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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

Revenue DEPARTMENT

G.O. No.
B.P. No.

2993

Press
Mis. ✓

Dated

11. 12

1976.

Not to be folded or roughly handled

Read the following papers :—

No. 445. Proceedings of the Madras Government in the Marine Department, dated Ootacamund, 13th July 1876, No. 258.

Telegram from the Master Attendant, Madras, dated 12th July 1876.

"GREAT encroachment sea, Calicut, vicinity of Custom-house. Large portion of sea wall and inner end of pier washed down. Public Works Department attending."

COMMUNICATED to the Department of Public Works.

2. The Master Attendant, who is on the eve of departure for Cochin in connection with the *Albuquerque*, has been directed by telegraph to visit Calicut and report.

(True Extract.)

(Signed)

W. HUDLESTON,
Chief Secretary.

No. 445-A. From Colonel W. FAREWELL, Officiating Deputy Chief Engineer, Public Works Department, to Major-General G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Fort St. George, 24th July 1876.

I HAVE the honor to report that agreeably to your instructions received by telegraph, in company with Captain Taylor, R.N.R., Master Attendant, Administrative Department of Madras, I inspected the Calicut pier on the 19th and 20th of July; and Lieutenant-Colonel Kennedy having on the latter date arrived at Calicut, I again inspected the work with him.

2. The present condition of the structure is as follows :—With the exception of the pair of piles nearest the shore, the screw pile portion of the pier is intact and appears to have stood the heavy sea that has been running very well; the sea was too high to admit of reliable soundings being obtained along the pier to ascertain if the bed of the sea in its vicinity had deepened or not; as soon as the state of the weather permits, this will be attended to and reported on. The timber platform of the bay resting partly on the abutment and on the last pair of piles was removed and saved, and so was that of the next bay, which was in danger of falling, the sand round the inner pair of screw piles having at one time been swept away to such a depth as to expose the flange of one of the screws which must have been screwed in at least 10 or 11 feet into the old beach. When I had it measured, the pile which is said to be 15 feet in length had a hole of about 5 feet 6 inches, showing that the beach, since the very heavy weather has ceased, is reforming. The masonry sea wall in front of the Custom-house, the abutment and wing walls of the pier have all been destroyed by the sea, and a considerable amount of sand washed away leaving a gap of 80 feet between the first pair of screw piles of the pier and the crest of present beach in front of the Custom-house, which now is nearly in a line with that north and south of it. From the description given, the destruction of the masonry works must have been very rapid; a heavy sea with high surf scooped out the sand, undermined the foundations, and the masonry collapsed, while all that could be done was to save as much of the material

as possible. An attempt was made to drive piles to protect the masonry, but the sea was so heavy that the work had to be abandoned.

3. Captain Gilham, the Master Attendant of Calicut, informed me that, for the last two or three years, the sea has been steadily encroaching on the coast between Calicut and the Ellatur backwater north of it, and that the floating mud bank which used to lie north of the pier has now taken up its position south of it, between it and the Kulai river. From my own recollection of the coast, I should say that from 100 feet to 200 feet in some places have been swept away by the sea since I saw it in 1872-73. The beach road to the West Hill and Puddingady, which was constructed some years ago by the Municipality at some distance from the then existing crest of the beach has, to within half a mile of the pier, been destroyed. I cannot help thinking it is a pity that this steady encroachment was not brought to notice before, and thus allowed of something being done to protect the pier works, which were left projecting into the sea courting destruction in heavy weather.

4. To save as much of the beach in front of the Custom-house as possible, where the sand has been cut with an almost perpendicular face of 3 or 4 feet in depth, Captain Taylor and myself were of opinion that it is advisable, as a temporary measure, to protect it with a revetment of sand bags, and this work which was roughly estimated at between 700 or 800 Rupees was directed to be put in hand at once. At the same time I impressed upon Lieutenant-Colonel Kennedy the necessity of using his discretion in regard to completing the revetment, which, if the sea abates and the surf goes down, may possibly not be all absolutely necessary.

5. For the permanent repair and security of the work and the beach in front of the present Custom-house, I beg to recommend—

I.—That a new abutment with very short wing walls should be constructed in the crest of the present line of beach, beyond which it should not project.

The foundations should be on masonry wells sunk at least 10 to 12 feet.

II.—That four new bays be added to the pier by the insertion of three more pairs of screw piles braced together and covered by a timber platform, &c., like the remainder of the pier, the present inner pair of screw piles should be removed and used next to the new abutment longer piles being screwed in their places.

III.—That a group of four or five groynes be constructed, three north and two south of the pier; these groynes should be from 150 to 180 feet in length and built to a height of 2 to 3 feet above high water mark and placed at from 300 to 360 feet apart. The materials required for the groynes can be obtained in any quantity from the eastern spur of the West Hill.

No. 445-B. From Lieutenant-Colonel R. B. KENNEDY, District Engineer, Malabar, to Major-General G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Calicut, 29th July 1876, No. 89.

I HAVE delayed reporting the damage to the Calicut pier, because I was aware that a report on the same subject, with all particulars up to date of his visit, was being drawn up by Colonel Farewell, and I wished mine to include anything that has occurred subsequently.

2. When Colonel Farewell was here, the damage included destruction of the abutment and the wing-walls on both sides, with the exception of a short length at each extremity; also considerable encroachment by the sea on the beach line.

3. To avoid repetition of what he must have already reported from the particulars with which he was supplied during his visit, I will confine myself to what has since occurred, the measures taken to prevent further damage, and what, in my opinion, may perhaps be necessary towards obtaining security against the next monsoon.

4. Colonel Farewell directed the whole face of the beach extending from the extremity of one wing wall to the other to be revetted with sand bags, and this work, as well as a short groyne of the same material, was carried out without loss of time. I myself hardly thought that the amount of further damage to the beach, which this could prevent, was likely to be so great as to make the expenditure worth incurring; and I am confirmed in this opinion by seeing that neither below nor above the site of our revetment has the sea cut the beach away more than some 5 or 6 feet further in than the line of revetment, although we have had continuous high tides and very heavy surf ever since; the plan of attempting to save the abutment by throwing in materials in front of it did not fail to suggest itself to both Captain Bailey and myself, but the beach at that part was then at so steep a slope that thousands of Rupees might have been spent and no real good effected; in fact the abutment would have been a very dear bargain at the price; as the only possibility of getting materials to stand, I proposed to Captain Bailey to sink piles a short distance in front of the abutment, and cutting them off short to leave them to act as a catch; but before even a single pile could be got in, the abutment, which from the very first had been completely undermined, fell in. I am quite convinced that nothing could possibly have saved it; in fact it is no longer a matter of opinion, but it is positively proved, that sand bags would have been utterly useless, seeing that the revetment, which is now 70 feet further inland, cannot stand the violence of the surf, but the bags are tumbled about, and washed away in every direction, at every high water, notwithstanding that they are staked in front and workmen are stationed to restore the bags to their places and constantly drive in fresh stakes; as for the temporary groyne, it disappeared altogether the third night after having been put up.

5. The only further damage that has been done, since Colonel Farewell's inspection, has been the fall of the two piles that stood nearest the abutment. These had the sand scoured away right down to the screws, but were held up until the night of the 26th, when they succumbed. They were held up for some time by the single diagonal ties which attached them to the next row of piles, but these at length breaking off, the piles of course fell; all the rest of the piles have double diagonal braces, and though several of them have been deeply scoured, I do not anticipate that they will go, for as yet they have not sunk in the smallest degree.

6. As for permanent remedial measures, in the first place there is no question but that at least three, if not four, more rows of piles will be necessary; and the line of beach must be protected by a regular and carefully planned system of groynes. I think it very doubtful whether it will be wise or worthwhile to go to heavy expense in sinking deep and costly foundations for another abutment; but would in preference recommend an extra row of piles, and a stone revetment, such as I have used for bridges in

the Wynaad. So far as utility is concerned, this will answer every purpose; and it will be time enough to think of the merely ornamental, when the line of beach has been recovered and made safe; several of the present bays of the pier will, I believe, have to be taken up and longer piles screwed in, those removed being used for the bays more in shore. Then with regard to the question of groynes, I understood Colonel Farewell to say that he thought three or four groynes of rough stone of 150 feet long each would be advisable; but as stone, with the exception of laterite, can only be procured from a great distance, this will cost a good deal of money; roughly estimated, perhaps about Rupees 5,000 for each groyne. I have so little knowledge and no experience of this style of work that I feel diffident about expressing an opinion; but I know that all along the south coast of England groynes erected to prevent the displacement of shingle are constructed entirely of timber, and, moreover, do not extend further seaward than from limit of highest spring tides to highest neaps; I do not see why the same material should not be used in this case, nor perhaps is it necessary to carry the groynes any further seaward. They would I suppose have to be more numerous and nearer together, but a dozen such short timber groynes might be put in for the cost of one of stone 150 feet long. The rise and fall of the tide is I believe $4\frac{1}{2}$ feet, and I do not suppose these groynes would require to be more than some 60 or 80 feet long. It is true, want of permanency may be objected to; but then, under any circumstances, good timber should last five or six years, and a less time would be necessary to reform beach between them, if groynes are to do any good at all; and after a certain width has been gained, either the same system can be again resorted to for others, further seaward, or stone groynes may be adopted, with a very great economy of material to what would be the case if stones were now used, and the groynes made so long.

7. There is a great dearth of information as to the former configuration of the beach, but I am endeavoring to obtain all that is procurable and will submit it with a careful survey of the coast line some distance above and below the pier site as soon as possible; meanwhile, I think, that no fear need be entertained of any more damage during the present monsoon.

8. Since writing the foregoing, the sea has moderated, and Captain Bailey has been able to obtain measurements which give the following information:—

From Floor of Pier.	To sand.	To flange of Screws.
1st row of piles.	Fallen.	
2nd do.	14 feet 18 inches.	16 feet 9 inches.
3rd do.	15 " 8 "	16 " 9 "
4th do.	16 " 3 "	17 " 9 "
5th do.	17 " 3 "	18 " 6 "
6th do.	19 " 0 "	21 " 10 "
7th do.	20 " 2 "	22 " 1 "
8th do.	21 " 9 "	23 " 7 "

These are all of which the measurements have been taken, the remainder Captain Bailey considers have not been much scoured; but from the above it will be seen that in no case are screws more than 2 feet 10 inches in the sand, while others are not more than 13, 15, and 18 inches. I must say I think all the piles put in were imprudently short, and, unless the beach silts up, there can be but little security

for the pier; at the same time, none of the piles show any signs of sinking, nor is there any vibration in the pier.

No. 445-BB. Endorsement of the Chief Secretary to Government, Marine Department, dated Ootacamund, 31st July 1876, No. 1,166.

From J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative Department, to the Hon. W. HUDLESTON, Chief Secretary to Government, dated Madras, 27th July 1876, No. 4,935.

I HAVE the honor, in advertence to the correspondence marginally noted, to report, for the information of His Grace the Governor in Council, that I visited the port of Calicut on 19th July, and under instruction received by telegram from Ootacamund, I made inquiry into the accident that has disabled the pier and which will compel certain expensive repairs. I would wish before entering into detail to offer some remarks founded on my long experience of this west coast which I hope may help to explain some of the action that obtains along the seaboard and account for the changes which disturb our most careful arrangements.

2. The south-west monsoon, which comes up heavily charged with moisture and with rain clouds ready to precipitate vapour at any change of temperature, are met by the great chain of mountains, which with slight interruption raises itself from Comorin to Bombay. The cold air from the hills causes a tremendous downpour of rain, which has in course of ages brought down the earth and clay and made almost precipices of the western front of the range. Hence the gigantic backwater system and number of river outfalls along the coast. The out-pour of these volumes of water exercises the usual effect of fresh water in the sea in over-riding it and calming its surface, to say nothing of the enormous force it brings to bear in direct opposition to the waves by its perpetual ebbing action. Hence, in what may be called a good monsoon, no great difference is observed on the beach. But in last year and in this a partial failure of the monsoon has occurred, and the result is the sea brought up from a distance and lashed of the winds from the westward exercises more power on the coast and causes erosion of the beach. 1875 was a partial monsoon, this is still worse; the effect of the sea on the Calicut coast in 1875 was so marked that the Master Attendant wrote to the District Engineer drawing his attention to it, and to the fact that cocoanut trees even whose fibrous roots go so far to bind the beach were being washed away. The Engineer made an inspection, but did nothing; probably expecting that the next monsoon would re-establish matters. This next monsoon has complicated the difficulty, and the sea has now made a clean sweep of everything that intercepted the new coast line it was forming for itself. Some three or four rows of cocoanut trees have been carried away to the northward of the Calicut pier, and also the whole of the masonry work forming the buttress of the pier. The pier itself is uninjured, but stands isolated about 80 feet from the road. Some of the planking has been removed to avoid injury from the sea, which has begun to undermine the road opposite the Custom-house. "This portion of road is now revetted with sand bags." There was never any real necessity

for the long wall and railing extending the whole length of the Custom-house and godown frontage, and I would beg to recommend very respectfully that the repair to the pier be confined to lengthening it inwards to meet the road; the buttress having been proved to be a source of weakness rather than support. A few wooden piles, if iron ones are not forthcoming, and planking would then suffice. I fear the pier will never prove remunerative; it is too far from the heart of all native business.

3. It will be very advisable to place some groynes on each side of the pier to check any recurrence of the present difficulty. It is unfortunate that stone will have to be brought from some distance thereby adding to the expense. I think that the periods of bad weather for this year may be considered over.

TRANSFERRED to the Public Works Department.

(Signed) W. HUDLESTON,
Chief Secretary.

No. 445-C. From Lieutenant-Colonel R. B. KENNEDY, District Engineer, Malabar, to Major-General G. W. WALKER, R.E., Chief Engineer, Public Works Department, dated Calicut, 30th August 1876, No. 110.

REFERENCE No. 1,274, dated 25th August 1876.

The records of this office have been searched, and I have inquired personally of Captain Gillham, and it does not appear that any communication on the subject of erosion of the coast north of Calicut has at any time been made by him to the District Engineer.

No. 445-D. From J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative Department, to Major-General G. W. WALKER, R.E., Chief Engineer, Public Works Department, dated Madras, 15th September 1876, No. 6,251.

As requested in your letter No. 1,346, dated 7th instant, I have the honor to forward copy of a letter from the Master Attendant, Calicut, dated 13th instant, together with transcript of correspondence relating to the reference made to the District Engineer, touching the erosion of the sea at that port in 1875. In drawing attention to the matter, I merely wished to point out that a difference of opinion existed on this matter. The Master Attendant has daily and hourly opportunities of observing, which are denied to the Engineer, who might easily, on a casual visit, see nothing alarming.

From Captain F. M. GILLHAM, Master Attendant, Calicut, to the Acting Collector of Malabar, dated Calicut, 28th June 1875, No. 299.

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I quite concur with the Deputy Collector as to the desirability of adopting some preventive measure to guard against the sea-wall in front of the Custom-house becoming damaged, although I do not anticipate any immediate likelihood of danger to the wall, yet the beach in the vicinity of

the Custom-house is not broad, and the sea has recently encroached here a little; the sand at the base of the wall lying in the first instance washed away by the heavy rains passing through the gutters, and then carried off by the sea and current. I would recommend that the Department Public Works be called on to frame an estimate for laying down two or three short groynes and a few stones along the base of the wall, and, at the same time, that sanction be obtained for changing the flat tramway rails along the pier for ordinary ones, similar to those in the Customs-yard; the flat rails are a great nuisance, and entail a great deal of extra time and labor in passing loaded trucks to and fro. It is also very desirable that the sharp curves of the tramway inside the Customs-yard be reduced, as there is also great difficulty experienced in working loaded trucks expeditiously in the Customs-yard on this account.

From W. LOGAN, Esq., Acting Collector of Malabar, to Captain F. M. GILLHAM, Master Attendant, Calicut, dated Calicut, 16th September 1875, No. 2,483.

With reference to your letter No. 299, dated 28th June last, I have the honor to inform you that the District Engineer considers that the pier wall is in no danger from erosion of the beach.

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“ “ “ “
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“ “ “ “

From Captain F. M. GILLHAM, Master Attendant, Calicut, to W. LOGAN, Esq., Acting Collector of Malabar, dated Calicut, 24th September 1875, No. 388.

In reply to your letter No. 2,483, dated 16th instant, I have the honor to inform you that as the high sea of the south-west monsoon is now over and the sands having also recently silted up to some extent opposite the Custom-house, there is no further danger to the wall at present, but I beg to observe, that when I wrote to you on this point in June last, the wall was in most imminent danger, parts of it then being nearly undermined; and as this is likely to occur again during the strength of any future south-west monsoon, I am still of opinion that it would be well to take some preventive measure to guard against the loss of the wall in time, particularly as the beach is never very broad near the Custom-house even in the fair season.

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“ “ “ “

From Captain F. M. GILLHAM, Master Attendant, Calicut, to J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative Department, Madras, dated Calicut, 13th September 1876.

I HAVE the honor, in reply to your letter of the 11th instant, to state that I first brought to notice of the Deputy Collector in charge of Customs personally (in June 1875) the probability of the wall being likely to come to grief if some remedial measures were not adopted to preserve it from impending danger. I conferred with that officer first, with a view that he should communicate with the Collector to get the Department Public Works to do the needful, as I was then of opinion that the preservation of the sea-wall, and the needful expenses to be incurred, was a matter which more immediately concerned the Customs Revenue Department. I send for your information now copies of further correspondence with the Collector on the same subject, and by which you will see that the matter was referred to the Department Public Works by the Collector, and the result of the Engineer's report that the wall was in no danger apparently put a stop to anything being done during last fine season; the wall was just as safe the day previous to the one on which the mischief took place as when the Engineer reported it as safe. It was certainly too late to do anything after the heavy sea set in last July, when the whole of the damage occurred.

*Proceedings of the Madras Government, Public Works Department,
24th November 1876. No. 3,157.*

suddenly. I am certain that if my suggestions had been attended to by the Department Public Works last year, the injury would not have occurred; one or two short groyne piers erected would certainly have saved the beach.

No. 445-E. From Lieutenant-Colonel R. B. KENNEDY, District Engineer, Malabar, to Major-General G. W. WALKER, R.E., Chief Engineer, Public Works Department, dated Camp at Luckadie, 25th September 1876, No. 125.

REFERENCE memorandum* No. 1,403,
dated 19th September 1876.

* Its enclosures returned herewith, No. 5.

In compliance with above, I have the honor to forward the only letter* on the subject which is on the records of the Malabar district office; permit me to add that the sea this year, at the time when the abutment of the Calicut pier was destroyed, was heavier than has been known by the oldest European resident; also that the late Acting District Engineer was correct in saying that after the monsoon the foreshore is restored, though perhaps not quite to the extent of that which has been encroached upon during the monsoon, as no doubt he would have found out had he had longer acquaintance with the locality; this is the case at the present time, but I have no doubt that there is a steady continuous encroachment each year, more or less, though with great variation as to the part of the beach acted on; and it will not do to leave matters as they are. I beg to add that the survey and sections of the beach will be ready in a few days, and it, with an estimate for restoration of the pier, will be forwarded to you without delay.

From T. D. HARRIS, Esq., Officiating District Engineer, Malabar, to W. LOGAN, Esq., Collector of Malabar, dated Calicut, 8th September 1875, No. 332.

In conformity with the request contained in yours, No. 1,796, dated 2nd July, I have the honor to forward herewith plans, estimates and specifications of the proposed works,* but I cannot recommend the groyne nor the revetment, although the revetment would be a very useful work in case of need, forming a rough sea wall, the groyne in such a position would serve no good purpose, and even after careful examination I do not consider the revetment absolutely necessary; the removal of the sand is chiefly due to the water passed off the road through the weepers, but it is brought back by the ingress of tides, and immediately after the monsoons the whole foreshore is restored; the seawall was never in any danger from erosion, so that I think you may safely strike out the item for groyne and revetment, viz., Rupees 2,855-4-0, for 634½ cubic yards of granite stones.

2. The changing of the flat rails is not either absolutely necessary, but, as suggested by the Master Attendant, it may be done as regards the piles of pier. I am inclined to think also that the barnacles or shells forming on them between low and high water has a tendency to preserve the iron. I am now conducting a series of observations on this subject, and it will be a great point gained if this fact can be established, and I have great hopes it will be so; but as regards all the exposed iron and wood-work of pier, it is of paramount importance that it is carefully painted every year immediately after the monsoon, and the whole platform should also be coated with a preparation of tar and asphalt in the proportion of 1 of asphalt to 3 of coal tar.

*Proceedings of the Madras Government, Public Works Department,
24th November 1876. No. 3,157.*

No. 445-F. Endorsement of the Chief Secretary to Government, Marine Department, dated Ootacamund, 20th October 1876, No. 1,517.

From J. H. TAYLOR, Esq., Lieutenant, R.N.R., Master Attendant, Administrative Department, Madras, to the Hon. W. HUDLESTON, Chief Secretary to Government, Marine Department, dated Madras, 27th September 1876, No. 6,496.

I HAVE the honor, in continuation of my letter to your address, numbered 4,935, and dated 27th July 1876, to report, for the information of His Grace the Governor in Council, that through the energetic efforts of Mr. Gillham, the Master Attendant of Calicut, communication for traffic has been restored between the Custom-house and the pier, and at the very trifling cost of Rupees (71-14-0) seventy-one and Annas fourteen.

2. I herewith submit a plan showing the mode in which the repairs have been executed to restore the traffic. The temporary platform has two lines of tramway rails laid upon it, connecting those on the pier with those leading into the Custom-house yard, and is of sufficient stability to bear the weight of loaded trucks passing over it as usual.

3. I would respectfully suggest that these repairs be not interfered with or dismantled until the close of shipping season in April next, in order to permit the traffic to proceed on without any interruption whatever, and to prevent any loss of revenue in the way of tolls levied on the pier. All the materials required for the permanent repairs of this structure could be collected near the spot, and the repairs themselves executed in all the month of May before the setting in of the south-west monsoon, which usually occurs about the first week in June.

4. Some of the piles of the inner section of the pier have at present only 1 and 2 feet of sand over the screws, and the necessity for replacing these by longer ones may be obviated by throwing out a groyne on either side of the pier (as already suggested by me) immediately, so as to secure as much accumulation of sand deposit during the present season, and before the setting in of the next south-west monsoon.

TRANSFERRED to the Public Works Department.

(Signed) W. HUDLESTON,
Chief Secretary.

No. 445-G. From Lieutenant-Colonel R. B. KENNEDY, District Engineer, Malabar, to Major-General G. W. WALKER, R.E., Chief Engineer, Public Works Department, dated Camp at Luckadie, 4th November 1876, No. 155.

I HAVE the honor to forward plan, estimate and specification for restoration of the Calicut pier, amounting to Rupees (5,970) five thousand nine hundred and seventy, which has been delayed owing to references having to be made regarding prices of iron work.

2. The portions of the pier that were destroyed were the abutment and sea-wall and the wood-work of one bay with its diagonal iron braces; the plan proposed embraces

*Proceedings of the Madras Government, Public Works Department,
24th November 1876. No. 3,157.*

the restoration of this bay, and the addition of four others, and that the three bays next to the one that was destroyed shall be dismantled, the present piles drawn, and longer ones screwed in, the old piles being used for the new bays; and that for the extreme shore-end of the pier two timber piles shall be used instead of iron, the approach to the abutment being kept up by a strong revetment of large stones built as a sea-wall.

3. The object of putting these wooden piles is simply economy; for, as I presume a system of groynes will be adopted with a view to recovering the beach line, it is to be hoped that the end bay may eventually be done away with, and a more ornamental style of abutment again built, which would occupy the site of that bay; it must be confessed that the plan, as now submitted will bring the pier so far in shore as to make it somewhat inconvenient for traffic along the beach-road while carts or trucks are loading or unloading at the place; the cost of the end bay is Rupees 460-6-8.

4. I am decidedly of opinion that except at great cost it is not possible to restore the abutment and sea-wall where they were stood with the smallest hope of security.

5. Temporary measures have been taken to accommodate traffic, and, as the Master Attendant is of opinion that great inconvenience would attend any earlier interruption of the same by commencing the restoration, I would propose to defer the actual construction until the end of the month of March, provided that all the materials are ready by that time; but in order to ensure that, early sanction is requested.

No. 446.

ORDER THEREON, 24th November 1876, No. 3,157.

CIVIL WORKS, No. 34-A.

His Grace the Governor in Council has little doubt but that the explanation offered by the Master Attendant, Administrative

Department, as to the causes of the erosion of the Malabar coast at Calicut may be accepted.

2. This erosion has been going on for some time. It appears to have been specially brought to the notice of the Collector of the District by Mr. Gillham in 1875, and Mr. Logan corresponded on the matter with the late Officiating District Engineer, Mr. Harris, who appears to have treated the report in a light and flippant way, which is noticed with dissatisfaction.

3. The Governor in Council is not disposed to sanction any outlay at present in connection with rebuilding or extending the pier, which, in the opinion of His Excellency, is, like the new Custom-house, badly situated.

4. The latter might perhaps be utilized as a Court-house, and the old Custom-house might be re-established, the pier being removed from its present site and re-erected thereat. Otherwise a double Customs establishment will be inevitable.

5. The propriety of such a change will be considered in the Marine Department, through which Colonel Kennedy will submit an approximate estimate of the cost of removing the pier, without the extension, to the site of the old Custom-house. Meanwhile with a view to protect the coast line generally from erosion, a series of groynes, composed of masses of such rock as is most readily procurable, should be run out to the north of the present pier.

*Proceedings of the Madras Government, Public Works Department,
24th November 1876. No. 3,157.*

6. For which work the District Engineer will at once prepare an estimate.

(True Extract)

(Signed) G. W. WALKER, Major-General, R.E.,
Secretary to Government.

To the District Engineer, Malabar.
" " Ganjam.
" Marine Department.
" Judicial do.

Order in the Marine Department 7 December 1876. N. 522

*Communicated to the Master Attendant
Madras and Collector of Malabar.*

(True Extract)

Chief Secretary.

The Master Attendant, Madras.

The Collector of Malabar.

The Revenue Department.

Exd. S. T. Austin.

Spare Copies

The Board of Revenue.

20 100

Govt. of 1876 Madras.

PUBLIC WORKS.

To.

THE DISTRICT ENGINEER,

MALABAR,

&c., &c., &c.

Dated November 24th.

Issued

Recd.

Encl.

G. O., 24th November 1876, No. 3457.

NOVEMBER.

Nos. 445-446.

Calicut Pier, Malabar District.—Passing
orders on papers relating to the damaged
state of the — and the measures to be adopt-
ed for its restoration.

Receivable No. 10. Dept

No. 5366

Pro. of for. Marine Dept

Dated 9 }
Recd 9 } Decr 1876

No. 522

Communicating order
in the Public Works Dept
relating to the damaged
state of the (Alcant-Vier.

No. 2973

Public Works

Decr

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