1. Number of pages 4
2. Date of Receipt 13-9-
3. List of References

M.R.O. 1—82 400—22-11-80

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

Con 23-12-57

G.O. No. 2351 Press Mis.

4950

Dated 19-12- 1857.

Not to be folded or roughly handled

No. 49. Read the following Extract from the Proceedings of the Chief Engineer, dated 8th December 1857, No. 5798.

From Captain H. W. RAWLINS, Garrison Engineer; to Colonel C. E. FABER, Chief Engineer, dated 9th November 1857, No. 457.

SIR,

In obedience to the orders conveyed in your proceedings No. 4552 of the 19th Ultimo, I have the honor to submit an estimate amounting to Rupees (95,000) ninty-five thousand, for constructing with piles a revetment wall outside DeHaviland's bulwark for the purpose of securing the Platform of the North Beach road between the Custom House and Clive's Battery.

2. The alignment for the piles would have to be at least 50 feet outside the present bulwark; and independent of the great cost of such a work, I fear that so solid a barrier would endanger the beaching of the boats, and make matters worse than they are at present. In rough weather the boatmen are unable to command a landing place. Their boats are often driven high and dry on to the beach far distant from where desired, and if a collision occurred against any part of the piled revetment, which was uncovered with sand, the consequences might be very serious.

3. Instead, therefore of constructing the revetment and extending the road opposite the Rice Godowns to its former width of 70 feet; I think it would be better to endeavour to draw off a part of the vast traffic from the Railway Terminus and Custom House, into one of the beach streets, and limiting the roadway along the beach to a width of 35 or 40 feet. The cost of a Tramway from the Terminus to the Customs is roughly estimated at about Rupees (31,000) thirty-one thousand. The accompanying plan shews the proposed line; and if the suggestion be approved, I shall be happy to make a careful survey, valuation return of the houses, and an estimate of the whole cost.

4. With regard to the measures most suitable to restore the Platform road now washed away between the P. and O. office and Clive's battery (a distance of 1000 feet); I recommend that the intermediate unfinished groyne be extended 40 yards from the bulwark that the drain on each side be prolonged 30 feet; and that the heads of these three works be protected by an arc or line of piles well driven down by the new Pile Driving Machine, and so close together and substantial, as to be of themselves strong enough to prevent the surf reaching the mouths of the drains, and the stones of the groyne from being scattered about.

5. The two drains would act as short intermediate groynes in support of the one prolonged to 40 yards; and these three works combined would, I think in time permanently accumulate a beach sufficiently broad to warrant the re-construction of the Platform road to at least 25 or 30 feet beyond the bulwark. At the edge of the road a small retaining or dwarf wall should be built, the top to be six inches above the level of the road. This wall need not be an expensive one. It would keep up the side of the road from being fretted away by the rains, and destroyed by people and goods going over it.

6. At the Royapooram Groynes the Beach is fast reforming; and beyond re-building the heels of the two northernmost groynes which were detached from the land during the late severe weather, I do not think any thing need be done. The Tannah is in my opinion secure, and the Groyne in front of it is re-accumulating a good beach. Thirty of the Boatmen's Huts (valued at about 300 Rupees) have been destroyed by an encroachment to the north of the Royapoorum Groynes, but they ought never to have been built so close to the sea, and it is only surprising they were not washed away long before.

7. At present all the Fisherman's huts from the Terminus to a mile northward abut on the sea within 15 or 20 yards of high tide; and the slightest rough weather destroys some of them, creating uneasiness and alarm among the owners I think it would be a good plan to take away these huts along the beach for a breadth of 50 feet, and to substitute a good broad unmetalled road way along it, also to open out a space in land opposite each groyne perpendicular to the beach, so as to admit more air and ventilation into the Town. The huts which would have to be pulled down are not worth 10 Rupees each; and I believe the whole might be purchased, and the ground levelled for less than Rupees 2,000.

[illegible] Superintending Engineer in charge of Contracts

8. The balance remaining on hand on account of all the Groynes up to this date amounts to Rupees (10,800) ten thousand and eight hundred.

Report by the Superintending Engineer in charge of Central Circle on the estimates for constructing an advanced bulwark of piles from the Custom House to Clive's Battery, and for carrying a line of Railway along the 2nd line beach from the Custom House to the Railway Terminus.

1. The first of these estimates Rupees (95,000) ninety-five thousand, was framed on my suggestion, as a means of protecting the enlarged roadway required for the heavy traffic along the beach, as I had no faith in the permanence of the effect of groynes, but on further consideration and inspection, I agreed entirely with Captain Rawlins, in thinking the piles would endanger the landing place, and that it would be much better to establish a line of rails along the road in rear, so as to draw off part of the traffic. An excellent line for the rails may be found in the Second line, and as the cost would probably not exceed Rupees (31,000) thirty-one thousand Rupees, this plan is preferable to the other on economical grounds.

2. The communication between the Custom House and the Terminus certainly requires improvement, and as the seond plan now proposed is decidedly the best, I recommend it for entry in the Budget of 1858-59.

3. The works proposed in paras. 4 and 5 of Captain Rawlins letter would certainly tend to reform the Beach ; but they are by no means likely to ensure its permanence.

Central office of P. W.,
Fort St. George, 13th
November 1857.

(Signed) E. LAWFORD, Major,

In charge of Central Circle.

From Colonel A. COTTON, Commandant of Engineers ; to Colonel C. E. FABER, Chief Engineer ; dated 2nd December 1857, No. 534.

SIR,

I have the honor to acknowledge the papers on the Northern Groyne, and in reply beg to transmit my remarks as follows—

I examined the Beach a short time after the storm and the state of it was not at all different from what I should have expected ; the storm following the long continuance of the southerly swells of the S. W. Monsoon, had cut away the sand that had been depositing previously at that point, but in the few days of smooth water that had intervened a very considerable deposit of sand had already taken place again.

I may as well just report my views of the operations of Groynes and of the Surf Groynes do not *make* sand ; they stop the current of sand that is continually travelling along the coast through the oblique action of the surf, which is for a great part of the year either to the Southward or to the Northward of West, but as the S. W. Monsoon continues to blow with violence for a much longer time and over a greater range of water, than the N. E., the quantity of sand travelling Northerly is always greatly in excess of that travelling Southerly. Hence the accumulations will always be greater on the south side of the Groyne than on the north side. When a new Groyne is made, the effect is, during the S. W. Monsoon, for the sand to collect on the south side, but of course as the action of the surf on the beach north of the Groyne continues, while the usual supply from the south is cut off, there is necessarily a cutting away of the sand on the north side, till the south side is filled up to the end of the Groyne, and the usual stream of sand passes round it and continues its course along the coast.

There is another action of the surf which depends entirely upon its force. When that force is slight, the beach is steep, and when it is severe the beach becomes more shelving so that after heavy surfs, a great deal of the sand all along the beach is carried out to seaward, but this is immediately thrown up again on the surf moderating, and this re-deposit is made in a few days.

Further it must be observed that there is only a certain quantity of sand travelling along the coast, and therefore to collect any quantity must take a certain time, which no increase in the number of Groynes, nor any mode of constructing them can in the least diminish.

To apply these principles to the present case, it was of course impossible to collect a great breadth of sand along the four miles of Coast at Madras, under a considerable time. And as

Groynes of considerable length were constructed so far south of Black Town, detaining such an enormous mass of sand to the southward, it was impossible but that the supply of sand to the Northern Groynes should be greatly delayed, and that while the process of collecting was going on to the southward, that the beach at Black Town would be liable to be very greatly demanded, during stormy weather, or rather during high surfs.

There has now been an enormous mass of sand accumulated to the southward, and as a current of it now passes round the ends of those Groynes, I have no doubt that the accumulation opposite Black Town will rapidly increase ; but it will still take some time to fill up thoroughly between the Groynes. I may mention here, that when I left Vizagapatam in 1845, though much sand had collected between the Groynes there in the course of two years, yet there was a considerable part of the southern side of each Groyne bare, but when I saw it again two or three years afterwards, the sand formed out to a perfectly straight line, and nothing at all was visible but the very points of the Groynes. This had taken 3 or 4 years through the length of beach widened was only about a mile.

Now at the end of the S. W. Monsoon, of course the Northern Groynes, would be very much denuded, and the storms at the setting in of the N. E. Monsoon would necessarily carry out to seaward what little sand was left. Thus the state of things was only just what was to be expected in October, but it does not in the least imply that the Groynes had failed in their operation, or that there would not in time be an ample beach there as well as to the southward. The only mistake has been in attempting to do too much at once, and constructing the Southern Groynes of such great length, thereby delaying the formation of beach where it was of much more consequence that is where the boats are beached.

There seems to me now nothing in the world to be done but to wait for the deposition of the sand which no works can possible hasten. The only question in my opinion now is, whether, when the present Groynes in Black Town are well covered with sand, it may not be advisable to lengthen them gradually in order still further to widen the beach there.

With respect to the Piling I quite agree with Major Lawford and Captain Rawlins, that such a work is out of the question. The ends of the Groynes at long intervals are so serious an evil to the boats, that I would on no account increase their number, but if a wider beach is wanted lengthen those already constructed, but piles would be intolerable and I conclude that the Master Attendant would not hear of such a mischievous expedient.

For Captain Rawlins plan for a Rail, I entirely approve of it. Whatever is done on the beach it is most desirable to diminish the traffic *along* it, that is North and South, because all goods landed and shipped must necessarily be carried across it, and if internal communications continue to be made, we must reckon upon an enormous increase of traffic. Therefore under any circumstances I would recommend the Rails on the second line of the beach, as an essential improvement of the Port.

I should think, that from the time the heavy surfs cease, there would be a great deposit of sand opposite Black Town.

With the above letters first recorded, the Garrison Engineer submits two estimates ; one of (95,000) ninety-five thousand Rupees, for constructing a revetment of piles along the space between the Custom House and Clives Battery ; the other of (31,000) thirty-one thousand for forming a Tramway along the 2nd line Beach, to connect the Custom House with the Railway station. The Superintending Engineer in charge of Central Circle has reported in favor of the latter work, and the Commandant of Engineers has also recommended its construction.

2. In forwarding the latter estimate for the consideration of Government, the Chief Engineer observes that the object of both projects is to secure and improve the thoroughfare for traffic, such as in the beginning of the present year was afforded by a wide road formed on the beach near the P. and O. Steam Company's Office, which had since been carried away by the action of the sea as far inland as the bulwark a dwarf groyne was sanctioned to secure the beach, and has been ordered to be constructed at this spot ; but the Chief Engineer sees reason for considering that some more permanent roadway should be established, and rejecting the piled revetment as injurious to the Port, he strongly recommends the formation of a Tramway in the 2nd line beach.

3. The Garrison Engineer has roughly estimated this Tramway at (31,000) thirty-one thousand Rupees, to which amount the Chief Engineer would propose an addition of (4000) four thousand Rupees, if the amount of Rupees (35,000) thirty-five thousand should be entered in the outgoing Budget.

4. Such a work would very greatly facilitate the shipment of goods, or their importation by Rail, and the increasing trade of the Port demands such aid, irrespective of the interests of the Railway compan[illegible]; but there is not now time to shew the amount of traffic that would pass along the branch line, the construction of which might be effected by that company as Contractors.

5. There would be no material interference with ordinary traffic along the street, and the Beach road would be greatly relieved.

6. The construction of the Dwarf groyne for securing the beach will be carried out as sanction, and the other groynes will be repaired, but the Chief Engineer is not disposed to recommend any further additions to those works at present, nor does he think it advisable to build the dwarf retaining wall suggested by Captain Rawlins, until the experience of another year shall show far the renewal of the former broad beach roadway may be expedient.

7. The Chief Engineer is aware that the Plans and Estimates are not in such a state of preparation as to justify their entry in the Budget; but for the further surveys and levels, and for consultation with the Municipal and Railway Officers, the time is not sufficient. He is therefore constrained to lay the subject before Government in its present state, with the view of enabling them to direct its further investigation, if such course should seem advisable.

8. As however the Government may desire to have the professional views of the Chief Engineer in detail, as to the mode in which the available cash balance in hand viz Rupees (10,800) ten thousand and eight hundred should be expended, resolved that the subjoined instructions directing the Garrison Engineer to complete the Dwarf groyne to a total length of at least 40 yards from the DeHavillands bulwark, and to carry on the further operations therein detailed, be forwarded for the information and favorable consideration of Government.

(Signed) C. E. FABER, Colonel,
Chief Engineer.

No. 5797.

Instructions for the Garrison Engineer in conducting the works on the Beach.

The Garrison Engineer will be good enough to proceed with the construction of the Dwarf groyne sanctioned by Government of 40 yards in length and with the repairs only of the Royapooram Groynes. The tunnels between Clives Battery and Custom House are to be repaired and secured by rough stone or piling at the heads.

No immediate attempt is to be made to restore the roadway along that part of the Beach seaward of the Bulwak.

Estimates are to be sent in for repairing the breach in the embankment at the Marine Villa and for constructing the two river groynes at that spot with rough stone of select size and shape.

Central Office of Public Works,
Fort St. George, 8th December 1857.

(Signed) E. LAWFORD, Major,
In charge of C. Circle.

No. 50. ORDER THEREON, No. 2351; dated 19th December 1857.

The Government observe that there is already a larger number of estimates before them for entry in the Budget of 1858-59 than can be admitted, and they must decline to receive any more. The Government are moreover not disposed to consider the estimate submitted with the above letter, in its present imperfect and incomplete state, a state which the Chief Engineer himself admits to unfit it for entry in the Budget. The estimate will accordingly be returned to the Chief Engineer, and he will be requested to re-submit it for the Budget of 1859-60 in a complete state, with returns of traffic, after communication with the Municipal and Railway Officers.

2. The Government approve of the instructions issued by the Chief Engineer to the Garrison Engineer regarding the construction of Dwarf Groynes.

(Signed) H. FORBES,
Acting Secretary to Government.

No. 5798.

Extract from the Proceedings of the Chief Engineer in the Department of Public Works Fort St. George,
Under date the 8th December 1857.

Read the following Papers.

From the Garrison Engineer
Submits a Plan of the North Beach with two Estimates for a Shell Revetment and a Tramway from the Railway Station to the Custom House - Also recommends clearing a space between the Boatmen's Village and the Sea at Royapooram. — (Here Enter No. 157 dated 9th November 1857) and Recorded in Diary 13th November 1857.

From — Do — Do — Do
Submits Abstracts Estimates for — Do — Do — Do — (Here Enter No. 6 dated 13th Nov 57)

From the Superintending Engineer in charge of Central Circle
Reports on the above Estimates forwarded by the Garrison Engineer — (Here Enter date 15th Nov 1857) and Recorded in Diary of the same date

From the Commandant of Engineers
Remarks on the papers regarding the groynes on the North Beach, and reports his views on the operations of groynes and of the surf and on the project for laying down a line of railway along the 2nd line Beach — (Here Enter No. 534 d/2nd Dec 57)

With the above letters first recorded, the Garrison Engineer submits two Estimates; one of (95,000) Ninety five Thousand Rupees, for constructing a Revetment of piles along the space between the Custom House and Clive's Battery; the other of (31,000) Thirty one thousand for forming a tramway along the 2nd line Beach, to connect the Custom House with the Railway Station. The Superintending Engineer in charge of Central Circle

Original Enclosures 5.
1 Letter from the Garrison Engineer. No. 157 d/9th Nov 57
1 Letter from the Supt. Engr. in charge of Central Circle No. — dated 13th Nov 57
1 Letter from the Commandant of Engineers No. 534 d/2nd December 1857
1 Plan.
1 Abstract Estimate.

Circle has reported in favor of the latter work, and the Commandant of Engineers has also recommended its construction.

2 In forwarding the latter estimate for the consideration of Government, the Chief Engineer observes that the object of both projects is to secure and improve the thoroughfare for traffic, such as in the beginning of the present year was afforded by a wide road formed on the beach near the P. & O. Steam Company's Office, which has since been carried away by the action of the Sea as far inland as the bulwark. A dwarf groyne was sanctioned to secure the beach, and has been ordered to be constructed at this spot; but the Chief Engineer sees reason for considering that some more permanent Roadway should be established, and rejecting the piled revetment as injurious to the Port, he strongly recommends the formation of a Tramway in the Sea Line Beach.

3 The Garrison Engineer has roughly estimated this tramway at (31,000) thirty one thousand Rupees, to which amount the Chief Engineer would propose an addition of (4,000) Four thousand Rupees, if the amount of Rupees (35,000) thirty five thousand should be entered in the outgoing Budget.

4 Such a work would very greatly facilitate the Shipment of goods, or their importation by Rail, and the increasing trade of the Port demands such Aid, irrespective of the interests of the Railway Company; but there is not now time to show the amount of traffic that would pass along the branch line, the construction of which might be effected by that Company as Contractors.

5 There would be no material interference with the ordinary traffic along the Street, and the Beach Road would be greatly relieved.

6 The construction of the Dwarf groyne for securing the beach will

will be carried out as Sanctioned, and the other groynes will be repaired, but the Chief Engineer is not disposed to recommend any further additions to those works at present, nor does he think it advisable to build the dwarf retaining wall suggested by Captain Rawlins, until the experience of another year shall show how far the renewal of the former broad beach Roadway may be expedient.

7 The Chief Engineer is aware that the Plans and Estimates are not in such a state of preparation as to justify their entry in the Budget; but for the further Surveys and levels, and for consultation with the Municipal and Railway Officers, the time is not sufficient. He is therefore constrained to lay the Subject before Government in its present state, with the view of enabling them to direct its further investigation, if such course should seem advisable.

8 As however the Government may desire to have the professional views of the Chief Engineer in detail, as to the mode in which the available cash balance in hand with Rs (10,800) ten thousand and eight hundred should be expended, Resolved that the subjoined instructions directing the Garrison Engineer to complete the Dwarf groyne to a total length of at least 60 Yards from the Esplanade bulwark, and to carry on the further operations therein detailed, be forwarded for the information and favorable consideration of Government.

I have the honor to be
Sir
Your most obedient Servant
A. Fraser Colonel
Chief Engineer

To,
The Secretary to Government P. W. D.

№ 3797

Instructions for the Garrison Engineer, in conducting the works on the Beach.—

The Garrison Engineer will be good enough to proceed with the construction of the Dwarf groyne sanctioned by Government of 40 Yards in length and with the repairs only of the Royapooram Groynes. The tunnels between Elive's Battery and Custom House are to be repaired and secured by rough stone or piling at the heads.

No immediate attempt is to be made to restore the Roadway along that part of the Beach Seaward of the Bulwark.—

Estimates are to be sent in for repairing the Beach in the imbankment at the Marine Villa and for constructing the two River groynes at that spot with rough stone of select size and shape.—

Central Office of Public Works,
Fort St George, 8 December 1857.

Signed E. Crawford, Major
In charge of E. Circle.

To The Garrison Engineer,
Fort Saint George.

A true Copy
Major
In charge of Circle.

P. W. D.

No 2357.

Extract from the Minutes of Consultation
Under date the 19th December 1857.

Read the following
Extract from the Proceedings
of the Chief Engineer.

(Here enter 8th December 1857 No 5798)

The Government
observe that there is already
a larger number of Estimates
before them for entry in the
Budget of 1858/59 than can be
admitted, and they must
decline to receive any more.
The Government are moreover
not disposed to consider the
Estimate submitted with the
above letter, in its present
imperfect and incomplete
state, a state which the Chief
Eng

Read.

Read.

No 2357 of 1857.

Enclosure in letter
dated 20th Dec
No 5798

Estimate for Repairs, extra establishment
and Contingencies of the Calcutta
Road Division for the year 1858.

Copy forwarded to Executive Engineer
Road Division Calcutta
by Railway
for Information
Railway Department
Western Circle

C12 Dec 1857.

Engineer himself admits to unfit it for entry in the Budget. The estimate will accordingly be returned to the Chief Engineer, and he will be requested to resubmit it for the Budget of 1859/60. in a complete state, with returns of traffic, after communication with the Municipal and Railway Officers.

2. The Government approve of the instructions issued by the Chief Engineer to the Garrison Engineer regarding the construction of Dwarf Groynes.

RB

9 Copies to the Chief Engr Dirs 21st.

Cons: 11th Augt 58/57 Nos 894 96

Public Works 1857 Dept.
Do to Cons 23d Decr.
No 2351.

Extract Mins of Cons:
of 19th Decr: 57.

From the Offg Chief Engr
& Secy Augt 58 Ct No 1743 inst.
14 Sh

Ry & Comns for
Constructing a Tramway
& Line Beach.
9 Sept 58.
Do 1857.

No 49 & 50.

Ordering the returns to
the Chief Engineer of the Estimate
Amounting to Rupees 35,200 for
laying down a single line of
Railway of 1200 Yards along the
2d line Beach from the Railway
Terminus to the Customs House,
and requesting him to resubmit
it for the Budget of 1859/60 in a
complete state.

12 Decr 1857