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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	2604	Press	<i>Original</i>
B.P. No.		Mis.	
Dated	27-9-	1876	
		195-	

Not to be folded or roughly handled

Proceedings of the Madras Government, Public Works Department,
27th September 1876. No. 2,604

No 499. Read the following endorsement of the Chief Engineer for Irrigation, dated Ootacamund, 15th September 1876, No 190 W.—

From J O'SHAUGHNESSY, Esq, District Engineer of Nellore, to Lieutenant-Colonel J. MULLINS, R E, Chief Engineer for Irrigation, dated Nellore, 27th August 1876, No. 85

In reference to G O, dated the 7th December 1875, No. 3,455, I have the honor to submit a revised plan and estimate of the Nellore tank weir, which have been prepared in accordance with your instructions, No 14, dated the 26th May 1876

2 I have endeavoured to keep the estimate within the amount (Rupees 15,000) which you roughly calculated it would cost, but I have found it impossible to do so, and, considering the quality of the work, it will be cheap at a cost of 20,000 Rupees, the amount of the estimate now submitted.

3 It is probable that a further sum of 5 or 6 thousand Rupees will be added to the estimate in the Examiner's office an account of "Direction" and "Accounts." I do not think that these capricious charges, to works of this nature, are entirely fair, they are not distributed in a similar manner to individual minor works or to works of ordinary conservancy, nor does the practice obtain in other departments of public service, and, so far as this particular work is concerned, it would not make a farthing of difference in the cost of that portion of the Executive Government, which appertains to the Public Works Department, whether it was constructed or not

The proportional amount of labor appertaining to this work in the Offices of Direction and Accounts cannot possibly cost the sums that are likely to be charged to it under these heads of services, and it will be a misrepresentation of facts to say that it will cost 25 or 26 thousand Rupees, when it really costs only 20,000 Rupees. It appears, moreover, that the cost of Establishments are debited to such works twice over for in the summary of yearly accounts, which are produced by the Accounts Office The amounts in question appear to be again included in the total cost of Establishments. This is a very important matter, more especially in regard to works, the cost of which is compared with results, and I take this opportunity of bringing the matter to your notice.

You are, of course, aware that on the authority of the Government Order under reference the work in question is in progress The accompanying section shows the progress made up to this date, and, if funds are available, the work can be completed in the current official year.

In this case a further allotment of Rupees 7,742 will be required as follows.—

	RS	RS
Amount of estimate	...	20,000
Expenditure in 1875-76	... 2,258	
Allotted for 1876-77 (<i>vide</i> Irrigation Budget Item, No 19)	... 10,000	
Total Allotments	...	12,258
Balance required	...	7,742

Should there be any difficulty in allotting the balance of the estimate (Rupees 7,742) in the next year, the excavation of the escape channel estimated to cost Rupees 5,580, and the formation of the roadway estimated to cost Rupees 910, can be deferred

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until next year without inconvenience or loss, and the further allotment required in the current year will be 1,252 Rupees, or allowing for probable savings 1,000 Rupees as follows:—

Amount of estimate	...	...	...	...	...	20,000
Deduct cost of escape channel	...	...	...	...	5,580	
Approach road	...	...	...	...	910	
Probable savings	...	...	...	...	252	
Total deductions						6,742
Work to be executed to end of 1876-77	...	...	...	...	13,258	
Previous year's expenditure	...	...	...	...	2,258	
Allotments for current year	...	...	...	...	10,000	
Total						12,258
Further allotment required in current year						1,000

If this amount cannot be obtained from any other source at present at the disposal of Government, I beg to recommend

* *Vide* Irrigation Budget 1876-77, Item 52, 19,500
Deduct as per Chief Engineer's Memorandum, No 1,254, of 19th August 1876 5,000
Net allotment available ... 14,500

that it be taken from the amount allotted to the Pennair right bank from Nellore anicut to the sea, which appertains to the same head of service.

I enclose a list of the plans and papers which accompany this letter, and I request that the plans and estimates may be returned to me when no longer required in your office.

DEPARTMENT PUBLIC WORKS, NELLORE.

ESTIMATE No OF 1876-77.

Work—Surplus weir in the bank of the Nellore Tank.

References

- No. 1—District Engineer's letter to Chief Engineer for Irrigation, No 44, dated 22nd August 1874
- „ 2—Chief Engineer's Memorandum, No 665, dated 3rd September 1874.
- „ 3—District Engineer's letter to Chief Engineer for Irrigation, No. 65, dated 6th November 1875
- „ 4—Chief Engineer for Irrigation Memorandum, No 1,400, dated 26th November 1875.
- „ 5—G O, No 3,455, dated 7th December 1875
- „ 6—District Engineer's letter to Chief Engineer for Irrigation, No. 31, dated 19th May 1875.
- „ 7—Chief Engineer for Irrigation Memorandum, No. 14, dated 26th May 1875.

Report

In the first of the letters above referred to, the then District Engineer (the late Mr R. Smith) brought to notice certain defects in the disposal of the surplus water of the Nellore tank

This tank receives the drainage of 17 square miles, and by the formula now in use in the Irrigation Department $C^3 \sqrt{M^2}$ the surplus discharge amounts on certain occasions to 3,718 cubic feet per second as follows—

$$C^3 \sqrt{17^2} = 5625 \times 661 = 3,718.$$

It is scarcely necessary to mention that the occasions on which this discharge occurs is during heavy rains and when the tank is already full.

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The tank receives a large supply from the Pennair river also, but this is not brought into the calculation, because the river-supply can be cut off at the existing head sluice, and chiefly because river floods and heavy rains never occur at the same time

The surplus is now discharged by an old weir at the east end of the tank and is carried off by old channels a distance of about 16 miles in a south-easterly direction, where it falls into the Kundelairroo or Uppatairoo at a distance of about 5 miles from the sea. In former times this surplus was utilized by being turned into other tanks along the course of the old drainage channels which carried it off from the Nellore tank; but since the construction of what is known as the "Survapully Project," these tanks are supplied direct from the Pennair river. The surplus of the Nellore tank is now seldom or never utilized, and it runs directly to the sea by the drainage channel already described.

This drainage enters the main channel of the Survapully Project at a distance of about 2 miles below the Nellore tank, and provision was made for carrying it off by a surplus sluice about a mile lower down the channel. This provision is found to be insufficient, and the drainage forces its way through the banks of the Survapully channel, or heads back over the country, and thereby occasionally injures a considerable extent of cultivation. Even when the surplus is so limited in quantity as to be capable of being passed by the existing means under the Survapully channel, it floods a considerable quantity of low lands recently brought under cultivation below the Survapully channel, and under any circumstance the present means of carrying off the surplus of the Nellore tank is a source of danger and loss

To remedy these defects, the District Engineer proposed to close the old weir and to construct a new weir at a point in the tank bank where the surplus could be discharged direct into the Pennair river about 5 miles above the anicut.

In the second of the letters under reference Colonel J Mullins, R E, Chief Engineer for Irrigation, expressed his concurrence in the District Engineer's views, and he approved generally of the District Engineer's proposals. He decided, first, that provision should be made for the discharge of 3,000 cubic feet per second of the tank surplus direct to the Pennair, second, that the old weir should be altered, so that it would discharge at maximum tank level 712 feet per second into the old drainages, and he ordered the submission of plans and estimates for the necessary works in time for entry in the Budget of 1875-76

The great flood that occurred in the Pennair in October 1874, and the work of repairing the damage done by it, delayed the preparation of the designs and estimates, and it was not, until November 1875, that plans and estimates for the new weir only were submitted.

At the site selected for the proposed weir, the river margin is only 1,233 feet distant from the tank, and a public road passes between the tank and the river, the deep bed of the river is 8,855 feet from the tank and 27 feet lower than the full tank level, the river bed at the margin next the tank is only 14 64 feet below full tank level

The District Engineer proposed that the lowest apron of the weir should be at the level of the deep bed of the river, or 27 feet below the crest of the work, but, in order to avoid the deep cutting which would be rendered necessary between the tank and the river and the construction of a bridge where the road crosses the line of the escape channel, he proposed the construction of two weirs instead of one. The first weir with an overfall of 10½ feet in two drops to be in the tank bank, and the second weir with an overfall of 16 feet in three drops to be on the margin of the river, a distance of 943 feet from the first weir. The connecting channel was to be 10½ feet deep and 330 feet wide at bottom, and paved with stone at the road crossing

The crest of the weir was to be at full tank level, or 66 14 feet above mean sea level. The highest flood of the Pennair rose in 1874 to 67 55 feet + mean sea level or 1 49 feet + the proposed crest of the weir. To provide against the water of a similar flood entering the tank, cast iron posts were to be fixed in the body of the weir 6 11 apart from centre to centre and projecting 4 feet above the crest level, moveable wooden shutters were to be placed between the posts to let out river floods, and to retain at certain seasons water above full tank level for the supply of the Nellore town

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The weir was designed to be 195 feet 6 inches long from wing to wing, and, after deducting the space occupied by the cast iron posts, these would be 180 feet of clear waterway.

The tank bank is constructed to withstand a head of water up to 69 14 feet above M.S.L. or 3 feet above the crest of the proposed weir, and with the water at this level the weir would by the usual formula and with a co-efficient of 667 discharge 3337 5 feet per second, or 337 5 feet more than it was supposed to have to discharge.

Finally, the work was estimated to cost Rupees 24,000 as follows:—

Upper weir	10,180
Lower do.	10,600
Connecting channel	4,110
	<u>24,000</u>

In placing these estimates before Government the Chief Engineer for Irrigation remarked that it was not necessary to drop the surplus of the tank a depth of 27 feet as proposed, he considered a drop of 15 66 sufficient for the present, and that it should be provided for by one weir in the tank bank.

In case the discharge channel even scoured out to the level of the deep bed, additional steps could be attached to the weir and all chance of its being undermined prevented; he suggested that accommodation for traffic by Baboo Row's chuttrum road should be provided on the weir itself by turning it over one of the aprons of the weir which was to be made specially wide for the purpose.

The Chief Engineer calculated that, if the 9 or 10 millions cubic yards of water that would be held up in the tank between full and maximum tank levels was taken into account, a weir, 120 feet long, would probably be ample, but, considering the size and importance of the reservoir, he would, in order to secure perfect safety, allow the full length or 195 14 of weir proposed.

The Chief Engineer remarked that risk would be incurred by the use of post and planks instead of self-acting shutters for keeping out the river floods, and he directed that the proposal to keep the water in the reservoir above full tank level for the use of the Nellore town be fully considered before incurring the risks that would attend it.

Finally, the Chief Engineer decided upon having a revised design in accordance with the modifications enumerated above, and he recommended that the District Engineer be authorized to take immediate steps for the construction of the work.

In G.O., dated 7th December 1875, No. 3,455, the Government approved of the Chief Engineer's proposals, they ordered the submission of a revised estimate at an early date; and they directed that the work be proceeded with on the provision of Rupees 5,000 entered for it in the Budget of 1875-76. The collection and preparation of materials were at once commenced on the above authority, but, owing to the lamented death of Mr Smith shortly afterwards, nothing was done towards the preparation of the revised estimate before the end of the official year 1875-76.

On the arrival of the present District Engineer, the Executive Officer had arranged to proceed with the construction of the work, on the plan of upper weir originally designed by Mr Smith, and the Government Order last quoted was considered sufficient authority for doing so, but the District Engineer thought it better to wait until the revised design was fully decided upon, and he stopped the work for this purpose; he submitted on the 19th May a revised section of the work for the approval of the Chief Engineer for Irrigation. This section was further revised by the Chief Engineer, and it was sent back to the District Engineer with corrections and instructions on the 26th of the same month.

The only part of the work upon which the Chief Engineer did not give a decided opinion is the proposed addition of posts and shutters on the body of the work. It would have been as well perhaps to have raised the crest of the dam to the flood level of the Pennair, and so far as this is concerned, there would then be no necessity for the additional posts and shutters at all, and so far as the impounding of water to a certain level for the domestic use of

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the inhabitants of Nellore, the addition of posts and shutters would be useless, because the water is constantly drawn off for irrigation purposes, and it is quite impossible at present, by any combination of posts and shutters to keep the water at the level required, to supply the town.

It appears from the original estimate that the water was to be kept up to a height of 4 feet above the crest of the proposed weir for this purpose, that is to say, 1 foot above maximum tank level, nothing is said about this in the report or specification, but the dimensions of the posts and shutters provided in the estimate show that this could be done.

The shutters were to be fixed or removed by manual labor, and as no dependence whatever could be placed on the certainty that this work would be attended to at the proper time it would be very dangerous to shut up the weir to maximum tank level. It would be more than dangerous to hold the water up 1 foot above maximum tank level even if the agency for relieving the tank when necessary could be trusted to do so, but lascars cannot be trusted in these cases. They have no idea of the danger that would be incurred by sometimes neglecting to remove the shutters, they would neglect to do so, sometimes through laziness, and they might at other times be bribed to keep the shutters in the work when they should be removed.

Under all these circumstances, it is considered better to place the safety of the tank beyond dependence on the energy or honesty of a lascar and beyond doubt. The posts provided for in the revised design are therefore to project only 1 14 feet above the crest or 1 68 inches above the Pennair flood level, and the river water will be shut out by flap shutters working in a horizontal bar which will run along through the tops of the posts. The length of the dam is no doubt much greater than it need be, and, even should these shutters be fastened down, there will be no occasion to fear for the safety of the tank. With the exception of the posts and shutters for keeping out the Pennair flood water, and regarding which the Chief Engineer ordered further inquiry, the plans and estimates now forwarded are in accordance with the Chief Engineer's sketch design and written instructions.

The estimate amounts to Rupees 20,000 as follows:—

Weir	13,510
Approaches	910
Escape channel	5,580
Total	<u>20,000</u>

The Chief Engineer roughly estimated that the work could probably be done for 15,000 Rupees, and, with the exception of the latente, there is no material difference between the rates in the revised and in the original estimate, but the quantities are much greater, especially in the escape channel, and the provision of a roadway on the work adds very much to the cost in comparison with the quantities and cost of the upper weir in the original estimate. The plans and estimates for the alterations of the old calingulah, ordered in connection with this work, will be submitted at an early date.

NELLORE,
27th August 1876

(Signed) J O'SHAUGHNESSY,
District Engineer

CAPITAL ORDINARY—ORIGINAL WORKS—N RESERVOIRS

DEPARTMENT PUBLIC WORKS—NELLORE DISTRICT

Revised Abstract Estimate No. of 1876-77.

WORK—Constructing a surplus weir in the bank of the Nellore Tank

Contents.	Particulars.	Rate.	Per	Amount	Total.
	<i>Body Wall</i>	RS A. P.		RS A. P.	RS. A. P.
43 1/2 C. yds.	Concrete	3 2 0	C yd.	132 15 9	
253 1/2 "	Brick in chunam	4 8 0	"	1,140 12 0	
26 1/2 "	Latente do	8 0 0	"	210 10 8	
24 5/8 sq. ft.	Plaster	2 8 0	Sq. ft.	61 4 0	
212 C. yds.	Puddle work	0 4 6	C yd.	59 10 0	
					<u>1,605 4 5</u>

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Work.—Constructing a surplus weir, &c.—(Continued)

Contents	Particulars	Rate	Per	Amount	Total
	1st Wing Wall.	RS. A. P.		RS. A. P.	RS. A. P.
25½ C. yards.	Concrete	3 2 0	C. yd.	80 3 4	
165 " "	Brick in chunam	4 8 0	"	742 8 0	
6½ squares	Pointing	2 8 0	Sqrs.	21 4 0	
					843 15 4
	1st Retaining Wall.				
36½ C. yards.	Concrete	3 2 0	C. yd.	113 1 3	
114 " "	Brick in chunam	4 8 0	"	514 0 0	
7 squares	Pointing	2 8 0	Sqrs.	17 8 0	
					643 9 3
	1st Floor				
24½ C. yards	Concrete	3 2 0	C. yd.	77 6 10	
24½ " "	Brick in chunam	4 8 0	"	111 8 0	
47½ " "	Laterite in chunam	8 0 0	"	379 8 11	
138 squares	Pointing	2 8 0	Sqrs.	34 8 0	
					602 15 9
	2nd Retaining Wall				
33 C. yards	Concrete	3 2 0	C. yd.	103 2 0	
91 " "	Brick in chunam	4 8 0	"	409 8 0	
					512 10 0
	2nd Floor.				
44½ C. yards	Concrete	3 2 0	"	138 3 1	
51½ " "	Brick in chunam	4 8 0	"	232 0 0	
70 " "	Laterite in chunam	8 0 0	"	560 0 0	
20 squares	Pointing	2 8 0	Sqrs.	50 0 0	
					980 3 1
	Cyclopean Rubble Floor				
120½ C. yards	Concrete	3 2 0	C. yd.	377 6 11	
211½ " "	Cyclopean rubble in hydraulic mortar	4 9 0	"	1,102 9 8	
					1,480 0 7
	2nd Wing Wall.				
16½ C. yards	Concrete	3 2 0	"	51 0 8	
108 " "	Brick in chunam	4 8 0	"	486 0 0	
6 squares	Pointing	2 8 0	Sqrs.	15 0 0	
					552 0 8
	3rd Retaining Wall				
29½ C. yards	Concrete	3 2 0	C. yd.	91 6 6	
138½ " "	Brick in chunam	4 8 0	"	623 4 0	
9½ squares	Pointing	2 8 0	Sqrs.	23 2 0	
					737 12 6
	Last Floor.				
47½ C. yards	Concrete	3 2 0	C. yd.	148 7 0	
48 " "	Brick in chunam	4 8 0	"	216 0 0	
69½ " "	Laterite in chunam	8 0 0	"	554 10 8	
18 squares	Pointing	2 8 0	Sqrs.	45 0 0	
					1 8
	Last Retaining Wall				
36½ C. yards	Brick cubes	4 8 0	C. yd.	161 4 0	
100½ " "	Brick in chunam	4 8 0	"	453 0 0	
					17 12 0

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27th September 1876. No. 2,604.

Work.—Constructing a surplus weir, &c.—(Continued)

Contents	Particulars	Rate	Per	Amount	Total
	Apron.	RS. A. P.		RS. A. P.	RS. A. P.
227½ C. yards	Rubble apron	1 14 0	C. yd.	427 1 4	
					427 1 4
	Pitching				
20½ C. yards	Rubble pitching	2 0 0	"	41 5 4	
6½ " "	Gravel backing	1 0 0	"	6 3 6	
					47 8 10
1,532 C. yards	Earthwork for removing the old bank.	0 1 6	"	143 10 0	
					143 10 0
				1,589 4 0	1,589 4 0
8,476 C. yards	Excavating foundations and filling in	0 3 0	"	248 0 0	
					248 0 0
31	Cast iron posts 3 feet high	8 0 0	Each.	360 0 0	
					360 0 0
30	Teak shutters 6 feet 4 inches × 2½ inches × 1½ feet including iron bands and rings	12 0 0			
	Baling			450 0 0	
					450 0 0
	Superintendence				326 0 0
	Sundries				50 0 0
	Contingencies				328 2 7
	Total				13,510 0 0
	Forming road approaches				
738 C. yards	Earthwork	0 2 6	C. yd.	115 5 0	
175 " "	Rough stone revetment on both sides	2 0 0	"	350 0 0	
60 " "	Metalling	1 4 0	"	75 0 0	
101 " "	Gravelling 3 inches do	0 14 0	"	88 6 0	
139½ " "	Metalling for forming road beyond approaches	1 4 0	"	174 2 8	
69½ " "	Gravelling for do	0 14 0	"	60 15 4	
	Superintendence			18 0 0	
	Sundries			10 0 0	
	Contingencies			18 3 0	
	Total				910 0 0
	Cutting Channel				
184,870 C. ft	Sixty feet cut—Earthwork	0 4 6	100	520 0 0	
					520 0 0
1886 " "	Widening to 200 feet—Earthwork	0 1 0		269 0 0	
					41 0 0
					830 0 0
					350 4 0
	Total				15,600 0 0

(Signed) J O'SHAUGHNESSY,
District Engineer,

27th August 1876

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SUBMITTED for the consideration of Government with reference to G.O., No. 3,455, of the 7th December 1875.

2. The report drawn up by the District Engineer affords a full account of the several steps taken in connection with the designing of the new surplus weir of the Nellore tank, and of the reasons why the detailed estimate submitted by the District Engineer exceeds the approximate estimate of Rupees 15,000 mentioned by the undersigned. The difference is principally due to the cost of the surplus channel, and there is no occasion fortunately for incurring the great expense on this account provided for in the estimate. It is one thing to found the masonry at a level believed to be quite safe, and another to cut a great channel to a corresponding level when the surplus will find its way into the river without difficulty if much less costly arrangements be adopted.

Rupees 20,000.

3. The estimate as submitted by the District Engineer consists of three items:—

	RS.
Surplus weir	13,510
Road approaches ..	910
Surplus channel	5,580
Total ...	20,000

Regarding the first it may be remarked that the rates appear to be higher than they should be, and this impression is strengthened by the circumstance that in the second item the rate for such very simple work as the earthwork of the road approaches is $2\frac{1}{2}$ Annas a cubic yard.

4. The surplus channel should be arranged as follows:—

1st—The bed need not be placed lower than 56 00 at its upper end, and should run to and terminate at the old channel shown on the site survey.

2nd—The width of the artificial cut should be made in the first instance 60 feet only, with vertical sides, as shown by dotted lines on the site survey. Afterwards the sides of this cut can be loosened with crowbars when the weir is discharging, and the soil will then be washed away.

3rd—The spoil banks to be made up to 6 feet above the bed of the 60 feet cut and to be placed about 120 feet from the centre line of channel to inside top line of spoil bank.

5. The cost of the channel with these arrangements will approximately be as follow:—

The deepest cutting will be $6\frac{1}{2}$ feet, and the greatest lift will not much exceed this while the lead will be about 50 yards, the rate for the 60 feet cut may therefore be taken as $1\frac{1}{4}$ Annas a cubic yard, or say $4\frac{1}{2}$ Annas for 100 cubic feet. The quantity and cost of excavation of this cut will be—

	RS.
184,870 cubic feet, at $4\frac{1}{2}$ Annas per 100	520
The further widening of the channel with the aid of the surplus water will not cost more than 1 Anna a 100 cubic feet. The quantity of soil to be removed will be 429,886 cubic feet, at 1 Anna per 100	269
Sundries and Contingencies	41

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6. The swing flood shutters should be removeable, as they will only rarely be wanted, and for them a shed should be built near the junction of the tank bund and river flood bank and just behind the latter. Rupees 350 will suffice.

7. The estimate will then become—

	RS.
Surplus weir	13,510
Road approaches	910
Surplus channel	830
Shutter shed	350
Total ...	15,600

and this may be sanctioned.

(Signed) JOHN MULLINS, Lt.-Col, R.E.,
Chief Engineer for Irrigation

No. 500. ORDER THEREON, 27th September 1876, No. 2,604.

IRRIGATION, No. 50-A.

Account

THE regular estimate, which, as revised by the Chief Engineer for Irrigation, amounts to Rupees 15,600 for constructing a new surplus weir for the

Nellore tank, is sanctioned as follows, in supersession of the approximate estimate of Rupees 15,000 which was approved in G.O., No. 3,455, of the 7th December 1875 —

PENNAIR ANICUT SYSTEM.

IRRIGATION.

Capital Ordinary.

Main-head —...

Sub-head —N, Reservoirs Nellore tank

Name of Work —Constructing surplus weir

Amount of Estimate —Rupees 15,600.

and the work will be carried out by the Public Works Department

This sanction has been registered as No. 160-I. of 1876-77.

	RS.
2 It appears that the expenditure on this work in 1875-76 was	2,258
the Budget provision of 1876-77 is	10,000

	12,258
Sum required to complete	3,342

and as the weir must be completed and the Government have no funds under Capital Ordinary available for transfer, the Government of India will be requested to sanction the transfer of Rupees 3,342 from the allotment of Rupees 19,500 made in the Budget, Item No. 299, for the flood embankment from the anicut to the sea, under Ordinary Agricultural, Original Works

(True Extract.)

(Signed) G. W. WALKER, Major-General, R.E.,
Secretary to Government.

To the District Engineer, Nellore
" Collector of Nellore
" Chief Engineer for Irrigation
" Examiner of Public Works Accounts
" Revenue Department.

Exd A Grt
Copy

Letter from D. L. Dillmore. No 86 of 27 Aug 1876
No 190-44.

Encls. 12

Submitted for the consideration
of Government with reference to
G.O. No 3455 of the 7th December
1876.

Rupus 20,000

The report drawn up by the
District Engineer affords a full
account of the several steps taken
in connection with the designing
of the new surplus weir of the Staller
Tank, and of the reasons why the
detailed estimate submitted by the
District Engineer exceeds the approxi-
mate estimate of Rupus 15,000 men-
tioned by the undersigned. The difference
is principally due to the cost of the
surplus channel, and there is no
occasion fortunately for incurring
the great expense on this account
provided for in the estimate. It is
one thing to found the masonry
at a level believed to be quite
safe, and another to cut a great
channel to a corresponding level

when the surplus will find its way
into the river without difficulty
if much less costly arrangements
be adopted.

3. The estimate as submitted
by the District Engineer consists
of 3 items -

Surplus weir	Rs 13,570
Road approaches	910
Surplus channel	5,580
<u>Total</u>	<u>20,000</u>

Regarding the first it may be re-
marked that the rates appear to be
higher than they should be and
this impression is strengthened by the
circumstance that in the 2nd item
the rate for such very simple work
as the earthwork of the road approaches
is $2\frac{1}{2}$ annas a cubic yard.

4. The surplus channel should
be arranged as follows -

1st The bed need not be placed
lower than 56.00 at its upper end
and should run to and terminate

at the old channel shown on the
site survey.

2nd The width of the artificial
cut should be made in the first
instance 60 feet only, with vertical
sides, as shown by dotted lines on
the site survey. Afterwards the sides of
this cut can be loosened with crowbars
when the weir is discharging and the
soil will then be washed away.

3rd The spoil banks to be made
up to 6 feet above the bed of the 60
feet cut and to be placed about 120
feet from the centre line of channel
to inside top line of spoil bank.

5. The cost of the channel with
these arrangements will approximately
be as follows -

The deepest cutting will be $6\frac{3}{4}$ feet
and the greatest lift will not much
exceed this while the head will be about
50 yards, the rate for the 60 feet cut
may therefore be taken as $1\frac{1}{4}$ annas
a cubic yard, or say $1\frac{1}{2}$ annas for

100 cubic feet. The quantity and cost of excavation of this cut will be

184,870 cubic feet at $4\frac{1}{2}$ annas per 100 =
Rs 520.

The further widening of the channel with the aid of the surplus water will not cost more than 1 anna

on 100 cubic feet. The quantity of earth to be removed will be 429,000 cubic feet at 1 anna per 100 = Rs 269

of contingencies & contingencies = 41
Total Rspees 830

6 annas. The wing flood shutters should be removable, as they will only rarely be wanted and for them a shed should be built near the junction of the tank bund and river flood bank and just behind the latter. Rspees 350 will suffice.

2. The estimates will then become
Surplus water Rspees 13570
Road approaches — 910
Surplus channel — 830
Shutter shed — 350
Total 15660

and this may be sanctioned.

As a command of John Bullins Lt Colonel &c
15th Sept: 1876
Chief Engineer for Irrigation

of the

idea?

is - 27 -

has subject that will

is a change of mind -

justly 30 at only the

nature of the matter has not

discussed -

highly that at the same time

is a change of mind -

P.W.D.

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

Dated 15th 3 Sept 1876.
Dep.

Encls 12

N: 190-W

Nellore Tank Surplus was -
- Submitted for consideration,
letter from the D.E., forwarding
revised estimate for constructing
the — & recommended that
sanction to the extent of Rs. 1500
be given to the estimate.

18499

Form No. 22.

PROCEEDINGS of the MADRAS GOVERNMENT

Under date the 27 Sept/76

Read the following —

Indorsement of the Chief Engineer
for Irrigation
N. 190-W. 27 Sept 1876.

The regular estimate,
which as provided by the
Chief Engineer for Irrigation,
amounts to Rs. 1500,
for constructing a new
surplus weir for the
Nellore Tank is sanc-
tioned as follows, in
supercessions of the
approximate estimate
of Rs. 15,000 which
was approved in G. O.
N. 3455 of the 7th December
1875.

Amara

Permanant system.

Irrigation

Capital - Ordinary

Main head —

Subhead - N. Reservoirs. Kallare Tank

Name of work - Constructing surplus weir

Amount of estimate - Rupees 15,000

and the work will be carried out by the P.W.D.

This sanction has been

registered at No. 100.I of

1876-77. It appears that the

expenditure on this work

in 75-76 was Rupees 2258.

The Budget provision with

of 1876-77 is $\frac{10000}{12258}$

Sum required to be

complete - 3342

and as the weir is not

the completed and the

Government have no

funds under Capital

Ordinary available for

transfer, the Government

of India will be requested to sanction the transfer of Rupees 3342 from the allotment of Rupees 19500 made in the Budget, Item No. 298, for the flood embankment from the river to the sea, under Ordinary Agricultural, Original Works.

May 15/9

S.E. Kallare ✓
Collection - do - ✓
C.E. for S. ✓
Encl. P.W.D. ✓
Receipt ✓
all with Original Enclosures.
4
Depd - 2nd hour 6

700
Govt. of 1876 Madras.
PUBLIC WORKS.

To

Mr. A. A. Sallu

Dated

Issued

Recd

Encl

G O, 27th 1876, No. 2004

Nos. 499-500

But in Regd.
2-11-76

New surplus Weir for the
Nellore Tank - Nellore S.
Squaring - P.
on the basis of
Estimate for constructing
a _____ & providing
by transfer the balance
required for the completion
of the work.