Public Works (1898) Department.

G.O., No. 3244 W / A

DATED 20 Dec '98

[Despatch Abstract.]

Mr H. J. Mackenzie Executive Engineer on Special Duty, Vizagapatam

Ordering, with remarks, that the Dy Director of the R.I.M. at Calcutta be requested by wire to send to ________, one whale boat, two log lines with lead complete, 1 diving apparatus complete for one diver.

(B)

Indexed.

[P. W. 3 / 200-11-10-95.]

G.O. 3080 W / 7.12.98

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.
4814 C 3.11.98							

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

P. W. 4
1,000—14-11-98.

Immediate

P. W. DEPARTMENT.

READ the following :—

Letter from the Supdg. Engr., I Circle, No 767 d/ 7.11.98
Memo No. 5211 C d/ 22.11.98.
Letter from the Presy. Post Office No 1497/4378. d/ 5.12.98
Telegram from the Dy. Director of the R. I. M. Dockyard
Calcutta d/ 10.12.98
— Do — d/ 15.12.98.

~~Circulated to~~

ORDER. N-3244W d/ 20 Dec 98

A

Ordered that the following telegram be despatched to the Dy Director of the Royal Indian Marine Dockyard at Calcutta.

"Yours 240 and 245x Please despatch urgently, to A. T. Mackenzie Esqre, Executive Engineer, Vizagapatam, whale boatx two log lines with lead completex and diving apparatus complete for one diverx If latter not available send apparatus for two diversx This Govt. will bear all charges".

2. The following telegram will be sent to Mr Mackenzie from Calcutta Dockyard sendi

Tels: despd: 20/12/98

B

W
with Yours A
Telegram

your whale boat, two log lines complete and diving apparatus. On receipt of these wire to Presidency Port Officer to send up the diver & signaller engaged".

3. On receipt of intimation from Mr. Mackenzie that the whale boat & other articles have arrived at Vizagapatam from Calcutta, the Presidency Port Officer will engage the services of the diver and signaller referred to by him, & direct them to proceed without delay to Vizagapatam & report themselves to Mr. Mackenzie for orders.

4. The Supdg. Engr., I Circle, will apply for such allot=ment of funds as may be necessary to meet these charges.

Date.

Tel. despd 20/12/98

To

The Presidency Port Officer
" Supdg. Engr., I Circle
" A. T. Mackenzie Esq.
" Examiner, P.W. Accts
" Marine Dept
22/12

P. W. DEPARTMENT.

Very Urgent

READ the following:—

Telegram from the Dy. Director of the R. I. M. Dockyard at Calcutta of 15th Decr. 1898.

Circulated to H. E. the Governor,

FOR ORDERS.

The Supdg. Engr., I. Circle, in the paper flagged U, reports that the following equipment is necessary to carry out the investigations ordered in connection with the Vizagapatam Harbour Scheme:—

(1) One European diver, for two ~~years~~ weeks from date of arrival, to give instructions to Mr. Mackenzie, & generally put matters on a satisfactory footing to start diving investi=gations.

(2) One thoroughly ~~reliable~~ trustworthy European signaller, who understands fitters work, for one year,

(3) One diving dress complete & in good order, with all appliances

[P. W. 43 / 500—14-11-98.]

H. G. 16.12.98 // 15.12.98

appliances for one year.

(4) One air pump in thorough order for one year

(5) One strong roomy boat, similar to those in use on the Madras Harbour works, for one year. A well found whale boat is the type required.

(6) One boats crew for one year.

(7) One ships lead for sounding up to 10 fathoms.

(8) One Assistant for levelling & observing operations.

2. Enquiries have been made ~~for supplying~~ regarding the equipment considered necessary, with the following result:-

(1) European diver for 2 weeks.

The Presidency Port Officer states that a European diver, ?. Shane, is willing to go to Vizag: His terms are a 2nd Class passage to Vizag. & back. ~~If by rail, double 2nd Class fare~~. If by rail, double 2nd Class fare & Rs 3 per diem during the journey. While at Vizag. Rs 10 per diem.

(2) European Signaller for one year. An Eurasian signaller, F. Brown, formerly employed with the Port diver at Madras, is willing to go. His terms are pay Rs 80 per mensem, with 2nd Class passage to Vizag. If by rail, Rs 3 per diem to be allowed during the journey, with double 2nd Class fare.

(3) One diving dress complete & in good order with all appliances for one year. The R. I. M. Dockyard at Calcutta can supply diving apparatus, new & complete for two divers for Rs 2,172; but as they belong to the dockyard, they will have to be replaced in kind, ~~but~~ Further information is promised about this matter.

(4) One air pump in thorough order for one year. This is ~~apparently~~ doubtless included in the diving apparatus which

the R. I. M. Dockyard at Calcutta promise to supply.

(5) a strong roomy whale boat for one year. The R. I. M. Dockyard at Calcutta can supply for Rs 480 a whale boat, in good condition & recently thoroughly repaired, for ~~Rs 450~~. This price includes oars & mast, but not sails, & does not include freight to Madras.

(~~6~~7) One ships lead lines for sounding up to 10 fathoms

The Presidency Port Officer can supply leads, but not the lines. The R. I. M. Dockyard at Calcutta can supply two log lines of 13 fathoms each with lead complete for Rs 3. The Presy Port Officer advises that two lines be obtained.

3. As regards items (6) & (8), the Supdg. Engr., I Circle, has been told to

engage

Sanctioned
A.S.H.
17.12.98

engage the boats' crew himself whenever required, & to submit an estimate of the cost for sanction; and ~~As~~ ~~[illegible]~~ Mr. Adami, Assistant Engineer recently arrived from Coopers Hill, has been posted to Vizag: as an Assistant to Mr. Mackenzie.

Orders are now solicited

(1) to wire to the R. I. M. Dockyard at Calcutta to despatch the whale boat; one diving dress complete with all appliances, ~~the whale boat~~ and two ships lines with lead complete to Mr. Mackenzie at Waltair,

(2) to engage the diver & signaller on the terms mentioned with effect from

the date on which inti=
=mation is received from Mr. Mackenzie by wire that the whale boat & other articles have arrived at Vizag: The services of the diver & signaller will presumably not be required till all these articles are ready for use.

It is not clear why the R. I. M. Dockyard want to send ~~two~~ diving dresses for two divers when only one has been asked for. But this is a matter that can be settled later on.

No budget provision exists for this outlay. It will have to be met from Excluded Local Port Funds. The Supdg. Engr., I Circle, will be asked to submit an estimate when the actual cost is known.

The articles required from Calcutta cannot be procured at Madras.

Rev.

AER
16-12-98.

The cost of the establishment & appliances reqd will amount to about Rs. 3500 for the year during which Mr. Mackenzie will conduct his observations. I believe them to be indispensable to the proper conduct of those observations & recommend that this expenditure be sanctd.

16-12-98

Public W&R

Telegram

(1898) Department.

CURRENT No. 10436

From
Marine East
Calcutta

No. 245

Dated 15-12-98
Received 3/16
Registered
Enclosures
Spare copies

SUBJECT

Diving apparatus —
Informing ~~that~~ ~~the~~
Can be supplied

P. W. D.
1,000—8-9-98.

BACK PAPERS.

G.O.	No.	Department.	Date.
✓	5605C	Pr	12.12-98
✓	5562C 63	"	9.12.98
✓	521415C	"	22.11.98
✓	4814C	"	3.11.98
✓	3996C	"	12-5-98
✓	7689 Mar,	"	8.5.98 S.C
✓	2854 W	"	6.11.98 "

FURTHER PAPERS.

G.O.	No.	Department.	Date.

INDIAN TELEGRAPH.

Monthly Local No. 340

To Station: Ms. Triplicane

From Station: Calcutta Watgunge

Words.	Day.	Hour.	Minute.
65/14	15	12	50

Official Instruction. Tfo

To (Person) Supdt as 100 Ms

From (Person) Marine Engr

1 245 yours 12th can
2 supply diving apparatus
3 new complete for
4 two divers for rupees
5 2172 but as they
6 belong to dockyard
7 would probably
8 require you to
9 replace in kind
10 but will inform
11 you later regarding
12 this please wire if
13 they are to be sent
14 as also the whole

Recd. from L. N. At Hrs. Mts. By

Sent to L. N. At Hrs. Mts. By

TRIPLICANE 15 DE. 98

Postmaster.

Date

CGP—No. 1006 PO—2 3 98—1000000.

T—1

INDIAN TELEGRAPH.

Monthly Local No.

Class.

To

From

Station

Words.	Day.	Hour.	Minute.

Official Instruction.

To (Person)

From (Person)

1 boat asked for
2 in your telegram
3 of 7th
4
5
6

Public W & Ro

Telegram

(1898) Department.

CURRENT No. 10262

From The Dy. Director of the Royal Indian Marine Dockyard, Kidderpore Calcutta
No. 240.

Dated 10—12—98

Received 3/12

Registered

Enclosures

Spare copies

SUBJECT

Informing that he can supply a boat not new but in good condition

[P. W. 29.
1,000—5-9-96.]

BACK PAPERS.

G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.

INDIAN TELEGRAPH. Monthly Local No. 30

To 105

Station Triplicane

From Station Calcutta

Words.	Day	Hour.	Minute.
58/12	10	14	2

Official Instructions. Lodge

To (Person) Madras Works Dockyard

From (Person) Ardene East

240 yours 9th have a whole boat not new but in good condition just thoroughly repaired can be supplied for rupees 480 this includes oars mast but not sail and does not include freight

Recd. from L. N.
At Hrs. Mts. By

Sent to L. N.
At Hrs. Mts. By

Date

TRIPLICANE
10 DE 98
Postmaster.

Class.

INDIAN TELEGRAPH. Monthly Local No.

To Station

From Station

Words.	Day	Hour.	Minute.

Official Instruction.

To (Person)

From (Person)

II

to madras two log lines of 13 fathoms each with lead complete rupees 3

No: 5605C d/ 12-12-98
C No. 10263

Dw

As the R. I. M. Dock-yard at Calcutta is able to supply a whale boat & log lines, it is possible that the diving apparatus & air pump, which are not available at Bombay, can also be procured thence.

Submitted that the following telegram be sent:-

To No: 5605C d/ 12.12.98
Calcutta

Marine East

"One diving dress complete with all appliances and one air pump are also urgently required for Vizag: Harbour scheme x Please wire whether you can supply them & at what cost."

ASK
12.12.98.

12.12.98

12.12.98

- Telegram despatched -
12/12/98

INDEXED.
13/12/98

P. W. D.

No: 5562 C d/9-12-98

Telegram

To

The Director of the Royal
Indian Marine
Bombay

State code address
"Director Marine"
Bombay.

One diving dress complete with all appliances and one air pump are urgently required for Vizagapatam Harbour scheme x Please wire whether you can supply them & at what cost x

APK
9.12.98

Desp. 9. XII. 98

No: 5563 C d/9-12-98

Telegram

To

The Dy. Director of the Royal
Indian Marine Dockyard,
Kidderpore
Calcutta

address in full

A ~~good~~ strong rowing whale boat and a ~~of~~ couple of

Desp 9. XII. 98

12/12/98

of ships lead lines ~~are~~ sounding to 10 fathoms are urgently required for Vizagapatam Harbour scheme x Please wire whether you can supply them and at what cost x.

AEK
9.12.98.

Dr.

C No. 10102.

Dr

With reference to Mr. Mackenzie's requirements in connection with the Vizag. Harbour scheme, the P.P.O. reports as follows.

(1) European diver for 2 weeks.

An European diver, R. Shane, is willing to proceed to Vizag. ~~in~~ his terms are a 2nd Class passage to Vizag. + back. If by rail, double 2nd Class fare + Rs 3 per diem during the journey. While at Vizag. Rs 10 per diem.

(2) European Signaller for one year

An Eurasian signaller, F. Brown, formerly employed with the Port Diver at Madras is willing to go. Terms are - pay Rs 80 per mensem - with 2nd Class passage to Vizag. If by rail - Rs 3 per diem to be allowed during the journey with double 2nd Class fare.

(3). One diving dress complete & in good order, with all appliances, for one year. Not available. May possibly be ~~available~~ obtained from the Director of the Indian Marine at Bombay. Will have to be purchased. The ~~cost~~ price is stated to be Rs 560.

4) One air pump in thorough order ~~for~~ one year. The P.P.O. says nothing about this. Possibly it forms part of the diving apparatus mentioned above.

(5) A strong roomy boat of the whale boat type for one year. The Harbour Trust Board have such a boat, but the chairman declines to part with it. The P.P.O. states that this boat is seldom used, & suggests that inquiry be made as to the number of times it has been used since its supply.

A boat of this description can be obtained from Calcutta but as the stock kept in hand is limited, it is probable

one

one will have to be built. The cost would be Rs1000 & it would take 4 months to build.

(6) One ships lead lines for sounding up to 10 fathoms. The P.P.O. can supply a lead of 28lbs & one of 14 lbs, but ~~that~~ lead lines, of which there should be more than one, will have to be obtained from the R.I.M. Dockyard at Calcutta.

The services of the diver & signaller will presumably be only required after the boat, diving dress, air pump & lead lines are ready.

Yes

Submitted that the Director of the Indian Marine at Bombay be asked by wire whether he can furnish the diving dress complete with all appliances and an air pump & if so, at what cost. The Dy Director of the R. I. M. Dockyard at Kidderpore might also be wired to to know whether he can supply a ~~good~~ strong roomy whale boat and a couple of lead lines & at what cost.

Yes

On receipt of replies the subject can be sub-mitted for the orders of Govt.

Yes

No budget provision exists for all this outlay. It will have apparently to be met from ~~the reserve~~ ~~under~~ Excluded Local Port funds. ~~which was amounts to~~.

R.S.
9.12.98.

P.W.

Marine (1898) Department.

CURRENT No. 10102

Order

From

The Presidency Port Officer
Madras

No. 1497/437 G

Dated 5th December 1898

Received } 6-12-98
Registered }

Enclosures 1.

Spare copies

Recd. 8/12/98.

SUBJECT.

Submitting report on the Establishment and articles required in Connection with the Vizagapatam Harbour scheme.

BACK PAPERS.

No.	Date.	
~~5214C~~	22-11-98	
5214-SC		
4814C	3-11-98	
3996C	12-9-98	
769 Mar.	8.9.98	SC)
768 "	8.9.98	

FURTHER PAPERS.

No.	Date.

Madras Harbour Trust

26th November 1898.

No. 350(C)

From

J. N. Atkinson Esquire I.C.S.

Chairman, Harbour Trust Board,

Madras.

To

The Presidency Port Officer

Madras.

Sir,

I have the honour to acknowledge the receipt of your letter dated 23rd November No. 1497-1422 in enquiring whether I would be disposed to part with the boat maintained for my special use, a similar one being required for the port of Vizagapatam.

2. On referring to the papers connected with the original supply of the boat in question I find that it was procured because it was at times necessary for such a boat to be available for the Preventive Officers, and for the use of Members of Council and high Officials when your own or the Deputy Conservator's gigs might not be available, also because it was agreed that I should not be dependent upon the Port Department for a suitable boat whenever I might require one personally.

3.

The description of boat required appears to have een very carefully considered, in view of these various equirements, and the whale boat procured was btained of the size and description suited to meet them.

I am therefore of opinion that a lighter boat s suggested by you would not be suitable for the equirements above indicated, and consider that it is necessary to maintain the large whale boat for uch purposes.

I have &c.,

(Signed) J. N. Atkinson
Chairman, Harbour Trust Board

(True Copy)

W. R. Fernandez
Manager

No. 1497/437 G

Presidency Port Office,

Madras, 5 December 1898.

From

Commander H. A. Street, R.I.M.,
Presidency Port Officer,
Madras,

To

THE SECRETARY TO GOVERNMENT,
MARINE DEPARTMENT,
CHEPAK.

Sir,

With reference to Marine Department Memorandum, No.5214 C, dated 22nd November 1898, I have the honour to acquaint you as follows:-

(1) An European Diver, R. Shane, residing at present in Madras is willing to proceed to Vizagapatam on the following terms, viz; 2nd class passage to Vizagapatam and back by sea or rail. If by rail, double 2nd class fare, and Rupees 3 per diem during the journey. Rupees (10) ten per diem while at Vizagapatam; pay to commence on date of arrival there whether A.M. or P.M, and to end on P.M. of day of departure whether he leaves before noon or not.

(2) An Eurasian Signaller F. Brown, formerly employed with the Port Diver at this port is willing to engage at Rupees (80) eighty per mensem; pay to commence on date of arrival at Vizagapatam whether A.M. or P.M. and to end on P.M. of day of departure whether he leaves before noon or not. A 2nd class passage by sea or rail

to be provided. If by rail Rupees 3 per diem to be allowed during journey in addition to double 2nd class fare.

3. Messrs Shane and Brown are willing to proceed at once to Vizagapatam.

4. No diving dresses are available. It is possible that they could be obtained complete from the Director of Indian Marine, Bombay. The cost of a complete dress is stated in the Indian Marine Rate Book of stores to be Rupees (560) five hundred and sixty for one diver. It would have to be purchased, and if found in good order after use at Vizagapatam might be kept for use at other ports where diving operations are necessary.

5. A lead of 28 lbs and one of 14 lbs can be made available from the stock of stores maintained here for out ports, but lead lines, of which there should be more than one, would have to be obtained from the Royal Indian Marine Dockyard stores at Calcutta.

6. The Chairman of the Harbour Trust Board has a large whaler boat which is just the kind of boat Mr. Mackenzie requires. It is seldom used by the Chairman but he has refused to part with it. I attach a copy of his reply to my letter on the subject and would suggest an enquiry being made as to the number of times the boat has been used for the purpose indicated in the letter each year since its supply.

7. A boat of a similar description would have to be obtained from Calcutta, and as the stock kept on hand in the Government Dockyard is limited, it is probable that one of the description required would have to be built. This would take about 4 months. The cost approximately would be Rupees (1000) ~~(700) seven hundred~~. one thousand.

8. I beg early instructions regarding the engagement

of

B

of Messrs. Shane and brown. The men are out of work and as they are seeking employment cannot afford to wait any length of time in expectation of being engaged by Government.

I have the honour to be,
Sir,
Your Obedient Servant,

Commander, R.I.M.,
Presidency Port Officer.

Wly inspt

P.W.D.

No. 5214 C dd 22nd November 1898

Memorandum

With reference to the accompany copy of a letter from the Supt. Engr., I Circle, No. 787/G dated 7th November 1898, the Presidency Port Officer is requested to be so good as to state whether he can procure the services of a European diver & Signaller with the qualifications and on the terms mentioned in para 3 clauses (i) & (ii); and if so, to report what salaries will be expected, & what other incidental expenses will have to be incurred.

2. The Presidency Port Officer is also requested to report whether he can supply the articles mentioned in para 3 clauses (iii), (IV), (V) & (vii), and if not available in the Marine Dept, whether they can

SAW Pwr.
EA

26/11/98

Memorandum

With reference to the accompany copy of a letter from the Supt. Engr., I Circle, No. 787/G dated 7th November 1898, the Presidency Port Officer is requested to be so good as to state whether he can procure the services of a European diver & Signaller with the qualifications and on the terms mentioned in para 3 clauses (i) & (ii); and if so, to report what salaries will be expected & what other incidental expenses will have to be incurred.

2. The Presidency Port Officer is also requested to report whether he can supply the articles mentioned in para 3 clauses (iii), (IV), (V) & (vii), and if not available in the

can be obtained from the Harbour Trust Board, and on what terms.

3. A very early reply is requested.

A.C.K.
21.11.98.
Dr.

22.11.98

To
The Presy. Port Officer.

D/22/11/98

C

P.W.D.

No. 5215 C dy 22nd November 1898

Memorandum

The Supdg. Engr. I Circle, is informed that he can himself engage the boats' crew referred to in para 3 clause (vi) of his letter No. 767 I.J. dated 7th Novr. 1898 whenever required, and submit an estimate of the cost for the sanction of Govt.

2. The other matters mentioned in his letter are under consideration, & early orders will be passed.

A.C.K.
21.11.98.
Dr.

22.11.98

S.A.W. Rw.

E.R.

E. to submit draft ordered by D.P.W.

S.A.10

Please see the remarks on your note dy 19.11.98 Rw.

22.11.98

To
The Supdg. Engr. ~~1st~~ I Circle D/22/11/98

23/11/98

C No. 9492

Dw

For orders.

The Supt. Engr. states that the following equipment is necessary to carry out the investigations ordered in connection with the Vizagapatam Harbour scheme:—

(1) One European diver for 2 weeks from date of arrival to give instructions to Mr. Mackenzie & generally put matters on a satisfactory footing to start diving investigations.

(2) One thoroughly reliable European signaller, thoroughly understanding fitters' work, for one year.

Yes { The Presidency Port Officer might be asked to select the men required for (1) + (2) and to report as to cost of wages & other expenses.

(3) One diving dress complete & in good order, with

all appliances for one year.

(4) One air pump in thorough order for one year.

(5) One strong roomy boat similar to those in use on the Madras Harbour works for one year. A well found whale-boat is the type required.

The Presidency Port officer might also be asked whether he can supply items (3), (4) + (5). If not available in the Marine Dept., they might be obtained on loan, or on payment if required, from the Harbour Trust Board.

Ask P.P.O.

(6) One boat's crew for one year.

The Supdg. Engr. might engage this himself & report the cost for sanction.

Yes

(7) One ship's lead for sounding up to 10 fathoms.

Can be obtained from the same source as items (3), (4) & (5) above.

Yes

(8) One Assistant for levelling and

---

and observing operations. He ~~should~~ will be required to reside permanently near the back water. Mr. Mackenzie is strongly in favour of a young European sergeant fresh from College & the S.E. agrees with him.

One of the two Military men who will complete their practical course in the early part of Jany. might be posted for this work.

RW
19.11.98.

S.A.W.O.

E/ To submit draft accordingly.

Proposals approved. Draft accordingly.

ALK
21.11.98.

Dro.

From the linked file (Current No: 9424), it will be seen that we propose to post one of the two Assistant Engineers coming out from England, to assist Mr. Mackenzie. Should this proposal be approved by His Excellency, it would be unnecessary to send a Military Upper Subordinate for Mr. Mackenzie's assistance.

[illegible]
22.11.98

Not nec. [illegible] [illegible] may [illegible]. The proposal approved

[illegible]
22.11.98

Let W. [illegible]

ALK
22.11.98

SAW

Public Works (1898) Department.

CURRENT No. 9492

From the Superintending Engr.
First Circle

Order

No. 767W3.

Dated 7/14. 11. 98.

Received } 17. 11. 98

Registered }

Enclosures 18/11/98

Spare copies

SUBJECT.

Vizagapatam Harbour works.
informs the nature and scope
of investigation & observations
required in connexion with the
— and equipment &c. required
for —

BACK PAPERS.		FURTHER PAPERS.	
No.	Date.	No.	Date.

S. E. I./2 500--15-1-98.

No. 767 V3

From
W. C. De Morgan, Esquire, M.I.C.E.
SUPERINTENDING ENGINEER,
FIRST CIRCLE.

Enclosures.

To
THE CHIEF ENGINEER
PUBLIC WORKS DEPARTMENT.

WALTAIR, 7th November 1898.

Camp.

Sir,

With reference to your Memo. No. 3996c of 12.9.98, I have the honor to inform you that I have considered and discussed the nature and scope of investigations and observations required in connection with the Vizagapatam Harbour Scheme.

2. At the outset we must proceed as follows:-

(i) Regular soundings at fixed intervals and periods of tide must be taken.

ii Observations of Velocity and direction of tides.

iii Determination of direction and conditions of sand travel along the coast.

(iv) A correct profile of the bar at suitable periods every month. This I regard as very important. Soundings are not to be depended on. The profile should be settled by ordinary levelling observations. Mr Mackenzie has suggested the general arrangement; and all that is required is for him to work it out in detail.

(v) A complete and accurate survey of the back water with necessary contours to be prepared.

(vi) Soundings and borings in the back water.

vii Determination of the material deposited in the Estuary and back water, and without and within the bar.

Modifications may, of course, have to be made both in the direction, and means adopted for carrying out these observations.

3. The following equipment &c is necessary.

(i) One European diver for 2 weeks from date of arrival, to give instructions to Mr Mackenzie and generally put matters on a satisfactory footing to start diving investigations.

(ii) One thoroughly reliable signaller, thoroughly understanding fitter's work, for one year.

i and ii should be Europeans.

iii One diving dress complete and in good order with all appliances for one year.

iv One air pump in thorough order for one year.

v One strong roomy boat, similar to those in use on the Madras Harbour works, for one year.

There is a very nice boat belonging to the Port officer here, but it is not safe in the surf. The Port officer declines to trust himself in it to cross the bar. A well found whale boat is the type required; because if Mr Mackenzie's investigations are to be of any value they must be extended North and South of the Dolphin's nose, and for this both sea and sailing power are required.

vi One boat's crew, for one year. These may be hired locally through the Port officer, who knows his men's capabilities.

vii One ships lead for sounding up to 10 fathoms.

I am of opinion that the shortest and most satisfactory course to decide on the nature of the deposit on either side of the bar, and the general direction of currents, will be by actual observation of the sea bottom. There is no difficulty after the end of November in walking over the whole of the estuary mouth in diving dress, and Mr Mackenzie's proposal seems to me the most rational way of settling the points raised in items vii and probably iii mentioned in para 2.

5. Of course the signaller is the most important assistant on the list. Work can easily be found for him and for the boat's crew when there is no diving.

6. Besides the above Mr Mackenzie will require one assistant for levelling and observing operations. This assistant would be required to reside permanently near the back water. His duties it is unnecessary to detail. They would be diversified, and he would always have work in hand.

7. Mr Mackenzie is strongly in favour of a young European Sergeant fresh from college. I am disposed to agree with him. A native would be no use. He would not care to work on the sea; and would probably get ill in the wet. A newly fledged European Sergeant

Sergeant

would probably take more interest in the work and carry out orders better than any one else. Mr Brown will, of course, be available as an occasional help. I cannot guarantee his assistance for long periods, but whenever he can be spared from the water works, he will certainly be at the harbour.

8. I am unable to submit a proposition statement in the prescribed form, as I have no means of judging the salaries of the subordinates I ask for, or to what head they should be charged. I presume, however, that there will be no difficulty in arranging a special sanction for a special staff.

9. Mr Mackenzie will submit a monthly note indicating the work he has in hand, general progress, and future proposals and arrangements. This will be submitted to you through me at the end of every month. This, I think, will be sufficient basis for a record of the progress of the investigation.

10. If the investigations are to be of any scientific value, they must be conducted on scientific principles, and no doubt proposals may be submitted which appear out of the ordinary routine.

11. All the information now at our disposal consists of a number of soundings more or less correct for the time at which they were taken, but which do not admit of any speculation as to the changes of the sea floor. It is not settled, and there are no observations, from which it can be determined which of the prevailing winds has the greatest action on the bar; and there is nothing from which we can conclude whether the ebb or flow of the tide has the greater effect on the bar; or whether the floods from the back water have any erosive effect on the bar at all.

12. I should be obliged by your making arrangements to let me have the establishment; and equipment asked for at as early a date as possible.

The North East monsoon has broken and at present, no work is possible, but from the end of this month, five clear months will be open.

13. Any office or Subordinate Establishment, I will sanction and forward for your approval. What are required

now

now are practical, trustworthy, out door han

I have the honor to be
Sir,
Your Most obedient Servan
W D Morgan
11.11.98
Suptg. Engineer, 1st circl