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Dear Mike

Queenstown Airport Master Plan – High Level Airport Siting Study

Thank you for inviting Arup to submit for the proposed scope of work to undertake a high level siting study for an optional second airport to support operations at Queenstown Airport. This letter outlines our response to your request to provide a proposal made during the Board workshop held on 7 July 2016 and the follow up phone discussion dated 14 July 2016.

1 Scope of Services

This section introduces Arup's approach and scope for the proposed high level siting study. The response focuses on the technical input of three aspects of delivering an airport. These being:

- Aeronautical Requirements – What are the land based requirements for airport infrastructure and can these be delivered at each of the proposed sites
- Surface Access Requirements – What access level and infrastructure is needed at each site and is this prohibitive due to restrictions in land use or terrain.
- Landside land use and Commercial Requirements – What other supporting land uses are required and do these fit within the proposed airport site area.
- Environmental and Heritage overlay – What environmental and cultural heritage land uses may restrict development of an airport

In addition to these technical focusses Arup will also supplement the finding of the study with a benchmarked costing for the airport. This costing will be independent of the chosen site and based on Arup's understanding of cost of other similar airports and relevant New Zealand based cost considerations.

1.1 Approach

Task 1 – Site identification

The first stage of the study will be a high level review of site options. QAC has identified the following criteria for identifying a site:

- Located 1 – 2 hours from the existing airport and Queenstown city
- Located within the arc extending from the NE and S relative to Queenstown Airport

Using this criteria Arup will identify the potential sites for placement of a second airport to support Queenstown Airport operations. Through a workshop with QAC this list will be narrowed to 4 sites to be focussed on as a part of the detailed study (Tasks 2 through 6).

As a part of the siting study we will be able to include an analysis of indicative sites that do not currently have an airstrip as well as sites which already have airstrips. Indicative sites will represent a range of sites within a prescribed region by considering a possible site that is typical of that region. Through providing an assessment based on indicative sites we will be able to narrow the field and identify if a particular region may be appropriate for further study at a later stage while still achieving the overall objective of the study within the necessary timeframes.

Task 2 – Review of Aeronautical Requirements

As identified above four concurrent studies will need to be undertaken to provide a measure on the suitability of each site. The first study will be into each site's ability to support the aeronautical operations for the proposed airport. These include:

- [1] Runway length;
- [2] Runway orientation; and
- [3] Obstacle Limitation Surfaces (OLS).

Runway Length

The first component of the aeronautical review will be an assessment of runway length needed at the site. Two runway length scenarios will be considered as a part of the assessment. These are:

- Code C Operations (estimated to be between 2,200 to 2,400 m); and
- Code E Operations (estimated to be ~3,000 m).

Arup will focus on identifying a high level runway length which serves the proposed aircraft (e.g. A321 for the Code C case) and typical routes suggested by the forecasts (e.g. to major cities on the east coast of Australia) which will inform the prescribed range for aircraft and therefore also payload. These will enable Arup to understand - to an appropriate level of detail - if each site will permit the necessary airport infrastructure.

Runway Orientation

The orientation of a runway to be used by fixed-wing aircraft is primarily dependant on prevailing winds, as an aircraft should always seek to land and take-off into the wind whilst minimizing crosswind components.

The study will review at a high level the dominant wind directions at each proposed site - based on available information provided by QAC - and the resulting orientation of the runway.

Obstacle Limitation Surfaces

The Obstacle Limitation Surfaces (OLS) are conceptual surfaces associated with a runway, which identify the lower limits of the aerodrome airspace above which objects become obstacles to aircraft operations and must be reported to the NZ CAA.

How the local terrain around each proposed site interacts with the OLS will identify if aircraft can take-off from and land at the proposed site and therefore the ability for each site to support the proposed operations.

Task 3 – Surface Access Requirements

Each of the proposed sites will be reviewed to identify the feasibility of linking the site with Queenstown on the existing road network. This review will need to consider the existing condition of access roads and therefore the necessary investment requirement to get passengers to/from the proposed airport.

In addition to this the review will also benchmark against the existing airport to identify the amount of surface access infrastructure required at the face of the terminal (e.g. drop-off/pick-up areas, short and long term parking, curb space for airport shuttles or public transport). This land take requirement will then be overlaid on to the site to understand if it can support the necessary surface access infrastructure.

Task 4 – Landside Land use and Commercial Review

Along with aeronautical and surface access requirements any proposed second airport would require land areas to support with other landside services (e.g. commercial, retail and other landside land uses). This review will consider the ability each site has to supporting such land uses. It is proposed that the outcome of this will largely be qualitative with sites ranked against each other to understand their relative performance.

Task 5 – Environmental and Heritage

The final element of the assessment of each site will be review of the local environmental and cultural heritage around the proposed site. This review will use existing GIS bases of environmentally or culturally sensitive areas close to each site, provided by QAC.

Task 6 – Reporting and Presentation

The final deliverable of the study will be a summary report that will combine the individual findings of each review listed above. This will be delivered to QAC in a Word style format and include a qualitative assessment of the suitability of each site given their ability to support aeronautical, surface access and other land side/commercial land use infrastructure.

The intention of this report will be to define at a high level if any of the proposed sites can support the necessary operations to make it an option for a second airport. We have allowed for one draft report and one final report within the proposed scope.

In addition to this report we have allowed time for development of a presentation of results to QAC and the board. This presentation would be delivered by Martin England.

1.2 Information Requirements

As a part of the study Arup will require a number of key inputs. These are assumed to be available to QAC and are listed below:

- 2045 unconstrained commercial forecasts – Aviado
- Existing safeguarding surfaces for Queenstown Airport – OLS, PANS-OPS
- Regional wind data
- Previous similar siting study reports prepared for QAC

In addition to the above data Arup will also need to utilise various GIS data sources which we have access to via our Auckland office. This includes:

- Terrain contours for the region – including each of the sites investigated in detail as a part of the study
- Regional environmental and cultural heritage sites
- Regional land-use mapping

5 Exclusions

Technical elements of the siting the study specifically excluded from the scope provided above include:

- Airspace modelling and consideration of the way in which each site integrates with Southern New Zealand airspace

- Detailed assessment of terminal sizing requirements and design
- Detailed surface access infrastructure sizing
- Detailed commercial and economic impact studies
- Flooding assessment
- Geotechnical assessment and constructability
- Social Impacts
- Noise Assessment
- Costing of options

These elements have been excluded given the high level nature of the proposed study and it is felt appropriate given the scope requested by QAC. If any of the above elements should be included as a part of future work these studies will be subject to a separate scope and fee.

As identified above Arup have not included scope to undertake costing of options and would assume that if QAC would require this data that a QS would need to be commissioned by QAC to undertake the costing exercise.