



PROPOSED COMMON USE INFRASTRUCTURE ON CHRISTMAS ISLAND

**SUBMISSION TO THE
PARLIAMENTARY STANDING COMMITTEE ON
PUBLIC WORKS**

April 2002



DEPARTMENT OF TRANSPORT AND REGIONAL SERVICES

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FOREWORD

1. The Department of Transport and Regional Services proposes to construct common use infrastructure on Christmas Island in support of a proposed space centre on the island.
2. The proposal was referred to the Public Works Committee (PWC) on 9 August 2001 and a submission provided, but the reference lapsed when the previous Committee ceased to exist with the prorogation of Parliament on 8 October 2001. Nevertheless, because of the urgency of the projects, the PWC granted approval in September 2001 for concurrent documentation.
3. The original referral included three projects:
 - (a) an Airport Upgrade;
 - (b) an Additional Port on the east coast; and
 - (c) a New Link Road from the east coast to Lily Beach Road.
4. The Additional Port and New Link Road projects will now be included in the infrastructure works associated with the Christmas Island Immigration Reception and Processing Centre, which will be the subject of an exemption motion.
5. This submission deals only with the Airport Upgrade project.

IDENTIFICATION OF THE NEED

INTRODUCTION

6. The proposal presented in this submission to the Parliamentary Standing Committee on Public Works (PWC) is for the construction of common use infrastructure on Christmas Island in the form of improvements to the airport. (Refer to Appendix A - Figure 1).
7. The proposed airport upgrade includes:
 - (d) improving, strengthening and extending the runway from the present 2.1km to approximately 2.65km to enable the use by wide bodied and heavy lift aircraft;
 - (e) extending the apron area and taxiways; and
 - (f) relocating and lowering sections of existing roads to suit the runway extension.
8. The provision of emergency services at the airport, including fire tenders and associated vehicle storage facilities, was included in the original referral in August 2001. Subsequent advice from the Civil Aviation Safety Authority (CASA) is that emergency services will not be required owing to the low volumes of air traffic forecast for the airport. Accordingly, emergency services facilities are not included in the proposed infrastructure.
9. The proposed airport upgrade is intended to provide improved services for the Christmas Island community and to support the proposed operation of a commercial space launch facility by the Asia Pacific Space Centre (APSC).
10. Consideration of the proposal is being sought to enable the construction programme for the proposed Commonwealth works to meet APSC's requirements for infrastructure support facilities. APSC is aiming for its first satellite launch to occur in 2004. In view of the need to expedite the proposed airport upgrade, permission was granted by the PWC in September 2001 for concurrent documentation of the common use infrastructure. Design and documentation is currently in progress.
11. The Department of Transport and Regional Services has referred the proposed airport upgrade to Environment Australia for environmental assessment under the Environmental Protection and Biodiversity Conservation Act, 1999.

HISTORICAL BACKGROUND

12. Historically, freight handling and unloading (which are both crucial to Christmas Island), and passenger transfer have been serviced by the existing port facility at Flying Fish Cove and the Christmas Island Airport. (Refer to Appendix A –Figure 2).
13. Christmas Island airport is operated by the Department of Transport and Regional Services through the Christmas Island Administration. The airport

has limited international status and comprises a single runway constructed in 1974 and aligned in the north/south direction.

14. The runway is 2,103m long and 45m wide within a runway strip 2,225m long by 150m wide. There is a 23m wide taxiway providing access to an apron area. Limited parking is available on the apron.
15. The airport is currently serviced mainly by BAe 146/RJ70 aircraft (70-85 seats) with twice-weekly flights from Australia and a B737 with a weekly flight from Jakarta.
16. The current pavement classification for the runway generally allows for operations by aircraft up to B737 type. A Master Plan for the Christmas Island airport prepared in 1996 by the Federal Airports Corporation reflected this by adopting a Code 4C aircraft as the design aircraft, which includes the B737, (140 passengers).
17. Boeing 767 size aircraft are able to use the existing airport but are not able to leave the runway as they cannot turn around in the apron area under their own power, and the airport does not have an aircraft tug. Consequently, the airport must be closed while such aircraft are on the runway. Boeing 767 size aircraft also exceed the design strength of the runway and shorten its life. Aircraft of this size have recently been used for the transfer of unauthorised boat arrivals to the mainland.
18. The elevation of the airport is approximately 280m and has a 32m fall from the north runway end to the south runway end.
19. The airport is built over a former phosphate mine that was subsequently filled to the current levels. However, the north and south ends of the existing runway were not filled and remain at mined levels and up to 20m below runway level.
20. Aircraft navigational aids provided at the airport include a Non-Directional Radio Beacon (NDB), VHF Omni-Direction Radio Range (VOR), Distance Measuring equipment (DME), and a T-VASIS landing aid. There is airfield lighting which includes the runway, taxiway and apron areas. Consideration is being given to taking the NDB out of service. Airservices Australia is proposing to install a GPS descent procedure later in 2002.
21. The Obstacle Limitation Surface (OLS) associated with the runway is extensively infringed to the west of the runway and its extended centreline to the north. These confine manoeuvring in Instrument Meteorological Conditions to the east of the runway. The NDB mast is a significant obstruction.
22. Because of its altitude, the airport is prone to poor visibility for pilots in low cloud and poor weather conditions. The provision of navigation aids and associated letdown procedures enables aircraft to descend to pre-determined levels above ground where a landing can continue if the pilot has visual contact with the runway, or a go-around can be initiated.

NEED

23. On June 22, 2001, the Federal Government announced that it would provide up to \$100 million, under the Strategic Investment Coordination process, to assist the Asia Pacific Space Centre (APSC) project to proceed on Christmas Island.
24. As part of Australia's Strategic Investment Incentives Process, the aim is to attract to Australia investment that would otherwise be located offshore. The process is designed to generate additional investment, not to subsidise investment that would have occurred anyway.
25. Of the \$100 million assistance, \$51.3 million will be made available for common use infrastructure on Christmas Island in the form of improvements to the airport.
26. The proposed airport upgrade is considered an essential element for APSC to operate a commercial space launch centre on Christmas Island. It will also provide a broader community benefit to Christmas Island.
27. In normal circumstances, the State or Territory would be expected to provide common use infrastructure. The Commonwealth has the equivalent role of a State Government on Christmas Island and therefore the provision of this infrastructure is the Commonwealth's responsibility. The Department of Transport and Regional Services will be responsible for the common use infrastructure.
28. Upgrading of the common use infrastructure will:
 - (a) support the Government's objectives for Christmas Island;
 - (b) allow for a more flexible approach to air services for the Indian Ocean Territories by increased strength and length of runway;
 - (c) secure for Australia a commercial satellite launch facility that would be the foundation for an Australian space industry; and
 - (d) create short and long term job opportunities for the local community and develop the local skills base.

OPTIONS CONSIDERED

29. Relocating the airport was considered and rejected on cost and environmental grounds.
30. Three options were considered at the present site for extending the runway to provide a length of 2.65km:
 - (a) a 550m extension to the south;
 - (b) a 550m extension to the north; or
 - (c) a combination of extensions to the north and the south.
31. Preliminary investigations indicated that the best option was to extend the runway 550m to the south.

32. Following a detailed site survey, and discussions with CASA, Environment Australia and Parks Australia, it was determined that the most economic and environmentally satisfactory option was to extend the runway 460m north and 90m south. The reasons for the decision are as follows.
- (a) Much of the Christmas Island runway falls steeply to the south. To improve safety for large aircraft landing from the north (the most common direction), CASA required that the runway be provided with a longer length of flatter gradient on the northern end. This can be achieved by extending the runway to the north or by cutting down the existing runway levels. Extension is less costly and cutting down the existing runway is impractical from an operational viewpoint.
 - (b) Accurate ground level information obtained from a site survey enabled a recalculation of the volumes of earthworks required for runway extensions. When considered in conjunction with CASA's requirement that ground levels north of the runway be reduced to improve aircraft obstacle clearances, and after allowing to relocate part of Lily Beach Road, a major extension of the runway to the north proved to be more economic.
 - (c) By utilising a CASA dispensation to allow a 3.3% approach slope at the northern end instead of the 2% nominally required, it became feasible to extend the runway 460m north without relocating or lowering the existing VOR/DME navigational aid. A minor adjustment to the VOR lightning protection is required.
 - (d) During a site inspection, representatives of Environment Australia and Parks Australia indicated strong reservations about a 550m runway extension to the south because of the potential impact on high quality rainforest. The proposed 90m southern extension will not impact on the high quality rainforest.
33. In addition to the runway extensions, new CASA regulations require Runway End Safety Areas (RESAs) with a minimum length of 90m to be provided at both ends of the runway to allow for aircraft overrun. Alternatively, engineered deceleration beds can be provided. The provision of engineered aircraft deceleration beds was investigated but, as they occupy nearly as much space as RESAs and are much more costly, RESAs are proposed.
34. A substantial increase in apron area for the parking of large aircraft is required. The preferred location for this is an extension to the north of the existing apron. The alternative location, south of the existing apron, is restricted by the proximity of existing infrastructure.

REASONS FOR ADOPTING PROPOSED COURSE OF ACTION

35. The proposed course of action provides the required facilities at the least cost and with the least environmental impact.

DESCRIPTION OF PROPOSAL

36. The airport upgrade is proposed to provide a facility which allows for Boeing 747-400 to land with a payload of 80 tonnes and to take-off with a payload of 72 tonnes, and for an Antonov 124-100 to land with a payload of 70 tonnes and to take-off with a payload of 63 tonnes. Both aircraft will be carrying enough fuel to enable them to return to Singapore or Jakarta without refuelling on Christmas Island.
37. The airport upgrade (Refer to Appendix A - Figures 3, and 4) includes:
- (e) a runway extension from 2100m to 2650m (460m to the north and 90m south); including runway and shoulder widening and strengthening, clearing, cut for fill, fill, runway pavements, turning nodes, lighting, pavement markings and relocation of the T-Visual Approach Slope Indicator System;
 - (f) apron and taxiway expansion, and provision of a second taxiway: including strengthening and shoulder widening of existing apron and taxiway, clearing, cut to fill, apron and taxiway pavements, lighting and drainage;
 - (g) relocation of a section Lily Beach Road to avoid the northern runway extension; and
 - (h) lowering parts of Lily Beach, Phosphate Hill and Vagabond Roads to provide adequate aircraft clearance.
38. The second taxiway is required for Boeing 747 and Antonov 124-100 aircraft. It will also enable a Boeing 767 to enter and leave the apron area under its own power.
39. The second taxiway must be installed close to the existing because of limitations on the permissible slopes of taxiways. (The runway rises steeply to the north near the terminal.)
40. The existing runway is designated as an instrument non-precision approach runway and will remain so after the upgrade. This is an instrument runway equipped with visual aids and a radio aid providing at least directional guidance adequate for a straight-in approach with a published Minimum Descent Altitude (MDA) of less than 500 feet above the aerodrome elevation. In the future, it is likely Category 1 Precision Approaches will be possible by using a Ground Based Augmentation System (GBAS) instead of installing an Instrument Landing System. GBAS is a development of the Global Navigational Satellite System (GNSS) with ground based augmentation to improve accuracy. Its commercial use is expected to become viable in the coming years. A precision approach Category 1 runway provides for aeroplane operations as low as 200 feet decision height and runway visual range in the order of 800 metres.
41. There are no proposed additional aircraft refuelling requirements for Christmas Island airport as design aircraft associated with the space centre are expected to refuel in Singapore or Jakarta. However, hydrant refuelling

infrastructure will be provided to the extended apron, for a future contingency.

42. An airport terminal upgrade is not included in this proposal but may be required at a later date depending upon passenger numbers and aircraft operations.
43. The proposals for the airport are consistent with the airport Master Plan that is in the process of being updated by Westralia Airports Corporation (the Airport Manager) and has been issued in draft form.

ENVIRONMENTAL IMPACT ASSESSMENT

44. The airport upgrade has been referred to Environment Australia for assessment under the Environmental Protection and Biodiversity Conservation Act, 1999. The environmental assessment of the common use infrastructure projects is expected to be completed during 2002.
45. Environment Australia has advised that the airport upgrade is to be assessed at the level of an Environmental Impact Statement (EIS) and the draft EIS is about to be submitted to Environment Australia.
46. None of the environmental investigations carried out for the preparation of the EIS revealed any significant environmental impediments to the construction of the airport upgrade. Overall, the environmental impacts are considered to be minor.
47. As a result of discussions with Environment Australia and Parks Australia during preliminary design, greater emphasis was given to extending the runway to the north rather than to the south because of Environment Australia and Parks Australia objections to a major southern extension.

HERITAGE CONSIDERATIONS

48. The airport upgrade is located outside the Christmas Island Natural Heritage Area. The Phosphate Hill Heritage Area north of the airport will not be impacted.

ORGANISATIONS CONSULTED

49. A comprehensive Community Consultation programme has been implemented throughout the planning and development stages of the proposed airport upgrade, involving Christmas Island Administration, stakeholders and the local community.
50. In September 2001, public meetings were held and organisations/stakeholders consulted on the original proposals for the common use infrastructure. The organisations/stakeholders consulted at that time included:
 - (a) Christmas Island Administration;
 - (b) Shire of Christmas Island;
 - (c) Christmas Island Power Authority;
 - (d) Water Corporation;

- (e) C I Airport Manager;
 - (f) Harbour Master;
 - (g) Christmas Island District High School;
 - (h) Indian Ocean Territories Health Service;
 - (i) Bureau of Meteorology;
 - (j) Christmas Island Chamber of Commerce;
 - (k) Union of Christmas Island Workers;
 - (l) Christmas Island Phosphates;
 - (m) Christmas Island Tourism Association
 - (n) Australian Federal Police and Immigration;
 - (o) Australia-Pacific Space Centre (APSC)/Softstar; and
 - (p) ECOZ, Parks Australia and Island Care.
51. The Australian Customs Service and Australian Quarantine and Inspection Service have also been consulted.
52. Further public consultation on the common use infrastructure was undertaken on Christmas Island in March 2002, to update the public and organisations and to show the revised layouts. Comprehensive information on the airport upgrade including noise forecasts was presented.

REVENUE DERIVED FROM PROJECT

53. The existing airport currently generates revenue from landing charges which are based upon tonnage of the aircraft. With the proposed runway extension allowing for the landing of larger aircraft, landing charge revenue can be expected to increase.

TECHNICAL INFORMATION

LOCATION

54. The proposed airport upgrade is located at the existing Christmas Island airport in the northeastern area of Christmas Island, south of Drumsite and between the road to South Point and Lily Beach Road.

SCOPE OF WORK

55. The proposed upgrade is designed to balance the commercial and social benefits with optimal protection of the terrestrial environment in this unique Commonwealth Territory.
56. A Functional Design Brief for the airport upgrade project has been prepared in consultation with APSC.
57. In developing specifications for the common use infrastructure, the Commonwealth will consult with APSC to ensure specifications for the work to be tendered will deliver the performance required by APSC.
58. The proposed works to be undertaken at the airport include:
- (a) a 550m runway extension (460m to the north and 90m to the south);
 - (b) a 90 m Runway End Safety Area (RESA) at each end of the runway;
 - (c) widening existing runway shoulders from 3m to 7.5m;
 - (d) widening the runway strip/flyover area from 150m to 300m where practical (CASA requirement);
 - (e) a new taxiway and widening of existing taxiway shoulders;
 - (f) expansion of the apron area;
 - (g) a nominal 60mm structural asphalt overlay of the existing runway to strengthen the pavement for the Boeing 747 and Antonov 124-100 aircraft;
 - (h) new runway and taxiway edge lighting;
 - (i) new apron lighting;
 - (j) relocating the T-Visual Approach Slope Indicator System at both ends of the runway to suit the runway extensions;
 - (k) relocating a section of Lily Beach Road to avoid the northern runway extension and consequential modifications to Phosphate Hill Road; and
 - (l) lowering ground levels northwest of the runway and parts of Lily Beach, Phosphate Hill and Vagabond Roads to provide improved obstacle clearance for aircraft.

59. The runway extensions at both ends cover land that has previously been mined with the result that ground levels are considerably lower (up to 20m) than the existing runway.
60. As ground levels to the northwest of the runway infringe the Obstacle Limitation Surface (aircraft clearance requirements) for the airport, it is proposed to cut existing ground levels in this area, and to use the excavated material for most of the necessary fill for the runway extensions. Geotechnical investigations indicate the materials in the area are suitable for use in constructing the runway extensions.
61. To avoid vehicular traffic infringing the Obstacle Limitation Surface, it is proposed that parts of Lily Beach, Phosphate Hill and Vagabond Roads will be lowered by up to 5m below adjacent finished ground surfaces.
62. Part of Lily Beach Road must also be relocated further north to allow for the runway extension. It is proposed that Lily Beach Road will intersect Phosphate Hill Road at a tee junction and that Phosphate Hill road will curve on to the old alignment of Lily Beach Road west of the airport. Phosphate Hill road will then become the through road (instead of Lily Beach Road) to improve access from the settled areas to the airport.
63. Temporary access roads will be provided while the existing roads are reconstructed.
64. Boeing 747 and Antonov 124 aircraft will park north of the terminal, parallel to the terminal building line (and runway centreline), and will be able to taxi out under their own power without the need for ground equipment such as tugs.
65. The parking position on the apron for the Boeing 747 and Antonov 124 will be determined to avoid jet blast on the existing terminal building, other structures and other aircraft parking positions.
66. The additional taxiway will enable Boeing 767 size aircraft to taxi into the existing apron in front of the terminal and to leave via the new taxiway under their own power.

SITE DESCRIPTION AND SITE SELECTION

67. The site of the proposed works is at the existing Christmas Island Airport. The runway is oriented in a north-south direction because of terrain constraints and to suit the prevailing wind directions.
68. The proposed southern runway extension encroaches into an adjacent Mining Lease but avoids the National Park. The northern extension is within airport land.
69. The airport site needs to be increased in size to accommodate the proposed southern runway extension and also to allow for future expansion of facilities in accordance with the revised Master Plan for the airport prepared by Westralia Airports Corporation. The Department of Transport and Regional Services is negotiating with Phosphate Resources Limited (PRL) to acquire parts of mining leases for the airport upgrade. The remaining areas required for the upgrade are Unallocated Crown Land.

70. It is not considered to be economically and environmentally practical to construct a new airport at a different site.

ZONINGS AND APPROVALS

71. The airport is located within the Airport Precinct under the Christmas Island Town Planning Scheme No. 1. However, extension of the airport runway outside the Airport Precinct will necessitate an amendment to the Town Planning Scheme, to accommodate this use into an area currently zoned “Mining Reserve”. The existing Airport Masterplan is being reviewed to include the longer runway, larger design aircraft and different aircraft movement mixture.

LAND ACQUISITION

72. The additional land that is proposed to be acquired for the airport includes:
- (a) part of an adjacent Mining Lease;
 - (b) part of a Mining Lease that is proposed for transfer to APSC; and
 - (c) Unallocated Crown Land.
73. The Department of Transport and Regional Services is negotiating with the leaseholders, PRL, to obtain the required land for the airport upgrade.
74. The proposed land acquisition includes land near the terminal for future apron, terminal, commercial/operational and car parking facilities in accordance with the revised Airport Master Plan.
75. The revised Airport Master Plan is expected to make provision for a future 500m runway extension to the south. Land acquisition, as currently proposed, is sufficient for a 90m southern runway extension but not for a 500m southern extension. In the event that the 500m southern extension should become necessary, additional land would need to be acquired. The required land is owned by the Commonwealth but, at present, is partly covered by a Mining Lease.

CODES AND STANDARDS

76. All structures, services and infrastructure will comply with all relevant Commonwealth and State, building, health and safety regulations, the Building Codes of Australia, and all relevant Australian Standards, including Austroads Standards. The proposed airport operations will be required to satisfy the standards of the Civil Aviation Safety Authority (CASA), with the runway to be designed and built to ICAO Annex 14 and Rules and Practices for Aerodromes Standards.

PLANNING AND DESIGN CONCEPTS

77. The proposed design of the infrastructure facilities is based on a functional construction concept designed to meet local demand and APSC operational requirements.

GEOTECHNICAL INFORMATION

78. Geotechnical investigations are generally complete. The results to date confirm the suitability of the site and proposed construction methods.

MASTER PLANNING

79. The proposed infrastructure facilities will require to be reflected in:

- (a) the Christmas Island Town Planning Scheme; and
- (b) the Airport Master Plan.

FIRE PROTECTION

80. CASA does not require emergency fire fighting facilities to be provided at the airport because of the low airport utilisation.

FUTURE EXPANSION

81. The airport upgrade has been designed to accommodate anticipated demand for known future local and APSC requirements. The design of the infrastructure will allow for future expansion.

OCCUPATIONAL HEALTH AND SAFETY

82. The infrastructure will comply with requirements of the *Occupational Health and Safety (Commonwealth Employment) Act 1991*.

EMPLOYMENT IMPACT

83. The project will create both short and long-term job opportunities for the local community and will assist in the development of the local skills base. During construction, this will be in the form of sub-contract work available from mainland head contractors. During the operational stage of the airport, employment will be generated in the management, operation and maintenance of these facilities.

PROJECT COST

84. The estimated cost of the common use infrastructure is \$51.3 million.

PROJECT DELIVERY SYSTEM

85. Gutteridge Haskins and Davey Pty Ltd has been appointed to provide Project Management, Design, and Contract Administration Services for this project.

86. The most appropriate form of delivery for this project is considered to be calling for Expression of Interest from construction contractors, short listing and then tendering for a Lump Sum Contract.

CONSTRUCTION PROGRAMME

87. Subject to the outcome of the Public Works Committee investigations and Parliamentary approval to proceed, tenders could be called in the second

half of 2002, with the airport upgrade scheduled for completion in early 2004.

88. The construction schedule for the airport upgrade will be aligned with APSC's spaceport construction programme. To this effect it will be necessary to parallel both construction programmes. This will allow for construction scheduling to meet the requirements for an anticipated 2004 spaceport launch.

SUMMARY AND RECOMMENDATIONS

89. In accordance with the Government announcement of June 2001 providing funds for common use infrastructure on Christmas Island, the Department of Transport and Regional Services considers that the proposed works as described in this submission are the most appropriate and cost effective way to provide such common use infrastructure on Christmas.
90. The proposed common use infrastructure on Christmas Island will meet the current and long term needs of Christmas Island. The proposed infrastructure will improve the safety, efficiency and reliability of airport freight and passenger transport facilities on Christmas Island and provide necessary support infrastructure for the functional operation of the APSC space launch centre at South Point.
91. The proposed infrastructure upgrade will create both short and long term job opportunities for the local community and develop the local skills base.
92. The proposal to upgrade the common use infrastructure, in the form of improvements to the airport, is accordingly recommended to the Committee.

Appendix A

Figures

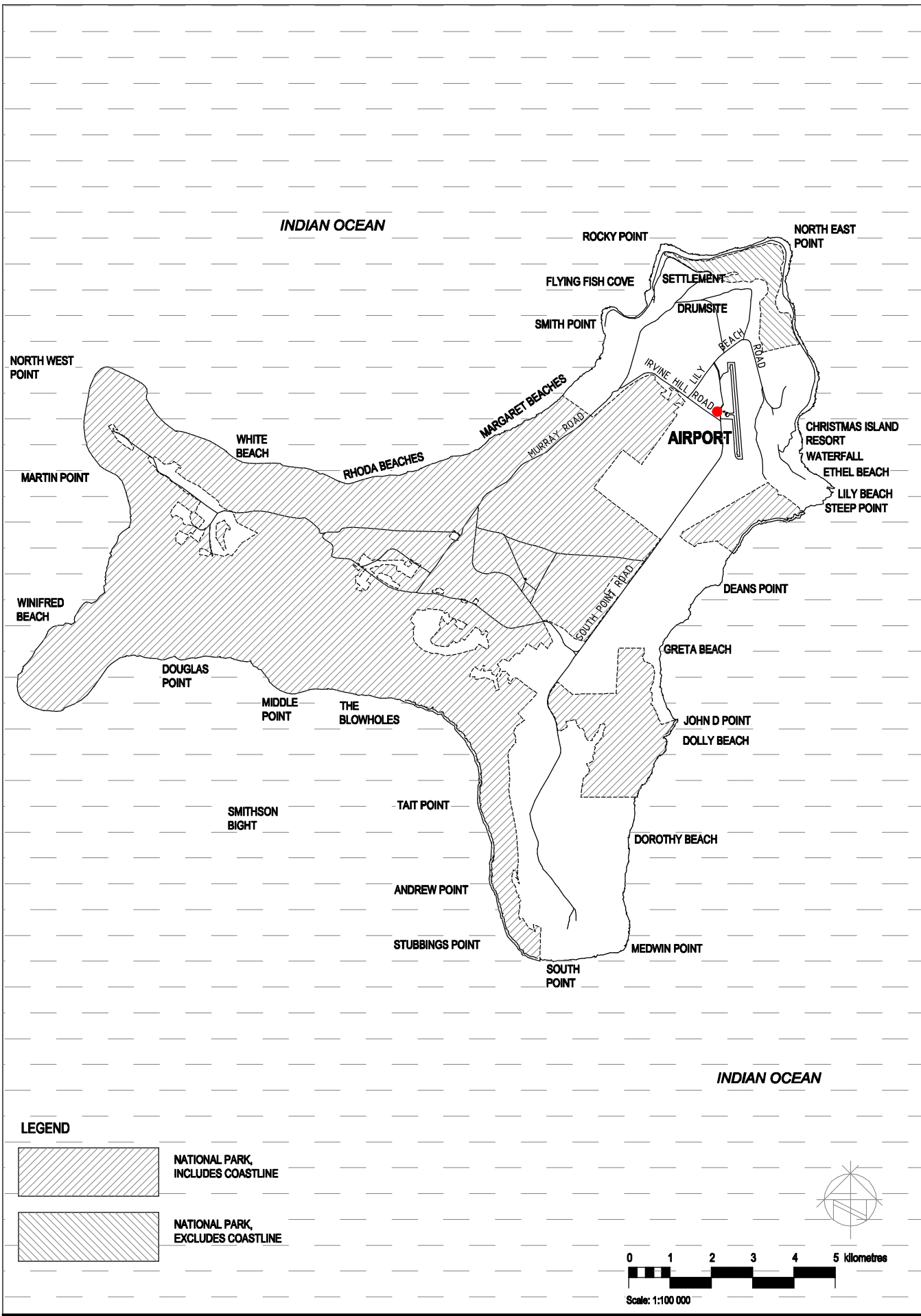


FIGURE 1
CHRISTMAS ISLAND - AIRPORT UPGRADE
LOCATION PLAN
DEPARTMENT OF TRANSPORT AND REGIONAL SERVICES

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Designer: GP	Drawn: JB



INDIAN OCEAN

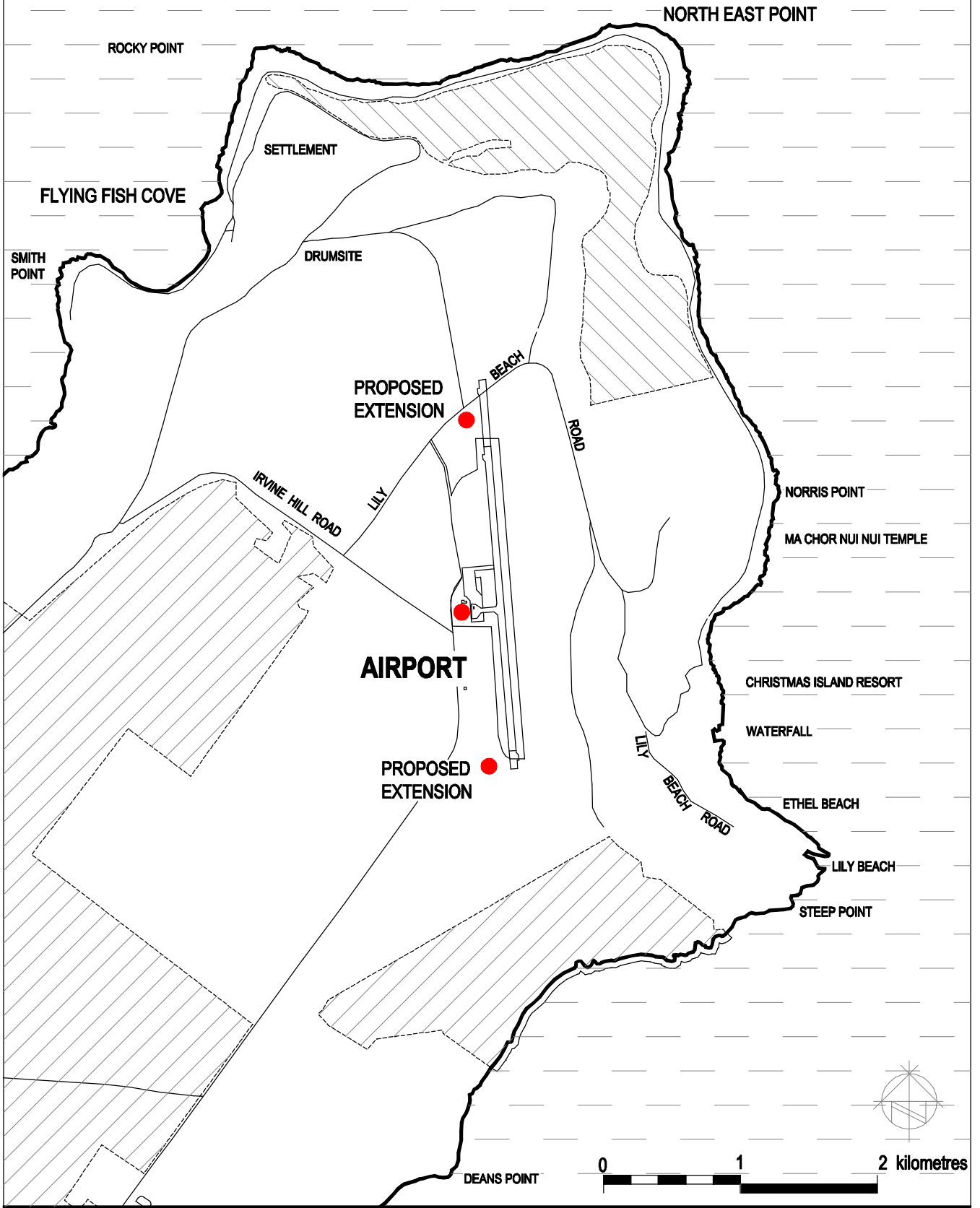
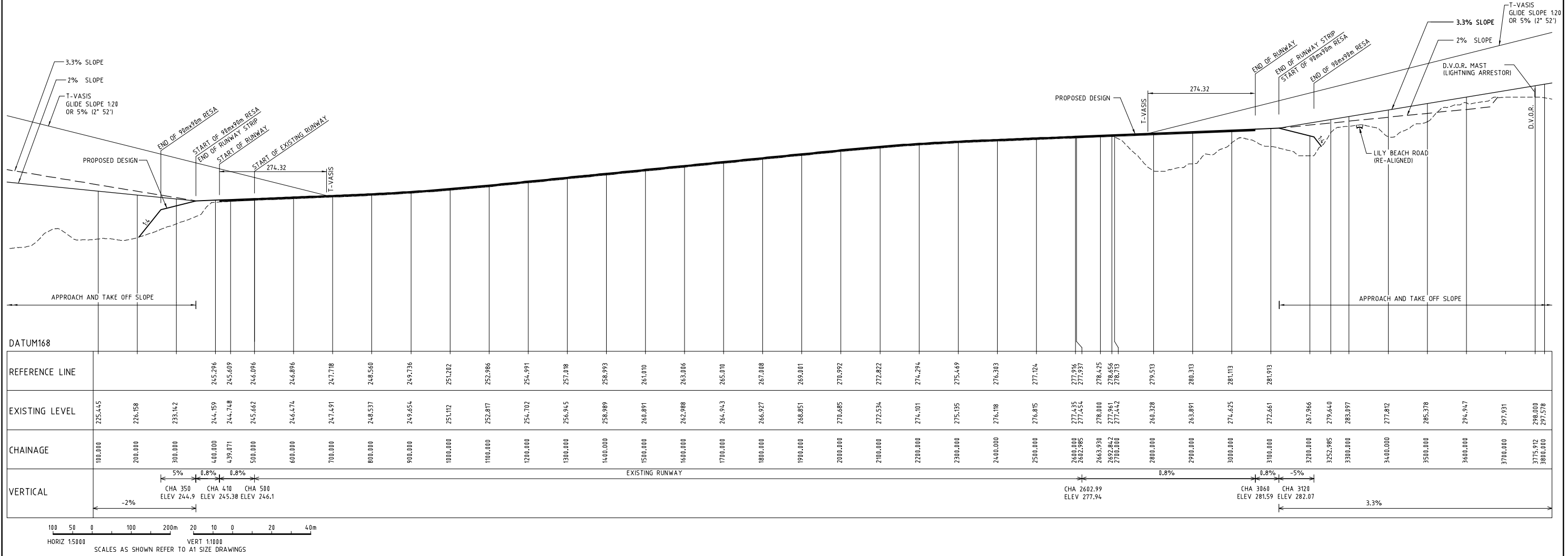
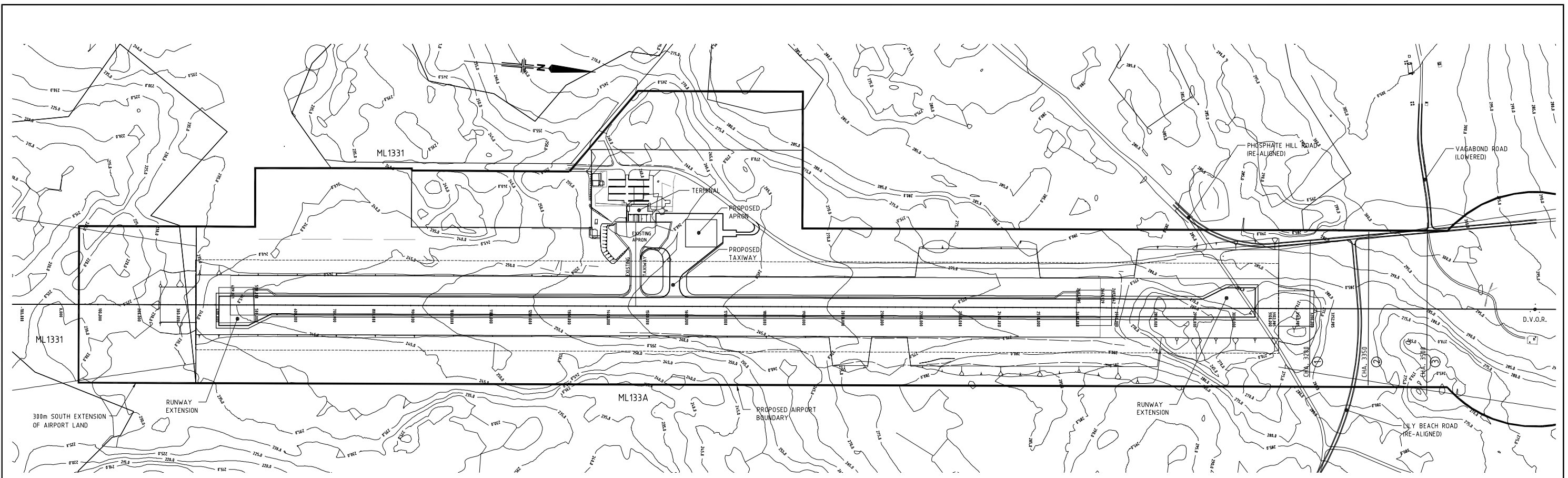


FIGURE 2
CHRISTMAS ISLAND - AIRPORT UPGRADE
SITE PLAN
DEPARTMENT OF TRANSPORT AND REGIONAL SERVICES

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Designer: GP	Drawn: JB



DEPARTMENT OF TRANSPORT AND REGIONAL SERVICES



FIGURE 3
CHRISTMAS ISLAND - AIRPORT UPGRADE
PREFERRED OPTION EXTENSIONS 90m SOUTH END & 460m NORTH END
GENERAL ARRANGEMENT

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FIGURE 3	
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