(1) பக்கங்களின் எண்ணிக்கை 66

(2) புதுக்கித் திருப்பிய நாள் முடிவில்

(3) ஆதாரங்குறிப்பவர் கருக்கொப்பம்

(100)

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

P.W.D. துறை

அரசாணை எண். 131 — அச்சகம்

மு. கோப்புத் தாள் எண். — பலவகை

நாள் : 18-1-1889. 198 .

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

32 Sheets

31+1

அரசு, கா-1—18,000—15-8-87.

131

131

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—again the following paper :—

G.O., dated 12th March 1888, No. 804 W., Public Works.

READ—also the following papers :—

Memorandum by the Presidency Port Officer.

In accordance with the instructions contained in G.O., No. 804 W., dated 12th March 1888, I placed myself in communication with Mr. Brunton, M.I.C.E., on my arrival at Cochin last month, respecting his proposal to deepen the bar at that port, and, with reference to this proposal, have the honor to submit the following remarks :—

1. Mr. Brunton proposes to use an apparatus which he describes as a "sluice dredger," the character and manner of working of which is set forth in his letter dated 21st February 1888 to the Superintending Engineer, IV Circle.

2. I have been unable to ascertain whether an apparatus of the kind proposed has ever been tried before, but Mr. Brunton seemed to think that the effect of "sluicing," as described in certain papers in the Minutes of Proceedings of the Institution of Civil Engineers, quoted by him in his letter of 21st February 1888 to the Superintending Engineer, IV Circle, afforded sufficient proof that the arrangement proposed would prove successful. It seems to me, however, that if the "sluicing" had even the effect of moving the sand, the ebb tide would only carry the sand a little further out, and that as the force of the tide decreased, so the sand would gradually settle, thus seriously affecting the depth of the water on the seaward side of the bar.

3. The cost of the vessel and apparatus of the kind specified in paras. 5 and 6 of Mr. Brunton's letter of 21st February 1888 is estimated by him at Rs. 1,20,000—a purely rough estimate—and of the working expenses at Rs. 500 per mensem. I was unable to check these figures as I could find nothing to guide me in doing so, but I think that they may be accepted as fairly correct.

4. The area which would have to be dredged to connect the line of soundings of 22 feet outside of the bar with the same depth on the harbour side of it is about 500,000 square yards.

5. The material of which this area is composed is sand, which, it is said, has been lodged on the bar and in its vicinity by the action of the surf during the south-west monsoon.

6. The depth of water on the north side of this area varies from 16 to 20 feet and on the south side from 15 to 24 feet, consequently any channel of greater depth between these lines would receive the sand which would be washed down by the action of the wind and sea.

7. As dredging operations would only be possible during the fine weather season, it would be impossible to maintain an average depth of water during the whole year, and the dredging of the area in question would have to be gone through at the commencement of each fine season.

8. The tendency of the sand to accumulate in the vicinity of the mouth of the harbour owing to the action of the surf on the coast, the heavy rollers which approach the mouth during the south-west monsoon months, and the fact that dredging operations would be impossible during the south-west monsoon, renders the harbour available only during the fine season when vessels lying in the roadstead experience little or no difficulty in loading or discharging.

9. It is seldom that vessels visiting Cochin require quick despatch; the coasting steamer generally arrives at daylight and is rarely anxious to leave before the time which will enable her to reach the next port at daylight the following morning; the other steamers and vessels which call at odd times are usually under charter, and quick despatch in their case is not always requisite.

10. The average draft of the coasting steamers calling at Cochin is about 19 feet and of other steamers about 22 feet.

11. A depth of 22 feet at low water spring tides might possibly be sufficient for the coasting steamers, but for vessels of greater draft the harbour would, I think, have no attraction unless there was, at the very least, a depth of 27 feet at low water spring tides, and to obtain and maintain this depth would be a most expensive undertaking.

12. Taking into consideration that the harbour, even if made available for coasting steamers, could only be used during the north-east monsoon, that a depth of 27 feet would have to be maintained during that period to make it generally useful to all classes of vessels, the little difficulty now experienced by vessels loading and discharging in the roads during the fine weather season, the cost connected with the procuring of the dredger in the first instance and of its upkeep afterwards and the uncertainty attending the use of a hitherto-untried apparatus, as well as the yearly expense which would have to be incurred in keeping the bar to the proper depth, I am of opinion that the scheme is not one which would prove of such advantage as to justify its adoption.

MADRAS,
8th January 1889. (Signed) H. A. STREET, Captain, H.M.'s I.M.,
Presidency Port Officer.

Note by the Acting Chief Engineer, Public Works Department.

In G.O., No. 804 W., dated 12th March 1888, Government ordered the Presidency Port officer and myself to give our opinions on the following points:—

1*st*.—Whether a depth of 22 feet could be obtained and maintained at a reasonable cost on the Cochin bar by Mr. Brunton's proposed system of sluicing.

2*ndly*.—Whether the depth of 22 feet would be sufficient for the classes of steamers or ships frequenting Cochin, or would prove of such advantage as to justify the estimated expenditure.

2. The Presidency Port officer, after placing himself in communication with Mr. Brunton and after a careful examination of the port in his memorandum, dated 8th January 1889, answers the above questions as follows:—

1*st*.—That it is a very doubtful experiment and the depth of 22 feet if obtained could not be maintained during the whole year; the fact that the sluicing would be impossible during the south-west monsoon would render the harbour available only during the fine season.

2*ndly*.—That the average draft of the coasting steamers is 19 feet and that of other steamers is 22 feet.

A depth of 22 feet at low water spring tides might possibly be sufficient for the coasting steamers of light draft (less than 19 feet), but would not suffice for vessels of greater draft.

That as during the fine season (during which time only would the harbour be available for steamers of light draft) there is at present little or no difficulty in loading or unloading, he is of opinion that the scheme is not one that would prove of such advantage as to justify its adoption.

3. I fully agree with the conclusions that Captain Street has arrived at, and will only add that in my opinion Mr. Brunton's proposed system of sluicing is not likely to attain the result he anticipates.

Sluicing and raking can be and have been successfully employed in removing local deposits of sand in rivers, &c., but in a bar existing in the embouchure of a tidal river thrown up by the action of the sea as at Cochin, the circumstances are different.

The velocity of the tidal water where the bar forms (in Cochin more than 2,000 yards form the mouth) owing to the larger area it is spread over would not be sufficient to carry off the sand after it had been disturbed by the sluicing to the distance required; no doubt but that at a great cost a slightly increased depth could be procured, but it is in my opinion hopeless to expect a depth of 22 feet to be obtained over an area of about 500,000 square yards (1,250 yards × 400 yards) that Captain Street shows to be necessary.

I regret, therefore, that I cannot recommend Mr. Brunton's proposal to be carried out.

CHEPÂK,
10th January 1889. (Signed) H. R. MEAD, Colonel, R.E.,
Ag. Chief Engineer, P.W.D.

ORDER—dated 18th January 1889, No. 131 W., Public Works.

His Excellency the Governor in Council regrets to find that, in the opinion of the Presidency Port officer and the Acting Chief Engineer, Mr. Brunton's proposal to deepen the bar of Cochin harbour by means of sluicing is one that is not likely to prove of such advantage as to justify the estimated expenditure, and therefore the Government must decline to sanction the proposal.

(True Extract.)

Captain, R.E.,
Under-Secy. to Govt., P.W.D.

To the Superintending Engineer, IV Circle.
" Marine Department.

Exd. J. Henricus.
Spare Copies

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1889} Madras.

PUBLIC WORKS.

Dated January, 18th.

Recd. *Encl.*

G.O., 18th Jan. 1889, No. 131 W.

JANUARY.

Cochin Harbour

Orders declining to sanction Mr. Brunton's proposal to deepen the bar of —.

131
3

12TH MARCH 1888, No. 804 W., PUBLIC WORKS.

131/3

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following letter from J. W. MARTIN, Esq., Officiating Superintending Engineer, IV Circle, to the Chief Engineer, Public Works Department, dated Coimbatore, 23rd February 1888, No. 64 E.W.:—

Adverting to paragraph 3 of G.O., No. 188 W., dated 17th January 1888, on His Excellency the Governor's tour in the Western and Southern Districts, I have the honor to forward letter, dated 21st instant, received from Mr. George Brunton, M.I.C.E., Cochin, giving the outlines of his scheme for increasing the depth of water on the bar at the entrance to Cochin harbour.

2. I regret I do not feel competent to offer any opinion on the merits of Mr. Brunton's scheme, particularly as I have not got any of the books and reports to which he refers, and as I am not acquainted with the work at Liverpool that he says was carried out successfully by a method similar to what he proposes should be adopted at Cochin. However, if Government desire that the subject should be further inquired into, I would recommend that Mr. Brunton should be invited to work out in detail his scheme furnishing an estimate of the cost of the necessary tools and plant and the working expenses. I think it is also advisable that some reliable information should be obtained of the work carried out at Liverpool, particularly as regards the depth of water maintained and the state of the water at the time the work was carried out as regards being rough or smooth.

ENCLOSURE.

From G. BRUNTON, Esq., M.I.C.E., to the Officiating Superintending Engineer, IV Circle, dated Cochin, 21st February 1888.

I have the honor to acknowledge receipt of your letter, dated 31st January 1888, and, in reply, would beg to draw your attention to the enclosed extract from the address of the Cochin Chamber of Commerce to His Excellency the Governor when he visited this town on his late tour.

2. My views with respect to the advantages to be derived from a sluicing apparatus to deepen this bar on the lines (with some modifications) laid down in the paper referred to have been greatly strengthened by perusal of other papers in the minutes of proceedings of the Institution of Civil Engineers, to be found in volume 83, page 386, and volume XC, page 308; this last paper gives a full account of the way in which the sand bank formed under the Liverpool landing stage was removed by sluicing.

3. The bar of this river has been formed and is maintained by the action of two forces opposing each other—one the constant endeavour of the sea to embank itself, the other the perpetual washing away of the sand by the velocity of the tides, the result being a pretty nearly unvarying depth of water on the bar of 14 feet.

4. The enormous area of backwater, which is filled and emptied every tide, accounts for the velocity of the currents in and out whereby the depth is maintained; the two forces neutralise each other at that depth, the sea cannot heap up more sand, the tides cannot cut more away; there is no doubt in my mind, however, that with a little extraneous help given to the outgoing currents the depth might be easily increased without much fear of the sand being rapidly replaced, because the velocity of the currents at bottom would not be decreased to any appreciable extent by the deepening, and the deeper the water the less would be the wave action tending to fill in.

Low water ordinary spring tides.

5. My scheme consists of building a boat, say, 120 feet long by 24 feet beam, in which I would place a compound engine of, say, 60 H.P. nominal and a boiler of sufficient power to drive the engine up to double its nominal power.

6. The engine should drive a centrifugal pump with a disc of 7 feet or 7 feet 6 inches diameter at 120 to 130 revolutions per minute; this disc would work in a large case bolted on to the bottom of the boat from which case a rectangular wrought iron pipe, say, 25 feet long with a cross section of 8 feet by 1 foot would be suspended by a flexible connection at any required angle. This pipe would be so counterbalanced as to leave only so much weight as would be required to keep its lower end in gentle contact with the sand, on which being provided with a shuttle-shaped cradle it should rest. Of course suitable apparatus would be necessary to raise and lower this pipe as required and to keep it in a line with the centre of the craft whichever way the latter would be moved.

7. The water would be taken into the pump above and be impelled through the pipe and impinge on the sand, which would be driven by the force of the water seaward, and upward, remaining in suspension a considerable time, sufficient with an ebb tide running at from 3 to 4 miles an hour to carry it well out into deep water (see Mr. Bergeron, volume LVIII, page 133).

8. The boat would be anchored and manœuvred in the manner shown in volume LXXXIII, page 387.

9. I have chosen the method above described instead of the double propeller of Mr. J. J. Van-Rutchoten, volume LVIII, page 145, because this sluicer will have to work in a seaway with sometimes a considerable swell and the vanes of propellers would be knocked off if allowed to come in contact with the sand, whereas the pipe hinged as above would allow of considerable rise and fall in the boat without damage, and a stream of water, such as would be maintained by a pump as above described, would be more effectual than that from propellers, as a large portion of their force would be lost in driving water which would not act directly on the sand. Another great advantage would be that all the working machinery would be inboard and easily get-at-able.

10. A vessel such as described above would be able not only to move itself by hydraulic propulsion (see volume 77, page 1), but to act as a tug in case of sailing vessels.

11. There is, I believe, no reason to doubt the efficiency of sluicing as given in the papers abovementioned. I have had very great experience of the action of streams of water on sand and mud whilst working the pumps I have used for years in the Travancore and Cochin paddy-fields, and I feel very confident that such a sluicer dredger as I contemplate would give an additional depth of 6 to 7 feet on this bar at a very reasonable cost, the tide itself being made to do all the carriage.

12. I append a skeleton sketch of the proposed sluicer and a section of the bar derived from the latest chart.

EXTRACT, Cochin Chamber of Commerce address to His Excellency the Governor.

Mr. George Brunton, M.I.C.E., our Chairman, has brought to the notice of the Chamber a method whereby "bars," such as the one we have to contend with, are removed and made navigable in an apparently easy manner.

2. The method suggested by Mr. Brunton was designed some years ago by a Mr. J. J. Van-Rutchoten of Rotterdam, and called by the inventor a propeller dredger.

3. The following description of this dredger is taken from the minutes of proceedings of the Institution of Civil Engineers, volume LVIII, page 145:—

"It (propeller dredger) consisted of an ordinary strong craft, a 12 H.P. portable engine and a pair of trussed beams, one on each side of the craft, carrying steel shafts and suitable bearing for them. These beams were hung from the sides of the craft, so that they could be lifted by tackles and lowered to any depth required. The lower ends of the shafts were fitted with ordinary propellers, about 3 feet 6 inches in diameter, and the upper ends with bevil wheels, to which power was transmitted from the engine fixed in the craft to a cross shaft driven by a belt from the fly-wheel. This machinery was tested several times in the river Maas, and in April 1876, when he was present, the craft was steamed into position by its own propellers against the current. The depth of water being then about 13 feet over the shoal with deep water all round, the propellers were lowered until they nearly reached the top of the shoal and work was commenced. The engine made ninety-six revolutions and the propellers about one hundred and fifty-six revolutions per minute. The craft being anchored in such a manner that it could be kept straight to its work and warped as required to keep on the higher part of the shoal. It soon became apparent that a large quantity of material was set in motion by the revolutions of the propellers, and after about forty minutes work the engine was stopped and soundings taken. It was then ascertained that the shoal had been lowered about 1 yard in depth for a length of 150 yards and a width of 8 yards.

"The craft was next turned round and worked with the stream, the results obtained being practically the same as when working against the stream. The shoal consisted of a coarse compact sand in water.

"The machinery was subsequently used under the supervision of the Engineers of the water start in various kinds of strata, such as fine sand, clay, peat, clay and peat mixed, &c., and the average results were that, including the time necessary for getting the craft in position, about 130 cubic yards of sand were moved per hour, 116 yards of sand mixed with clay and proportionally lower quantities in peat and clay. This appeared to indicate that a great deal might be done in the way of levelling the bottoms of rivers by simple and inexpensive mechanical appliances which could be worked almost continuously irrespective of variations in the depth of water," which the Chamber gives *in extenso*, as it will then be more simple to compare it with the requirements of this port.

4. Now the bar at the entrance to the Cochin harbour is about 960 yards 2,880 feet broad, the water varies in depth of at least 22 feet, and with such an apparatus as the propeller dredger the Chamber does not see that there would be any difficulty in attaining this, and what is more at a greatly reduced cost when compared with other schemes.

5. The Chamber is unable to state what the actual outlay would be, but if your Excellency will give the scheme your support, estimates will be made. It may be worth mentioning the whole work of construction and maintenance could be undertaken by Mr. Brunton, M.I.C.E.

ORDER—dated 12th March 1888, No. 804 W., Public Works.

The Governor in Council desires that the Chief Engineer and Master Attendant will submit a joint report, after careful inquiry on the spot, upon Mr. Brunton's proposals.

2. It is remarked that Mr. Robertson in his reports on Indian Harbours, dated 1871, came to the conclusions (1) that the Cochin Harbour would be much improved by the erection of groynes, one on each side of the harbour, 3,000 and 2,300 feet in length, and (2) that with the assistance of dredging and raking, a depth of 20 to 21 feet at low springs could be maintained.

3. The late Captain Taylor, in paragraph 5 of his report, No. 11132, dated 16th December 1880, stated that, in his opinion, a depth of 30 feet was necessary to justify a large ship in making a narrow harbour mouth like Cochin; and it appears from paragraph 15 of the report on Cochin Harbour by Colonel Sankey and Captain Taylor, printed with G.O., No. 911, of 4th April 1881, that this minimum depth of 30 feet was admitted by the Chamber of Commerce to be necessary to make Cochin a first-class harbour available for large ships.

4. Mr. Parkes, in his report, dated 11th March 1881, printed with the same Government order, considered that a depth of 27 feet was the least that could be allowed.

5. Mr. Brunton's proposals, if carried out and if perfectly successful, would give only 22 feet depth of water. The Chief Engineer and Master Attendant should state whether they consider it likely that a depth of 22 feet of water could be obtained and maintained at a reasonable cost with Mr. Brunton's proposed system of sluicing, and, if so, whether this depth would be sufficient for the classes of steamers and ships frequenting Cochin, or would prove of such advantage as to justify the estimated expenditure.

(True Extract.)

Captain, R.E.,
Under Secy. to Govt., P.W.D.

To the Chief Engineer, Public Works Department.
" Superintending Engineer, IV Circle.
" Marine Department.

Exd. J. Moses.
Spare Copies

Go W 804 W 12-3-88
2943 W original 27-12-80
912 W 4-4-88
2277 W 5-9-1879.
222 W 26-1-81.
2944 W 27-12-80
1313 W 5-5-83
2192 W 9-8-83
804 W 1-9-84.
59 W 10-1-84
1900 2-8-81
1301 W 12-[illegible]-87
188 17-1-88

P.W.C. No. 2721

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1888} Madras.

PUBLIC WORKS.

131 W

Dated March, 12th.

Read. 27-3-88 Encl. 1 (cheque)

G.O., 12th March 1888, No. 804 W.

MARCH.

Cochin Harbour

Directing the Chief Engineer and Master Attendant to submit a joint report, after careful inquiry on the spot, in regard to certain proposals of Mr. Brunton for increasing the depth of water on the bar at the entrance of the —.

P.W.S. III 6 27/3/88

131/5 (3)/5 P. W. D.

Note for the Supdt. in charge of the Govt. Records.

Please have the accompanying Chart on Cochin River plans files in the file of Letter G.O.S. 131 W. 18/84 original

Cutkathiravan
Supdt. Record Section
P. W. Secty

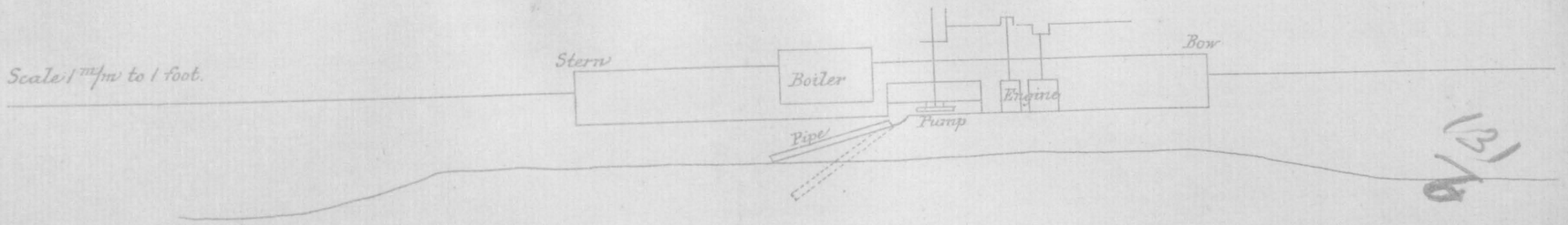
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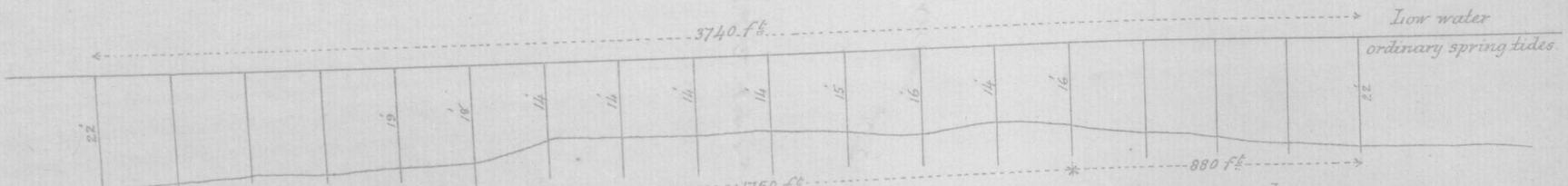
H.R. 1514

The Chart connected with this G.O. is kept separately below this outside in a separate box

G.O. Nº 804. W dy 12th March 1888.

SKELETON SKETCH OF PROPOSED SLUICE FOR THE COCHIN HARBOUR BAR.





16,296 C. yds

104,296 C. yds

19,555 C. yds

Each division 220 feet.

Breadth of Channel 200 ft.

Total 140,147 C. yds

140,147 / 2000 yds per hour = 70 hours = 8 3/4 days (8 hours per day)

Scale for heights 1 m/m to 1 foot.

(Signed) Geo: Brunton M.I.C.E.
Cochin 21st February 1888.

Transfer by Ms. T. Gothandapanny and Litho by J. Soares Govt. Litho Press Chepauk.
Madras March 1888.

2/131

2/131

G.O. 612 Mar. 88, No. 80478.

Memorandum.

131/7 (131)/7 18

In accordance with the instructions contained in G. O No 504 W, dated 12th March 1888, I placed myself in communication with Mr Brunton, M.I.C.E, on my arrival at Cocanada last month, respecting his proposal to deepen the bar at that port, and with reference to this proposal, have the honor to submit the following remarks;-

1. Mr. Brunton proposes to use an apparatus which he describes as a "Sluice Dredger"; the character and manner of working of which is set forth in his letter dated 21st February 1888, to the Superintending Engineer IV Circle.

2. I have been unable to ascertain whether an apparatus of the kind proposed has ever been tried before, but

but Mr Brunton seemed to think that the effect of "sluicing" as described in certain papers in the Minutes of Proceedings of the Institution of Civil Engineers, quoted by him in his letter of 21st February 1888, to the Superintending Engineer IV Circle, afforded sufficient proof that the arrangement proposed would prove successful. It seems to me, however, that if the "sluicing" had even the effect of moving the sand, the ebb tide would only carry the sand a little further out, and that as the force of the tide decreased, so the sand would gradually settle, thus seriously affecting the depth of the water on the seaward side of the bar.

3. The cost of the vessel and apparatus of the kind specified in para 5 and 6 of Mr Brunton's letter of 21st February 1888, is estimated by him

131/9

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31p

him at Rp. 1,20,000 - a purely rough estimate - and of the working expenses at Rp 500 per mensem. I was unable to check these figures, as I could find nothing to guide me in doing so, but I think that they may be accepted as fairly correct.

4. The area which would have to be dredged to connect the line of soundings of 22 feet outside of the bar with the same depth on the harbour side of it is about 500000 Square yards.

5. The materials of which this area is composed is sand, which, it is said, has been lodged on the bar and in its vicinity by the action of the surf during the S.W. Monsoon.

6. The depth of water on the North side of this area varies from 16 to 20 feet, and on the south side from 15 to 24 feet, consequently any channel of greater depth between these lines would

would receive the sand which would be washed down by the action of the wind and sea. 13/10 13/10

7. As dredging operations would only be possible during the fine weather season, it would be impossible to maintain an average depth of water during the whole year, and the dredging of the area, in question, would have to be gone through at the commencement of each fine season.

8. The tendency of the sand to accumulate in the vicinity of the mouth of the harbour owing to the action of the surf on the coast; the heavy rollers which approach the mouth during the S.W. Monsoon Months; and the fact that dredging operations would be impossible during the S.W. Monsoon, renders the harbour available only during the fine season when vessels lying in the roadstead experience little or no difficulty in loading

loading or discharging. 13/ 13/11 5-10

9. It is seldom that vessels visiting Cochin require quick despatch — the Coasting Steamer generally arrives at daylight and is rarely anxious to leave before the time which will enable her to reach the next port at daylight the following morning; the other steamers and vessels which call at odd times are usually under charter, and quick despatch in their case is not always requisite.

10. The average draft of the Coasting Steamers calling at Cochin is about 19 feet and of other Steamers about 22 feet

11. A depth of 22 feet at low water Spring tides might possibly be sufficient for the Coasting Steamers, but for vessels of greater draft the harbour would, I think have no

attraction

131/62 131/61

attraction unless there was at the very least a depth of 27 feet at low water spring tides, and to obtain and maintain this depth would be a most expensive undertaking.

12. Taking into consideration that the harbour, even if made available for Coasting Steamers, could only be used during the N.E. Monsoon; that a depth of 27 feet would have to be maintained during that period to make it generally useful to all classes of vessels; the little difficulty now experienced by vessels loading and discharging in the roads during the fine weather season; the cost connected with the procuring of the Dredger in the first instance and of its upkeep afterwards

and

131/13 131 137P

and the uncertainity attending the use of a hitherto untried apparatus, as well as the yearly expense which would have to be incurred in keeping the bar to the proper depth; I am of opinion that the scheme is not one which would prove of such advantage as to justify its adoption.

H.A. Tweet

Captain H.M. I.M.
Presidency Port-Officer.

Presidency Port-Office
Madras 8th January 1889 3

No 59 W d/10.1.84.
" 604 E d/1.9.84.
" 2192 W d/9.8.83
" 1313 W d/5.5.83
" 2943 W d/27.11.80
" 2277 W d/5.9.79
" 9124 W d/4.4.81
" 2944 W d/27.11.80.
" 2224 W d/26.1.81
" 1581 W d/17.1.88
" 1301 W d/12.5.87
" 804 W d/12.3.88 Orig & Sc.

Recd 17th

Reply 19/3/88

Secy (Colony)

131/14 131/14 P.W. Dept. 81

Note by the Chief Engineer.

In P.W.D. No: 804 dated 12th March 1888 Government ordered the Presidency Port Officer and myself to give our opinions on the following points.

1st Whether a depth of 22 feet could be obtained and maintained at a reasonable cost on the Cochin Bar by Mr. Brunton's proposed system of sluicing.

2nd Whether the depth of 22 feet would be sufficient for the classes of steamers or ships frequenting Cochin or would it be prone of such advantage as to justify the estimated expenditure

2. The Presidency Port Officer ~~Executive Engineer~~ after placing himself in communication with Mr. Brunton and after a careful examination of the Port, in his memorandum dated 8th January 1889 answers the above questions as follows.

That

1st That it is a very doubtful experiment and the depth of 22 feet if obtained could not be maintained during the whole year; the fact that the sluicing would be impossible during the South West Monsoon would render the harbour available only during the fine season.

2nd That the average draught of the coasting steamers is 19 feet and that of other steamers is 22 feet.

A depth of 22 feet at Low water spring tides might possibly be sufficient for the coasting steamers of light draft (less than 19 feet) but would not suffice for vessels of greater draft.

That as during the fine season (during which time only would the harbour be available for steamers of light draft) there is at present little or no difficulty in loading or unloading, he is of opinion that the scheme is not one that would

[illegible] 13/15 13/15 GP

prove of such advantage as to justify its adoption.

3. I fully agree with the conclusions that Captain Stuck has arrived at and will only add that in my opinion Mr. Brunton's proposed system of sluicing is not likely to attain the result he anticipates.

Sluicing and raking can be, and have been, successfully employed in removing local deposits of sand in rivers &c., but in a Bar existing in the embouchure of a tidal river thrown up by the action of the sea as at Cochin, the circumstances are different.

The velocity of the tidal waters where the bar forms (in Cochin more than 2000 yards from the mouth) owing to the larger area it is spread over, would not be sufficient to carry off the sand after it had been disturbed by the sluicing to the distance required; no doubt but that at a great cost a slightly increased

depth could be procured & that this in my opinion hopeless to expect a depth of 22 feet to be obtained over an area of about 500,000 Square yards (1250 yards × 400 yards) that Captain Stuart shows to be necessary.

I regret therefore that I cannot recommend Mr Brunton's proposal to be carried out.

Colonel R.E.
Chief Engineer P.W. Dept.

Chepauk
10th Jany/88

131

131/16 131/16

Cochin
5th June 1888.

SECRETARY TO GOVERNMENT
7 JAN 88
P.W. DEPARTMENT, MADRAS

Colonel Hasted Chief Sec.y to Govt P.W.
Madras

Dear Sir

I duly received your note of the 1st Inst. I shall be very glad to lay my plans fully before Captain Street when he visits this port and offer him every information in my possession

My proposed Dredger does differ in details but not in principle from those which have hitherto been tried. That water with a head of 25 feet will, if directed thro' a pipe, remove a large body of sand, even at a distance of 90 feet from the end of the pipe, has been proved, as you will see if you will kindly refer to the Minutes of proceedings of the I. C. E. Vol XC page 310, and I cannot see why water forced thro' a pipe with the velocity due to a similar head, and close to the sand which it has to remove, should fail to do the same.

The rush of water caused by the screw Vol IVIII page 145 and by the screw Vol IXXXIII page 386 was the only case of the disappearance of the sand in both Cases, as well as in that above quoted by Mead, and will be in mine by Pump. Provided the rush of water be there, and properly directed, I feel sure that it matters nothing, for the removal of the sand, how the rush is caused.

That an immense body of water at a great

131/21

131/18 131/1918

Syrian dredger. Attached to 2.
1.20.000 cap. 1.500 p.m.

Harbour of Iniè shows see Sr.
Time no object: see 9:

Inst

Ch: Engineer

Opr. wish shall further kindly
not whether pressure vessel
drawings available.

after H.S.; visit special
Superintendent mashyolin
master Chief officer

131/21

~~131/19~~ 131/19

Gs HE has signed
the cover and made
no remarks & the draft
GO that has been signed
by Hon The GO can
be issued

10/11/04

174

ant. in. 1. 89

131

Cochin Cochin à arder 20

à la ant à HE

131/81 20

46 13/27 13/27

Read 46 No 804 W
dated 12th March 80

Memorandum by the President
Port Elgin
dated 8th Jan 89

Note by the Ag Ch Es
dated 10th Jan 89

~~The Govr~~
H.E. The Governor in Council
regrets to find that the
Memorial of the President
Port Elgin and the Ag Ch Es
& Examiners instructed to
deepen the bar of Goderich
harbour by means of shoveling
is one which is not
likely to secure of such
advantage as to justify
the estimated expenditure
and therefore the Govt
~~regret that they~~ cannot
sanction it pursuant to
pursuant to which

S.S.W. 13/1
Manitoba

Please turn this ~~into~~ a
Note which I may
be sent I may take it
Hobbs & H.E. tomorrow morning

GRL

CRO 2921

13/2/3 31/8/9

CAW

Note is Encl

copies S.O. in 80246

vide para 1.

Draft runs that

he has written every-

thing he has to say

in the note attached

to the original S.O. -

& he desires me

to send on this

file to Dalg. for

submission to S. of

C.

27-3-58

I. CW

Submitted

6/7/58 AS

29.III

Ind.

The Sketch Map ... has been lithographed. There is only the one copy available at present ... the Proceedings of the ... C. 50 will be ... for ...

[illegible]

Supt. I find I was mistaken about the design of the ... not being lithographed. The originals of the ... to which I referred, contained no lithographed copy, and no communication on the original design to show that it had been lithographed. On looking through the file again, however, I see a lithographed copy of the design with C No. 2951. The original G.O. does not ... show that the ... have been supplied with lithographed copies of design ... I think ... the ... and ... that copies of this design ...

131 Note by the C. E. 95

In G.O. No 804 dated 12th November 1880 Gov^t. ordered the Marine Attendant with myself to give an opinion on the following points:

1st. Whether a depth of 22 ft could be obtained and maintained at a reasonable cost on the Cochin Bar by Mr Brunton's ~~system~~ proposed system of sluicing.

2nd. Whether the depth of 22 ft would be sufficient for the class of steamers ... which frequent Cochin or would it have to be ... by ... the estimated ... expenditure.

2. The Marine Attendant after ... communication with Mr Brunton and after a careful examination of the Port, ... the ... ... the ... as follows:

1st. That ...

about that embankment and the depth of 22 ft obtained could be maintained during the whole year. The fact that the channel would be unfavorable during the S W monsoon under which the least amount only during the fair season

2nd That the average draft of the steaming vessels is 19 ft and that of other steamers is 22 ft

A depth of 22 ft at low water during spring tides might hopefully be difficult to be had by steaming steamers of light draft (that than 19 ft) but would not suffice for vessels of greater draft

That as during the fair season (during which time only would the harbour be considered for steamers of light draft) there is not

pleasant basis or no difficulty in boarding or unboarding, he is of an opinion that the scheme is not one that would secure of such advantages as to justify its adoption

3 I fully agree with the conclusions that Capt Short has arrived at and will only add that - my opinion the Breakwater system of obtaining is not likely to attain the result by artificial scouring and sweeping can be and have been successfully employed in removing local deposits of sand &c in rivers &c but in a Bar entering on the construction of a tidal river known as by the action of the sea as at Cochin, the circumstances are different

The velocity of the tidal water when the tide turns (in Cochin river than 2000 yds from the mouth) during the longer ebb it is spread over a wide and the sufficient to carry off

the Ocean after it has been disturbed by the obtaining to the distance required, ... the doubt but that not a private coast a slightly more depth could be procured but it is in my opinion hopeless to contract an depth of 22 ft to be obtained over an area of about 500,000 sq yds (1250 yds × 400 yds) the left Hands shows to be necessary

I regret therefore that I cannot recommend the Brixton Harbour to be carried out

10/1/09

Sir John Coode Division on the Proposal of the Bar of Dublin Harbour by Artificial means 1796/79
Minutes of Proc C.S. Vol XXIII

the "first working of a high retaining of a bar formed by river deposit" also, through the head of many formed chiefly and solely by the action of the tide" "that to maintain the, but the natural height down by that the river deposits towards the head of the tidal basin, and that so as natural form the county are the form upon the side of the bay"

131/37

"Land reclaimed in

Mr. Bryan

Explanation in my current being a

Plan of more than 2½ from the

than 2 miles in base

J.F. Rawlinson C.B. on the Harbour

Ordnance formerly steamer was but

in not at half tide dropping large

harbour along the bottom of the

channel but that be taken the

tide fine up. "Any material

dredging in the bar itself would be

many known way, unless the

increasing tides of the first could

afford the annual cost of an

annual dredging"

Scientific American, 1 Feb 1879

Channel in Port Yale harbour is now

being deepened by means of vessels

built for 2 Dredging Engineers

131
98

Windows under or the Entrance of
the Cabin Main. Inside the Room
to be about in the Low Pressure
Chamber Above a Platform about
about 1000 ft above a Canvas only
15 or 16 feet over it. The most
Convenient System would be that
that the ordinary Cabin & Cabin Passage
of Vessels would suffice - the height to
Cabin Accommodation in Sitting Room
Bath & Cabin Many could not
Probably Cost of all Kinds of the
Cabin Pressure Cabin Cabin Cabin
Bridge would not Cost 100 Sterling
Days of 6 hours Each, Other Cabin
Attendance Cabin and the most
Expensive 166 Days of 16 hours Each.
The Ocean Route, Viewed by the Water
Width of Canal, Cabin & Bay and
Bay Cabin Cabin Cabin Cabin
Passage; for At 5.10 Minutes Each
of 5 or 6 Knots, Direct would
Cabin Cabin of the Cabin of Bay Canal
Bay & Cabin Accommodation Cabin.

Cabin Cabin of Cabin

Cabin 25 Days Cabin Cabin Cabin
Cabin R.N. Cabin Cabin Cabin
Cabin Cabin Cabin Cabin

Captain Taylor's letter in G.O.

146 M. 17th April 18[illegible]

"10 feet is the least that a hundred [illegible] could [illegible] between the [illegible] and the [illegible] the case in an ordinary fixed [illegible] & the [illegible] as to a [illegible] entrance of 36 to 36 feet [illegible] of it would be [illegible] the [illegible] difficulties [illegible] with [illegible] & [illegible] charge [illegible] [illegible] ... then [illegible] [illegible] a mile and a half of shallow water outside which [illegible] [illegible] effect [illegible] any [illegible] of [illegible] [illegible] [illegible] of [illegible] beyond the bar (which [illegible] itself a mile from the [illegible] [illegible] the depths [illegible] to only [illegible] feet, and [illegible] 36 feet another mile [illegible] [illegible] [illegible] [illegible]"

Report by Col. [illegible] & Capt. Taylor

[illegible] 6th April 18[illegible].

Dredging ... is not [illegible] [illegible] for [illegible] channels [illegible] [illegible] [illegible] are [illegible] [illegible] [illegible] [illegible] [illegible] & [illegible] [illegible].

W. [illegible] letter in [illegible] G.O.

Your questions [illegible] [illegible] [illegible] [illegible] the following

3. (131) 131/99

1. Can improvements commensurate with the cost be made for a sum not exceeding £250,000 for such improvement of the entrance as would enable the class of ships at present frequenting the port [illegible] to [illegible] [illegible] [illegible] when fully loaded ~~[illegible]~~ ...

"I feel compelled after much consideration & with very great reluctance, [illegible] [illegible] a [illegible] answer ...

"The swell from every direction between S.W. & N.W. must be reduced before the bar can be [illegible] & that can only be done by break waters 2 miles from shore."

131

39

PUBLIC WORKS DEPARTMENT.

131/31 131/89 No 131 W. 10P

PROCEEDINGS OF THE MADRAS GOVERNMENT.

~~Dated~~ date the January 18. 1889

again
READ the following

G. O. No 504 W Dated 12th March 1888

Read the following

Memorandum by the Presidency Port officer } R.E. dy 8th January/89

Note by the Ag. Chief Engineer — dy 10th January/89

His Excellency the Governor in Council regrets to find that in the opinion of the Presidency Port officer and the Ag. Chief Engineer, Mr. Brunton's proposal to deepen the bar of Cochin harbour by means of sluicing is one that is not likely to prove of such advantage as to justify the estimated expenditure and therefore the Government must decline to sanction the proposal.

HCL 12/Jan

S.C.W. Circle Marine Dept: 9/1/89

WCB 11.1.89

11/1/89

131/32 11

131/8.32

Issue

H.E. the Governor
15.1.39

8-2-13

1884

Govt. of Madras.

PUBLIC WORKS.

G.O. 18 Jan 1884 No. 134

Orders declining to
sanction Mr. Brunton's
proposal to dispose
the rest of —

181/38

181/33

MADRAS RECORD OFFICE
Government Records.

Public Works Department

G. O. (Printed).

Dated 18-1- 189

No. 1314

Chart. Only