

G.O., No. 677-Mar

DATED 18 July 1899.

[Despatch Abstract.]

Madras Harbour

Despatch from the Right Honble the Secy.
of State for India, forwarding ^{for consideration} ~~for consideration~~
a report by Sir A. Rendel on the various
measures which have been proposed for the
improvement of the ———, Commd to the
Chairman, Harbour Trust Board, for the
Consideration of the Board.

INDEXED

<i>Recd.</i>	} 1899.	<i>Enclosures</i>
<i>Regd.</i>		<i>Spare copies</i>

G.O., No. 677, 18th July 1899.

JULY.

Madras Harbour

Despatch from the Right Honourable the Secretary of State for India forwarding for consideration a report by Sir A. Rendel on the various measures which have been proposed for the improvement of the —, communicated to the Chairman, Harbour Trust Board, for the consideration of the Board.

GOVERNMENT OF MADRAS.

MARINE DEPARTMENT.

Read—the following paper:—

Despatch from the Right Honourable the Secretary of State for India, to His Excellency the Honourable the Governor in Council, Fort St. George, dated India Office, London, 15th June 1899, No. 3, Public Works.

In accordance with the request made in your Excellency's letter of the 3rd January 1899, No. 1 (Marine), a report * has been obtained from Sir A. Rendel on the various measures which have been proposed for the improvement of the Madras Harbour, and is forwarded herewith for the consideration of your Government.

* Dated 12th May 1899.

2. I shall await a further expression of your Excellency's views, after you have considered, on Sir A. Rendel's report, whether it is practicable to come to an understanding with the Harbour Trust Board as to the measures which may appear most suitable, in accordance with the interests of the mercantile and shipping community, for the improvement of the Harbour, and as to the manner in which funds should be provided to meet the expenditure involved.

ENCLOSURE.

From Sir A. RENDEL, K.C.I.E., 8, Great George Street, Westminster, S.W., to the Secretary of the Public Works Department, India Office, dated 12th May 1899.

Madras Harbour.

I have carefully studied the papers relating to this harbour and the schemes for its improvement sent to me on the 10th of February, and should have reported upon them much earlier, but that I learnt that other papers on the subject, including plans and estimates, in which the first papers were deficient, were on their way to England. These only reached me a few days ago.

2. In the first report which I wrote upon Madras Harbour (in 1889) I stated that it seemed to me that the present harbour could only be looked upon as a satisfactory entrance to a harbour yet to be constructed within it, i.e., to an inner harbour. That it is merely an outer harbour, with possibly not a satisfactory entrance, seems now to be the general opinion in Madras also, and the question discussed in the papers sent to me is, the best mode of constructing within it an inner harbour suited to the purposes of trade. As to the position of the entrance, there still seems to be competent opinion in favour of a north-eastern position. I adhere to my preference for the present eastern position; but I also think it just possible that it may yet be necessary, if the harbour is to fully serve its intention, to place its entrance in deeper water, that is to say, to construct a new outer harbour. I shall say something more on this point at the end of my report, but rather as a contribution to the discussion on the vexed question of the entrance, than as a practical part of the subject immediately under discussion.

3. My instructions are to report whether having regard to the state of the harbour it is expedient to expend further large sums upon it.

4. Although the stability of the breakwaters has not yet been tested by a severe cyclone, yet I think enough is now known to justify my opinion that they are of sufficient strength to resist one. I think also that the deposit of sand which has so far taken place in the harbour, has not yet been such as to make it improbable that a depth sufficient for the berthing of large shipping can be maintained in it by dredging at a moderate cost. There seems good ground also for the

opinion that the trade of Madras requires and would use the facilities afforded by a deep water wharf. For these reasons I think that a scheme for the provision of such facilities in a moderate degree is expedient.

5. Various schemes for both boat and ship docks have been prepared by Mr. Wilson, by Mr. Lee Pogson, the Engineer of the harbour, and by others connected with it. Those of Mr. Wilson being specially referred to in the papers sent to me and not varying from others in principle, I shall confine my remarks to them.

6. I should premise by saying that in all schemes yet put forward, a ship dock means a walled dock of such depth that the heaviest class of ships can lie afloat alongside its quays or in any part of it at all times of tide; and that a boat dock means a similar but smaller dock, of such depth that only the large boats or barges employed in Madras for the transfer of goods between ships and the shore can use it.

7. In respect to a boat dock, I do not think it should be accepted, unless it be clear that a ship dock would cost more than the general circumstances of the case warrant. At any rate a boat dock should not, I think, be so placed as to interfere with a ship dock being constructed later on, and this is a fault, to my mind, of the best schemes for a boat dock which have been prepared in India, so far as I know them. If a boat dock only is constructed, I should still prefer the scheme which I shall propose for a ship dock; because, amongst other reasons in its favour, it may be built, in the first instance, as a boat dock, not quayed, it is true, but with the advantage of a depth which will allow ships to lie afloat within it, and to carry on their business with the shore by means of boats in perfect quiet. The development into a ship dock, requiring as it would only the construction of the quay wall on its western side and some further dredging, might follow when money could be found for it without waste of executed, or greater cost of, work to be executed. But the harbour of Madras cannot, in my opinion, be considered as properly equipped for the rapid despatch which trade of all kinds now requires, until a certain number of ships can lie afloat alongside a quay constructed within it, that is to say, until what is understood in Madras as a ship dock, is provided.

8. The basis of Mr. Wilson's scheme for a ship dock is the ultimate enclosure of a quadrangular piece of water, about 23 acres in area, in the south-western or shore angle of the harbour, commencing with the construction of part of a covering pier on its east side running out from the south breakwater, and of a quay wall on its south side. The completion of the east covering pier, and the construction of the north and west sides of the enclosure are to follow as trade requires, with further extension southwards when necessary into the ground which has grown up south of the harbour. The entrance to this enclosure when finished would face north. Mr. Wilson also proposes to build a quay wall 600 feet long in front of and parallel to the shore end of the north breakwater.

9. I think one objection which may be raised to this scheme is that, until the enclosure of the south side of the harbour is completed, the accommodation provided for trade will be very small compared with the expenditure; for the east covering pier, being only 42 feet wide, will be much too narrow for rapid loading and unloading. But the main objection to it, in my mind, is that the covering pier alone, specially when only constructed in part, will add little if anything to the power of the harbour to disperse waves, and may even diminish it, because recoil within an enclosed space merely diverts a wave, it does not destroy it. Ships, therefore, would not be able to lie against, at all events, the 500 feet of this pier to be first constructed, or against the south quay which it covers, in much if any greater quietude than they can lie now in the open harbour, that is to say, vessels would be often unable to lie alongside either pier or quay.

10. The case would no doubt be different when the enclosure was completed by the construction of the north quay; ships might then lie in safety under all circumstances against all the quays which surround it. But it would not even then to my mind be a satisfactory scheme, because by diminishing the area of the harbour, already admittedly too small for the purpose, and surrounded as it would be by nearly vertical walls, it would, like the proposed east pier, and for the same reason, but in larger degree, diminish rather than increase the wave-dispersing power of the harbour. Its entrance also is so placed as to require ships to make a quarter turn to get into it, not perhaps a bad fault, yet one that in such a situation should be avoided if possible.

11. The quay on the north side of the harbour is open to the objection that it simply converts a part of the north breakwater into a deep water quay. If the sides of the harbour be as disturbed by sea as we are told they are, the use of this quay would be subject to great interruption.

12. The scheme in fact overlooks, as it appears to me, what I understand from the papers which have reached me, and should expect from the nature of the case, are the leading characteristics of the wave-action within the harbour, namely—that the main disturbance in it is on its sides, the waves as they enter the harbour running along one or other of both of the inner faces of its two breakwaters to the west shore on which they ultimately disperse, and, that the centre of the harbour is the quietest part of it throughout the year. Assuming this to be correct, the conclusion I come to is, that a thoroughly satisfactory scheme for trading purposes cannot be based on the utilisation of either of the breakwaters, and that we must look for it on the west or shore side of the harbour.

13. I have laid down an inner harbour devised on this view of the case, on the copy of the chart of the harbour and its neighbourhood lately made by the Indian Marine Department, which accompanies this report.

14. The scheme consists of a nearly semi-circular enclosure formed by two protecting arms, each about 1,500 feet long, run out from the west shore of the harbour at a sufficient distance from each other to allow of the construction of a quay wall, 1,750 feet long, being built on the west shore between them, and projecting sufficiently into the harbour (about 1,000 feet in the middle) to enclose an area of 34 acres, the whole dredged to a depth of 30 feet at low water of spring tides.

15. Such a quay wall would be long enough for the berthage alongside it of four or perhaps five of the ships likely within a reasonable time to trade to Madras, and should be sufficient, with the spacious quayage it would have behind it and the provision of sheds, railways and other conveniences, for the conduct of a considerable trade. The entrance to the inner harbour which this enclosure would form, and which I show 160 feet wide, is placed in its centre close to the quietest part of what would then become the outer harbour and facing the entrance to the latter from the sea. With so small an entrance in such a situation the inner harbour should be so quiet that, besides the ships lying alongside its west quay, several others might lie moored in tiers within it, and carry on the operations of loading and unloading by means of boats as at present.

16. I should construct the outer two-thirds of the protecting arms merely for protective purposes, for which a concrete wall averaging 10 feet thick, founded about 10 feet below low water on a deposit of rough stone and carried up to say 6 feet above high water, with a vertical "head" to each formed of concrete blocks founded 30 feet below low water, would be ample. But the inner third of both I should convert into quayage for boats by means of concrete blocks or by re-building behind them the present screw pile pier, half on each side; for this pier would probably interfere too much with shipping to be allowed to remain where it is. The west quay wall might be constructed as proposed by Mr. Wilson of hollow concrete blocks sunk through the sand to the requisite depth or say 10 feet below the bottom of the inner harbour. Of this method there are numerous successful examples both in England and India.

17. This scheme seems to me to meet the question of wave dispersion in a satisfactory manner; for, leaving as it does a minimum space of about 500 feet between it and each of the breakwaters, it does not materially interfere with the travel of waves along them. They will reach and break upon the west shore much as they do now; and even if these portions of the outer harbour should be, as is probable, more disturbed than they are at present, the evil will be small, because they will not be needed for the purposes of trade or anchorage.

18. I may remark that I should have shown the inner harbour larger in area if I were not afraid that the nautical authorities might object to its being pushed further eastwards—the only direction in which it could be enlarged on the principles on which it is designed—on account of its interference with the anchorage ground of the harbour outside it.

19. In respect to cost, I note that Mr. Wilson seems to estimate a quay wall with 28' 6" of water at low water of spring tides beside it at Rs. 381 per foot run including supervision and contingencies. For the same depth, therefore, the west wall I propose, 1,750 feet long with a return wall 100 feet long at each end of it, would cost 8½ lakhs: whilst at the rates he takes for concrete blocks and stone deposit, the two protecting arms of my plan with their heads would cost 5½ lakhs. The dredging of the enclosure at his price, Rs. 10/4 per 1,000 cubic feet, would cost 3½ lakhs. Allowing, therefore, 3 lakhs for sheds and railways, the total cost of the works I propose would be, at what I gather are Mr. Wilson's rates, 20 lakhs of rupees. But it is probable that Mr. Wilson takes English cement at old prices, which are much below those now current, and I should put the sinking of the hollow blocks at a higher rate than he does.

20. My estimate for my west quay wall with 30 feet of water in front of it (I think 28' 6" scant for ships of the near future) at 11½ lakhs and the protecting arms is 6½ lakhs; so that allowing 3½ lakhs for dredging and 3 lakhs for sheds, railways, &c., my estimate for the whole of my scheme would be 24 lakhs, a small sum, I think, for so considerable a result and not more than the circumstances warrant. But a very valuable part of the scheme might be secured for less than half this sum. If funds for the west quay could not be found, the protecting arms boats to lie within them and carry on their traffic with the shore in the present manner in perfect quiet at an expenditure not exceeding 10 lakhs. The construction of the west quay might follow afterwards as funds for it could be found. Further development would take the form proposed in Madras, namely, extension into the reclaimed land south of the harbour. A narrow dock here would, I think, be more economical of space and money than the wide dock proposed, and is feasible, because ships could be turned in the inner harbour outside it.

21. I said in the early part of this note that I should make a few observations at the end of it on the subject of a new outer harbour. Whether such work is necessary or not depends, in my opinion, on the amount of sand deposit which takes place in the present harbour. If dredging fails to maintain its depth at a reasonable cost, which I do not think it will do, then, if the harbour is to fully serve the purposes for which it was intended, the difficulty can in my

judgment be only met by making a new entrance in deeper water. This can only, in my opinion, be effected by the construction of a new outer harbour. The mere shifting of the present entrance to another point in the present breakwaters will, in my judgment, have no effect. Although I believe I was the first to suggest the construction of an entrance with a north-eastern aspect, having done so before the harbour was commenced, since I came to know it I have seen no reason to think its present eastern aspect wrong; but there is so much opinion in favour of a north-eastern aspect, that I have laid down on the chart which accompanies this note two plans for a new outer harbour, one with an eastern entrance, consisting of two partially detached breakwaters converging to each other from near the angles of the present breakwaters, the other with a north-east entrance, also consisting of two breakwaters, the southern attached to the present southern breakwater, the other partially detached. My own preference is for the former. But the latter is better, I think, though much more costly, than the one I suggested in my report of September 1896, in which, thinking mainly of cost, I showed the present entrance closed and a new one made in the eastern arm of the north breakwater by taking up a portion of it, a scheme which is not, I think, as good as the more costly scheme I now suggest. I propose partially detached breakwaters, where possible, in order that some part of the seas which enter the passage between them may be able to get out again, and may therefore disturb the entrance to what would then be the inner harbour less than they would if confined within the two entrances, and also to maintain as much current past the inner entrance as possible for the prevention of deposit; and I propose that the detachment shall be partial only, because I think it will be necessary to fill the gaps between the new and present breakwaters with stone deposit up to the level of say 20 feet below low water in order to check the travel of sand along the bottom. But both schemes, as I have before said, are to my mind for the future if ever, and it is fortunate that they are so, for their cost would be very large.

22. I return the papers sent to me with my instructions, and the portfolio of plans and other papers subsequently received from India.

ORDER—No. 677, Marine, dated 18th July 1899.

Communicated, with reference to G.O., No. 10, Marine, dated 3rd January 1899, to the Chairman, Harbour Trust Board, for the consideration of the Board.

(True Extract.)

(Signed)

W. B. DEWINTON,
Secretary to Government.

To the Chairman, Harbour Trust Board.
" Presidency Port Officer.

Marine
Local & Munt. (1899) Department.

CURRENT No. 962

Print urgent. 78

A
Honors
Order

677 Mar 2 18 July 99

From The Right Honourable
the Secretary of State
for India

Communicated, with reference
to G.O. No. 10 Marine, dated 3rd January
1899, to the Chairman, Harbour Trust
Board, for the consideration of the
Board.

R.S.
To

The Chairman, H.T.B.
" P.O.

H. T. B.
M

No. 3.

Dated 15-6-99.

Received } 13-7-99.
Registered }

Enclosures Plans. nil } Total nil
others nil }

Spare copies -

SUBJECT.

Forwarding for Consideration
a report by Sir A. Rendel
on the various measures
which have been proposed
for the improvement of the
Marina Harbour.

Note
Plans will be forwarded to the
Chairman, H.T.B. on receipt.

Note for the

We have no spare copy
of the papers. It is therefore
proposed to print them for issue.
The delay will not be of consequence,
as the plans have not yet arrived
from England.

R.S.
18 July 99

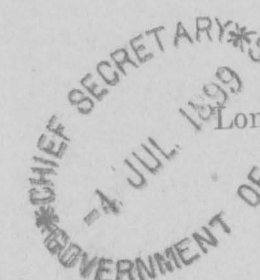
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G.O.	No.	Department.	Date.

Public Works,
No 3.



India Office,
London, 15th June 1899.

To His Excellency the Honourable the Governor
in Council, Fort St. George.

SIR,

In accordance with the request made in your Excellency's letter of the 3rd January 1899, No. 1 of the Madras Harbour. Report by Sir A. Rendel on proposed improvements. (Marine), a report* has been obtained from Sir A. Rendel on the various measures which have been proposed for the improvement of the Madras Harbour, and is forwarded herewith for the consideration of your Government.

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I have the honour to be,

Sir,

Your most obedient humble Servant,

George Hamilton

No. 1.

ENCLOSURE.

8, Great George Street, Westminster, S.W.,
12th May 1899.

Sir,

Madras Harbour.

I have carefully studied the papers relating to this harbour and the schemes for its improvement sent to me on the 10th of February, and should have reported upon them much earlier, but that I learnt that other papers on the subject, including plans and estimates, in which the first papers were deficient, were on their way to England. These only reached me a few days ago.

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19. In respect to cost, I note that Mr. Wilson seems to estimate a quay wall with 28 ft. 6 ins. of water at low water of spring tides beside it at Rs. 381 per foot run including supervision and contingencies. For the same depth, therefore, the west wall I propose, 1,750 feet long with a return wall 100 feet long at each end of it, would cost 8½ lakhs: whilst at the rates he takes for concrete blocks and stone deposit, the two protecting arms of my plan with their heads would cost 5½ lakhs. The dredging of the enclosure at his price, Rs. 10/4 per 1,000 cubic feet, would cost 3¼ lakhs. Allowing, therefore, 3 lakhs for sheds and railways, the total cost of the works I propose would be, at what I gather are Mr. Wilson's rates, 20 lakhs of rupees. But it is probable that Mr. Wilson takes English cement at old prices, which are much below those now current, and I should put the sinking of the hollow blocks at a higher rate than he does.

20. My estimate for my west quay wall with 30 feet of water in front of it (I think 28 ft. 6 ins. scant for ships of the near future) at 11½ lakhs and the protecting arms is 6½ lakhs; so that allowing 3¼ lakhs for dredging and 3 lakhs for sheds, railways, &c., my estimate for the whole of my scheme would be 24 lakhs, a small sum, I think, for so considerable a result and not more than the circumstances warrant. But a very valuable part of the scheme might be secured for less than half this sum. If funds for the west quay could not be found, the protecting arms with say two-thirds of the dredging required for the whole scheme would permit both ships and boats to lie within them and carry on their traffic with the shore in the present manner in perfect quiet at an expenditure not exceeding 10 lakhs. The construction of the west quay might follow afterwards as funds for it could be found. Further development would take the form proposed in Madras, namely, extension into the reclaimed land south of the harbour. A narrow dock here would, I think, be more economical of space and money than the wide dock proposed, and is feasible, because ships could be turned in the inner harbour outside it.

21. I said in the early part of this note that I should make a few observations at the end of it on the subject of a new outer harbour. Whether such work is necessary or not depends, in my opinion, on the amount of sand deposit which takes place in the present harbour. If dredging fails to maintain its depth at a reasonable cost, which I do not think it will do, then, if the harbour is to fully serve the purposes for which it was intended, the difficulty can in my judgment be only met by making a new entrance in deeper water. This can only, in my opinion, be effected by the construction of a new outer harbour. The mere shifting of the present entrance to another point in the present breakwaters will, in my judgment, have no effect. Although I believe I was the first to suggest the construction of an entrance with a north-eastern aspect, having done so before the harbour was commenced, since I came to know it I have seen no reason to think its present eastern aspect wrong; but there is so much opinion in favour of a north-eastern aspect, that I have laid down on the chart which accompanies this note two plans for a new outer harbour, one with an eastern entrance, consisting of two partially detached breakwaters converging to each other from near the angles of the present breakwaters, the other with a north-east entrance, also consisting of two breakwaters, the southern attached to the present southern breakwater, the other partially detached. My own preference is for the former. But the latter is better, I think, though much more costly, than the one I suggested in my report of September 1896, in which, thinking mainly of cost, I showed the present entrance closed and a new one made in the eastern arm of the north breakwater by taking up a portion of it, a scheme which is not, I think,

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as good as the more costly scheme I now suggest. I propose partially detached breakwaters, where possible, in order that some part of the seas which enter the passage between them may be able to get out again, and may therefore disturb the entrance to what would then be the inner harbour less than they would if confined within the two entrances, and also to maintain as much current past the inner entrance as possible for the prevention of deposit; and I propose that the detachment shall be partial only, because I think it will be necessary to fill the gaps between the new and present breakwaters with stone deposit up to the level of say 20 feet below low water in order to check the travel of sand along the bottom. But both schemes, as I have before said, are to my mind for the future if ever, and it is fortunate that they are so, for their cost would be very large.

22. I return the papers sent to me with my instructions, and the portfolio of plans and other papers subsequently received from India.

The Secretary of the
Public Works Department,
India Office.

I am, &c.,
A. M. RENDEL.

y walls will
have

(13)

Read the following:—

Despatch from the Right Honourable the Secretary of State for India, No. 3, Public Works, dated 15th June 1899.

Improvements to the Madras Harbour

Circulated to

~~The Hon. the Governor.~~
~~The Hon. the Member C.S.~~
~~The Hon. the Member W. L. B. L.~~

FOR ORDERS

46P

MA
14.7.99.

Maybe communicated to
the Chairman H.T.B. at
once I think for
consideration
14-7-99.

Note for the
The plans, to
me with the arrival
15 July 99

With the Despatch read above, the Secretary of State forwards Sir Alexander Rendel's report on the proposed improvements to the Madras Harbour. Sir A. Rendel puts forward an alternative scheme for a harbour with quay walls within the area of the present enclosure. The scheme is estimated to cost 24 lakhs of rupees; or, if the proposed western quay wall be omitted, rupees 10 lakhs.

2. He also discusses the question of a harbour outside the present enclosure; but this, he states, will be very costly and may be left for future consideration.

3. The proposal for the inner harbour with quay walls will have

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have to be referred to the Harbour
Trust Board for consideration.

Rf. I fear it will not advance
matters much

H. B. A. J.

22 13.7.11

Send to the Harbour
if approved, in the Char-
man interest - the
H. B. A. J.

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