(1) பக்கங்களின் எண்ணிக்கை 34
(2) புதுக்கித் திருப்பிய நாள் 23-3-89
(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

பொதுபணித் துறை

அரசாணை எண். 54(W)
மு. கோப்புத் தாள் எண்.

அச்சகம்
பலவகை

நாள் : 9-1-1890 19 .

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

ஆவண, கா-1—18,008—15-6-87.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following papers:—

From G. McWATTERS, Esq., M.A., C.S., Chairman, Harbour Trust Board, to the Chief Secretary to Government, Marine Department, dated Madras, 21st December 1889, No. 4819.

I have the honor to submit herewith, for the information and orders of Government, copy of letter from the Board's Engineer, No. 1095, dated 9th instant, furnishing information regarding the state of the foreshore and stone revetment north of the Harbour; also extract of proceedings and resolution passed thereon by the trustees last evening, who then visited and walked along the revetment. I also forward the estimate submitted by the Board's Engineer, with plan and tracing in duplicate.

2. The estimate it will be observed is for restoring the revetment throughout its whole length, but the trustees are of opinion that it will be sufficient for the present to repair only that portion of it from Masulah Boat Bay northward, as from the bay southward it is apparently in very much better condition.

3. The estimate will therefore be modified as follows:—

	RS.
Total	62,139
Deduct estimated cost of remaking revetment from Ráyapuram station to Masulah Boat Bay	28,366
	33,773
Add for cost of making up southern portion of revetment sufficiently to enable the line of railway to be taken along it	10,000
Total ...	43,773

With regard to the item of Rs. 10,000 inserted above it is merely approximate, and the Engineer will submit an estimate at an early date.

4. In anticipation of the sanction of Government the trustees have authorised their Engineer to at once procure sleepers, rails and fish-plates, &c., for laying a line of narrow-gauge railway, as sand is now being deposited by the southerly current which carries the sand along with it from the north. This current and the north-east monsoon may be expected to cease in February 1890, when the deposit of sand will have attained its maximum for the season, and should be at once secured by the restoration of the revetment; and it is essential, should orders be given to proceed with the work as proposed, that the Engineer should be ready to make an immediate start; while, should other means be adopted for securing the foreshore, the material purchased can be used for the Pallávaram quarry lines and beach improvements.

5. Referring to para. 2 of the Engineer's letter, he appears to be in error in stating that the property threatened with destruction by the sea during the next south-west monsoon belongs to Government; it consists of private property situate in Ráyapuram and upon the west side of Ghouse Mohideen Pettah Street, Cassimode, for which claims will arise unless some means are taken to protect it. It will be within the recollection of Government that the cost of the revetment aggregated Rs. 2,40,314 (*vide* memorandum attached), while the sum of Rs. 3,00,959 was paid in compensation.

6. The claims likely to arise for damage to property are an unknown quantity; but, unless the foreshore is protected, will probably ultimately extend to the Madras Railway Company General Stores and Ráyapuram Terminus, as it would appear to be only a matter of time for the present revetment to be entirely washed away unless maintained in efficient repair. In this connection I would remark that south of the Masulah Boat Bay the rubble appears to be settling down to a natural and permanent slope; but at the extreme north, the sea has attacked and completely washed away the *end* of the revetment, and in its present condition there appears reason to expect that the whole length will similarly in time be gradually dispersed altogether, when the destruction of property hitherto protected by it will follow as a matter of course.

7. It therefore appears to the trustees that to promptly restore the rubble to its original section at the northern portion, and afterwards to adopt some means of protecting the end, is the most economical course to pursue, indeed is the only one open.

8. I am therefore to request that very early orders may be issued, as unless the sand which is now accumulating be secured as far as practicable at the end of the present north-east monsoon, and further erosion prevented, heavy claims for damage to property at Cassimode are likely to arise before the close of the north-east monsoon of 1890-91; by which time also the cost of restoring the revetment would be considerably enhanced by reason of its continued depletion.

ENCLOSURES.

From A. L. POGSON, Esq., Engineer, Harbour Trust Board, to the Chairman, Harbour Trust Board, dated Madras, 9th December 1889, No. 1095.

In reply to your letter No. 4210, dated 13th November 1889, I now have the honor to furnish the information therein called for.

(*a*) and (*b*). The plan (tracing in triplicate) shows the extent of sand eroded and accreted during the years 1886, 1887 and 1888, also the present (November 1889) position of the shore line. The positions each year before 1886 have not been given for fear of confusing the plan, but the original shore line (that of 1876) has been given. The encroachment of the sea was similar from that date and position to the position shown for 1886 to what it has been since. A separate plan showing the comparative positions of high water mark each year immediately before the commencement of the north-east monsoon is not sent, as that information is given in the present one

(*c*). The work of protecting the foreshore was commenced as far back as the year 1878, when Rs. 7,865 was spent upon it, and there has been a steady outlay upon it ever since. The total cost up to date being Rs. 3,02,608, of this Rs. 67,515 has been paid in compensation for houses and land.

The greatest expenditure was in the year 1882-83, when Rs. 98,178 was spent in protective works and Rs. 52,181 paid in compensation.

2. The plan of protection at first adopted was one recommended by Mr. Parkes. It consisted of rubble stone groynes running into the sea at right angles to the shore; these averaged 100 feet in length, were about 10 feet wide at the top and 8 feet above DeHavilland's mean sea level and had slopes of 1½ to 1, and were placed from 300 to 400 feet apart. These groynes proved a failure. The sea washed the stone ashore, and the beach became lined with it. The plan then adopted was that of running a rubble stone revetment along the shore line (per plan and sections enclosed), thus utilizing the stone already cast there from the groynes by the sea. This revetment was 20 feet wide at the top, which was 11 feet above DeHavilland's mean sea level, and had slopes of 1½ to 1. The present condition of the revetment is too low to prevent the waves from washing in land, and to neglect making it up to the required height will mean a heavy outlay next year to purchase valuable Government land and houses which the sea must encroach upon early next season; hence my reason for framing the estimate given below in para. (*e*).

(*d*). Mr. Thorowgood does not appear to have left on record any proposals or suggestions for protecting the coast line.

(*e*). The cause of the present erosion is due to the revetment having considerably settled, and flattened out seawards (as shown in the sections in neutral tint), so much so that the waves wash over it and draw the sand in shore through the rubble, and when this backing has been washed through, the rubble has flattened down with every wave.

3. In my opinion the only plan is to repair the existing protection by raising the revetment to the former 11 feet above DeHavilland's mean sea level as soon as all the accretion of sand has taken place, which will mean commencing to deposit stone by the end of February next at latest, and the probable cost will be Rs. 62,139 as per my estimate accompanying this letter. If no

action is taken to repair the revetment this February, much valuable land belonging to Government will have to be purchased, which next year will undoubtedly be washed away, whereas the sanction to the present estimated outlay will be the only means of showing a saving in the cost of the Harbour of Madras It is for the trustees to decide at once what action they will take, as there is not time to refer the matter home for sanction. The work must be commenced about the middle of February, and it will take me all my time to procure the necessary railway materials and get the line of railway laid to commence the required protection by then.

It has long since been my wish to call the trustees' attention to this erosion at Cassimode, but as I was unable to place the present estimate before them without first securing accurate levels and sections of the existing revetment (to base my estimate upon), I have been obliged to delay calling attention to the matter until the sea was quiet enough to allow of the sections being taken.

4. The estimate now furnished gives (*a*) the cost of the necessary railway lines to convey the stone to Cassimode, and (*b*) outlay to secure the quantity of sand which will have accreted by the end of February, and the totals of these items, viz., Rs. 40,847, represents the required immediate outlay to prevent further erosion next season, or until the matter has been referred home to Sir A. Rendell as proposed; (*c*) gives cost of repairing the revetment to ensure safety to the roadway, Biden Home, and Carlton House.

The plate-laying will have to be commenced at once, and I propose to use the narrow-gauge system and purchase second-hand rails from the South Indian Railway hauling the stone with the narrow-gauge engine now on hire. The sleepers would have to be ordered at once to complete the required quantity and to replace the Harbour Works stock; I propose to draw up one.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras at a Meeting held at the Offices of the Board on Friday the 20th day of December 1889.

* * * * * *

7. Read again letter from the Board's Engineer, No. 1095, dated 9th December 1889, furnishing particulars regarding the erosion of the sea at Cassimode, called for in their resolution No. 9 of 8th November 1889.

Read minutes by Captain W. L. C. Baddeley, R.E., Captain H. A. Street, H M's.I.M., Messrs. Cowasjee Eduljee Panday, S. R. Turnbull, Mirza Mehdy Ispahani and M. Varadarajaloo Chetty.

The Trustees, accompanied by their Secretary and Engineer, visited the revetment north of the Harbour and examined the present condition of the same, from the point marked A at Ráyapuram to the point J at Cassimode (*vide* plan accompanying the Engineer's letter). The original dimensions, positions and extent of the revetment, as also the positions of the groynes previously constructed, but which had been washed away by the action of the sea, were pointed out by the Engineer, and the best method of protecting the foreshore discussed at length.

Resolved unanimously that, subject to the approval of Government, the revetment be made up to its original section, from Masulah Boat Bay northward to Cassimode, as proposed by the Board's Engineer; but that south of Masulah Boat Bay it be allowed to remain in its present condition, except in respect of such additions as may be needed to bring a narrow-gauge line of railway along it. Resolved further, that in anticipation of the sanction of Government the Engineer be authorised to at once procure sleepers, rails and fish-bolts and proceed with the extension of the narrow-gauge line from its present termination immediately north of Clive's Battery.

* * * * * *

(True Extract.)

(Signed) C. PINSENT,
Secretary, Harbour Trust Board.

Approved as modified and transferred to the Public Works Department for the early issue of the necessary orders.

(By Order.)

(Signed) A. G. CARDEW,
Under-Secretary.

2nd January 1890.

Note by the Acting Chief Engineer, P.W.D., General Buildings and Roads Branch.

The proposals made by the Harbour Trust Board for reforming the sea wall appear to be the best under the circumstances, and immediate measures should, I think, be adopted for carrying them out. A rubble wall of the sections and slopes provided in the estimate will necessarily flatten out unless the outer toe of the sea slope is in some measure prevented from moving. Where feasible it would be advisable to connect the old with the new work by means of short piles not less than 8 inches in diameter and, say, 6 feet in length, placed 3 feet apart and embedded in the old work to the depth of 4 feet, the heads of these piles being tied together by a longitudinal waling piece.

2. To protect the accretion of sand which is expected to form in the bay to the north of the sea wall from being washed away in subsequent seasons I should like to see what the effect would be of monoliths built *in situ* of the Greenway form of floating breakwater. This breakwater is the patented invention of the late Mr. E. C. Greenway Thomas of the Madras Civil Service and monoliths of the above form built at certain intervals along the face of a shore under process of erodation have been advocated by the patentee for adoption as calculated to have the same effect in securing such quiet water behind them as he considered would result from the use of his floating breakwater.

CHEPÂK,
7th January 1890.
(Signed) R. R. E. DRAKE-BROCKMAN, Lt.-Col., R.E.,
Ag. Chief Engineer, P.W.D., General
Buildings and Roads Branch.

ORDER—dated 9th January 1890, No. 54 W., Public Works.

The estimate, amounting to Rs. 43,773, as modified by the Harbour Trust Board, for restoring the revetment to the north of the Madras Harbour, is sanctioned.

2. The note by the Chief Engineer, Public Works Department, above recorded, will be communicated to the Harbour Trust Board for consideration.

(True Extract.)

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

To the Chairman, Madras Harbour Trust Board,
with six enclosures.
" Marine Department.

Exd. J. Moses
Spare Copies

54/3

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1890} Madras.

PUBLIC WORKS.

Dated January, 9th.

Recd.

Encl.

G.O., 9th Jan. 1890, No. 54 W.

JANUARY.

Madras Harbour

Estimate for restoring the revetment to the north of the —, sanctioned, and note by the Chief Engineer, Public Works Department, on the work, communicated to the Harbour Trust Board.

C. No. 1278

Harbour Trust Board Office.

1 P

MADRAS, 21st December 1889.
Despatched 24th Dec

No. 4819

57/

FROM

Geo: McWatters Esquire M. A. C.

CHAIRMAN, HARBOUR TRUST BOARD,
MADRAS,

TO

The Honorable J. F. Price C. S.

CHIEF SECRETARY TO GOVERNMENT,
Marine Department.

Sir

I have the honor to submit herewith for the information and orders of Government Copy of letter from the Boards Engineer No. 1095 dated 9th instant, furnishing information regarding the state of the foreshore and stone revetment North of the Harbour; also extract of proceedings and resolution passed thereon by the Trustees last evening, who then visited and walked along the revetment. I also forward the estimate submitted by the Boards' Engineer; with plan and tracing in duplicate.

2. The estimate it will be observe

is for restoring the revetment throughout its whole length, but the Trustees are of opinion that it will be sufficient for the present to repair only that portion of it from Masulah Boat Bay northward, as from the Bay Southward it is apparently in very much better Condition.

3. The estimate will therefore be modified as follows:

Total	Rs 62,139
Deduct estimated Cost of remaking revetment from Royapooram Station to Masulah Boat Bay	" 28,366
	33,773
Add for Cost of making up Southern portion of revetment sufficiently to enable the line of Railway to be taken along it.	10,000
	Rs 43,773

With regard to the item of Rs 10000/- inserted above it is merely approximate, and the Engineer will submit an estimate at an early date.

4. In anticipation of the sanction of Government the Trustees have authorised their Engineer to at-
[o]nce procure Sleepers, rails and

fish plates &c for laying a line of narrow gauge railway; as sand is now being deposited by the Southerly Current which carrys the sand along with it from the North. This Current and the North East monsoon may be expected to cease in February 1890, when the deposit of Sand will have attained its maximum for the season, and should be at once secured by the restoration of the revetment; and it is essential, should orders be given to proceed with the work as proposed, that the Engineer should be ready to make an immediate start; while should other means be adopted for securing the foreshore the material purchased can be used for the Pallavaram quarry lines and beach improvements.

G/5

5. Referring to para 2 of the Engineers' letter he appears to be in error in stating that the property threatened with destruction by the sea during the next South West monsoon belongs to Government; it Consists of private property situate in Royapooram and upon the West side of Ghouse

Mohidee

Mohideen Pettah Street Cassimode; for which claims will arise unless some means are taken to protect it. It will be within the recollection of Government that the Cost of the revetment aggregated Rs 2,40,314 /// – while the sum of Rs 3,00,959 /// was paid in Compensation.

Vide mem attached

6. The claims likely to arise for damage to property are an unknown quantity; but, unless the foreshore is protected, will probably ultimately extend to the Madras Railway Company General Stores and Royapooram Terminus, as it would appear to be only a matter of time for the present revetment to be entirely washed away unless maintained in efficient repair. In this Connection I would remark that South of the Masulah Boat Bay the rubble appears to be settling down to a natural and permanent slope: but at the extreme North, the sea has attacked and completely washed away the end of the revetment, and in its present condition there appears reason to

to expect that the whole length will similarly in time be gradually dispersed altogether, when the destruction of property hitherto protected by it will follow as a matter of course.

7. It therefore appears to the Trustees that to promptly restore the rubble to its original section at the northern portion, and afterwards to adopt some means of protecting the end is the most economical course to pursue, indeed is the only one open.

8. I am therefore to request that very early orders may be issued, as unless the sand which is now accumulating be secured as far as practicable at the end of the present North East monsoon, and further erosion prevented, heavy claims for damage to property at Cassimode are likely to arise before the close of the North East monsoon of 1890-91; by which time also the Cost of restoring the revetment would be considerably enhanced by reason

of its continued depletion.

I have the honor to be
Sir
Your most obedient servant

P.Sec

Lindwatters
Chairman
Harbour Trust Board.

E
Pd 10/

54
7

Endorsement: — 4 P

2d January '90

H.M.

Ms plan

Approved as modified and transferred to the Public Works Dept for the early issue of the necessary orders.

/ By order /

A. G. Cardew

Under Secretary.

F.D.B.
30.xii.89

C. 31/12

7-1-90

P.W.C. No. 10

MARINE DEPARTMENT.

C. No. 1278

FROM

THE CHAIRMAN,
HARBOUR TRUST BOARD,
MADRAS.

TO

THE CHIEF SECRETARY TO GOVERNMENT,
Marine Department.

Fort Saint George

CHIEF SECRETARY
24 DEC 89
GOVERNMENT OF MADRAS

DATED 21st
Desp 24th } December 1889.
RECEIVED
Regd 27/12

R 6-1-90

ENCLOSURE 3 (including 4 plans)

4819

No.

Recd 30/xii. 7 B.

SUBJECT.

Submitting for the information and orders of Government the Board's Engineers' letter and resolution passed thereon and also the estimate regarding the state of the foreshore and stone revetment North of the Harbour

Transferred.

No. 1095 Enclosure 5 P

From

The Engineer
Harbour Trust Board
Madras

To

The Chairman
Harbour Trust Board

Madras 9th December 1889

Sir,

In reply to your letter No. 4210 dated, 13th November 1889, I now have the honor to furnish the information therein called for.

(a and b) The Plan (tracing in triplicate) shows the extent of sand eroded and accreted during the years 1886, 1887 and 1888, also the present (November 1889) position of the shore line. The positions each year before 1886 have not been given for fear of confusing the plan, but the original shore line (that of 1876) has been given. The encroachment of the sea was similar from that date and position to the position shown for 1886 to what it has been since. A separate plan showing the comparative positions of high water mark each year immediately before the commencement of the N.E. monsoon is not sent, as that information is given in the present one

(C)

(C) The work of protecting the foreshore was commenced as far back as the year 1878 when Rs 7865 was spent upon it and there has been a steady outlay upon it ever since. The total Cost up to date being Rs 3,02,608 of this Rs 67,515 has been paid in Compensation for houses and land.

The greatest expenditure was in the year 1882-83 when Rs 98,178 was spent in protective works and Rs 52,181 paid in Compensation.

2 The plan of protection at first adopted was one recommended by Mr Parkes. It Consisted of rubble stone groynes running into the Sea at right angles to the Shore, these averaged 100 feet in length, were about 10 feet wide at the top and 8 feet above De Havilland's mean Sea level and had Slopes of 1½ to 1, and were placed from 300 to 400 ft apart. These groynes proved a failure. The Sea washed the Stone ashore, and the beach became lined with it. The plan then adopted was that of running a rubble stone revetment along the Shore line (per plan and Sections enclosed) thus utilizing the Stone already cast there from the groynes by the Sea. This revetment was 20 feet wide at the top, which was 11 feet above De Havilland's mean Sea level

an

and had Slopes of 1½ to 1. The present Condition of the revetment is too low to prevent the waves from washing in land, and to neglect making it up to the required height, will mean a heavy outlay next year to purchase valuable Government land and houses which the Sea must encroach upon early next Season - hence my reason for framing the estimate given below in para (e).

(d) Mr Thorowgood does not appear to have left on record, any proposals or suggestions for protecting the Coast line.

(e) The cause of the present erosion is due to the revetment having Considerably settled, and flattened out Seawards, (as shown in the Sections in neutral tint) So much so that the waves wash over it, and draw the sand in Shore through the rubble and when this backing has been washed through, the rubble has flattened down with every wave.

3 In my opinion the only plan is to repair the existing protection by raising the revetment to the former 11 feet above De Havilland's mean Sea level as soon as all the accretion of sand has taken place, which will mean commencing to deposit stone by the end of February next at latest,

and

and the probable cost will be Rs 62,139/- as per my estimate accompanying this letter. If no action is taken to repair the revetment this February, much valuable land belonging to Government will have to be purchased, which next year will undoubtedly be washed away; whereas the sanction to the present estimated outlay will be the only means of showing a saving in the cost of the Harbour of Madras. It is for the Trustees to decide at once, what action they will take as there is not time to refer the matter home for sanction. The work must be commenced about the middle of February and it will take me all my time to procure the necessary railway materials and get the line of Railway laid to commence the required protection by them.

It has long since been my wish to call the Trustees attention to this erosion at Cassimode, but as I was unable to place the present Estimate before them without first securing accurate levels and sections of the existing revetment (to base my estimate upon) I have been obliged to delay calling attention to the matter until the sea was quiet quite enough to allow of the Sections being taken.

4. The Estimate now furnished gives (a) the cost of the necessary Railway lines to convey the Stone to Cassimode and (b) outlay to secure the quantity of sand which will have accreted by the end of February and the totals of these items viz Rs 40,847/- represents the required immediate outlay to prevent further erosion next season, or until the matter has been referred home to Sir A. Rendell as proposed. (c) gives cost of repairing the revetment to ensure safety to the Roadway, Bidew Home, and Carlton House.

The platelaying will have to be commenced at once and I propose to use the narrow gauge system and purchase second hand rails from the South Indian Railway hauling the Stone with the narrow gauge Engine now on hire. The sleepers would have to be ordered at once to complete the required quantity and to replace the Harbour works stock, I propose to draw upon:

I have &c.

(Sd) A. Lee Pogson.

Engineer, Harbour Trust Board

(True copy)

Offg. C. Arbuthnot

Secretary, Harbour Trust Bd

Mar 1278/1 of 89

EXTRACT of Proceedings of the TRUSTEES OF THE HARBOUR OF MADRAS, at a Meeting held at the Offices of the Board on Friday the 20th day of December 1889. G 8/11

× × ×

7. Read again letter from the Board's Engineer, No. 1095 dated 9th December 1889, furnishing particulars regarding the erosion of the sea at Cassimode, called for in their resolution No. 9 of 8th November 1889.

Read minutes by Captain W. L. C. Baddeley R.E., Captain H. A. Street H.M's I.M., Messrs. Cowasjee Eduljee Panday, S. R. Turnbull, Mirza Mehdy Ispahani and M. Varadarajalu Chetty.

The Trustees accompanied by their Secretary and Engineer visited the revetment north of the Harbour and examined the present condition of the same, from the point marked A at Royapuram to the point J at Cassimode (vide plan accompanying the Engineer's letter). The original dimensions, positions and extent of the revetment, as also the positions of the groynes previously constructed, but which had been washed away by the

action

action of the sea, were pointed out by the Engineer, and the best method of protecting the foreshore discussed at length.

Resolved unanimously, that subject to the approval of Government, the revetment be made up to its original section, from Masulah Boat Bay Northward to Cassimode as proposed by the Board's Engineer; but that South of Masulah Boat Bay it be allowed to remain in its present condition, except in respect of such additions as may be needed to bring a narrow gauge line of railway along it. Resolved further, that in anticipation of the Sanction of Government the Engineer be authorised to at once procure sleepers, rails and fish bolts and proceed with the extension of the narrow gauge line from its present termination immediately North of Clive's Battery.

× × ×

(True Extract)

Secretary

Harbour Trust Board

Mar 1278/2 of 89

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9 P

Note by the Actg. Chief Engineer P.W. Department d/ 7th January 1890.

Letter from the Chairman Harbour Trust Board, Madras No. 4819 d/ 21st December 1889.

9/1

The proposals made by the Harbour Trust Board for reforming the sea wall appear to be the best under the circumstances, and immediate measures should I think be adopted for carrying them out. A rubble wall of the sections and slopes provided in the estimate will necessarily flatten out unless the outer toe of the sea slope is in some measure prevented from moving. Where feasible it would be advisable to connect the old with the new work by means of short piles not less than 8" in diameter and say 6' in length, placed 3' apart and imbedded in the old work wood to the depth of 4', the heads of these piles being tied together by a longitudinal waling piece.

2. To protect the accretion of sand which is expected to form in the bay to the north of the sea wall from being washed away in subsequent [illegible] I should like to see what the effect would be of monoliths built *in situ* of the Greenway form of floating breakwater. This breakwater is the patented invention of the late Mr. E.C. Greenway Thomas of the Madras Civil Service and monoliths of the above form built at certain intervals along the face of a shore under process of erodation have been advocated by the patentee for adoption as calculated to have the same effect in securing such quiet water behind them as he considered would result from the use of his floating breakwater.

Lt. Col. R.E.
Ag. Chief Engr. P.W.D.
Genl. Buildings & Roads Br.

P. W. DEPARTMENT.

READ the following:—

Letter from the Chairman Harbour Trust Board Madras No. 4819 dated 21st December 1889.

Note by the Ag. Chief Engineer P.W. Department dated January 1890.

FOR ORDERS.

Lt. Col. R.E.
Ag. Jt. Secy. to Govt.
P.W.D.

The Estimate should be sanctioned by Govt. & the Chief Engineer's note comd. to the H.T. Bd.

The work clearly falls under sec 61 (b) & the sanction of Govt. is required under sec 64 Act II of 1886.

8 Jan

To protect the accretio
of sand which is expecte
to form in the bay to the north
of the sea wall, from bein
washed away in subseque
seasons, I should like to
see what the effect woul
be of for the monoliths
built in situ of the Green
form of floating breakwa
This breakwater is the pat
invention of the late
Mr E. C. Greenway Thomas
of the Madras Civil Serv
and ~~his~~ monoliths of the above form, buil
at certain intervals at
the face of an exposed
under process of erosion
has been ~~was~~ advocated by the
patentee for adoption as
calculated to have the
same effect in securing
quiet water behind
them as he considered
would ~~be the case~~ resul
from the use of his float
breakwater. —

Rueds
6.1.90.

9/1/90

H.M. 7-1-90 R. 8-1-90

B & R
Works

No 54

57/16

A

Draft order with enclos.

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

9th January 1890

READ the following

Letter from the Chairman Harbour Trust Board Madras No. 4819 dated 21st December 1889.

Endorsement thereon by the Marine Department dated 2nd January 1890

Note by the Ag. Chief Engineer P. W. Department dated 7 January 1890.

10 P

The estimate amounting to Rs 43,773, as modified by the Harbour Trust Board, for restoring the revetment to the North of the Madras Harbour is sanctioned.

2. The note by the Chief Engineer P. W. Department above recorded will be communicated to the Harbour Trust Board for consideration.

Rueds
8-1-90

WCR
9.1.90

CM

To
The Chairman
M. H. T. Board
with 6 enclos: } 9/1/90

" Marine Dept. } 23/1/90

Ins- printed then to record.

Govt. of 18 Madras.

PUBLIC WORKS.

Dated 11/1/90

Recd.

Encl.

G.O. 9 Jan 1890 No. ~~52 W~~
54

Madras Harbour
=

Est for restoring the revetment to the North of the ——, sanctioned, & note by the Ch Engr, on dept on the work, comd to the Harbour Trust Board

6a/2

Ia 10/1/90

(1) பக்கங்களின் எண்ணிக்கை 34

(2) புதுக்கித் திருப்பிய நாள் 23-3-89

(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம்

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

பொதுபணித் துறை

அரசாணை எண். 54(W)
மு. கோப்புத் தாள் எண்.

அச்சகம்
பலவகை

நாள் : 9-1-1890

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

ஒரி

ஆவண, கா-1—18,008—15-6-87.

54/1

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

Read—the following papers :—

From G. McWATTERS, Esq., M.A., C.S., Chairman, Harbour Trust Board, to the Chief Secretary to Government, Marine Department, dated Madras, 21st December 1889, No. 4819.

I have the honor to submit herewith, for the information and orders of Government, copy of letter from the Board's Engineer, No. 1095, dated 9th instant, furnishing information regarding the state of the foreshore and stone revetment north of the Harbour; also extract of proceedings and resolution passed thereon by the trustees last evening, who then visited and walked along the revetment. I also forward the estimate submitted by the Board's Engineer, with plan and tracing in duplicate.

2. The estimate it will be observed is for restoring the revetment throughout its whole length, but the trustees are of opinion that it will be sufficient for the present to repair only that portion of it from Masulah Boat Bay northward, as from the bay southward it is apparently in very much better condition.

3. The estimate will therefore be modified as follows :—

	RS.
Total	62,139
Deduct estimated cost of remaking revetment from Ráyapuram station to Masulah Boat Bay	28,366
	33,773
Add for cost of making up southern portion of revetment sufficiently to enable the line of railway to be taken along it	10,000
Total ...	43,773

With regard to the item of Rs. 10,000 inserted above it is merely approximate, and the Engineer will submit an estimate at an early date.

4. In anticipation of the sanction of Government the trustees have authorised their Engineer to at once procure sleepers, rails and fish-plates, &c., for laying a line of narrow-gauge railway, as sand is now being deposited by the southerly current which carries the sand along with it from the north. This current and the north-east monsoon may be expected to cease in February 1890, when the deposit of sand will have attained its maximum for the season, and should be at once secured by the restoration of the revetment; and it is essential, should orders be given to proceed with the work as proposed, that the Engineer should be ready to make an immediate start; while, should other means be adopted for securing the foreshore, the material purchased can be used for the Pallávaram quarry lines and beach improvements.

5. Referring to para. 2 of the Engineer's letter, he appears to be in error in stating that the property threatened with destruction by the sea during the next south-west monsoon belongs to Government; it consists of private property situate in Ráyapuram and upon the west side of Ghouse Mohideen Pettah Street, Cassimode, for which claims will arise unless some means are taken to protect it. It will be within the recollection of Government that the cost of the revetment aggregated Rs. 2,40,314 (*vide* memorandum attached), while the sum of Rs. 3,00,959 was paid in compensation.

6. The claims likely to arise for damage to property are an unknown quantity; but, unless the foreshore is protected, will probably ultimately extend to the Madras Railway Company General Stores and Ráyapuram Terminus, as it would appear to be only a matter of time for the present revetment to be entirely washed away unless maintained in efficient repair. In this connection I would remark that south of the Masulah Boat Bay the rubble appears to be settling down to a natural and permanent slope; but at the extreme north, the sea has attacked and completely washed away the *end* of the revetment, and in its present condition there appears reason to expect that the whole length will similarly in time be gradually dispersed altogether, when the destruction of property hitherto protected by it will follow as a matter of course.

7. It therefore appears to the trustees that to promptly restore the rubble to its original section at the northern portion, and afterwards to adopt some means of protecting the end, is the most economical course to pursue, indeed is the only one open.

8. I am therefore to request that very early orders may be issued, as unless the sand which is now accumulating be secured as far as practicable at the end of the present north-east monsoon, and further erosion prevented, heavy claims for damage to property at Cassimode are likely to arise before the close of the north-east monsoon of 1890-91; by which time also the cost of restoring the revetment would be considerably enhanced by reason of its continued depletion.

ENCLOSURES.

From A. L. POGSON, Esq., Engineer, Harbour Trust Board, to the Chairman, Harbour Trust Board, dated Madras, 9th December 1889, No. 1095.

In reply to your letter No. 4210, dated 13th November 1889, I now have the honor to furnish the information therein called for.

(*a*) and (*b*). The plan (tracing in triplicate) shows the extent of sand eroded and accreted during the years 1886, 1887 and 1888, also the present (November 1889) position of the shore line. The positions each year before 1886 have not been given for fear of confusing the plan, but the original shore line (that of 1876) has been given. The encroachment of the sea was similar from that date and position to the position shown for 1886 to what it has been since. A separate plan showing the comparative positions of high water mark each year immediately before the commencement of the north-east monsoon is not sent, as that information is given in the present one.

(*c*). The work of protecting the foreshore was commenced as far back as the year 1878, when Rs. 7,865 was spent upon it, and there has been a steady outlay upon it ever since. The total cost up to date being Rs. 3,02,608, of this Rs. 67,515 has been paid in compensation for houses and land.

The greatest expenditure was in the year 1882-83, when Rs. 98,178 was spent in protective works and Rs. 52,181 paid in compensation.

2. The plan of protection at first adopted was one recommended by Mr. Parkes. It consisted of rubble stone groynes running into the sea at right angles to the shore; these averaged 100 feet in length, were about 10 feet wide at the top and 8 feet above DeHavilland's mean sea level and had slopes of 1½ to 1, and were placed from 300 to 400 feet apart. These groynes proved a failure. The sea washed the stone ashore, and the beach became lined with it. The plan then adopted was that of running a rubble stone revetment along the shore line (per plan and sections enclosed), thus utilizing the stone already cast there from the groynes by the sea. This revetment was 20 feet wide at the top, which was 11 feet above DeHavilland's mean sea level, and had slopes of 1½ to 1. The present condition of the revetment is too low to prevent the waves from washing in land, and to neglect making it up to the required height will mean a heavy outlay next year to purchase valuable Government land and houses which the sea must encroach upon early next season; hence my reason for framing the estimate given below in para. (*e*).

(*d*). Mr. Thorowgood does not appear to have left on record any proposals or suggestions for protecting the coast line.

(*e*). The cause of the present erosion is due to the revetment having considerably settled, and flattened out seawards (as shown in the sections in neutral tint), so much so that the waves wash over it and draw the sand in shore through the rubble, and when this backing has been washed through, the rubble has flattened down with every wave.

3. In my opinion the only plan is to repair the existing protection by raising the revetment to the former 11 feet above DeHavilland's mean sea level as soon as all the accretion of sand has taken place, which will mean commencing to deposit stone by the end of February next at latest, and the probable cost will be Rs. 62,139 as per my estimate accompanying this letter. If no action is taken to repair the revetment this February, much valuable land belonging to Government will have to be purchased, which next year will undoubtedly be washed away, whereas the sanction to the present estimated outlay will be the only means of showing a saving in the cost of the Harbour of Madras. It is for the trustees to decide at once what action they will take, as there is not time to refer the matter home for sanction. The work must be commenced about the middle of February, and it will take me all my time to procure the necessary railway materials and get the line of railway laid to commence the required protection by then.

It has long since been my wish to call the trustees' attention to this erosion at Cassimode, but as I was unable to place the present estimate before them without first securing accurate levels and sections of the existing revetment (to base my estimate upon), I have been obliged to delay calling attention to the matter until the sea was quiet enough to allow of the sections being taken.

4. The estimate now furnished gives (*a*) the cost of the necessary railway lines to convey the stone to Cassimode, and (*b*) outlay to secure the quantity of sand which will have accreted by the end of February, and the totals of these items, viz., Rs. 40,847, represents the required immediate outlay to prevent further erosion next season, or until the matter has been referred home to Sir A. Rendell as proposed; (*c*) gives cost of repairing the revetment to ensure safety to the roadway, Biden Home, and Carlton House.

The plate-laying will have to be commenced at once, and I propose to use the narrow-gauge system and purchase second-hand rails from the South Indian Railway hauling the stone with the narrow-gauge engine now on hire. The sleepers would have to be ordered at once to complete the required quantity and to replace the Harbour Works stock; I propose to draw up one.

EXTRACT of Proceedings of the Trustees of the Harbour of Madras at a Meeting held at the Offices of the Board on Friday the 20th day of December 1889.

* * * * * *

7. Read again letter from the Board's Engineer, No. 1095, dated 9th December 1889, furnishing particulars regarding the erosion of the sea at Cassimode, called for in their resolution No. 9 of 8th November 1889.

Read minutes by Captain W. L. C. Baddeley, R.E., Captain H. A. Street, H M's.I.M., Messrs. Cowasjee Eduljee Panday, S. R. Turnbull, Mirza Mehdy Ispahani and M. Varadarajaloo Chetty.

The Trustees, accompanied by their Secretary and Engineer, visited the revetment north of the Harbour and examined the present condition of the same, from the point marked A at Ráyapuram to the point J at Cassimode (*vide* plan accompanying the Engineer's letter). The original dimensions, positions and extent of the revetment, as also the positions of the groynes previously constructed, but which had been washed away by the action of the sea, were pointed out by the Engineer, and the best method of protecting the foreshore discussed at length.

Resolved unanimously that, subject to the approval of Government, the revetment be made up to its original section, from Masulah Boat Bay northward to Cassimode, as proposed by the Board's Engineer; but that south of Masulah Boat Bay it be allowed to remain in its present condition, except in respect of such additions as may be needed to bring a narrow-gauge line of railway along it. Resolved further, that in anticipation of the sanction of Government the Engineer be authorised to at once procure sleepers, rails and fish-bolts and proceed with the extension of the narrow-gauge line from its present termination immediately north of Clive's Battery.

* * * * * *

(True Extract.)

(Signed) C. PINSENT,
Secretary, Harbour Trust Board.

Approved as modified and transferred to the Public Works Department for the early issue of the necessary orders.

(By Order.)

(Signed) A. G. CARDEW,
Under-Secretary.

2nd January 1890.

Note by the Acting Chief Engineer, P.W.D., General Buildings and Roads Branch.

The proposals made by the Harbour Trust Board for reforming the sea wall appear to be the best under the circumstances, and immediate measures should, I think, be adopted for carrying them out. A rubble wall of the sections and slopes provided in the estimate will necessarily flatten out unless the outer toe of the sea slope is in some measure prevented from moving. Where feasible it would be advisable to connect the old with the new work by means of short piles not less than 8 inches in diameter and, say, 6 feet in length, placed 3 feet apart and embedded in the old work to the depth of 4 feet, the heads of these piles being tied together by a longitudinal waling piece.

2. To protect the accretion of sand which is expected to form in the bay to the north of the sea wall from being washed away in subsequent seasons I should like to see what the effect would be of monoliths built *in situ* of the Greenway form of floating breakwater. This breakwater is the patented invention of the late Mr. E. C. Greenway Thomas of the Madras Civil Service and monoliths of the above form built at certain intervals along the face of a shore under process of erodation have been advocated by the patentee for adoption as calculated to have the same effect in securing such quiet water behind them as he considered would result from the use of his floating breakwater.

CHEPÂK, (Signed) R. R. E. DRAKE-BROCKMAN, Lt.-Col., R.E.,
7th January 1890. Ag. Chief Engineer, P.W.D., General
Buildings and Roads Branch.

ORDER—dated 9th January 1890, No. 54 W., Public Works.

The estimate, amounting to Rs. 43,773, as modified by the Harbour Trust Board, for restoring the revetment to the north of the Madras Harbour, is sanctioned.

2. The note by the Chief Engineer, Public Works Department, above recorded, will be communicated to the Harbour Trust Board for consideration.

(True Extract.)

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

To the Chairman, Madras Harbour Trust Board,
with six enclosures.
„ Marine Department.

Exd. J. Moses
Spare Copies

54/3

BUILDINGS AND ROADS.
CIVIL WORKS.

Govt. of {1890} Madras.

PUBLIC WORKS.

Dated January, 9th.

Recd.

Encl.

G.O., 9th Jan. 1890, No. 54 W.

JANUARY.

Madras Harbour

Estimate for restoring the revetment to the north of the —, sanctioned, and note by the Chief Engineer, Public Works Department, on the work, communicated to the Harbour Trust Board.

C. No. 1278

Harbour Trust Board Office.

1P

MADRAS, 21st December 1889.
Despatched 24th Dec

No. 4819

57/

FROM

Geo: McWatters Esquire M.A. C.S

CHAIRMAN, HARBOUR TRUST BOARD,
MADRAS,

TO

The Honorable J. F. Price C.S.

CHIEF SECRETARY TO GOVERNMENT,
Marine Department.

Sir

I have the honor to submit herewith for the information and orders of Government Copy of letter from the Boards Engineer No. 1095 dated 9th instant, furnishing information regarding the state of the foreshore and stone revetment North of the Harbour; also extract of proceedings and resolution passed thereon by the Trustees last evening, who then visited and walked along the revetment. I also forward the estimate submitted by the Boards' Engineer; with plan and tracing in duplicate.

2. The estimate it will be observe

is for restoring the revetment throughout its whole length, but the Trustees are of opinion that it will be sufficient for the present to repair only that portion of it from the Masulah Boat Bay Northward, as from the Bay Southward it is apparently in very much better Condition.

3. The estimate will therefore be modified as follows:

Total	Rs 62,139
Deduct estimated Cost of remaking revetment from Royapooram Station to Masulah Boat Bay	" 28,366
	33,773
Add for cost of making up Southern portion of revetment sufficiently to enable the line of Railway to be taken along it.	10,000
	Rs 43,773

With regard to the item of Rs 10000/- inserted above it is merely approximate, and the Engineer will submit an estimate at an early date.

4. In anticipation of the sanction of Government the Trustees have authorised their Engineer to at-
-ce procure sleepers, rails and

28

fish plates &c for laying a line of narrow gauge railway; as sand is now being deposited by the Southerly Current which carrys the sand along with it from the North. This current and the North East monsoon may be expected to cease in February 1890, when the deposit of sand will have attained its maximum for the season, and

G/S should be at once secured by the restoration of the revetment; and it is essential, should orders be given to proceed with the work as proposed, that the Engineer should be ready to make an immediate start; while should other means be adopted for securing the foreshore the material purchased can be used for the Pallaveram quarry lines and beach improvements.

5. Referring to para 2 of the Engineers' letter he appears to be in error in stating that the property threatened with destruction by the sea during the next South West monsoon belongs to Government; it consists of private property situate in Royapooram and upon the West side of Ghouse

Mohidee

Mohideen Pettah Street Cassimode; for which claims will arise unless some means are taken to protect it. It will be within the recollection of Government that the Cost of the revetment aggregated Rs 2,40,314 ### while the sum of Rs 3,00,959 ### was paid in Compensation.

Vide mem attached

6. The claims likely to arise for damage to property are an unknown quantity; but, unless the foreshore is protected, will probably ultimately extend to the Madras Railway Company General Stores and Royapooram Terminus, as it would appear to be only a matter of time for the present revetment to be entirely washed away unless maintained in efficient repair. In this Connection I would remark that South of the Masulah Boat Bay the rubble appears to be settling down to a natural and permanent slope: but at the extreme North, the sea has attacked and completely washed away the end of the revetment, and in its present condition there appears reason to

to expect that the whole length will similarly in time be gradually dispersed altogether, when the destruction of property hitherto protected by it will follow as a matter of Course.

5%

7. It therefore appears to the Trustees that to promptly restore the rubble to its original Section at the Northern portion, and afterwards to adopt some means of protecting the end is the most economical Course to pursue, indeed is the only one open.

8. I am therefore to request that very early orders may be issued, as unless the sand which is now accumulating be secured as far as practicable at the end of the present North East monsoon, and further erosion prevented, heavy claims for damage to property at Cassimode are likely to arise before the close of the North East monsoon of 1890-91; by which time also the Cost of restoring the revetment would be considerably enhanced by reason

of its continued depletion.

I have the honor to be
Sir
Your most obedient servant

P. Sec

Lindwatters
Chairman
Harbour Trust Board.

E/
PH 10/

54
/7

Endorsement: 4P

2d January '90.

A.W.

Ms
Plan

Approved as modified
and transferred to
the Public Works Dept
for the early issue of
the necessary orders.

(By order)

A. G. Cardew
Under Secretary.

F.D.B.
30.XII.89

C. 31/12

7-1-90

P.W.C. No. 10

MARINE DEPARTMENT.

C. No. 1278

FROM

THE CHAIRMAN,
HARBOUR TRUST BOARD,
MADRAS.

TO

THE CHIEF SECRETARY TO GOVERNMENT,
Marine Department.

Fort Saint George

CHIEF SECRETARY
24 DEC 89
GOVERNMENT OF MADRAS

DATED 21st
Despd 24th December 1889.
Rd 5.1.90

RECEIVED Regd 27/12

ENCLOSURE [illegible] (including 4 plans)
4 8/9

No.

[illegible]

Recd 30/XII. 7B.

SUBJECT.

Submitting for the information and orders of Government the Board's Engineers' letter and resolution passed thereon, and also the estimate regarding the state of the foreshore and stone revetment North of the Harbour.

Transferred.

No. 1095 Enclosure

5 P.

From

The Engineer
Harbour Trust Board
Madras

To

The Chairman
Harbour Trust Board

Madras 9th December 1889

Sir,

In reply to your letter No. 4210 dated, 13th November 1889, I now have the honor to furnish the information therein called for.

(a and b) The Plan (tracing in triplicate) shows the extent of sand eroded and accreted during the years 1886, 1887 and 1888, also the present (November 1889) position of the shore line. The positions each year before 1886 have not been given for fear of confusing the plan, but the original shore line (that of 1876) has been given. The encroachment of the sea was similar from that date and position to the position shown for 1886 to what it has been since. A separate plan showing the comparative positions of high water mark each year immediately before the commencement of the N.E. monsoon is not sent, as that information is given in the present one.

(C)

(C) The work of protecting the foreshore was commenced as far back as the year 1878 when Rs 7865 was spent upon it and there has been a steady outlay upon it ever since. The total cost up to date being Rs 302,608 of this Rs 67515 has been paid in compensation for houses and land.

The greatest expenditure was in the year 1882-83 when Rs 98,178 was spent in protective works and Rs 52,181 paid in compensation.

2 The plan of protection at first adopted was one recommended by Mr Parkes. It consisted of rubble stone groynes running into the Sea at right angles to the Shore, these averaged 100 feet in length, were about 10 feet wide at the top and 8 feet above De Havilland's mean Sea level and had slopes of 1½ to 1, and were placed from 300 to 400 ft apart. These groynes proved a failure. The Sea washed the Stone ashore, and the beach became lined with it. The plan then adopted was that of running a rubble stone revetment along the shore line (per plan and sections enclosed) thus utilizing the stone already cast there from the groynes by the Sea. This revetment was 20 feet wide at the top, which was 11 feet above De Havilland's mean Sea level

an

and had slopes of 1½ to 1. The present condition of the revetment is too low to prevent the waves from washing in land, and to neglect making it up to the required height, will mean a heavy outlay next year to purchase valuable Government land and houses which the Sea must encroach upon early next season - hence my reason for framing the estimate given below in para (e).

(d) Mr. Thorowgood does not appear to have left on record, any proposals or suggestions for protecting the Coast line.

(e) The cause of the present erosion is due to the revetment having considerably settled, and flattened out seawards, (as shown in the sections in neutral tint) so much so that the waves wash over it, and draw the sand in shore through the rubble and when this backing has been washed through, the rubble has flattened down with every wave.

3 In my opinion the only plan is to repair the existing protection by raising the revetment to the former 11 feet above De Havilland's mean Sea level as soon as all the accretion of sand has taken place, which will mean commencing to deposit stone by the end of February next at latest,

and

And the probable Cost will be Rs 62,139/- as per my estimate accompanying this letter. If no action is taken to repair the revetment this February, much valuable land belonging to Government will have to be purchased, which next year will undoubtedly be washed away; whereas the sanction to the present estimated outlay will be the only means of showing a saving in the Cost of the Harbour of Madras. It is for the Trustees to decide at once, what action they will take as there is not time to refer the matter home for sanction. The work must be commenced about the middle of February and it will take me all my time to procure the necessary railway materials and get the line of Railway laid to commence the required protection by them.

It has long since been my wish to call the Trustees attention to this erosion at Cassimode, but as I was unable to place the present Estimate before them without first securing accurate levels and sections of the existing revetment (to base my estimate upon) I have been obliged to delay calling attention to the matter until the sea was quite quiet enough to allow of the Sections being taken.

4. The Estimate now furnished gives (a) the cost of the necessary Railway lines to convey the Stone to Cassimode and (b) outlay to secure the quantity of Sand which will have accreted by the end of February and the totals of these items viz Rs 40,847/- represents the required immediate outlay to prevent further erosion next season, or until the matter has been referred home to Sir A. Rendell as proposed. (c) gives cost of repairing the revetment to ensure safety to the Roadway, Bidew Home, and Carlton House.

The platelaying will have to be commenced at once and I propose to use the narrow nanon gauge system and purchase second hand rails from the South Indian Railway hauling the stone with the narrow gauge Engine now on hire. The sleepers would have to be ordered at once to complete the required quantity and to replace the Harbour works stock, I propose to draw up on upon.

I have &c.

(Sd) A. Lee Pogson.

Engineer, Harbour Trust Board

(True copy)

C. Arbuthnot

Secretary, Harbour Trust Bd

Mar 1278/1 of 89

EXTRACT of Proceedings of the TRUSTEES OF THE HARBOUR OF MADRAS, at a Meeting held at the Offices of the Board on Friday the 20th day of December 1889.

× × ×

7. Read again letter from the Board's Engineer, No 1095 dated 9th December 1889, furnishing particulars regarding the erosion of the Sea at Cassimode, called for in their resolution No 9 of 8th November 1889.

Read minutes by Captain W. L. C. Baddeley R.E., Captain H. A. Street H.M.S. I.a., Messrs Cowasjee Eduljee Panday, S. R. Turnbull, Mirza Mehdy Ispahani and M. Varadarajalos Chetty.

The Trustees accompanied by their Secretary and Engineer visited the revetment north of the Harbour and examined the present condition of the same, from the point marked A at Royapuram to the point J at Cassimode (vide plan accompanying the Engineer's letter). The original dimensions, positions and extent of the revetment, as also the positions of the groynes previously constructed, but which had been washed away by the

action

action of the sea, were pointed out by the Engineer, and the best method of protecting the foreshore discussed at length.

Resolved unanimously that subject to the approval of Government, the revetment be made up to its original section, from Masulah Boat Bay Northward to Cassimode as proposed by the Boards Engineer; but that South of Masulah Boat Bay it be allowed to remain in its present condition; except in respect of such additions as may be needed to bring a narrow gauge line of railway along it. Resolved further, that in anticipation of the sanction of Government the Engineer be authorised to at once procure sleepers, rails and fish bolts and proceed with the extension of the narrow gauge line from its present termination immediately North of Clive's Battery.

× × ×

(True Extract)

Secretary
Harbour Trust Board

Mar 1278/2 of 89

Note by the actg. Chief
Engineer P.W. Department
d/ 7th January 1890.

Letter from the Chairman
Harbour Trust Board,
Madras No. 4819 d/ 21st
December 1889.

The proposals made by the Harbour Trust Board for reforming the sea wall appear to be the best under the circumstances, and immediate measures should I think be adopted for carrying them out. A rubble wall of the sections and slopes provided in the estimate will necessarily flatten out unless the outer toe of the sea slope is in some measure prevented from moving. Where feasible it would be advisable to connect the old with the new work by means of short piles not less than 8" in diameter and say 6' in length, placed 3' apart and imbedded in the old work wood to the depth of 4', the heads of these piles being tied together by a longitudinal waling piece.

2. To protect the accretion of sand which is expected to form in the bay to the north of the sea wall from being washed away in subsequent seasons, I should like to see what the effect would be of monoliths built in situ of the Greenway form of floating breakwater. This breakwater is the patented invention of the late Mr. E.C. Greenway Thomas of the Madras Civil Service and monoliths of the above form built at certain intervals along the face of a shore under process of erodation have been advocated by the patentee for adoption as calculated to have the same effect in securing such quiet water behind them as he considered would result from the use of his floating breakwater.

R. Drake-Brockman

Lt. Col. R.E.
Ag. Chief Engr. P.W.D.
Genl. Buildings & Roads Bch.

P. W. DEPARTMENT.

READ the following:—

Letter from the Chairman Harbour Trust Board Madras No. 4819 dated 21st December 1889.

Note by the Ag. Chief Engineer P.W. Department dated January 1890.

FOR ORDERS.

R. Drake-Brockman
Lt. Col. R.E.
Ag. Jt. Secy. to Govt. P.W.D.

The Estimate should be sanctioned by Govt. & the Chief Engineer's note Comd. to the H.T. Bd.

The work clearly falls under Sec 6 (b) & the sanction of Govt. is required under Sec 6 of Act II of 1886.

8 Jan

To protect the accretion of sand which is expected to form in the bay to the north of the sea wall, from being washed away in subsequent seasons, I should like to see what the effect would be of for the monoliths built in situ of the Greenway form of floating breakwater. This breakwater is the patent invention of the late Mr E. C. Greenway Thomas of the Madras Civil Service and ~~his~~ monoliths of the above form, built at certain intervals at the face of an foreshore under process of erosion, ~~was~~ has been advocated by the patentee for adoption as calculated to have the same effect in securing quiet water behind them as he considered would ~~be the case~~ result from the use of his floating breakwater. —

Rueds

6.1.90.

H.M. 7-1-90 R. 8-1-90

B & R
Ordinarily

P. 544

57/14

PUBLIC WORKS DEPARTMENT.

A

Draft order with enclos.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

9th January 1890

READ the following

Letter from the Chairman Harbour Trust Board Madras No. 4819 dated 21st December 1889.

Endorsement thereon by the Marine Department dated 2nd January 1890

Note by the Ag. Chief Engineer P. W. Department dated 7 January 1890.

10 P

The estimate amounting to Rs 43,773, as modified by the Harbour Trust Board, for restoring the revetment to the North of the Madras Harbour is sanctioned.

2. The note by the Chief Engineer P. W. Department above recorded will be communicated to the Harbour Trust Board for consideration.

Rueds

8.1.90

WCR

9.1.90

CM

To The Chairman M. H. T. Board with 6 enclos: } D. 9/1/90

" Marine Dept. } D. 23/1/90

Mss. printed [illegible]

Govt. of 18 Madras.

PUBLIC WORKS.

Dated 11/1/90

Recd. Encl.

G.O. 9 Jan 1890 No. ~~52W~~ 54

Madras Harbour

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Est for restoring the Revetment to the North of the ——, sanctioned, & note by the Ch Engr, on depth on the work, comd to the Harbour Trust Board

60/2

10/1/90