No 16 dated [illegible]

8½ 2820.

Govt. of {1869} Madras.

PUBLIC WORKS.

To

THE SUPERINTENDING ENGINEER,

4TH DIVISION.

&c., &c., &c.

Dated August, 20th.

Recd. " 23$^{0}_{.}$ *Encl.*

G. O., 20th August 1869, No. 2,735.

AUGUST.

Nos. 421-422

No dt. 1st Septr/69 Encl 2 pp.

East Coast Canal.—Passing orders on the letter from Mr. Executive-Engineer Fraser, forwarding certain papers connected with the extension of the East Coast Canal to Kistnapatam.

No 1. 1st Septr/69

With order

No. 421. Read the following letter from the Executive-Engineer, East Coast Canal.

Forwards certain papers connected with the extension of the East Coast Canal to Kristnapatam. (Here enter 11th August 1869, No. 97.)

From the Executive-Engineer, East Coast Canal, to the Superintending Engineer, 4th Division, dated Mount Road, 9th August 1869, No. 95.

I HAVE the honour to forward, for submission to the Government, an estimate for the first 11¼ miles of the extension of the East Coast Canal from Doogooraz patam to Kistnapatam, a tracing of the detailed map and sections, and a tracing of the plans of the proposed bridges.

1 Estimate.
1 Specification.
1 Map.

This portion of the canal is between 72½ and 83¾ miles from Madras, the latter point being at the village of Kanapur. It is half a mile more than one-half of the whole length of the extension which is 21½ miles. From Kanapur to the Ramperu river at Kristnapatam the distance is 10¾ miles.

2. The whole amount of the estimate for these 11¼ miles is 1,88,210 Rupees; but this does not include the amount of compensation for land, the account of which I have not received, but which would probably not exceed 5,000 Rupees.

3. Kanapur is the farthest point to which the line of canal has been surveyed, levelled, and marked out in detail. For the remainder of the distance to the Ramperu, the line has been roughly marked out; a stone bench-mark at every quarter of a mile has been erected; and these have been carefully levelled over, and their heights fixed. About one-and-a-quarter miles at the northern end and a portion of the Ramperu have been surveyed in detail, so that about nine-and-a-half miles have yet to be surveyed and prepared for execution.

In a few days I shall be able to detach a surveyor from the junction canal work to proceed with this survey.

4. The estimate now furnished is an abstract of the detailed one which gives the estimate of each furlong from beginning to end. The prices are such as I have hitherto been able to get the work done for, and I believe them to be sufficient.

I have calculated the contingencies and extra superintendence at ten per cent., which I consider not too much for a work like this, where the canal is to be carried through back-waters and swamps across rivers, and where the material is so unstable. This per-centage is not included in the contracts, but is reserved for superintendence and such contingencies as may arise during the execution of the work.

5. In division No. 1 the line is carried along the edge of the back-water. The material throughout is almost pure sand with a large quantity of agglomerated oyster shells, which rendered the work tedious and difficult. Nearly the whole of the excavation was in water.

In the other divisions there is not much difference in the material to be cut through. There is generally a layer of clay at the surface varying from an inch to a yard in thickness, then alternate strata of sand, clay, and shells to the bottom. Water is generally come to at from one to two yards in depth, and the rest of the work must be kept dry by baling, which is troublesome and expensive, as the water is generally plentiful. In division No. 2 the soil is strongly impregnated with soda, which does not improve its quality. In this division there is a large proportion of clay. In Nos. 3 and 4 sand predominates.

6. For the remainder of the canal to the Ramperu the detailed estimate will be furnished so soon as I can get the survey completed. But in the meantime I can give you a close approximation to the cost. Between Kanapur and the Ramperu the excavation will be continuous, as there are no back-waters, but what is known as the "swamp" extends to within a mile of the river (the Ramperu.)

The canal must be carried somewhere through this swamp, and the levels already taken show that the cutting will not exceed three yards in depth. The soil is pretty much the same as that already cut through, and should not cost more; but there will probably be more difficulty in unwatering the excavation, as the high sand hills on both sides are usually surcharged with water. Taking the average depth at three yards, and the same dimensions and prices already adopted, the estimate for one mile would be as follows:—

	Cubic yards.		Rs.
1st yard cutting	44,000 at	0-1-9 =	4,812
2nd do.	33,440 at	0-3-3 =	6,793
3rd do.	22,880 at	0-4-0 =	5,720
	1,00,320		17,325
		Pie.	
Levelling spoil-banks, sloping, &c.,	1,00,320 at	3 =	1,567
			18,892
Contingencies, &c., at ten per cent.			1,889
Total cost for one mile...			20,781
And for 10¾ miles the total cost would be ...			2,23,396
Add the amount of estimate now submitted for 11¼ miles.			1,88,210
Total of probable estimate			... 4,11,606

This, I believe, would be the maximum cost of the work exclusive of compensation for land which will not amount to much.

7. Knowing it to be the desire of the Government to open the navigation to the Ramperu at the smallest cost of time and money, I do not propose to construct any bridges, or to level the spoil-banks, or dress off the slopes at first. These can be done afterwards.

So much of these items as can be deducted, amount, with their proportion of contingencies, to about 32,000 Rupees; and deducting this sum from 4,11,606 Rupees, there is left a sum of 3,79,606 as the total amount for which the canal can be opened.

8. The above calculations are made on the supposition that the canal will be carried along the swamp where there is solid ground, and where the excavation would average three yards in depth. This, however, may, and probably will, not be the case, as we may be able to take occasional advantage of a deep channel which runs through the swamp for nearly its whole length. As yet I do not know how far I can make this channel available, but I am satisfied that I shall be able to open the navigation for 3½ lacs of Rupees if the work is allowed to proceed without occasional stoppages.

There are no coolies to be had in the neighbourhood of the works; they must all be brought from great distances; and in consequence of the irrigation works at Parvapully and elsewhere we can get very few from the north and west of the line. We are consequently obliged to get coolies from Madras and the country south and west of Madras; and when they are stopped working and scattered as they were sometime ago, it is nearly impossible to collect them again.

9. In the Proceedings of Board of Revenue, No. 2,969, dated 3rd May, paragraph 13, a sum of 86,250 Rupees was allotted for this work, and a further sum of 15,000 was allotted for the current official year. These amount to 1,01,250 Rupees.

The actual expenditure up to this date has been 85,000 Rupees, and a further sum of nearly 30,000 Rupees will be required to pay for the work which was completed when I was obliged to stop further progress in consequence of the G. O., No. 2,059, dated 24th June 1869, and which I received on the 1st of last month.

From the Proceedings of the Board of Revenue, No. 2,969, dated 3rd May 1869, and received from your office on the 2nd of June, there appears to be a sum of 1,53,956 Rupees of the East Coast Canal Fund now available for expenditure. I would suggest that one lac of this amount should, without delay, be appropriated to the northern extension, and thus enable me to proceed with the work vigorously.

10. I am happy to be able to report that when the work was stopped we had opened, for navigation, over nine miles of the canal; that is up to 81⅔ miles which point is marked by a red × upon both the map and section. Boats go there now.

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422. ORDER THEREON, 20th August 1869, No. 2,735.

CIVIL WORKS, No. 54.

WITH this letter the Executive-Engineer in charge of the East Coast Canal, in submitting an estimate of Rs. 1,88,210 for the first 11¼ miles of the extension of that canal northwards from Doogooraz-pettah towards Kistnapatam, reports that upwards of nine miles of the distance have been excavated and opened for boat-traffic at an expenditure of Rs. 1,15,000, and gives it as his confident opinion that, if the erection of bridges, the levelling of spoil-banks and the dressing of slopes be deferred, he will be able to complete the work for navigation to tide water in the creek at Kistnapatam, for a total outlay of Rupees 3,50,000, or for a further sum of Rupees 2,35,000. This will, however, be contingent on no interruption being allowed to occur from the non-provision of funds, such as, the Government regret to learn, has now taken place, owing to that

cause and to Mr. Fraser's misapprehension of the scope of the orders conveyed in Proceedings, No. 2,059, of the 24th June 1869.

2. Those orders had no application to works in progress from Local Funds, nor ought they to have been interpreted to refer to works for which, although funds had not been allotted, money was known to be available. In paragraph 13 of Proceedings in the Revenue Department, under date the 16th March 1869, No. 711, it was shown that, notwithstanding the amount available for expenditure from Canal Funds was Rupees 1,42,650, only Rupees 1,01,250 had been allotted for the prosecution of the work of extension; and, as of this sum Rupees 86,000 were supposed to have been at that date expended and the balance appeared to be insufficient to carry on the work, the Board were directed to make a further grant. This has not been done, and the result is, as the Board will now be sorry to learn, that the Executive-Engineer in charge of the canal, alarmed at the prospect of out-running his credit, has had recourse to the injurious measure of dismissing his coolies.

3. Intimation has been received of the sanction by the Government of India of a loan of two lacs of Rupees to supplement the appropriations of funds at the credit of the canal for its extension to Kistnapatam, but as interest will be chargeable on all sums expended from this loan, it is not desirable that it should be drawn upon while money is available from other sources. The Board of Revenue will therefore be called upon in the Revenue Department to place at Mr. Fraser's disposal such portion of the balance of the Canal Funds as can be spared with due regard to the expediency of retaining a sufficient reserve for the expenses of maintenance, and that officer will take immediate steps for resuming operations, leaving, as he suggests, the erection of bridges and all work not essential to the opening of navigation, for future execution.

4. As the Government of India require the plans and estimates for the extension to be submitted to them for approval and sanction in a complete form, the fragmentary plan and estimate forwarded by Mr. Fraser will be returned to him, in order that he may combine them with the plan and estimate of the whole of the extension in the shape in which the project must be laid before His Excellency the Governor-General in Council.

(True Extract.)

Colonel, R.E.,
Secretary to Government.

To the Superintending Engineer, 4th Division.
" Controller of Public Works Accounts.
" Revenue Department.

Exd. F. R. Bantleman.

No 1.

10 Letter No 2733 Dated 20th August 1869