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G.O., 21st Sept. 1894, No. 377.

SEPTEMBER.

Mangalore Harbour.

Passing orders on Mr. Walch's preliminary report on the —.

No. 2558 W. dt 13th October 1894.

B

Recorded in continuation of Continuation of G.O. No. 1968 W dt 10th August 1894.

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GOVERNMENT OF MADRAS.

MARINE DEPARTMENT.

Read—the following paper:—

From G. T. WALCH, Esq., M.I.C.E., to the Chief Secretary to Government, dated Eckford, Ootacamund, 13th September 1894.

I have the honour to report that, in accordance with G.O., No. 296, dated 25th July 1894, Marine, I left Ootacamund on 13th August, reached Mangalore on 19th idem, staid there carrying out investigations and inquiries connected with the port till 2nd September, and reached Ootacamund again on 5th September.

2. When going to Mangalore I had to travel from Calicut by road and backwater, as no steamers were then touching at the West Coast ports north of Calicut; but on my return journey I took advantage of the first steamer of the season from Mangalore to Calicut.

3. During my stay at Mangalore I studied the port whilst the south-west monsoon was still preventing shipping operations being carried on and whilst the two rivers which affect the port were bringing down a considerable quantity of water.

4. It was undoubtedly advisable that the place should be seen under such circumstances; but if I am to proceed with the matter further and submit definite proposals and estimates, it is necessary that I should also see the port under the very different conditions which obtain when the action of the tides is unaffected by flood waters and the inner harbour is crowded with native craft and busy with traffic.

5. It appears that in February and March there is no water coming down the rivers, the traffic of the port is in full swing, the "bar" is at its *best*, and the inner harbour or backwater can be seen at its *worst* because the lowest tides of the year then occur, whilst in April the "bar" is generally at its *worst* and the port still busy; at least two more visits to the place would therefore be necessary to enable me to so master the subject as to submit definite proposals and estimates for improving the present defective state of affairs. The report which accompanies this is necessarily, as was anticipated would be the case, merely a "*preliminary*" one.

6. As it seemed advisable not to lose any time in setting matters going, I arranged * with the Public Works Department officers to have a required survey made with the assistance of a surveyor kindly supplied by Mr. Tomlinson (Deputy Superintendent, Madras Survey) on the condition that the Survey Department should be relieved of this man's pay whilst engaged on this work. The cost, including contingent expenses for boatmen and sundries, will probably not amount to Rs. 50, for which I of course hold myself personally responsible, but which doubtless Government will arrange for meeting.

* See copy of letter, dated 31st August 1894, to the Public Works Sub-divisional officer, Mangalore.

7. The Mangalore Port officer informed me that he was just about to put down a much-needed tide gauge and to take soundings of the port; it was very advisable that this work should be put in hand before being hampered by the presence of the

numerous craft which will soon be working and moored in the harbour, and I therefore addressed * him direct on the subject; but this one set of soundings will not suffice, and, as regards the "bar" and the harbour entrance at all events, a *monthly series* of soundings till the setting in of the next south-west monsoon will be required. It is not likely that the Port officer will be able to carry out this when he is busy with other duties during the shipping season unless he has under him a special party for the purpose; or it would be better to send a special officer and party to the place to carry out the work with all possible accuracy and in much greater detail than has ever been the case before. I trust that orders on this subject may issue as soon as possible and that, if I am to proceed with the general investigations, I may be authorized to communicate direct with the officer in charge of the sounding operations, sending copies of my letters to the Presidency Port officer.

* See copy of letter to him dated 1st September 1894.

Enclosures.

From G. T. WALCH, Esq., M.I.C.E., to the Sub-Divisional officer, Public Works Department, Mangalore, dated Mangalore, 31st August 1894.

With reference to the survey in connection with the harbour which you have kindly consented to undertake and about which I have written to the Executive Engineer in charge of the division, I have the honour to state that I have arranged with Mr. Tomlinson to supply you with a surveyor to assist you from Monday next.

2. The survey required is of the "sandspit" between the sea and the backwater from the casuarina plantation at Tannirbhavi to the mouth of the river near Ullal and then on to south of that mouth as far as the existing casuarina plantation; the survey should then be carried on along the south edge of the river to due south of Jeppu ferry, showing the mosque near the Ullal ferry and all the revetments along the edge of the river in that vicinity.

3. For the east side of the backwater the Revenue Survey as given on the map "showing port limits," scale 8″ = 1 mile, may be adopted, the survey now to be made being tied into it by cross bearings as explained.

4. The bearings and lengths of all survey lines, &c., should be written against them on the plan in red.

5. The scale to which the plan is to be plotted is 1″ = 660 feet as in the Revenue Survey map.

From G. T. WALCH, Esq., M.I.C.E., to the Port officer, Mangalore, dated Mangalore, 1st September 1894.

In continuation of our conversation on the subject, I write to ask you to be good enough to get the soundings of the Mangalore inner harbour ("backwater") and of the entrance and bar taken as soon as possible.

2. I would ask that special attention be paid to showing with accuracy the channel which laden boats have to use along the west side of the backwater from the harbour entrance to the pattimar anchorage about opposite the Port office; it is that channel which apparently will cause most hindrance to shipping operations in this year unless it be dredged or cleared in some way to a minimum depth of 6 feet at low water spring tides.

3. I would suggest that the soundings be plotted on the Revenue Survey map "showing port limits," scale 8″ = 1 mile, copies of which can doubtless be obtained at the Survey office, Madras.

4. I am having a survey made to show on that map the changes, since it was made in the "sandspit" between the sea and the backwater, and when prepared a copy shall be forwarded to you.

5. I will send a copy of this to the Presidency Port officer.

Preliminary Report called for in G.O., dated 25th July 1894, No. 296, Marine.

Mangalore port consists of an open roadstead where large vessels anchor from one to two miles from the shore, and a "backwater" forming an inner harbour used by the smaller seagoing craft ("pattimars"); access to this inner harbour is through the channel by which the waters of two rivers (the "Nétrávati" and the Gurupur river) find their way to the sea, the

channel being kept open, even when no fresh water is coming down the rivers, by the tidal scour due to the extensive natural basin affected by the tides.

2. *Mangalore town* lies for about three miles along the eastern side of the "backwater," which there varies from 1,800 to 2,800 feet in breadth and is separated from the sea by a low strip of sand, nowhere more than 1,000 feet wide and in parts but little more than 100 feet.

3. Into the "backwater" at its northern end near "Sultan's Battery" flows the "Gurupur river" draining some 320 square miles, and across the southern end of the backwater near the "Marine yard" flows the Nétrávati draining about 1,220 square miles. For some three or four miles before it enters the backwater proper near Sultan's Battery, the course of the "Gurupur river" is nearly north and south and roughly parallel to the coast, but the course of the Nétrávati for its last few miles is almost east and west, nearly at right angles to the coast line.

4. The sandy barrier between the backwater and the sea is so narrow, low and unstable that it is easily breached through when the level of the backwater is raised by river floods; the consequence is that new openings to the sea are frequently formed; sometimes each river has a separate mouth; at other times, as now, there is but one mouth common to both rivers, and these openings or "mouths" shift about along the whole length of the backwater between "Tannirbhavi" opposite Sultan's Battery on the north and the village of Ullal on the south.

5. This ever changing position of the harbour entrance and the resulting variations of the state of the bar and of the "backwater," which cause uncertainty as to what from year to year will be the difficulties in the way of shipping, are great drawbacks to the port. Its history is by no means one of continuous deterioration as is sometimes supposed, but one of constant change; a bad state of affairs having been followed by a better one, which has again deteriorated to be followed by improvement, *e.g.*, one of the great complaints as to the present state of the inner harbour is that whereas it used to be deep enough along its eastern side for "pattimars" and large laden cargo boats to approach the quay (locally known as the "bunder"), the place is now so shallow there that those crafts have to lie some distance from the quay and cargo has to be taken to and from them in small boats; in November *1843*, however, the then District Engineer (Captain, now General, F. C. Cotton, R.E.) says in his diary . . "*no boats* can approach the landing place except near the time of high water and the larger vessels which communicate with the pattimars in the offing make in consequence but one trip a day" . . . "the distance from deep water to the custom-house is about 900 feet;" he therefore proposed dredging a channel for the boats to pass to and from the larger craft; the state of affairs would thus appear to have then been considerably worse than now; and again, the channel from the harbour entrance to the pattimar anchorage opposite the custom-house is now much complained about and is certainly very bad, but in *1837* it was apparently even worse, for in a letter from the "Civil Engineer" to the "Principal Collector, Mangalore," dated 30th May 1837, he says that as the result of there being two mouths to the rivers . . "the backwater has become considerably shallow and when the tide is out greatly diminished in breadth, the consequence of which is that whereas formerly pattimars used to lie on the backwater opposite the custom-house, they are now obliged to remain lower down and immediately inside the mouth of the southern river."

6. Records also show that the "bar," though it has sometimes been better than it now is, has not infrequently been worse.

7. There does not appear to have been, in recent times at all events, any deterioration of the open sea anchorage for large vessels, and improvement of it could only be effected by an artificial harbour on the general lines of the one at Madras at an altogether prohibitory cost. It is not, it is understood, to be now dealt with, the present investigations being confined to the means of making the best of the inner harbour and its entrance.

8. The first step in this direction has been taken by an inspection of the port during the south-west monsoon when the rivers were in fresh and a general consideration under those conditions of the various proposals which have from time to time been made for improvement of the harbour. All the European merchants and most of the native ones were good enough to state their views and to give all information in their power.

9. But before it can be determined what detail proposals shall be made, it is necessary * that the port should be studied also under the different aspects which it will present when no river waters are affecting it and shipping operations are in full swing; certain surveys and soundings also are required; in the mean time, however, some of the general conclusions already arrived at may be thus stated—

* See covering letter, paragraphs 4 and 5.

(*a*) When, as often has been the case, there have been two openings to the sea, the entrances to the harbour and their "*bars*" have been worse than when the river waters and the tidal scour have been concentrated on one opening.

(*b*) When the "Nétrávati" has had its mouth towards the north of the backwater, its flood waters have scoured out the backwater along the town face to deeper than is the case when that river passes in the most natural course direct to the sea near the south end of the backwater; but on the other hand the latter position is the best for the harbour entrance and the bar.

(*c*) It is of *primary* importance to secure a good permanent "bar" and entrance to the inner harbour; the difficulties *in it* could always be dealt with by dredging which could be carried on in smooth water at all times.

(*d*) Though it is impossible to divert from the backwater much of the drainage which brings a considerable quantity of silt into it between the "Sultan's Battery" and the "Marine yard," the minor town drains which now form shoals in most inconvenient places along the face of the quay might be so dealt with by silt traps (to be kept constantly cleared by manual labour) that they would cease to be the annoyances and hindrances to traffic that they now are.

(*e*) The tidal scour is the chief, if not the only, factor in keeping the "bar" practicable during the dry season which is also the shipping season, and therefore no appreciable curtailment of the tidal basin should be allowed.

10. From these premises may be deduced the general lines which the proposals to be made will probably have to follow; they are—

(*a*) The protection of the barrier between the sea and the backwater so that it may be possible to carry out,

(*b*) the *fixing* of the entrance and bar and keeping them approximately uniform in size and depth instead of allowing them to vary in all those particulars year by year.

(*c*) The provision of means of dredging in the inner harbour whenever and wherever required.

11. It may be at once stated that there is no probability of the "Port funds," now considered as belonging exclusively to Mangalore, being able to meet the cost of the works which will be necessary, but the railway from Mysore will raise the port to a position of such general public importance as would seem to warrant its being dealt with liberally from "*Provincial*," if not "*Imperial*," funds.

12. Though perhaps not strictly within the intended scope of this report, it seems right to call attention to the necessity for, *as soon as possible*, dredging out the channel from the harbour entrance to the pattimar anchorage opposite the custom-house; the state of this channel has for some time past seriously hampered the port, and will, if not improved, again this year seriously hamper it. This work is one which may well be met from the local "Port funds" and "dues."

See appendices 1 and 2 with this report for correspondence with the Marine Department about this.

13. There is another subject connected with improvements to the port which it may be as well to notice here, and that is, the proposed reclamation of the ragged foreshore between the present "bunder" and the "Marine yard" referred to in paragraphs 3 and 5 of letter from the Presidency Port officer, No. 695—276 G., dated 20th July 1894, with Proceedings of the Madras Government No. 297-A, dated 26th July 1894.

The project was worked out in detail by Colonel A. T. Frazer, R.E., then Executive Engineer, West Coast Division, in September 1889. His estimate came to Rs. 45,520 and was doubtless approximately correct. The work appears a most advisable one on its own merits even irrespective of the general improvement of the harbour, especially if the railway runs into Mangalore at, or near, the "Marine yard" as will most probably be the case. This reclamation would not, of course, be recommended if it would appreciably reduce the tidal area [see (*e*) of paragraph 9 *supra*], but this would not be the case, for though it would provide some 11 acres of ground for a road, for wharves, for warehouses, and perhaps for railway sidings, &c., the area is so shoal that the quantity of tidal water which at times covers it forms but an insignificant percentage of that which passes in and out of the harbour mouth. Most certainly no private rights in connection with the foreshore in question should be allowed to spring up.

14. For reference there are sent with this report (1) "Marine chart sheet IX" *borrowed* from the Presidency Port officer, and (2) a copy on tracing linen of a "plan of Mangalore harbour taken in January 1885" *borrowed* from the office of the Superintending Engineer, IV Circle.

Ootacamund,
13*th September* 1894.

(Signed) G. T. WALCH, M.I.C.E.

APPENDIX No. 1.

From H. D. BADDELEY, Esq., to G. T. WALCH, Esq., M.I.C.E., dated Madras, 5th September 1894.

In the absence of Captain Powell, Presidency Port Officer, I write as the matter is urgent.

Will you kindly let us know as early as possible whether dredging should be commenced at Mangalore, as it is thought that whatever shape your recommendations may ultimately take dredging will form a part of the scheme.

We are sending the vessel to Bombay to be docked next month, and Government wish us to submit early proposals for her employment. It is possible therefore that on this point you can now give an opinion. Arrangements will have to be made at once for disposal of the spoil. The Port officer will send you the latest soundings when taken. The various plans made during the last ten years will show fairly well the changes that have taken place. These I presume have been made over to you.

APPENDIX No. 2.

From G. T. WALCH, Esq., M.I.C.E, to H. D. BADDELEY, Esq., dated Ootacamund, 8th September 1894.

Your letter of 5th instant. Quite irrespective of any scheme for general improvement of the Mangalore harbour, it is of great consequence to the place that for the season now just begun a practicable channel of not less than six feet at low water should be, as soon as possible, dredged from near the river mouth to the pattimar anchorage opposite the custom-house, the channel referred to in paragraph 2 of my letter of 1st instant to the Mangalore Port officer, of which a copy was sent to you. If this channel be not opened out, shipping operations will be very seriously hampered. There cannot be any arrangements made for utilizing the spoil this season; the "Wenlock" therefore must use her own hopper arrangements and "dump" the spoil out at sea beyond the six fathoms line and in such a position with reference to the harbour entrance that the then prevailing current will not carry the stuff back towards the bar. Of course the dredging in the channel referred to should be done at once to be of full use, for shipping operations are now commencing. I hear that some cheap form of spoil barge has been designed to use with the "Wenlock" at Tuticorin or *somewhere*. Will you let me know about it?

Order—dated 21st September 1894, No. 377, Marine.

The Government has perused Mr. Walch's preliminary report with interest. He will be requested to pursue his investigations as indicated in paragraphs 4 and 5 of the covering letter.

2. The Presidency Port officer will arrange for the payment from the landing and shipping dues fund of the expenses mentioned in paragraph 6.

3. The Government agrees as to the necessity for the soundings referred to in paragraph 7, and Mr. Walch will be requested to arrange, in communication with the Presidency Port officer, for the early entertainment of the necessary establishment, particulars of which should be submitted for the information of Government.

4. Orders * have already issued for the speedy despatch of the dredger "Wenlock" to Mangalore. The Presidency Port officer will see that she is put to the work indicated by Mr. Walch, viz., dredging out the channel from the harbour entrance to the pattimar anchorage opposite the custom-house.

* G.O., dated 14th September 1894, No. 368.

5. The authority sought in the concluding sentence of Mr. Walch's letter is granted.

(True Extract.)

Chief Secretary.

To G. T. Walch, Esq., M.I.C.E.
" the Presidency Port Officer.
" the Collector of South Canara.
" the Public Works Department.

Exd. C. A. Munisawmy.