

Govt. of 1891 Madras.

MARINE.

Issued

Recd.

Encl.

G.O., 4th August 1891, No. 347.

AUGUST.

Docks South of the Madras Harbour.

Stating, with remarks, that a detailed consideration of a scheme for the construction of — would be premature; but, that the subject may be fully discussed, communicating the papers to the Press, and requesting opinion, especially with regard to the construction of a graving, in addition to an ordinary dock, from the Presidency Port Officer, Chamber of Commerce and certain firms.

No 3005 W. of 1 November 1891

Comd to the
Chief Engineer Pub. Works
Department with reference
to paragraph 3 & to the
Cong. architect with
reference to para. 4 of
the Proceedings in the
Marine Department.

(SD/ E. T. W.)
W.

To the C. E. P. W. Secy }
in original }
C. A. to Govt.

MARINE DEPARTMENT.

From W. AUSTIN, Esq., C.S., Chairman, Harbour Trust Board, Madras, to the
Chief Secretary to Government, dated Madras, 2nd June 1891, No. 343.

I have the honour to submit, for the information of Government, a letter from the Board's Secretary, Mr. Pinsent, No. 2184, dated 17th March, suggesting the construction of a deep-water tidal dock, with also a graving dock attached, in the area of sand accreted to the south of the harbour.

2. The matter has been considered by the Trustees at their last three meetings, and although some of their number are of opinion that the question of building dock is somewhat premature, I have nevertheless been invited to lay the matter before Government without further delay, as a reference has been lately made to the Board, asking permission to sink trial pits in the sand to the south of the harbour, with a view to the erection thereon of Commissariat godowns; and the Board strongly deprecate the idea of allowing any building to be raised on this land, which might in the future interfere with a scheme the importance of which cannot, in the Board's opinion, be too highly estimated in the interests of the trade of the port.

3. I referred Mr. Pinsent's proposals to the Board's Engineer, for his opinion as to whether the scheme was practicable from an engineering point of view, and whether he considered it probable that the financial resources of the port would be sufficient to meet the heavy outlay. His reply, No. 22, dated 6th April, is enclosed. It is to the effect that there can be no difficulty whatever in constructing the proposed dock, which could be completed by the close of 1895, within the figures named as the probable financial resources of the port.

4. On referring to the Deputy Port Conservator, as to whether a dock would give the facilities of entrance and security in cyclones anticipated by the Secretary, Captain Simpson expresses his opinion that vessels would be perfectly safe during a cyclone in such a dock, and he further states that the opportunity of constructing a graving dock would be worth the whole expenditure. His letter is enclosed.

5. The Board's Engineer has explained to the Trustees the means he would suggest for carrying the scheme into effect, as sketched out in his letter, dated 6th April; and before his departure from Madras, Captain Street, H.M.'s I.M., Presidency Port Officer, recorded a minute, which I submit herewith, for the information of Government.

6. With reference to the Secretary's calculations as to tonnage, the cost of landing and shipping by boats, and the additional revenue which could be secured to the Trust by imposing an additional dock-due in lieu of the saving which docks would effect in boat-hire, I would remark as follows:—

(a) The tonnage handled here for the past four years is—

									TONS.
1887-88	..	..	..	..	..	..	..	..	3,16,988
1888-89	..	..	..	..	..	..	..	..	2,90,600
1889-90	..	..	..	..	..	..	..	..	3,59,184
1890-91	..	..	..	..	..	..	..	..	3,91,972
								Total ..	13,58,744

The average annual tonnage during the past four years is therefore 3,39,685 tons, and three lakhs of tons may be considered a very cautious estimate for the future.

(b) The Trustees consider that the cost of landing and shipping cargo is correctly stated as being about a rupee per ton all round.

(c) The trade of the port would in no way have any additional burden placed upon it by substituting a dock-due for the present boat-hire; and both steamers and merchants would benefit largely by the increased facilities afforded by a dock.

7. Should Government approve of the principle of Mr. Pinsent's proposals and agree that the engineering difficulties can be overcome without much difficulty, the Trustees will direct their Secretary and Engineer to lay more detailed information before them for submission to Government.

ENCLOSURES.

From C. PINSENT, Esq., Secretary, Harbour Trust Board, to the Chairman, Harbour Trust Board, dated Madras, 17th March 1891, No. 2184.

With reference to the letter from the Executive Engineer, Madras Division, No. 1347, dated 11th instant, asking permission to sink trial pits in the sand accreted to the south of the harbour, to ascertain whether a godown can be built there in lieu of the present Commissariat granary—in view of that site being made over to the Bank of Madras—I have the honour to invite your attention to the following remarks and suggestions having reference to the future welfare of this port, which, if sound and practicable, must preclude all idea of building upon the area in question, unless the future interests of the port are sacrificed.

2. The harbour in its present form can never be entirely satisfactory.

3. Landing and shipping operations, while the harbour affords no further facilities than at present, must always be delayed, if not altogether stopped, in bad weather as heretofore; and in cyclones vessels put to sea.

4. With an eastern entrance, it has never been claimed that the harbour would be a harbour of refuge in a cyclone; and no other possible entrance could ever render the present enclosed area such.

5. The method of loading into boats or lighters, and again unloading, is costly—about one rupee per ton—causes delay, and leads to frequent damage to cargo.

6. The depth of water alongside the north and south arms is not sufficient to allow large vessels to lie alongside.

7. Subsidiary jetties, to enable vessels to come alongside the arms, would still be very inconvenient for landing or shipping cargo; the distances are great; the arms are too narrow to allow more than a double line of rails; they could not be used for cargo purposes during the prevalence of a heavy swell; connections from the through lines of rail to jetties standing out into the harbour would be awkward to make; and to maintain rails on the arms would be expensive, as they rust so quickly.

8. A wall enclosing a part of the western portion of the present water area—including the iron screw-pile pier—would be of little service, except as a boat-harbour, and hardly worth the estimated cost.

9. To the south of the harbour is a large area formed by the accretion of sand from permanent natural causes, which area must go on increasing until the sand reaches the end of the south arm, when it will be carried past and to the northward; but there should be no difficulty in keeping the entrance clear with proper dredging plant.

10. It was part of Mr. Parkes' original design to make a boat-harbour within this area.

11. I would submit that, instead of a boat-harbour, a dock sufficiently large and deep to accommodate along its side, or sides, the whole trade of the port, ought to be constructed.

12. The advantages, should this be practicable, would be as follows:—

(a) The present harbour would become merely an outer entrance basin; which, being clear of shipping, would enable vessels to enter from sea at greater speed, and therefore with greater safety, than at present, when a strong current may be running across the mouth; thus rendering the narrow entrance both safer and easier of access.

(b) In a land-locked dock, any vessel would be as safe in Madras as in any other port in India during a cyclone, if not safer.

From the form the accretion has assumed, and must continue to take, the proposed dock must of necessity be in length from N.E. to S.W.

A vessel heading N.E. would be practically end on to a cyclone when blowing from the E.N.E. to N.N.E. and again when the wind had veered to W.S.W. and S.S.W.

While the wind direction is anywhere between S.S.W. and E.N.E. or again between N.N.E. and W.S.W.—in other words more or less a-beam—the hull of a vessel would be, to a great extent, under the lee of the dock walls and sheds alongside of her, or upon the opposite side. The means to be taken for the security of vessels so situated is for nautical men to consider. Steamers have rarely come to grief in this position in the Hugli from the wind alone; at any rate, Madras would have the advantage over Calcutta, inasmuch as a racing current and tidal bore would always be absent from the attendant dangers of a cyclone here.

13. The advantages of having a steamer alongside a jetty with railways and sheds thereon, instead of in the open only to be approached by water, is too obvious to need any comment.

14. Assuming that finance would be the chief difficulty, I would remark as follows:—

15. The total tonnage of imports and exports at and from Madras exceeds 3,00,000 of tons per annum. This quantity may be taken as a safe estimate.

16. Boat-hire and attendant charges are now all round about one rupee per ton, which would be entirely saved; and on three lakhs of tons would give Rs. 3,00,000.

17. If an additional harbour-due of Rupee 1 per ton be then substituted for the present expenses on account of boat-hire, the trade of the port would have no extra burden imposed upon it, but an additional revenue would be secured to the Trust of at least Rs. 3,00,000 per annum.

18. Three lakhs of rupees are, at $4\frac{1}{2}$ per cent., equal to the interest upon Rs. 66,66,666-6.

19. Should this be found insufficient to provide capital and sinking fund, then by imposing an additional dock-charge of eight annas a ton—for additional and improved facilities given—the total available additional income over and above present revenue would be Rs. 4,50,000; equal to $4\frac{1}{2}$ per cent. upon one crore of rupees.

20. Granted a smooth and deep-water dock, it would probably be possible to construct a graving dock—the one at Suez is in sand—or to provide a lift similar to the one in Bombay.

21. In 1886 I suggested to the then Chairman (Sir Richard Barlow) that when the harbour was completed, a canal should be constructed from the N.W. corner to a point adjacent to Cochrane's basin on the East Coast Canal; the object being to maintain the water in the canal between the Ennore and Adyar locks at a higher level, and thus to enable produce, including salt, brought by canal, to be taken direct alongside steamers without transshipment. Similar advantages could be obtained by making this junction canal a continuation of the deep-water dock, and connecting with the East Coast Canal through the Cooum to the south of Fort Saint George, or elsewhere, as Engineers may deem best.

22. With docks that would enable the Madras, the South Indian and the East Coast Railway Companies to run alongside steamers lying in security, with also water connection with the canal, enabling salt and other produce to be taken alongside without transshipment, Madras should become the terminal port of the East Coast; for the trade of the port—especially in salt—would appear capable of very considerable development.

23. In conclusion, I would point out that the harbour now gives sufficiently smooth water for ships' boats to land on the beach within the arms; and the protection afforded by our surf-bound coast has become a thing of the past.

From W. AUSTIN, Esq., C.S., Chairman, Harbour Trust Board, Madras, to the Engineer, Harbour Trust Board, Madras, dated 24th March 1891, No. 775 E.

I have the honour to forward herewith, for your information and for favour of remarks, a letter from the Board's Secretary, No. 2184, dated 17th instant, suggesting the construction of deep-water docks in the sand to the south of the harbour.

2. I shall be glad to know whether you consider the scheme practicable from an engineering point of view, and whether you consider it probable that the financial resources of the port, as shown by the Secretary, would be sufficient to meet the heavy outlay which would be entailed.

From A. LEE POGSON, Esq., Engineer, Harbour Trust Board, Madras, to the Chairman, Harbour Trust Board, Madras, dated Madras, 6th April 1891, No. 22.

I have the honour to acknowledge the receipt of your letter, No. 775 E., dated 24th ultimo, forwarding letter, No. 2184, dated 17th idem, from the Secretary, setting forth certain suggestions for the future of the Madras Harbour.

2. From time to time suggestions have been made regarding docks, quay-walls, canal and railway connections with East Coast Canal and Railways, but the time has not yet come when any final plans can be determined on as to docks, as the whole future of the Madras Harbour is dependent upon the completion of the harbour piers with an eastern entrance, and the state of the sea therein during the monsoons, which can only be known after the entrance is completed.

3. There is no doubt that in the event of docks being required at Madras, the only site for them will be upon the sand accreted to the south of the harbour, and as to the feasibility of their construction, there can be no difficulty whatever; all that is required is time and funds.
4. In my opinion, the present harbour should first be completed with an eastern entrance, and the Trustees have supported these views; it would therefore be premature to attempt to design docks until the entrance is completed and the state of the sea inside the harbour during a cyclone carefully watched, with a view to further improvements hereafter.
5. The western boundary of the harbour can never be left a sea beach, as it is now, and before any dredging can be commenced, a quay-wall must be built, no matter what improvements are to come in the future.
6. A quay-wall is therefore absolutely necessary to secure the beach and a uniform bottom level to the harbour. At present the sand, from high-water mark down to the three fathom contour line, shifts from north to south of the harbour each monsoon, and as long as this action of the sand is allowed to continue, no dredging or docks can be commenced.
7. The south pier must stand intact until the pier head and capping is completed, in about February 1893, therefore a dock cannot be commenced before that date; but meanwhile the necessary quay-wall and a temporary protecting arm, to give shelter to the dredger during cyclones, might be commenced; the former would enable the cargo boats, lighters, &c., to come alongside and discharge upon a low level wharf, thereby saving the unnecessary high lift up to the iron pier, and also enable the Traffic Department to deal with more lighters with cargo than is possible at present; also to load the same direct into railway wagons in all weather except during a cyclone.
8. A temporary arm inside the harbour will be necessary to afford shelter to the lighters and dredger during cyclones (in the event of the eastern entrance not affording the shelter anticipated) until the south pier can be cut through and docks commenced.
9. This arm may be constructed of superstructure blocks, which can, when no longer necessary, be taken up and utilized in completing the overlapping arm necessary at the entrance to any docks.
10. The depth of water alongside the proposed quay-wall would be 13½ feet at low-water, ordinary spring tides as far as the iron pier; and from this point to the south pier the wall would gradually deepen until 32 feet at low-water, ordinary spring tides is reached, from whence it would run level, which will provide a still-water wharf of 600 to 800 feet in length, with 32 feet at low water alongside in any weather; being under the shelter of the temporary protecting arm.
11. This temporary arm or spur would be built at about 700 feet up the south pier and extend 600 feet into the harbour at right angles to the south pier, which will give protection to the deep-water wharf and shelter to the dredger and lighters behind it until the docks, if decided upon, are commenced, and the permanent overlapping arm to the dock completed.
12. So far my proposal can be commenced and carried out before the south pier is completed, as a quay-wall will in any case be necessary whether docks are ultimately decided upon or not.
13. Heavy machinery can meanwhile be landed direct from a ship's side, from the two deep-water pier heads now under construction, and hoisted by the new All Round Titan Crane.
14. If the Trustees are prepared to meet the expenditure, and docks are decided upon, after the eastern entrance and the proposed quay-wall has been completed, they can be constructed with far less difficulty and uncertainty than the present piers; but the cost cannot be even approximately arrived at until the form of dock and requirements have been determined upon.
15. It is certain the cost of docks, quay-wall, warehouse accommodation and necessary machinery would not exceed the cost of the present harbour, as there will be no rough sea or swell to contend with, or stoppages during construction for the monsoons.
16. In 1893 if the eastern entrance is finally decided upon and a quay-wall built, 800 feet of the shore end of the south pier can be removed and the deep-water portion of the quay-wall already constructed extended in a south-westerly direction, which will form the north-west wharf or wall of a future deep-water dock.
17. The width of the dock can be 800 feet and any length necessary with graving docks at the southern extremity.
18. The south-east wharf or wall forming the dock should be extended into the harbour, to form a groyne or overlapping arm necessary to prevent any possibility of wave motion entering the dock; which, when projected and completed, the temporary arm would be removed, the entrance made, and the dock dredged to the required depth, which would give Madras a wet dock with an area of about 37 acres. Therefore, in my opinion, there is nothing to prevent Madras being provided with a first-class tidal, deep-water dock, with graving docks, &c., capable of berthing twelve vessels; constructed upon the above lines.

19. If the quay-wall was commenced at once, or as soon as the dredging plant could be got out from home, suitable docks could be built and completed by the close of 1895, and within the figures named as the probable financial resources of the port.

From W. AUSTIN, Esq., C.S., Chairman, Harbour Trust Board, Madras, to the Deputy Port Conservator, dated Madras, 11th April 1891, No. 19 C.

I have the honour to forward, for your information and favour of remarks, copy of a letter from the Board's Secretary, No. 2184, dated 17th March, suggesting the construction of deep-water docks at Madras to the south of the harbour, together with copy of a letter remarking thereon from the Board's Engineer, No. 22, dated 6th instant.

From Captain H. B. SIMPSON, H.M.'s I. M., Deputy Conservator of the Port of Madras, to the Chairman, Harbour Trust Board, dated Madras, 15th April 1891, No. 697.

I have the honour to acknowledge receipt of No. 19 C., of 11th April, and enclosures, proposing a scheme of dock accommodation for Madras, and would make the following remarks with reference to the same.

2. I entirely agree with the Secretary that the present form of the harbour cannot be considered entirely satisfactory. This was also the opinion of Sir A. Rendall, as expressed in paragraphs 12, 13 and 14 of his report accompanying G.O., No. 1737 W., Public Works, 1st July 1889, and the internal works he alluded to, I fancy, were docks such as now proposed. I do not agree with him as to the little value of a harbour at Madras unless it provides a quay wall alongside which ships may lie as in a dock, though, no doubt, such an arrangement would be convenient and would give the Harbour Trust much more control over cargo than it has at present; but greater facilities for loading and discharging lighters are certainly required, and if the low wall proposed by the Engineer on the west side is constructed, this requirement would be met to a great extent, but I do not think it should be built along the whole length of the western side, as it would be advantageous to leave a portion of it for hauling up boats and lighters for repairs, &c., and a beach should be left for the masulah boats to haul up on at night within the harbour, at least until the dock accommodation is ready for use. Of course, it may be said they can go outside as they did before the harbour was built, but to make them do so would to a great extent deprive that class of craft of the advantages of the harbour at present afforded them, and inconvenience the traffic.

3. The probable revenue from the dock I think the Secretary places too high at the present date, as I do not think coasting steamers would as a rule enter it.

4. In paragraph 5 the Secretary describes the present method as costly and causing delay and damage, but in paragraphs 17 and 19 he proposes a charge 50 per cent. higher than what he gives as the present cost, but does not state if the charge is to be borne by the cargo entirely or partly by the ship; this, I think, would be a great drawback to the dock.

5. The delay is not quite apparent, as I think the quantity of cargo discharged in a day compares favourably with other ports, and if a sufficient supply of boats is maintained, a vessel with efficient cargo appliances is able to get rid of her cargo more quickly, moored as at present, than at a wharf working one side only. Boats, no doubt, can be brought alongside the other side while at the wharf; the delay caused at present is by the want of means of landing and removing the cargo from the pier and not from the fact of discharging into boats. Despatch is a great matter when we consider the way in which goods from Europe are transported to Madras and *vice versa*, almost all vessels in the trade being bound for other ports and wishing to spend as little time as possible in Madras, and such vessels would prefer to remain in the harbour in ordinary weather if it was found to be the most expeditious method of discharging. Vessels with full cargoes of coal and iron would, I believe, prefer the dock.

6. In loading, I think the dock would offer advantages over the present method, but few vessels take full cargoes at present from Madras.

7. Much damage to cargo, I think, is done in the masulah boats, and a large amount of cargo is lost overboard from vessels in the harbour which could, I believe, be avoided in a dock.

8. Vessels, I believe, would be perfectly safe in a dock such as proposed under all circumstances of weather and entirely independent of tides.

9. The possibility of constructing graving docks I would consider one of the most important parts of the scheme, and a dock is worth constructing on that account alone almost.

10. If a dock is constructed on the south side of the harbour, it must be remembered that there is a possibility of the land gained there being again scoured away by an obstruction to the current created to the south, either naturally or artificially, and the east side of the dock should be constructed so as to withstand such a scour; another site, I think, could be found for a dock to the north of Messrs. Dymes and Co.'s office free of all danger from this source.

11. The normal condition of the water inside the harbour would, I think, permit the works being carried out at all seasons, and the only doubtful point is the amount of protection the present walls will afford, when completed, during a cyclone, which, if insufficient, would require to be supplemented by an inner wall or some sort of structure to ensure the entrance to the dock being perfectly protected.

Minute by Captain H. A. Street, H.M.'s I.M.

I think it is generally acknowledged that, even when the harbour is completed, sufficient protection from the sea will not be afforded during heavy weather to boats and lighters, and that until such protection is obtained, it would be inadvisable to procure lighters of a larger description. The difficulties attending the landing of cargo at the pier and of clearing it from the pier when one or more "foreign vessels" are discharging, have been much in evidence of late, and point to the necessity of effecting further improvements to the harbour. The question is—What form shall these improvements take? Will a boat harbour in accordance with Mr. Parkes' original scheme suffice, or shall we commit ourselves to the elaborate scheme of the Secretary as set forth in his letter under reference? There is no doubt that a boat harbour is an actual necessity, now that there is no chance of the north-east entrance scheme being carried out, but a boat harbour would not afford the same advantages to the shipping and to the trade of the port generally as a wet dock, with jetties alongside of which vessels could be taken to discharge and load. The saving on account of boat-hire alone would be considerable, and the facility with which a vessel can load and discharge in a wet dock is not the least of the many advantages such a dock offers. The scheme proposed by the Secretary includes a graving dock, and as there is no such dock at any port on the Indian coast between Calcutta and Bombay, a dock of this description would no doubt make Madras a favourite port of call; owing to the slight rise and fall of the tide, there would be less difficulty and delay in docking or undocking than at Calcutta or Bombay, and this is a great advantage to vessels tied to time.

During war or when sending troops away by sea, the facilities offered by a wet dock to the embarkation of troops cannot be too greatly estimated, and I think that this fact should be brought forcibly to the notice of Government. The situation proposed for the docks seems as good a one as could be selected.

On the whole, I am of opinion that, if we can find the means for paying the interest on the money which would have to be borrowed to meet the cost of carrying out the Secretary's scheme, on the lines proposed by the Engineer, the Government should be addressed on the matter.

23rd April 1891.

(Initialed) H. A. S.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras, at a meeting held at the Offices of the Sea Customs on Friday, the 10th day of April 1891.

3. Read letter from the Executive Engineer, Madras Division, No. 1347, dated 11th March 1891, requesting permission to sink trial pits in the sand accreted to the south of the harbour with a view of building Commissariat godowns.

Read letter from the Board's Secretary, No. 2184, dated 17th March 1891, addressed to the Chairman, in reference thereto, suggesting that deep-water docks sufficiently large to accommodate the trade of the port should be constructed to the south of the harbour.

Read letter, No. 22, dated 6th April 1891, from the Board's Engineer replying to a reference from the Chairman, thereon.

Mr. Pogson was in attendance and explained to the Trustees the means he would suggest for carrying out the Secretary's proposal, which he considered offered no engineering difficulty.

Resolution.—Resolved, that the matter lie over for further consideration.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras, at a meeting held at the Offices of the Sea Customs on Friday, the 24th day of April 1891.

10. Read again letter from the Executive Engineer, Madras Division, requesting permission to sink trial pits in the sand accreted to the south of the harbour with a view of building Commissariat godowns.

Read letter from the Deputy Conservator, No. 607, reporting upon the Secretary's proposal to construct deep-water and graving docks to the south of the harbour basin.

Read Minute by Captain H. A. Street, Her Majesty's Indian Marine.

Examined statement of tonnage imported and exported for the past four years, 1887—1891.

Resolution.—Resolved, that the Chairman be invited to address Government.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras, at a meeting held at the Offices of the Board on Friday, the 5th day of June 1891.

4. Read letter to the Chief Secretary to Government regarding the construction of docks, amended in accordance with the suggestion of the Honorable Mr. Boyson.
Resolution.—Approved.

ORDER—dated 4th August 1891, No. 347, Marine.

The Harbour Trust Board has no right to, or control over, the accretion on the south side of the southern arm of the harbour, and therefore the application to permit the sinking on it of trial pits for the erection of Commissariat godowns should not have been made to, or entertained by, the Board.

2. The Government has no doubt that the construction of some kind of inner harbour on the site in question is practicable at no great cost, but the estimate of receipts, which is based apparently upon the assumption that the dock would be used by the whole of the tonnage entering the port, appears too sanguine. Neither the coasting steamers—which constitute, it is believed, nearly one-half of the tonnage visiting Madras—nor other steamers calling at the port with small quantities of cargo to discharge, would be likely to enter or make use of the docks.

3. The Government is of opinion that, pending the completion of the harbour, the detailed consideration of a scheme for the construction of docks would be premature, but in order that the subject may be fully ventilated and discussed by those interested, His Excellency the Governor in Council resolves to communicate the papers read above to the press, and to request an expression of opinion, especially with regard to the construction of a graving, in addition to an ordinary, dock, from the following:—

The Presidency Port Officer.	Messrs. Parry and Co.
Chamber of Commerce.	" Wilson and Co.
Messrs. Arbuthnot and Co.	" Gordon, Woodroffe and Co.
Binny and Co.	

The Chief Engineer, Public Works Department, will, in consultation with Mr. Pogson, furnish a rough estimate of the cost of the works indicated in the correspondence.

4. Meanwhile, the Government directs that no buildings, excepting sheds of the most temporary character which can easily be removed, shall be constructed on any portion of the land referred to in paragraph 1 of this order.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Chairman, Harbour Trust Board.
" the Presidency Port Officer.
" the Chairman, Chamber of Commerce.
" Messrs. Arbuthnot and Co.
" Binny and Co.
" Parry and Co.
" Wilson and Co.
" Gordon, Woodroffe and Co.
" the Revenue Department.
" the Public Works Department.
" the Military Department.
" the Financial Department.
Editors' Table,

Exd. A. Raitt.

Gobt. of {1891} Madras.
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N^o. 3005 W. of 1 November 1891
Commd to the
chief engineer Pub. Works
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to paragraph 3 & to the
Cong. architect with
reference to para. 4 of
the Proceedings in the
marine department.

(SD) E. T. W.
W.

To the C. & P. W. Secy
in original }
C. A. to Govt.

C 8608978

8978

Chce

What action has
been taken in re-
sp. directing the Ch. Eng-
ineer with the H. H.
Engine to ascertain
improposed docks.
Send me a
copy of the P.
O. O.

C. A. W.

Copy of the Marine
G.O. put up. The original
is noted as sent to "W.
Periar" 29-9-91 - nothing
further is known of it
here. D.P. 28-10-91-

B.W.

Submitted

N.S.
28.10.91

N^o 3005 W. of 1 November 1891

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To the C. & P. W. Secy
in Original
C. A. to Govt.

4TH AUGUST 1891, No. 347, MARINE.

GOVERNMENT OF MADRAS.

MARINE DEPARTMENT.

READ—the following paper:—

From W. AUSTIN, Esq., C.S., Chairman, Harbour Trust Board, Madras, to the Chief Secretary to Government, dated Madras, 2nd June 1891, No. 343.

I have the honour to submit, for the information of Government, a letter from the Board's Secretary, Mr. Pinsent, No. 2184, dated 17th March, suggesting the construction of a deep-water tidal dock, with also a graving dock attached, in the area of sand accreted to the south of the harbour.

2. The matter has been considered by the Trustees at their last three meetings, and although some of their number are of opinion that the question of building docks is somewhat premature, I have nevertheless been invited to lay the matter before Government without further delay, as a reference has been lately made to the Board, asking permission to sink trial pits in the sand to the south of the harbour, with a view to the erection thereon of Commissariat godowns; and the Board strongly deprecate the idea of allowing any building to be raised on this land, which might in the future interfere with a scheme the importance of which cannot, in the Board's opinion, be too highly estimated in the interests of the trade of the port.

3. I referred Mr. Pinsent's proposals to the Board's Engineer, for his opinion as to whether the scheme was practicable from an engineering point of view, and whether he considered it probable that the financial resources of the port would be sufficient to meet the heavy outlay. His reply, No. 22, dated 6th April, is enclosed. It is to the effect that there can be no difficulty whatever in constructing the proposed dock, which could be completed by the close of 1895, within the figures named as the probable financial resources of the port.

4. On referring to the Deputy Port Conservator, as to whether a dock would give the facilities of entrance and security in cyclones anticipated by the Secretary, Captain Simpson expresses his opinion that vessels would be perfectly safe during a cyclone in such a dock, and he further states that the opportunity of constructing a graving dock would be worth the whole expenditure. His letter is enclosed.

5. The Board's Engineer has explained to the Trustees the means he would suggest for carrying the scheme into effect, as sketched out in his letter, dated 6th April; and before his departure from Madras, Captain Street, H.M.'s I.M., Presidency Port Officer, recorded a minute, which I submit herewith, for the information of Government.

6. With reference to the Secretary's calculations as to tonnage, the cost of landing and shipping by boats, and the additional revenue which could be secured to the Trust by imposing an additional dock-due in lieu of the saving which docks would effect in boat-hire, I would remark as follows:—

(a) The tonnage handled here for the past four years is—

	TONS.
1887-88	3,16,988
1888-89	2,90,600
1889-90	3,59,184
1890-91	3,91,972
Total ..	13,58,744

The average annual tonnage during the past four years is therefore 3,39,685 tons, and three lakhs of tons may be considered a very cautious estimate for the future.

(b) The Trustees consider that the cost of landing and shipping cargo is correctly stated as being about a rupee per ton all round.

(c) The trade of the port would in no way have any additional burden placed upon it by substituting a dock-due for the present boat-hire; and both steamers and merchants would benefit largely by the increased facilities afforded by a dock.

7. Should Government approve of the principle of Mr. Pinsent's proposals and agree that the engineering difficulties can be overcome without much difficulty, the Trustees will direct their Secretary and Engineer to lay more detailed information before them for submission to Government.

ENCLOSURES.

From C. PINSENT, Esq., Secretary, Harbour Trust Board, to the Chairman, Harbour Trust Board, dated Madras, 17th March 1891, No. 2184.

With reference to the letter from the Executive Engineer, Madras Division, No. 1347, dated 11th instant, asking permission to sink trial pits in the sand accreted to the south of the harbour, to ascertain whether a godown can be built there in lieu of the present Commissariat granary—in view of that site being made over to the Bank of Madras—I have the honour to invite your attention to the following remarks and suggestions having reference to the future welfare of this port, which, if sound and practicable, must preclude all idea of building upon the area in question, unless the future interests of the port are sacrificed.

2. The harbour in its present form can never be entirely satisfactory.
 3. Landing and shipping operations, while the harbour affords no further facilities than at present, must always be delayed, if not altogether stopped, in bad weather as heretofore; and in cyclones vessels put to sea.
 4. With an eastern entrance, it has never been claimed that the harbour would be a harbour of refuge in a cyclone; and no other possible entrance could ever render the present enclosed area such.
 5. The method of loading into boats or lighters, and again unloading, is costly—about one rupee per ton—causes delay, and leads to frequent damage to cargo.
 6. The depth of water alongside the north and south arms is not sufficient to allow large vessels to lie alongside.
 7. Subsidiary jetties, to enable vessels to come alongside the arms, would still be very inconvenient for landing or shipping cargo; the distances are great; the arms are too narrow to allow more than a double line of rails; they could not be used for cargo purposes during the prevalence of a heavy swell; connections from the through lines of rail to jetties standing out into the harbour would be awkward to make; and to maintain rails on the arms would be expensive, as they rust so quickly.
 8. A wall enclosing a part of the western portion of the present water area—including the iron screw-pile pier—would be of little service, except as a boat-harbour, and hardly worth the estimated cost.
 9. To the south of the harbour is a large area formed by the accretion of sand from permanent natural causes, which area must go on increasing until the sand reaches the end of the south arm, when it will be carried past and to the northward; but there should be no difficulty in keeping the entrance clear with proper dredging plant.
 10. It was part of Mr. Parkes' original design to make a boat-harbour within this area.
 11. I would submit that, instead of a boat-harbour, a dock sufficiently large and deep to accommodate along its side, or sides, the whole trade of the port, ought to be constructed.
 12. The advantages, should this be practicable, would be as follows:—
 - (a) The present harbour would become merely an outer entrance basin; which, being clear of shipping, would enable vessels to enter from sea at greater speed, and therefore with greater safety, than at present, when a strong current may be running across the mouth; thus rendering the narrow entrance both safer and easier of access.
 - (b) In a land-locked dock, any vessel would be as safe in Madras as in any other port in India during a cyclone, if not safer.
- From the form the accretion has assumed, and must continue to take, the proposed dock must of necessity be in length from N.E. to S.W.
A vessel heading N.E. would be practically end on to a cyclone when blowing from the E.N.E. to N.N.E. and again when the wind had veered to W.S.W. and S.S.W.

While the wind direction is anywhere between S.S.W. and E.N.E. or again between N.N.E. and W.S.W.—in other words more or less a-beam—the hull of a vessel would be, to a great extent, under the lee of the dock walls and sheds alongside of her, or upon the opposite side. The means to be taken for the security of vessels so situated is for nautical men to consider. Steamers have rarely come to grief in this position in the Hugli from the wind alone; at any rate, Madras would have the advantage over Calcutta, inasmuch as a racing current and tidal bore would always be absent from the attendant dangers of a cyclone here.

13. The advantages of having a steamer alongside a jetty with railways and sheds thereon, instead of in the open only to be approached by water, is too obvious to need any comment.

14. Assuming that finance would be the chief difficulty, I would remark as follows:—

15. The total tonnage of imports and exports at and from Madras exceeds 3,00,000 of tons per annum. This quantity may be taken as a safe estimate.

16. Boat-hire and attendant charges are now all round about one rupee per ton, which would be entirely saved; and on three lakhs of tons would give Rs. 3,00,000.

17. If an additional harbour-due of Rupee 1 per ton be then substituted for the present expenses on account of boat-hire, the trade of the port would have no extra burden imposed upon it, but an additional revenue would be secured to the Trust of at least Rs. 3,00,000 per annum.

18. Three lakhs of rupees are, at $4\frac{1}{2}$ per cent., equal to the interest upon Rs. 66,66,666-6.

19. Should this be found insufficient to provide capital and sinking fund, then by imposing an additional dock-charge of eight annas a ton—for additional and improved facilities given—the total available additional income over and above present revenue would be Rs. 4,50,000; equal to $4\frac{1}{2}$ per cent. upon one crore of rupees.

20. Granted a smooth and deep-water dock, it would probably be possible to construct a graving dock—the one at Suez is in sand—or to provide a lift similar to the one in Bombay.

21. In 1886 I suggested to the then Chairman (Sir Richard Barlow) that when the harbour was completed, a canal should be constructed from the N.W. corner to a point adjacent to Cochrane's basin on the East Coast Canal; the object being to maintain the water in the canal between the Ennore and Adyar locks at a higher level, and thus to enable produce, including salt, brought by canal, to be taken direct alongside steamers without transshipment. Similar advantages could be obtained by making this junction canal a continuation of the deep-water dock, and connecting with the East Coast Canal through the Cooum to the south of Fort Saint George, or elsewhere, as Engineers may deem best.

22. With docks that would enable the Madras, the South Indian and the East Coast Railway Companies to run alongside steamers lying in security, with also water connection with the canal, enabling salt and other produce to be taken alongside without transshipment, Madras should become the terminal port of the East Coast; for the trade of the port—especially in salt—would appear capable of very considerable development.

23. In conclusion, I would point out that the harbour now gives sufficiently smooth water for ships' boats to land on the beach within the arms; and the protection afforded by our surf-bound coast has become a thing of the past.

From W. AUSTIN, Esq., C.S., Chairman, Harbour Trust Board, Madras, to the Engineer, Harbour Trust Board, Madras, dated 24th March 1891, No. 775 E.

I have the honour to forward herewith, for your information and for favour of remarks, a letter from the Board's Secretary, No. 2184, dated 17th instant, suggesting the construction of deep-water docks in the sand to the south of the harbour.

2. I shall be glad to know whether you consider the scheme practicable from an engineering point of view, and whether you consider it probable that the financial resources of the port, as shown by the Secretary, would be sufficient to meet the heavy outlay which would be entailed.

From A. LEE POGSON, Esq., Engineer, Harbour Trust Board, Madras, to the Chairman, Harbour Trust Board, Madras, dated Madras, 6th April 1891, No. 22.

I have the honour to acknowledge the receipt of your letter, No. 775 E., dated 24th ultimo, forwarding letter, No. 2184, dated 17th idem, from the Secretary, setting forth certain suggestions for the future of the Madras Harbour.

2. From time to time suggestions have been made regarding docks, quay-walls, canal and railway connections with East Coast Canal and Railways, but the time has not yet come when any final plans can be determined on as to docks, as the whole future of the Madras Harbour is dependent upon the completion of the harbour piers with an eastern entrance, and the state of the sea therein during the monsoons, which can only be known after the entrance is completed.

3. There is no doubt that in the event of docks being required at Madras, the only site for them will be upon the sand accreted to the south of the harbour, and as to the *feasibility of their construction, there can be no difficulty whatever*; all that is required is time and funds.
4. In my opinion, the present harbour should first be completed with an eastern entrance, and the Trustees have supported these views; it would therefore be premature to attempt to design docks until the entrance is completed and the state of the sea inside the harbour during a cyclone carefully watched, with a view to further improvements hereafter.
5. The western boundary of the harbour can never be left a sea beach, as it is now, and before any dredging can be commenced, a quay-wall must be built, no matter what improvements are to come in the future.
6. A quay-wall is therefore absolutely necessary to secure the beach and a uniform bottom level to the harbour. At present the sand, from high-water mark down to the three fathom contour line, shifts from north to south of the harbour each monsoon, and as long as this action of the sand is allowed to continue, no dredging or docks can be commenced.
7. The south pier must stand intact until the pier head and capping is completed, in about February 1893, therefore a dock cannot be commenced before that date; but meanwhile the necessary quay-wall and a temporary protecting arm, to give shelter to the dredger during cyclones, might be commenced; the former would enable the cargo boats, lighters, &c., to come alongside and discharge upon a low level wharf, thereby saving the unnecessary high lift up to the iron pier, and also enable the Traffic Department to deal with more lighters with cargo than is possible at present; also to load the same direct into railway wagons in all weather except during a cyclone.
8. A temporary arm inside the harbour will be necessary to afford shelter to the lighters and dredger during cyclones (in the event of the eastern entrance not affording the shelter anticipated) until the south pier can be cut through and docks commenced.
9. This arm may be constructed of superstructure blocks, which can, when no longer necessary, be taken up and utilized in completing the overlapping arm necessary at the entrance to any docks.
10. The depth of water alongside the proposed quay-wall would be $13\frac{1}{2}$ feet at low-water, ordinary spring tides as far as the iron pier; and from this point to the south pier the wall would gradually deepen until 32 feet at low-water, ordinary spring tides is reached, from whence it would run level, which will provide a still-water wharf of 600 to 800 feet in length, with 32 feet at low water alongside in any weather; being under the shelter of the temporary protecting arm.
11. This temporary arm or spur would be built at about 700 feet up the south pier and extend 600 feet into the harbour at right angles to the south pier, which will give protection to the deep-water wharf and shelter to the dredger and lighters behind it until the docks, if decided upon, are commenced, and the permanent overlapping arm to the dock completed.
12. So far my proposal can be commenced and carried out before the south pier is completed, as a quay-wall will in any case be necessary whether docks are ultimately decided upon or not.
13. Heavy machinery can meanwhile be landed direct from a ship's side, from the two deep-water pier heads now under construction, and hoisted by the new All Round Titan Crane.
14. If the Trustees are prepared to meet the expenditure, and docks are decided upon, after the eastern entrance and the proposed quay-wall has been completed, they can be constructed with far less difficulty and uncertainty than the present piers; but the cost cannot be even approximately arrived at until the form of dock and requirements have been determined upon.
15. It is certain the cost of docks, quay-wall, warehouse accommodation and necessary machinery would not exceed the cost of the present harbour, as there will be no rough sea or swell to contend with, or stoppages during construction for the monsoons.
16. In 1893 if the eastern entrance is finally decided upon and a quay-wall built, 800 feet of the shore end of the south pier can be removed and the deep-water portion of the quay-wall already constructed extended in a south-westerly direction, which will form the north-west wharf or wall of a future deep-water dock.
17. The width of the dock can be 800 feet and any length necessary with graving docks at the southern extremity.
18. The south-east wharf or wall forming the dock should be extended into the harbour, to form a groyne or overlapping arm necessary to prevent any possibility of wave motion entering the dock; which, when projected and completed, the temporary arm would be removed, the dock with an area of about 37 acres. Therefore, in my opinion, there is nothing to prevent Madras being provided with a first-class tidal, deep-water dock, with graving docks, &c., capable of berthing twelve vessels; constructed upon the above lines.

19. If the quay-wall was commenced at once, or as soon as the dredging plant could be got out from home, suitable docks could be built and completed by the close of 1895, and within the figures named as the probable financial resources of the port.

From W. AUSTIN, Esq., C.S., Chairman, Harbour Trust Board, Madras, to the Deputy Port Conservator, dated Madras, 11th April 1891, No. 19 C.

I have the honour to forward, for your information and favour of remarks, copy of a letter from the Board's Secretary, No. 2184, dated 17th March, suggesting the construction of deep-water docks at Madras to the south of the harbour, together with copy of a letter remarking thereon from the Board's Engineer, No. 22, dated 6th instant.

From Captain H. B. SIMPSON, H.M.'s I. M., Deputy Conservator of the Port of Madras, to the Chairman, Harbour Trust Board, dated Madras, 15th April 1891, No. 697.

I have the honour to acknowledge receipt of No. 19 C., of 11th April, and enclosures, proposing a scheme of dock accommodation for Madras, and would make the following remarks with reference to the same.

2. I entirely agree with the Secretary that the present form of the harbour cannot be considered entirely satisfactory. This was also the opinion of Sir A. Rendall, as expressed in paragraphs 12, 13 and 14 of his report accompanying G.O., No. 1737 W., Public Works, 1st July 1889, and the internal works he alluded to, I fancy, were docks such as now proposed. I do not agree with him as to the little value of a harbour at Madras unless it provides a quay wall alongside which ships may lie as in a dock, though, no doubt, such an arrangement would be convenient and would give the Harbour Trust much more control over cargo than it has at present; but greater facilities for loading and discharging lighters are certainly required, and if the low wall proposed by the Engineer on the west side is constructed, this requirement would be met to a great extent, but I do not think it should be built along the whole length of the western side, as it would be advantageous to leave a portion of it for hauling up boats and lighters for repairs, &c., and a beach should be left for the masulah boats to haul up on at night within the harbour, at least until the dock accommodation is ready for use. Of course, it may be said they can go outside as they did before the harbour was built, but to make them do so would to a great extent deprive that class of craft of the advantages of the harbour at present afforded them, and inconvenience the traffic.

3. The probable revenue from the dock I think the Secretary places too high at the present date, as I do not think coasting steamers would as a rule enter it.

4. In paragraph 5 the Secretary describes the present method as costly and causing delay and damage, but in paragraphs 17 and 19 he proposes a charge 50 per cent. higher than what he gives as the present cost, but does not state if the charge is to be borne by the cargo entirely or partly by the ship; this, I think, would be a great drawback to the dock.

5. The delay is not quite apparent, as I think the quantity of cargo discharged in a day compares favourably with other ports, and if a sufficient supply of boats is maintained, a vessel with efficient cargo appliances is able to get rid of her cargo more quickly, moored as at present, than at a wharf working one side only. Boats, no doubt, can be brought alongside the other side while at the wharf; the delay caused at present is by the want of means of landing and removing the cargo from the pier and not from the fact of discharging into boats. Despatch is a great matter when we consider the way in which goods from Europe are transported to Madras and *vice versa*, almost all vessels in the trade being bound for other ports and wishing to spend as little time as possible in Madras, and such vessels would prefer to remain in the harbour in ordinary weather if it was found to be the most expeditious method of discharging. Vessels with full cargoes of coal and iron would, I believe, prefer the dock.

6. In loading, I think the dock would offer advantages over the present method, but few vessels take full cargoes at present from Madras.

7. Much damage to cargo, I think, is done in the masulah boats, and a large amount of cargo is lost overboard from vessels in the harbour which could, I believe, be avoided in a dock.

8. Vessels, I believe, would be perfectly safe in a dock such as proposed under all circumstances of weather and entirely independent of tides.

9. The possibility of constructing graving docks I would consider one of the most important parts of the scheme, and a dock is worth constructing on that account alone almost.

10. If a dock is constructed on the south side of the harbour, it must be remembered that there is a possibility of the land gained there being again scoured away by an obstruction to the current created to the south, either naturally or artificially, and the east side of the dock should be constructed so as to withstand such a scour; another site, I think, could be found for a dock to the north of Messrs. Dymes and Co.'s office free of all danger from this source.

11. The normal condition of the water inside the harbour would, I think, permit the works being carried out at all seasons, and the only doubtful point is the amount of protection the present walls will afford, when completed, during a cyclone, which, if insufficient, would require to be supplemented by an inner wall or some sort of structure to ensure the entrance to the dock being perfectly protected.

Minute by Captain H. A. Street, H.M.'s I.M.

I think it is generally acknowledged that, even when the harbour is completed, sufficient protection from the sea will not be afforded during heavy weather to boats and lighters, and that until such protection is obtained, it would be inadvisable to procure lighters of a larger description. The difficulties attending the landing of cargo at the pier and of clearing it from the pier when one or more "foreign vessels" are discharging, have been much in evidence of late, and point to the necessity of effecting further improvements to the harbour. The question is—What form shall these improvements take? Will a boat harbour in accordance with Mr. Parkes' original scheme suffice, or shall we commit ourselves to the elaborate scheme of the Secretary as set forth in his letter under reference? There is no doubt that a boat harbour is an actual necessity, now that there is no chance of the north-east entrance scheme being carried out, but a boat harbour would not afford the same advantages to the shipping and to the trade of the port generally as a wet dock, with jetties alongside of which vessels could be taken to discharge and load. The saving on account of boat-hire alone would be considerable, and the facility with which a vessel can load and discharge in a wet dock is not the least of the many advantages such a dock offers. The scheme proposed by the Secretary includes a graving dock, and as there is no such dock at any port on the Indian coast between Calcutta and Bombay, a dock of this description would no doubt make Madras a favourite port of call; owing to the slight rise and fall of the tide, there would be less difficulty and delay in docking or undocking than at Calcutta or Bombay, and this is a great advantage to vessels tied to time.

During war or when sending troops away by sea, the facilities offered by a wet dock to the embarkation of troops cannot be too greatly estimated, and I think that this fact should be brought forcibly to the notice of Government. The situation proposed for the docks seems as good a one as could be selected.

On the whole, I am of opinion that, if we can find the means for paying the interest on the money which would have to be borrowed to meet the cost of carrying out the Secretary's scheme, on the lines proposed by the Engineer, the Government should be addressed on the matter.

23rd April 1891.

(Initialled) H. A. S.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras, at a meeting held at the Offices of the Sea Customs on Friday, the 10th day of April 1891.

3. Read letter from the Executive Engineer, Madras Division, No. 1347, dated 11th March 1891, requesting permission to sink trial pits in the sand accreted to the south of the harbour with a view of building Commissariat godowns.

Read letter from the Board's Secretary, No. 2184, dated 17th March 1891, addressed to the Chairman, in reference thereto, suggesting that deep-water docks sufficiently large to accommodate the trade of the port should be constructed to the south of the harbour.

Read letter, No. 22, dated 6th April 1891, from the Board's Engineer replying to a reference from the Chairman, thereon.

Mr. Pogson was in attendance and explained to the Trustees the means he would suggest for carrying out the Secretary's proposal, which he considered offered no engineering difficulty.

Resolution.—Resolved, that the matter lie over for further consideration.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras, at a meeting held at the Offices of the Sea Customs on Friday, the 24th day of April 1891.

10. Read again letter from the Executive Engineer, Madras Division, requesting permission to sink trial pits in the sand accreted to the south of the harbour with a view of building Commissariat godowns.

Read letter from the Deputy Conservator, No. 607, reporting upon the Secretary's proposal to construct deep-water and graving docks to the south of the harbour basin.

Read Minute by Captain H. A. Street, Her Majesty's Indian Marine.

Examined statement of tonnage imported and exported for the past four years, 1887—1891.

Resolution.—Resolved, that the Chairman be invited to address Government.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras, at a meeting held at the Offices of the Board on Friday, the 5th day of June 1891.

4. Read letter to the Chief Secretary to Government regarding the construction of docks, amended in accordance with the suggestion of the Honorable Mr. Boyson.

Resolution.—Approved.

ORDER—dated 4th August 1891, No. 347, Marine.

The Harbour Trust Board has no right to, or control over, the accretion on the south side of the southern arm of the harbour, and therefore the application to permit the sinking on it of trial pits for the erection of Commissariat godowns should not have been made to, or entertained by, the Board.

2. The Government has no doubt that the construction of some kind of inner harbour on the site in question is practicable at no great cost, but the estimate of receipts, which is based apparently upon the assumption that the dock would be used by the whole of the tonnage entering the port, appears too sanguine. Neither the coasting steamers—which constitute, it is believed, nearly one-half of the tonnage visiting Madras—nor other steamers calling at the port with small quantities of cargo to discharge, would be likely to enter or make use of the docks.

3. The Government is of opinion that, pending the completion of the harbour, the detailed consideration of a scheme for the construction of docks would be premature, but in order that the subject may be fully ventilated and discussed by those interested, His Excellency the Governor in Council resolves to communicate the papers read above to the press, and to request an expression of opinion, especially with regard to the construction of a graving, in addition to an ordinary, dock, from the following:—

The Presidency Port Officer.	Messrs. Parry and Co.
" Chamber of Commerce.	" Wilson and Co.
Messrs. Arbuthnot and Co.	" Gordon, Woodroffe and Co.
" Binny and Co.	

The Chief Engineer, Public Works Department, will, in consultation with Mr. Pogson, furnish a rough estimate of the cost of the works indicated in the correspondence.

4. Meanwhile, the Government directs that no buildings, excepting sheds of the most temporary character which can easily be removed, shall be constructed on any portion of the land referred to in paragraph 1 of this order.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Chairman, Harbour Trust Board.
" the Presidency Port Officer.
" the Chairman, Chamber of Commerce.
" Messrs. Arbuthnot and Co.
" " Binny and Co.
" " Parry and Co.
" " Wilson and Co.
" " Gordon, Woodroffe and Co.
" the Revenue Department.
" the Public Works Department.
" the Military Department.
" the Financial Department.
Editors' Table.

Exd. A. Raitt.

(8608978)

Gobt. of {1891} Madras.
MARINE.

Issued

Recd.

Encl.

G.O., 4th August 1891, No. 347.

AUGUST.

N^o 3005 W of 1 November 1891

Comd to the Chief Eng^r.
Pub Works Dept with refer-
ence to paragraph 3 &
to the Cong architect
with reference to para 4
of the Proceedings in the
marine department

(Sd) G. T. W.
W.

To C. & P. W. Dept
in Oct
C. A. to Govt

Docks South of the Madras Harbour.

Stating, with remarks, that a detailed consider-
ation of a scheme for the construction of — would
be premature; but, that the subject may be fully
discussed, communicating the papers to the Press,
and requesting opinion, especially with regard to
the construction of a graving, in addition to an
ordinary dock, from the Presidency Port Officer,
Chamber of Commerce and certain firms.

Gobt. of {1891} Madras.
MARINE.

Issued

Recd.

Encl.

G.O., 4th August 1891, No. 347.

AUGUST.

N^o 3005 W of 1 November 1891

Communicated to the
Chief Engineer P. A. Sep
with reference to para-
graph 3, and to the
Consulting architect
with reference to para
4 of the Proceedings
in the Marine Dept.

(Sd) G. T. W.

Docks South of the Madras Harbour.

Stating, with remarks, that a detailed consider-
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the construction of a graving, in addition to an
ordinary dock, from the Presidency Port Officer,
Chamber of Commerce and certain firms.

C. E. P. A. (in original)
C. A. to Govt

C 8608978

Gobt. of {1891} Madras.
MARINE.

Learned

Recd.

Encl.

G.O., 4th August 1891, No. 347.

AUGUST.

Docks South of the Madras Harbour.

Stating, with remarks, that a detailed consideration of a scheme for the construction of — would be premature; but, that the subject may be fully discussed, communicating the papers to the Press, and requesting opinion, especially with regard to the construction of a graving, in addition to an ordinary dock, from the Presidency Port Officer, Chamber of Commerce and certain firms.

N^o 3005 W of 1 November

Comd to the Chief Eng.
Pub Works w/lt with refer-
ence to paragraph 3 &
to the Cong architect
with reference to para 4
of the Proceedings in the
marine department

(2) G. T. W.

To C. & P. W. Rep
in orig
C. A. to Govt

4TH AUGUST 1891, No. 347, MARINE.

GOVERNMENT OF MADRAS.

MARINE DEPARTMENT.

READ—the following paper:—

From W. AUSTIN, Esq., C.S., Chairman, Harbour Trust Board, Madras, to the Chief Secretary to Government, dated Madras, 2nd June 1891, No. 343.

I have the honour to submit, for the information of Government, a letter from the Board's Secretary, Mr. Pinsent, No. 2184, dated 17th March, suggesting the construction of a deep-water tidal dock, with also a graving dock attached, in the area of sand accreted to the south of the harbour.

2. The matter has been considered by the Trustees at their last three meetings, and although some of their number are of opinion that the question of building docks is somewhat premature, I have nevertheless been invited to lay the matter before Government without further delay, as a reference has been lately made to the Board, asking permission to sink trial pits in the sand to the south of the harbour, with a view to the erection thereon of Commissariat godowns; and the Board strongly deprecate the idea of allowing any building to be raised on this land, which might in the future interfere with a scheme the importance of which cannot, in the Board's opinion, be too highly estimated in the interests of the trade of the port.

3. I referred Mr. Pinsent's proposals to the Board's Engineer, for his opinion as to whether the scheme was practicable from an engineering point of view, and whether he considered it probable that the financial resources of the port would be sufficient to meet the heavy outlay. His reply, No. 22, dated 6th April, is enclosed. It is to the effect that there can be no difficulty whatever in constructing the proposed dock, which could be completed by the close of 1895, within the figures named as the probable financial resources of the port.

4. On referring to the Deputy Port Conservator, as to whether a dock would give the facilities of entrance and security in cyclones anticipated by the Secretary, Captain Simpson expresses his opinion that vessels would be perfectly safe during a cyclone in such a dock, and he further states that the opportunity of constructing a graving dock would be worth the whole expenditure. His letter is enclosed.

5. The Board's Engineer has explained to the Trustees the means he would suggest for carrying the scheme into effect, as sketched out in his letter, dated 6th April; and before his departure from Madras, Captain Street, H.M.'s I.M., Presidency Port Officer, recorded a minute, which I submit herewith, for the information of Government.

6. With reference to the Secretary's calculations as to tonnage, the cost of landing and shipping by boats, and the additional revenue which could be secured to the Trust by imposing an additional dock-due in lieu of the saving which docks would effect in boat-hire, I would remark as follows:—

(a) The tonnage handled here for the past four years is—

	TONS.
1887-88	3,16,988
1888-89	2,90,600
1889-90	3,59,184
1890-91	3,91,972
Total ..	13,58,744

The average annual tonnage during the past four years is therefore 3,39,685 tons, and three lakhs of tons may be considered a very cautious estimate for the future.

(b) The Trustees consider that the cost of landing and shipping cargo is correctly stated as being about a rupee per ton all round.

(c) The trade of the port would in no way have any additional burden placed upon it by substituting a dock-due for the present boat-hire; and both steamers and merchants would benefit largely by the increased facilities afforded by a dock.

7. Should Government approve of the principle of Mr. Pinsent's proposals and agree that the engineering difficulties can be overcome without much difficulty, the Trustees will direct their Secretary and Engineer to lay more detailed information before them for submission to Government.

ENCLOSURES.

From C. PINSENT, Esq., Secretary, Harbour Trust Board, to the Chairman, Harbour Trust Board, dated Madras, 17th March 1891, No. 2184.

With reference to the letter from the Executive Engineer, Madras Division, No. 1347, dated 11th instant, asking permission to sink trial pits in the sand accreted to the south of the harbour, to ascertain whether a godown can be built there in lieu of the present Commissariat granary—in view of that site being made over to the Bank of Madras—I have the honour to invite your attention to the following remarks and suggestions having reference to the future welfare of this port, which, if sound and practicable, must preclude all idea of building upon the area in question, unless the future interests of the port are sacrificed.

2. The harbour in its present form can never be entirely satisfactory.

3. Landing and shipping operations, while the harbour affords no further facilities than at present, must always be delayed, if not altogether stopped, in bad weather as heretofore; and in cyclones vessels put to sea.

4. With an eastern entrance, it has never been claimed that the harbour would be a harbour of refuge in a cyclone; and no other possible entrance could ever render the present enclosed area such.

5. The method of loading into boats or lighters, and again unloading, is costly—about one rupee per ton—causes delay, and leads to frequent damage to cargo.

6. The depth of water alongside the north and south arms is not sufficient to allow large vessels to lie alongside.

7. Subsidiary jetties, to enable vessels to come alongside the arms, would still be very inconvenient for landing or shipping cargo; the distances are great; the arms are too narrow to allow more than a double line of rails; they could not be used for cargo purposes during the prevalence of a heavy swell; connections from the through lines of rail to jetties standing out into the harbour would be awkward to make; and to maintain rails on the arms would be expensive, as they rust so quickly.

8. A wall enclosing a part of the western portion of the present water area—including the iron screw-pile pier—would be of little service, except as a boat-harbour, and hardly worth the estimated cost.

9. To the south of the harbour is a large area formed by the accretion of sand from permanent natural causes, which area must go on increasing until the sand reaches the end of the south arm, when it will be carried past and to the northward; but there should be no difficulty in keeping the entrance clear with proper dredging plant.

10. It was part of Mr. Parkes' original design to make a boat-harbour within this area.

11. I would submit that, instead of a boat-harbour, a dock sufficiently large and deep to accommodate along its side, or sides, the whole trade of the port, ought to be constructed.

12. The advantages, should this be practicable, would be as follows:—

(a) The present harbour would become merely an outer entrance basin; which, being clear of shipping, would enable vessels to enter from sea at greater speed, and therefore with greater safety, than at present, when a strong current may be running across the mouth; thus rendering the narrow entrance both safer and easier of access.

(b) In a land-locked dock, any vessel would be as safe in Madras as in any other port in India during a cyclone, if not safer.

From the form the accretion has assumed, and must continue to take, the proposed dock must of necessity be in length from N.E. to S.W.

A vessel heading N.E. would be practically end on to a cyclone when blowing from the E.N.E. to N.N.E. and again when the wind had veered to W.S.W. and S.S.W.

While the wind direction is anywhere between S.S.W. and E.N.E. or again between N.N.E. and W.S.W.—in other words more or less a-beam—the hull of a vessel would be, to a great extent, under the lee of the dock walls and sheds alongside of her, or upon the opposite side. The means to be taken for the security of vessels so situated is for nautical men to consider. Steamers have rarely come to grief in this position in the Hugli from the wind alone; at any rate, Madras would have the advantage over Calcutta, inasmuch as a racing current and tidal bore would always be absent from the attendant dangers of a cyclone here.

13. The advantages of having a steamer alongside a jetty with railways and sheds thereon, instead of in the open only to be approached by water, is too obvious to need any comment.

14. Assuming that finance would be the chief difficulty, I would remark as follows:—

15. The total tonnage of imports and exports at and from Madras exceeds 3,00,000 of tons per annum. This quantity may be taken as a safe estimate.

16. Boat-hire and attendant charges are now all round about one rupee per ton, which would be entirely saved; and on three lakhs of tons would give Rs. 3,00,000.

17. If an additional harbour-due of Rupee 1 per ton be then substituted for the present expenses on account of boat-hire, the trade of the port would have no extra burden imposed upon it, but an additional revenue would be secured to the Trust of at least Rs. 3,00,000 per annum.

18. Three lakhs of rupees are, at 4½ per cent., equal to the interest upon Rs. 66,66,666·6.

19. Should this be found insufficient to provide capital and sinking fund, then by imposing an additional dock-charge of eight annas a ton—for additional and improved facilities given—the total available additional income over and above present revenue would be Rs. 4,50,000; equal to 4½ per cent. upon one crore of rupees.

20. Granted a smooth and deep-water dock, it would probably be possible to construct a graving dock—the one at Suez is in sand—or to provide a lift similar to the one in Bombay.

21. In 1886 I suggested to the then Chairman (Sir Richard Barlow) that when the harbour was completed, a canal should be constructed from the N.W. corner to a point adjacent to Cochrane's basin on the East Coast Canal; the object being to maintain the water in the canal between the Ennore and Adyar locks at a higher level, and thus to enable produce, including salt, brought by canal, to be taken direct alongside steamers without transshipment. Similar advantages could be obtained by making this junction canal a continuation of the deep-water dock, and connecting with the East Coast Canal through the Cooum to the south of Fort Saint George, or elsewhere, as Engineers may deem best.

22. With docks that would enable the Madras, the South Indian and the East Coast Railway Companies to run alongside steamers lying in security, with also water connection with the canal, enabling salt and other produce to be taken alongside without transshipment, Madras should become the terminal port of the East Coast; for the trade of the port—especially in salt—would appear capable of very considerable development.

23. In conclusion, I would point out that the harbour now gives sufficiently smooth water for ships' boats to land on the beach within the arms; and the protection afforded by our surf-bound coast has become a thing of the past.

From W. AUSTIN, Esq., C.S., Chairman, Harbour Trust Board, Madras, to the Engineer, Harbour Trust Board, Madras, dated 24th March 1891, No. 775 E.

I have the honour to forward herewith, for your information and for favour of remarks, a letter from the Board's Secretary, No. 2184, dated 17th instant, suggesting the construction of deep-water docks in the sand to the south of the harbour.

2. I shall be glad to know whether you consider the scheme practicable from an engineering point of view, and whether you consider it probable that the financial resources of the port, as shown by the Secretary, would be sufficient to meet the heavy outlay which would be entailed.

From A. LEE POGSON, Esq., Engineer, Harbour Trust Board, Madras, to the Chairman, Harbour Trust Board, Madras, dated Madras, 6th April 1891, No. 22.

I have the honour to acknowledge the receipt of your letter, No. 775 E., dated 24th ultimo, forwarding letter, No. 2184, dated 17th idem, from the Secretary, setting forth certain suggestions for the future of the Madras Harbour.

2. From time to time suggestions have been made regarding docks, quay-walls, canal and railway connections with East Coast Canal and Railways, but the time has not yet come when any final plans can be determined on as to docks, as the whole future of the Madras Harbour is dependent upon the completion of the harbour piers with an eastern entrance, and the state of the sea therein during the monsoons, which can only be known after the entrance is completed.

3. There is no doubt that in the event of docks being required at Madras, the only site for them will be upon the sand accreted to the south of the harbour, and as to the *feasibility of their construction, there can be no difficulty whatever*; all that is required is time and funds.
4. In my opinion, the present harbour should first be completed with an eastern entrance, and the Trustees have supported these views; it would therefore be premature to attempt to design docks until the entrance is completed and the state of the sea inside the harbour during a cyclone carefully watched, with a view to further improvements hereafter.
5. The western boundary of the harbour can never be left a sea beach, as it is now, and before any dredging can be commenced, a quay-wall must be built, no matter what improvements are to come in the future.
6. A quay-wall is therefore absolutely necessary to secure the beach and a uniform bottom level to the harbour. At present the sand, from high-water mark down to the three fathom contour line, shifts from north to south of the harbour each monsoon, and as long as this action of the sand is allowed to continue, no dredging or docks can be commenced.
7. The south pier must stand intact until the pier head and capping is completed, in about February 1893, therefore a dock cannot be commenced before that date; but meanwhile the necessary quay-wall and a temporary protecting arm, to give shelter to the dredger during cyclones, might be commenced; the former would enable the cargo boats, lighters, &c., to come alongside and discharge upon a low level wharf, thereby saving the unnecessary high lift up to the iron pier, and also enable the Traffic Department to deal with more lighters with cargo than is possible at present; also to load the same direct into railway wagons in all weather except during a cyclone.
8. A temporary arm inside the harbour will be necessary to afford shelter to the lighters and dredger during cyclones (in the event of the eastern entrance not affording the shelter anticipated) until the south pier can be cut through and docks commenced.
9. This arm may be constructed of superstructure blocks, which can, when no longer necessary, be taken up and utilized in completing the overlapping arm necessary at the entrance to any docks.
10. The depth of water alongside the proposed quay-wall would be 13½ feet at low-water, ordinary spring tides as far as the iron pier; and from this point to the south pier the wall would gradually deepen until 32 feet at low-water, ordinary spring tides is reached, from whence it would run level; which will provide a still-water wharf of 600 to 800 feet in length, with 32 feet at low water alongside in any weather; being under the shelter of the temporary protecting arm.
11. This temporary arm or spur would be built at about 700 feet up the south pier and extend 600 feet into the harbour at right angles to the south pier, which will give protection to the deep-water wharf and shelter to the dredger and lighters behind it until the docks, if decided upon, are commenced, and the permanent overlapping arm to the dock completed.
12. So far my proposal can be commenced and carried out before the south pier is completed, as a quay-wall will in any case be necessary whether docks are ultimately decided upon or not.
13. Heavy machinery can meanwhile be landed direct from a ship's side, from the two deep-water pier heads now under construction, and hoisted by the new All Round Titan Crane.
14. If the Trustees are prepared to meet the expenditure, and docks are decided upon, after the eastern entrance and the proposed quay-wall has been completed, they can be constructed with far less difficulty and uncertainty than the present piers; but the cost cannot be even approximately arrived at until the form of dock and requirements have been determined upon.
15. It is certain the cost of docks, quay-wall, warehouse accommodation and necessary machinery would not exceed the cost of the present harbour, as there will be no rough sea or swell to contend with, or stoppages during construction for the monsoons.
16. In 1893 if the eastern entrance is finally decided upon and a quay-wall built, 800 feet of the shore end of the south pier can be removed and the deep-water portion of the quay-wall already constructed extended in a south-westerly direction, which will form the north-west wharf or wall of a future deep-water dock.
17. The width of the dock can be 800 feet and any length necessary with graving docks at the southern extremity.
18. The south-east wharf or wall forming the dock should be extended into the harbour, to form a groyne or overlapping arm necessary to prevent any possibility of wave motion entering the dock; which, when projected and completed, the temporary arm would be removed, the entrance made, and the dock dredged to the required depth, which would give Madras a wet dock with an area of about 37 acres. Therefore, in my opinion, there is nothing to prevent Madras being provided with a first-class tidal, deep-water dock, with graving docks, &c., capable of berthing twelve vessels; constructed upon the above lines.

19. If the quay-wall was commenced at once, or as soon as the dredging plant could be got out from home, suitable docks could be built and completed by the close of 1895, and within the figures named as the probable financial resources of the port.

From W. AUSTIN, Esq., C.S., Chairman, Harbour Trust Board, Madras, to the Deputy Port Conservator, dated Madras, 11th April 1891, No. 19 C.

I have the honour to forward, for your information and favour of remarks, copy of a letter from the Board's Secretary, No. 2184, dated 17th March, suggesting the construction of deep-water docks at Madras to the south of the harbour, together with copy of a letter remarking thereon from the Board's Engineer, No. 22, dated 6th instant.

From Captain H. B. SIMPSON, H.M.'s I. M., Deputy Conservator of the Port of Madras, to the Chairman, Harbour Trust Board, dated Madras, 15th April 1891, No. 697.

I have the honour to acknowledge receipt of No. 19 C., of 11th April, and enclosures, proposing a scheme of dock accommodation for Madras, and would make the following remarks with reference to the same.

2. I entirely agree with the Secretary that the present form of the harbour cannot be considered entirely satisfactory. This was also the opinion of Sir A. Rendall, as expressed in paragraphs 12, 13 and 14 of his report accompanying G.O., No. 1737 W., Public Works, 1st July 1889, and the internal works he alluded to, I fancy, were docks such as now proposed. I do not agree with him as to the little value of a harbour at Madras unless it provides a quay wall alongside which ships may lie as in a dock, though, no doubt, such an arrangement would be convenient and would give the Harbour Trust much more control over cargo than it has at present; but greater facilities for loading and discharging lighters are certainly required, and if the low wall proposed by the Engineer on the west side is constructed, this requirement would be met to a great extent, but I do not think it should be built along the whole length of the western side, as it would be advantageous to leave a portion of it for hauling up boats and lighters for repairs, &c., and a beach should be left for the masulah boats to haul up on at night within the harbour, at least until the dock accommodation is ready for use. Of course, it may be said they can go outside as they did before the harbour was built, but to make them do so would to a great extent deprive that class of craft of the advantages of the harbour at present afforded them, and inconvenience the traffic.

3. The probable revenue from the dock I think the Secretary places too high at the present date, as I do not think coasting steamers would as a rule enter it.

4. In paragraph 5 the Secretary describes the present method as costly and causing delay and damage, but in paragraphs 17 and 19 he proposes a charge 50 per cent. higher than what he gives as the present cost, but does not state if the charge is to be borne by the cargo entirely or partly by the ship; this, I think, would be a great drawback to the dock.

5. The delay is not quite apparent, as I think the quantity of cargo discharged in a day compares favourably with other ports, and if a sufficient supply of boats is maintained, a vessel with efficient cargo appliances is able to get rid of her cargo more quickly, moored as at present, than at a wharf working one side only. Boats, no doubt, can be brought alongside the other side while at the wharf; the delay caused at present is by the want of means of landing and removing the cargo from the pier and not from the fact of discharging into boats. Despatch is a great matter when we consider the way in which goods from Europe are transported to Madras and *vice versa*, almost all vessels in the trade being bound for other ports and wishing to spend as little time as possible in Madras, and such vessels would prefer to remain in the harbour in ordinary weather if it was found to be the most expeditious method of discharging. Vessels with full cargoes of coal and iron would, I believe, prefer the dock.

6. In-loading, I think the dock would offer advantages over the present method, but few vessels take full cargoes at present from Madras.

7. Much damage to cargo, I think, is done in the masulah boats, and a large amount of cargo is lost overboard from vessels in the harbour which could, I believe, be avoided in a dock.

8. Vessels, I believe, would be perfectly safe in a dock such as proposed under all circumstances of weather and entirely independent of tides.

9. The possibility of constructing graving docks I would consider one of the most important parts of the scheme, and a dock is worth constructing on that account alone almost.

10. If a dock is constructed on the south side of the harbour, it must be remembered that there is a possibility of the land gained there being again scoured away by an obstruction to the current created to the south, either naturally or artificially, and the east side of the dock should be constructed so as to withstand such a scour; another site, I think, could be found for a dock to the north of Messrs. Dymes and Co.'s office free of all danger from this source.

11. The normal condition of the water inside the harbour would, I think, permit the works being carried out at all seasons, and the only doubtful point is the amount of protection the present walls will afford, when completed, during a cyclone, which, if insufficient, would require to be supplemented by an inner wall or some sort of structure to ensure the entrance to the dock being perfectly protected.

Minute by Captain H. A. Street, H.M.'s I.M.

I think it is generally acknowledged that, even when the harbour is completed, sufficient protection from the sea will not be afforded during heavy weather to boats and lighters, and that until such protection is obtained, it would be inadvisable to procure lighters of a larger description. The difficulties attending the landing of cargo at the pier and of clearing it from the pier when one or more "foreign vessels" are discharging, have been much in evidence of late, and point to the necessity of effecting further improvements to the harbour. The question is—What form shall these improvements take? Will a boat harbour in accordance with Mr. Parkes' original scheme suffice, or shall we commit ourselves to the elaborate scheme of the Secretary as set forth in his letter under reference? There is no doubt that a boat harbour is an actual necessity, now that there is no chance of the north-east entrance scheme being carried out, but a boat harbour would not afford the same advantages to the shipping and to the trade of the port generally as a wet dock, with jetties alongside of which vessels could be taken to discharge and load. The saving on account of boat-hire alone would be considerable, and the facility with which a vessel can load and discharge in a wet dock is not the least of the many advantages such a dock offers. The scheme proposed by the Secretary includes a graving dock, and as there is no such dock at any port on the Indian coast between Calcutta and Bombay, a dock of this description would no doubt make Madras a favourite port of call; owing to the slight rise and fall of the tide, there would be less difficulty and delay in docking or undocking than at Calcutta or Bombay, and this is a great advantage to vessels tied to time.

During war or when sending troops away by sea, the facilities offered by a wet dock to the embarkation of troops cannot be too greatly estimated, and I think that this fact should be brought forcibly to the notice of Government. The situation proposed for the docks seems as good a one as could be selected.

On the whole, I am of opinion that, if we can find the means for paying the interest on the money which would have to be borrowed to meet the cost of carrying out the Secretary's scheme, on the lines proposed by the Engineer, the Government should be addressed on the matter.

(Initialled) H. A. S.

23rd April 1891.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras, at a meeting held at the Offices of the Sea Customs on Friday, the 10th day of April 1891.

3. Read letter from the Executive Engineer, Madras Division, No. 1347, dated 11th March 1891, requesting permission to sink trial pits in the sand accreted to the south of the harbour with a view of building Commissariat godowns.

Read letter from the Board's Secretary, No. 2184, dated 17th March 1891, addressed to the Chairman, in reference thereto, suggesting that deep-water docks sufficiently large to accommodate the trade of the port should be constructed to the south of the harbour.

Read letter, No. 22, dated 6th April 1891, from the Board's Engineer replying to a reference from the Chairman, thereon.

Mr. Pogson was in attendance and explained to the Trustees the means he would suggest for carrying out the Secretary's proposal, which he considered offered no engineering difficulty.

Resolution.—Resolved, that the matter lie over for further consideration.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras, at a meeting held at the Offices of the Sea Customs on Friday, the 24th day of April 1891.

10. Read again letter from the Executive Engineer, Madras Division, requesting permission to sink trial pits in the sand accreted to the south of the harbour with a view of building Commissariat godowns.

Read letter from the Deputy Conservator, No. 607, reporting upon the Secretary's proposal to construct deep-water and graving docks to the south of the harbour basin.

Read Minute by Captain H. A. Street, Her Majesty's Indian Marine.

Examined statement of tonnage imported and exported for the past four years, 1887—1891.

Resolution.—Resolved, that the Chairman be invited to address Government.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras, at a meeting held at the Offices of the Board on Friday, the 5th day of June 1891.

4. Read letter to the Chief Secretary to Government regarding the construction of docks, amended in accordance with the suggestion of the Honorable Mr. Boyson.

Resolution.—Approved.

ORDER—dated 4th August 1891, No. 347, Marine.

The Harbour Trust Board has no right to, or control over, the accretion on the south side of the southern arm of the harbour, and therefore the application to permit the sinking on it of trial pits for the erection of Commissariat godowns should not have been made to, or entertained by, the Board.

2. The Government has no doubt that the construction of some kind of inner harbour on the site in question is practicable at no great cost, but the estimate of receipts, which is based apparently upon the assumption that the dock would be used by the whole of the tonnage entering the port, appears too sanguine. Neither the coasting steamers—which constitute, it is believed, nearly one-half of the tonnage visiting Madras—nor other steamers calling at the port with small quantities of cargo to discharge, would be likely to enter or make use of the docks.

3. The Government is of opinion that, pending the completion of the harbour, the detailed consideration of a scheme for the construction of docks would be premature, but in order that the subject may be fully ventilated and discussed by those interested, His Excellency the Governor in Council resolves to communicate the papers read above to the press, and to request an expression of opinion, especially with regard to the construction of a graving, in addition to an ordinary, dock, from the following:—

The Presidency Port Officer.	Messrs. Parry and Co.
" Chamber of Commerce.	" Wilson and Co.
Messrs. Arbuthnot and Co.	" Gordon, Woodroffe and Co.
" Binny and Co.	

The Chief Engineer, Public Works Department, will, in consultation with Mr. Pogson, furnish a rough estimate of the cost of the works indicated in the correspondence.

4. Meanwhile, the Government directs that no buildings, excepting sheds of the most temporary character which can easily be removed, shall be constructed on any portion of the land referred to in paragraph 1 of this order.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Chairman, Harbour Trust Board.
" the Presidency Port Officer.
" the Chairman, Chamber of Commerce.
" Messrs. Arbuthnot and Co.
" Binny and Co.
" Parry and Co.
" Wilson and Co.
" Gordon, Woodroffe and Co.
" the Revenue Department.
" the Public Works Department.
" the Military Department.
" the Financial Department.
Editors' Table.

Exd. A. Baitt,

Gobt. of {1891} Madras.
MARINE.

Issued

Recd.

Encl.

G.O., 4th August 1891, No. 347.

AUGUST.

Docks South of the Madras Harbour.

Stating, with remarks, that a detailed consideration of a scheme for the construction of — would be premature; but, that the subject may be fully discussed, communicating the papers to the Press, and requesting opinion, especially with regard to the construction of a graving, in addition to an ordinary dock, from the Presidency Port Officer, Chamber of Commerce and certain firms.

3005 W of 1st November 1891
Communicated to the
Chief Engineer C.A. Sept
with reference to para-
graph 3, and to the
Consulting architect
with reference to para-
4 of the Proceedings
in the Marine Dept.

(Sd) G.T.W.

W

C.E. P.A.B. (in original)

led. to Encl.