

C.S.

INDUSTRIES (Misc.)  
LAND & SURVEY (Misc.)  
PUBLIC WORKS (Roads)  
MISCELLANEOUS (General)

TRN/LAN/4#3

19 43.

No. 141/43.

C.S.O.

SUBJECT.

19 43.

20th September.

~~CONFIDENTIAL~~

PROPOSED ROAD FROM STANLEY TO PORT SAN CARLOS  
Survey.

Previous Paper.

See 8/42.

MINUTES.

1. Letter from Colonel W. H. Hynes, F.I.F., of 20. 9. 43.
2. Minute to O/C, F.I.F., of 23. 9. 43.

C/12/44

Survey of Col. Dupire.

B.u.

1/2/44 ✓

Subsequent Paper.

ect:- Road Survey.

SECRET.

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122/CR/Z/159/15.

To:- His Excellency the Governor of the  
Falkland Islands.

From:- The Commander,  
Falkland Islands Force.

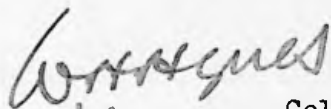
20 Sep 43.

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I have the honour to forward herewith  
as requested "Proposals for Road Survey from  
Port Stanley to Port San Carlos" - prepared by  
Lieut. T. L. Thomas, R.E., O.C. No. 2 Topographical  
Section, 14 Corps Field Survey Company, R.E.

I hope it contains all the necessary  
data which you require.

I have the honour to be,  
Your Excellency's Obedient Servant,



Colonel.

WHH/RCS.

Proposals for Road Survey from Port Stanley  
to Port San Carlos.

(10)

Proposals for a Road Survey, from Port Stanley  
to Port San Carlos.

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Sheet 2.....Para.4.(cont.) Details of Air Survey.  
 Para.5. Extension of Trigonometrical Control.

Sheet 3.....Para.6. Estimate of time required.  
 Para.7. Value of Air Photographs.

References.....Notes on the Making of Plans and Maps,  
 First Edition, 1937.

The Falkland Islands- Admiralty Chart No.1354B.

Falkland Islands Survey 1943- Military Survey of  
 Stanley Area, giving Trigonometrical and  
 Topographical data.

Diagram.....Illustrates proposals for Road Survey.

Sample of "Kodatracer"....Material used extensively in Air Survey.  
 (see Sheet 2 para.4. (v) b. )

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Proposals for a Road Survey, from Port Stanley to Port San Carlos.

1. It is proposed to run a road from Port Stanley to Port San Carlos, and it is required that the road shall pass through the belt marked in the attached diagram. No topographical map of the belt exists, the largest scale material covering the area being Admiralty Chart No. 1354 B, from which the attached diagram is taken. It will be seen therefore, that the first essential is a good topographical map covering the proposed route, the distance from Port Stanley to Port San Carlos being approximately 50 miles.

2. Survey Data Available. Trigonometrical Survey Data covering the area is indicated in the diagram. Details are as follows:-

- (i) The rays in green show the points observed in the original survey of the Islands carried out by the Navy a century ago. This survey depends upon an astronomical base with a probable accuracy of not more than 1/500 to 1/1000, and it should only be used for the purpose of reconnaissance for future work.
- (ii) A recent survey just completed ( August 1943 ) covers the Eastern end of the area, and extends for about 13 miles west of Port Stanley. This area is indicated on the diagram with form lines, and accurate maps are available at a scale of 1/25,000 ( 2 1/2" to the mile.) The survey depends upon a carefully measured base line, and it is believed that the accuracy is of the order of 1/50,000. Plans of Port Stanley, and the area immediately to the west for a distance of about a mile, are also available at a scale of 1/2,500 ( 25" to the mile.). The westernmost trig. points of this survey are shown on the diagram.

3. The proposed plan for the road survey is as follows:-

- (i) The road survey belt to be first of all covered by strips of overlapping Air Photographs, the strips to be flown, along the belt.
  - (ii) The trig. control of the 1943 Survey to be extended in a triangulation chain, along the proposed belt to Port San Carlos.
  - (iii) Using the Air Photographs, and the Trig. Control provided in (ii), a topographical map of the belt to be prepared at a scale of 1/25,000 ( 2 1/2" to the mile.).
  - (iv) Enough information should now be available to enable various control points to be selected, and the actual location line on the ground can be started, general procedure being as indicated in " Notes on the Making of Maps, and Plans", First Edition 1937, Pages 106 to 107.
- Each stage will now be considered separately.

4. Air Survey.

- (i) It is assumed that the Arundel method will be used, since only simple instruments are then required. The air camera available will probably be the F24 General Utility, and the lens required will be the Ross E.M.I. 5" focal length (see below.). The size of each photograph will probably be 5" x 5".
- (ii) Flying Conditions. There is no aerodrome available, so that a seaplane is required for flying the photographs. Stanley Harbour should provide a suitable base, but good shelter MUST be provided since the prevailing winds, from the west, are very troublesome, and the mean "wind force" is extremely high. On good days, visibility is excellent, but climatic changes are very sudden. Fairly reliable weather forecasts can be obtained from the Meteorological Office, which is maintained by the Navy.
- (iii) Details of Air Survey.

Range of height experienced within belt..... = 0 to 2,000 ft.

∴ Allowing ± 10% variation of height ( Arundel Assumption.).

Minimum Height of flight..... = 11,000 ft.

Assuming a scale of photography of 1/25,000 ( see below.).

Critical focal length of lens..... = 5 inches.

Distance between successive photographs in strip.= 0.79 miles.  
( 60% overlap.)

Distance between strips. ( 25% overlap.)..... = 1.48 miles.

Size of belt..... = 40 miles by 12 miles.

∴ Number of photographs per strip..... = 51

∴ Number of strips..... = 9



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4. Air Survey(Continued.)

If the scale of photography is increased, the number of photographs per strip, and the number of strips, become correspondingly larger. The figures given above are quite large enough, and it is suggested that a scale of 1/25,000 is suitable for the purpose required. To summarise the proposals:-

Height at which photographs are flown.....	=	11,000 ft.
Mean scale of photography.....	=	1/25,000
Camera required.....	=	F 24 General Utility.
Focal length of lens required.....	=	5" ( Ross E.M.I.)
Size of photographs.....	=	5" x 5"
Number of photographs per strip.....	=	51
Number of strips.....	=	9

(iv) The Air Photographs should be taken before the Survey is started, since by laying them down in a mosaic, and by examining pairs in a stereoscope, valuable reconnaissance information can be obtained before the survey commences.

It is also pointed out, that, whilst the plane is available, air photographs should be taken covering the whole of the Falkland Islands at the above scale, so that as the triangulation is extended topographical maps of the Island can be readily provided.

(v) Certain special requirements in the drawing office, for the purposes of Air Survey, are tabulated below:-

(a) Special Red Water-Colour for marking the photographs.

(b) "Kodatrace" for drawing Minor Control Plots etc.(Kodatrace is the trade name for a particular kind of tracing material used extensively in Air Survey. A sample is attached.)

(c) Ordinary Tracing Paper is used extensively, in Air Survey by the Arundel Method.

(d) Stereoscope Universal with Lenses Attachment Teleobjective.(It is suggested that three or four will be required.)

(e) Bars Parallax. (One required for each Stereoscope Universal.)

(f) Stereoscopes Pocket Magnifying. ( Three or four required.)

(g) Binoculars Prismatic No.2, Mk.2.( Standard Army Binoculars for use with teleobjective lenses.)

(h) It is estimated that three good draughtsmen, acquainted with the Arundel method, can produce the necessary map in two or three weeks.

5. Extension of Trigonometrical Control.

(i) It is proposed to run a triangulation chain along the Road Survey Belt, and to connect this chain with the existing survey of the Stanley area. Since this chain can form the basis for a triangulation covering the whole island, it is suggested that a check base line be measured in the Port San Carlos area, and it will in any event be necessary to obtain several check azimuths by astronomical means.

(ii) A suggested party for the survey would be composed as follows:-

(a) Three surveyors, and three assistants. The three assistants could be the three draughtsmen required later for Air Survey.

(b) The enginser who will eventually be responsible for the actual building of the road.

(c) A cook.

The only feasible means of transport for the party would be horses, and arrangements should be made so that the whole outfit is self-contained, and able to camp on site. The high velocity of the prevailing winds, and the uncertain climate present difficulties, since there are no trees, and it is difficult to find sheltered spots. Observation will be impracticable for long periods owing to the high winds, and care should be taken in building survey marks, or they will be blown down.( Flags flying in an exposed situation must be replaced after three or four weeks.). Large rock cairns may prove a suitable solution for this latter problem.

Settlements along the belt are indicated on the diagram. They can be reached by sea, and supply points can be set up for the survey party.

(iii) In order to provide a contoured map from Air Photographs, using simple instruments, four control heights should be provided per photograph. These can be supplied as the triangulation proceeds. Two methods are suggested:-

(a) The Main Triangulation can be rapidly broken down, and the belt heighted, by means of a plane table, and an Indian clinometer. Main features can be roughly shown, and heighted, and if the engineer accompanies the plane tabler, valuable and accurate reconnaissance information can be obtained.

(b) Heights can be obtained by means of aneroid barometers, a station barometer being maintained at the camp site. The engineer can accompany the surveyor who is doing the actual heighting.

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6. It is estimated that the work of producing a map of the belt at a scale of 1/25,000, should take approximately four to six months, with a party of the size indicated in paragraph 5 above, and granted reasonable weather conditions. In addition to the map, valuable reconnaissance information on the ground should have been obtained, and it should be easy for the engineer to select the best route. This route must now be traversed, and levelled, using the triangulation points for control. The general procedure is indicated in "Notes on the Making of Plans and Maps", First Edition, 1937, pages 106 to 107, and will not be repeated here. The same party can be used for the work, any extra labour required being ~~used~~ obtained locally. This work should take an additional two months.

7. If the building of a road through the proposed belt is absolutely impossible, the Air photographs should indicate this before the actual survey is commenced.

Falkland Camp  
6 Sept. 1943

*J. L. Shawes.*  
Lt. R.E.  
O.C. No. 2 Topographical Section,  
14. Corps Field Survey Company, R.E.



# FALKLAND ISLANDS 1943.

FROM ADMIRALTY CHART 1354 B

## DIAGRAM ILLUSTRATING PROPOSALS FOR ROAD SURVEY

Scale: 0 to 10 Statute Miles

