19/12/13	MJ	FINAL	BJH
1	10/12/13	SJ	DRAFT	BJH
0	08/12/13	MJ	DRAFT FOR COMMENT	BJH

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Project: PORT HEDLAND INTERNATIONAL AIRPORT REDEVELOPMENT PROGRAM REVIEW

Title: AIRSIDE PLANNING APRON CONCEPT LAYOUT

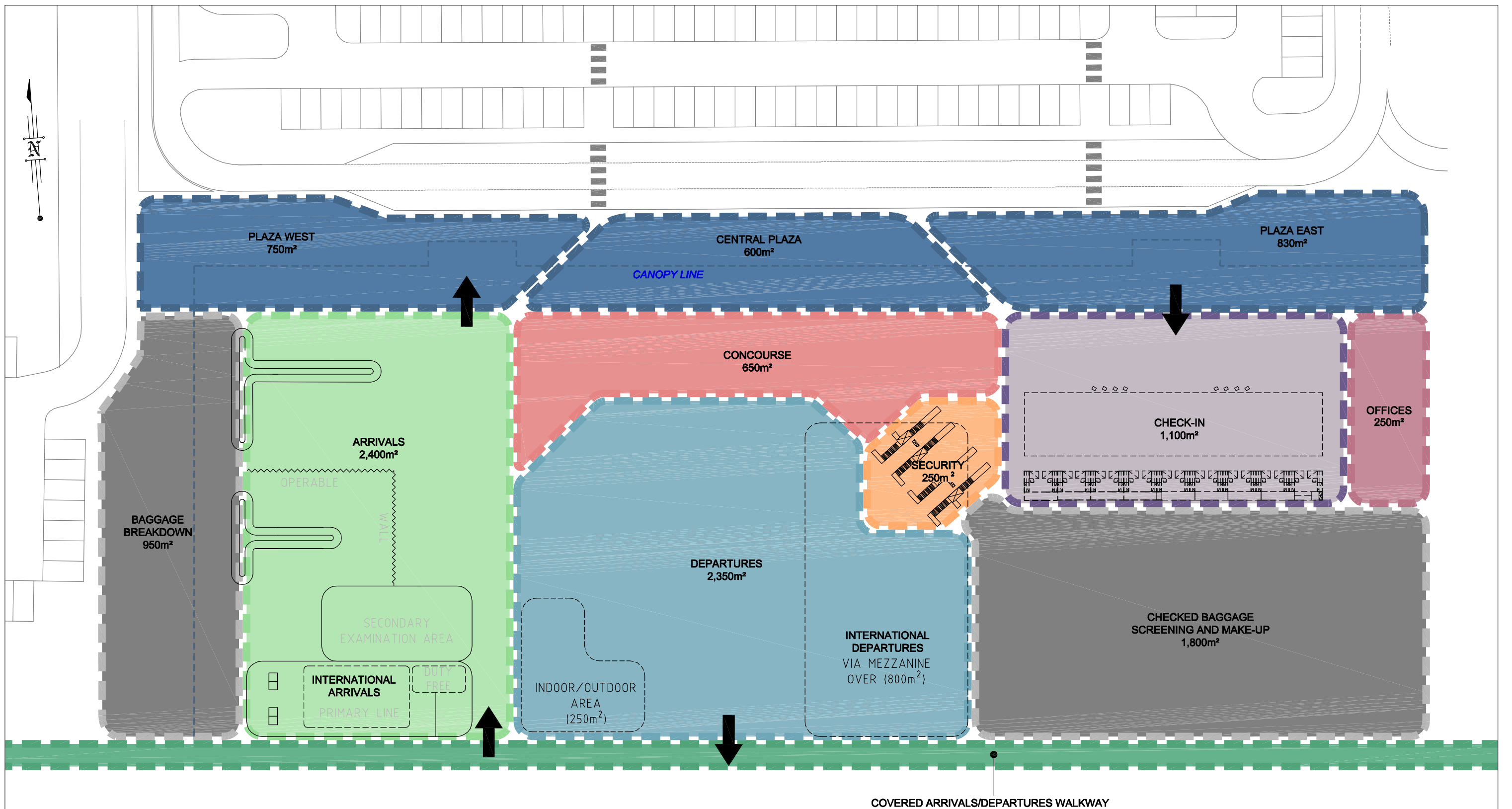
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Draftsperson: CF
Designer: CF
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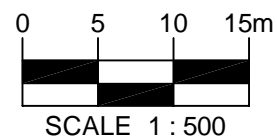
Checked: BJH
Approved: BJH
Date: 03/12/13

Sheet Size	Drawing No.
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INTERNAL AREA 8,800m²
EXTERNAL AREA 3,130m²



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2	10/12/13	SJ	DRAFT	BJH
1	05/12/13	MJ	DRAFT FOR COMMENT	BJH
0	02/12/13	LT	DRAFT FOR COMMENT	BJH

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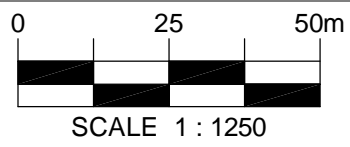
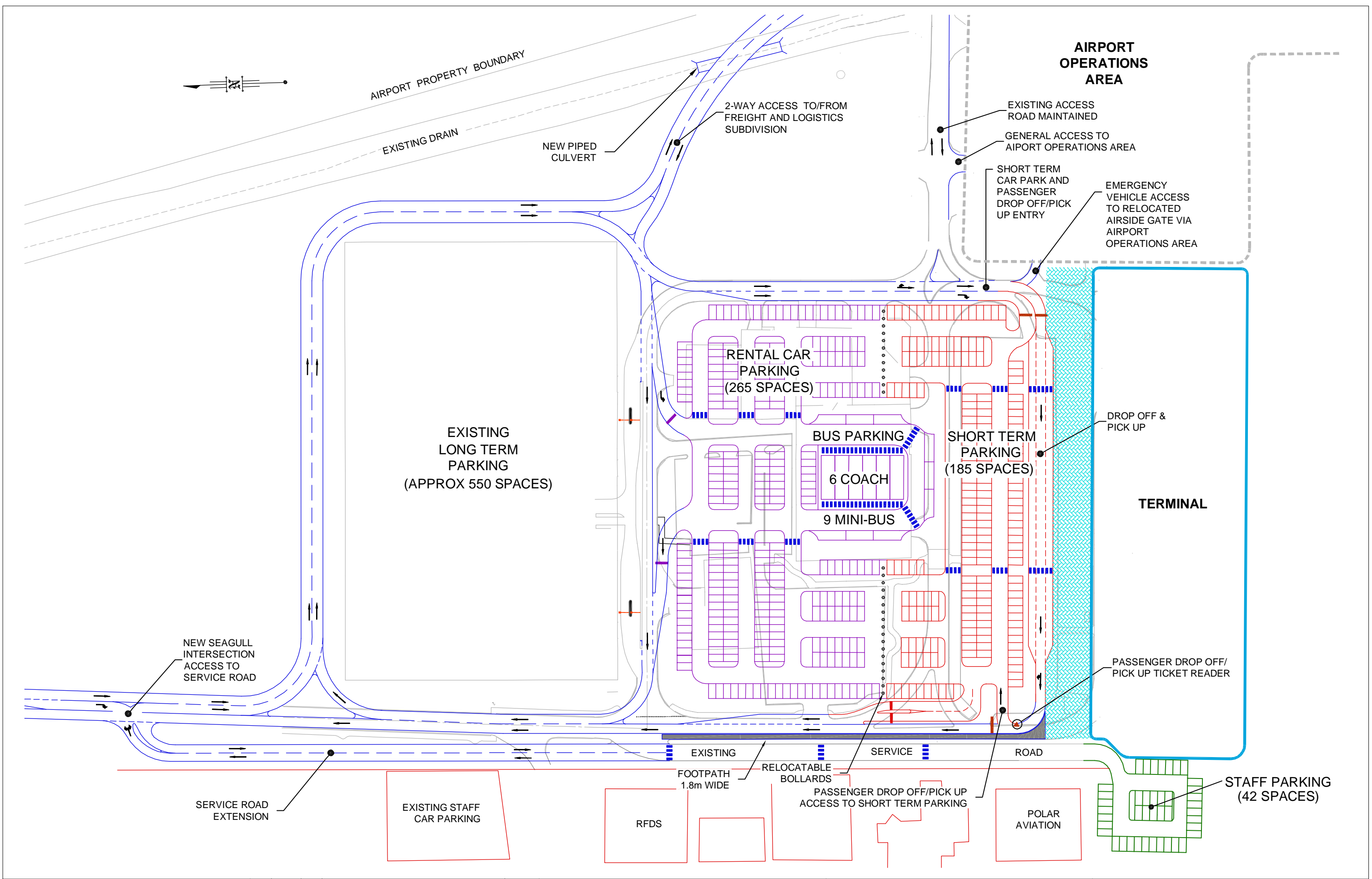
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Project: **PORT HEDLAND INTERNATIONAL AIRPORT REDEVELOPMENT PROGRAM REVIEW**

Title: **PASSENGER TERMINAL CONCEPT PLAN**

Client: <i>TOWN OF PORT HEDLAND</i>			
Draftsperson: LT	Checked: BJH	Sheet Size: A3	Drawing No.: B13341-A-004
Designer: LT	Approved: BJH		
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2	19/12/13	MJ	FINAL	BJH
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0	02/12/13	MJ	DRAFT FOR COMMENT	BJH

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Project: **PORT HEDLAND INTERNATIONAL AIRPORT REDEVELOPMENT PROGRAM REVIEW**

Title: **CARPARK/GROUND TRANSPORT CONCEPT LAYOUT**

Client: TOWN OF PORT HEDLAND		Drawing No. A3 B13341-A-005	
Draftsperson: MJ	Checked: BJH	Sheet Size: A3	Scale: 1:1250
Designer: MJ	Approved: BJH	Date: 02/12/13	
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