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**MADRAS RECORD OFFICE.****Government of Madras.***Public Works* **DEPARTMENT.**G.O. No. 1321 (W) Press  
Mia.

Dated 27-10-1877

Not to be folded or roughly handled

GOVERNMENT OF MADRAS.  
PUBLIC WORKS DEPARTMENT.

27th October 1877, No. 1,321 W.

Buildings and Roads.  
Civil Works.

Read the following papers:—

No. 291. Despatch from the Most Honorable the Secretary of State for India.  
Public Works, INDIA OFFICE, LONDON,  
No. 16. 27th September 1877.

MY LORD DUKE,—Herewith is forwarded for your Excellency's information copy  
of a report\* by Mr. Parkes on the pro-  
gress of the Madras Harbour Works  
during the quarter ending 30th June last, and I shall be glad to receive an expression  
of the opinion of your Government on the subject to which it relates.

I have, &c.,  
SALISBURY.

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

MADRAS HARBOUR.

Report of Progress of the Works for the Quarter ending 30th June 1877, 23, Abingdon Street,  
21st August 1877.

THE accompanying plan will show you the state of the works on the 30th June, and I also  
enclose two photographs showing the north and south piers, respectively, taken 4th July.

2. The small progress made in the north pier will no doubt be a disappointment to the  
Government as it is to myself, but I think the explanation I am about to submit will show that  
the obstacles which have presented a more satisfactory progress are local and temporary and that  
a much better rate of advance may be expected for the future.

3. The length of built work on the 17th March was 264 feet; on the 30th June it was  
321 feet, showing an advance of 57 feet in three and-a-half months.

4. These months however include the commencement of the South-west monsoon which  
must always be expected to retard the works to some extent, and this year the period of sea  
disturbance was extended by the heavy cyclone which visited the Madras coast in the month of  
May, which, although it did a very small amount of damage to the works, of course delayed  
operations for several days.

5. Notwithstanding these causes of delay, however, a fair rate of progress would have been  
shown but for another obstacle, which, although not altogether unforeseen, required special  
arrangements to overcome it, and those of a kind which it was impossible to prepare for until  
the exact mode in which the work would be affected was seen.

6. On the 16th March I wrote to Mr. Thorowgood, "I expect you will be troubled with  
sand in the foundation more or less till your rubble base is 4 or 5 feet above the natural  
level of the bottom." This letter reached Madras on the 6th April, and the anticipated trouble  
had made its first appearance some five or six days previously.

7. The form it took was that of a deposit of sand about 4 feet deep on the rubble base,  
immediately in front of the blocks last set, and of course covering the bed on which the next  
blocks would have to be set, so that the latter could not be levelled by the divers to receive them.

8. An attempt was made in the first moderate weather to dig away this sand, but this  
soon proved to be a hopeless task. Fine sand under water finds its own level almost as readily  
as a liquid, and no perceptible impression could be made upon it.

Fort St. George.

9. A kind of fence or caisson was then made of strong iron plates which would sink through the sand on to the rubble below, and enclose a space from which the sand could be cleared by the divers. The first attempt with this was made on the 14th May, and seemed likely to be successful, but the cyclone which commenced the following day of course stopped the work; after it had subsided and the divers returned to their work, the iron caisson had disappeared, and the sand had returned nearly to the same state as before.

10. Another caisson was put in hand, but before it could be put into place a new phase appeared. The sand for some 20 or 30 feet in front of the blocks had entirely disappeared, and for a few days all was clear for work. The foundations were levelled and blocks were set in the ordinary way.

11. This state of things, however, did not last long. The sand returned as before, the new iron caisson was lowered, and by the last accounts received, dated 25th July, the sand had been successfully cleared out of it for a length of 20 feet in advance of the work, the surface of stone was partly levelled to receive the blocks, but for a week the sea had not allowed the divers to descend.

12. The above statement will show that the resources of the Superintendent and his staff have been severely taxed, and will I think satisfy the Government that the difficulties have so far been met with intelligence and energy. The sand difficulty is vexatious rather than formidable, and it has hitherto been much enhanced by the uncertain state of the sea, which allowed fog examination and of work only at intervals, and by the varying effect of the waves and currents upon the sand itself, constantly throwing doubt alternately on the necessity and the sufficiency of the special arrangements which were being made to meet it.

13. There is however another view of the question which will naturally suggest itself, viz., whether this movement of sand may not be an evidence of that action which it has been so confidently asserted will be fatal to the success of the works. That I do not think it so will be readily surmised from the fact that I expressed an anticipation of the existence of temporary trouble from sand at the very time when I was expressing a confident expectation that there would be no permanent injury to the harbour from that cause.

14. The ground of the former anticipation may be shortly stated as follows:—The last heavy weather had been about Christmas and came from the north-east. This of course disturbed the sandy bottom to a greater distance from shore than the limit of the ordinary fair weather surf line, and when it subsided it left the sand in a form determined by the action of a north-east sea on the shore line as it then existed.

15. During the three months that followed, the pier had been advanced some 300 feet into the very part of the sea bottom of which the form had been so determined, and the next heavy weather might be expected with wind from south to south-east, thus meeting an altered line of shore at a different angle.

16. Some changes of the form of the bottom seemed inevitable from this change of circumstances, and especially in the intermediate neighbourhood of the abrupt termination of the pier in progress. But what the nature of the changes would be it was impossible to predict. It might have been deepening or it might have been shoaling, and it was equally impossible to anticipate what measures, if any, would be required to meet the new conditions.

17. The level of the rubble base was not more than 2 to 3 feet above the surface of the sand as it existed in March, so that a bank of 5 or 6 feet high which is no great change to follow such changed circumstances would suffice to bury it.

18. This is I believe an adequate explanation of this accumulation of sand. That it was not a part of any general alongshore movement which is the only movement which could cause permanent trouble is proved by the facts that at the time it was formed there was scarcely any advance of the beach by wave action, and there was no current that was sensible at a depth of 2 fathoms. When at a subsequent period the wave action commenced it was immediately evidenced by a marked advance of the shore line on the south of both piers, and when an alongshore current was established, as it was later, the effect was to clear away the sand as stated in paragraph 10 (*ante*), an effect of current which is far more in accordance with experience than the accumulation which had first taken place. The subsequent return of the sand was considered with a change of wind to south-west (off-shore) and a slackening of the current which allowed the sand to resume its former more nearly level surface.

19. Some information which has recently reached me shows that the changes in the surface of the sand are not greater than those which have formerly attended the changes of the monsoon, but which are not ordinarily noticed unless they affect the boat traffic. A record was kept during the years 1865 and 1866 of the depths alongside the screw pile pier which extends from the shore to a depth of between three and four fathoms. From these it appears that in the months of May 1865, May 1866, and November 1866, being the commencement of two South-west, and one North-east, monsoons, a bank of sand some 6 or 7 feet high was raised at a distance of from 300 to 500 feet from shore. The material for this bank appears to have been taken from immediately outside of it, and from between it and the shore where the depths are increased, those near the pier head being little changed. In November 1875 the changes are even greater than on the

other three occasions, but in an opposite direction. There was, however, a cyclone on the 25th November, which indicates an exceptional state of atmospheric conditions.

20. Such a bank as this modified as it would naturally be by the existence of such a structure as the north pier across its line would tail out over the end of the pier and produce the results noticed. It is no evidence of alongshore movement, but simply of the fact that there is a large quantity of sand in constant oscillation between the shore and the outer limit of the wave action. This latter varies with the force of the sea, but in ordinary seasons probably never extends beyond the 4 fathom line if so far, though at exceptional times it may extend to 6 or 7 fathoms. We may therefore naturally conclude that while we are within the range of wave action on the bottom we shall have more or less trouble with sand, but that when that is past, as it will be with a few weeks of favorable work, the trouble will cease.

21. I have stated that the damage done to the works by the cyclone was slight. I ought to add that to the portions of the work which were complete it was nil. The little damage which did occur was to a part which had not received its full protection of foreshore. The foot of the wall was therefore undermined and a length of 130 feet of the northern half canted over to the northward, leaving a gap of a maximum width of 3 feet between the two halves of the work. The portion of the northern half which has settled, though presenting a rather bulging line to the eye, has lost nothing of its stability. The gap between the two walls has been filled up with concrete, and the foreshore has been strengthened by the deposit of additional rubble and of concrete blocks of 6 tons weight. Some further addition of rubble and of heavier concrete blocks is intended, but this is in abeyance, in consequence of the pressure of the grain traffic on the Madras Railway which prevents access to the laterite quarries.

22. For the same reason the deposit of the rubble base by the steam hopper barges has not yet been brought into operation, but a considerable quantity of the rubble stone which was originally deposited in the first surf bank near the railway terminus and afterwards abandoned has been carried away in masula boats and catamarans to form foreshores and extension of the rubble base. The spit which was formed to the southward of the permanent surf bank has also been removed for the same purpose.

23. *The South Pier Surf Bank.*—This had only just been commenced when I made my last report to you. Its state on the 30th June is shown on the accompanying plan. Its progress is more obvious on paper than that of the north pier, but it is not what I had hoped for, and I much regret to have to adopt an apologetic tone with regard to it also.

24. The Government is already aware that the pressure of the grain traffic on the Madras Railway and on the beach rendered it impossible to carry out this work as originally intended. The original intention had been to have made it with laterite from the quarries on the line of the Madras Railway which would have been brought along the beach railway now partially made as shown in the plan. For this purpose the arrangements under which the north bank was carried out would only have had to be continued. The work would have been commenced as soon as the northerly seas had ceased to cut away the beach within harbour limits, and, at the rate of 700 tons a day from the first, the bank would have been quickly finished. But the superior claims of the famine traffic were imperative, and a new organization in connection with the South Indian Railway on the other side of Madras had to be arranged.

25. There are several spots on the latter line from which suitable stone can be procured. The one chosen was 15 miles from Madras and was preferred on account of the facility it seemed to afford for quarrying and loading a large quantity per diem. Two miles of railway involving a timber bridge 200 feet long over Cochrane's canal were made at the cost of the Harbour works to extend the South Indian Line to the beach, and the Company undertook to find rolling stock sufficient to carry 700 tons per day.

26. In consequence of the delay in procuring rolling stock, however, the first train was not despatched from these quarries till the 16th May, at least three months later than it ought to have been, and up to the 30th June the greatest quantity delivered in a day has been 210 tons. The total in the month of June was 3,204 tons, whereas the quantity in the month of June 1876 delivered to the north surf bank was 15,732 tons.

27. I ought however in fairness to state that two other circumstances would have caused the delay if the inefficient arrangements of the South Indian Railway authorities had done so. The first Contractor (an Englishman) employed to unload the stone failed to do so at the required rate, and had to be superseded by the one (a Native) who had done the corresponding work for the north surf bank. The quarries originally selected also turned out to have only a very small depth of suitable stone, and it had to be obtained elsewhere.

28. These various causes of delay, however, have been to some extent compensated for by two favorable circumstances. The first is that under an order of the Madras Government intended for the protection of the bank from dispersion, stone from other quarters was authorized to be brought. This was used for commencing the work and some progress was made before the South Indian trains were started. The other circumstances that Mr. Thorneycroft has adhered much more closely than was done in 1876 to my instructions to keep the bank as low and narrow as possible, and he thus gets double the length of bank from the same quantity

Fort St. George

of material. But for this I should have had to confess an almost entire failure to shut out the sand of a second monsoon from the harbour.

29. Indeed I am afraid that notwithstanding this there has already been an addition to the sand within harbour limits. The high water mark between the piers has advanced an average of 80 feet since 31st March. This must be due to sand which has passed the end of the south surf bank and will be shut in by the advance of the latter. I hope, however, that the evil will not extend; the bank is now well in advance of the shore line, and better progress may be hoped for in future so as to maintain a sufficient rate of advance till the end of the monsoon.

30. The rubble has not so far suffered from dispersion by the sea, but it is not to be expected that this immunity will continue. A certain amount of spreading out is not only anticipated, but is really an essential part of the work to give foundation for the more stable concrete blocks. An abundant supply of these is now prepared. In this respect the work is in a much more satisfactory state than the north surf bank was last year. A portable crane is on the ground for setting the small 6 ton blocks which will in the first instance be used, and the Titan crane despatched from here in April is being erected, and will be ready for placing the 27 tons blocks as soon as a sufficient depth of water has been reached.

31. I have thought it right to present to you in detail the reasons why a more satisfactory progress has not been made, because I trust the Government will come to the conclusion that they are not of a nature to justify any anticipation of new difficulties for the future, or the idea that there is not the means of meeting with energy and promptitude such as may arise. The entire change of front which was forced upon us by the transfer of our arrangements from the Madras to the South Indian Railway at a very short notice was a severe trial, and I think that I may ask that some allowance be made for it.

32. Some temporary complication was also occasioned by the objections raised by the Master Attendant, Captain Taylor, to the mode of construction decided on, and which led to a correspondence which has passed through the India Office. In the result, however, no departure was made from my original instructions, and the slight addition ordered by the Government fortunately had the effect of facilitating the work as described in paragraph 28. Everything has been done in accordance with my intentions, only at a much slower rate than I had hoped for.

33. With respect to the subsidiary works on shore, the buildings which interfered with the completion of the south block ground have been removed and workshops erected in the immediate neighbourhood. The block ground itself is being completed. The whole of the completed part is covered with blocks, of which 576 of 27 tons each and 92 small ones of 6 tons each were ready to be placed in the work on the 30th June.

34. The beach railway connecting the block ground with the south pier is completed with the exception of a length of 800 feet which is in abeyance in consequence of some question with the proprietors of the Madras Tramway which runs along the same line. This may be completed in a few days at any time when it may be required to send blocks or other materials to the south pier.

35. I would beg to suggest that it would be desirable to forward a copy of this report to the Government of Madras, as it contains certain conclusions based on the private as well as official information I have received which will supplement and confirm those which Mr. Thorowgood has already submitted to that Government.

(Signed) W. PARKES.

No. 292. ORDER THEREON, 27th October 1877, No. 1,321 W.

ORDERED that the following reply be sent and that a copy be forwarded for the information of the Government of India.

(Here enter No. 1,322 W, dated 27th October 1877.)

(True Extract.)

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

To the Superintendent, Harbour Works.  
„ Marine Department.

Exd. E. C. Shunker.  
Spere Copies

*In Person -*  
*The M.S. is ch*  
*being who supplied the*  
*Copy we have printed*  
*from. Please advise when*  
*W.H.*  
*10-11-77*  
*The Secretary of State*  
*supplied the copy.*  
*R.S.*  
*13/11*

for Garrison  
for Union  
for East River

14.11

The word "presented" is perfectly clear in your copy - In mine (which I received a week before the Govt. received theirs) it is "prevented" - The latter is the correct reading -

I am des in what office  
was your document written.

Yours sincerely  
J.P.

Nov 16.77

Fort. St. George.

GOVT.  
OF MADRAS. }

1877 .

{ P.W.  
DEPT.

Fort St. George,

Nov. 10. 1877.

OFFICE NOTE.

To Colonel. W. J. Maclellan.

Dear Colonel,

Herewith I send the printed

copy of Mr. Parker's report

on the Harbour Works up to

June 30th.

Look at the absurd errors

in printing. Can nothing

be done & have them put

right?

Respectfully

Presented for Perusal

"For"

Considered coincident

Circumstances - circumstance

27 tons

27 tons

Yours truly

J. P.

My dear Mr. Maclellan

This is not his fault or his

After 200 years the MS. was

Army - I think it is a good

With your own eyes - I think it is

The Secretary

State Secy

MEMO.

MADRAS HARBOUR WORKS,

SUPERINTENDENT'S OFFICE,

Nov 23. 1877.

5200

My dear Colonel,

I would have returned the

report of Mr. Parker earlier, only I have

lain up again with rheumatism - result

of getting wet through yesterday week.

Yours sincerely

J. H. M. M. M.

46 27: Oct. 7) 1877. 29 1

P.W.  
DPT  
Public Works  
No. 16.

India Office, London  
27<sup>th</sup> September 1877.

My Lord Duke,

Herewith is  
forwarded for Your  
Excellency's information  
copy of a report by  
Mr. Parkes on the  
progress of the Madras  
Harbour Works, during  
the quarter ending  
30<sup>th</sup> June last, and  
I shall be glad to receive  
an expression of the  
opinion of your Government  
on

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

on the subject to which  
it relates.

I have the honor to be,  
My Lord Duke,

Your Graces most obedient

humble servant,

John Lubbock

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Public Works

27<sup>th</sup> Sep. 1877

The  
Letter to Fort St. George  
No. 16.

Lead: 02/Act-1-7

Despatch from the Most Honorable  
the Secretary of State for India No 16 dated  
27<sup>th</sup> September 1877.

OR ORDERS.

And Coll Rs.

Fort St. George }  
Oct 1877 }

Key to Govt. U.S.

[illegible]

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 The following  
 Secretary of the  
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FOR ORDERS.

His  
 Mr. Secretary  
 Mr. Secretary

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 No 1321 W Public Works Department. 13W

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 27<sup>th</sup> Oct/77  
 Read the following:-

Despatch from the  
 Secy of State for India (H.E. No. 16 of 27 Sep/77)

Ordered that the  
 following reply be  
 sent and that a copy  
 be forwarded for the  
 information of the  
 Govt of India.

H.E. No 1322 W of 27 Oct/77

27/10

Capt. Harbour Works 3  
 Marine Dept 7  
 Office 38  
 Govt Secy 25-  
 Despatch 11-77

10607  
Govt. of 1877  
PUBLIC WORKS.

To

Dated

Issued

Recd.

Encl.

G. O., 27 Oct 1877, No. 132/45

Nos. 291-292

Head Mr. Burdett Works.

Ordered that the Home  
Govt be addressed on  
the subject of Mr. Parkes  
report on the progress  
of the

1.11.77