

G.O. No 2705 W. Y. 10-82
" " 706 A. 29. 6. 88

Inch 7269

Endorsement No 50 A dated
17th August 1885.

Forwarded to the Secretary
to Government P. H. Depart-
ment for information with
reference to G. O. No 706 A.
dated 29th June 1885.

Rev 18/8/85.

✓

D. C. Guinday

Examining P. H. Accts
Madras.

No 1997 W. Y. 18-8-85

CH.
27/8
No 1997 W. Y. 18th Aug/85

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Oct 18/87

Oct 19. 8. 85.

Oct 24. 8. 85.

of P. & Accounts for information

Madras
11 August
1885

Wdy Sidney Smith
Major R. E.
for Comdg. Engrs for Rys

/True Copies/

G. E. Patten
Supt. Correspondence Branch.

89.
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89.
17/8

Copy of a communication to the Super-
intending Engineer Fourth Circle, from
the Consulting Engineer for Railways,
Madras,

No 785. dated 11th August 1885.

In reply to your letter No ²³³_m dated 5th
August 1885, I have the honor to state
that the Agent and Manager of the
Madras Railway has asked the
instructions of his Board of Directors as
to the whole question of the incidence of
the cost of the Protective works at Beypore,
and requests that, in the meantime, the
refund of the sum expended by the
Public Works Department, may be
allowed to stand over until he receives
a reply from London.

A further communication from Mr
Saunders will therefore be awaited.

(Sd) Sidney Smith
Major Rb.
for Comdg. Engr. for Ry.

No 786.

Copy forwarded to the Examiner of

RAILWAY.

Govt. of 1885 Madras.

PUBLIC WORKS.

Dated June, 29th.

Recd.

Encd.

G.O., 29th June 1885, No. 706 R.

JUNE.

Protective Works at Beypore

Adhering to the view contained in G.O.,
of the 7th October 1882, No. 2705 W.,
regarding cost of —.

ORDER—dated 29th June 1885, No. 706 R., Public Works.

The Government adhere to the view which finds expression in their order, Public Works Department, dated 17th October 1882, No. 2705.

(True Extract.)

(Signed) C. J. SMITH, Lieut.-Col., R.E.,
Joint Secy. to Govt., P.W.D.,
Railway Branch.

To the Consulting Engineer for Railways.
„ Examiner, Guaranteed Railway Accounts.

Superintending Engineer H. K. Wick
Examiner P. W. Accounts.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Railway.

Read the following paper:—

From the Consulting Engineer for Railways, dated Madras, 18th June 1885, No. 193.

From the Agent and Manager, Madras Railway Company, to the Consulting Engineer for Railways, dated Madras, 6th March 1883, No. 166.

In reply to your letter, of the 2nd instant, No. 163 (received this afternoon), I have the honor to invite your attention to the enclosed copy of paragraph 22 of a letter from the Board of Directors, No. 696, dated London, the 13th October 1882, wherein I am informed that the Directors cannot admit that any of the cost of the protective works at Beypore should be borne by the Company.

I await a further communication from the Chief Engineer as to the completion of the work, before sending to you, for submission to Government, an application for a refund of the amount that has already been disbursed by the Company.

Letter from the Agent and Manager, Madras Railway Company, dated 15th October 1884, No. 711.
Do. do. do. „ 15th June 1885, „ 441.

Submitted for the consideration of Government, with reference to their proceedings, dated 17th October 1882, No. 2705 W.

2. In those proceedings the Government ruled that the whole of the expenditure on protection of railway property at Beypore should be borne by the Madras Railway Company. Application was accordingly made to the Agent and Manager for reimbursement of the sum of Rs. 5,159-2-11 expended by the Public Works Department. In reply, Mr. Saunders forwarded extract from a letter from the Board of Directors stating that they cannot admit that any of the cost of such work should be borne by the Company, and they further instruct him to apply for a refund of the expenditure incurred by the Railway Company on its completion.

3. The Agent and Manager proposed to defer the submission of a claim until the opening of the new line to Calicut shall have rendered it certain that no further outlay at Beypore will be required, but it does not appear to me desirable to postpone the settlement of the question at issue for an indefinite time, the materials for a decision being already available.

4. The total amount expended up to date appears to be as follows:—

	RS.	A.	P.
By the Public Works Department	5,159	2	11
Do. Railway Company	12,991	6	3
Total	18,150	9	2

The Government have directed that this expenditure shall be charged to the Railway Company and the latter have declined to accept the debit.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads,
Civil Works.

No. 103.

Read—the following papers:—

No. 284.

NOTES of Inspection by Lieutenant-Colonel H. R. MEAD, R.E., Superintending Engineer, 4th Circle, for July 1882.

Malabar District, West Coast Division, Calicut Sub-division, 17th and 18th July 1882.

BEYPORE SEA ENCROACHMENT, &c.

Inspected this by order in company with the Consulting Engineer and Deputy Consulting Engineer for Railways, the Chief and District Engineers of the Madras Railroad.

The sea was calm. The present state is shown on the tracing that accompanies this. (To be returned; there is a copy in the Chief Engineer's office forwarded with notes dated 26th June.)

The yellow and green dotted lines on the plan show the line of beach; on the 8th July in yellow and the previous work in green.

There has been but little alteration since; the accretion at the site of 6th, 7th and 8th groynes has increased, and there has been further erosion below the site of the 10th groyne.

The sea wall repairs are nearly completed and there is a decided shoaling and improvement in the line of breach between it and the Government groyne, but no decided accretion has formed.

The new Government groyne has been lengthened about 30 feet, total length about 120 feet; it is strong and good.

There has been considerable erosion in the beach, near the root of the groyne and south of it; but the Railroad Engineers have pitched the slope near it and placed on the sand between it and their No. 1 groyne a line of stone, say, 12 feet by 2 feet deep (this has no foundation), their No. 1 groyne is about 25 feet long with revetment on each side at root. No. 2 groyne is about 20 feet long with similar short revetment on each side of root.

No. 3 groyne was partly done, but the rough weather cut it off in rear and destroyed it; not a stone of it is to be seen.

No. 4 groyne similar to No. 3, but some of the stone is to be seen in the sand which is at the groyne site but little above L.W.L.

Nothing further has been done, the late rough weather stopped the supply of stone which was being brought down the river.

At present stone is being brought, but there appears no definite plan decided on by the Railroad Engineers as to what should be done, and the original estimate, Rs. 5,540, for ten small 50 feet groynes is abandoned, and I believe I may say that all agree that the proposal has not and will not answer.

COIMBATORE,
19th July 1882.

(Signed) H. R. MEAD, Lt.-Col., R.E.,
Superintending Engineer, Fourth Circle.

To the Chief Engineer, Public Works Department, Ootacamund.

No. 103-A.

From Lieutenant-Colonel H. R. MEAD, R.E., Superintending Engineer, Fourth Circle, to the Chief Engineer, Public Works Department, dated Coimbatore, 22nd July 1882, No. 292.

With reference to G.O., No. 1805 W., dated 15th July 1882, which I regret to say was not received in this office until the arrival of the afternoon post on the 17th, and therefore not seen by me until after my return from Beypore, I have the honor to report that as the Consulting Engineer for Railways considered the question regarding incidence of outlay on necessary protection of the sea beach at Beypore for the safety of the Railway was not for our discussion, this point was not entered on by us.

2. I feel it is hopeless for me to attempt to bring this matter to a satisfactory conclusion. I have however this day addressed the Consulting Engineer, and requested that he will obtain from the Railway authorities the reasons, &c., on which they base their claim (which they have indirectly made) for the Madras Government to protect their line of railroad from an encroachment of the sea.

3. With regard to communicating with the Master Attendant, I must point out that to me there are no grounds whatever for any claim being made on that department for the protection of the sea beach south of the sea wall (carried out on Mr. Robertson's recommendation) that connects the shore with the island.

The maintenance of the sea wall and the sea beach near the Beypore river mouth ought, I consider, to be a charge on the Marine Department, as those works affect the river bar, but I would submit that works south of the wall have nothing to do with it and should therefore be no charge on that department.

This being my opinion I request that I may be allowed to report hereafter without reference to the Master Attendant.

4. Referring to paragraph 2 of the Government Order under reply, in my Notes of Inspection, dated 17th and 18th July, will be found a description of the present state of the groyne work now being carried on by the Railway authorities. The original design and estimate is not being carried out and the progress made is but little. I regret that I can give no information as regards what the Railway authorities intend doing, my own impression is that no vigorous action will be undertaken until the question of incidence of outlay is decided.

5. I believe that both the Consulting Engineer and the Chief Engineer of the Railway consider the original sanctioned estimate, for 10—50 feet groynes, Rs. 5,540 as obsolete, and I believe further that they consider, after the experience of the last storm, that very considerable modifications are advisable.

They neither of them however gave me their opinion as to what they considered was the best plan to be adopted in protecting the beach, about 3,000 feet of which will probably for the safety of the railroad require protection.

No. 103-B. From the Consulting Engineer for Railways, dated Madras, 27th July 1882, No. 578.

From the Acting Chief Engineer, Madras Railway Company, to the Agent and Manager, dated Madras, 20th July 1882, No. R 201/563.

Your endorsement on Consulting Engineer's letter No. 484 of 8th current.

The groynes Nos. 1 to 4 to protect the sea beach at Beypore were commenced on 29th ultimo. During the week following there was very little work done owing to heavy weather. One boat carrying stone was swamped and the men refused to work until the weather moderated.

The greater portion of the materials of the four groynes was scattered by the action of the sea.

The sea broke so heavily on the south heel of the Government groyne on 5th current that the Resident Engineer considered it advisable to build a sea wall from the heel of the Government groyne to No. 1 groyne and this checked the erosion.

On Monday, 17th current, the works stood as follows:—

Pitching done from Government groyne to No. 1 groyne and for a short distance south of it. No. 1 groyne about 12 feet long.

No. 2 groyne recommenced with a T heel to prevent erosion.

The orders I have given with, I believe, the approval of the Consulting Engineer are:—

- To stop No. 2 groyne for the present.
- To go on with No. 3 groyne, changing the site slightly so as to take advantage of a projection in the beach.
- Not to go in with No. 4 groyne.
- To begin No. 5 groyne with a T heel to prevent erosion.
- Not to do any work between groynes Nos. 5 and 10 as the shore is being silted up.

It may at any time be necessary to modify these orders in order to protect different points which may be threatened.

No. 516.

Forwarded for the information of the Consulting Engineer for Railways.

MADRAS,
21st July 1882.

(Signed) J. W. MELLIS,
for Agent and Manager.

Copy of above forwarded for the information of the Chief Engineer, Public Works Department, in accordance with his request.

2. On the occasion of my visit to Beypore, (on 17th current,) it was explained by the Railway Officers that the proposals for protective works submitted by them were not intended to be rigidly adhered to, but to be modified according to experience of the conditions of the littoral currents, of changes in the coast line, &c.

3. As matter of fact, the original proposals had already been considerably modified on the date of my inspection.

4. The revised proposals, as roughly sketched above by Mr. Carter, have my concurrence, but will necessarily be liable to further modification.

5. Further reports will be forwarded to the Chief Engineer, Public Works Department, with respect to both the future progress of the works and the incidence of cost.

MADRAS,
27th July 1882.

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Consulting Engineer for Railways.

No. 103-C.

From Colonel J. BEATTY, R.E., Superintending Engineer, Sixth Circle, to the Chief Engineer, Public Works Department, dated Tanjore, 30th July 1882, No. 381 T.C.

With reference to paragraph 3 of G.O., No. 1805 W., of 15th July 1882, I have the honor to forward, for your information, a letter from Major Fraser regarding the delay in the construction of groynes to protect the beach at Beypore.

ENCLOSURE.

From Major A. F. FRASER, R.E., Executive Engineer, Trichinopoly Division, to the Superintending Engineer, Sixth Circle, dated Trichinopoly, 25th July 1882, No. 269 S.E.

I have the honor, with reference to your No. 363 T.C., dated 22nd July 1882, and G.O., No. 1805 W., of the 15th instant, to state the following circumstances regarding the beach at Beypore, which may not be fully known.

2. As soon as the work, "repair of the sea wall and constructing one groyne," was authorized, as the time was very short, I placed a European Overseer at Beypore, under the Sub-Engineer at Calicut, to collect laterite.

3. A native contractor was under agreement to deliver stone, but as it came in slower than required I went to ascertain the cause.

4. I found that though the sea was apparently calm loaded boats could not discharge laterite, which the contractor brought down the Beypore river, at the site of the work. The stone had to be landed near the Prince's jetty in the river, and carted to the sea wall about a quarter of a mile.

5. This was a state of things which could not have been anticipated and was a source of delay. There was not much stone, I think, got by blasting on the island, as the Marine authorities were rather averse to its being cut down, and the spray was latterly strong.

6. However enough stone was got to progress with the repair of the gap in the sea wall, but more was used than calculated upon, as the sea, while the work was actually going on, cut round the shore end of the sea wall, detaching it from the beach, thus necessarily absorbing in the extension stone that would have been available for the groyne.

7. The Sub-Engineer finding time pressing and stone likely to be insufficient, recommended a tender from Mr. Gay, Contractor to the Madras Railway, who engaged to make a siding and run down the laterite to the site of the groyne by ballast train in sufficient time, but at a rate increased by a fifth.

8. I think I incurred some slight responsibility in closing with Mr. Gay, and wrote for the assistance of the Madras Railway Company in lending worn permanent-way.

9. Mr. Gay constructed the siding, but just before it was commenced the sea began cutting away the beach in rapid manner, quite different from the former steady erosion, and to save the Inspector's quarters the Railway Company erected a cheap groyne, of sand bags and old sleepers, 25 yards long, which might fairly be debited to the contingencies of the "sea wall and groyne" estimate.

10. This was effective for some time, and I was under the expectation that Mr. Gay would make the stone groyne well before the setting in of the monsoon.

11. After giving over charge of the West Coast Division, on my way here, having an interest in the work, I looked at it while at the Railway Station, and found that the conditions of the problem had suddenly entirely altered.

12. The sea was eroding the coast line very rapidly, and not only breaking on it, but the water at high tide stood $1\frac{1}{2}$ feet above the land, and flowed back towards the railway. The siding was ready, but Mr. Gay had not brought down a ballast train.

13. It was evident that the groyne only protected the two hundred yards, if so much, on the north side of it, and that it had no effect in preventing the alarming erosion now setting in, as the Deputy Consulting Engineer for Railways states, for two miles of the south. In fact had the stone groyne been completed it would, in my opinion, have been turned and left out at sea. The Railway were only able to protect the Inspector's quarters by quick extension of their stake groyne landwards.

14. I had thought originally that a second groyne, constructed next season, similar to the one sanctioned, would have been enough to stop erosion; but seeing the conditions entirely changed from what they were when and for some time after the estimate was prepared, I wrote a memorandum for the information of the Superintending Engineer, Fourth Circle, dated June 3rd, during the short time I was waiting for the train, stating that the action of the sea was so much more forcible than ever before that keeping it off was beyond the resources of the Public Works Department at the place, and that the co-operation of the Railway authorities was urgent. I also saw Mr. Wilkinson, C.E., the Divisional Engineer.

15. Mr. Gay said the cause of his not delivering stone was a difficulty in getting labor, as the people were in the fields transplanting rice.

No. 568 E.

Referred to Colonel Mead for remarks.

11th August 1882.

(Signed) R. H. SANKEY, Col., R.E.,
Chief Engineer, P.W.D.

To the Superintending Engineer, Fourth Circle, (in original to be returned.)

No. 103-D.

From Lieutenant-Colonel H. R. MEAD, R.E., Superintending Engineer, Fourth Circle, to the Chief Engineer, Public Works Department, dated Camp, Vellore, 15th August 1882, No. 340.

With reference to your endorsement No. 568 of the 11th August 1882, I have

the honor to return the papers and to report that I have no remark to make on One Endorsement, No. 568 of 11th August 1882, with one enclosure.

paragraphs 1 to 7 further than I have already done in my letter No. 251, dated 3rd July 1882, in which I reported, as called on, the delay in the construction of the groynes at Beypore which Major Fraser was ordered to commence by me in anticipation of sanction in February, except that Major Fraser is mistaken in paragraph 6 in stating that owing to the rough weather stone was absorbed in the extension of the sea wall that would have been available for the groyne; my notes of inspection, dated 26th June, show that even by the 3rd June the total quantity estimated for the repair of the stone wall was not collected.

2. With reference to paragraph 8, Major Fraser reported the fact to me that he could not get stone for the groyne, owing to the bad weather, except by railroad at an increased cost, and received from me at once authority to do so. I am not aware that he gave orders for the work to be begun until he received that authority.

3. Major Fraser had received orders to complete the repairs to the sea wall and the groyne by the 15th May, but it was not until the 4th May that arrangements to bring it down by rail were made and quarrying commenced. I am aware that there was rough weather from the 10th April, but I consider most of the stones for both sea-wall and groyne ought to have been collected before that date, as it was, none whatever was collected for the groyne.

4. With regard to paragraphs 11, 12 and 13, I agree with Major Fraser that the encroachments of the sea was much greater and more rapid than anticipated, but I am not aware that any one thought that the groyne would do more than protect a small portion of the coast, and although it is to be regretted that the groyne was not put up before the monsoon as intended, my own opinion is that its construction would have done but little good. Had it been completed the heavy action of the sea at the end of May and June would probably have turned it, and if this had occurred it would have done more harm than good. We should have had no stone available to extend it inwards and without protection at the root it must have failed.

No. 103-E.

From the Consulting Engineer for Railways, dated Madras, 21st August 1882, No. 187.

From the Agent and Manager, Madras Railway Company, to the Consulting Engineer for Railways, dated Madras, 5th August 1882, No. 549.

In reply to your letter No. 539 of the 26th ultimo, I have the honor to forward you a copy of a letter, dated the 29th July, No. R. 201/588, from the Acting Chief Engineer, having reference to the incidence of the cost of the protective works at Beypore.

Mr. Carter explains the steps which he took to bring to notice the encroachments of the sea from time to time, and suggests that as the Department of Public Works did not carry out the protective works with the desired promptitude, the incidence of cost of these works which we are now undertaking should be borne by that department.

I concur with Mr. Carter in this view, and trust that His Excellency the Governor in Council will be pleased to approve of the suggestion that the Public Works Department should bear the entire cost.

I also forward a tracing showing the coast line at Beypore from the year 1867 to June 1882 which you will probably find useful.

ENCLOSURES.

From H. R. P. CARTER, Esq., Acting Chief Engineer, to the Agent and Manager, Madras Railway Company, dated Madras, 27th July 1882, No. R 201/582.

Your endorsement on Consulting Engineer's letter, No. 525, of 20th current, giving cover to Proceedings of Government, dated 15th July 1882, No. 1805 W., Public Works.

I am still of opinion that the erosion at Beypore is to a great extent due to the sea wall connecting the main land with the island, and my recent inspection in company with the Consulting Engineer, the Deputy Consulting Engineer, and the Superintending Engineer, when we found an immense amount of debris which had been evidently carried down the river and deposited on the foreshore to the south of the sea wall, still further confirms me in believing that the encroachment of the sea was caused by the sea wall.

At all events the erosion of the coast during the last year has been alarmingly rapid, and the groynes proposed by me even if they proved thoroughly effective would not restore half the foreshore which was washed away during the last twelve months.

In fact the work I have put in hands is merely to afford temporary protection to the Railway property.

If it is intended either to regain the foreshore already lost or thoroughly to protect the Railway a very comprehensive scheme would be necessary either in the first instance involving groynes of great length, or in the second a sea wall along the coast having a good foundation and of considerable section.

I don't think anything on a large scale could be done for less than about half a lakh of rupees.

No. 550.

Forwarded for the information of the Consulting Engineer for Railways with reference to paragraph 2 of his letter, No. 525, of the 26th ultimo.

5th August 1882. (Signed) A. M. SAUNDERS,
Agent and Manager.

From H. R. P. CARTER, Esq., Acting Chief Engineer, to the Agent and Manager, Madras Railway Company, dated Madras, 29th July 1882, No. R 201/588.

Your endorsement on Consulting Engineer's letter, No. 539, dated 26th July 1882.

So long ago as June 1880 I reported that the sea had washed away the sand opposite the Railway station at Beypore to within 9 feet of the fence. Laterite was deposited by the Department of Public Works, and the erosion of the land at this particular point was stopped.

On the 2nd June 1881 I again addressed you on the same subject and requested you to inquire what steps Government were about to take for the protection of the Railway property, and was informed that the Chief Engineer to Government stated that there was no danger of the encroachment increasing.

On 8th September I reported that the public road opposite the Inspector's bungalow had been washed away.

On 8th November I again called your attention to the fact that no action to prevent further encroachment of the sea had been taken by Government.

On 1st March 1882, finding that the Inspector's house was in danger, I ordered a temporary groyne of sand bags to be put in, and this saved the bungalow.

On 17th March Government passed certain orders for the thorough repair of the sea wall and the erection of a groyne, and I gave orders that every assistance should be given to the contractor, but I believe it was not commenced before the 1st June or thereabouts, before which date we had to work night and day to save our Inspector's house.

Had my reiterated warnings been attended to, or had the groyne been commenced in good time, much of the erosion would have been prevented, and so far as our property is concerned no further works would have been requisite. As however the want of prompt action by the Department of Public Works has now rendered extensive works necessary, I am clearly of opinion that the incidence of cost for these works as well as for the works we have already had to execute should be borne by that department.

Submitted for the consideration of Government, with advertence to their Proceedings, dated 15th July 1882, No. 1805 W.

2. The sum of Rs. 5,540, sanctioned for outlay by the Madras Railway Company on protective works at Beypore, has been expended with results which appear so far satisfactory; and the papers now submitted will, I trust, be sufficient to enable the Government to decide both as to the final incidence of that outlay and as to the responsibility for any further protective measures that may be necessary.

3. It will, I think, be admitted that the position occupied by the Madras Railway Company in connection with the recent erosion at Beypore has been unsatisfactory. The Company did not own the foreshore, which has always been understood to be the property of the State, while immediately outside their station-yard ran a public road which I believe was recently transferred to the custody of the Local Fund Board.

4. As stated by the Company's Chief Engineer he drew attention to the aggressive action of the sea at Beypore so long ago as June 1880.

The fact was at once notified to the Superintending Engineer of the Circle, with a request that the necessary steps might be taken to prevent further encroachment.

The reply, dated 2nd August 1880, was that "the Executive Engineer reports that at present nothing should be done."

5. A year later, in June 1881, the Company's Chief Engineer reported that the sea was making further encroachment, and inquired whether any measures were being taken by Government for the protection of the beach. The matter was again referred to the Superintending Engineer, who stated, in reply, dated 7th June 1881, that "if the encroachment of the sea at Beypore is similar to that that occurred last year, no notice need be taken of it."

6. In September 1881 the Company's Chief Engineer again reported upon the action of the sea at Beypore, stating that the public road had been completely washed away and that part of the station-yard had also disappeared. Copies of this report were forwarded on the 9th September both to the Superintending Engineer of the Circle and to the Local Fund Engineer of Malabar. From the Superintending Engineer no reply or acknowledgment was ever received, but on 24th November 1881 the President of the Local Fund Board stated that that body were not inclined to repair the road, as the outlay would be more than they could afford, and the result doubtful.

7. In their Proceedings, dated 17th March 1882, No. 708 W., sanction was accorded by the Government to an estimate amounting to Rs. 5,340, of which sum Rs. 2,470 provided for the thorough repair of the sea wall, or rather causeway, which connected two rocky islets with the beach, and Rs. 1,870 provided for the construction of a groyne, 70 feet in length, to the west of the Madras Railway station-yard. This expenditure was sanctioned in view to the completion of the works by the 15th May, the date named by the Superintending Engineer, but the Government are already aware that the burst of the monsoon found the groyne scarcely commenced, and that the delay would probably have proved destructive to some of the Railway Company's buildings had not their Engineers hurriedly constructed a groyne with sand bags and piles, which checked the action of the sea.

8. In the papers now laid before Government two points are specially urged by the Company's officers—

- (1) That the encroachment of the sea has been due to the existence of the causeway above alluded to, connecting the rocky islets with the beach.
- (2) That the failure on the part of the Public Works Department, to take effectual measures to arrest the encroachment of the sea, and the delay in constructing the groyne sanctioned in March last, have rendered necessary not only the outlay of nearly Rs. 7,000, recently incurred by the Company, but also further extensive protective works, the cost of which is roughly estimated at Rs. 50,000, and that the whole of such expenditure should therefore be borne by the Public Works Department.

9. With respect to the first point, I have already stated my opinion that the erosion of the beach cannot be properly ascribed to the existence of the causeway in question, and careful examination of the locality has confirmed that opinion.

In support of this view, it may be mentioned that, in the year 1858, the then Chief Engineer of the Madras Railway Company strongly advocated the construction of the causeway, in view to the formation of a boat harbour to the south, exactly opposite the portion of beach which has lately suffered from the action of the sea.

The proposal is recorded in the letter addressed to the Government of India on the 27th January 1859, No. 50.

10. With respect to the second point, it is for the Government to decide whether the arguments adduced by the Company's representatives are sufficient to justify the relief of the Railway budget from the very considerable outlay which will probably be required in view to the thorough protection of the station and line. It is not necessary to represent the importance of an early decision, in order that no doubt may remain as to the authority responsible for devising and executing any further protective works which may be required.

11. Whatever may be the decision arrived at, I think it is to be regretted that the Company's officials should have been met by mistaken assertions that they were wrong in foretelling the necessity for early protective measures. I also submit that it would have been more satisfactory to the Company if they had been informed from the first that the interests, neither of the Government, nor of the Local Fund Board, in the land lying between the Railway property and the sea were sufficient to justify the execution of the necessary protective works; and if they had then been placed in full possession of the foreshore, and authorised to undertake operations on their own account.

MADRAS, (Signed) J. SHAW-STEWART, Colonel, R.E.,
21st August 1882. Cong. Engineer for Railways.

No. 633 E.

Extract paragraphs 1 to 7 of the foregoing Note by the Consulting Engineer for Railways is forwarded to the Superintending Engineer, Fourth Circle, for such explanation as he may be in a position to offer.

24th August 1882. (Signed) R. H. SANKEY, Col., R.E.,
Secretary to Govt., P.W.D.

To the Superintending Engineer, Fourth Circle, with extract.

READ—the following letter from H. R. P. CARTER, Esq., Acting Chief Engineer, to the Agent and Manager, Madras Railway Company, dated Madras, 8th August 1882, No. R 201/613 :—

Progress of Groynes at Beypore. Second Fortnightly Report.

I beg to forward, for the information of the Consulting Engineer, the second fortnightly report with reference to the above work as requested in the second paragraph of his letter, No. 484, of 8th ultimo, to your address.

1. The construction of groynes Nos. 3 and 5, which were specially ordered, has been finished, and they have been further protected by the additions of T-headed heels.

2. The beach wall has been carried to groyne No. 2 and greatly strengthened all along towards the Government groyne.

3. Material for the remainder of the work is being delivered in ample quantity.

No. 560.

The Consulting Engineer for Railways for information with reference to his letter No. 484, of the 8th ultimo.

MADRAS, (Signed) J. W. MELLIS,
9th August 1882. for Agent and Manager.

From H. R. P. CARTER, Esq., Acting Chief Engineer, to the Agent and Manager, Madras Railway Company, dated Madras, 15th August 1882, No. R 201-633.

In continuation of my letter, No. R 201/613, of 8th current, I beg to report that the sea wall and groynes at Beypore have been completed, and I beg to forward a tracing showing how the works have been carried out.

You will observe that the original plan has been considerably modified, as we found as we worked that this was necessary in order to use the materials in the most economical manner.

I believe that the Consulting Engineer who lately inspected the works is satisfied that the modification was advisable.

I have directed the Resident Engineer to expend the small balance available in stacking stone to throw in where necessary, as since my inspection on the 9th current the sea has washed into the compound of one of our bungalows to the south of the Inspector's bungalow, carried away some of the Government groyne and shaken some of our work.

No. 593.

The Consulting Engineer for Railways for information in continuation of my endorsement, No. 560, of the 9th instant.

MADRAS, (Signed) A. M. SAUNDERS,
17th August 1882. Agent and Manager.

No. 188.

Endorsement on the above.

Copies of above forwarded for the information of the Chief Engineer, Public Works Department, in continuation of the report forwarded on 27th ultimo, with endorsement No. 578.

2. Plans Nos. 859-A and 859-B are also sent herewith for inspection. The first shows the coast line at Beypore, as taken in different years between 1867 and 1882. The second shows the protective works which have been recently carried out by the Madras Railway Company.

3. Since the commencement of those protective works the action of the sea has been more favorable. There has been a deposit of sand on the beach along the entire line of erosion; but chiefly at the south end, where nearly 100 feet have been acquired.

4. It is particularly requested that these two plans may be returned when no longer required.

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Consulting Engineer for Railways.

No. 103-F.

READ—the following letter from Lieutenant-Colonel H. R. MEAD, R.E., Superintending Engineer, Fourth Circle, to the Chief Engineer, Public Works Department, dated Coimbatore, 5th September 1882, No. 378 :—

I have the honor to acknowledge the receipt of extract paragraphs 1 to 7 of Note by the Consulting Engineer for Railways forwarded in your memorandum, No. 633 E., dated 24th August, for explanation.

I regret that I cannot agree with the Consulting Engineer in his statements, and have no course but to comment and add on to many of them.

2. In paragraph 4 it is stated that my attention was called to the aggressive action of the sea at Beypore in June 1880, and that my reply was that "the Executive Engineer reports that at present nothing should be done." I have to point out that although this statement is perfectly correct, the following should be added:—

1st.—That the encroachment complained of was north of the sea wall and has nothing to do with the present case.

2nd.—A reference to G.O., No. 2722 W., dated 26th November 1880, and G.O., No. 495 W., dated 23rd February 1881, will show, I think, clearly that the Railway authorities exaggerated the danger that you and the Master Attendant approved of my action and proposals, and finally that

Government in their Order, No. 2722 W. (see paragraph 3), considered that it was for the Local Fund Board to protect their road.

3. In paragraph 5 it is stated that further action of the sea was reported (this was south of the groyne), and that on its being reported to me I only said that if the encroachment was similar to that that had formerly been reported no notice need be taken of it. This is quite correct, and I think I was justified in giving that reply. I inspected the place in July, and in my notes of inspection and in letter, No. 281, dated 15th July 1881, I reported that a portion of the road had been washed away, but I considered as I do now that it was for the Local Fund Board or the Railway to protect their own property.

4. Paragraph 6. The Consulting Engineer on the 19th September forwarded to me copies of letters from the Chief Engineer and Manager of the Railway stating that the Local Fund Road had been washed away, and that they had arranged to allow a passage through their property (namely the Inspector's compound) for two months only, and requesting him, the Consulting Engineer, to urge the proper department to expedite the carrying out of the reconstruction of the road. No remark was made on this request, except that I was informed that a copy of the letters had been sent to the Local Fund Engineer. I did not reply to this, as I had nothing to do with the road; there was no request for me to address you on the encroachment which had already been reported.

5. Paragraph 7. While regretting that the groyne sanctioned in G.O., No. 708 W., dated 19th March 1882, was not as it should have been completed by the 15th May, I have again to repeat my opinion (as stated in paragraph 4 of my letter, No. 340, dated 15th August) that had the groyne been completed by that date it would have done but little good.

On the 21st April 1882, at the request of the Consulting Engineer, a sketch showing the position of the proposed groyne was sent to him, and I am sure that neither the Consulting Engineer nor the Railway Engineers considered that this groyne could possibly protect more than a very short line of the coast.

6. I think the above show that it is only now that the Madras Railway have made a direct claim to be protected at Government expense from the action of the sea, that previous to this they contented themselves with calling attention to encroachments, and that in September 1881 they tried to force the Local Fund Board to protect them by threatening not to allow a passage through their property. When in November 1881 they were told by the President that the Board were not inclined to protect or restore the road they were content to do nothing, and did not even ask Government or any Government official for works to be undertaken at Government cost from the protection of their property; also that the fact of Government having sanctioned a groyne near their property and not carrying it out as soon as intended gives them no claim for protection at Government cost. Further, my notes of inspection forwarded to you and my letter, No. 292, dated 22nd July, show that they did not take vigorous action when matters got serious, but wished Government to undertake the work.

7. On the receipt on the 19th July of G.O., No. 1805 W., dated 15th July 1882, I requested the Consulting Engineer for Railways to obtain from the Railway authorities the reasons on which they based their claim for the Madras Government to protect their line of railroad from encroachments of the sea, but in his letter, No. 656, dated 24th August, he informs me that the views of the officers of the Madras Railway have been forwarded to you for submission to Government; as therefore they have not been sent to me I am unable, as ordered in G.O., No. 1805 W., dated 15th July, paragraph I, to report regarding the incidence of outlay on protective works further than to express my opinion that the Madras Railway have no claim whatever on the Madras Government.

8. In conclusion I would urge that this question should be decided as soon as possible. There is no necessity I believe for works to be undertaken at present, as the sea is throwing up the beach again, but it may be necessary at any time to carry out protective works and unless it is decided at whose cost these works are to be executed it is I fear hopeless to expect vigorous action.

No. 103-G.

No. 394.

NOTES of Inspection by Lieutenant-Colonel H. R. MEAD, R.E., Superintending Engineer, Fourth Circle, for the month of September 1882.

Coimbatore Division, Malabar District, Calicut Taluk, 12th September.

BEYPORE GROYNES, &c.

The state of the work undertaken by the railroad is as follows:—

A groyne about 20 yards in length thrown out on the site of their proposed groyne No. 5. This groyne has a short T at its base; from it there has been an encroachment for about 60 yards in length on the south, but south of this as far as I can judge there has been no further encroachment and things remain much as they were. North of this at site of No. 3 proposed groyne another groyne about 18 yards in length with a T at root has been put down; this has caused action and encroachment south of it for about 35 yards. For 180 yards south of the Government groyne longitudinal revetment has been put down of a section of about 12 feet $\times$ 2 feet.

Government groyne completed and standing well; the longitudinal revetment put down by the railroad has protected the south side from any further encroachment.

Sea wall work completed and standing well about 40 yards in centre; not very good; this was the portion damaged last May; it is quite safe, but will require making up next year. Both sides of the sea wall silting up at both ends, and there is accretion on the shore between the sea wall south as far as the Government groyne.

No. 104.

ORDER—dated 17th October 1882, No. 2705 W., Public Works.

The Right Honorable the Governor in Council has carefully considered the correspondence recorded above, in regard to liability for the cost of protective works at Beypore, and, in the absence of any definite proof that the erosion of the beach is due to other than natural causes, is of opinion that the cost of the works already carried out, as well as such future expenditure as may be necessary to protect railway property, should be borne by the Madras Railway Company.

(True Extract.)

(Signed) R. H. SANKEY, Col., R.E.,
Secretary to Govt., P.W.D.

To the Superintending Engineer, Fourth Circle.

- „ Consulting Engineer for Railways, with two plans.
- „ Examiner, Railway Accounts.
- „ Examiner, Public Works Accounts.

Exd S. T. Austin.

Spare Copies



BUILDINGS AND ROADS.
CIVIL WORKS.

Gobt. of (1882) Madras.
PUBLIC WORKS.

Dated October, 17th.

Recd.

Encl.

G.O., 7th Oct. 1882, No. 2705 W.

OCTOBER.

Nos. 103-104.

Protective

Productive Works at Beypore.

*Deciding that the cost of the — as well as
such future expenditure necessary to pro-
tect railway property should be borne by
the Madras Railway Company.*