



**Option 1A**

**Design strategy:** Option 1A provided a 15 metre wide runway with maximum 2% longitudinal grade and maximum 2.5% transverse grade, located within a formed/graded 60 metre wide runway strip (as per MOS Part 139, Chapter 13), together with protection of the Obstacle Limitation Surfaces (OLS).

**Commentary:** Option 1A provided an operational runway length of 900 metres, essentially replicating the existing runway. The design investigation indicated that significant earthworks were required to comply with the grading and OLS requirements.

Earthworks required excavation of 1,018,000m<sup>3</sup> and fill of 202,000m<sup>3</sup>. These earthworks resulted in a surplus of 816,000m<sup>3</sup> of material. A significant proportion of the cut was required on the Woppaburra land parcel adjoining the southern boundary of the airport (the southern Woppaburra land (Lot 53 SP 190990)).

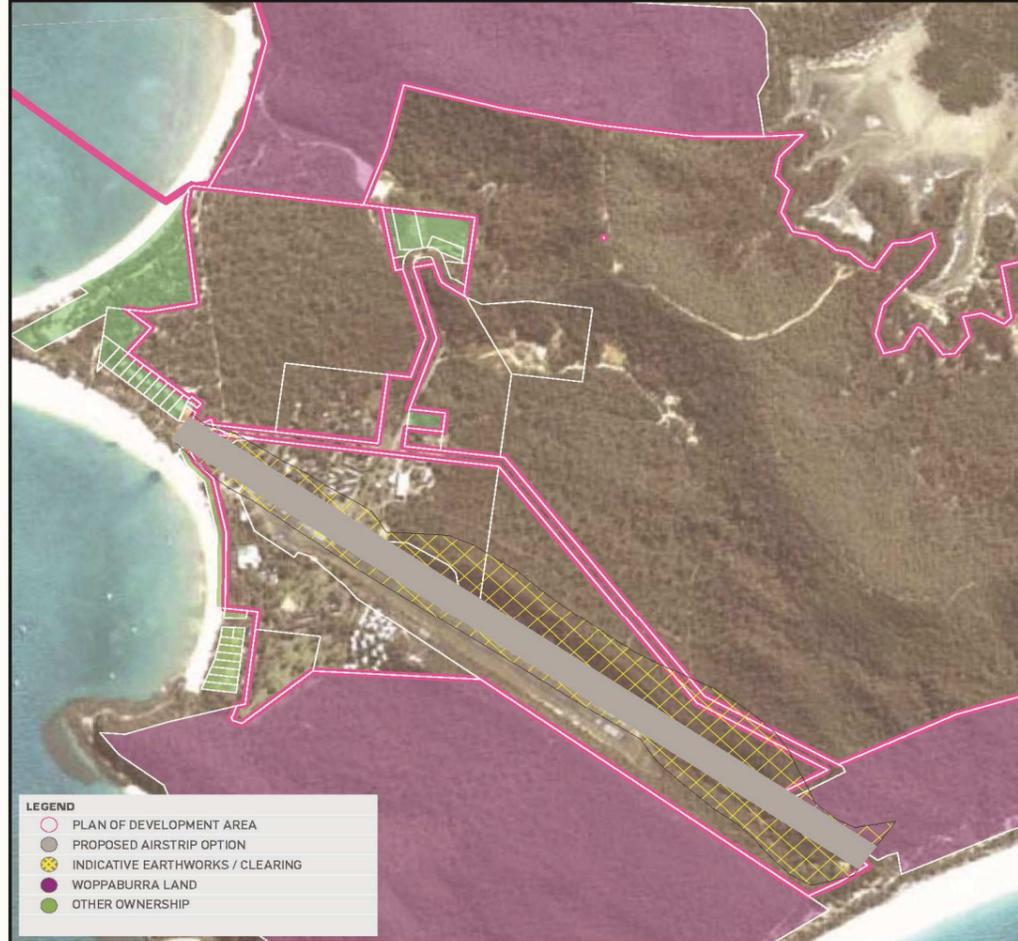


**Option 1B**

**Design strategy:** Option 1B examined the maximum length available on the existing runway alignment, adopting the same specification as for Option 1A. In this instance the runway formation was elevated to avoid excavation on Woppaburra land at the southern boundary.

**Commentary:** A runway length of 1,100 metres was achieved by extending the runway to the south-east, but earthworks required to achieve the MOS Part 139 grading included excavation of 315,000m<sup>3</sup> and fill of 1,297,000m<sup>3</sup>. This design required 982,000m<sup>3</sup> of additional fill. Option 1B also required minor earthworks on the northern Woppaburra land (Lot 52 SP 190991) in the approach to eastern end of the runway.

## AIRSTRIP OPTION 2



### Option 2

**Design strategy:** Option 2 examined a design comprising balanced cut and fill and a runway length of 1,100metres.

**Commentary:** Option 2 necessitated the following modifications to the existing runway alignment:

- an offset to the north of approximately 30 metres (parallel to the existing runway); and
- an approximate 2° anticlockwise rotation.

Option 2 required earthworks on the northern Woppaburra land(Lot 52 SP 190991) at the eastern end. The ultimate earthworks involved a cut volume of 976,000m<sup>3</sup>, fill of 740,000m<sup>3</sup>and a surplus of 236,000m<sup>3</sup>.

## AIRSTRIP OPTION 3



### Option 3

**Design strategy:** to meet necessary CASA requirements for the larger aircraft whilst maintaining a run-way alignment as close as is practicable to the existing airstrip.

**Commentary:** Option 3 necessitated the following modifications to the existing runway alignment:

- an offset to the north of approximately 45 metres(parallel to the existing runway); and
- an approximate 6° clockwise rotation.

This design achieved an operational runway length of 1,520 metres with similar impacts on the northern Woppaburra lands as for Option 2, but with major impacts on freehold land holdings, including the following:

- Lots 18-23 and 26-28 of LN1668 (various owners);
- Lot 39 LN2681 owned by the Lions Club of Yeppoon; and
- Lot 29 LN2747 leased to the Keppel Haven Resort.

Option 3 also impacts on Lot AP16085 which has no registered title.

This design involved excavation of 1,670,000m<sup>3</sup> and fill of 1,937,000m<sup>3</sup>, requiring 267,000m<sup>3</sup> of imported fill or borrow which can be readily sourced on-site by flattening the slope of batters in the cutting(s).

The runway formation and excavation requirements for Option 3required realignment of gazetted roads and/or creation of new roads, to be undertaken through road opening and road closing approvals (as required).



#### Option 4

**Design strategy:** The Option 4 design philosophy excludes any impact on Woppaburra land, freehold or other leasehold land and in addition, provides for land access to the proposed marina at the western end of the runway.

**Commentary:** Option 4 conforms to CASA requirements. However, with an operational runway length reduced to 1,350 metres results in operational ramifications for Phase 2 design aircraft types. The runway length could be increased to 1,420 metres (less than the 1,500 metres design objective), but with minor impacts on Great Keppel Haven leasehold land.

Option 4 involved excavation of 1,220,000m<sup>3</sup> and fill of 1,770,000m<sup>3</sup>, requiring 350,000m<sup>3</sup> of imported fill. This design involved only excavation for approximately 640 metres of its length, however required 20 metres of fill at the eastern end and 13 metres of fill at the western end of the runway.

The runway formation and excavation requirements for Option 4 also required realignment of gazetted roads and/or creation of new roads, to be undertaken through road opening and road closing approvals (as required).



#### Option 5

**Design strategy:** Option 5 considered relocation of the Option 4 airstrip alignment further north, with the objective to create excess excavation material for land remediation and to integrate the existing airport site into the resort redevelopment. A further objective of this design strategy was to reduce possible impacts on the Keppel Haven Resort.

**Commentary:** Option 5 necessitated the following modifications to the existing runway alignment:

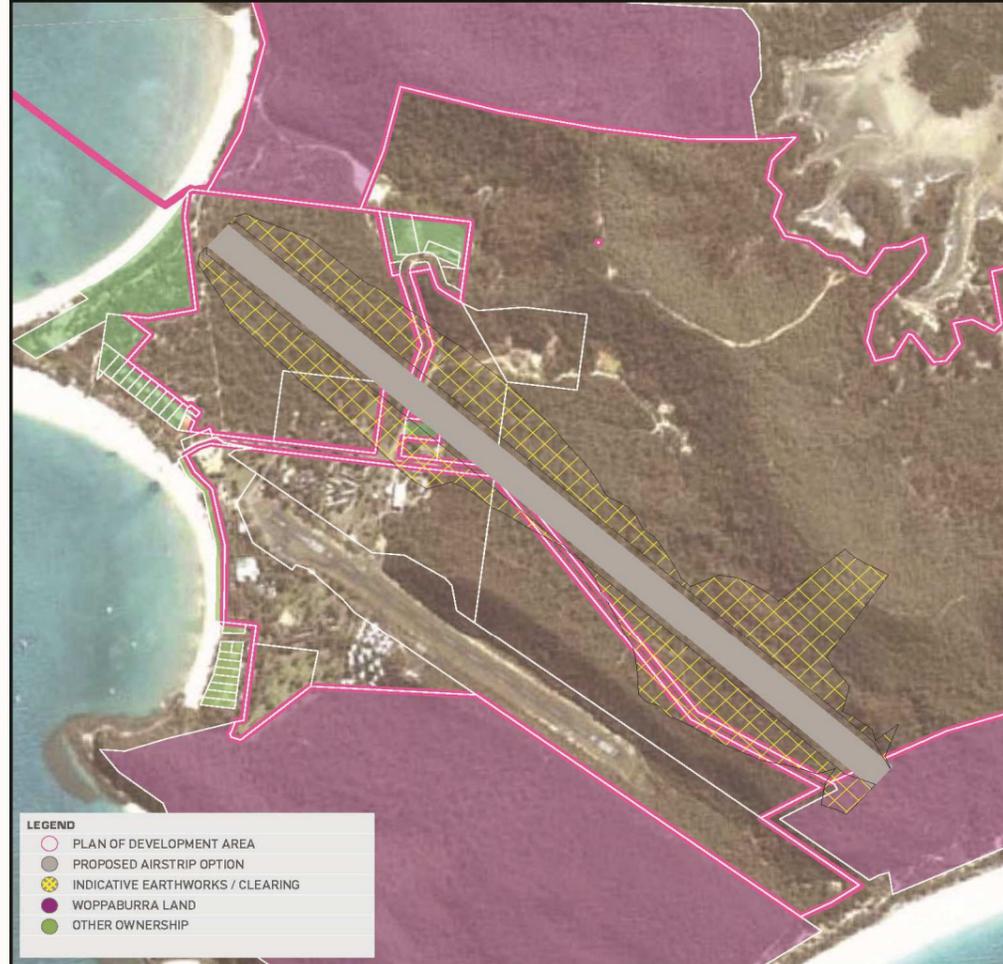
- an offset to the north of approximately 50 metres (parallel to the existing runway); and
- an approximate 12° clockwise rotation.

This design achieved an operational runway length of 1,470 metres and conformed with CASA requirements. However, the Option 5 modifications combined to impact on Lot 50 CP866044 with title registered to Rockhampton Regional Council. The shift in runway alignment also reintroduced some minor impacts on the northern Woppaburra land (Lot 52 SP 190991). The 12° rotation also introduced potential conflict with the operation of the proposed marina.

Earthworks involved excavation of 1,780,000m<sup>3</sup>, fill of 1,430,000m<sup>3</sup> and a material surplus of 350,000m<sup>3</sup>.

Road access to the marina was possible around the western runway end. A public road reserve traverses the runway alignment and its relocation and/or re-establishment would require further investigation.

## AIRSTRIP OPTION 6



### Option 6

**Design Strategy:** Option 6 represented a runway near-parallel to the existing runway alignment but with a northern shift of approximately 350 metres. The location was determined by an 8° anticlockwise rotation of the runway.<sup>3</sup>

**Commentary:** A design conforming with CASA requirements was achieved, with an operational runway length of 1,480 metres.

Earthworks involved an excavation volume of 1,750,000m<sup>3</sup>, fill of 1,950,000m<sup>3</sup> and a 200,000m<sup>3</sup> imported fill requirement.

Option 6 impacts directly on the northern Woppaburra land, although this can be avoided by reducing the operational runway length by around 150 metres, a significant operational penalty for the Phase 2 design aircraft types.

Relocation and/or re-establishment of the road reserve traversed by the runway would again be required.

A clear advantage with this design option is that the existing runway can remain fully operational while the new runway was being constructed.

## AIRSTRIP OPTION 7A



### Option 7A

**Design strategy:** The Option 7A design philosophy seeks to exclude any impact on Woppaburra land, freehold or Lot 50 CP866044 with title registered to Rockhampton Regional Council and to minimize excavation.

**Commentary:** Option 7A necessitated the following modifications to the existing runway alignment:

- an offset to the north of approximately 350 metres (parallel to the existing runway); and
- an approximate 12° clockwise rotation.

Fill height at the western end of the runway was reduced, an issue of concern for the protection of the approach and take-off OLS as there would be significant constraints on high mast yachts when moored at the proposed marina.

A CASA conforming design was achievable but with runway length reduced to 1,400 metres.

Relocation and/or re-establishment of the road reserve traversed by the runway would again be required.



**Option 7B**

**Design strategy:** Option 7B includes the same design objectives as Option 7A, with an additional objective to reduce potential conflict with high mast yachts moored at the proposed marina and allow protection of the approach and take-off OLS.

**Commentary:** A CASA conforming design was achieved with a runway length of 1,400 metres.

Earthworks involved an excavation volume of 2,780,000m<sup>3</sup>, fill of 2,480,000m<sup>3</sup> and a material surplus in the order of 200,000m<sup>3</sup>.

Relocation of the road reserve traversed by the runway would be avoided with a volumetric road closure, maintaining the functionality of the existing road reserve.