

(1) Number of pages _____

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(3) Initials of the Referencer _____

MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	1743	Press
B.P. No.		Mis.
Dated	11-7-	6876 —195—

Not to be folded or roughly handled

Read the following :—

No. 83 W.

No. 152.

Note by Chief Engineer for Irrigation.

THE District Engineer, Kurnool, forwards, with his letter marginally noted, estimate in connection with the Yeldurty Tank situated in the Ramulkota Taluq, Kurnool Range.

2. The nature of the work proposed for execution and the heads of account to which it is chargeable are as follow :—

Ordinary Agricultural.

	Rs.
Reconstructing two anicuts which have been washed away. Repairs ...	1,430
Constructing an arched communication between top of bund and head of sluice. Original Works ...	150
Extending and replacing the masonry weir Original Works ...	3,220
Closing the breach and constructing a culvert and raising and repairing the bund. Repairs...	5,254
Total...	10,054

3. The following particulars of this tank are recorded :—

Ayacut area ...	Acres	234
Assessment ...	Rupees	926
Average revenue ...	„	1,076
Highest do. ...	„	1,440
Expenditure during the previous four years ...	„	410

The tank was breached in July 1875, and the closing of the breaches was immediately undertaken, but it gave way again in October following partly owing to the inadequacy of the surplus weir, and partly because at the breach site there is a spring which caused the saturation of the soil. A small estimate of Rupees 1,700 submitted by the District Engineer was not accepted pending a complete investigation of the real requirements of the tank.

The area of the catchment basin is about 70 square miles ; the maximum flood supply is calculated at 8,500 cubic feet per second, for discharging which as surplus there is one masonry weir 315 feet in length, which has been considerably damaged.

4. The following remarks on the provisions of the estimate are made :—

Construction of two anicuts, Rupees 1,430.—These were originally built of loose stone and were washed away when the tank was breached. They are for the purpose of conveying water to the field channels, much of the irrigation lying beyond the surplus channel across which the water has to be taken. The circumstances have been carefully gone into by the Range Officer, and these weirs, or a substitute for them, are necessary. It appears, however, to be preferable that were culverts or

under-tunnels substituted for anicuts, the outlay on construction and that on subsequent maintenance would be less, and the District Engineer should reconsider the arrangements. The field channel bed levels have not been noted. Rough estimates prepared in this office indicate that Rupees 750 will suffice for two under-tunnels.

5. *Arched communication to sluice, Rupees 150.*—The object of this work is to give access to the sluice head. The arrangement proposed is not altogether good, and the simplest plan would be to add wings to the head wall and to run out a bund with a top width of 1 yard to form a pathway. The item may stand, and the work indicated may be carried out if the District Engineer finds that the pathway can be completed for the amount.

6. *Extending and repairing the surplus weir, Rupees 3,220.*—A greater length of weir than that with which the tank has hitherto been provided is clearly necessary. The catchment basin of the tank is said to be 75 square miles in the General Report and 52 square miles in the Report, paragraph 11. On the atlas sheet the area appears to be 70 square miles, and, part of the basin being steep, the flood discharge may be assumed to be 8,500 cubic feet a second. As the weir will never be drowned, the full length of the crest, though not straight, may be deemed effective, and the total length required will be 485 feet, instead of 315 feet as before, to prevent M.W.L. being more than 3 feet above F.T.L. The report and estimate do not show clearly what the exact extent of work to be done to the weir is intended to be, but it is gathered from the papers that the whole of the apron of the old weir is to be relaid in a different manner, and that the extension is to be of the section shown on plan E. The design, as shown on this cross section, needs modification: 1st, the soil being black cotton soil, the foundations are inadequate, being, if the surface of the ground be correctly delineated, placed on that surface. The masonry must be carried down to a short distance below the surface and must be placed on a good bed of concrete about 2 feet deep and 2 feet wider than the masonry; 2nd, the form of the crest wall should be modified as noted; 3rd, the retaining wall should be flush with the first apron and not be raised above it; 4th, the first apron must be of masonry, not merely packed stone, the overfall being 6 feet; the uneven ground should be filled in with small stone well rammed to 3 feet below the surface of the apron, then a bed of concrete 1 foot thick should be laid down and thoroughly consolidated, then the apron stones should be laid on edge in mortar; the outer apron may be of dry stone packed as shown, but its surface should be 1 foot lower than that of the first apron; 5th, the wings are very unnecessarily long, and should be of the form shown by dotted lines on the plan and section; the wing as shown in section is of insufficient thickness, and should be altered as noted. No cross section of the old weir has been given, and it cannot be judged therefore how far there is a necessity for altering its arrangements, but as much of the old work as possible should be left as it is, it being remembered that when lengthened as intended the strain on it will be less. The estimate, moreover, does not distinguish between the repair and alteration of the old weir and the extension which will be altogether new, and so an approximate estimate for the revised section cannot be framed in this office. Pending the submission of a revised estimate, the original amount may stand.

The tank is very unfavorably situated as regards storage capacity in relation to catchment area. It is stated to fill with one night's heavy rain, and the surplus

discharge is very large compared with the quantity retained. It had been proposed by the Range Officer to repair the existing bund during the current, and to leave the construction of the weir extension till next year, but this last work should precede the former, for there can be no security to the tank till it is completed, and the first thing to be done will therefore be to provide for the discharge of flood water.

7. *Closing the breach, &c., Rupees 3,614.*—As already mentioned, an attempt was made to repair this breach, but the bund gave way again as soon as the tank filled, which it did before the breach closing had been fully completed. The cost of the work destroyed was Rupees 1,074, but Rupees 300 is recoverable in the shape of revetment stones which can be used again. The arrangements proposed for filling the breach and rendering it secure exhibit much careful consideration, but they are, it is thought, more costly than is necessary, and it is not generally desirable to depend upon a masonry wall without wings for connecting the two sides of a breach where the depth of water as in this case is great, viz., 21 feet with 21 feet as maximum. The best, and probably the cheapest, plan will be to place a puddle wall in the centre of the bund as shown on plan C. To prevent any evil effects from leakage under the base of the bund a drain will be necessary, and it should be arranged as shown on plan C, viz., a catch drain should run all along the back of the puddle wall, and from this a drain with a slope of one in thirty cut in the soft rock should be carried clear of the back of the bund, after which it must have an outfall into the surplus channel or otherwise, and the bed-fall after leaving the bund may be much less. The drain may be formed of irregular lumps of stone, and it will not need to be covered in with concrete; it will suffice if the surface interstices between the lumps be filled with stone chips and if turf sods be then laid on the top. The revetment should be carried down to a firm foundation in the rock; it should be 2 feet thick at the sill of sluice level and $2\frac{1}{2}$ feet at the foundation, the thickness being measured at right angles to the slope. The gravel backing should be 2 feet thick at bottom and 1 foot at top. An approximate estimate of the cost of closing the breach in this way is appended, and amounts to Rupees 1,920 against Rs. 3,614 of the rough estimate. The rates in the latter are some of them very high, e.g., $10\frac{1}{2}$ Annas for puddle; on the other hand $1\frac{1}{2}$ Annas for earthwork appeared to be somewhat low, and it has been raised to $1\frac{1}{2}$ Annas. The puddle wall is to be carried at least 6 feet into the undisturbed bund on either side of the breach. Should the latter have widened in the interval, about 20 Rupees a-foot run will be the cost of closing it.

Raising the bund.—In the specification report it is mentioned that, soil being scarce and bad alongside the bund, it is intended to carry out the raising with good gravel from the hill at one end of the bund, but, unless this gravel will bind well and be water-tight, it must not be used below 1 foot above M.W.L. For the upper 2 feet of the bund gravel will do very well, much better indeed than ordinary soil.

This year's revenue of this tank, or more than 1,000 Rupees, will have been lost, and it is desirable that the tank repairs should be completed before the rains of 1877. It is moreover essential that the lengthening of the surplus weir should proceed concurrently with the closing of the breach. Although, therefore, it has been shown that the estimate needs extensive revision, and, although also the cost of extending the weir will exceed the ordinary limit of Rupees 2,500 for minor works, the follow-

Proceedings of the Madras Government, Public Works Department,
11th July 1876. No. 1,743.

ing approximate estimate is recommended for sanction, pending the submission of a revised estimate prepared with reference to the remarks in this note, in order that the District Engineer may be enabled to make immediate arrangements for the collection of stone and other material for the rapid prosecution of the work when the rainy season is over, and that such work as can be done at once may be gone on with.

Repairs.						RS.
Under-tunnel above Timascutwah...	...	...	...	...	...	290
Do. below do.	...	...	...	...	...	460
Closing breach	...	...	...	...	...	1,920
Raising bund	...	...	...	...	...	1,640
Total						4,310

Original Works.						RS.
Extending and improving surplus weir...	...	...	...	...	...	3,220
Forming pathway to sluice	...	...	...	...	...	150
						3,370

Grand Total ... 7,680

It is only right to add to these remarks that, though a revision of the Range Officer's proposed arrangements has been considered desirable, the papers submitted in connection with the estimate exhibit much careful consideration, and do Mr. Johnston, the Assistant Engineer, credit.

(Signed) A. DEC. SCOTT, Major, R.E.,
Deputy Chief Engineer for Irrigation,
for Chief Engineer for Irrigation.

To the Secretary to Government, Public Works Department.

No. 153. ORDER THEREON, 11th July 1876, No. 1,743.

IRRIGATION, No. 12.

Account.

THE following estimate from the Kurnool Range, forwarded by the District Engineer, Kurnool, is sanctioned:—

YELDURTY TANK.

Irrigation.

Fund.	Class.	Particulars.	Amount.
Ordinary Agricultural.	Repairs ...	1. Under-tunnel above Timascutwah...	290
		2. Do. below do.	460
		3. Closing breach	1,920
		4. Raising bund	1,640
	Original Works...	5. Extending and improving surplus weir	3,220
		6. Forming pathway to sluice...	150
	Total		7,680

Proceedings of the Madras Government, Public Works Department,
11th July 1876. No. 1,743.

2. This sanction has been registered as No. 63 I. of 1876-77.

(True Extract.)

Colonel,

Offg. Under Secy. to Govt., P.W.D.

To the District Engineer, Kurnool.

„ Collector of Kurnool.

„ Chief Engineer for Irrigation.

„ Examiner of Public Works Accounts.

„ Revenue Department.

Exd. J. W. Fischer.

Spare Copies

OFFICE OF THE CHIEF ENGINEER
FOR IRRIGATION,1st July 1876.

No. 83-W.

Note by Chief Engineer for Irrigation.

Suslo 15 THE District Engineer, Kurnool
No. 2 forwards, with his letter marginally noted, Estimate in connection
Dated 23 Feb 1876 with the Gelidwity Tank situated in the
Samukota Taluq, Kurnool Range.

2. The nature of the work proposed for execution and the heads of account to which it is chargeable are as follow:—

Reconstructing 2 ariants which have been washed away	Repairs	14 30
Constructing an arched communication between top of bund and head of sluice		150
Extending & replacing the masonry weir		3,220
Closing the breach & constructing a culvert & raising and repairing the bund		5,254
	Rspees	10,054

3. The following particulars of this Tank are recorded—

Ayacut area. 234 Acres

Assessment. 926 Rspees

Average revenue. 1076 Rspees

Highest do. 1440 Rspees

Expenditure during the previous four years. 410 Rspees

The tank was breached in July 1875, and the closing of the breaches was immediately undertaken, but it gave way again in October following, partly owing to the inadequacy of the surplus weir, and partly because at the breach site there is a spring which caused the saturation of

the soil. A small estimate of Rupees 1700 submitted by the District Engineer was not accepted pending a complete investigation of the real requirements of the tank. No. 1453-14 Dec/77

The area of the catchment basin is ^{about 70} square miles; the maximum flood supply is calculated at 8500 cubic feet per second for discharging which, as surplus there is one masonry weir 315 feet in length which has been considerably damaged.

4. The following remarks on the provisions of the estimate are made.

Construction of two minicuts. Rs. 1430

These were originally built of loose stone and were washed away when the tank was breached. They are for the purpose of conveying water to the field channels much of the irrigation lying beyond the surplus channel across which the water has to be taken. The circumstances have been carefully gone into by the Range Officer, and these weirs or a substitute for them are necessary. It appears, however, to be preferable that were culverts or undertunnels substituted for minicuts, the outlay on construction and that

on subsequent maintenance would be less, and the District Engineer should reconsider the arrangements. The field channel bed levels have not been noted. Rough estimates prepared in this office indicate that Rupees 750 will suffice for two undertunnels.

5. Archway communication to sluice. Rs. 100

The object of this work is to give access to the sluice head. The arrangement proposed is not altogether good and the simplest plan would be to add wings to the head wall and to run out a bund with a top width of 1 yard to form a pathway. The item may stop and the work indicated may be carried out if the District Engineer finds that the pathway can be completed for the amount.

6. Extending & repairing the surplus weir. Rs. 3220. A greater length of weir than that with which the tank has hitherto been provided is clearly necessary. The catchment basin of the tank

is said to be 75 square miles in the General Report and 52 square miles in the Report, para 11. On the Atlas sheet the area appears to be 70 square miles and part of the basin being steep the flood discharge may be assumed to be 8000 cubic feet a second. As the weir will never be drowned the full length of the crest though not straight may be deemed effective, and the total length required will be 485 feet, instead of 315 feet as before, to prevent the W.L. being more than 3 feet above F.T.L. The report and estimate do not show clearly what the exact extent of work to be done to the weir is intended to be, but it is gathered from the papers that the whole of the apron of the old weir is to be relaid in a different manner and that the section is to be of the section shown on plan E. The design as shown on this cross section needs modification

6 3
1st The soil being black cotton soil the foundations are inadequate being if the surface of the ground be correctly delineated, placed on that surface. The masonry must be carried down to a short distance below the surface and must be placed on a good bed of concrete about 2 feet deep and 2 feet wider than the masonry.
2nd The form of the crest wall should be modified as noted; 3rd The retaining wall should be flush with the first apron and not be raised above it; 4th The first apron must be of masonry not merely packed stone, the overfall being 6 feet; the uneven ground should be filled in with small stone well rammed to 3 feet below the surface of the apron, then a bed of concrete 1 foot thick should be laid down and thoroughly consolidated, then the apron stones should be laid on edge in mortar. The outer apron may be of dry stone packed as shown, but its surface should be 1 foot lower than

that of the first apron. 5th The wings are very unnecessarily long and should be of the form shown by dotted lines on the plan and section. The wing as shown in section is of insufficient thickness and should be altered as noted. A cross section of the old weir has been given, and it cannot be judged therefore how far there is a necessity for altering its arrangements, but as much of the old work as possible should be left as it is, it being remembered that when lengthened as intended the strain on it will be less. The estimate moreover does not distinguish between the repair and alteration of the old weir, and the extension which will be altogether new, and so an approximate estimate for the revised section cannot be framed in this office. Pending the submission of a revised estimate the original amount may stand.

The tank is very unfavorably

7 4 5
situated as regards storage capacity in relation to catchment area. It is stated to fill with one night's heavy rain and the surplus discharge is very large compared with the quantity retained.

It had been proposed by the Charge officer to repair the existing bund during the current, and to leave the construction of the weir extension till next year, but this last work should precede the former for there can be no security to the tank till it is completed, and the first thing to be done will therefore be to provide for the discharge of flood water.

7. Closing the breach Rs 36 1/4

As already mentioned an attempt was made to repair this breach but the bund gave way again as soon as the tanks filled which it did before the breach closing had been fully completed. The cost of the work.

destroyed was Rs 1074, but Rs 300 is recoverable in the shape of revetment stones which can be used again. The arrangements proposed for filling the breach and rendering it secure exhibit much careful consideration, but they are it is thought more costly than is necessary, and it is not generally desirable to depend upon a masonry wall without wings for connecting the two sides of a breach where the depth of water as in this case is great, viz 21 feet with 24 feet as maximum. The best and probably the cheapest plan will be to place a puddle wall in the centre of the bund as shown on plan C. To prevent any evil effects from leakage under the base of the bund a drain will be necessary, and it should be arranged as shown on plan C, viz a catch drain should run all

8 5
along the back of the puddle wall and from this a drain with a slope of 1 in 30 cut in the soft rock should be carried clear of the back of the bund, after which it must have an outfall into the surplus channel or otherwise, and the bed fall after leaving the bund may be much less. The drain may be formed of irregular lumps of stone, and it will not need to be covered in with concrete; it will suffice if the surface interstices between the lumps be filled with stone chips, and if turf sods be then laid on the top. The revetment should be carried down to a firm foundation in the rock; it should be 2 feet thick at the sill of sluice level and $2\frac{1}{2}$ feet at the foundation the thickness being measured at right angles to the slope. The gravel backing should be 2 feet thick at bottom and 1 foot at top.

An approximate estimate of the cost of closing the breach in this way is appended and amounts to Rupees 1920 against $3\frac{1}{4}$ of the rough estimate. The rates in the latter are some of them very high e.g. $10\frac{1}{2}$ annas for puddle, on the other hand $1\frac{1}{3}$ annas for earth work appeared to be somewhat low, and it has been raised to $1\frac{1}{2}$ annas. The puddle wall is to be carried at least 6 feet into the undisturbed bund on either side of the breach. Should the latter have widened in the interval about 20 Rupees a foot run will be the cost of closing it.

Raising the bund. In the specification report it is mentioned that soil being scarce and bad alongside the bund it is intended to carry out the railing with good gravel from the hill at one end of the bund, but unless this gravel will bind well and be watertight

it must not be used below 1 foot above M. W. L. For the upper 2 feet ^{on} of the bund gravel will do very well, much better indeed than ordinary soil.

This year's revenue of this tank or more than 1000 Rupees will have been lost, and it is desirable that the tank repairs should be completed before the rains of 1877. It is moreover essential that the lengthening of the surplus weir should proceed concurrently with the closing of the breach. Although therefore it has been shown that the estimate needs extensive revision and although also the cost of extending the weir will exceed the ordinary limit of Rupees 2500 for minor works, the following approximate estimate is recommended for sanction, pending the submission of a revised estimate prepared with reference to the remarks in this note, in order

that the District Engineer may be enabled to make immediate arrangements for the collection of stone and other material for the rapid prosecution of the work when the rainy season is over and that such work as can be done at once may be gone on with.

Repairs

Under Tunnel above Trinacutmark	290
— do — below — do —	460
Closing breach	1920
Raising bund	1640
	<u>4310</u>

Original Works

Extending & improving surplus weir	3220
Forming pathway to sluice	150
	<u>3370</u>
<u>Grand Total Repairs</u>	<u>7680</u>

It is only right to add to these remarks that though a provision of the Range officer's proposed arrangements has been considered desirable, the papers submitted

in connection with the estimate exhibit much careful consideration, and do not Johnston, the Assistant Engineer, credit.

Adm Ltr.

Major R. B.

Dy. Chief Engr. for Design
for Chief Engr. for Design.

To

The Secretary to Govt P.W.D.

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P. W. 1876 Department
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Issue Case.

FORMER CASES.

Ch. No. 2509 of 1875
A " 1455 "

I. E. Form No. 31.

P. H. 1876. Department
Sd/-
The Chief Engineer for Irrigation.

Issue No.

Dated 1st July 1876.

LATER CASES.

R. No. 2 R.R. of 1876.
" 1 KR "

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18

W. of

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dated

REMINDERS ISSUED.

No. 1, dated 187
" 2, " "
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KEEP-WITH.

2nd 13 271
Cin 7-7-76 P.M. 11-7-76
H. Street 4 July

RECEIPT No.

H.C.
Dated 23rd Feb 1876.

Date d 1st July } 1876.
Received 15th "

80.83%.

Subject:—

Yaldurthy Tank. Kurnool
District. Submits estimates
to for repairing the —

ENCLOSURES.

15

13. annexes in D.R. letter.
1 D.R. letter 4th 23-276.
1 Appx. to the D.R. attached to the
15

E. I. Form No. 4.

No. 1743. M.D.
Proceedings of the Madras Govt.
Under date the 11 July/76
Read the following

Note by the Chief Eng. for
Irrigation } H.R. 27th July/76. No 83 W

The following Estimate from the Kurnool Range forwarded
by the District Engineer, Kurnool is sanctioned:—

Tank.

Yaldurthy.

Irrigation.

Irrigation.			
Fund	Class.	Particulars	Amount.
Ordinary Agricultural	Repairs	1. Under tunnel above Timascutnah	290
		2. - do - below - do -	460
		3. Closing breach	1920
		4. Raising bund	1640
	Original Works	Extending & improving surplus weir	3220
		Forming pathway to sluice	150

2. This sanction has been registered as No. 63 I. of 1876-77.

Sd/- Kurnool
Collection - do
C. E. for I. with 15 Encl.
Ex. H. W. C.
Recd 29/7/76

[Signature]

