

(1) Number of pages 6
(2) Date of repair 13-8-82
(3) Initials of the Referencer _____

TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

Revenue DEPARTMENT

G.O. No.	<u>528</u>	Press.
B.P. No.		Mis.
Dated	<u>27.2.1828</u>	<u>197</u>

Not to be folded or roughly handled

525
11

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

15th February 1878, No. 134 I.

Irrigation.

Account.

Read the following paper :—

No. 39. Endorsement of the Chief Engineer for Irrigation, dated Camp, Godavery, 11th January 1878, No. 9 I.

From Lieutenant-Colonel H. L. PRENDERGAST, R.E., District Engineer, North Arcot, to the Chief Engineer for Irrigation, dated Vellore, 16th November 1877, No. 2,963.

2 Survey Sketch.
5 Longitudinal Sections.
5 Cross do.
1 Channel do.

1 Plan of stone revetment.
1 General Abstract Estimate.
7 Detailed do. do.
7 Abstract do. do.

I HAVE the honor to forward five plans relating to the Palar embankment works, drawn by Assistant Engineer Mr. Swinden, viz. :—

1. Survey sketch of the river.
2. Longitudinal sections of embankments.
3. South. } Embankment cross sections.
4. North. }
5. Cross sections of river.

2. Mr. Swinden finally took charge of the work from the Revenue Department on the 3rd September, and on the 5th the river rose, and has not run dry since then. A portion of the southern embankment near the bridge was the first to suffer in consequence of the deep channel of the river running in that direction; but as the water rose and extended from bank to bank, the embankment on both sides gave way for long distances; when the river first rose the clay wall in front of the embankments was in course of construction, and the excavation for this clay wall received the first stream of water; where the clay coating was not thrown over from the foot of the bank the latter was undermined, became cut, and the sand inside soon slipped down, followed by its covering of earth. But as the depth and velocity of the river increased the irregular points in the line of embankment gave way to the force of the stream, the earthen banks were rutted by several heavy showers of rain so as to expose the sand within, and so by degrees a great part of the embankments was brought down, even in portions where the clay work had been finished it would not stand. Rain and floods are usually not expected in September, and when the water began to come down the river measures were adopted to protect the embankments by throwing out brushwood and bamboo spurs, but little was done in this way, as the effect of the water was soon found to be much too great to be overcome. The coolies were then employed in rectifying the portions that were not seriously damaged and completing the clay wall in the upper mile.

3. Plan No. 1 shows the present condition of the embankments with the lengths of work that are sound, almost sound, so much damaged as to be called destroyed and entirely washed away; the plan also shows for what lengths the clay wall has been completed, and partly so. On the south bank the sound portion is 4,120 feet in length, or 28 of the whole length of 14,420 feet, while 4,700 feet are quite gone or 33 of the whole length. On the north bank the sound portion is 6,080 feet or 48 of the whole length of 12,780 feet; no portion on the north bank is entirely washed away.

4. Mr. Swinden writes regarding the effect of the embankment as it now stands in the event of the river rising to the highest recorded level. From the two sections on plan No. 5, the sectional area of the river bed at 4,000 yards above the bridge is 13,065 feet, and at 500 yards above the bridge it is 13,243 square feet, and the difference between the volumes discharged at the two points is about 7,000 cubic feet per second; this represents the spill over both banks in a length of about 2 miles. The breach in the south embankment, however, occupies nearly a mile, or from $\frac{3}{4}$ mile to $1\frac{1}{2}$ mile, and the rise in the surface of the water due to the interception by the embankments is $3\frac{1}{2}$ inches. But as the spill through the long breach in the south embankment will be of greater depth than it would have been before the embankments were thrown up, there will be no great difference between the volume of water that would be now thrown over the south bank, and that which there would be, without the embankments. Hence the embankments as at present will not cause any injury to the country or Public Works. The embankments do not intercept any drainage, and the fields along both banks are drained into irrigation channels, which run in a course parallel to the river.

5. But the height that the river has attained this year is four feet below the maximum flood level, or that of 1874, when part of the bridge was carried away; and a higher flood would have caused still more destruction to the embankments than what is shown by the cross sections in plans 3 and 4.

6. In reply to your memorandum No. 51 N. A. of the 29th ultimo, Assistant Engineer Mr. Vincent gave his assistance in laying out the line of embankment to the Revenue Department; but as I was present occasionally at the work and might have interfered to alter the alignment I cannot relieve myself of responsibility. There was a large number of distressed people requiring employment; the land is of great value along the river banks. The holders of the land were strongly averse to having their fields touched even for the excavation of earth, and would not consent to banks being formed over their fields. Much delay would have been involved if the Revenue officers had taken steps to acquire the land; and it was considered to be far more economical to follow generally the lines of the river banks. If I had had the benefit of your Circular No. 81 on river embankments six months before the instructions therein given would have shown that the correct principles for embankments must be followed, and the work would probably not have been put in hand from the opposition that would have been made by the ryots. The modifications as pointed out by you with G.O., No. 151, of the 16th July, were at once put in hand, but the work was carried on by a great number of coolies who were scattered over its length; and the water came just at the most unfavorable time when the clay wall was being built. Nothing was done in the way of planting nanal as the earthwork had to be done first.

The estimate was being revised and the depths were being measured to which the clay was sunk below the surface of the river bed when the water came down and prevented the measurements being carried out; the depth of the clay wall is shown on the Range Officer's sections to be five feet, as that was expected to be the general depth. But Mr. Swinden's sections show the depth at seven feet, as representing

* One survey.
Four longitudinal sections.
Three cross sections.

more nearly the quantity of work that has been actually done. Thus the estimate is now forwarded also with the plans; * the total amount is Rupees 84,317

at famine relief rates, and the expenditure has amounted to Rupees 82,444; at the ordinary departmental rates the amount of estimate is Rupees 37,133.

6. The detailed abstract shows separately for the north and the south bank the items of original estimate as reviewed in your note No. 62 I, in G.O., No. 151 I, dated 10th July 1877 for Rupees 16,500, the extensions of the embankment, and the modification in adding the clay wall, and protection of the foot of the banks.

In revising the estimate the Range Officer found that the rates on the original estimate had been considerably exceeded, although no turfing work had been done; and by comparing the actual expenditure with the work performed the original estimate of Rupees 16,500 had to be increased to Rupees 38,069. Calculating in the same manner for the clay work and extensions provision is made for the amount that appeared likely to be necessarily required.

Since the work began the coolies received higher daily pay, and their tasks were reduced from 75 to 50 per cent. of an ordinary departmental task; so that a considerable rise in payments was unavoidable. Sunday wages were also given; and many people came in an enfeebled condition to the works throughout the most trying time of the distress.

The sand work for the embankments as first estimated was entered at 4 Annas per 100 cubic feet or Rupees 6,808 at departmental rates; but this was found to have cost Rupees 14,998, or at the rate of 8 Annas 9 $\frac{3}{4}$ Pies; the rate for the extensions was therefore made 8 Annas 9 Pies. The departmental rate for earth was entered at Rupee 1 per 100 cubic foot, or Rupees 6,524; but the work is supposed to have cost Rupees 15,723, or at the rate of Rupees 2-6-6 $\frac{1}{2}$; and the rate for the extensions has been taken at Rupees 2-6-6. It was

In Public Works Department, No. 45 I, 29th August 1877. suggested in G.O., No. 2,467, Revenue Department, of the 7th August, that piece-work should be introduced. But I represented in my letter, No. 1,966, of the 17th September (addressed to the Chief Engineer, Public Works Department), that on consultation with the Collector I had decided we could not suddenly change the system without causing great hardship in throwing many of the weak and sickly out of work, but that the endeavour would be made gradually to work up the gangs to a more remunerative outturn. This is now known to have been actually the case; for the expenditure since the work came into the hands of the Public Works Department has cost Rupees 33,016, and by Mr. Swinden's measurements this outturn would have cost Rupees 53,679 at the rates of the revised estimate.

SUBMITTED for the consideration of Government.

In Proceedings, Madras Government, No. 472 I, of the 8th November 1877, the District Engineer's first report on the damage sustained by the Palar river embankments above Vellore bridge was recorded pending the receipt of a further report.

2. The District Engineer has reported the extent of the damage sustained and has forwarded plans illustrative of the works and showing what parts of the banks have escaped injury and what parts have been partially or wholly destroyed.

3. The undersigned is of opinion that the restoration of the embankments on defective alignments would not be desirable. The upper ends of both banks may be retained, but all the rest should be realigned if protective embankments of any real value are to be obtained. On plan No. 1 have been noted the arrangements which appear to be suitable.

Dated 29th October 1877.

4. Whether the embankments be or be not completed and made efficient the nanal planting indicated on plan No. 1 will be desirable to improve the river and the approach to the bridge.

5. The District Engineer has submitted a number of estimates, but with these it does not appear to be necessary now to deal. The expenditure already incurred

should it be thought to be a final charge to famine. These estimates are as given in the general abstract.

North Embankment—

	Public Works rates	Famine rates
Original length ...	8,850	20,284
Extension ...	2,740	5,600
Clay work ...	5,260	12,796
	16,850	38,680

South Embankment—

	Public Works rates	Famine rates
Original length ...	7,850	17,785
Extension ...	5,250	11,350
Clay work ...	5,650	13,769
	18,750	42,904

Stone revetment ... 1,733 2,733

Total ... 37,133 84,317

The District Engineer explains that the famine rates are based on actuals.

6. It is recommended that before any revision of estimates is made the nature and extent of the interests to be protected and the advantages which the construction of stable embankments would secure should be ascertained and stated. Then an approximate estimate may be made of the cost of constructing the flood banks on the revised alignments, including land compensation, masonry works, &c. It will then be seen whether it is likely to be worth while to carry out the work, and if this be decided in the affirmative regular estimates can be prepared.

(Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
Chief Engineer for Irrigation.

To the Joint Secretary to Government, Public Works Department, Irrigation Branch.

No. 40. ORDER THEREON, 15th February 1878, No. 134 I.

HIS GRACE the Governor in Council does not consider it desirable to incur further expenditure on these embankments beyond finishing the clay coating of a portion* of the north embankment. The District

* In the 2nd and 3rd miles from the bridge. Engineer will state what amount will be required for this purpose.

(True Extract.)

Lieut.-Col. R.E.,
Joint Secy. to Govt., P.W.D.,
Irrigation Branch.

To the District Engineer, North, Arcoot with
all the plans and estimates.
" Chief Engineer for Irrigation.
" Examiner of Public Works Account.
" Revenue Department.

End. C. Howarth.
Spare Copies

525
3

Revenue Dept.
No 860

IRRIGATION
ACCOUNT

Govt. of (1878) Madras:
PUBLIC WORKS.

THE DISTRICT ENGINEER,
NORTH ARCOT,
Do., Do., Do.

Dated February 15th

Issued

Recd.

26

Recd.

G. O., 15th February 1878, No. 134 L.

FEBRUARY.

Nos. 39-40.

Palar River Embankments above the Vellore
Bridge, North Arcot District.—No further
expenditure to be incurred on the —beyond
finishing the clay coating of a portion of the
north embankment.

No 525
Comm. to the
Board of Revenue
27 Feb 78 *C. L.*

16 Feb. 1878. P. O. No. 2878