BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of (1881). Madras.

PUBLIC WORKS.

To

THE SUPERINTENDENT,
MADRAS HARBOUR WORKS,

&c., &c., &c.

Dated November, 1881.

Read

Read

Read

G.O., 24th November 1881, No. 2951 W.

NOVEMBER.
Nos. 118-119.

*Madras Harbour Works.*—Reports regarding the state of the —, and the probable amount of funds required in 1882-83, with reports of the damage to the Harbour Works during the late cyclone, ordered to be forwarded to the Government of India.

choice, not only for present, but for future, arrangements. It may be that the number of screws is unnecessarily great for present requirements, but their fixing requires special appliances which may not be available when an extension of accommodation is required, and as the whole expenditure upon their purchase and fixing is only about Rs. 50,000, there does not appear to be much object in deferring the fixing of such portion as might, so far as immediate arrangements are concerned, be dispensed with, to be hereafter fixed at a much increased cost.

7. I would therefore express a hope that these considerations be weighed before any departure is permitted from the arrangement of the *screws* already sanctioned (with one small modification which I have already suggested to Mr. Thorowgood), but the number and position of the *buoys* is a question on which I have no opinion to offer.

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Read also—

No. 118-B. From F. N. THOROWGOOD, Esq., M. INST. C.E., Superintendent, Madras Harbour Works, to the Secretary to Government, Public Works Department, dated Madras, 9th November 1881, No. 58 W.

I HAVE the honor to submit the following report in reply to the Order of Government No. 2701 W. of the 2nd November, on a letter* from the Government of India.

* No. 379 A-C, 22nd October 1881.

2. I forwarded for the Government of India, with my letter No. 54 W. of 24th October 1881, a plan showing the state of the harbour at the end of September, and this may be taken practically to represent the present state of affairs as regards the lengths of the piers, the depths of water, and the state of the shore within and without the harbour.

3. STATE OF THE PIERS.—The two piers are now completed in length, and terminate in water eight fathoms deep below mean sea level, with an opening of 550 feet between their terminations. There yet remains to be built on each pier a return wall or horn, the object of which is to prevent the waves from running round the curved walls, by deflecting them off at first starting.

4. DATE OF COMPLETION.—These horns are only 70 feet in length, but they are designed on so sharp a curve that it will be necessary to alter the wheels of the Titan cranes before any blocks can be set. The two cranes have likewise to be turned completely round in their own length, which will probably be a risky and difficult undertaking. I do not therefore think that the piers will be actually and finally completed before April of next year.

5. CONCRETE BLOCK-WORK.—The length of the concrete block-work of the north pier is 3,870 lineal feet, and this has been built in $4\frac{3}{4}$ years. The length of the block-work of the south pier is 3,972 feet, and this has been built in 4 years. The estimated quantity of concrete blocks for the piers was 2,00,100 cubic yards; the quantity actually used has been 2,06,581 cubic yards, and it is possible that about 80 cubic yards additional will still be required.

6. SETTLEMENT.—Towards the ends of the two piers, where the rubble foundation is deep, there has been in some places an excess of settlement by the compression of the underlying rubble. This settlement has, however, never brought the work down to more than 9 inches lower than the designed height of 3 feet 6 inches above high water. The *general* appearance of the upper surface of the whole 7,842 feet of block-work is fairly regular, although irregularities are conspicuous at some places on close inspection. During the construction of the piers no block has ever been bodily displaced by the sea, but in November 1880 one block at the extreme end of the north pier (as it was then) was undermined and sunk down 3 feet. The shallow-water portions of the piers also suffered during construction, owing to the foundations being buried in sand. Some repairs will be necessary to those portions when the piers are completed, but I have not judged it necessary to carry these out yet because of the traffic along the piers.

7. SHELTER AFFORDED.—The harbour affords excellent shelter now during all winds except those from due east, and with the wind in this quarter the surf is greatly reduced, but not entirely abolished. All steamers calling at Madras now enter



the harbour, and there can be no doubt as to the immense benefit derived from the work. Large full-rigged sailing ships also come inside during the fair season, and are at present only excluded during the storm months on account of the absence of a steam tug and the backward state of the moorings.

8. MOORINGS.—The fixing of the moorings is proceeding but slowly, the executive difficulties having proved heavier than was anticipated. These, however, are diminishing as we gain more experience. There are now nine shallow water moorings fixed in position, and one buoy attached to four screws is fixed in nearly $4\frac{1}{2}$ fathom water. These buoys are used freely by vessels, but the moorings in deeper water are what are more needed at present, and these will now be proceeded with whenever the sea is sufficiently smooth, for the surface has to be perfectly calm to allow of the screwing apparatus to be worked.

9. DEPTH OF WATER.—The bottom of the harbour was surveyed by the Harbour Works staff in September last with the utmost care and accuracy, and the result has been submitted to Government with approval.* There is absolutely no silting up except in the south corner, and this is easily accounted for. The depths were compared with those of September 1879, and in both instances are reduced to what is called DeHavilland's mean sea level, which seems to be in reality about 1 foot below high water.

* G.O., No. 2521 W., dated 15th October 1881.

10. With reference to the probable expenditure during the current year, I have carefully gone into each head of account, and I believe that the total sum granted for the current year will be sufficient.

11. EXPENDITURE.—The following table will place the figures more clearly:—

| | RS. |
|---|---|
| Amount allotted as per budget estimate, 1881-82 ... ... ... | 3,78,247 |
| First supplemental grant—G.O., No. 1483 W., 14th June 1881 ... | 73,822 |
| Second " " " " 1997 W., of 13th August 1881. | 2,00,000 |
| Third " " " " 2475 W., 8th October 1881 ... | 74,000 |
| (This was on account of the Madras Railway). | |
| Total ... | 7,26,069 |
| Expenditure up to 31st October (approximate) ... ... ... | 5,14,225 |
| Balance for remaining five months ... ... ... ... ... | 2,11,844 |
| Estimated in detail to be expended up to 31st March 1882 ... | 2,02,724 |
| Balance ... | 9,120 |

I have allowed for payments to be made in England for moorings and for all other expenses that I can think of as likely to occur, but not for any very heavy charge on account of purchase of land to the north of the harbour, as I do not know how that matter stands. It seems therefore that for the remainder of the current year no extra funds will be needed.

12. For the ensuing year 1882-83 the executive work will be confined to completing the moorings, fixing a lighthouse and generally closing the work, and possibly for purchasing land to the north or carrying on heavy protective works. It is hard to estimate at this date what will be required, as the months of November and December may bring such seas as will do more damage to property than has yet occurred. With such a possibility in view I think Rs. 2,00,000 ought to be available for next year. It must, however, be borne in mind that Rs. 80,000 may pretty safely be reckoned upon for the sale of plant, and that possibly some gain may accrue from the land newly formed to the south of the harbour.

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No. 2661.

REFERRED to the Master Attendant, Administrative Department, Madras, for any observations he may wish to offer, particularly on the subject of paragraph 7.

(Signed) R. H. SANKEY, Col., R.E.,
Secy. to Govt., P.W.D.

14th November 1881.

No. 118-C. From J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative Department, to the Secretary to Government, Public Works Department, dated Madras, 19th November 1881, No. 10176.

THE altered conditions of the harbour render it unnecessary to notice any portion of the letter, No. 58 W., dated 9th November 1881, from the Superintendent of the Madras Harbour Works, except paragraph 7, and on that I have the honor to forward the following remarks.

2. A very considerable amount of shelter is still given to steamers in respect of landing and shipping operations, and so far the use of the harbour is of great benefit to the port; but owing to the large space occupied by the wrecks of the *Hobart* and *Salisbury*, and the necessity of giving the injured walls a wide berth, I have felt it necessary to limit the entry of steamers to three at one time. It is possible, therefore, though at this season not probable, that vessels might have to wait their turns for a few hours. The distribution of the mooring chains already laid down in the south corner also limits the practicable space on that side. The subject of the moorings will have to be carefully reconsidered. Mr. Thorowgood in a letter to me says it is imperatively necessary that the buoys should keep the ground shackle well off the ground. Mr. Parkes in a letter,* recently forwarded to me by Government for report on the same subject, says that the cables and bridles may be allowed to lie on the ground for an indefinite period. One thing is certain that an ample amount of play must be given to the buoys, without which the moorings cannot be safe. I am informed, though not officially, that the large buoy which parted its fastening without any ship at it, was hove down to the upper shackle with a force equal to six tons. It is obvious that with a sea running 10 or 12 feet high something must go. I expected the buoy, which is very thin material, would have collapsed, but it seems the chain broke. All doubts about the safety of these moorings must be removed before they can be brought into general use. I suppose they were tested in England, but information on that head should be sought from the India Office.

* Dated 12th October 1881, herewith returned.

3. As regards the steam tug, Mr. Green, who I had hoped would have carried out the order for me, informs me that the India Office declined his interference, and deputed the work to their broker. The tug would doubtless have been here before the accident, if the former arrangement had been uninterrupted, and the choice would have that of practical men. The want of success that has attended all indents for steam vessels for this Presidency hitherto makes me anxious for this one. It is unnecessary to say she would be of great use now.

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No. 119. ORDER THEREON, 25th November 1881, No. 2954 W.

ORDERED that the reports above recorded from the Superintendent, Madras Harbour Works, and the Master Attendant, Madras, be forwarded to the Government of India, with reference to their letter of the 22nd October, No. 379 A.G.

2. The Government of India will also be furnished with the subsequent reports made by the Chief Engineer, Public Works Department, and the Superintendent of the Madras Harbour Works, detailing the damage sustained by the harbour by the recent storm.

(Here enter No. 2955 W., dated 25th November 1881.)

(True Extract.)

(Signed) R. H. SANKEY, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.
" Marine Department, with copy of Note by the Honorable W. Hudleston.
" Master Attendant.

Exd. E. C. Shunker.
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