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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

PUBLIC WORKS DEPARTMENT

G.O. No. 4174.W.
B.P. No.

Press.
Mis.

Dated 29-10-1878

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Not to be folded or roughly handled

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

29th October 1878, No. 4,174 W.

Buildings and Roads.
Civil Works.

Read the following paper :—

No. 324. Despatch from the Right Honorable the Secretary of State for India.

Public Works,
No. 18.

INDIA OFFICE,
LONDON, 26th September 1878.

MY LORD DUKE,—In continuation of my Public Works Despatch, No. 9, dated the 6th June last, I forward, for your Grace's information, copy of a report, dated 27th August 1878, by Mr. W. Parkes, on the progress of the Madras Harbour Works during the quarter ended 30th June 1878.

I have, &c.,
CRANBROOK.

To His Excellency the Most Noble
The Governor in Council, Fort St. George.

MADRAS HARBOUR.

Report on the Progress of the Works for the Quarter ending 30th June 1878.

SIR,

23, Abingdon Street,
27th August 1878.

I HAVE the honor to forward you a plan showing the progress of the above works in the quarter ending 30th June last, and two photographs of the north and south piers respectively, taken from the head of the screw pile pier on the 6th July.

2. There had been, up to the 30th June, an advance of 76 feet at the north pier and 34 feet at the south, and the whole of this advance had been made in the month of June. In the following month of July the north pier advanced a further 113 feet, and the south pier 43 feet, showing that the rate of progress was continuing, even during the unfavorable season of the south-west monsoon. I shall refer to the difference in the progress of the two piers further on.

3. In my last quarterly report (paragraphs 8—11) I mentioned that block-setting had been suspended after the 1st of April to give the blocks more time to harden. It was not resumed till the last day of May.

4. This suspension of the work during the most favorable season was a very serious matter, as, besides the evil of the delay itself, it seemed to imply either a fault in the original arrangements of the work or a miscarriage of those arrangements. Mr. Thorowgood was himself absent on account of illness from the 18th March to 18th May, so that he was not personally responsible for the suspension, and was able on his return to form an unbiassed judgment as to its necessity.

5. I may repeat that the area of the block ground was originally calculated to hold the full number of blocks which could be set at the most favorable season in the time necessary for new blocks to harden. The calculation was based on the experience of the similar work at Kurrachee, and I think that to have made a larger provision in the first instance would have been an unjustifiable expense.

6. The result of Mr. Thorowgood's investigation is, however, that, for some reason not yet fully known, the concrete does not harden quite so quickly at Madras as it did at Kurrachee, and also that, as the sea is never so quiet at Madras as it was during the short working season at Kurrachee, the blocks are subjected to heavier blows and strains while being set, and consequently require greater strength. Two or three blocks were actually broken, but not to a serious extent.

7. From these two considerations combined, neither of which could have been taken into the original calculation of the number of blocks required to be kept in stock, Mr. Thorowgood is of opinion that a delay of two or three weeks would have been justifiable, but that so long as six weeks, which was extended to two months by rough weather in the latter part of May, was unnecessary.

8. The delay appears to have been strongly urged by Mr. Lowe, the principal foreman. If Mr. Thorowgood had been himself on the spot, he would no doubt have over-ruled Mr. Lowe, but I am not surprised that Mr. Beardmore, while only in temporary charge, did not feel justified in doing so. It is to be regretted, however, that Mr. Beardmore did not report the facts either to Mr. Thorowgood or to myself more fully, and at an earlier date. Had he done so either of us would have taken the responsibility of authorising the resumption of work.

9. Experiments are now being made with the view of determining more definitely at what age the blocks may be safely used, and at the same time, with a view to avoiding the possibility of a similar delay in the next favorable season, Mr. Thorowgood has applied for sanction to form a supplementary block ground near the south pier. On this either new blocks may be made by hand labor and used when the stock of machine-made blocks of the proper age at the present block ground is exhausted, or the machine-made blocks may be stacked upon it when hard enough to be removed, but not hard enough to be lowered into the sea. The existing block grounds have also been slightly lengthened at each end, as shown in red on the plan.

10. During the two months that block setting was suspended considerable progress was made at both piers in the formation of the rubble bases in advance. The extent to which stone had been deposited up to 30th June is shown on the plan. This stone was carried out mainly by masula boats from the shore. The masula boats answer very well for the present, and the work is done at almost exactly the cost I estimated, but as the work advances into deeper water the quantity of stone required for filling up to the level of the foundation of the concrete blocks will be greater, and a greater speed of work than is possible with the masula boats will be required to keep ahead of the block-setting.

11. For this purpose the steam hopper barges which have been so long waiting are now being brought into action. The use of the masula boats to a greater extent than I originally anticipated has rendered unnecessary the construction of a timber jetty for the hopper barges to lie alongside of to receive their cargoes of stone. The side of the north pier itself is now available for this purpose, and thus much of the expense originally anticipated for the jetty has been saved. There are, however, still some practical difficulties on account of the strong run of the sea along the solid face of the pier even on the lee side, but I have no doubt means will soon be found to overcome these.

12. I now come to the ever recurring sand question. It will be seen from an inspection of the plan that there has been since 31st March to the southward of the south pier an accumulation forming a triangle of 350 feet along the pier, and of 2,000 feet along the coast. Although the present is not a favorable time for drawing any definite conclusions as to the effect of future accumulations, which will be better deferred till the close of the north-east monsoon, yet the lines, laid down from actual survey, are so clearly illustrative of the principle on which my previous anticipations have been based that I think I may usefully call attention to them.

13. The triangle in question may be taken to represent approximately the accumulation for the whole year, as both in 1876 and 1877 it was found that the north-east monsoon removed all the accumulation which had taken place since June. Taking this triangle, therefore, as our unit of quantity for a year's accumulation, each succeeding year may be expected to add an equal quantity in the form of a parallel strip on the hypotenuse of the triangle which will be longer and deeper, but proportionally narrower every year. Ultimately the triangle will extend from some point near the bend of the pier (say, where it crosses the seven fathom line) to a point a proportionate distance along the shore to the southward. As this triangle will have its side along the pier seven times the length of the corresponding side of the present triangle, its length will be 7 fathoms instead of 2 fathoms, it will be seen that the time necessary for its formation must be well in excess of the hundred years which I have already put forward as the probable period for which the south pier will act as an effectual protection to the harbour. Yet, I think, the advance of the sand must have had a more menacing appearance to local observers this year than on either of the former years at the same period.

14. On comparing the present coast line between the piers with those of 31st March 1878 and of 30th June 1877, it will be seen that there has been no advance. Last year, it will be remembered, there was an advance between March and June, which I attributed to the length of the south pier being insufficient to prevent the passage of sand round its end. It is now

obviously quite effectual for this purpose, and the next few months' advance of the pier will, I hope, put a final stop to any anxiety as to future encroachment on the water space of the harbour. The width of beach which has been gained, however, appears to be already fully occupied for the purposes of trade. As the piers give more shelter the travelling of the sand northward and southward according to the monsoon will be lessened, and the line of shore will become more permanent, and, therefore, still more useful.

15. The coast to the northward of the north pier continues to waste during the prevalence of southerly winds, and the waste is regained in northerly winds. The effects of these fluctuations are not very serious, but when their possible extent has been more clearly determined by experience, it may be desirable to adopt some permanent measures of protection.

16. I now come to the movements of the sand near the ends of the piers. Similar movements caused so much trouble and delay last year, that in the nine months from April to December, the north pier could only be advanced 60 feet. This year, in two months (June and July), the north pier has advanced 189 feet, and the south pier 77 feet. The inferior progress of the latter, however, is due to the same cause as affected the north pier last year, viz., the accumulation of sand over the rubble base in front of the blocks.

17. The contour lines of depth on the plan show generally the state of the bottom in February of this year. The soundings in figures are the depths found by Mr. Beardmore at the end of June and the beginning of July. It is a very difficult matter to get soundings at all in such a situation, and such as there are must have been obtained by the exhibition of great promptitude and at some risk. It is, therefore, no reflection on Mr. Beardmore to say that they are insufficient to give anything like a complete idea of the form and extent of the accumulation. Still less would they justify any definite conclusion as to the cause of it. We must still rely upon theoretical considerations as the main basis of our anticipations for the future, though we may usefully test the correctness of our theories by comparison with such a partial collection of facts as we have obtained.

18. It will be seen that upon the line which was the 4 fathom (or 24 feet) contour in February there is now at the end of the south pier a shoal with a least depth of 8 feet, showing an accumulation of 16 feet. This is very similar to the accumulation which was formed off the end of the north pier last year, when that was in a position relatively to the depth of water and the coast line, very similar to that of the south pier at present. Now, the end of the north pier is perfectly free of sand, and it will be seen that the depths north and south of it in the three lines of soundings differ little from the depths shown by the February contours.

19. This marked contrast in the state of the sand near the ends of the two piers is, so far, a literal fulfilment of the anticipation I ventured to express, that the good advance of the north pier made in the early part of the year would have carried it past any future sand difficulty. There are yet two or three months before the change to northerly winds may be expected to introduce a change of conditions as regards the movement of sand, but it is hardly likely that any serious accumulation will now take place.

20. The question now arises whether we may anticipate that the advance of the south pier before the next south-west monsoon will carry it into a position as favorable as that in which the north pier now is. I can see no reason to doubt it. The conditions required are a greater depth of water and a greater distance from the broken water which fringes the beach. It may be suggested that the fact of the advance of the beach along the north pier having been arrested, while that at the south pier will continue, will make a difference to the disadvantage of the latter, but the pier will advance much more rapidly than the beach, and, if the interval between the end of the pier and the beach is sufficient, the advance of the beach cannot affect the movement of the sand near the head of the pier.

21. I have previously expressed an opinion that the advances of the line of beach, and the accumulation of sand at the pier end, are due to two distinct causes, the one being an along-shore movement of the sand, the other a movement in the direction of the waves, originally obliquely transverse to the line of shore, but diverted and confused by the abrupt obstruction of the pier. The form of the bottom, as shown by the soundings near the south pier, is more consistent with this theory than any other. There is an accumulation of 16 feet on the 2 fathom line, close to the pier, and there is an accumulation of 16 feet to the N.E. of the end of the pier on the 4 fathom line, but between the two, on the 3 fathom line, the accumulation is only 9 feet. These two maxima of accumulation, with a minimum between, can hardly be due to a single cause. It is more probable that if the two maxima had been at a greater distance apart, the two banks would have appeared quite independent of one another, with an interval between, in which there would be no accumulation.

22. On the whole I think I am justified in representing the present state of the works as very encouraging. In June and July 1877 the north pier advanced only 14 feet. The difficulties of sand, breaking seas, and uncertain weather, were then at their height. In June and July this year, at the south pier, with the same difficulties, but with better knowledge of how to meet them, the advance has been 77 feet, while at the north pier with the difficulties of sand and breaking seas left behind, but with presumably the same conditions of uncertain weather, the

advance has been 189 feet. This is more than I anticipated at this season, but I take it as a confirmation of the belief I have always entertained that the most formidable difficulties of this work would be encountered before we reached the 4 fathom line. I think it is also a proof of the energy displayed by the executive staff under very trying circumstances.

23. The season has been remarkably unfavorable, the heat having been extreme, and it must be remembered that the European members of the staff are men who, having gained their special experience in England, have gone to India at a latter age than is usual. I regret to say that the effect has been felt. Mr. Thorowgood was absent for two months from illness, and has again suffered since his return; Mr. Beardmore was also obliged to take a short leave of absence from the same cause, and a still greater misfortune has occurred in the death, from abscess of the liver, on the 19th July, of Mr. John Chicken, the Foreman Mechanic, a very valuable member of the staff. His place will be supplied by promotions among the subordinates of his department.

24. I would request that a copy of this report be forwarded to the Government of Madras for their information.

The Under Secretary of State for India.

(Signed) I have, &c.,
W. PARKES

No. 325.

ORDER THEREON, 29th October 1878, No. 4,174 W.

ORDERED to be recorded.

(True Extract.)

Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintendent, Madras Harbour Works.
" Marine Department.

Exd. T. D. Ryan.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of (1878) Madras.
PUBLIC WORKS.

THE SUPERINTENDENT,
MADRAS HARBOUR WORKS.

Dated October 29th.

Recd.

Recd.

Encl.

G. O., 29th October 1878, No. 4,124 W.

OCTOBER.

Nos. 324-325

Madras Harbour Works.—Despatch from
the Home Government forwarding copy of
Mr. Parkes' report on the — for quarter
ended 30th June 1878, recorded.

India Office,
London, 26th September 1878.

Public Works,
No. 18.

To His Excellency The Most Noble The Governor in
Council, Fort St. George.

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spatch, No. 9, dated the 6th June last, I forward,
for your Grace's information, copy of a report,
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I have the honour to be,

My Lord Duke,

Your Grace's most obedient humble Servant,

Lea

ENCLOSURE.

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I have, &c.,
(Signed) W. PARKES.

The Under Secretary of State
for India.

80.2924 W. 19-7-78

J.M.

1878

N^o 2.

N^o 12239

Public Works

26th Sept 1878

The
Letter to Lord St. George

N^o 18. enclosure.

Recd 19 October 1878

Recd 30th Oct

Mr. Dept.

Despatch from the Secretary of State
for India, dated 26 Sept 1878, No 18.

Circulated
for information.

Edmund Caldwell
Secy to Govt. Ind.

[Faint signature]

L 11/10/78

24th Oct 1878

Cir 24 10 78. Recd 24 10 78
of Shul to B. C. B.

This is to certify
that the within
has been examined
and found correct

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miller orders

B. H. Clark

No 4174 W 729 Cull 70

Recorded

at 20/10

Cir 27-10-78
at Phil. D. A. Cote

Supt. Dr. H. H. Clark
Marine Dept
Oct 12-11-78

12239
Govt. of (1878) Madras.

PUBLIC WORKS.

To

The Engineer-in-Chief

Dated

2-11-78

Issued

Recd.

Encl.

G. O. 29th Oct 1878. No. 4174 B

No. 329 L 325

Madras Harbour Works.

In answer to report on the
~~franchise~~
for 2nd ended 30 June 1878,
revised.

Col. G. H. D. 1878.