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GOVERNMENT OF MADRAS

Revenue DEPARTMENT

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No. 61. Read the following letter from Lieutenant-Colonel W. FAREWELL, Inspecting Engineer for Ports and Communications, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Chepauk, Madras, 11th April 1874, No. 27:—

3 Tracings marked No. $\frac{1}{A}$ No. $\frac{2}{B}$ and No. $\frac{316}{C}$.
1 Section marked No. $\frac{3}{D}$.
1 Estimate, Rupees 1,63,060.
1 Copy of a letter from the Resident of Travancore and Cochin, No. 91, dated 12th February 1874, etc.

I HAVE the honour to report that, during the early portion of last month, in company with the Collector of Malabar, the District Engineer, and the Cochin Range Officer, I inspected the Ponany Canal from Tiroor Railway Station to Cochin. I explained to the District Engineer exactly what was required to be done to improve the navigation, and pointed out to the Collector the injurious effect of the dams, now annually constructed to exclude salt water from the cultivation, upon the traffic of the canal, which it virtually closes for at least two or three months of the year.

2. I have given the District Engineer written instructions in detail as to how the survey of the canal is to be carried out, the scales on which it and the longitudinal and cross sections are to be drawn, how the present property of the canal and land to be taken up are to be depicted, and how to be officially applied for (accompanied with survey measurements, etc.), from the Collector, and the mode in which the work should be carried out; thus I hope that the survey, estimate, and specification for the work when again submitted will be useful, intelligible papers, that will tend much to simplify the examination of the project, checking the estimate, and clearly explain what is contemplated to be effected therewith.

3. The navigable line from Tiroor Railway Station to Ponany has much improved since I last passed through it, the heavy freshes last year having considerably scoured out and deepened the backwater. The canal from Ponany to Velliangode also showed better depths than I ever remember, the repairs having been carefully attended to during the past year; but between the dams at Velliangode and three miles below Chowghaut little else but mud existed, and, except in the jheels, where there was water, it was barely sufficient to float our canoes. I was glad to find, however, that the work executed to define the canal where it passes through the jheels in this section has proved more successful than I hoped for, and very much reduces the supposed difficulties in raising water-tight embankments in these localities, as projected, to exclude salt water from the fields when the troublesome dams are done away with. Generally the bed of the canal in this section is deep enough, though it will require to be considerably widened and straightened; the remainder of the canal is in much the same condition as when last reported upon. I take this opportunity of noting that the Diwan of Cochin's letter, offering to share the expense of maintenance,

Public Works G. O., No. 42, dated 7th November 1873.

ted with Government Order in the cal Department, No. 413, dated 2nd

October 1873, it is not clear how nal he refers to.

4. At Cochin the result of closing the Cruz Milagre Gap is very marked, the Survey* of the coast north of Vypeen, lately made by the Chief Engineer of Cochin, compared with that† made some years ago, both herewith forwarded, will give an idea of the changes that have taken place since the gap has been closed, though the lagoon in front of the dam is silting in but very slowly; of the old bars in front of it one has entirely closed up, and the other is reduced to a width of about 150 feet, and at low tide to a depth of 18 inches; a fine, broad shelving beach has formed from groyne M on Survey marked No. $\frac{2}{B}$ up to just beyond the Malliapooram old gap, and this beach is gradually rising above high tide, and advancing like a wave up the coast; and in communication with the Chief Engineer of Cochin, I understand he is about to submit the measures he proposes to secure the sand that has formed at Malliapooram from being again swept away.

* Marked No. $\frac{2}{B}$.
† Marked No. $\frac{1}{A}$.

5. A close inspection of the dam works shows the work to have been well done, and to be most carefully maintained. I would here note that at the small gap from the lagoon into the sea, I found a ferry boat maintained, in consequence, it was said, of the Post-office runners and foot passengers not being permitted to cross the dam works, this interdiction I have on certain conditions removed, and addressed a letter,* of which the following is an extract, to the Resident on the subject:—

* No. 131-A, dated 13th March 1874.

"At Cochin I found that, for postal purposes, a ferry has been established outside the dam works across the present opening from the newly formed lagoon in front of the dam; as it is essential that the bottom or bed of the opening in question should not be deepened or the opening widened, as is likely to be the case by poling, and by the ferry boat or boats being run against the shore, north and south, I request you will be so good as to address the Cochin Government in the matter, and note that it is very undesirable that a ferry should be established at the point in question. If the Cochin Government will place a peon to take care that no injury is done by foot passengers to the dam works, I see no objection to the dam being used by the Post-office runners and foot passengers, and I have called for the submission of an estimate for gravelling and fitting the crest of the dam for this purpose; in the meantime the Post-office runners may at once be permitted to use it, but I would particularly beg that the Cochin Government be urged to keep a peon at the work to prevent cattle, under any circumstances, being driven over the dam or over the present exit from the lagoon in front of it."

6. I believe the establishment of a ferry in the locality in question will be likely to prove injurious to the works, as from what I heard on the spot it was evident that the ferrymen were averse to its being done away with, and thus surreptitiously would do all in their power to prevent the outer gap closing; as to my mind it ought to have done speedily, and I cannot help thinking that it has already been meddled with, to such an extent as not to be detected. I see no objection, now the dam has sufficiently consolidated, to its being used by foot passengers, provided that it is guarded, and approaches to it are made so as to prevent injury to the returns, etc. I have called upon the District Engineer to prepare an estimate for the work, and for an annual maintenance for the dam, etc., which will be submitted with the report and estimate for maintaining the groynes, called for in G. O., No. 368, dated 14th February 1874. In his letter, No. 1, dated 7th January 1874, the District Engineer reported that, owing to erosion from the ebb current, a portion of the dam slipped and had immediately to be repaired and revetted; he submitted an estimate, including the cost of the work executed, for revetting the whole dam; on inspecting it, it appeared to me that the current did set all along the face of the work, and the estimate for revetting the dam to its whole length was submitted; as, however, the cause of erosion has not been deemed to be sufficiently proved, the papers have been remitted to the District Engineer for further report and revision if necessary.

7. How far the permanency of the newly formed beach, from groyne M on Survey marked No. $\frac{2}{B}$, can be relied upon, cannot, I think, be fairly decided until after the monsoon, when, should it be found to have, as I believe it will be, increased, the value of the work that has been effected by closing the gap will be very evident. In 1870, an estimate was submitted by the Chief Engineer of the Cochin Government for protecting the coast from the rapid erosion then taking place between Vypeen Point and Malliapooram, amounting to upwards of two lakhs of rupees, now rendered unnecessary by the action of a work that has cost but a little over one-fourth of this amount while, the benefit of what has been done is now daily showing itself in the increasing depth of the estuary, from the old gap downwards, the deepening of the entrance of the harbour, and, lastly, the increased depth of at least a foot on the bar.

8. In order that all changes that may hereafter take place may be duly recorded and clearly shown, I have issued detailed instructions regarding their systematic and periodical preparation, regular submission, etc., etc. Although the reclamations in the backwater in the immediate vicinity of Cochin have been put a stop to, I think some limit should be fixed regarding the whole sale reclamation now going on in the backwater all along the line of navigation; to a certain extent these reclamations are good, *i. e.*, they tend to confine the water and deepen the navigable channel, but they should be carried out on some systematic principle, and never be permitted, as some of them do at present, to threaten the extinction of the line of navigation, and necessitate its most inconvenient diversion.

9. I beg to report that the instructions laid down in paragraph 2 of the Chief Engineer's memorandum, No. 130, of the 8th April 1873, have been attended to, and the Travancore Government have agreed to hand over the quarries therein referred to to this department; copy of the Resident's letter, etc., is herewith attached for information, one, together with plan, etc., has also been supplied to the District Engineer of Malabar. Lastly, the more I have studied the whole subject of the immediate improvement of the Cochin harbour, the more I feel convinced that, when the gap has been closed and Government have determined* to dredge the Cochin bar, the huge training walls proposed by Mr. Robertson might with advantage be considerably reduced in height, and thus bring the cost of the work within a limit to which I hope funds will be available, and admit of its being taken in hand at an early date, and the work required effected and maintained.

* G. O., No. 45, dated 7th February 1874.

Judging from what has already taken place at Kurrachee, I believe that once the bar is dredged to 20 feet below low water springs, or 8 feet deeper than it is at present, two groynes, 1,500 and 1,000 feet respectively in length, constructed on the shallow ground shown in red lines on the survey, will be quite sufficient to direct the ebb discharge from the harbour and its huge estuaries upon the bar, and maintain it at the dredged depth, and so long as the works that have been lately completed remain intact, Cochin will be a perfect harbour and accessible to vessels of considerable tonnage. No dredging in the harbour itself is necessary, as in time this will all deepen itself to the depth of the bar by the joint action of the ebb tide and heavy monsoon freshes.

10. As the sea at Cochin in the shallow sites proposed for the two groynes is never very heavy, I do not think that it is necessary to use concrete blocks in their construction; large quantities of excellent gneiss in huge blocks is obtainable from the Kakanaad quarries and could be deposited on the sites noted at the very outside cost of Rupees 5 per cubic yard, while concrete blocks would cost nearly three times this amount. The southern groyne, it will be observed, starts from the vicinity of the light-house; this appears too far south, but if the space between the groynes is narrowed too much, it would be likely to deepen the entrance too close to the base of the groynes, and thus cause them to collapse; the distance apart shown in the survey is nearly that named by Mr. Robertson, as is also their sites. To construct these groynes with *pierre perdue*, with the section given in the plan marked No. $\frac{3}{D}$, would cost about Rupees 1,63,060, and thus the harbour of Cochin may be restored to its former great value, and maintained in perfect order for the future. I omit noting probable cost of dredging the bar as that, under any circumstances, appears to have already been decided upon. If the training walls or groynes proposed are not carried out, I am afraid that, sooner or later, the coast south of Cochin must be further protected, and a group of groynes costing at least 30,000 or 40,000 Rupees be constructed in the vicinity of the cocoanut tope, containing the port boundary pillar, about a mile or a mile and a half south of the entrance to the harbour.

Vide dotted red lines on old Survey marked No. $\frac{316}{C}$, enclosed.

11. The instructions given in paragraph 3 of G. O., No. 318-B, dated 10th February 1874, have been duly attended to.

No. 62. ORDER THEREON, 4th July 1874, No. 1,792.

CIVIL WORKS, No. 3.

His Excellency the Governor in Council will await the submission of the detailed survey and estimate for improving the section of the West Coast between Ponany and Chetwye, on which the attention of the officer in charge is ordered to be concentrated in G. O., No. 2,585, of 4th November 1872, as early submission of the entire scheme. But it may be well that he should, in the first instance, deal with the short length of three miles between Ponany and the Cochin Bar, which is entirely artificial and of very insufficient width and depth, and submit plans and estimates for sanction in order that it may be taken in hand this next dry season, and so a commencement made with the sum of Rupees 20,000 allotted in the current year's Budget.

2. The favourable effects of the closure of the Cruz Milagre Gap are noted with satisfaction. The Resident of Cochin will be so good as to report the result of Lieutenant-Colonel Farewell's application to him to cause the Cruz Milagre Ferry to be disused, and the dam used for foot traffic instead; the passage of cattle being prohibited. The attention of the officer in charge of the West Coast Canal will be directed to the maintenance of the dam, which will evidently require careful watching as well against the forces of nature, which may be directed so as to strengthen it on both sides, as accidental and intentional damage.

3. The proposal to take in hand two long groynes on either side of the entry to Cochin Harbour commends itself to His Excellency the Governor in Council (as already intimated in paragraph 3 of G. O., No. 2,138, of 27th August 1873,) as combining means of improving the harbour with those of securing the adjacent shores from erosion; and he is not unwilling that a considerable sum, say Rupees 50,000, should be entered in the Provincial Budget of 1875-76 on their account. But he is hardly prepared to allow action to be taken on the very concise estimate now submitted, without details of the means to be used for obtaining, conveying, and depositing, the stones required, and of the data by which a rate of Rupees 5 a cubic yard was arrived at. It would appear that some correspondence has been going on between the District Engineer and Chief Engineer on the subject; and that the Inspecting Engineer has acted upon the latter's suggestion to obtain possession of ground for quarrying stone, and for a canal by which to convey it into the backwater; which has been conceded by the Maharajah of Travancore on favourable terms, for which the Resident will be so good as to convey the acknowledgments of this Government to His Highness. But none of these details have yet been laid before His Excellency the Governor in Council, and he must look to the District Engineer for detailed plans and estimates illustrative of the means and cost of carrying out the great work provided for in Lieutenant-Colonel Farewell's condensed estimate as follows, viz.:—

South Groyne, 1,500 feet long.			
		RS.	
14,200 Cubic yards, at Rs. 5	... ...	71,000	
Sundries, 10 per cent.	... ...	7,100	
			78,100
North Groyne, 1,000 feet long.			
15,450 Cubic yards, at Rs. 5 ...	... ...	77,250	
Sundries, 10 per cent.	... ...	7,750	85,000
Total ...			1,63,100

4. It is observed, with reference to the concluding remark of paragraph 3 of Lieutenant-Colonel Farewell's letter, that there is no doubt as to the length of canal the part maintenance of which the Cochin Government have agreed to defray. It is distinctly stated in the letter from the Diwan, and repeated in that of the President, recorded with the Political Department of the 17th October 1873, No. 413, that the Government are prepared to defray half of the cost of improvements and maintenance of the canal the whole way from

Cochin to Ennamakal, which is opposite Chetwye, and this proposal has been accepted by the Madras Government.

5. The Collector of Malabar will be good enough to report whether anything can be derived from the reclamation of (useless) portions of the backwater outside the embankment, and if so, the probable amount that may be expected from this source.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the District Engineer, Malabar.
,, Revenue Department.
,, Financial do.
,, Political do.
,, Officiating Controller of Public Works Accounts.

Exd. S. T. Austin.
10 Spare Copies sent forthwith

N. 2249.
Revenue Dept.

Govt. of 1874 Madras.

PUBLIC WORKS.

To

THE DISTRICT ENGINEER, MALABAR,

&c., &c., &c.

Dated July 4th.

Read. -9- Encl.

G. O., 4th July 1874, No. 1,792.

JULY.

Nos. 61-62

917

17

West Coast Canal, Cruz Milagre Gap, and Cochin Harbour.—Passing orders on the subject of the improvements of the section of the West Coast Canal between Ponany and Chetwye, and noticing with satisfaction the effects of the closure of the Cruz Milagre Gap and offering observations on the estimate for constructing groynes on either side of the entry to Cochin Harbour.

N. 86
Communicated to the Board of
for the report of the Collector
on the subject referred
Order