

# EXECUTIVE COUNCIL

## CONFIDENTIAL

**Title of Report:** Improvements to Beaver Island Airstrip  
**Paper No:** 176/10  
**Date:** 29/07/2010  
**Report of:** Christopher McLean, Design Engineer (acting for Director of Public Services Department)

### 1. Purpose

- (a) To inform ExCo of the latest situation in relation to the assessment of Beaver Island airstrip.
- (b) To seek retrospective approval for the supply, transport of plant and materials to Beaver Island.
- (c) To seek agreement from ExCo that a recommendation is made to the Standing Finance Committee on the funding to supply materials and technical support to the owners of Beaver Island to complete the improvement works to the Beaver Island Airstrip.

### 2. Recommendations

- 2.1 It is recommended that ExCo give retrospective approval for the partial use of funds allocated for the investigation of the three marginal Airstrips be used to transport plant and materials to Beaver Island.
- 2.2 It is recommended that ExCo give approval for the partial use of funds allocated for the investigation of the three marginal Airstrips be used to fund the use of a PSD surveyor to set out the proposed works.
- 2.3 It is recommended that, in line with the New Legislative Council's desire to assist in re-opening the closed airstrips, that FIG fund the plant & materials costs as well as technical support to the owners of Beaver Island in order to extend the Beaver Island airstrip to allow FIGAS to resume flights to the island.
- 2.4 It is recommended that ExCo seek funding from the Standing Finance Committee for additional funding to supply materials and technical assistance to attempt to stabilize the extension of Beaver Island airstrip.

### 3. Summary of Financial Implications

- 3.1 £38,600 has been estimated as being required to complete the works.
- 3.2 £8,300 of this amount is to come from the 2009/10 Airstrip Evaluation Capital Works Code 0958 3012.
- 3.3 An additional £30,300 is estimated to be required to complete the works.

	2010/11 £	2011/12 £	Total Project Cost £
<u>Capital Programme</u>	30,300	00,000	38,600

### 4. Background

- 4.1 Following the FIGAS aircraft accident on West Point in November 2006 and subsequent regulatory advice from Air Safety Support International and the aircraft manufacturer, FIGAS suspended operations to West Point, Beaver and New Island airstrips in June 2008. Suspension of operations was due to the runway lengths not meeting the requirements specified for the Islander aircraft.
- 4.2 Subsequently ExCo (paper 108/08 refers) agreed that a programme should be implemented to assess the work involved in lengthening or otherwise improving the three marginal airstrips so that FIGAS operations can recommence.
- 4.3 Initial assessment surveys highlighted the need for a more detailed inspection of each airstrip. A £20,000 virement from Infrastructure Development was approved in October 2008 to fund further investigations at the three sites.
- 4.4 PSD carried out a full survey in September 2009. In relation to the solution, PSD have agreed with the owners that a degree of trialing of surface preparations would be helpful before putting together the final design details and associated costs. As of July 2010, these trials had not taken place, as the required materials arrived too late in the season to begin any trials.
- 4.5 In June 2010, the owners of Beaver Island approached FIG and offered their services to help expedite the works. If FIG would supply various items of plant, materials (matting, fertilizer, grass seed, fuel, etc.) and technical assistance, the owners of Beaver Island would supply an excavator, operator and labour free of charge to extend the runway.

- 4.6 In conjunction with the Chief Pilot at FIGAS & PSD, a list of minimum lengths of extension vs. number of passengers was compiled. This report is attached as Appendix A.
- 4.7 The DCA has been consulted on the contents and details of the paper and is satisfied with the contents of Appendix A. The DCA produced in 2008 a Standard at the request of PSD for guidance on airstrip compliance, which was used in determining the proposed extension lengths. This document is attached as Appendix B.
- 4.8 Costs to bring the airstrip up to the minimum required length (allowing 2 passengers) were calculated as being only £6,500 less than extending to the maximum possible length. These costs are laid out in Appendix C.
- 4.9 A revised cost estimate for the works was produced indicating the cost to FIG for proceeding with the works with the assistance of the Islands' owners. Estimated costs to do the works will be in the order of £38,600, inclusive of materials and plant hire. This was based on extending the strip to the full possible length. A breakdown of the costs is laid out in Appendix C.
- 4.10 Following a discussion with the Acting Chief Executive and MLA's on July 7<sup>th</sup> 2010, it was agreed to use part of the approved funding for airstrip evaluations (on Beaver, West Point and New Island) to get plant and fuel ashore on the last ferry visit to the island before it goes into dry-dock. Plant, spare parts and some material was sent over on the voyage the week of July 12<sup>th</sup> 2010. Fuel will be supplied to the Islands owners via the owner's sailboat, due to head out in late July. A PSD representative will go to the Beaver Island to assist in setting out the works by mid-August. Initial costs to come from the airstrip evaluation funding are approximately £8,300, as indicated in Appendix C.
- 4.11 Further funding will be required to supply matting, grass seed, an additional visit by a PSD representative, and to recover the plant from the Island upon completion of the works. These costs are in the order of £30,300, inclusive of a 25% contingency, indicated in Appendix C.
- 4.12 When considering the total amount of funding, FIG takes into full consideration the risks associated with delivering this work to estimated budgets. Currently the known total cost estimate is £38,600 (as per Appendix C), which includes the 25% contingency; however, there still remains a fair risk that future modifications may be necessary to deliver an effective landing surface.
- 4.13 The co-operation of Beaver Island's owners would set a precedent to the other Islands in assisting FIG with the extension of the other airstrips by sharing in the cost of the works. A report is being prepared by the Director of Procurement and Efficiency on the status of the other airstrips.

**5. Financial Implications**

- 5.1 At this moment in time there is no funding provision in the capital budget to fund any of the airstrip modification work.
- 5.2 It was proposed and agreed with MLA's and the Acting Chief Executive on July 7<sup>th</sup> 2010 to use part of the funding allocated to Airstrip Evaluations to get the project started. £8,300 of the remaining funds is to be used for the purpose of extending Beaver Island airstrip.
- 5.3 The balance of the funds, £30,300, is required to purchase and fund the materials and support to complete the improvements.

**6. Legal Implications**

None.

**7. Human Resources Implications**

None.

## APPENDIX A

### Beaver Island Airstrip Design

The following lengths of runway are given relative to unfactored take-off distance including 60m undershoot and overshoot.

These figures are however subject to many factors and should in no way be used as a guide for final load limits. They have however been used as a basis for pricing the probable workload for each length.

It is likely that under most circumstances the 3 person (including pilot) distance of 400m will require a headwind component of some sort to enable us to operate.

Other factors that will affect the load limit are:

- Ambient temperature and pressure.
- Weight, Altitude, Temperature limits.
- Runway gradient.
- Wind speed and direction.
- Engine failure.
- Length of grass.
- Take-off flight path and obstacles.
- Approach flight path and obstacles.
- Undershoot and overrun areas.
- Runway surface condition.

Only when a prepared surface of a given length has been properly surveyed can a load limit be applied and the true passenger numbers be determined.

The table below is filled in using full overshoot calculations.

<b>number of passengers (excluding pilot)</b>	<b>total airstrip length required excluding over/undershoot</b>	<b>Total length of extension required including over/undershoot</b>	<b>Total m2 of extension required</b>
2	400	51 + 60	3108
3	410	61 + 60	3388
4	420	71 + 60	3668
5	430	81 + 60	3948
6	440	91 + 60	4228
7	450	101 + 60	Not possible*

Notes:

The existing strip is 349m long

\*450m runway length i.e. 510m total length is not possible without significant earthworks due to the ground slopes steeply down to the beach at the eastern edge

## APPENDIX B

### STANDARDS FOR CAMP AIRSTRIPS IN THE FALKLAND ISLANDS

#### **Safety Standards from FIG Civil Aviation Department for Approval of Camp Airstrips**

These standards are specific to the Falkland Islands and designed to supplement or vary other appropriate standards.

- Existing runways in the Falkland Islands retain ‘grandfather’ rights in terms of their surface characteristics, except where any characteristic has developed since the aerodrome was licensed and it is deemed to be such that works can be carried out to lessen its severity.
- Lateral and Longitudinal gradients for camp airstrip runways are required to be 1:33.
- Where cut or fill has been required on a runway the slope from the runway edge out to a distance of 5 metres from the runway edge must not exceed 1:10.
- Runways should wherever ground availability allows have an area 5 metres extending out from the runway edge which is acceptable for an aircraft to run onto causing minimal damage.
- The overshoot and undershoot areas of runways may be offset to a maximum of 30 degrees from the runway heading.
- There should be no obstacles (fences, huts or other structures) within 30 metres of any edge of the runway and overshoot/undershoot areas.
- There should be no obstacles in excess of 150 feet above runway elevation within 2000 metres of the main runway centre-point except in circumstances where the runway location is unavoidable and the obstacles have been assessed and mitigated.
- The minimum runway length required for FIGAS Islander aircraft take off and landing is 400 metres for minimum load operations. This 400 metres can include overshoot and undershoot areas where the possible runway length available does not exceed 400 metres but overshoot and undershoot areas should be additional to the runway length available whenever possible.
- All runways have a maximum aircraft operating weight defined by FIGAS. This in turn defines a runway length for Islander aircraft operations at that weight. These distances can be obtained from FIGAS for each runway.
- The minimum width of runways must be 18 metres. The Islander aircraft undercarriage width is 3.6 metres.
- Runway markers should be white at least 0.5 x 1.0 metre in size (or other types of approved marker), spaced at intervals of no more than 60 metres with **L** shaped threshold markers.
- Overshoot and undershoot areas will be defined by red and white markers and the **L** shaped threshold markers.

### **Information from CAP 168 Licensing of Aerodromes Chapter 3 – Aerodrome physical characteristics.**

- All camp airstrips are less than 800 metres in length and are therefore classed as Code 1.
- All main runways are 18 metres or more in width with the exception of Beaver Island (15 and 17) and are therefore classed as Code letter A.
- The overall longitudinal slope (calculated by dividing the difference in elevation between the runway ends by the length of the runway) should not exceed 2% (1:50) for Code 1.
- Where a slope cannot be avoided the change between two consecutive slopes should not exceed 2%.
- The transition from one slope to another should be accomplished by a curved surface with a rate of change not exceeding 0.4% per 30 metres for Code 1.
- Transverse slopes should not exceed 3% for Code 1.
- A runway strip should extend beyond each end of a runway and of any associated stopway for a distance of 30 metres for a Code 1 visual runway.
- Natural surfaces of unpaved runways should be prepared or treated to remove irregularities which might adversely affect directional control, braking or riding characteristics of an aeroplane.
- A simple method of assessing the evenness of a natural surface is to drive over it in a Land Rover or similar vehicle at 30 mph. If the surface is acceptably even, this test should be accomplished without discomfort to the vehicle occupants. (No further definition in this manual).

### **CAP 428 Safety Standards at Unlicensed Aerodromes.**

- Runway should be of sufficient length and width (standard recommendation 18 metres) to meet requirements of the aircraft that will operate from the aerodrome.
- Natural surfaces (grass etc) should be mown, rolled and kept debris free. It is recommended that grass be kept to a maximum of 10cms (4 ins) high.
- Obstacles, potholes, bad ground should be marked with the appropriate aerodrome markings.
- It is recommended that there are no obstacles greater than 150 ft. above the average runway elevation within 2,000 metres of the aerodrome mid point.
- Taking off or landing up or down a slope is acceptable. Taking off or landing across the slope is dangerous. It is recommended that lateral and longitudinal gradients are limited to 1:33 maximum.
- A clearly visible wind sock should be provided.
- A simple method of assessing the evenness of a natural surface is to drive over it in a Land Rover or similar vehicle at 30 mph. If the surface is acceptably even, this test should be accomplished without discomfort to the vehicle occupants.
- Over-run areas may not be directly in line with the runway. Over-run areas should be positioned /identified such that to reach it a bank angle must be limited to 30 degrees or less and the heading change should be less than 30 degrees either side of the aircrafts nose.
- Determination of appropriate level of emergency equipment is dependant on the level of operations at the aerodrome.

## APPENDIX C

### ESTIMATED COSTS

Length of extension (m)*	Length of runway (m)	Number of Passengers**	Costs to FIG
51 + 60 m	400	2	£32,150
61 + 60 m	410	3	£32,300
71 + 60 m	420	4	£37,500
81 + 60 m	430	5	£38,450
91 + 60 m	440	6	£38,600

\* an additional 60 m is required to extend the runway on top of the length required to extend it to 400m or more (30m overshoot & 30m undershoot)

\*\* excluding pilot

Note: Numbers of matting rolls required are the same for first two extension lengths (40) and the same for the last 3 extension lengths (50) as rolls are supplied in fixed lengths. This results in minimal cost differences for longer lengths as the matting costs make up most of the cost for the works

Costs for extending runway to 440m (plus 60 m under/overshoots)

Description	Costs	Funding from 958 3012	Additional Funding Required
Plant Charges	£2,450	£1,700	£750
Labour Charges	£1,750	£1,100	£650
Fuel Charges	£1,450	£1,450	
Materials	£23,625	£2,600	£21,025
Transport	£1,600	£1,450	£150
Contingency (25%)	£7,725		£7,725
<b>TOTAL</b>	<b>£38,600</b>	<b>£8,300</b>	<b>£30,300</b>