

(1) Number of pages _____

(2) Date of repair _____

(3) Initials of the Referencer _____

MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	2494	Press
B.P. No.		Mis.
Dated	3-9-	C874 195-

Not to be folded or roughly handled

*Proceedings of the Madras Government, Public Works Department,
3rd September 1874.*

Read the following papers:—

No. 56. From the District Engineer, Kurnool, dated 22nd July 1874, No. 13.

No. 574.

No. 57. *Note by the Chief Engineer for Irrigation.*

With a letter No. 6, of the 20th May last (despatched 22nd June,) the Acting District Engineer, Kurnool, transmitted an estimate, amounting to Rupees 220, for the repair of a sluice of the Musalimadugu tank, which had been reconstructed in 1871 by a Contractor, in place of one which had been swept away by the tank breaching. The District Engineer was, in reply, informed that the original and revised plans for this sluice would be required, and that the amount of the original estimate should be reported, together with particulars of the area of irrigation, revenue, etc.

2. The papers transmitted with the Acting District Engineer's No. 13, of the *Vide* report, dated November 1871, by Super-visor Hayes, 22nd ultimo, show that the—

Ayacut area under the tank is	...	...	...	...	Acres	?
Present extent of cultivation	...	...	...	...	"	237
Do. Revenue	...	...	...	...	Rupees	1,221

It would appear, for no connected account of the work has been given, that Mr. Hayes prepared an estimate, amounting to Rupees 7,821, for the repair of this tank which provided for—

1. Closing eight breaches.
2. Repairing and rebuilding revetment.
3. Raising bund to a uniform height of 4½ feet above full tank level.
4. Rebuilding one sluice.

3. The estimate of 1871 has not been transmitted, but Captain Taylor states that under it work of the value of Rupees 3,663 on closing the breaches and reconstructing the sluice were expended in 1871-72 by Messrs. Hayes and C. Norfor. Then the estimates were returned in 1873-74 to Captain Taylor for revision of rates, and these for the work remaining to be done were accordingly fixed by him. In this year also an additional sluice was built at a cost of Rupees 600, probably as a Minor New Work.

4. The Acting District Engineer now transmits a revised abstract estimate, amounting altogether for Repairs and Minor New Works to Rupees 10,721, and comprising the following items:—

					<i>Repairs.</i>			
					Rs.	A.	P.	Rs.
Repairing the Bund—					1,341	13	6	
Earthworks	...	...	...	...	1,155	0	0	
New revetment	...	...	...	...	245	7	0	
Old do.	...	...	...	...	416	8	0	
Backing to revetment	...	...	...	...	311	3	6	
Contingencies	...	...	...	...				3,470
Repairing and closing breaches								2,469
Rebuilding sluice	...	...	...	...	1,202	0	0	
Repairing do. thereafter	...	...	...	...	220	0	0	
								1,422
								7,361
Of which already expended								3,663
Work remaining to be done								3,698

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The work also provided for in the estimate of Rupees 220 has been undertaken on emergency and has probably been nearly carried out.

Minor New Works.					RS.
New sluice (already built)	...	...	...	...	660
Do. surplus weir, 200 feet	...	...	...	...	2,700
					3,360

of which the surplus weir alone remains to be constructed.

5. The tank is of moderate size, with apparently nothing remarkable in its circumstances. Much time was spent in taking sections not only of the bund but of the bed of the tank: of the information obtained as to the area and capacity of the tank nothing has been said, and although it appears to be contemplated to extend the area of irrigation to 137 acres now under dry cultivation, it has not been shown that there will be water available. Again, with regard to the proposed additional surplus weir 200 feet in length, no information whatever has been afforded demonstrating either that any further means of disposing of surplus water are required, or that the dimensions of the work estimated for are appropriate. The existing escape is apparently 103 feet in length; the breaching of the tank was manifestly due primarily to the state of disrepair into which the bund had fallen; it is very possible that an additional weir is needed, but it must be shown what the area of the drainage basin of the tank is, what the probable maximum flood discharge therefrom amounts to, how much can be disposed of by the existing escape, and then what further discharging power is required.

6. The design of the reconstructed sluice which has proved a failure was reasonably good. It required front wings of some sort to retain the interior slope of the bund, but if suitably founded it would no doubt have stood, and wings might have been added. The nature of the soil is specified to be black cotton with a substratum of gravel. A good foundation was essential, and paragraph 9 of

Vide also paragraph 9 of report, dated 1st May 1871, signed by Mr. Fraser.

the report, dated November 1871, states how the foundations were to be prepared and laid. It must be remarked that,

quite independently of the Contractor's very bad work, the instructions given for the preparation of the foundations would have alone sufficed, if duly carried out, to render the failure of the sluice highly probable. A trench was to be cut, all soft soil removed and refilled with fresh sound earth, which was to be well rammed. If any made earth was placed under the sluice, settlements were a natural result. The plan was defective also in presenting continuous lines right through the bund along which percolation would be comparatively easy.

It must be noticed also that the specification for the new sluice contains the same improper directions for placing made soil under the concrete where needful.

7. The rates shown in the estimate appear to be very high. The highest rate for cotton soil on a small tank of this sort should not exceed a rupee for 12 to 14 cubic yards, exclusive of tamping, while most of the work might very well be done for 10 Pies the cubic yard. For closing the breaches 4 Annas a cubic yard for tamped earth, and 2 Annas for untamped, are shown, and have probably been paid; for the work most of which remains to be done 1½ Annas and 3 Annas are entered. It is altogether unreasonable to suppose that the consolidation of earth-

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work need cost as much as excavating it and bringing it to a bund; an addition of 3 Pies a cubic yard for tamping is very ample, and it should form a separate provision in the estimate. I am of opinion that it is necessary to decline to sanction the high rates of this estimate, for I am quite sure that they are unnecessary, and that first the work does not need to be done in a manner which would necessitate such rates; and, secondly, the people actually doing the work would not receive them or anything approaching to them. I would therefore modify the earthworks of the part of the estimate as yet uncarried out as follows:—

	RS.	A.	P.
7,269 cubic yards of earthwork, average rate 1 Anna	454	5	0
7,269 " of tamping, at 1½ Pies a cubic yard	56	12	7
3,522 " of earthwork at 1 Anna	220	2	0
3,522 " of tamping thoroughly, at 3 Pies	55	0	6
Total...	786	4	1

Against Rupees 1,341-13-6. Difference... 555 9 5

The revetment with new stone may also be struck out and the backing thereto appertaining, the consequent reduction will be 1,320 cubic yards at 14+4 = Rs. 1-2-0 = 1,485. If new revetment be required it should be brought forward separately. The tank is not a deep one, and it is doubtful whether it is exposed to high winds during the time it retains much water.

8. If another surplus weir be required, and if a site can be obtained where the ground and full tank level are about equal, a suitable design can be made for about 5 or 6 Rupees the foot run instead of 13½ Rupees. There is no necessity for a top width of bund of 15 feet with, as a consequence, a great length of wing; and a width of apron of 41½ feet with little or no overfall would be a great waste of money. At a site such as that supposed a simple wall with the ends stepped up to the proper height, carried into the bund to 3 or 4 feet more than the height* of the latter, and the bund

* i.e., so as to allow a slope of 1 to 1 to the earthwork at the junction.

retted, will with 6 to 9 feet of rough stone apron below the crest wall, answer

the required purpose. Even adopting the design submitted, in its general features the alteration sketched would, with the omission of plastering, which, with rubble masonry, is unnecessary, reduce the estimate by 800 or 900 Rupees, and it may further be remarked that if stone can be procured for Annas 14 a cubic yard, rubble masonry should probably not cost more than 2 to 2½ Rupees, instead of 3 Rupees. On the canal not far off very excellent rubble masonry has of late years been executed for Rupees 2½, and abounding as the Kurnool District does in very good building stone, the work done should be both cheap and durable.

9. The items recommended for sanction are —

Repairs.					RS.	RS.
Raising and improving bund	...	...	...	...	3,470	
Deduct on earthworks as above	...	...	555	9	5	
New revetment and backing	...	...	1,485	0	0	
Contingencies	...	...	204	6	7	
					2,245	
						1,225
Repairing and closing breaches (already carried out)	...	...	...	...	2,469	
Re-building sluice 1,202+220	...	...	...	...	1,422	
Total Repairs...						5,116

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Minor New Work.

Constructing a new sluice Rs. 660
10. Even as thus reduced the amount is very large compared with the revenue, and it will be seen from the Curnam's statement, countersigned by the Tahsildar, and dated 25th October 1871, that the revenue of 1870-71 after deducting remissions amounted to only Rupees 573. There appears to have been great delay in carrying out the necessary repairs; if all the irrigation works of the district were to be dealt with as this one, and if such extravagant rates be allowed, their maintenance would be rendered impracticable; a little common sense and comprehension of what is necessary and reasonable are required; in paragraph 3 of the report dated 1st May 1871, it is prescribed that the earth brought to the bund if dry shall be broken up into "pieces not larger than half a cubic inch," and no advantage would result from such a minute sub-division, while, on the other hand, it must absorb much labor which might be profitably employed on useful work, and occasion much waste of money.

OOTACAMUND, (Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
6th August 1874. Chief Engineer for Irrigation.

No. 53. ORDER THEREON, 3rd September 1874, No. 2,494.

IRRIGATION, No. 11.

In accordance with the recommendation of the Chief Engineer for Irrigation the following estimates in connection with the Musalimadugu tank in the Kurnool District are sanctioned:—

Repairs including work executed in 1871-72 Rs. 5,116
Minor New Work, a new sluice already constructed 660

2. The remarks in the Note on the estimates contain additional evidence that a radical improvement of the administration of the Public Works Department in the district is urgently needed, and the Government trust that the newly appointed District Engineer, Mr. Goodchap, will be successful in introducing the reforms required, and in securing both prompt attention to the requirements of existing works, and due economy in carrying out all that may be necessary. Extravagance in rates must be altogether abandoned. Work must be well done at rates based on proper data, and in all cases, until a great change for the better shall have been obtained, the District Engineer must require from all Range Officers such information as will enable him to judge whether the rates entered in estimates are fully justified by the actual circumstances of the work.

(True Extract.)

(Signed) JOHN MULLINS, Lieut.-Colonel, R.E.,
Joint Secretary to Government.

To the District Engineer, Kurnool.
,, Chief Engineer for Irrigation.
,, Officiating Controller of Public Works Accounts.

Exd. S. T. Austin.
Spare Copies

*List of papers connected with
the Musalimadugu Tank Estimate*

- ✓ 1 Longitudinal Section of the bund
and cross sections.
- ✓ 1 Plan of Kalingulak.
- ✓ 1 Do of Sluice.
- ✓ 1 Survey and cross sections of the Tank.
- ✓ 2 Original Reports.
- ✓ 1 Abstract Estimate.
- ✓ 1 Report on Sluice.
- ✓ 1 Telugu letter with translation.
- ✓ 1 Statement of land to be cultivated.

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17/11/1874
17/11/1874

17/11/1874

17/11/1874

- Enclosures
- 4 Plans
 - 2 Original Reports
 - 1 Abstract Estimate
 - 1 Report on Plans
 - 1 Letter to the Chief Engineer
 - 1 Statement
 - 1 List of the

No 13 District Engineer's Office
Camp Ambam, 22 July 1874
The District Engineer,
Kurnool.

To The Chief Engineer for Irrigation
Subject Musalimadugu Tank

Sir In reply to your Memorandum No 463 of the 29 ultimo, I have the honor to enclose the plans &c therein called for. I was under the impression that these were despatched to your address last December.

Of the entire estimate the following items have already been expended.

Closing breaches &c
reconstructing a } 3668 in 1871-72 by Messrs
Large ones which do } Haig & Son for
Small do do 660 by Capt Taylor 1873-74
Total Rs 4328

The estimates were returned to me last year for revision of rates and after inspecting the Tank I fixed the prices for such work as remains to be finished i.e. raising the bund, and constructing a new talingula.

The sluice put up by Mr. Hayes (regarding which I wrote to you) has since collapsed, and as it is necessary to save the Pound and crops, I have directed the Range Officer to have it repaired on emergency. I shall be obliged if you would sanction the balance of estimate now submitted and place funds at my disposal, as this reservoir is a source of great anxiety to me in its present incomplete state; last year I had to cut through the bund to save the work from utter destruction.

+ the foundations rest on black cotton & I propose rebuilding the face walls of sluice on foundations resting on the substratum of gravel.

I have the honor to be
Sir,
Your most Obedt. Servant.
W. H. E. M. Captain
District Engineer.

[Faint, illegible handwritten notes in the right margin.]

The choice put up by Mr. Hayes (regarding)

C.E.'s No 1380
From ^{Sup.} Chief District Eng
Kurnool

2. The Chief Engineer
for Irrigation

Dated 22nd 2 July 1874
Asd 1st Aug

No 13. Enc: 11.

Forwards Plans and
Estimates for raising of
the Musalimadugu tank
for sanction.

6/8/74
M. 5232/74

MSB

By District Engineer.

No 574.
Note by the Chief Engineer for Irrigation
With a letter No 6 of the 20th May
last (despatched 22nd June) the Acting
District Engineer, Kurnool transmit-
ted an estimate, amounting to
Rupees 220, for the repair of a sluice
of the Musalimadugu Tank, which
had been reconstructed in 1871 by
a contractor in place of one which
had been swept away by the tank
breaking. The District Engineer
was in reply informed that
the original and revised plans
for this sluice would be required,
and that the amount of the
original estimate should be re-
ported, together with particulars
of the area of irrigation, revenue
&c.

2. The papers transmitted with
the Acting District Engineer's No 13
of the 22nd Utters show that the

vide report dated 14th November 1871 by Supervisor Hayes
under the Tank is Acres? 257
Present extent of cultivation —
Revenue — Rupees 1221

It would appear, for no connected account of the work has been given, that Mr. Hayes prepared an estimate amounting to Rupees 7821 for the repair of this Tank which provided for

1. Closing breaches. 2. repairing and rebuilding revetment. 3. Raising bund to a uniform height of $4\frac{1}{2}$ feet above full Tank level.
4. Rebuilding one sluice.

3. The estimate of 1871 has not been transmitted, but Captain Taylor states that under it work of the value of Rupees 3668 in closing the breaches and reconstructing the sluice were expended in 1871-72 by Messrs. Hayes and C. Norfor. Then the estimates were returned in 1873-74 to Captain Taylor for revision of rates, and those for the work remaining to be done were accordingly fixed by him.

In this year also an additional sluice

sluice was built at a cost of Rupees 660, probably as a minor new work.

4. The Acting District Engineer now transmits a revised abstract estimate amounting altogether for repairs and minor new works to Rupees 10,721 and comprising the following items

<u>Repairs</u>	
Repairing the bund	
Earthworks	Rupees 1341-13-6
New revetment	1155
Old do	245-7
Backing to revetment	416-8
Contingencies	311-3-6
Repairing & closing breaches	2469
Rebuilding sluice	1202
repairing do thereafter	220
	1522
	7361
of which already expended	3668
Work remaining to be done	3693

The work also provided for in the estimate of Rupees 220 has been undertaken on emergency and has probably been nearly carried

carried out

minor new works

New sluice (already built) 660

surplus weir 200 feet 2700

3360

of which the surplus weir alone remains to be constructed.

5. The tank is of moderate size, with apparently nothing remarkable in its circumstances much time was spent in taking sections not only of the bed but of the bed of the tank. of the information obtained as to the area and capacity of the tank nothing has been said, and although it appears to be contemplated to extend the area of irrigation to 137 acres now under dry cultivation, it has not been shown that there will be water available. Again with regard to the proposed additional surplus weir 200 feet in length, no information whatever has been afforded

demonstrating either that any further means of disposing of surplus water are required, or that the dimensions of the work estimated for are appropriate. The existing escape is apparently 103 feet in length: the breaching of the tank was manifestly due primarily to the state of disrepair into which the bund had fallen; it is very possible that an additional weir is needed, but it must be shown what the area of the drainage basin of the tank is, what the probable maximum flood discharge therefrom amounts to, how much can be disposed of by the existing escape, and then what further discharging power is required.

6. The design of the reconstructed sluice which has proved a failure was reasonably good. It required

front wings of some sort to re-
tain the interior slope of the
bank, but if suitably founded
it would no doubt have stood,
and wings might have been add-
ed. The nature of the soil is
specified to be black cotton
with a substratum of gravel.
A good foundation was essen-
tial, and para 9 of the re-
port dated November 1871
states how the foundations were
to be prepared and laid. It
must be remarked that quite
independently of the contractors
very bad work, the instructions
given for the preparation of
the foundations would have
alone sufficed, if duly carried
out, to render the failure of
the sluice highly probable. The
trench was to be cut, all soft
soil removed and refilled with
fresh sound earth, which was
to be well rammed. If any
made

vide also para
9 of report dated
1st May 1871
signed by Mr
Fraser.

This is a
very bad
example of
the failure of
the sluice
which was
to be cut
all soft
soil removed
and refilled
with fresh
sound earth
which was
to be well
rammed.

made earth was placed under
the sluice, settlements were a
natural result. The plan was
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continuous lines right through
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tion would be comparatively
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The highest rate for cotton soil
on a small tank of this
sort should not exceed a
Rupee for 12 to 14 cubic yards
exclusive of tamping, while
most of the work might
very well be done for 10 pice
the cubic yard. For closing
the breaches 4 annas a cubic
yard

yard for tamped earth, and
 2 annas for untamped, are
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 such

such rates, and secondly the
 people actually doing the work
 would not receive them or any-
 thing approaching them. I would
 therefore modify the earthwork
 of the part of the estimate
 as yet uncarried out as follows.

7269 Cys of Earthwork	at 1 anna	456-5-0
7269-- of tamping	at $1\frac{1}{2}$ pice a C42	56-12-7
3522-- of earthwork	at 1 anna	220-2-0
3522-- of tamping	thoroughly at 3 pice	55-0-6
Total Rupees		786-4-1
against Rupees 1341-13-6		Difference - 555-9-5

The revetment with new stone may
 also be struck out, and the
 backing thereto appertaining,
 the consequent reduction will
 be 1320 Cubic yards at $14 + 14 =$
 $1.2.0 = 148.5$. If new revetment
 be required, it should be brought
 forward separately. The tank
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 of wing, and a width of
 apex of $4\frac{1}{2}$ feet with little
 or no overfall would be a
 great waste of money. At
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 proper height, carried into
 the bund to 3 or 4 feet more
 than the height of the latter,
 and the bund revetted, with
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 answer the required purpose.
 Even adopting the design submitted
 in

*x i.e. so as to
 allow a slope
 of 1 to 1 to the
 earthworks at
 the junction.*

in its general features the
 alterations sketched would, with
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 uol District does in very
 good building stone, the work
 done should be both cheap
 and durable.

9. The items recommended for
 sanction are

Repairs

Raising & improving bund. Rupees 3470

do do do in earthworks 555-9-5

as above 1485-

new revetment & backing 206-6-7

Contingencies 2245 1225

minor new work

660

would

Colacamed
to August 1874.

Chief Engineer for Irrigation
To The Secretary to Govt. P.W.D.

5232

~~13~~
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Govt. of 1874 Madras.

PUBLIC WORKS.

The Dist. Engr.
Kurnool

Dated

Recd.

Encl. 6

G. O. 5 Sept. 1874, No. 2497

Nos. 56-58.

Muralidurga Tank
Kurnool District

Estimates in con-
-nection with the repair
of the Tank, sanctioned
with certain instructions
to the newly appointed
District Engineer.

56-58.

R. 201 Aug 1/74
Recd 11/8/74 Recd 18/8/74