

MADRAS RECORD OFFICE.

Government of Madras.

Marine DEPARTMENT.

G.O. No.

511

Press

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Dated

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1859

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*Proceedings of the Madras Government, Marine Department,
from 5th to 21st October 1859.*

No. 24. Read the following Proceedings of the Madras Government, in the Public Works Department, (*Marine*), dated 4th October 1859, No. 2365.

(*Vide Public Works Proceedings from 24th September to 4th October 1859, Nos. 164 & 165.*)

(*Referring for consideration paragraphs 18 to 23 of a letter from the Chief Engineer, dated 2nd September No. 4498, forwarding an original report from Captain Brinc, Superintending operations at Paumbem, with its covering letter from the District Engineer of Madura, reviewing the work performed by the Steam dredge in the Paumbem Channel from the 1st May 1858 to the 30th April 1859.*)

No. 25. ORDER THEREON, 12th October 1859, No. 511.

The Superintendent of Marine, who will be furnished with a copy of Lieutenant Colonel Bell's letter, 2nd Ultimo, No. 4498, will report on the suggestions made by the Officer superintending the operations at Paumbem, as given in paragraphs 18 to 23.

2. Major Horsley's sketch of Paumbem, to which Colonel Bell refers in paragraphs 20 and 21 of his letter, was forwarded to the Court of Directors under date the 12th August 1850. Application will be made to the Home Government to return it, or send a copy of it.

3. Government remark that in Extract Minutes of Consultation, 10th March 1855, No. 56, they authorised the levying of tolls for pilotage according to draught of water instead of by tonnage on Vessels passing through the Paumbem channel, on the ground that the change would establish the charge on a fairer basis without injury to the interests of the craft navigating the channel, or without materially varying the amount levied on each. The Superintendent of Marine will state whether under the facilities at present afforded for the passage of Vessels, the system of charging pilotage according to tonnage might not now be reverted to.

(Signed) T. PYCROFT,
Chief Secretary.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letter from Lieutenant-Colonel J. H. BELL, Chief Engineer; to J. D. BOURDILLON, Esq., Secretary to Government, dated 2nd September 1859, No. 4498.

1. I have the honor to forward for the information of Government, a report in original from Captain Brine, superintending operations at Paumbem, together with its covering letter from the District Engineer of Madura, reviewing the work performed by the steam dredge in the Paumbem channel from the 1st May 1858 to the 30th April 1859.

No. 1, dated 1st May 1859, with 2 plans.

No. 181, dated 11th June 1859.

1 Original letter from the District Engineer of Madura, No. 181, dated 11th June 1859 with 3 enclosures, viz.

1 Report from Captain Brine and 2 charts.

1 Original letter No. 6, dated 2nd May 1859, from District Engineer, Madura.

2. The dredge was employed principally during the past year in widening the sand bank channel, south of Paumbem, though for a time during the height of the south west monsoon, it was transferred to the northern entrance of the reef channel between the bury and the first reef.

3. Captain Brine has prepared charts of the reef and sand bank channels respectively, which are herewith forwarded. From these it will be seen that there is now a minimum depth of $11\frac{1}{2}$ feet in the centre of the reef channel at low water neaptides, shewing an improvement of about $3\frac{1}{2}$ feet over the minimum depth as taken in June 1850. The sand bank channel is in course of being windened on its eastern side 35 feet, and excavated to the depth of 13 feet. The work is represented as being in a forward state, and the remainder, it is hoped, will be completed with the means at the disposal of the superintendent, notwithstanding that a considerable sum was expended out of the estimate for this work, while the dredge was employed on the reef channel. By referring to the chart of the sand bank channel, it will be seen that there is now a minimum depth in the old portion of the same of $10\frac{1}{4}$ feet in the centre. It is Captain Brine's intention to remove the deposit of silt in this part of the channel by means of the new hand dredge, which was to have been completed in June last.

4. The minimum soundings, in the newly cut part of the sand bank channel, give 10 feet in the centre at low water neap tides.

5. Vessels drawing 11 feet, can now pass through the reef and sand bank channels at high water and those drawing 10 feet at half tide.

6. During the past 12 months 68,414 cubic feet of sand and stone have been removed from the reef channel and 6,43,420 cubic feet of sand and mud from the sand bank channel.

7. The expenditure during the same period is given by the District Engineer at Rupees 11,184, out of a total estimate of Rupees 15,700. The details of the expenditure are given in

	Rs.
Writer and Maistry	282
Convicts' hire	2,880
Boatmen	2,659
Dhories	1,233
Artificers	1,191
Copper, iron, rope, tar, &c. ..	2,303
Sappers' working pay	348
Sundries	285
Total Rupees	11,184

the margin. Of the total expenditure Rupees 2,880 are charged for convict hire, which Captain Ryves considers very large, and he has accordingly called upon Captain Brine for a statement of the amount and description of work done by the convicts during the year. He has also called for an account of the stores and materials purchased at a cost of Rupees 2,303, as he thinks it probable that a large proportion of the amount of this charge will be recoverable to the credit of the estimate.

8. The cost of the dredge establishment for the year amounts to Rupees 4,248, as shewn in the margin. If this sum be added to the former, we have the

	Rs.
Dredge Engineer @ 225 Rupees per mensem	2,700
Do. Crew	1,548
Total Rs.	4,248

total cost of raising and removing 712,000 cubic feet of soil and stone, viz. Rupees 15,150, exclusive of interest on first cost of dredge, and the superintendent's establishment. This is at the rate of 47 cubic feet per Rupee. For simply raising the sand and mud from the bottom to the lighter, the District Engineer

computs the cost at about 70 cubic feet per Rupee, and he further remarks that the cost of an effective horse power has been $11\frac{1}{2}$ Rupees per hour on the Paumbem works during the last year, a rate of working far in excess of that for such work in England.

9. There would seem, however, to be some mistake in this latter calculation, for, if we take the number of days on which the engine worked, viz. 157, and six hours as the average days work, we have 942 hours, and dividing the cost for simply raising the sand and mud from the bottom to the lighter, viz. Rupees 10,500, by this sum the result will give a little more than 11 Rupees per hour for the whole work of the engine of eight nominal horse power, or about three effective horse power, taking the average of the 121 days work on the sand bank channel at 5,320 cubic feet per diem, which, at six hours per diem, would be equivalent to about 59 tons per hour. In Captain Ryves' calculation, no allowance seems to have been made for the work done by the engine in excavating the soil before raising it. This, in soft loose sand, is reckoned to be equal to an additional 21 feet raised, making altogether 37 feet.

10. It is well known that dredging machines even of the best construction and worked as economically as possible, do not work up to any thing like their nominal horse power, owing to the great loss from friction and waste of power in the engine and its gearing, besides the work of excavation performed by the Engineer, in addition to raising. Thus we find by a table of performances of dredging machines given at page 210 of the Artisan for September 1855, that a 15.6 nominal horse power engine excavated 166 tons of very soft mud per hour that height raised being 11 feet to water line and say 16 feet more to top of bucket ladder, making 22 feet in all. This if calculated by the formula given at the same page is the work of only $10\frac{1}{2}$ horse power, so that not more than two-thirds of the nominal power was really effective. In the Paumbem dredge, as is shewn above, for eight nominal, we have three effective horse power distributed over the average work of 121 days, which is not quite so much out of proportion as Captain Ryves seems to think, and is at the rate of $3\frac{3}{4}$ Rupees per hour for one effective horse power.

11. If we compare the cost of the work done at Paumbem during the past year with that done in deepening and cleaning the Clyde and harbour of Glasgow from 1841 to 1844, as given in the Engineer's and Contractor's pocket book for 1852-1853, we find, that whereas it cost on average 10 pence per cubic yard at the Clyde, at Paumbem it averaged $13\frac{3}{4}$ pence per cubic yard, taking the total cost as above at Rupees 15,150 and the quantity raised and removed at 7,12,000 cubic feet.

12. It is thus seen that the cost is far above what it ought to be, considering the value of labor in this country as compared with that in England.

13. One of the principal causes of this large expenditure is the small number of dhonies available for removing the soil raised by the dredge, and the loss of time in the use of the small number that are available. Another cause is the attempt to work the dredge throughout the year, thus maintaining boats, artificers, dredge establishment, &c., on monthly hire without any possibility of working them efficiently for more than a third of that time.

14. To remedy this, the District Engineer proposes, and I entirely agree with him, that nothing should be done between April and December except collecting firewood, and making up duplicate bolts and shackles, &c., and that during the four months, viz. from the middle of December to the middle of April, the dredge should be worked regularly 8 to 10 hours per diem. Captain Ryves recommends that there should be 15 lighters to remove the stuff, while the dredge is at work, but I am inclined to think that 10 spoil boats, each capable of carrying 10 tons, would be found sufficient.

15. In his letter of the 2nd May 1859, the District Engineer states that he has desired Captain Brine to prepare an estimate of the cost of these lighters, and promises to submit the estimate when received for sanction. The cost he believes will not be more than two years hire of the dhonies at present in use, of which seven is the largest number that Captain Brine has even been able to muster. During the pearl fishery this year, all the dhonies were taken away by their owners.

16. As respects the revenue derived from the channel in the shape of port dues levied on the draught of vessels passing through it during the past year, the superintendent reports, there has been a considerable falling off as compared with that of 1857 and 1858. The Government share of dues for the year 1858-59 is Rupees 9,030-10-3 (inclusive of hire of warps and grapnels) whereas, for the year 1857-58 it was Rupees 11,692-2-9, shewing a deficit on the present year of

Rupees 2,661-8-6. The amount of tonnage which passed through the channel in 1857-58, was 1,87,912, while that of 1858-59 is 1,38,341, shewing a decrease of 49,571 tons.

17. The superintendent attributes this diminution in revenue and tonnage to the losses sustained by wreck and damage to vessels during the gales of May and November 1858, and to the scarcity of rice and consequent inability of vessels to obtain cargoes from the Tanjore ports. Moreover, the exportation of rice from Tanjore was prohibited for a short time in December last, and as the re-opening of the export trade was not generally known for some time after, this naturally deterred vessels from frequenting these ports. He is sanguine, however, that the deficit will be more than covered by the increase of revenue in the present year.

18. In addition to the application for more spoil boats, the superintendent's report contains the following propositions:—

1st. The publication of revised charts of the Paumbem channel shewing its present state.

2nd. Widening the reef channel:—

3rd. To alter the system of levying dues, substituting tonnage for draught.

19. With reference to the 1st point, the superintendent remarks that the existing charts of the Paumbem pass and its vicinity published in 1845 are incorrect, and that were Commanders of English vessels aware of the real depth of the channel, many of them would take this route in preference to that via Galle to Colombo, Tuticorin, &c., as they would thereby effect a considerable saving in time and expense.

20. A correct sketch of Paumbem, shewing the position of buoys and the bearing of the light-house, as also with plan of sounding in the channel was made by Major Horsley in 1850, the latter is forthcoming in this office, but what has become of the sketch is not known. It appears to have been forwarded to the Chief Secretary to Government with the Chief Engineer's letter, dated 16th July 1850. Major Horsley informs me that he saw a printed copy of it in the possession of Colonel A. T. Cotton, when he visited Paumbem in 1853, but that also cannot now be found, nor do there appear to be any other copies forthcoming, either in this office or in that of the Superintendent of Marine.

21. If the original sketch could be found, a new chart might be printed from it and the latest soundings in the channel introduced therein, for the information of Commanders of vessels and others interested in this route. It is certainly very desirable that correct information as to the present state of the channel should be before the public.

22. As respects the 2nd proposition, the District Engineer concurs in opinion with the superintendent, that it is necessary to widen the reef channel in the vicinity of the sharp bend a little distance north of the north reef, as the rapid current there, (from five to seven miles an hour) renders it difficult for large vessels to pass through without fouling the side of the channel at the bend; and in the case of a vessel in tow of a steam tug it would be almost certain to do so. If the Government approve, I will call upon the District Engineer to furnish an estimate of the probable expense that will be incurred for widening this portion of the channel an additional 50 feet. The present width is 100 feet.

23. The 3rd proposition is to alter the system of levying dues. The present mode of levying them is stated by the District Engineer to have been introduced in 1854-55, and was then only just to the shipowners, as in consequence of want of depth of water they had frequently to lighten their vessels, an operation which entailed no little expense, besides the delay and injury to goods. But as all vessels up to 200 tons can now pass without lightening (last year only two vessels had to lighten) the trade carried on by vessels above 80 tons burthen is relieved from $\frac{2}{3}$ of the expense incurred formerly in passing the channel, having now only to pay the Government dues of pilotage. It is evident, therefore, that the dues might be raised without pressing very heavily on the shipping, but on this point, I would beg to suggest, that the opinion of the Superintendent of Marine should be requested.

ORDER THEREON, 4th October 1859, No. 2365.

With this letter the Chief Engineer submits the usual report on the operations at Paumbem during the year 1858-59, accompanied by charts of the reef and sand bank channels prepared by the superintendent and a letter from the District Engineer reviewing the report,

2. It appears from these papers that the present minimum depth at low water neap-tides, is $11\frac{1}{2}$ feet in the centre of the reef channel, and $10\frac{1}{4}$ feet in the old portion of the sand bank channel. The latter is being widened 35 feet on its eastern side, with a depth of 13 feet. The minimum soundings in this new part are already 10 feet in the centre at low water neap-tides.

Both passages may now be taken at high water by vessels drawing 11 feet, and at half tide by those drawing 10 feet.

3. The expenditure during the year is stated to have been Rupees 11,184. The high charge of Rupees 2,880 having been made for convicts' hire, the District Engineer has properly called for a statement of the amount and description of work done. The Government request

* The inter-departmental charges formerly made at home for convict labour have been abolished.

that the result may be reported to them, through the Chief Engineer; *also the rate at which the services of the convicts are paid for—and whether they are worth it, compared with free labor.

The salaries paid during the year to the dredge establishment amounted to Rupees 4,248—and the total expenditure on account of the operations in the channels, to Rupees 15,432 exclusive of interest on the first cost of the dredge and the superintendent's salary. The quantity of soil and stone raised and removed was 7,12,000 cubic feet.

4. This result is admitted not to be commensurate with the outlay. The want of a sufficient number of lighters to remove the material raised by the dredge, and the occasional withdrawal of those employed, impedes the work and so makes it more expensive than it would otherwise be. Another cause is the maintenance of boats and establishments throughout the year, while they cannot be fully worked for more than four months. "This bad economy,"

Letter 2nd May 1859 p. 4.

the District Engineer remarks, "has already occasioned very considerable loss i. e. for the amount expended during the

"last year we might have turned out probably 50 per cent. more work."

5. The Governor in Council fully approves the measure proposed by the District Engineer, and supported by Colonel Bell in the first part of paragraph 14 of his letter viz. to carry on operations vigorously during the four months January to April in each year, and to devote the remaining eight months to the collection of fuel and making other preparations.

6. With respect to the number of lighters to be employed, a question treated of in the same paragraph, the Governor in Council has to remark that there ought certainly to be a sufficiency of them, and that it is very bad economy to have too few. He is of opinion that Captain Ryves should be left free to employ as many as he thinks necessary, only taking care that no more are kept than can be really and fully employed.

7. In paragraph 15 the Chief Engineer adverts to Captain Ryves's proposal to build a few spoil boats; but it must be remembered that the hire includes very much besides the mere price of the vessel. With regard to the complaint that donis at work are often taken away at very short notice to other employments, the Governor in Council conceives that this might be easily prevented by a stipulation made at the time of hiring.

9. Paragraphs 18 to 23 will be referred to the Marine Department for consideration.

10. As suggested by Captain Ryves, paragraph 12 of the superintendent's report will be published as a notification in the Fort St. George Gazette. Paragraph 12. The papers generally will also be made as public as possible.

(True Extract.)

J. Ryves
Chief Secretary.

To the Chief Engineer.

„ Marine Department. ✓

Exd. Wm. Thomas.

No. 511- 12 October 1859.

The Superintendent of Marine, who will be furnished with a copy of Lt. Col. Bell's letter, No. 4498, will report on the suggestions made by the Officer Superintendent-ing the operations at Paumbem, as given in paras 18 to 23.

2. Major Horsley's Sketch of Paumbem, to which Colonel Bell refers in paras 20 & 21 of his letter was forwarded to the Council of Directors under date the 12th August 1850. Application will be made to the ^{Home Govt.} to return it, or send a copy of it.

3. Govt. remark that in Ex. Minis. Cons: 10th March 1850 No. 56, they authorised the levying of tolls for

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J. P.

The Superintendent
of Marine, with No. 2365
" Sub. Com. Deph.
" Chief Engineer.

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Pro of Govt of India
Marine 1859 Department

Proceedings of Govt in
the Pub. Works Department
No 2365

Dated 4th }
Dec 5th } October 1859

5 spare copies

No 470

Referring for consi-
deration paras 18 to 23 of
a letter from the Chief Engr
of 2nd Sept. No 4498 forwarding
an original report from
Capt. Bruce, Supd of operations
at Panambur with its cover
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from the 1st May 58 to the 30th
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With an Order.

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